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# Impact of COVID-19 on the Retail and Food & Beverage Services Sectors

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## Introduction

The COVID-19 pandemic which broke out at the end of 2019 has had an adverse impact on global economic activities, with many countries implementing lockdowns and movement restrictions to contain the spread of the outbreak.

In Singapore, travel restrictions and strict safe distancing measures were put in place to manage the community spread of COVID-19, with the Circuit Breaker (CB) measures imposed from 7 Apr to 1 Jun 2020. The CB measures included the closure of businesses that provide non-essential services, prohibition of social gatherings and allowing only delivery service and take-aways for food & beverage (F&B) establishments. While these measures were necessary to curtail COVID-19 transmissions, they dampened domestic economic activities and impacted consumer-facing sectors such as the retail and F&B services.

This article looks at the performance of Singapore's retail and F&B services sectors in 2020, by examining the impact of the CB measures (for the period of Apr to May 2020) as well as the performance of these sectors post CB (for the period of Jun to Dec 2020).

## Industry Performance of the Retail and F&B Services Sectors in 2020

### The Retail and F&B Services Sectors Saw Their Worst Performances in Sales in 2020

The COVID-19 pandemic and the CB measures had a significant impact on the retail and F&B services sectors in Singapore. Retail sales fell 15 per cent compared to the same period a year ago. Excluding Motor Vehicles, retail sales declined 14 per cent during this period. Similarly, F&B sales registered a year-on-year decline of 26 per cent in 2020 (Chart 1). This was the worst performing year since 1986, when growth rate data on both indices were first compiled.

**CHART 1** YEAR-ON-YEAR CHANGE OF RETAIL SALES AND F&B SERVICES INDICES (AT CURRENT PRICES), 1986 - 2020

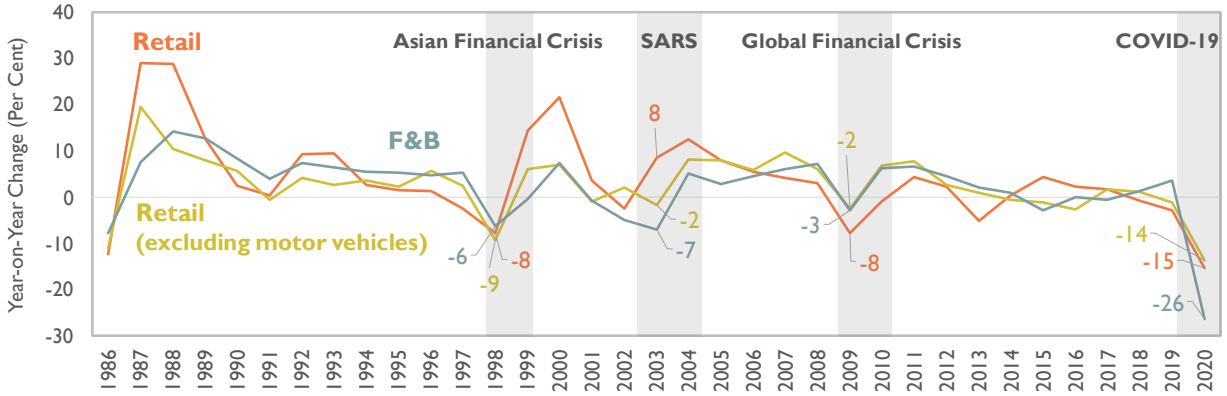
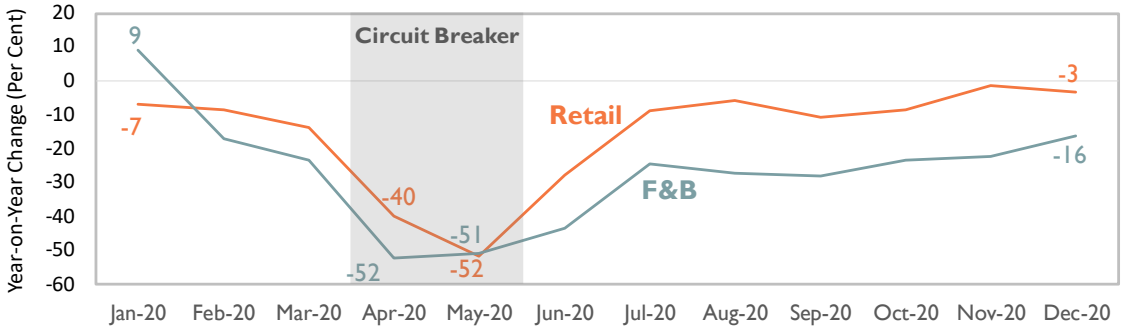


**CHART 2** YEAR-ON-YEAR CHANGE OF RETAIL SALES AND F&B SERVICES INDICES (AT CURRENT PRICES), JAN - DEC 2020




## Retail and F&B Sales Declined Significantly During the Circuit Breaker Period

During the CB period, most physical retail stores were closed except for those deemed essential such as supermarkets. Dining-in was not allowed at F&B establishments. As a result, retail and F&B sales contracted year-on-year by up to 52 per cent during this period (Chart 2).

In nominal terms, retail and F&B sales declined about S$4 billion in total during the CB period, which was around 40 per cent of the 2020 full-year decline in the total retail and F&B sales of S$10 billion.

## Within the Retail Sector, Discretionary Industries Were Significantly Impacted, While Some Industries Benefitted from Work-From-Home Arrangements

Discretionary retail industries such as Department Stores, Wearing Apparel & Footwear and Watches & Jewellery were severely affected due to low tourist arrivals as a result of travel restrictions, and dampened consumer sentiment on account of weak labour market conditions, with year-on-year declines in sales of between 32 per cent and 42 per cent in 2020. These industries were the worst hit during the CB period when physical stores had to be closed, and thus saw declines in sales of between 87 per cent and 92 per cent (Chart 3).

On the other hand, as a result of such restrictions and concomitant changes in consumer behaviour, the Supermarkets & Hypermarkets, Mini-Marts & Convenience Stores, Computer & Telecommunications Equipment industries saw growths in sales of between 4 per cent to 31 per cent in 2020. The increase in sales were attributed to higher demand for groceries as well as computers and peripheral equipment with people spending more time at home due to work-from-home arrangements.

Excluding Supermarkets & Hypermarkets and Mini-Marts & Convenience Stores, which remained open throughout the year and saw higher sales with more people staying at home, retail sales declined 25 per cent in 2020 over 2019, compared to the 15 per cent decline at the overall retail level.

## Within the F&B Services Sector, Food Caterers Were the Most Impacted

With restrictions on large-scale events and gatherings, Food Caterers saw low demand for event catering and were the most impacted within the F&B services sector by the COVID-19 pandemic. Sales of Food Caterers contracted by 54 per cent in 2020 (Chart 4), with a smaller year-on-year decline of 49 per cent during the CB period due to a surge in demand for catered meals from foreign worker dormitories. Similarly, sales of Restaurants and Cafes, Food Courts & Other Eating Places declined 33 per cent and 17 per cent respectively in 2020 as compared to 2019, with year-on-year declines of 69 per cent and 43 per cent respectively during the CB period when dining-in was not allowed.

In contrast, Fast Food Outlets were the least affected, registering a decline in sales of 7 per cent in 2020, due to their convenience and ease of access.

## CHART 3 PERFORMANCE OF THE RETAIL SECTOR IN 2020

### Total Retail Sales

| Year-on-Year (2020) | Year-on-Year (CB period) | Year-on-Year (Post CB) |
|---|---|---|
| -15% | -46% | -9% |

### Total Retail Sales Excluding Supermarkets & Hypermarkets and Mini-Marts & Convenience Stores

| Year-on-Year (2020) | Year-on-Year (CB period) | Year-on-Year (Post CB) |
|---|---|---|
| -25% | -70% | -16% |

### INDUSTRIES WITH YEAR-ON-YEAR DECLINES

| | Year-on-Year (2020) | Year-on-Year (CB period) | Year-on-Year (Post CB) |
|---|---|---|---|
| Furniture & Household Equipment | -3% | -50% | +12% |
| Recreational Goods | -12% | -67% | +2% |
| Petrol Service Stations | -21% | -54% | -18% |
| Optical Goods & Books | -24% | -71% | -16% |
| Motor Vehicles | -25% | -81% | -6% |
| Cosmetics, Toiletries & Medical Goods | -28% | -47% | -30% |
| Watches & Jewellery | -32% | -92% | -20% |
| Food & Alcohol | -37% | -55% | -40% |
| Wearing Apparel & Footwear | -37% | -87% | -31% |
| Department Stores | -42% | -87% | -37% |

### INDUSTRIES WITH YEAR-ON-YEAR GROWTHS

| | Year-on-Year (2020) | Year-on-Year (CB period) | Year-on-Year (Post CB) |
|---|---|---|---|
| Supermarkets & Hypermarkets | +31% | +65% | +26% |
| Mini-Marts & Convenience Stores | +4% | +13% | +3% |
| Computer & Telecommunications Equipment | +4% | -11% | +9% |

## CHART 4 PERFORMANCE OF THE F&B SERVICES SECTOR IN 2020

### Total F&B Sales

| Year-on-Year (2020) | Year-on-Year (CB period) | Year-on-Year (Post CB) |
|---|---|---|
| -26% | -51% | -26% |

| | Year-on-Year (2020) | Year-on-Year (CB period) | Year-on-Year (Post CB) |
|---|---|---|---|
| Restaurants | -33% | -69% | -31% |
| Fast Food Outlets | -7% | -24% | -8% |
| Food Caterers | -54% | -49% | -67% |
| Cafes, Food Courts & Other Eating Places | -17% | -43% | -15% |

Note: 'Year-on-Year (CB period)' refers to the 2020 over 2019 year-on-year growth for the April – May period.
Similarly, 'Year-on-Year (Post CB)' refers to the 2020 over 2019 year-on-year growth for the June to December period.

