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**ICT Household Statistics –  
The Case of Hong Kong, China**

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## **Introduction**

Hong Kong has been renowned for its achievement in the adoption of new information and communication technology (ICT). Backed by an excellent ICT infrastructure, the economy's mobile phone penetration rate, broadband coverage, and external connectivity capacity are among the highest in the world. People in Hong Kong are generally voracious users of ICT. In 2005, 70% of households in Hong Kong had personal computers (PC), 65% of all households in Hong Kong had their PCs at home connected to Internet, and mobile phone subscriber penetration rate was 123%.

2. The Census and Statistics Department (C&SD) of Hong Kong, China has developed and regularly compiles a host of ICT statistics including: IT usage and penetration in the household and business sector; ICT sector statistics; IT expenditure statistics; IT manpower; and e-commerce statistics. The following is a brief account of the compilation of ICT household statistics in Hong Kong.

### **Major Players of ICT Household Statistics**

3. Surveys on IT usage and penetration in households have been conducted annually by C&SD since 2000 under its series of Thematic Household Survey (THS). The surveys are conducted to meet the requests from government policy bureaux and departments for statistical data on ICT. In Hong Kong, the Commerce, Industry, and Technology Bureau (CITB) is the main ICT policy maker. The Office of the Government Chief Information Officer (OGCIO), which is a branch under CITB directly responsible for policy, strategy and execution of IT programmes. The Government first announced its vision of making Hong Kong a leading digital city in the globally connected world of the 21<sup>st</sup> century in 1998 by setting out the Digital 21 IT Strategy. Since then, the goals and targets of the Digital 21 IT strategy had been reviewed and updated twice in 2001 and 2004.

### **Thematic Household Survey (THS) on IT Usage and Penetration**

4. The THS on IT usage and penetration in households is a voluntary survey conducted by C&SD under the authority conferred by Part IIIA of the Census and Statistics Ordinance (Chapter 316 of the Laws of Hong Kong). The first round of the survey was carried out in 2000 and the latest completed one was conducted in mid-2005 with results released in end-2005.

5. The major work of the THS is contracted out to a private research firm through open tendering. While the research firm is responsible for data collection and data processing, C&SD plays a co-ordination and management role throughout different stages of the survey to ensure that the service rendered by the research firm is able to meet the data needs of major users and up to professional standard.

## **Survey Methodology**

### *Survey Coverage*

6. The survey covers the land-based non-institutional population of Hong Kong, representing some 99% of the Hong Kong Resident Population. It makes use of the frame of quarters maintained by C&SD as the sampling frame. The frame consists of two parts: (i) Register of Quarters; and (ii) Register of Segments. The Register of Quarters contains computerized records of all identifiable addresses of permanent quarters in built-up areas. The Register of Segments contains records of segments in non-built-up areas which are delineated by relatively permanent and identifiable landmarks such as footpath and river.

### *Sample Design*

7. The records in the Register of Quarters are first stratified by geographical area and type of quarters. Systematic replicated sampling is then applied for sample selection. The sampling method for the Register of Segments is similar, except that the area segments are sorted by geographical area only (and not also by type of quarters). The sampling units for the THS are permanent quarters in built-up areas and segments in non-built-up areas.

### *Questionnaire Design*

8. The survey collects information on the penetration of PC and Internet among households, and individual household member's PC and Internet usage at different locations, usage of electronic business services, usage of online government services and awareness of information security.

9. Each year, C&SD will review the survey questionnaire, by taking into consideration the views of OGCIO, feedback from respondents and other data users as appropriate. This ensures that the information collected can reflect the

changing needs of Hong Kong's IT market. For instance, the 2004 survey covered new questions on the type of wireless technology used by mobile devices, whether had used Government services and views on online Government services, while the 2005 survey included new questions related to pattern of playing electronic games and usage of electronic Government services.

10. Questions on the demographic and socio-economic characteristics of the respondents, such as gender, age, educational attainment and household income are also included in the survey questionnaire. The availability of socio-economic data, combined with the data on IT usage and penetration, allows an in-depth understanding and analysis of the extent of digital divide in Hong Kong.

