

Supplemental Materials

Supplemental Tables

Table S1. Multivariate associations of authentic income deciles with incident chronic kidney disease

Income deciles	Number of participants (%)	Crude event rates (per 1,000 PYs)				Cox modes for CKD development					
		Model 1		Model 2		Model 1			Model 2		
		Incidence (95% CI)		Incidence (95% CI)		HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Decile 1	718,433 (9.7)	4.11	(4.04-4.18)	1.89	(1.84-1.94)	1.29	(1.25-1.32)	<.001	1.29	(1.24-1.34)	<.001
Decile 2	637,606 (8.6)	3.59	(3.52-3.66)	1.69	(1.64-1.74)	1.13	(1.10-1.16)	<.001	1.15	(1.10-1.19)	<.001
Decile 3	596,808 (8.1)	3.14	(3.08-3.21)	1.45	(1.40-1.49)	1.10	(1.06-1.13)	<.001	1.08	(1.04-1.13)	<.001
Decile 4	533,984 (7.2)	2.95	(2.88-3.01)	1.35	(1.31-1.40)	1.03	(0.99-1.06)	.10	1.01	(0.96-1.05)	.72
Decile 5	582,090 (7.9)	3.07	(3.01-3.14)	1.41	(1.37-1.46)	1.01	(0.98-1.04)	.56	0.99	(0.95-1.04)	.72
Decile 6	602,553 (8.1)	3.25	(3.18-3.31)	1.50	(1.46-1.55)	1.00			1.00		
Decile 7	676,460 (9.1)	3.38	(3.32-3.45)	1.52	(1.48-1.56)	0.99	(0.96-1.01)	.30	0.96	(0.92-1.00)	.06
Decile 8	877,286 (11.9)	3.51	(3.45-3.56)	1.60	(1.56-1.64)	0.97	(0.95-1.00)	.03	0.97	(0.94-1.01)	.19
Decile 9	1,113,712 (15.0)	3.49	(3.44-3.54)	1.59	(1.56-1.63)	0.96	(0.94-0.99)	.004	0.98	(0.94-1.02)	.29
Decile 10	1,066,783 (14.4)	4.03	(3.97-4.08)	1.81	(1.78-1.85)	0.98	(0.96-1.01)	.15	1.01	(0.98-1.05)	.52

Note: Incident CKD was defined as an eGFR <60 mL/min/1.73m² (model 1), or ≥25 % decline in eGFR from the baseline values accompanied by an eGFR <60 mL/min/1.73m² (model 2). All Cox models were adjusted for age, sex, residential area, comorbidities, smoking status, alcohol intake, physical activity, albuminuria, use of antihypertensive medications, use of statins, body mass index, systolic blood pressure, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglyceride, and estimated glomerular filtration levels. *Abbreviations:* CKD, chronic kidney disease; person-years, PYs; eGFR, estimated glomerular filtration; HR, hazard ratio; CI, confidence interval.

Table S2. Associations between income deciles and incident chronic kidney disease across various subgroups

