

# Developing Register-Based Statistics to Meet Growing Demand for Statistics

# Agenda

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- What are the challenges?
- Register-based Statistics in Singapore
- On-going development of register-based statistics

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# Challenges

# Challenges

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- Growing demand for statistics
  - wider range of statistical data
  - more detailed tabulations
  - more data by smaller geographic areas
  - more timely and better quality data

# Challenges

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- Increased difficulty in conducting surveys
  - more effort required to establish contact with respondents
  - more effort required to encourage respondents' participation
  - other government and private agencies also conduct surveys, resulting in survey fatigue

# Challenges

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- Limitation of survey data
  - Adding new questions will increase respondent burden
  - Sample may not support detailed tabulations, nor tabulations at smaller geographic areas
  - Conduct of larger scale survey is costly and increases respondent burden

# The Way Forward

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- Increase use of admin data
- Conditions in place for Singapore to use admin data
  - Unique Identification Code systems
    - Unique Identification Number (UIN) for persons
    - Address in standard format
  - Availability of reliable data from government agencies collected for administrative purpose

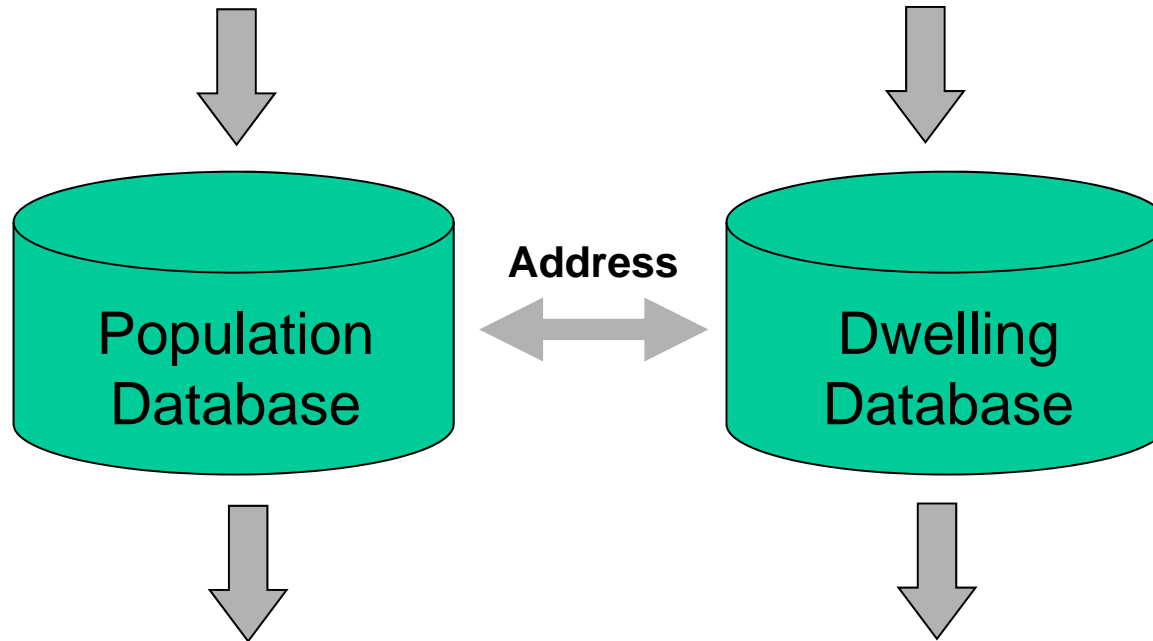
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# Register-based statistics in Singapore



# Population and Dwelling Databases

Updates from External Administrative Sources



Population and Dwelling Statistics

# Population and Dwelling Databases

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## Population Database

## Dwelling Database

Provide basic population count and profile at national level and at smaller geographic areas	Estimates on stock number of residential dwellings in Singapore (e.g. by dwelling type)
	<ul style="list-style-type: none"><li>• Sample design and selection services for household surveys</li></ul>
<p>Serve as a base to conduct Population Censuses /Surveys</p> <ul style="list-style-type: none"><li>➤ First register-based Census in 2000 and subsequently in 2010</li><li>➤ Mid-decade General Household Surveys</li><li>➤ Household Expenditure Surveys</li></ul>	

# Types of Admin Data Usage: Sampling Frame and Sampling Design

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- Sampling frame used to select samples of residential dwelling units for household survey is based on the Dwelling Database.
- Primary sampling divisions are based on the planning areas demarcated by Urban Redevelopment Authority's Master Plan.
- Samples of addresses provided include type of dwelling, which is from admin sources.

