

How are family doctors serving the Hong Kong community during the COVID-19 outbreak? A survey of HKCFP members

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ABSTRACT

Introduction: This study evaluated the preparedness of family doctors during the early phase of the coronavirus disease 2019 (COVID-19) outbreak in Hong Kong.

Methods: All members of the Hong Kong College of Family Physicians were invited to participate in a cross-sectional online survey using a 20-item questionnaire to collect information on practice preparedness for the COVID-19 outbreak through an email followed by a reminder SMS message between 31 January 2020 and 3 February 2020.

Results: Of 1589 family doctors invited, 491 (31%) participated in the survey, including 242 (49%) from private sector. In all, 98% surveyed doctors continued to provide clinical services during the survey period, but reduced clinic service demands were observed in 45% private practices and 24% public clinics. Almost all wore masks during consultation and washed hands between or before patient contact. Significantly more private than public doctors (80% vs 26%, $P < 0.001$) experienced difficulties in stocking personal protective equipment (PPE); more public doctors used guidelines to manage suspected patients. The main concern of the respondents was PPE shortage. Respondents appealed for effective public health interventions including border control, quarantine measures, designated clinic setup, and

public education.

Conclusion: Family doctors from public and private sectors demonstrated preparedness to serve the community from the early phase of the COVID-19 outbreak with heightened infection control measures and use of guidelines. However, there is a need for support from local health authorities to secure PPE supply and institute public health interventions.

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New knowledge added by this study

- The coronavirus disease 2019 (COVID-19) outbreak in Hong Kong resulted in reduced primary care service demands and abrupt shortage of personal protective equipment (PPE) among primary care clinics.
- The majority of surveyed Hong Kong family doctors consistently adopted facemask wearing and handwashing for infection control at their practice.
- Public health measures including border control, quarantine, and public education were advocated as important interventions to limit the spread of COVID-19.

Implications for clinical practice or policy

- Family doctors in Hong Kong from both public and private sectors were willing and prepared to provide first-contact clinical service to the community during the COVID-19 outbreak.
- Family doctors in Hong Kong needed better support from local health authorities on PPE supply, guided management of patients with COVID-19, greater availability of rapid diagnostic tests, and complementary public health interventions.
- Better coordination between public and private sectors is crucial, to include private family doctors as part of the overall health system strategy and emergency responses, because 70% of primary care consultations take place in the private sector in Hong Kong.

Introduction

Family doctors, serving as the first point of professional contact for patients, are inevitably first to identify probable cases of coronavirus disease 2019 (COVID-19) among the many patients presenting with respiratory symptoms each day.¹ Family doctors in Hong Kong have experience in dealing with the severe acute respiratory syndrome (SARS) epidemic in 2003^{2,3} and the H1N1 pandemic in 2009.^{4,5} However, their preparedness in handling another outbreak of a novel infectious disease has not been explored. Furthermore, Hong Kong has a dual-track healthcare system in which 70% of primary medical care, especially acute episodic care, is provided in the private sector where practice settings and resources vary and differ from those of public clinics.⁶⁻⁸ Family doctors play a crucial role in the community to offer first contact and coordinated care for patients, and their preparedness, perceptions, and attitudes towards COVID-19 are particularly important to inform future strategies for responding to epidemics. Hence, the Hong Kong College of Family Physicians (HKCFP) conducted an online survey among its members to evaluate preparedness and to identify clinic-related challenges of private and public family doctors who were providing primary care services during the early phase of the evolving COVID-19 outbreak in Hong Kong.

Methods

All family doctors who are HKCFP members were invited to complete an online survey. The structured questionnaire (online supplementary Appendix 1) comprised 20 questions. Twelve closed-ended questions assessed the effects of the COVID-19 outbreak (at the time of the survey, the World Health Organization had not announced it as a pandemic) on clinical services and the preparedness of the responding family doctors, such as changes in infection control practice. An open-ended question invited respondents to express their concerns towards the COVID-19 outbreak and suggest measures that would facilitate their clinical practice. The last seven questions collected demographics of the respondents. The survey questions were modified from a previous survey for primary care doctors in Hong Kong and Canada^{9,10} and pilot-tested by a panel of experienced academic family doctors and HKCFP Research and Executive Committee members. Invitation e-mails and short message service reminders were sent to target participants between 31 January 2020 and 3 February 2020.

