For information
on 17 November 2014

Legislative Council Panel on Health Services

Measures for the Prevention and Control of Dengue Fever

PURPOSE

This paper provides background information of dengue fever and sets out the Administration's measures for the prevention and control of dengue fever.

BACKGROUND

2. Dengue fever is a mosquito-borne disease caused by dengue viruses. The virus encompasses four different serotypes. The symptoms of the first infection are usually mild but, once recovered, immunity to that serotype of dengue virus will develop and subsequent infections with other serotypes of dengue virus are more likely to result in dengue haemorrhagic fever, a severe and potentially fatal complication. Moreover, dengue fever is an infectious disease of great public health significance due to its potential in causing rapid and extensive epidemics.

3. *Aedes* mosquitoes are the principal vector for transmitting dengue fever to human. In Hong Kong, the efficient vector *Aedes aegypti* is not found but *Aedes albopictus*, which can also transmit the disease, is widely present.

4. In the past decade (2004-2013), there were totally 505 confirmed cases of dengue fever in Hong Kong. The annual number of cases ranged between 30 and 103 and an increasing trend was observed in recent years. Almost all cases were imported cases but local cases were also recorded in 2002 (20 cases), 2003 (1 case) and 2010 (4 cases). In 2014, there were 100 confirmed dengue fever cases as of 9 November

and among them, three were local cases and 97 were imported infection. Due to the large volume of travel to the endemic places in Southeast Asia and Guangdong, it is expected that the number of cases would be increasing.

5. The three local cases of 2014 were recorded on 25 October, 3 November and 7 November respectively. Similar to the outbreak in 2002, the former two cases mentioned above occurred in cluster and were related to construction site. Both patients had been working at the construction site of Sai Ying Pun Mass Transit Railway Station where they recalled mosquito bites during the incubation period. The third patient lived in Tsing Yi and she recalled mosquito bites at home and in Tsing Yi Northeast Park. The Centre for Health Protection ("CHP") of the Department of Health ("DH"), in collaboration with the Food and Environmental Hygiene Department ("FEHD") and other government departments, carried out cases investigation and has implemented control measures including:

- Enhanced surveillance of dengue fever;
- Active case finding through questionnaire survey, blood test and early referral of suspected cases to hospital;
- Enhanced anti-mosquito work and health education through interdepartmental efforts on multiple fronts e.g. holding interdepartmental meetings, joint site visits with various departments and distributing health education materials;
- Reminded the public to protect themselves against mosquito bites and remove stagnant water to eliminate mosquito breeding grounds through press conference, hotlines, and talks;
- Immediately issued letters to doctors and private hospitals to enlist their support in early diagnosis, control and prevention;
- Issued letters to the person-in-charge of institutions including primary/secondary schools, kindergartens/child care centres, elderly homes, and disabled homes to remind them to remain vigilant against the disease; and
- Arrange to discuss the local preventive and control measures in the Scientific Committee on Vector-borne Diseases with

attendance from local experts.

6. Disease surveillance and epidemiological investigation are ongoing. Patients of all local cases of 2014 have recovered uneventfully and discharged. As of 9 November 2014, active case finding through questionnaire survey, blood tests and hospital referral has not identified further cases in the localities in question.

PREVENTION AND CONTROL MEASURES

Disease surveillance, investigation and control

7. In Hong Kong, dengue fever is statutorily notifiable and all medical professionals are required to report cases to the CHP. Case investigation is initiated immediately when a notification is received. DH has established collaboration with the Hospital Authority and private hospitals for the arrangement of laboratory investigations and patient isolation to prevent secondary spread in case the patient is febrile. DH also works closely with FEHD to conduct vector survey and control at places where the patient has visited during the incubation period and after the onset of symptoms as appropriate.

