



ISN

INTERNATIONAL SOCIETY
OF NEPHROLOGY

ACADEMY

KIDNEY HEALTH EDUCATION FOR GLOBAL IMPACT

Rethinking CKD Screening: Global Perspectives on Early Detection and Timely Intervention

Who, When, and How to Screen for CKD? Lessons from International Practices



Insights and Korean perspectives

October 13th 2026

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1. CKD in South Korea

- Current snapshot
- National Health screening program in South Korea and KNOW-CKD cohort study
- Who, When, How ?

2. Who actually progresses?

3. Detection into outcomes

- Stop ESKD progression
- Stay healthy in your stage
- Save patients lives

4. Summary



CKD in South Korea (1)

- Current snapshot

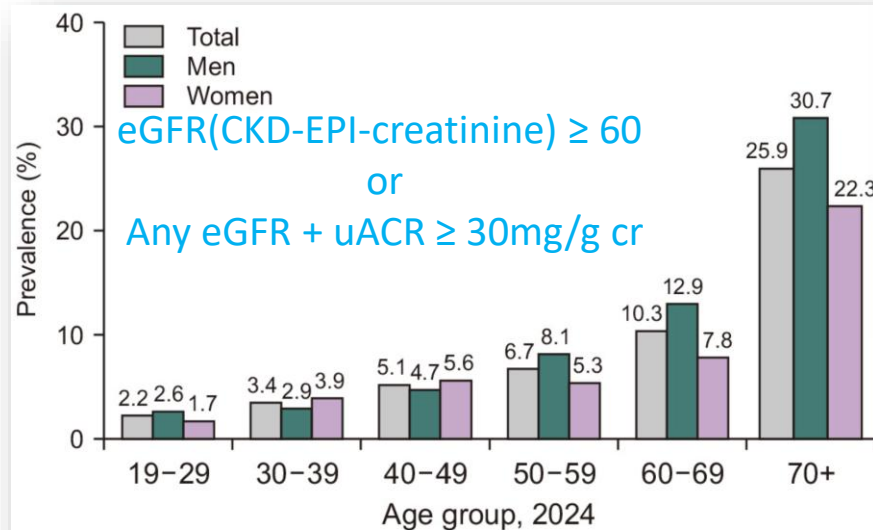


Fig 2. Prevalence of chronic kidney disease by age group, 2024

Public Health Weekly Report 2026;19:433~434 <https://doi.org/10.56786/PHWR.2026.19.9.3>
 Public Health Weekly Report 2024; 17(9): 381-382 <https://doi.org/10.56786/PHWR.2024.17.9>
 Kidney Res Clin Pract 2024;43(1):8-19 <https://doi.org/10.23876/j.krcp.23.232>

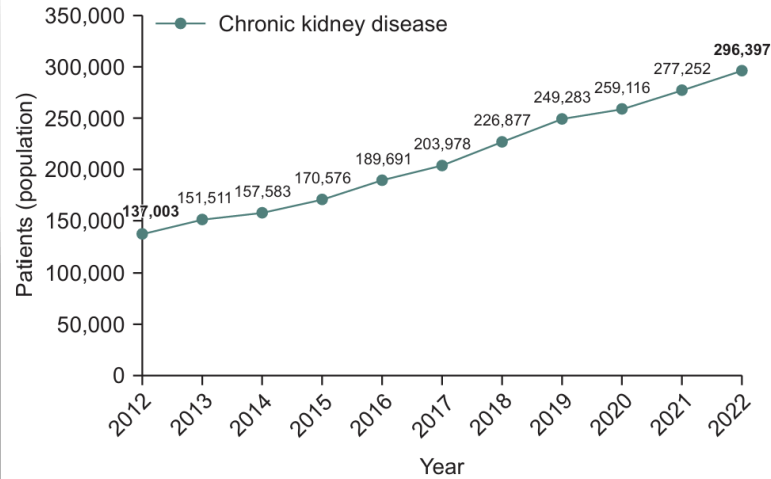


Figure 1. Chronic kidney disease patients, 2012-2021

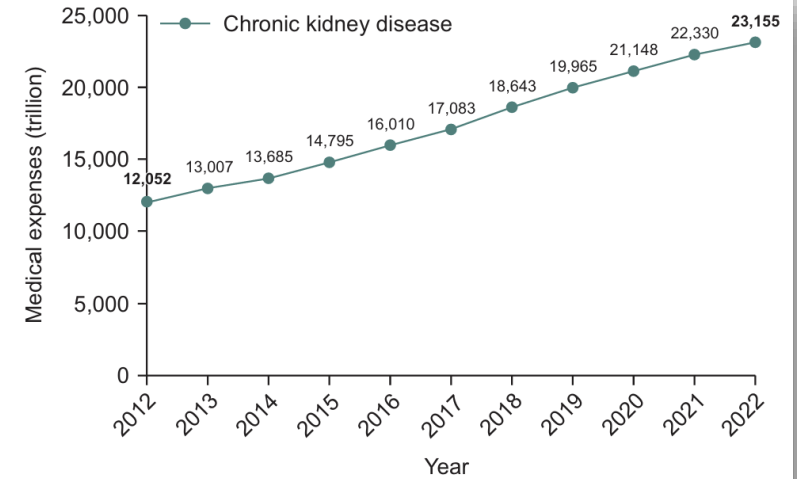
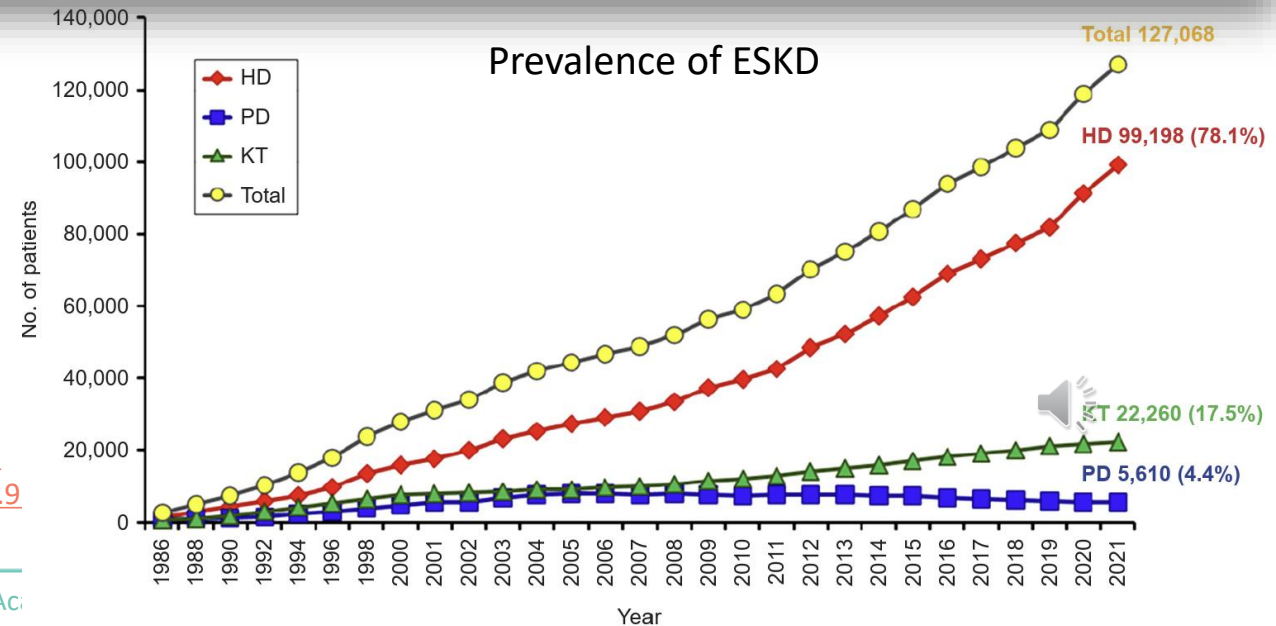


