

Title Page

(1) manuscript title

Did the socioeconomic inequalities in avoidable and unavoidable mortality worsen during the first year of the COVID-19 pandemic in the Republic of Korea?

(2) type of manuscript

Original article

(3) full authors' names (first name family name) and affiliations

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(4) information about funding sources

This work was supported by a grant of the National Medical Center, Republic of Korea (grant number: NMC2021-General Research Program-09).

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(6) short running head

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(7) conflicts of interest of all listed authors.

The authors have no conflicts of interest to declare for this study.

(8) funding

This work was supported by a grant of the National Medical Center, Republic of Korea (grant number: NMC2021-General Research Program-09).”

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Conceptualization: MHK, JL, RH, JK, RO Data curation: JL, RO. Formal analysis: RO. Funding acquisition: MHK. Methodology: MHK, RO. Writing – original draft: RO. Writing – review & editing: MHK.

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1 **Abstract**

2 **Purpose:** This study examined changes in socioeconomic inequalities in mortality in the Republic of Korea before
3 and after the outbreak of COVID-19.

4 **Methods:** From 2017 to 2020, age-standardized mortality rates were calculated for all-cause deaths, avoidable
5 deaths (preventable deaths, treatable deaths), and unavoidable deaths using National Health Insurance claims data
6 and Statistics Korea's cause of death data. In addition, the slope index of inequality (SII) and the relative index of
7 inequality (RII) by six income levels (Medical Aid beneficiary group and quintile of health insurance premiums)
8 were computed to analyze the magnitude and change of mortality inequalities.

9 **Results:** All-cause and avoidable mortality rates decreased steadily between 2017 and 2020, whereas unavoidable
10 mortality remained relatively stable. In the case of mortality inequalities, the disparity in all-cause mortality
11 between income classes was exacerbated in 2020 compared to 2019, with the SII increasing from 185.44 to 189.22
12 and the RII increasing from 3.99 to 4.29. In particular, the preventable and unavoidable mortality rates showed an
13 apparent increase in inequality, as both the SII (preventable: 91.31 to 92.01, unavoidable: 69.99 to 75.38) and RII
14 (preventable: 3.42 to 3.66, unavoidable: 5.02 to 5.89) increased.

15 **Conclusions:** In the first year of the COVID-19 pandemic, mortality inequality continued to increase, although
16 there was no sign of exacerbation. It is necessary to continuously evaluate mortality inequalities, particularly for
17 preventable and unavoidable deaths.

18

19 **Keywords:** COVID-19, Mortality, Health Inequalities, Korea

20 Introduction

21 In general, the Republic of Korea's (hereinafter, Korea) response to the coronavirus disease 2019 (COVID-19)
22 pandemic has been extensively praised [1-4]. Among various indicators, excess mortality is regarded as an
23 objective estimate of the pandemic's total impact since it includes both direct and indirect deaths caused by
24 COVID-19 [5]. The number of excess deaths from the COVID-19 pandemic in 2020 was estimated at around 4.48
25 million people worldwide (95% CI: 3.93, 5.07) [6]. However, during the first year of the pandemic, significant
26 excess mortality was not observed in South Korea [6-10].

27 Although the first year of the pandemic did not affect overall excess mortality, the impacts of the pandemic may
28 have varied significantly across socioeconomic groups. In the United States, ethnic minority groups showed higher
29 levels of excess mortality [11-13], while in the United Kingdom, the poorest quintile regions showed the highest
30 excess mortality [14] and the most years of life lost [15]. In contrast, in Belgium, excess mortality was salient
31 among high-income men of working age, first-generation non-Belgian migrant men, and low-educated women,
32 indicating that socioeconomic inequality is not straightforward; in particular, leisure or work-related travel, which
33 increases the risk of COVID-19 infection, might have been more common among high-income men aged 25–
34 64 [16].

35 In Korea, Kim et al. (2022) found excess deaths among male Medical Aid beneficiaries (531 per 100,000
36 population) [9]. Meanwhile, Oh et al. (2022) found a disproportionate impact of the pandemic on mortality by
37 cause of death, education level, and marital status. The excess mortality related to the pandemic was pronounced
38 in people with metabolic and ill-defined diseases, those with lower levels of education, and those who were
39 single [10]. Kim et al. (2021) divided the Korean population into 3 income groups according to the level of
40 national health insurance premiums and examined the relationship of income with COVID-19 infection, morbidity,
41 and mortality [17]. The results showed that people with low-income levels were more vulnerable to COVID-19
42 infection, but COVID-19 morbidity and mortality in the Korean population were unrelated to income level [17].
43 Thus, the consequences of socioeconomic inequality in death during the pandemic in Korean society also seem
44 mixed.

45 We sought to supplement and expand upon the existing studies in 2 aspects. First, several studies have examined
46 which causes of death have significantly increased in Korea during the COVID-19 pandemic [9, 10, 17], but the
47 concept of avoidable death has not been utilized. Avoidable death refers to deaths resulting from causes that can
48 be avoided by adequate and timely prevention and treatment [18]. Thus, this parameter can be used to indicate

49 whether the Korean healthcare system and socioeconomic policies during the COVID-19 pandemic have
50 adequately protected people from dying from avoidable causes. Avoidable deaths are divided into treatable and
51 preventable ones; treatable mortality includes death that can be avoided if quality healthcare services, including
52 timely treatment, are provided based on current medical knowledge and technology, while preventable mortality
53 indicates deaths that can be avoided through effective public policies and primary preventive interventions [19].
54 Unavoidable or non-avoidable mortality refers to all causes of death except avoidable causes. By classifying all-
55 cause deaths into avoidable (preventable and treatable) and non-avoidable deaths, we can view changes in
56 mortality rates from various angles, with implications for the healthcare system and policy response.
57 Second, there seems to be little evidence of whether the pattern and magnitude of socioeconomic inequality
58 changed during the first year of the COVID-19 pandemic. Since the focus of previous studies has been on changes
59 in the magnitude of mortality, it is necessary to study changes in the degree of inequality as well. Our study aimed
60 to investigate the impact of the COVID-19 pandemic on socioeconomic inequality in mortality by examining
61 changes in absolute and relative inequality of all-cause, avoidable (preventable and treatable), and unavoidable
62 death over the 3 years preceding COVID-19 and the first year of the pandemic.

63

64 **Materials and Methods**

65 **Data**

66 We obtained cause of death data for the years 2017 to 2020 from Statistics Korea and linked it to National Health
67 Insurance claims data, covering the entire population of Korea. The total number of deaths in the merged dataset
68 was 1,189,022. The number of deaths included in the final analysis was 1,170,909 (Appendix 1), excluding cases
69 with missing key information such as cause of death, sex, age, and health insurance contribution.

70

71 **Mortality and causes of deaths**

72 We calculated annual age-standardized mortality rates (ASMRs) per 100,000 using the direct standardization
73 method with the standard 2005 mid-year population. Avoidable mortality, which is divided into treatable and
74 preventable mortality, was defined based on the OECD/Eurostat standardization. Some causes of death belong to
75 both treatable and preventable mortality, so the sum of treatable and preventable mortality is greater than the total
76 value of avoidable mortality. Meanwhile, the upper age limit was set at 74 years [19].

77 The list of avoidable causes of death should be updated in a timely manner to reflect advances in medical
78 knowledge and skills and changes in the social environment [18]. Causes of death previously considered
79 unavoidable can now be defined as avoidable. In this study, the latest version (published in 2022) of the list jointly
80 adopted by the OECD and Eurostat was used [19], with slight modifications. For privacy protection, Statistics
81 Korea provided some causes of death (as International Classification of Disease, 10th revision [ICD-10] codes)
82 in aggregate form, so we could not accurately apply the OECD/Eurostat classification. The final version was
83 developed with reference to the classifications of the United Kingdom's Office for National Statistics (2021) [20]
84 and Kang et al. (2016) [21], and in consultation with experts. The final classification scheme can be found in
85 Appendix 2.

