

### Appendix 1. The International Classification of Diseases-10 coding of chronic kidney disease and other major non-communicable chronic diseases

Disease	ICD-10 coding
CKD	E10.2+, E11.2+, E13.2+, E14.2+, I12.0, I12.9, I13.0, I13.1, I13.2, I13.9, N11, N12, N14, N15, N16.*, E74.8, E72.0, N25.1, M32.1+N08.5*, M32.1+N16.4*, M35.0+N16.4*, M31.0+N08.5*, M31.7+N08.5*, M31.001 <sup>†</sup> , M31.802 <sup>†</sup> , M32.101+N08.5* <sup>†</sup> , M31.102+N08.5* <sup>†</sup> , M31.303+N08.5* <sup>†</sup> , N18, N19, N13.0, N13.1, N13.2, C64, N07, N08 (excluding N08.5*), N13.6, Q60, Q61.1, Q61.2, Q61.3, Q61.5, Q63.1, Q63.9, M10.3, N26, N28.0, N28.8, N28.9, A52.7+N08.0*, N99.0, P96.0, R39.2, K76.7, Q27.1, I70.1, M31.4 (combined with I15.0) N00.8, N02, N03, N04, N05, N06, N39.1
CHD <sup>†</sup>	I21.001, I21.002, I21.004, I21.101, I21.103, I21.104, I21.105, I21.201, I21.202, I21.203, I21.204, I21.205, I21.206, I21.207, I21.208, I21.209, I21.210, I21.211, I21.213, I21.214, I21.215, I21.301, I21.302, I21.304, I21.907, I21.403, I24.803, I20.001, I20.002, I20.003, I20.004, I20.005, I20.006, I20.101, I20.102, I20.802, I20.803, I21.303, I21.401, I21.402, I21.901, I21.910, I22.001, I22.101, I22.801, I22.802, I22.803, I22.901, I23.001, I23.002, I23.101, I23.201, I23.301, I24.001, I24.002, I24.003, I24.004, I24.005, I24.006, I24.101, I24.102, I24.801, I24.802, I24.901, I20.801, I20.804, I20.805, I20.806, I20.902, I25.103, I25.104, I25.105, I25.201, I25.202, I25.203, I25.204, I25.205, I25.206, I25.207, I25.208, I25.209, I25.210, I25.211, I25.212, I25.213, I25.214, I25.215, I25.501, I25.601, I25.901, I25.902
CHD	I21.000, I21.001, I21.002, I21.003, I21.004, I21.005, I21.006, I21.007, I21.100, I21.101, I21.102, I21.103, I21.104, I21.105, I21.200, I21.201, I21.202, I21.203, I21.204, I21.205, I21.206, I21.300, I21.301, I21.401, I20.000, I20.001, I20.002, I20.003, I20.004, I20.005, I20.006, I20.100, I20.101, I20.102, I20.804, I21.302, I21.303, I21.400, I21.402, I21.900, I22.000, I22.100, I22.800, I22.900, I23.000, I23.100, I23.200, I23.300, I23.400, I23.500, I23.600, I23.601, I23.800, I24.000, I24.001, I24.100, I24.101, I24.800, I24.801, I24.900, I24.901, I20.801, I20.802, I20.803, I20.804, I20.900, I25.000, I25.100, I25.101, I25.102, I25.103, I25.200, I25.500, I25.600, I25.800, I25.801, I25.900, I25.901,
COPD	J44.901 <sup>†</sup> , J44.003 <sup>†</sup> , J44.103 <sup>†</sup> , J44.900 <sup>†</sup> , J44.000 <sup>†</sup> , J44.100 <sup>†</sup> , J44.800 <sup>†</sup>
Stroke	I60, I61, I63, I64, G45, H34.1
Diabetes	E10, E11, E12, E13, E14
Cancer	C00-C26, C30-C34, C37-C41, C43-C58, C60-C85, C88, C90-C97, D00-D07, D09, D37-D48, B21, Z85, Z08 Z51.10 <sup>†</sup> , Z51.20 <sup>†</sup> , Z51.50 <sup>†</sup> , Z03.101 <sup>†</sup> , E87.805 <sup>†</sup> , O99.8011 <sup>†</sup> , O99.8021 <sup>†</sup> , O99.8024 <sup>†</sup> , O99.8031 <sup>†</sup> , Z51.00 <sup>†</sup> , Z51.10 <sup>†</sup> , Z51.80 <sup>†</sup> , Z03.10 <sup>†</sup> , O99.802 <sup>†</sup> , Z35.802 <sup>†</sup> , Z54.001 <sup>†</sup> , E88.805 <sup>†</sup> , Z86.000 <sup>†</sup>
Hypertension	I10

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<b>Disease</b>	<b>ICD-10 coding</b>
Sepsis	A41
Pneumonia	J12-J18

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<sup>1</sup>Applicable for ICD-10 (Beijing Version 4.0) only.

<sup>2</sup>Applicable for ICD-10 (National Standard Version1.0) only.

\*Denotes to any possible number so that the whole sequence represents all the subclasses of the disease.

Abbreviations: CHD, coronary heart disease; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary diseases. ICD-10, International Classification of Diseases-10.