Figure 2. Chronic kidney disease medical expenses, 2012-2022



CKD in South Korea (2)

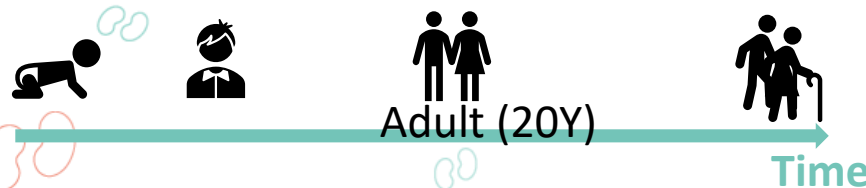
- National Health screening program in South Korea

Infant and Child (age 0—5)	School age (age 6—18)	Adult age (age ≥19)
Screening for Infant and Child 1st: 14 days 2nd: 4 months 3rd: 9 months 4th: 18 months 5th: 30 months 6th: 42 months 7th: 54 months 8th: 66 months (Total 8 times)	Screening for School Children 1st: Grade 1 2nd: Grade 4 3rd: Grade 7 4th: Grade 10 (Total 4 times)	General Health Screening Program - Other diseases: anemia, tuberculosis, liver disease, hepatitis B, - Cardiovascular risk factors: hypertension, diabetes mellitus, dyslipidemia, health behaviors - Mental health: depression - Geriatric disease and function: osteoporosis, dementia, risk of fall - Every 2 years (every years for manual laborer) National Cancer Screening Program - Stomach cancer: age ≥ 40, every 2 years - Liver cancer: age ≥ 40, high risk group, every 6 months - Colon cancer: age ≥ 50, every year - Breast cancer: age ≥ 40, every 2 years - Cervical cancer: age ≥ 20, every 2 years - Lung cancer: age 54-74, high risk group, every 2 years
	Screening for non-school Children Every 3 years	

Urinalysis

요 검사	신장질환 Kidney disease	요 단 백 Proteinuria	+	음성	약양성 ±
빈혈 등 Anemia	혈 색 소 Hemoglobin	g/dL		남:13-16.5 여:12-15.5	남:12-12.9 여:10-11.9
당뇨병 Diabetes	공복혈당 Fasting glucose level	mg/dL		100미만	100-125
고혈압, 이상지질혈증, 동맥경화	총콜레스테롤	mg/dL		200미만	200-239
	HDL-콜레스테롤	mg/dL		60이상	40-59
	트리글리세라이드	mg/dL		150미만	150-199
	LDL-콜레스테롤	mg/dL		130미만	130-159
만성신장질환 Chronic kidney disease	혈청크레아티닌 Creatinine	2.1 mg/dL		1.5이하	-
	신사구체여과율(e-GFR)	39 mL/min/1.73m ²		60이상	-

Reference value



Low awareness of CKD (4%)

CKD unawareness
(n = 1,906)

CKD awareness
(n = 78)

Precision and Future Medicine 2022;6(1):9-31 <https://doi.org/10.23838/pfm.2021.00135>

International Urology and Nephrology (2023) 55:2005–2013 <https://doi.org/10.1007/s11255-023-03513-4>

CKD in South Korea (3)



Number of iNET-CKD cohort studies: 32

Country: Republic of Korea
Project: KNOW-CKD
Study Patients: 2238

The ISN leads the International Network of Chronic Kidney Disease cohort studies (iNET-CKD), bringing together independently funded CKD cohort studies worldwide. This collaboration helps improve our understanding of CKD progression and its outcomes.

iNET-CKD: Cohorts Empowering Kidney Research

82,915 patients

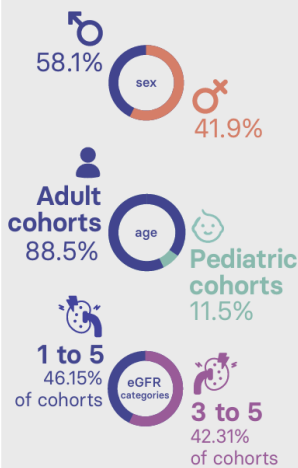
26 cohorts

Most cohorts are still following up participants

worldwide representation

4C	CKDopps Germany	GCKD	NURTURE-CKD
C-STRIDE	CKDopps US	ICKD	PECERA
CanPREDICT	CKiD	KNOW-CKD	PROGRESER
CKD-JAC	CORE CKD	KNOW-ped CKD	PROVALID
CKD-REIN	CRIC	MMKD	PSI BIND-NL
CKDopps Brazil	EQUAL	NRHP-URU	RRID
			SKS

