

Singapore Longitudinal Early Development Study (SG LEADS)



Panel Survey Wave 1

Technical Report 2

Calculation of Sampling Weights in SG LEADS Wave 1

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Singapore Longitudinal EARly Development Study (SG LEADS) is a nationally representative 2-wave panel survey on Singapore young children to study their early childhood development. SG LEADS 2018 weights allow researchers to generalize their statistical results using these data to the national population of households corresponding to our selection criteria (i.e., at least one Singapore citizen or permanent resident aged under 7), while accounting for uneven selection probabilities. Similarly, the child weight allows research to generalize their results to the national population of children meeting our selection criteria.

1.Sampling Design for SG LEADS Wave 1

Sample: 5,000 children under the age of 7 and their primary caregivers. We employed a customized sampling frame that consists of only households with at least one Singapore resident below the age of 7 (0-6). We adopted a multi-stage probability sampling - clustered and stratified sampling strategy - with an oversample of population residing in 1-3-room HDB units:

At the first stage, we adopted a stratified disproportionate sample strategy to oversample 1- to 3-room flats by housing types (sampling unit– dwelling unit). The frame comprising addresses with at least 1 Singapore resident aged under 7 years was divided into 3 broad housing types, i.e., HDB 1- to 3-room flats, HDB 4-room flats, and other remaining housing types (including 5-room HDB, executive HDB, condominium, landed properties, and others). We drew the dwelling units so that 40% of the sample was from HDB 1- to 3-room flats, 30% was from HDB 4-room flats, and 30% was from the remaining housing types.

Table.1 distribution of households of each dwelling type in the SG LEADS sample frame

	Total number of households with at least one child under 7 in 2017	1-2 room flats and 3 room flats	4 room flats	5-Room and Executive Flats, Condominiums, Landed Properties
% sample	100%	40%	30%	30%
Selection probability provided by DOS		0.09357	0.02828	0.02219

At the second stage, within each broad housing type, we surveyed all planning areas (PAs) with residents under 7 within the 5 URA regions in Singapore (Central, East, North, North-East, West). There are 55 PAs altogether in Singapore. According to the statistics in 2017, 10 PAs have no 0-9 population. Those 10 PAs are mainly the natural reservoirs, the industrial areas and the commercial areas. We surveyed all the PAs with residents under 7 years. The required number of addresses in each PA was calculated proportionately to its size of households with at least one child under 7 (PPS). Within each PA, the addresses were randomly selected. These produced dwelling units of different sizes (a proxy for SES status) in 55 PAs across the 5 regions in Singapore.

At the third stage, we randomly selected up to 2 eligible children (age under 7) in each selected household [sampling unit – child]. Based on the sampling design, the probability of selection is different for each of the 3 broad housing types, and hence the overall selected sample will not be of equal probability or self-weighting. The selection probability of each household was provided by the Department of Statistics (DOS), Singapore.

2. Steps to construct SG LEADS 2018 weights:

2.1 Account for all probabilities of selection for eligible families and children through the initial determination of eligibility for SG LEADS.

Use the inverse of selection probability for each housing type provided by DOS to get the initial household selection weight.

Table 2. Probability of Selection and Weight by Household

	N (addresses with at least one Singapore resident aged under 7 years)	% in sample	DOS selection probability	Raw weight (1/selection probability)	raw weight *n	N (Singapore resident HH ¹ with At least one member aged 0-6 years)	% in population
1- and 3-Room Flats	2,630	40%	0.09357	10.68719	28,107	30,776	14.7%
4-Room Flats	1,973	30%	0.02828	35.36068	69,767	75,457	35.9%
5-Room and Executive Flats, Condominiums, Landed Properties	1,972	30%	0.02219	45.06534	88,869	103,156	49.1%
Total	6,575	100%			186,743	209,997	100%

The SG LEADS sample frame is based on addresses with at least one Singapore resident under 7 (the child is a Singapore resident). The last column of Table 2 is the total number of resident households with at least 1 member aged 0-6 years (the child may not be a Singapore resident). In addition, one residential address may contain more than one households, therefore, the total numbers in the 5th and 6th columns are different.

We need to adjust sample distribution by planning area (PA) as the SG LEADS team allowed condo and landed properties being substituted by a unit with same housing type but **in a different PA**. It means that for condos and landed properties in a few PAs, their selection probability actually decreases, while that for the other PAs increases. We treat the substitutes as the original cases. We name the sample frame after substitution a **new sample frame** (the one provided by DOS is the original sample frame).

The adjustment factor was calculated by using the number of a specific housing type in a PA in the original sample fame (sample frame after substitution) to be divided by the number of that specific housing type in a PA in the new sample fame (sample frame from DOS). E.g., condos in AM in the original SF / condos in the AM in the new SF. Below is the adjustment factor for each PA. A “na” was assigned for cells with no completed households in the SG LEADS dataset.

