Supplementary Data

Figure 1. Flowchart of sampling and recruitment

| Contacted workers from HealthServe | Invitation flyers distributed and posted in dormitories | E-Invitation flyers posted on 10 Facebook pages |

↓ ↓ ↓

Interested migrant worker provides the Research Team (RT) with his phone number and preferred language through Whatsapp or phone calls

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Phone Interview (N = 293)

RT sends the contact info of the participant to an assigned volunteer

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Volunteer calls the participant to conduct a phone interview (~20 mins) and record the responses in Word file provided by RT

↓

Volunteer sends back the survey responses to RT by email

Online Survey (N = 216)

RT sends a link to a self-administered online survey form through WhatsApp to participants who opted for the online survey

↓

Participant completes the survey online and his responses are automatically stored in the system

↓

Upon completion of the survey, participants are given an option to:
(1) Choose either $10 mobile top-up OR NTUC voucher for an incentive; AND
(2) Refer the survey to their friends from other dormitories for an additional incentive ("Respondent driven sampling (RDS)")
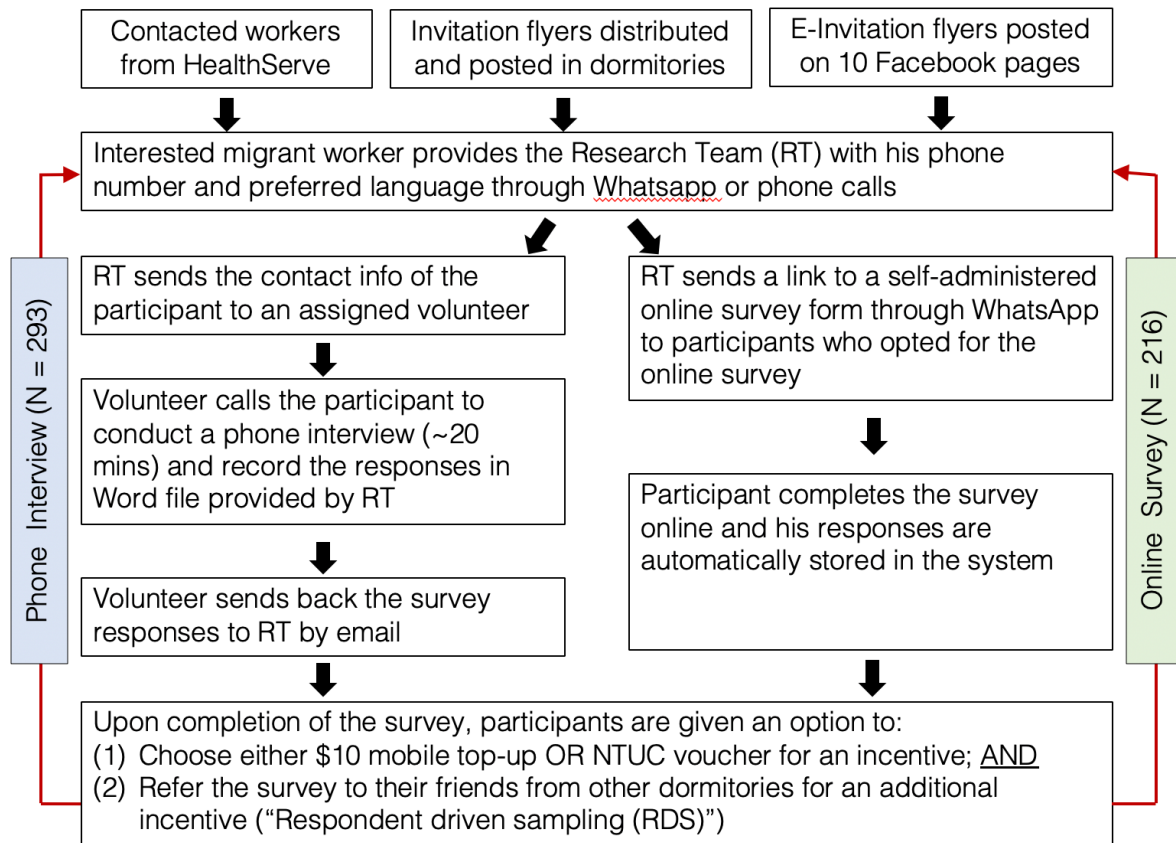
Table 1. A grid-type network questionnaire of visits

On your rest day, where do you usually go? Please list the places you usually went on your rest day before the circuit break?

Place	Time (Weekday or Weekend)	Purpose	How many friends do you meet?	How many from same dormitory?	How many from same work?	How many are local (not worker?)

Figure 2. 106 locations identified from mobility data

Table 2. Categorization of 106 locations into nine areas

Area	Number of trips* (N=436)	Popular destinations; quoted >5 times	Description
1. West	13 (3.0%)	Joo Koon (5)	Far west of Singapore. Primarily industrial area with developing residential areas and several PBDs.
2. Southwest	13 (3.0%)	Jurong East (7) Boon Lay (6)	West of Singapore. Contains a mix of residential, commercial, and industrial areas. A few PBDs are located there.
3. Southcentral	56 (12.8%)	Marina Bay (39) Sentosa (21)	A cluster of Singapore's most famous tourist attractions, including Gardens by the Bay, Chinatown and Sentosa. Popular for sightseeing.
4. Southeast	34 (7.8%)	Geylang (14) Geylang Mosque (6) Kallang Park (6)	Near the city centre; heritage area with places of worship. Some migrant workers are known to stay in the shophouses there.
5. East	39 (8.9%)	Paya Lebar (9) East Coast Park (6)	Contains a mix of residential, commercial, and industrial areas. East Coast Park, a popular green space, is located there. There are a few PBDs, particularly in the Changi and Tampines area.
6. Northeast	6 (1.4%)	-	Contains a mix of residential and commercial areas. The area is still undergoing development and construction. There are a few PBDs there.
7. Northcentral	13 (3.0%)	Yishun (5)	Northern-central part of Singapore. Contains a mix of residential, commercial, and industrial areas. There are is one PBD in the area.
8. Northwest	31 (7.1%)	Woodlands (17)	Contains a mix of residential, commercial, and industrial areas. A few PBDs are located there.
9. Migrant worker hub	231 (53.0%)	Mustafa (172) Serangoon Road (19) Little India (27) Farrer Park (8) Tekka (15)	Near the city centre; well-known for its places of worship and variety of shops selling South Asian goods. Telecommunication and remittance services are widely available.