Demographics



Consistently captured causes of kidney disease

Comorbidities Captured



Laboratory data captured



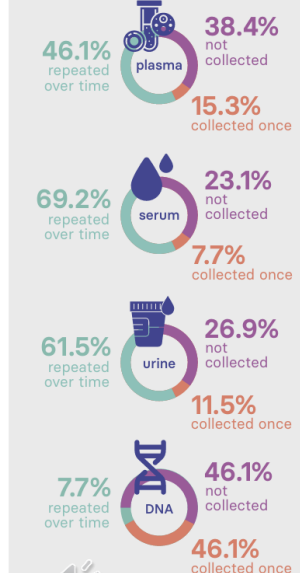
Medications captured



Outcomes



Biosamples Available

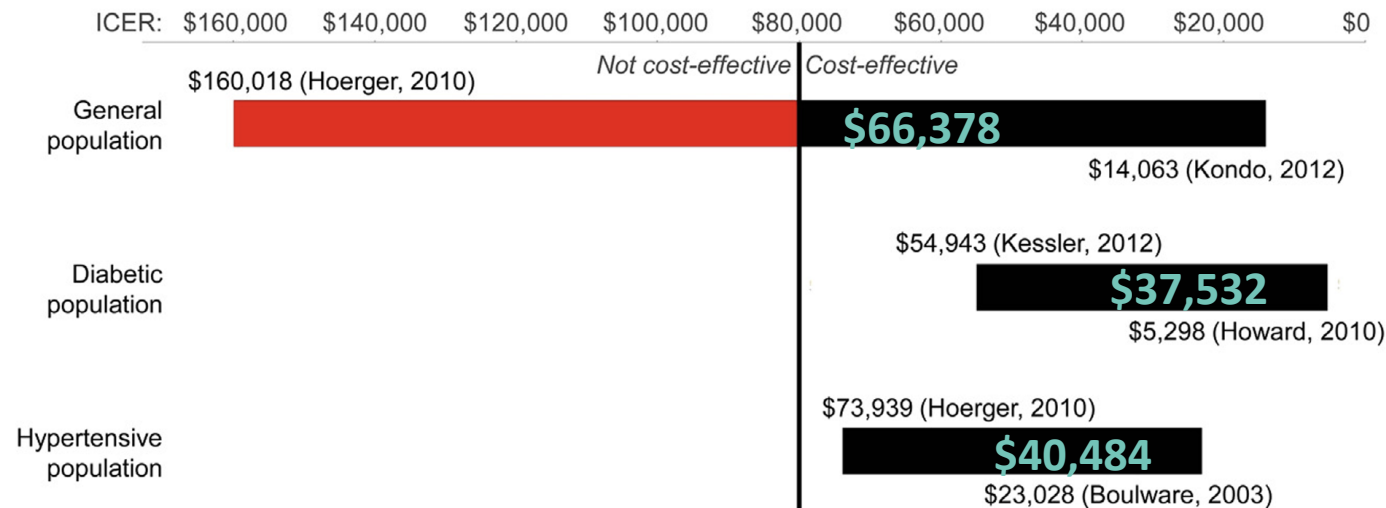
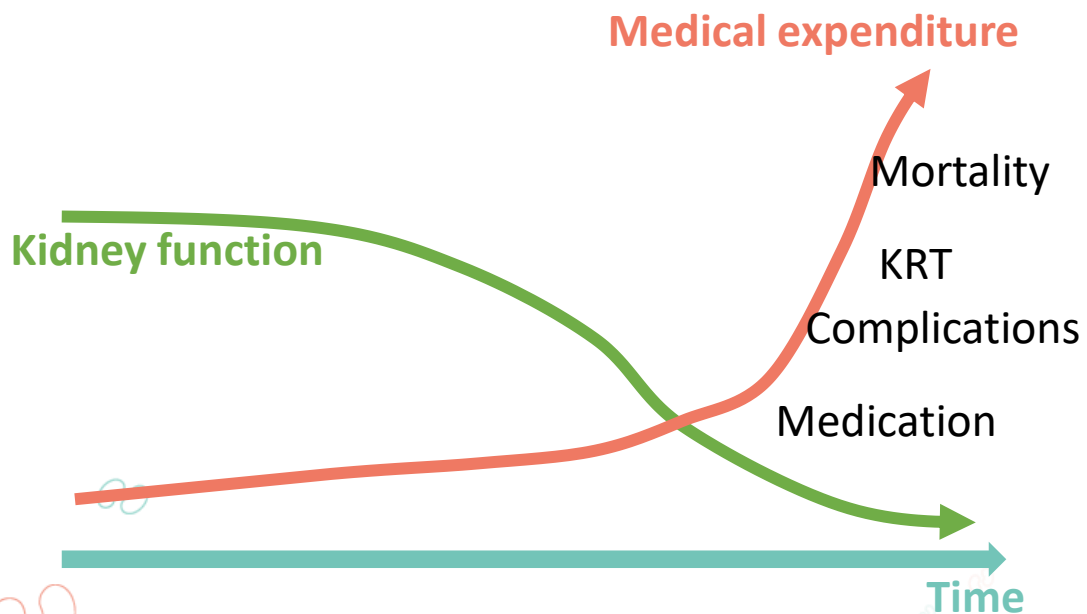


Interested in collaborating with iNET-CKD or learning more?
Visit www.theisn.org/cohort-studies-i-net-ckd or email research@theisn.org



CKD in South Korea (4)

- Who : over 50y, When : per 3 years, How : microalbuminuria mono screening?
- Late detection is expensive, and the bill is already due



- Annual eGFR + urinalysis for all \$5 vs HD \$7925.87 (per year) in Brazil

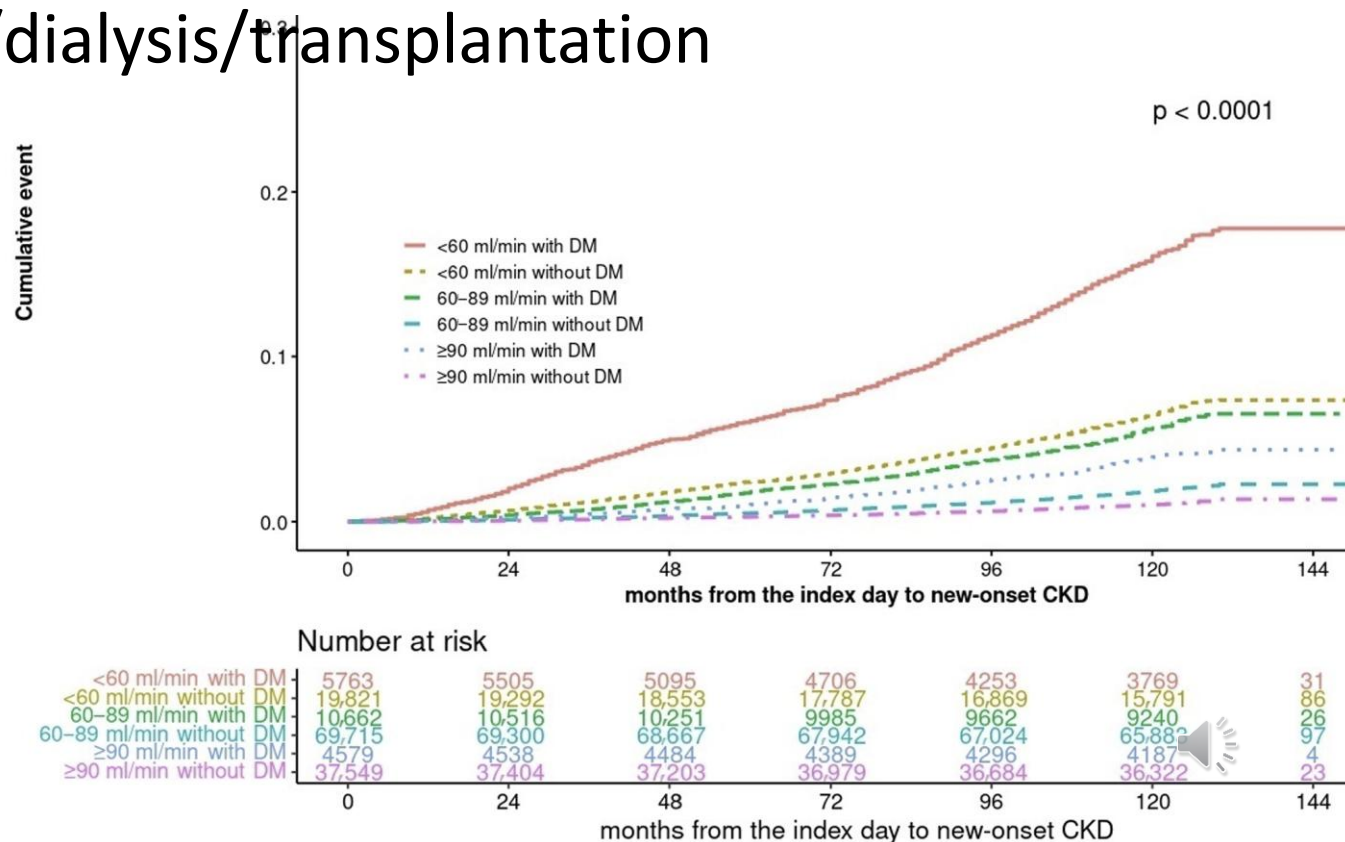
Am J Kidney Dis. 2014;63(5):789-797 <http://dx.doi.org/10.1053/j.ajkd.2013.12.012>

An Evaluation of National Screening Program for Chronic Kidney Disease, Korean CDC, 2016