¹A household refers to a group of 2 or more persons living together in the same house and sharing common food or other arrangements for essential living. It also includes a person living alone or a person living with others but having his own food arrangements. Although persons may be living in the same house, they may not be members of the same household. Singapore resident households refer to households headed by a resident (i.e., headed by a Singapore citizen or permanent resident). Other members of the households could be residents or non-residents. The head of a household is the person generally acknowledged as such by other members of the household.

Table 3. Adjustment factor for condos and landed properties by PA.

Planning Area	original sample frame- condos	new sample frame - condos	adjustment factor for condos	original sample frame- landed properties	new sample frame - landed properties	adjustment factor for landed properties
AM	13	7	1.86	11	12	0.92
BD	60	42	1.43	36	33	1.09
BK	23	20	1.15	3	4	0.75
BM	16	5	3.20	0	0	-
BP	20	15	1.33	2	3	0.67
BS	17	13	1.31	5	4	1.25
BT	45	26	1.73	24	20	1.20
CK	16	36	0.44	2	2	1.00
CL	21	14	1.50	4	3	1.33
GL	19	16	1.19	7	7	1.00
HG	33	38	0.87	15	17	0.88
JE	3	2	1.50	0	0	-
JW	22	18	1.22	3	5	0.6
KL	23	15	1.53	1	1	1
MD	1	1	1.00	0	0	-
MP	23	23	1.00	8	8	1
NT	8	6	1.33	0	0	-
NV	24	15	1.60	7	0	na
OR	1	1	1.00	0	0	-
OT	4	5	0.80	0	0	-
PG	41	53	0.77	0	0	-
PR	44	75	0.59	4	8	0.5
QT	10	11	0.91	3	3	1
RC	2	3	0.67	0	0	-
RV	11	13	0.85	1	0	na
SB	8	28	0.29	3	5	0.6
SE	47	42	1.12	1	1	1
SG	15	9	1.67	23	27	0.85
SR	5	2	2.50	0	0	-
TM	40	54	0.74	0	0	-
TN	20	24	0.83	4	1	4.00
TP	15	18	0.83	4	7	0.57
WD	25	30	0.83	1	2	0.50
YS	21	21	1.00	4	5	0.80
Z5	0	0	-	2	2	1.00
Z6	0	0	-	1	1	1.00
Z8	1	1	1	0	0	-
ZA	0	0	-	1	1	1.00
DT	2	0	na	0	0	-
MU	1	0	na	0	0	-
SI	2	0	na	1	0	na

Z1	0	0	-	0	0	-
Z2	0	0	-	0	0	-
Z3	0	0	-	0	0	-
Z4	0	0	-	1	0	na
Z7	0	0	-	0	0	-
Z9	0	0	-	0	0	-
Total	702	702		182	182	

2.2 Adjust the initial weight for SG LEADS non-response to produce interim household weight.

We adjusted response rate by housing type in each PA using the inverse of response rate for each subgroup (e.g., inverse of the response rate of the HDB 1-3 room flat at AM). Following the China Family and Panel Survey (2010, baseline survey), the Response Rate 1 (RR1) defined by AAPRO which assumes all cases with unknown eligibility are eligible was adopted. The RR1 is calculated through the equation listed below:

$$RR1 = \frac{I}{I + R + NC + UE}$$

where *I*, *R*, *NC*, *UE* refer to complete interviews, refusal, non-contact and unknown eligibility.

Table 4. Response Rate (RR1) and nonresponse adjustment factor by housing type and PA

Planning Area	Dwelling types	Interview	refuse	Non-contact	Ineligible	RR1	Non-response adjustment factor
AM	HDB 1- to 3-room flats	125	25	22	30	0.73	1.38
BD	HDB 1- to 3-room flats	83	34	18	64	0.61	1.63
BK	HDB 1- to 3-room flats	72	13	2	20	0.83	1.21
BM	HDB 1- to 3-room flats	88	26	11	62	0.70	1.42
BP	HDB 1- to 3-room flats	41	5	8	4	0.76	1.32
BS	HDB 1- to 3-room flats	5	6	4	1	0.33	3.00
CK	HDB 1- to 3-room flats	53	5	2	4	0.88	1.13
CL	HDB 1- to 3-room flats	51	23	8	13	0.62	1.61
GL	HDB 1- to 3-room flats	40	17	22	35	0.51	1.98
HG	HDB 1- to 3-room flats	41	12	18	21	0.58	1.73
JE	HDB 1- to 3-room flats	37	11	10	17	0.64	1.57
JW	HDB 1- to 3-room flats	111	13	11	28	0.82	1.22
KL	HDB 1- to 3-room flats	45	13	23	27	0.56	1.80
MP	HDB 1- to 3-room flats	15	2	10	8	0.56	1.80
NV	HDB 1- to 3-room flats	20	4	2	5	0.77	1.30
OT	HDB 1- to 3-room flats	14	4	5	7	0.61	1.64
PG	HDB 1- to 3-room flats	84	17	17	11	0.71	1.40
PR	HDB 1- to 3-room flats	6	2	2	1	0.60	1.67
QT	HDB 1- to 3-room flats	64	29	18	24	0.58	1.73
RC	HDB 1- to 3-room flats	3	5	3	4	0.27	3.67