#### *Data Collection Method*

11. At the start of each survey cycle, notification letters are sent to the sampled quarters to explain the purpose of the survey and to seek cooperation from households living therein. Face-to-face interviews are then conducted to collect the required data. In each of the previous rounds of THS, some 10 000 households were successfully enumerated, representing a response rate of around 75%.

12. Within each enumerated household, the household head or a person knowledgeable on IT matters is first selected for interview with a view to collecting information in respect of the household as a whole such as whether or not PCs are available in the household and if in the affirmative, the number and type of PCs, and whether the PCs are connected to Internet.

13. Information at individual level is also obtained. All persons aged 10 and over in the enumerated households are asked questions in respect of their knowledge of using PC as well as their usage of PC and Internet service during the 12 months before enumeration. Persons aged 15 and over are further asked about their usage of electronic business services and electronic Government services for personal matters. They are also asked some questions about IT security and pattern of playing electronic games.

14. Based on the information collected from the successfully enumerated households, the situation related to all households and the entire population in Hong Kong is inferred using established statistical methods.

### *Data Quality Control*

15. Before commencement of fieldwork, a comprehensive training programme on survey concepts, fieldwork procedures and interviewing techniques is given to the interviewers. The commissioned research firm is required to set up a fieldwork monitoring system to supervise the interviewers, and monitor fieldwork progress and data quality. Appropriate measures are adopted to maintain a high response rate such that the survey results will not be biased by non-contact and non-response cases. These measures include setting up a telephone enquiry hotline (for making appointments with respondents and answering enquiries) and re-visiting non-response cases by more experienced interviewers or field supervisors.

16. Meanwhile, various measures are also taken by C&SD to ensure that the quality of data collection, data processing and data analysis services delivered by the commissioned research firm is of high standard. On fieldwork monitoring, the commissioned research firm is required to submit weekly fieldwork progress reports to C&SD, highlighting the number of visits made and the number of successful interviews. Besides, C&SD also sends its field staff to conduct joint visits with the interviewers to a random sub-sample of the sampled households to ensure that the interviews are properly conducted, the survey concepts and fieldwork instructions are strictly adhered to and the performance of individual enumerators is up to the required standard. On data quality, C&SD also closely monitors the survey to ensure that audit check procedures are properly instituted by the commissioned research firm and any errors detected are properly documented and rectified. Furthermore, separate audit checks (e.g. direct sample audit checks with respondents) are conducted by C&SD as a further safeguard of data quality.

### *Estimation Method*

17. The ratio estimation method is adopted to estimate parameters of the population and households based on data collected from the THS. When applying the method, the independent estimates of population with age and sex breakdowns as obtained from the Population Data System maintained by C&SD are taken as control totals for grossing-up.

18. The Population Data System is a system adopted by C&SD for compiling population estimates. In particular, population estimates by age-sex group derived from this system are often used as control totals when applying the

ratio estimation method to estimate parameters of the population in sample household surveys.

19. In specific terms, the sample statistics of the number of persons by age and sex are computed based on post-stratification of data obtained from the THS. The grossing-up factor for each of the age-sex specific groups is the ratio derived by dividing the age-sex specific control total by the sample statistic of the group concerned.

20. To illustrate, the population total having characteristic Y is estimated by

$$\hat{Y} = \sum_{i=1}^N X_i \left( \frac{y_i}{x_i} \right)$$

- where
- $\hat{Y}$  – Estimated population total having characteristic Y
  - $N$  – Total number of the age-sex groups
  - $y_i$  – Sample count of population having characteristic Y in the  $i^{\text{th}}$  age-sex specific group (obtained from the THS)
  - $X_i$  – Independent population estimate in the  $i^{\text{th}}$  age-sex specific group from the Population Data System
  - $x_i$  – Sample count of population in the  $i^{\text{th}}$  age-sex specific group (obtained from the THS)

## Data Dissemination

21. The final report and press release of the THS are prepared by C&SD. The ICT household statistics are released, together with the results of a similar survey conducted in the business sector concurrently, within 6 months after the conclusion of fieldwork. C&SD believes that the usefulness of statistics is related to the timeliness with which the statistics are made available to users.