Braz. J. Nephrol. 2026, 48(1):e20250112

Who actually progresses? (1) general population

- National Health Insurance service (NHIS)
1 million sample cohort (2% of national population)
- New CKD incidence : CKD code/dialysis/transplantation
 - Elderly (over 75 yrs)
 - Previous low eGFR with DM
 - Male
 - Ischemic stroke history in men
 - Heart failure in women
 - Hypertension
 - Dyslipidemia
 - Atrial fibrillation and flutter



Who actually progresses? (2) among CKD patients

- Renal composite endpoint risk factors (1)

Table 4. Risk factors for renal composite end-points

	Number of events (%)	Hazard Ratio	95% CI
Age			
20–39	81 (25.6)	1	
40–49	131 (29.7)	0.73	0.55–0.96
50–59	207 (31.7)	0.52	0.40–0.68
60–69	182 (32.3)	0.41	0.31–0.54
≥ 70	61 (29.6)	0.34	0.24–0.48
Gender			
Female	266 (31.6)	1	
Male	396 (29.6)	1.14	0.97–1.33
DM			
Non-DM	348 (24.0)	1	
DM	314 (43.1)	1.95	1.66–2.30
CKD stage			
G1	12 (3.4)	1	
G2	48 (11.5)	4.10	2.17–7.74
G3a	66 (18.4)	7.46	4.00–13.89
G3b	149 (32.4)	14.04	7.72–25.51
G4	275 (59.5)	41.19	22.85–74.27
G5	112 (84.8)	145.24	79.12–266.64

Table 4 | Slopes of eGFR decline according to SBP-TTR

SBP-TTR category	Slope of eGFR decline (95% CI) (ml/min per 1.73 m ² per year)	P	P _{trend}
SBP-TTR 0%	–3.17 (–3.66 to –2.69)	Reference	<0.001
SBP-TTR 1%–50%	–3.02 (–3.35 to –2.68)	0.599	
SBP-TTR 51%–99%	–2.62 (–2.89 to –2.36)	0.050	
SBP-TTR 100%	–2.33 (–2.62 to –2.04)	0.004	

CI, confidence interval; eGFR, estimated glomerular filtration rate; SBP, systolic blood pressure; TTR, time-in-target range.

Cause of CKD	Kidney failure		Composite kidney outcome	
	HR (95% CI)	P value	HR (95% CI)	P value
Glomerulonephritis	Reference		Reference	
Hypertensive nephropathy	0.88 (0.64–1.21)	0.429	0.80 (0.60–1.07)	0.129
Diabetic nephropathy	1.20 (0.92–1.57)	0.176	1.18 (0.93–1.49)	0.182
Polycystic kidney disease	1.82 (1.25–2.65)	0.002	2.00 (1.46–2.75)	<0.001

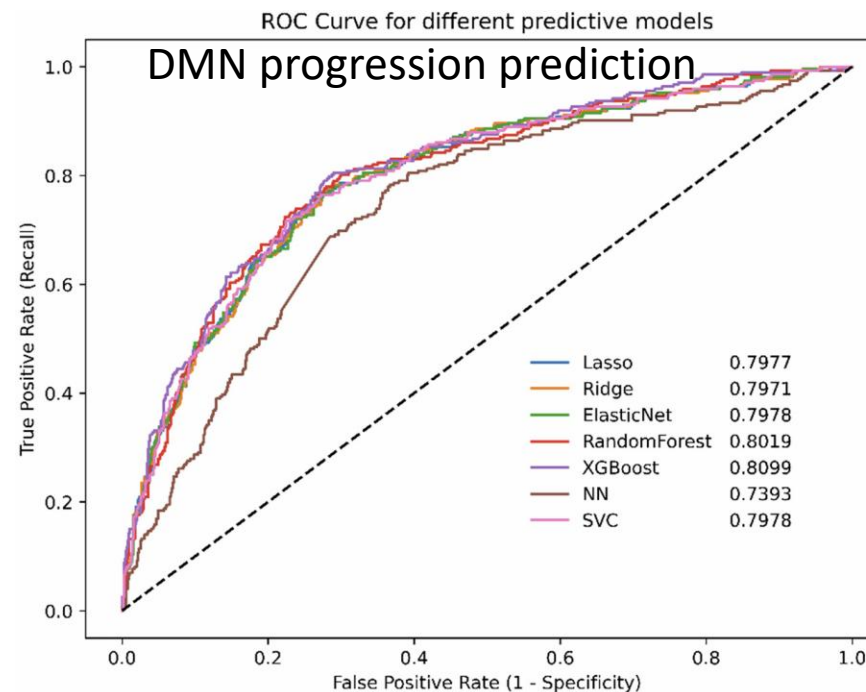
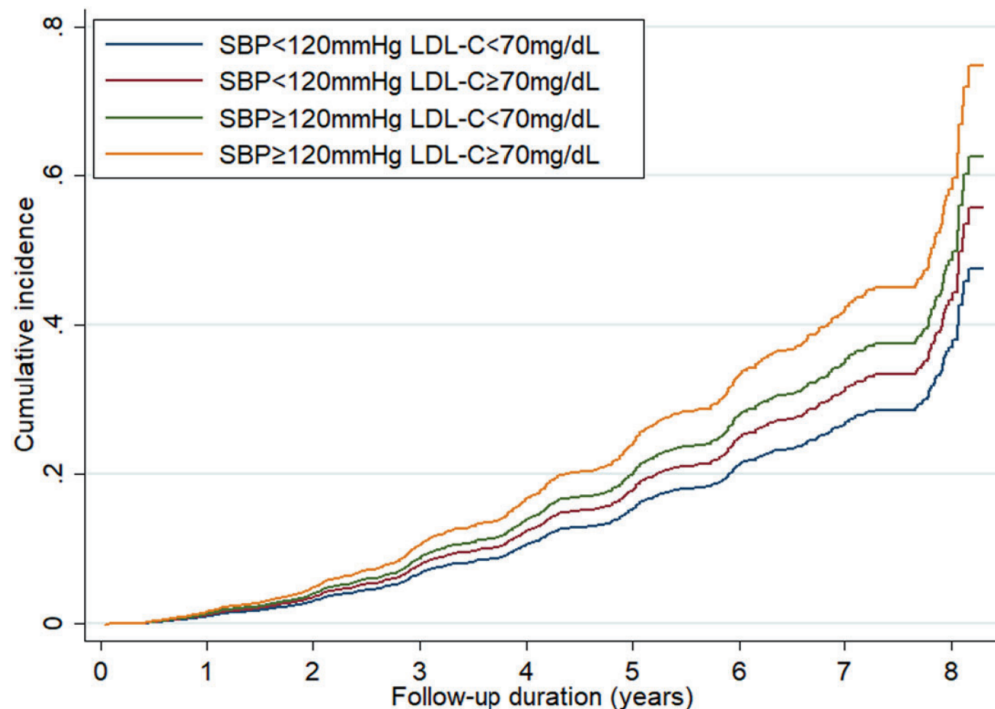
Kidney Res Clin Pract. 2020;39(2):121–135, <https://doi.org/10.23876/j.krcp.20.042>

Kidney International (2024) 105, 835–843 <https://doi.org/10.1016/j.kint.2023.12.008>

