

Singapore Longitudinal Early Development Study (SG LEADS)



Panel Survey Wave 1

Technical Report 1

Calculation of Response Rate in SG LEADS Wave 1

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1. Sample design of SG LEADS

Singapore Longitudinal EARly Development Study (SG LEADS) surveys Singapore children aged under 7 and their primary caregivers. The sample frame is addresses with at least one Singapore resident aged under 7 (the child is a Singapore citizen or permanent resident). The addresses distributes across the 5 planning regions and 55 planning areas of Singapore. In Wave 1 survey, 5,005 children in 3,476 households have been successfully interviewed.

The interviewers are instructed to visit the addresses and record the outcome for every visit (refer to Figure 1 below for types of outcome). For non-contact addresses, the interviewers need to pay 5 visits in different time slots in different days across weeks.

2. Types of outcome code and response rates

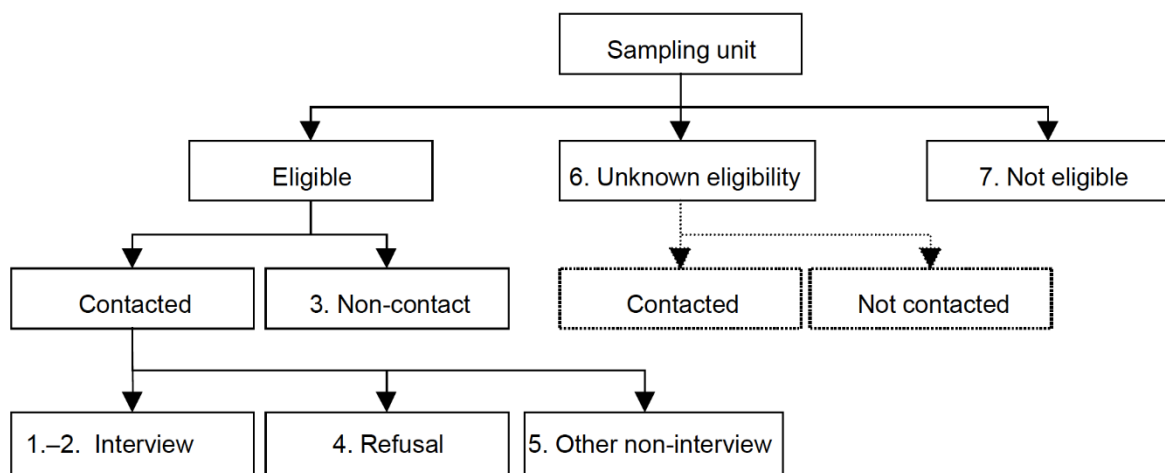


Figure 1: The hierarchical process of establishing survey outcomes

Source: Lynn et. al., (2003)

The **response rate** is defined as the number of completed interviews divided by the number of eligible cases.

There are 7 types of outcomes for the cases as shown in Figure 1.

- 1) **Complete interview (I)**
- 2) **Partial interview (P)**
- 3) **Non-contact (NC)** (eligible)
 - a. Not able to contact anybody in the HH (able to identify the eligibility from some ways, e.g., information from the neighbors, see kids' shoes or baby carriage)
 - b. Not able to contact the selected respondent (e.g., the child and parents are overseas during the whole period of survey).
- 4) **Refusal (R)**
- 5) **Other non-interview (O)** (eligible, contacted) (e.g. non-participation because of illness or language)
- 6) **Unknown eligibility (UE)** (both contacted and non-contact)

Three ways to deal with these cases (Phillips et al., 2017):

- a. Assume all non-respondents are eligible
 - b. Estimate the probability of non-respondent eligibility through the observed eligibility rate.
 - c. Use other records to know that all non-respondents are eligible.
- 7) **Not eligible (NE)** : households which are ineligible, or out of scope (e.g., the child is older than 7 years or none of the child in the selected household is not a Singapore Citizen or permanent resident, or the address is vacant or a vacation home) are excluded when calculating response rates.

American Association for Public Opinion Research (AAPOR) provides six methods of calculating the response rates (RR) (AAPOR, 2016).

I: full interviews

P: partial interviews

R: refusals

NC: non-contact

O: others

UE: unknown eligibility

e(UE): Estimated proportion of cases of unknown eligibility that are eligible

- RR1 and RR2 assume that all non-respondents are eligible

$$RR1 = I / (I + R + NC + O + UE)$$

$$RR2 = (I + P) / (I + P + R + NC + O + UE) \text{ (include partial interviews)}$$

- RR3 and RR4 use the estimated eligibility

$$RR3 = I / (I + R + NC + O + e(UE))$$

$$RR4 = (I + P) / (I + P + R + NC + O + e(UE)) \text{ (include partial interviews)}$$