Descriptive statistics were used to summarise the characteristics of the respondents. Respondents were stratified by their practice sector (ie, public vs private). The differences in the effects of the COVID-19 outbreak on the clinical practices, clinic

香港家庭醫學學院會員問卷調查：2019冠狀病毒病爆發期間家庭醫生在社區服務的情況

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引言：本研究旨在評估香港2019冠狀病毒病（COVID-19）爆發早期家庭醫生的準備情況。

方法：邀請香港家庭醫學學院所有會員參加一項橫斷面在線調查，問卷共20項目，於2020年1月31日至2020年2月3日期間進行，並通過電子郵件和提醒短訊方式收集有關COVID-19爆發的實踐準備情況資料。

結果：被邀請的1589名家庭醫生中，491名（31%）參與問卷調查，其中242名（49%）為私家醫生。問卷調查期間98%受訪醫生繼續提供臨床服務，但45%私家醫生和24%公立醫院醫生表示服務需求則有所減少。絕大部份受訪醫生表示問診時會戴口罩以及接觸患者之前或期間會洗手。較多私家醫生表示個人防護裝備存量不足（80%比26%， $P < 0.001$ ），較多公立醫院醫生會使用相關指引管理可疑患者。受訪者最關注的是個人防護裝備短缺問題。他們也呼籲當局採取有效公共衛生干預措施，包括邊境管制、檢疫措施、指定診所設置和公眾教育。

結論：公立醫院和私家家庭醫生在COVID-19爆發初期便作好為社區服務的準備並加強感染控制措施和準則，然而，個人防護裝備供應和採取公共衛生干預措施還需要有關當局支持。

service, and infection control practices between public and private family doctors were evaluated by Pearson Chi squared test. Thematic analysis was performed on the respondents' free comments and suggestions. The responses were reviewed independently by two investigators and consolidated into themes. Inconsistencies were resolved by discussion between the two investigators to reach consensus on a common theme. The consolidated themes from the respondents' suggestions and concerns were further stratified by respondents' practice sector using descriptive statistics.

All significance tests were two-tailed and those with a P value of < 0.05 were considered statistically significant. The statistical analysis was executed by Stata (Version 16.0; StataCorp LLC, College Station [TX], US).

Since the survey was initially conducted to examine the needs and preparedness of frontline family doctors who are members of the HKCFP during the early phase of COVID-19 outbreak in Hong Kong, ethics approval was obtained from the Survey and Behavioural Research Ethics Committee of The Chinese University of Hong Kong subsequently for data analysis and presentation.

The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist for cross-sectional studies was used in the drafting of this article.¹¹

Results

Of 1589 HKCFP members invited to complete the survey, 491 (31%) provided a complete and valid response (Table 1). Of the respondents, 393 (80%) had attained higher qualifications in Family Medicine. Among the respondents, 236 (48%) worked at public primary care clinics operated by the Hospital Authority or Department of Health, and 242 (49%) worked in the private sector, half of whom were solo practitioners. The ratio of public to private sector respondents was approximately 1:1.

Effects of the COVID-19 outbreak on clinical practices and regular clinic services

The vast majority of the respondents (n=482, 98%)

TABLE 1. Characteristics of respondents*

	Respondents (n=491)
Age (years)	45.0 ± 11.5
Sex	
Female	201 (40.9%)
Male	290 (59.1%)
Qualification	
Higher qualification in Family Medicine	393 (80.0%)
Without higher qualification in Family Medicine	82 (16.7%)
Others	16 (3.3%)
Employed full time	440 (89.6%)
Type of practising clinic†	
Public sector	246 (50.1%)
Primary care clinic operated by Hospital Authority‡	201 (81.7%)
Primary care clinic operated by Department of Health §	35 (14.2%)
Specialist out-patient clinic	12 (4.9%)
Accident & Emergency Department	7 (2.8%)
Private sector	242 (49.3%)
Solo practice	124 (51.2%)
Group practicell	105 (43.4%)
Out-patient department of private hospital	19 (7.9%)

