

**REPORT OF A GASTROENTERITIS OUTBREAK DUE TO
NOROVIRUS AT SHUI OI CONVALESCENT HOME FIRST BRANCH
瑞愛護老院
307-308, 86, WATERLOO ROAD, KOWLOON CITY, KOWLOON**

1. OUTBREAK INVESTIGATION

1.1. Notification of outbreak

The Centre for Health Protection (CHP) of Department of Health (DH) was informed by Queen Elizabeth Hospital (QEH) Community Geriatric Assessment Team (CGAT) in the morning of 4 September 2004 of a cluster of residents of an elderly home (Shui Oi Convalescent Home First Branch 瑞愛護老院) presenting with gastrointestinal symptoms from 1 September.

1.2. Description of the elderly home

Shui Oi Convalescent Home First Branch was a private elderly home with a registered capacity of 34 residents located on the 3/F of a building in Kowloon City. It had 13 staff that included one home manager, three health workers, six care workers, two ancillary workers and one cook. As of 1 September, 31 residents were living in this elderly home (Picture 1 & 2). About half of the residents were mobile while the other half were chair-bound. The kitchen and toilet facilities were located outside the elderly home (Appendix 1 and picture 3).

1.3. Epidemiologic investigation

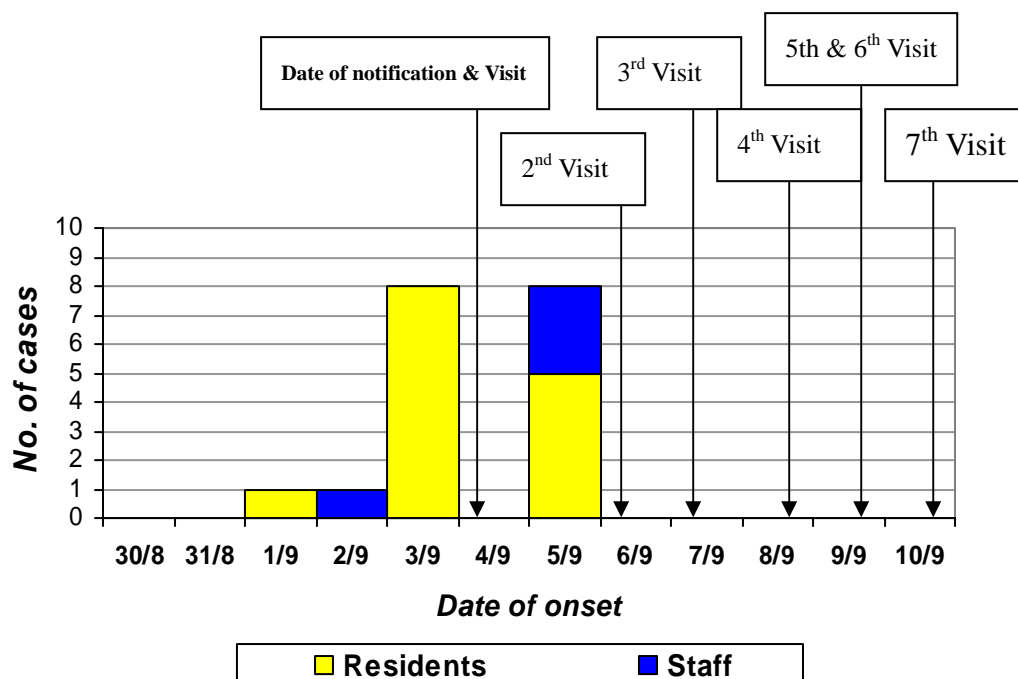
Staff from CHP visited the elderly home in the morning of 4 September and carried out an investigation immediately after receiving the notification. In this outbreak, a case was defined as a resident or staff of the elderly home who had gastroenteritis symptoms, including diarrhoea or vomiting, since 25 August.

As of 10 September, a total of 14 residents and 4 staff met the case definition. They included 16 females and 2 males, age ranging from 36 to 94 years old. Onset dates were from 1 September to 5 September. The predominant presenting symptoms were diarrhoea (13/18) and vomiting (11/18), while a few cases reported nausea (2/18) and abdominal pain (1/18).

Six residents had been admitted to QEH (4) and KWH (2) and three of them

had already been discharged as of 10 September. The other three were in stable condition.

