

CHAPTER 7

Financial Services and the Treasury Bureau Census and Statistics Department

**Statistical services provided by
the Census and Statistics Department**

**Audit Commission
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STATISTICAL SERVICES PROVIDED BY THE CENSUS AND STATISTICS DEPARTMENT

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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.

PART 1: INTRODUCTION

1.1 This PART describes the background to the audit and outlines the audit objectives and scope.

Background

1.2 Government statistical services are provided by the Census and Statistics Department (C&SD) and the statistical units established in various government bureaux and departments (B/Ds — Note 1). The policy bureau of C&SD is the Financial Services and the Treasury Bureau. C&SD's vision is to provide high-quality statistical services, contributing to the social and economic developments of Hong Kong. Its missions are to:

- (a) provide adequate, relevant, reliable and timely statistics to facilitate research, discussion, planning and decision making within the Government and in the community;
- (b) ensure that the compilation and dissemination of statistics are in accordance with scientific principles, professional ethics and international standards; and
- (c) promote a user-based culture, ensuring that users can obtain effective and convenient services.

1.3 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 or voluntary. Mandatory surveys

Note 1: *While C&SD is responsible for most general-purpose statistics, including the collection, compilation and publication of statistical information concerning Hong Kong, the statistical units in various B/Ds are responsible for statistics for dedicated use in their respective areas of work.*

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specified under the Census and Statistics Orders (Note 2) include population census which is conducted every ten years and by-census which is conducted in the middle of intercensal period. The respondents in these surveys are required to provide information on a mandatory basis. For voluntary statistical surveys such as the General Household Survey (GHS) conducted on a monthly basis and the Household Expenditure Survey (HES) conducted every five years, the respondents are not required to provide information on a mandatory basis (Note 3). Advance notifications of surveys are gazetted. Both mandatory and voluntary surveys are subject to the same provision for confidentiality of information concerning individuals or companies. The key results of the statistical surveys are published through press releases and on C&SD website. 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 — Note 4). In addition, to ensure that the needs of various sectors of the community can be suitably taken into account in the development of government statistical activities, a Statistics Advisory Board (Note 5) was established by the Government in 1972 to advise C&SD on matters pertaining to government statistical work.

1.4 Headed by the Commissioner for Census and Statistics, C&SD is organised into five divisions, as follows:

Note 2: *The Census and Statistics Orders announced in the gazette the purpose of survey, survey period, target interviewees, specified survey matters (or schedules to be completed), and deadline for destroying completed schedules.*

Note 3: *Of the 30 regular statistical surveys conducted in 2018, 18 were voluntary (e.g. GHS) and 12 were mandatory (e.g. Annual Survey of Imports and Exports of Services specified in the Census and Statistics (Annual Survey of Imports and Exports of Services) Order under Cap. 316L).*

Note 4: *IMF has accepted Hong Kong's subscription to the Special Data Dissemination Standard, which shows that the quality of Hong Kong's economic and financial statistics has met the international standards regarding the coverage, periodicity, timeliness, integrity and accessibility of disseminated data.*

Note 5: *The Board is a non-statutory advisory body chaired by the Commissioner for Census and Statistics. It comprises 11 non-official members (including professionals from the business sector, the academia and the community) and 3 official members including the Director of Planning (or his representative), Government Economist (or his representative) and a representative from the Financial Services and the Treasury Bureau.*

- (a) ***Economic Statistics Division (1)***. It deals with external merchandise trade statistics, price statistics and household and income statistics;
- (b) ***Economic Statistics Division (2)***. It deals with sectoral economic statistics, statistics on science and technology, and statistics on companies in Hong Kong with parent companies located outside Hong Kong. It also handles publication matters and organises human resources development activities for statistical grade staff;
- (c) ***Economic Statistics Division (3)***. It deals with national income statistics and Balance of Payments statistics (see para. 1.5(c)). It also provides support in applications of information technology (IT) and handles data dissemination matters for the department;
- (d) ***Social Statistics Division***. It deals with demographic and other social statistics, plans and executes population censuses and by-censuses and conducts social surveys; and
- (e) ***Labour Statistics Division***. It deals with labour statistics and undertakes surveys of employment, labour force, payroll, wages and hours of work.

In addition to the five divisions, there are three supporting branches, namely the Technical Secretariat, Development Branch and Administration Branch responsible for technical, development and administrative matters respectively. The organisation chart of C&SD as at 1 April 2019 is at Appendix A. As at 1 April 2019, C&SD had an establishment of 1,281 permanent staff (Note 6). In addition, there were 247 statistical posts in 34 B/Ds.

1.5 According to its Controlling Officer's Report, C&SD has six programmes, as follows:

Note 6: *They included 7 Directorate posts, 83 posts in the Statistician grade, 735 posts in the Statistical Officer/Census and Survey Officer/Statistics Supervisor grades and 456 posts from other grades (e.g. Executive Officer grade, Analyst/Programmer grade and Clerical & Secretarial grades etc.).*

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- (a) **Trade statistics.** The aim is to process import/export declarations and cargo manifests, to safeguard the Government's revenue from import/export declaration charges, and to produce and analyse trade statistics;
- (b) **Social statistics.** The aim is to produce and analyse demographic, labour force and social statistics, and to maintain a register of quarters as a sampling frame for conducting household surveys;
- (c) **National accounts and Balance of Payments statistics.** The aim is to produce and analyse Gross Domestic Product, Gross National Income, Balance of Payments statistics (Note 7) and related statistics in a timely and accurate manner, and to assist in the preparation of the Government's forecasts of various economic aggregates;
- (d) **General statistical services.** The aim is to provide statistical consultancy services and to maintain quality standards in statistical work;
- (e) **Price/Industry/Service statistics.** The aim is to produce and analyse price, industry and service statistics; and
- (f) **Labour statistics.** The aim is to produce and analyse statistics on employment, vacancies, wage, labour earnings and hours of work, and to maintain a Central Register of Establishments as a sampling frame for conducting establishment surveys.

Statistical surveys

1.6 C&SD strives to provide quality statistical services, contributing to the social and economic developments of Hong Kong. In 2018, C&SD handled

Note 7: *The Balance of Payments records economic transactions between Hong Kong and the rest of the world. It represents a comprehensive set of statistics, covering trade in goods and services, investment and income. These statistics on cross-border transactions are useful for monitoring financial flows between Hong Kong and other economies.*

40 surveys/projects (Note 8) and produced 56 reports under the six programmes of Controlling Officer's Report (see Table 1).

Table 1

Number of surveys/projects handled and reports produced by C&SD (2018)

Programme under C&SD's Controlling Officer's Report (Note)	Number of surveys/projects handled	Number of reports produced
Trade statistics	6	8
Social statistics	3	11
National accounts and Balance of Payments statistics	1	4
General statistical services	10	5
Price/Industry/Service statistics	15	23
Labour statistics	5	5
Total	40	56

Source: C&SD records

Note: The social statistical work and labour statistical work are shared among the Social Statistics Division, the Labour Statistics Division and the Economic Statistics Division (1). The remaining statistical work of other nature is shared among the three Economic Statistics Divisions (see para. 1.4(a) to (c)).

1.7 According to C&SD, there are two categories of surveys, namely establishment surveys and household surveys:

- (a) **Establishment surveys.** These are surveys on economic activities (e.g. Annual Survey of Economic Activities on Import/Export, Wholesale and Retail Trades, and Accommodation and Food Services Sectors) undertaken by individual survey sections. In a typical establishment survey, questionnaires are mailed to a selected sample of respondents who are

Note 8: These refer to surveys undertaken by C&SD and projects owned by other B/Ds in which C&SD provided professional assistance.

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required to return the completed questionnaires by post/fax/email or complete the questionnaires online. Where necessary (e.g. in the case of non-delivery or no response), a sampled case will be followed up by telephone interview or field visit, as appropriate; and

- (b) ***Household surveys.*** These are surveys relating to the demographic and socio-economic characteristics of the population (e.g. GHS and HES — see Note 35 to para. 2.40(b)). For GHS, the fieldwork is distributed among all frontline field officers. 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.

1.8 ***Thematic Household Surveys (THSs).*** In addition to the above surveys conducted in-house, in order to meet the demand for statistical data on selected social issues by B/Ds, C&SD has been conducting various THSs since 1999. THSs are contracted out to private research firms under the coordination and management of C&SD. Examples of THS topics included “Housing Conditions of Sub-divided Units in Hong Kong”, reports of which were published in 2015 and 2016, and “Education and Employment Trajectories of Young and Middle-aged Persons”, a report of which was published in 2019.

1.9 ***Review of statistical data quality.*** In response to media reports about the data quality of surveys concerning GHS, the Labour Earnings Survey and the Annual Earnings and Hours Survey, in January 2013, the Government set up an Investigation Task Force on Statistical Data Quality Assurance (hereinafter referred to as the Task Force — Note 9) to examine the authenticity of statistical data and the existing data quality assurance mechanism. In March 2013, the Task Force completed the review and reported that:

Note 9: *The chairperson of the Task Force was the Commissioner for Census and Statistics. Other members comprised a renowned academic in statistics and an experienced senior management executive, as well as an expert in compiling financial indices, and a Principal Economist representing the Government Economist.*

- (a) based on the findings of the verification checks and other related parameters and arguments provided by C&SD, there was not sufficient evidence showing the existence of systematic data fabrication in GHS, the Labour Earnings Survey, and the Annual Earnings and Hours Survey;
- (b) there was not sufficient evidence to query the overall authenticity of the data collected in the above three surveys, and the quality of data collected from the three surveys was sufficiently sound to provide basic inputs for the compilation of the relevant statistical figures;
- (c) in view of the data inconsistencies noted in the verification checks and the increasing challenges faced by C&SD field officers in data collection work, the possibility that individual field officers had not strictly followed the fieldwork guidelines, such as misapplying personal judgement to handle some of the questions in the questionnaire based on their knowledge/experience, or skipping some instructions in the guidelines could not be ruled out;
- (d) while in general the necessary processes were in place to control data quality, C&SD should introduce measures to strengthen and reinforce the existing data quality assurance system in various dimensions; and
- (e) the fieldwork management system encompassed a host of historical, complex and deep-seated issues which would need to be addressed in an integrated and coherent manner in a separate review.

1.10 The Task Force made six recommendations for improving the data quality assurance process and fieldwork management system:

- (a) identification of data categories vulnerable to mis-classification/error and data fabrication for close monitoring of data quality;
- (b) setting up a Departmental Committee on quality assurance of GHS;
- (c) fostering a sense of ownership in the mindset of all stakeholders involved in conducting GHS;

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- (d) conducting research studies to assess the impact of the declining response rate and the increasing rate of proxy reporting on GHS results;
- (e) introducing appropriate measures to raise public awareness of GHS and C&SD's work; and
- (f) conducting a comprehensive review of the existing fieldwork management system.

1.11 Regarding the recommendation in paragraph 1.10(f), in July 2013, C&SD commissioned a consultant to comprehensively review the fieldwork management system. In May 2014, the consultant made 23 recommendations (see Appendix B) covering four areas:

- (a) workload and work pressure;
- (b) arrangement of GHS fieldwork (including the development and communication of policy on how to deal with sub-divided units (SDUs) in GHS samples);
- (c) communications; and
- (d) a computerised time-log system.

Up to June 2019, C&SD had implemented recommendations on all improvement areas, except for the implementation of a computerised time-log system under (d) above.

Population censuses and by-censuses

1.12 ***Sampling basis.*** In line with the established practice, 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 (Note 10), while by-censuses enquire about the detailed characteristics of the population on the basis of a large sample (Note 11). Population censuses and by-censuses differ from other general sample household surveys in their sizeable scale. This makes them feasible to provide statistics of high precision for population sub-groups and small geographical areas. The last by-census was conducted in 2016 (16BC) and the next population census will be conducted in 2021 (21C).

1.13 *Mode of data collection.* Before 2011, data was collected basically by postal questionnaires and face-to-face interviews in population censuses and by-censuses, where enumerators visited households to interview persons therein one by one. C&SD introduced two data collection modes, namely self-enumerations through the Internet (online questionnaires) in 2011 and telephone interviews in 2016. In 21C, C&SD will continue adopting a multi-modal data collection approach, including online questionnaires, postal questionnaires, telephone interviews and face-to-face interviews.

1.14 *Costs of 16BC and 21C.* For 16BC, C&SD incurred departmental expenses of \$267 million, of which \$87 million were spent on hiring 7,120 temporary field workers (TFWs) to interview selected households. It also procured IT equipment and services at a cost of \$85 million. For 21C, C&SD would make financial provision of \$746 million for departmental expenses and \$203 million for procurement of IT equipment and services. It planned to hire around 18,000 TFWs to enumerate over three million selected quarters.

Information Systems Strategy

1.15 C&SD's work primarily involves four major activities, namely pre-survey preparation, data collection, processing and analysis, and dissemination. The

Note 10: *In the population census conducted in 2011, following international practices, two types of questionnaires (the "Short Form" for the simple enumeration and the "Long Form" for the detailed sample enquiry) were used. The sampling fraction for the detailed sample enquiry ("Long Form") was set at one-tenth of the population.*

Note 11: *In the by-census conducted in 2016, a sample of about one-tenth of the quarters in Hong Kong was randomly selected for detailed enquiry.*

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application systems used by C&SD comprise infrastructure systems, administrative and management systems, statistical survey systems and a separate set of systems for population censuses and by-censuses. Overall, C&SD has over 100 departmental or survey-specific systems, platforms and applications, including more than 80 End-User Computing (EUC) systems/applications. The application systems are either maintained by the Information Technology Management Unit comprising three branches under the Economic Statistics Division (3) and the Census System Services Branch under the Social Statistics Division, or by individual user branches/sections.

1.16 In May 2003, C&SD commenced an Information Systems Strategy (ISS) study to formulate a five-year plan, with the objectives to improve the overall productivity, service quality and cost-effectiveness. In the study report issued in March 2004 (2004 ISS Report), a total of 16 projects were proposed. Having assessed the impact and complexity of the 16 proposed projects, C&SD decided to implement the projects by two phases (i.e. implementing 9 projects in Phase 1 from 2004 to 2016 and conducting a mid-term review (Note 12) in December 2017 before implementing the remaining 7 projects in Phase 2). As of 31 March 2019, \$66 million had been spent on the implementation of the 9 Phase 1 projects. A final report of the review was issued in January 2019 (2019 ISS Report). C&SD is examining the way forward based on the findings of the report.

Financial provision

1.17 The total expenditure of C&SD in 2017-18 was \$644 million, and that in 2018-19 was \$666 million. In both years, about 88% (i.e. \$564 million and \$586 million respectively) of the expenditures were related to personal emoluments or personnel related expenses.

Note 12: *A Departmental Information Technology Planning cum ISS Review was carried out to review the implementation of IT projects recommended in the 2004 ISS Report and develop a Departmental Information Technology Plan under the Government Technology and System Architectures Framework.*

Audit review

1.18 In April 2019, the Audit Commission (Audit) commenced a review to examine the statistical services provided by C&SD, focusing on:

- (a) statistical surveys (PART 2);
- (b) population censuses and by-censuses (PART 3); and
- (c) implementation of information systems strategy (PART 4).

Audit has found room for improvement in the above areas and has made a number of recommendations to address the issues.

General response from the Government

1.19 The Secretary for Financial Services and the Treasury appreciates Audit's efforts in conducting the review and putting forward recommendations to help improve the operation of C&SD and agrees with the audit recommendations.

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

Acknowledgement

1.21 Audit would like to acknowledge with gratitude the assistance and full cooperation of the staff of C&SD during the course of the audit review.

PART 2: STATISTICAL SURVEYS

2.1 This PART examines the conduct of statistical surveys by C&SD, focusing on:

- (a) GHS (paras. 2.2 to 2.18);
- (b) SDU Survey (paras. 2.19 to 2.37);
- (c) Monthly Retail Price Survey (MRPS) (paras. 2.38 to 2.46); and
- (d) implementation of a department-wide computerised time-log system (paras. 2.47 to 2.51).

General Household Survey

2.2 As mentioned in paragraph 1.7(b), an on-going household survey (i.e. GHS) involving around 9,000 quarters is conducted each month through online questionnaire, field visit and Computer-Assisted Telephone Interview (CATI — Note 13). Its main objective is to collect information on:

- (a) labour force, employment, unemployment and under-employment; and
- (b) demographic and socio-economic characteristics of the population.

The information collected is useful for the Government to review and formulate social and economic policies. Such information is also widely used in research conducted by academic and private sectors.

2.3 In a GHS, each enumerated household member typically answers some 20 to 40 questions, depending on his/her economic activity status (i.e. whether he/she is employed, unemployed, under-employed or economically inactive). While the

Note 13: *Some 2,000 to 3,000 cases in the repeated samples are enumerated through CATI each month.*

report of GHS is published quarterly, labour force related statistics compiled from GHS, including unemployment and under-employment statistics (for the last three months), are released on a monthly basis. Since 2003, GHS fieldwork has been shared by all frontline field officers in 10 field pools in 4 divisions within C&SD, with support provided by a central and independent team (known as GHS Central Field Team) on the field operation and the conduct of quality checks (QCs). In response to Audit's enquiry, in July 2019, C&SD provided a breakdown on the estimated number of field officers (i.e. Senior Census and Survey Officers (SCSOs), Census and Survey Officers (CSOs), Assistant Census and Survey Officers (ACSOs) and Survey Interviewers (SIs)) involved in GHS work, expressed in terms of full-time equivalent (FTE) posts (see Table 2).