* Data are shown as mean ± standard deviation or No (%)

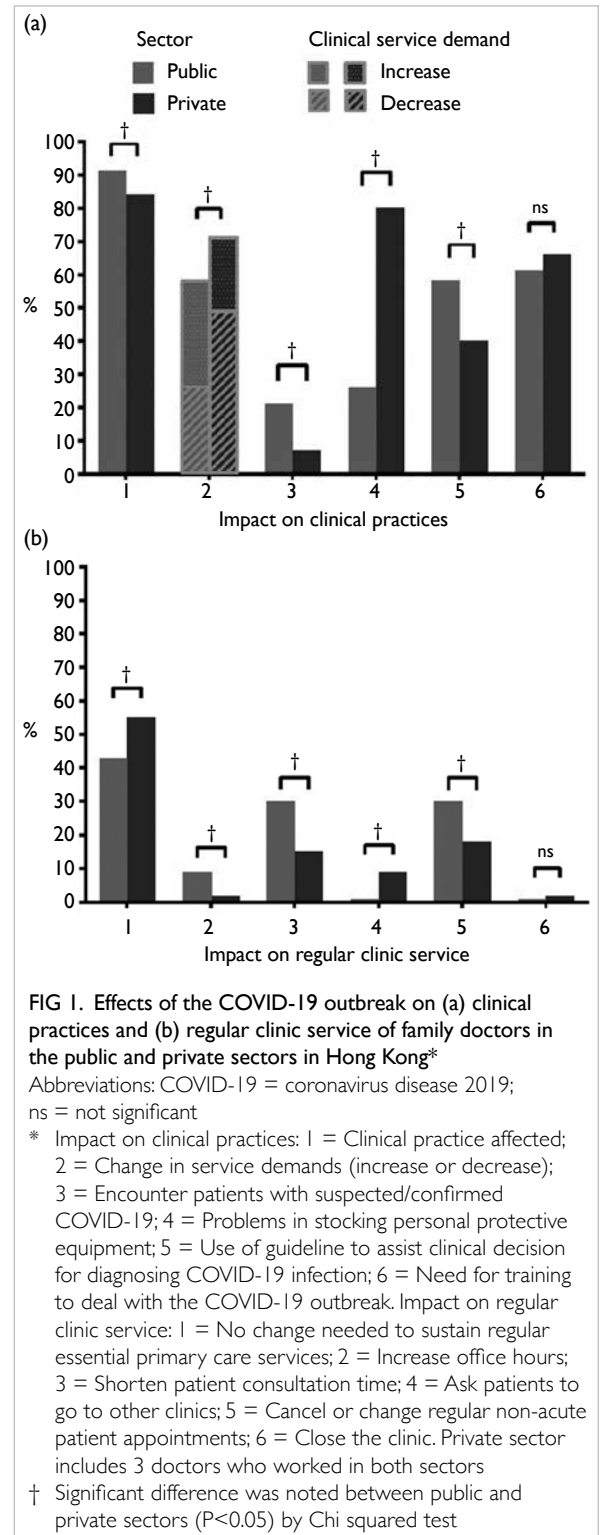
† Three surveyed family doctors worked in both public and private sectors. Some doctors worked in more than one clinic in both sectors

‡ General Out-Patient Clinic/Family Medicine Integrated Clinic/ Training Centre/Hospital Authority Staff Clinic

