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THE UNIVERSITY OF HONG KONG
FACULTY OF MEDICINE

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CONFIDENTIAL

July 9, 2003

Mr. Ronald Arculli
Chairman, HA Review Panel on SARS Outbreak
c/o Hospital Authority
4/F, Hospital Authority Building
147B Argyle Street
Kowloon

Dear Mr. Arculli,

Submission to HA Review Panel on SARS Outbreak

Enclosed please find a submission by the Faculty of Medicine. We wish to stress that the comments are meant for the future good of the community, and should not be regarded as adverse remarks made against rival institutions, a notion which our critics apparently believe in. In fact, the Faculty has been criticized for trying to make anti-SARS heroes into SARS culprits. These criticisms have unfortunately inhibited many professionals and Faculty members from making comments for the good of the common large, thereby denting the accountability of Hong Kong.

We wish to draw the Committee's attention to the existence of a culture within the government and public system, consciously and unconsciously, of appeasement, face-saving, which is a Chinese characteristic, and political balancing. This is particularly obvious in the distribution of resources. In a crisis situation, this could make Hong Kong unresponsive.

HA does not appear to accept, at least openly, that there is a variability in the standard of service delivered by its various hospitals. Hospitals do vary in standard, attitude, policy, political concerns, e.g. that a certain measure may cause undue alarm to the public, or that individual's rights such as the right to visit the sick must be respected. This would affect central HA planning and policy, and individual hospital's response to crisis management.

The Faculty regards this review as a means to do forward planning to prevent and contain any SARS outbreak in the future, and will be happy to discuss further with the Panel on the issue.

Yours sincerely,

Professor S.K. Lam
Dean

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Submission by the Faculty of Medicine of The University of Hong Kong to the SARS review panels

The ultimate objective of any postmortem examination is to find out the cause of death, learn from it, and come up with ways to prevent a similar happening in future.

The following are some hard facts regarding SARS in Hong Kong.

1. Corona Virus Pneumonia is a disease completely new to man. Hong Kong is one of the hardest hit cities, with over 1,700 confirmed cases and nearly 300 deaths. The SARS epidemic in Hong Kong came under control in two and a half months. Hong Kong introduced temperature check at the border, and was able to confine the disease within the city limits. The innovative temperature check was copied by the rest of the world, and helped to abort a world epidemic.

2. The utter professionalism displayed by frontline healthcare workers particularly in hospitals worst hit by SARS such as PWH and UCH will make a place in the history of Hong Kong. This Faculty salutes them.

3. There is one special feature of this deadly infection: the disease starts in the community, but because of the physical sufferings, the patients always end up in a hospital. If the hospital's infection control is faulty, there will be a hospital outbreak, and if the outbreak is not contained, the infection goes back to the community. A community outbreak ensues and a community-hospital vicious cycle is then established, amplifying the spread. A key to stop the spread in a hospital is isolation, and the earlier the isolation is installed - isolation of beds, isolation of a ward, isolation of a floor, isolation of a building, and even isolation of a hospital, as the severity of the spread demands - the fewer the number of lives lost.

4. Figure 1 is taken from a report by Professor Moira Chan and her colleagues in the British Medical Journal (attached). It shows that each of five regional hospitals in Hong Kong admitted at least one index case in early March. One hospital did not spread the disease to medical staff; one hospital eventually did so when it was overwhelmed with new admission cases. Two others had a small outbreak involving hospital staff, which was soon controlled. Prince of Wales Hospital (PWH) developed a large outbreak, involving 168 medical staff, medical students, patients and visitors, failed to contain it, and resulted in a community outbreak, completing the vicious cycle described earlier.

5. As shown in Figure 2, the disease spread to Amoy Gardens, and to other hospitals and their vicinities, including United Christian Hospital, Tuen Mun Hospital, Princess Margaret Hospital, Nethersole Hospital and the North District Hospital.

6. As shown in Figure 1, at Queen Mary Hospital (QMH), four simple infection-control measures were started from the outset: droplet prevention, patient isolation, patient triage, and no visiting. During the whole epidemic, two hospital staff were infected, and both infections were due to an environmental error, which was immediately corrected. Hospitals, that were late in installing these measures, suffered more hospital-acquired infections (Figure 1). Two other measures at QMH are worth mentioning. The professors and senior staff, and not the junior staff, were the major frontline workers, because they realized that this was a deadly and totally new disease so that sending clinically inexperienced doctors to the frontline would only expose them to great risk. Every day, a team headed by a professor or senior staff went round the general wards to screen and transfer out any possible SARS case, to minimize the spread of SARS to the other patients and staff.