Vector surveillance

8. Since 2003, FEHD has put in place an enhanced dengue vector surveillance programme ("the surveillance programme") to monitor the distribution of *Aedes albopictus* at selected areas, evaluate the effectiveness of mosquito prevention and control work carried out by various parties, and provide surveillance information to the public for timely adjustment to their mosquito control strategies and measures.

9. Under the surveillance programme, small plastic containers, known as ovitraps, are placed at selected locations for detecting the larval breeding rate of Aedine mosquitoes. Ovitrap index for Aedes albopictus is the percentage of ovitraps that are found to have positive larval breeding result. Two different indices, namely Area Ovitrap Index for Aedes albopictus ("AOI") and Monthly Ovitrap Index for Aedes

albopictus ("MOI"), are recorded. AOI indicates the extensiveness of the distribution of Aedine mosquitoes in the surveyed area while MOI reflects the extensiveness of *Aedes albopictus* throughout the territory. A total of 44 areas in the community are currently covered under the surveillance programme. Starting from 2004, the surveillance programme has been extended to cover all major port areas. Port Monthly Ovitrap Index for Aedes albopictus ("PMOI") is enumerated to reflect the overall monthly situation of mosquito breeding in port areas. All the indices are announced each month on FEHD's website and through press release.

10. In addition, an ovitrap index rapid alert system targeting the management offices of residential premises, social welfare facilities, schools, construction companies and utilities companies that fall within the 44 areas of surveillance has been introduced to ensure that anti-mosquito measures are taken promptly when the AOI of a particular area reaches the alert level of 20%. Whenever the AOI reaches 20%, subscribers to the system whose premises are situated within the surveillance area concerned will be individually notified by the relevant departments upon the publication of the AOI. Subscribers will be invited to post up specially designed alert notices in the common parts of their premises to draw the attention of occupants and management staff to take mosquito preventive and control measures promptly. Starting from 2014, tests on dengue virus have been conducted on dengue vectors collected in areas where AOIs have reached/exceeded 20%. Collaboration has been made with the Chinese University of Hong Kong on dengue virus test by testing dengue vectors collected in areas where AOI have reached 15% or above but below 20%. Since late October 2014, dengue vectors collected from port areas by FEHD would be tested for the presence of dengue virus as well.

MOIs

11. The MOIs recorded in 2014 (up to September) were in general lower than those in previous years. A chart showing the trend is at **Annex I**. The MOIs recorded in the first three months were 0.0%. In the following months, the MOIs gradually rose to 12.0% in May. The MOIs dropped from June onwards. The fluctuations in MOIs in 2014

(up to September) were in general similar to the pattern in previous years.

AOIs

12. In 2014 (up to September), the highest AOI of 45.6% was recorded in Tseung Kwan O in May, followed by 41.4% in Ma On Shan in July (see **Annex II**). In total, 20 areas had recorded AOIs reaching or exceeding the alert level of 20% at least once. In response, FEHD convened district task force meetings and activated the ovitrap rapid alert system to step up the co-ordination of government efforts in mosquito control and to mobilise community participation in anti-mosquito efforts.

PMOIs

13. From January to September 2014, the ovitrap indices for *Aedes albopictus* of the six groups of port areas were below 20%. The highest ovitrap index of 10.5% was recorded in the group of Cross Boundary Check Points on Land in June. The PMOIs in all ports from January to March 2014 were 0.0%. Positive PMOIs were recorded in the following months, at 0.3% in April and maintained between 2.2% to 2.5% from May to July. The PMOI then dropped to 1.3% in August and 0.3% in September. The fluctuations in PMOIs showed a similar pattern as in previous years.

14. Further to the extension of the surveillance programme to cover the areas of the Kai Tak Cruise Terminal which came into operation in September 2013, the coverage has been expanded to the second berth upon its operation in mid-2014. FEHD will continue to work closely with relevant government departments and organisations, including the Airport Authority, the Mass Transit Railway Corporation ("MTRC") and freight forwarding companies, in strengthening the anti-mosquito work in the port areas.

