BEHAVIOUR CHANGES TOWARDS ACCESSIBILITY TO MEDICAL RESOURCES IN THE POST-PANDEMIC ERA IN CHINA AND THE UK CITIES

Jiayi Yan[1], Zigeng Fang[1], Qiuchen Lu[1,*], Junqing Tang[2], Long Chen[3], Michael Pitt[1]

1. **The Bartlett School of Sustainable Construction, University College London, Gower Street, London WC1E, UK**
2. **School of Urban Planning and Design, Shenzhen Graduate School, Peking University, Shenzhen 518055, China**
3. **Loughborough University, Loughborough LE11 3TU, UK**

ABSTRACT

Medical resources are the important components of the city systems. In the post-pandemic era, the intervention of the global Covid-19 pandemic has caused pressure on medical services in different countries to a different level of extent. This affects the public's accessibility to medical resources. However, many previous studies have focused on the influences of physical or spatial factors like intensive care unit (ICU) bed availability or transport distance. The psychological influence of people's behaviour and decision change to access medical resources has been overlooked. Under this background, this study (1) systematically examines current studies and summarises 30 and 42 factors based on a 'COM-B' behaviour system model with three essential categories (i.e., capability, opportunity, and motivation) that might affect the accessibility of medical resources in the pre-Covid and post-Covid era respectively; (2) conducts an online survey in the UK and China cities to determine and compare to what extent that these factors might affect people's behaviour and decision change to access medical resources. A total number of 121 responded survey has been collected. The data are analysed descriptively and through statistical modelling techniques. Results show that the driving factors change significantly from pro-Covid to post-Covid era in both the UK cities and Chinese cities.

Keywords: Covid-19, behaviour change, medical resources, medical services, post-pandemic, the UK and China cities

1 INTRODUCTION

1.1 New normal is forming in the post-pandemic era

Since the coronavirus disease 2019 (Covid-19) was declared a public emergency in January 2020 and a global pandemic in March 2020 by World Health Organization (WHO) , over 520 million cases of Covid-19 and 6.2 million deaths have been confirmed worldwide (as on May 19th, 2022) (WHO, 2022). In response to the global health crisis over the two years, several rounds of lockdown policy implemented in almost all countries (Nikiforiadis et al., 2022). Besides, the non-pharmaceutical strategies such as keeping social distance and wearing a mask have played an important role to contain the spread of the virus (Bavel et al., 2020). These strategies have effectively contained the spread of the virus, while the public and the cities have been affected greatly by the restrictions (Joffe, 2021).

Under the long-term Covid-19 pandemic tension and control strategies, people's life patterns and behaviours have shifted. For example, the lockdown and work-from-home policy

restricted people's commuting and travel mobility (Nikiforiadis et al., 2022); researchers have proved that lifestyles such as physical activities, sleeping and dietary behaviours, alcohol consumption have been changed greatly, even permanently (Arora and Grey, 2020). Especially, (Holmes et al., 2020) published their work in the Lancet Psychiatry that people's mental health conditions should arouse high-level attention in this post-pandemic era. In general, a new normal is forming gradually confronting this long-term global health crisis. Consequently, the new normal is also influencing re-shaping the operations of cities (Lu et al., 2021). For instance, tourism and transportation (e.g., by trains and flights) have been wrecked (Kraemer et al., 2020, Wen et al., 2020); schools have been locked from time to time and online education has been blooming gradually (Bellini et al., 2021). However, one of the most significant interruptions should be focused on the medical resources area (Emanuel et al., 2020, Joffe, 2021).

1.2 The bi-directional COM-B model

The British Psychological Society's Behavioural Science and Disease Prevention Taskforce advises using the Capability, Opportunity, Motivation- Behaviour (COM-B) model of behaviour change to understand and facilitate the enactment of preventative behaviours in the context of the pandemic (Michie et al., 2011, Chater et al., 2020, Michie and West, 2021). The COM-B model proposes that an individual must have sufficient capability, opportunity, and motivation in order to enact a behaviour. Capability can be psychological (e.g., knowledge) or physical (e.g., skills); opportunity can be social (e.g., societal norms) or physical (e.g. environmental resources); motivation can be automatic (e.g. emotional and habitual) or reflective (e.g. beliefs and intentions) (Figure 1) (Anderson et al., 2021). For COM-B model, the relation between capability, motivation, opportunity interventions and human behaviour change is bi-directional (Michie et al., 2011). It has been used to explore pregnant women's understanding of the behavioural restrictions and their perceived ability to comply and the most concerning impacts of the measures in the post-pandemic time (Anderson et al., 2021); it has also been used as the model to underpin sustained behaviour change for Covid-19 and future pandemics (Michie and West, 2021). In this study, the COM-B model could be adapted to analyse what are the potential interventions that affect people's decision on medical resources accessibility. And the interventions comparison between pre-pandemic and post-pandemic times is possible.

Additionally, culture is an important factor that has influenced the trend of the pandemic from behaviour aspect (Bavel et al., 2020). Researchers have pointed out two dimensions of cultural variance might be critical to examine reactions of the pandemic, which are "interdependent vs independent" and "tight vs loose" (Bavel et al., 2020). Some Asian countries turn to be more interdependent and tighter because they commit to collectives like country, tribe, and family and have stricter social norms. Some Western countries turn to be more independent and looser due to the endorsement of individualism and the more permissive feature (Bavel et al., 2020). Under these dimensions, the differences appear between Asian and Western cities such as the public and cities' reaction to the medical policies, recognitions on viral infection like herd immunity and collaboration to survive (Bavel et al., 2020). Therefore, it is meaningful to compare the extent of behaviour change in different countries, especially when the medical resources systems and allocations vary from country to country.

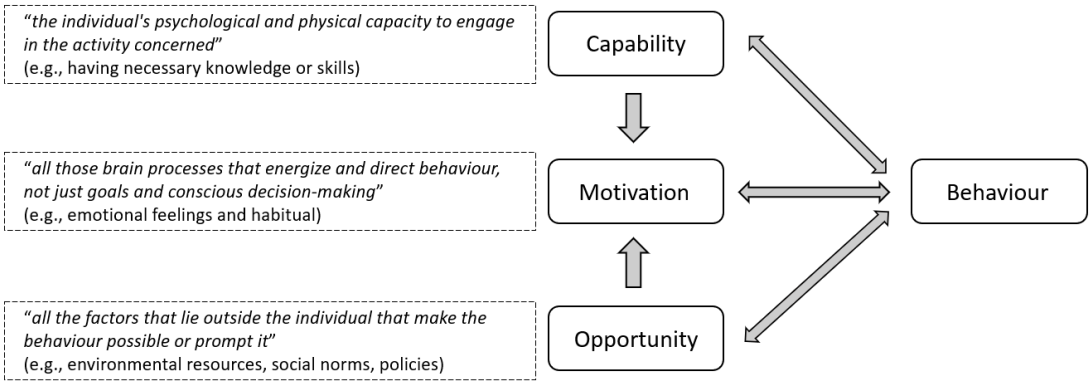

Figure 1 The capacity, opportunity and motivation model from (Michie et al., 2011, Anderson et al., 2021)

This study aims to (1) examine the behaviour change of people' accessibility for medical resources; (2) figure out the potential factors that are critical for people's access decisions for medical resources and comparing between the UK and Chinese cities; and (3) provide insights from the results for researchers, policy makers and practitioners on cities' medical resources allocation. To achieve the goals, the following of this study is structured as follows: the literature review is presented in Section 2 following the COM-B model to existing factors and interventions considering people's medical resources accessibility; (2) Section 2 introduces the methodology of this study including the conduct of an online survey to collect data on the reviewed factors from the public in the UK and Chinese cities; (3) Section 3 and 4 presents the survey results in four comparison scenarios, (4) Section 5 discusses the findings and (5) Section 6 concludes this study.

2 METHODOLOGY

This study focuses on the people's behaviour change on medical resources accessibility through three steps:

First, the literature review is conducted following the COM-B model, which finds out the factors or interventions that of the behavioural change from capability, opportunity and motivation aspects (Michie et al., 2011, Michie and West, 2021). For each aspect, sub-categories exist to classify the factors or interventions in details (Tables 1 and 2).

Second, a survey is conducted through the form of distributing online questionnaire. The survey intends to figure out (1) the significant influential factors or interventions that affect people's accessibility of medical sources, (2) the differences and changes of the accessing behavioural between the UK cities and Chinese cities before and after Covid-19. Thus, the survey questionnaire is designed using the factors and interventions summarised from the literature review. There are three parts of the questionnaire for participant to fill in. The first part is demographic information including "gender", "age group", "current occupation status", "location area (i.e., the UK or China)", and "current work/study mode". The second and third parts assess the degree of importance of multiple factors/interventions from "rare important" to "most important". For pre-pandemic era questionnaire, there are 31 factors/interventions categorised in capability (coded with #C1, C2, C3 …), opportunity (coded with #O1, O2, O3 …) and motivation (coded with #M1, M2, M3 …); for post pandemic era questionnaire, there are 42 factors and interventions categorised and coded in the same way. The questionnaire is distributed via social network pages anonymously for two weeks to the public. There is no limit and requirements of the participants to fill the questionnaire. Then, the raw data is collected for the analysis in the next step.

Thirdly, the one-sample t-test is used here to evaluate the significance of 31 factors and identify which one of them is more likely to intervene in people's hospitalisation behaviours.

The t-test is probably the most commonly applied statistical test in medical and psychology studies (Bridge & Sawilowsky, 1999) (Rochon & Kieser, 2011). The t-tests have been used as an important component in many quantitative human behaviour studies (Link et al., 2020) (Jha & Pradhan, 2020) and health-related studies (Jakse et al., 2020) (Kresojević & Gajić, 2019). The t-test is normally used when needed to infer the population mean μ, given a sample of n independent observations X_1, X_2, . . ., X_n from a distribution of F. In this research one-sample t-test is used to compare the mean of the survey sample degree of importance of 31 behaviour change factors with their hypothesised population mean to see if the survey sample's mean degree of importance is significantly different. IBM's Statistical Product and Service Solutions (SPSS) 28.0.1 is applied to carry out the statistical analysis (George & Mallery, 2019). The null hypothesis for the 31 behaviour change factors is that their degree of importance is moderately important for people's behaviours. The population mean is set as 3, and the confidence interval is set to equal 90%.

Table 1. 30 factors before the COVID-19

Category	**No.**	**Capability Factors**
Physical capacity	C1	Go to the hospital on your own without a family member/friend
	C2	Severity of the emergency illness (if not admitted to hospital immediately)
	C3	Severity of the long-term/basic disease (e.g., high blood pressure, diabetes)
Psychological capacity	C4	Level of psychological acceptance of going to the hospital by oneself without family or friends
	C5	Level of acceptance digital medical Apps/platforms (e.g., Dr. IQ mobile app in the UK)
Economic capacity	C6	Affordability of travel to the medical resources
	C7	Affordability of medical treatment
	C8	Applicability of national medical insurance (not a case in UK)
Educational capability	C9	Capability of using digital medical apps (e.g., Dingxiang Doctor App in China, Dr. IQ in the UK)
	C10	Capability of self-caring at home (e.g., Covid lateral flow test)
Transportation capability	C11	Accessibility by private vehicles (e.g., own a car or have a driver license)
	C12	Accessibility by public transportation (e.g., live near a bus stop)
Category		**Opportunity factors**
Physical opportunity	O1	Degree of congestion in the medical services (e.g., long queue in hospital or GP)
	O2	Degree of comfort in the medical services (e.g., attitude, atmosphere, decoration, greening etc.)
	O5	(Up-to-date) hospital bed capacity information
	O7	Transfer efficiency (among different levels of medical services)
Built environment	O12	Availability of public transportation infrastructure (e.g., bus or subway stops)
	O13	Availability of walking/bicycling infrastructure (e.g., walking/bicycling lanes)
	O14	Availability of private vehicles infrastructure (e.g., easy parking, good driving lanes condition)
	O15	Availability of shared cars services (e.g., taxi, uber)
	O16	Neighbourhood connectivity to medical resources by walking/bicycling
	O17	Neighbourhood connectivity to medical resources by public transportation

Category		Motivation factors
Automatic motivation	M4	Anxiety (fear) of personal health status being noticed by other people
	M6	Low willingness to communicate
Reflective motivation	M7	Efficacy of general physicians' consultation
	M8	Availability of required pre-descriptive medicine
	M10	Availability of required non-Covid related life-sustaining equipment (e.g., Dialysis devices)
	M11	Time spending on transportation
	M12	Waiting time in the medical services
	M13	Medical services provided in grass Root healthcare (China)/GPs (the UK)
	M14	Medical services provided in Secondary-Tertiary hospitals (China)/Secondary-Tertiary care (the UK)

Table 2. 42 factors after the COVID-19

Category		Capability Factors
Physical capacity	C1	Go to the hospital on your own without a family member/friend
	C2	Severity of the emergency illness (if not admitted to hospital immediately)
	C3	Severity of the long-term/basic disease (e.g., high blood pressure, diabetes)
Psychological capacity	C4	Level of psychological acceptance of going to the hospital by oneself without family or friends
	C5	Level of acceptance digital medical Apps/platforms (e.g., Dr. IQ mobile app in the UK)
Economic capacity	C6	Affordability of travel to the medical resources
	C7	Affordability of medical treatment
	C8	Applicability of national medical insurance (not a case in UK)
Educational capability	C9	Capability of using digital medical apps (e.g., Dingxiang Doctor App in China, Dr. IQ in the UK)
	C10	Capability of self-caring at home (e.g., Covid lateral flow test)
Transportation capability	C11	Accessibility by private vehicles (e.g., own a car or have a driver license)
	C12	Accessibility by public transportation (e.g., live near a bus stop)
Category		**Opportunity Factors**
Physical opportunity	O1	Degree of congestion in the medical services (e.g., long queue in hospital or GP)
	O2	Degree of comfort in the medical services (e.g., attitude, atmosphere, decoration, greening etc.)
	O3	COVID-19 influenced real-time road condition information for arrival at target hospitals
	O4	(Up-to-date) hospital COVID-specific equipment capacity information
	O5	(Up-to-date) hospital bed capacity information
	O6	Compulsory COVID-19 test before hospitalisation
	O7	Transfer efficiency (among different levels of medical services)
Policy regulation	O8	Indoor mask-must requirement
	O9	Full Covid-19 vaccination requirement
	O10	Social distance requirement
	O11	Whether the medical services take Covid-19 patients

Built environment	O12	Availability of public transportation infrastructure (e.g., bus or subway stops)
	O13	Availability of walking/bicycling infrastructure (e.g., walking/bicycling lanes)
	O14	Availability of private vehicles infrastructure (e.g., easy parking, good driving lanes condition)
	O15	Availability of shared cars services (e.g., taxi, uber)
	O16	Neighbourhood connectivity to medical resources by walking/bicycling
	O17	Neighbourhood connectivity to medical resources by public transportation
Category		**Motivation Factors**
Automatic motivation	M1	Anxiety (fear) of COVID-19 infection
	M2	Anxiety (fear) of COVID-19 hospitalisation traffic restriction
	M3	Anxiety (fear) of COVID-19 offsite control (cannot return to home)
	M4	Anxiety (fear) of personal health status being noticed by other people
	M5	Anxiety (fear) of level of Covid-19 risk evaluation
	M6	Low willingness to communicate
Reflective motivation	M7	Efficacy of general physicians' consultation
	M8	Availability of required pre-descriptive medicine
	M9	Availability of required Covid related life-sustaining equipment (e.g., Ventilator and Extracorporeal circulation device)
	M10	Availability of required non-Covid related life-sustaining equipment (e.g., Dialysis devices)
	M11	Time spending on transportation
	M12	Waiting time in the medical services
	M13	Medical services provided in grass Root healthcare (China)/GPs (the UK)
	M14	Medical services provided in Secondary-Tertiary hospitals (China)/Secondary-Tertiary care (the UK)

3 RESULTS

The questionnaire was post for two weeks in March 2022. For the questionnaire distribution and data collection in China and the UK, the web-based Wenjuanxing platform and Google Form platform were adopted respectively (Barbieri et al., 2020). There were 76 respondents from Chinese cities and 45 respondents from the UK cities. The demographic distributions of "Gender", "Age group" and "Current work/study mode" shows in Table 3. It was noticed that, currently, the respondents' work/study mode is almost half commuting and half working from home for both the Chinese and the UK cities, despite the fact that China sticks to the "dynamic zero-COVID policy" and the UK has removed a number of Covid-19 policy like quarantine, travel restrictions, compulsory mask wearing etc.

Table 3 Demographic distribution of respondents from Chinese and the UK cities

Variants	In Chinese cities respondents (N=77)	In the UK cities respondents (N=44)
Gender		
Female	50	28
Male	27	16
Age group		
18-30	42	30
31-45	25	13
46-65	8	1
Above 65	2	0
Current work/study mode		

Commute	39	22
Work from home	38	22

The collected data was analysed through one-sample test in the four situations: respondents' answer during pre-Covid time in Chinese cities, respondents' answer during post-Covid time in Chinese cities, respondents' answer during pre-Covid time in the UK cities and respondents' answer during the post-Covid time in the UK cities. The results are presented in Table 2-5. For the results of Chinese cities, the factors/interventions are regarded as influential (when $t>t_c=1.665$ or $t<-t_c=-1.665$) to the people's medical resources accessibility. The higher the absolute value of t, the more influential that the respondents think of the factor/intervention (i.e., more important or less important). It is the same explanation for the results of the UK cities, but the t_c changes to 1.681 according to the critical value table. The t value is colour coded to show the level of importance when people considering accessing medical resources in Table 4-7. The comparison and discussion between the situations are illustrated in the next section.

Table 4 Analysed result of respondents in Chinese cities in the pre-Covid time

One-Sample Test (Pre-covid, respondents in Chinese cities)

Factors/ interventions	Test Value = 3						
			Significance			90% Confidence Interval of the Difference	
	t	df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
Capability							
C1	1.121	76	0.133	0.266	0.169	-0.08	0.42
C2	9.468	76	0.000	0.000	1.013	0.83	1.19
C3	8.385	76	0.000	0.000	0.961	0.77	1.15
C4	0.491	76	0.313	0.625	0.078	-0.19	0.34
C5	0.189	76	0.425	0.850	0.026	-0.20	0.25
C6	-0.271	76	0.394	0.787	-0.039	-0.28	0.20
C7	3.898	76	0.000	0.000	0.532	0.31	0.76
C8	0.448	76	0.328	0.655	0.065	-0.18	0.31
C9	0.883	76	0.190	0.380	0.130	-0.12	0.37
C10	1.136	76	0.130	0.260	0.156	-0.07	0.38
C11	1.433	76	0.078	0.156	0.195	-0.03	0.42
Opportunity							
O1	6.776	76	0.000	0.000	0.753	0.57	0.94
O2	4.356	76	0.000	0.000	0.519	0.32	0.72
O5	6.783	76	0.000	0.000	0.727	0.55	0.91
O7	4.397	76	0.000	0.000	0.571	0.36	0.79
O12	2.662	76	0.005	0.009	0.351	0.13	0.57
O13	-1.116	76	0.134	0.268	-0.156	-0.39	0.08
O14	1.978	76	0.026	0.052	0.273	0.04	0.50
O15	3.329	76	0.001	0.001	0.442	0.22	0.66
O16	0.089	76	0.465	0.929	0.013	-0.23	0.26
O17	1.978	76	0.026	0.052	0.273	0.04	0.50
Motivation							
M4	1.367	76	0.088	0.176	0.182	-0.04	0.40
M6	-0.288	76	0.387	0.774	-0.039	-0.26	0.19

M7	10.774	76	0.000	0.000	1.052	0.89	1.21
M8	7.303	76	0.000	0.000	0.818	0.63	1.00
M10	3.863	76	0.000	0.000	0.532	0.30	0.76
M11	2.233	76	0.014	0.028	0.273	0.07	0.48
M12	4.815	76	0.000	0.000	0.545	0.36	0.73
M13	0.823	76	0.206	0.413	0.104	-0.11	0.31
M14	6.640	76	0.000	0.000	0.714	0.54	0.89

Table 5 Analysed result of respondents in Chinese cities in the post-Covid time

One-Sample Test (Post-covid, respondents in Chinese cities)

	Test Value = 3						
Factors/ interventions			Significance			90% Confidence Interval of the Difference	
	t	df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
Capability							
C1	3.392	76	0.001	0.001	0.468	0.24	0.70
C2	9.665	76	0.000	0.000	1.026	0.85	1.20
C3	7.179	76	0.000	0.000	0.857	0.66	1.06
C4	0.087	76	0.466	0.931	0.013	-0.24	0.26
C5	2.402	76	0.009	0.019	0.325	0.10	0.55
C6	-1.395	76	0.084	0.167	-0.195	-0.43	0.04
C7	3.423	76	0.001	0.001	0.468	0.24	0.69
C8	2.587	76	0.006	0.012	0.351	0.12	0.58
C9	2.835	76	0.003	0.006	0.351	0.14	0.56
C10	2.126	76	0.018	0.037	0.286	0.06	0.51
C11	2.361	76	0.010	0.021	0.286	0.08	0.49
Opportunity							
O1	6.696	76	0.000	0.000	0.779	0.59	0.97
O2	2.870	76	0.003	0.005	0.325	0.14	0.51
O3	1.646	76	0.052	0.104	0.221	0.00	0.44
O4	5.642	76	0.000	0.000	0.753	0.53	0.98
O5	7.062	76	0.000	0.000	0.805	0.62	1.00
O6	4.514	76	0.000	0.000	0.597	0.38	0.82
O7	5.902	76	0.000	0.000	0.714	0.51	0.92
O8	5.767	76	0.000	0.000	0.805	0.57	1.04
O9	3.455	76	0.000	0.001	0.468	0.24	0.69
O10	4.804	76	0.000	0.000	0.662	0.43	0.89
O11	7.430	76	0.000	0.000	0.935	0.73	1.14
O12	1.424	76	0.079	0.159	0.208	-0.04	0.45
O13	-2.782	76	0.003	0.007	-0.403	-0.64	-0.16
O14	3.654	76	0.000	0.000	0.481	0.26	0.70
O15	2.332	76	0.011	0.022	0.312	0.09	0.53
O16	-0.550	76	0.292	0.584	-0.078	-0.31	0.16
O17	0.276	76	0.392	0.784	0.039	-0.20	0.27
Motivation							
M1	2.133	76	0.018	0.036	0.247	0.05	0.44

M2	1.454	76	0.075	0.150	0.182	-0.03	0.39
M3	3.874	76	0.000	0.000	0.519	0.30	0.74
M4	0.656	76	0.257	0.514	0.091	-0.14	0.32
M5	5.589	76	0.000	0.000	0.701	0.49	0.91
M6	-3.097	76	0.001	0.003	-0.442	-0.68	-0.20
M7	8.278	76	0.000	0.000	0.935	0.75	1.12
M8	5.528	76	0.000	0.000	0.714	0.50	0.93
M9	4.790	76	0.000	0.000	0.649	0.42	0.88
M10	4.234	76	0.000	0.000	0.597	0.36	0.83
M11	2.177	76	0.016	0.033	0.299	0.07	0.53
M12	5.210	76	0.000	0.000	0.610	0.42	0.81
M13	2.146	76	0.018	0.035	0.286	0.06	0.51
M14	7.500	76	0.000	0.000	0.844	0.66	1.03

Table 6 Analysed result of respondents in the UK cities in the post-Covid time

One-Sample Test (Pre-covid, respondents in the UK cities)

Factors/ interventions	Test Value = 3						
			Significance			90% Confidence Interval of the Difference	
	t	df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
Capability							
C1	0.000	43	0.500	1.000	0.000	-0.33	0.33
C2	4.532	43	0.000	0.000	0.727	0.46	1.00
C3	3.095	43	0.002	0.003	0.477	0.22	0.74
C4	-0.236	43	0.407	0.814	-0.045	-0.37	0.28
C5	-0.147	43	0.442	0.884	-0.023	-0.28	0.24
C6	0.504	43	0.309	0.617	0.091	-0.21	0.39
C7	2.771	43	0.004	0.008	0.455	0.18	0.73
C8	-0.330	43	0.372	0.743	-0.045	-0.28	0.19
C9	2.143	43	0.019	0.038	0.341	0.07	0.61
C10	-0.784	43	0.219	0.437	-0.136	-0.43	0.16
C11	2.552	43	0.007	0.014	0.409	0.14	0.68
Opportunity							
O1	6.871	43	0.000	0.000	0.932	0.70	1.16
O2	3.622	43	0.000	0.001	0.545	0.29	0.80
O5	2.366	43	0.011	0.023	0.386	0.11	0.66
O7	2.190	43	0.017	0.034	0.364	0.08	0.64
O12	3.045	43	0.002	0.004	0.500	0.22	0.78
O13	-1.349	43	0.092	0.184	-0.227	-0.51	0.06
O14	-0.247	43	0.403	0.806	-0.045	-0.35	0.26
O15	0.443	43	0.330	0.660	0.068	-0.19	0.33
O16	0.401	43	0.345	0.691	0.068	-0.22	0.35
O17	1.906	43	0.032	0.063	0.273	0.03	0.51
Motivation							
M4	1.138	43	0.131	0.262	0.205	-0.10	0.51
M6	-0.244	43	0.404	0.809	-0.045	-0.36	0.27

M7	5.854	43	0.000	0.000	0.864	0.62	1.11
M8	3.325	43	0.001	0.002	0.545	0.27	0.82
M10	2.659	43	0.005	0.011	0.477	0.18	0.78
M11	2.585	43	0.007	0.013	0.432	0.15	0.71
M12	4.442	43	0.000	0.000	0.727	0.45	1.00
M13	1.552	43	0.064	0.128	0.318	-0.03	0.66
M14	2.382	43	0.011	0.022	0.455	0.13	0.78

Table 7 Analysed result of respondents in the UK cities in the post-Covid time

One-Sample Test (Post-covid, respondents in the UK cities)

Factors/ interventions	Test Value = 3						
			Significance			90% Confidence Interval of the Difference	
	t	df	One-Sided p	Two-Sided p	Mean Difference	Lower	Upper
Capability							
C1	1.401	43	0.084	0.168	0.250	-0.05	0.55
C2	6.711	43	0.000	0.000	1.045	0.78	1.31
C3	3.760	43	0.000	0.001	0.636	0.35	0.92
C4	0.805	43	0.213	0.425	0.159	-0.17	0.49
C5	1.269	43	0.106	0.211	0.205	-0.07	0.48
C6	-0.961	43	0.171	0.342	-0.159	-0.44	0.12
C7	2.370	43	0.011	0.022	0.432	0.13	0.74
C8	1.279	43	0.104	0.208	0.227	-0.07	0.53
C9	3.693	43	0.000	0.001	0.568	0.31	0.83
C10	-1.269	43	0.106	0.211	-0.205	-0.48	0.07
C11	1.568	43	0.062	0.124	0.227	-0.02	0.47
Opportunity							
O1	7.250	43	0.000	0.000	1.000	0.77	1.23
O2	3.325	43	0.001	0.002	0.545	0.27	0.82
O3	0.758	43	0.226	0.452	0.136	-0.17	0.44
O4	3.339	43	0.001	0.002	0.568	0.28	0.85
O5	2.881	43	0.003	0.006	0.500	0.21	0.79
O6	1.102	43	0.138	0.277	0.205	-0.11	0.52
O7	3.352	43	0.001	0.002	0.636	0.32	0.96
O8	2.172	43	0.018	0.035	0.432	0.10	0.77
O9	3.587	43	0.000	0.001	0.659	0.35	0.97
O10	2.492	43	0.008	0.017	0.432	0.14	0.72
O11	1.552	43	0.064	0.128	0.318	-0.03	0.66
O12	4.539	43	0.000	0.000	0.659	0.42	0.90
O13	-1.857	43	0.035	0.070	-0.318	-0.61	-0.03
O14	0.746	43	0.230	0.460	0.136	-0.17	0.44
O15	0.264	43	0.396	0.793	0.045	-0.24	0.33
O16	-0.980	43	0.166	0.333	-0.159	-0.43	0.11
O17	1.308	43	0.099	0.198	0.182	-0.05	0.42
Motivation							

M1	0.713	43	0.240	0.480	0.136	-0.19	0.46
M2	0.000	43	0.500	1.000	0.000	-0.30	0.30
M3	2.407	43	0.010	0.020	0.409	0.12	0.69
M4	0.000	43	0.500	1.000	0.000	-0.34	0.34
M5	1.885	43	0.033	0.066	0.341	0.04	0.64
M6	-2.062	43	0.023	0.045	-0.386	-0.70	-0.07
M7	4.716	43	0.000	0.000	0.682	0.44	0.92
M8	2.750	43	0.004	0.009	0.477	0.19	0.77
M9	1.357	43	0.091	0.182	0.250	-0.06	0.56
M10	1.891	43	0.033	0.065	0.318	0.04	0.60
M11	2.501	43	0.008	0.016	0.409	0.13	0.68
M12	7.638	43	0.000	0.000	0.977	0.76	1.19
M13	2.074	43	0.022	0.044	0.364	0.07	0.66
M14	4.371	43	0.000	0.000	0.705	0.43	0.98

4 RESULTS ANALYSIS

According to the results, the analysis and comparisons can be made between the UK cities and Chinese cities before and after the outbreak of Covid-19 (i.e., the pre-pandemic and post-pandemic eras)

4.1 The comparison of medical resources accessibility in Chinese cities and the UK cities in the pre-pandemic era

Generally, before the outbreak of Covid-19, the factors and interventions that affected people accessing medical resources have overlapped. For capacity aspect, the severity of the illness (C2), personal chronic disease situation (C3) and the financial affordability of medical treatments (C7) were the main considerations. Besides, even without Covid-19, people in the UK would take the capability of self-treatment (C9) and the medical accessibility by public transportation (C11) into consideration. For opportunity aspect, the most affected factor is the level of congestion (O1), then the degree of comfort(O2), ICU bed availability (O5), transfer efficiency (O7), public transportation connectivity (O12, O17) were critical for the UK and Chinese cities. In addition, the availability of private car parking and shared car availability were important for Chinese cities (O14, O15). For motivation aspect, the order of respondents' key factor/interventions decently in the Chinese cities were treatment efficacy (M7), pre-description availability (M8), medical services provider level (M14), waiting time (M12), medical equipment (M10) and transportation time (M11), while the order decently for the UK cities was M7, M12, M8, M11, M14.

4.2 The comparison of medical resources accessibility in Chinese cities and the UK cities in the post-pandemic era

In the post-pandemic era, there are some obvious changes on the factors/interventions of people's medical accessibility behaviour comparing with the pre-pandemic time.

From the capability aspect, the key factors/interventions from respondents from the UK cities were not changed many, which were the severity of the illness (C2), personal chronic disease situation (C3), the financial affordability of medical treatments (C7) and the capability of self-treatment (C9). However, the importance of medical accessibility by public transportation (C11) was removed. For respondents from the Chinese cities, the factors/interventions changes were very obvious. Besides the same factors in the pre-pandemic time (i.e., C2, C3

C7), the factors/interventions of family or friend accompany (C1), the acceptance level and capability of digital application usage (C5, C8), the capability of self-treatment (C9), and both the private vehicles and public transportation accessibility (C10, C11) became significant.

From the opportunity aspect, besides the same factors/interventions with pre-pandemic era (O1, O2, O5, O7), the influence of policy regulation was witnessed including mask wearing (O8), vaccination requirement (O9) and social distance (O10) for both the UK and Chinese cities. Especially, the compulsory Covid-19 test before hospitalisation (O6) was an important affected factor in the Chinese cities. Moreover, it was noticeable that the consideration of neighbourhood connectivity to medical resources by public transportation (O17) was not as important as in pre-pandemic time for both the UK and Chinese cities.

From the motivation aspect, the shared factors/interventions including treatment efficacy (M7), pre-description availability (M8), medical services provider in secondary-tertiary level (M14), waiting time (M12), medical equipment (M10) and transportation time (M11) of the two countries' cities were still important in the post-pandemic era. Moreover, respondents in both counties increased the level of importance of medical services provider in grass root and GPs level (M13) and the potential Covid-19 quarantine control risk (M3). Particularly in the Chinese cities, the anxiety or fear of infection (M1) and Covid-19 related medical equipment (M9) became a factor when considering hospitalisation.

5 DISCUSSIONS

Based on the results and analysis of this study, the factors and interventions and respondents' feedback of their level of importance varied in the capability, opportunity, and motivation categories in the pre- and post-pandemic eras. According to the COM-B model from (Michie et al., 2011, Michie and West, 2021), it can be concluded that the people's behaviour of medical resources accessibility has been affected because of the outbreak of Covid-19 over two years. Several insights can be generated from the comparisons and analysis of factors and interventions of both the UK and Chinese cities.

5.1 The built environment of medical resources

The first aspect worth mentioning is the accessibility related to the built environment of medical resources, which specifically indicates to the concern of public transportation. In the UK cities, the individual's neighbourhood connectivity to the medical resources (i.e., capability) and in both the UK and Chinese cities the availability of public transportation near the medical resources (i.e., opportunity) were important factors when people considering medical resources accessibility. However, these factors were not the dominant in the post-pandemic era. Possible causes might be the policy regulation of periodical and unpredictable shutdown of public transportation because of Covid-19, which has caused inconvenience for patients. And the higher density in public transportations like buses and subways could bring higher risks of Covid-19 infection. At the same time, the level of importance (i.e., larger number of t value) of private vehicle infrastructure around the medical resources became higher, and the availability of shared car services still mattered despite of a little bit drop after Covid-19 in the Chinese cities. This proved the fact people might prefer transportation with physical distance and privacy in the post-pandemic era. Although there were limitations of this study to find out the interrelation that directly caused the avoidance of public transportation and whether this trend would last long, it was beneficial to learn the public's awareness for more private accessibility over public transportation

5.2 The digital transformation for medical resources

Secondly, in Chinese cities, the use of digital methods like mobile tracking and reminding

applications and telemedicine by the public to help with medical resources allocation has been proved by the survey in this study. In the post-pandemic era, the factors/interventions of the capability and psychological acceptance of digital applications for medical resources became obvious on people's behaviour. For example, if people get fever or flu, they could turn to digital applications or telemedicine for treatments instead of going to the GPs or hospitals, which has been suggested also during Covid-19 (Scott, 2020). This might be helpful to avoid infection risks and policies regulation like compulsory Covid-19 test. And the accumulation of big data in the pandemic era was helpful to identify close contacts with infection risks. However, the transformation was not obvious in the UK cities.

6 CONCLUSION

Covid-19 has been lasting over two years, the new normal in cities has formed gradually. The medical resources have been influenced greatly under the pressure of pandemic. At the same time the new normal could also change people's behaviour. This study adopted the COM-B (e.g., capability, opportunity, motivation and behaviour) behaviour change model, reviewed the factors and interventions that might affect people's medical resources accessibility behaviour. There were 31 and 42 factors/interventions categorised from capability, opportunity and motivation aspects in the pre- and post-pandemic eras respectively. A survey was conducted using the factors/interventions and the data was collected and analysed to determine the key factors of behaviour changes on medical resources accessibility for the UK and Chinese cities. Based on the analysis and comparison, it could be validated that people's accessibility for medical resources has been reshaped, specifically from the built environment, digital transformation, medical services level and mental anxiety perspectives. In the future work, the interrelationship and of the factors need to be examined in more countries or cities to verify the change from the broader range, a larger number of samples should be used to conduct the survey.

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