

# **STATISTICAL SERVICES PROVIDED BY THE CENSUS AND STATISTICS DEPARTMENT**

## **Executive Summary**

1. Government statistical services are provided by the Census and Statistics Department (C&SD) and the statistical units established in various government bureaux and departments. Under the Census and Statistics Ordinance (Cap. 316), C&SD conducts statistical surveys which provide an important basis for the formulation of government policies. The surveys are either mandatory (e.g. population census conducted every ten years and by-census conducted in the middle of intercensal period) or voluntary (e.g. General Household Survey (GHS) conducted on a monthly basis and Household Expenditure Survey (HES) conducted every five years). In carrying out its activities, C&SD follows international standards and practices, such as the Special Data Dissemination Standard of the International Monetary Fund (IMF). In 2018-19, the total expenditure of C&SD was \$666 million. The Audit Commission (Audit) has recently conducted a review to examine the statistical services provided by C&SD.

### **Statistical surveys**

#### ***General Household Survey***

2. GHS is one of the household surveys relating to the demographic and socio-economic characteristics of the population. To have more precise estimation of changes over time, half of the sampled households in each month will be sampled again three months later. The first round of enumeration is conducted by means of online questionnaire or field visit, while the second one could be conducted by online questionnaire, telephone interview or field visit, subject to the respondent's preference. C&SD conducts in-depth quality checks (QCs), which comprise two stages of independent checking, to ensure the quality of GHS data collection process. In Stage 1, cases are selected by field pool supervisors according to a purely random mechanism. In Stage 2, cases are selected by GHS Central Field Team based on a target-based mechanism. The errors identified in the in-depth QCs of GHS questionnaires are classified into "major errors" and "minor errors". "Major errors"

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are related to misclassification of economic activity status of respondents and “minor errors” are errors identified in other parts of the questionnaires which have no or minimal impact on the labour force statistics (paras. 1.7(b), 2.5 and 2.6). Audit examination has revealed the following issues:

- (a) ***Small number of error cases identified by field pool supervisors and the majority of error cases identified were “minor error cases”.*** The in-depth QCs conducted on enumerated cases from April 2018 to March 2019 covered 11,606 GHS questionnaires. Of the 899 error cases found: (i) only 48 were identified by the field pool supervisors with an error rate of 0.8% while 851 were found by GHS Central Field Team with an error rate of 15.23%; and (ii) the bulk of the error cases were “minor error cases”. The overall “major error” rate was 0.54%, and the overall “minor error” rate was 7.2%. Of the 836 “minor error cases” found, only 43 (5%) were identified by field pool supervisors while 793 (95%) were found by GHS Central Field Team (para. 2.8(a) and (b));
- (b) ***Inadequate follow-up of non-contact cases due to wrong/no telephone numbers.*** QC checkers are required to attempt to call respondents at least three times (including one night-call between 6:30 pm and 10 pm) for any in-depth QC cases to be regarded as non-contact cases. In Stage 1 in-depth QCs, another case will be selected for checking if a case sampled for in-depth QCs is found to have a wrong/no telephone number. These wrong/no telephone number cases are then not checked in Stage 1 in-depth QCs. While such cases are subject to selection for checking in Stage 2 in-depth QCs, only a certain number of them identified in Stage 2 in-depth QCs will be selected for follow-up actions by GHS Central Field Team by field visits. As cases involving wrong/no telephone numbers pose a higher risk of falsification, C&SD needs to step up actions in following up these cases (paras. 2.8(c) and 2.9); and
- (c) ***Monitoring of Assistant Census and Survey Officers (ACSOs) involved in GHS work.*** C&SD maintained a Monitoring List to identify ACSOs involved in GHS work with completion rates consistently lower than the benchmark by more than 5 percentage points for over six months during the past twelve months. These ACSOs were required to be closely monitored and coached by their supervisors case by case. Audit noted that in April 2019, there were five ACSOs on the Monitoring List covering the period from January to December 2018 but apart from records on

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supervisory field visits made, there was no other documentation on the monitoring and coaching given to them (paras. 2.12 and 2.13).

