

American Diabetes Association Framework for Glycemic Control in Older Adults: Implications for Risk of Hospitalization and Mortality

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Supplemental Table S1. ICD-9 codes used to define American Diabetes Association comorbidities

Comorbidity	ICD-9 Codes Used	CMS Claims Used
Arthritis	714.X 715.X	Yes
Emphysema and COPD	416.8 416.9 490 491 492 493 494 495 496 500 501 502 503 504 505 506.4 508.1 508.8	
History of falls	E880.0 E880.1 E880.9 E881.0 E881.1 E882 E883.0 E883.1 E883.2 E883.9 E884.0 E884.1 E884.2 E884.3 E884.4 E884.5 E884.6 E884.9 E885 E885.0 E885.1 E885.2 E885.3 E885.4 E885.9 E886.0 E886.9 E888 E888.0 E888.1 E888.8 E888.9 E968.1 E987.0 E987.1 E987.2 E987.9	Yes
Hypoglycemia	250.3 250.8 251 251.1 251.2 270.3 775 775.6 962.3	Yes
Incontinence	788.3	Yes
Chronic kidney disease	585.3 585.4 585.5 585.6 585.9	

Abbreviations: ICD, International Classification of Diseases; CMS, Centers for Medicare and Medicaid;
COPD, chronic obstructive pulmonary disease

Supplemental Table S2. Mortality and total hospitalizations in older adults with diabetes according to A1C categories, overall and by comorbid health status: The Atherosclerosis Risk in Communities (ARIC) Study, 2011 to 2018

A1C & health status categories		N total	All-Cause Mortality HR (95% CI)*	Total Hospitalizations IRR (95% CI)*
A1C <7%	Healthy	433	1 (Ref)	1 (Ref)
	Complex/Intermediate	547	2.12 (1.46, 3.07)	1.92 (1.61, 2.28)
	Very Complex/Poor	337	4.60 (3.15, 6.73)	3.40 (2.78, 4.15)
A1C 7-<8%	Healthy	101	1 (Ref)	1 (Ref)
	Complex/Intermediate	143	1.90 (0.99, 3.63)	2.79 (1.98, 3.92)
	Very Complex/Poor	90	3.48 (1.77, 6.83)	3.70 (2.53, 5.42)
A1C ≥8%	Healthy	48	1 (Ref)	1 (Ref)
	Complex/Intermediate	76	1.21 (0.47, 3.14)	3.02 (1.88, 4.85)
	Very Complex/Poor	66	3.33 (1.33, 8.34)	3.96 (2.39, 6.56)
Alternative A1C Cut-points				
A1C <6%	Healthy	181	1 (Ref)	1 (Ref)
	Complex/Intermediate	219	2.76 (1.57, 4.86)	1.88 (1.42, 2.49)
	Very Complex/Poor	135	5.00 (2.76, 9.08)	3.44 (2.48, 4.77)
A1C ≥9%	Healthy	24	1 (Ref)	1 (Ref)
	Complex/Intermediate	36	4.40 (0.54, 36.10)	4.08 (1.98, 8.39)
	Very Complex/Poor	31	8.68 (1.10, 68.60)	4.61 (2.06, 10.30)

Abbreviations: HR, hazard ratio; IRR, incidence rate ratio

* Adjusted for age, sex, race-center

Supplemental Table S3. Tabulation of health status categories according to glucose-lowering medication use, overall and in individuals with A1C below 7%

	Overall	No glucose-lowering medication	Non-insulin/sulfonylurea medication only	Insulin or sulfonylurea
Health status categories				
Healthy	582	257 (44.2)	159 (27.3)	166 (28.5)
Complex/Intermediate	766	289 (37.7)	192 (25.1)	285 (37.2)
Very Complex/Poor	493	166 (33.7)	115 (23.3)	212 (43.0)
Health status categories in people with A1C <7%				
Healthy	433	238 (55.0)	118 (27.3)	77 (17.8)
Complex/Intermediate	547	272 (49.7)	146 (26.7)	129 (23.6)
Very Complex/Poor	337	148 (43.9)	90 (26.7)	99 (29.4)

N (row %)

