

## SUPPLEMENTARY DATA

Supplementary Table 1-a. Sensitivity analysis without assumption of progressively earlier diagnosis of diabetes over time: Age-sex-race/ethnicity adjusted average annual mortality (per 1000 person-years) among adults aged 20 years or older, NHIS mortality follow-up 1988 – 2015\*

	All years	1988 – 1994	1995 – 1999	2000 – 2004	2005 – 2009	2010 – 2015	10-Year Absolute Change	10-Year Percent Change
<b>Sample CVD death, <i>n</i></b>								
With diabetes	3830	315	421	781	1039	1274	---	---
Without diabetes	14993	1711	2200	3263	3861	3958	---	---
<b>Major CVD</b>								
With diabetes	8.17 (7.73, 8.61) <sup>†</sup>	11.19 (9.34, 13.04)	11.20 (10.00, 12.40)	8.73 (7.90, 9.57)	6.67 (6.17, 7.18)	5.22 (4.84, 5.61)	-3.24 (-3.92, -2.56)	-32.69 (-37.16, -27.90)
Without diabetes	3.88 (3.78, 3.98)	5.24 (4.89, 5.59)	4.83 (4.59, 5.06)	4.15 (3.95, 4.34)	3.20 (3.07, 3.32)	2.84 (2.73, 2.95)	-1.18 (-1.32, -1.03)	-26.15 (-28.57, -23.65)
RR (95% CI) <sup>†</sup>	2.11 (1.99, 2.23) <sup>‡</sup>	2.14 (1.80, 2.53)	2.32 (2.06, 2.61)	2.11 (1.90, 2.33)	2.09 (1.92, 2.27)	1.84 (1.69, 2.00)	<i>P</i> -value < 0.0001 <sup>§</sup>	<i>P</i> -value = 0.0108 <sup>‡</sup>
<b>Ischemic heart diseases</b>								
With diabetes	4.74 (4.42, 5.05)	7.29 (6.05, 8.52)	6.81 (5.85, 7.76)	5.19 (4.53, 5.84)	3.46 (3.10, 3.82)	2.61 (2.34, 2.88)	-2.45 (-2.92, -1.99)	-40.32 (-44.70, -35.60)
Without diabetes	2.07 (2.00, 2.14)	3.18 (2.93, 3.44)	2.76 (2.57, 2.96)	2.16 (2.02, 2.29)	1.61 (1.53, 1.70)	1.28 (1.21, 1.35)	-0.90 (-1.01, -0.79)	-35.26 (-38.02, -32.37)
RR (95% CI)	2.29 (2.13, 2.46)	2.29 (1.89, 2.77)	2.46 (2.10, 2.89)	2.41 (2.10, 2.75)	2.14 (1.91, 2.41)	2.03 (1.82, 2.28)	<i>P</i> -value < 0.0001	<i>P</i> -value = 0.0668
<b>Stroke</b>								
With diabetes	1.17 (1.02, 1.31)	1.43 (0.79, 2.07)	1.62 (1.20, 2.05)	1.19 (0.92, 1.45)	1.09 (0.89, 1.28)	0.76 (0.63, 0.88)	-0.40 (-0.63, -0.18)	-29.23 (-39.98, -16.55)
Without diabetes	0.67 (0.63, 0.70)	0.83 (0.71, 0.95)	0.85 (0.75, 0.95)	0.77 (0.69, 0.86)	0.56 (0.51, 0.60)	0.47 (0.42, 0.51)	-0.20 (-0.24, -0.15)	-25.49 (-30.23, -20.42)
RR (95% CI)	1.75 (1.53, 1.99)	1.73 (1.10, 2.74)	1.91 (1.42, 2.57)	1.53 (1.19, 1.97)	1.95 (1.61, 2.37)	1.62 (1.34, 1.97)	<i>P</i> -value = 0.0778	<i>P</i> -value = 0.5635
<b>Heart failure</b>								
With diabetes	0.57 (0.48, 0.67)	0.46 (0.14, 0.77)	0.60 (0.29, 0.91)	0.64 (0.45, 0.84)	0.61 (0.45, 0.78)	0.53 (0.41, 0.65)	-0.00 (-0.13, 0.13)	-0.53 (-20.69, 24.75)
Without diabetes	0.23 (0.21, 0.25)	0.23 (0.16, 0.30)	0.22 (0.17, 0.26)	0.26 (0.21, 0.31)	0.23 (0.19, 0.26)	0.23 (0.20, 0.27)	0.01 (-0.02, 0.04)	2.63 (-9.36, 16.20)
RR (95% CI)	2.45 (2.04, 2.93)	1.99 (0.95, 4.19)	2.80 (1.60, 4.89)	2.43 (1.70, 3.49)	2.72 (2.03, 3.66)	2.27 (1.74, 2.94)	<i>P</i> -value = 0.8926	<i>P</i> -value = 0.8087
<b>Arrhythmia</b>								
With diabetes	0.19 (0.13, 0.24)	0.23 (0.00, 0.48)	0.16 (0.03, 0.29)	0.16 (0.05, 0.28)	0.17 (0.09, 0.24)	0.22 (0.15, 0.29)	0.02 (-0.06, 0.10)	11.98 (-29.36, 77.52)
Without diabetes	0.11 (0.10, 0.12)	0.05 (0.03, 0.08)	0.09 (0.06, 0.12)	0.12 (0.09, 0.15)	0.11 (0.09, 0.13)	0.14 (0.11, 0.16)	0.04 (0.02, 0.05)	40.35 (-19.63, 64.67)
RR (95% CI)	1.74 (1.26, 2.40)	4.17 (1.24, 14.02)	1.82 (0.73, 4.53)	1.30 (0.61, 2.78)	1.53 (0.94, 2.48)	1.61 (1.12, 2.30)	<i>P</i> -value = 0.7143	<i>P</i> -value = 0.3245