### *Sub-divided Unit Survey*

3. At the request of the Transport and Housing Bureau, C&SD conducted a Thematic Household Survey (THS) on sub-divided units (SDUs) from June to November 2014 (first THS on SDUs). According to C&SD, the major objective of THS on SDUs in 2014 was to estimate the total number of SDUs in private domestic/composite buildings (excluding village houses) aged 25 or above in Hong Kong. The estimated number of SDUs identified in the survey was 86,400. The second THS on SDUs in private domestic/composite buildings (excluding village houses) aged 25 or above in Hong Kong was conducted from May to September 2015. The results showed that the estimated number of SDUs was 88,800. The long-term housing demand from households living in SDUs was projected based on the relevant results of the second THS on SDUs for the annual update of the Long Term Housing Strategy in 2015. In the 2016 By-census (16BC — see para. 6), a new data topic on SDU was included. In January 2018, C&SD published the report entitled “Thematic Report: Persons Living in Sub-divided Units” (16BC Thematic Report on SDUs). According to the report, there were some 27,100 quarters with SDUs in Hong Kong and the total number of SDUs in these quarters was estimated to be 92,656 (paras. 2.19 to 2.21 and 2.26). Audit examination has revealed the following areas for improvement:

- (a) ***Need to closely monitor the progress of the Frame of Quarters (FoQ) updating exercise on SDUs.*** FoQ refers to a database (containing a list of addresses in land areas to be sampled) maintained by C&SD. C&SD conducted a special frame updating exercise to identify quarters with SDUs in FoQ before 16BC to help devise an appropriate sample design for enumerating SDUs and facilitate the effective allocation of fieldwork assignments of 16BC. According to C&SD, a complete FoQ (i.e. covering all quarters in Hong Kong) was necessary to ensure full coverage of the target population to be sampled. Audit noted that, as of March 2019, there were only about 46,500 (i.e. about 50% of the 92,656 SDUs reported in the 16BC Thematic Report on SDUs) known SDUs recorded in FoQ. As an FoQ updating exercise on SDUs, C&SD has planned to visit all private residential buildings aged 40 years or more in built-up areas (covering 22,000 buildings and 410,000 quarters) before the conduct of 2021 Population Census (21C). Given the substantial amount of work (i.e.

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visiting 22,000 buildings and 410,000 quarters), C&SD needs to closely monitor the progress of the FoQ updating exercise on SDUs and take appropriate actions to bring the SDU data in the sampling frame up-to-date to facilitate sample selection in the coming 21C (paras. 2.22, 2.26, 2.27 and 2.32); and

- (b) *Need to take measures to improve the success rate of SDU enumeration.* According to C&SD, of the 299,300 sampled quarters in 16BC, 5,440 SDUs were identified through successful enumeration. Of the 92,656 estimated number of SDUs reported in the 16BC Thematic Report on SDUs, only 50,623 (54.6%) were derived from successfully-enumerated cases (i.e. the 5,440 cases). For the remaining 42,033 (45.4% of 92,656) SDUs, 12,849 (13.9% of 92,656) were based on imputation by macro-editing using auxiliary data of 16BC or other sources, and 29,184 (31.5% of 92,656) were based on imputation using SDU data in FoQ directly. While successfully-enumerated SDU cases could provide the most reliable and up-to-date data for estimating the number of SDUs, Audit noted that there was a heavy reliance on imputation on estimating the SDU figures in 16BC because of the relatively low success rate of SDU enumeration. In Audit's view, paying more visits to non-contact quarters suspected to be SDUs as observed in field visits during the enumeration period, preferably by a variety of means on different dates and at different times, should improve the success rate of SDU enumeration. Given the short data collection period (about 5 weeks), to collect more reliable and up-to-date data on SDUs, C&SD needs to take measures to improve the success rate of SDU enumeration under population censuses/by-censuses as far as practicable (paras. 2.33 and 2.35).

### *Monthly Retail Price Survey*

4. The main purpose of conducting the Monthly Retail Price Survey is to regularly collect price data and related information of a fixed basket of consumer goods and services commonly purchased by general households from local retail outlets (e.g. market stalls) and service providers (e.g. tour companies) for the compilation of the Consumer Price Index (CPI). According to C&SD, compilation of CPI in Hong Kong follows closely the international standards. Hong Kong's CPI is a base-weighted type of price index compiled to reflect changes in the price level of consumer goods and services generally purchased by households. Changes in CPI are widely used as an indicator of the inflation or deflation affecting consumers. The

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Government also uses CPI as an indicator or analytical tool to formulate and monitor its policies (paras. 2.38 and 2.39).

