

Public Transport in the era of COVID-19:

Comparison of infection prevention and control measures taken by Malaysia, China and Singapore

ZY Ang¹, KY Cheah², AS Jailani¹, M Chan¹, YL Kong¹, S Sararaks¹
1. Centre for Health Outcomes Research, Institute for Health Systems Research, Ministry of Health, Malaysia.
2. Centre for Clinical Trial, Institute for Clinical Research, Ministry of Health, Malaysia.

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Introduction

This study compared the infection and prevention control measures in domestic public transport (urban bus and urban train, taxi / e-hailing services) in Malaysia, China and Singapore during the COVID-19 outbreak.

Methods

- Documents dated 1st Jan 2020 - 3rd May 2020 were searched from:
 - each country's Ministry of Health (MOH) & Ministry of Transport (MOT) websites
 - Proquest (Malaysia local online newspapers)

- Data was categorised according to "World Health Organisation guideline on Management of ill travelers at Points of Entry - in the context of COVID-19 outbreak" and additional domains (if needed).

- Case occurrence in each was mapped according to days from first 100 confirmed cases.

Results

- Public tranport IPC measures adopted by these countries during *cordon sanitaire* period could be categorised into five domains and 13 subdomains (Figure 1).

- For taxi / e-hailing services, only Malaysia enforced the need for social distancing. Ventilation procedures was required in Singapore and China guidelines for the studied modes of transportation.

- Malaysia and China released the first transportation guidelines 10 and 5 days respectively **after** the first 100 confirmed cases, while Singapore released the guidelines 17 days **before** the first 100 cases (Figure 2).

Discussion & Conclusion

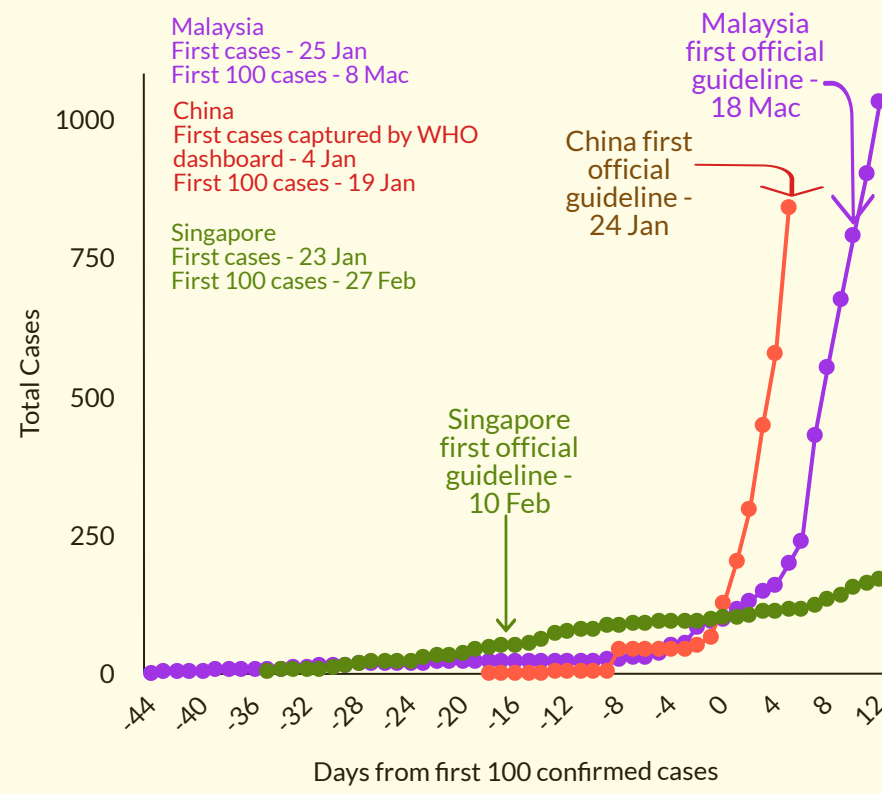
- The differences in the approach taken by the three countries could be due to contextual variation in country demographics, outbreak scale and infrastructure.

- Singapore proactively implemented infection prevention and control measure on domestic public transport when the total confirmed in the country was still relatively low.

- Relevant authorities could consider regulating the ventilation procedures in domestic public transport.

- The IPC measures served as a useful reference for Malaysia in developing and updating public transport IPC guidelines.

Figure 2. Case occurrence in each country mapped according to days from first 100 confirmed cases * #



* Figure 2 based of data reported to WHO. Day of first 100 confirmed cases was set as Day 0.
Data range was selected based on relevant events:
1. Malaysia - 1 Jan to 20 Mac
2. China - 1 Jan to 24 Jan
3. Singapore - 1 Jan to 10 Mac

Abbreviations:
CDC - Center for Disease Control and Prevention;
FAQs - Frequently Asked Questions
IPC - infection control and prevention;
LTA - Land Transport Authority Singapore;
MCO - Movement Control Order;
NEA - National Environment Agency Singapore
PPE - Personal Protective Equipment;
PTC - Public Transport Council Singapore;
SOP - Standard Operating Procedures

Notes for Figure 1.
V - Vehicle
Station;
Urban / Stage Bus;
Urban Train;
Taxi / e-hailing services;
or P - Passenger;
or D - Staff / Driver;
- Not mentioned;