SB	HDB 1- to 3-room flats	23	8	0	5	0.74	1.35
SE	HDB 1- to 3-room flats	54	20	21	4	0.57	1.76
SG	HDB 1- to 3-room flats	17	1	9	4	0.63	1.59
TM	HDB 1- to 3-room flats	81	22	22	25	0.65	1.54
TP	HDB 1- to 3-room flats	67	21	8	36	0.70	1.43
WD	HDB 1- to 3-room flats	64	20	7	28	0.70	1.42
YS	HDB 1- to 3-room flats	111	29	11	42	0.74	1.36
Z1	HDB 1- to 3-room flats	2	1	0	1	0.67	1.50
AM	HDB 4-room flats	24	7	11	3	0.57	1.75
BD	HDB 4-room flats	32	16	9	16	0.56	1.78
BK	HDB 4-room flats	44	7	2	7	0.83	1.20
BM	HDB 4-room flats	43	18	4	4	0.66	1.51
BP	HDB 4-room flats	71	7	8	6	0.83	1.21
BS	HDB 4-room flats	13	8	4	5	0.52	1.92
BT	HDB 4-room flats	2	1	0	0	0.67	1.50
CK	HDB 4-room flats	86	16	5	6	0.80	1.24
CL	HDB 4-room flats	19	8	8	2	0.54	1.84
GL	HDB 4-room flats	16	9	6	5	0.52	1.94
HG	HDB 4-room flats	45	21	15	16	0.56	1.80
JE	HDB 4-room flats	21	1	1	7	0.91	1.10
JW	HDB 4-room flats	76	20	4	23	0.76	1.32
KL	HDB 4-room flats	14	4	11	8	0.48	2.07
MP	HDB 4-room flats	1	0	1	3	0.50	2.00
NV	HDB 4-room flats	7	3	2	0	0.58	1.71
OT	HDB 4-room flats	3	5	1	1	0.33	3.00
PG	HDB 4-room flats	103	46	53	22	0.51	1.96
PR	HDB 4-room flats	22	11	4	11	0.59	1.68
QT	HDB 4-room flats	32	11	1	6	0.73	1.38
RC	HDB 4-room flats	3	0	1	0	0.75	1.33
SB	HDB 4-room flats	32	7	5	9	0.73	1.38
SE	HDB 4-room flats	94	53	69	20	0.44	2.30
SG	HDB 4-room flats	14	2	9	3	0.56	1.79
TM	HDB 4-room flats	52	19	32	16	0.50	1.98
TP	HDB 4-room flats	24	5	5	4	0.71	1.42
WD	HDB 4-room flats	64	31	15	33	0.58	1.72
YS	HDB 4-room flats	96	18	13	30	0.76	1.32
Z2	HDB 4-room flats	0	0	0	1		
AM	HDB 5-room flats	12	3	4	3	0.63	1.58
BD	HDB 5-room flats	9	11	7	9	0.33	3.00
BK	HDB 5-room flats	20	5	0	2	0.80	1.25
BM	HDB 5-room flats	13	9	3	4	0.52	1.92
BP	HDB 5-room flats	40	6	5	1	0.78	1.28
BS	HDB 5-room flats	6	7	5	3	0.33	3.00
BT	HDB 5-room flats	2	0	1	0	0.67	1.50
CK	HDB 5-room flats	42	16	8	2	0.64	1.57
CL	HDB 5-room flats	5	5	2	2	0.42	2.40