Mosquito Control Work

15. An Anti-Mosquito Steering Committee ("AMSC") has been set up since 2002 to set strategies and directions for territory-wide anti-mosquito efforts. Chaired by the Permanent Secretary for the Food

and Health (Food), AMSC comprises members from 12 policy bureaux and departments. AMSC meets (usually at the beginning of the rainy season and on a need basis in the latter part of the year) to review the mosquito prevention and control measures as well as the actions undertaken by respective departments. Moreover, an Interdepartmental Coordinating Committee on Dengue Fever was set up in 2001 to coordinate efforts at the operational level. FEHD has been coordinating the mosquito prevention and control work by various departments under their respective purviews.

16. The regular mosquito control work undertaken by FEHD includes inspections to problematic spots, elimination of breeding places and potential breeding places, investigation of complaints, and enforcement actions.

17. FEHD staff will inspect the areas prone to mosquito breeding, such as roof-top, car park, rear lane and refuse collection points. Whenever breeding of mosquitoes is detected, immediate actions will be taken to remove stagnant water or apply larvicide. Moreover, warning or enforcement action will be taken against the concerned parties. According to section 27(2)(a) and 27(3A) of the Public Health and Municipal Services Ordinance (Cap. 132), if any accumulation of water which may lead to mosquito breeding (or if any mosquito breeding) is found, the person responsible for that premises shall be guilty of an offence subject to a maximum fine of $25,000 and a daily fine of $450.

18. Before every rainy season, the District Environmental Hygiene Offices of FEHD will assess the efficiency of mosquito control work in the past year to devise strategies and work plans for mosquito control. District task force meeting will be convened with all relevant departments. Technical advice will be given to help them enhance the mosquito control work within their venues. We will also appeal for support from parties including schools and management organisations of residential buildings to make concerted efforts in mosquito control work. FEHD will also deploy additional staff during the rainy season to strengthen the mosquito prevention and control work.

19. In addition to the regular mosquito control work, FEHD launches

territory-wide anti-mosquito campaign in collaboration with other government departments every year. The aim is to deepen public awareness of the potential risk of mosquito-borne diseases and the importance of mosquito prevention and control in the community, and to encourage community participation and forge close partnership of government departments in carrying out mosquito control work within their venues. FEHD will also invite active participation of District Council members in launching mosquito control operations at the district level.

20. As stated in paragraph 5 above, upon receipt of notification of the local dengue fever cases, FEHD staff commenced investigation work immediately. Detailed inspection and surveillance work has been carried out within 500 metres from the residence and workplace of the patients, as well as the areas they have visited during the incubation period. All potential breeding places and receptacles have been removed and accumulation of water eliminated. Fogging operations have been carried out to kill the adult mosquitoes. Moreover, FEHD has initiated prosecution against five parties responsible for managing the venues in which the breeding of mosquito larvae was found. Three of them are the contractors of construction sites appointed by the MTRC and Housing Department. The other two are the management companies of public housing estates.

21. To strengthen the mosquito prevention and control work at the district level, task force meetings were convened in the concerned districts, including the residence and workplace of the patients, as well as the areas they have visited during the incubation period. Technical advice has been given to the concerned government departments assisting them in carrying out mosquito control work in areas within their ambit. FEHD has also appealed for support from the MTRC to strengthen their mosquito prevention and control work at their construction sites, including the dissemination of messages on mosquito prevention and control to their appointed contractors and site supervisors. Moreover, FEHD staff have given health talks and distributed health education and promotion leaflets to the schools and hospitals nearby. An outdoor broadcasting van has been deployed to the relevant areas in Central & Western, Sha Tin, Wong Tai Sin and Tsing Yi to alert the people and

advise them to implement mosquito prevention and control measures.