*If a respondent visits multiple places in the same area, it is categorised as a single trip to facilitate network analysis. Place names provided by respondents vary in specificity, from entire districts (e.g. Geylang) to buildings (e.g. Geylang Mosque) and cannot be classified into clearly delineated subcategories. Therefore, they are not summarised in percentages.

Table 3. Classification of nine visit areas

We classified the destinations visited by migrant workers into nine areas. This classification was based on official district boundaries and places specific to migrant workers.

Area	Description
1. West	Far west of Singapore. Primarily industrial area with developing residential areas and several PBDs.
2. Southwest	West of Singapore. Contains a mix of residential, commercial, and industrial areas. A few PBDs are located there.
3. Southcentral	A cluster of Singapore's most famous tourist attractions, including Gardens by the Bay, Chinatown and Sentosa. Popular for sightseeing.
4. Southeast	Near the city centre; heritage area with places of worship. Some migrant workers are known to stay in the shophouses there.
5. East	Contains a mix of residential, commercial, and industrial areas. East Coast Park, a popular green space, is located there. There are a few PBDs, particularly in the Changi and Tampines area.
6. Northeast	Contains a mix of residential and commercial areas. The area is still undergoing development and construction. There are a few PBDs there.
7. Northcentral	Northern-central part of Singapore. Contains a mix of residential, commercial, and industrial areas. There are no PBDs in the area.
8. Northwest	Contains a mix of residential, commercial, and industrial areas. A few PBDs are located there.
9. Migrant worker hub	Near the city centre; well-known for its places of worship and variety of shops selling South Asian goods. Telecommunication and remittance services are widely available.

Table 4. Characteristics of participants by COVID-19 risk exposure: demographic variables

| | Total (n=509) | Have A Friend(s) with COVID-19 | | Statistic (t or X^2) |
| | | Yes (n=120, 23.6%) | No (n=389, 76.4%) | |
	Mean (sd) or N (%)	Mean (sd) or N (%)	Mean (sd) or N (%)	
Age (mean, SD)				5.28 ns
< 20	3 (0.6%)	2 (1.7%)	1 (0.3%)	
21-30	264 (52.7%)	71 (61.2%)	193 (50.1%)	
31-40	194 (38.7%)	40 (34.5%)	154 (40.0%)	
> 40	40 (8.0%)	3 (2.6%)	37 (9.6%)	
Nationality				4.73 ns
Bangladesh	476 (93.7%)	113 (94.2%)	363 (93.3%)	
India	15 (3.0%)	1 (0.8%)	14 (3.6%)	
China	15 (3.0%)	6 (5.0%)	10 (2.6%)	
Myanmar	2 (0.4%)	0 (0.0%)	2 (0.5%)	
Education				16.59**
No school	6 (1.2%)	1 (0.8%)	5 (1.3%)	
Primary	19 (3.8%)	1 (0.8%)	18 (4.6%)	
Middle	59 (11.7%)	9 (7.6%)	50 (12.9%)	
Secondary	231 (45.7%)	45 (38.1%)	186 (47.9%)	
Post-secondary	191 (37.7%)	62 (52.5%)	129 (33.2%)	
Work sectors				4.49 ns
Construction	385 (76.2%)	94 (80.3%)	291 (75%)	
Shipyard	55 (10.9%)	14 (12.0%)	41 (10.6%)	
Landscaping	10 (2.0%)	2 (1.7%)	8 (2.1%)	
Manufacturing	4 (0.8%)	1 (0.9%)	3 (0.8%)	
Waste management	2 (0.4%)	0 (0.0%)	2 (0.5%)	
Maintenance	14 (2.8%)	2 (1.7%)	12 (3.1%)	
Others	35 (6.9%)	4 (3.4%)	31 (8.0%)	
Years lived in current dormitory/ residence	1.5 (2.0)	2.2 (2.6)	1.2 (1.8)	18.48***
Number of workers per room	10.4 (7.2)	13.1 (7.0)	9.6 (7.0)	21.82***
Number of fans per room	3.5 (4.0)	4.6 (5.8)	3.2 (3.2)	9.45**
Number of rooms per level/unit	8.2 (13.0)	11.6 (20.4)	7.1 (9.3)	9.72**
Number of showers in the level/unit	5.5 (7.1)	6.6 (7.5)	5.2 (6.9)	5.53 ns
Number of toilets per level/unit	5.9 (7.2)	7.3 (7.4)	5.5 (7.1)	5.05*
Supermarket in dorm/nearby	384 (75.4%)	102 (85%)	282 (72.5)	7.08***
Social ties: Number of friends				
Your dormitory/residence	6.3 (8.4)	7.9 (10.8)	5.8 (7.4)	5.23*
Other dormitory/residence	4.9 (8.1)	6.5 (11.5)	4.4 (6.6)	5.43*
Your work	6.5 (10.8)	7.6 (13.6)	6.1 (9.8)	1.39 ns
Other works	2.4 (7.9)	4.1 (12.8)	1.8 (5.6)	5.59*
Foreign domestic workers	2.5 (7.9)	2.7 (11.2)	2.8 (6.6)	0.15 ns
Local Singaporeans	1.3 (8.2)	1.2 (2.5)	1.5 (2.6)	1.12 ns
Places visited				
Little India	231 (45.4%)	70 (58.8%)	161 (41.3%)	10.62***
South	56 (11.0%)	16 (13.4%)	40 (10.3%)	0.65 ns