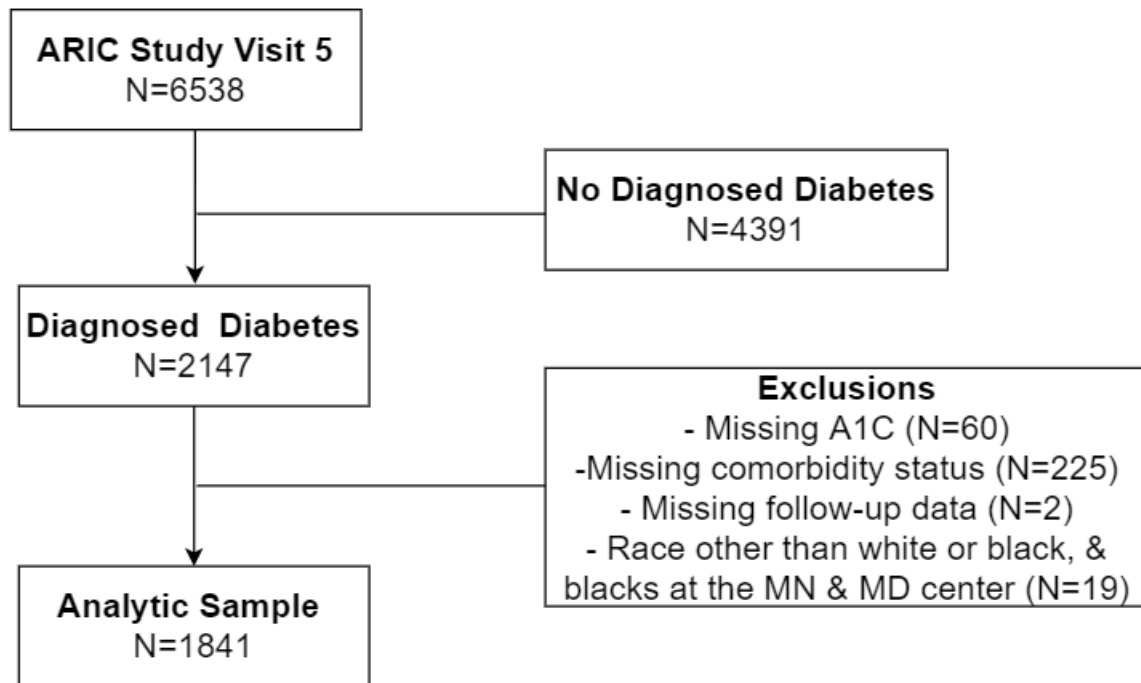
Supplemental Table S4. Mortality and total hospitalizations in older adults with diabetes restricted to insulin or sulfonylurea users, according to comorbid health status, overall and by A1C categories: The ARIC Study, 2011 to 2018

Insulin or Sulfonylurea Users (N=663)		Mortality HR (95% CI)*	Total Hospitalizations IRR (95% CI)*
Health status categories*			
Healthy		1 (Ref)	1 (Ref)
Complex/Intermediate		1.96 (1.20, 3.20)	2.71 (2.10, 3.50)
Very Complex/Poor		3.84 (2.34, 6.30)	3.80 (2.89, 5.00)
Health status & A1C categories			
Healthy	A1C <7%	1 (Ref)	1 (Ref)
	A1C 7-<8%	1.13 (0.42, 3.07)	1.25 (0.74, 2.12)
	A1C ≥8%	1.72 (0.55, 5.35)	1.33 (0.73, 2.43)
Complex/Intermediate	A1C <7%	1 (Ref)	1 (Ref)
	A1C 7-<8%	1.04 (0.61, 1.77)	1.10 (0.79, 1.53)
	A1C ≥8%	1.18 (0.63, 2.20)	1.38 (0.95, 2.01)
Very Complex/Poor	A1C <7%	1 (Ref)	1 (Ref)
	A1C 7-<8%	0.98 (0.57, 1.68)	0.77 (0.53, 1.11)
	A1C ≥8%	1.59 (0.91, 2.78)	0.91 (0.61, 1.35)