# Types of Admin Data Usage:

## Direct Tabulation

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- Since 2000, basic population count and profiles (e.g. age, sex, type of dwelling, geographic areas) were compiled from administrative sources.

# Types of Admin Data Usage: Direct Tabulation

Info on age

Table A1.2 Singapore Residents by Planning Area/Subzone, Age Group and Sex, June 2012

Planning Area	Subzone	Total	0 – 4	5 – 9	10 – 14	15 – 19	20 – 24	25 – 29	30 – 34	35 – 39	40 – 44	45 – 49	50 – 54	55 – 59	60 – 64	65 & Over
Total ('000)																
Total	Total	3,818.2	186.7	206.3	233.3	258.9	264.5	254.6	295.4	314.0	308.8	320.9	310.4	271.8	214.0	378.6
Ang Mo Kio	Total	178.9	7.5	8.1	9.1	10.0	10.9	11.7	14.1	14.3	13.5	14.4	14.3	14.1	12.7	24.1
	Cheng San	31.0	1.4	1.4	1.4	1.5	1.7	2.2	2.8	2.7	2.4	2.5	2.4	2.5	2.3	3.9
	Chong Boon	29.5	1.1	1.2	1.4	1.5	1.7	2.0	2.4	2.3	2.2	2.4	2.3	2.4	2.2	4.4
	Kebun Bahru	25.3	1.0	1.1	1.3	1.3	1.5	1.6	1.9	2.0	1.9	2.1	2.0	2.0	1.8	3.7
	Sembawang Hills	6.9	0.3	0.4	0.5	0.6	0.5	0.4	0.3	0.4	0.5	0.6	0.6	0.5	0.5	0.9
	...															
Males ('000)																
Ang Mo Kio	Total	86.6	3.9	4.1	4.7	5.0	5.3	5.6	6.6	6.9	6.6	7.2	7.2	6.6	6.0	10.7
	Cheng San	15.1	0.7	0.7	0.8	0.8	0.9	1.0	1.3	1.3	1.2	1.3	1.2	1.1	1.1	1.7
	Chong Boon	14.4	0.6	0.6	0.8	0.8	0.8	1.0	1.2	1.1	1.0	1.2	1.2	1.1	1.1	2.0
	Kebun Bahru	12.3	0.5	0.6	0.7	0.7	0.7	0.8	0.9	1.0	0.9	1.1	1.0	0.9	0.9	1.7
	Sembawang Hills	3.3	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.4
	...															
Females ('000)																
Ang Mo Kio	Total	92.3	3.6	4.0	4.4	5.0	5.5	6.2	7.3	7.4	6.9	7.3	7.1	7.4	6.7	13.4
	Cheng San	16.0	0.8	0.7	0.8	0.8	0.9	1.2	1.5	1.4	1.2	1.3	1.2	1.3	1.2	2.2
	Chong Boon	15.0	0.5	0.5	0.7	0.7	0.9	1.1	1.2	1.2	1.1	1.1	1.1	1.3	1.2	2.4
	Kebun Bahru	13.1	0.5	0.6	0.6	0.7	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.1	1.0	2.1
	Sembawang Hills	3.7	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.5
	...															

Info on geographic areas

## Types of Admin Data Usage: Replace Survey Data Collection

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E.g. In Census 2010, basic demographic variables such as date of birth, sex, type of dwelling etc were obtained directly from administrative sources

Items not available from administrative sources were collected from sample survey of about 200,000 households.

Admin data merged with survey data for tabulations.

