For discussion on
6 October 2006

LegCo Panel on Food Safety and Environmental Hygiene

Suspected Tampering of Ovitraps and Mosquito Control Work

PURPOSE

This paper briefs Members on the ovitrap surveillance programme and year-round mosquito preventive and control measures against dengue vector.

RECENT INCIDENT

2. The Food and Environmental Hygiene Department (FEHD) recently received a complaint from a staff member of the pest control contractor that the ovitraps, a device for monitoring prevalence of dengue fever vectors, were suspected to have been tampered with. FEHD took a very serious view on the complaint and had referred the case to the Police for investigation.

INTER-DEPARTMENTAL ANTI-MOSQUITO EFFORTS

3. To protect public health, the Government attaches great importance to mosquito prevention and control work. We have allocated over $200 million on anti-mosquito work in 2006/07. An Anti-Mosquito Steering Committee (AMSC) has been set up since 2002 under the Health, Welfare and Food Bureau to set strategies and directions for mosquito control in Hong Kong. The AMSC comprises members from eleven government bureaux and departments, namely Agriculture, Fisheries and Conservation Department, Department of Health, Education and Manpower Bureau, Environment, Transport and Works Bureau, FEHD, Health, Welfare and Food Bureau, Home Affairs Department (HAD), Housing Department, Information Services Department, Lands Department, and Leisure and Cultural Services Department. Each department is tasked to carry out mosquito prevention and control work under their respective purview.

4. The AMSC takes into account a basket of factors in drawing up anti-mosquito plans. These indicators include the ovitrap index, information made available by health authorities of nearby cities or countries and the World Health Organization (WHO), the number of imported and local mosquito-borne disease cases, the number of mosquito complaints received and feedback from District Councils (DCs) and local personalities. Ovitrap survey, dedicated to monitor the breeding of dengue fever vectors, namely, Aedes albopictus and Aedes aegypti, is only one of the tools for monitoring the mosquito breeding situation. In view of the increase in number of dengue fever cases in Guangdong Province, the AMSC reminded all relevant departments in early September to step up anti-mosquito efforts. The public has also been urged to remain vigilant and take precautionary measures to prevent infection when visiting nearby cities.

5. At district level, District Anti-Mosquito Task Forces have been established under HAD in all 18 districts since 2004 to further strengthen the co-ordination of government efforts in combating mosquito problem and to encourage community involvement in anti-mosquito activities.

DENGUE FEVER IN HONG KONG

6. Dengue fever has become a notifiable disease in Hong Kong since 1994. Most of the reported cases were imported from neighbouring dengue-endemic countries, though Hong Kong is not immune to local cases of dengue fever. Local dengue fever outbreak was first reported in Hong Kong in September 2002 with a cluster of 20 local cases. Although there has not been any local case reported since September 2003, Hong Kong is vulnerable to dengue outbreaks through importation of the virus from neighboring areas from time to time.

DENGUE VECTOR SURVEILLANCE AND CONTROL

7. Ovitrap was first introduced in 1998 as a surveillance tool for the detection of the presence of Aedine mosquitoes in the airport. The ovitrap was further employed as a tool for a territory-wide surveillance programme on dengue vector in 2000 by the Pest Control Advisory Section (PCAS) of FEHD. PCAS provides professional advice and technical support to different government departments, as well as FEHD's district operational staff on pest control matters. The surveillance programme is

totally independent from FEHD's district operations. The results of the dengue survey provide useful information on the distribution, prevalence and the seasonal fluctuation of the dengue vectors in Hong Kong. Ovitrap is a simple device made up of an approximately 200 ml black plastic container with straight and slightly tapered sides and a brownish paddle is placed diagonally in it. Each paddle is labelled with a number to indicate the position of the ovitrap. The ovitrap provides a favourable breeding place for aedine mosquitoes to lay eggs. Ovitraps with eggs or larvae of Aedes albopictus or Aedes aegypti, if any, would be counted as positive. An "Ovitrap Index" would be enumerated by dividing the number of positive ovitraps by the number of ovitraps collected and multiplied by hundred percent.

8. An average of 55 ovitraps are placed in each selected sites which cover an area of around 0.55 km^2 in size. As the normal average flight range of Aedes albopictus is usually less than 100 m, the ovitraps are set at distance about 100 m from each other so that the same mosquito might not oviposit in two ovitraps. All ovitraps are set and collected one week after setting by staff of PCAS and placed in the laboratory for incubation and hatching of eggs, if any.

9. In 2000, a total of 34 localities were selected for the surveillance. Each of the localities was surveyed once every three months. The frequency of survey was increased from once every three months to once a month in 2003 and the number of localities also increased from 34 to 38. Among the 38 localities, two were in outlying islands, eight in Hong Kong, 11 in Kowloon and 17 in the New Territories. Together, they covered all the 19 FEHD districts. The 38 locations were mainly areas where previous local dengue fever cases were reported as well as areas with high human concentrations such as residential areas, schools and hospitals. This was in line with the recommendations of the WHO for dengue vector surveillance. The surveillance was further enhanced in 2004 by extending the ovitrap survey from the community to port areas. A total of 30 different port areas were added to the surveillance programme.

10. The locations of the ovitraps are deliberately fixed throughout the calendar year to enable the authority to monitor the trend and to make meaningful comparison on a monthly basis. These locations are reviewed annually, taking into consideration past experience, new development and emerging public health needs.

11. Under this territory-wide surveillance programme, three different indices, namely, Provisional Ovitrap Index (POI), Area Ovitrap Index (AOI) and Monthly Ovitrap Index (MOI) are enumerated while two indices, namely Port Ovitrap Index and Monthly Port Ovitrap Index, are calculated to indicate the situation in port areas. The indices obtained and detailed locations of the positive traps are distributed to FEHD district offices as well as other concerned departments of the Interdepartmental Working Group on Pest Prevention and Control (the Working Group) (the member departments of the Working Group is at **Annex I**) for follow up actions. The POIs were usually available about two days after the retrieval of the ovitraps and AOIs would be available about one week after the retrieval.

