

SARS


– Environmental Issues



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Questions

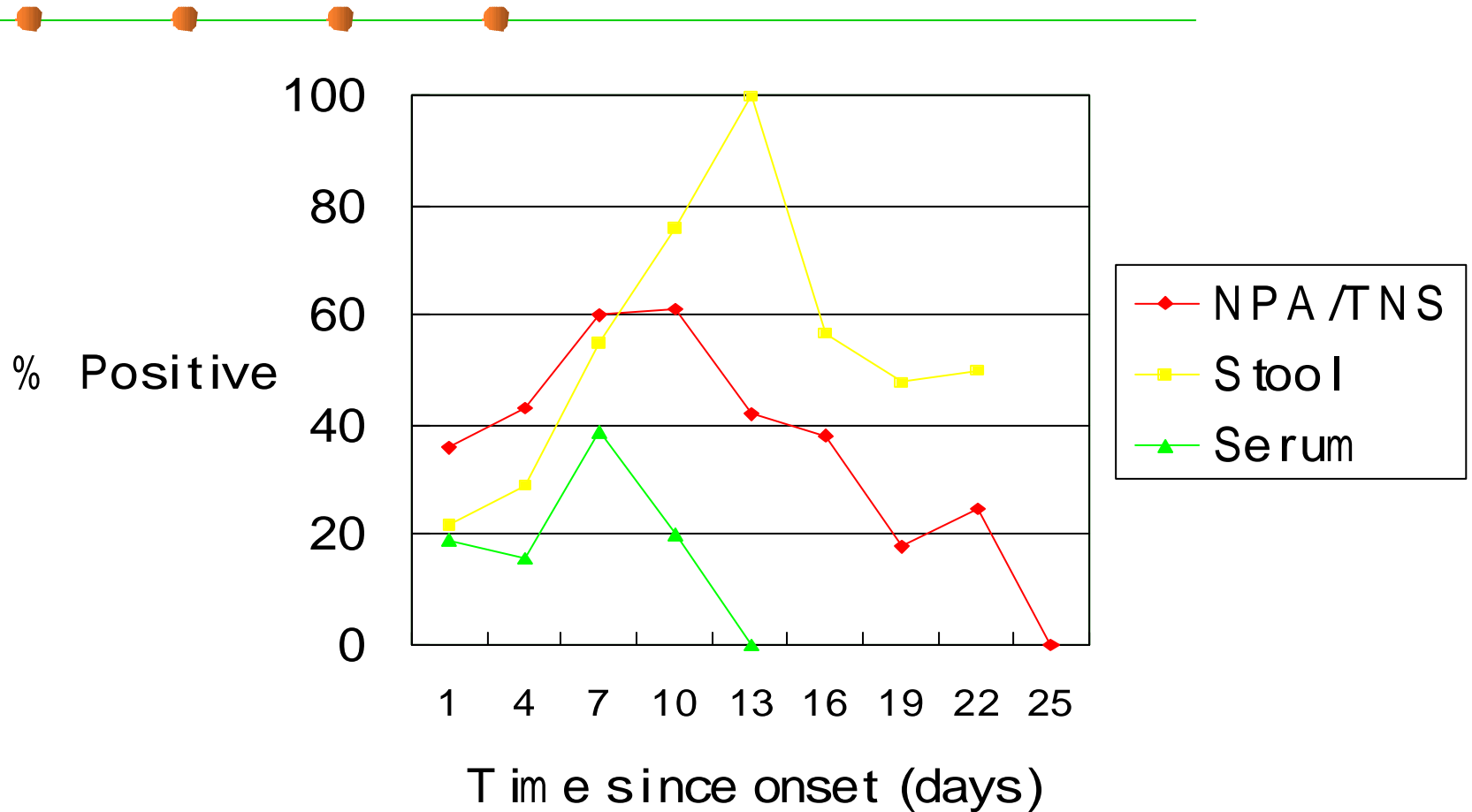
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- What role does the environment play in SARS transmission in the community?
 - How do we tackle environmental issues to minimize SARS transmission?

