Singapore Longitudinal Early Development Study (SG LEADS)

Panel Survey Wave 2

Technical Report 1
SG LEADS Wave 2 Response Rates

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The objective of the report is to develop and report a measure of the response rates for the cohort of SG LEADS sample persons interviewed in the first wave of panel data collection. It should be noted that the derived response rate statistics reported here do not take into account noncoverage for the original samples from which the original panel of Wave 1 families and sample persons were derived (e.g., children born after Wave 1 samples). Three different types of response rates were calculated: the unweighted unconditional cross-sectional response rates (RRs), the unconditional cumulative response rates (UCRRs) and the weighted unconditional cumulative response rates (WUCRRs).

1. Cross-sectional response rates (RRs)

1.1 Conceptualization

Response rates are calculated by dividing the number of successful responses returned by the total number eligible in the sample chosen (Fincham, 2008). Definition of each outcome group is listed below:

Respondents— Each study defines a "response" in a given wave as full or partial completion of a core interview or proxy interview, but not necessarily the supplemental components (e.g. self-completion or nurse visit). In SG LEADS W2, we define a "response" as full completion or partial completion of the interview (e.g., completion of the household booklet, but not the child booklet) in that wave.

Ineligible — In SG LEADS study, participants who have died after wave 1 study are treated as ineligible.

Non-respondents — This group consists mainly of those who have refused at a given wave or who could not be contacted.

Unknown eligibility—Each study has a sub-group of sample members whose eligibility is 'unknown' at a given wave due to non-contact or unsuccessful tracing. Those "unknown" cases not reclassified as ineligible remain as non-respondents.

1.2 Calculation of unconditional cross-sectional response rate (RRs):

In Wave 2, one household reported a death of sample children after Wave 1. Therefore, at the household level, there is 1 ineligible household, with 1 ineligible child at the child level. The unweighted response rates in Wave 2 are 86.8% and 86.9% at the household-level and child-level, respectively.

Table 1. Wave 2 Unconditional Cross-sectional Response Rates (RRs)

	Household level	Child level
Total number in our sample	3,476	5,005
Wave 2 completions	3,016	4,352
Ineligible cases	1	1
RRs	3016/ (3476-1) =86.8%	4352/ (5005-1) =87.0%

A breakdown of the circumstance of the nonresponse household is presented in Table 2. The top reason of nonresponse is refusal (59.4%), with 23.3% clearly indicating a refusal because of concerns on the COVID-19 situation. Another top reason of nonresponse is unreachable (e.g., the respondent is no longer living in the address indicated in wave 1, and can not be contacted through phone or email address provided, 33.3%). Other reasons of nonresponse include special circumstances such as the respondent is too busy to arrange an interview within the fieldwork period; the families are abroad and will not be back before the fieldwork ends; there is a change in the primary caregiver, and the current caregiver loses contact with the previous caregiver.

Table 2. Breakdown of the Nonresponse

Circumstances	n	%
Refusal	166	36.1%
Refusal (COVID 19 concerns)	107	23.3%
Unreachable	153	33.3%
Special circumstances	33	7.1%
Total	460	100.0%

We also compared the nonresponse and response cases by their wave 1 characteristics. As seen in Table 3, the nonresponse cases are more likely to have a male primary caregiver ($p<0.1$), and the head of household tends less likely to have a bachelor's degree ($p<0.1$) or being employed ($p<0.05$). These nonresponse households are more likely to live in rental HDB flats ($p<0.1$) and less likely to live in HDB 5-room flats. These households tend to have a family income fall in the lowest quartile ($p<0.05$), and locate in the West planning region ($p<0.1$). At the child level, nonresponse children are more likely to be born in low birth weight ($p<0.05$) and have an absent mother ($p<0.05$).

Table 3. SG LEADS W2 Response and Nonresponse Sample by Wave 1 Characteristics (weighted)

	nonresponse	response	Total	P value
Household level				
Head of household's age	39.8	39.3	39.4	
Head of household is male	90.7%	88.0%	88.4%	
head has a spouse living in the HH	95.9%	95.9%	95.9%	
PCG is male	4.6%	3.8%	3.9%	+
Head of household's race				
Chinese	64.5%	67.5%	67.1%	
Malay	15.8%	14.1%	14.3%	
Indian	15.4%	13.1%	13.4%	
Others	4.3%	5.2%	5.1%	
Head of household's education				
secondary and below	26.6%	23.4%	23.8%	
post-secondary	31.5%	29.1%	29.4%	
university and above	41.9%	47.4%	46.7%	+
Head of household's employment status				
working	90.8%	94.3%	93.9%	*