22. The C&SD Website also serves as a one-stop portal for disseminating statistics and information that it produces (including ICT statistics). It is worth noting that C&SD has recently launched a free download policy in June 2006 such that users can acquire download versions of statistical publications (in PDF format) and statistical tables (in CSV format) free of charge. The implementation of this new policy represents an important milestone in the dissemination of official statistics.

## ICT Household Statistics at a Glance

23. With an advanced stage of ICT development, Hong Kong is at the forefront of adopting ICT in virtually all aspects of activities. The community is

speeding up its adoption of ICT in recent years, as witnessed by the footprints of the following key ICT household statistics:

- (a) The household PC penetration rate increased substantially from 50% in 2000 to 70% in 2005, with the Internet penetration rate surging from 36% in 2000 to 65% in 2005. The steeper rise in Internet penetration rate was partly facilitated by the liberalisation of the local telecommunication market thus offering more choices to consumers at competitive prices. (Chart 1)
- (b) The younger generation is IT-savvy. Persons aged 10-14 had the highest rate (99%) of PC usage in 2005, up substantially by 26 percentage points over the corresponding rate of 73% in 2000. Concurrently, the IT awareness of the older persons, who typically had the lowest rate of using PC, had also increased. The PC usage rate for persons aged 65 and over increased from 0.6% in 2000 to 3.2% in 2005. (Chart 2)
- (c) The profiles of persons using Internet service are similar to those of PC, i.e. higher penetration rate for younger persons. Persons aged 10-14 had the highest rate of using Internet service, at 97% in 2005, up notably from 43% in 2000. (Chart 3)
- (d) The 2005 survey results indicated that among those persons aged 10 and over having used Internet service via non-mobile web device, the major purposes of using Internet were: communication with others (83%), browsing/surfing web pages (excluding Government websites) (71%) and searching for/downloading information online (excluding Government information) (54%). (Chart 4)

### **Major Issues and Challenges**

24. The following are the major issues and challenges faced by C&SD in developing ICT household statistics:

- (a) Questions on PC penetration need to keep in pace with the ever changing technological landscape. For example, the definition of PC has been changed to include not only desktop computer, but also laptop/notebook computer and Personal Data Assistant. While this is a necessary adaptation to changes, this may make the penetration rates

over the years not strictly comparable.

- (b) The above also applies to the measurement of Internet penetration. The speed and mode of Internet connection is changing rapidly. Thus, instead of just looking at the overall penetration rate, detailed analysis of Internet penetration by different modes of connection is necessary.
- (c) The survey results can, no doubt, provide necessary data for socio-economic analysis of digital divide. In fact, the digital divide is less of a problem in Hong Kong and individual IT policy makers may be more interested in assessing the digital inclusiveness for special groups (e.g. persons with disabilities) instead. However, the household IT survey is targeted to measure IT penetration and usage at the overall population level and may not be able to support detailed analysis as such.
- (d) As an official statistical agency, C&SD has to balance the sometimes conflicting needs of increasing demand from data users for more ICT statistics and escalating concerns of respondent reporting burden.

