Supplementary Table 1: Baseline characteristics and incident outcomes in the overall MIPS cohort and by vitamin D category.

Baseline Characteristics	All (n = 535)	Normal (>30ng/mL) (n = 256)	Insufficiency (20-30ng/mL) (n = 163)	Deficiency (<20ng/mL) (n = 116)
Age (years)	64.0 (9.0)	65.0 (8.0)	63.0 (8.0)	62.0 (9.0)[A]
Male	415 (77.6%)	192 (75.0%)	138 (84.7%)	85 (73.3%)[AB]
Black Race	134 (25.0%)	36 (14.1%)	41 (25.2%)	57 (49.1%)[AB]
BMI, kg/m^2	29.7 (5.2)	28.8 (4.7)	30.4 (5.4)	30.7 (5.5)[A]
Current or Former Smoker	322 (60.2%)	151 (59.0%)	94 (57.7%)	77 (66.4%)
History of Hypertension	394 (73.6%)	179 (69.9%)	126 (77.3%)	89 (76.7%)
History of Hyperlipidemia	441 (82.4%)	215 (84.0%)	127 (77.9%)	99 (85.3%)[A]
History of Diabetes	167 (31.2%)	59 (23.0%)	56 (34.4%)	52 (44.8%)[A]
CHD	348 (65.0%)	166 (64.8%)	109 (66.9%)	73 (62.9%)
History of MI	167 (31.2%)	75 (29.3%)	50 (30.7%)	42 (36.2%)[A]
History of Heart Failure	78 (14.6%)	27 (10.5%)	25 (15.3%)	26 (22.4%)[A]
History of CABG	176 (32.9%)	84 (32.8%)	52 (31.9%)	40 (34.5%)
eGFR, mL/min/1.73 m^2	81.7 (22.2)	81.2 (19.6)	83.4 (23.7)	80.2 (25.5)[A]
Medications				
ACEi/ARB Use	339 (63.4%)	109 (42.6%)	104 (63.8%)	81 (69.8%)
Beta-blocker Use	393 (73.5%)	45 (17.6%)	123 (75.5%)	94 (81.0%)[A]
Statin Use	457 (85.4%)	176 (68.8%)	137 (84.0%)	100 (86.2%)
Aspirin Use	462 (86.4%)	220 (85.9%)	142 (87.1%)	101 (87.1%)[A]
Plavix Use	162 (30.3%)	219 (85.5%)	40 (24.5%)	43 (37.1%)[A]
Events				
All-cause Death	52 (9.7%)	17 (6.6%)	16 (9.8%)	19 (16.4%)[A]
Cardiovascular Death	28 (5.2%%)	7 (2.7%)	10 (6.1%)	11 (9.5%)[A]
Myocardial Infarction	36 (6.7%)	12 (4.7%)	15 (9.2%)	9 (7.8%)

Continuous variables are presented as mean [SD], categorical variables as count (percentage). Letter superscripts denote significant differences ($p<0.05$) in column means/proportions between the vitamin D deficient group and either normal[A] or insufficient[B] groups.

Supplementary Table 2: Relationship between VDD and adverse outcomes in the validation cohort.

Outcome	N	Model	HR [95% CI]	P-value
All-cause death	535	Unadjusted	2.64 [1.34 – 5.19]	**0.005**
		1	2.97 [1.45 – 6.09]	**0.003**
		2	3.54 [1.52 – 8.26]	**0.003**
		3	3.41 [1.46 – 7.96]	**0.005**
Cardiovascular death	534	Unadjusted	2.91 [1.17 – 7.23]	**0.022**
		1	2.71 [1.03 – 7.14]	**0.044**
		2	5.17 [1.57 – 17.05]	**0.007**
		3	4.93 [1.46 – 16.61]	**0.010**

Cox models investigated the relationship between VDD and 5-year adverse outcomes in the MIPS validation cohort.

Model 1 was adjusted for age, sex, Black race, BMI, and current/former smoking history.

Model 2: Model 1 + hypertension, hyperlipidemia, diabetes, CHD, heart failure history, and eGFR.

Model 3: Model 2 + aspirin, ACEi/ARB, and statin use.

Supplementary Table 3: Relationship between hsCRP and adverse outcomes.

