Supplemental material

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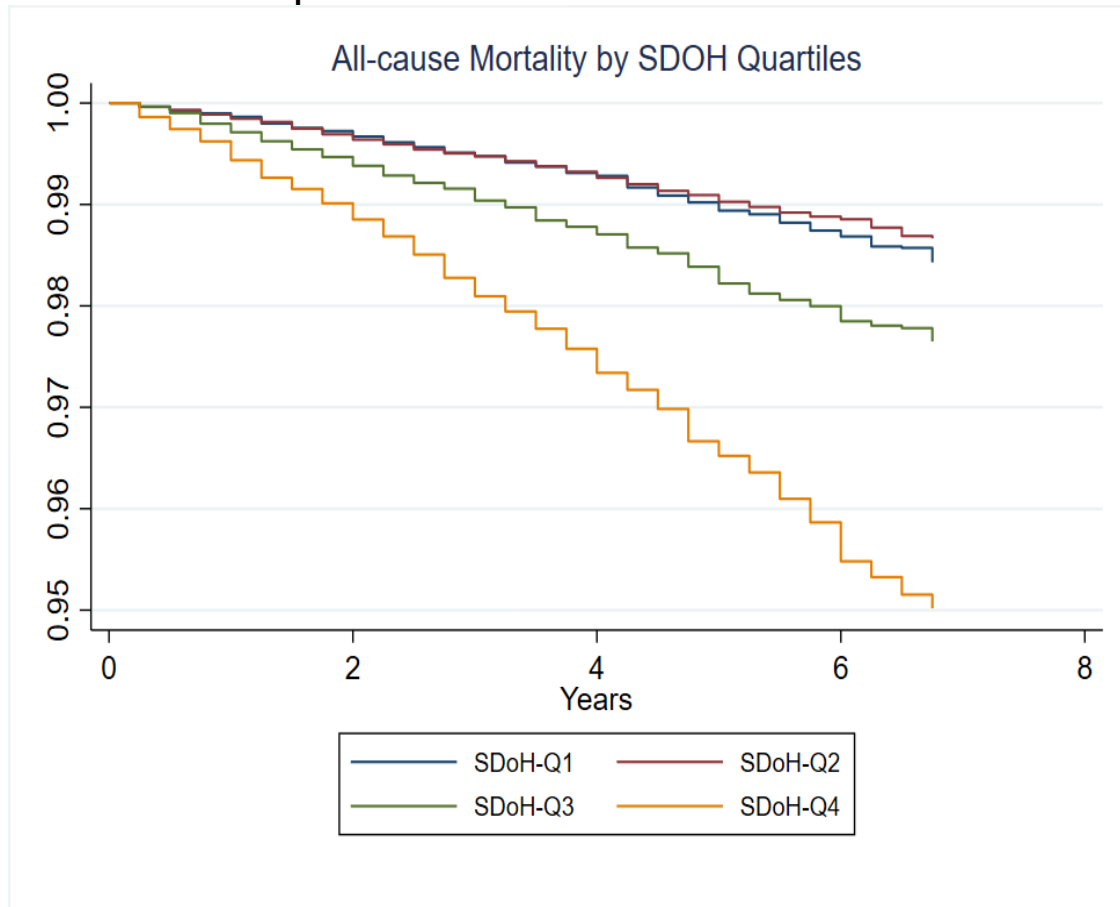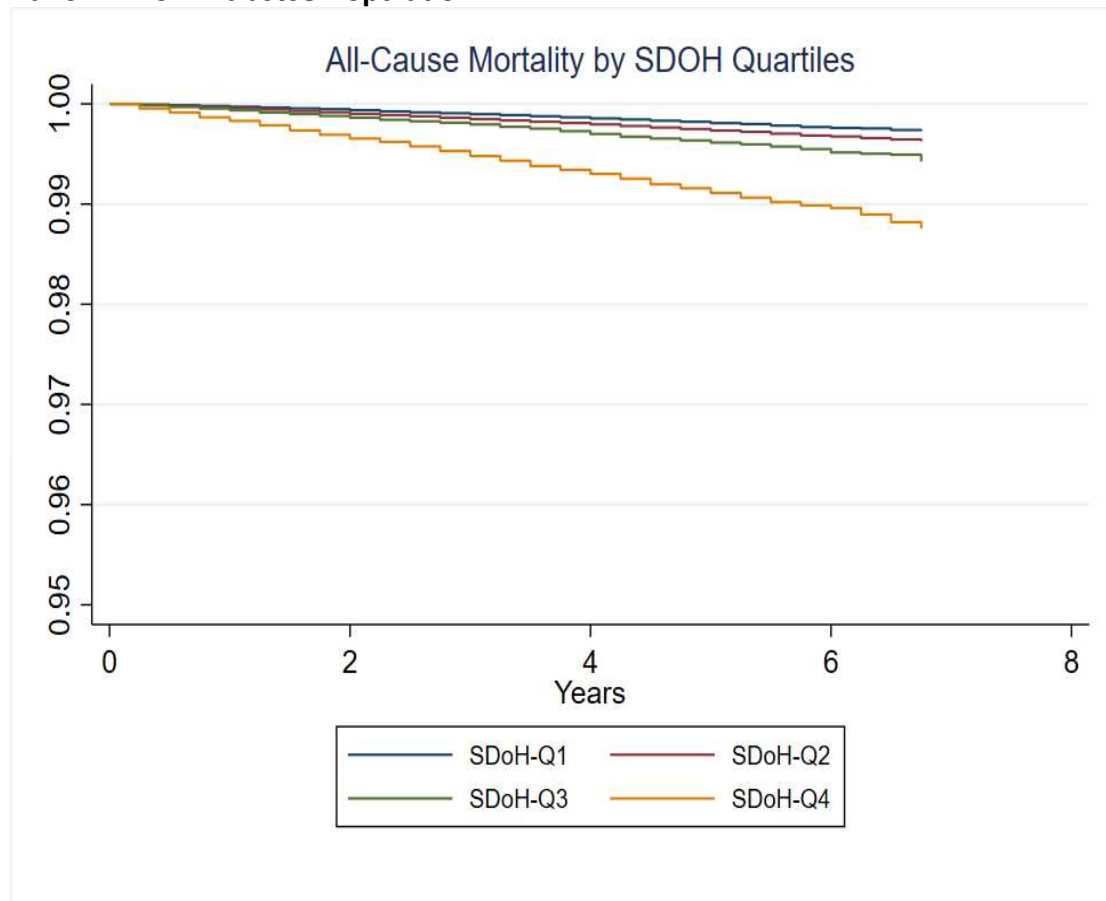
BMJ Open Diab Res Care