What were the reasons for hospitals, especially the PWH, for not instituting these four basic infection control measures early in the course of the outbreak?

There could be four possibilities.

1. Defect in knowledge and training in basic hospital infection control.
2. Underestimating the significance of the initial outbreak.
3. Too much misdirected political consideration so that the interest of the community at large was missed, e.g. worrying about causing "undue" alarm to the public, concern for individual's rights such as the right to visit the sick.
4. Mismanagement, e.g. low index of suspicion, non-vigilance, indecisiveness, negligence, incompetence at the management level.

Solution: (1) Enhance the flow of information between HA, DH and the two medical schools, as a short-term measure. (2) Centre for Disease Control and Prevention, which has facilities for surveillance and statutory power to intervene, as a long-term measure.

Why did the infection of hospital staff continue to occur for so long despite the availability of protective gears?

There could be several possibilities.

1. Staff became less vigilant in the face of relatively high workload and long working hours.
2. Education and training of staff in infection control measures were not vigorous enough.
3. Inadequate understanding of infection control, e.g. instead of degowning at the exit of an infected area, the protective but then "dirty" gowns were worn even in canteens (pictures shown by Professor Joseph Sung during his talks), spreading the infection to other staff.

4. Enforcement of infection control measures was inadequate and not strict enough.
5. Failure to detect less symptomatic patients nursed in general wards. Note that asymptomatic carriers have not yet been documented.
6. Wrong gear

The good work at the QMH and PYH was apparently seldom referred to, for example not in the HA Board Meeting minutes, and Dr. Szeto Wing Hong and Dr. Raymond Yung, the consultants responsible for the success in these hospitals (through vigorous control, vigilance, education and training), were not formally consulted, and were approached for advice late in the course of the outbreak. This could have delayed the eventual control of the spread of the infection to staff in many of the hospitals.

There could be several explanations.

1. The success at QMH or PYH was not known.
2. HA was worried that appreciation might reveal the high variability in standards of the various hospitals.
3. Hospital rivalry and pride prevented individual hospitals from consulting each other.
4. HA management considered it politically unwise to ask QMH or PYH to advise other hospitals e.g. PWH.

Solution: Intensive training, persistent education, and vigorous enforcement of control measures

To properly manage an epidemic, it is obviously important to know what the epidemic is due to. After the discovery of the Coronavirus as the probable cause by The University of Hong Kong (HKU) microbiologists, the university made the virus available to all researchers in the world including the Chinese University of Hong Kong (CUHK), and sought to understand what the outbreak in PWH, which at the time had 70% of the cases in Hong Kong under their charge, was due to, by asking PWH to share their patient specimens with them. This had not happened despite intervention by the Department of Health and by Dr. E.K. Yeoh, who then had to manage an epidemic without knowing what 70% of it was due to. This uncertainty could have slowed the Bureau to adopt correct measures to control the epidemic.

There could be several explanations.

1. CUHK/PWH worried that their research results could be proven wrong by sharing their patient specimens with HKU; that is, pride and ego came before the common good of the community.
2. The administration wanted to appease the two rival medical schools; that is, political balancing came before the common good of the society.

3. The management was weak, which meant that orders were not followed, let alone executed.

Solution: The culture of face-giving and political balancing is to be turned into a culture of appreciation and recognition of good performance.

Conclusions:

1. *The government, while slow in the initial period of the outbreak, did an excellent job in controlling the epidemic.*
2. *Hospitals varied widely in standard, attitude, and policy as well as the practice of infection control.*
3. *Political balancing, as practiced in Hong Kong, is detrimental. This would be counter productive to making Hong Kong competitive and puts patients/community at risk.*

July 10, 2003

Notes:

Figure 1 shows the number of new cases of SARS arising from hospital staff (solid bar), and from the community (open bar) each day from February 22nd to April 12th 2003.

* indicates the timing of admission of first index case admitted to each hospital.

