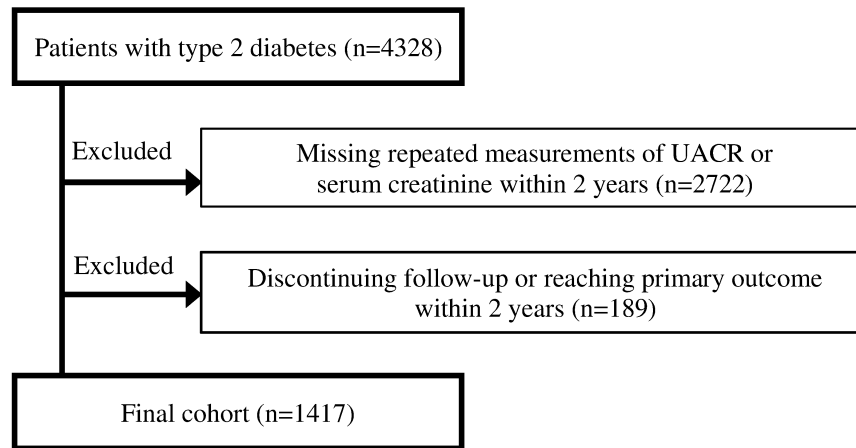
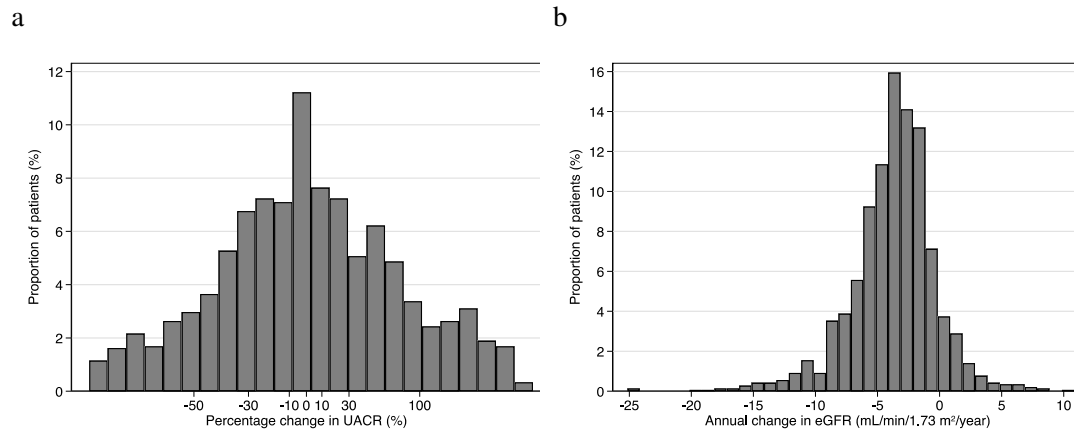


Supplementary Figure 1: Flow chart of the study cohort

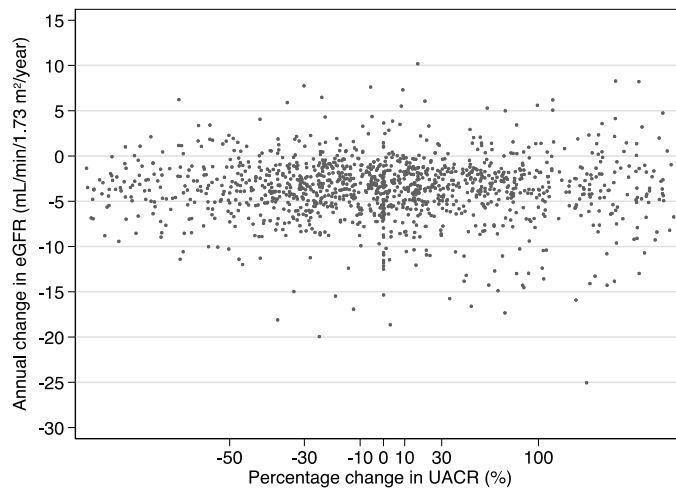
Supplementary Figure 2: Distribution of percentage changes in UACR (a) and annual changes in eGFR (b) over 2 years



Supplementary Figure 3: Scatter plots of annual changes in eGFR and percentage (a) and absolute (b) changes in UACR over 2 years