Table 2

**Estimated number of field officers involved in GHS work
(31 March 2019)**

Rank (Note)	10 field pools		GHS Central Field Team		Total	
	No. of posts (a)	No. of FTE posts (b)	No. of posts (c)	No. of FTE posts (d)	No. of posts (e) = (a) + (c)	No. of FTE posts (f) = (b) + (d)
SCSO	10	1	1	1	11	2
CSO	84	12	7	7	91	19
ACSO/SI	187	66	12	12	199	78
Total	281	79	20	20	301	99

Source: C&SD records

Note: SCSO is the head of field pool. CSO and ACSO are the supervisor and frontline field officer respectively. Equivalent to permanent ACSO staff, SIs are employed on a temporary basis.

2.4 According to the Task Force Report of March 2013 (see para. 1.9):

- (a) it was alleged that some frontline field officers might circumvent:
 - (i) enumeration work on SDUs by falsifying the enumeration results of such cases as non-contact (NC) or un-occupied; and

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- (ii) supervisors' review checks by falsifying the telephone number of respondents.

Nevertheless, the Task Force was of the view that there was not sufficient evidence showing the existence of systematic data fabrication in GHS nor convincing evidence to query the overall authenticity of the data collected; and

- (b) C&SD should identify data categories which were vulnerable to mis-classification/error or data fabrication. According to C&SD, these included data related to employment status (e.g. falsely stating unemployed respondents as employed in order to skip collecting data on some follow-up questions).

In June 2013, in response to the Task Force's recommendations, C&SD set up a Departmental Committee on Data Quality Assurance of GHS (DCQA-GHS — Note 14) to coordinate and strengthen the quality assurance system of GHS.

Need to improve in-depth QCs of GHS

2.5 According to C&SD, in-depth QCs are conducted to ensure the quality of GHS data collection process before all questionnaires are thoroughly edited by indoor statistical officers and validated by the GHS computer system. The in-depth QCs comprise two stages of independent checking:

- (a) *Stage 1 in-depth QCs by field pool supervisors.* Cases are selected according to a purely random mechanism, such that each successfully enumerated case has an equal chance of being selected for checking to ensure that there is no selection bias among the cases. Each CSO supervisor will select a proportion of cases completed by his/her ACSO subordinates. The results of checking can be generalised to all cases for objective assessment of the overall data quality; and

Note 14: *DCQA-GHS was chaired by the Deputy Commissioner for Census and Statistics, with representatives from different ranks and grades involved in GHS work as members.*

- (b) **Stage 2 in-depth QCs by GHS Central Field Team.** Cases are selected based on a target-based mechanism instead. Top priority of selection is accorded to the proper classification of the economic activity status of the respondents (i.e. whether they are employed, unemployed, under-employed or economically inactive). Only cases not checked (including cases selected but cannot be checked due to no/wrong telephone number) in Stage 1 will be subject to selection for checking at this stage in order to avoid over-burdening the respondents from being re-checked for the same survey. Stage 2 checking aims to minimise reporting errors in important/high risk cases with the resources available.

2.6 Field pool supervisors include SCSO and CSO rank officers, and GHS Central Field Team consists of 1 SCSO and 7 CSOs. The errors identified in the in-depth QCs of GHS questionnaires are classified into two categories, namely:

- (a) **“Major errors”.** “Major errors” are related to misclassification of economic activity status of respondents (e.g. unemployed classified as economically inactive and vice versa); and
- (b) **“Minor errors”.** “Minor errors” are errors identified in other parts of the questionnaires which have no or minimal impact on the labour force statistics, such as inadequacy in recording details of the occupation of the respondents to the finest coding level (e.g. “account clerk” or “personnel clerk” rather than just “clerk”).

2.7 In order to strengthen in-depth QCs of GHS, the percentage of in-depth QCs for high-risk data categories has increased from 10% to 15% on field cases since 2013. According to the GHS Manual on Fieldwork Control (for field pools) and the Work Manual for GHS Central Field Team, field pool CSO supervisors and GHS Central Field Team will respectively select randomly and with priority (e.g. household cases with unemployed persons) 7.5% of GHS questionnaires on successfully enumerated household cases for conducting in-depth QCs each month. QC checkers will make telephone calls to contact the respondents to verify the attendance of enumerators (i.e. ACSOs) and accuracy of key data items recorded. Audit analysis of the in-depth QCs on enumerated GHS cases from April 2018 to March 2019 is shown in Table 3.

Table 3

**Analysis of in-depth QCs on enumerated GHS cases
(April 2018 to March 2019)**

Month/Year	No. of QC cases successfully conducted (a)	Error cases (Note)					
		Major error cases		Minor error cases		Total	
		(b) No.	(c) = $\frac{(b)}{(a)} \times 100\%$ %	(d) No.	(e) = $\frac{(d)}{(a)} \times 100\%$ %	(f) = (b) + (d) No.	(g) = $\frac{(f)}{(a)} \times 100\%$ %
<i>QCs by field pool supervisors (Stage 1 checking)</i>							
4-6/2018	1,572	3	0.19%	10	0.64%	13	0.83%
7-9/2018	1,550	1	0.06%	13	0.84%	14	0.90%
10-12/2018	1,474	1	0.07%	7	0.47%	8	0.54%
1-3/2019	1,422	0	0.00%	13	0.91%	13	0.91%
Overall	6,018	5	0.08%	43	0.71%	48	0.80%
<i>QCs by GHS Central Field Team (Stage 2 checking)</i>							
4-6/2018	1,409	13	0.92%	176	12.49%	189	13.41%
7-9/2018	1,399	19	1.36%	192	13.72%	211	15.08%
10-12/2018	1,409	12	0.85%	210	14.90%	222	15.76%
1-3/2019	1,371	14	1.02%	215	15.68%	229	16.70%
Overall	5,588	58	1.04%	793	14.19%	851	15.23%
<i>Overall QCs</i>							
4-6/2018	2,981	16	0.54%	186	6.24%	202	6.78%
7-9/2018	2,949	20	0.68%	205	6.95%	225	7.63%
10-12/2018	2,883	13	0.45%	217	7.53%	230	7.98%
1-3/2019	2,793	14	0.50%	228	8.16%	242	8.66%
Overall	11,606	63	0.54%	836	7.20%	899	7.75%

Source: Audit analysis of C&SD records

Note: Each questionnaire with error in one or more data items spotted during in-depth QCs was counted as one error case. Questionnaires with both “major errors” and “minor errors” were counted as “major error cases” only.

2.8 Audit examination revealed the following findings:

- (a) ***Small number of error cases identified by field pool supervisors.*** Audit analysis of the results of the in-depth QCs covering 11,606 GHS questionnaires from April 2018 to March 2019 revealed that, of the 899 error cases found, only 48 were identified by the field pool supervisors with an error rate of 0.8% (i.e. $48 \div 6,018 \times 100\%$) while 851 were found by GHS Central Field Team with an error rate of 15.23% (i.e. $851 \div 5,588 \times 100\%$);
- (b) ***The majority of error cases identified were “minor error cases”.*** The bulk of error cases identified by in-depth QCs of GHS were “minor error cases”. From April 2018 to March 2019, 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; and
- (c) ***Inadequate follow-up of NC cases due to wrong/no telephone numbers and cases with duplicate telephone numbers.*** According to the GHS Manuals for field pools and GHS Central Field Team:
 - (i) 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 NC cases;
 - (ii) if such in-depth QC cases selected by field pools are found to have wrong/no telephone numbers, some of them would be randomly selected for checking by GHS Central Field Team (see para. 2.5(b)); and
 - (iii) for in-depth QC cases selected by GHS Central Field Team with wrong/no telephone numbers, section head or field head of GHS Central Field Team will select some of them (around 20% to 30%) for follow-up actions by field visits.

In Stage 1 in-depth QCs, another case will be randomly selected for checking if a case sampled for in-depth QCs is found to have a wrong/no telephone number so that the required 7.5% of in-depth QC rate for each field officer is met. These wrong/no telephone number cases are regarded

as cases not checked in Stage 1 in-depth QCs and are subject to selection for checking in Stage 2 in-depth QCs. In Stage 2 in-depth QCs, another case will not be selected for checking if a case sampled for in-depth QCs is found to have a wrong/no telephone number. According to C&SD, such arrangement is adopted due to time constraint as Stage 2 in-depth QCs have to be completed within one to two days under the tight monthly cycle of GHS (Note 15). Notwithstanding this, a certain number of wrong/no telephone number cases identified in Stage 2 in-depth QCs will still be selected for follow up by GHS Central Field Team by field visits. It was also noted that according to the Task Force Report, an in-house examination of GHS questionnaires for the 11-month period from February to December 2012 revealed that some questionnaires with the same telephone numbers recorded were identified. Such cases involved 61 questionnaires (including 29 pairs of questionnaires and 1 group of 3 questionnaires) which were handled by 40 field officers.

2.9 In response to Audit's enquiry, in August and September 2019, C&SD said that:

- (a) in-depth QCs conducted by GHS Central Field Team were important/vulnerable cases which were more prone to error. It was therefore natural that the error rate for major mistakes was higher for cases checked by GHS Central Field Team than those checked by field pools;
- (b) among the cases with wrong/no telephone numbers, the vast majority were no telephone number cases since some respondents preferred not to disclose their telephone numbers due to privacy concerns;
- (c) there was a monthly average of around 50 wrong/no telephone number cases identified in Stage 2 in-depth QCs in the period from January to March 2019. These cases were consolidated at the end of each month and four such cases were selected for checking by two CSOs of GHS Central Field Team on a rotational basis by field visits. No irregularities had been found so far; and

Note 15: *According to C&SD, the QC rate of Stage 2 in-depth QCs could still meet the 7.5% target even if the selected wrong/no telephone number cases were not counted. The average in-depth QC rate was 7.8% for the first quarter of 2019.*

- (d) the cases with same telephone numbers recorded as reported in the Task Force Report accounted for less than 0.1% of all enumerated cases in the period concerned.

In Audit's view, in-depth QC cases involving wrong/no telephone numbers pose a higher risk of falsification and they should be investigated thoroughly, instead of being substituted by another cases in Stage 1 in-depth QCs. As cases involving duplicate telephone numbers also pose a higher risk of falsification, they should also be monitored and followed up where necessary. In order to improve the in-depth QCs of GHS, C&SD needs to review the proportion of Stage 1 checking (i.e. those conducted by field pool supervisors on a random basis) and Stage 2 checking (i.e. those conducted by GHS Central Field Team on a target basis), and consider conducting more Stage 2 checking. C&SD also needs to step up actions in following up NC cases in Stage 1 and Stage 2 checking due to wrong/no telephone numbers and in checking enumerated cases with duplicate telephone numbers.

***Need to keep proper documentation
on monitoring of ACSOs on the Monitoring List***

2.10 As mentioned in paragraph 2.4(a), it was alleged that some ACSOs might circumvent enumeration work on SDUs by falsifying the enumeration results of such cases as NC or un-occupied. According to C&SD, the overall NC rate of GHS field visits dropped from 18.7% in the first quarter of 2016 to 13.4% in the fourth quarter of 2018 (Note 16). According to the GHS Manual on Fieldwork Control (for field pools), management statistics reports on quality indicators and their comparisons with benchmarks are provided to CSO supervisors for reference in monitoring the performance of their subordinates and for taking follow-up actions where necessary.

2.11 To further facilitate CSO supervisors to monitor the performance of their ACSO subordinates in respect of GHS work, a report "Performance Management Statistics Report" showing the trend of performance (achievement vs benchmark) in each month was prepared for each ACSO concerned and passed to the respective CSO supervisors on a quarterly basis as a reference for assessing the performance of the ACSO in respect of GHS fieldwork. Based on the Performance Management Statistics

Note 16: *According to C&SD, the reduction of NC rate was partly attributable to the implementation of online questionnaires, which provided an alternative means of data provision by some households. Otherwise, these cases would be NC cases.*

Statistical surveys

Reports prepared for the 160 ACSOs with GHS work involvement of 6 months or more in 2018 in nine field pools (excluding one field pool with 21 ACSOs responsible for enumeration work through CATI only), Audit noted that 32 ACSOs had high average NC rates of more than 25% in 2018 (ranging from 25.1% to 39.3%).

2.12 According to the GHS Manual on Fieldwork Control (for field pools), a CSO supervisor should take necessary actions (e.g. requesting the ACSO concerned to provide details of visits made for those NC cases) to verify the cases if the number of NC cases reported by an ACSO is high. In September 2019, C&SD informed Audit that a Monitoring List was maintained to identify ACSOs with completion rates consistently lower than the benchmark by more than 5 percentage points for over six months during the past twelve months (Note 17). These ACSOs would be closely monitored and coached by their supervisors case by case. C&SD explained that the completion rate was used for monitoring because it was unfair to the ACSOs if analysis on their performance was simply based on NC rate. The reasons were as follows:

- (a) while the NC rate in Performance Management Statistics Report was one performance indicator, it only focused on eligible cases for GHS (i.e. domestic quarters being occupied by households), and non-eligible cases were not included in the calculations. Field officers' efforts in visiting non-eligible cases (e.g. quarters without occupiers, quarters used for non-domestic purposes, and demolished quarters) and in ascertaining the non-eligibility of these cases were not reflected; and
- (b) since the allocation of GHS assignments to individual ACSOs was based on their place of residence, some ACSOs might have consistently high NC rate (or low completion rate) due to inherent contact/response patterns of the households in the geographical locations of their assignments (e.g. assignments in West Kowloon, Mid-Levels and the Peak tended to have lower completion rates as it was generally more difficult to contact the households living in these areas) rather than performance factors.

Note 17: *According to C&SD, the benchmark was based on the performance of ACSOs in the same assignment area and housing type in the past 12 months. CSO supervisors would keep monitoring these field officers for a period of time after they had improved their performance and been removed from the Monitoring List. For those who were retained in the list, C&SD would try to understand their development needs and offer suitable support to help them improve their performance.*

2.13 Audit noted that in the DCQA-GHS meeting held on 3 April 2019, there were 5 ACSOs on the Monitoring List covering the period from January to December 2018 (compared with 14 and 10 ACSOs on the List covering the same period in 2016 and 2017). Audit requested C&SD to provide documentation on the monitoring and coaching given to the five ACSOs. However, C&SD said that while written records on supervisory field visits made were kept, no other written records on the monitoring and coaching given to those ACSOs on the Monitoring List were available since such types of work were performed by CSO supervisors as part of their routine day-to-day supervisory duties. In Audit's view, for better supervision of ACSOs with consistently low completion rates and for management review, C&SD needs to keep proper documentation on the monitoring and coaching of ACSOs on the Monitoring List.

Need to continue to closely monitor proxy reporting

2.14 According to C&SD, DCQA-GHS has been monitoring the proxy rate of GHS regularly. Audit noted that at the meeting of DCQA-GHS held in May 2016, it was pointed out that:

- (a) proxy reporting should be avoided as far as possible;
- (b) all field officers should attempt to contact the absent household members after completing field visits by asking them to call back and/or by making follow-up calls to them later; and
- (c) when it is unavoidable to obtain information by proxy, the field officer should ensure that the respondent has enough knowledge to provide reliable information about the absent members and should attempt to verify the information with the absent members afterwards if considered necessary.

The GHS Manual on Fieldwork Control (for field pools) states that the use of proxy reporting to speed up fieldwork progress is undesirable as this may affect data quality.

2.15 According to the report of the Task Force issued in March 2013, there had been an increase in the rate of proxy reporting in GHS from 52.4% in the fourth quarter of 2003 to 59% in the fourth quarter of 2012, and considered that such

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increase in the rate of proxy reporting in GHS might lead to deterioration of quality of GHS data. However, Audit noted that, from 2016 to 2018, the rate of proxy reporting remained at a high level, ranging from 53.4% to 56.5%.

2.16 In response to Audit's enquiry in September 2019, C&SD said that high rate of proxy reporting was a universal phenomenon in labour force surveys across the world. For example, the rate of proxy reporting of such survey in the United States was around 50%, and that in Canada was around 65%. In practice, proxy reporting was often a preference by the respondents on which the government statistical office had no control. In Audit's view, in light of the persistently high rate of proxy reporting, C&SD needs to continue to closely monitor the rate of proxy reporting in cases completed by field officers and reinforce training for field officers in handling proxy reporting.

