
Supplementary Materials

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Part A: calculation formulas

1. Gini decomposition method

The Gini decomposition formulas are as follows:

$$\Delta G = G_1 - G_0 \equiv R - P \quad (1)$$

$$R = G_1 - G_1^{(0)} \quad (2)$$

$$P = G_0 - G_1^{(0)} \quad (3)$$

Where G_1 and G_0 represent G in the 0th and the 1st years, respectively. $G_1^{(0)}$ also known as the concentration coefficient, is the G in the 1st year based on the ranks in the 0th year. ΔG is the difference in the G in different years, and can be decomposed into reranking (R) and proportionality (P). R represents the importance of the G change from reranking of causes and indicates the mobility of mortality causes. A higher and lower indicates greater and smaller rank changes, respectively. At a constant rank, $R=0$, and, when the rank is completely reversed, $R=2G_1$. P indicates the change in the G that accounts for the proportion, when ranking is held constant at the original distribution; thus, P indicates the progressivity of mortality causes. Table S1 presents relationships among P -values, aggregate rates, and mortality causes.

2. Mortality-rate-difference method

The crude mortality rate (CMR) difference equates to the sum of the age structure difference (weighted by the mean mortality rate) and mortality difference (weighted by the age structure). Assume that we have two comparison 1991 and 2019 for which we have the CMR and populations data by age groups. We use M to express the CMR, C to express the age structure, and x to express age groups. In this study, we use 5-year age groups. Thus, the CMR difference between 1991 and 2019 can be calculated using the following steps.^{1,2}

Step 1: Determine the population proportion and mortality rate by age group (5-year-old for one group) in 1991 and 2019.

Step 2: Calculate the difference of population proportion by age: $C_x^{2019} - C_x^{1991}$.

Step 3: Calculate weight 1: $(M_x^{2019} + M_x^{1991})/2$.

Step 4: Calculate the effect of age structure difference: $\sum_0^\infty (C_x^{2019} - C_x^{1991}) \times \frac{M_x^{2019} + M_x^{1991}}{2}$.

Step 5: Calculate age-specific mortality difference between 1991 and 2019: $M_x^{2019} - M_x^{1991}$.

Step 6: Calculate weight 2: $(C_x^{2019} + C_x^{1991})/2$.

Step 7: Calculate the effect of mortality difference: $\sum_0^\infty (M_x^{2019} - M_x^{1991}) \times \frac{C_x^{2019} + C_x^{1991}}{2}$.

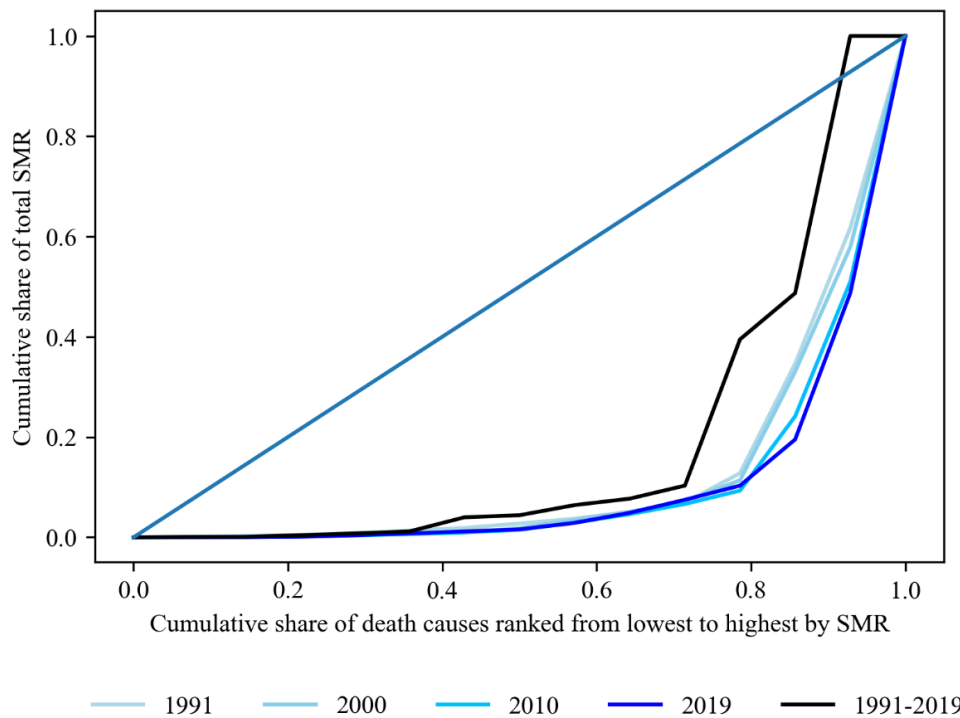
The CMR difference is expressed as values and percentages.