SUPPLEMENTARY MATERIAL

eFigure 1. Kaplan-Meier Survival Curves, by Diabetes Status and SDOH Quartiles.

Panel A. Diabetes Population

Panel B. Non-Diabetes Population

Compared to individuals without diabetes, diabetes patients experienced a greater decrease in survival rate at each quartile of SDOH burden.

eTable 1. SDOH Characteristics of the Study Population, by Diabetes Status, from the National Health Interview Survey 2013-18.

	No DM	DM	*p value*
Sample (N)	162,366	20,079	
Weighted sample, (weighted %)	215,015,330 (90.3)	23,211,567 (9.7)	
Employment, n (weighted %)			<0.001
Employed or Retired	128,962 (78.8)	14,152 (70.8)	
Never or Previously Employed	33,284 (21.2)	5,921 (29.2)	
Sick Leave, n (weighted %)			0.23
Paid sick leave at current/most recent job	84,757 (55.7)	10,398 (56.4)	
No paid sick leave	67,658 (44.3)	8,182 (43.6)	
Family Income, n (weighted %)			<0.001
Middle/High-income	98,999 (70.3)	10,191 (60.5)	
Low-income	52,218 (29.7)	8,406 (39.5)	
Difficulty Paying Medical Bills, n (weighted %)			<0.001
No DPMB	122,829 (79.8)	13,874 (75.8)	
DPMB	28,168 (20.2)	3,954 (24.2)	
Unable to Pay Medical Bills, n (weighted %)			<0.001
No DPMB	150,997 (92.7)	17,828 (88.3)	
Unable to Pay Med Bills	11,369 (7.3)	2,251 (11.7)	
Worried about money for retirement, n (weighted %)			<0.001
Not too worried/Not at all	87,637 (55.1)	10,381 (50.6)	
Mod/Very Worried about money for retirement	70,633 (44.9)	9,191 (49.4)	
Worried about med costs of illness/accident, n (weighted %)			<0.001
Not too worried/Not at all	91,983 (57.8)	11,092 (54.5)	
Mod/Very Worried about med costs of illness/accident	66,345 (42.2)	8,498 (45.5)	
Worried about maintaining std of living, n (weighted %)			<0.001
Not too worried/Not at all	99,753 (62.8)	11,290 (56.2)	
Mod/Very Worried about maintaining std of living	58,552 (37.2)	8,299 (43.8)	
Worried about medical costs of normal healthcare, n (weighted %)			<0.001
Not too worried/Not at all	113,971 (71.7)	13,243 (65.4)	
Mod/Very Worried about medical costs of normal healthcare	44,373 (28.3)	6,355 (34.6)	
Worried about paying monthly bills, n (weighted %)			<0.001
Not too worried/Not at all	114,353 (72.5)	12,731 (63.9)	
Mod/Very Worried about paying monthly bills	44,012 (27.5)	6,866 (36.1)	
Worried about paying rent/mortgage/housing costs, n (weighted %)			<0.001
Not too worried/Not at all	123,259 (78.1)	14,330 (71.8)	
Mod/Very Worried about paying rent/mortgage/housing costs	35,090 (21.9)	5,266 (28.2)	
Foregone/Delayed Care due to Cost, n (weighted %)			<0.001
No Delay Medical Care due to Cost	143,769 (90.1)	17,365 (87.1)	