Income	Age 40-59 years (N=5,548,424)						Age ≥60 years (N=1,857,291)					
	Model 1			Model 2			Model 1			Model 2		
	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Decile 1	1.41	(1.35-1.47)	<.001	1.47	(1.37-1.57)	<.001	1.29	(1.25-1.33)	<.001	1.33	(1.27-1.38)	<.001
Decile 2	1.22	(1.17-1.28)	<.001	1.27	(1.18-1.36)	<.001	1.19	(1.15-1.22)	<.001	1.24	(1.18-1.30)	<.001
Decile 3	1.09	(1.04-1.14)	<.001	1.09	(1.02-1.17)	.01	1.11	(1.08-1.15)	<.001	1.16	(1.11-1.22)	<.001
Decile 4	1.08	(1.03-1.13)	.002	1.08	(1.01-1.16)	.02	1.08	(1.04-1.11)	<.001	1.08	(1.03-1.13)	.002
Decile 5	1.00	(0.95-1.05)	.95	1.03	(0.96-1.10)	.44	1.03	(0.99-1.06)	.12	1.04	(0.99-1.09)	.09
Decile 6	1.00			1.00			1.00			1.00		
Decile 7	0.99	(0.94-1.04)	.76	1.05	(0.98-1.13)	.17	0.99	(0.97-1.02)	.70	0.97	(0.93-1.01)	.17
Decile 8	1.00	(0.95-1.05)	.91	1.05	(0.98-1.13)	.16	0.95	(0.93-0.98)	.002	0.96	(0.92-1.01)	.09
Decile 9	1.00	(0.95-1.05)	.99	1.10	(1.02-1.17)	.009	0.99	(0.96-1.02)	.67	0.99	(0.94-1.03)	.57
Decile 10	1.03	(0.98-1.08)	.24	1.11	(1.04-1.19)	.002	0.99	(0.96-1.01)	.32	0.97	(0.92-1.01)	.11
Income	Male (N=3,881,978)						Female (N=3,523,737)					
	Model 1			Model 2			Model 1			Model 2		
	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Decile 1	1.30	(1.26-1.35)	<.001	1.35	(1.28-1.42)	<.001	1.31	(1.26-1.36)	<.001	1.35	(1.28-1.42)	<.001
Decile 2	1.15	(1.11-1.19)	<.001	1.18	(1.12-1.24)	<.001	1.21	(1.16-1.25)	<.001	1.27	(1.20-1.34)	<.001
Decile 3	1.05	(1.01-1.09)	.008	1.08	(1.03-1.14)	.003	1.13	(1.09-1.17)	<.001	1.14	(1.07-1.20)	<.001
Decile 4	1.05	(1.01-1.09)	.009	1.04	(0.98-1.09)	.18	1.09	(1.05-1.13)	<.001	1.09	(1.03-1.15)	.005
Decile 5	0.97	(0.94-1.01)	.10	0.99	(0.94-1.04)	.75	1.07	(1.03-1.11)	.001	1.07	(1.01-1.13)	.02
Decile 6	1.00			1.00			1.00			1.00		
Decile 7	0.99	(0.96-1.03)	.71	1.00	(0.95-1.06)	.91	1.00	(0.97-1.04)	.80	1.00	(0.94-1.05)	.94
Decile 8	0.98	(0.95-1.02)	.37	1.04	(0.99-1.10)	.12	0.95	(0.92-0.99)	.02	0.96	(0.91-1.01)	.15
Decile 9	1.04	(1.01-1.08)	.02	1.10	(1.05-1.16)	<.001	0.94	(0.91-0.98)	.002	0.96	(0.91-1.01)	.11
Decile 10	1.04	(1.00-1.07)	.03	1.06	(1.01-1.11)	.02	0.95	(0.91-0.98)	.004	0.97	(0.92-1.03)	.34

Income	Urban resident (N=6,917,805)						Rural resident (N=487,910)					
	Model 1			Model 2			Model 1			Model 2		
	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Decile 1	1.30	(1.27-1.34)	<.001	1.32	(1.27-1.37)	<.001	1.22	(1.12-1.34)	<.001	1.35	(1.19-1.54)	<.001
Decile 2	1.16	(1.13-1.19)	<.001	1.17	(1.13-1.22)	<.001	1.14	(1.03-1.25)	.008	1.25	(1.09-1.43)	.001
Decile 3	1.07	(1.04-1.10)	<.001	1.07	(1.03-1.11)	.001	1.13	(1.02-1.24)	.01	1.26	(1.11-1.44)	.001
Decile 4	1.06	(1.03-1.09)	<.001	1.05	(1.00-1.09)	.03	1.06	(0.96-1.17)	.21	1.07	(0.93-1.23)	.39
Decile 5	1.01	(0.98-1.04)	.56	1.02	(0.98-1.06)	.42	1.03	(0.93-1.13)	.58	1.07	(0.93-1.23)	.36
Decile 6	1.00			1.00			1.00			1.00		
Decile 7	1.00	(0.98-1.03)	.76	1.01	(0.97-1.05)	.72	0.97	(0.88-1.06)	.48	0.99	(0.87-1.14)	.92
Decile 8	0.98	(0.95-1.00)	.08	1.02	(0.98-1.06)	.43	0.96	(0.87-1.05)	.37	0.99	(0.86-1.14)	.90
Decile 9	1.01	(0.98-1.03)	.64	1.05	(1.01-1.09)	.008	0.98	(0.89-1.08)	.66	1.02	(0.88-1.17)	.82
Decile 10	1.01	(0.98-1.03)	.62	1.04	(1.01-1.08)	.02	0.98	(0.88-1.10)	.78	0.94	(0.79-1.10)	.43
Income	Never smoker (N=4,609,927)						Former or current smoker (N=2,795,788)					
	Model 1			Model 2			Model 1			Model 2		
	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Decile 1	1.29	(1.25-1.33)	<.001	1.30	(1.24-1.36)	<.001	1.31	(1.25-1.36)	<.001	1.37	(1.29-1.45)	<.001
Decile 2	1.16	(1.12-1.19)	<.001	1.19	(1.13-1.25)	<.001	1.17	(1.12-1.22)	<.001	1.20	(1.13-1.27)	<.001
Decile 3	1.09	(1.05-1.12)	<.001	1.09	(1.04-1.15)	<.001	1.06	(1.01-1.10)	.02	1.09	(1.02-1.16)	.01
Decile 4	1.07	(1.03-1.11)	<.001	1.04	(0.99-1.10)	.08	1.05	(1.00-1.09)	.04	1.06	(1.00-1.13)	.06
Decile 5	1.02	(0.99-1.05)	.20	1.03	(0.98-1.08)	.27	0.99	(0.95-1.04)	.72	1.02	(0.95-1.08)	.62
Decile 6	1.00			1.00			1.00			1.00		
Decile 7	1.01	(0.98-1.04)	.69	1.00	(0.95-1.04)	.87	0.99	(0.95-1.03)	.64	1.02	(0.96-1.09)	.55
Decile 8	0.97	(0.94-1.00)	.04	0.97	(0.93-1.02)	.26	0.99	(0.95-1.04)	.69	1.09	(1.02-1.16)	.01
Decile 9	0.98	(0.95-1.02)	.33	1.02	(0.97-1.06)	.50	1.04	(1.00-1.09)	.06	1.10	(1.04-1.17)	.002
Decile 10	0.99	(0.96-1.02)	.36	1.01	(0.96-1.05)	.80	1.04	(1.00-1.08)	.06	1.09	(1.03-1.16)	.005

