AMERICAN JOURNAL OF AGRICULTURAL SCIENCE, ENGINEERING, AND TECHNOLOGY (AJASET)

ISSN: 2158-8104 (ONLINE), 2164-0920 (PRINT)

VOLUME 7 ISSUE 3 (2023)

PUBLISHED BY: E-PALLI PUBLISHERS, DELAWARE, USA

American Journal of Agricultural Science, Engineering, and Technology (AJASET)

Volume 7 Issue 3, Year 2023
ISSN: 2158-8104 (Online), 2164-0920 (Print)
DOI: https://doi.org/10.54536/ajaset.v7i3.1870
https://journals.e-palli.com/home/index.php/ajaset

Impact of Human Behavior According to Social Distance Rules During Covid-19 (Case Study Bukit Bintang - Kuala Lumpur)

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Article Information

Received: March 30, 2023

Accepted: April 25, 2023

Published: Aug 17, 2023

Keywords

Territoriality, Covid-19, Overcrowding, Shopping Mall, Private Residence

ABSTRACT

SARS-CoV-2 was linked to COVID-19 in Wuhan, China, in December 2019. After confirmed cases and deaths in numerous countries, WHO proclaimed a global pandemic. During the outbreak, territorial public and private socializing spread the virus quickly with friends, families, and relatives. Hence, this research examines the effectiveness of social distance rules in preventing the spread of COVID-19 in Bukit Bintang, Malaysia, from the perspectives of residents and shopping mall visitors during the recovery Movement Control Order (RMCO period). This study examines space territoriality among Bukit Bintang's foreign workers and mall visitors using qualitative (structured observation) and quantitative (questionnaire) methodologies. Structured observations examine human behavior in uncontrolled (home, neighborhood) and controlled (shopping mall) situations. As part of the quantitative method, a questionnaire survey is utilized to learn about respondents' specific actions, such as personal and public space invasion. This study collects data by purposeful sampling and included 250 people. The study's findings confirm the association between numerous constructs, and indicates that the number of territories people occupy in private and public contexts tends to spread COVID-19 in Bukit Bintang, Malaysia. Social distancing drastically affects COVID-19's spread and number of deaths. According to the study, the virus spreads more when people ignore the social distance rule.

INTRODUCTION

In December 2019, SARS-CoV-2 was connected to an acute respiratory syndrome (COVID-19) pandemic in Wuhan, China (Zhou *et al.*, 2020). After three months, 118,000 confirmed viral infections and 4,291 fatalities in 114 countries prompted the WHO to proclaim a global pandemic. As a result of the epidemic, there has been a large public health push to restrict the virus's spread through hand washing, less face touching, public mask use, and physical distance. This is where social and behavioral sciences give key insights on how to manage the epidemic and its effects as vaccine research continues. Pandemics demand drastic behaviors to prevent virus propagation. Social and cultural factors affect the degree and pace of behavioral change (Lunn *et al.*, 2020). Social norms, or what people think their peers approve or disapprove of, affect how they act (Cialdini & Goldstein, 2014). A large corpus of literature differentiates learning from others from seeking connection or social acceptability as motives for complying to standards (Wood, 2000). Internalizing standards distorts people's perceptions despite social pressure (Miller & Prentice, 1996). People often overestimate the negative features of their behavior while emphasizing the beneficial parts of health-promoting ones, such as hand washing and social distancing.

During an outbreak, mass meetings can be harmful to friends, friends of friends, and family in territorial private homes and public spaces (shopping malls) (Christakis & Fowler, 2013). Territoriality in this study refers to ownership over a territory or geographical location. Territoriality is a person's sense of duty to their home or community (Angeli, 2015; Banai, 2014; Miller, 2011 Moore, 2016; Stilz, 2011). Those socializing with friends in a territory are generally the first to get the virus. People may inhibit the spread of the virus by modelling protective measures like social distance in their territorial space (Christakis & Fowler, 2010). Kim *et al.* (2015) found that the most substantial influence of an intervention may not be perceived by the people who get it, but by others who replicate their conduct.