86

87 **Inequality measures**

88 Socioeconomic position (SEP) was measured by health insurance type and health insurance premiums; National
89 Health Insurance beneficiaries were divided into quintiles (Q1-Q5) based on their insurance premiums, a proxy
90 for income, and Medical Aid beneficiaries, who consist of around 3% of the total population, were set as the
91 lowest SEP group (Q0). The National Health Insurance Service provides a total of 20 quintiles based on household
92 insurance premiums. We used this information and divided it into 5 bands. It was not possible to adjust for the
93 number of people in the household because data on household size were not provided. In addition, although there
94 is a difference between employment-based policyholders and self-employed subscribers in how insurance
95 premium deciles are calculated, this study did not distinguish between the 2 groups and used the combined
96 premium deciles.

97 To assess absolute and relative inequality in mortality across the 6 SEP subgroups (Q0~Q5), we calculated the
98 slope index of inequality (SII) and the relative index of inequality (RII) from the years 2017 to 2020. The SII and
99 RII are used to show health inequalities across multiple groups with a hierarchy, such as education or income.
100 The SII shows the magnitude of absolute inequality by calculating the difference in index estimates between the
101 most disadvantaged group and the most advantaged one, taking into account the population size of all subgroups
102 based on a regression model. Meanwhile, the RII shows the extent of relative inequality through the ratio of the
103 most disadvantaged group to the most advantaged one, derived from the same regression model for the SII [22].
104 Additionally, we examined changes in inequality between health insurance premium deciles (Q1~Q5), excluding
105 Medical Aid beneficiaries (Q0). For absolute inequality, we calculated the rate difference (RD) in mortality

106 between Q1 and Q5, and for relative inequality, we calculated the rate ratio (RR) between Q1 and Q5.
107 Statistical analyses were performed using R, and the PHEindicatormethods package was used to calculate the SII
108 and RII [23].
109 The study protocol was approved by the Institutional Review Board (IRB) of the National Medical Center of
110 Korea (IRB No. NMC-2021-06-078) and the National Health Insurance Service (NHIS-2021-1-850).

111

112 **Result**

113 **1. Overall change in mortality from 2017 to 2020**

114 Annually, the ASMR of all-cause, avoidable, preventable, and treatable deaths decreased from 2017 to 2020. In
115 contrast, the ASMR of unavoidable deaths increased and decreased repeatedly, increasing by 0.97% in 2020
116 compared with 2019 (Figure 1, Table 1).

117

118 **2. Absolute and relative inequalities of mortality from 2017 to 2020**

119 **1) All-cause mortality**

120 All-cause mortality rates increased in Q0 (Medical Aid beneficiaries) between 2018 and 2020 and in Q2 between
121 2019 and 2020. They decreased in all other SEP groups between 2019 and 2020. When analyzed by sex, all-cause
122 mortality increased in 2020 compared to 2019 in Q0 and Q2 for men and in Q2, Q3, and Q4 for women (Table 2).
123 Both the SII and RII of all-cause mortality increased steadily from 2017 to 2020. The SII and RII increased in
124 men for 4 consecutive years, whereas the SII for women decreased slightly in 2020 compared to 2019, while the
125 RII remained unchanged (Table 2). The RD and RR values comparing Q1 and Q5 increased from 2017 to 2019
126 and then decreased in 2020.

127

128 **2) Avoidable and unavoidable mortality**

129 The avoidable mortality rates in Q2 increased slightly between 2019 and 2020, while they continued to decrease
130 in Q3, Q4, and Q5 from 2017 to 2020. When analyzed by sex, the avoidable mortality rates increased for men in
131 Q2 and for women in Q2, Q3, and Q4 compared to 2019. The SII of avoidable mortality showed a slight decrease
132 in 2020 compared to 2019, while the RII increased for 4 consecutive years. The RII increased from 2017 to 2020
133 for men and increased from 2017 to 2019 for women, before decreasing slightly in 2020. The RD and RR of Q1

134 and Q5 increased from 2017 to 2019 and then decreased in 2020 (Table 3).
135 The unavoidable mortality rate of Q0 increased for 4 consecutive years. For men, Q0, Q1, and Q2 showed an
136 increase in 2020 compared to 2019. For women, those in Q0, Q2, Q3, and Q4 showed an increase in 2020
137 compared to 2019. Both the SII and RII increased for the unavoidable mortality rate in 2020 compared to 2019.
138 The RD and RR values comparing the Q1 and Q5 also increased for both males and females in 2020 compared to
139 2019 (Table 4).

140

141 **3) Treatable and preventable mortality**

142 Although there was an increase in the treatable and preventable mortality rates in Q2 in 2020 compared to 2019,
143 the rest of the groups showed a decline in the mortality rate. There was an increase in treatable mortality rate in
144 Q2 for men, but no group showed an increase in mortality for women in 2020. There was an increase in the
145 preventable mortality rate in Q2 for men and in Q2, Q3, and Q4 for women in 2020 compared to 2019.

146 The SII and RII for treatable mortality decreased slightly in 2020 compared to 2019 (Table 5). The RD and RR
147 of Q1 and Q5 also decreased marginally in 2020. However, the magnitude of both absolute and relative inequality
148 increased in 2020 compared to 2019 for preventable mortality (Table 6). The RD and RR values decreased in
149 2020 for preventable mortality in the entire population, but the RR values for women increased in 2020.

150

151 **Discussion**

152 The ASMRs for all-cause, avoidable, treatable, and preventable deaths from 2017 to 2020 showed a continuous
153 decline. In contrast, for non-avoidable deaths, the ASMR fluctuated and showed almost no change. This result is
154 consistent with a study indicating that Korea's unavoidable mortality rate leveled off after 2003 and 2004 [24].

155 The disparity in all-cause mortality between income classes has widened. Specifically, the preventable and
156 unavoidable mortality rates exhibited an apparent increase in inequality, as both the SII and RII rose in 2020.
157 Unavoidable mortality was an exception in that not only did inequality increase, but outcomes for the entire
158 population showed no improvement (Figures 2, 3).

159 It is a favorable finding that the improvement in all-cause mortality is mostly attributable to a decline in avoidable
160 deaths. In addition, the continuously declining pattern of treatable mortality in Korea, despite the impact of
161 COVID-19, suggests that the healthcare system was quite stable during the first year of the COVID-19 pandemic.

162 In Korea, the number of COVID-19 patients in the first year of the pandemic was relatively small. The cumulative
163 number of confirmed COVID-19 cases in Korea was 61,769 as of December 31, 2020, which was much lower
164 than in the US (20,219,871), the UK (2,488,780), and Italy (2,107,166) [25]. Thus, in contrast to Western societies,
165 Korea seems to have prevented the collapse of the healthcare system. This also seems to explain the results of
166 previous studies on excess death, which showed no substantial increase in mortality in 2020 [6-10].

167 Meanwhile, although the declining pattern was not halted during COVID-19, special attention must be paid to
168 preventable mortality. Preventable deaths account for a large proportion of avoidable deaths and showed a wider
169 gender gap during COVID-19. Not only Q2, but Q3 and Q4, also showed an increase in preventable mortality in
170 women. In addition, absolute and relative inequalities in preventable mortality increased during the pandemic.
171 The increase in preventable mortality and related inequalities suggests a potential failure of public health
172 interventions focused on the broader social determinants of health. As the pandemic continues and socioeconomic
173 inequalities deepen [26], it is important to continue monitoring whether inequalities in preventable mortality
174 increase.