Stability of SARS CoV on surfaces


(J Tam et al, CUHK)

	In TC Medium	In Stool
Glass	72h	96h
Formica	36h	72h
Stainless steel	36h	36h
Cotton cloth	12h	24h
Paper file Cover	24h	36h

Virus Excretion (W Lim, DH)



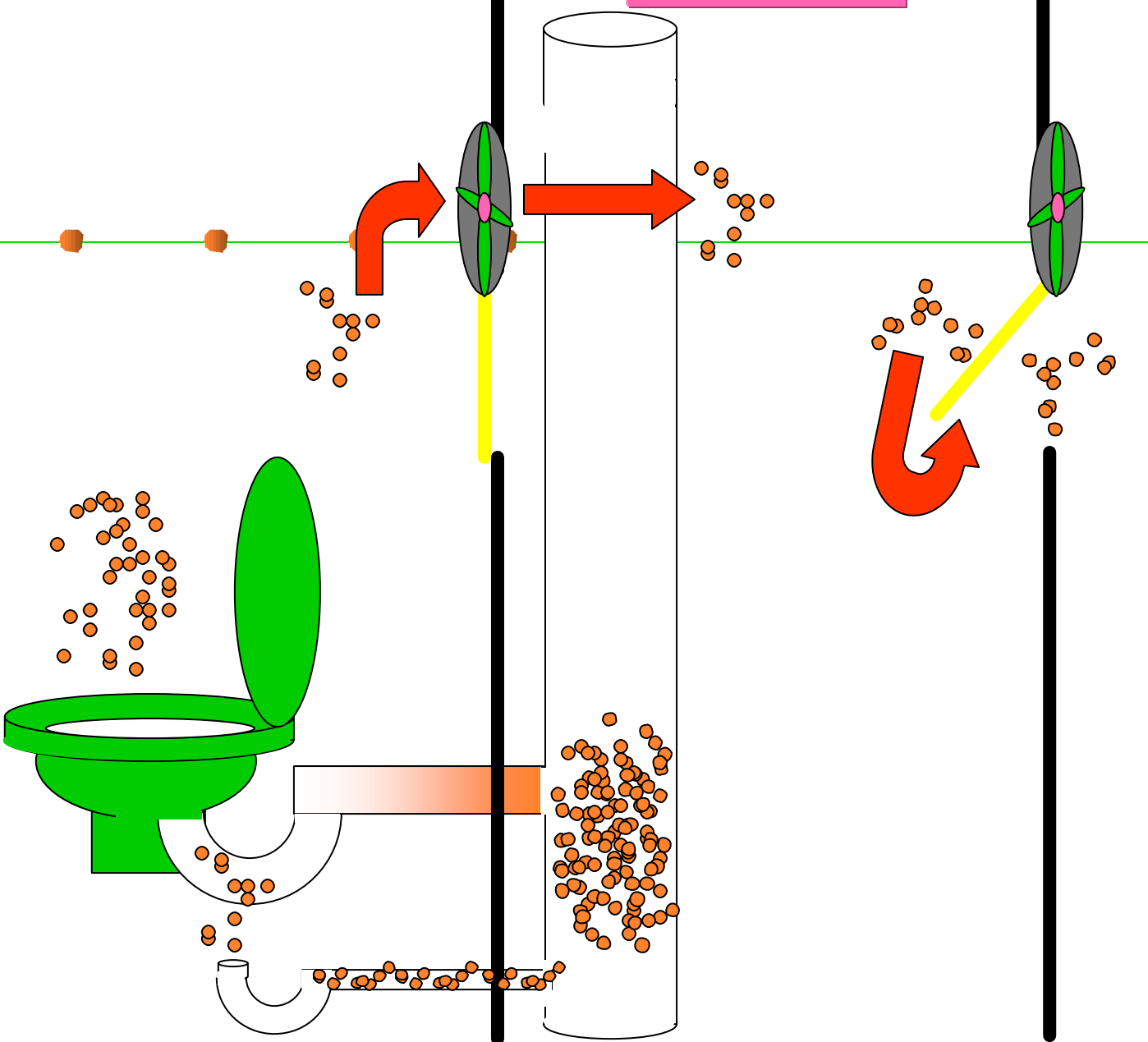
Hotel M

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- Guangzhou visitor came to HK, onset Feb 15, subsequently died of SARS
 - Lived in 9/F, Room 911, Hotel M during Feb 21-22
 - As of June 12, 2003, 16 probable / suspect SARS cases associated with hotel M

Hotel M SARS transmission

							939		0/5							
									938							
							937			936						