This paper examines foreign worker territory (resident) and shopping mall visitors' (public) overcrowded behavior toward the social distancing requirement to reduce COVID-19 spread in Bukit Bintang, Malaysia. The area is foreign worker territory (resident) and the most frequented during the Recovery Movement Control Order (RMCO). The Malaysian Ministry of Health said 78% of positive cases in Kuala Lumpur came from foreign workers who combat the virus owing to poor living conditions (Loheswar, 2020). Foreign workers' crowded living conditions helped spread the virus quickly. Due to the government's execution of RMCO from June 10 to August 31, 2020, COVID-19 cases dropped to the lowest level since the pandemic began in Malaysia. During this period, most activities and company operations were allowed, but people had to follow COVID-19 standard operating procedure (SOP). These precautions include keeping a one-meter social distance, wearing a face mask in public, utilizing the MySejahtera app, and checking temperature readings before entering a building. MySejahtera is a Malaysian app that aids with COVID-19 contact tracing. The MySejahtera app was used to capture

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name and phone number (MySejahtera, 2020). Very little research has been done on the Malaysian RMCO period addressing foreign worker territory (resident) and shopping mall visitors' (public) overcrowding behavior and the rise of COVID-19. This paper evaluates the issue and direction of Malaysia's RMCO during the COVID-19 epidemic.

LITERATURE REVIEW

Overcrowding occurs when more people use a location that is safe and healthy. This can happen at home or in public. Home (resident) is a person's primary place of safety, too many people living there may be a concern (Gray, 2001). Academics and specialists debate overcrowding's ambiguous signs. Overcrowding can be measured by the number of persons per bedroom, the floor per person, or both. The first is more subjective because it depends on room sizes and resident choices. According to Morrison (1994), overcrowding measurement might be misleading; the ratio between the number of rooms (excluding service spaces) and the house's size is needed. According to Karmel (1998), the number of bedrooms is a false indicator. United Nations Urban Indicators (2006) define overcrowding in poor countries as two people per room (including service, storage, porches, courtyards, and other domestic spaces). The UN examined 96 developed and developing nations in 2000 to determine an acceptable floor area per person (United Nations, 2000). In developing regions (Africa, Latin America, the Caribbean, Asia and Oceania except Japan, Australia, and New Zealand), 89% of dwelling units studied had floor per person < 20m2. Developed regions had 58% more than 20m2. In nine African countries examined, floor per person was < 20m2. The World Health Organization (WHO) defines overcrowding based on individuals per bedroom area (m2) as shown in Table 1. Under-12-month-olds were not considered, and 1-10-year-olds are counted as 0.5.

Table 1: WHO Indicator for Overcrowding

Area(M2)	No. People
<11	2
9-10	1.5
7-9	1
5-7	0.5
>5	0

In Britain and Canada, the two-person-per-bedroom (ppb) norm is used, with genre, age, and familial differences. In Canada, two children of opposite genders must be at least 5 years old to share a room. British law allows ppb sharing till age 20, whereas Canadian law is 17 years old. In Britain, the ppb norm is 18 years; in Canada, it's 21 years (Gray, 2001). Differences are social and cultural. Studies show that overcrowding hurts health and safety. Sullivan and Chang (2011) say crowded places generate mental suffering, despair, and worry. A crowded home causes sickness, fire, and stress, according to Corburn (2015). Liu (2015) found that Beijing's congestion depressed and disturbed rural migrants. The U.K. Deputy Prime Minister's Office (2004) says confined living harms physical and mental health. Renalds *et al.* (2010) and Guite *et al.* (2006) both agree that a well-designed space can improve people's health.

Malaysian buildings are overcrowded. MPKj received complaints about illegally partitioned foreign workers and student apartments (Tan, 2012). Sri Hartamas and Sungai Way were overcrowded, per Nair (2014). Kuala Lumpur's fire chief warns congestion endangers renters' lives (Priya, 2016). Despite study (Zainal *et al.*, 2012; Nazli & Omar, 2014), the consequences of overcrowding in Malaysian low-cost housing on COVID-19 spread are generally overlooked. Few research suggests that the living environment of certain residents contributes to the large frequency of COVID-19 cases, which can be divided into three groups: First, cramped living quarters in rental buildings with cubicles or rooms (Bong, 2021). A single property can house four or five homes, with a total population of twenty—COVID-19 rose due to overcrowding. Sibu Jaya Flats in Malaysia caused 1079 COVID-19-positive cases on March 23, 2021. (Dayak Daily, 2021a). Second, Sarawak and Sabah in Malaysia have longhouses. These are communities with close-spaced homes. A longhouse is a timber construction with one portion partitioned into family rooms and another as a communal gathering place. Living in a shared place increases the risk of contracting a contagious virus, making it difficult to maintain social distance. Because of this, 2,000 COVID-19 cases were confirmed as of March 9, 2021. (Dayak Daily, 2021b). Third, foreign workers housed in full quarters, spreads coronavirus (Bernama, 2020). Due to tight confines, workers had little social space. Worsening living circumstances for foreign employees in Malaysia boosted COVID-19 cases. As of November 30, 2020, more than 5,000 positive cases were documented at Top Glove Corporation's Malaysian employee dorms (Hassan, 2020). Hence the motivation of this study.