¹ Kitagawa, E.Y. Components of a difference between two rates. JASA 1955;50(272): 1168-1194.

² Zhai Z, Lu L, Luo M, et al. Modern population analysis techniques: China Renmin University Press 1989.

Part B: supplementary figure

Figure S1. Lorenz curve for secondary-cause standardized mortality rates ranked from lowest to



highest by contribution to the all-cause standardized mortality rates of non-communicable diseases, from 1991 to 2019.

SMR: standardized mortality rate.

Part C: supplementary tables**Table S1. Association between proportionality index and attributable causes**

Aggregate Rate	Proportionality (<i>P</i>)	Causes responsible for growth/decline
Growing	+ <i>P</i>	Low-ranking
	- <i>P</i>	High-ranking
Declining	+ <i>P</i>	High-ranking
	- <i>P</i>	Low-ranking

Table S2. Changes in ranks and proportion of secondary causes for the combined and, male, female, rural, and urban categories, from 1991 to 2019

	1991		2000		2010		2019	
	Rank*	Proportion	Rank*	Proportion	Rank*	Proportion	Rank*	Proportion
Total								
CMNN								
<i>total</i>		100%		100%		100%		100%
Infectious and parasitic diseases	1	36.00%	2	29.09%	2	32.45%	2	31.14%
Respiratory infections	2	36.22%	1	48.63%	1	49.63%	1	54.31%
Conditions arising during the perinatal period	3	22.64%	3	17.72%	3	13.22%	3	5.66%
Nutritional deficiencies	4	2.96%	4	3.35%	4	3.93%	4	8.58%
Pregnancy, childbirth and puerperal complications	5	2.17%	5	1.21%	5	0.78%	5	0.31%
NCD								
<i>total</i>		100%		100%		100%		100%
Cardiovascular diseases	1	44.73%	1	54.47%	1	48.51%	1	53.22%
Respiratory diseases	2	31.55%	2	28.59%	3	14.42%	3	9.95%
Malignant neoplasms	3	7.65%	4	2.95%	2	27.92%	2	27.23%
Digestive diseases	4	7.16%	3	5.21%	4	2.68%	5	2.46%
Genito-urinary diseases	5	2.14%	5	2.58%	7	1.44%	7	1.18%
Congenital anomalies	6	1.74%	8	0.96%	8	0.48%	11	0.22%
Neuro-psychiatric conditions	7	1.68%	6	2.08%	6	1.54%	6	1.90%
Diabetes mellitus	8	1.06%	7	2.01%	5	2.09%	4	2.79%
Endocrine disorders	9	0.67%	9	0.34%	10	0.26%	9	0.33%
Musculoskeletal and connective tissue diseases	10	0.64%	11	0.26%	9	0.31%	8	0.37%
Non-malignant neoplasms	11	0.35%	10	0.29%	11	0.25%	10	0.27%
Sensory organ diseases	12	0.30%	13	0.12%	14	0.00%	13	0.01%
Skin diseases	13	0.21%	12	0.14%	12	0.09%	12	0.08%
Oral conditions	14	0.11%	14	0.01%	13	0.00%	14	0.00%
Injury								
<i>total</i>		100%		100%		100%		100%
Self-inflicted injuries	1	32.33%	2	27.16%	2	16.45%	3	13.35%
Other unintentional injuries	2	18.32%	3	14.85%	4	13.26%	4	13.28%
Road traffic accidents	3	14.78%	1	27.22%	1	38.55%	1	31.14%
Drownings	4	14.63%	4	11.14%	5	8.07%	5	6.98%
Poisonings	5	6.62%	6	6.40%	6	6.03%	6	5.97%
Falls	6	6.28%	5	6.56%	3	14.43%	2	27.09%
Violence	7	4.03%	7	4.38%	7	1.84%	8	0.74%