## Post Circuit Breaker Performance of the Retail and F&B Services Sectors

### Retail Sales Have Recovered to About 91 per cent of Pre-COVID Levels[1]

Following the CB period, a three-phased re-opening starting from 1 Jun 2020 was taken to resume activities safely. From 19 Jun 2020 (Phase 2), physical retail stores were allowed to re-open and dining at F&B outlets were permitted for groups of up to 5 diners. This was extended to groups of 8 persons from 28 Dec 2020 (Phase 3).

During the post CB period from Jun to Dec 2020, retail sales recovered to about 91 per cent of pre-COVID levels, mainly supported by higher demand for groceries. Excluding Supermarkets & Hypermarkets and Mini-Marts & Convenience Stores, retail sales were about 84 per cent of pre-COVID levels (Chart 3).

Although domestic spending gradually increased towards the end of the year, retail sales of discretionary industries remained weak with low tourist arrivals. Post CB sales of the Department Stores, Cosmetics, Toiletries & Medical Goods, Wearing Apparel & Footwear and Watches & Jewellery industries were about 60-80 per cent of pre-COVID levels as domestic consumption was unable to make up for the lack of tourist spending.

It is notable that even though overall retail sales remained weak, some retail industries have recovered well and even surpassed pre-COVID levels. In particular, while the Furniture & Household Equipment and Recreational Goods industries recorded declines in sales in 2020, these industries recorded higher sales post CB on a year-on-year basis.

As working from home was the default option for most workplaces during the post CB period, there was higher demand for groceries and products such as computers, household appliances and sporting goods, which boosted the sales of the Supermarkets & Hypermarkets, Furniture & Household Equipment, Computer & Telecommunications Equipment, Mini-Marts & Convenience Stores and Recreational Goods industries.

### F&B Sales Have Recovered to About 74 per cent of Pre-COVID Levels

Similarly, F&B sales remained weak post CB, with safe distancing measures and restrictions on large group dining remaining in place. In the post CB period, F&B sales have recovered to about 74 per cent of pre-COVID levels (Chart 4). Sales of Fast Food Outlets and Cafes, Food Courts and Other Eating Places saw a stronger recovery to more than 85 per cent of pre-COVID levels while sales of Restaurants stabilised to about 69 per cent of pre-COVID levels. Sales of Food Caterers remained badly affected by the low demand for event catering at about 33 per cent of pre-COVID levels.

## Change in Consumer Behaviour with Greater Prevalence of Online Purchases

### Accelerated Growth in Online Sales and Shift from In-Store Sales to Online Sales

There was an accelerated shift from in-store to online sales in 2020 for the retail and F&B services sectors as businesses and consumer behaviour adapted to the COVID-19 situation. Online sales outpaced in-store sales and there was a strong divergence in in-store and online sales trends, starting from the CB period, when non-essential retail establishments closed and dining at F&B establishments was prohibited (Chart 5). During the post CB period, there was a sustained demand in online shopping.

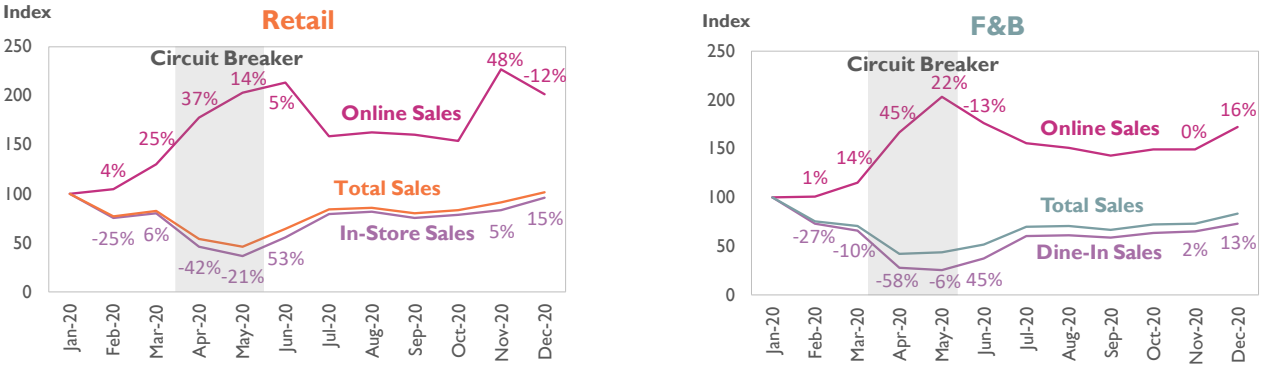
### Online Retail and F&B Sales Proportions Doubled in 2020

With growths in online sales, the online retail proportion doubled in 2020, making up about 12 per cent of total retail sales, compared to 6 per cent in 2019. The increase in online retail sales proportion was mainly driven by industries with higher online sales, namely Computer & Telecommunications Equipment, Furniture & Household Equipment and Supermarkets & Hypermarkets (Chart 6).

In Dec 2020, about 36 per cent of the sales transactions for the Computer & Telecommunications Equipment industry were conducted online.

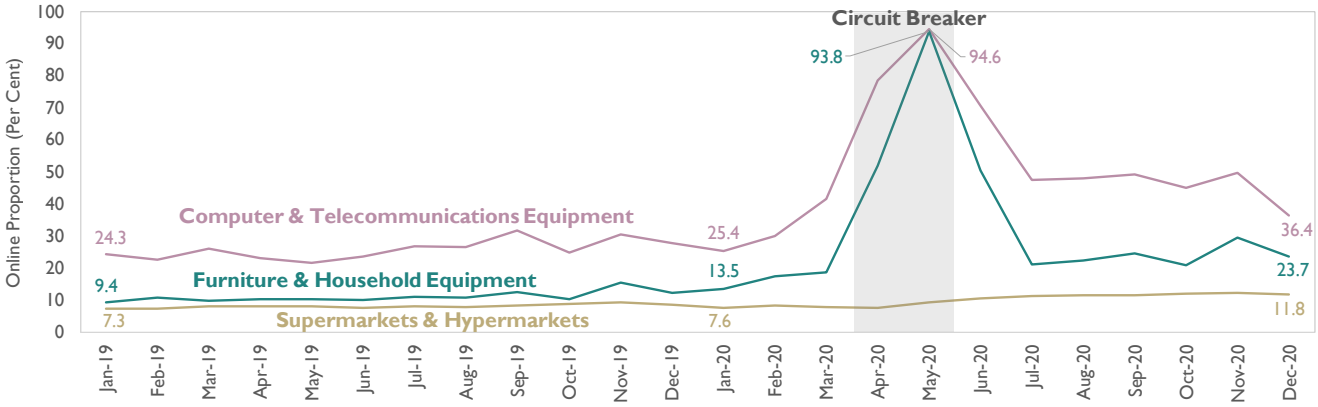
1 Pre-COVID levels refers to the average sales levels for the Jun – Dec 2019 period, which was used as a year-on-year comparison for the post CB period.

**CHART 5** ONLINE AND IN-STORE (INCLUDING DINE-IN) SALES INDICES (JAN 2020=100) FOR THE RETAIL AND F&B SECTORS, JAN - DEC 2020




Note: Labels in the charts refer to month-on-month growth rates. The larger month-on-month growth in online sales in Nov 2020 was due to the online shopping events in November such as Singles' Day (11.11) and Black Friday.

**CHART 6** ONLINE RETAIL SALES PROPORTION OF INDUSTRIES WITH HIGHER ONLNE PRESENCE, JAN 2019 - DEC 2020[2]




Supermarkets & Hypermarkets, whose stores remain open throughout the year, saw a gradual increase in online sales proportion with more online sales transactions recorded during the post CB period, as retailers scaled up their logistical capabilities and consumers embraced the convenience of online grocery shopping.

Similarly, online F&B sales proportion increased more than twofold from 9 per cent in 2019 to 22 per cent in 2020, due to the increased utilisation of online food delivery platforms since the CB period.

## Concluding Remarks

The retail and F&B services sectors have been significantly impacted by COVID-19, with the two-month long CB measures and tighter border restrictions weighing heavily on the performance of these sectors in 2020.

Within the sectors, performance and recovery were uneven, with some industries benefitting from the work-from-home arrangements while others continue to see their sales performing below pre-COVID levels.

While performance was weak in 2020, online sales saw strong growth as firms embraced digitalisation and e-commerce in order to reach a wider consumer base and consumers adopted new behaviours such as online purchasing. The change in consumer behaviour from in-store sales to online sales will likely be sustained as Singapore moves towards a 'new normal'.

2 The high online retail sales proportion during the CB period (from 7 Apr – 1 Jun 2020) was due to the closure of most physical stores, which resulted in majority of the sales being made online. Total retail sales were low during this period.