Income	Non-diabetes (N=6,680,787)						Diabetes (N=724,928)					
	Model 1			Model 2			Model 1			Model 2		
	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Decile 1	1.34	(1.30-1.37)	<.001	1.35	(1.30-1.41)	<.001	1.18	(1.12-1.24)	<.001	1.23	(1.15-1.31)	<.001
Decile 2	1.17	(1.14-1.21)	<.001	1.19	(1.14-1.24)	<.001	1.11	(1.06-1.17)	<.001	1.16	(1.08-1.24)	<.001
Decile 3	1.08	(1.04-1.11)	<.001	1.08	(1.03-1.13)	.001	1.07	(1.02-1.13)	.007	1.09	(1.02-1.17)	.01
Decile 4	1.06	(1.02-1.09)	.001	1.03	(0.98-1.08)	.26	1.07	(1.02-1.12)	.01	1.09	(1.02-1.17)	.01
Decile 5	1.00	(0.97-1.03)	.84	1.01	(0.97-1.06)	.57	1.03	(0.98-1.08)	.28	1.04	(0.97-1.11)	.31
Decile 6	1.00			1.00			1.00			1.00		
Decile 7	1.01	(0.98-1.04)	.50	1.02	(0.98-1.07)	.29	0.99	(0.94-1.04)	.61	0.98	(0.92-1.05)	.55
Decile 8	0.98	(0.95-1.01)	.26	1.04	(0.99-1.09)	.10	0.98	(0.93-1.03)	.42	0.99	(0.93-1.06)	.79
Decile 9	1.02	(0.99-1.05)	.12	1.09	(1.04-1.14)	<.001	0.98	(0.94-1.03)	.49	1.01	(0.94-1.08)	.83
Decile 10	1.03	(1.01-1.06)	.02	1.10	(1.05-1.15)	<.001	0.96	(0.92-1.01)	.13	0.96	(0.90-1.02)	.20
Income	Antihypertensive non-users (N=6,815,906)						Antihypertensive users (N=589,809)					
	Model 1			Model 2			Model 1			Model 2		
	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>	HR	95% CI	<i>p</i>
Decile 1	1.31	(1.27-1.34)	<.001	1.32	(1.27-1.38)	<.001	1.25	(1.19-1.32)	<.001	1.31	(1.22-1.41)	<.001
Decile 2	1.15	(1.12-1.18)	<.001	1.17	(1.12-1.22)	<.001	1.18	(1.12-1.24)	<.001	1.21	(1.12-1.30)	<.001
Decile 3	1.07	(1.04-1.11)	<.001	1.08	(1.04-1.13)	<.001	1.07	(1.02-1.14)	.01	1.09	(1.00-1.18)	.04
Decile 4	1.06	(1.03-1.09)	<.001	1.05	(1.00-1.10)	.04	1.07	(1.01-1.13)	.02	1.05	(0.97-1.14)	.23
Decile 5	1.01	(0.98-1.04)	.69	1.00	(0.96-1.05)	.91	1.02	(0.97-1.08)	.48	1.08	(1.00-1.17)	.05
Decile 6	1.00			1.00			1.00			1.00		
Decile 7	1.00	(0.98-1.03)	.81	1.02	(0.97-1.06)	.44	1.00	(0.95-1.06)	.95	0.98	(0.91-1.06)	.67
Decile 8	0.97	(0.95-1.00)	.08	1.02	(0.98-1.07)	.35	1.00	(0.95-1.05)	.98	1.01	(0.94-1.10)	.73
Decile 9	1.01	(0.98-1.04)	.62	1.06	(1.02-1.11)	<.001	1.02	(0.97-1.08)	.42	1.05	(0.97-1.13)	.22
Decile 10	1.03	(1.00-1.05)	.07	1.06	(1.02-1.11)	<.001	0.96	(0.91-1.01)	.15	1.00	(0.92-1.07)	.90