Foregone/Delayed Medical Care due to Cost	18,597 (9.9)	2,714 (12.9)	
House Tenure, n (weighted %)			<0.001
Own or being bought	98,175 (65.3)	12,825 (68.8)	
Rent/Other arrangement	63,915 (34.7)	7,228 (31.2)	
Agree: People in neighborhood help each other, n (weighted %)			<0.001
Yes	127,102 (83.0)	15,106 (79.2)	
No	26,826 (17.0)	3,960 (20.8)	
Agree: There are people I can count on in neighborhood, n (weighted %)			<0.001
Yes	127,036 (82.4)	15,449 (80.4)	
No	27,609 (17.6)	3,723 (19.6)	
Agree: People in neighborhood can be trusted, n (weighted %)			<0.001
Yes	127,580 (83.8)	15,262 (80.9)	
No	26,056 (16.2)	3,707 (19.1)	
Agree: This is a close-knit neighborhood, n (weighted %)			<0.001
Yes	99,257 (64.7)	12,029 (62.5)	
No	55,104 (35.3)	7,098 (37.5)	
≥ 3 days did not eat, n (weighted %)			<0.001
No	160,654 (99.1)	19,746 (98.7)	
Yes	1,712 (0.9)	333 (1.3)	
Kessler K6 Scale, n (weighted %)			<0.001
No Psychological Distress	152,006 (96.8)	18,143 (93.4)	
Psychological Distress	5,429 (3.2)	1,333 (6.6)	
Marital status, n (weighted %)			<0.001
Never married/living with partner	49,955 (31.7)	3,337 (15.8)	
Married	71,686 (52.5)	8,557 (55.2)	
Previously married	40,437 (15.8)	8,148 (29.0)	
Hungry but did not eat because not enough money, n (weighted %)			<0.001
No	156,879 (97.0)	18,949 (94.9)	
Yes	5,487 (3.0)	1,130 (5.1)	
Eat less than felt should because not enough money, n (weighted %)			<0.001
No	153,337 (94.9)	18,134 (91.3)	
Yes	9,029 (5.1)	1,945 (8.7)	
Cut size or skipped meals because not enough money, n (weighted %)			<0.001
No	152,507 (94.6)	18,033 (90.9)	
Yes	9,859 (5.4)	2,046 (9.1)	
≥ 3 days cut size or skipped meals, n (weighted %)			<0.001
No	154,358 (95.6)	18,351 (92.3)	
Yes	8,008 (4.4)	1,728 (7.7)	
Could not afford to eat balanced meals, n (weighted %)			<0.001
No	145,255 (90.3)	16,418 (83.3)	

