

Chronic Kidney Disease

Associated
With Type 2
Diabetes

The Silent Threat
in the US

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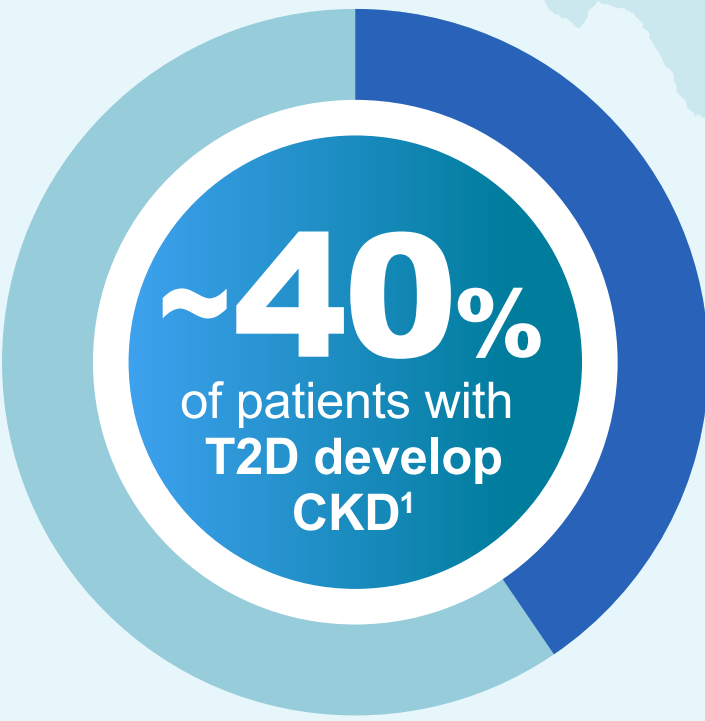
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T2D Is a Leading Cause of CKD in the US¹

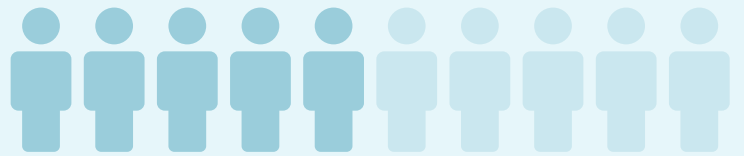


~35.4M

Americans (~10.7%)
have T2D²



~40%
of patients with
T2D develop
CKD¹



~50%

of patients with T2D and CKD
do not have a CKD diagnosis³

Hallmarks of CKD are **low eGFR** and/or **albuminuria**.⁴ In patients with diabetes, both increase the risk of CKD progression⁵

MORE INFO 

CKD, chronic kidney disease; eGFR, estimated glomerular filtration rate; T2D, type 2 diabetes.

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Patient Awareness of CKD Is Low⁶

CKD awareness is low compared with other chronic conditions, such as **diabetes and hypertension**⁶



Diabetes

~80%



Hypertension

~70%



CKD Stages 3-4

~20%

MORE INFO 

CKD, chronic kidney disease.