12. In 2005, a computer information system called Geospatial Information Hub (GIH) was introduced as a platform for disseminating survey results to all concerned government departments and other parties. Detailed information of positive ovitrap locations and the surrounding environment within 100 m radius of each positive trap could be obtained from the GIH to facilitate mosquito control work. Concerned departments and parties are required to take appropriate actions to contain the mosquito problem in venues or properties under their purview. Technical assistance would be provided by the PCAS when necessary.

13. In-house pest control staff of FEHD are informed of the locations of the egg-positive traps together with the figures on POI, and required to initiate larval survey and control actions at 100 m radius around the positive trap locations[1]. The AOI is available around one week afterwards and the staff then extend their mosquito control work to 100 m around other Aedes-positive locations other than the egg-positive locations. Ovitrap Indices are classified into four categories, each of which requires the initiation of different control actions and health education work. The categorization of the action levels is shown at **Annex II**. The MOIs of the 38 surveyed areas obtained for 2004, 2005 and 2006 (January to August) and their comparison are presented at **Annexes III to IV** for reference.

14. As highlighted in paragraph 4 above, ovitrap index is only one of the tools to monitor the mosquito breeding situation.

[1] Ovitraps at the designated locations have already been collected after placing there for one week.

COMMUNITY PARTICIPATION

15. To enhance the community awareness of mosquito problem in designated locations in the territory, the MOI which is available at around the 10th day of the following month is uploaded onto FEHD's website. The AOI of each surveyed area is also publicized in the mass media and FEHD's website. The MOI and AOIs are updated monthly and maps outlining the survey areas are posted up for easy reference of the public. The results of MOI and AOIs are available to member departments of the Working Group. HAD, assuming a leading role at district level, is responsible for community liaison on mosquito control work and she may further dispatch the information to respective DCs for taking mosquito control actions in areas under their purview.

THREE-PHASE ANTI-MOSQUITO CAMPAIGN

16. To enhance the awareness of the community in the prevention of mosquito breeding, FEHD, in collaboration with departments concerned, launches a territory-wide three-phase Anti-mosquito Campaign (the Campaign) every year. The Campaign aims at heightening public awareness on the potential risk of dengue fever, encouraging community participation and forging close partnership of government departments concerned as well as eliminating breeding places of mosquitoes. To sustain the momentum of each phase of the Campaign when it comes to an end, another large-scale Thematic Mosquito Control Operation (the Thematic Operation) will follow shortly after. Each Thematic Operation would adopt a targeted approach focusing on enhanced mosquito control works at strategic areas including passenger and cargo / container terminals; village houses / old tenement buildings; cross boundary check points; open space in the vicinity of pig farms; and other problematic spots including water-logged fields, ponds and other water bodies in the vicinity of villages.

17. The Campaign and the Thematic Operations aim at heightening public awareness on the potential risk of mosquitoes, encouraging community participation and close collaboration among government departments and enhancing mosquito measures. The Campaign is widely participated by DC members. Results of actions taken by FEHD in each district during the periods of the Campaign and Thematic Operations in 2006 are provided at **Annex V**.

18. The findings of the dengue vector surveillance programme as well as year-round anti-mosquito efforts are regularly reported to the LegCo Panel on Food Safety and Environmental Hygiene.

ROUTINE PREVENTIVE AND CONTROL MEASURES

19. The FEHD district offices are responsible for, inter alia, the day-to-day mosquito preventive measures in public places. At the beginning of the rainy season every year, district pest control staff of FEHD review the effectiveness of the mosquito preventive work in the district in the past year for formulating appropriate anti-mosquito strategies and mapping out appropriate operational plans for the year. In general, FEHD staff handle complaints, carry out inspections and surveys to construction sites and problematic spots and take prosecution actions. In the course of carrying out the routine schedules, district pest control staff together with contractor's staff would adhere to operational guidelines and technical instructions in carrying out mosquito preventive work in particular the way to eliminate mosquito breeding / potential breeding grounds, i.e. treatment of stagnant water by larviciding and clearing of waste (e.g. abandoned receptacles) capable of holding water. These actions continue all year round irrespective of the levels of AOI. Instructions have also been issued to district staff and contractor not to tamper ovitraps.

20. At present, there are some 400 in-house staff and about 1 600 contractor's workers in 263 multi-skill roving teams during April to October (1 300 workers in 216 teams during cool season) dedicated to the provision of mosquito and other pest prevention / control services.

21. As mentioned in paragraph 13 above, the AOIs are categorized into four action levels. The scale of mosquito control actions will commensurate with the respective action levels. In the event that the ovitraps are found to be positive and mosquito control actions are required, district staff will first conduct survey to all locations with positive traps for identifying mosquito breeding / potential breeding grounds and, depending on the action levels, treat / eliminate the breeding / potential breeding grounds by larviciding to kill mosquito larvae and clearing of waste (e.g. abandoned receptacles) capable of holding water and carrying out fogging of insecticides to kill adult mosquitoes as required.

22. For AOI which is equal to or greater than 20%, i.e. Action Level III and above, District Environmental Hygiene Superintendent of

FEHD would convene district inter-departmental anti-mosquito task force meeting as soon as possible. All relevant government departments / school management / residential management / private organizations would be invited to immediately intensify mosquito control measures and to review the mosquito prevention strategies in place for improvement. District staff would deploy extra manpower to carry out mosquito control work by re-shuffling resources. DCs and Area Committees were advised to organize anti-mosquito activities.

23. FEHD has increased the number of contractor's workers to carry out anti-mosquito operation from about 900 workers in 2003 to 1 600 workers in 2006. The number of mosquito-related complaint cases for the first eight months of the year has dropped from about 9 500 in 2003 to about 7 200 in 2006.

DENGUE FEVER CASES

24. In 2006, there was no local dengue fever cases so far and a total of 24 imported cases of dengue fever has been reported. FEHD has been closely following up each and every such case in accordance with the established protocol. The number of cases of imported and local dengue fever since 2003 are set out below.