## **Concluding Remarks**

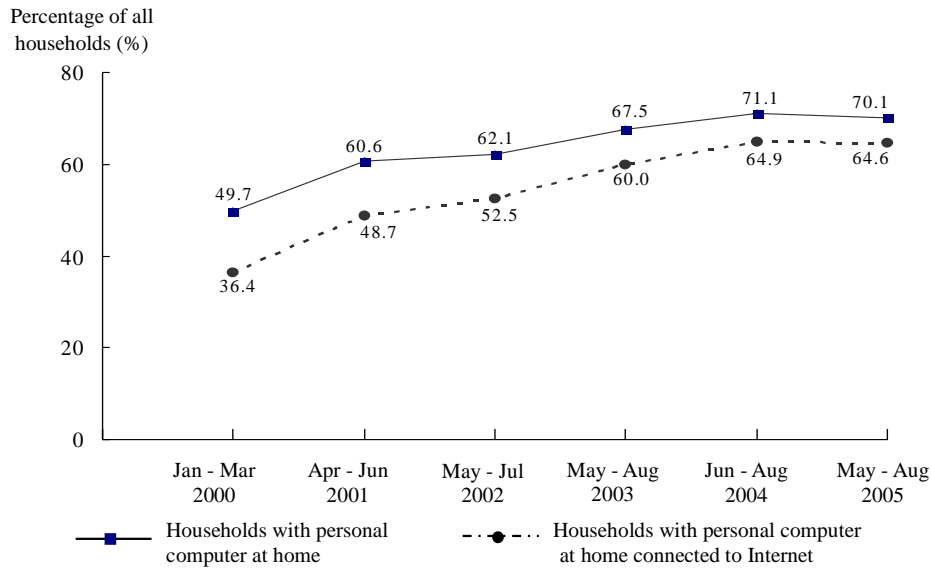
25. Results of the household IT survey can provide an objective basis for identifying focal areas for promoting IT use and at the same time serve as a useful reference for developing IT strategies and policies. It is encouraging to see Hong Kong becoming a more digitally inclusive society.

26. On ICT statistics development, most of the core ICT indicators<sup>1</sup> can be compiled from the existing statistical systems in Hong Kong. Nevertheless, the collection and compilation of ICT statistics still pose a challenge to C&SD in view of the dynamic development of this subject. C&SD will continue to enhance its framework for measuring the information society, with a view to meeting the needs of Hong Kong and contributing to the international statistical community.

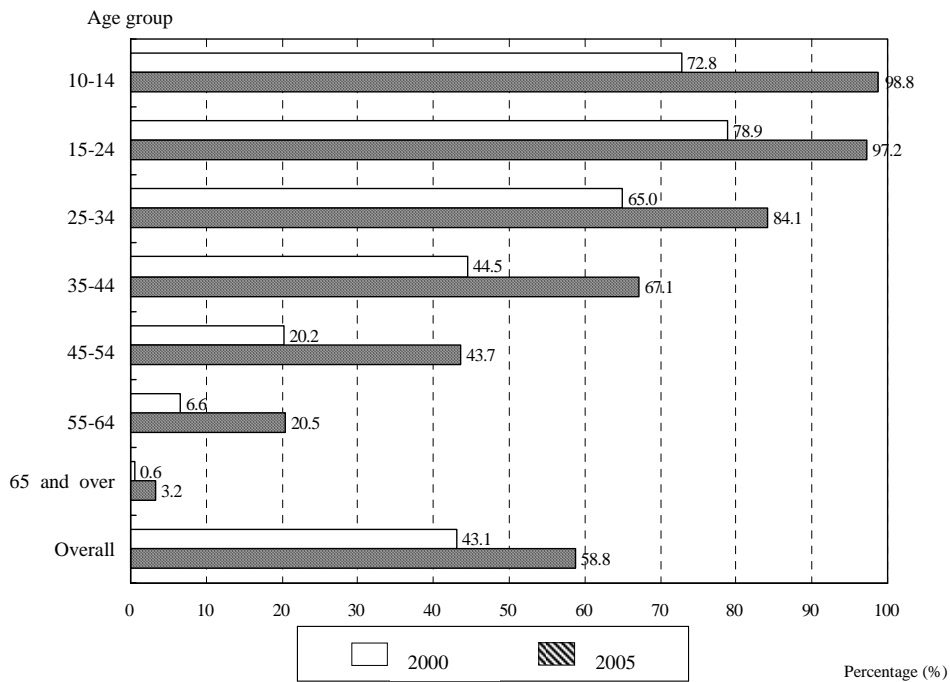
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<sup>1</sup> The Core ICT Indicators provides definitions, model questions and methodological notes agreed at 2005 global meeting organized by the *Partnership on Measuring ICT for Development*. ([www.itu.int/ITU-D/ict/partnership/material/CoreICTIndicators.pdf](http://www.itu.int/ITU-D/ict/partnership/material/CoreICTIndicators.pdf))