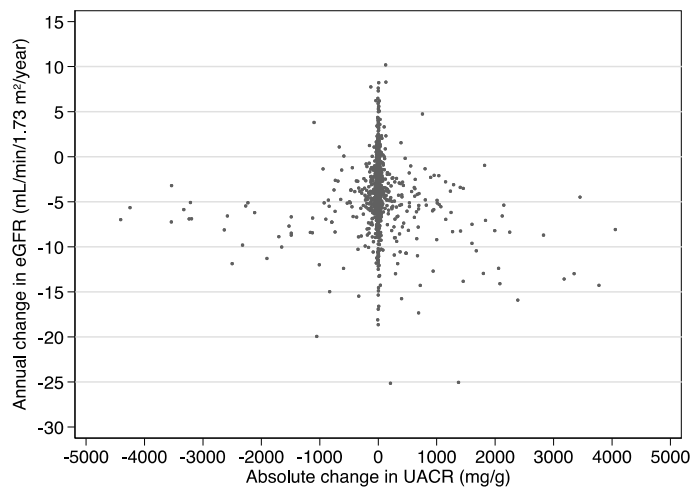
a

$$|r| = 0.05, p = 0.06$$



b

$$|r| = 0.05, p = 0.06$$



Correlations between the changes in UACR and eGFR were tested using Pearson's correlation coefficient.

Supplementary Table 1: Adjusted odds ratios (95% CIs) of baseline patient characteristics for a >30% increase in UACR and a substantial decline in eGFR (>5 mL/min/1.73 m²/year) over 2 years

	Odds ratio (95% CI)	P
>30% increase in UACR		
Male (versus female)	1.14 (0.90–1.43)	0.28
Age (per 10 years)	0.87 (0.78–0.98)	0.018
History of cardiovascular disease (versus no history)	1.19 (0.81–1.75)	0.37
HbA1c (per 1 percentage)	1.12 (1.05–1.20)	0.001
Systolic blood pressure (per 10 mmHg)	0.96 (0.90–1.02)	0.16
Log-transformed UACR (per 1 log(mg/g))	0.88 (0.82–0.94)	<0.001
eGFR (per 10 mL/min/1.73 m ²)	0.91 (0.86–0.96)	0.001
Substantial decline in eGFR (> 5 mL/min/1.73 m²/year)		
Male (versus female)	0.81 (0.62–1.05)	0.11
Age (per 10 years)	1.20 (1.06–1.35)	0.005
History of cardiovascular disease (versus no history)	1.11 (0.72–1.71)	0.63
HbA1c (per 1 percentage)	1.18 (1.09–1.27)	<0.001
Systolic blood pressure (per 10 mmHg)	0.96 (0.90–1.03)	0.23
Log-transformed UACR (per 1 log(mg/g))	1.77 (1.62–1.93)	<0.001
eGFR (per 10 mL/min/1.73 m ²)	1.30 (1.22–1.38)	<0.001

Adjusted for sex, age, history of cardiovascular disease, and baseline covariates including HbA1c, systolic blood pressure, log-transformed UACR, and eGFR.

Supplementary Table 2: Subgroup analysis of adjusted hazard ratios (95% CIs) for ESKD by percentage changes in UACR and annual changes in eGFR over 2 years