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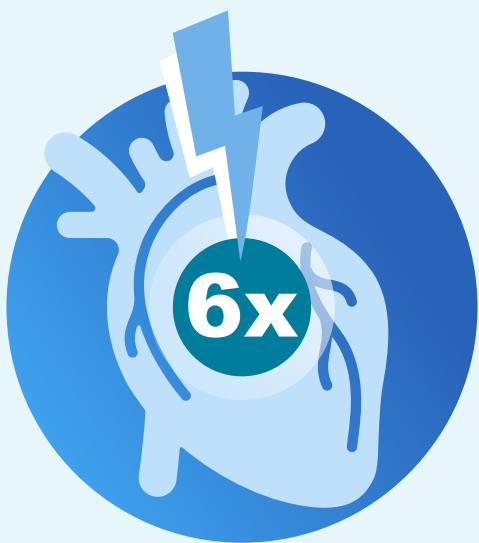
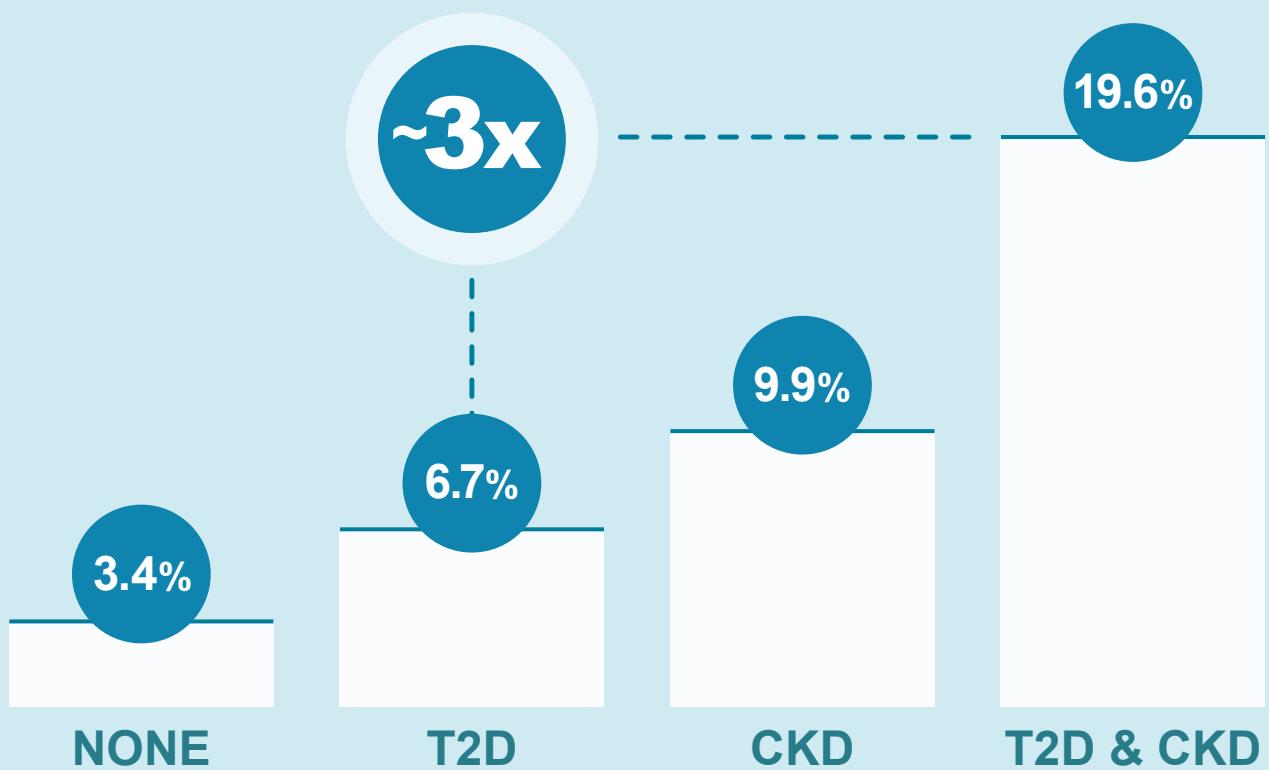
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Kidney Disease Triples the Risk of CV Mortality in Patients With T2D⁷

10-Year Standardized CV Mortality
Cumulative Incidence^{7,a}



Patients with CKD are
**6x more likely to die
from a CV event than
to progress to ESKD⁸**

MORE INFO 

^aData from 15,046 NHANES III (Third National Health and Nutrition Examination Survey) participants aged ≥ 20 years who had follow-up mortality data through 2006.⁷

CKD, chronic kidney disease; **CV**, cardiovascular;
ESKD, end-stage kidney disease; **T2D**, type 2 diabetes.

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As CKD Progresses in Patients With Diabetes, It Reduces the Patient's Health-Related Quality of Life⁹

CKD
STAGE

QUALITY
OF LIFE



**Medicare costs
in the US (2019)**
for CKD associated
with T2D exceeded¹⁰

\$22B



45%
higher costs
per person than for
diabetes alone¹⁰

MORE INFO 

CKD, chronic kidney disease; T2D, type 2 diabetes.