Data presented in this article are based on the monthly Retail Sales Index and Food & Beverage Services Index. More information can be found on the SingStat Website: www.singstat.gov.sg/find-data/search-by-theme/industry/services/latest-data

# Census of Population 2020 - Modes of Submission and Reminders Amidst COVID-19

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## Introduction

The Singapore Department of Statistics (DOS) conducted the Census of Population 2020 (Census 2020) in 2020. While the main Census data collection period was from Feb to Oct 2020 when the Internet submission was open and outreach was done, returns from respondents continued to come in through the hotline and clarifications were made till end Dec 2020. Census 2020 adopted a register-based approach supplemented with a large-scale sample survey similar to the approach adopted in Census 2010. Under the register-based approach, the basic population count and characteristics[1] were obtained from administrative records from multiple sources. A sample survey of some 150,000 households was then conducted to obtain additional information[2] that was not available from administrative sources.

The Census 2020 sample survey was launched on 4 Feb 2020. A tri-modal data collection strategy comprising Internet self-enumeration, telephone interviews, and face-to-face interviews was implemented to cater to the varied profile and needs of the population while balancing resource considerations. While the tri-modal data collection approach had been undertaken since Census 2000, the COVID-19 pandemic and the ensuing Circuit Breaker measures implemented nationwide to control its spread invariably impacted how respondents chose to provide their Census 2020 submissions.

This article presents a summary analysis of the response modes used by households to submit their returns for the Census 2020 survey. The Internet mode of data collection played an important role in Census 2020, as it was found to be the most popular response mode in 2020, exceeding reception levels in the Censuses of 2000 and 2010. The impact of reminder letters, which were used to address the challenges posed by the pandemic, including limitations of face-to-face visits are also examined.

### KEY FEATURES OF TRI-MODAL COLLECTION STRATEGY IN CENSUS 2020

**Internet** - Respondents submit their survey returns directly through the Internet. This provides flexibility and convenience to respondents as the online submission portal is available round-the-clock.

**Census Hotline** – Respondents complete the survey over the phone via the Census hotline. The daily operating hours for the Census hotline is from 9 am to 10.30 pm (including Saturdays, Sundays and Public Holidays).

**Face-to-Face Interviews** - For respondents who did not respond through the online survey and could not be contacted by phone, interviews are conducted. While it is labour-intensive, it is an essential mode to reach out to respondents, especially those who are not Internet-savvy or prefer an in-person validation before proceeding with the survey.

1 The basic population characteristics include age, sex, ethnic group, place of birth, type of dwelling, geographical distribution and other basic demographic statistics.

2 The additional data required for in-depth studies included marital status and fertility, education and language spoken, literacy, economic characteristics, housing and household characteristics, mode of transport, religion, and difficulty in performing basic activities.

## Submission Modes in Census 2020 Compared with Earlier Censuses

The proportion of respondents who submitted their survey returns over the Internet surged to 64 per cent in Census 2020 (Chart 1) compared to 15 per cent in Census 2000 and 38 per cent in Census 2010.

While respondents who submitted their responses over the telephone constituted the majority during the Censuses of 2000 and 2010, the proportion of such respondents declined from 62 per cent in Census 2000 to just 25 per cent in Census 2020.

### Profile of Responding Households

In Census 2020, households that submitted their returns over the Internet had a larger average household size of 3.3 persons (Table 1) compared with households who opted for the other two modes (2.5 persons for Telephone and 2.3 persons for Face-to-Face interviews).

Some 45 per cent of those who responded through the Internet had 4 or more members in their households compared to only 21 per cent for those responding through face-to-face interviews.

This trend in Census 2020 was generally consistent with that observed in Census 2010, where respondents from household of larger sizes were more likely to use the online submission mode. This could be due to the convenience the Internet option provided, since respondents could respond to the survey any time and over a number of sessions according to the availability of individual members.

**CHART 1**

SHIFTS IN USE OF MODES OF SUBMISSION, 2000 - 2020

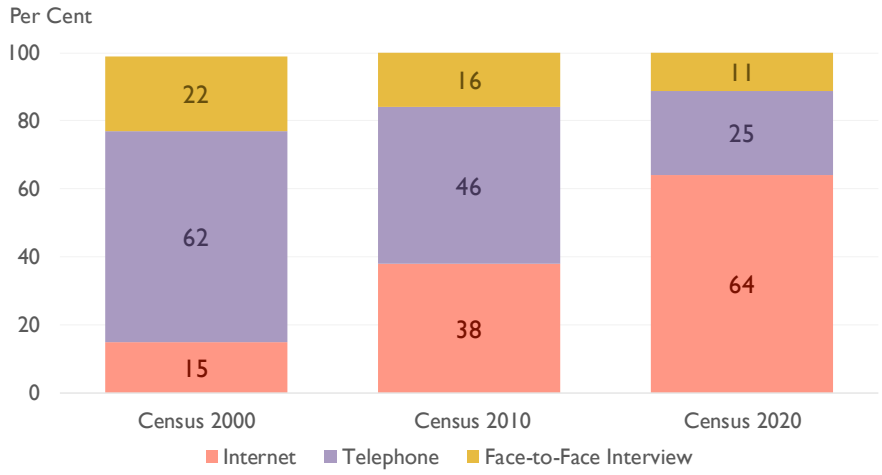



**TABLE 1**

DISTRIBUTION OF HOUSEHOLD SIZE BY MODE OF SUBMISSION, 2010 AND 2020

Per Cent

| | Internet | | Telephone | | Face-to-Face Interview | |
|---|---|---|---|---|---|---|
| Household Size | C2010 | **C2020** | C2010 | **C2020** | C2010 | **C2020** |
| 1 Person | 10.4 | **16.6** | 15.1 | **31.2** | 39.2 | **46.6** |
| 2 Persons | 15.3 | **19.5** | 19.5 | **27.6** | 18.1 | **19.8** |
| 3 Persons | 19.0 | **19.4** | 19.5 | **17.0** | 13.9 | **12.5** |
| 4 Persons | 25.2 | **21.3** | 21.7 | **12.3** | 12.8 | **10.1** |
| 5 and More Persons | 30.0 | **23.3** | 24.1 | **11.9** | 15.8 | **10.9** |
| Average Household Size (Person) | 3.7 | **3.3** | 3.4 | **2.5** | 2.6 | **2.3** |

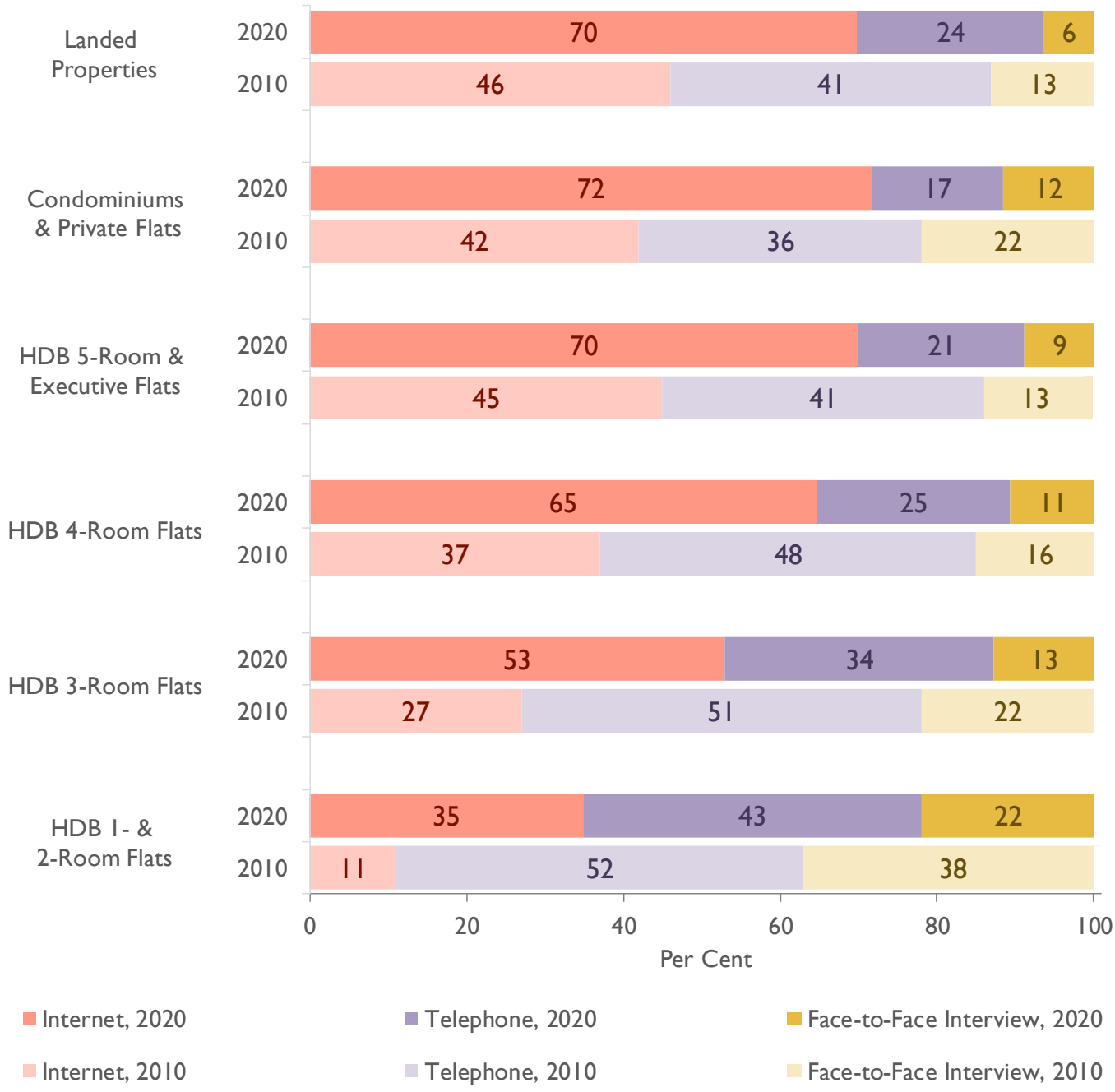
## More than 50 per cent of Households in HDB 3-Room and Larger Flats and Private Housing Used Internet Submission in Census 2020

More than 50 per cent of households residing in HDB 3-room or larger flats and private housing submitted their returns via the Internet in Census 2020 (Chart 2).