* $p < .05$. ** $p < .01$. *** $p < .001$. ns = not significant

Table 5. Characteristics of participants by COVID-19 risk exposure: COVID-19 related variables

| | Total (n=509) N (%) | Have A Friend(s) with COVID-19 | | Statistic (t or X^2) |
		Yes (n=120, 23.6%) N (%)	No (n=389, 76.4%) N (%)	
Transmission modes				
Coughing/sneezing	474 (93.1%)	114 (95.0%)	360 (92.5%)	0.52 ns
Close personal contact	427 (83.9%)	112 (93.3%)	315 (81.0%)	9.48**
Touching contaminated surfaces	396 (77.8%)	109 (90.8%)	287 (73.8%)	14.47***
Touching/eating raw meat	271 (53.2%)	81 (67.5%)	190 (48.8%)	12.08***
Touching/ eating contaminated food	309 (60.7%)	88 (73.3%)	221 (56.8%)	9.81**
Mosquito bites	171 (33.6%)	48 (40.0%)	123 (31.6%)	2.52 ns
Protection measures				
Wash hands frequently with soap	474 (93.1%)	116 (96.7%)	358 (92.0%)	2.40 ns
Use hand sanitizer	454 (89.2%)	115 (95.8%)	339 (87.1%)	6.31*
Drink warm water	420 (82.5%)	113 (94.2%)	307 (78.9%)	13.74***
Wear a mask	449 (88.2%)	115 (95.8%)	334 (85.9%)	7.84**
Take vitamin C	356 (69.9%)	97 (80.8%)	259 (66.6%)	8.20**
Avoid mosquito bites	256 (50.3%)	70 (58.3%)	186 (47.8%)	3.65 ns
Avoid raw/undercooked meat	282 (59.2%)	82 (74.5%)	200 (54.6%)	13.06***
Avoid crowded places	418 (82.1%)	106 (88.3%)	312 (80.2%)	3.59 ns
Actively searched for information	429 (84.3%)	107 (89.2%)	322 (82.8%)	2.37 ns
Feel like I have sufficient information	376 (73.8%)	102 (85%)	274 (70.4%)	9.34**
Sources of information				
Official government notices	397 (78.0%)	103 (85.8%)	294 (75.6%)	5.04*
Local news/television	265 (52.1%)	72 (60.0%)	193 (49.6%)	3.56 ns
Home country new/television	263 (51.7%)	68 (56.7%)	195 (50.1%)	1.32 ns
Social networking sites	423 (83.1%)	110 (91.7%)	313 (80.5%)	7.42**
Health professionals	181 (35.6%)	57 (47.5%)	124 (31.9%)	9.10**
Friends and co-workers	306 (60.1%)	84 (70%)	222 (57.1%)	5.87*
Health Condition				
Occupation-related	154 (30.3%)	30 (25.0%)	124 (31.9%)	1.74 ns
Headache	111 (21.8%)	33 (27.5%)	78 (20.1%)	2.56 ns
Backache	107 (21.0%)	29 (24.2%)	78 (20.1%)	0.07 ns
Skin Disease	60 (11.8%)	20 (16.7%)	40 (10.3%)	3.01 ns
Hypertension	57 (11.2%)	12 (12.5%)	42 (10.8%)	0.12 ns
Diabetes	40 (7.9%)	10 (8.3%)	30 (7.7%)	0.00 ns
Cold-like Symptoms	80 (15.7%)	22 (18.3%)	58 (14.9%)	0.57 ns

* $p < .05$. ** $p < .01$. *** $p < .001$. ns = not significant

Table 6. Characteristics of participants by COVID-19 risk exposure: self-efficacy and perceived susceptibility

| | Total (n=509) | Have A Friend(s) with COVID-19 | | Statistic (t or X^2) |
| | | Yes (n=120, 23.6%) | No (n=389, 76.4%) | |
	Mean (sd) or N (%)[+]	Mean (sd) or N (%)[+]	Mean (sd) or N (%)[+]	
Confident in protecting myself	2.7 (0.6)	2.6 (0.7)	2.7 (0.5)	4.16*
Not at all	25 (5.0%)	10 (8.8%)	15 (3.9%)	4.98 ns
Little	96 (19.3%)	24 (21.1%)	72 (18.8%)	
Very much	377 (75.7%)	80 (70.2%)	297 (77.3%)	
Confident in preventing spread to others	2.6 (0.7)	2.7 (0.6)	2.6 (0.7)	0.25 ns
Not at all	49 (9.8%)	6 (5.3%)	43 (11.2%)	6.64 ns
Little	83 (16.7%)	26 (23.0%)	57 (14.8%)	
Very much	366 (73.5%)	81 (71.7%)	285 (74%)	
Worried about being infected in the past one week	1.9 (0.8)	2.1 (0.7)	1.8 (0.8)	8.62**
Not at all	175 (35.4%)	25 (22.5%)	150 (39.1%)	10.40**
Little	205 (41.4%)	54 (48.6%)	151 (39.3%)	
Very much	115 (23.2%)	32 (28.8%)	83 (21.6%)	
Perceived likelihood of being infected in the next one month	1.6 (0.7)	1.8 (0.7)	1.6 (0.7)	7.38**
Not at all	263 (53.0%)	45 (40.2%)	218 (56.8%)	9.62**
Little	158 (31.9%)	46 (41.1%)	112 (29.2%)	
Very much	75 (15.1%)	21 (18.8%)	54 (14.1%)	