22. Since the number of dengue fever cases in neighbouring areas remains at a high level, the anti-mosquito campaign at the district level will continue throughout this winter. Furthermore, enhanced inspections will be carried out to the cross boundary check points, passenger and cargo/container terminals and handling areas, large private residential estates and the construction sites. Vector surveillance has also been enhanced at relevant port areas such as cross boundary check points and ferry piers. Stringent enforcement action will be taken whenever breeding of mosquitoes is found.

23. The Development Bureau also disseminates advice on the importance of sustained anti-mosquito efforts at construction sites to their contacts in the local construction industry, such as the Hong Kong Construction Association and developers.

24. AMSC held a special meeting on 11 November 2014 to review the anti-mosquito work conducted by relevant departments in response to the recent confirmation of three local cases of dengue fever, and discuss how to step up preventive actions.

Emergency preparedness

25. A contingency plan for prevention and control of dengue fever which covers the guidance and actions for the detection and response to dengue fever cases occurring in Hong Kong is in place. The plan contains public health actions including protocols for enhanced surveillance, active case finding and case investigation, emergency vector control, and risk communication. To test the departments' responsiveness, interdepartmental cooperation and implementation of intervention measures in times of community outbreak of dengue fever, the DH has organised a two-fold exercise code-named "Exercise CORAL" in November 2013 and March 2014. A total of 23 bureaux and departments participated in the exercise. Ninety experts from the public health and related organisations from local, the Mainland and Macau were invited to participate in the exercise as observers.

Travel health measures

26. To prevent importation of dengue fever into Hong Kong, Port Health Office has implemented a series of measures at boundary control points ("BCPs") in Hong Kong. Temperature screening for all arriving passengers is in place at all BCPs and suspected cases of infectious diseases will be referred to medical institutions for medical advice. Health promotion at BCPs has also been enhanced through pamphlet distribution and poster display to remind the travellers on preventive measures of dengue fever. In addition, regular inspections are conducted at BCPs to ensure good environmental hygiene and mosquito control measures are implemented properly. Port Health Office has been closely monitoring the overseas and regional situation of dengue fever. Updated information and travel health advice on Dengue Fever are made available at the DH's Travel Health website (http://www.travelhealth.gov.hk/).

Health education

27. To echo the World Health Day 2014 with the theme of vector-borne diseases, DH, together with about 50 partners including supporting organisations from health care and related sectors, and eight government departments/bureau, have launched a territory-wide publicity and public education campaign in April 2014. The campaign aims to raise awareness of the general public about the threat posed by vectors and vector-borne diseases and to encourage families and communities to take relevant vector prevention actions.

28. The DH has produced a variety of health education materials on prevention of vector-borne diseases, these include a thematic web page, animated videos, television and radio announcements in public interests ("APIs"), pamphlets, posters and exhibition boards. Various publicity and health education channels e.g. press conferences, websites, television and radio stations, mobile apps, health education hotline, giant wall banners, public transports, newspapers and media interviews, have been deployed under the campaign. DH has also briefed District Council committees on World Health Day 2014 and solicited their support on raising public awareness about the threat posed by vectors and

vector-borne diseases. DH has included “Vector-borne diseases” as one of the main themes of the 2014/15 “I'm So Smart” Community Programme, to engage community organisations in promoting public awareness and encouraging community actions to prevent vector-borne diseases.

29. In view of the rapidly increasing dengue fever cases in the Guangdong Province as well as the recent occurrence of local cases in Hong Kong, the DH has further strengthened public education on prevention of vector-borne diseases. This is done through media interviews, broadcasting APIs and animated videos at public and private venues, mantling giant wall banners on government buildings, etc. Targeting the place where people live, the DH has solicited the Hong Kong Housing Department and private estates to enhance publicity and further distribute related health education materials. The DH has also kept the stakeholders including various bureaux and government departments, hotel and guesthouse associations, property management associations, Hong Kong Housing Society, District Councils, Healthy Cities, non-government organisations, ethnic minority groups and World Health Day 2014 publicity and public education partners, updated of the disease status and solicited their co-ordination and support to strengthen various publicity activities.