METHODOLOGY

This paper analyses the space territoriality of foreign worker residents and shopping mall visitors using qualitative (structured observation) and quantitative (questionnaire survey) data aggregation methods. Structured observation focuses on one or more specific human behaviors in an uncontrolled (residence) and controlled (shopping mall) context than naturalistic and participant observation. While quantitative research uses a questionnaire to identify human behavior in the studied area. The study examines territorial (personal-public space) invasion according to social distance rules. Bukit Bintang (study location) was the most frequented place during RMCO, according to past studies. Most positive

cases were from foreign employees who struggle to avoid infection owing to poor living circumstances. Confined and crowded settings may have contributed to the virus's rapid transmission. Most of the relevant information is gathered by questionnaire. This study employed purposeful sampling, which ensures everyone has equal sample selection chances. This study has 250 respondents.

Study Location Selection

Bukit Bintang is Kuala Lumpur, Malaysia's shopping district. The area has shopping centers, alfresco cafés, pubs, night markets, food street, Mamak vendors, and hawker meals.

The area is frequented by tourists, residents, and teens. Malaysia's health minister said all districts in Selangor, Kuala Lumpur, and Putrajaya are in COVID-19 red zones, making it difficult to manage people's movement (Yahoo News, 2020). Using covid-19 outbreak data and human mobility data (Qwasmi *et al.*, 2022) in Figure 1, Kuala Lumpur was separated into zones and the Bukit Bintang area had the most cases (3,555) from 1 December to 15 January 2021.

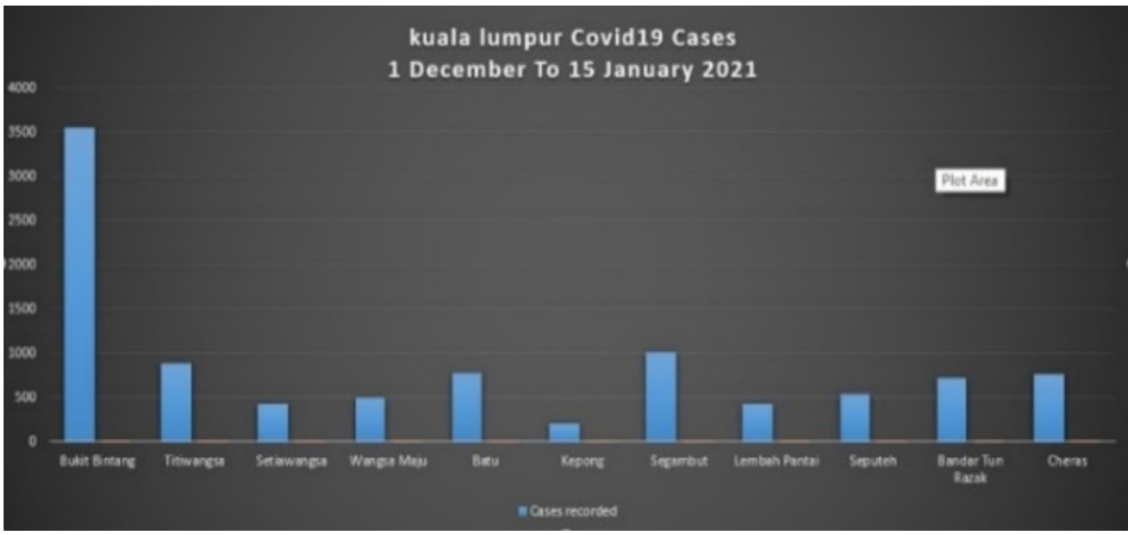

Figure 1: Kuala Lumpur COVID-19 Cases by Districts (Qwasmi *et al.*, 2022)