Audit recommendations

2.17 **Audit has recommended that the Commissioner for Census and Statistics should:**

- (a) **take measures to improve in-depth QCs of GHS, including:**
 - (i) **reviewing the proportion of Stage 1 and Stage 2 checking, and considering conducting more Stage 2 checking; and**
 - (ii) **stepping up actions in following up NC cases in Stage 1 and Stage 2 checking due to wrong/no telephone numbers, and in checking enumerated cases with duplicate telephone numbers;**
- (b) **keep proper documentation on the monitoring and coaching of ACSOs on the Monitoring List; and**
- (c) **continue to closely monitor the rate of proxy reporting in cases completed by field officers and reinforce training for field officers in handling proxy reporting.**

Response from the Government

2.18 The Commissioner for Census and Statistics agrees with the audit recommendations. She has said that:

- (a) apart from in-depth QCs in data collection stage, all GHS questionnaires are thoroughly edited by indoor statistical officers and validated by computer. In the light of Audit's recommendations, C&SD will review the proportion of Stage 1 and Stage 2 checking taking into account the time and resources available and the impact on respondents. C&SD will also step up the checking on NC cases due to wrong/no telephone numbers starting from January 2020. Besides, a new checking mechanism will be introduced for cases with duplicate telephone numbers with effect from January 2020;
- (b) C&SD is formulating a set of guidelines to ensure proper documentation on the day-to-day monitoring and coaching work on ACSOs on the Monitoring List; and
- (c) C&SD will continue to closely monitor the rate of proxy reporting, and will remind field officers of the proper procedures of handling proxy reporting in the coming refresher training on GHS for field officers to be organised in the first quarter of 2020.

Sub-divided Unit Survey

Thematic household surveys

2.19 *First THS on SDUs in 2014.* At the request of the Transport and Housing Bureau (THB), C&SD included the topic of SDU in THS conducted from June to November 2014, which was the 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. Information relating to the housing conditions of SDUs was also collected in the survey. The estimated number of SDUs was 86,400, which was

reported in the Long Term Housing Strategy (LTHS — Note 18) Implementation Milestones (as at December 2014). Detailed results of the first THS on SDUs (2014 THS Report) were published in July 2015.

2.20 *Second THS on SDUs in 2015.* 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 (2015 THS Report) were published in March 2016. The estimated number of SDUs was 88,800 (comprising 17,800 on Hong Kong Island, 51,900 in Kowloon and 19,100 in the New Territories). According to the 2015 THS Report, 61.6% and 36.3% of SDU households said that the reason for living in SDUs was “more affordable rent” and “convenience to go to work/school” respectively. Other reasons included “financial difficulties” (22.6%), “lack of space to live with parents/relatives” (5.7%) and “family problems” (5.1%). 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 LTHS in 2015.

Enumeration on SDUs under 16BC (16BC SDU enumeration)

2.21 In August 2013, in order to estimate the number of inadequately housed households, THB suggested adding a new data topic on “Whether the household’s accommodation is inside an SDU” (Note 19) in 16BC. In this connection, a new data topic on SDU was included in 16BC conducted in 2016. According to C&SD, respondents were asked whether the unit of quarters they occupied was an SDU. Coupled with information collected on other data topics (e.g. household composition, education and employment), statistics on the characteristics of households and persons living in SDUs were compiled. About one-tenth of all quarters in Hong Kong (i.e. 299,300) were sampled in 16BC.

Note 18: *In December 2014, the Government announced LTHS. It was the first long-term strategic document in housing since 1998. Its strategic direction was to gradually avert the current supply-demand imbalance.*

Note 19: *Other than THB, the Social Welfare Department also suggested adding a data topic on SDU, taking into account that: (a) the Government was facing great pressure from the public and political parties to help those low-income households living in SDUs in private housing; and (b) availability of additional information would enable the Government to grasp an overall picture of such situation (i.e. number and characteristics of families) in Hong Kong, thereby facilitating an evidence-based approach in addressing the problem.*

2.22 In September 2019, C&SD informed Audit that the first requirement of sampling for the whole 16BC was a complete and accurate list of the addresses to be sampled (hereinafter referred to as Frame of Quarters (FoQ)). FoQ refers to a database maintained by C&SD covering land areas. It serves as the sampling frame of population censuses/by-censuses and other household surveys (Note 20). To ensure the precision of statistical analyses on the new data topic on SDU, and following the consultant's recommendation in May 2014 (see para. 1.11) that measures should be developed to cope with the unanticipated increase in workload due to numerous SDUs newly discovered in a unit of sampled quarters, a special frame updating exercise on SDUs was conducted before 16BC for the purpose of devising an appropriate sample design for enumerating SDUs and facilitating the effective allocation of fieldwork assignments of 16BC. In this connection, C&SD had collated intelligence on the locations with higher chances of having SDUs. In particular:

- (a) in September 2014, C&SD requested the Home Affairs Bureau (HAB) to provide information (Note 21) relating to the first launch of the "One-off living subsidy for low-income households not living in public housing and not receiving Comprehensive Social Security Assistance (CSSA —

Note 20: *FoQ comprises two registers, namely Register of Quarters and Register of Segments. Register of Quarters contains a full list of addresses in built-up areas in Hong Kong, each with a unique house number, street name, floor number and flat number. Register of Segments is a list of area segments in non-built-up areas. Each area segment contains some 8 to 15 quarters and is delineated by some natural or easily identifiable boundaries (such as footpaths). According to C&SD, regular updating of FoQ is based on the administrative information on the demolition of old buildings and the construction of new buildings, which is available from various sources including the Housing Department and the Buildings Department. As an established practice, an updating exercise for area segments will also be conducted prior to the conduct of each population census/by-census through field visits.*

Note 21: *C&SD obtained from HAB three data fields (which would not enable identification of individual applicants) in the one-off living subsidy applications: (a) address of the applicant; (b) type of accommodation as declared in the application form; and (c) an indicator on whether the application was successful.*

Statistical surveys

Note 22)” programme (the one-off living subsidy programme) under the Community Care Fund (CCF — Note 23); and

- (b) in May 2015, C&SD also obtained from the Social Welfare Department a list of addresses (with information on type of accommodation) of CSSA cases with recipients residing in private residential buildings.

According to C&SD, since many SDU residents might be recipients of CSSA or the one-off living subsidy programme, the addresses obtained from these administrative sources were useful reference for identifying buildings that were more likely to have SDUs and thus prioritising the resources for identifying quarters with SDUs in FoQ.

2.23 The special frame updating exercise on SDUs for 16BC was conducted from August to October 2015, covering 5,000 selected buildings in 18 districts. According to C&SD, the 5,000 buildings were selected based on information from CCF, the Social Welfare Department and other sources (e.g. SDUs identified in 2014 THS). Enumerators of the outsourced contractor classified the quarters in these selected buildings into the following types by field observations (Note 24):

Note 22: *CSSA scheme provides a safety net for those who cannot support themselves financially. It is designed to bring their income up to a prescribed level to meet their basic needs.*

Note 23: *Established in early 2011, CCF’s main objective is to provide assistance to people facing financial difficulties, in particular those who fall outside the social safety net or those within the safety net but still have special circumstances that are not covered. Under CCF, three one-off living subsidy programmes were launched in December 2013, January 2015 and January 2016 respectively to relieve the financial pressure of such low-income households (commonly known as “N have-nots households”). Subject to the eligibility criteria, applicants living in private housing (including SDUs), industrial buildings or commercial buildings could apply for the subsidy.*

Note 24: *According to C&SD, enumerators of the outsourced contractor were required to observe whether each unit of the quarters in the assigned buildings contained SDUs, and if so, to record the number of SDUs and relevant observations (e.g. number of door bells, mail boxes and water/electricity meters), and to draw sketch maps showing the relative positions of SDUs and their entrances. To ensure the data quality of the exercise, QCs on the observation results were also conducted by an independent QC team of the contractor as well as C&SD field officers (each covering some 250 buildings).*

- (a) **Type 1.** These were quarters without any SDUs or quarters having SDUs for non-residential use only;
- (b) **Type 2.** These were quarters having SDUs and the number of SDUs therein was certain;
- (c) **Type 3.** These were quarters having SDUs but the number of SDUs therein was uncertain; and
- (d) **Type 4.** These were quarters which could not be verified whether they had any SDUs.

After completing the 10-week fieldwork, the outsourced contractor reported that there were 275,871 quarters, comprising 260,239 Type 1 quarters, 4,945 Type 2 quarters, 1,960 Type 3 quarters, 6,268 Type 4 quarters and 2,459 merged quarters. According to C&SD, coupled with information collected in the updating exercise for area segments by C&SD field officers (see Note 20 to para. 2.22), C&SD updated the quarters with SDUs in FoQ for sampling in 16BC (Note 25).

2.24 **Various stages of SDU Survey.** 16BC SDU enumeration involved mainly three stages, namely pre-survey stage, enumeration stage and post-survey stage, as follows:

- (a) **Pre-survey stage.** This mainly involved the updating of FoQ, sampling and allocation of assignments to enumerators in 16BC;
- (b) **Enumeration stage.** This mainly involved the collection of data (e.g. questionnaires completed by enumerators through face-to-face interviews) for 16BC; and

Note 25: *According to C&SD, samples in 16BC were basically selected using disproportionate stratified systematic sampling method with type of housing, geographical areas and type of quarters as the stratification factors. To improve the precision of data analyses on SDUs, “known and suspected SDUs in high-rise private residential blocks” were placed in a separate stratum and the remainder in another stratum during the sampling process. In other words, regardless of whether the quarters were labelled as SDUs in FoQ before 16BC, they would be sampled and their SDU status would be confirmed in the field operation of 16BC.*

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- (c) ***Post-survey stage.*** This mainly involved data processing, estimation procedures and dissemination of survey results. Statistics and analysis relevant to the new data topic on SDUs were published in the form of thematic report after releasing the main results of 16BC.

2.25 ***Estimation procedures.*** According to 16BC Technical Report (Note 26) issued by C&SD in November 2017, the procedures were:

- (a) ***Treatment of NC cases.*** Despite repeated visits during the fieldwork period of 16BC, there were cases where enumerators were not able to contact the households to collect the required information (i.e. NC cases — Note 27). The overall NC rate was 20.2% of households covered in 16BC. For these NC households, their basic characteristics were imputed. According to C&SD, for NC cases imputed as SDUs under 16BC (regardless of whether they were imputed based on SDU data in FoQ directly or auxiliary data of 16BC or other sources (see para. 2.33)), the characteristics of households and persons living in those SDUs were imputed based on those of successfully-enumerated SDUs, which served as the donor of imputed values; and
- (b) ***Estimation based on sample enquiry.*** It aimed to estimate detailed characteristics of the population and households.

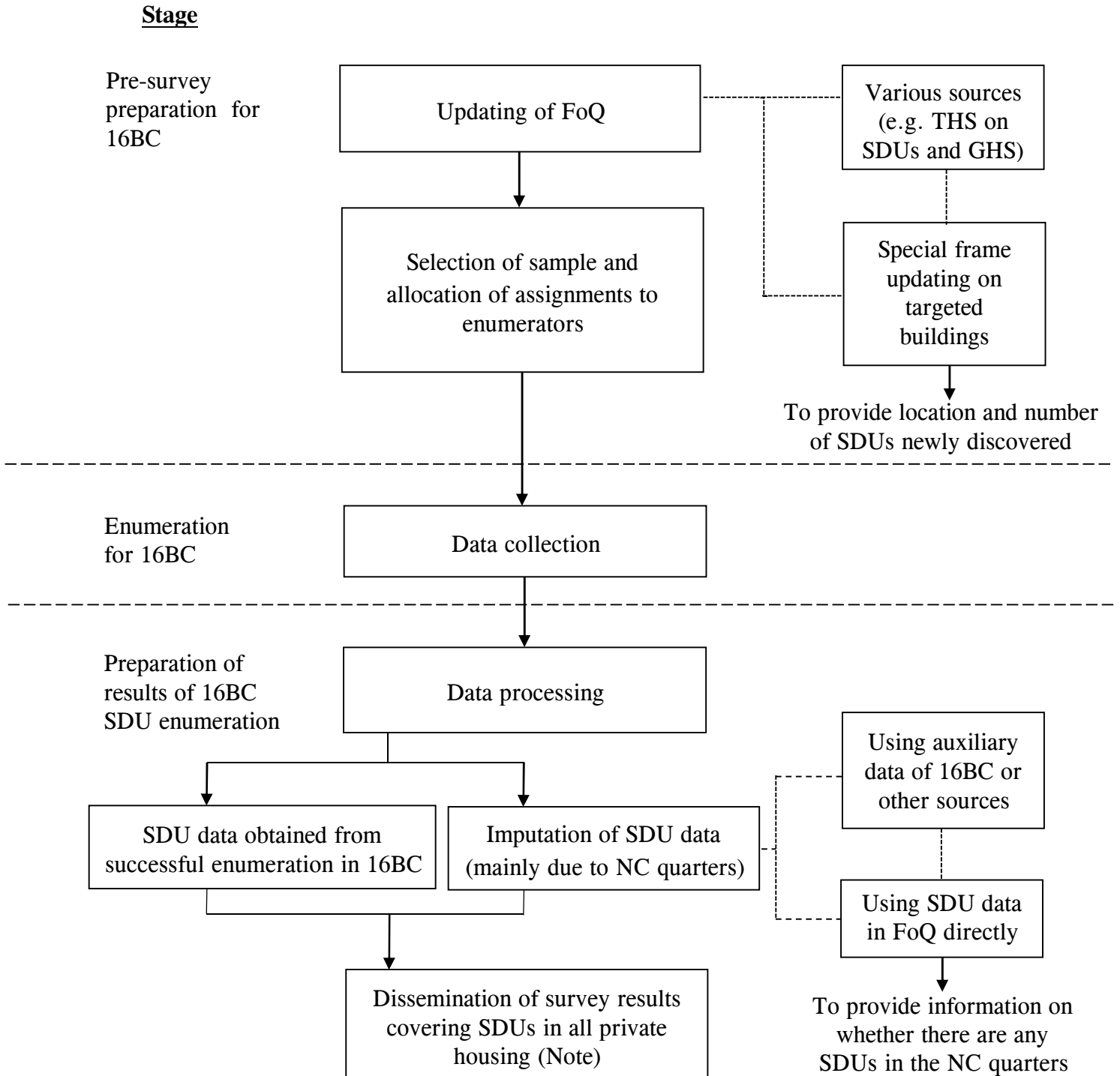
Figure 1 shows the flow chart of the 16BC SDU enumeration. Figure 2 shows the enumeration results of 16BC extracted from the 16BC Technical Report.

Note 26: *According to C&SD, the 16BC Technical Report provided an overview on how 16BC was conducted, with detailed descriptions on various aspects from planning to data collection, processing and dissemination. It supplemented the other reports that contained findings of 16BC, enabling users to better understand the methodology/procedures pertaining to the data collected in 16BC.*

Note 27: *In general, a household was classified as an NC case only if an enumerator had visited it for more than four times on different dates and at different times during the by-census period.*

Figure 1

Flow chart of the 16BC SDU enumeration

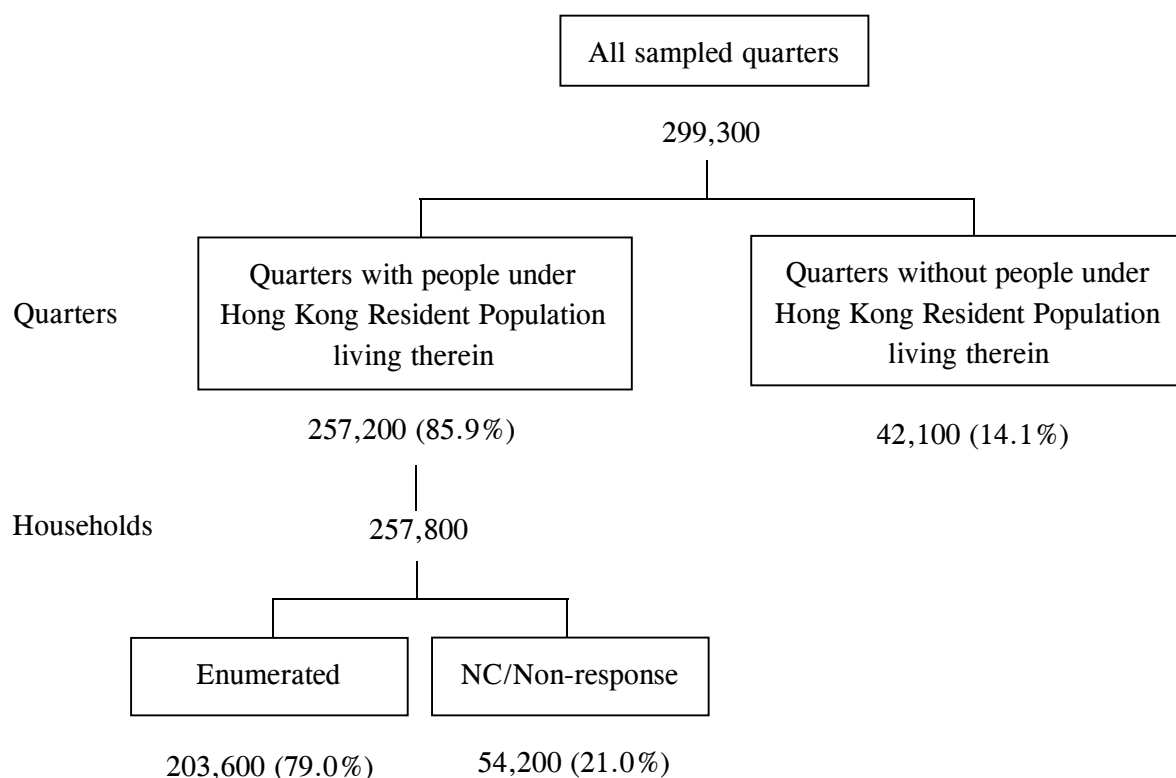


Source: Audit analysis of C&SD records

Note: Private housing included private residential flats, village houses, commercial buildings and temporary quarters.