GL	HDB 5-room flats	3	3	1	5	0.43	2.33
HG	HDB 5-room flats	21	8	8	7	0.57	1.76
JE	HDB 5-room flats	11	4	3	3	0.61	1.64
JW	HDB 5-room flats	60	19	13	24	0.65	1.53
KL	HDB 5-room flats	7	2	6	0	0.47	2.14
MP	HDB 5-room flats	1	1	0	2	0.50	2.00
NV	HDB 5-room flats	3	0	0	0	1.00	1.00
PG	HDB 5-room flats	51	14	24	13	0.57	1.75
PR	HDB 5-room flats	27	9	2	7	0.71	1.41
QT	HDB 5-room flats	8	3	0	2	0.73	1.38
SB	HDB 5-room flats	27	7	1	7	0.77	1.30
SE	HDB 5-room flats	47	25	49	12	0.39	2.57
SG	HDB 5-room flats	7	1	6	2	0.50	2.00
TM	HDB 5-room flats	21	11	28	15	0.35	2.86
TP	HDB 5-room flats	11	8	1	1	0.55	1.82
WD	HDB 5-room flats	41	20	10	24	0.58	1.73
YS	HDB 5-room flats	35	6	7	8	0.73	1.37
Z3	HDB 5-room flats	0	0	1	0	0.00	
Z7	HDB 5-room flats	1	0	0	0	1.00	1.00
Z9	HDB 5-room flats	0	1	0	0	0.00	
AM	Condos	4	0	3	0	0.57	1.75
BD	Condos	16	2	23	1	0.39	2.56
BK	Condos	14	0	6	0	0.70	1.43
BM	Condos	1	0	3	1	0.25	4.00
BP	Condos	13	0	2	0	0.87	1.15
BS	Condos	7	1	5	0	0.54	1.86
BT	Condos	14	0	11	1	0.56	1.79
CK	Condos	31	1	4	0	0.86	1.16
CL	Condos	6	0	8	0	0.43	2.33
GL	Condos	11	3	2	0	0.69	1.45
HG	Condos	32	5	1	0	0.84	1.19
JE	Condos	2	0	0	0	1.00	1.00
JW	Condos	13	0	5	0	0.72	1.38
KL	Condos	7	1	5	2	0.54	1.86
MD	Condos	0	0	1	0	0.00	
MP	Condos	7	1	14	1	0.32	3.14
NT	Condos	4	0	2	0	0.67	1.50
NV	Condos	8	0	7	0	0.53	1.88
OR	Condos	0	0	1	0	0.00	
OT	Condos	2	0	1	2	0.67	1.50
PG	Condos	44	0	7	2	0.86	1.16
PR	Condos	36	1	38	0	0.48	2.08
QT	Condos	7	1	3	0	0.64	1.57
RC	Condos	2	0	1	0	0.67	1.50
RV	Condos	4	0	9	0	0.31	3.25
SB	Condos	27	0	1	0	0.96	1.04

SE	Condos	29	5	8	0	0.69	1.45
SG	Condos	5	3	1	0	0.56	1.80
SR	Condos	0	1	1	0	0.00	
TM	Condos	20	7	27	0	0.37	2.70
TN	Condos	5	0	19	0	0.21	4.80
TP	Condos	7	0	10	1	0.41	2.43
WD	Condos	27	1	2	0	0.90	1.11
YS	Condos	17	0	4	0	0.81	1.24
Z8	Condos	0	0	1	0	0.00	
AM	Landed properties	3	0	9	0	0.25	4.00
BD	Landed properties	7	0	26	0	0.21	4.71
BK	Landed properties	2	0	2	0	0.50	2.00
BP	Landed properties	2	0	1	0	0.67	1.50
BS	Landed properties	0	0	4	0	0.00	
BT	Landed properties	6	0	14	0	0.30	3.33
CK	Landed properties	0	0	2	0	0.00	
CL	Landed properties	0	0	3	0	0.00	
GL	Landed properties	4	0	2	1	0.67	1.50
HG	Landed properties	2	0	15	0	0.12	8.50
JW	Landed properties	2	0	3	0	0.40	2.50
KL	Landed properties	1	0	0	0	1.00	1.00
MP	Landed properties	2	0	6	0	0.25	4.00
PR	Landed properties	5	0	3	0	0.63	1.60
QT	Landed properties	2	0	1	0	0.67	1.50
SB	Landed properties	3	0	2	0	0.60	1.67
SE	Landed properties	0	0	1	0	0.00	
SG	Landed properties	6	2	19	0	0.22	4.50
TN	Landed properties	0	0	1	0	0.00	
TP	Landed properties	4	0	3	0	0.57	1.75
WD	Landed properties	2	0	0	0	1.00	1.00
YS	Landed properties	1	0	4	0	0.20	5.00
Z5	Landed properties	0	0	2	0	0.00	
Z6	Landed properties	0	0	1	0	0.00	
ZA	Landed properties	0	0	1	0	0.00	

Note: A zero response rate indicates that there is no such housing type in that PA in our final dataset. Thus, adjustment factor is not provided for PAs without successful interviews (keep as blank).

Table 5. SG LEADS weighted sample description by dwelling type with the interim weight

Housing type	Weighted (n)	Weighted (%)	2017 National statistics (%) ^a
1- and 2- Room Flats	129	3.72	2.90
3-Room Flats	420	12.12	11.75
4-Room Flats	1,291	37.15	35.93
5-Room and Executive Flats	985	28.33	27.45
Condominiums	546	15.73	18.16

Landed Properties	102	2.94	3.51
Total	3,476	100	100

^a Singapore resident households by the presence of member aged 0-6 years and type of dwelling, 2017

The weighted percentage of each dwelling type is close to the distribution of Singapore resident households by presence of member aged 0-6 years and type of dwelling, 2017.