Outcome	N	Model	HR/sHR [95% CI]	P-value
All-cause death	5,406	Unadjusted	1.92 [1.69 – 2.19]	**<0.001**
		1	2.16 [1.88 – 2.48]	**<0.001**
		2	1.95 [1.68 – 2.28]	**<0.001**
		3	1.91 [1.64 – 2.23]	**<0.001**
CV death	5,406	Unadjusted	2.06 [1.71 – 2.49]	**<0.001**
		1	2.17 [1.79 – 2.64]	**<0.001**
		2	1.86 [1.54 – 2.26]	**<0.001**
		3	1.85 [1.52 – 2.25]	**<0.001**
MACE	5,379	Unadjusted	1.31 [1.15 – 1.48]	**<0.001**
		1	1.38 [1.21 – 1.57]	**<0.001**
		2	1.27 [1.11 – 1.44]	**<0.001**
		3	1.28 [1.12 – 1.46]	**<0.001**

Cox (all-cause death) and Fine-Gray models (cardiovascular death, MACE) investigated the relationship between hsCRP elevation above the median (>3mg/L) and adverse outcomes.

Covariates included in models are the same as defined in Supplementary Table 2.

Supplementary Table 4: Relationship between hsCRP and adverse outcomes in the validation cohort.

Outcome	N	Model	HR [95% CI]	P-value
All-cause death	535	Unadjusted	1.79 [0.90 – 3.56]	0.096
		1	1.82 [0.89 – 3.72]	0.10
		2	1.34 [0.62 – 2.91]	0.45
		3	1.44 [0.66 – 3.11]	0.36
Cardiovascular death	534	Unadjusted	2.30 [0.87 – 6.05]	0.092
		1	2.36 [0.86 – 6.46]	0.095
		2	1.65 [0.58 – 4.69]	0.34
		3	2.02 [0.70 – 5.82]	0.19

Cox models investigated the relationship between hsCRP elevation above the median (>1.7mg/L) and adverse outcomes in the validation cohort.

Covariates included in models are the same as defined in previous tables.

Supplementary Table 5: Relationship between VDD, inflammation, CPCs, and cardiovascular mortality in the validation cohort.

Vitamin D and hsCRP status	**N**	**HR [95% CI]**	**P-value**
No VDD, <median hsCRP	190	Referent	Referent
VDD, >median	40	7.91 [1.30 – 48.38]	**0.025**
No VDD, >median	170	2.23 [0.55 – 9.01]	0.26
VDD, >median	57	9.21 [1.73 – 49.02]	**0.009**
Vitamin D and CD34+ count status	**N**	**HR [95% CI]**	**P-value**
No VDD, >median CD34+ count	172	Referent	Referent
VDD, >median	42	3.29 [0.65 – 16.80]	0.15
No VDD, <median	171	0.55 [0.14 – 2.10]	0.38
VDD, <median	54	4.27 [1.06 – 17.18]	**0.041**

Cox models investigated the relationship between VDD, hsCRP, CD34+ CPC count, and cardiovascular mortality. Models were adjusted for covariates in Model 2 in previous tables. The median hsCRP level (1.7mg/L) and CD34+ cell count (1.5956 cells/μL) were determined from the MIPS validation cohort.