Submission of census returns over the Internet has also increased from Census 2010 among those residing in HDB 1- and 2-room flats. Within this group, 35 per cent of households had used the Internet for their Census 2020 submissions, more than three times the proportion in Census 2010. Nonetheless, households in this group remained more likely to use telephone and face-to-face survey submissions modes in Census 2020, at 43 per cent and 22 per cent respectively.

**CHART 2**

MODES OF SUBMISSION BY DWELLING TYPES, 2010 AND 2020



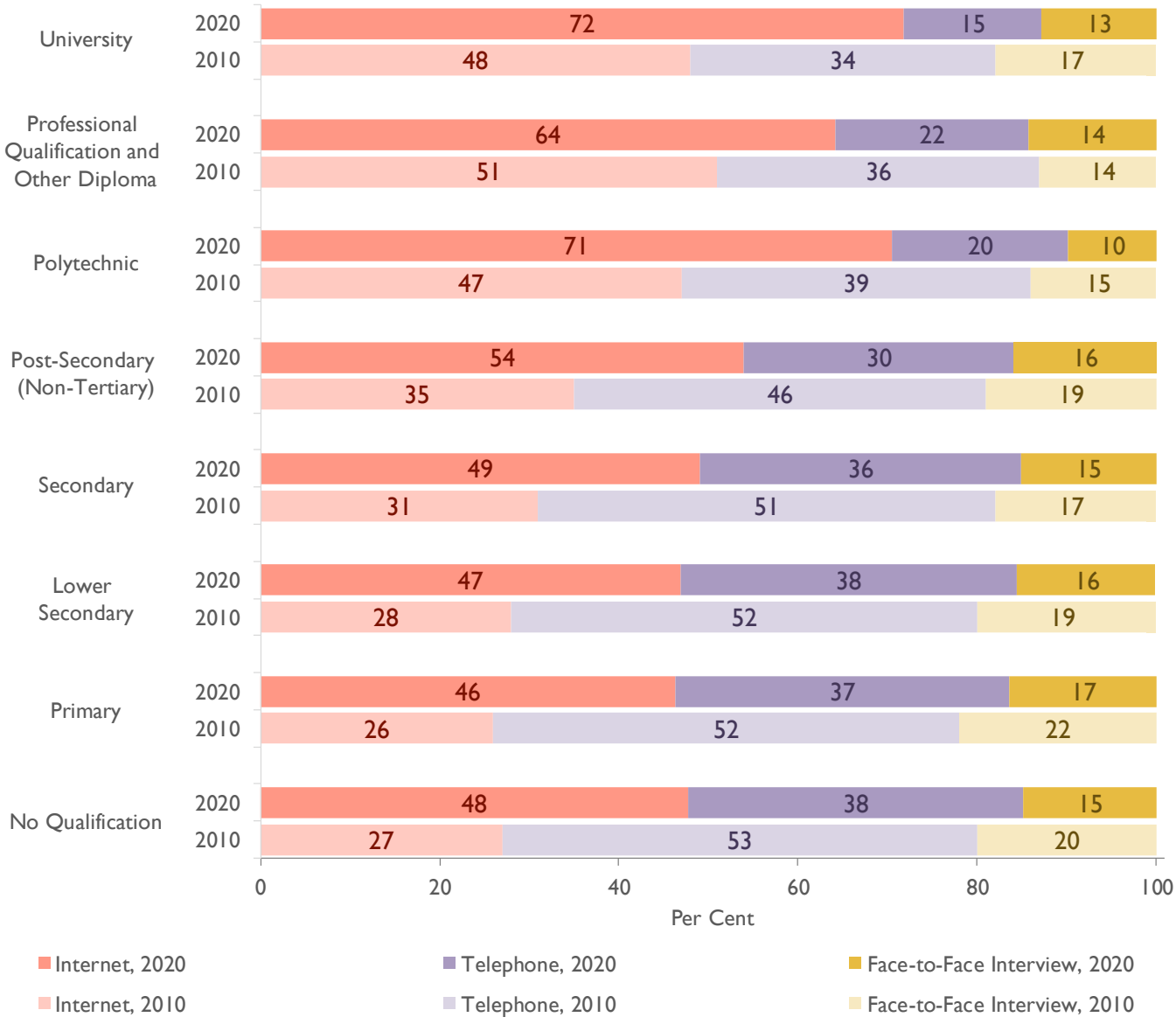
## Internet Submission Remained the Most Popular Choice among Better-Educated

Households with reference persons[3] holding higher educational qualifications had greater propensity to use the Internet to submit their Census 2020 returns. Among households whose reference persons had University qualifications, 72 per cent submitted their returns through the Internet (Chart 3), an increase from 48 per cent in Census 2010.

The corresponding proportion was lower at slightly below 50 per cent among households with reference persons whose educational qualification is at Secondary level or lower, albeit a significant increase from 31 per cent in Census 2010.

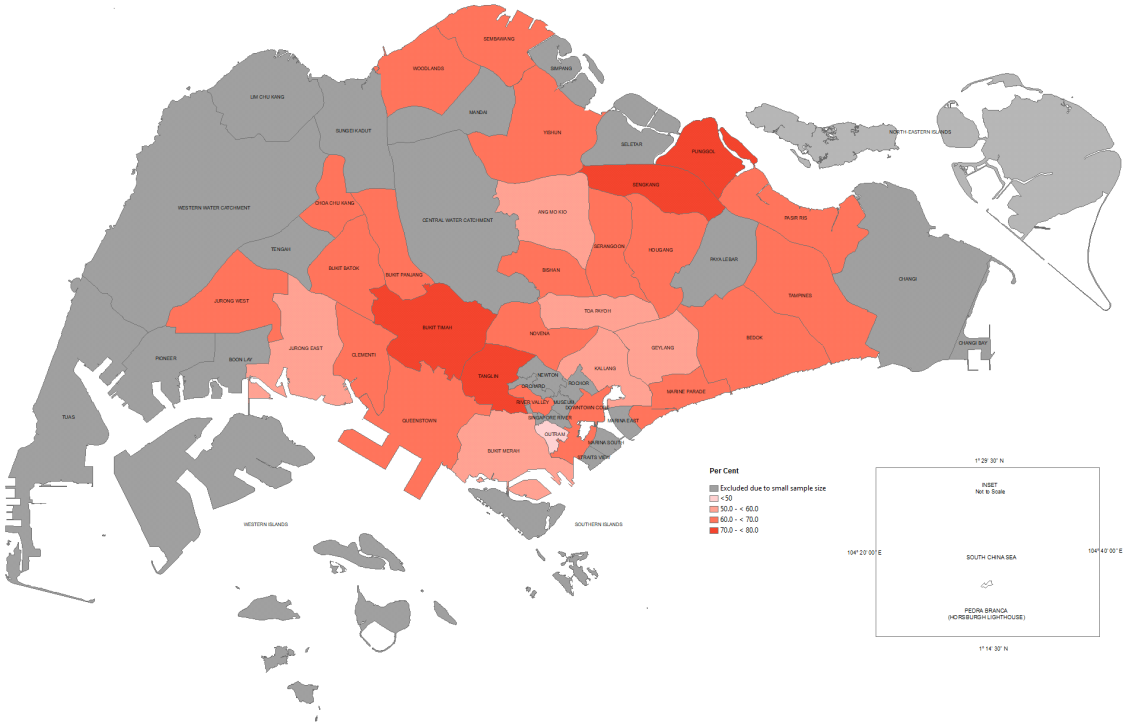
**CHART 3**

SUBMISSION MODES BY HIGHEST QUALIFICATION ATTAINED OF REFERENCE PERSON, 2010 AND 2020




3 Introduced in Census 2020, the term 'Household Reference Person' may refer to the oldest member, the main income earner, the owner-occupier of the house, the person who manages the affairs of the household, or the person who supplied the information pertaining to other members. Prior to Census 2020, survey respondents were asked to identify the 'head of household'. The identified person is used as the reference person to determine relationships between household members. In Census 2020, the term 'head of household' was replaced with 'household reference person'.

**CHART 4**
INTERNET SUBMISSION RATE BY PLANNING AREA, 2020




## Internet Submission Remained as the More Popular Submission Mode among Households in Younger Estates

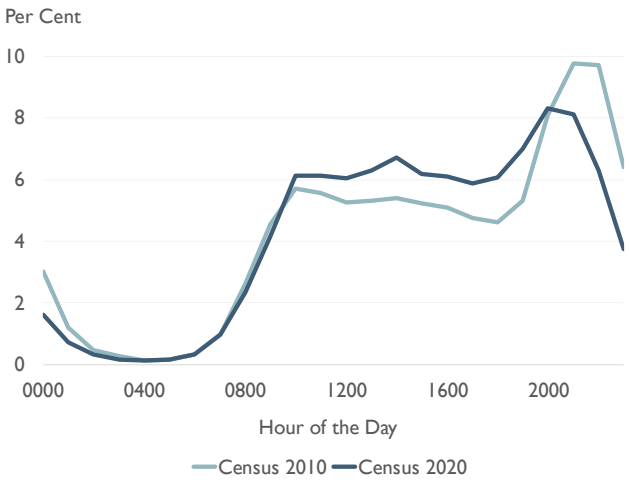
Among the planning areas[4] covered in Census 2020, Punggol and Sengkang remained the top two estates (Chart 4) with the highest Internet submission rates[5] of 73 – 74 per cent. In contrast, more mature estates such as Outram, Geylang, Kallang and Bukit Merah registered lower Internet submission rates of 48 – 55 per cent.