- RR5 and RR6 exclude the non-respondents

$$RR5 = I / (I + R + NC + O)$$

$$RR6 = (I + P) / (I + P + R + NC + O) \text{ (include partial interviews)}$$

Following the China Family and Panel Study (CFPS 2010), RR1, RR3, RR5(exclude partial interviews) are calculated. As the RR1 and RR5 either underestimate or overestimate the response rates, the researcher suggests the RR3 to be used. For the RR3, the estimation was done in several steps (Sun, 2012. p9):

- a) Define the conditions of an ineligible case. In SG LEADS, the following conditions are treated as not eligible:

- the address is valid (invalid address: code 500);
- the house is vacant or under renovation (invalid home: code 900);
- none of the child in the household is a Singapore citizen or permanent resident (ineligible nationality: code 410);
- the child is older than 7 years (ineligible child: code 400).

b) Calculate the percentage according to the four codes in step a) using count of each outcome code for sample after substitution (C1 and C2 in Table 1) .

- percentage of valid address: $e1=1-$ (number of invalid address / sample size - unvisited address)

$$e1 = 1 - \frac{14}{6575} = 99.79\%$$

- percentage of valid home: $e2=1-$ (number of invalid home / number of valid address)

$$e2 = 1 - \frac{118}{(6575-14)} = 98.20\%$$

- percentage of valid household (nationality): $e3=1-$ (number of non-Singaporean or non-PR / number of valid home with known nationality)

$$e3 = 1 - \frac{46}{(6575-14-118)-(1148)} = 99.13\%$$

- percentage of valid household (eligible child): $e4=1-$ (number of HH without eligible child / number of valid household with eligible child)

$$e4 = 1 - \frac{792}{(6575-14-118-46)-(1148)} = 84.91\%$$

Table 1. outcome code of SG LEADS sample (updated on 15 December 2021)

	outcome codes	C1: Sample after substitution	C2: n
complete interview (I)	110 Proceed with survey	3,476	3,476
Refusal ®	200 Refusal	981	981
Non-contact (NC)	300 Visited Household (No one at home)	889	1148
	310 Visited Household (Respondents is busy / Not at home)	15	
	700 Restricted access (condo)	244	
Ineligible (IE)	400 Ineligible Household (No kids aged 0-6 years)	792	955
	410 Ineligible Household (No Singaporean Citizen / PR)	46	

	500 Invalid Address (Demolished / En bloc / No such Address)	14	
	900 Others please specify	118	
Total		6575	6575

c) estimate the number of eligible cases among the cases with unknown eligibility (eUE)

$eUE = \text{unvisited Household} * e1 * e2 * e3 * e4 + \text{non-contact household with unknown residential status}^1 * e2 * e3 * e4 + \text{household with unknown nationality} * e3 * e4 + \text{household with valid nationality but unknown information on child} * e4$

- In SG LEADS field work, interviewers have visited all the addresses in the sample frame, therefore, the eligibility of each address in the sample frame is known.
- cases with unknown eligibility (code 900 + code 300 + code 700) have been visited, but the residential status, nationality of the residents and the age of the child (if any) are unknown, therefore the calculation is:

$$eUE = 1148 * 98.20\% * 99.13\% * 84.91\% = 949$$

Among the cases with unknown eligibility, $(1148 - 949) = 199$ are ineligible. roughly, 17% $(199/1148)$ of households are ineligible. Given there are still a large number of non-contact households even after 5 visits in different time slots in different days across weeks, it is reasonable to assume a higher ineligibility rate. If we assume that 25% of the households with unknown eligibility are ineligible, the number is 287.

Table 2. Types of Response Rates of SG LEADS

	Assume <u>all</u> cases with unknown eligibility are eligible	Assume <u>proportion of</u> cases with unknown eligibility are ineligible (25%)	Assume <u>none</u> of the cases with unknown eligibility are eligible
Response rates	RR1	RR3	RR5

sample after substitution (treat the substitutes as the original sample) (use C1 and C2 in table 1)

Completed interviews: 3,476

Number of Ineligible after substitution: 949

Unknown eligible: 1148

¹ Whether anyone lives in the address (e.g., whether vacant home, or whether the place is under renovation).

$$RR1 = 3476 / (6575 - 949) = 61.8\%$$

$$RR3 = 3476 / (6575 - 949 - 0.25 * 1148) = 65.1\%$$

$$RR5 = 3476 / (6575 - 949 - 1148) = 77.6\%$$

Therefore, if we use RR3, the response rate is 65.1% for sample after substitution.

Reference

AAPOR. 2016. “*Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. 9th edition.*” Access through:

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Phillips, A. W., Friedman, B. T., & Durning, S. J. (2017). How to calculate a survey response rate: Best practices. *Academic Medicine*, 92(2), 269.

Sun, Y., (2012) . “*China Family and Panel Study 2010 baseline survey sample contact status*”(中国家庭动态跟踪调查 2010年基线调查样本联系情况). Access through: <http://www.iss.pku.edu.cn/cfps/docs/20180927133037660777.pdf>