

**International Seminar on Environmental Health:
The professional challenges in the 21st century**

**Surabaya, INDONESIA
12 – 14 December 2008**

**THE STATE OF ENVIRONMENTAL HEALTH IN SINGAPORE
2008**

A country-paper presented by

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With acknowledgements to National Environment Agency [NEA], Singapore for the facts and figures in this paper-presentation

Today Singapore is recognized globally as a clean and green city with a high standard of public health. But this accolade did not come easily. There was a time when Singapore's streets were badly littered and our drains and rivers polluted. Diseases, like malaria and cholera, were not uncommon occurrences. How did Singapore transform into a world-renowned clean and green city? How do we continue to sustain this? It can be attributed to good environmental management and the Singapore Government's efforts in tackling preventable diseases that are caused by poor sanitation, poor food hygiene and other environmental factors. This country-paper focuses on the efforts by the National Environment Agency [NEA], the Singapore Government agency that has been mandated to ensure a sustainable quality environment in Singapore and whose vision is, embracing all, to care for Singapore's clean and healthy environment - Today, for Tomorrow.

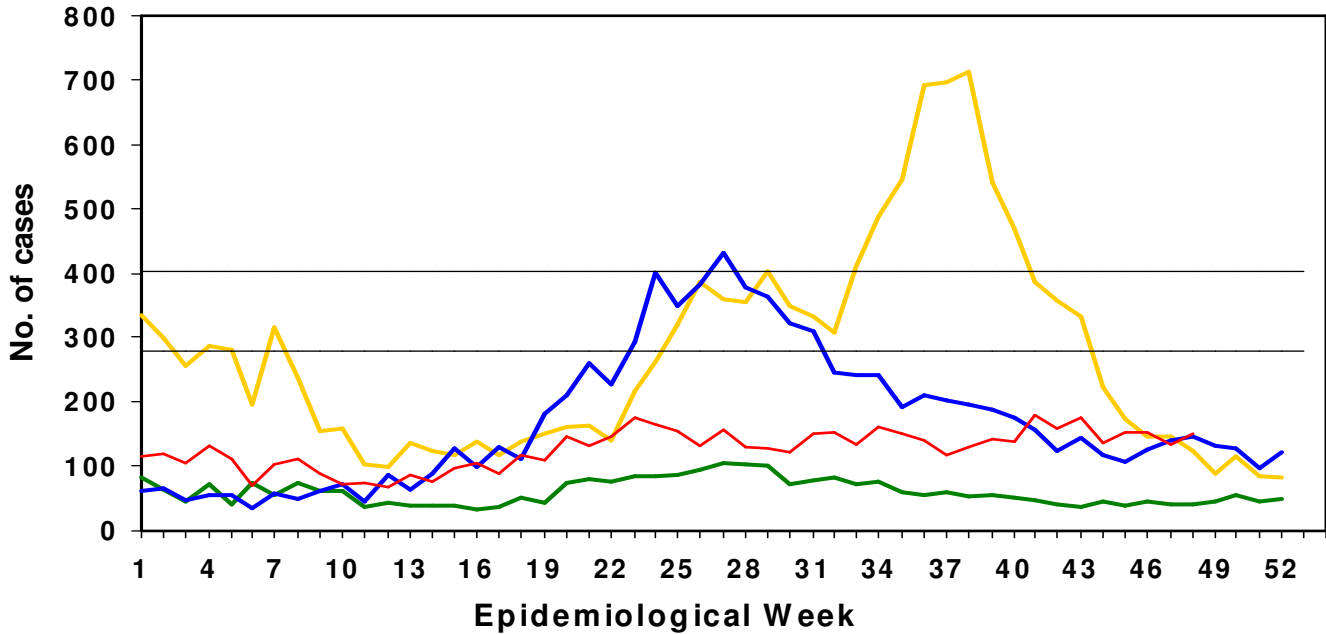
While there are several programmes that underpin NEA's mission and vision, this paper focuses on three aspects, that is,

- **Control of dengue and chikungunya fever**
- **Control of food borne diseases**
- **Smoking prohibition in public areas**