Fires	8	2.31%	8	1.90%	8	1.27%	7	1.36%
Other intentional injuries	9	0.66%	9	0.40%	9	0.10%	9	0.09%
War	10	0.04%	10	0.00%	10	0.00%	10	0.00%
Male								
CMNN								
<i>total</i>		100%		100%		100%		100%
Infectious and parasitic diseases	1	40.83%	2	33.61%	2	37.76%	2	36.87%
Respiratory infections	2	34.24%	1	45.98%	1	45.54%	1	51.14%
Conditions arising during the perinatal period	3	22.97%	3	17.18%	3	13.51%	3	5.86%
Nutritional deficiencies	4	1.97%	4	3.24%	4	3.19%	4	6.13%
Pregnancy, childbirth and puerperal complications	5	0.00%	5	0.00%	5	0.00%	5	0.00%
NCD								
<i>total</i>		100%		100%		100%		100%
Cardiovascular diseases	1	35.69%	1	54.14%	1	46.13%	1	50.00%
Respiratory diseases	2	25.59%	2	27.94%	3	14.17%	3	10.33%
Malignant neoplasms	3	25.04%	4	3.31%	2	31.08%	2	30.67%
Digestive diseases	4	6.51%	3	6.10%	4	2.99%	4	2.72%
Genito-urinary diseases	5	1.98%	5	2.76%	6	1.41%	7	1.22%
Congenital anomalies	6	1.40%	8	1.02%	8	0.47%	11	0.21%
Neuro-psychiatric conditions	7	1.37%	6	2.03%	7	1.37%	6	1.66%
Diabetes mellitus	8	0.74%	7	1.66%	5	1.63%	5	2.33%
Endocrine disorders	10	0.37%	10	0.26%	9	0.24%	8	0.29%
Musculoskeletal and connective tissue diseases	9	0.48%	11	0.20%	11	0.21%	9	0.26%
Non-malignant neoplasms	11	0.30%	9	0.28%	10	0.24%	10	0.25%
Sensory organ diseases	12	0.25%	12	0.20%	14	0.00%	13	0.00%
Skin diseases	13	0.20%	13	0.10%	12	0.06%	12	0.06%
Oral conditions	14	0.08%	14	0.01%	13	0.00%	14	0.00%
Injury								
<i>total</i>		100%		100%		100%		100%
Self-inflicted injuries	1	24.41%	2	21.53%	3	13.12%	4	12.16%
Other unintentional injuries	2	21.77%	3	16.88%	2	14.28%	3	13.39%
Road traffic accidents	3	18.14%	1	30.36%	1	42.09%	1	34.72%
Drownings	4	16.08%	4	11.38%	5	7.91%	5	6.75%
Poisonings	5	6.51%	5	6.81%	6	6.29%	6	6.62%
Falls	6	5.44%	6	6.35%	4	13.10%	2	24.21%
Violence	7	4.31%	7	4.48%	7	1.85%	8	0.63%
Fires	8	2.26%	8	1.60%	8	1.20%	7	1.40%

Other intentional injuries	9	1.04%	9	0.62%	9	0.14%	9	0.12%
War	10	0.03%	10	0.00%	10	0.00%	10	0.00%
Female								
CMNN								
<i>total</i>		100%		100%		100%		100%
Infectious and parasitic diseases	2	30.95%	3	24.15%	2	24.99%	2	22.88%
Respiratory infections	1	39.08%	1	51.57%	1	55.30%	1	58.97%
Conditions arising during the perinatal period	3	22.67%	2	18.22%	3	12.81%	3	5.38%
Nutritional deficiencies	4	4.14%	4	3.49%	4	4.99%	4	12.08%
Pregnancy, childbirth and puerperal complications	5	4.50%	5	2.56%	5	1.92%	5	0.69%
NCD								
<i>total</i>		100%		100%		100%		100%
Cardiovascular diseases	1	40.59%	1	54.87%	1	51.84%	1	57.56%
Respiratory diseases	2	28.10%	2	29.34%	3	14.79%	3	9.44%
Malignant neoplasms	3	17.85%	4	2.53%	2	23.50%	2	22.58%
Digestive diseases	4	5.48%	3	4.16%	5	2.26%	6	2.12%
Genito-urinary diseases	5	1.60%	6	2.35%	7	1.48%	7	1.14%
Congenital anomalies	6	1.56%	8	0.89%	8	0.49%	11	0.23%
Neuro-psychiatric conditions	7	1.49%	7	2.15%	6	1.78%	5	2.23%
Diabetes mellitus	8	1.10%	5	2.43%	4	2.72%	4	3.41%
Endocrine disorders	9	0.81%	9	0.43%	10	0.29%	9	0.38%
Musculoskeletal and connective tissue diseases	10	0.60%	10	0.34%	9	0.45%	8	0.51%
Non-malignant neoplasms	11	0.30%	11	0.30%	11	0.27%	10	0.30%
Sensory organ diseases	12	0.25%	13	0.03%	14	0.00%	13	0.01%
Skin diseases	13	0.15%	12	0.18%	12	0.14%	12	0.10%
Oral conditions	14	0.11%	14	0.01%	13	0.00%	14	0.00%
Injury								
<i>total</i>		100%		100%		100%		100%
Self-inflicted injuries	1	43.93%	1	37.17%	2	24.14%	3	15.58%
Other unintentional injuries	2	13.35%	3	11.27%	4	10.89%	4	13.09%
Road traffic accidents	3	12.52%	4	10.72%	5	8.44%	5	7.42%
Drownings	4	9.76%	2	21.70%	1	30.33%	2	24.39%
Poisonings	5	7.50%	5	6.94%	3	17.53%	1	32.52%
Falls	6	6.79%	6	5.68%	6	5.45%	6	4.75%
Violence	7	3.61%	7	4.08%	7	1.77%	8	0.96%
Fires	8	2.38%	8	2.44%	8	1.45%	7	1.30%
Other intentional injuries	9	0.10%	9	0.00%	9	0.00%	9	0.00%