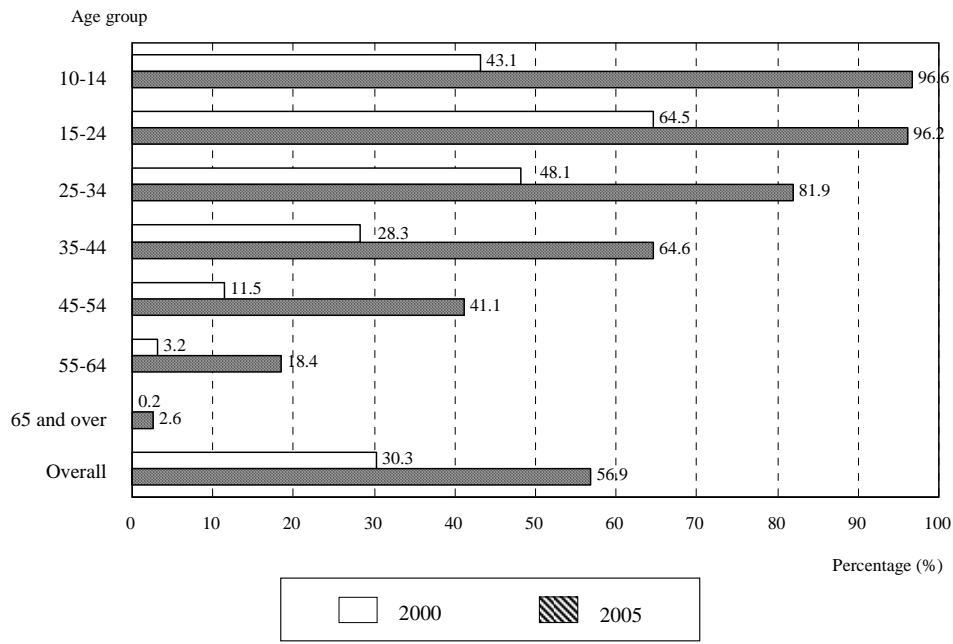
**Chart 1: Percentage of households with personal computer (PC) at home and percentage of households with PC at home connected to the Internet**



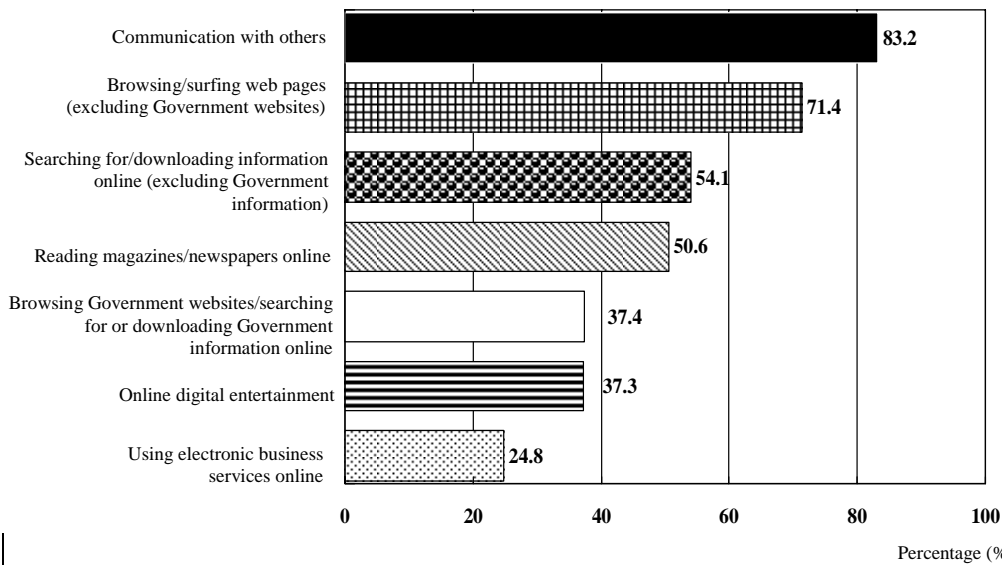
**Chart 2: Percentage of PC users by age group**



**Chart 3: Percentage of Internet users by age group**



**Chart 4: Percentage of Internet users by major purpose of using Internet service via non-mobile web device in 2005**



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