2.3 Post-stratify to population totals to get initial post-stratification weight.

We post-stratified the interim weight from Step 2 to population totals calculating using data from the 2015 General Household Survey (2015 GHS). The post-stratification adjustment was conducted at the household level over three characteristics:

- **Ethnic group of the household head** (Chinese, Malays, Indians, Others)
- **Dwelling type** (1- and 2- Room Flats, 3-Room Flats, 4-Room Flats, 5-Room and Executive Flats, Condominiums, Other Apartments and Landed Properties)
- **Education of the household head** (Secondary and Below, Post-Secondary, University)

Fifty-four subgroups were formed by the three-way cross-classification of these categorical variables (Table 6). As some of the subgroups are missing, imputation was conducted by using the existing numbers in the table.

Table 6. Resident households with at least 1 child aged below 7 years, by type of dwelling, highest qualification attained and ethnic group of head of household, 2015

Ethnic Group	Type of Dwelling	Total	Secondary	Post-	University ²
			and Below	Secondary	
Total	Total	207,040	49,800	60,670	96,320
	1- and 2- Room Flats	7,020	4,890	1,960	170
	3-Room Flats	25,560	10,710	7,120	7,670
	4-Room Flats	75,680	19,830	27,440	28,270
	5-Room and Executive Flats	57,870	10,810	17,380	29,680
	Condominiums, Other Apartments and Landed Properties	40,380	3,390	6,590	30,410
Chinese	Total	138,720	32,270	36,450	69,850
	1- and 2- Room Flats	1,820	1,380	480	240
	3-Room Flats	14,850	6,730	4,090	3,970
	4-Room Flats	51,280	13,890	15,970	21,330
	5-Room and Executive Flats	40,170	7,060	10,980	22,130
	Condominiums, Other Apartments and Landed Properties	30,210	3,090	4,930	22,180

² Secondary and below refers to no formal schooling/pre-primary, primary and secondary ('O' \ 'N' level). Post-secondary refers to post- secondary (non-tertiary): general & vocational ('a' level), polytechnic diploma and professional qualification and other diploma. University refers to bachelor's or equivalent, postgraduate diploma) certificate (excluding master's and doctorate) and master's and doctorate or equivalent.

Malays	Total	29,660	12,460	14,410	2,780
	1- and 2- Room Flats	4,280	2,910	1,370	0
	3-Room Flats	4,620	2,710	1,690	220
	4-Room Flats	12,350	4,590	7,170	590
	5-Room and Executive Flats	7,580	2,190	3,900	1,480
	Condominiums, Other Apartments and Landed Properties	830	60	280	490
Indians	Total	27,760	4,130	8,130	15,400
	1- and 2- Room Flats	800	550	280	60
	3-Room Flats	4,570	1,050	1,190	2,320
	4-Room Flats	9,180	1,080	3,770	4,290
	5-Room and Executive Flats	7,470	1,340	2,120	4,010
	Condominiums, Other Apartments and Landed Properties	5,600	110	770	4,720
Others	Total	10,910	940	1,670	8,290
	1- and 2- Room Flats	120	50	70	0
	3-Room Flats	1,530	220	160	1,150
	4-Room Flats	2,870	270	530	2,070
	5-Room and Executive Flats	2,650	280	300	2,060
	Condominiums, Other Apartments and Landed Properties	3,740	120	610	3,010

Notes (DOS):

- Data are rounded to the nearest 10.
- Cells shaded in blue are based on small sample size and are to be used with caution.
- Cells shaded in yellow have been suppressed due to small sample size and should not be used to draw any inferences.

Notes (CFPR):

Cells shaded in yellow have been imputed by using the numbers in a same dwelling type or Education

Numbers in BLACK in yellow cells were calculated directly using the numbers in the same dwelling type or same educational level within a specific race group

Numbers in GREEN in yellow cells were calculated directly using the TOTAL of a specific dwelling type and education minus that for each race

Numbers in RED in yellow cells were calculated directly using both the original or estimated numbers in the same dwelling type or same educational level within a specific race group

If there are fewer than 10 households in a subgroup in the sample, adjacent subgroups are combined cross dwelling type. In addition, cells with population less than 500 (in Table 6) were also collapsed with adjacent cells across the dwelling type. After such combination, 37 subgroups were formed.

The SG LEADS weighted population estimate count was calculated with the interim weight from Step 2. Initial post-stratification adjustment factors were computed as the ratio of the 2015 GHS totals to the SG LEADS weighted population estimate count. These data are presented in Table 7.

