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## Community pharmacist in public health emergencies: Quick to action against the coronavirus 2019-nCoV outbreak

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### ABSTRACT

The 2019-nCoV infection that is caused by a novel strain of coronavirus was first detected in China in the end of December 2019 and declared a public health emergency of international concern by the World Health Organization on January 30, 2020. Community pharmacists in one of the first areas that had confirmed cases of the viral infection, Macau, joined the collaborative force in supporting the local health emergency preparedness and response arrangements. This paper aimed to improve the understanding of community pharmacists' role in case of 2019-CoV outbreak based on the practical experiences in consultation with the recommendations made by the International Pharmaceutical Federation on the Coronavirus 2019-nCoV outbreak.

Macau confirmed its first case of the 2019-nCoV infection on 22 January 2020<sup>1</sup> and as of Feb 8, 2020, there were 10 confirmed cases in the city.<sup>2</sup> The 2019-nCoV is a novel strain of coronavirus that was first detected in the city of Wuhan, in the province of Hubei China. With cases confirmed earlier in its neighboring cities of Shenzhen and Zhuhai in mainland China, the small city is vulnerable to the spread of the virus and has escalated the health emergency preparedness and response arrangements soon after the reports about a cluster of pneumonia-like illnesses with unknown causes in Wuhan came into light in the end of December 2019. On January 5, 2020, the local government swiftly took the lead in coordinating and communicating actions across various sectors.<sup>3</sup> To support infection prevention and control overseen by the health department, departments of economy and finance, police service and customs, information, tourism, gaming, social welfare, consumer protection, municipal affairs, education formed partnerships to step up border control and surveillance, execute isolation and quarantine measures, promote personal and environmental hygiene, ensure medical and daily supply stability and monitor the pricing, deliver public and tourist education, and disseminate accurate up-to-date information on a unified platform. This echoed the recommendations made in the *2019 Novel Coronavirus (2019-nCoV): Strategic Preparedness and Response Plan* published by the World Health Organization on February 3, 2020.<sup>4</sup> During the previous 6 weeks, the stages of “preparedness”, “high risk of imported cases”, “imported cases” and possibly “local transmission” in an infection outbreak had been experienced. The highest alert is now on to try to avoid or minimize the last stage of “community transmission”, a highly challenging task considering the possible existence of super spreaders.<sup>5</sup>

At a professional level, while many doctors and nurses were fighting the uphill battle in the frontline, pharmacists at community settings also played an important part in the prevention of the spread of the 2019-nCoV outbreak and contributed to the overall emergency management. Apart from ensuring the stable supply of key medicines and becoming the information hub about the coronavirus infection, being the most common first point of contact, community pharmacists were also charged with the responsibility of early detection and appropriate referral. They also played a key role in implementing the government arrangement of “The Guaranteed Mask Supply for Macao Residents Scheme” which highlighted the importance of public-private partnerships and data exchange at times of emergency. On January 30, 2020, the World Health Organization (WHO) declared the emergence of 2019-nCoV a public health emergency of international concern calling on all countries to take urgent measures to contain the respiratory disease<sup>6</sup> as the spread has already extended to at least 24 countries.<sup>7</sup> It is speculated that pharmacists in many cities and countries are finding their ways to contribute to the collaborative forces in combating the spread of the virus. On February 5, 2020, the International Pharmaceutical Federation (FIP) issued the “*Coronavirus 2019-nCoV outbreak: Information and interim guidelines for pharmacists and the pharmacy workforce*” to provide relevant information and guidelines on coronavirus outbreaks for pharmacists and the pharmacy workforce.<sup>8</sup> This paper aimed to improve the understanding of community pharmacists' role in case of 2019-CoV outbreak by sharing the experiences in Macau in consultation with the FIP guideline.

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## Knowing about the coronaviruses

To many people, the memories about severe acute respiratory syndrome (SARS) and the recent outbreak of Middle East respiratory syndrome (MERS) were still fresh and worrisome. SARS was caused by a novel betacoronavirus that emerged in Guangdong, China in November 2002.<sup>9</sup> It resulted in more than 8000 human infections and 774 deaths in 37 countries during 2002–03.<sup>10</sup> At that time, SARS hit hard on the neighboring city of Hong Kong which resulted in 1755 confirmed cases including 300 fatal cases<sup>11</sup> but no cases were identified in Macau. On the other hand, MERS, caused by a different kind of novel coronavirus, was first detected in Saudi Arabia in 2012<sup>12</sup> and was responsible for 2499 human infections and 861 fatalities since September 2012.<sup>13</sup> When scientific evidence suggested that the virus responsible for the pneumonia-like disease spreading fast across China in December 2019 was closely related to SARS and MERS, any miscommunication could easily spark panic among the general public.

Out of the hundreds of coronaviruses, 7 of them are known to cause human disease and only 3 of the 7 can have more serious outcomes in people including SARS, MERS and 2019-CoV.<sup>13</sup> Similar to SARS and MERS, patients infected with 2019-CoV exhibited symptoms of viral pneumonia including fever, difficulty breathing, and bilateral lung infiltration.<sup>14</sup> In the most severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure and even death.<sup>15</sup> However, the disease may occur with mild symptoms only, including: low-grade fever, cough, malaise, runny nose, sore throat but without any warning signs,<sup>16,17</sup> which made early detection challenging. Epidemiological evidence shows that 2019-nCoV can be transmitted from person to person among close contacts possibly through respiratory droplets. The acute respiratory infection has an incubation period of 2–14 days before any symptoms show. Preliminary data report 11% lethality among hospitalized patients.<sup>16</sup> At the time of this manuscript's authorship, there was no specific medicine or vaccine for coronavirus 2019-nCoV.<sup>17,18</sup> According to the cases identified in Macau, the impact of 2019-CoV on human health appears to be mild, and the first patient with the confirmed diagnosis had full recovery and been discharged on February 6, 2020.<sup>19</sup>

Such information is important for community pharmacist to know, convey and employ. Being able to address the public enquires with accurate up-to-date information about the local situation and the overall infection progress is the key to build trustful relationship with them at troubled times. This will in turn improve the outcomes of educating the public about the preventative measures of the 2019-CoV outbreak and the early recognition of symptoms. As FIP suggested, *“community pharmacies in outbreak-affected and unaffected countries are often the first point of contact with the health system for those with health-related concerns or simply in need of information and reliable advice.”*<sup>48</sup>

## Practicing and educating about personal and environment hygiene

Pharmacists, like any other health professionals, are responsible for providing safe and ethical care to the public in accordance to the professional standards at all times. Implementation of infection prevention and control practices in the community pharmacy can help both staff and customers feel safe and at ease inside the premise. More importantly, it is critical for ensuring personal safety, reducing the risks of transmitting the virus between people, and preventing the spread of infection through contacts of items in the pharmacy. For this, pharmacy managers will need to ensure the correct and regular practice of hand hygiene among all staff members, and to ensure all the necessary facilities are installed and hand hygiene products readily available for use.<sup>20</sup> Additionally, regular cleaning of surfaces and items will also help to eliminate the potential sources for spread of infection.<sup>21</sup> Pharmacy staff should be encouraged to educate all customers about hand hygiene, infection prevention and control strategies as instructed by the government. All these preventative measures at the community

pharmacies were exceptionally important for pharmacies visited not only by local residents but also tourists from around the world. Similarly, the personal and environmental practice by the public should be reinforced whenever possible and community pharmacists are well-positioned to do so more than any other health professionals.

Routine hand hygiene is essential for preventing the spread of the virus and requires the correct use of alcohol-based formulation.<sup>21</sup> However, community pharmacists encountered a major issue soon after the news about the potential spread of 2019-CoV to the city – a foreseeable short supply of hand hygiene products which were all imported products. Community pharmacy is often one of the major retail outlet of such products and is expected to play the important role of ensuring the availability of such products in the pharmacy. Ever since the first diagnosis of 2019-CoV, the supply of various disinfection products, such as alcohol, alcohol hand rub, and disinfectant, has been tight. The over-reliance on importation exposed the public health to substantial vulnerability. Community pharmacists continued to seek new product sources but without success. On February 7, 2020, the local government stepped in and commissioned two local pharmaceutical manufacturers to produce disinfectant products.<sup>22</sup> On reflection, instead of being less than proactive, community pharmacists could have taken steps to try to prepare alcohol-based handrub formulations. Some of them indicated the lack of knowledge and therefore lack of confidence to do so. The underlying problem was indeed the lack of knowledge about where to locate reliable instructions of preparing such formulations. A step-by-step guide for production of handrub formulations at pharmacy bench had been provided by the WHO<sup>23</sup> and re-iterated in the Annex 4 of the FIP guideline.<sup>8</sup> It is important for community pharmacists to get familiarized with the procedure and to ensure all the necessary reagents and devices are available in the pharmacy.

## Implementing “The Guaranteed Mask Supply for Macao Residents scheme”

One of the most unforgettable lessons learnt from the SARS outbreak was that wearing a mask could offer protection against SARS and other viral infections alike.<sup>24</sup> According to the WHO, wearing a surgical mask, in combination with hand hygiene and other preventative measures, is one of the prevention measures to limit the spread of 2019-nCoV in affected areas.<sup>25</sup> More importantly, stable accessibility of this protective gear was considered a key to stability in the society. This posed another vulnerability for the city as the supply of surgical mask totally relied on external sources. On this matter, community pharmacists in Macau were positioned to do three things: (1) help consumers differentiate surgical masks from other types of face masks not made for protection against virus transmission; (2) control the price of surgical masks within reasonable price range; and (3) help implement “The Guaranteed Mask Supply for Macao Residents Scheme” in response to the new government policy.

Many types of face masks are available in the local market and online. Misinformed choice of face masks that are not designed to offer protection against viral transmission would cause a false sense of security and hamper the defense mechanism at the society level. Unlike ordinary face masks, surgical masks were required to demonstrate their performance in terms of bacterial filtration efficiency, differential pressure, resistance to penetration by synthetic blood, sub-micron particulate filtration efficiency and/or flammability as stipulated in the WHO guideline and national standards.<sup>26–28</sup> The spreading of the new coronavirus infection inevitably drove demands for protective masks and community pharmacists should play a reliable gatekeeper in advising about the right choice and stocking the appropriate surgical masks for the intended purposes. In addition, by selling the surgical masks within the reasonable price range, the community pharmacies set the reference price which could help counteract irrational pricing elsewhere. Pharmacists' self-conscious about upholding ethical and professional responsibilities towards the safety of the community was

evident across the community setting and should be continually encouraged.

One of the policies the government put in place to allay fears of surgical mask shortage and dissuade people of the need to stockpile supplies was the “The Guaranteed Mask Supply for Macao Residents Scheme” in which community pharmacy played a key role in the smooth implementation. After the first coronavirus case was confirmed in the city on January 22, 2020, the local government ordered 20 million masks and announced a controlled distribution through pharmacies.<sup>29</sup> According to the scheme, each local resident and person on working visa could buy a maximum of 10 surgical masks every 10 days for only 8 patacas (US\$1) at contracted pharmacies as long as they presented their valid identity card. Moreover, the government had set up a webpage with updates every 15 minutes of the number of surgical masks available at different pharmacies and their contact details for the convenience of the buyers.<sup>30</sup> This scheme was feasible due to the pre-existing partnership between the government and the participating pharmacies. Fifty-six of the 294 community pharmacies in Macau joined the public-private partnership and became the contracted pharmacies to share the dispensing duties and pharmaceutical care for patients from the public health institutes long before the outbreak. In order to monitor the pharmacy stock take of pharmaceutical products as required in the partnership agreement, an IT system was installed so that the data about the purchase and sales of those pharmaceutical products were collected during each transaction at the pharmacy and immediately submitted to the central data system in the government for real-time monitoring purposes. With this system already in place before the 2019-CoV outbreak, only minor adjustment was needed to include government-provided surgical masks on the monitoring list, and make such information publicly available on the official website. While the community pharmacies were the components of this “The Guaranteed Mask Supply for Macao Residents Scheme” and the IT system being the infrastructure, it was really the data that ensured the connectivity of the system for it to run smoothly and serve the purpose. Community pharmacists, therefore, played the role of custodian in data availability and accuracy.

### Active surveillance of suspicious cases

All the imported cases of 2019-CoV infection in Macau were residents from Wuhan who fell ill during their stay in Macau. Considering the possibility of human-to-human transmission and the continuous growth of outbreak, the high volume of travel from Wuhan was considered a major threat to the effectiveness of infection prevention and control. Reinforcement of health inspection and isolation efforts at various cross-boundary checkpoints, mandatory requirements for all travelers from Wuhan to declare their health status, and tighter border-control took place immediately. While these measures aimed to step up the respiratory-disease-surveillance system, the potential risks of carrying and transmitting the virus by the Wuhan travelers who were still staying in Macau could not be dismissed. Early detection and referral of suspected cases were crucial to prevent large-scale community transmission. As mentioned above, the early symptoms could be mild and non-specific,<sup>15,16</sup> and community pharmacy could well be the first point of contact when the affected people sought basic medical aid for symptomatic relief. Community pharmacists, therefore, must be on full alert and be able to screen patients for any necessary referral. The guide for the evaluation of patients under investigation for 2019-nCoV recommended provided by the US CDC was included in the FIP Guideline and community pharmacists should become familiar with the criteria recommended.<sup>8</sup>

### Conclusion

Community pharmacists have a key role in preventing the spread of 2019-CoV virus. They are charged with key responsibilities of

informing, advising and educating the community, maintaining a stable supply of pharmaceuticals and personal hygiene products, and screening of suspected cases and making appropriate referral as required. As this or similar situations evolve, community pharmacists should remain engaged in the coordinated efforts and be readily adaptive to changes required in pharmacy practice. For pharmacists to assume a role in the health emergency preparedness and response arrangements at community level, public private partnership and the application of real-world data have been shown to be vital.

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