ADVICE SOUGHT

30. Members are invited to note the content of the paper.

Food and Health Bureau
Department of Health
Food and Environmental Hygiene Department
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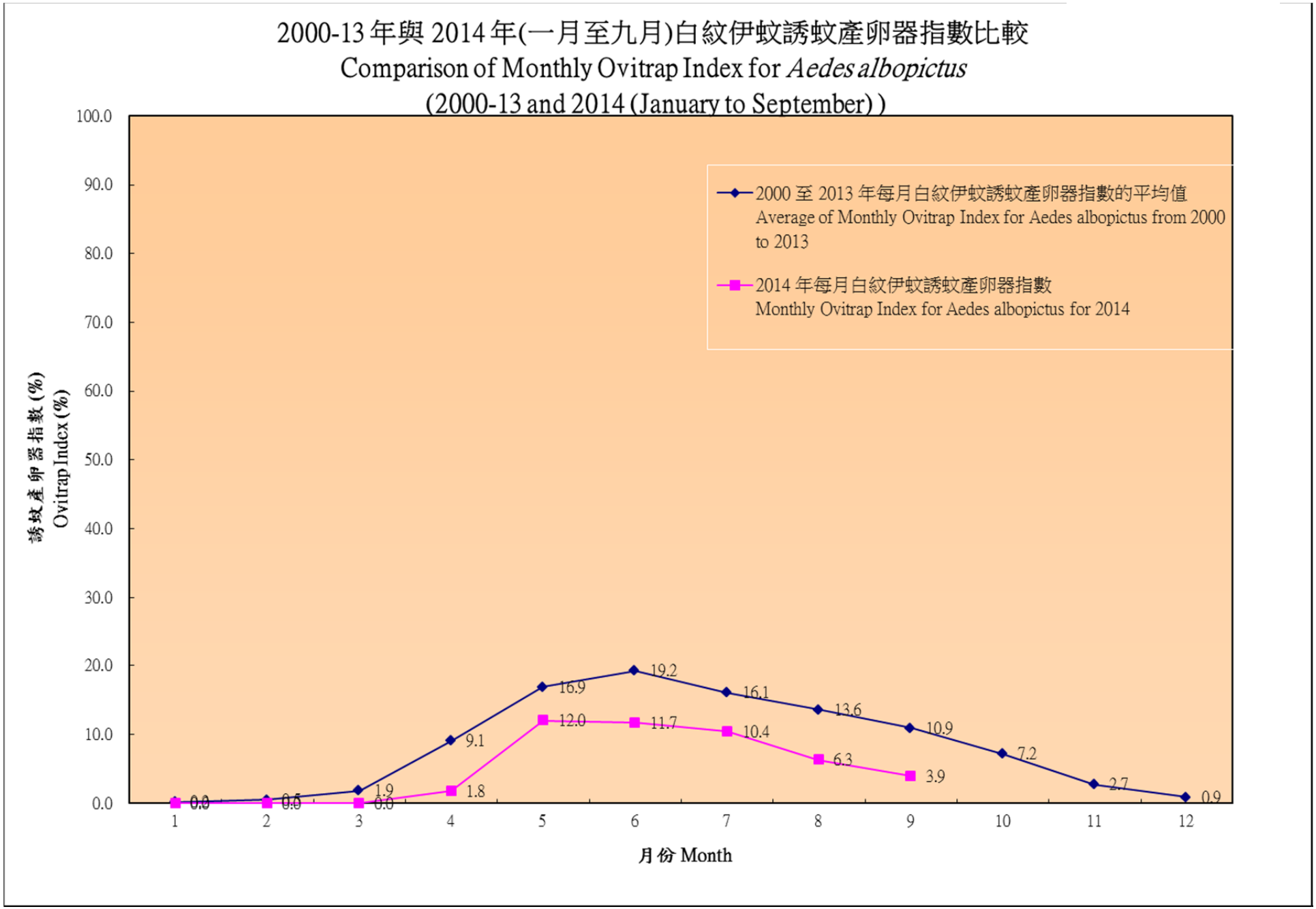
Annex I