1. Control of dengue and chikungunya fever

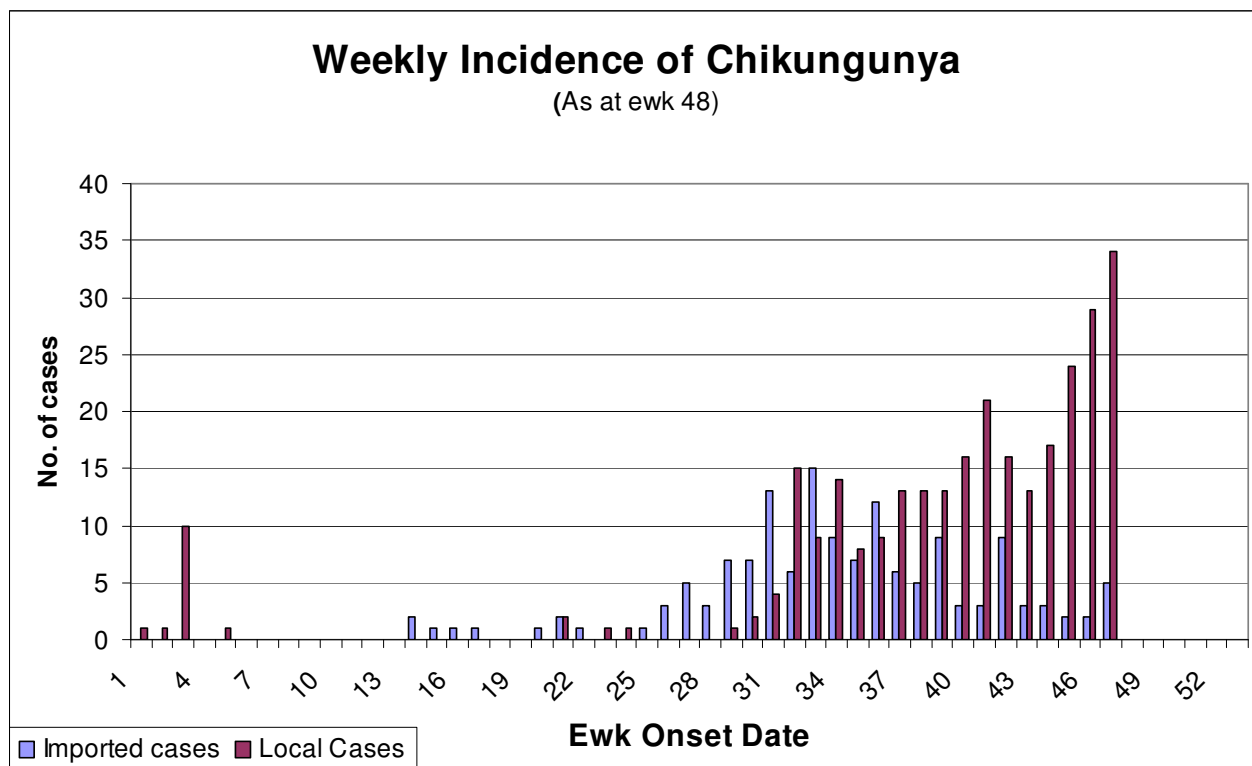
Dengue fever and chikungunya fever are spread through the bite of the *Aedes* mosquito, which is a common vector in Singapore. While dengue fever is endemic in Singapore, chikungunya fever is **not** endemic. Nevertheless, both diseases are considered serious threats to public health and significant measures have been put in place by NEA to keep the diseases under control.

Over the past three years, NEA has experienced many challenges in the control of dengue fever. In 2005, Singapore experienced a dengue outbreak, with a total of 14,209 dengue fever cases being reported in the year. This figure was the highest ever recorded. In 2006, the number of dengue cases in Singapore fell to 3,126. In 2007, the dengue threat returned as the number of cases climbed to 8,826. For the first eleven months of 2008 [up to epidemiological week 48], the number of dengue cases is 6,086.



Year	2005	2006	2007	2008 [E-week 48]
Cases	14,209	3,126	8,826	6,086

Chikungunya fever, which was relatively unknown in the previous years, emerged as a new disease threat in Singapore in 2008, with 340 cases being reported for between January and October 2008. Most of these cases are imported rather than locally transmitted. Most victims were foreign workers or Singaporeans who returned to Singapore from neighbouring countries where chikungunya fever had been reported. The emergence of Chikungunya fever in Singapore also mirrors the worrying trends in many Southeast Asian countries, with outbreaks being reported in several states in Malaysia. As of E-week 48, there were 149 imported cases and 323 local cases making it a total of 472 cases in 2008.



To control dengue and chikungunya fever, NEA adopts a pre-emptive approach towards the control of *Aedes* mosquito. NEA has put in place a surveillance programme to monitor the activity of mosquito population and the trends in dengue and chikungunya fever. By monitoring the spatial and temporal distribution of dengue and chikungunya fever cases, NEA was able to put in place preventive and control measures to reduce the impact of disease outbreaks.