Year	Dengue Fever	
	Local	Imported
2003	1	48
2004	0	31
2005	0	31
2006 (January to September)	0	24

REVIEW OF MOSQUITO PREVENTION AND CONTROL WORK IN 2006

25. FEHD has reviewed the dengue vector situation in 2006. In May to August 2006, as far as the number of AOIs on or above 20% in the 38 locations is concerned, there was one location each where the AOI was over 20% (Fanling) and 30% (Tsing Yi) in May respectively; three locations

(Tung Chung, Wong Tai Sin Central and Ma Wan) with AOIs over 20% and two locations (Diamond Hill and Tai Wai) with AOIs over 30% in June; and only one location (Wong Tai Sin Central) with AOI over 20% in July.

26. In accordance with the departmental guidelines, the above AOI level indicated that the infestation of dengue vector had exceeded one-fifth of the area covered by the survey. It reflects a wide distribution of the vector. The scale of anti-mosquito measures should be stepped up and strengthened within FEHD and other departments to increase the coverage of the operations. Potential breeding grounds should be eliminated at once. For those breeding grounds that could not be removed, weekly inspection should be conducted to review the situation and larviciding should be carried out whenever necessary. Reports from FEHD district staff revealed that appropriate actions have been carried out by its staff in collaboration with concerned departments / parties to bring down the ovitrap indices to below 20%.

27. FEHD has also taken a closer look at localities where there was abrupt fall of the level of AOIs to see whether the sudden fall commensurate with actions taken. In such review, we have identified five localities (Lai Chi Kok, Yuen Kong, Yuen Long Town, Ma Wan and Tsing Yi) where AOIs were about and over 10% in different months from May to July 2006 and fell to zero in subsequent months. In analyzing the control actions and ancillary efforts taken by FEHD and other government departments / agencies / local community in the above localities, our view is that the concerted efforts made by all parties has helped to improve the situation. Please see **Annex VI** on the efforts made in the five localities. As to whether the ovitraps in these localities have been tampered with, the case is being investigated by the Police.

IMPROVEMENT MEASURES

28. To prevent the tampering of ovitrap in the future, the FEHD had immediately taken improvement measures, including -

(a) issue notice to staff and contractor reminding them not to tamper with the ovitraps;

(b) consider ways and means of improving the security and the design of the ovitraps; and

(c) arrange a special training course on mosquito control for its staff.

CONCLUSION

29. Anti-mosquito operations are on-going exercises being carried out throughout the year irrespective of the level of ovitrap indices. Ovitrap Index is only dedicated to monitoring the breeding of dengue vectors and reflects the effectiveness of the dengue vector preventive work carried out by FEHD and other government departments concerned. The day-to-day preventive actions will be supplemented by control measures, the intensity of which depends on the severity of the action levels.

WAY FORWARD

30. All concerned government departments will continue to closely monitor the mosquito breeding situation taking into account a basket of indicators. Anti-mosquito operation will be carried out year round irrespective of the ovitrap indices. Measures will be devised to improve the security and the design of ovitraps so as to prevent the recurrence of the recent ovitrap tampering incident. The community should stay alert and take proactive action throughout the year to eliminate mosquito breeding places in their premises and their neighbourhood.

Health, Welfare and Food Bureau
Food and Environmental Hygiene Department
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Annex I

Member Departments of
the Inter-departmental Working Group on
Pest Prevention and Control (IWGPPC)

(a) Food and Environmental Hygiene Department
(b) Agriculture, Fisheries and Conservation Department
(c) Architectural Services Department
(d) Buildings Department
(e) Correctional Services Department
(f) Department of Health
(g) Drainage Services Department
(h) Education and Manpower Bureau
(i) Environmental Protection Department
(j) Government Logistics Department
(k) Highways Department
(l) Home Affairs Department
(m) Hospital Authority
(n) Housing Department
(o) Immigration Department
(p) Labour Department
(q) Lands Department
(r) Leisure and Cultural Services Department
(s) Marine Department
(t) Social Welfare Department
(u) Water Supplies Department

Annex II

The Categorization System of Ovitrap Index

Classification	Ovitrap Index	Level of Action by FEHD	
		District Level	**Community Level**
Level I	O.I. < 5%	➢ To mount an one-off control operation around the Aedes-positive traps aiming at elimination of breeding places.	
Level II	5% ≤ O.I. <20%	➢ To conduct weekly inspection around the positive traps until no more breeding is detected or the result of the next survey period shows a negative finding.	➢ A variety of health education activities including health talks, exhibitions, etc. will be conducted for the public to arouse their awareness.
Level III	20% ≤ O.I. <40%	➢ To reshuffle resources and mobilize staff of other sections of the district, e.g. Cleansing Section, for the elimination of breeding places.	➢ District organizations such as District Councils and Area Committees would be liaised and advised to organize anti-mosquito activities.
Level IV	40% ≤ O.I.	➢ Adult control by fogging would be conducted in parallel with larval control whenever necessary, e.g. with dengue fever cases in past 3 months.	➢ The Inter-departmental Working Group on Pest Prevention and Control will direct coordinate actions to be taken against mosquitoes at all levels.