§ Department of Health (DH) Family Clinic/Other DH centres/ clinics (eg, Elderly Health Centre, Maternal and Child Health Centre)

|| Group private clinic/institutional clinic, including charitable organisation clinic & exempted clinic in public section/clinic in university/tertiary institution/clinic & mobile clinic of the Family Planning Association of Hong Kong in public section

continued to provide clinic services although most of their clinic practices (n=428, 87%) had been affected by the COVID-19 outbreak (Fig 1, online supplementary Appendix 2). Significantly a higher proportion of private than public family doctors reported reduced clinic service demands during this outbreak (n=111 [45%] vs n=60 [24%], P<0.001). Half of the surveyed family doctors adjusted non-acute



consultation services and/or reduced consultation time. As of 4 February 2020, over 140 patients with suspected severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection had been encountered by 70 (14%) surveyed family doctors; one public family doctor reported a patient who was subsequently confirmed to have SARS-CoV-2 infection. Among the surveyed family doctors, 310 (63%) perceived needs for more training on how to deal with the COVID-19 outbreak. At time of the survey, to assist clinical decision making for diagnosing COVID-19, guidelines from the Centre for Health Protection or the Hospital Authority were used by public family doctors more frequently than by private family doctors (n=143 [58%] vs n=98 [40%], $P<0.001$). Conversely, 195 (80%) of the surveyed private family doctors encountered problems in stocking personal protective equipment (PPE).

Changes in infection control practices in response to the COVID-19 outbreak

Nearly all respondents wore masks during consultations (n=490, 99%) and washed hands between or before patient encounter (n=486, 99%) [Fig 2 and Supplementary Appendix 2]. A greater proportion of public than private family doctors insisted patients wear masks during consultations (n=210 [85%] vs n=165 [67%], $P<0.001$) and routinely screened patients' body temperatures (n=211 [86%] vs n=183 [75%], $P=0.002$). In contrast, a greater proportion of private than public family doctors cleaned work surfaces with antiseptics at least once a day (n=223 [91%] vs n=200 [81%], $P=0.002$) and installed air purifiers (n=71 [29%] vs n=35 [14%], $P<0.001$).

Suggested measures to respond to the COVID-19 outbreak

Of the respondents, 159 (32%) answered the open-ended question, among which 135 (85%) suggested measures to be instituted by government and/or local health authorities to facilitate frontline family doctors to respond to the COVID-19 outbreak (Table 2). A significant proportion of respondents (n=52, 39%) appealed to the government, health service providers and/or professional bodies for securing adequate supply of PPE, especially surgical masks, for frontline healthcare workers as well as the general public. There was a strong call (n=49, 36%) for more effective public health policy to contain the outbreak, such as border control and/or quarantine measures for returning residents and travellers to reduce imported cases. Two respondents (1.5%) had expectations for better coordination between the public and private sectors with respect to role delineation and resource allocation, for example, setting up a Primary Care Authority to maximise

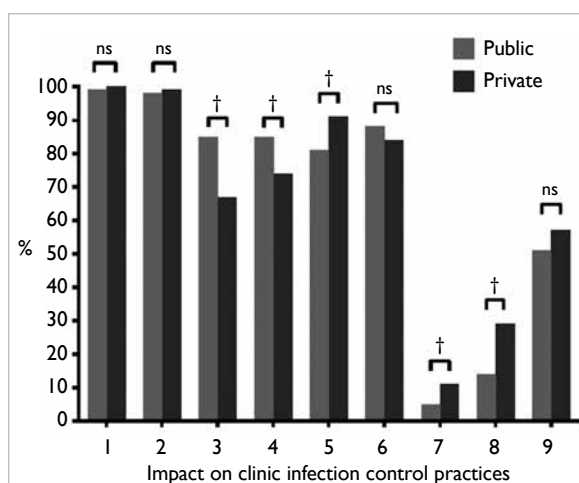


FIG 2. Clinic infection control practices of family doctors in the public and private sectors in Hong Kong in response to the COVID-19 outbreak*