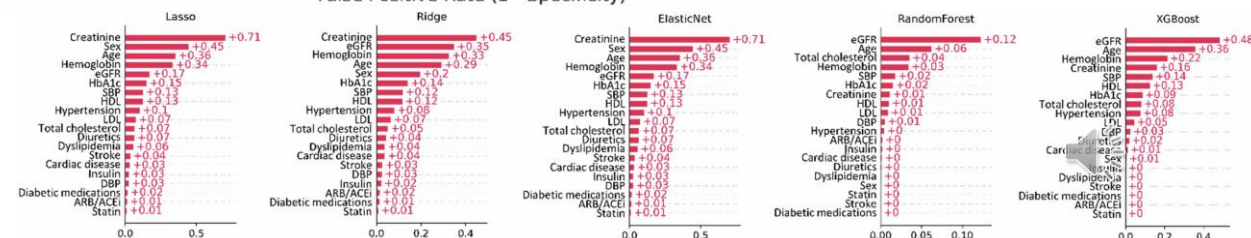
Sci Rep. 2023;13:3570 | <https://doi.org/10.1038/s41598-023-29844-x>

Who actually progresses? (2) among CKD patients

Renal composite endpoint risk factors (2)



SHAP values
eGFR/creatinine
Age
Hb
SBP
HDL
HbA1c
Total Chol
HTN
LDL



Hypertension Research 2023 <https://doi.org/10.1038/s41440-023-01230-0>
J. Clin. Med. 2025, 14, 2065 <https://doi.org/10.3390/jcm14062065>

Who actually progresses? (3) Mortality

Dipstick proteinuria predicts all-cause mortality in general population

National representative sample cohort

Product-limit survival estimates

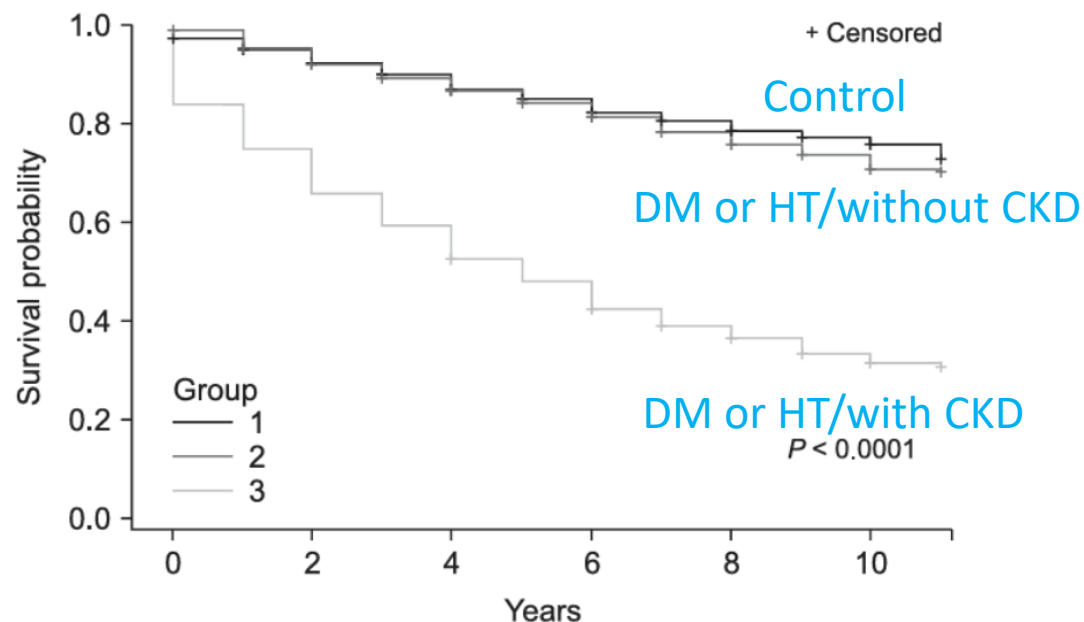
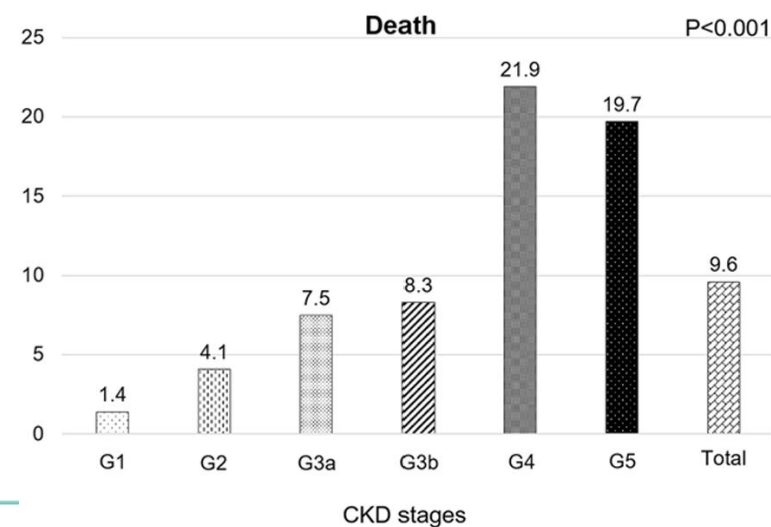
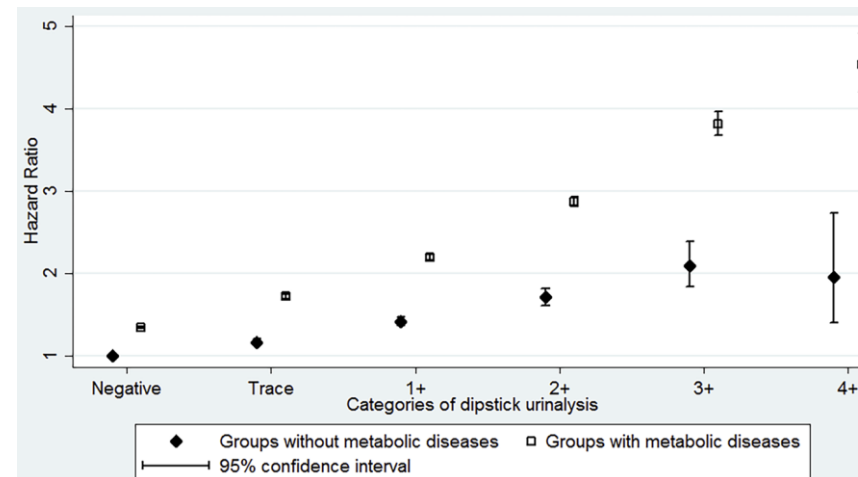


Figure 2. Kaplan–Meier survival curves for comparisons of survival rates by group ($P < 0.0001$ by log-rank test).