Note: Incident chronic kidney disease was defined as an eGFR <60 mL/min/1.73m² (model 1), or ≥25 % decline in eGFR from the baseline values accompanied by an eGFR <60 mL/min/1.73m² (model 2). All Cox models were adjusted for age, sex, residential area, comorbidities, smoking status, alcohol intake, physical activity, albuminuria, use of antihypertensive medications, use of statins, body mass index, systolic blood pressure, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglyceride, and estimated glomerular filtration levels. eGFR=estimated glomerular filtration; HR=hazard ratio; CI=confidence interval.

Supplemental Figures

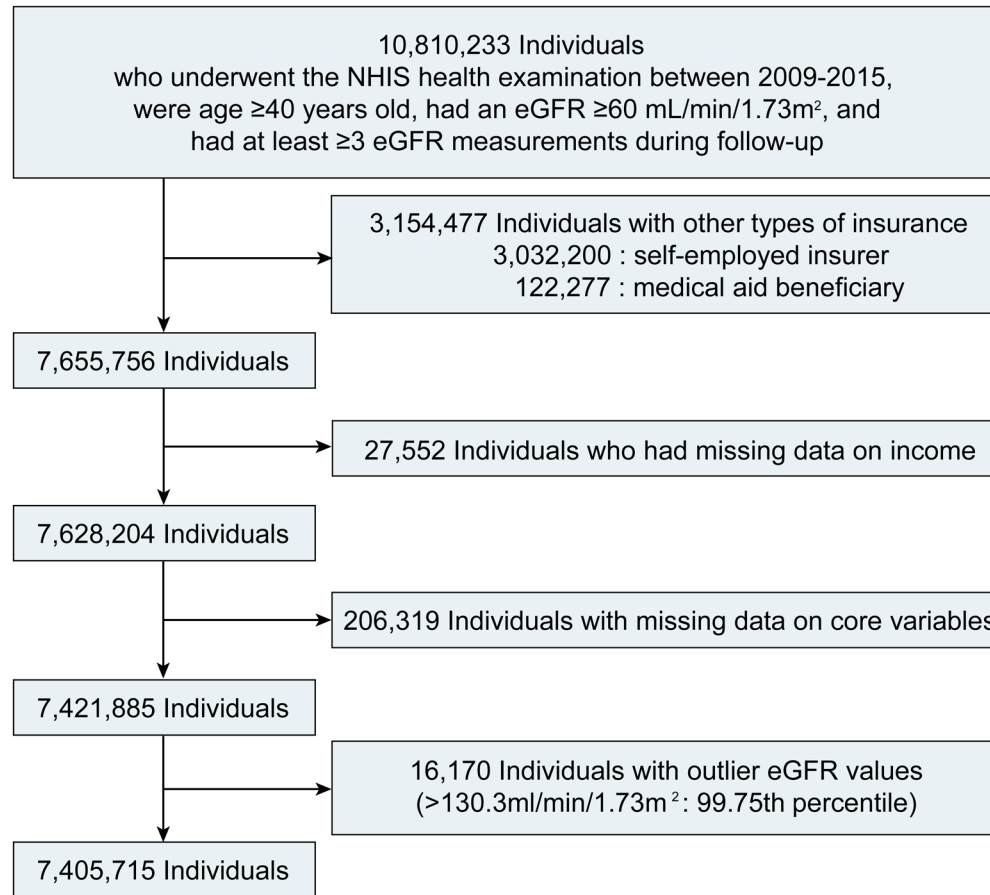


Figure S1. Flow chart of study cohort construction. NHIS=National Health Insurance Service; eGFR=estimated glomerular filtration rate.