Abbreviations: COVID-19 = coronavirus disease 2019;

ns = not significant

* Impact on clinic infection control practices: 1 = Wear mask during consultations; 2 = Wash hands between or before patient encounter; 3 = Insist every patient to wear a mask during consultations; 4 = Screen / measure every patient's body temperature as a routine procedure; 5 = Clean work surface with antiseptics at least once a day; 6 = All staff have to wear masks; 7 = Open all the windows; 8 = Install air purifiers; 9 = Request all staff to check their body temperature before coming to work. Private sector includes 3 doctors who worked in both sectors

† Significant difference was noted between public and private sectors ($P<0.05$) by Chi squared test

efficiency and effectiveness of scattered primary healthcare delivery locally. Some family doctors (n=9, 7%) advocated for the introduction of designated clinics and requested availability of rapid diagnostic tests. A few respondents (n=8, 6%) stressed the importance of public education on infection control practice and reporting accurate travel and contact history during consultation.

Concerns of Hong Kong family doctors in response to the COVID-19 outbreak

Nineteen respondents (4%) expressed personal concerns that were consolidated into six themes (Fig 3 and online supplementary Appendix 3). The major concern was the risk of SARS-CoV-2 infection, as a result of the lack of PPE, consultation with an asymptomatic patient with SARS-CoV-2 infection, or dishonest patients with unreliable history. Owing to the lack of rapid tests and/or PPE, two private family doctors (11%) worried that they would be unable to provide clinic services, resulting in public healthcare system overload. Three respondents (16%) raised concerns about the need to handle and/or clarify "fake news" (ie, misinformation).

TABLE 2. Measures suggested by surveyed family doctors to facilitate their clinic practice during the COVID-19 outbreak

	Respondents (n=135)
To the Hong Kong SAR Government, health service providers, and professional bodies	
Monitor and/or supply personal protective equipment for healthcare workers and/or the public	52 (38.5%)
To the Hong Kong SAR Government	
Establish effective border control and/or quarantine measures for returning residents and travellers	49 (36.3%)
Make accurate disclosure of travel history compulsory for patients	2 (1.5%)
Institute penalties for dishonest patients	3 (2.2%)
To health authorities (ie, Department of Health)	
Provide ongoing surveillance and update of SARS-CoV-2	6 (4.4%)
Provide updated scientific information of SARS-CoV-2 to doctors	6 (4.4%)
Educate public on infection control, immunity promotion, and importance of accurate travel, occupation, and contact history	8 (5.9%)
Establish hotline for professional enquiries	1 (0.7%)
To health service providers (ie, Hospital Authority and/or Department of Health)	
Establish guidelines for family doctors on appropriate triage and screening measures for handling patients with suspected SARS-CoV-2 infection	12 (8.9%)
Establish guidelines on proper clinic protocols for infection control (eg, ventilation system, use of disinfectant)	3 (2.2%)
Arrange escort service for suspected cases to hospital	1 (0.7%)
Provide training for all frontline healthcare workers on proper use of personal protective equipment (ie, how, when, required standards)	9 (6.7%)
Provide rapid diagnostic tests	5 (3.7%)
Enhance coordination of primary care service between public and private sectors	2 (1.5%)
Establish designated clinics to handle patients with suspected SARS-CoV-2 infection	4 (3.0%)
To other family doctors	
Share experiences with other doctors (ie, provide peer support)	1 (0.7%)
Research studies on COVID-19 and SARS-CoV-2	1 (0.7%)

Abbreviations: COVID-19 = coronavirus disease 2019; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2

Discussion

The vast majority of surveyed family doctors were committed to discharging their duties in the early phase of the COVID-19 outbreak despite clinical uncertainties, psychological distress arising from infectious risk to self and family, and corresponding significant effects on clinical services. Only 2% of the surveyed private family doctors had closed their clinics, compared with 8% during the SARS epidemic in 2003.⁹ These figures were also much lower than reported absenteeism rates of healthcare workers during influenza pandemics.¹²⁻¹⁴ In the 2009 H1N1 pandemic in 2009, 59% of local primary care doctors reported higher demands in clinical services.⁴ In contrast, in the present study, 25% of public family doctors and 45% of private family doctors reported reductions in clinical service demand. Different from an influenza outbreak when primary care doctors are tasked with providing confirmatory diagnostic tests and antiviral treatment, rapid diagnostic tests were not readily accessible in the primary care setting at time of our survey, and treatments for COVID-19