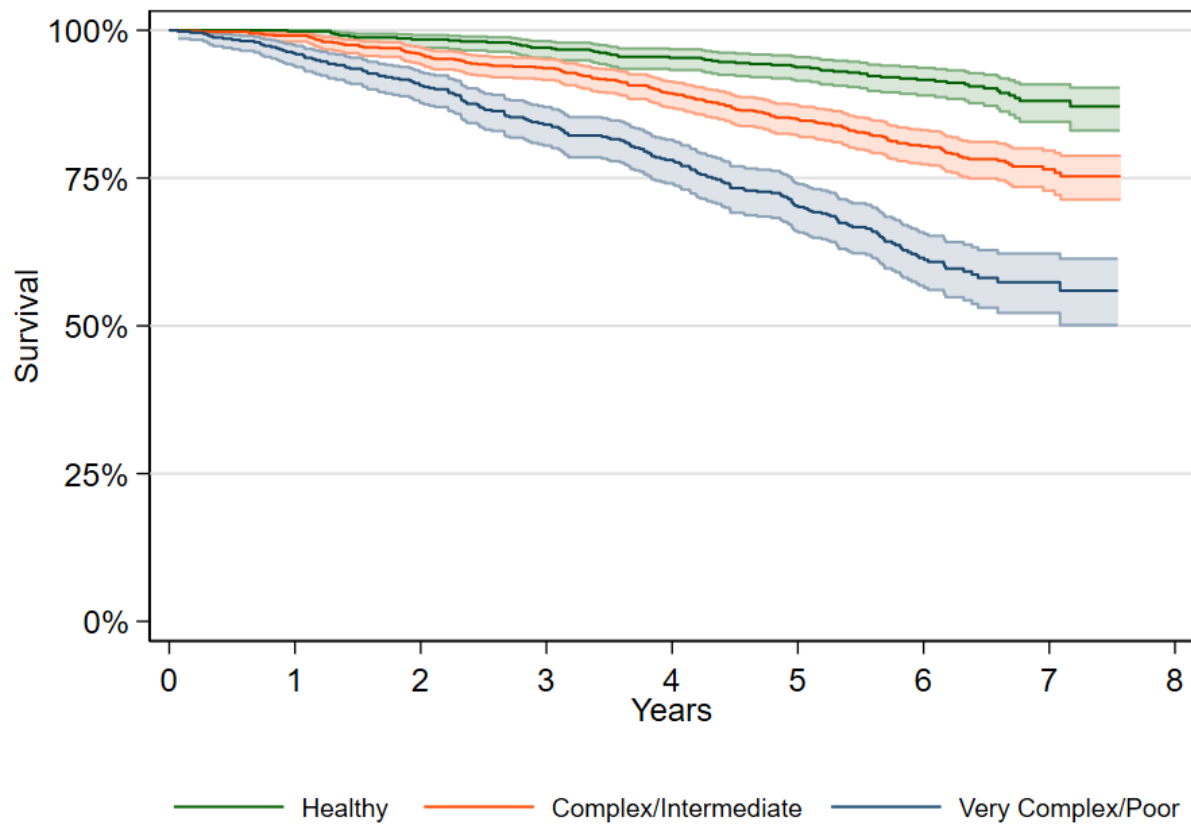
Abbreviations: HR, hazard ratio; IRR, incidence rate ratio

* Adjusted for age, sex, race-center

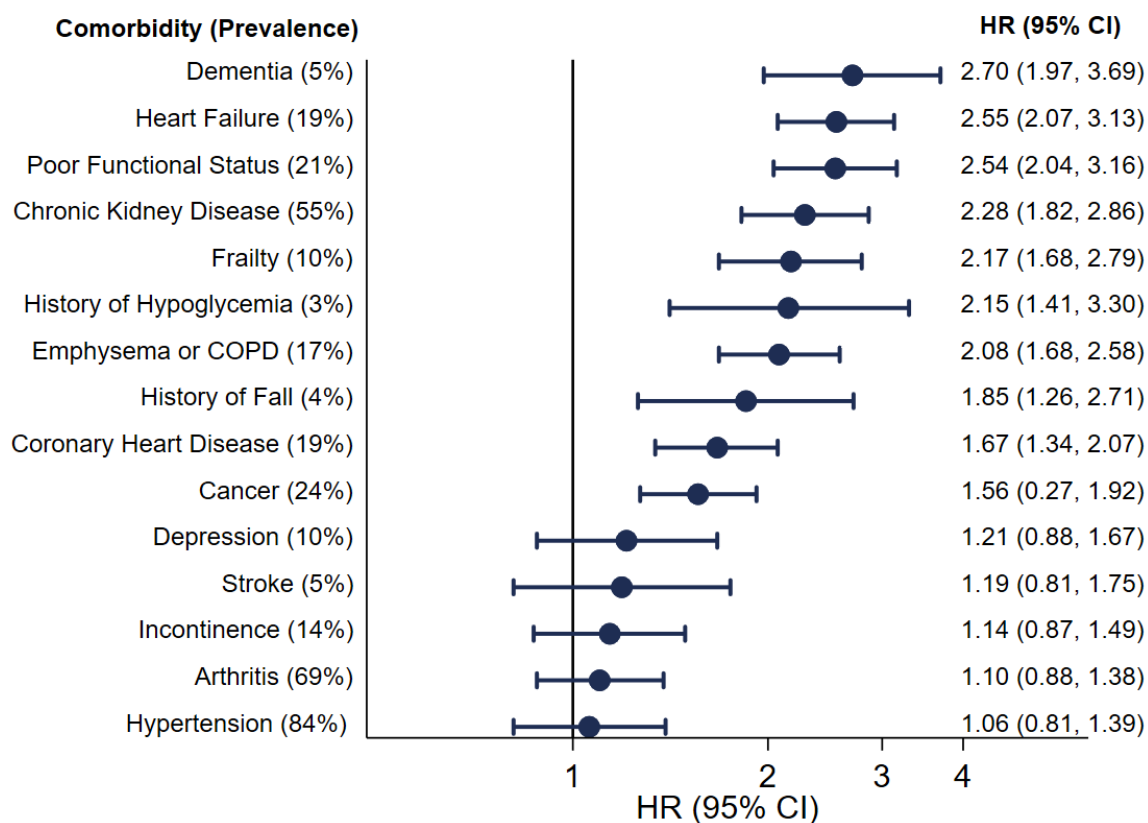
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Supplemental Figure S2. Kaplan Meier survival curves of mortality in older adults with diabetes according to health status: The ARIC Study, 2011 to 2018