175 Among the categories of causes of death, cancer, injuries, and circulatory diseases accounted for 82.16% of all
176 avoidable deaths in 2020 (Appendix 3). We further examined changes in mortality inequality for avoidable deaths
177 from these major 3 causes of death (Appendix 4-7). The inequality in death from injuries was largely responsible
178 for the magnitude of absolute inequality in avoidable mortality. Suicide accounted for the largest proportion of
179 deaths from injury. For men, the SII of suicide decreased slightly from 2019 to 2020, but for women, both the SII
180 and RII of suicide increased slightly from 2019 to 2020. Thus, it is worth keeping an eye on whether inequalities
181 in female suicide rates have increased, and further research extending beyond the first year of the COVID-19
182 pandemic is needed.

183 Moreover, it is noteworthy that absolute and relative inequality worsened for both men and women in unavoidable
184 mortality. Unlike avoidable mortality, unavoidable mortality did not show a decreasing pattern in the entire
185 population. This raises a grave concern because increasing inequality is combined with stagnating outcomes for
186 the entire population. Benach et al. (2011) summarized the policy implications of the various possible scenarios
187 depending on the combination of changes (maintenance, deterioration, and improvement) in the health level and
188 inequality level of the entire population [27]. The unavoidable deaths in our study reflect a scenario in which
189 health outcomes are stable at the overall population level, but inequality increases. This reflects a situation where
190 society's inability to provide adequate support to those who need help the most harms the entire level of health

191 outcome [27], suggesting that the problem of unfair distribution also hinders the improvement of outcomes in the
192 entire population.

193 Conceptually, unavoidable mortality refers to an area beyond human control and cannot be solved by mobilizing
194 given resources and current technologies. Thus, there are some views that healthcare interventions are impossible
195 and measurements of inequality are not suitable for unavoidable death [28]. From the standpoint of healthcare,
196 socioeconomic inequality in unavoidable death should be minimal since healthcare cannot make any difference
197 in the area. However, our observation, similar to a prior study that identified a clear inverse relationship between
198 SES and unavoidable death [29], suggests that socioeconomic inequality in this area is not trivial, and there may
199 still be some amenable factors generated by social determinants of health.

200 Several aspects of unavoidable causes of death can support this view. First of all, there is no clear boundary
201 between “avoidable” and “unavoidable,” and there are few causes of death that are entirely “avoidable” or
202 “unavoidable” [30, 31]. For example, rare cancers experienced by a small number of people such as C23-26
203 (biliary tract and pancreatic family), C30-32 (nasal and laryngeal cancer), and C37-39 (mediastinal sinus cancer)
204 belong to unavoidable causes of death. However, although a complete cure is impossible, there is still a chance to
205 delay death through early diagnosis and treatment.

206 Furthermore, unavoidable causes of death include the ICD-10 codes of R00-R99 (symptoms, signs and abnormal
207 clinical and laboratory findings, not elsewhere classified). This cause of death has increased [9] and showed
208 substantial excess death (2756, 95% CI: 2021, 3378) [10] in Korea during the pandemic. Furthermore, a study
209 examining the mortality pattern of the different causes of death before and during the COVID-19 pandemic using
210 an interrupted time series analysis showed that the deaths observed outside medical facilities increased, and this
211 increase was mainly attributable to neoplasms and unclassified causes of death [32]. Thus, it is highly convincing
212 to assume that deaths for which the specific cause was not given could have been poorly diagnosed and treated
213 due to the affected individuals’ low socioeconomic status. Thus, the increase in inequality in the unavoidable
214 death seems “avoidable” if socioeconomic conditions are well addressed.

215 Korea’s mortality rate from R00-R99 was the highest among OECD countries after Poland in 2019 [33]. The
216 magnitude of R-code deaths can lead to an underestimation of the size of avoidable deaths, as deaths with R-codes
217 could have been classified as avoidable if they were properly classified [34]. Since the high proportion of R codes
218 in South Korea highlights a problem with the quality of Korea's cause-of-death statistics [35], there is a need to
219 expand efforts to reduce unexplained deaths by systematically analyzing cases where the causes of death were

220 unknown. Meanwhile, the increase in R-coded deaths during COVID-19 can be attributed to out-of-hospital deaths
221 of vulnerable people who were unable to access public hospitals [36-37] and unattended deaths of people who
222 lacked social networks. In this study, we could not analyze unavoidable deaths in detail due to data availability,
223 but future studies should consider exploring them.

224 This study has the following limitations. First, we only covered the first year of the COVID-19 pandemic. In
225 particular, Korea did not have a large outbreak in the first year. Thus, the study period may have been too short
226 to determine the impact of COVID-19. However, we could still confirm the pattern of exacerbated inequality
227 despite the overall mortality decrease. This suggests a strong need for follow-up studies.

228 In addition, as we were unable to use a detailed classification of certain causes of death for analysis due to privacy
229 purposes, we incorporated these causes into a broader category. Thus, the ICD-10 codes corresponding to each
230 disease group shown in Appendix 1 may be slightly inaccurate. For example, the ICD-10 code of malaria is B50-
231 B54, but we had no choice but to use B50-B64, representing all protozoal diseases. However, deaths other than
232 malaria are negligible and would not have made a substantial difference. There were no deaths from B55
233 (leishmaniasis) or B56-B57 (trypanosomiasis) during 2017-2020, according to Statistics Korea [38].

234 Lastly, the type of healthcare coverage or the health insurance premium quintile used in this study as a proxy for
235 SEP may not have accurately reflected the income class. However, these indicators have shown consistent results
236 with various health outcome indicators in previous studies. In addition, we considered the distribution of the entire
237 income group by using a regression-based scale such as the SII and RII, rather than a paired comparison of the
238 highest and lowest groups. Although the mortality rate of the entire population declined, the annual mortality rate
239 of the middle class, such as Q2, Q3, and Q4, has not decreased consistently in specific groups defined according
240 to sex and causes of death. These results would never have been identified if only the highest and lowest pairs
241 were compared.

242 The results of this study can be summarized as follows. The mortality inequality increased in the first year of
243 COVID-19, even though there were no signs of a worsening trend in mortality inequality. We must continue to
244 evaluate mortality disparities, especially regarding unavoidable and preventable mortality.

245

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Epub ahead of print

Table 1. Annual age-standardized mortality rates from 2017 to 2020 (unit: per 100,000 people)

| | All | | | | Male | | | | Female | | | |
|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| All-cause mortality (95% CI) | 164.24 (163.24- 165.25) | 162.79 (161.80- 163.79) | 156.63 (155.66- 157.60) | 153.86 (152.91- 154.82) | 233.09 (231.39- 234.79) | 229.66 (228.00- 231.33) | 220.52 (218.91- 222.13) | 215.36 (213.78- 216.94) | 97.90 (96.79- 99.02) | 98.14 (97.03- 99.26) | 94.56 (93.47- 95.66) | 94.12 (93.04- 95.22) |
| Avoidable (95% CI) | 110.41 (109.59- 111.25) | 107.97 (107.16- 108.79) | 103.80 (103.00- 104.59) | 100.52 (99.74- 101.30) | 158.82 (157.42- 160.23) | 154.27 (152.91- 155.65) | 147.28 (145.96- 148.61) | 141.24 (139.96- 142.53) | 63.92 (63.01- 64.83) | 63.27 (62.37- 64.18) | 61.65 (60.76- 62.55) | 61.08 (60.19- 61.97) |
| Treatable (95% CI) | 44.18 (43.67- 44.70) | 43.02 (42.52- 43.52) | 40.85 (40.37- 41.34) | 39.80 (39.33- 40.28) | 56.99 (56.16- 57.82) | 55.67 (54.86- 56.48) | 52.54 (51.77- 53.31) | 51.09 (50.35- 51.85) | 32.18 (31.55- 32.81) | 31.09 (30.48- 31.70) | 29.77 (29.17- 30.37) | 29.07 (28.49- 29.67) |
| Preventable (95% CI) | 90.56 (89.81- 91.31) | 88.11 (87.37- 88.85) | 84.44 (83.73- 85.17) | 81.55 (80.85- 82.26) | 136.38 (135.08- 137.69) | 131.71 (130.44- 132.98) | 125.55 (124.33- 126.78) | 120.00 (118.81- 121.19) | 46.29 (45.52- 47.07) | 45.77 (45.00- 46.55) | 44.38 (43.62- 45.16) | 44.09 (43.33- 44.86) |
| Unavoidable (95% CI) | 53.83 (53.26- 54.40) | 54.82 (54.25- 55.39) | 52.83 (52.28- 53.39) | 53.34 (52.79- 53.90) | 74.27 (73.32- 75.22) | 75.39 (74.45- 76.34) | 73.24 (72.32- 74.16) | 74.11 (73.20- 75.03) | 33.98 (33.34- 34.64) | 34.83 (34.18- 35.49) | 32.91 (32.29- 33.55) | 33.01 (32.39- 33.65) |

CI, confidence interval.