Figure 2

**Enumeration results of 16BC
extracted from 16BC Technical Report issued in November 2017**



Source: *Audit analysis of C&SD records*

2.26 In January 2018, C&SD published the report entitled “Thematic Report: Persons Living in Sub-divided Units” (16BC Thematic Report on SDUs). The estimated number of SDUs was 92,656 (Note 28). According to the 16BC Thematic Report on SDUs:

Note 28: *For 16BC, SDUs referred to those formed by splitting a unit of quarters into two or more “internally connected” (i.e. the occupants could move between rooms without going outside through a public corridor, landing or staircase) and “externally accessible” (i.e. the occupants had direct access to the street, a public corridor or landing without going through someone else’s quarters) units commonly for rental purposes. SDUs in all private housing regardless of building age were covered.*

- (a) there were some 27,100 quarters with SDUs in Hong Kong. The total number of SDUs in these quarters was estimated to be 92,656. Each of these quarters was sub-divided into 3.4 SDUs on average. These SDUs accommodated some 91,800 households and 209,700 persons. The average household size was 2.3 persons; and

- (b) 52,688 (56.9%) SDUs were located in Kowloon, 21,888 (23.6%) in the New Territories and 18,080 (19.5%) on Hong Kong Island. Districts with a larger number of SDUs included Yau Tsim Mong (21,485), Sham Shui Po (15,449), Kowloon City (9,030), Eastern (8,389) and Tsuen Wan (6,574).

Table 4 shows the breakdown of SDUs by region and district of the 16BC SDU enumeration (only the total estimated numbers of SDUs in the respective regions and districts (i.e. column (d) in Table 4) were disclosed in the 16BC Thematic Report on SDUs).

Table 4

**Breakdown of SDUs by region and district
(16BC SDU enumeration)**

Region and district	Successful enumeration (a)		Imputation				Total (d) = (a) + (b) + (c)	
			Macro-editing (b)		FoQ (c)			
	Number of SDUs	%	Number of SDUs	%	Number of SDUs	%	Number of SDUs	%
Hong Kong Island							18,080	100%
Eastern	3,084	36.8%	3,744	44.6%	1,561	18.6%	8,389	100%
Wanchai	2,062	42.2%	1,568	32.1%	1,257	25.7%	4,887	100%
Central and Western	1,812	46.2%	1,422	36.3%	684	17.5%	3,918	100%
Southern (Note)								
Kowloon							52,688	100%
Yau Tsim Mong	13,795	64.2%	519	2.4%	7,171	33.4%	21,485	100%
Sham Shui Po	9,711	62.9%	350	2.3%	5,388	34.8%	15,449	100%
Kowloon City	4,902	54.3%	161	1.8%	3,967	43.9%	9,030	100%
Kwun Tong	2,797	60.4%	112	2.4%	1,721	37.2%	4,630	100%
Wong Tai Sin (Note)								
New Territories							21,888	100%
Tsuen Wan	2,549	38.8%	2,069	31.5%	1,956	29.7%	6,574	100%
Kwai Tsing	1,526	40.8%	1,288	34.4%	926	24.8%	3,740	100%
Tai Po	1,157	33.9%	828	24.3%	1,423	41.8%	3,408	100%
Yuen Long	2,538	75.2%	226	6.7%	610	18.1%	3,374	100%
North	1,840	56.5%	395	12.1%	1,022	31.4%	3,257	100%
Tuen Mun (Note)								
Sha Tin (Note)								
Islands (Note)								
Sai Kung (Note)								

Source: *Audit analysis of C&SD records*

Note: *Figures were not disclosed in the 16BC Thematic Report on SDUs due to precision consideration.*

Remarks: *Among the figures quoted in the above table, the 16BC Thematic Report on SDUs only reported the total estimated number of SDUs by region and district (i.e. only figures in column (d)). In September 2019, C&SD informed Audit that it had made substantial inputs in the entire estimation process (i.e. imputation), making good use of the results of the special frame updating exercise on SDUs (see paras. 2.23 and 2.27), which was completed successfully under a sound quality assurance framework.*

2.27 *Sampling frame (i.e. FoQ).* The purpose of identifying quarters with SDUs in FoQ before 16BC was to help devise an appropriate sample design for enumerating SDUs and facilitate the effective allocation of fieldwork assignments of 16BC (see para. 2.22). 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 for a sample survey, but FoQ needed not contain complete information of all SDUs (i.e. each and every SDU to be clearly labelled in the corresponding record of quarters in FoQ) in order to estimate the number of SDUs and the characteristics of persons living therein. Through random sampling (see Note 25 to para. 2.23), both quarters known to be SDUs before the survey and those not known could be covered in the sampling process. In all sample surveys (including population censuses/by-censuses), most attributes (e.g. ethnicity and whether being a single parent) were estimated without the need for the sampling frame to contain complete information about them.

2.28 *Special frame updating exercise on SDUs.* According to C&SD, other than CCF recipients, a significant number of CSSA recipients (who were outside the purview of CCF) also lived in SDUs. As mentioned in paragraphs 2.22 and 2.23, based on CCF information provided by HAB and CSSA information provided by the Social Welfare Department, in 2015, C&SD conducted a special frame updating exercise on SDUs for 16BC, covering 5,000 selected buildings in 18 districts. The results of the updating exercise were used to update the quarters with SDUs in FoQ (see Figure 1 in para. 2.25).

2.29 *Non-sampling errors (Note 29).* According to C&SD, non-sampling errors in the 16BC SDU enumeration mainly arose from the following:

- (a) the alterations made in some SDUs were illegal. Although C&SD had emphasised the confidentiality of respondent information, some households living in SDUs were not willing to participate in 16BC;

Note 29: *Sampling errors are inherent in every sample survey where statistics are obtained from a sample. They refer to the variation of a sample estimate if samples are drawn repeatedly using the same method, dependent on the sample size and sampling method. Non-sampling errors are not related to sampling variability. Examples of non-sampling errors include incomplete geographical records and maps, careless omission of households or persons in the enumeration, and failure to gain full co-operation of households in providing accurate answers. They could affect the total count of the population, households and quarters, breakdown figures of individual characteristics and cause bias in the results.*

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- (b) access to some SDUs were denied by a gate or a solid door located outside a group of SDUs; and
- (c) enumerators were mostly higher education students with limited experience in identifying SDUs. Newly identified SDUs needed to be verified subsequently by experienced C&SD field officers.

According to C&SD, such non-sampling errors were mainly tackled through publicity and training of enumerators. For publicity, C&SD reassured respondents through various channels that information pertaining to individual households and persons obtained during 16BC would be kept confidential and would not be transferred to any third parties, including other government departments, for enforcement actions. For training of enumerators, the definition of SDUs, common characteristics of SDUs, and treatments of known, suspected and newly discovered SDUs, were set out in the enumerators' manual.

2.30 *Limitation of THS on SDUs.* C&SD completed two THSs on SDUs in 2014 and 2015 (which were commissioned by THB) and the 16BC SDU enumeration in 2016 (see paras. 2.19 to 2.21). In September 2017, to facilitate the consideration of the way forward of SDU estimation for the annual update of LTHS in 2018 and beyond, THB discussed with C&SD the possibility of conducting a new round of THS or some sort of on-site surveys/investigations (albeit in sparser intervals) in between population censuses/by-censuses. Noting that the main objective of conducting THSs on SDUs was to obtain information on the number of households living in SDUs for housing demand projection under LTHS and that there were technical constraints of conducting further rounds of THSs in terms of consistently low response rate, statistical reliability, operational cost and availability of experienced contractors, THB informed C&SD in January 2018 that they agreed with C&SD's recommendation to adopt a hybrid approach in estimating SDUs, as follows:

- (a) enumeration of SDUs should be included in future population censuses/by-censuses; and
- (b) a desktop-estimate approach, based on the trend data from the results of 16BC and past THSs on SDUs, as well as relevant information on the construction and demolition of buildings while making reference to information on new SDUs from the on-going GHS and other surveys (for reviewing the validity of year-on-year growth rate of SDUs in general), would be adopted during the intercensal period instead of conducting THSs.

In September 2019, C&SD informed Audit that population censuses/by-censuses were better means to collect data on SDU households compared with THSs in view of the full coverage of all private quarters in Hong Kong and the much larger sample size. In fact, 16BC supported more refined analyses than THSs. For example, statistics on the number of SDUs for 12 districts could be released based on the results of 16BC (see Table 4 in para. 2.26) whereas only those for broad regions could be released in THSs (e.g. Hong Kong Island, Kowloon and the New Territories in the second THS on SDUs in 2015). Having regard to policy needs and professional and operational considerations, the availability of relatively more precise SDU estimates from population censuses/by-censuses at 5-yearly intervals which served as benchmark data, together with annual updates from model-based estimates, was considered as the optimal option.

***Need to closely monitor the progress of
FoQ updating exercise on SDUs***

2.31 According to C&SD, the sample selection for 16BC was conducted in the fourth quarter of 2015. After the cut-off of FoQ for sample selection in 16BC, C&SD continued its efforts to update FoQ. However, Audit noted that there were no records showing that further FoQ updating exercises on SDUs had been conducted using the selected data fields of some 63,000 applications for the second launch of the one-off living subsidy programme obtained by C&SD from HAB in May 2016 (Note 30). In response to Audit's enquiry, in September 2019, C&SD informed Audit that since the samples for 16BC had been drawn by the time such information was obtained from HAB, the information was used to facilitate quality assurance and imputation in 16BC SDU enumeration. For quality assurance, the CCF data was used to provide information on the geographical distribution of SDUs, which could help verify to some extent the reasonableness of the 16BC results. As for imputation, NC cases in areas/buildings with high concentration of CCF cases were more likely to be imputed as SDUs (see para. 2.25(a)).

2.32 As of March 2019, there were only about 46,500 (i.e. about 50% of the number of SDUs reported in 16BC Thematic Report on SDUs) known SDUs

Note 30: *According to HAB's website, there were also some 67,000 applications received for the third launch of the one-off living subsidy programme in 2016. However, there were no records showing that C&SD had requested HAB to provide similar information relating to SDUs (see para. 2.22(a)).*

(Note 31) recorded in FoQ. According to C&SD, the prevalence of SDUs was highly correlated with the building age. 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) in 5-year cycles. In September 2019, C&SD informed Audit that with the creation of time-limited field officers for supporting the 21C operation work, the FoQ updating exercise on SDUs would be completed before the conduct of 21C. Given the substantial amount of work (i.e. 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.

Heavy reliance on imputation

2.33 As reported in the 16BC Technical Report, the overall response rate for 16BC was 79% (see Figure 2 in para. 2.25). According to C&SD, of the 299,300 sampled quarters in 16BC, 5,440 SDUs were identified through successful enumeration. Regarding the basis for deriving the 92,656 estimated number of SDUs reported in the 16BC Thematic Report on SDUs (see para. 2.26), only 50,623 (54.6%) were derived from successfully-enumerated cases (i.e. the 5,440 cases) (Note 32). For the remaining 42,033 (45.4% of 92,656) SDUs not derived from successfully-enumerated cases, 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 (see Figure 3), as follows:

- (a) *Using auxiliary data of 16BC or other sources.* Some quarters were determined to be SDUs by making reference to information collected during the unsuccessful field enumeration or market intelligence (e.g. news reports concerning SDUs). The information collected during field enumeration included observations by enumerators on the structure of the quarters using “side” information (e.g. observing door bells, electricity meters and mail

Note 31: *According to C&SD, known SDUs were those with exact locations and numbers ascertained by C&SD field officers or contractors. Suspected SDUs were those with exact locations and numbers unconfirmed (e.g. due to access denial).*

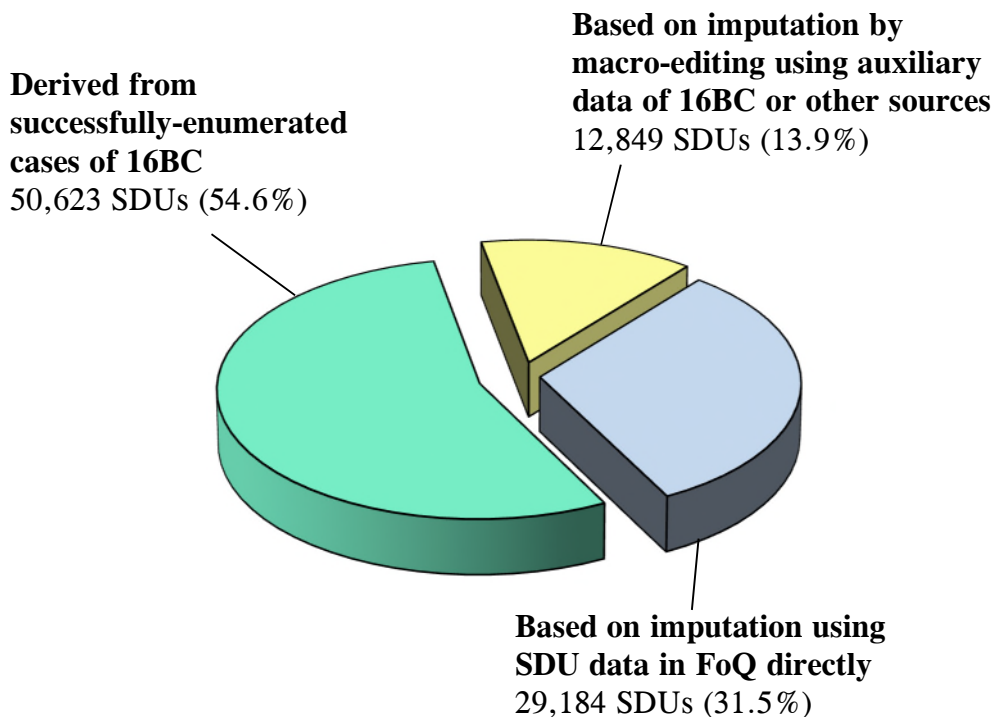
Note 32: *According to C&SD, it was not possible to compile the response rate of the 16BC SDU enumeration because the total number of SDU households in the sample (see Figure 2 in para. 2.25) was not known.*

boxes, and information provided by neighbours and security guards) (Note 33); and

- (b) **Using SDU data in FoQ directly.** Some other quarters that could not be enumerated during 16BC were counted as SDUs for compilation of the 16BC Thematic Report on SDUs based on the information on SDU status (i.e. SDU data) of quarters covered in FoQ. Such data was sourced from the special frame updating exercise on SDUs, THSs on SDUs, feedback from other household surveys and subsequent updates from other sources (see paras. 2.22, 2.23 and 2.31).

Figure 3

**Analysis of the 92,656 estimated number of SDUs
in 16BC Thematic Report on SDUs**



Source: C&SD records

Note 33: Enumerators were required to submit a feedback form if the structure was different from what was recorded in FoQ as at the position of sample selection. The discrepancies reported would be followed up by C&SD field officers in subsequent field visits.

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- 2.34 Upon Audit's enquiry, in September 2019, C&SD informed Audit that:
- (a) the use of administrative data in statistical surveys (including but not limited to imputation) was a common practice in the international statistical arena. FoQ could be regarded as an administrative source as it included administrative returns from various B/Ds, feedback from other household surveys as well as results of routine updating by C&SD field officers. In particular, the comprehensive special frame updating exercise on SDUs (see para. 2.28) conducted under the close monitoring of C&SD had provided solid inputs for imputing the SDU status of NC cases. In sum, imputation using SDU data in FoQ was a legitimate and effective statistical method;
 - (b) the main purposes of updating SDU status of quarters covered in FoQ were to:
 - (i) help devise a more efficient sample design for enumeration of SDUs by enabling more refined stratification in the sampling process, thereby improving the precision of the SDU estimates; and
 - (ii) facilitate more effective allocation of fieldwork assignments as unknown SDUs might lead to unexpected surge in workload; and
 - (c) for the coming 21C, C&SD would explore the wider use of administrative data to enhance enumeration of SDUs, including updating the quarters with SDUs in FoQ and imputation of SDU status for NC cases.