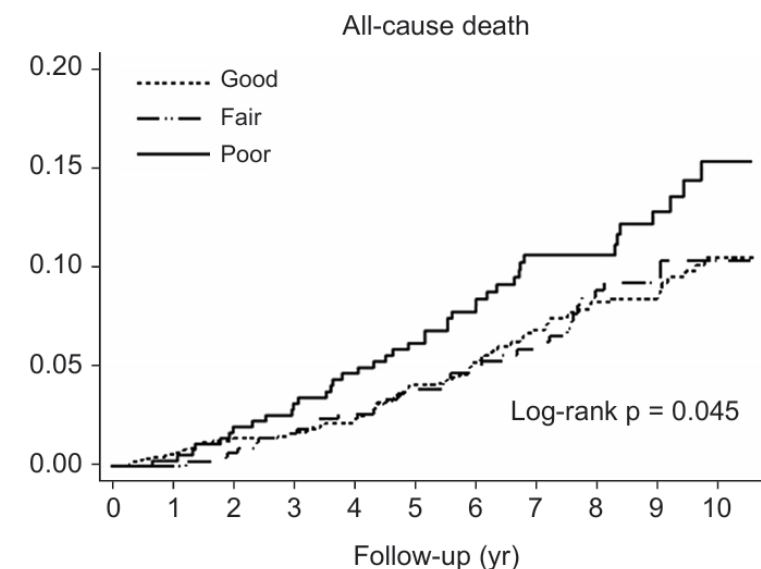
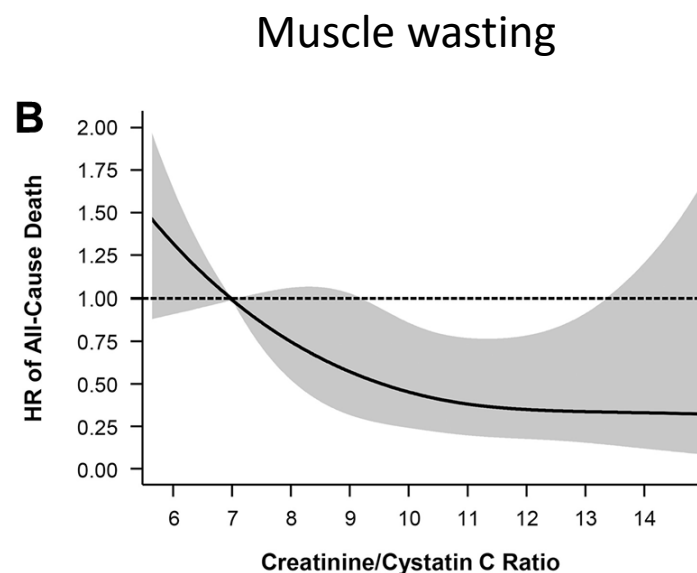
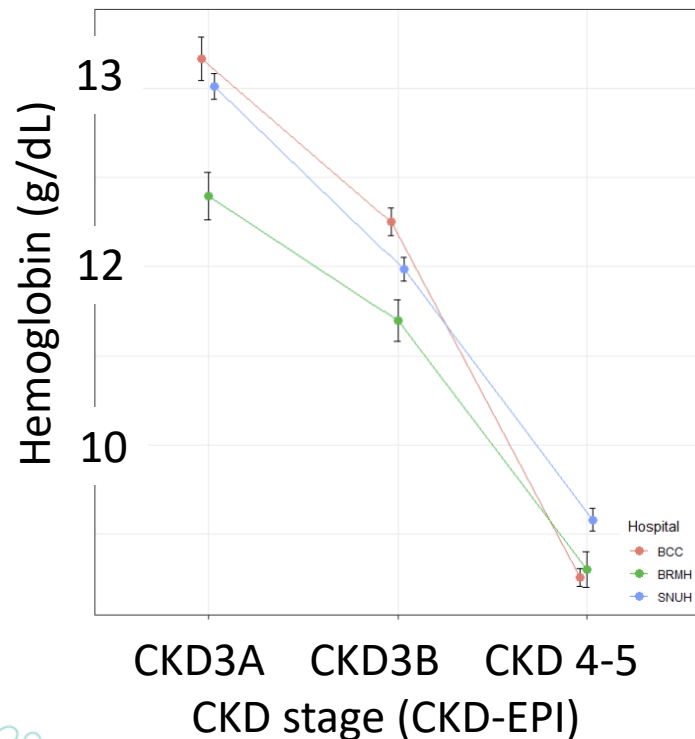
Kidney Res Clin Pract 2019;38(3):382-390 <https://doi.org/10.23876/j.krcp.18.0128>

PLoS ONE 13(6): e0199913. <https://doi.org/10.1371/journal.pone.0199913>

Scientific Reports volume 11, Article number: 1131 (2021) <https://doi.org/10.1038/s41598-020-80877-y>



Who actually progresses? (3) Mortality

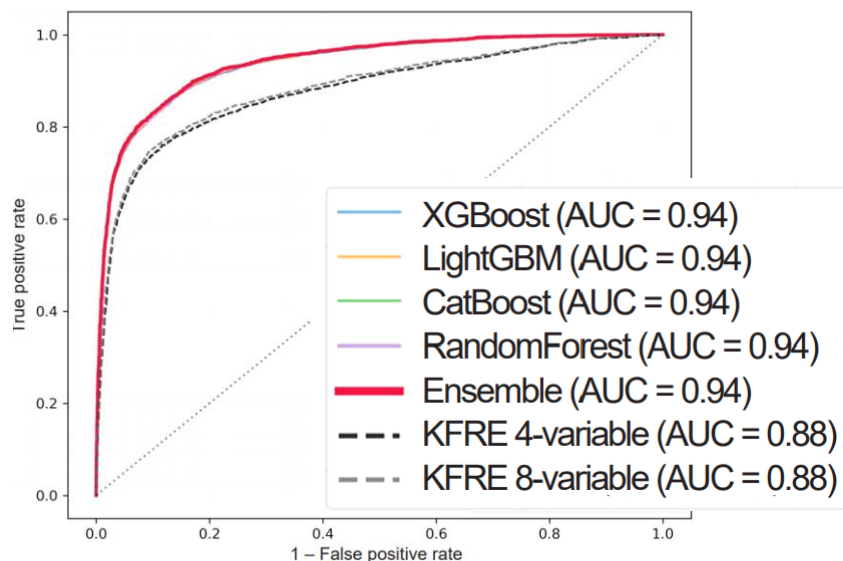


Non dialysis CKD (21,225)
Higher Hb = lower mortality aHR 0.9

KSN Abstract A-1443 Dose anemia is associated with ESKD progression and mortality? : Study from multinational cohort
Frontiers in Nutrition, 26 September 2022 <http://www.frontiersin.org/articles/10.3389/fnut.2022.996674/full>
Kidney Res Clin Pract 2026;45(2):232-243 <https://doi.org/10.23876/j.krcp.24.034>

Detection into outcomes (1) Stop ESKD progression

• ESKD Prediction models



• Treatment

1. Baseline proteinuria $\geq 0.5\text{g/g cr}$ $\rightarrow$ 50% reduction
2. Baseline SBP $\leq 140\text{mmHg}$ & decrease in SBP over 5
3. Phosphate ($\geq 4.5\text{mg/dL}$) $\rightarrow$ lower over 1
4. Uric acid ($\geq 7.0\text{ mg/dL}$) $\rightarrow$ lower over 1
5. Hb ($< 10\text{g/dL}$) $\rightarrow$ elevate $\geq 1\text{g/dL}$
6. Bicarbonate in target range (over 21mmol/L)

Table 4. Model performance by clinical subgroup from internal validation set

Subgroup	Number	Events (outcome $\geq 40\%$), n (%)	Model	AUROC (95% CI)
DKD	739	309 (41.8)	Ensemble	0.946 (0.929–0.962)
			KFRE 4-variable	0.861 (0.831–0.889)
			KFRE 8-variable	0.866 (0.836–0.893)
GN	316	183 (57.9)	Ensemble	0.941 (0.913–0.966)
			KFRE 4-variable	0.908 (0.873–0.939)
			KFRE 8-variable	0.912 (0.876–0.943)
HTN	660	203 (30.8)	Ensemble	0.900 (0.870–0.928)
			KFRE 4-variable	0.829 (0.793–0.867)
			KFRE 8-variable	0.840 (0.804–0.876)
Proteinuria (UACR $\geq 300\text{ mg/g}$)	1,063	533 (50.1)	Ensemble	0.927 (0.912–0.941)
			KFRE 4-variable	0.893 (0.874–0.912)
			KFRE 8-variable	0.895 (0.876–0.915)