Figure 2: Kuala Lumpur cases by districts (MOH, 2021)

Then, things were bad. Third-wave COVID-19 instances have steadily increased. By 7 February 2021, there were 7,995 COVID-19 instances in Kuala Lumpur and 718 in Bukit Bintang (MOH, 2021). Figure 2 As a result, this study aims to evaluate the issue and direction across the RMCO phase of the Movement Control Order implemented in Malaysia during the COVID-19 pandemic.

RESULTS AND DISCUSSIONS

This Study's Results are Observational and Statistical Observation Analysis (Resident)

The structural observational research shows how public and private domains mix in a foreign worker's home. Foreign workers tend to live in smaller residences and spend more time outside and in close proximity to

Figure 3: Foreign workers in close proximity in their territory (*Source: Snap for research*)

neighbors. Figure 3 shows how this makes both public thoroughfares and extensions of the house's private activity space. Foreign workers' housing complexes did not protect inhabitants from spreading the virus to guests since they can gather without warning. The territory's privacy zoning in private building was not clearly stated, so users may not recognize the danger of mas gathering without social distance.

Further, the local streets were mostly uninterrupted, making it easy for foreign employees to congregate and spread the virus. The front walkway's width and construction wasn't marked during the RMCO period to clearly show the required social distance. Everyone can walk freely, and borders are blurred, and no definable boundaries help keep out unwelcome guests. To prevent the virus from spreading, people entering the apartment building from the outside must wash their hands and check the temperature, none of these regulations exist. Further observation shows that hands were not cleaned with disinfectant or soap and water when gathering or walking into a building. This shows there's no control or surveillance before entering a residential building. The foreign worker's residential area has no indications to help individuals understand the use of the space. No signs tell people how to walk based on COVID-19 recommendations or remind them to keep their social and physical distance, avoid crowds and close closeness, and wear a mask when there isn't enough airflow. Figure 4 demonstrates the defensible space and symbol boundaries are gone. Also, the people-per-room ratio in the foreign worker residential building was survey. People-per-room ratio is a frequent indication of household overpopulation. This affects personal defensible space, an important feature of space territoriality.

A house's population density is the dividing of the number of occupants by the number of bedrooms. Overcrowding definition includes number of people in residence regardless of size, ratio of occupants to floor space in square feet, and person-to-size ratio modified for household composition, building type, location, or lot size. The researcher analyzed literature to determine indicators that best represent overcrowding and fit with industry norms. PPR and PPB were the most common research metrics.

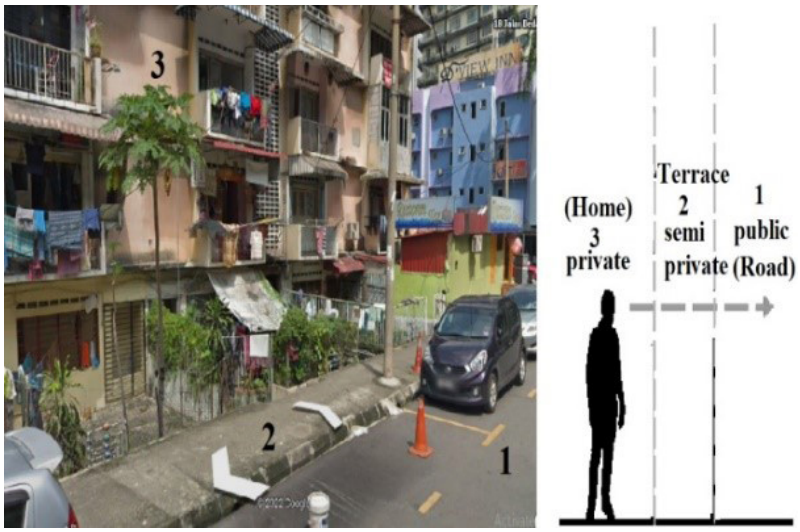

Figure 4: Defensible space in foreign worker's residence Bukit Bintang

Table 2 shows how much foreign workers' residences are overcrowded, based on data from the UK Crowding Index Table (WHO Housing and Health Guidelines). More than two individuals in a room are overcrowded; more than four are highly overcrowded. Residents were questioned on the number of inhabitants and bedrooms in their homes to assess the extent of crowding and the specific bounds of the residential area for this study. This provided a statistic known as the average persons-per-room (PPR). This ratio is derived by dividing the total number of housemates (including children) by the number of bedrooms. Table 2 provides PPR count standards. The formula for average PPR is given below.

$A_{ppr} = n_t/n_r = (2562/737) = 3.47$

Table 2: Foreign worker's residential buildings overcrowding

Number of Rooms	Max No. person
1	2
2	3
3	5
4	7
5	10
>10	Two per room

Where 2562 is the total number of people living in the houses and 737 is the total number of bedrooms in the houses. The average PPR is 3.47, higher than normal. Because there is no distinct area limit and no controlling surveillance in private homes, fewer locations in the building can be safely guarded to avoid gathering. Due to the overcrowding of Malaysian foreign worker residences, social distance is impractical, resulting to the proliferation of COVID-19. This observation is in line with studies from Mat *et al.* (2020).

Observation Analysis (Shopping Mall)

To limit the spread of the virus, shopping malls forced people to sanitizer their hands before entering the mall. Before letting customers into the mall, the securities check the temperature. This was a must to be done. Figure 5 shows controls and surveillance in place before entering the mall. Mall symbols guide shoppers. These symbols advise the mall users how to walk based on MOH standard operating procedure, such as maintaining social and physical distance. Avoid crowds and near people. When it's impossible to leave overcrowded or poorly ventilated areas, users should wear a mask, and frequent use of hand sanitizer as shown in Figure 6. Busy malls used changeable opening and closing times and limited

Figure 5: Lowyat-plaza shopping mall control and surveillance

Figure 6: Lowyat-plaza shopping mall guidelines and control

Figure 7: Lowyat-plaza shopping mall overcrowding during (RMCO)

customer capacity per entry. Some stores may rope off to enforce the 1-to-2-meter social distance. Figure 7 shows that random access without limiting causes overcrowding on some days and near-emptiness on others. This overcrowding leads to the spread of the COVID-19 virus on some days.

Statistical Analysis (Resident)

In this section of the study analysis, quantitative analysis is employed to validate the observation analysis of territoriality by surveying foreign workers residents, and visitors in shopping malls in the study region. The results of a pilot and main survey of respondents in the study location are discussed below.

Pilot Study Result

The questionnaire is being disseminated online to foreign workers in the research area to test its understandability and reliability. Since the URL to the questionnaire was made public, 50 foreign workers of the same residence responded. Cronbach's alpha analysis indicates how consistent the five (5) constructs are.

Table 3: Reliability Test Result for Pilot Study (Resident)

No.	Construct	Alpha Coefficient	No. of item
1.	RPAS[1]	.853	6
2.	RPUS[2]	.793	6
3.	H.B .	.915	6

As noted in Table 3, internal reliability tests on each construct show that resident data can fall between 0.793 and 0.915 for each item that makes up the construct. "Residential Public Space" received the lowest alpha, 0.793. Human Behavior has the greatest alpha coefficient, 0.915, whereas Residential Private Space has 0.853. This shows that responders easily comprehended and answered each concept question. However, Table 4 shows that shopping mall data ranged from 0.700 to 0.724. "Social Distance Rules" has 0.793 alpha while "Shopping Mall Public Space (Territory)" has 0.724 alpha. This shows that the results collected for each construct were internally consistent and the questionnaire's dependability was understood.

Table 4: Reliability Test Result for Pilot Study (shopping mall)

No.	Construct	Alpha Coefficient	No. of item
1.	PST[4]	.724	6
2.	SD[5]	.700	6

The statistical analysis of the questions, including the Pearson Correlation and Sig, are shown in Table 5 for the resident survey. Results from a two-tailed test (2-tailed) of the correlation between "Human Behavior," "Residential Private Space," and "Residential Public Space" show that both values are statistically significant at 0.0000 (<0.05).

[1] Residential Private Space
[2] Residential Public Space
[3] Human Behavior
[4] Shopping Mall Public Space (Territory)
[5] Social Distance Rules

Table 5: Pilot Data Pearson Correlation for Resident

RPAS	RPAS	RPUS	HB
Pearson Correlation	1	.141	.553**
RPUS			
Pearson Correlation	.141**	1	.414**
HB			
Pearson Correlation	.553**	.414**	1
Sig. (2-tailed)	.000	.000	.000
N	50	50	50

Whereas Table 6 presents the results of the statistical analysis performed on the questions for the shopping mall survey. Both values are statistically significant at

the 0.0000 level, according to the findings of a test that compared the correlation between "Social Distance Rules" and "Physical Space Territory" The test conducted shows statistically significant at 0.0000 (<0.05).
The pilot data analysis confirms the existence of a strong correlation between the questions on the different constructs of the questionnaire. So, the questionnaire can serve as the study's primary data-gathering source.

Table 6: Pilot Data Pearson Correlation for shopping mall

T-PST	**T-PST**	**T-FC**
Pearson Correlation	1	.0.476**
T-FC		
Pearson Correlation	.0.476**	1
Sig. (2-tailed)	.000	.000
N	50	50

Primary Data Analysis and Result
The main questionnaire's reliability is tested to ensure a minimal standard. The identical evaluation technique employed for pilot study was used for the main data surveys. Every construct was reliable and met minimal standard. Malhotra (2002) found that a construct is reliable if its alpha coefficient is between 0.8 and 1.0. Between 0.6 and 0.8 is moderate, and less than 0.6 is week reliability.

Table 7: Reliability Test Result for Primary Data (Resident)

No.	**Construct**	**Alpha Coefficient**	**No. of item**
1.	RPAS	.795	6
2.	RPUS	.804	6
3.	H.B .	.908	6

Table 7 presents the results of a reliability test on the study's primary data to ensure it's consistent with respondent responses, under Malhotra's criteria. All constructs have good internal reliability (0.795, .804, and 0.908, respectively). This shows consistency in each construct's data. This shows that the respondents understood the questions and the core questionnaire's reliability.

Table 8: Reliability Test Result for Primary Data (shopping mall)

No.	**Construct**	**Alpha Coefficient**	**No. of item**
1.	PST	.921	6
2.	SD	.903	6

The results from the primary study for shopping mall data (Table 8) indicate that the alpha coefficient for the construct labeled "Public Space Territory" is 0.921. On the other hand, "Social Distance Rules" has an alpha of 0.903. All of the necessary conditions have been satisfied, and the reliability of each construct is high and usable in this study.

Inferential Analysis
The researcher generalizes data on respondents' understanding of Malaysia's SOP. The study's purpose is to illustrate that human behavior in private and public territory favors COVID-19 spread more in residential areas than in public places like shopping malls.
The data normality test is done to define the study's data analysis type. This test determines whether data are regularly distributed. The primary study's analysis type is defined by the normalcy test. Shapiro-Wilk test is used for samples under 50. Shapiro-Wilk and Kolmogorov-Smirnov can also analyze 2000 sample data types. This study will employ the Shapiro-Wilk test, a numerical approach for analyzing data normality, to see if the data is normal. The p-value for responder data was below.05. Statistically, data is normal if the Shapiro-Wilk test result is greater than.05 and not normal if it's less than.5. Given the nature of the data, non-parametric analysis is the most suited approach for the data analysis. Table 9 summarizes the research objective, hypotheses, and methodology used in the study's analysis.

Table 9: Research Test and Analysis Methods

		Analysis
Objective	To identify human behaviour in private and public spaces territory.	Ordinal Regression & Spearman Correlation
Hypothesis 1	There is a positive relationship between human behaviour in private and public spaces territory (Resident)	
Hypothesis 2	There is a positive relationship between the social distance rules and COVID-19 spread in public space territory (shopping malls).	

Spearman Correlation
Spearman's correlation test compares each construct. This is employed to analyze SOP observation levels in home and public places.
Table 10 displays the foreign worker residents' correlation findings, showing a weak and moderate positive connection between all constructs. In Table 11, the result of the shopping mall visitor's respondents is displayed, showing a strong positive relationship between all constructs and no negative correlations for all tables.

Table 10: Spearman's Correlation Test Result for Main Data (Resident)

			RPAS	**RPUS**	**HB**
Spearman's rho	RPAS	Correlation Coef.	1.000	.323**	.393**
		Sig. (2-tailed)	.	.000	.000
	RPUS	Correlation Coef.	.323**	1.000	.615**
		Sig. (2-tailed)	.000	.	.000
	HB	Correlation Coef.	.393**	.615**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	250	250	250

Table 11: Spearman's Correlation Test Result for Main Data (shopping mall)

			PST	SD
Spearman's rho	PST	Correlation Coef.	1.000	.737**
		Sig. (2-tailed)	.	.000
	SD	Correlation Coef.	.737**	1.000
		Sig. (2-tailed)	.000	.
		N	250	250

Hypothesis 1: There is A Positive Relationship between Human Behavior in Private and Public Space Territory (Resident)

Table 10 shows that human behavior in private residential space has a weak coefficient of.393** with a significant level of 0.000. This means that foreign employees' behavior in a private residential space territory does not follow government-set SOP while they are with roommates, friends, or visitors, driving COVID-19 spread. The residential public space territory has a coefficient of.615** with a significant level of 0.000, showing a considerable failure of foreign workers human behavior to obey government-set SOP, boosting COVID-19 in the area. This analysis directly justifies the structural observation analysis made in section 4.1 that foreign worker behavior in residential territory boosts COVID-19 spread.

Hypothesis 2: There is A Positive Relationship between the Social Distance to Control COVID-19 Spread in Public Spaces Territory (Shopping Malls)

Furthermore, according to Table 11, restriction in public spaces (shopping malls) has a strong coefficient of.737** with a significant level of 0.000. This shows that mall visitors follow government SOPs, limiting the spread of COVID-19. Ordinal regression analysis is performed in addition to Spearman's correlation analysis to analyze the variance in the COVID-19 spread construct is attributed to human behavior in private and public territories.

Ordinal Regression

Table 12 shows the -2 log-likelihood of a simple intercept model and the total model (with all predictions). Chi-

Table 12: Model Fitting Information

Model	-2 Log-Likelihood	Chi-Square	df	Sig.
Intercept Only	271.429			
Final	96.689	174.740	8	.000

square probability ratio testing determines if the overall model fit is better than the intercept model. The final model fit is statistically incongruent with the intercept mode χ^2 (4) = 174.740, p <.000].

Table 12 pseudo-R-squared values are approximations of ordinal regression's R-squared. Little is written on using or interpreting this finding practically (Lomax & Hahs-Vaugn, 2012; Osborne, 2015; Pituch & Stevens, 2016; Smith & McKenna, 2013). Petrucci (2009) says the "Nagelkerke" accounts for a certain percentage of the construct's volatility. The Nagelkerke coefficient in this study is.553, implying 55.3% of the COVID-19 spread variance is ascribed to human behavior in private and public regions.

Table 13: Pseudo R-Square

Methods	Coe.
Cox and Snell	.503
Nagelkerke	.553
McFadden	.292

Ordinal regression assumes "all comparable alternatives" involving the COVID-19 spread have the same association between private and public human behavior. The researcher looks at the parallel line test findings to determine if the requirement has been met. Table 13 shows the statistical analysis results from this study; as the p-value is >.005, the result fulfils the hypothesis.

Table 14: Test of Parallel Lines[a]

Model	-2 Log-Likelihood	Chi-Square	df	Sig.
Null Hypothesis	96.689			
General	000b	96.689	24	.007

CONCLUSIONS

The analysis shows a valid association between each construct. Human behavior in private and public settings enhances COVID-19 distribution in Bukit Bintang, Kuala Lumpur, according to the study. According to Nan Zhang *et al.* (2020), close contact in dwellings, places of employment, places of study, restaurants, shopping malls, marketplaces, and public transit dropped by 8.3%, 30.8%, 66.0%, 38.5%, 48.6%, 41.0%, and 36.1%. Behavioral changes reduced the virus's propagation by 63.1%, according to the author. Hong Kong's COVID-19 outbreak affected residents' behavior. Over 47% of the decline in COVID-19 infection rates was due to controlling close contacts. De Souza *et al.* (2021) found a link between social isolation and SARS-CoV-2 mortality and infections. Social distancing reduces COVID-19 infections and mortality. When people don't follow the authority's social isolation index, the virus spreads more.

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