Annex III(a)

Summary of AOI in 2004, 2005 & 2006 in Hong Kong Districts (including Islands District)

Location	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chai Wan West	2004	2.1%	0.0%	0.0%	1.9%	22.9%	9.8%	16.0%	7.5%	5.9%	1.9%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	9.6%	0.0%	2.0%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	1.9%	6.1%	0.0%	7.5%	6.0%	-	-	-	-
Wan Chai North	2004	0.0%	0.0%	0.0%	0.0%	4.3%	11.8%	28.8%	17.3%	19.6%	2.0%	7.5%	2.0%
	2005	0.0%	0.0%	0.0%	0.0%	9.8%	16.0%	9.8%	8.7%	10.2%	8.9%	2.0%	0.0%
	2006	0.0%	0.0%	0.0%	0.0%	5.8%	10.4%	1.9%	0.0%	-	-	-	-
Happy Valley	2004	0.0%	0.0%	1.9%	1.9%	39.6%	19.2%	21.8%	17.6%	13.2%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	5.6%	5.5%	3.6%	5.5%	1.9%	1.9%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	0.0%	14.8%	18.9%	3.7%	5.8%	-	-	-	-
Sheung Wan	2004	0.0%	0.0%	0.0%	0.0%	32.1%	36.0%	24.5%	28.3%	27.8%	5.9%	3.7%	2.0%
Sheung Wan	2005	0.0%	0.0%	0.0%	0.0%	26.0%	32.1%	3.9%	1.9%	4.3%	0.0%	0.0%	0.0%
Central, Sheung Wan & Sai Ying Pun	2006	0.0%	0.0%	0.0%	2.0%	8.0%	2.0%	3.8%	0.0%	-	-	-	-
Kennedy Town	2004	0.0%	0.0%	0.0%	18.8%	43.1%	12.2%	26.4%	11.1%	9.4%	7.3%	3.7%	0.0%
Kennedy Town	2005	0.0%	0.0%	0.0%	0.0%	19.2%	26.9%	2.0%	0.0%	3.8%	1.9%	0.0%	0.0%
Sai Wan	2006	0.0%	0.0%	0.0%	1.9%	5.9%	4.1%	2.0%	0.0%	-	-	-	-
North Point	2004	0.0%	0.0%	0.0%	6.0%	19.6%	20.4%	15.7%	7.7%	10.4%	3.9%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	1.9%	1.9%	3.8%	6.1%	2.0%	2.0%	2.2%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	3.8%	5.7%	3.8%	5.6%	1.9%	-	-	-	-
Aberdeen	2004	0.0%	2.2%	0.0%	44.7%	11.8%	6.8%	5.6%	18.4%	0.0%	2.0%	0.0%	0.0%
Aberdeen and Ap Lei Chau	2005	0.0%	0.0%	0.0%	6.7%	16.0%	2.1%	3.8%	0.0%	1.9%	0.0%	0.0%	0.0%
Aberdeen and Ap Lei Chau	2006	0.0%	0.0%	0.0%	4.0%	14.9%	4.3%	2.0%	6.0%	-	-	-	-
Pokfulam	2004	0.0%	0.0%	3.6%	34.0%	39.6%	16.7%	5.5%	13.5%	5.7%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	22.6%	3.8%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	5.8%	9.3%	1.8%	0.0%	0.0%	-	-	-	-
Cheung Chau	2004	0.0%	0.0%	0.0%	0.0%	22.2%	33.3%	15.6%	5.9%	2.9%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	0.0%	2.8%	5.6%	5.7%	3.0%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	6.1%	9.1%	2.9%	0.0%	8.3%	-	-	-	-
Tung Chung	2004	0.0%	0.0%	0.0%	9.4%	28.6%	14.3%	14.7%	38.9%	13.9%	5.7%	3.0%	0.0%
	2005	0.0%	0.0%	0.0%	6.3%	20.0%	8.8%	5.9%	2.8%	22.9%	0.0%	2.8%	0.0%
	2006	0.0%	0.0%	2.9%	3.0%	11.1%	25.7%	9.1%	5.7%	-	-	-	-
Monthly Ovitrap Index	2004	**0.1%**	**0.1%**	**1.5%**	**11.9%**	**31.6%**	**22.0%**	**21.1%**	**17.7%**	**15.9%**	**5.2%**	**2.4%**	**0.2%**
	2005	**0.0%**	**0.0%**	**0.0%**	**3.4%**	**9.9%**	**13.2%**	**7.0%**	**3.5%**	**4.4%**	**2.7%**	**1.3%**	**0.2%**
	2006	**0.1%**	**0.1%**	**0.2%**	**4.9%**	**10.3%**	**10.4%**	**6.8%**	**3.9%**	-	-	-	-

REMARKS - There are the following changes in survey areas in 2005 & 2006 –

(a) Aberdeen has replaced by Aberdeen and Ap Lei Chau since 2005
(b) Sheung Wan has been replaced by Central, Sheung Wan and Sai Ying Pun since 2006
(c) Kennedy Town has replaced by Sai Wan since 2006

Annex III(b)