# Types of Admin Data Usage: Replace Survey Data Collection

TABLE 4 MARITAL STATUS OF RESIDENT POPULATION AGED 65 YEARS AND OVER, 2010

Info on Age and Gender are from administrative sources Per Cent

	Resident Population Aged 65 Years & Over			65 – 74 Years		75 – 84 Years		85 Years & Over	
	Total	Males	Females	Males	Females	Males	Females	Males	Females
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Single	4.6	4.9	4.4	5.5	5.6	4.2	3.0	2.7	1.7
Married	59.1	80.9	42.0	84.5	55.8	76.8	27.8	60.9	9.6
Widowed	33.3	11.6	50.3	7.0	34.2	17.2	66.9	35.0	87.8
Divorced/ Separated	3.0	2.6	3.3	3.0	4.3	1.8	2.2	1.4	1.0

Info on marital status are collected from sample survey

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# On-going development of register-based statistics



# Takes Time to Develop: Evolution of Singapore's Censuses

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## Year

- 2010
  - Second Register-based Census
    - Use of admin data for basic population count and profile
    - Supplemented with sample enumeration for additional topics
  
- 2000
  - First register-based Census
    - Use of admin data for basic population count and profile
    - Supplemented with sample enumeration for additional topics
  
- 1990
  - Traditional Census
    - Complete coverage of population
    - Use of admin records on basic particulars for verification with households
  
- 1980
  - Traditional Census
    - Complete coverage of population (basic information)
    - 20% sample enumeration for specialised topics
  
- 1871
  - First Census in Singapore

# Census 2010 Data Items

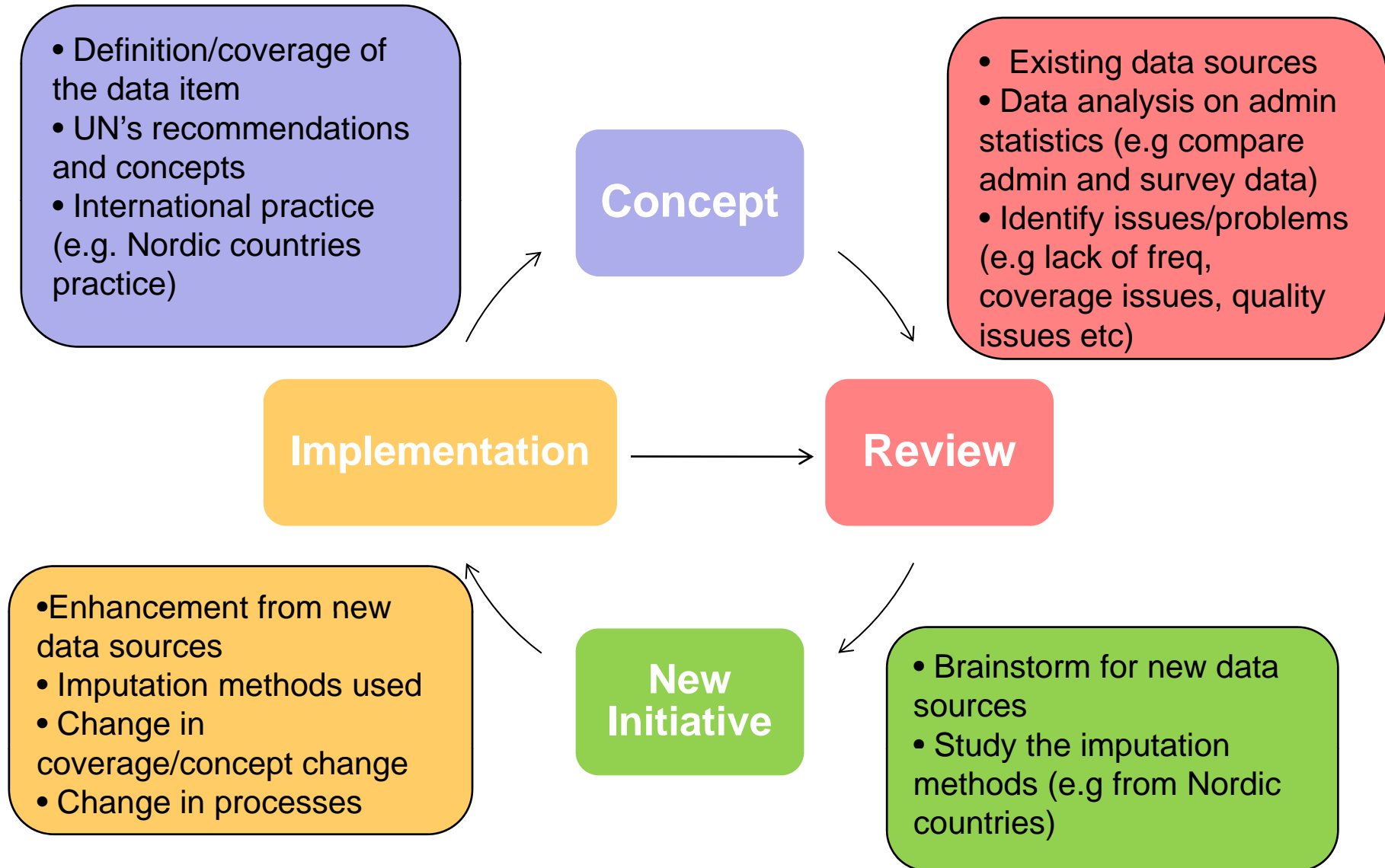
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From Administrative Data	From Sample Enumeration
Basic Population Count	Marital Status & Fertility
Age	Education, Language & Literacy
Sex	Economic Characteristics
Ethnic Group	Mode of Transport
Place of Birth	Religion
Type of Dwelling	Housing Tenancy
	Household Characteristics