Table 7: Initial post-stratification adjustment

SN	Race	Education	Dwelling	n	SG LEADS weighted estimate	2015 GHS totals	Initial adjustment factor
1	Chinese	Post-Secondary	1- and 2- Room Flats & 3-Room Flats	204	3,249	4,570	1.41
2	Chinese	Post-Secondary	4-Room Flats	218	12,602	15,970	1.27
3	Chinese	Post-Secondary	5-Room and Executive Flats	127	9,505	10,980	1.16
4	Chinese	Post-Secondary	Condominiums, Other Apartments and Landed Properties	76	5,920	4,930	0.83
5	Indian	Post-Secondary	1- and 2- Room Flats & 3-Room Flats	70	1,091	1,470	1.35
6	Indian	Post-Secondary	4-Room Flats	42	2,247	3,770	1.68
7	Indian	Post-Secondary	5-Room and Executive Flats & Condominiums, Other Apartments and Landed Properties	25	1,925	2,890	1.50
8	Malay	Post-Secondary	1- and 2- Room Flats	51	769	1,370	1.78
9	Malay	Post-Secondary	3-Room Flats	110	1,680	1,690	1.01
10	Malay	Post-Secondary	4-Room Flats	141	7,937	7,170	0.90
11	Malay	Post-Secondary	5-Room and Executive Flats & Condominiums, Other Apartments and Landed Properties	40	3,011	4,180	1.39
12	Others	Post-Secondary	1- and 2- Room Flats & 3-Room Flats & 4-Room Flats & 5-Room and Executive Flats & Condominiums, Other Apartments and Landed Properties	39	1,484	1,670	1.13
13	Chinese	Secondary and Below	1- and 2- Room Flats	66	1,058	1,380	1.30
14	Chinese	Secondary and Below	3-Room Flats	205	3,214	6,730	2.09
15	Chinese	Secondary and Below	4-Room Flats	129	7,211	13,890	1.93
16	Chinese	Secondary and Below	5-Room and Executive Flats	49	3,651	7,060	1.93
17	Chinese	Secondary and Below	Condominiums, Other Apartments and Landed Properties	16	1,581	3,090	1.95
18	Indian	Secondary and Below	1- and 2- Room Flats	30	481	550	1.14

19	Indian	Secondary and Below	3-Room Flats	30	480	1,050	2.19
20	Indian	Secondary and Below	4-Room Flats & 5-Room and Executive Flats & Condominiums, Other Apartments and Landed Properties	17	1,026	2,530	2.47
21	Malay	Secondary and Below	1- and 2- Room Flats	186	2,945	2,910	0.99
22	Malay	Secondary and Below	3-Room Flats	136	2,107	2,710	1.29
23	Malay	Secondary and Below	4-Room Flats	63	3,372	4,590	1.36
24	Malay	Secondary and Below	5-Room and Executive Flats	17	1,416	2,190	1.55
25	Others	Secondary and Below	1- and 2- Room Flats & 3-Room Flats & 5-Room and Executive Flats	28	491	550	1.12
26	Chinese	University	1- and 2- Room Flats & 3-Room Flats	153	2,502	4,210	1.68
27	Chinese	University	4-Room Flats	354	20,903	21,330	1.02
28	Chinese	University	5-Room and Executive Flats	229	18,598	22,130	1.19
29	Chinese	University	Condominiums, Other Apartments and Landed Properties	367	28,371	22,180	0.78
30	Indian	University	1- and 2- Room Flats & 3-Room Flats	49	779	2,380	3.06
31	Indian	University	4-Room Flats	60	3,542	4,290	1.21
32	Indian	University	5-Room and Executive Flats	33	2,706	4,010	1.48
33	Indian	University	Condominiums, Other Apartments and Landed Properties	14	1,759	4,720	2.68
34	Malay	University	3-Room Flats & 4-Room Flats	37	1,859	810	0.44
35	Malay	University	5-Room and Executive Flats & Condominiums, Other Apartments and Landed Properties	23	1,710	1,970	1.15
36	Others	University	1- and 2- Room Flats & 3-Room Flats & 4-Room Flats	35	1,349	3,230	2.39
37	Others	University	5-Room and Executive Flats & Condominiums, Other Apartments and Landed Properties	15	1,285	5,070	3.95

2.4 Trim very large and very small values of the initial post-stratified weight.

The initial post-stratification adjustment factors were applied to the interim weight to produce an initial post-stratified weight. To reduce the influence of extreme weight values on the variances of sample estimates of population statistics, we decided to trim extreme values at each end of the distribution. The trimming rule applied to the SG LEADS Wave 1 Household Weight assigned the cases with the weight values in the top 5% and in the bottom 5% of the weight distribution to the 5th and 95th percentile values of the weight distribution, respectively.