Every day, NEA deploys officers to carry out inspections of residential, commercial and outdoor areas throughout the country to thoroughly search and destroy potential mosquito breeding sites. Fines and other penalties are imposed on owners, occupiers or the management of these premises if mosquito breeding is detected. While NEA’s intensive ground operations are going on, NEA officers also worked with the community and various organisations to spearhead many educational initiatives to promote the mosquito prevention message among the

stakeholders. These activities include exhibitions, talks and door-to-door visits in which educational pamphlets and flyers are distributed.

2. Prevention of food-borne diseases

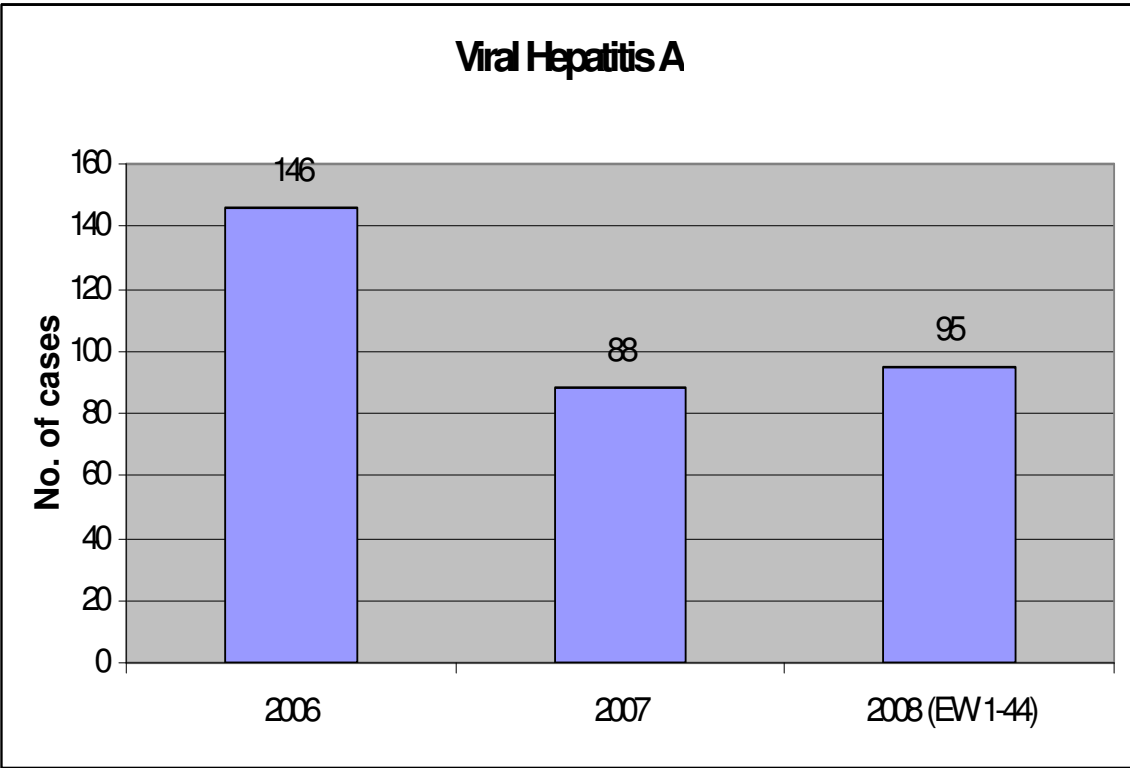
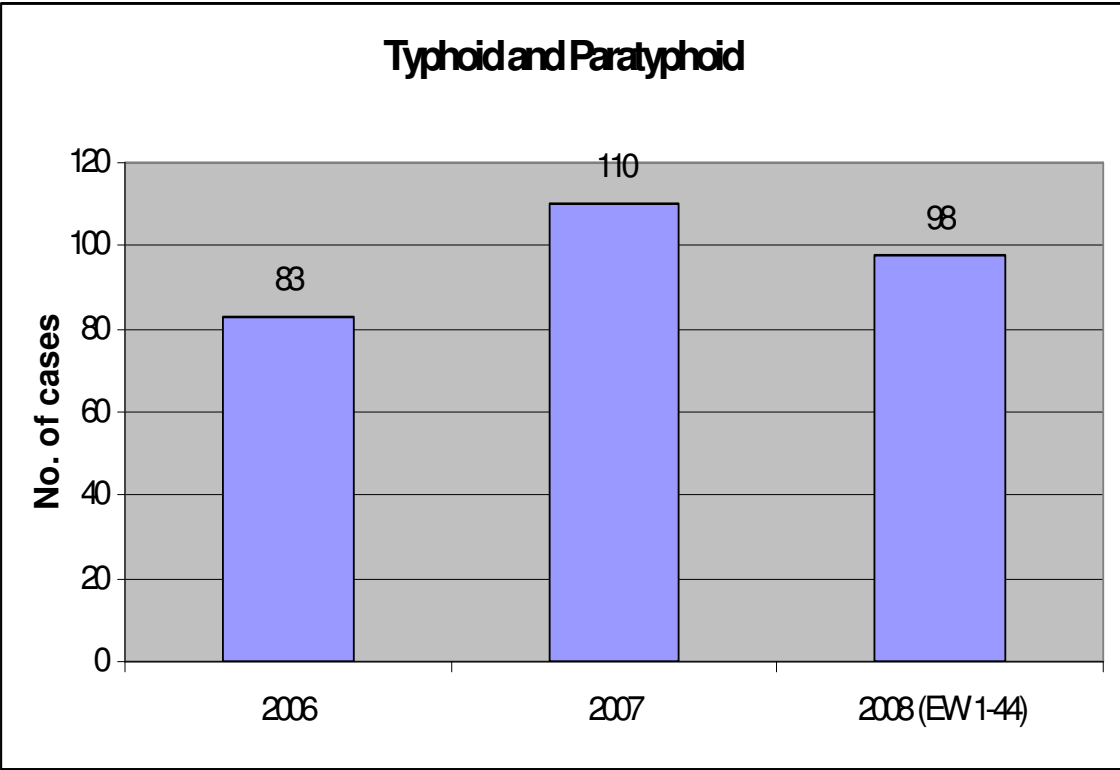
Singapore has been successful in maintaining a low incidence of food-borne diseases through a stringent regime that encompasses licensing and inspection of food establishments, as well as enforcement against unhygienic practices. The incidence of food outlet-related food poisoning outbreaks has remained low, with an average of 4 cases per 1,000 food outlets per year for the past three years.