For some survey-based items, aim to progressively switch to administrative sources for future censuses.

# Process to develop register-based statistics

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# Challenges in Usage of Admin Data

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- Admin data is collected according to administrative purpose, and may differ from statistical concepts and coverage.
- Usually would require the combination of multiple administrative sources to develop one data item.
- To improve data standardization across data sources
- To further improve co-operation with data sources for operational efficiency

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On-going development of  
register-based statistics:  
Highest Qualification Attainment

# Definition

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Highest Qualification Attainment (HQA) – refers to the highest grade or standard a person has passed or the highest level where a certificate, diploma, or degree is awarded.

The Singapore Standard Education Classification 2010 (SSEC 2010) is used to classify persons by HQA.

# International Practices

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Made reference to the practices of Finland, Norway, Sweden and Demark

<b>Data Concerns</b>	<b>Description</b>
Data sources	- All countries rely mainly on register systems. Ad hoc surveys are also conducted for specific target groups.
Overseas Qualifications	- Sweden has a university board to which residents will send their overseas qualifications to be converted to Swedish equivalence.
Qualifications of Immigrants	- Sweden and Denmark conduct survey to collect education information of these immigrants.

# Review

## Review of Existing Highest Qualification Attainment (HQA)

<b>Data Issues</b>	<b>Studies</b>
Unknown HQA	<ul style="list-style-type: none"><li>- magnitude of unknown</li><li>- which specific group of persons</li><li>- reason for the unknown</li></ul>
Overseas Qualifications	Insufficient data on residents with overseas qualifications
Qualifications obtained from Private Schools	Insufficient data on residents graduated from private schools.
Undercount or Overcount of specific level of HQA as compared to survey data	<ul style="list-style-type: none"><li>- how are the data collected by different sources</li><li>- how are the data classified by different sources</li></ul>



# New Initiatives

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- Identify new data sources (more than 50 sources)
  - Data from register systems of new data agencies
  - Survey data from the new data agencies
  - Requisite historical data
- Identify Data Quality Issues
  - Missing / incomplete data
  - Data entry / reporting error
  - Data Inconsistency between sources
  - Lack of detailed classification codes

# New Initiatives

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## Refinements due to data quality issues

- Not all data sources will be used due to data quality issue
- Extensive study and clarification with sources on their data collection and classification code used

# Assessment

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- Compare the new register-based HQA with HQA collected from Census 2010
- Identify the specific groups of persons which lead to significant difference, further studies and reviews on these groups

# Thank You

## **Our Vision**

*A National Statistical System of Quality,  
Integrity and Expertise*

## **Our Mission**

*We provide Reliable, Relevant and  
Timely Statistics to support Singapore's  
Social and Economic Development*