War	10	0.06%	10	0.00%	10	0.00%	10	0.00%
Urban								
CMNN								
<i>total</i>		100.00%		100.00%		100.00%		100%
Infectious and parasitic diseases	1	43.91%	2	30.71%	2	26.69%	2	25.31%
Respiratory infections	2	36.56%	1	54.21%	1	60.97%	1	63.13%
Conditions arising during the perinatal period	3	17.81%	3	11.51%	3	7.43%	3	4.54%
Nutritional deficiencies	4	0.63%	4	2.56%	4	4.43%	4	6.79%
Pregnancy, childbirth and puerperal complications	5	1.09%	5	1.02%	5	0.48%	5	0.24%
NCD								
<i>total</i>		100.00%		100.00%		100.00%		100%
Cardiovascular diseases	1	55.57%	1	61.91%	1	46.65%	1	51.38%
Respiratory diseases	2	22.51%	2	19.19%	3	12.05%	3	8.81%
Digestive diseases	3	6.17%	3	4.65%	5	2.84%	5	2.67%
Malignant neoplasms	4	4.22%	7	1.62%	2	30.97%	2	29.06%
Neuro-psychiatric conditions	5	2.75%	5	3.24%	6	1.71%	6	2.05%
Genito-urinary diseases	6	2.70%	6	2.89%	7	1.39%	7	1.18%
Diabetes mellitus	7	2.54%	4	4.10%	4	2.85%	4	3.38%
Congenital anomalies	8	1.44%	8	1.09%	8	0.41%	11	0.21%
Endocrine disorders	9	0.87%	9	0.43%	10	0.35%	9	0.41%
Musculoskeletal and connective tissue diseases	10	0.51%	11	0.34%	11	0.31%	8	0.43%
Non-malignant neoplasms	11	0.42%	10	0.36%	9	0.36%	10	0.33%
Skin diseases	12	0.23%	12	0.14%	12	0.11%	12	0.07%
Sensory organ diseases	13	0.06%	13	0.03%	13	0.00%	13	0.01%
Oral conditions	14	0.00%	14	0.00%	14	0.00%	14	0.00%
Injury								
<i>total</i>		100.00%		100.00%		100.00%		100%
Road traffic accidents	1	23.53%	1	33.96%	1	37.65%	2	29.35%
Self-inflicted injuries	2	20.68%	2	16.51%	3	15.04%	4	11.72%
Falls	3	14.23%	3	14.02%	2	18.44%	1	31.39%
Other unintentional injuries	4	14.04%	4	10.75%	4	12.79%	3	14.20%
Violence	5	8.73%	6	7.48%	7	2.09%	8	0.73%
Drownings	6	8.73%	7	4.98%	6	6.28%	5	6.25%
Poisonings	7	8.16%	5	10.59%	5	6.37%	6	4.99%
Fires	8	0.95%	8	1.09%	8	1.14%	7	1.23%
Other intentional injuries	9	0.76%	9	0.62%	9	0.19%	9	0.14%
War	10	0.19%	10	0.00%	10	0.00%	10	0.00%