Note. Perceived susceptibility and self-efficacy were assessed on three-point Likert scale (1 = not at all, 2 = somewhat, 3 = very much)
* p < .05. ** p < .01. *** p < .001. ns = not significant

Table 7. Characteristics of participants by COVID-19 risk exposure: mental health

	Total (n=509) Mean (sd) or N (%)[+]	Have A Friend(s) with COVID-19		Statistic (t or X^2)
		Yes (n=120, 23.6%) Mean (sd) or N (%)[+]	No (n=389, 76.4%) Mean (sd) or N (%)[+]	
Nervous?	1.52 (0.63)	1.7 (0.63)	1.48 (0.62)	11.22***
None	266 (54.4%)	44 (38.9%)	222 (59.0%)	14.29***
Sometimes	188 (38.4%)	59 (52.2%)	129 (34.3%)	
All the time	35 (7.2%)	10 (8.8%)	25 (6.6%)	
Hopeless?	1.46 (0.58)	1.55 (0.6)	1.44 (0.58)	3.26 ns
None	271 (58.3%)	54 (50.5%)	217 (60.6%)	3.51 ns
Sometimes	173 (37.2%)	47 (43.9%)	126 (35.2%)	
All the time	21 (4.5%)	6 (5.6%)	15 (4.2%)	
Restless or fidgety?	1.46 (0.59)	1.52 (0.59)	1.44 (0.59)	1.66 ns
None	259 (58.9%)	54 (52.4%)	205 (60.8%)	2.44 ns
Sometimes	160 (36.4%)	44 (42.7%)	115 (34.4%)	
All the time	21 (4.8%)	5 (4.9%)	16 (4.7%)	
Depressed that nothing could cheer you up?	1.37 (0.59)	1.5 (0.67)	1.33 (0.55)	7.46**
None	295 (68.4%)	61 (59.2%)	234 (71.3%)	7.76*
Sometimes	113 (26.2%)	32 (31.1%)	81 (24.7%)	
All the time	23 (5.3%)	10 (9.7%)	13 (4.0%)	
That everything was an effort?	1.41 (0.63)	1.48 (0.65)	1.38 (0.62)	1.92 ns
None	290 (67.0%)	63 (60.6%)	227 (69.0%)	2.58 ns
Sometimes	110 (25.4%)	32 (30.8%)	78 (23.7%)	
All the time	33 (7.6%)	9 (8.7%)	24 (7.3%)	
Worthless?	1.27 (0.53)	1.31 (0.58)	1.26 (0.52)	0.64 ns
None	328 (76.6%)	77 (74.8%)	251 (77.5%)	0.92 ns
Sometimes	82 (19.2%)	20 (19.4%)	61 (18.8%)	
All the time	18 (4.2%)	6 (5.8%)	12 (3.7%)	

Note. Mental health was assessed on three-point Likert scale (1 = not at all, 2 = somewhat, 3 = very much)
* $p < .05$. ** $p < .01$. *** $p < .001$. ns = not significant

Table 8. Visit events by area and purpose
Table 8.1. Social gathering, grocery shopping

	Social Gathering	Grocery Shopping	Remittance
Migrant worker hub	34.5%	47.1%	49.8%
Southeast	35.0%	27.5%	7.5%
West	53.8%	15.4%	38.5%
Southwest	61.5%	23.1%	7.7%
Southcentral	76.6%	5.2%	5.2%
East	34.8%	30.4%	21.7%
Northwest	22.6%	29.0%	45.2%
Northcentral	46.2%	46.2%	15.4%
Northeast	28.6%	28.6%	28.6%

Table 8.2. Outdoor leisure, religious activities, movie

	Outdoor leisure	Religious Activities	Movie
Migrant worker hub	4.2%	9.6%	1.9%
Southeast	20.0%	17.5%	-
West	7.7%	7.7%	-
Southwest	15.4%	-	-
Southcentral	23.4%	5.2%	-
East	15.2%	2.2%	4.3%
Northwest	9.7%	3.2%	6.5%
Northcentral	23.1%	15.4%	-
Northeast	28.6%	-	-

Table 8.3. Medical care, dating, training

	Medical Care	Dating	Training
Migrant worker hub	0.4%	0.8%	-
Southeast	5.0%	-	-
West	-	-	7.7%
Southwest	-	-	-
Southcentral	3.9%	5.2%	-
East	-	2.2%	-
Northwest	-	-	3.2%
Northcentral	-	-	-
Northeast	14.3%	-	-