housewife/homemaker	4.9%	3.6%	3.8%	
other-not working	4.4%	2.0%	2.3%	
Housing type and homeownership				
Rental HDB Flats	6.6%	4.6%	4.9%	+
Owned HDB 1- and 2-Room Flats	1.1%	0.6%	0.7%	
Owned HDB 3-Room Flats	12.4%	11.6%	11.7%	
Owned HDB 4-Room Flats	36.1%	36.4%	36.3%	
Owned HDB 5-Room/Executive Flats	22.3%	28.5%	27.7%	*
Owned/rental Condominiums & Landed Properties	21.6%	18.2%	18.7%	
Income Quartile				
incomeQ1_lowest	28.9%	25.0%	25.5%	*
incomeQ2	24.2%	25.8%	25.6%	
incomeQ3	22.2%	26.3%	25.8%	
incomeQ4_highest	24.7%	22.9%	23.2%	
Planning region				
Central	21.3%	18.9%	19.2%	
East	11.1%	13.5%	13.2%	
North	10.9%	15.4%	14.8%	+
North-East	36.5%	28.2%	29.3%	+
West				
N	460	3,016	3,476	

Child level				
Age	3.0	3.2	3.2	
Boy (1=yes)	50.5%	51.2%	51.1%	
Child has chronic conditions (1=yes)	7.7%	6.2%	6.4%	
Low birth weight (1=yes) a	12.8%	8.3%	8.9%	*
Absent father (1=yes)	2.2%	2.7%	2.6%	
Absent mother (1=yes) b	0.8%	0.2%	0.3%	*
N	653	4,352	5,005	

* $p<0.05$, + $p<0.1$

a there are 914 missing values in low birth weight; b there are only 31 children who have an absent mother

The unweighted response rates by planning region and planning area are also provided in Table 4 and Table 5. As seen, the overall response rates in each planning region are between 84% to 89%, with the North-East having the lowest response rates. A breakdown of the response rates by planning area is shown in Table 5.

Table 4. Unweighted HH-level Cumulative Response Rate by Planning Region

planning region	W1	W2 complete	RR by W1 planning region (ascending)	# of incomplete households
North-East	864	721	83.5%	143
Central	680	591	86.9%	89
East	417	362	87.1%	55

West	944	834	88.3%	110
North	571	508	89.0%	63
total	3,476	3,016	86.8%	460

Table 5. HH-level Cross-sectional Response Rates by Planning Area

planning area	W1	W2 complete	RRs by W1 planning area (ascending)	# of incomplete households
(Z7) ANG MO KIO	1	0	0.0%	1
(Z1) BUKIT TIMAH	2	1	50.0%	1
NOVENA	38	28	73.7%	10
RIVER VALLEY	4	3	75.0%	1
ANG MO KIO	167	131	78.6%	36
BUKIT TIMAH	24	19	79.2%	5
TANGLIN	5	4	80.0%	1
MARINE PARADE	26	21	80.8%	5
PUNGGOL	282	228	80.9%	54
SERANGOON	49	41	83.7%	8
TOA PAYOH	113	96	85.0%	17
JURONG EAST	71	61	85.9%	10
TAMPINES	172	148	86.0%	24
PASIR RIS	96	83	86.5%	13
BUKIT PANJANG	167	145	86.8%	22
JURONG WEST	261	227	87.0%	34
SENGKANG	224	195	87.1%	29
BISHAN	31	27	87.1%	4
QUEENSTOWN	113	99	87.6%	14
BEDOK	147	129	88.4%	18
YISHUN	260	231	88.8%	29
CLEMENTI	81	72	88.9%	9
WOODLANDS	199	177	88.9%	22
BUKIT MERAH	145	129	89.0%	16
GEYLANG	74	66	89.2%	8
SEMBAWANG	112	100	89.3%	12
HOUGANG	141	126	89.4%	15
OUTRAM	19	17	89.5%	2
CHOA CHU KANG	212	190	89.6%	22
BUKIT BATOK	152	139	91.4%	13
KALLANG	74	69	93.2%	5
NEWTON	4	4	100.0%	0
ROCHOR	8	8	100.0%	0
SIMEI	2	2	100.0%	0
Total	3,476	3,016	82.3%	185