Rural								
CMNN								
total		100.00%		100.00%		100.00%		100%
Infectious and parasitic diseases	1	35.18%	2	28.84%	2	36.08%	2	30.53%
Respiratory infections	2	36.18%	1	47.85%	1	42.43%	1	42.97%
Conditions arising during the perinatal period	3	23.14%	3	18.61%	3	16.88%	4	5.60%
Nutritional deficiencies	4	3.20%	4	3.47%	4	3.61%	3	8.50%
Pregnancy, childbirth and puerperal complications	5	2.29%	5	1.24%	5	1.00%	5	0.29%
NCD								
total		100.00%		100.00%		100.00%		100%
Cardiovascular diseases	1	41.89%	1	52.15%	1	49.57%	1	54.09%
Respiratory diseases	2	33.92%	2	31.53%	3	15.77%	3	10.49%
Malignant neoplasms	3	8.54%	4	3.36%	2	26.19%	2	26.36%
Digestive diseases	4	7.42%	3	5.38%	4	2.59%	5	2.37%
Genito-urinary diseases	5	1.99%	5	2.48%	6	1.46%	7	1.19%
Congenital anomalies	6	1.82%	8	0.92%	8	0.52%	11	0.22%
Neuro-psychiatric conditions	7	1.40%	6	1.72%	7	1.44%	6	1.83%
Musculoskeletal and connective tissue diseases	8	0.68%	11	0.24%	9	0.31%	8	0.33%
Diabetes mellitus	9	0.68%	7	1.36%	5	1.66%	4	2.51%
Endocrine disorders	10	0.62%	9	0.30%	10	0.21%	9	0.29%
Sensory organ diseases	11	0.36%	12	0.15%	14	0.00%	13	0.00%
Non-malignant neoplasms	12	0.34%	10	0.27%	11	0.19%	10	0.25%
Skin diseases	13	0.21%	13	0.14%	12	0.08%	12	0.08%
Oral conditions	14	0.14%	14	0.01%	13	0.00%	14	0.00%
Injury								
total		100.00%		100.00%		100.00%		100%
Self-inflicted injuries	1	33.71%	1	29.08%	2	16.96%	3	13.95%
Other unintentional injuries	2	18.83%	3	15.58%	3	13.43%	4	12.95%
Drownings	3	15.33%	4	12.25%	5	8.72%	5	7.24%
Road traffic accidents	4	13.74%	2	26.01%	1	38.90%	1	31.77%
Poisonings	5	6.44%	5	5.65%	6	5.91%	6	6.33%
Falls	6	5.33%	6	5.21%	4	12.96%	2	25.52%
Violence	7	3.47%	7	3.82%	7	1.74%	8	0.77%
Fires	8	2.47%	8	2.05%	8	1.32%	7	1.42%
Other intentional injuries	9	0.65%	9	0.35%	9	0.07%	9	0.06%
War	10	0.03%	10	0.00%	10	0.00%	10	0.00%

CMNN: communicable, maternal, neonatal, and nutritional diseases; NCD: non-communicable diseases. *1 represents the highest rank.

Table S3. Changes in ranks and proportion of neoplasms and cardiovascular diseases for the combined and, male, female, rural, and urban categories, from 1991 to 2019

	1991		2000		2010		2019	
	Rank*	Proportion	Rank*	Proportion	Rank*	Proportion	Rank*	Proportion
Total								
Neoplasms								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Stomach cancer	1	21.25%	3	19.06%	3	14.88%	3	12.05%
Liver cancer	2	19.12%	2	20.35%	2	18.09%	2	15.04%
Trachea, bronchus and lung cancers	3	18.29%	1	21.69%	1	26.34%	1	29.22%
Esophagus cancer	4	12.66%	4	10.43%	5	8.79%	6	7.39%
Other malignant neoplasms	5	7.21%	5	7.99%	4	9.36%	4	10.15%
Colon and rectum cancers	6	5.50%	6	4.91%	6	6.04%	5	7.52%
Leukemia	7	4.01%	7	3.51%	8	2.65%	9	2.33%
Mouth and oropharynx cancers	8	2.37%	8	2.13%	10	1.76%	11	1.85%
Breast cancer	9	1.85%	10	1.90%	9	2.39%	8	2.41%
Pancreas cancer	10	1.84%	9	2.10%	7	2.69%	7	3.69%
Lymphomas and multiple myeloma	11	1.46%	12	1.25%	11	1.67%	10	2.18%
Cervix uteri cancer	12	1.37%	13	1.18%	14	1.04%	12	1.64%
Bladder cancer	13	1.15%	11	1.39%	13	1.05%	13	1.27%
Corpus uteri cancer	14	0.77%	14	0.86%	12	1.37%	16	0.76%
Melanoma and other skin cancers	15	0.51%	15	0.53%	17	0.39%	17	0.48%
Ovary cancer	16	0.39%	17	0.34%	16	0.68%	15	0.87%
Prostate cancer	17	0.24%	16	0.38%	15	0.80%	14	1.16%
Cardiovascular diseases								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Cerebrovascular disease	1	51.45%	1	56.07%	1	55.28%	1	47.17%
Ischemic heart disease	2	15.42%	2	20.69%	2	34.25%	2	40.45%
Hypertensive heart disease	3	14.58%	4	9.53%	3	5.04%	3	7.25%
Other cardiovascular diseases	4	12.22%	3	10.41%	4	4.00%	4	3.84%
Rheumatic heart disease	5	6.33%	5	3.29%	5	1.43%	5	1.29%
Male								
Neoplasms								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Stomach cancer	1	21.98%	3	19.91%	3	15.79%	3	12.87%
Liver cancer	2	21.82%	2	22.53%	2	20.76%	2	17.14%
Trachea, bronchus and lung cancers	3	20.06%	1	23.78%	1	28.43%	1	31.72%

