Survey data:
Technical documentation

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Introduction

This document describes the survey responses data table. This table includes the original survey responses data in addition to several columns that describe, summarise or attempt to clean some of the responses. Files currently available relating to the survey data are:

- *SERL_survey_data_v01.csv*: the survey data collected during the SERL pilot study - the first phase of recruitment, described in this document

- *SERL_survey_responses_summary_v01.csv*: a report on the number of each type of response to each question in the survey, including information about response rates.

This document is structured as follows. First we describe the data collection process. The next section details the survey response columns and the meaning of the values they can take, the final section describes the remaining data fields.

Data collection

The SERL pilot study recruited the first wave of participants during September and October 2019. 18,000 households in central and southern England and in Wales were sent up to 4 letters inviting them to participate in SERL. All mailings encouraged sign-up online, and some of the mailings provided a paper consent form and survey to sign up by post. The consent form giving access to their smart meter data was mandatory for participation. Completion of the survey was encouraged but not required.

The survey dataset contains 1673 rows (one per participant who started the survey) and 155 columns.

Survey data fields: question responses

Table 1 describes:

- *Survey field:* the survey question fields in the survey data table whose number corresponds to the question numbers in the survey. In some cases the questions come in multiple parts, in which case they have names such as "A13_01" and "A13_02" or "A1501" and "A1502". Some questions allowed for multiple options to be selected, in which case each option has its own column in the table with possible answers yes (selected) and

no (not selected). For example question A3 has ten options, with columns named A301 - A310. There is also a box for participants to write free text. In this case that option is called "A3_Other".

- *Approximate question:* The corresponding survey question (sometimes with approximate wording for brevity). See the electronic copy of the paper survey for the exact question wording and options.

- *Freetext option:* a binary TRUE/FALSE indicating whether participants could write free text as part of their response to the question.

- *Possible values:* the pre-defined values that code different response options (where the responses are pre-defined). If free text is available then this may be "NA" (such as for *A3_Other*) or the free text response may not be listed (such as for *A5* which asks for the temperature households set their thermostat to).

- *Value meanings:* the response option in the survey corresponding to each value code.

Table 1: Questions, options and possible responses to all survey questions

Survey field	Approximate question	Freetext option	Possible values	Value meanings
L1	Please select your language preference	FALSE	-9	Not applicable
		FALSE	1	English
		FALSE	2	Cymraeg
A1	Before we contacted you about this study, did you know you had a smart meter?	FALSE	-2	No answer
		FALSE	1	Yes
		FALSE	2	No
A2	Having a smart meter has affected the way you use gas or electricity?	FALSE	-9	Not applicable
		FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	A lot
		FALSE	2	Some

Survey field	Approximate question	Freetext option	Possible values	Value meanings
		FALSE	3	A little
		FALSE	4	Not at all
A301	Type of central heating - None	FALSE	0	No
		FALSE	1	Yes
A302	Type of central heating - gas, gas boiler	FALSE	0	No
		FALSE	1	Yes
A303	Type of central heating - electric storage heaters	FALSE	0	No
		FALSE	1	Yes
A304	Type of central heating - electric radiators	FALSE	0	No
		FALSE	1	Yes
A305	Type of central heating - other electric	FALSE	0	No
		FALSE	1	Yes
A306	Type of central heating - oil	FALSE	0	No
		FALSE	1	Yes
A307	Type of central heating - solid fuel	FALSE	0	No
		FALSE	1	Yes
A308	Type of central heating - biomass	FALSE	0	No
		FALSE	1	Yes
A309	Type of central heating - district or community	FALSE	0	No
		FALSE	1	Yes
A310	Type of central heating - other	FALSE	0	No
		FALSE	1	Yes
A3_Other		TRUE		

Survey field	Approximate question	Freetext option	Possible values	Value meanings
A401	Central Heating controls - timer	FALSE	-9	Not applicable
		FALSE	0	No
		FALSE	1	Yes
A402	Central Heating controls - temperature setting	FALSE	-9	Not applicable
		FALSE	0	No
		FALSE	1	Yes
A403	Central Heating controls - smart device	FALSE	-9	Not applicable
		FALSE	0	No
		FALSE	1	Yes
A404	Central Heating controls - manually	FALSE	-9	Not applicable
		FALSE	0	No
		FALSE	1	Yes
A405	Central Heating controls - none of the above	FALSE	-9	Not applicable
		FALSE	0	No
		FALSE	1	Yes
A406	Central Heating controls - dont know	FALSE	-9	Not applicable
		FALSE	0	No
		FALSE	1	Yes
A5	Temperature controller set at for late afternoons or evenings	TRUE	-9	Not applicable
		TRUE	-2	No answer
		TRUE	-1	Don't know / Doesn't apply
A6	Does your household use any standalone heaters	FALSE	-2	No answer
		FALSE	1	No
		FALSE	2	Yes