							935			934						
							933			932						
Stairs	902	904	906	908	910	Lifts		Stairs		922	924	926	928	Stairs		
	0/2	0/5	0/9	0/7	0/2	0/7	Lifts			Freight lift						
0/13																
0/2	0/2	0/2	0/7	0/7	0/10	0/7	0/11									
901	903	905	907	909	911	915	917	919	921	923	925	927	929	931		

Re-entrant



Positive environmental samples (RT-PCR), Amoy Gardens

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- Toilet rim (case flat)

 - Cockroaches
 - Surface swab
 - Gut


 - Rodent droppings

 - Cats/dogs throat and anal swabs

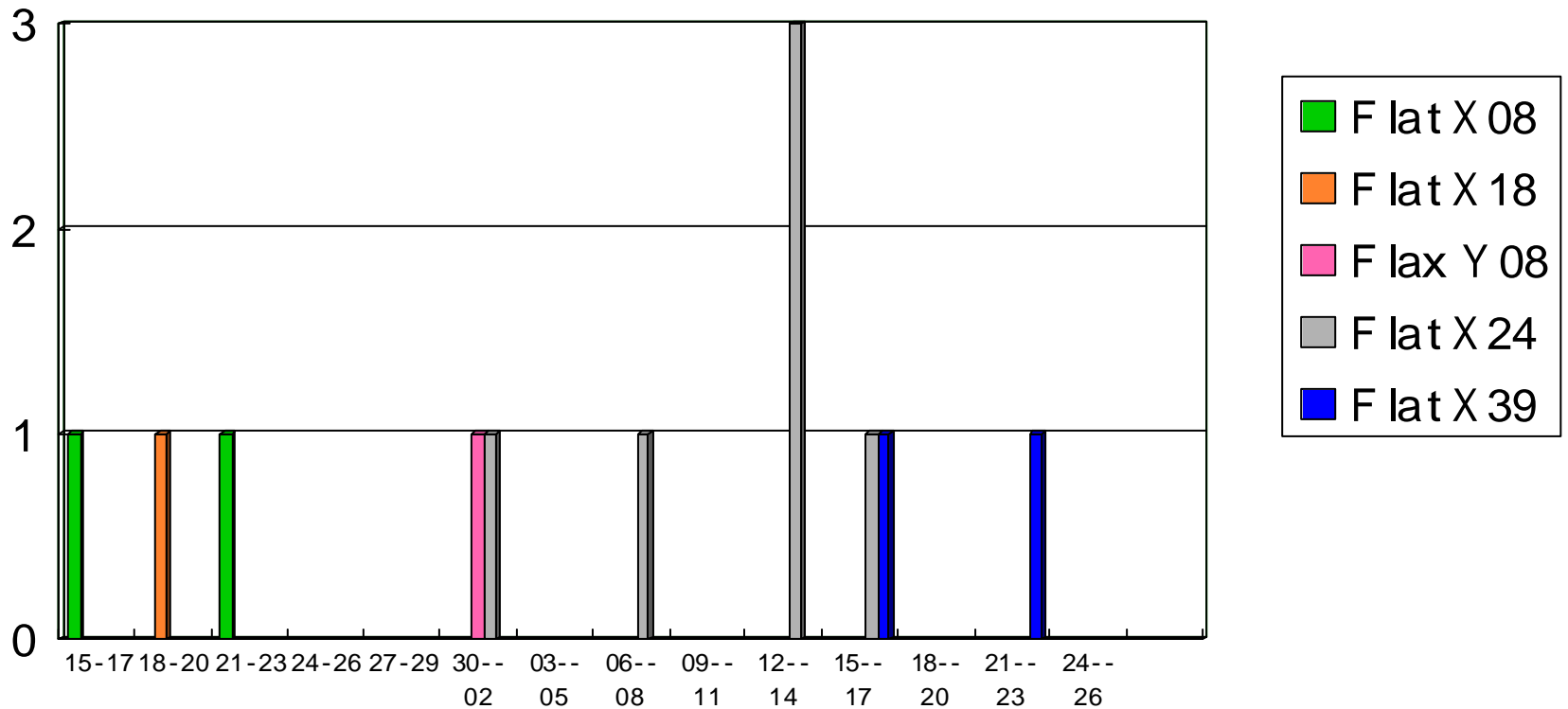
Other buildings with multiple SARS cases