Esophagus cancer	4	13.59%	4	9.89%	4	9.89%	5	8.57%
Other malignant neoplasms	5	6.30%	5	7.15%	5	8.44%	4	9.34%
Colon and rectum cancers	6	4.81%	6	4.35%	6	5.44%	6	6.98%
Leukemia	7	3.29%	7	3.09%	8	2.39%	9	2.10%
Mouth and oropharynx cancers	8	2.57%	8	2.18%	9	1.90%	8	2.12%
Pancreas cancer	9	1.87%	9	1.88%	7	2.45%	7	3.27%
Lymphomas and multiple myeloma	10	1.53%	11	1.22%	10	1.62%	10	2.07%
Bladder cancer	11	1.17%	10	1.75%	12	1.19%	12	1.55%
Melanoma and other skin cancers	12	0.48%	13	0.45%	13	0.34%	13	0.41%
Prostate cancer	13	0.38%	12	0.59%	11	1.24%	11	1.79%
Breast cancer	14	0.11%	14	0.13%	14	0.12%	14	0.06%
Cardiovascular diseases								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Cerebrovascular disease	1	52.54%	1	57.77%	1	56.66%	1	49.00%
Ischemic heart disease	2	16.25%	2	20.86%	2	33.49%	2	39.33%
Hypertensive heart disease	3	14.22%	4	9.30%	3	4.69%	3	6.52%
Other cardiovascular diseases	4	11.85%	3	9.61%	4	4.11%	4	4.11%
Rheumatic heart disease	5	5.14%	5	2.46%	5	1.05%	5	1.03%
Female								
Neoplasms								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Stomach cancer	1	19.95%	2	17.49%	2	13.18%	4	10.53%
Trachea, bronchus and lung cancers	2	15.15%	1	17.81%	1	22.49%	1	24.65%
Liver cancer	3	14.33%	3	16.36%	3	13.16%	3	11.20%
Esophagus cancer	4	11.00%	6	6.77%	6	6.77%	7	5.23%
Other malignant neoplasms	5	8.79%	5	9.49%	4	11.08%	2	11.63%
Colon and rectum cancers	6	6.74%	6	5.91%	5	7.13%	5	8.49%
Leukemia	7	5.31%	8	4.24%	9	3.14%	10	2.74%
Breast cancer	8	4.90%	7	5.08%	7	6.58%	6	6.73%
Cervix uteri cancer	9	3.80%	9	3.32%	11	2.95%	8	4.63%
Corpus uteri cancer	10	2.15%	11	2.40%	8	3.91%	13	2.16%
Mouth and oropharynx cancers	11	2.02%	12	2.00%	14	1.50%	14	1.36%
Pancreas cancer	12	1.80%	10	2.50%	10	3.13%	9	4.46%
Lymphomas and multiple myeloma	13	1.34%	13	1.31%	13	1.77%	12	2.38%
Bladder cancer	14	1.12%	15	0.72%	15	0.78%	15	0.76%