Table 2. Annual age-standardized mortality rates and absolute and relative inequality for all-cause mortality from 2017 to 2020

| | All | | | | Male | | | | Female | | | |
|--------------------|---------------------|---------------------|---------------------|---------------------|----------------------|-----------------------|-----------------------|-----------------------|---------------------|---------------------|---------------------|---------------------|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| ASMR (/100,000) | | | | | | | | | | | | |
| Q0 | 822.72 | 819.59 | 840.83 | 848.30 | 1198.17 | 1172.69 | 1185.22 | 1199.73 | 468.76 | 477.23 | 496.92 | 491.36 |
| (95% CI) | (805.43- 840.21) | (802.75- 836.61) | (822.80- 859.06) | (830.18- 866.62) | (116.96- 1228.79) | (1143.95- 1201.81) | (1154.51- 1216.32) | (1169.05- 1230.79) | (449.67- 488.26) | (458.07- 496.80) | (476.44- 517.82) | (470.66- 512.51) |
| Q1 | 168.62 | 167.58 | 175.71 | 167.95 | 269.03 | 262.41 | 268.84 | 259.34 | 88.83 | 90.75 | 96.76 | 93.35 |
| (95% CI) | (165.93- 171.35) | (164.97- 170.22) | (173.17- 178.28) | (165.41- 170.51) | (264.02- 274.11) | (257.61- 267.27) | (264.30- 273.43) | (254.77- 263.96) | (86.09- 91.64) | (88.06- 93.50) | (94.08- 99.49) | (90.65- 96.11) |
| Q2 | 166.47 | 166.49 | 147.49 | 155.01 | 241.87 | 243.48 | 219.04 | 229.01 | 92.78 | 91.99 | 81.44 | 86.16 |
| (95% CI) | (163.73- 169.24) | (163.74- 169.28) | (144.81- 150.20) | (152.36- 157.70) | (237.24- 246.55) | (238.79- 248.23) | (214.38- 223.78) | (224.40- 233.68) | (89.76- 95.88) | (88.99- 95.05) | (78.54- 84.42) | (83.28- 89.10) |
| Q3 | 163.63 | 160.31 | 152.25 | 149.73 | 228.62 | 220.23 | 211.90 | 204.97 | 96.98 | 98.80 | 91.06 | 93.84 |
| (95% CI) | (161.16- 166.14) | (157.88- 162.77) | (149.90- 154.62) | (147.44- 152.05) | (224.52- 232.77) | (216.26- 224.25) | (208.05- 215.81) | (201.23- 208.76) | (94.25- 99.77) | (96.03- 101.62) | (88.44- 93.73) | (91.21- 96.51) |
| Q4 | 143.04 | 140.34 | 130.91 | 126.31 | 195.29 | 189.59 | 178.48 | 167.85 | 91.33 | 91.24 | 83.31 | 84.58 |
| (95% CI) | (141.04- 145.06) | (138.37- 142.33) | (129.03- 132.81) | (124.46- 128.18) | (192.03- 198.59) | (186.41- 192.81) | (175.44- 181.56) | (164.92- 170.83) | (89.01- 93.69) | (88.91- 93.61) | (81.10- 85.56) | (82.33- 86.87) |
| Q5 | 112.00 | 109.09 | 104.03 | 100.23 | 152.73 | 147.79 | 138.13 | 132.40 | 76.55 | 75.51 | 74.34 | 72.11 |
| (95% CI) | (110.36- 113.65) | (107.46- 110.73) | (102.45- 105.63) | (98.67- 101.81) | (150.02- 155.46) | (145.13- 150.49) | (135.59- 140.69) | (129.92- 134.90) | (74.59- 78.55) | (73.53- 77.52) | (72.37- 76.35) | (70.14- 74.11) |
| Inequality | | | | | | | | | | | | |
| SII | 175.31 | 179.99 | 185.44 | 189.22 | 283.20 | 286.28 | 293.49 | 303.08 | 75.89 | 80.56 | 84.20 | 84.09 |
| (95% CI) | (171.14- 179.54) | (175.85- 184.18) | (181.33- 189.67) | (185.08- 193.42) | (276.08- 290.39) | (279.30- 293.31) | (286.55- 300.53) | (296.17- 310.16) | (71.21- 80.67) | (75.83- 85.37) | (79.44- 89.00) | (79.37- 88.94) |
| RII | 3.34 | 3.54 | 3.99 | 4.29 | 4.18 | 4.46 | 5.16 | 6.00 | 2.26 | 2.38 | 2.60 | 2.60 |
| (95% CI) | (3.22- 3.45) | (3.42- 3.67) | (3.84- 4.15) | (4.11- 4.47) | (3.99- 4.38) | (4.25- 4.68) | (4.89- 5.45) | (5.65- 6.39) | (2.15- 2.39) | (2.26- 2.52) | (2.45- 2.76) | (2.45- 2.76) |
| RD (Q1-Q5) | 56.62 | 58.49 | 71.68 | 67.72 | 116.3 | 114.62 | 130.71 | 126.94 | 12.28 | 15.24 | 22.42 | 21.24 |
| RR (Q1/Q5) | 1.51 | 1.54 | 1.69 | 1.68 | 1.76 | 1.78 | 1.95 | 1.96 | 1.16 | 1.20 | 1.30 | 1.29 |

CI, confidence interval; SII, slope index of inequality; RII, relative index of inequality; RD, rate difference; RR, rate ratio; Q0, Medical Aid beneficiaries, Q1~Q5= quintile of national health insurance premiums

Table 3. Annual age-standardized mortality rates and absolute and relative inequality for avoidable mortality from 2017 to 2020