\* this table presents the exactly same results as Table 2 in article except with 2 decimal places.

<sup>†</sup> numbers in parentheses are 95% confidence intervals; <sup>‡</sup> RR (95% CI): hazard ratio (with diabetes vs. without diabetes) and 95% confidence intervals; <sup>§</sup> *P*-value for difference of absolute or percent change between adults with and without diabetes

## SUPPLEMENTARY DATA

Supplementary 1-b. Sensitivity analysis assuming progressively earlier diagnosis of diabetes over time: Age-sex-race/ethnicity adjusted average annual mortality (per 1000 person-years) among adults aged 20 years or older, NHIS mortality follow-up 1988 – 2015

	All years	1988 – 1994	1995 – 1999	2000 – 2004	2005 – 2009	2010 – 2015	10-Year Absolute Change	10-Year Percent Change
<b>Sample CVD death, <i>n</i></b>								
With diabetes	3753	315	421	772	1019	1226	---	---
Without diabetes	15070	1711	2200	3272	3881	4006	---	---
<b>Major CVD</b>								
With diabetes	8.19 (7.75, 8.63)*	11.19 (9.34, 13.03)	11.21 (10.01, 12.41)	8.76 (7.91, 9.61)	6.72 (6.21, 7.23)	5.24 (4.84, 5.63)	-3.23 (-3.91, -2.55)	-32.52 (-37.04, -27.69)
Without diabetes	3.89 (3.79, 3.99)	5.24 (4.89, 5.59)	4.82 (4.59, 5.06)	4.15 (3.96, 4.35)	3.21 (3.08, 3.33)	2.86 (2.74, 2.97)	-1.17 (-1.31, -1.03)	-25.95 (-28.36, -23.45)
RR (95% CI) <sup>†</sup>	2.11 (1.99, 2.23) <sup>‡</sup>	2.14 (1.80, 2.53)	2.32 (2.07, 2.61)	2.11 (1.90, 2.34)	2.09 (1.92, 2.28)	1.83 (1.69, 1.99)	<i>P</i> -value < 0.0001 <sup>‡</sup>	<i>P</i> -value = 0.0108 <sup>‡</sup>
<b>Ischemic heart diseases</b>								
With diabetes	4.74 (4.43, 5.06)	7.28 (6.05, 8.51)	6.82 (5.86, 7.77)	5.20 (4.53, 5.86)	3.46 (3.10, 3.82)	2.63 (2.35, 2.91)	-2.44 (-2.90, -1.98)	-40.11 (-44.53, -35.33)
Without diabetes	2.07 (2.00, 2.14)	3.18 (2.93, 3.44)	2.76 (2.57, 2.96)	2.16 (2.02, 2.29)	1.62 (1.54, 1.71)	1.29 (1.22, 1.36)	-0.90 (-1.00, -0.79)	-35.06 (-37.82, -32.17)