Survey field	Approximate question	Freetext option	Possible values	Value meanings
A7	Do any of your standalone heaters have their own source of power	FALSE	-9	Not applicable
		FALSE	-2	No answer
		FALSE	1	Yes, some or all have their own source of fuel (e.g. logs, coal, bottled gas, etc.)
		FALSE	2	No, all are powered by mains gas or electric
A8	In very cold winter weather, how often are these standalone heaters typically used	FALSE	-9	Not applicable
		FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Daily
		FALSE	2	Most days
		FALSE	3	Rarely - only if I/we really have to
		FALSE	4	Never
		FALSE	5	Varies - depends on temperature or other reasons
A901	Do you adjust your heating - When is is especially cold	FALSE	0	No
		FALSE	1	Yes
A902	Do you adjust your heating - Because of children, infants, babies	FALSE	0	No
		FALSE	1	Yes
A903	Do you adjust your heating - Visitors	FALSE	0	No
		FALSE	1	Yes
A904	Do you adjust your heating - Pets	FALSE	0	No
		FALSE	1	Yes
A905	Do you adjust your heating - Stress	FALSE	0	No
		FALSE	1	Yes

Survey field	Approximate question	Freetext option	Possible values	Value meanings
A906	Do you adjust your heating - Working at home	FALSE	0	No
		FALSE	1	Yes
A907	Do you adjust your heating - None of these	FALSE	0	No
		FALSE	1	Yes
A10	How do you adjust heating controls when house in unoccupied	FALSE	-2	No answer
		FALSE	1	Always
		FALSE	2	Very often
		FALSE	3	Quite often
		FALSE	4	Not very often
		FALSE	5	Never
		FALSE	6	Not applicable, cannot do this
A11	During the winter, are there living spaces not normally heated	FALSE	-2	No answer
		FALSE	1	Yes
		FALSE	2	No
A12_Shower_DK	Shower water heated (Dont Know)	FALSE	0	No
		FALSE	1	Yes
A12_Shower_EH	Shower water heated (Electrical Heater)	FALSE	0	No
		FALSE	1	Yes
A12_Shower_GB	Shower water heated (Gas Boiler)	FALSE	0	No
		FALSE	1	Yes
A12_Shower_NA	Shower water heated (Not applicable)	FALSE	0	No
		FALSE	1	Yes
A12_Shower_Other	Shower water heated (Other)	FALSE	0	No
		FALSE	1	Yes

Survey field	Approximate question	Freetext option	Possible values	Value meanings
A12_Shower_SWH	Shower water heated (Solar Water Heater)	FALSE	0	No
		FALSE	1	Yes
A12_Taps_DK	Tap water heated (Dont Know)	FALSE	0	No
		FALSE	1	Yes
A12_Taps_EH	Tap water heated (Electrical Heater)	FALSE	0	No
		FALSE	1	Yes
A12_Taps_GB	Tap water heated (Gas Boiler)	FALSE	0	No
		FALSE	1	Yes
A12_Taps_NA	Tap water heated (Not applicable)	FALSE	0	No
		FALSE	1	Yes
A12_Taps_Other	Tap water heated (Other)	FALSE	0	No
		FALSE	1	Yes
A12_Taps_SWH	Tap water heated (Solar Water Heater)	FALSE	0	No
		FALSE	1	Yes
A13_01	How often do you .. Switch off lights	FALSE	-2	No answer
		FALSE	1	Always
		FALSE	2	Very often
		FALSE	3	Quite often
		FALSE	4	Not very often
		FALSE	5	Never
		FALSE	6	Not applicable, cannot do this
A13_02	How often do you .. Put on more clothes when cold	FALSE	-2	No answer
		FALSE	1	Always
		FALSE	2	Very often

Survey field	Approximate question	Freetext option	Possible values	Value meanings
		FALSE	3	Quite often
		FALSE	4	Not very often
		FALSE	5	Never
		FALSE	6	Not applicable, cannot do this
A14	How much effort do you say your household makes to limit energy usage	FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	A great deal of effort
		FALSE	2	Some effort
		FALSE	3	A little effort
		FALSE	4	No effort at all
A1501	How often will your household open the windows .. on a typical cold day	FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Always
		FALSE	2	Very often
		FALSE	3	Quite often
		FALSE	4	Not very often
		FALSE	5	Never
A1502	How often will your household open the windows .. on a typical warm day	FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Always
		FALSE	2	Very often
		FALSE	3	Quite often
		FALSE	4	Not very often
		FALSE	5	Never