Summary of AOI in 2004, 2005 & 2006 in Kowloon Districts

Location	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tsim Sha Tsui	2004	0.0%	0.0%	0.0%	0.0%	6.3%	6.5%	16.3%	9.6%	17.6%	5.9%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	9.4%	8.0%	3.9%	1.9%	2.1%	1.9%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	4.0%	14.0%	10.7%	7.8%	9.1%	-	-	-	-
Yau Ma Tei	2004	0.0%	0.0%	1.9%	0.0%	12.5%	9.8%	29.1%	13.7%	18.5%	9.6%	9.8%	1.9%
Yau Ma Tei	2005	0.0%	0.0%	0.0%	0.0%	17.3%	10.0%	27.1%	12.0%	7.8%	9.3%	4.1%	1.9%
Mong Kok	2006	0.0%	0.0%	0.0%	3.7%	14.0%	4.8%	7.8%	4.3%	-	-	-	-
Lai Chi Kok	2004	0.0%	0.0%	0.0%	3.8%	32.1%	15.7%	16.7%	5.6%	3.8%	1.9%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	3.8%	3.8%	1.8%	0.0%	3.7%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	3.7%	6.1%	10.9%	11.1%	0.0%	-	-	-	-
Sham Shui Po (East)	2004	0.0%	0.0%	0.0%	0.0%	13.5%	43.1%	38.3%	29.6%	20.8%	1.9%	5.8%	0.0%
	2005	0.0%	0.0%	0.0%	1.9%	13.0%	24.5%	21.2%	2.0%	11.5%	4.3%	4.9%	0.0%
	2006	0.0%	1.9%	0.0%	1.9%	13.7%	14.3%	8.7%	3.9%	-	-	-	-
Cheung Sha Wan	2004	2.0%	0.0%	6.7%	13.5%	31.5%	23.5%	21.6%	23.5%	26.9%	3.6%	3.8%	0.0%
	2005	0.0%	0.0%	0.0%	3.8%	16.3%	19.6%	13.2%	12.3%	0.0%	6.0%	2.2%	0.0%
	2006	0.0%	0.0%	0.0%	0.0%	11.6%	9.8%	5.8%	5.3%	-	-	-	-
Kowloon City North	2004	0.0%	0.0%	0.0%	0.0%	27.8%	16.0%	14.8%	14.8%	24.5%	5.8%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	3.8%	0.0%	0.0%	2.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	0.0%	4.1%	6.3%	1.9%	1.9%	-	-	-	-
Ho Man Tin	2004	0.0%	0.0%	0.0%	0.0%	16.0%	27.1%	24.5%	32.7%	29.4%	15.7%	2.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	7.7%	17.3%	6.1%	6.1%	1.9%	0.0%	2.3%	0.0%
	2006	0.0%	0.0%	0.0%	0.0%	2.2%	6.5%	3.9%	2.0%	-	-	-	-
Wong Tai Sin Central	2004	0.0%	0.0%	1.7%	16.7%	49.2%	23.3%	13.3%	32.2%	11.7%	9.8%	1.6%	1.6%
	2005	0.0%	0.0%	0.0%	8.1%	28.8%	13.6%	5.2%	5.1%	11.7%	5.2%	3.4%	0.0%
	2006	1.7%	0.0%	0.0%	13.0%	15.5%	23.7%	24.1%	9.3%	-	-	-	-
Diamond Hill	2004	0.0%	0.0%	0.0%	6.0%	30.8%	55.1%	42.3%	14.8%	25.9%	13.5%	4.0%	0.0%
	2005	0.0%	0.0%	0.0%	2.2%	12.8%	19.1%	10.2%	14.0%	6.4%	8.3%	4.3%	0.0%
	2006	0.0%	0.0%	0.0%	17.0%	18.2%	39.1%	14.0%	6.4%	-	-	-	-
Kwun Tong Central	2004	0.0%	0.0%	3.6%	44.8%	32.1%	13.2%	15.1%	3.6%	5.6%	5.6%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	0.0%	14.3%	9.8%	3.5%	0.0%	5.4%	2.1%	0.0%
	2006	0.0%	0.0%	0.0%	0.0%	5.7%	10.4%	1.9%	1.8%	-	-	-	-
Lam Tin	2004	0.0%	0.0%	0.0%	34.7%	50.0%	13.5%	29.4%	13.2%	14.8%	9.6%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	3.8%	21.2%	3.8%	11.1%	2.0%	1.9%	2.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	3.7%	7.8%	9.3%	5.6%	0.0%	-	-	-	-
Monthly Ovitrap Index	2004	**0.1%**	**0.1%**	**1.5%**	**11.9%**	**31.6%**	**22.0%**	**21.1%**	**17.7%**	**15.9%**	**5.2%**	**2.4%**	**0.2%**
	2005	**0.0%**	**0.0%**	**0.0%**	**3.4%**	**9.9%**	**13.2%**	**7.0%**	**3.5%**	**4.4%**	**2.7%**	**1.3%**	**0.2%**
	2006	**0.1%**	**0.1%**	**0.2%**	**4.9%**	**10.3%**	**10.4%**	**6.8%**	**3.9%**	-	-	-	-

REMARKS - Yau Ma Tei has been replaced by Mong Kok since 2006

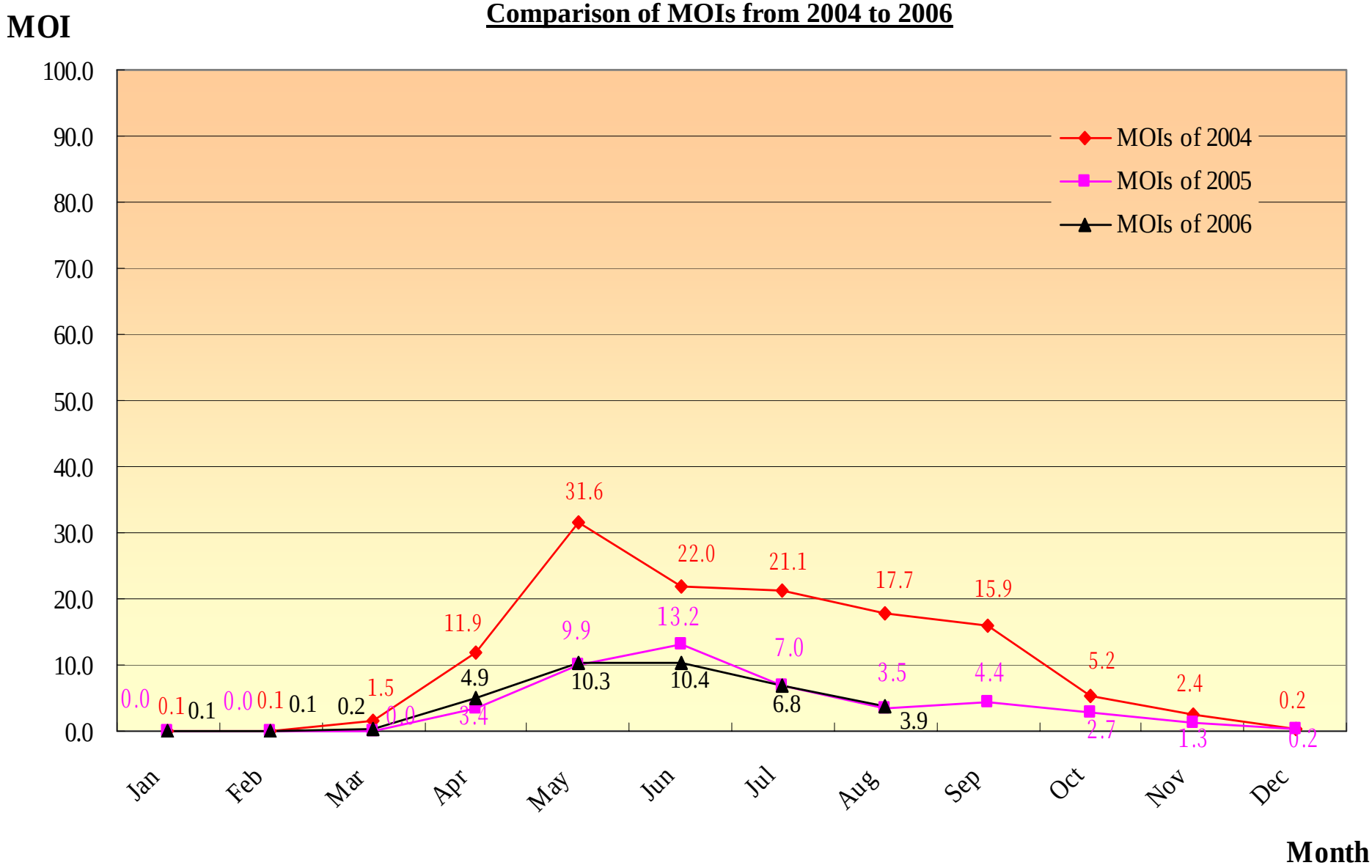
Annex III(c)