Figure 3. Visit paths from dormitories to areas of destination

Figure 3.1. Overall visit paths

(a) Overall mobility paths
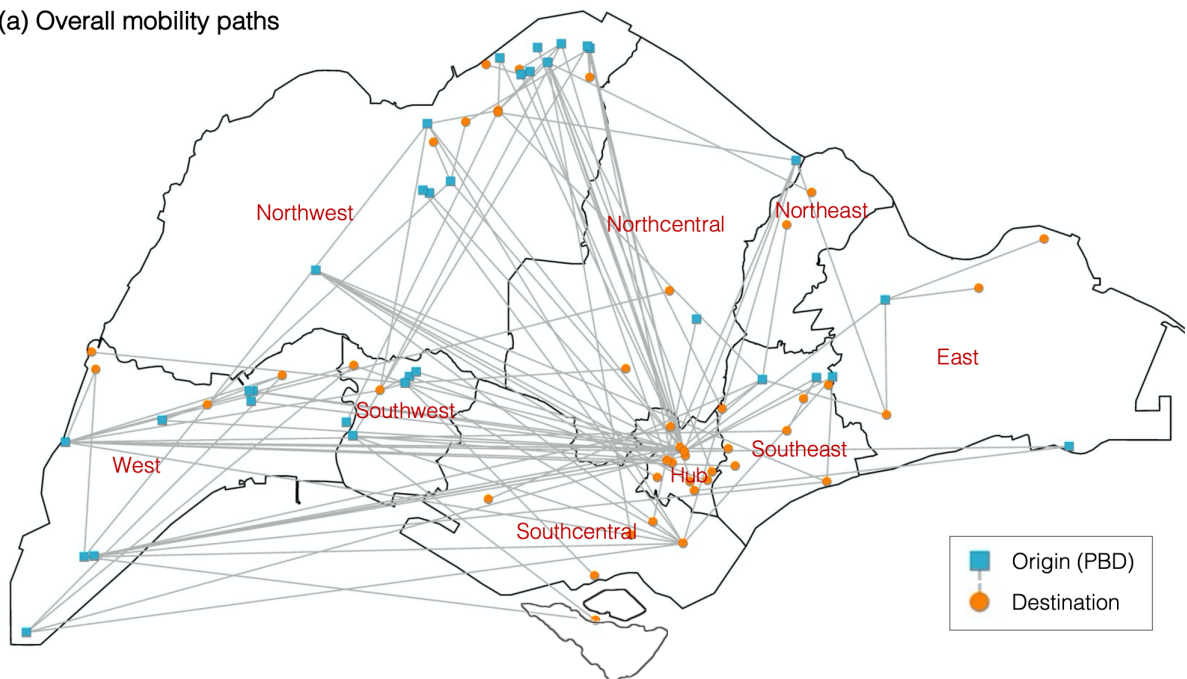
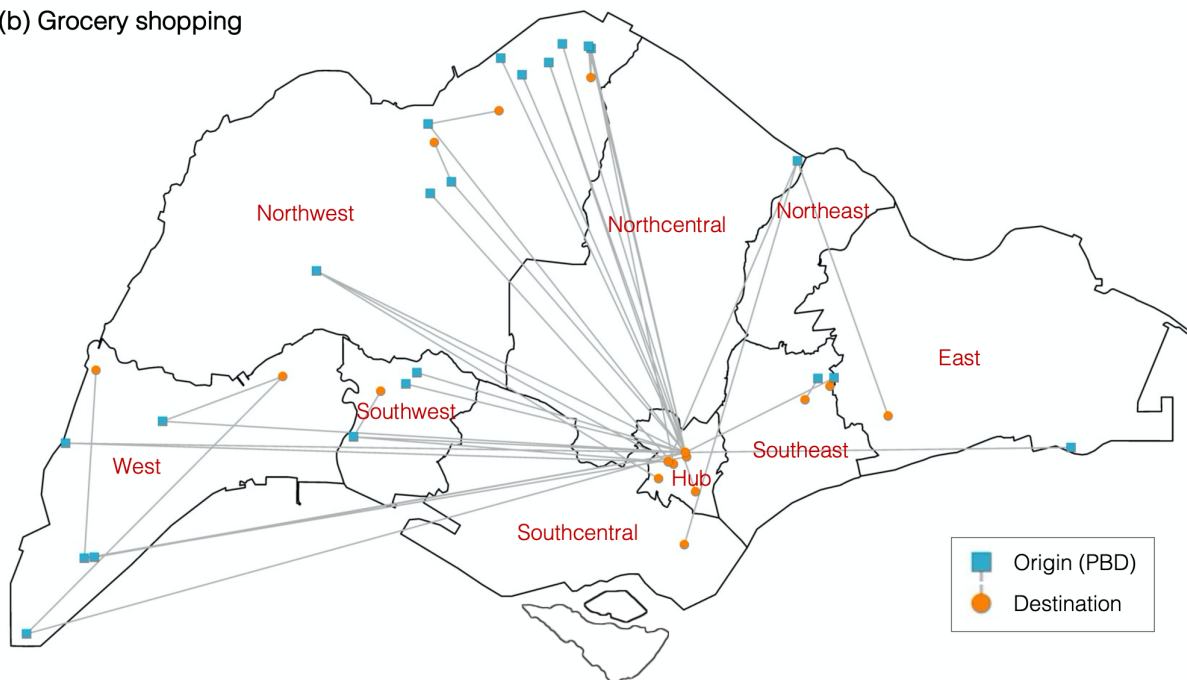**Figure 3.2. Grocery shopping**