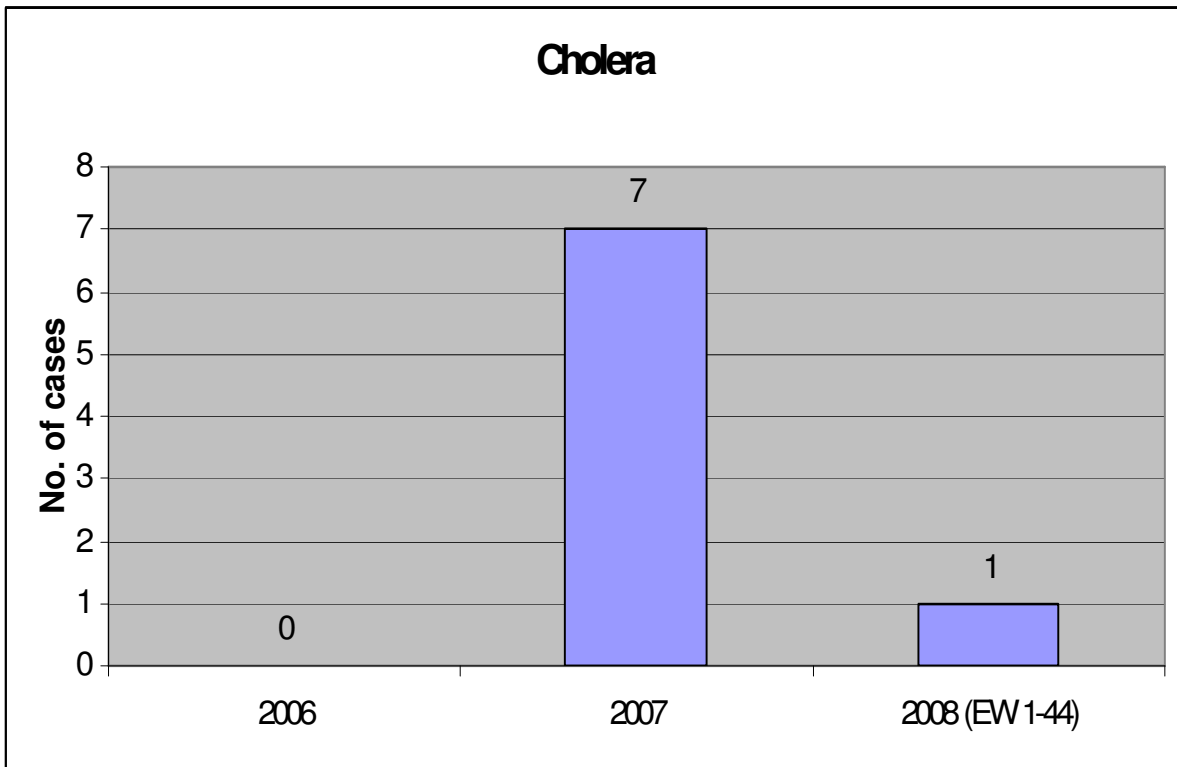
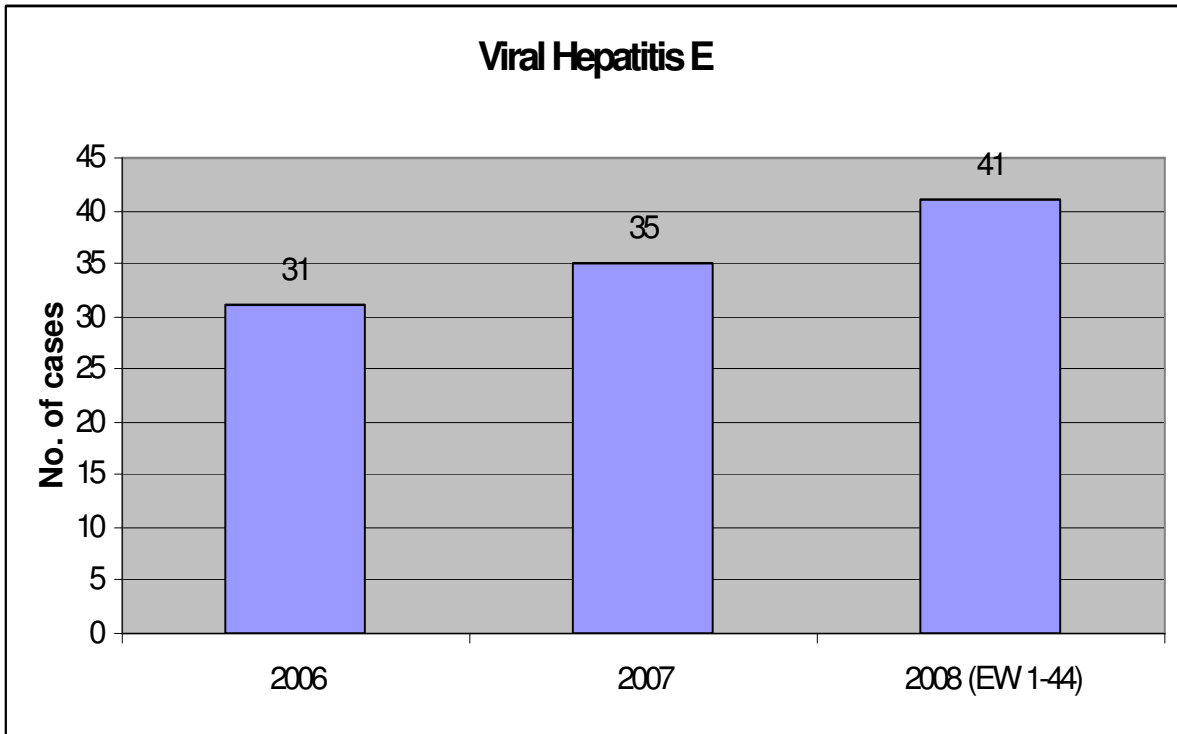
The reported cases of common food-borne diseases such as enteric fever (typhoid and paratyphoid), viral hepatitis A and E and cholera have also remained low. For example, the number of enteric fever cases (typhoid and paratyphoid) reported in 2006 and 2007 is 83 and 110 respectively. In 2008, the number of cases as of E-week 44 is 98. Over 98% of these cases are imported.