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2. American Diabetes Association: Statistics about diabetes. 2022. Accessed August 1, 2023.
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6. Chu CD, et al. *Am J Kidney Dis*. 2020;76(2):174-183.
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9. Zimbudzi E, et al. *PLoS One*. 2016;11(12):e0168491.
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11. de Boer IH, et al. *Diabetes Care*. 2022;45(12):3075-3090.



Prognosis of CKD by GFR and Albuminuria Categories¹¹

			Albuminuria categories			
			A1	A2	A3	
			Normal to mildly increased <30 mg/g <3 mg/mmol	Moderately increased 30-299 mg/g 3-29 mg/mmol	Severely increased ≥300 mg/g ≥30 mg/mmol	
GFR categories, mL/min/1.73 m ²	G1	Normal or high	≥90	Low risk (if no other markers of kidney disease, no CKD)	Moderately increased risk	High risk
	G2	Mildly decreased	60-89	Low risk (if no other markers of kidney disease, no CKD)	Moderately increased risk	High risk
	G3a	Mildly to moderately decreased	45-59	Moderately increased risk	High risk	Very high risk
	G3b	Moderately to severely decreased	30-44	High risk	Very high risk	Very high risk
	G4	Severely decreased	15-29	Very high risk	Very high risk	Very high risk
	G5	Kidney failure	<15	Very high risk	Very high risk	Very high risk

Low risk (if no other markers of kidney disease, no CKD)

Moderately increased risk

High risk

Very high risk

A2 = microalbuminuria⁴ (older classification system)

A3 = macroalbuminuria or proteinuria⁴ (older classification system)

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CKD, chronic kidney disease; **GFR**, glomerular filtration rate.

4. Kidney Disease Improving Global Outcomes. *Kidney Int Suppl*. 2013;3(1):1-150.

11. de Boer IH, et al. *Diabetes Care*. 2022;45(12):3075-3090.