Summary of AOI in 2004, 2005 & 2006 in New Territories Districts

Location	Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Tseung Kwan O	2004	0.0%	0.0%	0.0%	44.8%	16.1%	16.4%	18.5%	11.1%	8.8%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	1.7%	1.7%	1.8%	3.3%	1.7%	5.1%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	5.2%	5.1%	9.3%	17.9%	12.1%	-	-	-	-
Ma On Shan	2004	0.0%	0.0%	2.0%	17.0%	51.9%	32.7%	11.1%	18.9%	9.4%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	17.0%	3.8%	0.0%	1.9%	5.6%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	0.0%	9.8%	18.4%	5.7%	5.7%	-	-	-	-
Lek Yuen	2004	0.0%	0.0%	3.8%	7.4%	32.0%	20.4%	5.5%	13.0%	11.3%	3.8%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	1.9%	3.8%	0.0%	0.0%	0.0%	0.0%	1.9%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	3.9%	7.7%	15.4%	13.5%	7.8%	-	-	-	-
Tai Wai	2004	0.0%	0.0%	0.0%	12.0%	61.8%	51.0%	23.6%	18.5%	18.9%	0.0%	3.7%	0.0%
	2005	0.0%	0.0%	0.0%	19.2%	28.8%	7.7%	4.1%	9.8%	7.5%	0.0%	1.9%	0.0%
	2006	0.0%	0.0%	0.0%	3.7%	7.7%	35.4%	19.6%	8.0%	-	-	-	-
Tai Po North	2004	0.0%	0.0%	0.0%	0.0%	46.3%	26.2%	36.0%	30.8%	29.4%	7.5%	5.6%	0.0%
	2005	0.0%	0.0%	0.0%	9.8%	4.0%	39.2%	19.2%	3.7%	3.9%	6.5%	4.3%	2.0%
	2006	0.0%	0.0%	0.0%	5.6%	7.8%	9.4%	18.5%	2.3%	-	-	-	-
Fanling	2004	0.0%	0.0%	0.0%	1.9%	55.1%	18.5%	39.2%	26.9%	28.8%	15.4%	8.7%	0.0%
	2005	0.0%	0.0%	0.0%	11.3%	17.3%	38.9%	16.4%	3.7%	9.6%	13.7%	1.9%	0.0%
	2006	0.0%	0.0%	0.0%	11.5%	26.0%	8.0%	11.8%	4.4%	-	-	-	-
Sheung Shui	2004	0.0%	0.0%	0.0%	0.0%	43.1%	20.8%	25.5%	4.2%	16.0%	1.8%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	5.6%	3.8%	26.4%	3.6%	0.0%	1.9%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	13.0%	14.8%	3.8%	0.0%	5.8%	-	-	-	-
Tin Shui Wai	2004	0.0%	0.0%	0.0%	12.0%	23.1%	15.0%	18.5%	13.5%	13.5%	3.8%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	8.9%	6.1%	9.6%	10.2%	6.0%	3.7%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	5.6%	3.9%	7.4%	5.5%	13.0%	-	-	-	-
Yuen Kong	2004	0.0%	0.0%	0.0%	0.0%	50.0%	45.8%	8.3%	8.0%	16.0%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	8.0%	30.4%	8.0%	4.3%	0.0%	0.0%	4.2%	0.0%
	2006	0.0%	0.0%	0.0%	12.5%	4.0%	8.7%	0.0%	0.0%	-	-	-	-
Yuen Long Town	2004	0.0%	0.0%	3.8%	30.4%	31.4%	22.9%	10.9%	6.4%	18.2%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	10.0%	2.0%	26.5%	0.0%	4.2%	2.0%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	7.5%	10.4%	2.0%	0.0%	0.0%	-	-	-	-
Tuen Mun (South)	2004	0.0%	0.0%	22.0%	26.9%	26.4%	9.4%	21.2%	27.3%	25.0%	1.9%	9.4%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	11.1%	13.5%	13.7%	0.0%	1.9%	2.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	2.1%	2.3%	8.0%	7.7%	3.9%	-	-	-	-
Tuen Mun (North)	2004	0.0%	0.0%	0.0%	3.6%	33.3%	16.7%	13.2%	5.7%	3.7%	1.9%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	5.8%	0.0%	1.9%	3.7%	3.8%	0.0%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	1.7%	8.8%	0.0%	3.5%	0.0%	-	-	-	-
Tsuen Wan Town	2004	0.0%	0.0%	0.0%	35.2%	29.1%	17.5%	5.3%	24.1%	7.8%	0.0%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	5.2%	1.7%	1.7%	1.8%	3.6%	1.9%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	9.6%	7.0%	7.7%	10.2%	1.8%	-	-	-	-
Ma Wan	2004	0.0%	0.0%	0.0%	0.0%	44.0%	16.0%	37.5%	16.0%	4.3%	7.8%	4.2%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	17.4%	12.0%	8.3%	0.0%	4.0%	4.5%	0.0%	0.0%
	2006	0.0%	0.0%	0.0%	4.3%	10.5%	29.2%	0.0%	0.0%	-	-	-	-
Kwai Chung	2004	0.0%	0.0%	0.0%	0.0%	23.1%	24.5%	38.0%	33.3%	17.0%	14.0%	5.8%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	10.0%	13.7%	10.4%	4.3%	6.1%	7.0%	2.3%	4.0%
	2006	0.0%	0.0%	2.0%	2.1%	16.7%	17.8%	4.0%	0.0%	-	-	-	-
Lai King	2004	0.0%	0.0%	5.9%	5.5%	33.3%	47.2%	24.5%	31.5%	33.3%	13.2%	9.3%	0.0%
	2005	0.0%	0.0%	0.0%	1.9%	5.9%	30.2%	3.6%	1.9%	7.5%	2.0%	3.8%	0.0%
	2006	0.0%	0.0%	2.0%	18.2%	3.8%	9.4%	3.6%	0.0%	-	-	-	-
Tsing Yi	2004	0.0%	0.0%	0.0%	1.8%	38.5%	18.5%	32.7%	18.9%	21.8%	13.5%	0.0%	0.0%
	2005	0.0%	0.0%	0.0%	0.0%	0.0%	10.5%	7.0%	0.0%	3.5%	1.8%	3.6%	0.0%
	2006	0.0%	0.0%	0.0%	7.4%	36.5%	0.0%	0.0%	1.9%	-	-	-	-
Monthly Ovitrap Index	2004	**0.1%**	**0.1%**	**1.5%**	**11.9%**	**31.6%**	**22.0%**	**21.1%**	**17.7%**	**15.9%**	**5.2%**	**2.4%**	**0.2%**
	2005	**0.0%**	**0.0%**	**0.0%**	**3.4%**	**9.9%**	**13.2%**	**7.0%**	**3.5%**	**4.4%**	**2.7%**	**1.3%**	**0.2%**
	2006	**0.1%**	**0.1%**	**0.2%**	**4.9%**	**10.3%**	**10.4%**	**6.8%**	**3.9%**	-	-	-	-