Risk improvement ^a	Person-years	Events ^b	Incidence rate ^b	Kidney outcome					
				Model 1 ^c		Model 2 ^d		Model 3 ^e	
				HR (95% CI)	P value	HR (95% CI)	P value	HR (95% CI)	P value
0	1757.5	191 (41.0%)	10.9 (9.4–12.5)	Reference		Reference		Reference	
1	980.7	136 (48.9%)	13.9 (11.7–16.4)	0.83 (0.65–1.06)	0.14	0.95 (0.75–1.21)	0.69	0.97 (0.77–1.25)	0.86
≥ 2	359.6	50 (52.6%)	13.9 (10.5–18.3)	0.49 (0.34–0.70)	<0.001	0.53 (0.37–0.76)	0.001	0.52 (0.36–0.75)	0.001
Total	3097.8	377 (44.9%)	12.2 (11.0–13.5)						

Detection into outcomes (2) Stay healthy in your stage

- 12.5% reached composite CV/death

A Incidences of all cause death

Study	Incidence rates (95% CI) (events/1,000 person-years)	Number of events	Person- years
CKD-QLD (AUS)	48 (40–57)	105	2,166
RIISC (GBR)	48 (39–57)	130	2,698
CRIC (USA)	43 (12–75)	990	22,808
KNOW-CKD (KOR) ←	7 (4–10)	26	3,705
CAN-PREDDICT (CAN)	38 (30–46)	301	7,912
NRHP (URY)	45 (44–47)	2,878	63,842
CKD-JAC (JPN)	10 (6–15)	82	7,946

Incidence rates of all-cause mortality
(events/1,000 person-years)

Cochran's Q: 640.27 Df (6) $p < 0.001$
 I^2 (95% CI): 99.1% (98.8–99.3%)

Variable	Transition 1 (Enrollment to CVD)		Transition 2 (Enrollment to ESKD)		Transition 3 (CVD to death)		Transition 4 (ESKD to death)		Transition 5 (Enrollment to death)	
	HR (95% CI)	<i>p</i>	HR (95% CI)	<i>p</i>	HR (95% CI)	<i>p</i>	HR (95% CI)	<i>p</i>	HR (95% CI)	<i>p</i>
Age	1.07 (1.05, 1.09)	<0.001	1.02 (1.01, 1.02)	<0.001	1.10 (1.02, 1.18)	0.017	1.12 (1.08, 1.16)	<0.001	1.06 (1.04, 1.09)	<0.001
Male (Reference: female)	1.71 (1.17, 2.50)	0.006	1.15 (0.94, 1.41)	0.183	1.04 (0.34, 3.21)	0.948	1.56 (0.85, 2.88)	0.154	2.18 (1.14, 4.16)	0.019
BMI	1 (0.95, 1.05)	0.96	1.01 (0.98, 1.04)	0.416	0.92 (0.78, 1.08)	0.312	0.99 (0.91, 1.07)	0.726	0.98 (0.90, 1.07)	0.646
SBP	1.01 (1.00, 1.02)	0.134	1.02 (1.01, 1.03)	<0.001	1.00 (0.97, 1.04)	0.781	0.99 (0.97, 1.01)	0.172	1.03 (1.01, 1.04)	0.003
eGFRcreatinine (per 10 ml/min/1.73m ² increment)	0.99 (0.98, 0.99)	<0.001	0.92 (0.91, 0.93)	<0.001	1.00 (0.98, 1.02)	0.83	0.98 (0.96, 1.01)	0.246	0.98 (0.97, 0.99)	0.001
log(FGF-23 + 1)	1.07 (0.95, 1.20)	0.253	1.42 (1.32, 1.53)	<0.001	0.94 (0.70, 1.27)	0.693	0.93 (0.77, 1.13)	0.464	1.25 (1.02, 1.52)	0.032
log(CRP)	1.13 (1.00, 1.28)	0.044	1.09 (1.01, 1.17)	0.022	0.92 (0.65, 1.31)	0.653	1.24 (1.02, 1.50)	0.028	1.22 (1.01, 1.48)	0.04
Spot protein-to-creatinine ratio	1.15 (1.06, 1.25)	0.001	1.41 (1.36, 1.46)	<0.001	1.06 (0.87, 1.30)	0.567	0.88 (0.77, 1.00)	0.057	1.28 (1.15, 1.43)	<0.001
Current or former smoker (Reference: never)	1.58 (1.12, 2.24)	0.01	1.27 (1.04, 1.54)	0.002	1.03 (0.40, 2.67)	0.951	1.24 (0.72, 2.14)	0.444	1.97 (1.11, 3.49)	0.02
Cardiovascular disease history	4.56 (3.04, 6.84)	<0.001	1.84 (1.33, 2.54)	<0.001	1.06 (0.38, 2.99)	0.907	2.69 (1.37, 5.26)	0.004	4.33 (2.21, 8.49)	<0.001
CKD subtype (Reference: GN)										
Diabetes mellitus	4.71 (2.97, 7.49)	<0.001	3.53 (2.78, 4.48)	<0.001	1.34 (0.42, 4.24)	0.623	1.47 (0.74, 2.92)	0.274	7.79 (3.10, 19.56)	<0.001
Hypertension	2.37 (1.41, 3.97)	<0.001	1.02 (0.74, 1.39)	0.912	0.669 (0.15, 3.07)	0.622	1.18 (0.47, 3.01)	0.725	4.83 (1.29, 9.47)	0.014
Polycystic kidney disease	1.2 (0.66, 2.21)	0.551	0.85 (0.62, 1.18)	0.329	- **	- **	1.40 (0.55, 3.59)	0.479	4.43 (1.60, 12.25)	0.004