Note: CFPS 2010 bottom coded at 5% and top coded at 95%; PSID CDS 2014 bottom coded at 2% and top coded at 98%.

2.5 Post-stratify the trimmed weights to get household-level weight.

After trimming the weights, the sum of initial post-stratified weight does not equal to the population (2015 GHS totals). Therefore, the post-stratification procedure (Step 4) was repeated so that the final trimmed weights again matched the 2015 GHS totals. Table 8 shows the post-stratification of trimmed weights and final adjustment factors. The SG LEADS weighted estimate was computed by the trimmed initial post-stratified weight. Final adjustment factors were computed as the ratio of the 2015 GHS totals to the SG LEADS weighted population estimate count.

The final post-stratification adjustment factors were applied to the trimmed initial post-stratified weight to produce a household-level weight.

Table 8: Post-stratification adjustment of trimmed weights.

SN	Race	Education	Dwelling	n	SG LEADS weighted estimate	2015 GHS totals	Final adjustment factor
1	Chinese	Secondary and Below	1- and 2- Room Flats	65	1,368	1,380	1.01
2	Chinese	Post-Secondary	1- and 2- Room Flats & 3-Room Flats	201	4,520	4,570	1.01
3	Chinese	University	1- and 2- Room Flats & 3-Room Flats	150	4,150	4,210	1.01
4	Chinese	Secondary and Below	3-Room Flats	201	6,628	6,730	1.02
5	Chinese	Post-Secondary	4-Room Flats	221	16,228	15,970	0.98
6	Chinese	Secondary and Below	4-Room Flats	132	13,989	13,890	0.99
7	Chinese	University	4-Room Flats	363	21,834	21,330	0.98
8	Chinese	Post-Secondary	5-Room and Executive Flats	128	11,030	10,980	1.00

9	Chinese	Secondary and Below	5-Room and Executive Flats	49	6,242	7,060	1.13
10	Chinese	University	5-Room and Executive Flats	226	21,289	22,130	1.04
11	Chinese	Post-Secondary	Condominiums, Other Apartments and Lande d Properties	73	4,662	4,930	1.06
12	Chinese	Secondary and Below	Condominiums, Other Apartments and Lande d Properties	16	1,740	3,090	1.78
13	Chinese	University	Condominiums, Other Apartments and Lande d Properties	362	21,367	22,180	1.04
14	Indian	Secondary and Below	1- and 2- Room Flats	29	536	550	1.03
15	Indian	Post-Secondary	1- and 2- Room Flats & 3-Room Flats	70	1,474	1,470	1.00
16	Indian	University	1- and 2- Room Flats & 3-Room Flats	49	2,388	2,380	1.00
17	Indian	Secondary and Below	3-Room Flats	30	1,053	1,050	1.00
18	Indian	Post-Secondary	4-Room Flats	43	3,848	3,770	0.98
19	Indian	University	4-Room Flats	60	4,286	4,290	1.00
20	Indian	Secondary and Below	4-Room Flats & 5-Room and Executive Flats & Condominiums, Other Apartments and Lande d Properties	17	2,161	2,530	1.17
21	Indian	University	5-Room and Executive Flats	33	3,732	4,010	1.07
22	Indian	Post-Secondary	5-Room and Executive Flats & Condominiums, Other Apartments and Lande d Properties	25	2,714	2,890	1.06

23	Indian	University	Condominiums, Other Apartments and Lande d Properties	14	1,881	4,720	2.51
24	Malay	Post-Secondary	1- and 2- Room Flats	50	1,348	1,370	1.02
25	Malay	Secondary and Below	1- and 2- Room Flats	184	2,972	2,910	0.98
26	Malay	Post-Secondary	3-Room Flats	111	1,764	1,690	0.96
27	Malay	Secondary and Below	3-Room Flats	134	2,685	2,710	1.01
28	Malay	University	3-Room Flats & 4-Room Flats	36	865	810	0.94
29	Malay	Post-Secondary	4-Room Flats	143	7,274	7,170	0.99
30	Malay	Secondary and Below	4-Room Flats	65	4,733	4,590	0.97
31	Malay	Secondary and Below	5-Room and Executive F lats	17	1,942	2,190	1.13
32	Malay	Post-Secondary	5-Room and Executive F lats & Condominiums, Other Apartments and Lande d Properties	37	3,609	4,180	1.16
33	Malay	University	5-Room and Executive F lats & Condominiums, Other Apartments and Lande d Properties	24	1,988	1,970	0.99
34	Others	University	1- and 2- Room Flats & 3-Room Flats & 4-Room Flats	34	2,985	3,230	1.08
35	Others	Post-Secondary	1- and 2- Room Flats & 3-Room Flats & 4-Room Flats & 5-Room and Executive F lats & Condominiums, Other Apartments and Lande d Properties	41	1,738	1,670	0.96

36	Others	Secondary and Below	1- and 2- Room Flats & 3-Room Flats & 5-Room and Executive Flats	28	552	550	1.00
37	Others	University	5-Room and Executive Flats & Condominiums, Other Apartments and Landed Properties	16	2,137	5,070	2.37

2.6 Construct within family child selection factor to produce child-level weight.

Within family selection factor could be calculated through dividing the number of responded children in a family by the number of eligible children in the family. The weight for each responded child from each address is illustrated below.