RR (95% CI)	2.49 (2.08, 2.98)	2.29 (1.89, 2.77)	2.47 (2.10, 2.89)	2.40 (2.10, 2.75)	2.13 (1.90, 2.39)	2.04 (1.82, 2.29)	<i>P</i> -value < 0.0001	<i>P</i> -value = 0.0690
<b>Stroke</b>								
With diabetes	1.16 (1.02, 1.30)	1.43 (0.79, 2.07)	1.63 (1.20, 2.05)	1.18 (0.91, 1.46)	1.09 (0.89, 1.30)	0.74 (0.60, 0.87)	-0.41 (-0.64, -0.18)	-29.53 (-40.37, -16.71)
Without diabetes	0.67 (0.64, 0.70)	0.83 (0.71, 0.95)	0.85 (0.75, 0.95)	0.78 (0.69, 0.86)	0.56 (0.51, 0.61)	0.47 (0.43, 0.51)	-0.19 (-0.24, -0.15)	-25.19 (-29.93, -20.13)
RR (95% CI)	1.74 (1.52, 1.98)	1.73 (1.10, 2.74)	1.91 (1.42, 2.57)	1.53 (1.18, 1.97)	1.96 (1.61, 2.39)	1.56 (1.28, 1.91)	<i>P</i> -value = 0.193	<i>P</i> -value = 0.5060
<b>Heart failure</b>								
With diabetes	0.58 (0.49, 0.67)	0.46 (0.14, 0.77)	0.60 (0.29, 0.91)	0.65 (0.45, 0.85)	0.63 (0.46, 0.79)	0.54 (0.42, 0.67)	-0.00 (-0.13, 0.14)	0.79 (-19.69, 26.48)
Without diabetes	0.23 (0.21, 0.25)	0.23 (0.16, 0.30)	0.22 (0.17, 0.26)	0.26 (0.21, 0.31)	0.23 (0.19, 0.26)	0.23 (0.20, 0.27)	0.01 (-0.01, 0.02)	2.50 (-9.47, 16.05)
RR (95% CI)	2.45 (2.04, 2.93)	1.99 (0.95, 4.19)	2.80 (1.60, 4.90)	2.43 (1.72, 3.54)	2.78 (2.07, 3.74)	2.33 (1.79, 3.03)	<i>P</i> -value = 0.9860	<i>P</i> -value = 0.8970
<b>Arrhythmia</b>								
With diabetes	0.19 (0.13, 0.24)	0.23 (0.00, 0.48)	0.16 (0.03, 0.29)	0.16 (0.05, 0.28)	0.17 (0.10, 0.25)	0.21 (0.14, 0.27)	0.01 (-0.07, 0.09)	6.15 (-32.68, 67.38)
Without diabetes	0.11 (0.10, 0.12)	0.05 (0.03, 0.08)	0.09 (0.06, 0.12)	0.12 (0.09, 0.15)	0.11 (0.09, 0.13)	0.14 (0.11, 0.17)	0.04 (0.02, 0.06)	42.47 ( 21.33, 67.30)
RR (95% CI)	1.71 (1.23, 2.37)	4.16 (1.24, 14.01)	1.82 (0.73, 4.54)	1.32 (0.62, 2.82)	1.57 (0.97, 2.56)	1.47 (1.00, 2.17)	<i>P</i> -value = 0.5209	<i>P</i> -value = 0.1858