Epidemic Curve



The first case was an 85-year-old female resident who had three episodes of vomiting at her bedside on 1 September. The vomitus contaminated her bedding and clothing and all the contaminated materials were disposed of by a care worker. However, no proper disinfection was carried out after the vomiting incidents. She was admitted to QEH on the same day.

On September 2, a care worker of the home had onset of vomiting and diarrhoea at home and she took sick leave afterwards. On September 3, multiple vomiting incidents on beds occurred in other residents of the elderly home, and these incidents were managed in the same way as the first case. Three other staff, including two care workers and one cook subsequently developed symptoms on 5 September. The floor plan (Appendix 1, drawn by CHP staff) showed the case distribution in the elderly home. The last case had onset on 5 September, one day after CHP’s first visit on 4 September.

The kitchen of the elderly home was not in service since 26 August. The elderly home received food deliveries from the Shui Oi Convalescent Home Second Branch of the same organization located in Kowloon City twice per day since 26 August. The food items were put into containers and were reportedly

consumed immediately upon delivery. Inspection of the food menu since 26 August found no suspicious food item. Inspection was carried out in the kitchen of this Second Branch on 4 September and the food processing and delivery procedures were reviewed. There was no outbreak of gastroenteritis in this elderly home.

1.4. Site inspections and interventions

4 September

Many windows of the elderly home were found to be closed. The toilet facilities of the elderly home were suspended since 26 August due to seepage from the toilet and ownership disputes. The home drew fresh water supply from a plumping system outside the window (Picture 4). The residents used commode chairs and the staff emptied excreta regularly into buckets. These buckets were found to be placed at the corridor outside the elderly home without proper cover. (Picture 5) The buckets were emptied at regular intervals at the staff washroom of the management company, which was located on 5/F of the same building. From 26 August to 29 August, the residents used the bathing facilities of another elderly home located one storey below, on the second floor.

During the site visit, the elderly home was in the process of installing two new toilets inside the elderly home. Elderly home staff informed that the first toilet would be ready for use in the afternoon of 4 September.

Advice on proper disposal of vomitus and stools, disinfection of the whole elderly home, infection control procedures, as well as personal and food hygiene was given to the staff of the elderly home. The elderly home was warned explicitly against the keeping of excreta in buckets, and staff were told to dispose of such excreta immediately.

CHP informed SWD of its initial assessment that a gastroenteritis outbreak, suspected to be due to norovirus, was taking place in the elderly home. SWD was aware of the sewage problem in this elderly home. To ensure that proper systems were in place for sewage disposal, CHP liaised with SWD and the property management of the building concerning the problems in the availability of toilets for use by the home. At that juncture, staff of CHP discussed with SWD about the possibility of relocation of the residents if proper toilet facilities could not be provided in a short time.

CHP also liaised with the property management and Owners Corporations of the building in the morning of 4 September concerning the re-opening of the original kitchen and toilet facilities but was refused due to seepage problems from these facilities.

Subsequently, staff of the elderly home confirmed that a new toilet with tap water supply was installed in the afternoon of 4 September, and a second washroom would be in place within a few days. In accordance with advice rendered by CHP, wastes and feces were properly disposed of immediately, and proper disinfection and infection control procedures were implemented.

5 September

Staff of CHP followed up with the elderly home with phone call for medical surveillance and reinforcement of infection control advice. The new toilet was in use and functioning since the afternoon of 4 September.

6 September

Staff from CHP and SWD jointly visited the elderly home again on 6 September. The ventilation had improved with most windows open. The new washroom was inspected and tap water was available (Pictures 6). No more buckets holding feces were seen in the home.

7 September

A joint team comprising staff of two branches of CHP (Infection Control Branch, Surveillance & Epidemiology Branch), SWD, and a member of QEH CGAT team inspected the elderly home on 7 September. The team assessed hygiene condition of the elderly home. Waste disposal was no longer a problem with the new functioning toilet in place. The home had followed disinfection advice given with potable water supply available. The team concluded that the hygiene factors aggravating the outbreak had been addressed and the chance of outbreak propagation was minimized if the elderly home continued to adhere to the infection control advice rendered.

8 September

A joint team comprising staff of Health, Welfare and Food Bureau, SWD, DH

and Buildings Department inspected the elderly home on 8 September. A second toilet had been installed and put into use. The elderly home was in the process of installing a third toilet (Picture 7). It was understood that the original kitchen and toilet which was located outside the elderly home would not be reopened within a short period of time. Renovation works was required to install a new kitchen inside the elderly home, which would take a few months time. The team supported temporarily relocation of the residents to avoid disturbing their daily routine.