# Usage Patterns of Respondents

## Internet Responses were More Evenly Distributed Throughout the Day with Short Peak at Night

In both Census 2010 and Census 2020, most of the respondents who provided their Census submissions through the online submission platform logged in between 8 pm and 10 pm each day (Chart 5). In Census 2020, the distribution of logins was more evenly spread out from 9 am to 5 pm. In comparison, Census 2010 saw the peak period spread over shorter hours in the evenings from 8 pm to midnight and a lower proportion of logins during the day. This could be due to the increased accessibility of mobile devices to complete the Census Internet submission form for Census 2020.

**CHART 5**
SESSIONS LOGGED IN TO THE CENSUS ONLINE SUBMISSION PORTAL, 2010 AND 2020



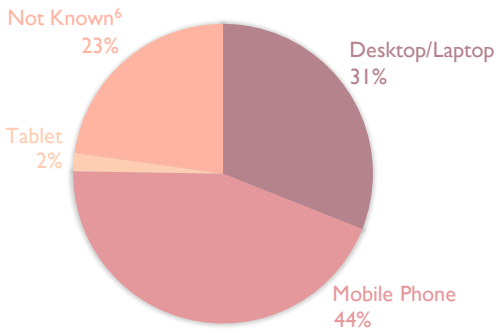

4 Refers to the planning areas for the physical development of Singapore as demarcated in the Urban Redevelopment Authority's Master Plan 2019.

5 Based on sample counts and refers to the proportion of households who submitted their returns through the Internet vis-à-vis the total submissions in the stated planning area.

## Devices Used to Submit Census Returns

The Census online submission portal for Census 2020 was designed to be mobile-responsive, where the online questionnaires were optimized for better viewing on various screen sizes of devices, and according to the type of mobile device used by the respondent. Mobile phones were the most commonly used device at 44 per cent, with Desktop/Laptop at a close second in popularity at 31 per cent (Chart 6).

**CHART 6**
TYPE OF DEVICES USED TO SUBMIT CENSUS RETURNS, 2020



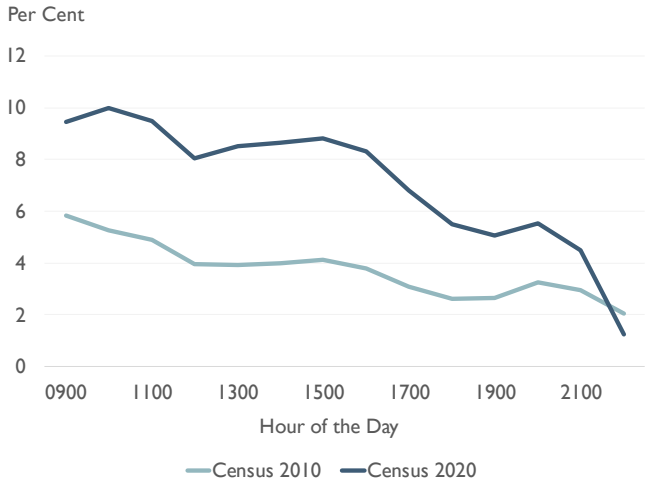

## More Calls to Census Hotline in the Day

Some 25,300 calls were made to the Census 2020 hotline between Feb and Oct 2020[7]. These included calls from respondents who submitted their Census returns over the phone, respondents who required assistance while completing their survey over the Internet, and calls from the public who had general enquiries relating to the Census 2020. In contrast to the late-night peak period for respondents using the Internet, the Census hotline received the highest number of calls in the morning from 9 am and the call volume remained high throughout the day, until 4 pm (Chart 7). The trend in Census 2020 is similar to that registered for Census 2010.

## Effectiveness of Reminder Letters

The sample of 150,000 households were divided into 21 batches and respondents were progressively notified by batch. Respondents first received

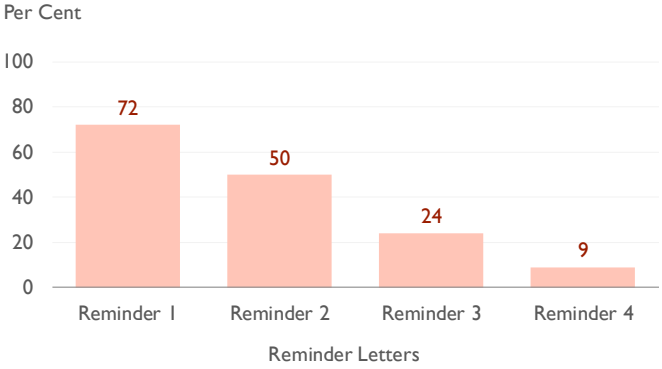
**CHART 7**
PROPORTION OF TOTAL CALLS RECEIVED BY THE CENSUS HOTLINE BY HOUR OF THE DAY, 2010 AND 2020




a notification letter, informing them that they had been selected to participate in the Census 2020, and that they were given two weeks to provide their survey returns. Thereafter, reminder letters to encourage participation were sent to respondents who had not completed their returns by the end of the second week and by the end of the fourth week. Reminder letters are necessary to prompt respondents to continue with uncompleted survey submissions.

In contrast to Census 2010 where two reminder letters were sent, a total of four reminders were sent in Census 2020 to encourage submissions through Internet and telephone, as face-to-face interviews were delayed due to the COVID-19 pandemic (Chart 8).

**CHART 8**
VOLUME OF REMINDER LETTERS AS A PROPORTION OF SURVEYED SAMPLE, 2020




6 Refers to device types that are not distinguishable from "Desktop/Laptop", "Mobile Phone" and "Tablet".

7 Includes calls received from Feb up till 31 Oct 2020 and excludes the Circuit Breaker period and up till the Phase 2 Re-opening from 7 Apr – 20 Jun 2020 when the call operation was managed by a team working from home.

## Impact of First Reminder (R1)

Similar to the dispatch of notification letters, reminder letters were sent to respondents in batches. In order to manage the call volume arising from inbound traffic at the Census 2020 call centre during the Circuit Breaker period from Apr to Jun 2020 where only a small number of officers were managing the calls from the Census hotline, the dispatch of R1 for the last five Batches was delayed. The effect of the delayed R1 is distinct (Chart 9).

For a more in-depth view, a comparison between two Groups was made, with Groups 1 and 2 comprising the average completion rate of batches 1-16 and batches 17-21 respectively. A difference of 56 days in the average number of elapsed days between the date of notification letter and R1 of Group 1 (16 days) and Group 2 (72 days) was observed. From Chart 10, R1 is shown to be more effective in helping Group 1 to increase the survey completion rate by 36 per cent compared to Group 2 where R1 was delayed by 56 days.

## Concluding Remarks

Amidst an uncertain pandemic environment, DOS responded swiftly to facilitate data collection for the Census 2020 under challenging conditions through adaptation or by delaying some of the survey operations. The continued support and co-operation of respondents who provided their survey responses was a key success factor for the completion of the Census 2020.

The Internet appeared to be the pivotal mode of data collection in the tri-modal survey strategy that allowed Census 2020 to be successfully completed. Nonetheless, all three modes of data collection remain relevant in Singapore's context. Reminder letters were also effective in nudging respondents into completing their survey submissions.

Moving forward, DOS will continue to review the most appropriate mode(s) to administer household surveys, while taking into consideration the nature of the survey and the changing lifestyle of the population.

The COVID-19 pandemic has underscored the importance of operational adaptability in a rapidly changing environment. While it invariably increased the challenges for the data collection process, it also provided opportunities to leverage technology to encourage self-help and self-enumeration through digital means.