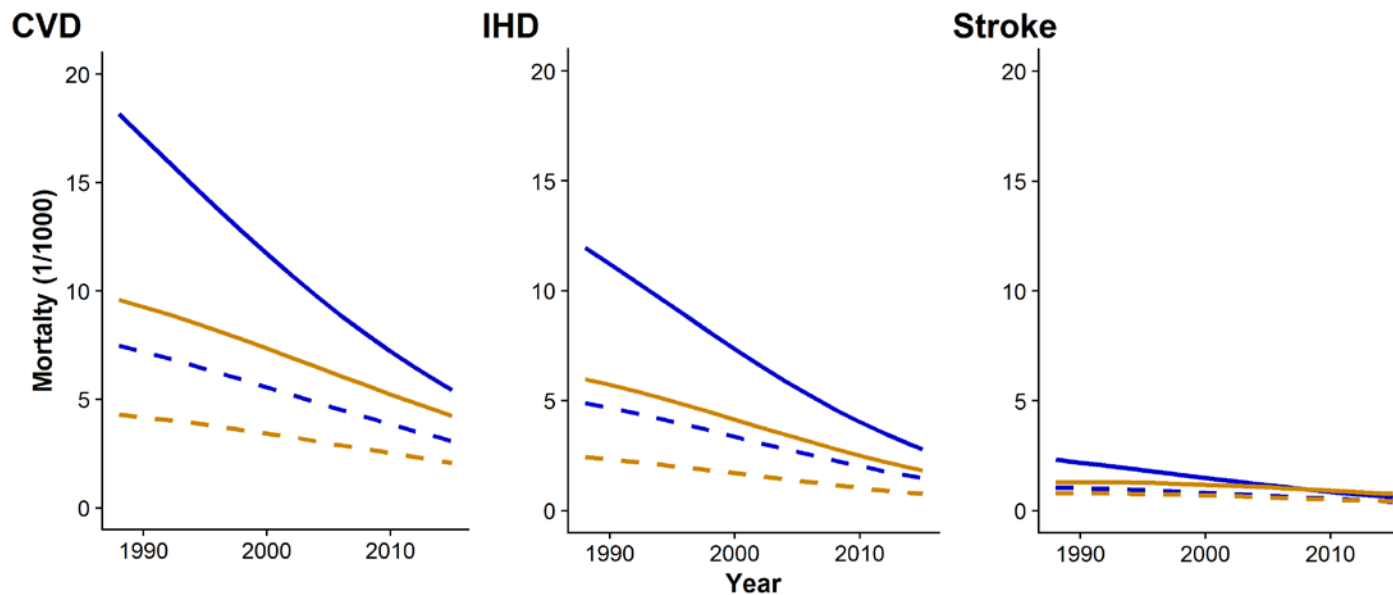
\* numbers in parentheses are 95% confidence intervals; <sup>†</sup> RR (95% CI): hazard ratio (with diabetes vs. without diabetes) and 95% confidence intervals; <sup>‡</sup> *P*-value for difference of absolute or percent change between adults with and without diabetes

## SUPPLEMENTARY DATA

Supplementary Figure 1. Trends in mortality by sex and select cardiovascular diseases among adults with diabetes

Caption: Among both US adults with and without diabetes by sex, the age- and race/ethnicity-adjusted death rates from major CVD including IHD and stroke have decreased steadily from 1988 to 2015, especially among men with diabetes.

Legend: CVD: major cardiovascular disease, IHD: ischemic heart disease, stroke: cerebrovascular. The solid lines represent the mortality of adults with diabetes, and the dash lines represent the mortality of adults without diabetes. The blue lines represent the mortality of men, the orange lines represent the mortality of women.