	Percentage change in UACR	n/N (%)	Event rates per 1000 patient-years	HR (95% CI)	P for interaction	Annual change in eGFR	n/N (%)	Event rates per 1000 patient-years	HR (95% CI)	P for interaction
Age (years) <60	Decline >30%	13/164 (8)	10.8	0.42 (0.21–0.87)	0.89	Substantial decline (>5 mL/min/1.73 m ² /year)	57/205 (28)	51.8	9.69 (2.16–43.6)	0.34
	Minor change	28/258 (11)	15.6	1.00 (reference)		Decline (2.5–5 mL/min/1.73 m ² /year)	14/191 (7)	10.4	5.53 (1.23–24.9)	
	Increase >30%	32/217 (15)	23.1	2.07 (1.18–3.63)		eGFR minor change (<2.5 mL/min/1.73 m ² /year)	2/243 (0.8)	1.0	1.00 (reference)	
≥60	Decline >30%	15/243 (6)	9.8	0.58 (0.28–1.19)		Substantial decline (>5 mL/min/1.73 m ² /year)	31/214 (14)	29.0	2.61 (0.95–7.18)	
	Minor change	18/292 (6)	9.6	1.00 (reference)		Decline (2.5–5 mL/min/1.73 m ² /year)	19/306 (6)	10.1	2.11 (0.82–5.41)	
	Increase >30%	23/243 (9)	16.9	3.06 (1.54–6.06)		eGFR minor change (<2.5 mL/min/1.73 m ² /year)	6/258 (2)	3.3	1.00 (reference)	
Sex Male	Decline >30%	16/213 (8)	11.3	0.38 (0.20–0.70)	0.63	Substantial decline (>5 mL/min/1.73 m ² /year)	61/227 (27)	53.6	3.97 (1.41–11.17)	0.47
	Minor change	38/321 (12)	18.4	1.00 (reference)		Decline (2.5–5 mL/min/1.73 m ² /year)	23/283 (8)	12.7	3.17 (1.18–8.49)	
	Increase >30%	35/268 (13)	21.6	2.25 (1.37–3.71)		eGFR minor change (<2.5 mL/min/1.73 m ² /year)	5/292 (2)	2.3	1.00 (reference)	
Female	Decline >30%	12/194 (6)	9.1	0.67 (0.26–1.75)		Substantial decline (>5 mL/min/1.73 m ² /year)	27/192 (14)	26.2	5.33 (1.41–20.2)	
	Minor change	8/229 (3)	5.0	1.00 (reference)		Decline (2.5–5 mL/min/1.73 m ² /year)	10/214 (5)	7.0	2.37 (0.61–9.10)	
	Increase >30%	20/192 (10)	17.8	2.81 (1.14–6.91)		eGFR minor change (<2.5 mL/min/1.73 m ² /year)	3/209 (1)	1.9	1.00 (reference)	
eGFR (mL/min/1.73 m ²) ≥60	Decline >30%	6/328 (2)	2.6	0.27 (0.09–0.77)	0.026	Substantial decline (>5 mL/min/1.73 m ² /year)	38/325 (12)	20.5	6.43 (2.09–19.80)	0.034
	Minor change	16/459 (3)	4.9	1.00 (reference)		Decline (2.5–5 mL/min/1.73 m ² /year)	12/397 (3)	4.4	3.58 (1.13–11.32)	
	Increase >30%	32/365 (9)	14.0	4.06 (2.13–2.75)		eGFR minor change (<2.5 mL/min/1.73 m ² /year)	4/430 (0.9)	1.2	1.00 (reference)	
<60	Decline >30%	22/79 (28)	56.0	0.61 (0.34–1.10)		Substantial decline (>5 mL/min/1.73 m ² /year)	50/94 (53)	158.7	3.81 (1.18–12.3)	
	Minor change	30/91 (33)	78.3	1.00 (reference)		Decline (2.5–5 mL/min/1.73 m ² /year)	21/100 (21)	40.2	2.25 (0.74–6.83)	
	Increase >30%	23/95 (24)	49.5	1.95 (1.02–3.72)		eGFR minor change (<2.5 mL/min/1.73 m ² /year)	4/71 (6)	9.9	1.00 (reference)	
UACR (mg/g) <30	Decline >30%	1/188 (0.5)	0.7	0.72 (0.06–8.63)	0.70	Substantial decline (>5 mL/min/1.73 m ² /year)	2/192 (1)	1.8	3.67 (0.40–33.33)	0.63
	Minor change	2/373 (0.5)	0.7	1.00 (reference)		Decline (2.5–5 mL/min/1.73 m ² /year)	4/313 (1)	2.0	4.45 (0.70–28.16)	
	Increase >30%	5/287 (2)	2.7	2.99 (0.54–16.46)		eGFR minor change (<2.5 mL/min/1.73 m ² /year)	2/343 (10)	0.7	1.00 (reference)	
30–<300	Decline >30%	5/147 (3)	5.0	0.64 (0.18–2.27)		Substantial decline	10/96 (10)	18.5	8.26 (2.06–33.16)	

					(>5 mL/min/1.73 m ² /year)			
	Minor change	5/98 (5)	7.5	1.00 (reference)	Decline (2.5-5 mL/min/1.73 m ² /year)	11/133 (8)	11.8	2.54 (0.67–9.34)
	Increase >30%	14/114 (12)	19.7	1.50 (0.50–4.51)	eGFR minor change (<2.5 mL/min/1.73 m ² /year)	3/130 (2)	3.3	1.00 (reference)
≥300	Decline >30%	22/72 (31)	57.1	0.43 (0.25–0.77)	Substantial decline (>5 mL/min/1.73 m ² /year)	76/131 (58)	154.2	3.43 (1.03–11.37)
	Minor change	39/79 (49)	123.8	1.00 (reference)	Decline (2.5-5 mL/min/1.73 m ² /year)	18/51 (35)	68.2	2.28 (0.64–8.05)
	Increase >30%	36/59 (61)	173.1	2.30 (1.36–3.86)	eGFR minor change (<2.5 mL/min/1.73 m ² /year)	3/28 (11)	19.9	1.00 (reference)

Adjusted for sex, age, history of cardiovascular disease, and baseline covariates including HbA1c, systolic blood pressure, log-transformed UACR, and eGFR, and stratified with institution.