were available only in hospital settings. Patients with highly probable SARS-CoV-2 infection were sent directly to hospital isolation wards for further management. Patients suspecting themselves to have SARS-CoV-2 infection presented in large numbers to emergency departments instead of primary care clinics. Local citizens were also strongly encouraged to practise social distancing, especially avoiding areas of high contact risk, including clinics.¹⁵ Patients with other non-urgent health needs might opt to delay their clinic visits. Nevertheless, family doctors encountered probable SARS-CoV-2 infection, especially patients with milder, non-specific respiratory symptoms and with less clear travel and/or contact history. Thus, family doctors needed to remain vigilant in identifying suspected cases in the community during this period, while providing continuing care to other patients with unrelated medical conditions, mental health support for patients affected by the outbreak and educating healthy patients.

Although the mode of transmission of COVID-19 was not clearly understood in the early

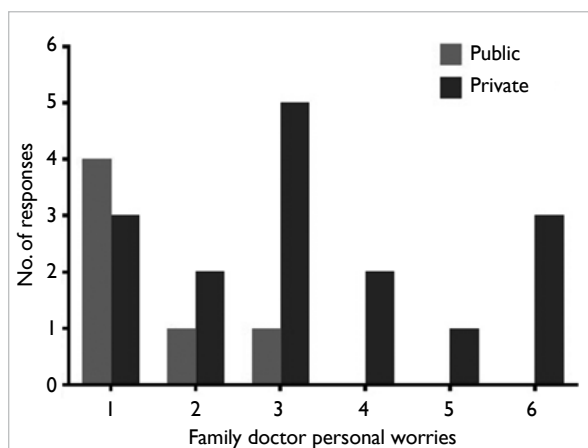


FIG 3. Concerns of Hong Kong family doctors in response to the COVID-19 outbreak*

Abbreviations: COVID-19 = coronavirus disease 2019; PPE = personal protective equipment

* Family doctor personal worries: 1 = Risks of being infected by COVID-19 (due to the lack of PPE, asymptomatic COVID carrier and/or dishonest patients with unreliable history); 2 = Affecting family members and cross-infection; 3 = Overloading public healthcare system (due to lack of rapid tests and/or PPE); 4 = Unable to provide clinic service because of lack of PPE; 5 = Available support for family doctors infected by COVID-19; 6 = Need to handle/clarify fake news or misinformation

phase of outbreak, almost all surveyed family doctors readily adopted standard droplet and contact precautions, including wearing facemasks during consultation and washing hands before and/or between seeing patients as recommended by the Centre for Health Protection of Hong Kong.¹⁶ Wearing facemask during consultation became a common practice among family doctors in Hong Kong since the global outbreak of SARS.^{4,9,17} Conversely, hand hygiene practices of family doctors were less consistent and varied between 45% before the H1N1 influenza epidemic⁴ to 70% during SARS in 2003.⁹ In the present survey, 99% of family doctors reported washing their hands before patient encounters during the current outbreak, which has been proven more effective than facemask wearing alone in limiting the transmission of respiratory infections.^{18,19} The practice of other recommended infection control measures differed between public and private family doctors, reflecting practical challenges in their implementation. A particular infection control challenge for local small-sized clinics would be the required isolation of patients with suspected SARS-CoV-2 infection, where an extra single isolation room with or without negative pressure, or even a designated isolation area >1 m from the rest of the waiting area, was often unavailable.¹⁶ To protect other patients from possible cross-infection in clinics, respondents adjusted non-

acute patient appointments, shortened consultation times to avoid crowding of patients in the clinic, or divert patients to other clinics. Despite the variations, these infection control measures might be contributory to the zero-infection rate observed among primary care providers in Hong Kong at the time of the survey.