Awareness of Chronic Conditions, Unadjusted⁶

US NHANES 1999-2016^a

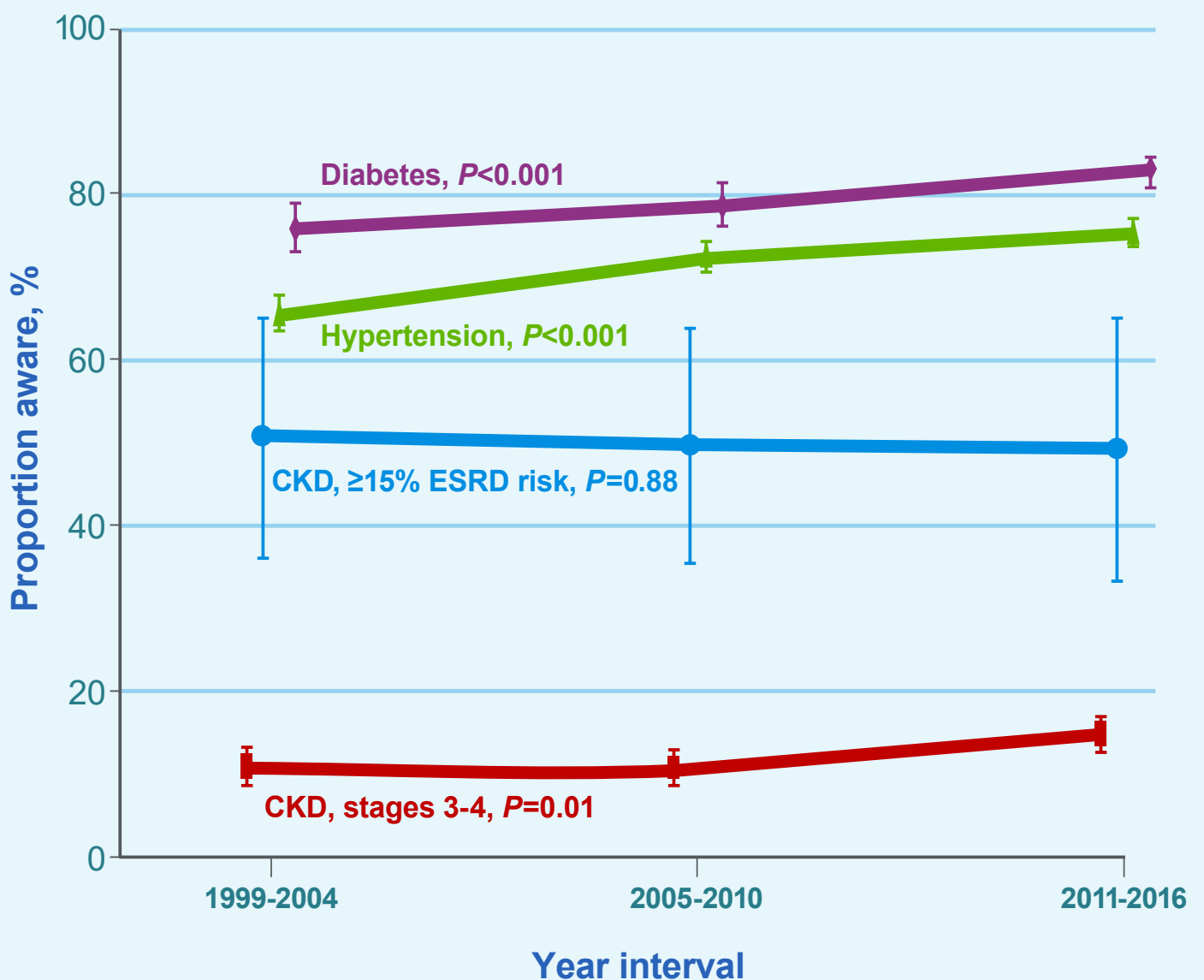


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^aUnadjusted data; N=3713.

CKD, chronic kidney disease; **ESRD**, end-stage renal disease; **NHANES**, National Health and Nutrition Examination Survey.

6. Chu CD, et al. *Am J Kidney Dis.* 2020;76(2):174-183.



Risk of CV Mortality Increases With Decreasing eGFR and Increasing UACR⁴

Summary of Relative Risks From Categorical Meta-analysis for General Population Cohorts With UACR^a

	UACR <10	UACR 10-29	UACR 30-299	UACR ≥300
eGFR >105	Low to no risk	Low to no risk	Moderately increased risk	Moderately increased risk
eGFR 90-105	Ref	Moderately increased risk	Moderately increased risk	Moderately increased risk
eGFR 75-90	Low to no risk	Low to no risk	Moderately increased risk	Moderately increased risk
eGFR 60-75	Low to no risk	Low to no risk	Moderately increased risk	High risk
eGFR 45-60	Low to no risk	Moderately increased risk	High risk	Very high risk
eGFR 30-45	Moderately increased risk	Moderately increased risk	High risk	Very high risk
eGFR 15-30	Very high risk	Very high risk	Very high risk	Very high risk

Low to no risk
0.9-1.5

Moderately increased risk
1.5-2.2

High risk
2.2-4

Very high risk
>4

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^aeGFR and albuminuria are expressed as categorical variables. All results are adjusted for covariates and compared to the reference cell (Ref). Each cell represents pooled RR from a meta-analysis. Colors reflect ranking of adjusted RR. The point estimates for each cell were ranked from 1 to 28 (the lowest RR having rank number 1, and the highest number 28). The categories with rank numbers 1-8 are green, the rank numbers 9-14 are yellow, the rank numbers 15-21 are orange, and the rank numbers 22-28 are red.

CV, cardiovascular **eGFR**, estimated glomerular filtration rate; **Ref**, reference; **RR**, relative risk; **UACR**, urine albumin-to-creatinine ratio.