Ovary cancer	15	1.05%	14	0.94%	12	1.95%	11	2.46%
Melanoma and other skin cancers	16	0.55%	16	0.69%	16	0.49%	16	0.60%
Cardiovascular diseases								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Cerebrovascular disease	1	50.25%	1	54.14%	1	53.55%	1	45.03%
Ischemic heart disease	2	14.46%	2	20.43%	2	35.20%	2	41.76%
Other cardiovascular diseases	4	12.64%	3	11.34%	4	3.87%	4	3.52%
Hypertensive heart disease	3	15.00%	4	9.83%	3	5.48%	3	8.11%
Rheumatic heart disease	5	7.65%	5	4.27%	5	1.91%	5	1.59%
Urban								
Neoplasms								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Trachea, bronchus and lung cancers	1	26.27%	1	29.62%	1	28.73%	1	30.09%
Liver cancer	2	16.04%	2	16.93%	2	14.86%	2	13.16%
Stomach cancer	3	14.54%	3	13.07%	3	12.79%	3	10.84%
Other malignant neoplasms	4	10.71%	4	8.99%	4	10.59%	4	10.48%
Esophagus cancer	5	7.59%	6	5.23%	6	5.94%	6	6.15%
Colon and rectum cancers	6	6.76%	5	6.55%	5	7.60%	5	8.85%
Leukemia	7	3.87%	8	3.38%	9	2.50%	10	2.28%
Pancreas cancer	8	3.08%	7	3.41%	7	3.72%	7	4.38%
Breast cancer	9	2.73%	9	2.96%	8	3.06%	8	2.89%
Mouth and oropharynx cancers	10	2.17%	10	2.68%	11	1.88%	11	1.79%
Lymphomas and multiple myeloma	11	1.42%	12	1.57%	10	2.18%	9	2.43%
Bladder cancer	12	1.22%	11	1.95%	12	1.36%	14	1.44%
Corpus uteri cancer	13	0.99%	15	0.84%	16	1.03%	16	0.69%
Cervix uteri cancer	14	0.95%	13	1.08%	15	1.10%	13	1.47%
Ovary cancer	15	0.83%	14	0.98%	14	1.13%	15	1.11%
Melanoma and other skin cancers	16	0.51%	17	0.28%	17	0.38%	17	0.44%
Prostate cancer	17	0.32%	16	0.49%	13	1.15%	12	1.51%
Cardiovascular diseases								
<i>total</i>		100.00%		100.00%		100.00%		100.00%
Cerebrovascular disease	1	54.91%	1	53.06%	1	49.38%	1	45.16%
Ischemic heart disease	2	21.71%	2	27.05%	2	38.69%	2	42.62%
Hypertensive heart disease	3	10.44%	4	7.75%	4	5.02%	3	6.62%
Other cardiovascular diseases	4	9.00%	3	9.98%	3	5.67%	4	4.37%
Rheumatic heart disease	5	3.95%	5	2.16%	5	1.24%	5	1.24%

Rural								
Neoplasms								
total		100.00%		100.00%		100.00%		100.00%
Stomach cancer	1	21.25%	3	19.06%	3	16.27%	3	12.67%
Liver cancer	2	19.12%	2	20.35%	2	20.25%	2	16.02%
Trachea, bronchus and lung cancers	3	18.29%	1	21.69%	1	24.74%	1	28.78%
esophagus cancer	4	12.66%	4	10.43%	4	10.70%	5	8.04%
Other malignant neoplasms	5	7.21%	5	7.99%	5	8.55%	4	9.98%
Colon and rectum cancers	6	5.50%	6	4.91%	6	4.99%	6	6.81%
Leukemia	7	4.01%	7	3.51%	7	2.75%	8	2.35%
Mouth and oropharynx cancers	8	2.37%	8	2.13%	10	1.68%	11	1.88%
Breast cancer	9	1.85%	10	1.90%	9	1.94%	9	2.16%
Pancreas cancer	10	1.84%	9	2.10%	8	2.00%	7	3.34%
Lymphomas and multiple myeloma	11	1.46%	12	1.25%	12	1.34%	10	2.05%
Cervix uteri cancer	12	1.37%	13	1.18%	13	0.99%	12	1.73%
Bladder cancer	13	1.15%	11	1.39%	14	0.84%	13	1.18%
Corpus uteri cancer	14	0.77%	14	0.86%	11	1.60%	15	0.80%
Melanoma and other skin cancers	15	0.51%	15	0.53%	16	0.41%	17	0.50%
Ovary cancer	16	0.39%	17	0.34%	17	0.38%	16	0.74%
Prostate cancer	17	0.24%	16	0.38%	15	0.58%	14	0.97%
Cardiovascular diseases								
total		100.00%		100.00%		100.00%		100.00%
Cerebrovascular disease	1	50.25%	1	57.19%	1	58.41%	1	48.08%
Hypertensive heart disease	2	16.02%	4	10.20%	3	5.05%	3	7.54%
Other cardiovascular diseases	3	13.34%	3	10.58%	4	3.11%	4	3.60%
Ischemic heart disease	4	13.24%	2	18.33%	2	31.89%	2	39.47%
Rheumatic heart disease	5	7.16%	5	3.71%	5	1.54%	5	1.31%

CMNN: communicable, maternal, neonatal, and nutritional diseases; NCD: non-communicable diseases.

*1 represents the highest rank.