5. ***Compilation of CPI.*** CPI shows the relative change over time in the overall cost of a specified and fixed (in terms of quality and quantity) basket of consumer goods and services, therefore reflecting pure price change. The consumer goods and services covered in CPI basket (CPI items) are based on the expenditure patterns of households on different CPI items purchased through different types of retail outlets in the base period, which form the expenditure weights for compiling the index series. The expenditure weights are updated every five years with reference to the latest expenditure patterns of households primarily obtained through HES. A new series of CPI will be compiled based on the updated expenditure weights, with historical figures retrospectively computed to maintain comparability of the index series. This process is called CPI rebasing (para. 2.40). Audit examination has revealed the following issues:

- (a) ***Need to continue to keep in view the latest international developments in the CPI compilation standards.*** At present, price quotations are collected from local stores/online retailers but not from non-domestic stores/online retailers. According to C&SD, IMF issued a consultation draft in July 2018 which suggested, among others, the inclusion of expenditures made on goods and services purchased via the Internet from Internet-based outlets based/registered abroad as a “special consideration” in compiling CPI for the local economy. To prepare for the possible changes in the next CPI rebasing cycle, C&SD has already enhanced the questionnaires for the current round of HES being conducted in 2019/20 to collect more comprehensive information on online purchases from the households. With the growing popularity of online purchases from Internet-based outlets, C&SD needs to continue to keep in view the latest international developments on whether to include online purchases from non-domestic retailers in CPI compilation (paras. 2.41 and 2.42); and
- (b) ***Need to continue to take into account changes in expenditure patterns in next CPI rebasing exercise.*** According to C&SD, individual retail outlets and service providers are selected for collecting price quotations having regard to the popularity of the outlets (e.g. whether the location is in main streets/shopping arcades and frequently patronised by many consumers). Audit noted that there had been changes in mode of purchases since the last CPI rebasing exercise in 2014/15. In particular, more purchases were made

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online in addition to retail shops and in recent years, there were also new physical stores operated by local online retailers. Besides, among the 984 CPI items in the prevailing CPI basket, eight CPI items might have become unpopular as of June 2019 (i.e. with over 60% of the price quotations without updated price data in the past 12 months). In this connection, C&SD needs to continue with the existing CPI rebasing mechanism to take into account the changes in expenditure patterns and popularity of goods and services in the upcoming 2019/20 CPI rebasing exercise (paras. 2.43 and 2.44).

### Population censuses and by-censuses

6. Population censuses have been conducted in Hong Kong at 10-year intervals since 1961, with by-censuses being carried out in the middle of the intercensal period. The aims of conducting population censuses and by-censuses are to obtain up-to-date benchmark information on the socio-economic characteristics of the population and on its geographical distribution. They provide benchmark data for studying the direction and trend of population changes, which are key inputs for making projections concerning population, household and labour force. Population censuses involve a complete headcount of the population, while by-censuses enquire about the detailed characteristics of the population on the basis of a large sample. The last by-census was conducted in 2016 (i.e. 16BC) and the next population census will be conducted in 2021 (i.e. 21C) (para. 1.12). Audit examination of the conduct of 16BC has revealed the following areas for improvement:

- (a) ***Need to strengthen control over salary payments to temporary field workers (TFWs).*** In 2017, during the audit of the financial statements of the Government's General Revenue Account for the year ended 31 March 2017, Audit sample checked the largest single payment of 16BC (i.e. \$74 million of salary payments to TFWs) and found that there were some inaccurate payments, missing supporting documents, improper certification on summary records for payments and mis-classification of expenses, which were not in compliance with the relevant government regulations (i.e. Standing Accounting Instructions and Financial and Accounting Regulations) and C&SD's payment procedures. In light of the inadequacies identified in 2017, in August 2019, Audit conducted an extended checking of the same salary payments and found that of the 1,442 attendance records verified and certified, 884 (involving 4,730 TFWs) or 61% were verified and/or certified before the end of the