2.35 *Need to take measures to improve the success rate of SDU enumeration.* Audit notes that successfully-enumerated SDU cases provide the most reliable and up-to-date data for estimating the number of SDUs. According to C&SD, the response rate of surveys on SDUs has all along been relatively low compared to other household surveys. One major reason is that households living in SDUs which are not legally constructed might tend to avoid participation in surveys despite assurance of data confidentiality. In Audit's view, paying more visits to NC 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. C&SD may encounter similar problems in the enumeration of SDUs in the coming 21C as it will be held in a shorter enumeration period (i.e. about 5 weeks as compared with 15 weeks in the 2015 THS on SDUs). 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 (e.g. improving manpower planning for SDU enumeration to be conducted in the coming 21C to allow for more re-visits within a short survey period and stepping up publicity efforts to raise public awareness of the benefits of SDU enumeration).

Audit recommendations

2.36 **Audit has recommended that the Commissioner for Census and Statistics should:**

- (a) **closely monitor the progress of the sampling frame (i.e. 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; and**
- (b) **take measures to improve the success rate of SDU enumeration under population censuses/by-censuses as far as practicable.**

Response from the Government

2.37 The Commissioner for Census and Statistics agrees with the audit recommendations. She has said that C&SD will:

- (a) closely monitor the progress of the FoQ updating exercise on SDUs to facilitate an efficient sample design for enumerating SDUs in the coming 21C, and explore the wider use of administrative data to help identify new SDUs; and
- (b) explore further measures to improve the success rate of SDU enumeration under population censuses/by-censuses as far as practicable.

Monthly Retail Price Survey

2.38 *Purpose of MRPS.* The main purpose of conducting MRPS 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).

2.39 *Compilation of CPI.* According to C&SD, compilation of CPI in Hong Kong follows closely the international standards (Note 34). 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. It is set to be 100 for the base period, and takes a different value for other periods depending on changes in the price level. Changes in CPI are widely used as an indicator of the inflation or deflation affecting consumers. The Government also uses CPI as an indicator or analytical tool to formulate and monitor its policies.

2.40 In September 2019, C&SD informed Audit that salient features of CPI include:

- (a) 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. On average, about 10,000 visits and 1,000 telephone calls are made to some 4,000 retail outlets and service providers each month to collect about 47,000 price quotations in MRPS;
- (b) 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

Note 34: *According to C&SD, the prevailing international recommendations on compilation of CPI are promulgated in the "CPI Manual: Theory and Practice", which was released by IMF jointly with the International Labour Organization, the Organisation for Economic Co-operation and Development, Eurostat, the United Nations Economic Commission for Europe, and the World Bank in 2004.*

form the expenditure weights for compiling the index series. Relevant information is primarily obtained through HES (Note 35);

- (c) the expenditure weights are updated every five years with reference to the latest expenditure patterns of households. 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; and
- (d) three separate CPI series are compiled to reflect the price changes faced by households in different expenditure ranges (CPI(A), CPI(B) and CPI(C) with average monthly household expenditure of \$5,500 to \$24,499, \$24,500 to \$44,499 and \$44,500 to \$89,999 respectively at 2014/15 prices). A Composite CPI is also compiled based on the overall expenditure patterns of households (with average monthly household expenditure of \$5,500 to \$89,999 at 2014/15 prices).

Need to continue to keep in view the latest international developments in the CPI compilation standards

2.41 According to C&SD, at present, price quotations are collected from local stores/online retailers but not from non-domestic stores/online retailers. C&SD explained that the prevailing international standards stipulated that only purchases from domestic market should be covered in CPI compilation, while those from non-domestic markets should not be included.

2.42 In July 2018, IMF issued a consultation draft to update the CPI Manual (see Note 34 to para. 2.39). According to C&SD, it suggested, among others, the inclusion of expenditures made on goods and services purchased via the Internet from Internet-based outlets which were based/registered abroad as a “special consideration”

Note 35: *The objective of HES is to collect up-to-date information on the expenditure patterns of households for updating the expenditure weights used in compiling CPI. It is conducted by C&SD once every five years and the last round of HES was conducted in 2014/15.*

in compiling CPI for the local economy (Note 36). According to C&SD, whether IMF's suggestion will be incorporated into the updated CPI Manual is not yet confirmed. Nevertheless, C&SD has already been preparing for the potential changes. In fact, C&SD has been providing comments to IMF as early as in February 2018 when the preliminary draft chapters were first revealed. 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. Audit notes C&SD's preparatory work and considers that with the growing popularity of online purchases from Internet-based outlets, C&SD needs to continue to keep in view the latest international developments in the CPI compilation standards.

Need to continue to take into account changes in expenditure patterns in next CPI rebasing exercise

2.43 According to the MRPS Manual, 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:

- (a) more purchases were made online in addition to retail shops. In recent years, there were also new physical stores operated by local online retailers; and
- (b) as mentioned in paragraph 2.38, the CPI basket included consumer goods and services commonly purchased by general households from local retail outlets. While based on the results of the 2014/15 HES, six obsolete items (namely fax machine, video recorder, roller blade/ice-skate, blank recording media, pomfret-live and video rental) were removed from the CPI basket, Audit noted that the prevailing 2014/15 CPI basket (containing

Note 36: *According to C&SD, specifically, in the latest version of the draft manual released by IMF in September 2019, it was once again stated that "Strictly speaking, under the domestic concept, these expenditures (on Internet purchases) would not be included because they could be defined as expenditure abroad. In practice, however, applying the domestic concept considering Internet purchases requires a broader interpretation. The nature of Internet purchases requires a different way of thinking and special consideration, especially regarding the domestic concept."*

984 CPI items since 2014/15) included eight CPI items (Note 37) which might have become unpopular as of June 2019. For these eight CPI items, over 60% of the price quotations were without updated price data in the past 12 months.

2.44 Regarding the audit findings in paragraph 2.43, in September and October 2019, C&SD informed Audit that:

- (a) whether to include/delete a new/obsolete CPI item or type of outlet was part of the prevailing CPI rebasing mechanism, which had been practised for many years;
- (b) the eight CPI items identified by Audit only accounted for a minimal share of 0.07% of all expenditure weights;
- (c) the CPI basket and the corresponding expenditure weights would be updated based on results of the 2019/20 HES according to C&SD's prevailing compilation framework; and
- (d) as household expenditure patterns changed only gradually, the current mechanism to update the basket and the weights every 5 years, which was in line with the international standards, was considered appropriate.

Audit notes C&SD's mechanism in reviewing the CPI items every 5 years in order to take into account the changes in expenditure patterns and popularity of goods and services, and considers that in the upcoming 2019/20 CPI rebasing exercise, C&SD needs to continue with the existing CPI rebasing mechanism so as to incorporate the emerging trends mentioned in paragraph 2.43 in the upcoming 2019/20 rebasing exercise.

Note 37: *These CPI items were: (a) sea perch – live; (b) sea perch – fresh/chilled; (c) mangrove red snapper – fresh/chilled; (d) edible tilapia – fresh/chilled; (e) pigeon – live/fresh/chilled; (f) electronic dictionary; (g) decorative items – wall painting/poster; and (h) school fees – French.*

Audit recommendations

2.45 **Audit has recommended that the Commissioner for Census and Statistics should:**

- (a) **continue to keep in view the latest international developments on whether to include online purchases from non-domestic retailers in CPI compilation; and**
- (b) **continue with the existing CPI rebasing mechanism to take into account the changes in expenditure patterns and popularity of goods and services, including the changes mentioned in paragraph 2.43 in the upcoming 2019/20 CPI rebasing exercise.**

Response from the Government

2.46 The Commissioner for Census and Statistics agrees with the audit recommendations. She has said that C&SD:

- (a) has made efforts in reviewing the CPI items in the rebasing exercise to take into account changes in expenditure patterns and popularity of goods and services. Emerging trends, such as those mentioned in paragraph 2.43, will be reflected in the 2019/20-based CPI series; and
- (b) will also keep in view the latest international developments in the CPI compilation standards.

Implementation of a department-wide computerised time-log system

2.47 *Department-wide computerised time-log system.* As mentioned in paragraphs 1.9 and 1.10, the Task Force completed the review of the authenticity of statistical data and the existing data quality assurance mechanism in March 2013 and made a number of recommendations to address the related issues. While acknowledging that there was a need for compiling time logs for monitoring and supervising the fieldwork carried out by C&SD field officers, the Task Force noted that there were diversified and conflicting views from field officers on the time-log

system. In May 2014, the consultant (see para. 1.11) recommended the automation of field time recording process through deployment of the Computer-Assisted Personal Interviewing (CAPI), supported by a consolidated time-log system to capture field-time-activity records for ensuring cost-efficiency and work-effectiveness. In September 2015, DCQA-GHS (Note 38) was informed that C&SD would study the feasibility of using CAPI to capture the field-time-activity records. In October 2016, the Independent Commission Against Corruption completed an assignment study on C&SD's supervision of data collection duties. Among others, the study found that:

- (a) C&SD's monitoring system in terms of outdoor attendance and data quality control was much labour intensive, relying a lot on manual inputs (e.g. cross checking of daily field itineraries against time logs and various data verification). With the vast number of entries involved each day, the manual records might be susceptible to human errors, inadvertent or otherwise; and
- (b) to reduce the risk of undue discretion in the monitoring of data collection duties, it was recommended that C&SD should consider:
 - (i) using electronic devices in field visits (e.g. CAPI devices such as the mobile tablets used in 16BC) to enable real time monitoring of the physical locations as well as activities of field officers (e.g. through analysing the survey data captured at real time) both on-site and from the office; and
 - (ii) computerising the attendance records, field itineraries and time logs to facilitate timely reconciliation of these records.

2.48 In December 2017, DCQA-GHS was informed that CAPI with some built-in time-logging functions had been implemented in 16BC and MRPS. Moreover, the feasibility of the wider application of CAPI would be considered in the next ISS study. In May 2018, in response to the Independent Commission Against Corruption's recommendation of computerising the time-logging procedures, C&SD said that a new ISS study had commenced in December 2017 (see para. 4.5), which

Note 38: *After the completion of the consultancy study on the fieldwork management system in May 2014, DCQA-GHS (see para. 2.4) also took up the role of coordinating the recommendations of the consultancy study, including the implementation of a computerised time-log system.*

Statistical surveys

would explore the deployment of electronic devices for fieldwork and the department-wide computerisation of fieldwork management.

Need to draw up a strategy in implementing a department-wide computerised time-log system

2.49 More than five years have elapsed since the consultant recommended implementing a computerised time-log system for C&SD field officers in May 2014. In response to Audit's enquiry, in August 2019, C&SD said that it had applied to the Office of the Government Chief Information Officer (OGCIO) for \$8.1 million to conduct a feasibility study on the use of mobile devices in data collection and fieldwork management. According to C&SD, subject to funding approval tentatively by June 2020, the feasibility study was planned to commence in July 2020 and targeted for completion in February 2022. Audit considers that C&SD needs to draw up a strategy in implementing a department-wide computerised time-log system, taking into account the result of the feasibility study and the views of field officers. C&SD should also remind its staff to regularly report to DCQA-GHS the progress of the implementation of the department-wide computerised time-log system.

Audit recommendations

2.50 **Audit has recommended that the Commissioner for Census and Statistics should:**

- (a) **draw up a strategy in implementing a department-wide computerised time-log system for monitoring and supervising the fieldwork carried out by C&SD field officers, taking into account the result of the feasibility study and the views of field officers; and**
- (b) **remind C&SD staff to regularly report to DCQA-GHS the progress of the implementation of the department-wide computerised time-log system.**

Response from the Government

2.51 The Commissioner for Census and Statistics agrees with the audit recommendations. She has said that:

- (a) following the recommendation of the review of the ISS completed in early 2019, C&SD is seeking funding under the established mechanism for conducting a feasibility study and will take into account the findings of the study in formulating a strategy on the implementation of a department-wide computerised time-log system; and
- (b) C&SD staff will continue to regularly report to DCQA-GHS the progress of the implementation of the department-wide computerised time-log system.

PART 3: POPULATION CENSUSES AND BY-CENSUSES

3.1 This PART examines the conduct of population censuses and by-censuses by C&SD, focusing on:

- (a) control of salary payments to TFWs (paras. 3.2 to 3.7);
- (b) provision of office accommodation and disposal of furniture (paras. 3.8 to 3.18); and
- (c) use of mobile tablets and power banks (paras. 3.19 to 3.29).

Control of salary payments to temporary field workers

3.2 The fieldwork of 16BC was conducted from 16 July to 2 August 2016 where TFWs were employed to visit approximately 300,000 selected quarters (i.e. about one-tenth of quarters in Hong Kong) to obtain information on the socio-economic characteristics of the population and on the geographical distribution. Other than the procurement for IT equipment and services, C&SD incurred departmental expenses of \$267 million in 16BC (Note 39). \$87 million (including payments for salaries and training allowances) were spent on hiring 7,120 TFWs, most of whom worked in field centres and ended their fieldwork on 2 August 2016. 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 (SAIs) and Financial and Accounting Regulations (F&ARs)) and C&SD's payment procedures (Note 40). C&SD agreed with the audit findings and took improvement measures to

Note 39: *These mainly included \$114 million for hiring temporary staff, \$89 million for personal emoluments of civil servants and \$32 million for office rent and rates.*

Note 40: *The procedures were incorporated into C&SD's internal guidelines on "Payment of Training Allowances, Honoraria and Travelling Expenses — TFWs of the Pilot Survey for 16BC" which were applicable to pilot and regular run of 16BC.*

ensure compliance with SAIs, F&ARs and the departmental guidelines (see Appendix C for details).

3.3 *Extended checking.* In light of the inadequacies identified in paragraph 3.2, in August 2019, Audit conducted an extended checking of the salary payments of \$74 million to TFWs deployed to work in the 19 field centres. Audit noted that according to C&SD's payment procedures (see Note 40 to para. 3.2), all attendance records of TFWs should be verified by an officer (Chief Enumerator or CSO) after the wage period and then certified for payment by another officer (CSO or SCSO). Audit examined the TFWs' attendance records and found that of the 1,442 attendance records, 884 (involving 4,730 TFWs) or 61% were verified and/or certified before the end of the wage period of 2 August 2016, verified/certified without dates, or without sign-off to prove proper verification/certification. For example, while the fieldwork ended on 2 August 2016, 111 attendance records (involving 714 TFWs) were verified in the period from 29 to 31 July 2016, and 290 (involving 1,770 TFWs) were verified and certified before 2 August 2016. As a result, the number of working hours of the concerned TFWs could not be fully substantiated but the TFWs were paid in full for the whole wage period.

3.4 In response to Audit's enquiry, in September 2019, C&SD said that:

- (a) of the 884 attendance records, 32 attendance records verified and/or certified with typo errors in dates or without dates, or without sign-off to prove proper verification/certification were due to careless mistakes; and
- (b) the remaining 852 attendance records verified and/or certified before the end of the wage period was considered acceptable. It was because according to the Employment Ordinance (Cap. 57), an employer should pay wages to an employee as soon as practicable but in any case not later than seven days after the end of the wage period. In the case of 16BC, 2 August 2016 was the end of the wage period and hence the Government was obliged to pay wages to TFWs by 9 August 2016, which was a Tuesday. While the seven-day period covered weekends and taking into account the time required by the bank to process the payments, C&SD staff had to complete their related work within two working days, in order to send payment information to the bank by 5 p.m. (i.e. close of business) on 4 August 2016, which was a Thursday. Given the tight schedule and the large number of some 7,000 TFWs involved, C&SD considered that the

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process to verify and certify payments had to be carried out in advance, as follows:

- (i) on 28 July 2016, C&SD instructed field centre supervisors to, based on the up-to-date attendance/absence information of individual TFWs and an assumption that TFWs would be present for the remaining wage period, start to verify and certify TFWs' attendance records on 30 July 2016;
- (ii) on 30 July 2016, C&SD noted that a typhoon was approaching and the Tropical Cyclone Warning Signal Number 8 was predicted to be issued on the last day of the wage period, i.e. 2 August 2016. Therefore, from 30 July to 1 August 2016, C&SD reminded field centre supervisors to advance the wrap up process of the fieldwork, including verification and certification of attendance and payment records of TFWs for contingency sake;
- (iii) if there was any change in the attendance of TFWs after the advance verification/certification, C&SD required the relevant verifying and certifying field centre supervisors to make manual adjustments on the attendance records; and
- (iv) C&SD's clerical staff responsible for processing the payments checked the verified and certified records.

Need to strengthen control over salary payments

3.5 Audit considers that there is room for improvement regarding verification and certification of salary payments to TFWs, which was not in full compliance with the relevant government regulations (i.e. SAIs 1205(c), 1335(b) and 155(1)(b) — see Appendix C) and C&SD's payment procedures. C&SD needs to:

- (a) strengthen its control over salary payments to TFWs for implementation in 21C; and
- (b) require field centre supervisors to further certify that the TFWs' attendance records in the remaining wage period are in order, if advance

verification/certification of attendance records before the end of the wage period is considered necessary.