Table 9. Ways to construct child-level adjustment factor

Address	No. of eligible children in address	No. of children responded in address	Child-level adjustment factor
Address A	5	2	$5/2=2.5$
Address B	3	1	$3/1=3$
Address C	2	2	$2/2=1$

3. Weighted description of SG LEADS dataset

3.1 Household level

As shown in Table 10a, the weighted percentage of each dwelling types in the sample

Table 10a. SG LEADS weighted sample distribution of dwelling type

Dwelling type	n	%	weighted n	weighted %	2017 National statistics (%) ^a
HDB 1- to 2-room flats	388	11.16	129	3.72	2.90
HDB 3-room flats	957	27.55	420	12.12	11.75
HDB 4-room flats	1,097	31.55	1291	37.15	35.93
HDB 5-Room and Executive Flats	550	15.82	985	28.33	27.45
Condominiums	428	12.31	546	15.73	18.16
Landed Properties	56	1.61	102	2.94	3.51
Total	3,476	100	3,476	100	100

^a Singapore resident household by presence of member aged 0-6 years and type of dwelling, 2017

Table 10b. SG LEADS weighted sample distribution of education of head of household

Education of the household head	n	%	weighted n	weighted %	GHS2015(%) ^a
Secondary and Below	967	27.81	830	23.87	24.03

Post-Secondary	1,143	32.87	1,022	29.42	29.30
University	1,366	39.32	1,623	46.71	46.52
Total	3,476	100	3,476	100	100

^a Resident household with at least 1 child aged below 7 years, by type of dwelling, highest qualification attained and ethnic group of head of household, 2015

Table 10c.SG LEADS weighted sample distribution of race of head of household

Race of the household head	n	%	weighted n	weighted %	GHS2015 (%) ^a
Chinese	2,187	62.9	2,334	67.14	66.81
Malay	801	23.0	499	14.35	14.2
Indian	369	10.7	465	13.41	13.38
Others	119	3.4	177	5.10	5.31
Total	3,476	100	3,476	100	100

^a Resident household with at least 1 child aged below 7 years, by type of dwelling, highest qualification attained and ethnic group of head of household, 2015

Table 11a. weighted distribution of household size

household size	Unweighted n	Unweighted %	Weighted n	Weighted %
2	29	0.83	17	0.49
3	733	21.11	718	20.68
4	1,334	38.37	1390	39.99
5	770	22.15	764	21.98
6	351	10.09	364	10.48
7	174	5.00	156	4.49
8	52	1.50	38	1.10
9	23	0.66	20	0.58
10	4	0.12	2	0.07
11	3	0.09	2	0.06
12	2	0.06	3	0.08
13	1	0.03	0	0.01
total	3476	100	3,476	100

Table 11b. Distribution of SG LEADS child by household

# of child under 7 in the household	# of child interviewed		total	weighted n	weighted %
	1	2			
1	1,923	0	1,921	1,962	56.5
2	20	1,270	1,290	1,296	37.3
3	4	216	220	190	5.5
4	1	35	36	23	0.7
5	0	7	7	2	0.06
7	0	1	1	2	0.04

Total	1,947	1,529	3,476	3,476	100
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The total percentage resident households with more than one member aged 0-6 years in 2017 is 31%. In SG LEADS, 43% of the households have more than one Singapore resident aged under 7.

3.2 Child level

Table 12a. Age distribution of the SG LEADS child

age in years	n	%	weighted n	weighted %
0	508	10.17	490	9.81
1	717	14.32	677	13.52
2	807	16.12	833	16.63
3	805	16.08	808	16.13
4	708	14.14	719	14.36
5	725	14.48	727	14.52
6	735	14.68	752	15.03
Total	5,005	100	5,005	100

Table 12b. gender of the SG LEADS child

gender	n	%	weighted n	weighted %
boy	2,518	50.3	2,558	51.1
girl	2,487	49.8	2,466	48.9

Table 12c. race of the SG LEADS child

the child's race	n	%	weighted n	weighted %
Chinese	3140	62.8	3,384	67.6
Malay	1269	25.2	850	17.0
Indian	454	9.3	524	10.5
Others	142	2.8	246	4.9
Total	5,005	100	5,005	100