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wage period, verified/certified without dates, or without sign-off to prove proper verification/certification. C&SD needs to strengthen its control over salary payments to TFWs for implementation in 21C (paras. 3.2, 3.3 and 3.5);

- (b) ***Need to continue exploring feasibility of developing a joint-user specialist and departmental building (SDB).*** Owing to the temporary and periodic nature of office accommodation for previous population censuses/by-censuses, there was a need to carry out fitting out/reinstatement works and procure furniture and equipment for every population census/by-census. In Chapter 8 of the Director of Audit's Report No. 69 entitled "Provision of government office accommodation and utilisation of government sites" issued in October 2017, Audit recommended that the Registration and Electoral Office (REO) and C&SD, in consultation with the Government Property Agency (GPA), should explore the feasibility of developing a joint-user SDB to meet their periodic accommodation requirements. In the Government Minute in response to the Report of the Public Accounts Committee No. 71 of February 2019, it was reported that REO and C&SD had taken positive steps to follow up the recommendation. C&SD needs to, in consultation with GPA, continue liaising with REO with a view to exploring the feasibility of developing a joint-user SDB to cater for the periodic accommodation requirements of REO and C&SD (paras. 3.11 and 3.13);
- (c) ***Need to improve furniture disposal process after completion of population census/by-census.*** Upon closure of the offices and field centres in 16BC, there was surplus furniture requiring disposal. Such surplus furniture was disposed of through auctions organised by the Government Logistics Department (GLD). In April 2018, C&SD staff found that the successful bidder had posted photographs showing the furniture with logo and name of C&SD onto the Internet to invite buyers. As GLD's prior approval had not been obtained, the arrangement was in breach of GLD's Terms and Conditions of sales. Subsequently, the successful bidder re-sold the concerned furniture items and arranged for picking-up inside government premises. To prevent recurrence of similar incidents, C&SD needs to be vigilant in ensuring that its furniture disposal process after completion of a population census/by-census is properly carried out (paras. 3.14 and 3.15); and

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- (d) *Need to ensure proper implementation of security measures in 21C.* For 16BC, C&SD procured mobile tablets to facilitate TFWs to collect information during their face-to-face interviews with selected households. Audit noted that there were two incidents of loss of mobile tablets during the 16BC face-to-face interview period and remote data wiping could not be effected on one of the two tablets. C&SD considered that there was a very low risk of data leakage because the data had been encrypted in the tablet and various data protection measures were in place. While C&SD has in its latest plan considered putting in place additional measures in 21C, to prevent recurrence of incidents of loss of mobile tablets, C&SD needs to ensure proper implementation of the additional security measures planned for 21C (paras. 3.19 to 3.22).

### Implementation of information systems strategy

7. In order to make effective use of information technology (IT) in statistical services, in May 2003, C&SD commenced an information systems strategy (ISS) study to formulate an ISS plan for implementation in five years from 2004 to 2009. The study proposed a strategic IT programme of implementing 16 IT projects at a total estimated cost of \$106.1 million to bring about significant benefits and transformation in the operation/service approach to C&SD, survey respondents and statistics users. After assessing the benefits and resources available, C&SD selected 9 priority projects which were scheduled for commencement from April 2005 to September 2007 and planned to be completed fully or partially from December 2005 to December 2008 (paras. 4.3 and 4.4). Audit examination has revealed the following issues:

- (a) *Long time taken in implementing two departmental data capturing projects.* Audit noted that of the 9 priority projects, 7 projects had taken more time for implementation/completion as compared with the planned implementation dates (delays ranging from 1 to 7.8 years, averaging 2.6 years). In particular, C&SD's departmental data capturing system, namely Project T7 (i.e. the departmental Computer-Assisted Telephone Interview (CATI) System), took the longest time for completion (i.e. 7.8 years after the planned completion date). Audit examination found that: (i) in implementing CATI System, while a request for inviting tenders was sent to GLD in May 2008, it took more than two years to commence inviting tenders in September 2010. According to C&SD and GLD, the long time taken was attributed to the need to review and revise the user