Audit recommendations

3.6 **Audit has *recommended* that the Commissioner for Census and Statistics should:**

- (a) **strengthen the control over salary payments to TFWs for implementation in 21C; and**
- (b) **require field centre supervisors to further certify that the TFWs' attendance records in the remaining wage period are in order, if advance verification/certification of attendance records before the end of the wage period is considered necessary.**

Response from the Government

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

Provision of office accommodation and disposal of furniture

3.8 During 16BC, other than the common requirement of a General Office, Central Processing Area and Packing Site, C&SD deployed 19 field centres in all the districts. While 16BC involved detailed enquiries covering approximately 300,000 quarters (i.e. about one-tenth of quarters in Hong Kong), 21C will involve a complete headcount of the population covering 3,112,000 quarters. To meet the survey requirements, 56 field centres will be deployed for 21C.

3.9 ***General Office, Central Processing Area and Packing Site.*** To prepare for the conduct of 21C, C&SD has been working with the Government Property Agency (GPA) to identify suitable office accommodation to meet the requirements. In March 2018, C&SD submitted to GPA the preliminary accommodation

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requirements of the 21C offices (a total of 7,657 square metres for General Office, Central Processing Area and Packing Site). Audit noted the following:

- (a) **General Office.** In November 2018, the Schedule of Accommodation was approved by GPA (with accommodation requirement of 2,346 square metres for the period from April 2019 to June 2023). In May 2019, GPA confirmed that the General Office, as well as one telephone centre (about 383 square metres) (i.e. one of the two telephone centres included in the planned Central Processing Area mentioned in para. 3.9(b) below), would be accommodated on 39/F and 40/F in the Immigration Tower after the office space was vacated by the Transport Department (amounting to 2,858 square metres). Due to the deferred completion of the new accommodation of the Transport Department, such premises could not be made available to accommodate the 21C General Office upon its establishment in April 2019. After ongoing discussion with the Architectural Services Department on the details of fitting-out works (Note 41), such as the setting up of a telephone centre, C&SD expected that the premises would be ready for use from September 2020 at the earliest. With the support of GPA, as an interim arrangement, C&SD has taken over two tenancy agreements de-leased from other B/Ds in Kwun Tong View as a temporary site of the General Office from September 2019 to September 2020 tentatively; and

- (b) **Central Processing Area and Packing Site.** In February 2019, the Schedules of Accommodation of the Central Processing Area and the Packing Site were approved by GPA (with accommodation requirement of 2,290 square metres and 2,229 square metres respectively for the period from October 2020 to late 2021). GPA also suggested that when the office areas in the Immigration Tower became ready for use as the General Office, C&SD might convert the office areas in Kwun Tong View into the Central Processing Area. Regarding the Packing Site, C&SD is liaising with GPA and the Education Bureau to identify any suitable government land/premises such as idle school premises and warehouse with tenancy agreement de-leased from other B/Ds for the purpose.

Note 41: *Such costs would be chargeable to the Capital Works Reserve Fund, which was set up for financing the Public Works Programme, acquisition of land, capital subventions and major systems and equipment items.*

3.10 *Field centres.* According to C&SD's Business Process Re-engineering Study Report issued in May 2019, C&SD reviewed the operation of 16BC with a view to identifying improvement opportunities for the conduct of 21C. The report revealed that, in 16BC, there were difficulties in hiring school premises as training and field centres due to numerous school activities during the summer holidays. For 21C, there will be 56 field centres scattered territory-wide. According to C&SD, existing schools are usually the major source of field centres of population census and by-census. As of August 2019, C&SD had taken or planned to take the following actions to secure adequate venues:

- (a) commencing discussion in May 2019 with associations of school heads to understand more about their concerns in hiring of school premises for field centres;
- (b) commencing liaison in May 2019 with the Hong Kong Examinations and Assessment Authority to avoid the 21C fieldwork schedule clashing with the release of the 2021 Hong Kong Diploma of Secondary Education Examination results;
- (c) discussing with the Education Bureau in December 2019 for:
 - (i) incorporating the 21C schedule into the 2020/21 school calendars to avoid clashing with critical school activities, such as the Pre-Secondary One Hong Kong Attainment Test; and
 - (ii) obtaining a list of schools which planned to conduct small-scale improvement works in 2021 so that earlier contact with these schools can be arranged to explore whether the schedule of small-scale works could be juggled to avoid clashing with the 21C fieldwork operation; and
- (d) exploring the use of venues of other B/Ds in November 2020, such as the Home Affairs Department and the Leisure and Cultural Services Department, as well as the campuses of tertiary institutions as contingency.

Need to continue exploring feasibility of developing a joint-user specialist and departmental building

3.11 ***Proposal 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 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: (a) REO and C&SD had taken positive steps to follow up the recommendation; and (b) they would continue to explore hand-in-hand the feasibility of developing a joint-user SDB to cater for their accommodation requirements, and in parallel, explore other possible options such as planning joint-user projects with other B/Ds or joining other SDBs under planning.

3.12 ***Progress in developing a joint-user SDB.*** Audit noted that C&SD had followed up the issue with REO on the development of a joint-user SDB. According to C&SD:

- (a) a meeting with REO was held in June 2018 to explore the feasibility of developing a joint-user SDB based on ballpark operational requirements;
- (b) C&SD also provided the accommodation requirements for operational use for 21C to REO in May 2019 with a view to exploring the possibility of identifying premises jointly with REO for meeting both parties' accommodation requirements. Concurrently, C&SD requested GPA to render advice on the way to pursue the development of a joint-user SDB with REO. GPA advised that it would be better to deal with the long-term accommodation requirements as recommended in Chapter 8 of the Director of Audit's Report No. 69 and separately deal with the short-term accommodation requirements for 21C (see para. 3.9);
- (c) in September 2019, a second meeting with REO was held to further explore the feasibility of developing a joint-user SDB and to exchange views on the two departments' periodic accommodation requirements in the coming

15 years with a view to linking REO's election cycles and C&SD's population censuses/by-censuses/major survey cycles. The information would facilitate reviewing whether the periodic accommodation requirements of the two departments would complement each other and warrant a joint-user SDB. The preliminary accommodation requirements would be submitted to GPA for advice (Note 42); and

- (d) apart from exploring the feasibility of developing a joint-user SDB with REO, C&SD also explored other means to provide permanent premises for population censuses/by-censuses. For instance, in January 2019, the possibility of becoming a joint user at the proposed ambulance depot on Chung Kong Road, Sheung Wan was explored. However, the space requirements for C&SD to conduct population censuses/by-censuses/surveys did not suitably fall under the purpose of the proposed project.

3.13 While joint-user development is not a new concept (e.g. the Kennedy Town Community Centre), the co-working space concept exploited in the commercial sectors has not been fully explored. Audit considers that 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.

Need to improve furniture disposal process

3.14 *Disposal of furniture items after use in 16BC.* 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 the event, 2 lots of 424 furniture items were sold to the same successful bidder at \$280 in total, who inspected the items on 6 April 2018. On 10 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

Note 42: *In October 2019, GPA informed Audit that once REO and C&SD agree to develop a joint-user SDB, they may approach the relevant department(s) to take forward the site search process under the established mechanism.*

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arrangement was in breach of GLD's Terms and Conditions of sales (Note 43). Upon request by C&SD, the successful bidder removed the photographs from the Internet and completed collection of the furniture items on 11 April 2018. GLD issued a warning letter for the breach of the Terms and Conditions of sales on the same day after investigating a media enquiry. On 16 April 2018, the media reported that the successful bidder re-sold the concerned furniture items and arranged for picking-up inside government premises.

3.15 According to C&SD, it planned to take the following improvement measures in 21C:

- (a) ***Refraining from procuring new items as far as possible.*** Subject to availability of storage space and funding, C&SD would consider keeping non-sizable excess items for future use. In addition, it would minimise procurement by reusing existing furniture within C&SD or left over by the previous occupant of offices;
- (b) ***Auctioning excess items in smaller lots.*** C&SD would arrange auctions to sell the excess furniture items in smaller lots. This would attract more buyers through reducing removal and storage costs; and
- (c) ***Exercising more stringent monitoring of successful bidders.*** C&SD would remind successful bidders not to take photographs of furniture items with the name of the Government and C&SD, and require collection of goods by the agreed time by designated persons or specified removal company.

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.

Note 43: *Clause 15(a) requires successful bidder to submit to GLD for prior written approval all advertising or other publicity materials relating to the auction or goods purchased in connection with the auction wherein the Government's name is mentioned or language used from which a connection with the Government can reasonably be inferred or implied.*

Audit recommendations

3.16 Audit has *recommended* that the Commissioner for Census and Statistics should:

- (a) 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 periodic accommodation requirements of REO and C&SD; and
- (b) be vigilant in ensuring that the furniture disposal process after completion of a population census/by-census is properly carried out.

Response from the Government

3.17 The Commissioner for Census and Statistics agrees with the audit recommendations. She has said that C&SD is reviewing with REO the long-term periodic accommodation requirements of the two departments to explore the feasibility of developing a joint-user SDB. The results will be submitted to GPA for advice once ready.

3.18 The Chief Electoral Officer has said that:

- (a) REO will, on the one hand, continue liaising with C&SD, in consultation with GPA, to further explore the feasibility of developing a joint-user SDB to cater for the periodic accommodation requirements of the two departments, and explore other possible options on the other hand; and
- (b) in September 2019, C&SD and REO held a second meeting to exchange views on the two departments' periodic accommodation requirements in the coming 15 years with a view to linking REO's election cycles and C&SD's population censuses/by-censuses/major survey cycles, and exploring the feasibility of whether the periodic accommodation requirements of the two departments would complement each other and warrant a joint-user SDB. The preliminary accommodation requirements would be submitted to GPA for advice in due course.

Use of mobile tablets and power banks

3.19 For 16BC, C&SD procured 6,101 mobile tablets at \$8 million and 5,388 power banks at \$0.8 million to facilitate TFWs to collect information during their face-to-face interviews with selected households. For 21C, based on an IT study completed in November 2018 (Note 44), C&SD has planned to procure approximately 17,000 mobile tablets and related accessories (e.g. power banks) at \$52 million.

Need to ensure proper implementation of security measures in 21C

3.20 *Loss of mobile tablets during 16BC.* There were two incidents of loss of mobile tablets during the 16BC face-to-face interview period. The concerned enumerators reported the loss cases (involving two mobile tablets) to field centre supervisors and the Hong Kong Police Force. Subsequently, C&SD tried to enable the remote data wiping function to delete the personal data stored in the two tablets. However, remote data wiping could not be effected on one of them. According to C&SD, there was a very low risk of data leakage because the data had been encrypted (Note 45) in the tablet and various data protection measures (Note 46) were in place. The involved respondents of such case were informed about what data were involved and what protection measures were in place. C&SD also reported the loss cases to the Office of the Privacy Commissioner for Personal Data (Note 47).

Note 44: *The objectives of the 21C IT study were to examine the technical requirements and financial implications of the proposed information systems.*

Note 45: *Decryption of the data was possible only after the tablet was connected to the 16BC server for authentication, but as soon as the tablet was connected to the Internet, the remote wiping function could be triggered. Such fail-safe mechanism was designed to protect the encrypted data in case remote wiping could not be effected, for one reason or the other.*

Note 46: *The data protection measures included: (a) keeping minimal amount of personal data in the mobile tablet as after completion of interviews, the data would be uploaded to the server and removed from the tablet; (b) the transient data (i.e. data of partially completed questionnaires) kept in the tablet were protected by encryption; and (c) the USB port of the tablet had been disabled. If there was an attempt to access the tablet through the USB device, the database would automatically be further encrypted and an SMS message would be sent to C&SD notifying the potential misuse.*

Note 47: *After considering the security measures taken at the material time and the remedial action, the Office of the Privacy Commissioner for Personal Data decided in February 2017 that it would not take further action.*

3.21 *Additional security measures in 21C.* In September 2019, C&SD informed Audit that:

- (a) on top of the data protection measures implemented in 16BC, C&SD has in its latest plan considered putting in place additional measures in 21C, such as installing timer-based wipe function in the tablet as the automatic data wiping will be triggered when the device is not logged on after a specified period of time, and providing a physical strap for fastening the tablet case and enumerator bag together as an additional means to prevent loss of mobile tablets; and
- (b) in respect of the responsibilities of field officers/TFWs in the safe custody of mobile tablets and protection of personal data, C&SD will continue to provide relevant training and guidelines to the field officers/TFWs as in 16BC.

3.22 Audit appreciates C&SD's plan to enhance the security measures of personal data stored in the mobile tablet for 21C. To prevent recurrence of similar incidents of loss of mobile tablets, C&SD needs to ensure proper implementation of the additional security measures planned for 21C.

Need to issue safety guidelines on proper use of power banks

3.23 *A power bank caught fire during 16BC.* C&SD provided some 5,000 power banks for use by TFWs. In July 2016, one of the power banks caught fire and a few fragments flew out in one of the field centres. While no injuries were reported, C&SD immediately stopped using all power banks.

3.24 Audit noted that the cause of power bank incident was not known. In Audit's view, it is important to avoid any misuse of power banks by field officers/TFWs in order to minimise the recurrence of similar incidents. With a view to enhancing their safety awareness of using power banks, C&SD needs to issue safety guidelines on proper use of power banks.

Population censuses and by-censuses

Need to continue to devise a disposal plan for serviceable mobile tablets

3.25 *Deployment of mobile tablets after use in 16BC.* According to the funding paper submitted to the Finance Committee of the Legislative Council in May 2014 seeking funding on acquiring computer equipment and services for 16BC:

- (a) C&SD would re-deploy the IT equipment to meet other operational needs in the department where appropriate after the completion of 16BC, with a view to maximising the utilisation of resources available; and
- (b) any surplus equipment would then be re-deployed to other B/Ds or donated to non-governmental organisations following the established government procedures.

Audit noted that for the 6,101 mobile tablets (at unit cost of about \$1,300) procured for 16BC, 111 (2%) were retained within the Government and 5,692 (93%) were subsequently donated to non-governmental organisations (see Table 5).

Table 5

Deployment of mobile tablets after 16BC

Status	Number	Percentage
Loss (see para. 3.20)	2	0.03%
Non-serviceable and destroyed	296	4.85%
Retained within Government	111	1.82%
Donated to non-governmental organisations	5,692	93.30%
Total	6,101	100.00%

Source: C&SD records

3.26 *Planned deployment of mobile tablets after use in 21C.* For 21C, C&SD has planned to procure approximately 17,000 mobile tablets. In view of the large quantity of the mobile tablets which may not be completely retained within the Government, C&SD explored with the Education Bureau in the early planning stage in June 2018 the option of donating mobile tablets to public sector schools for

educational purpose, in addition to non-governmental organisations. According to C&SD, after consulting School Councils, the Education Bureau replied that the education sector welcomed the proposal and the Education Bureau would help with the relevant liaison work in due course. The Finance Committee of the Legislative Council was informed in March 2019 of such additional means of deploying the mobile tablets for use by public sector schools after the completion of 21C.

3.27 Audit noted that the number of mobile tablets required would increase by 179% from 6,101 units in 16BC to approximately 17,000 units in 21C and C&SD had initiated actions on deploying such mobile tablets after use in 21C. C&SD needs to continue to work closely with relevant B/Ds in devising a disposal plan to ensure that serviceable mobile tablets, after completion of 21C, will be put to gainful use within the Government or donated to appropriate organisations as soon as possible.

Audit recommendations

3.28 **Audit has recommended that the Commissioner for Census and Statistics should:**

- (a) **ensure proper implementation of the additional security measures planned for 21C to protect personal data stored in the mobile tablets;**
- (b) **issue safety guidelines on proper use of power banks with a view to enhancing field officers'/TFWs' safety awareness of using power banks; and**
- (c) **work closely with relevant B/Ds in devising a disposal plan to ensure that serviceable mobile tablets, after completion of 21C, will be put to gainful use within the Government or donated to appropriate organisations as soon as possible.**

Response from the Government

3.29 The Commissioner for Census and Statistics agrees with the audit recommendations. She has said that:

Population censuses and by-censuses

- (a) in particular, she thanks Audit's appreciation of C&SD's plan to enhance the security measures of personal data stored in the mobile tablets for 21C; and

- (b) C&SD will ensure that the additional security measures planned for 21C to protect personal data stored in the mobile tablets will be properly implemented.

PART 4: IMPLEMENTATION OF INFORMATION SYSTEMS STRATEGY

4.1 This PART examines the implementation of ISS by C&SD for conducting statistical survey work and population censuses/by-censuses.

4.2 *Information systems.* According to C&SD, its work primarily involves four major activities, including pre-survey preparation, data collection, processing and analysis, and dissemination (see para. 1.15). As of September 2019, C&SD maintained different types of information systems for supporting these activities, which could be classified into departmental application systems and EUC systems/applications, as follows:

- (a) *Departmental application systems.* There were 38 application systems, comprising 4 infrastructure systems, 6 administrative and management systems, 11 departmental systems/platforms, 10 survey-specific systems and 7 other systems for population censuses and by-censuses; and
- (b) *EUC systems/applications.* There were over 80 EUC systems/applications (Note 48) developed for use by different user branches/sections.