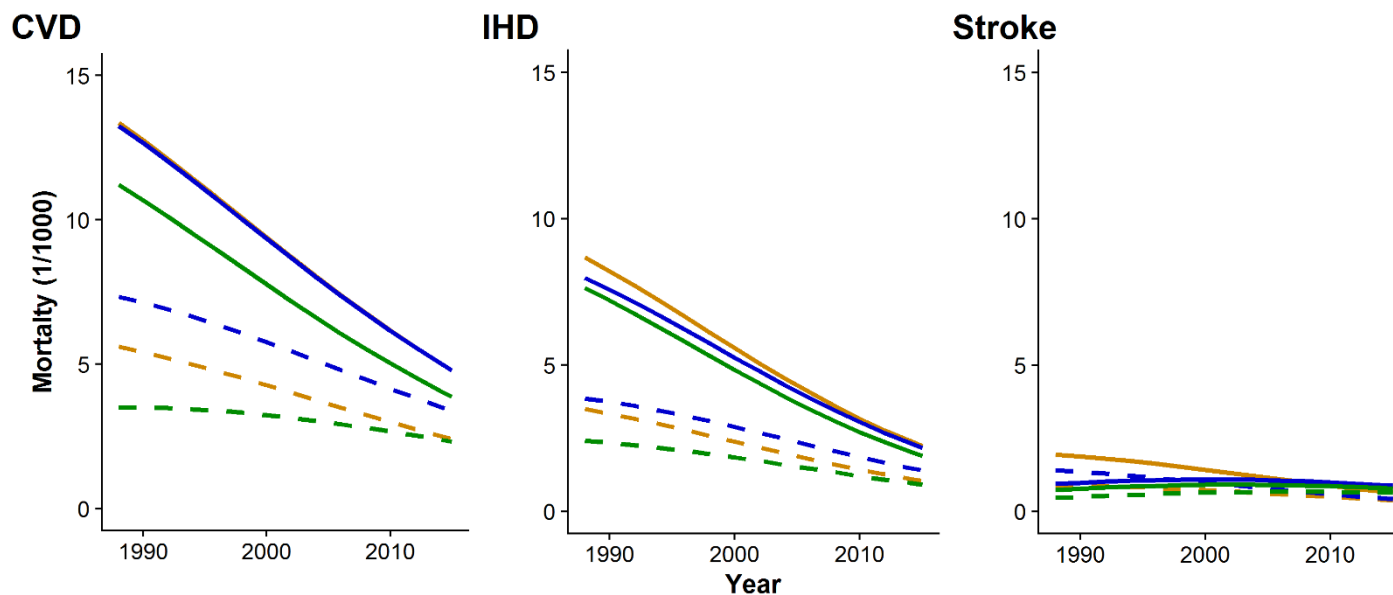


## SUPPLEMENTARY DATA

Supplementary Figure 2. Trends in mortality by race/ethnicity group and select cardiovascular diseases among adults with diabetes

Caption: Among both US adults with and without diabetes by race/ethnicity group, the age- and sex-adjusted death rates from major CVD including IHD and stroke have decreased steadily from 1988 to 2015, especially among adult with diabetes.

Legend: CVD: major cardiovascular disease, IHD: ischemic heart disease, stroke: cerebrovascular. The solid lines represent the mortality of adults with diabetes, and the dash lines represent the mortality of adults without diabetes. The blue lines represent the mortality of non-Hispanic white, the orange lines represent the mortality of non-Hispanic black, and the green lines represent the mortality of other adults.



## SUPPLEMENTARY DATA

Supplementary Figure 3. Trends in mortality by education and select cardiovascular diseases among adults with diabetes

Caption: Among both US adults with and without diabetes by education level, the age-, sex-, and race/ethnicity-adjusted death rates from major CVD including IHD and stroke have decreased steadily from 1988 to 2015, especially among adult with diabetes.

Legend: CVD: major cardiovascular disease, IHD: ischemic heart disease, stroke: cerebrovascular. The solid lines represent the mortality of adults with diabetes, and the dash lines represent the mortality of adults without diabetes. The blue lines represent the mortality of adults with high school or less education, the orange lines represent the mortality of adults with more than high school education.