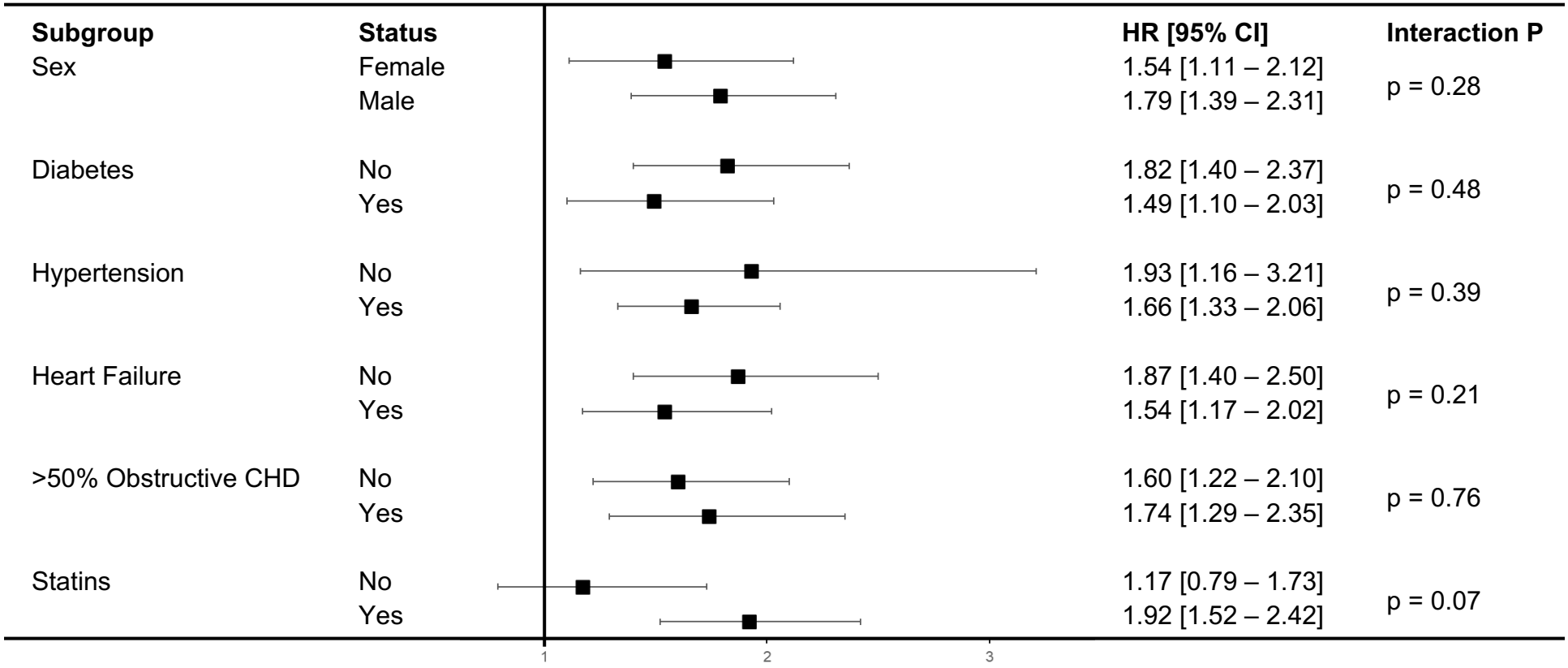
Figure Legends:

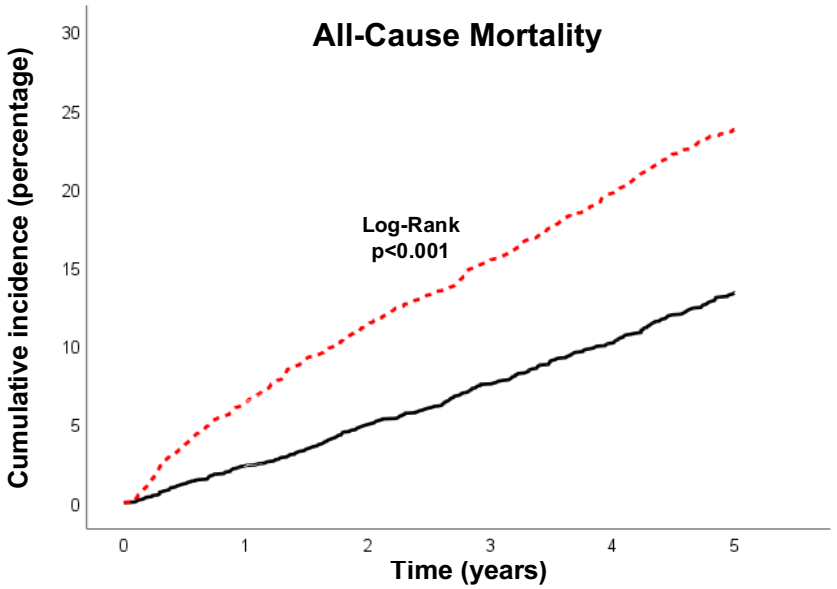
Supplementary Figure 1: Sensitivity analysis of VDD and cardiovascular death for each subgroup in the EmCAB. Cox models investigated the relationship between VDD (25-hydroxyvitamin D<20 ng/mL) and cardiovascular mortality. Model was adjusted for covariates including age, sex, Black race, BMI, and current/former smoking history, hypertension, hyperlipidemia, diabetes, CHD, heart failure history, eGFR, aspirin use, ACEi/ARB use, and statin use. N=4,426.