(b) Grocery shopping
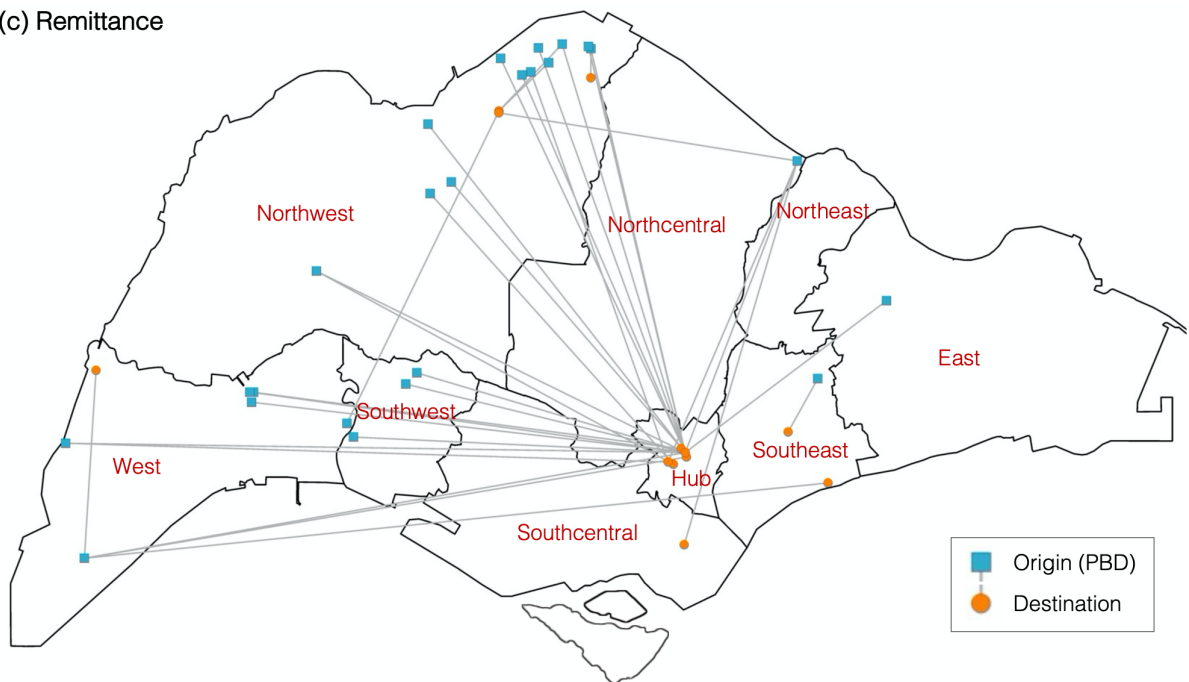
Figure 3.3. Remittance