1 = timing of implementation of infection control policy for "Droplet precautions"

2 = timing of establishment of isolation wards

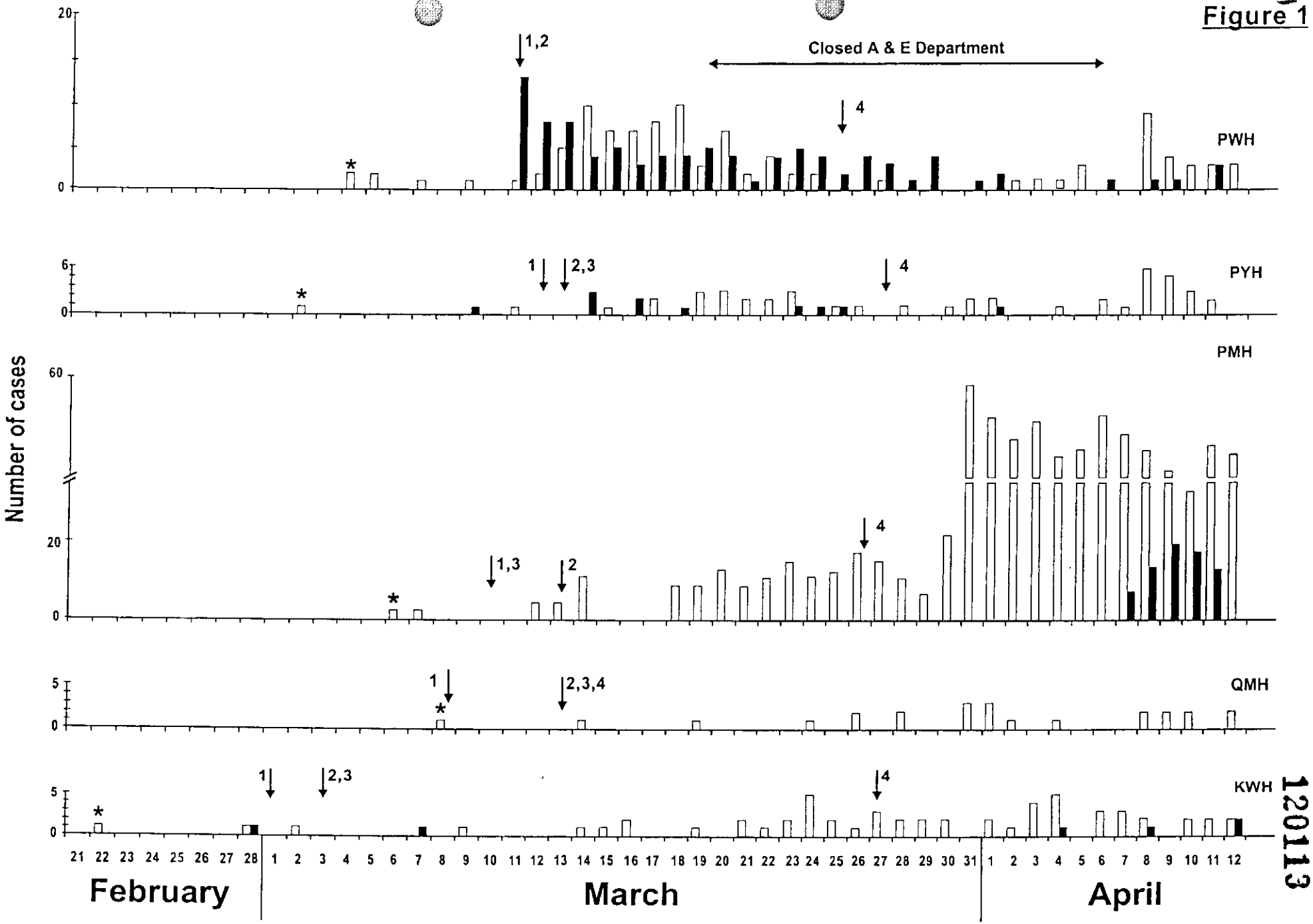
3 = timing of direct admission of definite and suspected SARS patients to separate isolation wards

4 = closure of isolation wards to all visitors.

Note that the contents were reported to BMJ (attached as Annex I)

Figure 2 shows the distribution of the buildings affected by SARS as reported by the Department of Health. Affected buildings aggregate around hospitals with affected staff.