Yes	17,111 (9.7)	3,661 (16.7)	
Worried food would run out before getting money to buy more, n (weighted %)			<0.001
No	139,936 (87.0)	15,766 (79.9)	
Yes	22,430 (13.0)	4,313 (20.1)	
Food did not last before getting money to get more, n (weighted %)			<0.001
No	143,299 (89.1)	16,142 (81.9)	
Yes	19,067 (10.9)	3,937 (18.1)	
Lose weight because not enough money for food, n (weighted %)			<0.001
No	159,102 (98.2)	19,289 (96.6)	
Yes	3,264 (1.8)	790 (3.4)	
Not eat for a whole day because not enough money for food, n (weighted %)			<0.001
No	159,890 (98.7)	19,588 (98.0)	
Yes	2,476 (1.3)	491 (2.0)	
English Language, n (weighted %)			<0.001
Well/Very well	140,468 (94.7)	16,995 (91.7)	
Not well/Not at all	7,547 (5.3)	1,400 (8.3)	
Education, n (weighted %)			<0.001
≥ Some college	102,089 (63.7)	9,831 (50.5)	
≤ High School	59,685 (36.3)	10,146 (49.5)	
Looked up health info on Internet in past 12 m, n (weighted %)			<0.001
Yes	79,649 (51.9)	7,076 (39.2)	
No	80,483 (48.1)	12,736 (60.8)	
Filled a prescription on Internet in past 12 m, n (weighted %)			<0.001
Yes	12,995 (8.7)	2,114 (12.3)	
No	147,195 (91.3)	17,700 (87.7)	
Scheduled medical appointment on Internet in past 12 m, n (weighted %)			<0.001
Yes	15,811 (11.3)	1,494 (9.4)	
No	144,358 (88.7)	18,320 (90.6)	
Communicated with health care provider by email in past 12 m, n (weighted %)			0.51
Yes	17,140 (11.7)	2,033 (11.9)	
No	143,025 (88.3)	17,777 (88.1)	
Insurance Status, n (weighted %)			<0.001
Insured	141,049 (87.8)	18,730 (93.2)	
Uninsured	19,622 (12.2)	1,177 (6.8)	
Usual Source of Care, n (weighted %)			<0.001
Usual source of care	137,624 (85.0)	19,256 (96.1)	
No usual source of care	23,652 (15.0)	697 (3.9)	
Citizenship Status, n (weighted %)			<0.001
US Citizens	149,252 (91.6)	19,028 (93.7)	
Non-Citizens	12,908 (8.4)	1,037 (6.3)	

Delayed Medical Care: Couldn't get through on phone, n (weighted %)			<0.001
No	157,183 (97.7)	19,234 (96.5)	
Yes: Couldn't get through on phone	3,894 (2.3)	690 (3.5)	
Delayed Medical Care: Couldn't get appt soon enough, n (weighted %)			<0.001
No	151,440 (94.1)	18,292 (91.3)	
Yes: Couldn't get appt soon enough	9,615 (5.9)	1,632 (8.7)	
Delayed Medical Care: Wait too long at MD's office, n (weighted %)			<0.001
No	154,732 (96.2)	18,714 (93.6)	
Yes: Wait too long at MD's office	6,307 (3.8)	1,209 (6.4)	
Delayed Medical Care: Not open when you could go, n (weighted %)			<0.001
No	156,478 (97.2)	19,228 (96.3)	
Yes: Not open when you could go	4,561 (2.8)	692 (3.7)	
Delayed Medical Care: Transport, n (weighted %)			<0.001
No	157,854 (98.4)	18,985 (96.0)	
Yes	3,198 (1.6)	939 (4.0)	
Quality of Care (Satisfaction), n (weighted %)			<0.001
Somewhat/Very Satisfied	132,217 (83.1)	18,006 (91.0)	
Somewhat/Very Dissatisfied	26,640 (16.9)	1,644 (9.0)	

eTable 2.

Panel A. Age-Adjusted Mortality Rates, Diabetes Population

	SDOH-Q1	SDOH-Q2	SDOH-Q3	SDOH-Q4
Total Population	1052.7 (884.9, 1220.5)	1752.8 (1542.0, 1963.6)	1894.6 (1665.4, 2123.7)	2073.1 (1827.2, 2319.0)
Sub-group Analysis				
Age Category				
18-39	225.8 (92.8, 358.8)	376.0 (158.3, 593.6)	406.4 (167.2, 645.6)	444.7 (188.0, 701.3)
40-64	852.8 (688.3, 1017.2)	1419.9 (1178.2, 1661.6)	1534.8 (1296.3, 1773.2)	1679.4 (1433.1, 1925.7)
65+	3168.3 (2669.3, 3667.3)	5275.4 (4689.2, 5861.5)	5702.0 (5030.5, 6373.5)	6239.3 (5440.8, 7037.9)
Sex				
Male	1191.6 (996.5, 1386.7)	2040.9 (1771.9, 2309.9)	2254.2 (1955.5, 2552.8)	2539.6 (2191.1, 2888.2)
Female	831.8 (682.1, 981.4)	1424.7 (1228.0, 1621.4)	1573.5 (1355.7, 1791.3)	1772.8 (1542.4, 2003.1)
Race/Ethnicity				
Non-Hispanic White	1116.4 (933.8, 1299.0)	1884.8 (1646.6, 2123.1)	2131.2 (1860.5, 2401.9)	2449.8 (2111.6, 2788.0)
Non-Hispanic Black	1000.2 (794.4, 1206.0)	1688.7 (1404.2, 1973.2)	1909.4 (1582.0, 2236.8)	2194.8 (1848.2, 2541.5)
Non-Hispanic Asian	677.0 (392.8, 961.2)	1143.0 (659.9, 1626.1)	1292.4 (742.5, 1842.3)	1485.6 (846.6, 2124.6)
Hispanic	641.2 (485.9, 796.4)	1082.5 (843.7, 1321.4)	1224.0 (966.0, 1482.0)	1407.0 (1140.1, 1673.8)
CRF Profile				
Optimal	902.7 (683.8, 1121.6)	1503.9 (1161.1, 1846.7)	1618.2 (1265.3, 1971.0)	1788.0 (1388.9, 2187.1)
Average	1137.4 (932.4, 1342.4)	1894.9 (1639.1, 2150.6)	2038.9 (1749.3, 2328.4)	2252.9 (1945.5, 2560.2)
Poor	1012.2 (838.0, 1186.4)	1686.3 (1448.8, 1923.9)	1814.5 (1563.2, 2065.7)	2004.9 (1731.4, 2278.4)
Comorbidities				
0	651.5 (520.6, 782.4)	1061.8 (878.0, 1245.7)	1120.0 (917.2, 1322.8)	1143.5 (946.7, 1340.4)