**CHART 9**

OVERALL COMPLETION RATE BY BATCHES, 2020

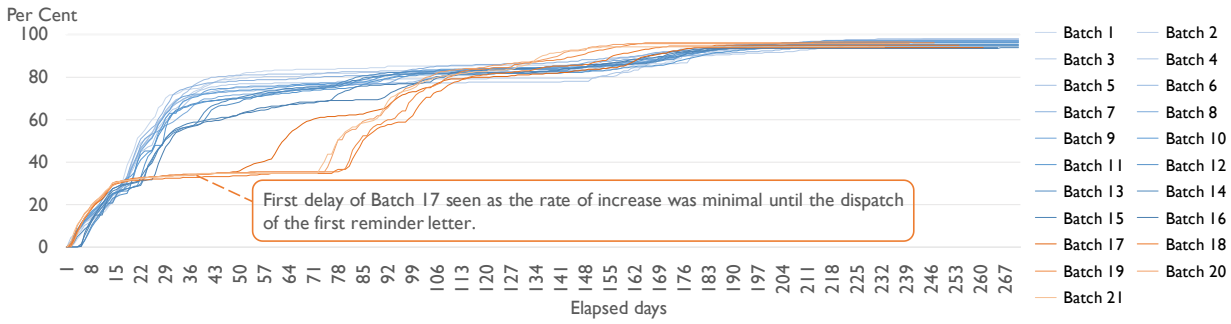
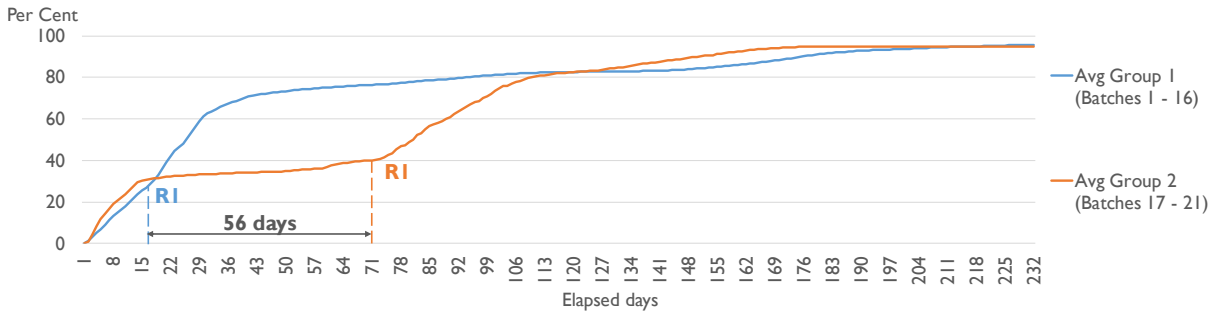



**CHART 10**

AVERAGE COMPLETION RATE OF GROUP 1 (BATCHES 1-16) AND GROUP 2 (BATCHES 17-21), 2020



# Statistical Best Practices to Improve Data Quality

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Singapore Department of Statistics

## Introduction

Data have become increasingly important in all organisations, providing insights to facilitate planning and decision-making. Valuable insights are only possible with good quality data.

The Statistical Best Practices (SBP) 2020 handbook published by the Singapore Department of Statistics (DOS) details the statistical processes to produce quality data. The best practices described in the handbook are in line with the latest standards and recommendations by international bodies and take into account recent developments in the use of alternate data sources and methods.

While the SBP 2020 handbook was developed with the public sector agencies in mind, it is also a useful resource for private sector organisations seeking to improve data quality. This article highlights the key concepts of data quality and how the best practices are structured in the SBP 2020 handbook.

## Data Quality

### Quality Dimensions

To produce quality data, one must first understand the factors determining data quality. There are six quality dimensions (Chart 1) which are interrelated, with trade-offs between some of them. For example, to produce data in a timely and frequent manner, the accuracy of the data may be affected. This may arise if some sources of data are not yet available or it is not cost-effective to obtain the information within the required timeframe.

When the quality dimensions are interrelated, it implies that there are dimensions that are not mutually exclusive. For example, when data is coherent, it is comparable with other data and can be reliably combined. The new combined data may then be used to meet the needs of users, thus making it relevant.

CHART 1
DATA QUALITY DIMENSIONS

**Accuracy**
The extent to which the data correctly describe the phenomena they are designed to measure.

**Timeliness**
The length of time between the reference point (or the end of the reference period) to which the data pertain, and the date when the data become available

**Interpretability**
Availability of data and metadata needed to interpret and use the data appropriately.

**Accessibility**
The ease with which the data can be found, obtained and used.

**Coherence**
The extent to which the data can be reliably combined and compared with other data within a broad analytic framework over time.

**Relevance**
The extent to which the data meet the needs of users.

### Statistical Processes

The SBP 2020 handbook identifies five key statistical processes of a statistical activity[1], which can be further divided into sub-processes (Chart 2). While the statistical processes and sub-processes are arranged in a sequential order, some may not be applicable to every activity. For example, if the activity involves producing output from administrative data sources, Key Process 2: Survey Design will not be applicable since there is no need to conduct surveys to obtain the information.

1 Any activity in the collection, handling and processing of information to produce statistical outputs, e.g. conducting a census or survey.

**CHART 2**
KEY STATISTICAL PROCESSES AND SUB-PROCESSES OF A STATISTICAL ACTIVITY

**1 - Planning & Preparation**
- 1.1 Initial Planning
- 1.2 Planning Proposal
- 1.3 Resources
- 1.4 Training
- 1.5 Confidentiality

**2 - Survey Design**
- 2.1 Coverage & Frame
- 2.2 Sampling Techniques
- 2.3 Questionnaire Design
- 2.4 Questionnaire Testing

**3 - Data Collection**
- 3.1 Survey Data Collection Procedures
- 3.2 Use of Data from Administrative Sources & Databases

**4 - Data Processing**
- 4.1 Data Capture & Coding
- 4.2 Editing
- 4.3 Imputation
- 4.4 Seasonal Adjustment
- 4.5 Data Integration

**5 - Compilation,Analysis & Dissemination**
- 5.1 Compilation & Analysis
- 5.2 Dissemination
- 5.3 Documentation

**CHART 3**
SELECTED REQUIREMENTS AND RECOMMENDATIONS

**5.1 Compilation & Analysis**

**S5.1.1** Classifications on the compilation of data that are in broad conformity with national/international recommendations are adopted.

**R5.1.1** If more than one data source is used, the consistency and impact of data sources are considered and integrated into the analysis.

**5.2 Dissemination**

**S5.2.1** The confidentiality requirements governing the data being disseminated are complied with.

**R5.2.1** Prices of data outputs are disclosed clearly.

**5.3 Documentation**

**S5.3.1** The entire statistical activity is documented. For example, adequate information on the meaning of the data and the methodology used to collect and process them, the type of statistical analysis and techniques used, and sources and references are provided.

**R5.3.2** For regular surveys, the documentation is reviewed regularly to ensure that it meets the needs of users.

## Statistical Best Processes

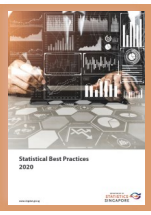
In the SBP 2020 handbook, the best practices are divided into two groups, namely, ***requirements*** (which are mandatory for DOS and Research and Statistical Units (RSUs) that collect and produce data under the Statistics Act, while other public sector agencies are encouraged to adopt) and ***recommendations*** (which all public sector agencies can consider adopting where appropriate). Overall, there are 113 requirements and 96 recommendations in the handbook.

For example, the fifth key process 'Compilation, Analysis and Dissemination' has three sub-processes, namely, 'Compilation and Analysis', 'Dissemination' and 'Documentation' (Chart 3). Best practices considered requirements are prefixed with the letter 'S', while those that are recommendations are prefixed with the letter 'R'.

- When compiling data, there is a requirement to adopt classifications that are aligned with national and international standards to ensure data coherence, which is one of the six data quality dimensions. One of the recommended practices is to consider the consistency and impact of different data sources.
- When disseminating data, one of the requirements is to comply with the confidentiality obligations (e.g. non-disclosure of identifiable information), while it is recommended to clearly state the prices of statistical outputs.
- When performing documentation, one of the requirements is to record the entire statistical activity, while reviewing the documentation of regular surveys is a recommended practice.

## Concluding Remarks

The SBP 2020 handbook aims to improve the quality of data to facilitate planning and decision-making. It would serve as a useful resource for all organisations, including private sector organisations that are involved in producing data.



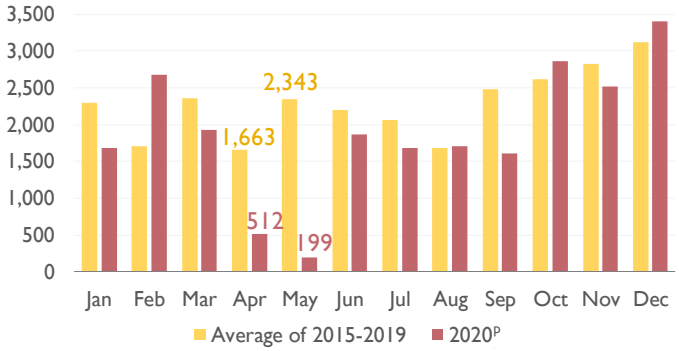

To access the full SBP 2020 handbook, visit
www.singstat.gov.sg/standards/standards-and-classifications/sbp

# Do You Know: Impact of COVID-19 on Marriages in Singapore

2020 was an unprecedented and challenging year with the spread of the COVID-19 pandemic, affecting many aspects of Singaporeans' lives, including the registration of marriages.

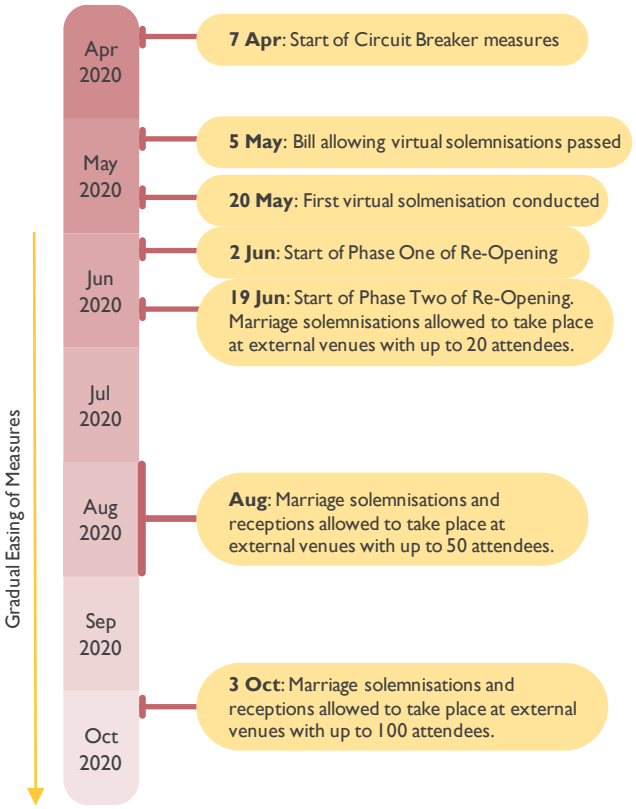
There were 22,649 registered marriages[1] in 2020, 17 per cent lower than the annual average number of marriages registered between 2015 and 2019. The most significant dip in the number of registered marriages were in the months of April and May, when the number of marriages declined 69 per cent and 92 per cent respectively (Chart 1), affected by the Circuit Breaker (CB) measures implemented from 7 Apr to 1 Jun 2020.