Figure 1



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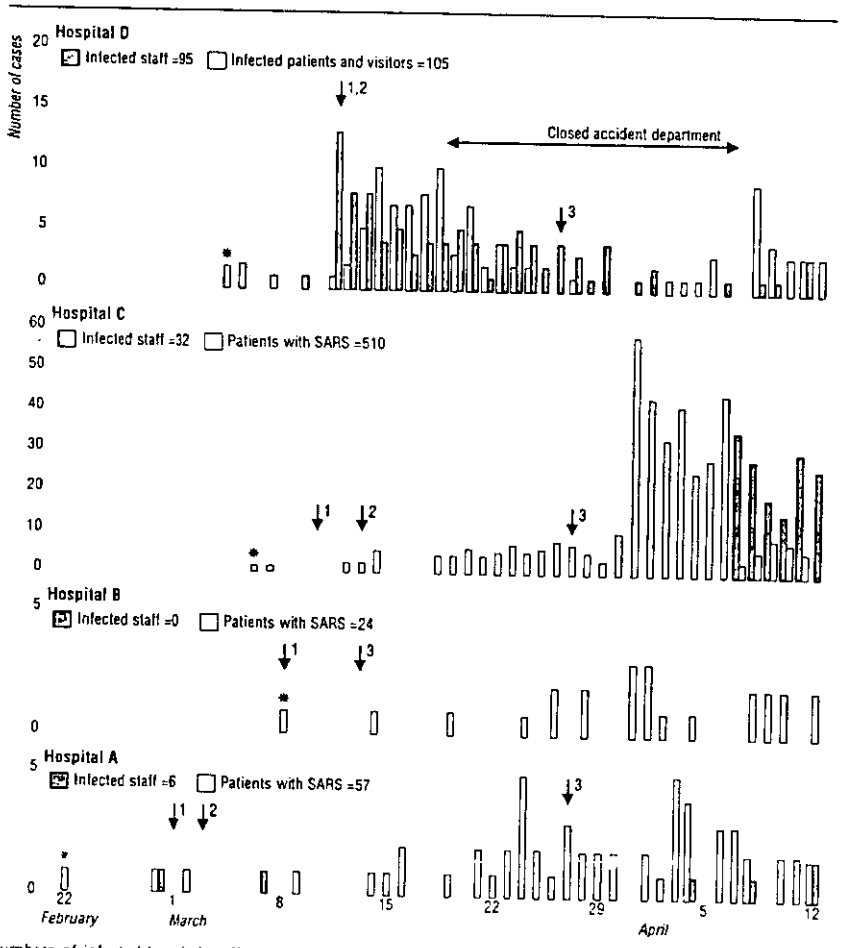
Letters

Severe acute respiratory syndrome

Patients were epidemiologically linked

EDITOR—Severe acute respiratory syndrome (SARS) is a new disease that caught the medical profession in Hong Kong unawares. The causative agent, identified as a new coronavirus, is transmitted by droplets and direct contact.[1,2] Healthcare workers are at high risk, accounting for about one quarter of all cases of SARS in Hong Kong.[3] We here describe the spread of this highly infectious disease between 22 February and 8 March 2003 among the staff in four regional hospitals (A to D) in Hong Kong after admission of the first patient with SARS. These patients were linked epidemiologically.

All hospitals implemented infection control policies for "droplets precaution" and direct admission of probable and suspected cases of SARS to isolation wards within one week. Hospital B closed the isolation wards to visitors on 12 March and other hospitals on 26 or 27 March. The figure shows the timing of implementation of various policies and the numbers of infected hospital staff and patients with SARS admitted to each hospital until 12 April.



Numbers of infected hospital staff and patients with SARS admitted daily to each hospital from 22 February to 12 April 2003. *Admission of first index case. 1=implementation of infection control policy for "droplet precautions"; 2=establishment of isolation wards and direct admission of patients with probable and suspected SARS to separate isolation wards; 3= closure of isolation wards to all visitors

We observed five things.

- Admission of the first patient with SARS to a general medical ward (hospital D) together with administration of bronchodilator using a jet nebuliser was associated with infection of a large number of staff, patients, and visitors.
- Direct admission of index patients to intensive care with isolation resulted in very few or no infected hospital staff (hospitals A and C).
- Admission of a large number of patients with SARS in a short period overwhelmed the capacity of hospital C and resulted in infection of staff.
- Early and strict policy of direct admission of patients with probable and suspected SARS to designated wards and fewer admissions for SARS were associated with no staff infection in hospital B.
- Late closure of isolation wards led to infection of visitors and spread of the disease to the community.

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Competing interests: None declared.