The number of viral hepatitis A cases reported in 2006 and 2007 is 146 and 88 respectively. As of E-week 44 in 2008, the number reported is 95. About 75% of these cases are imported.

The number of reported viral hepatitis E cases in 2006 and 2007 is 31 and 35 respectively. As of E-week 44 in 2008, the number is 41. About 73% of the cases are imported.

Singapore is also largely free from cholera. In 2006, there was no reported cholera case. In 2007, 7 cases were reported. As of E-week 44 in 2008, only 1 case was reported. This was an imported case.





Although food poisoning cases are low and under control, NEA has to ensure that food establishments maintain a high standard of hygiene so as to prevent the transmission and spread of infectious diseases within the premises. To do so, NEA licenses all public eateries and imposes stringent requirements on all operators to ensure there are adequate and proper facilities for food storage, preparation and service, toilet facilities and proper refuse management.

Since June 1997, NEA has implemented a grading system to effectively appraise all foodshops and foodstalls and motivate licensees to improve and maintain a high level of hygiene. Under the grading system, all food establishments and foodstalls are categorized into four grades: A, B, C and D. These establishments are graded based on housekeeping and cleanliness measures, control of pest infestation, food hygiene and personal hygiene of the food handlers.

Besides ensuring a proper infrastructure, all food handlers are required to take a basic food hygiene course where they learn basic food microbiology, proper handling and preparation of food and maintenance of a food establishment. This enables them to practise good food and personal hygiene at all times. These food handlers are also required, once every three years, to be inoculated against typhoid while handlers above 45 years undergo a mandatory chest X-ray.

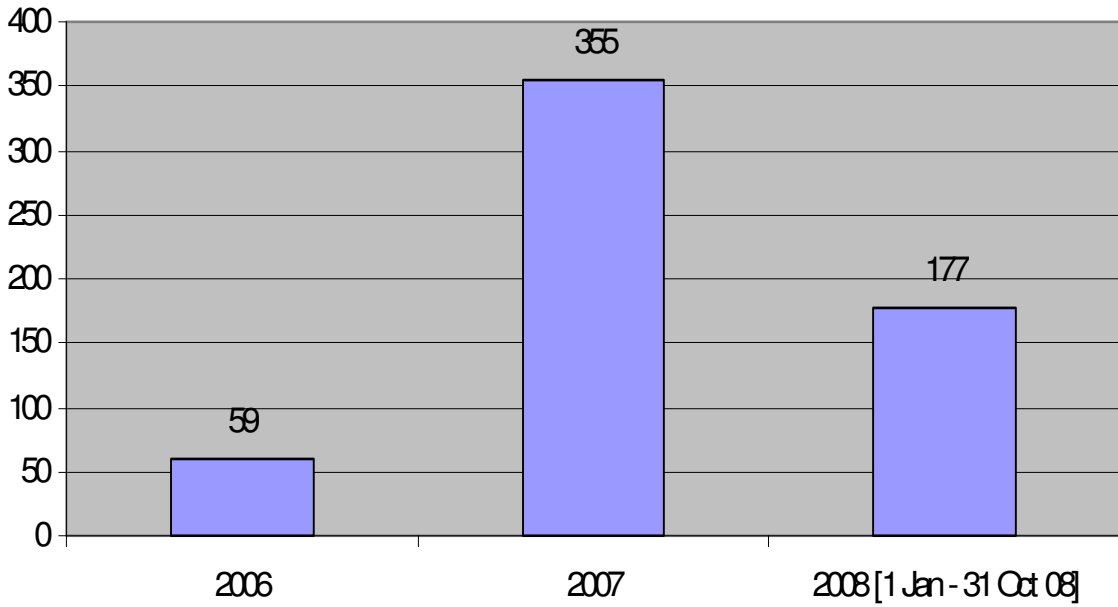
Upon notification of food poisoning cases, NEA officers will carry out epidemiological investigations to trace the sources of infections and establish their modes of transmission so that measures could be taken to prevent a recurrence. Investigations include interviews with affected persons, questionnaire surveys, inspection of the implicated premises, laboratory analyses of the food and health screening of the food handlers.