2. Cumulative response rates

As a statistical measure of panel retention (or the complement, panel attrition), estimates of Cumulative Response Rates can take several forms. This document introduces the unweighted cumulative response rates and weighted cumulative response rates. unweighted cumulative response rates are the ratio in which the numerator is the unweighted count of W1 sample households/persons responding at Wave 2 and the denominator is the unweighted count of W1 sample households /persons alive at Wave 2 (Heeringa, Chang and Johnson, 2018). Below is the calculation of the unweighted response rates at the household and the child level:

2.1 Unweighted cumulative response rates (UCCRs):

Household level

$$UCRR(t)\_HH = \frac{R_t}{N_{wave1} - MX_t}$$

Where:

R_t =the unweighted count of Wave1 sample households responding at Wave t;

$N_{wave1=}$the unweighted count of Wave 1 sample households (N=3,477); and

MX_t= cumulative total of households with <u>no alive</u> Wave 1 sample children at Wave t.

Child level

$$UCRR(t)\_child = \frac{r_t}{n_{wave1} - mx_t}$$

Where:

r_t =the unweighted count of Wave1 sample children responding at Wave t;

$n_{wave1=}$the unweighted count of Wave 1 sample children (N=5,006); and

mx_t= the Wave t cumulative total of deaths of Wave1 sample children

It is worth mentioning that the Wave 2 cross-sectional response rate is same as the wave 2 Unweighted Cumulative Response Rates since both are measuring the percentage of successful re-interviews in of Wave 1 households in Wave 2. From Wave 3 and onwards, these two would be different.

UCRRs

In Wave 2, one household reported a death of sample children after Wave 1. Therefore, at the household level, there is 1 ineligible household, with 1 ineligible child at the child level.

Table 6. Wave 2 unweighted cumulative response rates (UCCRs)

	Household level	Child level
Total number in our sample	3,476	5,005
Wave 2 completions	3,016	4,352
Ineligible cases	1	1
UCRRs	3016/ (3476-1) =86.8%	4352/ (5005-1) =87.0%

2.2 Weighted cumulative response rates (WCCRs):

To account for the different response rates by subgroups we calculated the weighted response rates. The weighted cumulative response rates are defined as below:

$$WCRR(t) = \frac{\widehat{N}_{t,r}}{\hat{S}_{t,r}} = \frac{\sum_i W_{i,wave1} * I_{i\epsilon r(t)}}{\sum_i W_{i,t} * I_{i\epsilon r(t)}}$$

$\widehat{N}_{t,r}$ =the weighted estimate of the count of the Wave1 study population "represented" by Wave1 sample persons responding at Wave t;

$\hat{S}_{t,r}$=the weighted estimate of the count of the Wave1 study population members alive at Wave t;

i = indexes the individual Wave1 sample persons (n=5,006)

$I_{i\epsilon r(t)}$=indicator that Wave1 sample person i is a SG LEADS respondent at Wave t,

   = 1 if respondent at Wave t, 0 otherwise;

$W_{i,wave1}$ =Wave 1 base sampling weight for Wave 1 sample person i;

$W_{i,t}$=Wave t SG LEADS longitudinal individual weight for Wave1 sample person i, includes mortality and nonresponse adjustments at and prior to Wave t.

In Wave 2 study, we have completed data collection from 3,016 households and 4,352 children. Using Wave 1 raw weights, the WCRRs at the household level and child level is listed below:

Household level WCRRs: 87.1%

Child level WCRRs: 87.1%

Table 7. Weighted HH-level Cumulative Response Rates by Wave 1 Dwelling Types.

Wave 1 dwelling type	(A unweighted count by Wave1 housing types	(B) Wave 2 respondents by Wave 1 housing type	(C) **weighted** count by Wave1 housing types	(D) **Weighted** count of Wave 2 respondents by Wave 1 housing type	**WCRRs** at the household level by Wave 1 housing type (C)/(D)
HDB 1- and 2-Room flats	388	313	7,655	6,197	80.9%
HDB 3-Room flats	957	827	25,002	21,540	86.2%
HDB 4-Room flats	1,097	962	76,015	66,787	87.2%
HDB 5-Room flats	550	493	58,427	52,316	89.5%
Condominium	428	376	32,441	27,386	84.4%
Landed Properties	56	45	6,056	5,350	88.3%
Total	3,476	3,016	206,220	179,599	87.1%

Reference

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