**CHART 1**
NUMBER OF MONTHLY REGISTERED MARRIAGES




Note: The 2020 marriage data presented in this article are preliminary as at the time of release of the article. The finalised annual data on marriages will be made available around mid-2021 on the SingStat Website[2].

Timeline on Impact of COVID-19 on Registration of Marriages




Note: For the latest update on COVID-19 wedding restrictions after 2020, please visit MOH's website.

## Do You Know?

While COVID-19 has resulted in fewer number of marriages registered, it has not deterred some couples from marrying on "popular dates" in 2020. The five most popular dates were as follows:

| 2020 | 2020 | 2020 | 2020 | 2020 |
|---|---|---|---|---|
| 10 Oct | 12 Dec | 22 Feb | 8 Aug | 2 Feb |
| 865 marriages | 669 marriages | 538 marriages | 335 marriages | 306 marriages |

The number of marriages registered on these dates were higher than the daily average of 75 marriages from 2015 - 2019. In fact, the number of registrations in August, October and December were higher in 2020 compared to the average registration numbers in the corresponding months in 2015 - 2019.

In 2020, 662 couples solemnised their marriages via video link[3].

1 Statistics on marriages include those registered under the Women's Charter maintained by the Registry of Marriages, as well as those registered under the Administration of Muslim Law Act maintained by the Registry of Muslim Marriages.

2 The latest annual/monthly data on marriages by ethnic group of couple is available on the SingStat Table Builder from the following tables:

- Marriages Under the Women's Charter by Ethnic Group of Couple and Month of Marriage, Annual;
- Marriages Under the Administration of Muslim Law Act by Ethnic Group of Couple and Month of Marriage, Annual

3 The government passed the COVID-19 (Temporary Measures for Solemnisation and Registration of Marriages) Bill on 5 May 2020. This allowed marriage solemnisations and registrations to be conducted remotely via video link in the online presence of their witnesses.

# SingStat Website Retains Top Spot in the Global Open Data Inventory (ODIN) 2020/21 Ranking

The Singapore Department of Statistics is pleased to have clinched the **top spot** in the global ODIN 2020/21 ranking. The Department's SingStat Website was placed first among the **187** National Statistical Offices' websites assessed!

ODIN is a global index compiled by Open Data Watch (ODW) which assesses National Statistical Offices (NSOs) on **accessibility (openness)** and **availability (coverage)** of official statistics on their websites. The assessment covers various data categories in the domains of economic, social and environment statistics.

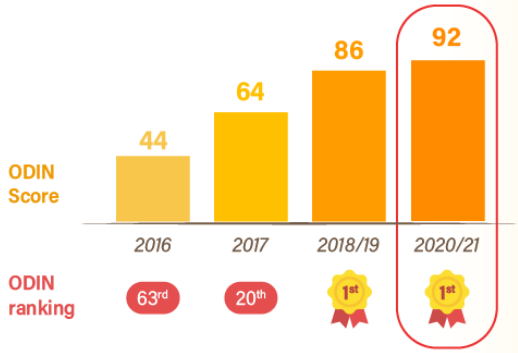
## OPEN DATA INVENTORY

**ODIN is compiled by Open Data Watch, an international, non-profit organisation of data experts**

Coverage  Openness

**187** NSOs were assessed in ODIN 2020/21 Assessment


*SingStat Website*




*Note: Singapore was first included in the ODIN assessment in 2016*

The SingStat Website is recognised as **fully open**, acheiving a full score of 100 for data accessibility in the ODIN 2020/21 assessment.

In improving data availability, our Department continues to closely work with public sector agencies to facilitate convenient and user-friendly access to a wide range of statistics via the SingStat Website.

Specifically, our Department undertook the following efforts to improve our coverage and openness scores.

### Coverage

- ✔ Worked with agencies (e.g., Ministry of Health, Ministry of Sustainability and the Environment, Ministry of Education, Energy Market Authority and National Environment Agency) to include disaggregated data and historical series
- ✔ Engaged Open Data Watch assessors on assessment criteria that unduly disadvantaged small countries like Singapore

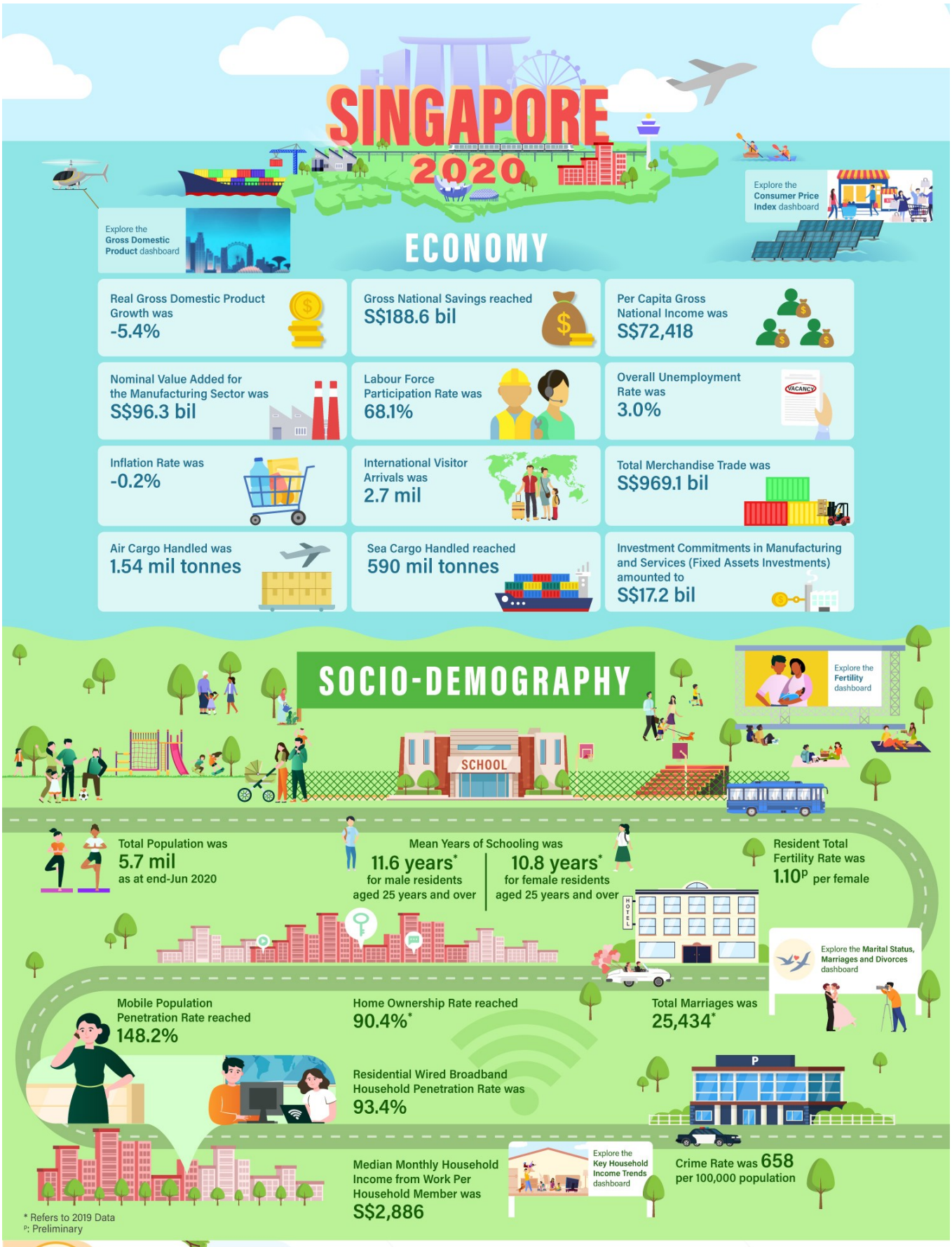
### Openness

- ✔ Reviewed SingStat Website's Terms of Use to improve openness, in consultation with Attorney-General's Chambers
- ✔ Enabled data download in multiple machine-readable formats, and facilitated data access via multi-table download and API features
- ✔ Included metadata page for data discovery with comprehensive information about the data

**UN Economic and Social Commission for Asia and the Pacific's (UNESCAP)** ***Asia and the Pacific Sustainable Development Goals (SDG) Progress Report 2020*** has also recognised the SingStat Website as **"a great example for other countries"** for its increased data accessibility and openness.