| | All | | | | Male | | | | Female | | | |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| ASMR (/100,000) | | | | | | | | | | | | |
| Q0 | 506.38 | 485.56 | 504.05 | 488.26 | 732.28 | 686.42 | 696.42 | 675.11 | 294.65 | 290.45 | 310.56 | 296.29 |
| (95% CI) | (493.01- 519.94) | (472.88- 498.42) | (490.35- 517.94) | (474.93- 501.79) | (709.33- 755.61) | (665.12- 708.09) | (673.80- 719.42) | (653.27- 697.30) | (279.49- 310.22) | (275.71- 305.58) | (294.30- 327.26) | (280.27- 312.75) |
| Q1 | 113.26 | 112.11 | 117.23 | 109.73 | 181.19 | 176.95 | 180.50 | 169.33 | 58.90 | 59.36 | 63.62 | 60.74 |
| (95% CI) | (111.04- 115.50) | (109.97- 114.28) | (115.15- 119.34) | (107.67- 111.81) | (177.06- 185.38) | (173.00- 180.95) | (176.78- 184.29) | (165.63- 173.09) | (56.67- 61.19) | (57.16- 61.61) | (61.44- 65.86) | (58.55- 62.98) |
| Q2 | 112.54 | 110.98 | 100.06 | 103.63 | 163.60 | 163.21 | 147.90 | 151.76 | 61.80 | 59.87 | 55.23 | 58.12 |
| (95% CI) | (110.29- 114.83) | (108.73- 113.26) | (97.85- 102.30) | (101.47- 105.83) | (159.80- 167.46) | (159.37- 167.12) | (144.07- 151.79) | (148.02- 155.56) | (59.35- 64.32) | (57.46- 62.34) | (52.83- 57.70) | (55.76- 60.55) |
| Q3 | 110.60 | 107.52 | 102.25 | 101.28 | 156.55 | 150.67 | 143.43 | 140.12 | 63.49 | 63.12 | 59.93 | 61.82 |
| (95% CI) | (108.56- 112.66) | (105.53- 109.55) | (100.32- 104.20) | (99.39- 103.20) | (153.15- 160.00) | (147.39- 154.01) | (140.26- 146.66) | (137.02- 143.26) | (61.28- 65.76) | (60.91- 65.38) | (57.78- 62.13) | (59.67- 64.02) |
| Q4 | 98.44 | 94.78 | 87.30 | 82.17 | 137.90 | 130.61 | 120.70 | 110.18 | 59.38 | 58.88 | 53.85 | 54.28 |
| (95% CI) | (96.77- 100.13) | (93.15- 96.43) | (85.75- 88.86) | (80.67- 83.70) | (135.16- 140.69) | (127.96- 133.30) | (118.20- 123.25) | (107.80- 112.61) | (57.49- 61.31) | (56.99- 60.81) | (52.05- 55.70) | (52.44- 56.16) |
| Q5 | 76.02 | 73.69 | 69.96 | 66.90 | 106.62 | 102.19 | 94.69 | 89.74 | 49.28 | 48.85 | 48.31 | 46.74 |
| (95% CI) | (74.65- 77.40) | (72.33- 75.06) | (68.65- 71.30) | (65.60- 68.22) | (104.35- 108.93) | (99.95- 104.45) | (92.57- 96.84) | (87.68- 91.84) | (47.68- 50.91) | (47.22- 50.52) | (46.68- 49.97) | (45.11- 48.40) |
| Inequality | | | | | | | | | | | | |
| SII | 109.45 | 109.39 | 115.45 | 113.84 | 173.92 | 173.18 | 180.39 | 179.80 | 50.02 | 49.87 | 54.66 | 52.71 |
| (95% CI) | (106.09- 112.85) | (106.08- 112.71) | (112.15- 118.79) | (110.61- 117.12) | (168.16- 179.75) | (167.68- 178.83) | (174.89- 185.97) | (174.41- 185.26) | (46.22- 53.87) | (46.08- 53.75) | (50.78- 58.59) | (48.92- 56.61) |
| RII | 3.01 | 3.11 | 3.59 | 3.70 | 3.50 | 3.67 | 4.32 | 4.71 | 2.29 | 2.30 | 2.59 | 2.51 |
| (95% CI) | (2.90- 3.13) | (2.99- 3.25) | (3.43- 3.75) | (3.53- 3.88) | (3.33- 3.68) | (3.49- 3.87) | (4.07- 4.58) | (4.43- 5.02) | (2.14- 2.45) | (2.15- 2.47) | (2.40- 2.79) | (2.33- 2.71) |
| RD (Q1-Q5) | 37.24 | 38.42 | 47.27 | 42.83 | 74.57 | 74.76 | 85.81 | 79.59 | 9.62 | 10.51 | 15.31 | 14.00 |
| RR (Q1/Q5) | 1.49 | 1.52 | 1.68 | 1.64 | 1.70 | 1.73 | 1.91 | 1.89 | 1.20 | 1.22 | 1.32 | 1.30 |

CI, confidence interval; SII, slope index of inequality; RII, relative index of inequality; RD, rate difference; RR, rate ratio; Q0, Medical Aid beneficiaries, Q1~Q5= quintile of national health insurance premiums

Table 4. Annual age-standardized mortality rates and absolute and relative inequality for unavoidable mortality from 2017 to 2020

| | All | | | | Male | | | | Female | | | |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| ASMR (/100,000) | | | | | | | | | | | | |
| Q0 | 316.34 | 334.03 | 336.78 | 360.04 | 465.89 | 486.27 | 488.79 | 524.62 | 174.11 | 186.14 | 186.35 | 193.35 |
| (95% CI) | (305.41- 327.47) | (323.00- 345.26) | (325.09- 348.68) | (347.81- 372.48) | (446.33- 485.90) | (467.05- 505.89) | (468.12- 509.90) | (503.15- 546.52) | (162.60- 186.04) | (174.02- 198.70) | (174.01- 199.13) | (180.42- 206.72) |
| Q1 | 55.37 | 55.47 | 58.48 | 58.22 | 87.84 | 85.46 | 88.34 | 90.01 | 29.93 | 31.39 | 33.14 | 32.61 |
| (95% CI) | (53.83- 56.93) | (53.98- 56.99) | (57.03- 59.96) | (56.75- 59.72) | (85.01- 90.75) | (82.73- 88.25) | (85.76- 90.97) | (87.35- 92.73) | (28.34- 31.58) | (29.84- 32.99) | (31.60- 34.73) | (31.04- 34.24) |
| Q2 | 53.93 | 55.52 | 47.43 | 51.38 | 78.27 | 80.27 | 71.15 | 77.25 | 30.98 | 31.82 | 26.22 | 28.04 |
| (95% CI) | (52.38- 55.52) | (53.93- 57.13) | (45.93- 48.97) | (49.85- 52.94) | (75.65- 80.95) | (77.59- 83.01) | (68.50- 73.87) | (74.56- 80.00) | (29.22- 32.81) | (30.07- 33.64) | (24.61- 27.90) | (26.41- 29.74) |
| Q3 | 53.04 | 52.79 | 50.00 | 48.45 | 72.07 | 69.56 | 68.47 | 64.85 | 33.49 | 35.68 | 31.13 | 32.02 |
| (95% CI) | (51.64- 54.46) | (51.40- 54.20) | (48.67- 51.36) | (47.17- 49.76) | (69.79- 74.41) | (67.34- 71.82) | (66.29- 70.71) | (62.76- 66.98) | (31.90- 35.14) | (34.03- 37.39) | (29.64- 32.68) | (30.52- 33.56) |
| Q4 | 44.61 | 45.56 | 43.62 | 44.14 | 57.39 | 58.98 | 57.78 | 57.67 | 31.95 | 32.36 | 29.46 | 30.30 |
| (95% CI) | (43.51- 45.72) | (44.45- 46.69) | (42.55- 44.70) | (43.06- 45.23) | (55.65- 59.17) | (57.23- 60.77) | (56.07- 59.53) | (55.98- 59.41) | (30.62- 33.33) | (31.00- 33.76) | (28.19- 30.76) | (29.01- 31.63) |
| Q5 | 35.98 | 35.40 | 34.06 | 33.34 | 46.10 | 45.60 | 43.44 | 42.65 | 27.28 | 26.66 | 26.03 | 25.37 |
| (95% CI) | (35.08- 36.90) | (34.50- 36.31) | (33.19- 34.95) | (32.48- 34.21) | (44.65- 47.59) | (44.16- 47.08) | (42.05- 44.86) | (41.30- 44.03) | (26.14- 28.45) | (25.54- 27.81) | (24.92- 27.17) | (24.27- 26.49) |
| inequality | | | | | | | | | | | | |
| SII | 65.87 | 70.60 | 69.99 | 75.38 | 109.28 | 113.10 | 113.11 | 123.28 | 25.87 | 30.46 | 29.54 | 31.13 |
| (95% CI) | (63.42- 68.38) | (68.12- 73.13) | (67.50- 72.53) | (72.84- 77.96) | (105.06- 113.60) | (108.88- 117.38) | (108.87- 117.45) | (118.89- 127.74) | (23.09- 28.74) | (27.66- 33.37) | (26.78- 32.38) | (28.30- 34.05) |
| RII | 4.19 | 4.68 | 5.02 | 5.89 | 6.65 | 7.27 | 7.99 | 11.16 | 2.22 | 2.52 | 2.63 | 2.75 |
| (95% CI) | (3.92- 4.49) | (4.36- 5.05) | (4.65- 5.44) | (5.42- 6.45) | (5.96- 7.49) | (6.48- 8.25) | (7.05- 9.19) | (9.49- 13.44) | (2.03- 2.44) | (2.30- 2.78) | (2.38- 2.92) | (2.49- 3.06) |
| RD (Q1-Q5) | 19.39 | 20.07 | 24.42 | 24.88 | 41.74 | 39.86 | 44.90 | 47.36 | 2.65 | 4.73 | 7.11 | 7.24 |
| RR (Q1/Q5) | 1.54 | 1.57 | 1.72 | 1.75 | 1.91 | 1.87 | 2.03 | 2.11 | 1.10 | 1.18 | 1.27 | 1.29 |

CI, confidence interval; SII, slope index of inequality; RII, relative index of inequality; RD, rate difference; RR, rate ratio; Q0, Medical Aid beneficiaries, Q1~Q5= quintile of national health insurance premiums

Table 5. Annual age-standardized mortality rates and absolute and relative inequality for treatable mortality from 2017 to 2020

| | All | | | | Male | | | | Female | | | |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| ASMR (/100,000) | | | | | | | | | | | | |
| Q0 | 262.82 | 262.64 | 266.93 | 253.36 | 364.88 | 351.43 | 352.58 | 337.31 | 167.38 | 175.26 | 181.09 | 166.01 |
| (95% CI) | (253.63- 272.19) | (253.74- 271.70) | (257.27- 276.77) | (244.40- 262.48) | (349.20- 380.94) | (337.26- 365.91) | (336.73- 368.80) | (323.15- 351.79) | (156.88- 178.25) | (164.17- 186.74) | (169.49- 193.08) | (154.77- 177.65) |
| Q1 | 43.97 | 42.26 | 42.18 | 40.06 | 64.15 | 60.16 | 59.14 | 55.63 | 27.76 | 27.59 | 27.80 | 27.30 |
| (95% CI) | (42.62- 45.35) | (40.98- 43.56) | (40.97- 43.40) | (38.86- 41.28) | (61.76- 66.61) | (57.94- 62.44) | (57.08- 61.25) | (53.60- 57.72) | (26.28- 29.29) | (26.16- 29.07) | (26.42- 29.23) | (25.90- 28.76) |
| Q2 | 41.32 | 39.73 | 37.27 | 37.52 | 52.81 | 52.67 | 49.14 | 49.98 | 29.65 | 26.83 | 25.86 | 25.46 |
| (95% CI) | (39.97- 42.70) | (38.41- 41.09) | (35.95- 38.63) | (36.25- 38.82) | (50.70- 54.98) | (50.54- 54.87) | (46.99- 51.36) | (47.92- 52.10) | (27.98- 31.39) | (25.25- 28.48) | (24.26- 27.54) | (23.95- 27.05) |
| Q3 | 41.76 | 40.07 | 38.37 | 38.16 | 52.16 | 48.83 | 47.80 | 47.54 | 31.46 | 31.30 | 28.89 | 28.76 |
| (95% CI) | (40.52- 43.03) | (38.87- 41.30) | (37.20- 39.55) | (37.02- 39.32) | (50.21- 54.17) | (46.97- 50.73) | (45.99- 49.66) | (45.76- 49.37) | (29.93- 33.05) | (29.78- 32.88) | (27.44- 30.39) | (27.35- 30.22) |
| Q4 | 37.58 | 35.88 | 32.44 | 31.36 | 45.78 | 43.89 | 39.47 | 37.08 | 24.21 | 22.78 | 22.18 | 21.93 |
| (95% CI) | (36.58- 38.61) | (34.91- 36.87) | (31.53- 33.37) | (30.46- 32.27) | (44.23- 47.37) | (42.39- 45.42) | (38.07- 40.91) | (35.74- 38.46) | (23.16- 25.30) | (21.75- 23.84) | (21.16- 23.23) | (20.87- 23.01) |
| Q5 | 28.86 | 27.52 | 25.79 | 24.89 | 35.14 | 33.91 | 30.85 | 29.26 | 24.21 | 22.78 | 22.18 | 21.93 |
| (95% CI) | (28.06- 29.67) | (26.75- 28.32) | (25.05- 26.55) | (24.15- 25.66) | (33.88- 36.43) | (32.69- 35.17) | (29.72- 32.02) | (28.15- 30.40) | (23.16- 25.30) | (21.75- 23.84) | (21.16- 23.23) | (20.87- 23.01) |
| Inequality | | | | | | | | | | | | |
| SII | 52.19 | 52.76 | 53.82 | 51.72 | 78.13 | 76.15 | 78.02 | 76.72 | 26.52 | 28.85 | 29.45 | 26.64 |
| (95% CI) | (50.09- 54.37) | (50.68- 54.86) | (51.75- 55.93) | (49.72- 53.75) | (74.65- 81.66) | (72.85- 79.54) | (74.67- 81.43) | (73.55- 79.94) | (23.96- 29.16) | (26.25- 31.52) | (26.88- 32.11) | (24.10- 29.26) |
| RII | 4.07 | 4.44 | 5.19 | 5.06 | 5.83 | 6.03 | 7.78 | 8.41 | 2.42 | 2.75 | 2.98 | 2.70 |
| (95% CI) | (3.79- 4.38) | (4.12- 4.81) | (4.76- 5.69) | (4.65- 5.54) | (5.21- 6.59) | (5.38- 6.83) | (6.75- 9.11) | (7.25- 9.93) | (2.21- 2.67) | (2.49- 3.06) | (2.67- 3.34) | (2.43- 3.01) |
| RD (Q1-Q5) | 15.11 | 14.74 | 16.39 | 15.17 | 29.01 | 26.25 | 28.29 | 26.37 | 3.55 | 4.81 | 5.62 | 5.37 |
| RR (Q1/Q5) | 1.52 | 1.54 | 1.64 | 1.61 | 1.83 | 1.77 | 1.92 | 1.90 | 1.15 | 1.21 | 1.25 | 1.24 |

CI, confidence interval; SII, slope index of inequality; RII, relative index of inequality; RD, rate difference; RR, rate ratio; Q0, Medical Aid beneficiaries, Q1~Q5= quintile of national health insurance premiums

Table 6. Annual age-standardized mortality rates and absolute and relative inequality for preventable mortality from 2017 to 2020

| | All | | | | Male | | | | Female | | | |
|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 | 2017 | 2018 | 2019 | 2020 |
| ASMR (/100,000) | | | | | | | | | | | | |
| Q0 | 383.19 | 359.73 | 370.67 | 362.85 | 571.94 | 526.68 | 532.15 | 517.83 | 204.68 | 196.46 | 207.48 | 202.88 |
| (95% CI) | (371.66- 394.92) | (348.84- 370.80) | (359.20- 382.33) | (351.33- 374.55) | (551.97- 592.29) | (508.15- 545.56) | (512.95- 551.71) | (498.65- 537.37) | (191.86- 217.93) | (184.12- 209.21) | (194.15- 221.25) | (189.50- 216.70) |
| Q1 | 94.19 | 93.48 | 98.29 | 92.10 | 156.74 | 153.83 | 157.30 | 148.19 | 44.40 | 44.60 | 48.34 | 46.06 |
| (95% CI) | (92.18- 96.23) | (91.53- 95.46) | (96.39- 100.22) | (90.22- 94.01) | (152.91- 160.63) | (150.14- 157.58) | (153.82- 160.84) | (144.72- 151.72) | (42.47- 46.39) | (42.71- 46.55) | (46.44- 50.31) | (44.16- 48.00) |
| Q2 | 95.47 | 94.1 | 83.45 | 87.30 | 145.33 | 143.65 | 129.51 | 133.63 | 46.16 | 45.88 | 40.69 | 43.88 |
| (95% CI) | (93.41- 97.57) | (92.04- 96.19) | (81.43- 85.50) | (85.31- 89.32) | (141.75- 148.97) | (140.06- 147.30) | (125.92- 133.17) | (130.12- 137.22) | (44.05- 48.34) | (43.78- 48.05) | (38.63- 42.83) | (41.83- 46.00) |
| Q3 | 92.33 | 88.89 | 83.84 | 82.64 | 136.99 | 130.33 | 123.71 | 120.06 | 46.26 | 46.09 | 42.73 | 44.61 |
| (95% CI) | (90.47- 94.22) | (87.08- 90.73) | (82.10- 85.61) | (80.93- 84.37) | (133.82- 140.21) | (127.28- 133.44) | (120.77- 126.71) | (117.20- 122.97) | (44.37- 48.21) | (44.20- 48.05) | (40.91- 44.60) | (42.77- 46.50) |
| Q4 | 80.93 | 77.67 | 71.52 | 66.78 | 119.50 | 112.93 | 104.31 | 94.63 | 42.17 | 41.69 | 38.04 | 38.31 |
| (95% CI) | (79.41- 82.47) | (76.18- 79.17) | (70.11- 72.95) | (65.41- 68.17) | (116.94- 122.10) | (110.47- 115.44) | (101.97- 106.68) | (92.41- 96.89) | (40.57- 43.81) | (40.09- 43.33) | (36.50- 39.61) | (36.75- 39.92) |
| Q5 | 61.75 | 59.99 | 56.94 | 53.75 | 91.69 | 87.98 | 81.42 | 76.70 | 34.71 | 34.73 | 34.62 | 32.46 |
| (95% CI) | (60.51- 63.00) | (58.75- 61.24) | (55.74- 58.15) | (52.58- 54.94) | (89.57- 93.84) | (85.90- 90.09) | (79.44- 83.42) | (74.78- 78.65) | (33.36- 36.09) | (33.33- 36.16) | (33.22- 36.05) | (31.11- 33.86) |
| Inequality | | | | | | | | | | | | |
| SII | 88.35 | 87.05 | 91.31 | 92.01 | 144.22 | 141.82 | 147.87 | 149.10 | 38.43 | 37.55 | 40.00 | 40.99 |
| (95% CI) | (85.38- 91.38) | (84.11- 90.03) | (88.38- 94.26) | (89.11- 94.93) | (139.03- 149.47) | (136.78- 146.98) | (142.85- 152.93) | (144.20- 154.10) | (35.20- 41.74) | (34.32- 40.85) | (36.74- 43.32) | (37.75- 44.33) |
| RII | 2.95 | 3.00 | 3.42 | 3.66 | 3.30 | 3.42 | 3.98 | 4.43 | 2.43 | 2.39 | 2.64 | 2.73 |
| (95% CI) | (2.83- 3.08) | (2.88- 3.14) | (3.26- 3.59) | (3.49- 3.86) | (3.14- 3.48) | (3.24- 3.61) | (3.75- 4.23) | (4.16- 4.73) | (2.24- 2.64) | (2.20- 2.60) | (2.42- 2.89) | (2.50- 3.00) |
| RD (Q1-Q5) | 32.44 | 33.49 | 41.35 | 38.35 | 65.05 | 65.85 | 75.88 | 71.49 | 9.69 | 9.87 | 13.72 | 13.60 |
| RR (Q1/Q5) | 1.53 | 1.56 | 1.73 | 1.71 | 1.71 | 1.75 | 1.93 | 1.93 | 1.28 | 1.28 | 1.40 | 1.42 |

CI, confidence interval; SII, slope index of inequality; RII, relative index of inequality; RD, rate difference; RR, rate ratio; Q0, Medical Aid beneficiaries, Q1~Q5= quintile

of national health insurance premiums

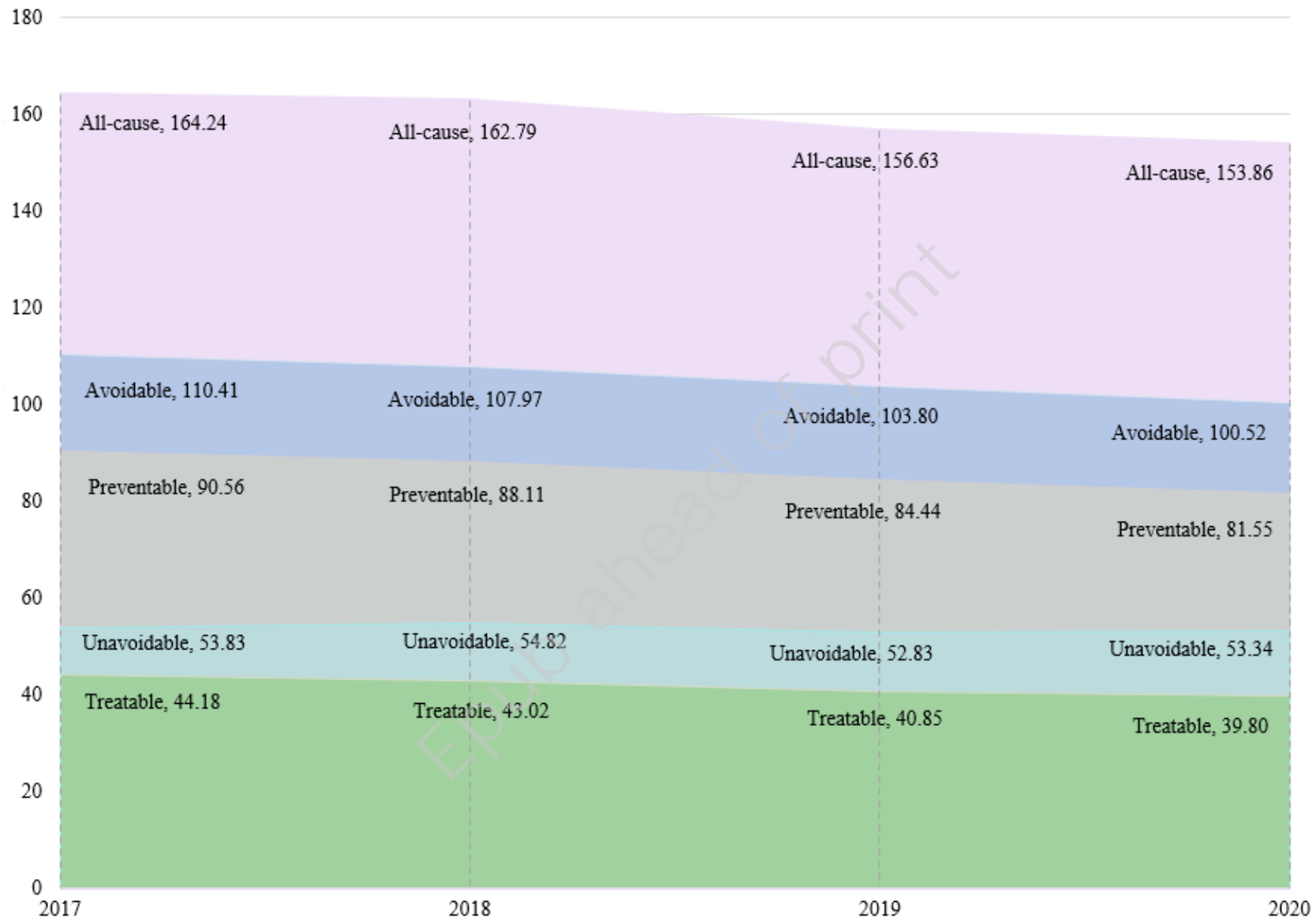


Figure 1. Annual age-standardized mortality rates from 2017 to 2020 (unit: per 100,000 people)

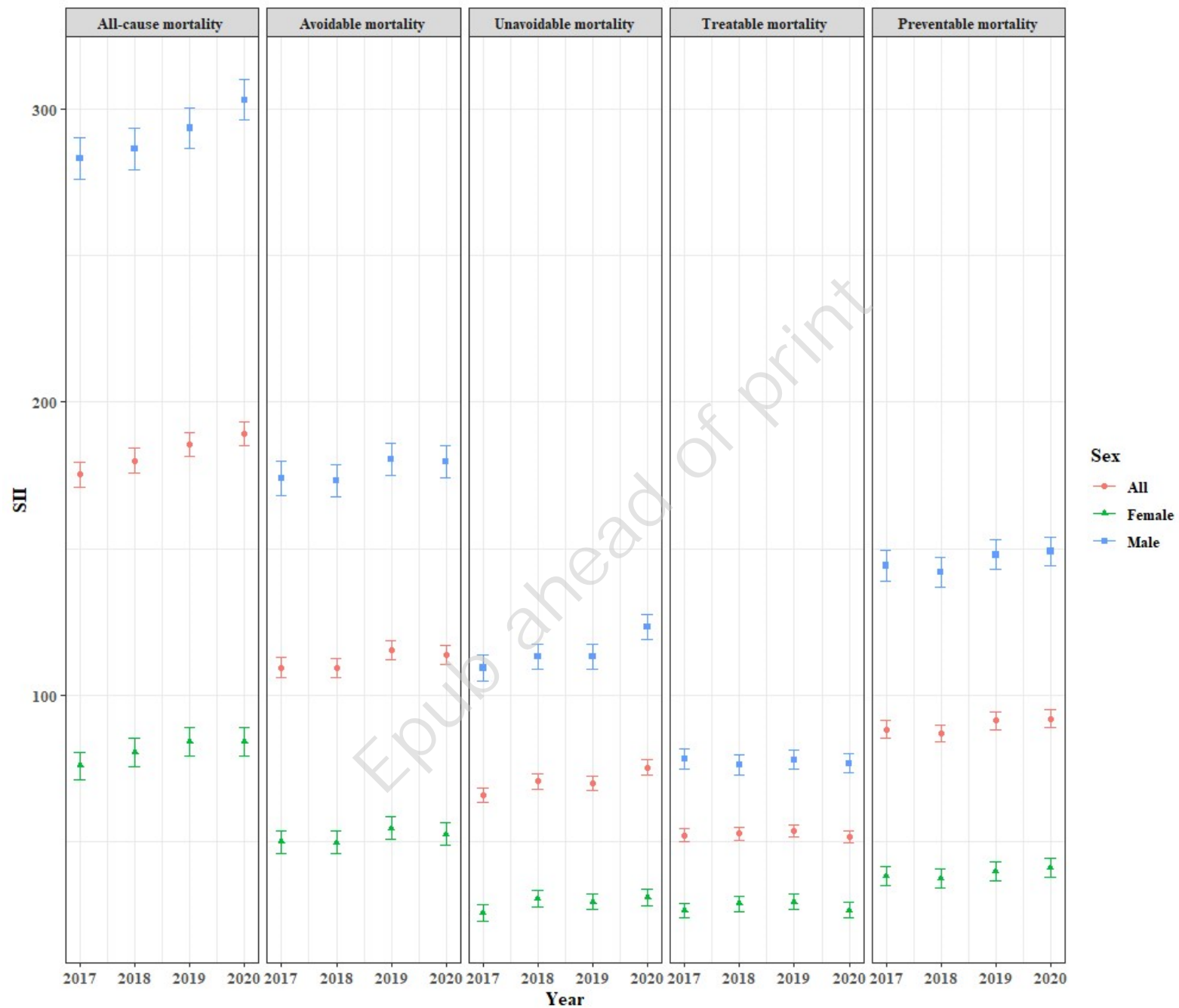


Figure 2. Slope index of inequalities from 2017 to 2020

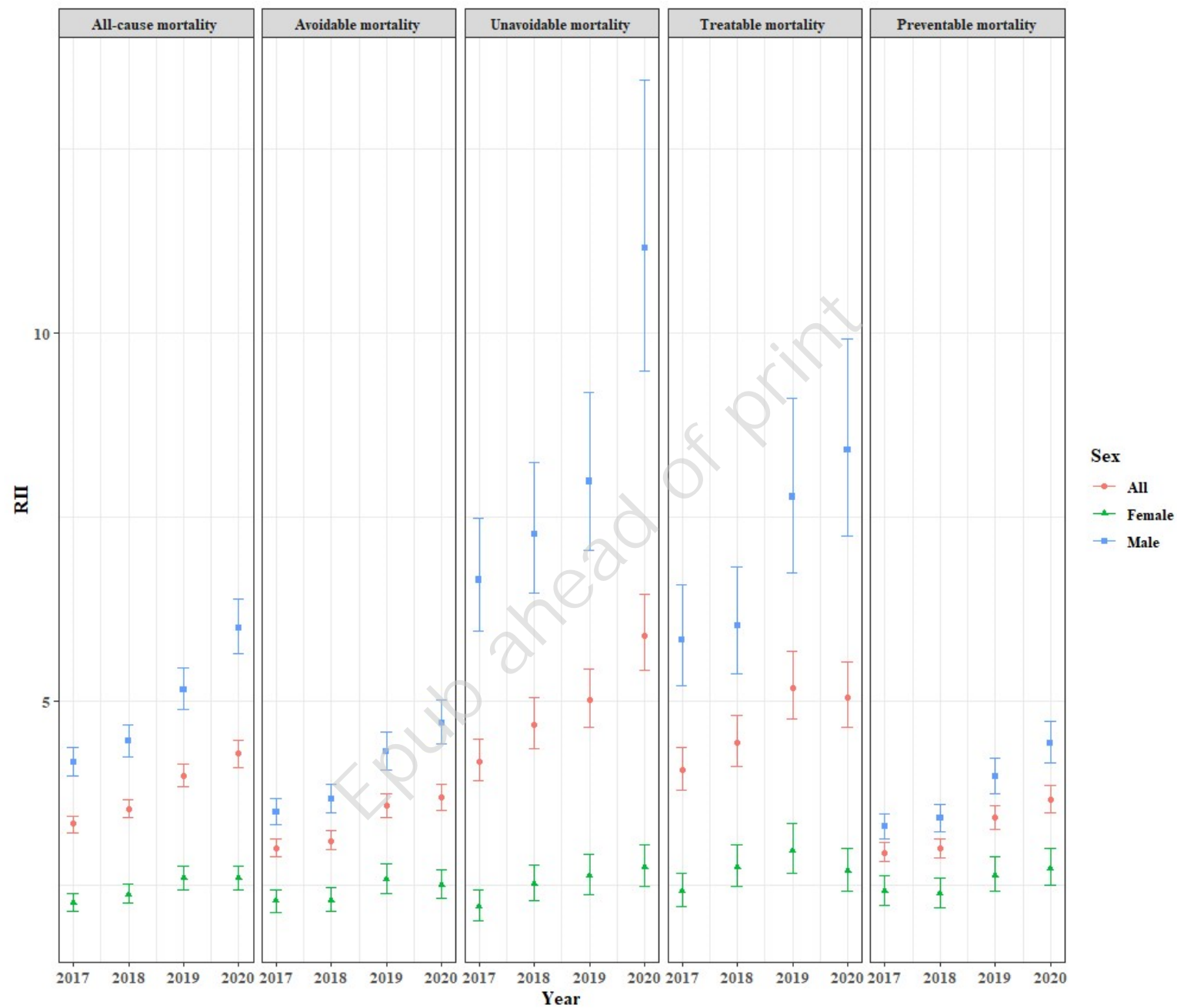


Figure 3. Relative index of inequalities from 2017 to 2020