Figure 1. Comparison of Responses: Urban / Stage Bus, Urban Train & Taxi / E-hailing Services					
Domain	Subdomain	Mode of transport	Malaysia Conditional MCO (after 4 May)	Hubei, China Lockdown lifted (after 25 Mar)	Singapore Circuit Breaker (after 7 Apr)
1. Detection of ill travellers or staff	1.1 With symptoms - cough, sneezing, etc.	Bus & Train	Not allowed if symptomatic Screened before work daily	✗	✗
		Taxi	Not allowed if symptomatic Checked daily before duty	✗	Provide mask for those unwell and without mask Not allowed to drive if unwell
		Bus	Not allowed if feverish Checked daily before duty	Monitor at station Station - once / 4 hours Vehicle - once / trip	Monitor at station Monitor regularly
		Train	Not allowed if feverish Checked daily before duty	Monitor at station Station - once / 4 hours	Monitor at station Monitor regularly
	1.2 Temperature screening	Bus	Not allowed if feverish Checked daily before duty	✗	✗
		Train	Not allowed if feverish Checked daily before duty	1 time before first departure, 1 time after ending service	Monitor daily
		Taxi	Not allowed if feverish	✗	✗
		Bus & Train	MySejahtera mobile app. (health assessment & contact tracing)	Mobile app. digital health code / health access card (contact tracing)	TraceTogether & Safe Entry mobile app. (contact tracing)
	1.3 Health assessment/ self reporting (physical/digital)	Bus	✗	✗	✗
		Train	✗	✗	✗
		Taxi	✗	✗	✗
		Bus & Train	✗	✗	✗
2. Reporting of suspected cases	2.1 Refer exposed cases for further treatment	Bus	Stop duty if symptomatic	Seek medical attn. if unwell	Seek medical attention if fever Report to supervisors & see doctor if unwell
		Train	Stop duty if symptomatic	Temporary isolate and Refer medical treatment if > 37.3C. Seek medical attn. if unwell	Seek medical attention if fever Report to supervisors & see doctor if unwell
		Taxi	✗	✗	✗
		Bus & Train	✗	Disinfect bus & station under CDC guide if positive case detected	✗
	2.2 Communicate alerts with CDC	Bus	✗	✗	✗
		Train	✗	✗	✗
		Taxi	✗	✗	✗
		Bus & Train	✗	✗	✗
3. Isolation and management of suspected cases	3.1 Isolation and management of suspected cases	Bus	✗	✗	✗
		Train	✗	Set up temporary isolation area for suspected case	✗
		Taxi	✗	✗	✗
		Bus & Train	✗	✗	✗
	4.1 Availability or wearing of PPE - masks	Bus	P & D - to wear mask P & D - to wear mask	P & D - to wear mask P & D - to wear mask	P & D - to wear mask P & D - to wear mask
		Train	P & D - to wear mask	P & D - to wear mask	P & D - to wear mask
		Taxi	✗	✗	✗
		Bus & Train	✗	✗	✗
	4.2 Availability or use of hand sanitizers	Bus	P & D- provided at counters, gates & platforms	P & D -provided at public facilities at station	Provided at all bus interchanges
		Train	Before boarding and after alighting the vehicle. Before loading and after unloading passengers	To equip with sanitisers	Provided by taxi operators
		Taxi	✗	✗	✗
		Bus & Train	✗	✗	✗
4. Disease prevention	4.3 Frequency of cleaning or sanitisation	Bus	Disinfect 8-hourly Disinfect after each trip & operation hour	Disinfect hourly Disinfect after each trip	Disinfect 2- hourly Daily. Additional disinfection weekly
		Train	Disinfect 8-hourly. Toilet 3-hourly Disinfect after operation daily	Disinfect hourly Disinfect 4-hourly & after operation daily	Disinfect 8- hourly Disinfect daily
		Taxi	✗	Disinfect 4-hourly in high-risk area.	✗
		Bus & Train	✗	✗	✗
	4.4 Social distancing measures	Bus	Cashless / automated ticket. 1 meter social distance. 50% capacity. 1 meter social distance.	Cashless ticket. ≤ 4 people/m2 ≤ 4 people/m2	Social distancing marking Social distancing marking
		Train	Cashless / automated ticket. 1 meter social distance. 50% capacity. 1 meter social distance.	≤ 50% max passenger load ≤ 50% max passenger load	Social distancing marking Social distancing marking
		Taxi	≤ 50% max passenger load	✗	✗
		Bus & Train	✗	Continuous ventilation Open windows or air condition with external circulation mode	Clean ventilation systems regularly ✗
	4.5 Ventilation measures	Train	✗	Continuous fresh air ventilation mode Max uninterrupted ventilation	Clean ventilation systems regularly ✗
		Taxi	✗	After boarding	Max. uninterrupted ventilation
		Bus	Regularly announce IPC advisory. To obey driver's instructions.	Education in station and vehicle through radio, poster & video	Advises to practise social distancing & correct cough etiquette.
		Train	MOT provides FAQs	National Health Commission and MOT provides guidelines	MOH, LTA, PTC & NEA provides guidelines

5. Risk communication

5.2 Having SOP for IPC measures