2000-13 年與 2014 年(一月至九月)白紋伊蚊誘蚊產卵器指數比較
Comparison of Monthly Ovitrap Index for Aedes albopictus
(2000-13 and 2014 (January to September))
2000 至 2013 年每月白紋伊蚊誘蚊產卵器指數的平均值
Average of Monthly Ovitrap Index for Aedes albopictus from 2000 to 2013
2014 年每月白紋伊蚊誘蚊產卵器指數
Monthly Ovitrap Index for Aedes albopictus for 2014
誘蚊產卵器指數 (%)
Ovitrap Index (%)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
0.5
1.9
9.1
16.9
19.2
16.1
13.6
10.9
7.2
2.7
0.9
0.0
0.0
1.8
12.0
11.7
10.4
6.3
3.9
1
2
3
4
5
6
7
8
9
10
11
12
月份 Month

Annex II

Ovitrap Indices for 44 locations in 19 districts – 2014 (January to September)

	Locations	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Hong Kong Island & Outlying Islands	Chai Wan West	0.0%	0.0%	0.0%	0.0%	3.6%	10.9%	9.1%	7.3%	5.7%			
	Shau Kei Wan and Sai Wan Ho	0.0%	0.0%	0.0%	0.0%	12.1%	21.4%	27.1%	8.5%	3.5%			
	North Point	0.0%	0.0%	0.0%	0.0%	13.2%	5.7%	3.7%	9.4%	1.9%			
	Wan Chai North	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%	10.2%	4.3%	4.2%			
	Happy Valley	0.0%	0.0%	0.0%	0.0%	3.5%	16.1%	16.1%	13.5%	3.5%			
	Central, Sheung Wan and Sai Ying Pun	0.0%	0.0%	0.0%	0.0%	14.8%	5.6%	9.1%	3.8%	3.6%			
	Sai Wan	0.0%	0.0%	0.0%	0.0%	22.6%	7.4%	9.3%	3.9%	9.6%			
	Aberdeen and Ap Lei Chau	0.0%	0.0%	0.0%	0.0%	2.0%	5.9%	3.8%	4.3%	3.8%			
	Pokfulam	0.0%	0.0%	0.0%	0.0%	16.3%	6.1%	10.4%	6.1%	4.3%			
	Deep Water Bay and Repulse Bay	0.0%	0.0%	0.0%	1.8%	13.0%	32.1%	10.9%	0.0%	0.0%			
	Cheung Chau	0.0%	0.0%	0.0%	0.0%	2.9%	11.8%	20.6%	13.9%	5.6%			
	Tung Chung	0.0%	0.0%	0.0%	5.4%	13.2%	13.5%	8.1%	2.7%	8.1%			
Kowloon	Tsim Sha Tsui	0.0%	0.0%	0.0%	0.0%	0.0%	12.3%	14.5%	1.8%	0.0%			
	Mong Kok	0.0%	0.0%	0.0%	0.0%	1.8%	3.7%	5.5%	1.9%	1.8%			
	Lai Chi Kok	0.0%	0.0%	0.0%	0.0%	16.0%	9.3%	2.1%	9.6%	4.0%			
	Sham Shui Po East	0.0%	0.0%	0.0%	9.3%	23.6%	14.8%	5.5%	3.7%	0.0%			
	Cheung Sha Wan	0.0%	0.0%	0.0%	3.7%	9.3%	5.7%	13.5%	7.4%	1.9%			
	Kowloon City North	0.0%	0.0%	0.0%	1.8%	18.2%	3.7%	13.2%	4.0%	7.3%			
	Hung Hom	0.0%	0.0%	0.0%	0.0%	0.0%	9.4%	9.6%	5.9%	3.7%			
	Ho Man Tin	0.0%	0.0%	0.0%	0.0%	0.0%	7.4%	13.2%	10.0%	11.3%			
	Wong Tai Sin Central	0.0%	0.0%	0.0%	0.0%	6.3%	20.6%	3.2%	6.3%	3.2%			
	Diamond Hill	0.0%	0.0%	0.0%	0.0%	0.0%	9.6%	3.8%	3.8%	1.9%			