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- Hing Tung Hse
 - Wing Shui Hse
 - Koway Court

Positive environmental samples (RT-PCR), Hing Tung House

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- 0/39 inside case units
 - 0/31 in light well
 - 1 positive sample on soil stack on roof top


Wing Shui House



Positive environmental samples (RT-PCR), Wing Shui House

- Case units and common areas
 - No positive samples
- 2 units adjacent to case unit – positive samples on:
 - Toilet floor
 - Internal surface of balcony window
 - Wall between kitchen and toilet


Environmental investigation

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- Multi-disciplinary Rapid Response Team
 - Led by Dpt of Health – epidemiology
 - Housing Dpt, Buildings Dpt – buildings, drainage
 - Food & Environmental Hygeiene Dpt – pests control, garbage disposal, disinfection
 - Environmental Protection Dpt – ventilation, gross environmental factors
 - Electrical & Mechanical Service Dpt – engineering

Inactivation by disinfectants (W Lim, KH Chan, JSM Perirs)

- SARS CoV is completely inactivated by ≤5 min of exposure to
 - 75% ethanol
 - 2% phenol
 - Hypochlorite (500ppm available chlorine)
 - Household detergent

Disinfection & disinfection

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- Guidelines on household disinfection
 - 1:99 hypochlorite for routine disinfection
 - 1:49 hypochlorite for case flats
 - Disinfection of sewage system
 - Elimination of rodents and cockroaches
 - Proper garbage disposal


Lessons and conclusions

- WHO position still holds
 - The major mode of transmission of the SARS virus is through close person contact, in particular exposure to droplets of respiratory secretions from an infected person
 - Contamination of inanimate materials or objects by infectious respiratory secretions or other body fluids (e.g. saliva, tears, urine and feces) may play a role in disease transmission


Lessons and conclusions

- SARS transmission via fecal droplets is uncommon but can result in large outbreak if given the right combination of circumstances
 - Predisposing factors: dry U-traps, interruption of toilet flushing water, powerful exhaust fan
 - Fecal-oral route not proven but could not be excluded

Lessons and conclusions

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- Fomite transmission probably occurred in some cases
 - Hotel M
 - Wing Shui House
 - Amoy Gardens
 - ? Related to relatively longer survival of SARS CoV
 - Virus genomic fragments can still be detected in carpet despite intensive disinfection

Lessons and conclusions

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- Environmental investigations generally have low yield in positive swab samples using RT-PCR
 - Positive samples are sometimes found in non-affected flats
 - Rodents and cockroaches can play the role of passive carrier, but definitive transmission via these pests has not been proven.

Lessons and conclusions



- Multidisciplinary response team is useful in investigating structural factors in buildings that possibly give rise to cases
 - Epidemiologist
 - Buildings experts
 - Engineers
 - Disinfection team
 - Pest control experts
- Disinfection may help to reduce fomites and secondary cases



Thank you