9 September

Two visits were made to the home. The first inspection found that the general hygiene condition was satisfactory. A second visit was made in the afternoon after receiving report from QEH CGAT that a resident there had passed loose stool twice that day and was referred to QEH AED. Advice on infection control was reinforced. The patient's condition was stable and did not vomit or pass loose stool after admission. The cause of her illness is under investigation.

1.5. Laboratory investigations

Stool samples from two affected residents were obtained by CHP on 6 September and laboratory result showed positive RT-PCR results for norovirus on 7 September.

1.6. Chronology of events

A detailed chronology of events is attached as Appendix 2.

2. DISCUSSION

Based on clinical and epidemiological information obtained on 4 September, the working diagnosis was a norovirus outbreak spreading among residents and staff through patients' vomitus and excreta. Norovirus is known to spread through ingestion of contaminated food/water, from person to person through vomitus and excreta, and contaminated fomites. It was therefore imperative that vomitus and excreta were properly handled to interrupt further transmission of disease.

The first case had onset of symptoms on 1 September. The cause of her illness could not be established, but was unlikely to be due to contaminated food source from Shui Oi Convalescent Home Second Branch since there was no gastroenteritis outbreak at the latter home. Judging from the epidemic curve, poor management of the excreta and lack of disinfection following vomiting incidents likely led to the propagation of the outbreak. The unavailability of toilet facilities since 26 August could be a main contributing factor.

During the first visit on 4 September, the feasibility of relocation of the residents was discussed with SWD owing to our concern about toilet facilities in the home. In the afternoon of 4 September, a new toilet was installed, and a second washroom would be in place within a few days. The home then had facilities to dispose wastes properly and no longer needed to hold feces in buckets. Since water supply was available, proper disinfection and infection control procedures could be readily performed in accordance with advice rendered by CHP, relocating residents to another site became unnecessary on hygiene ground. It was also recognized that urgent relocation of elderly residents in the home, many of whom were in a frail medical state, carried the risk of worsening their medical conditions and would be detrimental to their health. CHP therefore worked closely with SWD to monitor the hygiene situation of the elderly home, and carry out daily medical surveillance of the residents.

After CHP's first intervention on 4 September, no new cases had onset on or later than 6 September. This suggested that the intervention was effective, given that the maximum incubation period of norovirus infection was 60 hours. Furthermore, a joint inspection on 7 September by CHP, SWD, and QEH CGAT with epidemiological, infection control, and clinical expertise confirmed that hygiene conditions in the home were acceptable and factors contributing to the spread of gastroenteritis had been addressed in accordance with our advice.. Daily visits during 5-10 September found steady improvements and that the elderly home had complied with the infection control advice provided.

3. OBSERVATIONS AND RECOMMENDATIONS

3.1. Notification of outbreak

This elderly home did not notify SWD about an increased number of residents presented with gastroenteritis symptoms. This reflected a lack of alertness,

knowledge, or willingness on its management in reporting outbreak. The DH, SWD, and HA had devoted significant efforts and resources in recent years to improve notification of outbreaks from elderly homes. Examples include seminars and forums for elderly home operators, guidelines on infection control which were distributed to elderly homes and put on the Internet (updated 2004), designation and training of Infection Control Officers in elderly homes, establishing flowcharts of communication between relevant parties, regular assessment visits to elderly homes with infection control advice, and so on.

3.2. Infection control practice

During our first visit on 4 September, we found that the environment was not properly disinfected with diluted household bleach after the vomitus was cleaned. Excreta was stored in buckets without proper cover and not immediately disposed of. The practices were highly unsatisfactory, and likely led to the spread of infection. Since some elderly homes have high staff turnover rate, we recommend regular reinforcements in infection control training, particularly in the area of vomitus and excreta handling.

3.3. Sanitary facilities

While toilet facilities and fresh water supply was restored shortly after intervention by CHP and SWD on 4 September, the absence of basic hygiene facilities in the elderly home during 26 August through 4 September reflects mismanagement on part of the elderly home, and is unacceptable from a public health point of view. We recommend appropriate measures be taken to make elderly home operators aware of the need to report breaches in sanitary facilities to the appropriate authorities, so that remedial action could be taken at the earliest to prevent occurrence of infection.