Annex IV

Comparison of MOIs from 2004 to 2006



Annex V

Summary of Actions Taken in Anti-mosquito Campaign and Thematic Mosquito Control Operations in 2006

Districts	Mosquito Control Actions and Measures Taken					
	Anti-mosquito Campaign (Phases I and II) 27.2.2006 – 25.3.2006 and 24.4.2006 – 30.6.2006			Thematic Mosquito Control Operation (Phases I and II) 27.3.2006 – 13.4.2006 and 10.7.2006 – 4.8.2006		
	No. of mosquito breeding / potential breeding grounds treated / eliminated	No. of verbal warnings / advice / warning letters issued	No. of referrals to other government departments / authorities	No. of mosquito breeding / potential breeding grounds treated / eliminated	No. of verbal warnings / advice / warning letters issued	No. of referrals to other government departments / authorities
Central / Western	3 220	4 752	19	421	33	0
Eastern	811	63	6	178	22	0
Southern	1 755	668	10	81	47	0
Wanchai	7 500	422	16	1 349	66	8
Islands	1 950	147	4	768	42	2
Sham Shui Po	3 904	301	15	454	12	0
Kowloon City	11 342	6 858	15	112	141	3
Kwun Tong	7 687	1 455	44	869	134	3
Wong Tai Sin	2 801	838	36	301	70	0
Yau Tsim Mong	11 803	692	3	1 067	105	0
Kwai Tsing	5 620	317	18	1330	167	19
Tsuen Wan	15 231	522	10	7 199	159	7
Yuen Long	2 885	910	9	1 308	562	0
Tuen Mun	3 410	665	60	2 245	399	12
Shai Tin	4 369	3 261	3	718	123	0
Sai Kung	23 586	13 851	20	478	118	6
North	2 623	5 193	28	531	52	0
Tai Po	2 209	620	5	718	166	0

Annex VI

Control Actions and Ancillary Efforts taken by FEHD in the Five Localities with Abrupt Fall of AOIs

Locations	AOI Level	Manpower Deployment	Action Taken	Results and Community Participation
Lai Chi Kok	• The AOI dropped from 11.1% in July to 0% in August. • Out of the six positive ovitraps in July, four traps were placed in public places while the other two were within private lots.	• In-house pest control staff first carried out thorough surveys to building sites and other black spots in the area. • In addition to the normal working programme undertaken by two roving teams, one malaria prevention gang were assigned to conduct fogging around streams twice in July. • Two additional roving teams were deployed to enhance control measures including removal of potential breeding grounds and application of larvicidal oil to stagnant water that could not be drained, e.g. sand traps and road gullies in the area twice weekly.	• Verbal advice was given to the management of the respective private lots for elimination of potential breeding grounds. • There were one imported dengue and three malaria patients hospitalized in the Princess Margaret Hospital in July. Extensive larval control and adult elimination by larviciding and fogging within a radius of 500 m / 2 Km from the focus (the Hospital) of the diagnosed case are required. • 447 potential breeding grounds were treated / eliminated and 0.85 tonnes of waste were removed.	• The AOI dropped from 11.1% in July to 0% in August. • The number of complaints dropped from five in July to one in August.
Yuen Kong	• The AOI dropped from 8.7% in June to 0% in July and the AOI remained at 0% in August. • The two positive ovitraps were placed in public places.	• A dedicated roving team is carrying on preventive actions once every four to five days to Shek Kong areas including different parts of Yuen Kong aiming at enhancing mosquito control measures to all potential breeding grounds in the areas.	• Yuen Kong has been included as one of the black spots in the village black spot list for mosquito preventive actions. • The roving team intensified mosquito control actions first to all areas within 100 m radius of the two positive traps by removal of waste that led to accumulation of water, clearing of blocked surface channels, spraying of larvicidal oil to stagnant water and in particular intensified insecticide spraying to dense vegetation and shrubby areas where harbourage of adult mosquitoes was frequent. This was followed by control actions to the whole area.	• The AOI dropped from 8.7% in June to 0% in July and the AOI remained at 0% in August. • The number of complaints was quite steady in June (four) and July (five) and dropped to one in August.