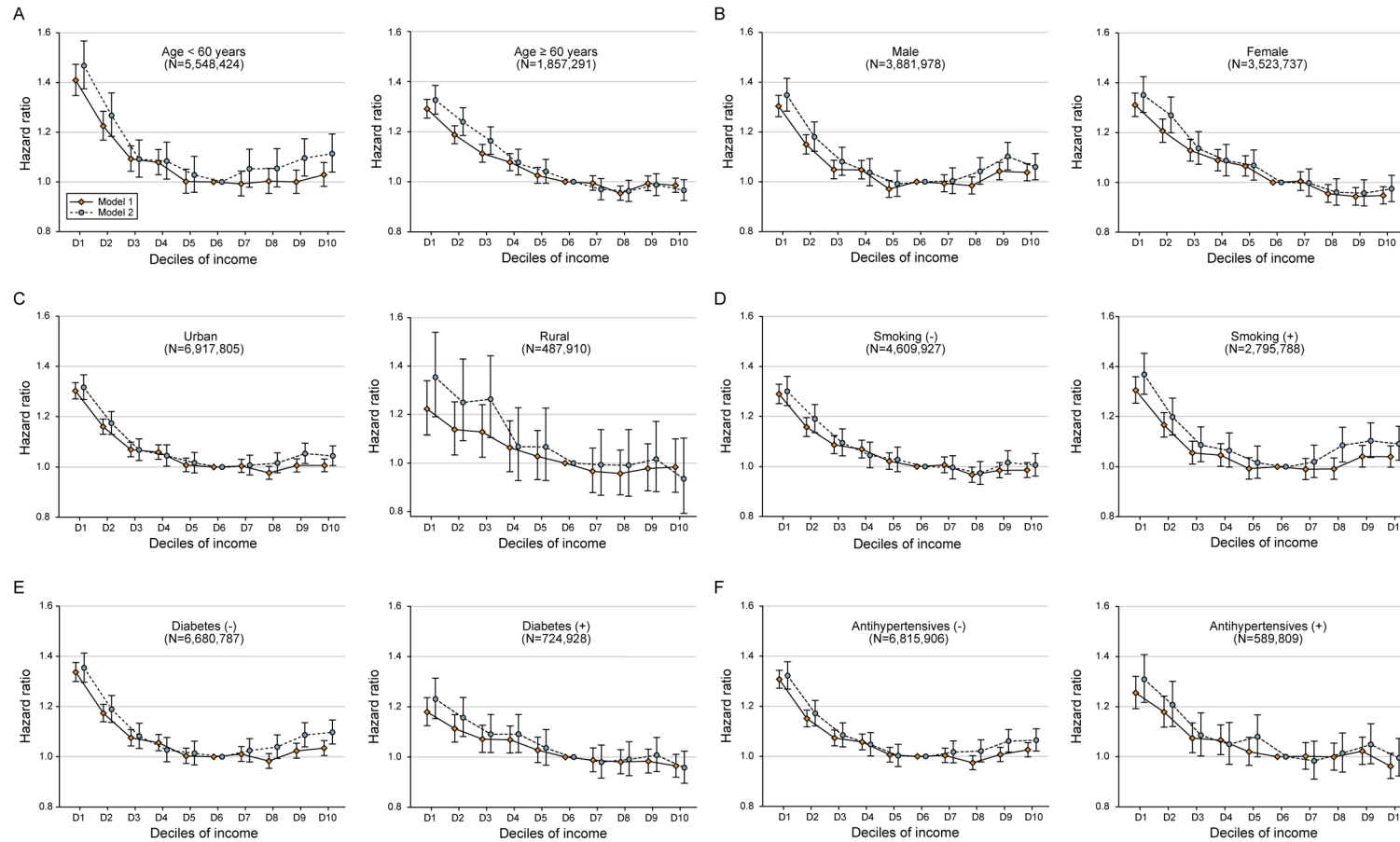


Figure S2. Subgroup analyses of the association between income deciles and risk of incident chronic kidney disease. Incident chronic kidney disease was defined as an eGFR <60 mL/min/1.73m² (model 1), or ≥25% decline in eGFR from the baseline values accompanied by an eGFR <60 mL/min/1.73m² (model 2). All subgroup analyses including (A) age (40-59 vs ≥60 years), (B) sex (male vs female), (C) residential area (urban vs rural), (D) smoking status (never vs former or current), (E) diabetes, and (F) use of antihypertensive medications were adjusted for age, sex, residential area, comorbidities, smoking status, alcohol intake, physical activity, albuminuria, use of antihypertensive medications, use of statins, body mass index, systolic blood pressure, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, triglyceride, and estimated glomerular filtration levels. eGFR=estimated glomerular filtration.