3. Smoking Prohibition In Public Areas

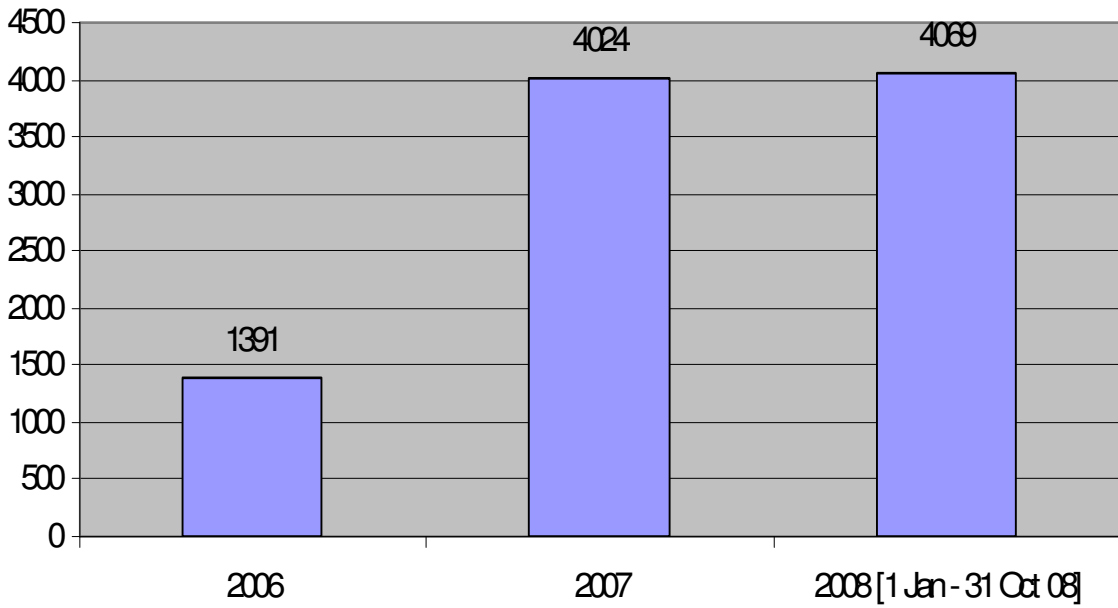
To protect our population from the negative health effects of second-hand smoke, Singapore is moving quickly in tandem with other parts of the world to legislate against tobacco use. The Smoking (Control of Advertisements and Sale of Tobacco) Act, which prohibits tobacco advertising and promotion, and The Smoking (Prohibition in Certain Places) Act which prohibits smoking in various public places, were both enacted in 1970. The Acts have been reviewed regularly over the years and revised to ensure relevance with changes in social and consumption trends and global best practices.

Over the years, smoking prohibition has been progressively extended to more public areas. By 2008, smoking has been prohibited in over 30 categories of public places and public transport vehicles – the list of places include food shops, amusement centres, air-conditioned premises such as offices and factories, underground pedestrian walkways, bus shelters, public toilets, discotheques and pubs. [Please see Annex 1 for complete list]. These measures have significantly reduced the public's exposure to second hand smoke and brought about an improvement in indoor air quality by reducing the amount of air-borne particulate matter, which is associated with a higher risk of developing respiratory and cardiovascular problems.

Enforcement Against Management Of Premises



Enforcement Against Smokers



From 1 January next year [2009], the smoking prohibition will be extended to more public areas such as children's playgrounds, exercise areas, markets, underground and multi-storey carparks. The smoking prohibition will also be extended to non-air conditioned areas in offices, factories, shopping complexes and lift lobbies from the same date.

Besides discouraging smokers from smoking in certain public areas, Singapore has also taken steps to restrict the sale of tobacco. Tobacco advertising and promotion is prohibited. Youths under 18 years are also prohibited to smoke or possess tobacco products. The Government has also over the years, increased the price of cigarettes through tobacco taxation. Singapore's tax incidence for cigarettes is among the highest in the world and we will continue to review the need to increase the tax of cigarettes. Increasing the price of cigarettes will deter people, especially the youths, from picking up the smoking habit.

While the Government continue to enforce the legislations to curb smoking in Singapore, a total ban on the sale of tobacco products however, is not recommended for two key reasons:

- Cigarettes will become a contraband item. This is likely to lead to an increase in cigarette smuggling.
- Tobacco smoking is a transnational problem that demands a global solution and co-operation. It will be unrealistic for Singapore to compel people passing through or visiting Singapore to quit smoking for the length of their stay.

Nevertheless, NEA's current policies will enable it to prevent smokers from lighting up in public places where there is a potential for another

person to breathe second hand smoke. To ensure compliance to the smoking prohibition in public areas, NEA officers have been working with the management of these premises to ensure that they take steps to clearly demarcate non-smoking areas and ensure that users of these premises observe the no-smoking rule. NEA has also stepped up its enforcement presence and routine checks against the minority of the population who disregard the smoking prohibition.

The reasons for Singapore's successful smoking control programme may be attributed to the smoking prohibition been widely accepted and closely observed by the general public while the effectiveness of our rules and regulations may be attributed to them being well publicised, clearly defined and seriously enforced.

Conclusion

With a high population density in a largely urbanised setting, it is important for Singapore to keep vector-borne and food-borne diseases at bay and a smoke-free environment so as to protect the health of the population. Moving forward, Singapore will continue to be vigilant over our environmental health standards and take a multi-pronged approach consisting of ground operations and surveillance, public education and collaborations with various stakeholders.

Thank you.