4. Kidney Disease Improving Global Outcomes. *Kidney Int Suppl.* 2013;3(1):1-150.



HRQoL Declines as CKD Progresses^{9,a}

Burden of Kidney Disease Scores by CKD Stage in Patients With Diabetes⁹

$P_{\text{trend}} = 0.000$

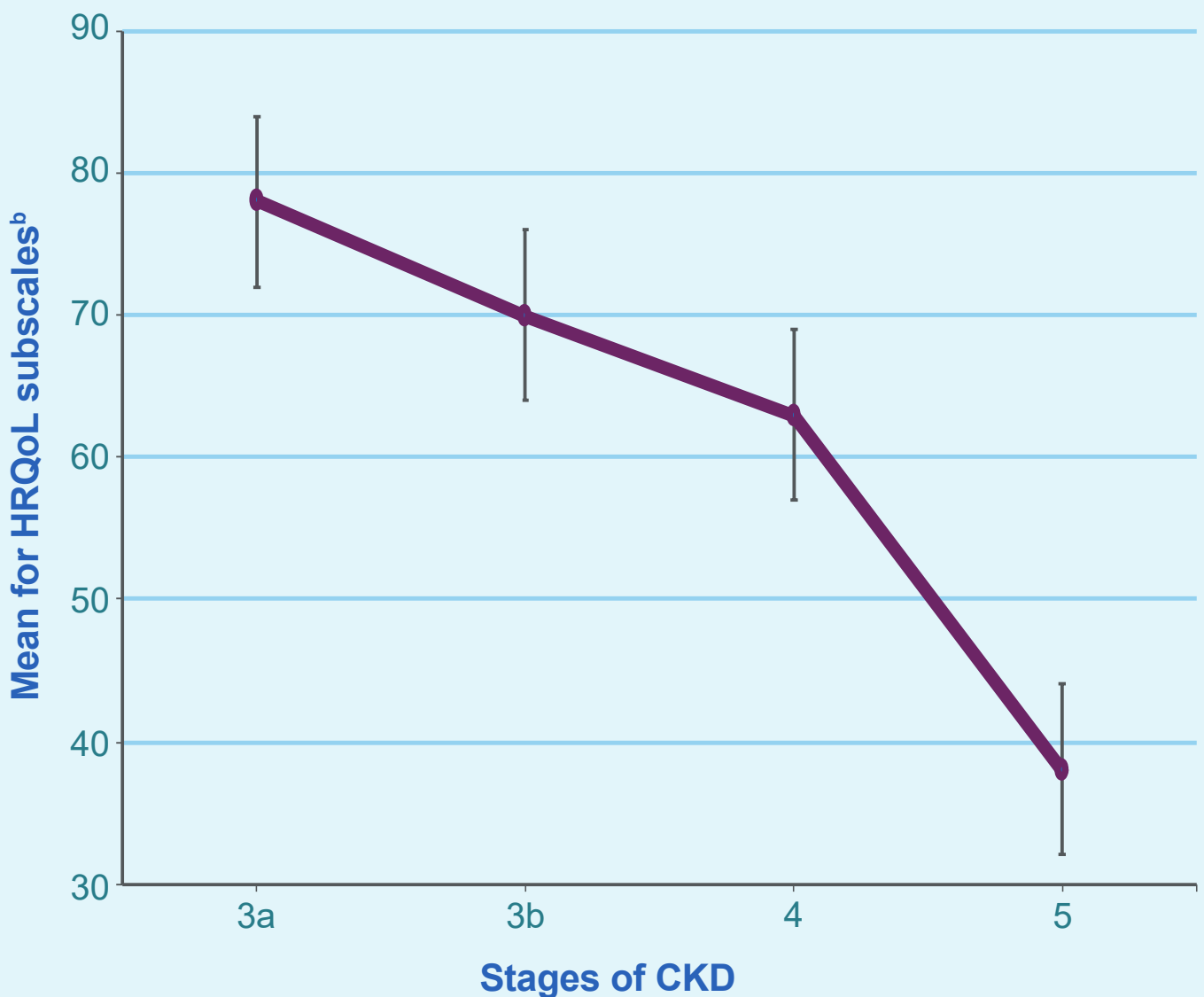


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^aCross sectional study among adults with diabetes and CKD (eGFR <60 mL/min/1.73 m²) recruited from renal and diabetes clinics of four large tertiary referral hospitals in Australia between 2013 and December 2014 (N=308). ^bError bars are 95% CI.

CI, confidence interval; **CKD**, chronic kidney disease; **eGFR**, estimated glomerular filtration rate; **HRQoL**, health-related quality of life.

9. Zimbudzi E, et al. *PLoS One*. 2016;11(12):e0168491.