Table S4. Changes in Gini coefficients, reranking, and proportionality of neoplasms and cardiovascular diseases for the combined and, male, female, rural, and urban categories, from 1991 to 2019

	Both	Male	Female	Urban	Rural
Neoplasms					
<i>Gini index</i>					
1991	0.599	0.658	0.523	0.582	0.622
2000	0.602	0.664	0.525	0.587	0.622
2010	0.588	0.659	0.506	0.565	0.610
2019	0.569	0.608	0.492	0.556	0.576
<i>Reranking</i>					
1991-2000	0.007	0.010	0.003	0.003	0.009
2000-2010	0.005	0.001	0.004	0.003	0.018
2010-2019	0.004	0.030	0.016	0.001	0.007
1991-2019	0.050	0.073	0.056	0.010	0.072
<i>Proportionality</i>					
1991-2000	0.003	0.004	0.001	-0.001	0.009
2000-2010	0.019	0.006	0.023	0.024	0.030
2010-2019	0.024	0.081	0.029	0.010	0.042
1991-2019	0.081	0.124	0.087	0.036	0.118
Cardiovascular diseases					
<i>Gini index</i>					
1991	0.374	0.396	0.350	0.384	0.356
2000	0.468	0.489	0.440	0.393	0.462
2010	0.547	0.557	0.535	0.415	0.566
2019	0.514	0.523	0.503	0.393	0.519
<i>Reranking</i>					
1991-2000	0.002	0.001	0.046	0.011	0.034
2000-2010	0.004	0.002	0.006	0.000	0.007
2010-2019	0.000	0.000	0.000	0.005	0.000
1991-2019	0.000	0.000	0.133	0.000	0.128
<i>Proportionality</i>					
1991-2000	-0.092	-0.092	-0.044	0.002	-0.072
2000-2010	-0.076	-0.066	-0.089	-0.022	-0.097
2010-2019	0.033	0.034	0.032	0.026	0.048
1991-2019	-0.140	-0.127	-0.020	-0.009	-0.035

Table S5. Changes in contributory percentage of the demographic structure and non-demographic factors to the year- and sex-specific crude mortality difference of neoplasm and cardiovascular diseases, from 1991 to 2019

	Mortality Difference	Demographic Structure	Non-demographic Factors
Neoplasms			
<i>Both</i>			
1991-2000	22.745	17.56%	7.65%
2000-2010	24.081	18.30%	3.02%
2010-2019	25.410	35.40%	-16.86%
1991-2019	72.235	84.58%	-4.51%
<i>Male</i>			
1991-2000	29.505	18.60%	7.44%
2000-2010	31.627	18.28%	3.87%
2010-2019	32.626	36.06%	-17.35%
1991-2019	93.758	87.22%	-4.46%
<i>Female</i>			
1991-2000	15.702	16.76%	6.92%
2000-2010	16.123	17.62%	2.03%
2010-2019	18.328	35.65%	-16.97%
1991-2019	50.153	82.04%	-6.40%
<i>Urban</i>			
1991-2000	14.468	19.47%	-7.71%
2000-2010	7.612	17.24%	-11.71%
2010-2019	17.914	26.63%	-14.29%
1991-2019	39.993	67.14%	-34.65%
<i>Rural</i>			
1991-2000	24.026	16.29%	13.47%
2000-2010	27.341	15.40%	10.70%
2010-2019	30.033	41.97%	-19.23%
1991-2019	81.400	91.35%	9.48%
Cardiovascular diseases			
<i>Both</i>			
1991-2000	44.582	24.76%	3.78%
2000-2010	37.284	7.60%	10.96%
2010-2019	79.416	56.81%	-23.46%
1991-2019	161.282	107.63%	-4.41%
<i>Male</i>			
1991-2000	51.266	26.31%	5.45%
2000-2010	46.201	9.09%	12.63%
2010-2019	78.670	53.82%	-23.43%
1991-2019	176.138	111.18%	-2.08%
<i>Female</i>			

1991-2000	37.431	23.44%	1.35%
2000-2010	28.051	5.53%	9.36%
2010-2019	80.390	61.30%	-24.17%
1991-2019	145.872	104.75%	-8.14%
Urban			
1991-2000	39.771	27.36%	-5.23%
2000-2010	-0.889	14.29%	-14.69%
2010-2019	69.701	47.72%	-15.84%
1991-2019	108.582	95.77%	-35.36%
Rural			
1991-2000	45.046	23.43%	6.72%
2000-2010	55.518	0.58%	27.97%
2010-2019	82.682	64.00%	-30.93%
1991-2019	183.246	111.89%	10.74%