"Between 2017 and 2018, the overall ODIN score of Singapore increased by 21 points as a result of increased availability and openness of data. With a nearly perfect openness score of 99 out of 100, the website of the Singapore NSO (SingStat) serves as a **great example for other countries**. In 2018, Singapore launched a completely redesigned website with many features, such as a table builder and information briefs describing concepts, methods and applications used for production of statistics. The new website has increased accessibility and openness. In addition, Singapore has updated their terms of use for data to conform to open data standards, resulting in a fully open data use policy."

Source: Asia and the Pacific SDG Progress Report 2020, UNESCAP


SINGAPORE
2020
ECONOMY
Explore the Gross Domestic Product dashboard
Explore the Consumer Price Index dashboard
Real Gross Domestic Product Growth was -5.4%
Gross National Savings reached S$188.6 bil
Per Capita Gross National Income was S$72,418
Nominal Value Added for the Manufacturing Sector was S$96.3 bil
Labour Force Participation Rate was 68.1%
Overall Unemployment Rate was 3.0%
VACANCY
Inflation Rate was -0.2%
International Visitor Arrivals was 2.7 mil
Total Merchandise Trade was S$969.1 bil
Air Cargo Handled was 1.54 mil tonnes
Sea Cargo Handled reached 590 mil tonnes
Investment Commitments in Manufacturing and Services (Fixed Assets Investments) amounted to S$17.2 bil
SOCIO-DEMOGRAPHY
SCHOOL
Explore the Fertility dashboard
Total Population was 5.7 mil as at end-Jun 2020
Mean Years of Schooling was
11.6 years* for male residents aged 25 years and over
10.8 years* for female residents aged 25 years and over
Resident Total Fertility Rate was 1.10p per female
HOTEL
Explore the Marital Status, Marriages and Divorces dashboard
Mobile Population Penetration Rate reached 148.2%
Home Ownership Rate reached 90.4%*
Total Marriages was 25,434*
Residential Wired Broadband Household Penetration Rate was 93.4%
P
Median Monthly Household Income from Work Per Household Member was S$2,886
Explore the Key Household Income Trends dashboard
Crime Rate was 658 per 100,000 population
* Refers to 2019 Data
p: Preliminary
Find out more: Singapore Economy Infographic
SINGAPORE POPULATION
Find out more: Singapore Population Infographic
Access on-the-go with SingStat Mobile App
Scan and download the app today!
DEPARTMENT OF STATISTICS SINGAPORE
Empowering You with Trusted Data

# CELEBRATING 100 YEARS
## of the Singapore Department of Statistics

Official statistics in Singapore dates back 150 years to 1871 when the first Census of Population was taken. With the enactment of the Statistics Ordinance in 1921, a legal framework was established for data gathering, compilation and release of official statistics. Thus, 2021 marks the centennial anniversary for the Singapore Department of Statistics (DOS).

After independence in 1965, the Department's scope of statistical activities was broadened to meet the increased data demands. The expansion and diversification of Singapore's economic activities necessitated the collection of a wider range of statistics to chart and monitor the economic developments. In addition, to obtain comprehensive information on the population and households, the first post-independence Census of Population was conducted in 1970.

Singapore has adopted a decentralised statistical system since 1973, following the recommendations of the Commission of Inquiry on Statistical Activities appointed by the President. Since then, official statistics are gathered, compiled and released by DOS and Research and Statistics Units (RSUs) in various government Ministries and Statutory Boards. In 1973, the Statistics Ordinance was also repealed, and the Statistics Act was enacted in its place. The Statistics Act is the primary piece of legislation that governs statistical activities of DOS and the gazetted RSUs, and safeguards the confidentiality of information collected from individuals and companies.

The 1990s marked a period of technology applications as DOS launched the SingStat Website and enabled businesses to submit their survey returns via the Internet for the first time. In the 2000s, DOS improved the process of data collection by optimising the use of administrative data and leveraging technology to improve data processing, enabling DOS to meet the increasing demand for better quality and timelier data. DOS's digital services were expanded in the 2010s with the roll-out of the SingStat Table Builder and the launch of the SingStat Mobile App. Digital data services were continuously enhanced to improve users' experience in accessing DOS's data and data services. Data sources were diversified to include Big Data sources and new and more timely indicators were released to monitor the changing economic and socio-demographic landscape.

In the 2020s, DOS continues the digitalisation strategy with the use of new technologies such as Artificial Intelligence and Machine Learning to improve operational excellence across the data value chain. At the same time, DOS officers are provided with training and opportunities to master their data science expertise and advance their analytic capabilities.

As DOS celebrates the centennial anniversary in 2021, we strive to extend our outreach to the public, with more data and better services offerings. We remain committed to delivering insightful statistics and trusted statistical services that empower decision making in this century and beyond.

# DOS's Key Milestones

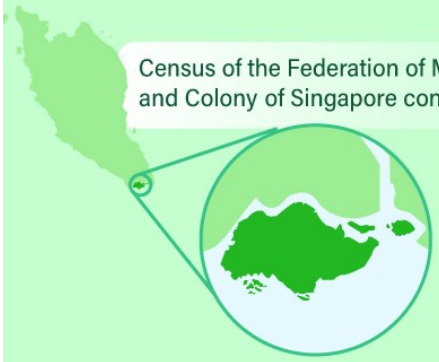
To commemorate the DOS's Centenary, let's look back on the key milestones:

## 1921

Statistics Ordinance enacted

## 1947

Census of the Federation of Malaya and Colony of Singapore conducted



## 1950s

- 1st Census of Population for Singapore conducted
- 1st Household Expenditure Survey conducted
- Occupational and Industrial Classifications developed

## 1960s

- Gross Domestic Product and Balance of Payments released
- Consumer Price Index released
- Survey of Services launched
- Yearbook of Statistics publication released


## 1970s

- 1st post-independence Census of Population conducted
- Decentralised statistical system adopted
- The Statistics Act, 1973 enacted
- Business Expectations Survey launched for new and more timely data
- Producer and International Trade Price Indices released
- Input-Output Tables released

## 1980s

- Sampling service for household surveys launched
- Survey of Singapore's Investment Abroad, and Monthly Survey of Retail Sales and Food & Beverage Services launched for new and more timely data
- Unit Labour Cost and Unit Business Cost Indices released

## 2000

- 1st register-based Census of Population conducted
- Annual population estimates compiled
- Singapore subscribed to IMF's Special Data Dissemination Standards
- Publications released for free access on SingStat Website
- Standard Classifications developed for Education and Individual Consumption According to Purpose
- Household Sector Balance Sheet released
- International Investment Position released

## 1990s

- Chief Statistician designated as the National Statistical Coordinator
- Administrative data used for statistics compilation
- SingStat Website, DOS's corporate website, launched
- Gross Domestic Product released by production, expenditure and income approaches

- Online submission (e-survey) offered for business surveys
- Quarterly Survey of Services, Quarterly Survey of Wholesale Trade, and International Trade in Services Survey launched for new and more timely data

## 2020s

- 6th Census of Population conducted amid the COVID-19 pandemic
- More detailed Consumer Price Index by household income group released for better insights on price changes

- More disaggregated Gross Domestic Product released for Services Producing Industries

- Visualising Data webpage published on SingStat Website with varied visualisations to better communicate statistics

- eBook of Statistics, an interactive digital publication, replaced the Yearbook of Statistics print publication
- SingStat Website retained top spot in the global Open Data Inventory (ODIN) 2020/21 ranking

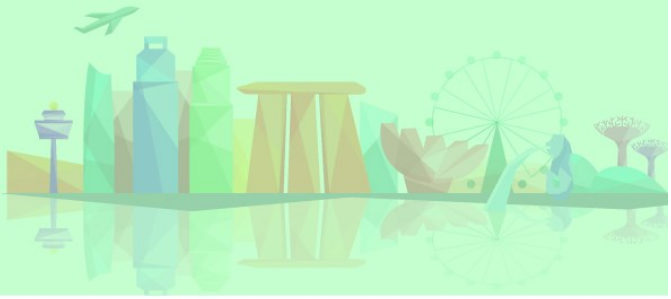

- DOS's Centennial Anniversary. Tagline 'Empowering You with Trusted Data' added to corporate logo

## 2010s

- The Statistics Act amended to clarify DOS's legislative power
- Standard Classifications developed for Type of Dwelling, Household Tenure and Marital Status

- SingStat Table Builder, DOS's e-service, launched with free access to data and access via APIs
- SingStat Mobile App, DOS's mobile service, launched
- Sustainable Development Goals webpage published on SingStat Website

- Annual Supply, Use and Input-Output Tables released
- Business e-survey service enhanced to allow submission via mobile devices
- Big Data used in statistics compilation



To learn more, check out: www.singstat.gov.sg/who-we-are

DEPARTMENT OF STATISTICS SINGAPORE
Empowering You with Trusted Data

## DOS's Refreshed Logo and Tagline

The Department's logo finds anchor in our vision and mission, and projects our ideals, aspirations and progressive stance. The tagline **'Empowering You with Trusted Data'** is added to the logo as DOS reaches a historical milestone of a 100 years. The tagline underscores DOS's established standing as a provider of trusted data and data services for data-driven decision making.

# CONTENTS



DEPARTMENT OF STATISTICS SINGAPORE
Empowering You with Trusted Data

**Statistics Singapore Newsletter Issue 1, 2021**

The Statistics Singapore Newsletter is issued twice a year by the Singapore Department of Statistics (DOS).

It aims to inform readers on recent statistical findings as well as latest information on statistical methodologies, processes, products and services.

*DOS achieved the **BCA Green Mark Gold**[Plus] Award in Feb 2021!*

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