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requirements and tender documents to include additional functions on audio recording and voice logging; (ii) the tender for Project T7 was cancelled in 2011 and a price negotiation was conducted with the tenderer in 2013 during the re-tender exercise; and (iii) since C&SD intended to implement Projects T6 (i.e. the departmental data capturing system using imaging technology (subsequently replaced by the Online Questionnaire System in 2012)) and T7 concurrently, Project T6 had been put on hold until Project T7 was ready to be put to tender (paras. 4.6 and 4.9); and

- (b) ***Need to enhance system integration for Projects T6 and T7.*** According to the 2019 ISS Report, the two systems under Projects T6 and T7 (i.e. Online Questionnaire System and CATI System), which were intended to be applied together to collect data for some statistical surveys, did not allow real-time data integration and whenever there was a change in the questionnaire design, the changes had to be made to the supporting system for each data collection mode separately. To streamline the workflow and reduce duplicate efforts, C&SD needs to take measures to enhance the integration between the two departmental data collection systems, taking into consideration technical feasibility and business needs (para. 4.10).
8. ***Deficiencies of End-User Computing (EUC) systems/applications.*** Other than departmental systems, individual sections of C&SD had developed over 80 EUC systems/applications to manage and store raw data and statistics collected by different surveys (para. 4.11). Audit examination has revealed the following deficiencies in the EUC systems/applications:
- (a) ***Lack of common data standards across EUC systems/applications.*** As each C&SD branch/section had its own way of managing and storing data, the format and definitions of same data elements varied across EUC systems/applications. To standardise the practices of managing and storing data across EUC systems/applications, C&SD needs to establish a common data model (para. 4.11(a)); and
- (b) ***Slow progress in migrating EUC systems/applications running on an obsolete programming language.*** As of August 2019, 37 EUC systems/applications developed in 2007 or before were running on an obsolete programming language, which had already reached its end-of-support since January 2015. While C&SD had taken actions to migrate its EUC systems/applications from the obsolete programming

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language to other updated programming languages since April 2008, as at the end of August 2019, the migration of 31 EUC systems/applications was still outstanding. C&SD needs to formulate a strategy to complete the migration of these EUC systems/applications in a more timely manner (para. 4.11(b)).

### **Audit recommendations**

9. **Audit recommendations are made in the respective sections of this Audit Report. Only the key ones are highlighted in this Executive Summary. Audit has *recommended* that the Commissioner for Census and Statistics should:**

#### *Statistical surveys*

- (a) **take measures to improve in-depth QCs of GHS and keep proper documentation on the monitoring and coaching of ACSOs on the Monitoring List (para. 2.17(a) and (b));**
- (b) **take appropriate actions to bring the SDU data in the sampling frame (i.e. FoQ) up-to-date to facilitate sample selection in the coming 21C and improve the success rate of SDU enumeration under population censuses/by-censuses as far as practicable (para. 2.36(a) and (b));**
- (c) **continue to keep in view the latest international developments on whether to include online purchases from non-domestic retailers in CPI compilation and continue with the existing CPI rebasing mechanism to take into account the changes in expenditure patterns and popularity of goods and services in the upcoming 2019/20 CPI rebasing exercise (para. 2.45(a) and (b));**

#### *Population censuses and by-censuses*

- (d) **strengthen the control over salary payments to TFWs for implementation in 21C (para. 3.6(a));**
- (e) **in consultation with GPA, continue to liaise with REO with a view to exploring the feasibility of developing a joint-user SDB to cater for the**

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periodic accommodation requirements of REO and C&SD (para. 3.16(a));

- (f) be vigilant in ensuring that the furniture disposal process after completion of a population census/by-census is properly carried out (para. 3.16(b));
- (g) ensure proper implementation of the additional security measures planned for 21C to protect personal data stored in the mobile tablets (para. 3.28(a));

### *Implementation of information systems strategy*

- (h) in implementing future IT projects, ascertain the user requirements before seeking funding approval as far as practicable (para. 4.13(a));
- (i) take measures to enhance the integration between CATI System and the Online Questionnaire System, taking into consideration technical feasibility and business needs (para. 4.13(b)); and
- (j) establish a common data model to standardise the practices of managing and storing data across EUC systems/applications and formulate a strategy to complete the migration of EUC systems/applications running on the obsolete programming language in a more timely manner (para. 4.13(c) and(d)).

## Response from the Government

10. The Commissioner for Census and Statistics generally agrees with the audit recommendations.