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1 Peiris JSM, Lai ST, Poon LLM, Guan Y, Yam LYC, Lim W, et al. Coronavirus as a possible cause of severe acute respiratory syndrome. *Lancet* 2003;361:1319. Published ahead of print on 8 April (www.thelancet.com).
2 Drosten C, Günther S, Preiser W, van der Werf S, Brodt HR, Becker S, et al. Identification of a novel coronavirus in patients with severe acute respiratory syndrome. *N Engl J Med* 2003;348:1967-76. Published ahead of print on 10 April 2003 (www.nejm.org).
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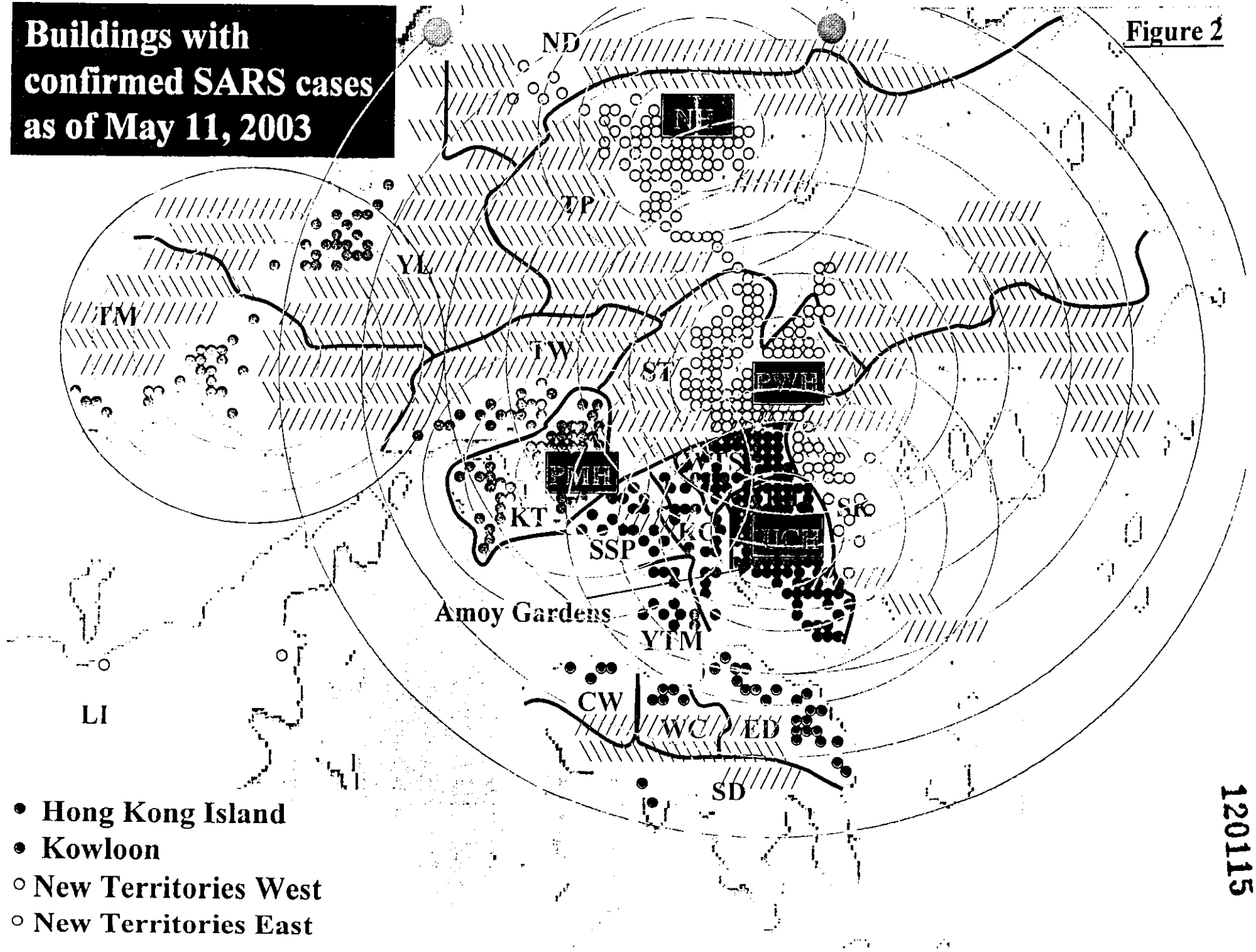
Imported cases of severe acute respiratory syndrome to Singapore had impact on national epidemic

EDITOR—Travel is responsible for the rapid intercontinental spread of the severe acute respiratory syndrome (SARS).[1] Singapore has one of the busiest airports in Asia, with numerous passengers arriving each day from countries affected by SARS, and it is

Buildings with confirmed SARS cases as of May 11, 2003

Figure 2



- Hong Kong Island
- Kowloon
- New Territories West
- New Territories East

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