Supplementary Figure 2: Cumulative incidence of outcomes including A) all-cause mortality, B) cardiovascular death, and C) MACE by hsCRP level either ≤3mg/L or >3mg/L. Incidence of all three outcomes was significantly higher ($p<0.001$) in individuals with hsCRP>3mg/L than in those with levels ≤3mg/L. N=5,406 for all-cause mortality and cardiovascular mortality, N=5,379 for MACE.

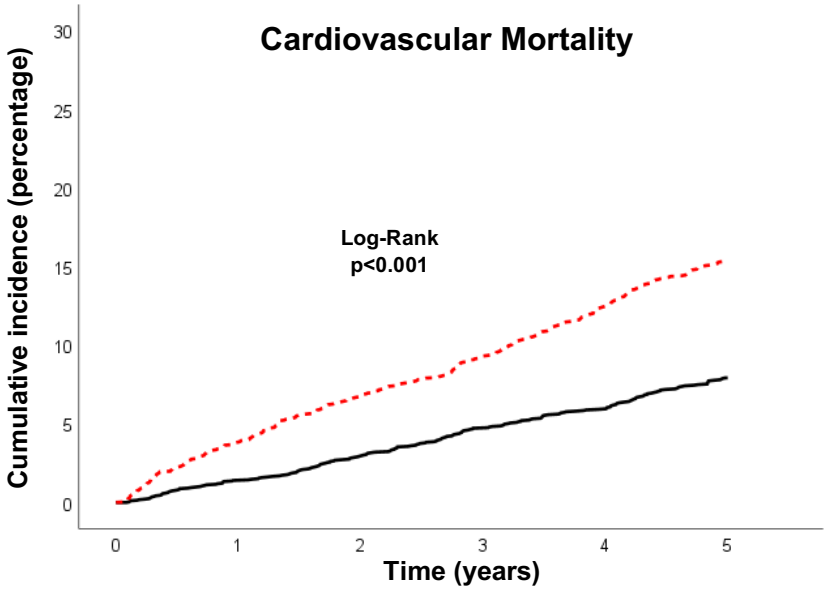
Supplementary Figure 3: Cumulative incidence of outcomes including A) all-cause death, B) cardiovascular death, and C) MACE by CD34+ cell count relative to median (1.6924 cells/μL). Incidence of all-cause mortality and cardiovascular mortality were significantly higher in individuals with CD34+ cell counts beneath the median than in those with counts above the median. N=1,506 for all events.

Supplementary Figure 1: Sensitivity analysis of VDD and cardiovascular death for each subgroup in the EmCAB.

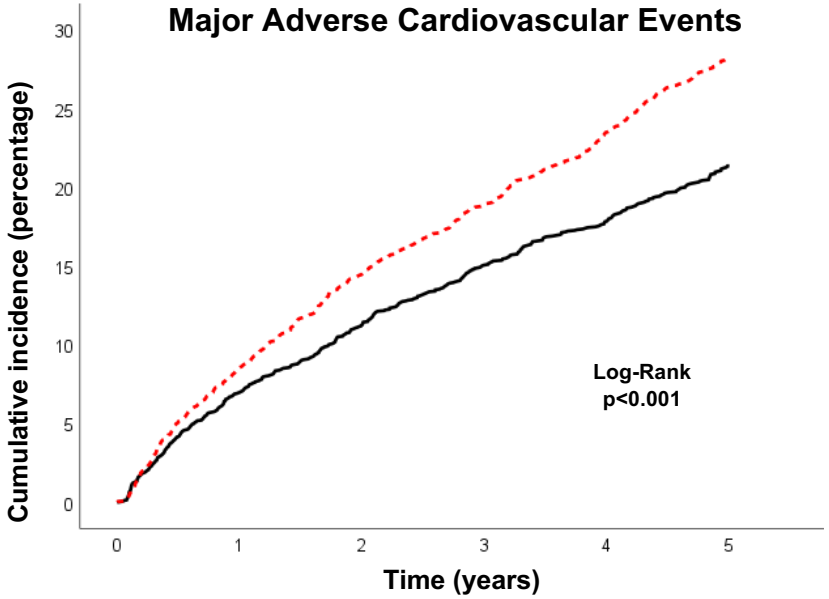




0	161	282	382	486	583	Events
2530	2356	2162	2060	1942	1831	At-risk
0	67	140	211	283	371	Events
2876	2786	2631	2556	2469	2357	At-risk