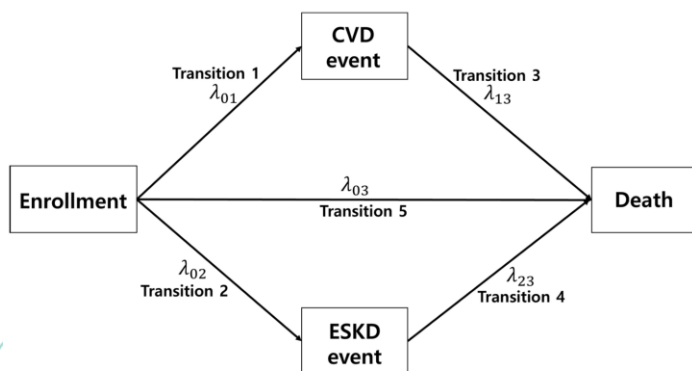
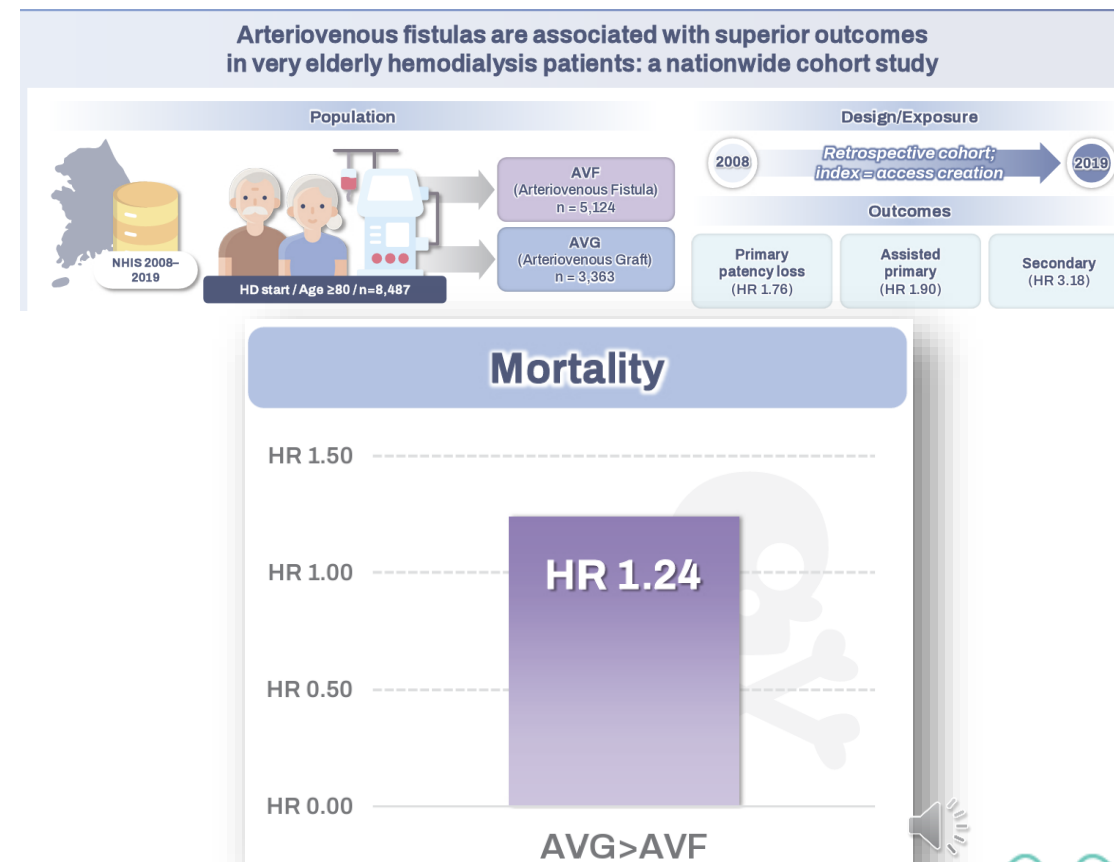


Fig. 2. Multi-state model composed of five transitions.

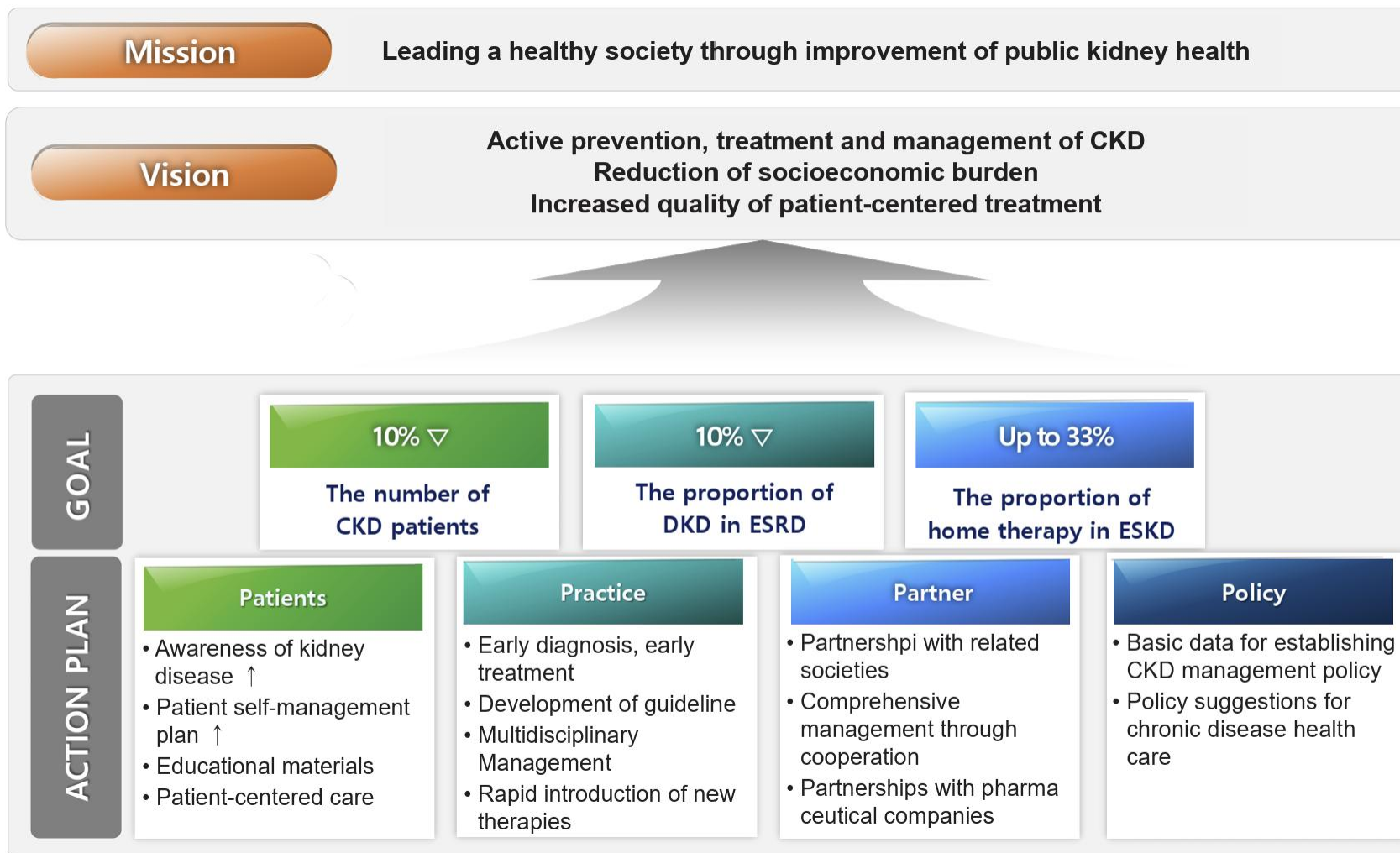
Detection into outcomes (3) Save patients lives

- Prepare kidney replacement therapy in timely manner

CKD1-3	Primary care for CVD Exercise Healthy eating Smoking cessation BP, BS, lipid control
CKD 4-5	Secondary care for CKD complications Anemia Mineral bone disorder Nutrition management
ESKD	Multidisciplinary care for RRT Shared decision making Dialysis and/or kidney transplant AVF Psychological support



CKD total care, set a goal : Kidney Health Plan 2033



Summary

- South Korea screens every adult from age 20, every two years, with about three quarters participating — one of the most complete kidney screening platforms in the world.
- Creatinine-eGFR, dipstick protein/albuminuria
- CKD Progression differs by etiology, so detection should be followed by risk stratification, not by uniform follow-up.
- Screening only pays off when a treatment pathway is attached to it: Stop ESKD progression, Stay healthy, Save lives.



 BUSAN
METROPOLITAN CITY

 BUSAN TOURISM ORGANIZATION

 bexco

 THE KOREAN SOCIETY
OF NEPHROLOGY

APCM-ISPD 2027

12th ISPD Asia Pacific Chapter Meeting

2027-09-30 ~ 2027-10-03



- Thank you for your attention

