

Introduction

Cross-border movement of human speed up the transmission of multidrug-resistant organisms (MDROs), with high-income regions likely to be the recipients [1]. Such transmission has been characterized by a rise in prevalence and diversity of MDROs since 2020 [2]. The abundance of MDRO in non-host populations [3] highlighted the need to study the MDRO epidemiology among inbound visitors.

Aim

This study aims to estimate the prevalence of MDROs harbored by inbound visitors of Hong Kong, an international travel hub.

Methods

In 2024, a cross-sectional study was conducted among inbound travelers. Subjects were recruited by mass recruitment among new exchange students at a local university, distributing promotional leaflets, and onsite recruitment at designated hotels and university hostels in Hong Kong.

Subjects completed a self-administrated questionnaire and provided stool, for screening of extended-spectrum β-lactamase–producing Enterobacteriaceae (ESBL-E) and carbapenemase-producing Enterobacteriaceae (CPE), and nasal samples, for screening of methicillin-resistant Staphylococcus aureus (MRSA).

Result

There were 300 subjects with a nasal sample (**Table 1**).

Table 1. Characteristics of subjects and their association with MDRO carriage

Characteristics	Subjects with a nasal sample (N=300)		Subjects with a stool sample (N=64)		
	Number (%)	<i>P</i> ^a (MRSA)	Number (%)	<i>P</i> ^a (ESBL-E)	<i>P</i> ^a (CPE)
Female	191 (63.7)	1.00	35 (54.7)	1.00	0.75
Age (years)		0.79		0.45	0.74
18-39	268 (89.3)		56 (87.5)		
40-59	15 (5.0)		5 (7.8)		
60 or above	17 (5.7)		3 (4.7)		
Duration of stay in Hong Kong (days) ^b		0.70		0.06	0.85
1-3	49 (16.3)		3 (4.7)		
4-7	76 (25.3)		11 (17.2)		
8-14	11 (3.7)		3 (4.7)		
15-28	30 (10.0)		11 (17.2)		
>28	131 (43.7)		34 (53.1)		
Travel from ^c		0.68		0.66	0.75
China	107 (35.7)		20 (31.3)		
South/southeast/west Asia/Africa	36 (12.0)		4 (6.3)		
East Asia	33 (11.0)		11 (17.2)		
Europe/North America/Oceania	124 (41.3)		28 (43.8)		
Travel Purpose ^d		0.36		0.08	0.44
Sightseeing	112 (37.3)		10 (15.6)		
Non-sightseeing	155 (51.7)		42 (65.6)		
Multi-purpose	25 (8.3)		6 (9.4)		

^a Fisher-exact test to compare the difference in the carriage prevalence among subgroups

^b Missing data from 3 subjects with a nasal sample and 2 subjects with a stool sample

^c Missing data from 1 subject with a stool sample

^d Missing data from 8 subjects with a nasal sample and 6 subjects with a stool sample

Results (continued)

Majority were <40 years (89.3%, 268/300), and from Europe/North America/Oceania (41.3%) or China (35.7%). They usually stayed in Hong Kong for ≤7 days (41.7%) or >28 days (43.7%). Half of them (51.7%) visited for non-sightseeing purposes.

There were 64 subjects with a stool sample (**Table 1**), who usually had a longer period of study in Hong Kong (≥15 days: 70.3%, 45/64). The carriage prevalence of MDROs are in **Table 2**.

Table 2. Prevalence of carriage of MDROs among inbound travelers

	MRSA	ESBL-E	CPE
Prevalence	1.3% (4/300)	65.6% (42/64)	6.3% (4/64)

ESBL-E prevalence marginally varied by travel purposes (p=0.08) and duration of stay (p=0.06) (**Table 1**).

Conclusion

This study extrapolated existing findings about the risk of MDROs imported by migrants [3] to that by travelers. Here, inbound travelers exhibited higher colonization rates than the general community in Hong Kong for ESBL-E (65.6% *versus* 43.4-54.8%) and CPE (6.3% *versus* 0.5-2.13%) [4,5]. This implied the risk of MDROs attributable to visitors should be factored into public health policies globally. Risk-based strategies, such as screening for visitor arrivals from hotspots, may identify high-risk carriers without overwhelming current infrastructure.

References

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