List of public places in Singapore where smoking is prohibited under First Schedule of Smoking (Prohibition in Certain Places) Notification

- 1.** Any amusement centre.
- 2.** Any foodshop, except that the Director-General may designate for smoking, such part of the outdoor refreshment area of the foodshop not exceeding 20% of the total floor area of that outdoor refreshment area.
- 3.** Any air-conditioned hall, ballroom or function room (including any such premises located in a hotel) during such time when it is used for holding a meeting, conference, seminar, course or an exhibition or for the purpose of serving meals.
- 4.** Any cinema or theatre.
- 5.** Any enclosed premises of a bank to which members of the public have access for the purpose of carrying out banking transactions.
- 6.** Any clinical laboratory, healthcare establishment, hospital, maternity home, medical clinic or nursing home.
- 7.** Any indoor ice-skating rink, roller-skating rink or roller-discotheque.
- 8.** Any indoor sports arena, bowling alley, billiard saloon, gymnasium or aerobic or fitness centre.
- 9.** Any lift.
- 10.** Any public library or any library in any institution of higher learning.
- 11.** Any public museum or public art gallery.
- 12.** Any air-conditioned office premises, except that the manager of such premises may designate for smoking, any enclosed room therein —

(a) which is independently ventilated; and

(b) which is not —

(i) required to be used by any person employed in such premises for the performance of the duties of his employment; or

(ii) a pantry or other common area to which persons employed in such premises have access.

13. Any air-conditioned factory.

14. Any enclosed or air-conditioned corridor, lobby, stairwell or other common area of —

(a) any building which wholly or principally consists of office premises; or

(b) such part of any building which consists wholly or principally of office premises.

15. Any enclosed or air-conditioned common area of any private residential premises or building.

16. The Supreme Court, the Subordinate Courts and Small Claims Tribunals.

17. Any air-conditioned area in the terminal buildings of Singapore Changi Airport, except that the Civil Aviation Authority of Singapore may designate for smoking, any enclosed room therein —

(a) which is independently ventilated; and

(b) which is not —

(i) required to be used by any person employed in such terminal buildings for the performance of the duties of his employment; or

(ii) a pantry or other common area to which persons employed in such terminal buildings have access.

18. Any air-conditioned shopping mall or complex, including any shop, atrium, corridor, lobby, stairwell or other area within the shopping mall or complex.

- 19.** Any underground pedestrian walkway.
- 20.** Any area occupied by a queue of 2 or more persons in a public place.
- 21.** Any air-conditioned shop.
- 22.** Any air-conditioned restaurant, bowling alley, billiard saloon, arcade games room (including jackpot machine room), gymnasium, fitness centre, library, reading room, theatre or cinema in any private club.
- 23.** Any school, junior college, polytechnic or any training institute established under the Institute of Technical Education Act (Cap. 141A), including any area within its compound.
- 24.** Any enclosed or air-conditioned part of any building, hall of residence, canteen, lecture theatre, sports and recreation centre or stairwell in any university.
- 25.** Any public swimming pool, including any changing or shower room, or any area in the vicinity of such swimming pool which is likely to be frequented by any user of the swimming pool.
- 26.** Any washroom (including any mobile toilet), whether managed privately or otherwise, to which members of the public or a section of the public have or ordinarily would have access whether on payment of a fee or otherwise.
- 27.** Any sports stadium, including any facility, shop or common area within its compound.
- 28.** Any community building, community centre or community club belonging to or managed or maintained by the People's Association, including any facility, shop or common area within its compound.
- 29.** Any bus interchange, bus terminus (except a bus terminus which is situated along the side of a road and does not provide for boarding of or alighting by passengers) or bus shelter, including any facility, shop or common area within its compound.
- 30.** Any hawker centre, except that the Director-General may designate for smoking —
 - (a) such part of the outdoor refreshment area of the hawker centre not exceeding 20% of the total outdoor seating capacity;
or

(b) where the hawker centre does not have an outdoor refreshment area, such part of the indoor refreshment area of the hawker centre not exceeding 10% of the total indoor seating capacity.

31. Any discotheque, pub, bar, lounge or night club in any premises or building (including any private club), except that the Director-General may, subject to such conditions as he may specify, designate for smoking —

(a) such part of the outdoor refreshment area of the discotheque, pub, bar, lounge or night club not exceeding 20% of the total floor area of that outdoor refreshment area; and

(b) any enclosed and independently ventilated room not exceeding 10% of the total indoor refreshment area of the discotheque, pub, bar, lounge or night club.

List of public vehicles in Singapore where smoking is prohibited under Second Schedule of Smoking (Prohibition in Certain Places) Notification

1. Any omnibus.
 2. Any private bus.
 3. Any private hire bus.
 4. Any school bus.
 5. Any taxi.
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