10 September 2004
Centre for Health Protection
Department of Health

Picture 1. The elderly home



Picture 2. The elderly home



Picture 3. Suspended kitchen (left) and toilet (right)



Picture 4. Temporary water supply outside the window of the elderly home in the morning of 4 September



Picture 5. Corridor outside the elderly home where buckets of excreta found on 4 September



Picture 6. First new toilet installed in the afternoon of 4 September



Picture7. The third toilet under construction



Appendix 1. Floor plan of the Shui Oi Convalescent Home First Branch (drawn by CHP staff, not to scale)

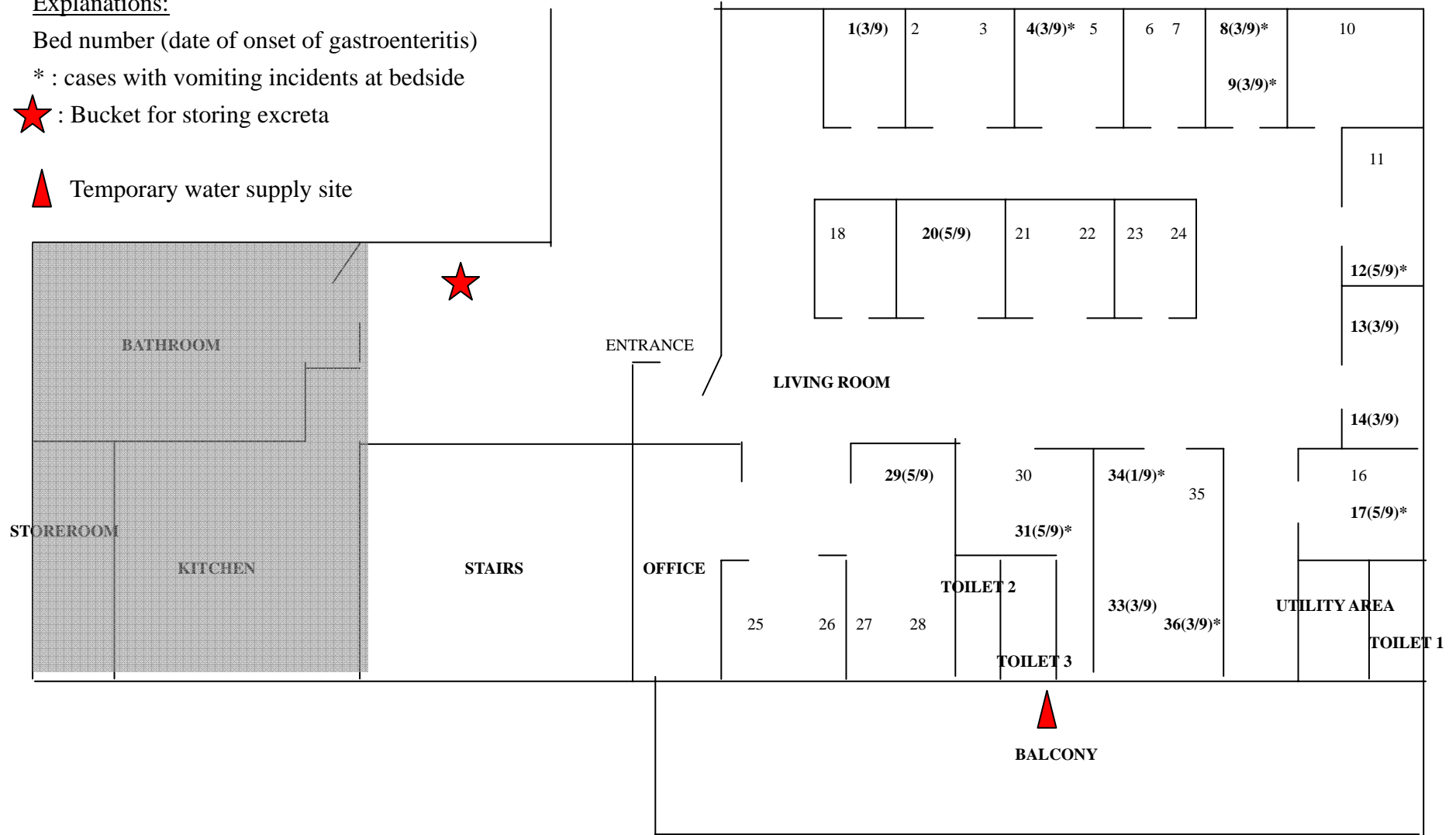
Explanations:

Bed number (date of onset of gastroenteritis)

* : cases with vomiting incidents at bedside

★ : Bucket for storing excreta

▲ Temporary water supply site



**CHRONOLOGY OF EVENTS ON THE NOROVIRUS OUTBREAK IN
SHUI OI CONVALESCENCE HOME FIRST BRANCH**

DATE	EVENTS	ACTION TAKEN
4 September 2004	<ul style="list-style-type: none"> • Centre for Health Protection (CHP) received notification from Queen Elizabeth Hospital (QEH) Community Geriatric Assessment Team (CGAT) nurse that there were a cluster residents in the Shui Oi Convalescent Home First Branch presented with gastroenteritic symptoms 	<ul style="list-style-type: none"> • Staff of Surveillance and Epidemiology Branch (SEB), CHP including two doctors and one nursing officer visited the Shui Oi Convalescent Home First Branch in the morning of 4 September for investigations, and advice on infection control measures. • It was found that one staff and nine residents of the home developed with diarrhoea and/or vomiting from 1 to 3 September. • CHP staff also visited another home Shui Oi Convalescent Home Second Branch, supplying meals to the Shui Oi Convalescent Home First Branch. Inspection and advice on food preparation and transferred was given to the staff. • Senior Medical officer (Epidemiology Section)1, SMO(ES)1 of CHP informed S(Licensing Office of Residential care Homes for the Elderly)2, S(LCORCHE)2 of Social Welfare Department (SWD) about the outbreak. It was noticed that SWD staff was already aware that the use of toilet and

		<p>kitchen in the home was suspended. SMO(ES)1 of CHP asked S(LORCHE)2 to assist in liaising with management office to resume toilet facilities and convenient fresh water supply for the residents and staff. SMO(ES)1 also discussed with S(LORCHE)2 for the possibility of relocating the residents to another place where toilet facility and convenient fresh water supply were available.</p> <ul style="list-style-type: none"> • By afternoon on the same day, the Home had the first toilet installed and was put into use. Convenient fresh water supply was available. CHP staff reinforced health advice on infection control.
5 September 2004		<ul style="list-style-type: none"> • Doctor of SEB, CHP contacted the Home through phone for reinforcement of health advice and medical surveillance.
6 September 2004	<ul style="list-style-type: none"> • The Home reported to CHP that about 4 residents and 3 staff developed diarrhoea and/or vomiting on 5 September. 	<ul style="list-style-type: none"> • CHP doctor and nursing staff, together with SWD staff jointly visited the Home. Advice on infection control in the home was reinforced. The newly installed toilet and water supply was in use.
7 September 2004		<ul style="list-style-type: none"> • Doctors and nurses of ICB and SEB of CHP, together with CGAT doctor and SWD staff jointly visited the Home. Advice on infection control was

		reinforced.
8 September 2004		<ul style="list-style-type: none"> • Doctor and nurse of CHP revisited the Home to reinforce infection control. • The second toilet was installed in the Home. • HWFB, SWD, BD and DH jointly visited the Home. • Several residents of the Home were transferred to Holiday Camp. • CHP doctor paid a site visit to the Holiday Camp and advice on infection control was given to staff of the Camp. Residents transferred to the Camp were put under surveillance.
9 September 2004	<ul style="list-style-type: none"> • A resident of the Home reported passing loose stool twice and was admitted to the Queen Elizabeth Hospital 	<ul style="list-style-type: none"> • Doctor and nursing staff of SEB, CHP revisited the Home before and after the resident was admitted to Queen Elizabeth Hospital for reinforcement of infection control advice and medical surveillance. • Nursing staff of CHP revisited the Holiday Camp to reinforce infection control advice.
10 September 2004		<ul style="list-style-type: none"> • Doctor and nursing staff of SEB, CHP revisited the Home and the Holiday Camp to reinforce infection control advice. • Residents were transferred to the TWGHs Wong Cho Tong Care and

		<p>Attention Home and QHC Man Kee Elderly Home</p> <ul style="list-style-type: none">• Doctors and nursing staff of SEB, CHP visited the TWGHs Wong Cho Tong Care and Attention Home and QHC Man Kee Elderly Home. Health advice on infection control was given to the staff.
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