Many respondents considered public health policies and interventions in response to the COVID-19 outbreak to be important. There has been an escalation of infection control responses to the COVID-19 outbreak, especially wearing of facemasks, in the healthcare²⁰ and community settings.²¹ Consequently, an acute shortage of facemasks was experienced by respondents, similar to the situation observed in the US.²² Echoing the viewpoints of Australian general practitioners towards influenza pandemic management, family doctors from Hong Kong also considered that government and health authorities should be responsible for ensuring steady supply of PPE to frontline healthcare workers and/or the public.²³ A few surveyed family doctors commented that they would cease to provide clinical service if PPE became unavailable, owing to the high infection risk. Moreover, a large proportion of respondents advocated for border controls and quarantine measures to limit cross-border transmission.²⁴ Subsequently, border controls and mandatory quarantine were implemented on people arriving from mainland China in early February 2020,²⁵ and extended to travellers from most regions around the globe in March 2020.²⁶ These measures may have contributed to the relatively slow rise in the number of confirmed COVID-19 cases in Hong Kong.

Some private family doctors requested the introduction of designated fever clinics for the public, so that high-risk patients presenting with fever and/or respiratory symptoms could be diverted to a designated location and managed appropriately. Such arrangements would be particularly important for protecting the many small private clinics which lack the capacity to properly isolate high-risk patients. Designated clinics were successfully implemented in Hong Kong during the 2009 H1N1 pandemic⁵ and in China and the US during the current COVID-19 outbreak.^{1,22} Unfortunately, local citizens opposed these clinics owing to a fear of COVID-19 transmission in the neighbourhood. Instead, designated doctors were assigned to attend high-risk or febrile patients in certain public primary care clinics. However, the arrangement was not clear to the public nor frontline private family doctors and symptomatic patients continued to seek care from private family doctors. Despite repeated calls for coordinated care or clear role delineation of family doctors between public and private sectors at times of outbreak, this has still not been achieved.^{5,9}

Strengths and limitations of the study

This study had two key strengths. First, our survey was conducted in the early phase of the COVID-19 outbreak, thus the survey rapidly captured the early effects of an emerging outbreak on primary care services and reflected the clinic preparedness and needs of frontline family doctors in Hong Kong. Second, our study covered family doctors from both public and private sectors, allowing for comparison between the two sectors. Possible service gaps in the current dual-track primary healthcare system could be readily identified to inform policy makers.

A major limitation of this study was the low response rate, attributable to the relatively short survey period. Although our response rate (31%) was lower than previous similar surveys among family doctors in Hong Kong during SARS (75%) and H1N1 pandemic (42%), the crude response rate was higher (n=491, vs 137 and 126, respectively). However, our respondents included only approximately 10% of the doctors listed in the Primary Care Directory.²⁷ Also, only HKCFP members and fellows were targeted in this survey. Hence, the sample might not be representative of all primary care physicians in Hong Kong. Lastly, as an observational study, reporting bias existed.

Conclusion

Family doctors from both public and private sectors in Hong Kong reported willingness and preparedness to provide primary, continuous, and whole-person care to the community from the early phase of the COVID-19 outbreak. Despite limitations in clinic physical settings and potential for PPE shortages, most family doctors adopted standard precautions and effectively protected themselves and the public from cross-infection. Nevertheless, there is an obvious need for health authorities to improve role delineation and coordination between private and public primary care services and to provide relevant support during an outbreak, so that family doctors can continue to play their various roles in the community under the current dual-track primary healthcare system.

Author contributions

Concept or design: SYS Wong, EYT Yu, WLH Leung.
Acquisition of data: SYS Wong, EYT Yu, WLH Leung.
Analysis or interpretation of data: All authors.
Drafting of the manuscript: All authors.
Critical revision of the manuscript for important intellectual content: All authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Declaration

This research has not been presented in any academic conference or published previously. Part of the findings from the survey was disseminated through a local press release on 10 March 2020.

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Ethics approval

This study was approved by the Survey and Behavioural Research Ethics Committee of The Chinese University of Hong Kong (Ref SBRE-19-578).

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