Supplementary Table 3: Adjusted hazard ratios (95% CIs) for ESKD and ESKD or death by percentage changes in UACR and annual changes in eGFR over 2 years

		n/N (%)	Event rates per 1000 patient-years	HR (95% CI)	P	P for trend
ESKD	UACR decline >30%	28/407 (7)	10.2	0.47 (0.29–0.77)	0.003	<0.001
	UACR minor change	46/550 (8)	12.5	1.00 (reference)		
	UACR increase >30%	55/460 (12)	20.0	2.31 (1.52–3.51)	<0.001	
ESKD or death	UACR decline >30%	51/407 (13)	18.6	0.60 (0.42–0.87)	0.008	<0.001
	UACR minor change	73/550 (13)	19.9	1.00 (reference)		
	UACR increase >30%	80/460 (17)	29.1	1.68 (1.21–2.33)	0.002	
		n/N (%)	Event rates per 1000 patient-years	HR (95% CI)	P	P for trend
ESKD	eGFR substantial decline (>5 mL/min/1.73 m ² /year)	88/419 (21)	40.6	4.19 (1.87–9.38)	<0.001	<0.001
	eGFR decline (2.5–5 mL/min/1.73 m ² /year)	33/497 (7)	10.2	2.89 (1.32–6.33)	0.008	
	eGFR minor change (<2.5 mL/min/1.73 m ² /year)	8/501 (2)	2.1	1.00 (reference)		
ESKD or death	eGFR substantial decline (>5 mL/min/1.73 m ² /year)	102/419 (24)	47.0	1.97 (1.25–3.11)	0.003	0.003
	eGFR decline (2.5–5 mL/min/1.73 m ² /year)	66/497 (13)	20.4	1.47 (0.97–2.22)	0.07	
	eGFR minor change (<2.5 mL/min/1.73 m ² /year)	36/501 (7)	9.6	1.00 (reference)		

Adjusted for sex, age, history of cardiovascular disease, and baseline covariates including HbA1c, systolic blood pressure, log-transformed UACR, and eGFR, and stratified with institution.

Supplementary Table 4 : Adjusted hazard ratios (95% CIs) for ESKD by additional categories of changes in UACR over 2 years

	n/N (%)	Event rates per 1000 patient-years	HR (95% CI)	P	P for trend
Percentage changes in UACR					
UACR decline >30%	28/407 (7)	10.2	0.47 (0.29–0.76)	0.002	<0.001
UACR decline ≤30% to increase ≤43%	49/597 (8)	12.3	1.00 (reference)		
UACR increase >43%	52/413 (13)	22.5	2.46 (1.62–3.74)	<0.001	
Absolute changes in UACR^{*1}					
UACR decline (<-3.7 mg/g)	49/474 (10)	15.5	0.84 (0.42–1.67)	0.61	<0.001
UACR minor change (-3.7 to 3.7 mg/g)	11/471 (2)	3.4	1.00 (reference)		
UACR increase (≥3.7 mg/g)	69/472 (15)	24.70	2.33 (1.23–4.44)	0.01	
Progression of albuminuria^{*2}					
Yes	12/66 (18)	32.3	2.86 (1.16–7.00)	0.02	
No	20/1141 (2)	2.5	1.00 (reference)		
Regression of albuminuria^{*3}					
Yes	9/128 (7)	10.6	0.56 (0.28–1.14)	0.11	
No	112/441 (25)	46.0	1.00 (reference)		

Adjusted for sex, age, history of cardiovascular disease, and baseline covariates including HbA1c, systolic blood pressure, log-transformed UACR, and eGFR, and stratified with institution.

^{*1} Patients were divided into three categories using the tertiles of the absolute changes in UACR over 2 years.

^{*2} Progression of albuminuria was defined as a UACR increase from <30 to ≥30 mg/g or from 30-<300 to ≥300 mg/g.

^{*3} Regression of albuminuria was defined as a UACR decrease from ≥30 to <30 mg/g or from ≥300 to <300 mg/g.

Supplementary Table 5 : Adjusted hazard ratios (95% CIs) for ESKD by the percentage changes in eGFR over 2 years

	n/N (%)	Event rates per 1000 patient-years	HR (95% CI)	P	P for trend
Percentage changes in eGFR					
eGFR decline >30%	67/154 (44)	114.1	2.73 (1.26–5.89)	0.01	0.003
eGFR decline >0 to 30%	52/919 (6)	8.5	1.38 (0.69–2.77)	0.37	
eGFR increase \geq 0%	10/344 (3)	4.1	1.00 (reference)		

Adjusted for sex, age, history of cardiovascular disease, and baseline covariates including HbA1c, systolic blood pressure, log-transformed UACR, and eGFR, and stratified with institution.