1	961.9 (772.8, 1151.0)	1567.8 (1316.7, 1818.9)	1653.6 (1379.7, 1927.6)	1688.4 (1417.4, 1959.4)
≥ 2	1859.0 (1514.9, 2203.1)	3029.8 (2554.9, 3504.8)	3195.8 (2714.4, 3677.2)	3262.9 (2787.4, 3738.5)

Panel B. Age-Adjusted Mortality Rates, Non-Diabetes Population

	SDOH-Q1	SDOH-Q2	SDOH-Q3	SDOH-Q4
Total Population	562.2 (518.7, 605.6)	1064.8 (997.5, 1132.1)	1093.1 (1007.2, 1179.0)	1428.5 (1311.1, 1545.9)
Sub-group Analysis				
Age Category				
18-39	53.1 (43.2, 63.1)	100.6 (81.5, 119.8)	103.3 (83.4, 123.2)	135.0 (108.5, 161.5)
40-64	283.6 (253.1, 314.1)	537.2 (483.8, 590.6)	551.4 (493.1, 609.8)	720.7 (644.2, 797.2)
65+	2104.1 (1935.9, 2272.3)	3985.3 (3727.8, 4242.8)	4091.2 (3757.5, 4424.8)	5346.6 (4888.6, 5804.6)
Sex				
Male	667.6 (611.6, 723.6)	1298.2 (1205.6, 1390.8)	1338.7 (1221.5, 1455.9)	1769.8 (1609.4, 1930.3)
Female	460.9 (420.9, 500.8)	896.2 (830.1, 962.3)	924.2 (844.8, 1003.5)	1221.8 (1113.6, 1330.0)
Race/Ethnicity				
Non-Hispanic White	582.0 (536.4, 627.7)	1113.4 (1040.3, 1186.4)	1187.2 (1088.8, 1285.7)	1645.0 (1494.2, 1795.9)
Non-Hispanic Black	609.2 (528.9, 689.5)	1165.4 (1028.1, 1302.6)	1242.7 (1090.0, 1395.4)	1721.9 (1508.0, 1935.8)
Non-Hispanic Asian	338.0 (251.7, 424.3)	646.5 (482.4, 810.6)	689.4 (520.6, 858.2)	955.2 (711.1, 1199.3)
Hispanic	303.2 (243.3, 363.1)	579.9 (468.8, 691.0)	618.4 (494.6, 742.2)	856.8 (702.6, 1011.1)
CRF Profile				
Optimal	430.8 (385.9, 475.7)	802.7 (728.7, 876.7)	809.5 (720.9, 898.1)	1021.6 (903.0, 1140.1)

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Average	635.3 (580.7, 690.0)	1183.9 (1096.3, 1271.5)	1193.9 (1091.0, 1296.8)	1506.7 (1369.8, 1643.6)
Poor	670.3 (599.3, 741.2)	1249.0 (1132.8, 1365.3)	1259.6 (1133.6, 1385.6)	1589.6 (1428.7, 1750.5)
Comorbidities				
0	350.5 (315.7, 385.4)	660.7 (604.0, 717.4)	665.8 (597.5, 734.1)	816.0 (730.2, 901.8)
1	584.4 (530.9, 638.0)	1101.5 (1006.4, 1196.7)	1110.0 (1008.0, 1211.9)	1360.5 (1229.3, 1491.7)
≥ 2	1090.6 (985.4, 1195.9)	2055.6 (1880.0, 2231.2)	2071.4 (1871.1, 2271.7)	2538.8 (2284.9, 2792.7)