(c) Remittance

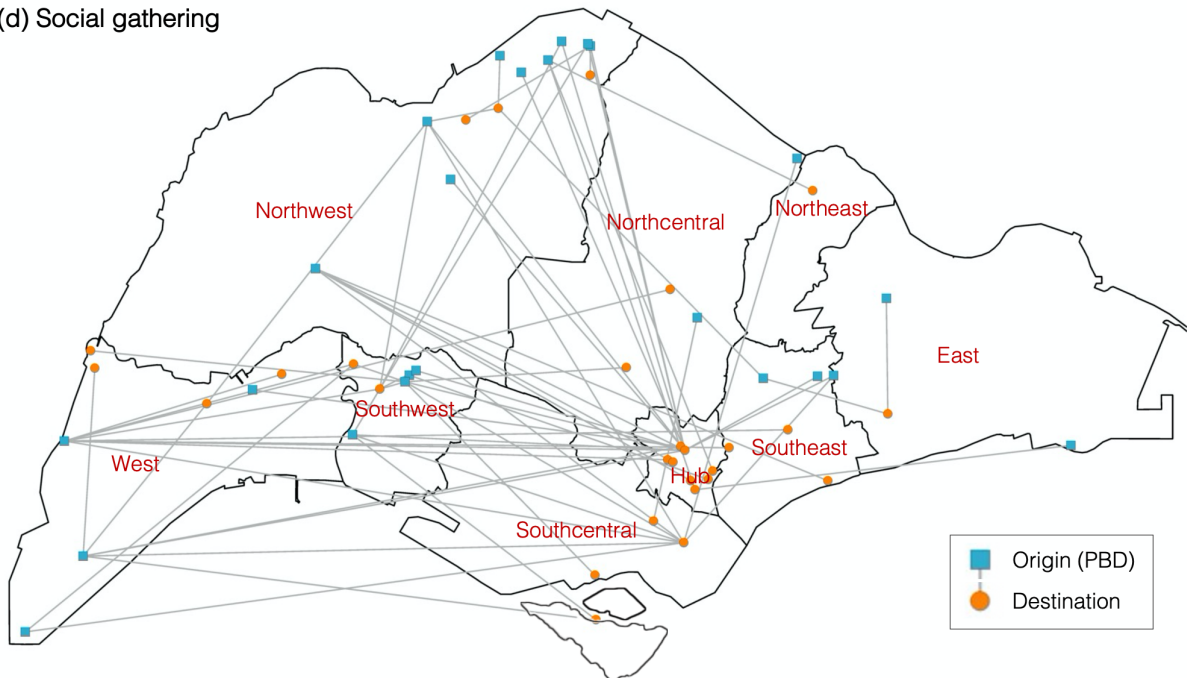**Figure 3.4. Social gathering**

(d) Social gathering

Figure 4. Two-mode network between migrant workers and areas of visit by individual attributes
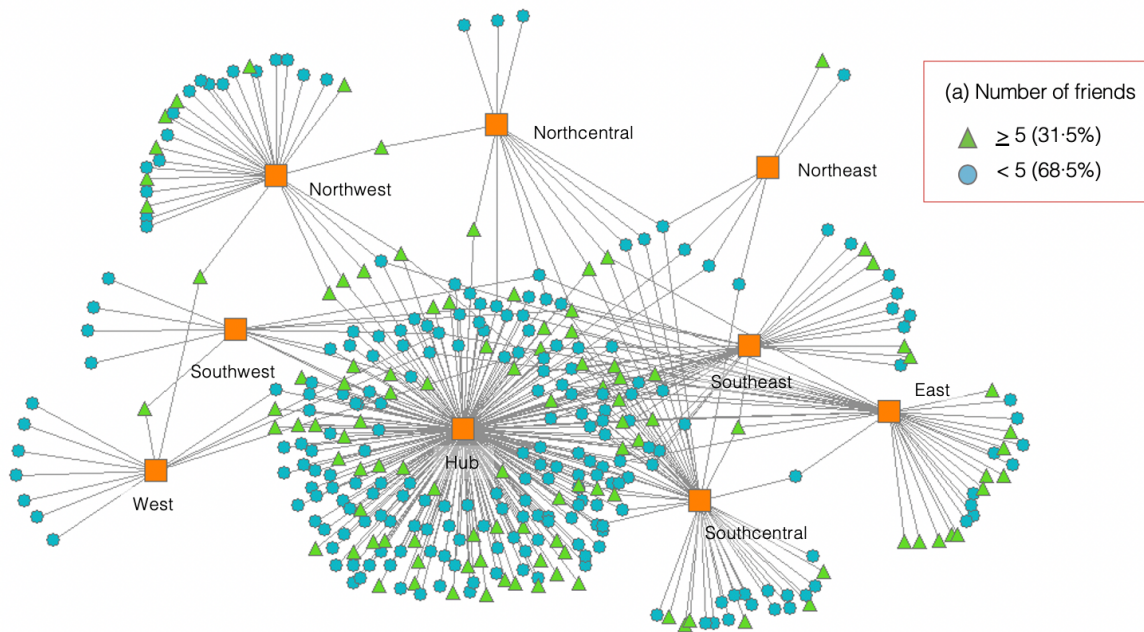
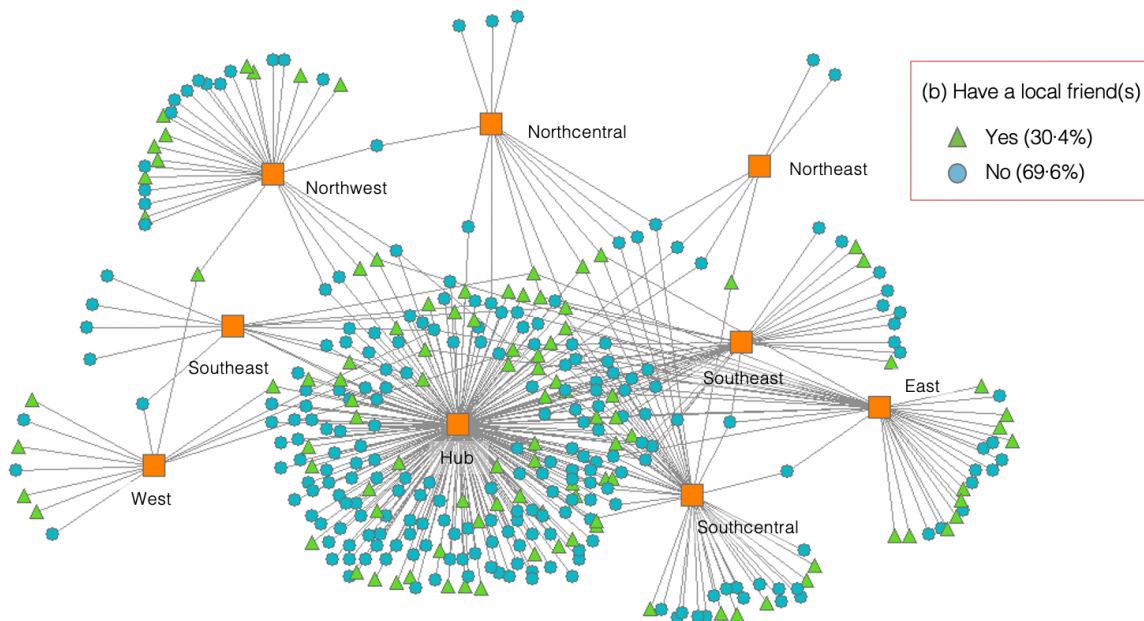**Figure 4.1. Friends of migrant workers**