**Appendix 2. Effects of chronic kidney disease stages 3-5 on length of stay, costs, and in-hospital mortality for each non-communicable disease**

Condition	Covariates in the model	Length of stay % change (95% CI)	Costs % change (95% CI)	In-hospital mortality relative risk (95% CI)
CHD	Model 1	36.67 (35.19, 38.17)	14.54 (12.64, 16.47)	1.90 (1.73, 2.08)
	Model 2	38.68 (37.07, 40.30)	6.22 (4.35, 8.13)	1.93 (1.76, 2.13)
	Model 3	38.41 (36.81, 40.03)	5.69 (3.83, 7.58)	1.93 (1.76, 2.13)
Stroke	Model 1	22.81 (20.89, 24.75)	30.39 (27.46, 33.38)	2.12 (1.88, 2.39)
	Model 2	21.76 (19.67, 23.88)	25.48 (22.49, 28.55)	1.92 (1.69, 2.19)
	Model 3	21.13 (19.05, 23.24)	23.60 (20.66, 26.60)	1.79 (1.58, 2.05)
Hypertension	Model 1	19.77 (19.01, 20.54)	0.62 (-0.29, 1.53)	1.60 (1.49, 1.72)
	Model 2	25.88 (25.02, 26.75)	4.10 (3.10, 5.11)	1.83 (1.69, 1.98)
	Model 3	25.69 (24.83, 26.55)	3.47 (2.48, 4.47)	1.76 (1.63, 1.91)
Diabetes	Model 1	23.75 (22.71, 24.80)	10.24 (8.92, 11.58)	1.91 (1.75, 2.09)
	Model 2	29.22 (28.06, 30.40)	13.22 (11.80, 14.65)	2.14 (1.95, 2.36)
	Model 3	29.06 (27.90, 30.23)	12.55 (11.15, 13.98)	2.13 (1.93, 2.34)
COPD	Model 1	14.97 (11.79, 18.25)	36.41 (31.07, 41.97)	1.70 (1.37, 2.12)
	Model 2	15.21 (11.75, 18.77)	22.93 (17.93, 28.14)	1.74 (1.38, 2.19)
	Model 3	15.38 (11.92, 18.95)	22.80 (17.83, 27.97)	1.72 (1.36, 2.16)
Cancer	Model 1	24.54 (21.36, 27.80)	20.65 (17.08, 24.34)	2.15 (1.86, 2.49)
	Model 2	20.58 (17.23, 24.02)	12.13 (8.53, 15.85)	1.68 (1.44, 1.95)
	Model 3	19.72 (16.40, 23.14)	11.26 (7.70, 14.94)	1.49 (1.28, 1.73)

Note: Numbers in the table are percent-changes/relative risks of patient records with CKD compared with patient records without CKD

for each non-communicable disease. Percent of change (% change) and relative risk with 95% confidence interval (CI) were calculated as  $\exp(\beta)-1$  from the generalized regression model and  $\exp(\beta)$  from the Poisson regression model, respectively.

Covariates in model 1 included age and sex.

Covariates in model 2 included age, sex, occupation, type of health insurance, type of admission, intensive care unit stay, presence of CHD, stroke, hypertension, diabetes, COPD, and cancer (except for the disease used to define the subgroup).

Covariates in model 3 included covariates in model 2, plus the presence of sepsis and pneumonia.

Abbreviations: CHD, coronary heart disease; CI, confidence interval; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease.

**Appendix 3. Effects of chronic kidney disease stages 3-5 on length of stay, costs, and in-hospital mortality, compared with other major non-communicable diseases**

<b>Condition</b>	<b>Covariates in the model</b>	<b>Length of stay % change (95% CI)</b>	<b>Costs % change (95% CI)</b>	<b>In-hospital mortality relative risk (95% CI)</b>
CKD	Model 1	32.02 (31.40, 32.65)	14.97 (14.26, 15.70)	1.76 (1.67, 1.85)
	Model 2	35.61 (34.93, 36.30)	19.65 (18.86, 20.45)	1.92 (1.82, 2.02)
CHD	Model 1	-5.95 (-6.08, -5.83)	28.00 (27.78, 28.22)	1.34 (1.32, 1.36)
	Model 2	-7.67 (-7.80, -7.53)	31.31 (31.06, 31.56)	1.32 (1.29, 1.34)
Stroke	Model 1	16.71 (16.55, 16.86)	9.00 (8.81, 9.20)	1.62 (1.60, 1.65)
	Model 2	17.76 (17.59, 17.94)	9.58 (9.37, 9.80)	1.74 (1.71, 1.77)
Hypertension	Model 1	5.07 (4.97, 5.18)	9.26 (9.11, 9.40)	0.92 (0.91, 0.93)
	Model 2	2.15 (2.03, 2.26)	5.11 (4.95, 5.27)	0.78 (0.76, 0.79)
Diabetes	Model 1	10.38 (10.23, 10.53)	5.90 (5.70, 6.10)	1.09 (1.07, 1.11)
	Model 2	9.54 (9.37, 9.71)	1.90 (1.69, 2.11)	1.03 (1.01, 1.05)
COPD	Model 1	3.99 (3.74, 4.24)	-9.96 (-10.25, -9.67)	1.32 (1.29, 1.35)
	Model 2	5.83 (5.56, 6.11)	-9.48 (-9.80, -9.17)	1.24 (1.21, 1.27)
Cancer	Model 1	9.51 (9.41, 9.60)	26.96 (26.80, 27.11)	2.00 (1.98, 2.03)
	Model 2	14.07 (13.95, 14.18)	38.95 (38.76, 39.13)	2.87 (2.82, 2.91)

Note: Numbers in the table are percent-changes/relative risks of patient records with corresponding disease compared with patient records without

corresponding disease. Percent of change (% change) and relative risk with 95% confidence interval (CI) were calculated as  $\exp(\beta)-1$  from the generalized regression model and  $\exp(\beta)$  from the Poisson regression model, respectively.

Covariates in model 1 included age and sex.

Covariates in model 2 included age, sex, occupation, type of health insurance, type of admission, intensive care unit stay, presence of CKD, CHD, stroke, hypertension, diabetes, COPD, and cancer, and presence of sepsis and pneumonia.

Abbreviations: CHD, coronary heart disease; CI, confidence interval; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease.