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1 **Health inequality experienced by the socially disadvantaged populations in the**
2 **outbreak of COVID-19 in Hong Kong: An interaction with social inequality**

3

4 **ABSTRACT**

5 Health inequality creates conditions for the transmission of infectious diseases, and existing
6 health disparities can contribute to unequal burdens of morbidity and mortality. In Hong Kong,
7 low socio-economic districts were the epicentres of third-wave outbreak of COVID-19 in July
8 and August 2020, suggesting that people from low socio-economic class are vulnerable groups.
9 Socially disadvantaged people are relatively more vulnerable to the physical, mental, and social
10 impacts of infectious diseases. To achieve more effective infection control, the social
11 determinants of health and existing health inequalities should be identified, and understanding
12 the experiences of socially disadvantaged groups in the COVID-19 outbreak will be beneficial to
13 health authorities in formulating a responsive infection control policy targeting the needs of the
14 socially disadvantaged. This article investigates the experiences of economically disadvantaged
15 groups during the COVID-19 outbreak and examines how they were further disadvantaged in the
16 outbreak by delineating how health inequality intersected with social inequality. In-depth,
17 semistructured interviews were conducted from February to April 2020 with 35 participants from
18 the poverty class in Hong Kong. The high prices of surgical face masks and disinfecting products
19 as well as the economic impacts induced by COVID-19-related social distancing policies
20 imposed severe economic burden on the participants. In addition to economic and housing
21 deprivation, social inequality was closely associated with health inequality, which made the
22 participants more vulnerable to infection. Social inequality is associated with and can worsen
23 health inequality. Here, the participants, who were of low socioeconomic status were more

24 disadvantaged in health and in the attainment of social resources such as employment, education,
25 face masks, disinfection products, and right to use public facilities, during the COVID-19
26 outbreak. All these elements may have interrelated effects and in turn limit accessibility to health
27 care and lead to less positive health outcomes and consequently to health inequality.

28

29 **Keywords:** health inequality, social inequality, socially disadvantaged groups, COVID-19, Hong
30 Kong.

31

32 **What is known about this topic**

- 33 • Health inequality creates conditions for infectious disease transmission
- 34 • Health disparities contribute to unequal burdens of morbidity and mortality
- 35 • Socially disadvantaged people are more vulnerable to infectious diseases

36

37 **What this paper adds**

- 38 • COVID-19 outbreak manifests the correlation between health inequality and social
39 inequality
- 40 • People with low socioeconomic status were more disadvantaged in the attainment of
41 social resources such as employment, housing, education, and right of using public
42 facilities as well as of health resources including face masks and disinfecting products
- 43 • Government's infection control policies such as home confinement, work-from-home,
44 and study-from-home failed to benefit the people with low socio-economic status during
45 the outbreak

46

47 **INTRODUCTION**

48 COVID-19 is a novel infectious disease caused by the newly discovered coronavirus, and has
49 become a pandemic globally. The disease spreads mainly through respiratory droplets, and
50 transmits to others through eyes, nose, or mouth by contacting the things that are contaminated
51 by the virus (World Health Organization, 2019). As of 31 August 2020, 25,118,689 confirmed
52 cases have been recorded throughout the world, with 844,312 deaths (World Health
53 Organization, 2019). In Hong Kong, as of 31 August 2020, there have been 4811 confirmed
54 cases, with 89 deaths recorded (Centre for Health Protection, 2020). The morbidity and mortality
55 of COVID-19 is still rising globally at the time of this article in September 2020.

56 Socially disadvantaged people are more vulnerable to infectious diseases physically
57 (Estenssoro et al., 2019; Williams & Bryant, 2018), mentally (Williams & Bryant, 2018), and
58 socially (DiOrio et al. 2018; Sun et al., 2018; Williams & Bryant, 2018). Although COVID-19
59 has hit different districts since the first-wave outbreak in Hong Kong, the outbreak was
60 particularly more serious in low socio-economic districts during the third-wave outbreak in July
61 and August 2020. The most severe community outbreak with the biggest cluster of infected cases
62 was at Tsz Wan Shan (Centre for Health Protection, 2020; RTHK, 2020), which is located in
63 Wong Tai Sin district with masses of public housing estates for low socio-economic classes and
64 has the highest poverty rate in Hong Kong (Census and Statistics Department, 2019). Out of the
65 4811 confirmed cases, at least 83 cases are recorded in Tsz Wan Shan (Centre for Health
66 Protection, 2020). In response to this cluster outbreak, the Hong Kong Government launched a
67 programme to test the residents who are living in public housing estates in Tsz Wan Shan for
68 COVID-19 in late July 2020 (Information Services Department, 2020). Other remarkable cluster
69 outbreaks are also focused in public housing estates or low socio-economic districts such as

70 Sham Shui Po, Kwun Tong, and Tuen Mun (Centre for Health Protection, 2020). Such
71 epidemiological data suggests that people from low socio-economic class are more vulnerable to
72 the infection, resulting in health inequality and disparity.

73 Health inequality creates conditions for the transmission of infectious diseases, and
74 existing health disparities further contribute to unequal burdens of morbidity and mortality
75 (Farmer, 2001; Quinn & Kumar, 2014). The effects of infectious disease on economically
76 deprived groups are particularly remarkable, as they are more vulnerable to the suffering of
77 infection as well as the socio-economic impacts of the infection (Farmer, 2001; Quinn & Kumar,
78 2014). To improve infection control, the social determinants of health and existing health
79 inequalities should be identified, such that infections among socially disadvantaged
80 subpopulations will not go undetected (Quinn & Kumar, 2014). This article uses economically
81 disadvantaged groups in Hong Kong for a case study on how health inequality is closely
82 interrelated with social inequality, increasing the vulnerability of these groups during the
83 epidemic outbreak.

84

85 **Significance**

86 Although socially disadvantaged groups are highly vulnerable to infectious disease outbreaks,
87 studies have indicated that policymakers may not prioritize the needs of vulnerable populations
88 during resource allocation in community health policy planning (Rozier et al., 2018). Most
89 literature on COVID-19 focuses on the biomedical aspects such as the development of vaccines
90 and treatment, with a lack of social studies on the difficulties and experiences encountered by
91 socially disadvantaged groups. Moreover, few qualitative studies have attempted. Taking an
92 evidence-based policy perspective, this study investigates the experiences of economically

93 disadvantaged groups during the COVID-19 outbreak and examines how they were further
94 disadvantaged in the outbreak by delineating how health inequality intersects with social
95 inequality from a qualitative approach. Understanding the experiences of socially disadvantaged
96 groups in the COVID-19 outbreak will benefit health authorities in formulating a responsive
97 infection control policy targeting the needs of the socially disadvantaged in future.

98

99 **METHODS**

100 Using Hong Kong as a case study, the study adopted a qualitative research approach with in-
101 depth, semistructured individual interviews to investigate how the COVID-19 outbreak could
102 manifest health inequality for economically disadvantaged groups and how health inequality is
103 closely interlocked with social inequality.

104

105 **Data collection**

106 Thirty-five participants identified as impoverished were sampled for the aforementioned
107 interviews with purposive sampling, using the following sampling criteria: (1) age 18 years or
108 older, (2) at poverty class, ie. personal monthly income was less than HK\$4000 (\approx US\$512.82)
109 or the monthly family income of a four-person household was less than HK\$21000 (\approx
110 US\$2692.31) during the study period, and (3) Hong Kong Chinese ethnicity. According to the
111 Census and Statistics Department of the Hong Kong government, personal monthly income less
112 than HK\$4000 or monthly family income of a four-person household lower than HK\$21000 in
113 2018 is considered the poverty line of Hong Kong (Census and Statistics Department, 2005).

114 The participants were sampled through a social service centre located in Kwun Tong,
115 which is the district with the highest rate of poverty in Hong Kong (Census and Statistics

116 Department, 2019). Participant recruitment posters were posted in public areas of the social
117 service centre that are accessible to public in February 2020. The centre manager also invited
118 those registered service users who fulfilled the sampling criteria for the interviews. Participant
119 recruitment was considered complete after data saturation.

120 Interviews were conducted from February to April 2020. The interviews were open-
121 ended to offer flexibility to participants in expressing their perceptions and experiences. Prior to
122 the interview, an interview question guide (see Appendix 1) was prepared, using past literature
123 on the relationship between infectious diseases and socioeconomic status as a reference (DiOrio
124 et al. 2018; Estenssoro et al., 2019; Farmer, 2001; Quinn & Kumar, 2014; Sun et al., 2018;
125 Williams & Bryant, 2018). The guide included specific questions that targeted the participants’
126 risk perceptions of COVID-19, the measures taken in dealing with the epidemic, the experiences
127 and difficulties that they encountered, and their coping strategies. The interviews were conducted
128 using the question guide in a semistructured yet open-ended format; this ensured that interviews
129 were focused on the research topics while providing flexibility to all participants in freely
130 expressing their opinions. This allowed for an in-depth understanding of their subjective
131 thoughts and experiences.

132 Because the interviews were conducted during the epidemic outbreak with social
133 distancing policies in place, the interviews were taken place using online communication tools,
134 namely Skype for Business or Zoom. The author conducted the interviews anonymously in a
135 private office of the institution to ensure participants’ privacy, and the participants could choose
136 a place for the interviews at their own convenience. The author was the interviewer for all 35
137 interviews, resulting in enhanced consistency and reduced the risk of data flaws. Throughout the
138 interview process, the interviewer probed the participants for various aspects of their experiences

139 during the outbreak in relation to their socioeconomic status. Each interview lasted for 40–50
140 minutes and was audio-recorded with participants' consent. All the interviews were conducted in
141 Cantonese Chinese, the native dialect for both the interviewer and the participants. Supermarket
142 cash coupons of HK\$200 were sent to the participants via the postal service to each participant
143 after the interviews were completed as compensation for their time.

144

145 **Ethics approval**

146 Ethical approval was obtained from the Human Subjects Ethics Subcommittee at The Hong
147 Kong Polytechnic University prior to the study.

148

149 **Data analysis**

150 All interviews were transcribed verbatim and each participant was assigned a code in the data.
151 Post-transcription member checking was performed; each interview transcript was checked by
152 the participants to prevent content distortion. The author conducted an inductive coding process
153 to identify the subjective thinking and behavioral patterns of all participants (Liamputtong &
154 Ezzy, 2005). The transcripts were analyzed line by line. The raw interview texts were thoroughly
155 read for content familiarization and then re-read to determine possible themes (Thomas, 2006).
156 Distinct concepts were developed and used in memo documentation to enable systematic
157 analysis of the interviews. The transcripts were segmented into meaning units, which were
158 labeled and then collapsed into categories (Thomas, 2006). Categories and themes were created
159 from actual phrases in specific text segments. Upper-level categories were identified based on
160 the research questions, and *in vivo* coding was conducted (Thomas, 2006). Recurrent categories
161 were highlighted. Overlapping codes and categories were consolidated to form broader themes

162 after repeated examination and comparison (Thomas, 2006). The codes, categories, and themes
163 derived from the data, alongside supporting interview quotes, were documented in a coding table
164 (Green & Thorogood, 2004), where designated concepts and categories were highlighted to
165 translate the interviews into meaningful symbols to represent the thoughts of all participants. As
166 the coding process was conducted by one researcher, a recoding process was conducted within 1
167 month of the first coding to ensure the analyzed data was reliable, credible, and trustworthy. The
168 analyzed codes, themes, and categories were consistent between the first coding and recoding.
169 Next, overlap and redundancy in the codes were further consolidated. The category system was
170 then further refined to reduce verbosity among the categories, and thus, the most meaningful
171 themes were identified. Data saturation, at which new themes cease to emerge from the data
172 (Liamputtong & Ezzy, 2005), was achieved.

173

174 **FINDINGS**

175 **Participants**

176 Of the 35 participants, 20 were women and 15 were men. The participants aged 25–60 years, and
177 all belonged to the poverty class according to the Census and Statistics Department and were
178 recipients of Comprehensive Social Security Assistance from the Social Welfare Department of
179 the Hong Kong government. Twenty-one participants were living in public housing estates,
180 whereas 14 of them were living in rented subdivided flats, which are the single flats that are
181 shared by several households, usually unknown with one another. Twenty-four participants
182 reported that they were employed in a full-time temporary job, whereas eight of them were
183 working part-time, and three of them were unemployed. Most participants were working in food
184 and catering industry, whereas the remaining participants were working in the cleaning industry,

185 construction industry, service and retail, or transportation. Eighteen participants were married, 10
186 were divorced, 5 were single, and 2 were widowed.

187

188 **Difficulties encountered by the participants**

189 High price of surgical face masks

190 Because of the shortage in the face mask supply at the onset of the outbreak, the price of face
191 masks had been increasing continuously. This imposed a heavy financial burden on the
192 participants:

193

194 *The face masks are so expensive now. The price is “seafood price” [different price*
195 *everyday] and goes up every day. My whole family has only 10 face masks as stock, but I*
196 *have four members in my family. Of course, we need to buy more face masks, but they are*
197 *becoming so expensive that we can hardly afford them. [P15]*

198

199 Because of the high price of face masks, more than half of the participants were forced to
200 engage in health-compromising behavior, such as not using a face mask in public areas.
201 However, this put the participants not only in a more dangerous, but also in a more marginalized
202 position:

203

204 *I cannot afford to buy face masks as they have become so expensive now. However, I must*
205 *have them because wearing a face mask is a must if I need to go out now. If I do not use a*
206 *face mask, others would discriminate against me. I have tried not using a face mask to save*
207 *the stock; at that time, I just went to a convenience store that is very close to my home.*

208 *However, all others walked away from me and paid me a dirty look when they saw me*
209 *without a face mask. The shopkeeper even asked me to leave immediately as he said it is*
210 *the company's rule to serve only the customers with face masks. I was just like a "crossing*
211 *road rat" [a Cantonese slang term meaning something disgusting]. [P3]*

212

213 Another participant also shared how he was discriminated against when using public
214 transport without a face mask:

215

216 *The bus captain asked me to use a face mask when I got on board, but I did not have one*
217 *because I really cannot buy one. The bus captain then refused to let me on the bus.*

218 *However, I had already paid the bus fare, so I had a quarrel with him. However, other*
219 *passengers joined the bus captain and accused me as dirty, irresponsible, spreading virus,*
220 *etc. for not using a face mask. There were so many people accusing me, so I had to leave*
221 *the bus. Now if you go out without a face mask, you will lose a lot of basic rights. [P7]*

222

223 To avoid such discrimination, some other participants kept using the same face mask for
224 several days, which exposed them to a higher infection risk:

225

226 *I only have few face masks left, and I have to use one every day when I go out to work.*

227 *Therefore, I try to make my face mask as clean as possible so that I can reuse it for more*
228 *days. I know a face mask should be changed every day, and reusing it can be very*

229 *dangerous because it has gotten dirty. However, I have no choice because I cannot afford*

230 *to buy face masks now as they have become so expensive. After all, I cannot not use a face*
231 *mask when going out, because others would discriminate against me. [P24]*

232

233 Some participants even washed their face masks for reuse, which is against medical advice
234 that surgical face masks should only be used once:

235

236 *I only have five face masks left, but face masks have become so expensive now. Therefore, I*
237 *will use washing detergent to wash the face mask for reuse. I think it is okay because you*
238 *wash dishes with washing detergent as well. I think the face mask is still in good condition*
239 *after washing. You just need to let the face mask dry out in the sunlight and then it is okay*
240 *for you to reuse it. ... I know this is not good, but face masks are so expensive now, and I*
241 *cannot afford to change face masks every day. [P11]*

242

243 Many participants worked as cleaners in public facilities; however, their low-ranking job
244 status could mean they had little bargaining power, further disadvantaging them in obtaining
245 anti-infection products from their employers. One participant working as a public toilet cleaner
246 shared her experience:

247

248 *My boss only provides one face mask for me every day. However, I have to clean up toilets,*
249 *empty rubbish bins, and touch a lot of dirty stuff. These are all very risky because you*
250 *know, the virus can spread through urine, feces, and rubbish. Therefore, one face mask for*
251 *a whole day's work is definitely not enough. Actually, my colleagues have asked the boss to*

252 *give us two more face masks for our work in one single day, but he just ignored our*
253 *request. [P28]*

254

255 High price of disinfecting products

256 The price of disinfecting products had also become more expensive at the onset of the outbreak,
257 so the participants encountered difficulty purchasing them. This participant indicated a popular
258 opinion:

259

260 *It has become so expensive to buy alcohol, bleach, Dettol [a brand of disinfecting liquid],*
261 *green water [a brand of disinfecting liquid], etc. now. In the past, they were very cheap.*
262 *But now, they have become so expensive. I also want to buy them to disinfect my home, but*
263 *how can I afford them? If I buy them, then I have to sacrifice my meals. After all, filling my*
264 *stomach is the most fundamental thing for me to survive. [P7]*

265

266 Another participant added,

267

268 *Hand sanitizers are a privilege now. They cost more than HK\$20 but just for a very small*
269 *bottle. I would rather use this HK\$20 to buy a meal. To you, HK\$20 may be just a little*
270 *and cannot buy much but to me, it can still fill up my stomach. [P9]*

271

272 Economic impacts induced by social distancing advocates

273 To prevent the spread of the epidemic, the Hong Kong government health authorities advocated
274 social distancing, suggesting that people implement home confinement and work-from-home

275 policies. Moreover, the government health authorities also recommended that people avoid social
276 gatherings including for meals. These policies had serious economic impacts that greatly affected
277 the livelihoods of the participants.

278

279 *Unstable income*

280 Unstable income was the most prominent experience for the participants during the outbreak:

281

282 *I work in a restaurant, and the business has really dropped a lot. In the past, the restaurant*
283 *would be 80% full at night. However, after the outbreak, there are only 2 or 3 tables eating*
284 *at lunchtime and dinnertime every day. It is very difficult for the boss to sustain because*
285 *the business cannot cover the expenses of rent, water, electricity, gas charges, etc. Now the*
286 *boss is asking us to work in rotation, which means I have to switch to part-time now. Not*
287 *only do I earn less, but I also cannot predict how much I can earn in a month. It is difficult*
288 *to sustain my livelihood now. How can I buy face masks? [P21]*

289

290 *Unpaid leave*

291 Other participants were asked to take unpaid leave from their jobs, which made it even more

292 difficult for them to sustain their livelihood during the outbreak:

293

294 *At the beginning, the boss just asked us to take all of our annual leave. Then we were asked*
295 *to have unpaid leave now, and the restaurant will be closed for 1 month. Although the boss*
296 *said the restaurant will be reopened after 1 month, who knows? The situation is really very*
297 *difficult now. How can I make my living this month? I do not have any savings because my*

298 *salary is low, but I have to support the whole family. The expenses in the past several*
299 *months have been high because we have to buy face masks and disinfecting products. But*
300 *now, not to mention face masks, but the basic cost of living is a critical issue to me. [P23]*

301

302 *Unemployment*

303 Some participants lost their jobs during the outbreak, which further disadvantaged them in
304 protecting themselves from the infection:

305

306 *The restaurant closed down suddenly, and I have lost my job and salary now. It is very*
307 *difficult to find another job because all the businesses are thinking about how to “cut*
308 *people” [fire staff], so they will not hire any new staff. Now I have no income. How can I*
309 *afford to buy face masks now? [P29]*

310

311 Higher vulnerability manifested by social inequality

312 *Poor housing conditions*

313 Some participants were living in subdivided flats, where the living conditions were often
314 crowded and unsatisfactory. These subdivided flats are the smaller units inside an ordinary
315 apartment that are shared by several households and some units are without windows, possibly
316 leading to poor ventilation; also, these different households may need to share facilities like
317 bathroom and kitchen, which may promote the spread of infections. The poor living conditions
318 experienced by the participants exposed them to higher infection risk. One participant who was
319 living in a subdivided flat shared:

320

321 *You know the virus can be spread through feces and through sharing public things. I live in*
322 *a subdivided flat and have to share a bathroom and kitchen with other roommates whom I*
323 *do not know. Although I can tell myself to keep good hygiene, I cannot control how other*
324 *roommates behave. If one of my roommates has the virus, then we all will be infected. I*
325 *always think that I will get infected sooner or later—it is just a matter of time. Even though*
326 *I follow the government’s advice to stay at home as much as possible, I cannot avoid the*
327 *risk because my home is not safe.... [P30]*

328

329 *Difficulty in following home confinement*

330 Although the government encouraged home confinement and work-from-home to prevent the
331 spread of the epidemic, the participants encountered remarkable difficulty in following this
332 advocate because of their job nature and lower socio-economic status, which make them to suffer
333 from a higher infection risk:

334

335 *Work-from-home is impossible for me. My job does not allow work-from-home so I cannot*
336 *bargain with my boss. I need my job and money to survive though I know working outside*
337 *is risky. Work-from-home is a privilege for the high-rank people, because their jobs are*
338 *better, they can bargain with their bosses, and they can easily find another job. However,*
339 *for me as a low-rank person, if I bargain for working from home, my boss would just fire*
340 *me and say I can stay at home then. [P35]*

341

342 Inaccessibility of educational resources

343 Because of the social distancing policy, all in-school teaching was suspended, and online
344 teaching was implemented instead. However, online teaching was unfavorable to the
345 participants, as many of them did not have access to computers and an Internet connection for
346 their children to receive online education:

347

348 *I do not have a computer and Internet at home, but my son has to attend classes online*
349 *every day. At the beginning, my son would go to his different classmates' homes for classes*
350 *together, but still, you cannot disturb others for such a long time, and maybe other parents*
351 *dislike others going to their homes at this time. All public libraries are closed, so my son*
352 *cannot access any public computers either. His class teacher has noticed my son's absence*
353 *and has contacted me several times. However, I really cannot afford to buy a computer for*
354 *him, and I do not know where to get a second-hand one. But a second-hand computer also*
355 *needs money. What can I do? [P22]*

356

357 Another participant added,

358

359 *Online teaching is a luxury. The government [officials] just cannot understand that not*
360 *every family can afford a computer and Internet at home. There is no support for this kind*
361 *of family. My son can only wait until at night to listen to the playback of the classes*
362 *because he has to wait for me to come back home from work so that he can use my*
363 *[smart]phone to listen to the classes. However, I only have limited data because my plan is*
364 *a cheap one. Therefore, I would go to shopping malls or parks nearby with my son to get*
365 *free Wi-Fi at night so that my son could listen to the classes. But doing this means I have to*

366 *sacrifice my sleep, and my son has to stay up late as well. It is not good for my son as he*
367 *still has to go outside for classes, which is not just more dangerous but also means higher*
368 *infection risk for him, too. [P34]*

369

370 **DISCUSSION**

371 This article investigates how the COVID-19 outbreak manifests the correlation between social
372 inequality and health inequality in Hong Kong. Health disparity is caused by social inequality,
373 which affects how well a population can control the spread of COVID-19 (Okoi & Bwawa,
374 2020). As demonstrated by the participants, people with low socioeconomic status were more
375 disadvantaged in health during the outbreak. This echoes previous results confirming a close
376 relationship between health outcomes and low socioeconomic status during times of epidemic
377 outbreak (Farmer, 2001; Marmot, 2017). A study done in sub-Saharan Africa shows that
378 economic inequalities and social determinants can manifest significant health disparities, and
379 thus can increase the poor's vulnerability to COVID-19, with elders as the most vulnerable (Okoi
380 & Bwawa, 2020). Poverty and unemployment are correlated to COVID-19 morbidity and
381 mortality in Colorado (Ramírez & Lee, 2020). This article further demonstrates that people with
382 low socioeconomic status were more disadvantaged in the attainment of social resources such as
383 employment, housing, education, and right of using public facilities as well as of health
384 resources including face masks and disinfecting products. All these social determinants can have
385 interrelated effects on the accessibility of health in turn, leading to less positive health outcomes
386 and thus health inequality in an epidemic outbreak.

387 Using a face mask in public areas has been a social norm of Hong Kong during epidemic
388 outbreaks since the Severe Acute Respiratory Syndrome (SARS) (Siu, 2016). Face masks can

389 convey symbolic meanings; by using face masks, people can show that they are fulfilling the
390 social expectation of supporting health care providers and having a sense of civic responsibility
391 by not spreading virus (Siu, 2016). In the COVID-19 outbreak, face mask using has become a
392 new social norm again in Hong Kong. Failure to comply with this new social norm could make
393 one to become social deviant, and thus invite negative social outcomes. However, because of the
394 financial strain, face masks have become a luxury for the participants. They could not afford to
395 buy face masks, and thus they were forced to behave contrary to this new social norm and
396 become social deviants by not using a face mask in public areas. Their right to use public
397 facilities was denied, and they were discriminated against and rejected. The economically
398 disadvantaged position prevented these participants from accessing social resources during the
399 outbreak, further pushing them to a more marginalized position. Robling (2020) indicated that it
400 is important to ensure that variable use of face masks does not reinforce existing health
401 inequalities. However, the new social norm of face mask using has reinforced social inequality
402 by contributing to their marginalization, affecting their right in accessing social resources and
403 public facilities, which could affect their mental health and thus leading to health inequality in
404 turn.

405 Most participants, therefore, were under remarkable social pressure arising from the new
406 social norm of using a face mask in public areas to avoid being marginalized. Although most
407 participants still used a face mask in public areas, the financial strain forced them to act against
408 medical advice by reusing face masks. Their disadvantaged economic position has thus exposed
409 them to a higher infection risk. Their financial strain also caused the participants to experience
410 difficulty purchasing disinfecting products, resulting in differential outcomes in health in the
411 outbreak, in which they were more vulnerable to higher infection risk.

412 Social inequality, thus, is correlated with and can worsen health inequality. The
413 participants were mostly working in low-ranking jobs; the power difference between themselves
414 and their employers positioned them at a disadvantage in the acquisition of infection control
415 products from their employers, exposing them to a higher infection risk in their work
416 environment. Furthermore, consistent with other literature showing that the working class is
417 more uncertain about job security during the COVID-19 outbreak (Nicola et al., 2020), the
418 employment of the participants became more unstable because of the outbreak and social
419 distancing policies, not just affecting their livelihoods, but more importantly it affected their
420 accessibility to infection control products. Infection control products became a luxury that the
421 economically disadvantaged participants could hardly afford, further worsening health
422 inequality.

423 Although the government implemented home confinement and work-from-home policies
424 to contain the spread of the infection, the unsatisfactory housing conditions with poor ventilation,
425 shared facilities, and overcrowding condition that the participants experienced could also expose
426 them to a higher infection risk. Therefore, home confinement does not necessarily mean a lower
427 infection risk to the participants. Indeed, cases show that the socially disadvantaged living in
428 public housing were more vulnerable to the cluster of infection as they could get infected at
429 home (South China Morning Post, 2020), and the most severe cluster outbreak was in a densely
430 populated district with the highest poverty rate (Centre for Health Protection, 2020; RTHK,
431 2020). Furthermore, work-from-home advocates were a kind of luxury that the participants could
432 hardly enjoy, as their low socio-economic status served as an obstacle for the participants to
433 bargain their rights from their employers on one hand, and their job nature could not allow them
434 to follow this advocate on the other. Because of their disadvantaged social and economic

435 position, the participants were not protected by the government’s home confinement and work-
436 from-home policy during the outbreak. This is consistent with the observation of Ali, Asaria, and
437 Stranges (2020), indicating that the marginalized groups are often employed in jobs that cannot
438 accommodate work-from-home arrangement and living in dense housing, which increases their
439 exposure to the infection. The worldwide slogan of advocating home confinement—“I
440 [healthcare providers] stay at work for you, you stay at home for us”—during the COVID-19
441 outbreak, thus, is creating difficulties for the disadvantaged groups.

442 Consistent with a report by the United Nations (2020), online teaching may manifest
443 social inequality and disparity because economically disadvantaged families may be unable to
444 afford the computer and Internet connection that are the prerequisites for online learning. As
445 demonstrated by the participants, the rights of children from economically disadvantaged
446 families to receive quality education were denied during the outbreak, as either their children
447 were forced to go to public locations with free Internet connections to continue learning, or their
448 children were forced to sacrifice learning. Online education, thus, can worsen educational
449 inequality. This shows consistency with van Deursen’s observation (2020), suggesting less
450 advantaged people are more vulnerable to digital inequality in the COVID-19 outbreak.
451 Furthermore, such social inequality could worsen health inequality, as online teaching does not
452 necessarily encourage study-from-home and a reduced health risk, particularly for economically
453 disadvantaged groups. As demonstrated by the participants, disadvantaged children still had to
454 go to public places with free Internet connection to attend online classes, which can mean a
455 higher vulnerability to getting the infection.

456

457 **Limitations**

458 The participants were sampled through a social service centre in one district in Hong Kong.
459 Further research should consider having more field sites in different districts to provide a more
460 holistic picture of the issue. The semistructured interviews were conducted using online
461 communication tools, and the interviewer was not in the same location with the participants
462 during the interviews. The quality of the interviews may thus have been affected because some
463 participants may have been distracted and unable to fully concentrate on the interviews.

464

465 **CONCLUSION**

466 To ensure a more successful infection control outcome, government policymakers are
467 encouraged to pay particular attention to the needs of economically disadvantaged groups and to
468 design more responsive measures to assist these vulnerable populations during epidemic
469 outbreaks. Health care and social work practitioners are also encouraged to fill the gap in
470 government policies by providing more responsive health care and social services to improve
471 social and health resources accessibility for these vulnerable groups so that economically
472 disadvantaged groups are more empowered to protect themselves from future epidemics.

473

474 **Data Availability Statement/ Data Accessibility Statement**

475 The data that support the findings of this study are available on request from the corresponding
476 author. The data are not publicly available due to privacy or ethical restrictions.

477

478 **REFERENCES**

479 Ali, S., Asaria, M., & Stranges S. (2020). COVID-19 and inequality: are we all in this together?
480 *Canadian Journal of Public Health*, 111(3): 415–416. doi: 10.17269/s41997-020-00351-
481 0

482 Census and Statistics Department, the Government of the Hong Kong Special Administrative
483 Region (2005). Poverty situation. Retrieved from
484 <https://www.censtatd.gov.hk/hkstat/sub/so461.jsp>

485 Census and Statistics Department, the Government of the Hong Kong Special Administrative
486 Region. (2016). Population and Household Statistics Analysed by District Council
487 District. Retrieved from
488 <https://www.statistics.gov.hk/pub/B11303012016AN16B0100.pdf>

489 Census and Statistics Department, the Government of the Hong Kong Special Administrative
490 Region (2019). Hong Kong Poverty Situation Report 2018. Retrieved from
491 <https://www.statistics.gov.hk/pub/B9XX0005E2018AN18E0100.pdf>

492 Centre for Health Protection, the Government of the Hong Kong Special Administrative Region.
493 (2020). Latest Situation of Coronavirus Disease (COVID-19) in Hong Kong. Retrieved
494 from <https://chp-dashboard.geodata.gov.hk/covid-19/en.html>

495 Centre for Health Protection, the Government of the Hong Kong Special Administrative Region.
496 (2020). List of Buildings With Confirmed / Probable Cases of COVID-19. Retrieved
497 from https://www.chp.gov.hk/files/pdf/building_list_eng.pdf

498 DiOrio, D., Kroeger, K., & Ross, A. (2018). Social Vulnerability in Congenital Syphilis Case
499 Mothers: Qualitative Assessment of Cases in Indiana, 2014 to 2016. *Sexually Transmitted*
500 *Diseases*, 45(7):447-451. doi: 10.1097/OLQ.0000000000000783

501 Estenssoro, E., Loudet, C.I., Edul, V.S.K., Osatnik, J., Ríos, F.G., Vásquez, D.N., Pozo, M.O.,
502 Lattanzio, B., Pálizas, F., Klein, F., Piezny, D., Rubatto Birri, P.N., Tuhay, G., Díaz, A.,
503 Santamaría, A., Zakalik, G., Dubin, A.; & investigators of the SATISEPSIS Group.
504 (2019). Health inequities in the diagnosis and outcome of sepsis in Argentina: a
505 prospective cohort study. *Critical Care*, 23(1):250. doi: 10.1186/s13054-019-2522-6.

506 Farmer, P. (2001). *Infections and Inequalities: The Modern Plagues*. Berkeley, CA: University
507 of California Press.

508 Green, J., & Thorogood, N. (2004). *Qualitative Methods for Health Research*. Thousand Oaks,
509 CA: SAGE Publications.

510 Information Services Department, the Government of the Hong Kong Special Administrative
511 Region. (2020). Tsz Wan Shan testing scheme set. Retrieved from
512 https://www.news.gov.hk/eng/2020/07/20200727/20200727_163612_526.html

513 Liamputtong, P., & Ezzy, D. (2005). *Qualitative Research Methods*. South Melbourne, VIC,
514 Australia: Oxford University Press.

515 Marmot, M. (2017). Social justice, epidemiology and health inequalities. *European Journal of*
516 *Epidemiology*, 32(7): 537-546. doi: 10.1007/s10654-017-0286-3.

517 Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., Agha, M., & Agha, R.
518 (2020). The Socio-Economic Implications of the Coronavirus and COVID-19 Pandemic:
519 A Review. *International Journal of Surgery*. doi: 10.1016/j.ijsu.2020.04.018

520 Okoi, O, & Bwawa, T. (2020). How health inequality affect responses to the COVID-19
521 pandemic in Sub-Saharan Africa. *World Development*, 135: 105067. doi:
522 10.1016/j.worlddev.2020.105067

523 Quinn, S.C., & Kumar, S. (2014). Health inequalities and infectious disease epidemics: a
524 challenge for global health security. *Biosecurity and Bioterrorism*, 12(5): 263-273. doi:
525 10.1089/bsp.2014.0032

526 Ramírez, I.J., & Lee J. (2020). COVID-19 emergence and social and health determinants in
527 Colorado: A rapid spatial analysis. *International Journal of Environmental Research and*
528 *Public Health*, 17(11):3856. doi: 10.3390/ijerph17113856

529 Robling, M.R. (2020). Variable uptake of face masks could reinforce health inequalities. *BMJ*,
530 369: m2001

531 Rozier, M.D., Singh, S.R., Jacobson, P.D., & Prosser, L.A. (2018). Priorities for Investing in
532 Community Health Improvement: A Comparison of Decision Makers in Public Health,
533 Nonprofit Hospitals, and Community Nonprofits. *Journal of Public Health Management*
534 *and Practice*. doi: 10.1097/PHH.0000000000000848

535 RTHK. (2020). Feature: In Tsz Wan Shan, whole families catch Covid. Retrieved from
536 <https://news.rthk.hk/rthk/en/component/k2/1539957-20200727.htm>

537 Siu, J.Y.M. (2016). Qualitative study on the shifting sociocultural meanings of the facemask in
538 Hong Kong since the Severe Acute Respiratory Syndrome (SARS) outbreak:
539 Implications for infection control in the post-SARS era. *International Journal for Equity*
540 *in Health*, 15(1): 73. doi: 10.1186/s12939-016-0358-0

541 South China Morning Post (2020). Coronavirus: Hong Kong public housing estate evacuated
542 after cluster of Covid-19 infections found. Retrieved from
543 [https://www.scmp.com/news/hong-kong/health-](https://www.scmp.com/news/hong-kong/health-environment/article/3087526/coronavirus-new-cluster-infection-expands-elderly)
544 [environment/article/3087526/coronavirus-new-cluster-infection-expands-elderly](https://www.scmp.com/news/hong-kong/health-environment/article/3087526/coronavirus-new-cluster-infection-expands-elderly)

545 Sun, S., Crooks, N., Kemnitz, R., & Westergaard, R.P. (2018). Re-entry experiences of Black
546 men living with HIV/AIDS after release from prison: Intersectionality and implications
547 for care. *Social Science and Medicine*, 211: 78-86. doi: 10.1016/j.socscimed.2018.06.003

548 Thomas, D.R. (2006). A general inductive approach for analyzing qualitative evaluation data.
549 *American Journal of Evaluation*, 27(2): 237-246. doi: 10.1177/1098214005283748

550 Williams, S.P., & Bryant, K.L. (2018). Sexually Transmitted Infection Prevalence among
551 Homeless Adults in the United States: A Systematic Literature Review. *Sexually*
552 *Transmitted Diseases*, 45(7): 494-504. doi: 10.1097/OLQ.0000000000000780

553 United Nations. (2020). Startling disparities in digital learning emerge as COVID-19 spreads:
554 UN education agency. Retrieved from <https://news.un.org/en/story/2020/04/1062232>

555 van Deursen, A.J. (2020). Digital inequality during a pandemic: quantitative study of differences
556 in COVID-19-related Internet uses and outcomes among the general population. *Journal*
557 *of Medical Internet Research*, 22(8): e20073. doi: 10.2196/20073

558 World Health Organization. (2019). Q&As on COVID-19 and related health topics. Retrieved
559 from [https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses)
560 [answers-hub/q-a-detail/q-a-coronaviruses](https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses)

561 World Health Organization (2019). WHO Coronavirus Disease (COVID-19) Dashboard.
562 Retrieved from <https://covid19.who.int/>