Figure 4.2. Friends of local Singaporean

Figure 5 (b): Social ties with local Singaporeans
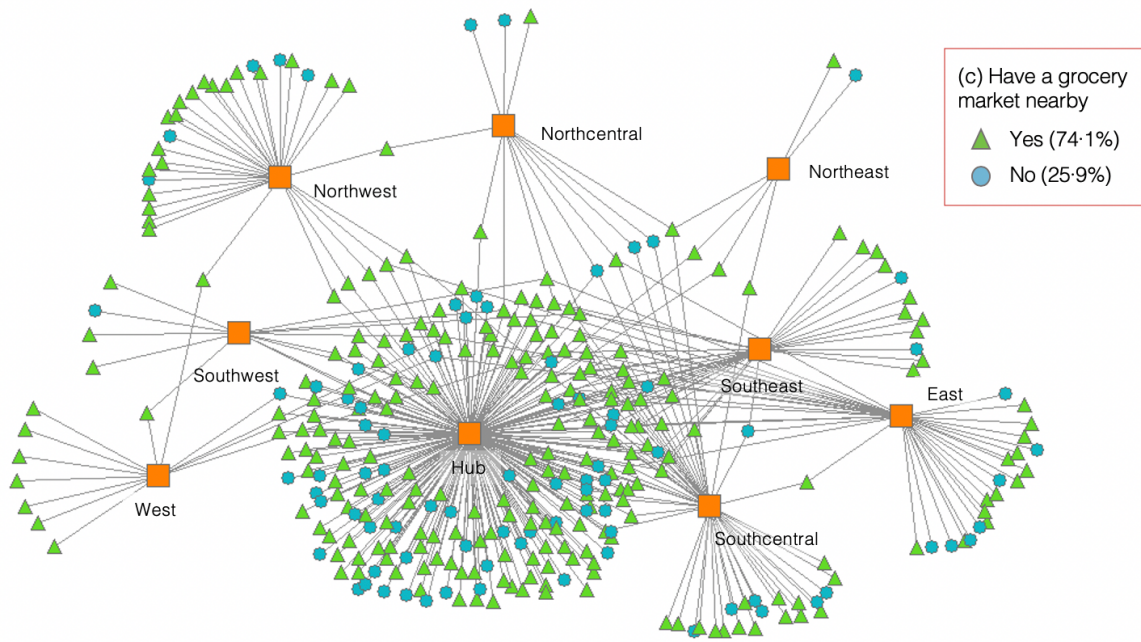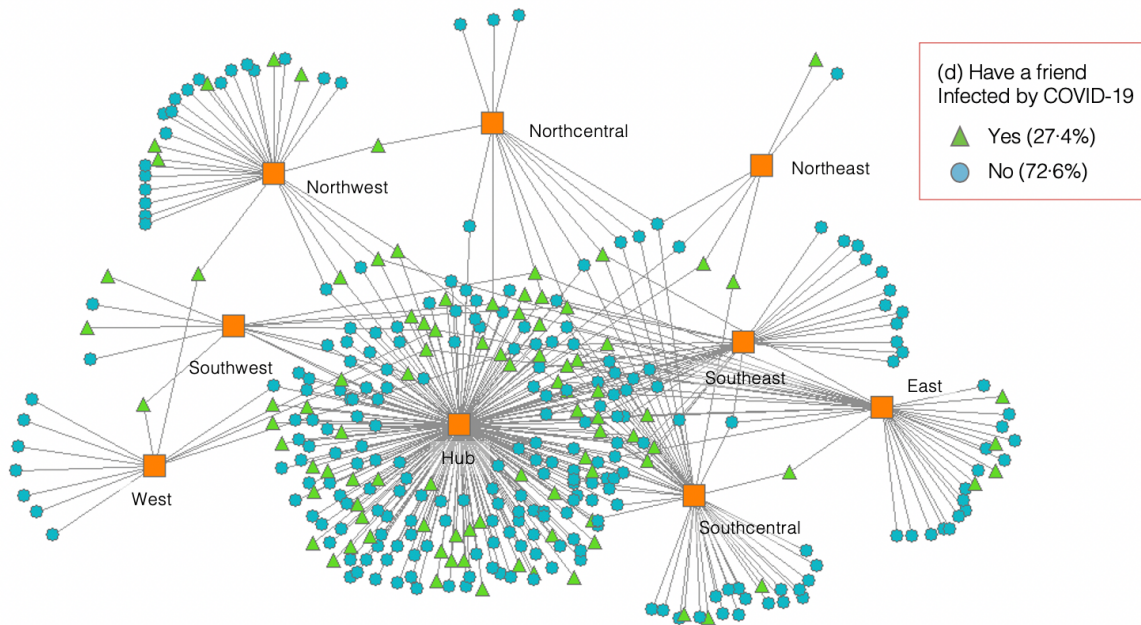
Figure 4.3. Have a supermarket nearby

(c) Have a grocery market nearby
▲ Yes (74·1%)
● No (25·9%)

Figure 4.4. Have a fiend(s) infected with COVID-19

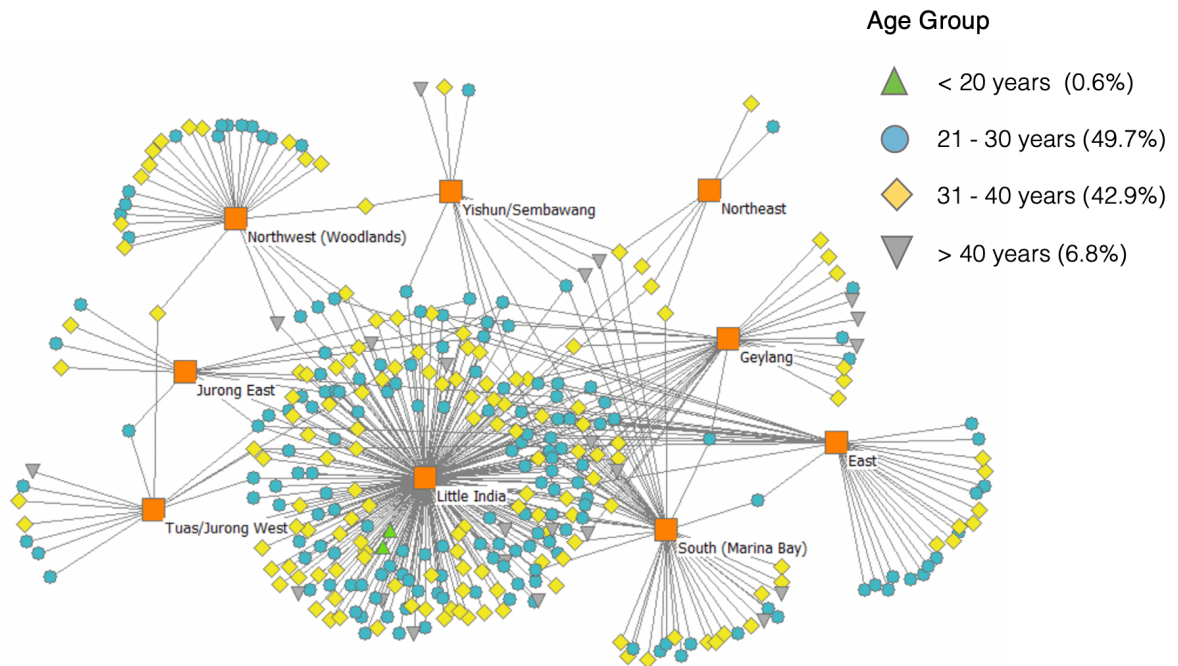(d) Have a friend Infected by COVID-19
▲ Yes (27·4%)
● No (72·6%)

Figure 4.5. Age

Figure 4.6. Years of working in Singapore