Locations	AOI Level	Manpower Deployment	Action Taken	Results and Community Participation
Yuen Long Town	• The AOI dropped from 10.4% in May to 2% in June and remained at 0% in July and August. • Three of the five positive ovitraps in May were found in public places. • The remaining two positive traps were found inside Pok Oi Hospital area.	• Two roving teams were dedicated to mosquito preventive actions in the area.	• The roving teams inspected once every three to five days and treated / eliminated all mosquito breeding / potential breeding grounds once discovered. • Hospital Authority and the hospital management were informed to strengthen mosquito control work.	• The AOI dropped from 10.4% in May to 2% in June and remained at 0% in July and August. • The number of complaints was 10 in May and 15 in June and dropped to one in July and six in August.
Ma Wan	• The AOI dropped from 29.2% in June to 0% in July and remained at 0% in August. • There were 24 ovitraps collected in the Ma Wan area. Among the seven positive ovitraps in June, three of them were found in public places while the remaining four were within venues managed by Leisure and Cultural Services Department (LCSD) and private estate management.	• In-house pest control staff first carried out thorough surveys to all potential breeding grounds in the locality. Inspection had been conducted daily to Park Island and weekly to building sites which covered a large proportion of the developing area in Ma Wan. • In addition to the normal working programme undertaken by four roving teams, two additional roving teams were deployed to reinforce mosquito control actions to cover all problematic locations within public places in Ma Wan.	• From 4.7.2006 when district staff were notified of the AOI at 29.2% to 8.8.2006 when the AOI in July dropped to 0%, 215 inspections have been made to the Ma Wan area, 38 times of fogging / spraying operations were carried out to reduce the number of adult mosquitoes, 663 mosquito breeding / potential breeding grounds were treated / eliminated and 3.7 tonnes of waste were removed for disposal. • District Environmental Hygiene Superintendent (Tsuen Wan) (DEHS(TW)) convened a task force meeting on 13.7.2006 with eight parties participating namely Lands Department (Lands D), LCSD, Highways Department (Hy D), District Officer (Tsuen Wan), the property management of Park Island, property agencies of many building sites and developments in Ma Wan and the management of CCC Kei Wai Primary School to draw members' attention to the prevalence of the dengue vector in the local environment and the concerted effort required in tackling the problem.	• The AOI dropped from 29.2% in June to 0% in July and remained at 0% in August. • The number of complaints dropped from six in June to three each in July and August. • DC members paid site inspection to Ma Wan on 31.7.2006 and LegCo Member and DC members also visited Ma Wan on 29.9.2006. They were satisfied with the actions taken by FEHD.

Locations	AOI Level	Manpower Deployment	Action Taken	Results and Community Participation
			• The planned control actions were also reported to the Environmental Hygiene and Affairs Committee and Clean Hong Kong Committee of the Tsuen Wan District Council (DC) on 6.7.2006 and 20.7.2006 respectively for concerted effort of the local community. DC members appreciated the commitments of FEHD and other departments / agencies for mosquito control actions. • DEHS(TW) sustained effort of mosquito control work by requiring in-house staff to continue with weekly inspection to the problematic spots in the area until present. Regular action to eliminate potential breeding grounds continued by contractor's roving teams.	
Tsing Yi	• The AOI dropped from 36.5% in May to 0% in the respective months of June and July and arose to 1.9% in August. • There were 57 ovitraps placed in Tsing Yi area and 11 of them were located in public places. For the 19 positive ovitraps in May, six of them were found in public places and 13 of the remaining ones were within the boundaries of LCSD, Housing Department (HD), schools, Mass Transit Railway Corporation (MTRC) and private residential areas.	• In-house pest control staff first carried out thorough survey to all potential breeding grounds in the locality. • In addition to the normal working programmes undertaken by three roving teams provided by pest contractor, District Environmental Hygiene Superintendent (Kwai Tsing) (DEHS(KwT)) deployed four more roving teams to the area for intensified actions.	• From 22.5.2006 when district staff were notified of the AOI at 36.5% to 26.6.2006 when the AOI in June dropped to 0%, 299 inspections were made, 76 times of fogging / spraying operations were carried out to reduce the number of adult mosquitoes, 2 745 mosquito breeding / potential breeding grounds were treated / eliminated and about three tonnes of waste were removed for disposal by FEHD alone, not to mention anti-mosquito measures such as grass-cutting and clearance of hillside illegal cultivation spots taken by other departments.	• The AOI dropped from 36.5% in May to 0% in the respective months of June and July and arose to 1.9% in August. • There was a gradual drop of justified complaints from six in May to three in June, two in July and zero in August. • LegCo Member and DC members visited the locality on 29.9.2006. They were satisfied with the actions taken by FEHD.
			• DEHS (KwT) convened a task force meeting on 30.5.2006 with 12 parties participating namely Drainage Services Department, District Officer (Kwai	

Locations	AOI Level	Manpower Deployment	Action Taken	Results and Community Participation
			Tsing), HD, Hy D, LCSD, Lands D, the management company of Government Property Agency, the school management of the Hong Kong Sze Yap Commercial and Industrial Association Chan Lai So Chun Memorial School, the property management of the MTRC and the property management of three residential estates to draw members' attention to the prevalence of the dengue vector in the local environment and concerted effort was required to tackle the problem. • Following the task force meeting, site visit was organized to visit problematic spots with DC Chairman and Vice-Chairman, DC members and Chairmen of Area Committees for appealing to the local community for concerted effort. • In reviewing the cause for the high AOI in May, district staff discovered the use of inferior larvicidal oil by contractor which was unable to kill all mosquito larvae in 24 hours. This was rectified after warning given by FEHD staff.	