C&SD's IT projects are funded under Head 710 (Note 49) of the Capital Works Reserve Fund (see Note 41 to para. 3.9). C&SD has set up an IT Steering Group (Note 50) to steer and monitor the progress of its IT projects.

Note 48: *According to C&SD, an EUC system/application usually comprises a group of similar applications/programmes written by the end-user. However, there is no standardised way on how to group similar applications/programmes and the counting rules for EUC systems/applications may vary across different end-users. The figure of over 80 EUC systems/applications was an estimate based on the individual figures reported by user branches/sections.*

Note 49: *The non-recurrent costs were met by Head 710 of the Capital Works Reserve Fund while the recurrent costs were met by C&SD.*

Note 50: *The IT Steering Group, chaired by the Deputy Commissioner for Census and Statistics, comprises all division heads as members.*

Implementation of 2004 Information Systems Strategy

4.3 **2004 ISS.** As mentioned in paragraph 1.16, to improve the overall productivity, service quality and cost-effectiveness of C&SD in managing its statistical processes and providing statistical services through effective use of IT, in May 2003, C&SD commenced an ISS study to formulate an ISS plan for implementation in five years from 2004 to 2009. In March 2004, the ISS study report (2004 ISS Report) was issued. It proposed a strategic IT programme of implementing 16 IT projects (Projects T1 to T16 — see Appendix D) 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 (Projects T1, T4, T5, T6, T7, T10, T11, T15 and T16) for implementation and the funding bids for kicking off the projects were initially submitted to OGCIO from 2005 to 2007.

4.4 **Completion of 9 priority projects.** According to the implementation plan of the 9 priority projects submitted to the IT Steering Group in March 2006, depending on the system complexities and departmental priority, the 9 projects were scheduled for commencement from April 2005 to September 2007 and planned to be completed fully or partially from December 2005 to December 2008. In the event, the 9 priority projects were completed between December 2005 and December 2016, eight years later than the original scheduled completion date of December 2008 (see Table 6). In response to Audit's enquiry on the implementation plan and actual rolled-out dates of the 9 projects, C&SD said in September 2019 that the prolonged completion of the projects was mainly due to the complexity of the departmental systems involved, manpower constraint and other external factors such as unexpectedly long tendering time.

Implementation of information systems strategy

Table 6

Implementation of 9 priority projects (April 2005 to December 2016)

IT project	Planned start date	Completion date			Actual expenditure (\$ million)
		Planned	Actual	Delay (Number of years)	
T1 Departmental output production system (Note 1) • Business Process Re-engineering Study • Feasibility Study • Implementation	August 2005 N/A N/A	April 2006 N/A N/A	April 2007 August 2009 December 2012	1.0 N/A N/A	11.7
T4 Data input sub-system	April 2005	December 2005	December 2005	—	1.2
T5 Conducting process review and feasibility study for data capturing	September 2005	June 2006	June 2006	—	2.0
T6 Departmental data capturing system using imaging technology (DCS) • Replacement by Online Questionnaire System (OQS — Note 2)	September 2007 March 2014	December 2008 August 2015	N/A December 2016	N/A 1.3	8.4
T7 Departmental CATI System	September 2007	December 2008	September 2016	7.8	9.5
T10 Developing a common data processing and analysis platform	January 2006	January 2007	August 2008	1.6	9.0
T11 Replacing Full Harmonised System	April 2007	December 2008	April 2010	1.3	9.1
T15 Knowledge Management Support System (Note 1) • Consultancy Study • Implementation	January 2006 N/A	June 2007 N/A	October 2010 January 2011	3.3 N/A	6.4
T16 Enhancing Departmental IT infrastructure	July 2005	March 2007	January 2009	1.8	8.9
Total					66.2

Source: *Audit analysis of C&SD records*

Note 1: *The projects were planned to be implemented by stage. The planned start and completion dates referred to those of the first stage only. The project schedule of the subsequent stage(s) was to be drawn up after completion of the first stage.*

Note 2: *In 2012, noting that paper questionnaires would gradually be replaced by electronic questionnaires, C&SD decided to replace DCS by OQS (see para. 4.9(b)). The planned start and completion dates referred to the dates stated on the funding application form.*

Implementation of information systems strategy

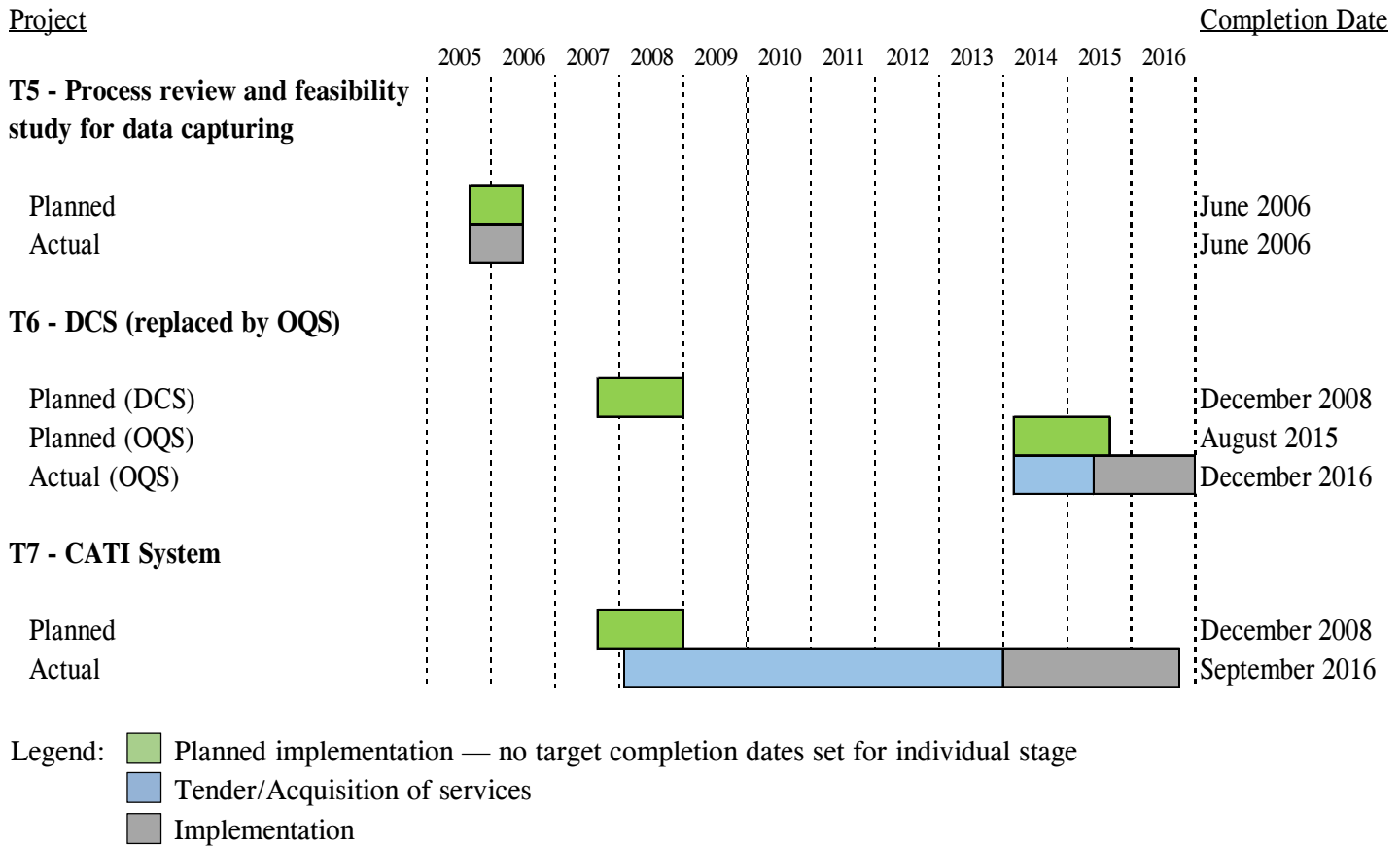
4.5 **2019 ISS.** After completing the 2004 strategic IT programme in 2016, C&SD commissioned an updated ISS study in December 2017 to map out a new ISS and to formulate a Departmental Information Technology Plan for the upcoming five to ten years. In January 2019, the final report (2019 ISS Report) was issued. The remaining 7 projects pending review upon the completion of the 9 priority projects would not be pursued. Instead, the IT requirements of these projects had been addressed in the 2019 ISS. The 2019 ISS Report recommended 11 new IT projects (including 4 IT projects with funding applications submitted in 2018-19) for implementation in five years from 2019 to 2024.

Long time taken in implementing two departmental data capturing projects

4.6 Of the 9 priority projects shown in Table 6, 7 projects (i.e. except Projects T4 and T5) 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 (CATI System), took the longest time for completion (i.e. 7.8 years after the planned completion date). The project was developed in synchronisation with Project T6 (DCS and subsequently replaced by OQS) after completion of Project T5 (Process review and feasibility study for data capturing). Figure 4 shows the implementation of Projects T5 to T7. Audit examination of Projects T5 to T7 revealed areas for improvement in project implementation as elaborated in paragraphs 4.7 to 4.10.

Figure 4

Implementation of Projects T5 to T7



Source: Audit analysis of C&SD records

4.7 **Benefits of data capturing system.** According to the 2004 ISS Report, the process review and feasibility study for departmental data capturing would be conducted under Project T5 before the commencement of Projects T6 and T7, which were inter-related and would be carried out concurrently. The implementation of departmental data capturing system would bring about the following benefits:

- (a) reducing the efforts of the manual data entry as much as possible by automating the data capturing process across different channels; and
- (b) enabling C&SD to centrally manage and maintain all statistical data.

Implementation of information systems strategy

4.8 *Delay in implementing Projects T6 and T7.* Project T6 (DCS) was developed to capture images of paper questionnaires for conversion to electronic data for further processing, while Project T7 (CATI System) was developed to use “Voice over Internet Protocol” and “Computer Telephony Integration” technologies to enable data collection through telephone interviews (Note 51). The new CATI System was designed to support surveys conducted by C&SD, aiming at improving the efficiency and quality of its survey activities. It would enable interviewers to carry out surveys through CATI System and input answers provided by respondents over the telephone into the System directly. It would also enable C&SD to centrally edit, code, manage/maintain survey data and to track the progress of data collection for surveys being conducted. In March 2013, in examining the Estimates of Expenditure 2013-14, a Member of the Legislative Council said that: (a) IT had been advancing at a tremendous pace; and (b) after a lapse of nine years (since the completion of the ISS study), C&SD had not yet fully implemented the recommendations in the 2004 ISS, and as a result some items might have become obsolete. He enquired about the slow progress and the reasons for continuing the implementation of IT projects based on the recommendations made nine years ago. C&SD replied that it had updated the recommendations made in 2004 in response to IT development. Regarding the two outstanding Projects T6 and T7, the system design of Project T7 had been updated and the scope of Project T6 was decided to be changed to implementation of OQS, having due regard to the latest IT development.

4.9 Audit examination revealed the following issues:

- (a) *Project T7.* Upon the completion of the feasibility study for CATI System under Project T5 in June 2006 (see Table 6 in para. 4.4), funding application was submitted to OGCIO in April 2007. In January 2008, OGCIO approved funding of \$9.933 million. However, a contract was only awarded in December 2013 (about five years later) due to:
 - (i) *Long tender processing time.* Audit noted that while a request for inviting tenders for CATI System was sent to GLD in May 2008, it took more than two years to commence inviting tenders for

Note 51: *There were two dedicated CATI Systems in use at the time, which were tailor-made for five specific surveys comprising: (a) GHS and three trade statistics related surveys; and (b) quarterly survey of employment and vacancies. Limited by the design of these systems, they could not be configured or did not have the flexibility to cater for use by other surveys.*

Project T7 in September 2010. According to C&SD and GLD, the long time taken was attributed to the need to review and revise the user requirements and tender documents to include additional functions in audio recording and voice logging; and

- (ii) ***Tender negotiation.*** In March 2011, C&SD sought GLD Tender Board's approval to cancel the tender because two out of the three tenders received did not meet the mandatory requirements at Stage 1 (Assessment of the Statement of Compliance with the Project Specifications) of the marking scheme for tendering evaluation and the tender price quoted by the only conforming offer at \$20.1 million had exceeded the pre-tender estimate of \$9.4 million by 113.8%. With the approval from GLD Tender Board, the tender was cancelled. C&SD conducted a market research to review the scope and estimate of the project, and updated the tender specifications to incorporate the latest requirements and trends in technological developments (Note 52). In November 2012, a re-tender was conducted and only one tender was received at a tender sum of \$26.2 million which had exceeded the pre-tender estimate of \$19.5 million by \$6.7 million (34.4%). With the approval from the Director of Government Logistics, GLD conducted negotiation with the tenderer for price reduction. After negotiation, the tenderer offered to reduce the tender price to \$21.7 million. With the approval of the Central Tender Board, in December 2013, C&SD awarded the contract at a total contract sum of \$21.7 million (comprising a one-off cost of \$9.5 million plus a ten-year recurrent cost of \$12.2 million). In September 2016, the system was rolled-out.

According to OGCIO Circular No. 2/2017, project delay has been the subject of concern by Members of the Legislative Council on various occasions, which will increase project risks such as change of personnel in contractor team and B/Ds, change in business requirements, delay in delivering intended benefits, and sometimes, increase in project costs. In

Note 52: *The changes in tender specifications included: (a) deletion of voice/screen recording functions; (b) removal of 144 workstations, telephone sets and writing pads allowing use of voice over Internet protocol and virtualisation technologies; (c) relaxing requirements on backup and recovery software; and (d) addition of a central repository to consolidate all returns from various e-channels to be developed in other IT projects.*

Implementation of information systems strategy

Audit's view, the long tender processing time was unsatisfactory. Late changes in the user requirements after funding approval should be avoided as far as possible as there were time and cost implications to the award of contract. To avoid tender cancellation and negotiation in implementing future IT projects, C&SD should ascertain the user requirements before seeking funding approval as far as practicable and make a more realistic estimation of pre-tender estimate for the purpose; and

- (b) **Project T6.** The feasibility study for DCS under Project T5 was completed in June 2006. Since C&SD intended to implement Projects T6 and T7 concurrently based on the recommendation in 2004 ISS, Project T6 had been kept in abeyance until Project T7 could be put to tender. In February 2011, C&SD planned to start the procurement process. However, pending the response of self-enumeration through the Internet in the 2011 Population Census, the process did not proceed. In August 2012, the IT Steering Group noted that Project T6, which aimed to process paper questionnaires, had not been implemented and there was an overwhelming good responses of householders to electronic version of data collection through the Internet in the 2011 Population Census. Considering that the application of imaging technology in processing survey questionnaires was less cost effective, the IT Steering Group then endorsed in principle the proposal of changing the scope of Project T6 from capturing image of paper questionnaires to web-based electronic data collection. In December 2012, C&SD submitted to OGCI0 a funding application on implementing OQS for processing online questionnaires. In February 2014, OGCI0 approved funding of the project with tentative completion in August 2015. In May 2015, C&SD awarded the contract under a Standing Offer Agreement (Note 53). In December 2016, OQS was rolled-out. However, Audit noted that there were limitations on the integration between the CATI System and OQS (see para. 4.10).

Note 53: *Government departments may invite proposals for individual work assignments from OGCI0's list of contractors in the Quality Professional Services, in this case Category 3 (Implementation and combined system development services), and select suitable contractors to undertake the assignments.*

Limitations on integration of departmental data collection systems

4.10 *Need to enhance system integration for Projects T6 and T7.* As mentioned in paragraph 4.6, Projects T6 and T7 were developed in synchronisation, and the two departmental systems were applied together to collect data for some statistical surveys. According to C&SD, Project T6 was used by respondents in self-reporting survey data through the Internet and Project T7 was used by field officers in performing telephone interview. Taking balance of the system complexity to implement very frequent data synchronisation and the business needs to have most updated data in both systems, a batch mechanism had been developed to perform recurrent data exchange. Under the batch mechanism, the enumeration statuses of individual survey cases (e.g. the case had been completed by respondents using OQS or by field officers using CATI System) were synchronised every 10 minutes between the two systems while the survey data were synchronised once per day in the late evening/midnight in order not to affect the daily operation of the two systems. However, according to the 2019 ISS Report (see para. 4.5):

- (a) the two systems did not allow real-time data integration (i.e. responses provided by respondents in one channel could not be instantaneously retrieved by another channel for taking follow-up actions); and
- (b) 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.