0	95	164	223	294	358
2530	2356	2162	2060	1942	1831
0	40	82	130	162	214
2876	2786	2631	2556	2469	2357



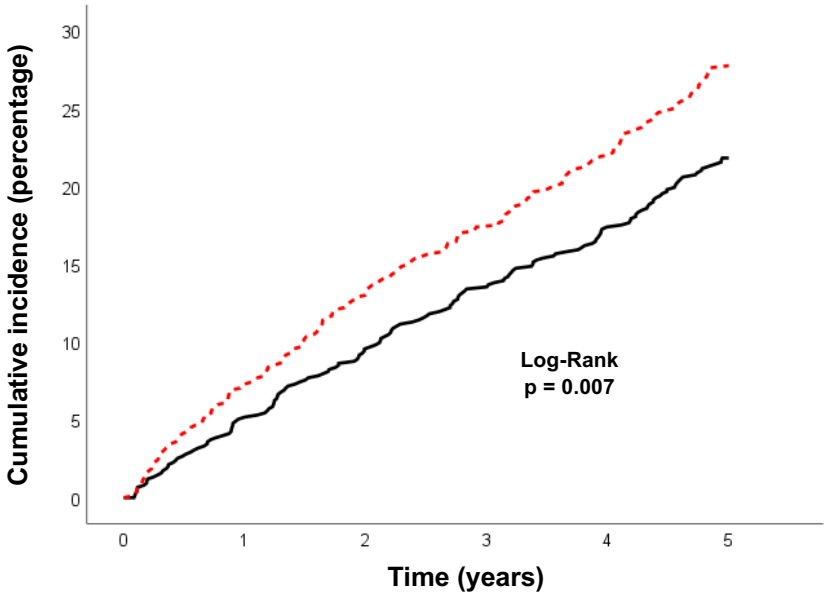
0	207	336	426	510	593
2519	2165	1787	1561	1370	1198
0	194	303	395	457	532
2860	2551	2183	1974	1791	1607

hsCRP status

——— ≤3mg/L (n = 2,876 for mortality, n = 2,860 for MACE)

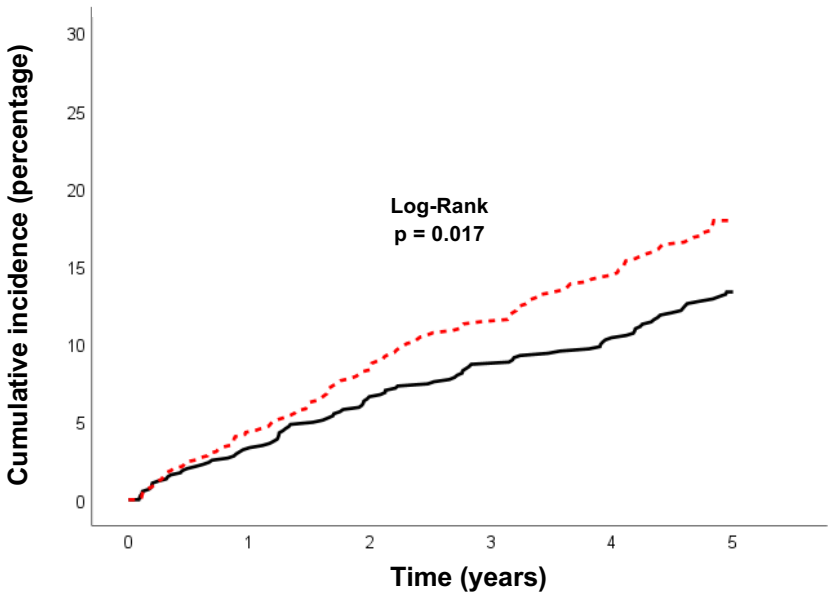
- - - - >3mg/L (n = 2,530 for mortality, n = 2,519 for MACE)

All-Cause Mortality



0	54	98	131	165	208	Events
753	699	655	622	582	523	At-risk
0	38	72	101	131	164	Events
753	715	681	652	620	576	At-risk

Cardiovascular Mortality



0	32	61	83	103	127
753	699	655	622	582	523
0	24	49	64	76	96
753	715	681	652	620	576

CD34+/CD45med cell count

——— >median (n = 753)

- - - - ≤median (n = 753)