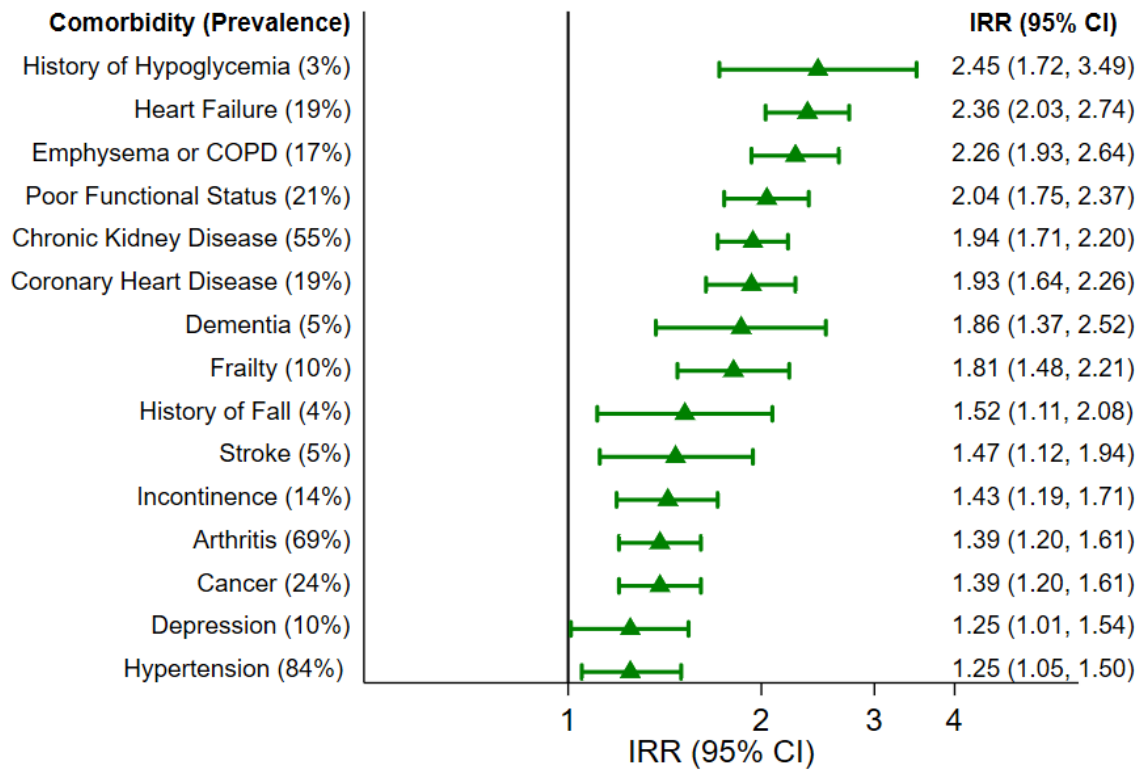


Supplemental Figure S3. Adjusted hazard ratio of the association of individual comorbidities with all-cause mortality: The ARIC Study, 2011 to 2018



Abbreviations: HR, hazard ratio; COPD, chronic obstructive pulmonary disease. HR adjusted for age, sex, race-center

Supplemental Figure S4. Adjusted incidence rate ratio of the association of individual comorbidities with total count of hospitalizations: The ARIC Study, 2011 to 2018



Abbreviations: IRR, incidence rate ratio; COPD, chronic obstructive pulmonary disease. IRR adjusted for age, sex, race-center