Deficiencies of EUC systems/applications

4.11 Other than departmental systems, individual sections of C&SD had developed their own EUC systems/applications to manage and store raw data and statistics. Based on the findings of the 2019 ISS Report, in C&SD, there were over 80 EUC systems/applications for different surveys developed using various applications. Audit noted the following deficiencies in the EUC systems/applications:

- (a) *Lack of common data standards across EUC systems/applications.* EUC systems/applications operated like stand-alone “silos” and were developed

Implementation of information systems strategy

by individual branches/sections based on their own operational needs. Each branch/section had its own way of managing and storing data. As a result, 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; 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. As the obsolete programming language was a file-based database system where authorisation levels could not be assigned to different users owing to its architectural design limitation, the use of this programming language could not comply with the requirements specified in the Government's IT Security Guidelines (Note 54). Audit noted that since April 2008, C&SD had taken actions to migrate its EUC systems/applications from the obsolete programming language to other updated programming languages. However, as at the end of August 2019, while the migration of 49 EUC systems/applications had been completed and migration of 6 EUC systems/applications was in progress and planned to be completed by 2020, the migration of the other 31 EUC systems/applications was still outstanding (see Table 7). According to C&SD, the migration of these systems/applications would proceed after the planned implementation of the IT project recommended in the 2019 ISS Report on adoption of modular data processing and analysis approach in economic surveys in 2023. In Audit's view, C&SD needs to formulate a strategy to complete the migration of these EUC systems/applications in a more timely manner.

Note 54: *According to the IT Security Guidelines of December 2016 issued by OGCIO, an information system should have logical access control including "upon user authentication, authorisation to access will be granted by mapping the user/group of users to the system resources".*

Table 7

**Migration of EUC systems/applications
running on an obsolete programme language
(August 2019)**

Status of migration	Number of EUC systems/applications
Completed	49
In progress	6
Not yet commenced	31
Total	86

Source: C&SD records

4.12 Furthermore, according to the Government’s Practice Guide for Security Risk Assessment and Audit (SRAA — Note 55), SRAA shall be conducted periodically for existing systems to discover and correct security issues. In this connection, Audit noted that C&SD conducted SRAA of two EUC systems/applications in 2012-13, which found that there was no application audit trail for logging of both successful/failed access in both systems and no access control implemented at an application level for one of the two systems. In the event, the SRAA recommended some enhancement measures (e.g. establishing periodic log review mechanism). In September 2019, C&SD informed Audit that while system migration was planned, C&SD had also taken measures to enhance the security of EUC systems/applications. The measures included storage of survey data in encrypted network folders with restricted access to authorised officers only and strengthening the protection of classified documents to avoid unauthorised persons from opening and viewing them. C&SD also planned to set up a secure and isolated computing environment where data would be protected to avoid being accessed/processed by unauthorised applications and being copied out externally. However, since the SRAA was conducted in 2012-13, only one EUC system had been covered in the SRAA conducted in 2018-19. C&SD needs to include all EUC systems/applications in future SRAAs and critically review the systems/applications

Note 55: *According to the Practice Guide for SRAA of November 2017 issued by OGCIO, Security Risk Assessment shall be conducted at least once every two years or upon major changes and Security Audit shall be conducted periodically.*

Implementation of information systems strategy

to ensure that they meet the security requirements as specified in the Government's IT Security Guidelines.

Audit recommendations

4.13 **Audit has recommended that the Commissioner for Census and Statistics should:**

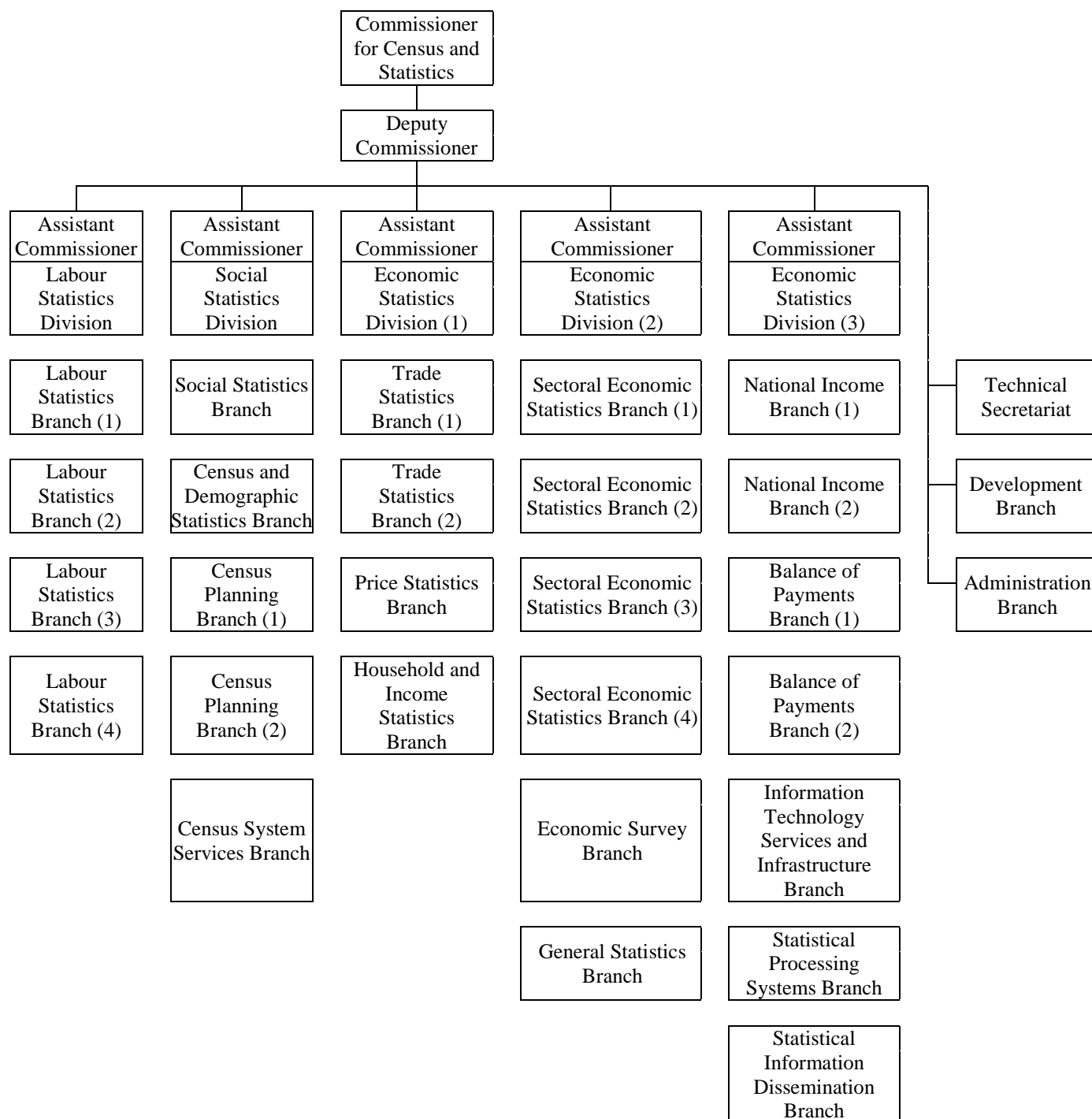
- (a) **in implementing future IT projects, ascertain the user requirements before seeking funding approval as far as practicable and make a more realistic pre-tender estimate for the purpose;**
- (b) **take measures to enhance the integration between CATI System and OQS, taking into consideration technical feasibility and business needs;**
- (c) **establish a common data model to standardise the practices of managing and storing data across EUC systems/applications;**
- (d) **formulate a strategy to complete the migration of EUC systems/applications running on the obsolete programming language in a more timely manner; and**
- (e) **include all EUC systems/applications in future SRAAs and critically review the systems/applications to ensure that they meet the security requirements as specified in the Government's IT Security Guidelines.**

Response from the Government

4.14 The Commissioner for Census and Statistics agrees with the audit recommendations. She has said that C&SD:

- (a) has recently completed the review of ISS and will take on board the audit recommendations when implementing future IT projects and formulating the strategies for EUC systems/applications; and
- (b) will continue to enhance the security of the existing EUC systems/applications before their migration.

**Census and Statistics Department:
Organisation chart
(1 April 2019)**



Source: C&SD records

**Recommendations of consultant’s
comprehensive review of fieldwork management system
(May 2014)**

Workload and work pressure	
1	Explore scope for rationalising GHS data requirements
2	Review survey forms for establishment surveys and explore scope for rationalising data items
3	Manage respondent burden for establishment surveys (e.g. introducing relaxing period for private sector organisations) and review and consider strengthening and expanding “customer window”
4	Develop a structured community engagement programme (i.e. to leverage territory-wide broadcasting initiatives, underpinned by a range of activities in reaching out to local resident groups and relationship building with property management/security offices)
5	Explore e-option for GHS (e.g. web-based self-administered questionnaires and/or Computer-Assisted Personal Interviewing)
6	Strengthen communications, particularly getting buy-in on stepped-up quality control efforts
Arrangement of GHS fieldwork	
7	Engender work ownership, delineate clearly the allocation of roles and accountabilities for all functional blocks involved in GHS work delivery and management
8	Strengthen the GHS central team to take up specific functions and responsibilities (e.g. training, assisting in data collection for sub-divided flats, strengthening quality control checks, manning GHS helpdesk), with a view to enhancing GHS data quality assurance
9	Further enhance the GHS Ambassador system so that Ambassadors can carry out their roles more effectively
10	Organise centrally-run face-to-face training/briefing sessions regularly, to keep field officers up-to-date on the GHS
11	Review performance appraisal system, considering how performance of frontline field officers in GHS could be reflected more clearly and explicitly

Appendix B
(Cont'd)
(para. 1.11 refers)

Arrangement of GHS fieldwork (cont'd)	
12	Regarding assignment allocation, conduct regular reviews of the weightings attached to various types of quarters and agree on a more structured, organised approach to adjusting the GHS assignment bundles after computerised allocation
13	Review outcomes of enhanced decentralisation approach in 12 months
14	Develop further details on the consolidation arrangements and carry out staff consultation
15	Revisit outsourcing option and consider switching to consolidation
16	Develop and communicate the policy on how to deal with sub-divided flats in the GHS samples
17	Mobilise a central back-up pool for taking up additional caseload or agree on team redevelopment approach
18	Plan and carry out targeted quality control checks and frame update
19	Pilot weekend working and review effectiveness
Communications	
20	Strengthen existing mechanism for field staff feedback on GHS
21	Organise structured communication plan and activities (e.g. the Directorate Team running town hall sessions for communications and engaging all staff for major reforms or transformation programmes)
22	Consider conducting a pulse check, through focus group discussions, covering topics such as work-life balance, job satisfaction and stress at work
Computerised time-log system	
23	Automatic capturing of field-time-activity information through Computer-Assisted Personal Interviewing, supported by consolidation of existing time-log systems

Source: C&SD records

**Findings of Audit’s sample check of salary payments
 to temporary field workers (2016 By-census)
 (2017)**

Issues noted in 16BC	Regulations	C&SD’s reply
<ul style="list-style-type: none"> • Inaccurate payment and missing records: <ul style="list-style-type: none"> ○ discrepancy between the Summary Reports and bank payment records; ○ discrepancies between Individual Reports and the Summary Reports; and ○ six Individual Reports missing. • Improper certification for payments: <ul style="list-style-type: none"> ○ the Summary Report (\$49.6 million) for Enumerators not certified; and ○ the Summary Report for Chief Enumerators (\$10.1 million) certified by a staff of inappropriate level. 	<ul style="list-style-type: none"> • The relevant sections of SAIs: <ul style="list-style-type: none"> ○ <i>SAI 1205(c)</i>. It requires that all payments to be made must be checked and confirmed by responsible officers as to the accuracy of every payment details; ○ <i>SAI 1335(b)</i>. It requires that in certifying the payment, the designated certifying officers should ensure the amount of payment is correct; ○ <i>SAI 155(1)(b)</i>. It requires that, for proper maintenance of accounting books and records, Controlling Officers should ensure that all the accounting transactions are properly supported by relevant documentation; and 	<p>C&SD would endeavour to locate the missing records of 16BC. Improvement measures in the next population census and other similar large-scale projects included:</p> <ul style="list-style-type: none"> • stepping up the payment control measures to ensure strict compliance with the requirements of the SAIs; • maintaining proper documentation for the specified period; and • ensuring that payments were certified by the proper authorities according to internal payment guidelines.

Appendix C
 (Cont'd)
 (paras. 3.2 and
 3.5 refer)

Issues noted in 16BC	Regulations	C&SD's reply
	<ul style="list-style-type: none"> ○ <i>SAI 225(1)</i>. It requires that the documentation which provides details of and support to a prime entry in the books of accounts may only be destroyed seven years after the end of the financial year in which the entry occurred. • C&SD's guidelines on Payment of Training Allowances, Honoraria and Travelling Expenses — TFWs of the Pilot Survey for 16BC required certification by a Senior Statistician for payment over \$10 million. 	
<p>Advertising expenses of \$6 million were charged to training expenses.</p>	<p>F&ARs section 300(1) requires Controlling Officer to ensure that expenditure is charged against subheads strictly in accordance with their ambits and that every charge against a subhead is for the purpose or purposes for which the subhead is intended.</p>	<p>C&SD noted that the funding approved for advertising expenses of 16BC fell short of the requirements and the expenditure was charged as "other training expenses". It would ensure that, in 21C, sufficient funding would be reserved under the appropriate subhead and expenditure would be properly charged in strict compliance with the requirements of F&ARs.</p>

Source: *Audit findings and C&SD records*

**List of 16 IT projects recommended by
2004 Information Systems Strategy**

IT Project		Planned (Note 1)		Estimated Cost (\$ million)
		Start date	Completion date	
T1	Conduct organisation and process review for output production and implement output production system (Note 2) <ul style="list-style-type: none"> • Organisation and process review • Implementation 	August 2005 N/A	April 2006 N/A	6.7
T2	Conduct process review and feasibility study for output dissemination	N/A	N/A	2.7
T3	Implement output data repository, statistics user relationship management and web-based channels of data dissemination	N/A	N/A	17.3
T4	Implement data input sub-system	April 2005	December 2005	2.6
T5	Conduct process review and feasibility study for data capturing	September 2005	June 2006	2.9
T6	Implement department-wide data capturing system	September 2007	December 2008	7.8
T7	Implement other modes of data capturing and survey tracking	September 2007	December 2008	5.1
T8	Conduct process review and feasibility study for fieldwork management	N/A	N/A	5.3
T9	Implement department-wide fieldwork management systems	N/A	N/A	14.7
T10	Replace the Quarterly Survey of Construction Output System and the Wage and Payroll System and develop common data processing and analysis tools	January 2006	January 2007	7.6
T11	Replace Full Harmonised System	April 2007	December 2008	5.0

Appendix D
(Cont'd)
(para. 4.3 refers)

IT Project		Planned (Note 1)		Estimated Cost (\$ million)
		Start date	Completion date	
T12	Review and re-design business register structure and sampling methodologies	N/A	N/A	3.0
T13	Implement business register system	N/A	N/A	8.8
T14	Implement management information system	N/A	N/A	3.3
T15	Enhance knowledge management support system (Note 2) <ul style="list-style-type: none"> • Design knowledge management framework and processes • Implementation 	January 2006 N/A	June 2007 N/A	4.0
T16	Enhance departmental IT infrastructure	July 2005	March 2007	9.3
Total				106.1

Source: C&SD records

Note 1: According to C&SD, the planned start date and completion date referred to the dates stipulated in the implementation plan submitted to IT Steering Group in March 2006.

Note 2: The projects were planned to be implemented by stage. The planned start and completion dates referred to those of the first stage only. The project schedule of the subsequent stage(s) was to be drawn up after completion of the first stage.

Remarks: The implementation of Projects T2, T3, T8, T9 and T12 to T14 was subject to review after completing the 9 priority projects.

Acronyms and abbreviations

16BC	2016 By-census
21C	2021 Population Census
ACSO	Assistant Census and Survey Officer
Audit	Audit Commission
B/Ds	Government bureaux/departments
C&SD	Census and Statistics Department
CAPI	Computer-Assisted Personal Interviewing
CATI	Computer-Assisted Telephone Interview
CCF	Community Care Fund
CPI	Consumer Price Index
CSO	Census and Survey Officer
CSSA	Comprehensive Social Security Assistance
DCQA-GHS	Departmental Committee on Data Quality Assurance of GHS
DCS	Data capturing system using imaging technology
EUC	End-User Computing
F&ARs	Financial and Accounting Regulations
FoQ	Frame of Quarters
FTE	Full-time equivalent
GHS	General Household Survey
GLD	Government Logistics Department
GPA	Government Property Agency
HAB	Home Affairs Bureau
HES	Household Expenditure Survey
IMF	International Monetary Fund
ISS	Information Systems Strategy
IT	Information technology
LTHS	Long Term Housing Strategy
MRPS	Monthly Retail Price Survey

Appendix E
(Cont'd)

NC	Non-contact
OGCIO	Office of the Government Chief Information Officer
OQS	Online Questionnaire System
QC	Quality check
REO	Registration and Electoral Office
SAIs	Standing Accounting Instructions
SCSO	Senior Census and Survey Officer
SDB	Specialist and departmental building
SDU	Sub-divided unit
SI	Survey Interviewer
SRAA	Security Risk Assessment and Audit
TFW	Temporary field worker
THB	Transport and Housing Bureau
THS	Thematic Household Survey