	Locations	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
	Kwun Tong Central	0.0%	0.0%	0.0%	3.8%	11.8%	20.4%	3.8%	7.3%	7.5%			
	Lam Tin	0.0%	0.0%	0.0%	3.7%	32.7%	18.9%	13.0%	7.7%	5.9%			
New Territory East	Tseung Kwan O	0.0%	0.0%	0.0%	18.3%	45.6%	13.3%	8.6%	5.2%	0.0%			
	Sai Kung Town	0.0%	0.0%	0.0%	10.0%	30.6%	10.4%	8.2%	4.0%	0.0%			
	Ma On Shan	0.0%	0.0%	0.0%	0.0%	3.4%	17.2%	41.4%	3.6%	3.6%			
	Yuen Chau Kok	0.0%	0.0%	0.0%	0.0%	10.9%	12.7%	29.6%	16.7%	11.3%			
	Tai Wai	0.0%	0.0%	0.0%	0.0%	7.3%	16.4%	23.6%	8.9%	1.9%			
	Tai Po	0.0%	0.0%	0.0%	0.0%	3.6%	27.3%	5.6%	3.7%	9.3%			
	Fanling	0.0%	0.0%	0.0%	0.0%	16.7%	13.0%	9.4%	13.0%	0.0%			
	Sheung Shui	0.0%	0.0%	0.0%	0.0%	5.7%	18.2%	10.9%	14.5%	5.8%			
New Territory West	Tin Shui Wai	0.0%	0.0%	0.0%	3.6%	3.8%	10.9%	14.0%	5.3%	1.8%			
	Yuen Kong	0.0%	0.0%	0.0%	0.0%	12.0%	16.0%	16.0%	16.0%	4.0%			
	Yuen Long Town	0.0%	0.0%	0.0%	0.0%	20.0%	7.7%	5.7%	1.9%	1.8%			
	Tuen Mun (South)	0.0%	0.0%	0.0%	0.0%	2.0%	9.4%	2.0%	3.8%	9.6%			
	Tuen Mun (North)	0.0%	0.0%	0.0%	0.0%	8.5%	7.0%	5.1%	3.4%	0.0%			
	So Kwun Wat	0.0%	0.0%	0.0%	0.0%	5.7%	11.1%	0.0%	1.9%	0.0%			
	Tsuen Wan Town	0.0%	0.0%	0.0%	3.4%	25.5%	6.7%	12.3%	3.6%	3.4%			
	Ma Wan	0.0%	0.0%	0.0%	0.0%	12.0%	4.2%	4.0%	8.0%	8.7%			
	Sheung Kwai Chung	0.0%	0.0%	0.0%	1.9%	20.4%	3.8%	2.0%	0.0%	0.0%			
	Kwai Chung	0.0%	0.0%	0.0%	10.2%	14.8%	5.8%	5.6%	7.4%	0.0%			
	Lai King	0.0%	0.0%	0.0%	1.9%	14.5%	20.0%	5.5%	10.9%	9.3%			
	Tsing Yi	0.0%	0.0%	0.0%	0.0%	22.8%	5.5%	5.4%	7.1%	5.3%			
Monthly Ovitrap Index		0.0%	0.0%	0.0%	1.8%	12.0%	11.7%	10.4%	6.3%	3.9%			