Survey field	Approximate question	Freetext option	Possible values	Value meanings
A1601	Considering replacing or adding heating or energy- Not considering	FALSE	0	No
		FALSE	1	Yes
A1602	Considering replacing or adding heating or energy- Not applicable	FALSE	0	No
		FALSE	1	Yes
A1603	Considering replacing or adding heating or energy- Gas Boiler	FALSE	0	No
		FALSE	1	Yes
A1604	Considering replacing or adding heating or energy- Solar panels for electricity	FALSE	0	No
		FALSE	1	Yes
A1605	Considering replacing or adding heating or energy- Solar water heating	FALSE	0	No
		FALSE	1	Yes
A1606	Considering replacing or adding heating or energy- Wood or fuel burner	FALSE	0	No
		FALSE	1	Yes
A1607	Considering replacing or adding heating or energy- Heat pump	FALSE	0	No
		FALSE	1	Yes
A1608	Considering replacing or adding heating or energy- Micro combined HPU	FALSE	0	No
		FALSE	1	Yes
A1609	Considering replacing or adding heating or energy- Wind turbine	FALSE	0	No
		FALSE	1	Yes
A1610	Considering replacing or adding heating or energy- other specify	FALSE	0	No
		FALSE	1	Yes
A16_Other	Considering replacing or adding heating or energy- other	TRUE		

Survey field	Approximate question	Freetext option	Possible values	Value meanings
B1	What type of accomodation do you live in	FALSE	-2	No answer
		FALSE	1	detached
		FALSE	2	semi detached
		FALSE	3	terraced (including end terrace)
		FALSE	4	in a purpose-built block of flats or tenement
		FALSE	5	part of a converted or shared house (including bedsits)
		FALSE	6	in a commercial building (e.g. in an office building, hotel or over a shop)
B2	Is your accomodation self contained	FALSE	-2	No answer
		FALSE	1	Yes, all the rooms are behind a door that only my household can use
		FALSE	2	No
B3	How many other households do you share with	TRUE	-9	Not applicable
		TRUE	-2	No answer
B4	Do you own or rent this accomodation	FALSE	-2	No answer
		FALSE	1	Own it outright / buying it with a mortgage/loan
		FALSE	2	Part own and part rent (shared ownership)
		FALSE	3	Privately
		FALSE	4	From council (local authority) or housing association
		FALSE	5	Live here rent free
B5	How many rooms are available for use by this household	TRUE	-2	No answer
		TRUE	-4	Unusable

Survey field	Approximate question	Freetext option	Possible values	Value meanings
B6	How many of these rooms count as bedrooms	TRUE	-2	No answer
		TRUE	-4	Unusable
B7	During the cold winter weather can you keep comfortably warm	FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Yes
		FALSE	2	No
B8	Do you have problems with condensation, damp or mould	FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Yes
		FALSE	2	No
B9	When was your accomodation built	FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Before 1900
		FALSE	2	1900 to 1929
		FALSE	3	1930 to 1949
		FALSE	4	1950 to 1975
		FALSE	5	1976 to 1990
		FALSE	6	1991 to 2002
		FALSE	7	2003 onwards
B1001	Appliances in accomodation - Kitchen - Electric Oven	FALSE	0	No
		FALSE	1	Yes
B1002	Appliances in accomodation - Kitchen - Gas Oven	FALSE	0	No
		FALSE	1	Yes

Survey field	Approximate question	Freetext option	Possible values	Value meanings
B1003	Appliances in accomodation - Kitchen - Electric Hob	FALSE	0	No
		FALSE	1	Yes
B1004	Appliances in accomodation - Kitchen - Gas Hob	FALSE	0	No
		FALSE	1	Yes
B1005	Appliances in accomodation - Kitchen - Dishwasher	FALSE	0	No
		FALSE	1	Yes
B1006	Appliances in accomodation - Kitchen - Fridge or fridge-freezer	FALSE	0	No
		FALSE	1	Yes
B1007	Appliances in accomodation - Kitchen - Separate stand alone freezer	FALSE	0	No
		FALSE	1	Yes
B1008	Appliances in accomodation - Laundry - Combined clothes washer dryer	FALSE	0	No
		FALSE	1	Yes
B1009	Appliances in accomodation - Laundry - Washing machine	FALSE	0	No
		FALSE	1	Yes
B1010	Appliances in accomodation - Laundry - Tumble dryer	FALSE	0	No
		FALSE	1	Yes
B1011	Appliances in accomodation - Consumer electronics - Laptop, computer	FALSE	0	No
		FALSE	1	Yes
B1012	Appliances in accomodation - Consumer electronics - TV	FALSE	0	No
		FALSE	1	Yes
B1013	Appliances in accomodation - Cooling - all conditioning unit	FALSE	0	No
		FALSE	1	Yes
B1014	Appliances in accomodation - Cooling - cooling fan	FALSE	0	No
		FALSE	1	Yes

Survey field	Approximate question	Freetext option	Possible values	Value meanings
C1	How many people live in household	TRUE	-2	No answer
C2_Female_0_15	Females in houshold (0-15)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Female_16_24	Females in houshold (16-24)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Female_25_44	Females in houshold (25-44)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Female_45_64	Females in houshold (45-64)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Female_65_74	Females in houshold (65-74)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Female_75_84	Females in houshold (75-84)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Female_85_plus	Females in houshold (85+)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Male_0_15	Males in houshold (0-15)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Male_16_24	Males in houshold (16-24)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Male_25_44	Males in houshold (25-44)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Male_45_64	Males in houshold (45-64)	TRUE	-9	Not applicable
		TRUE	-2	No answer

Survey field	Approximate question	Freetext option	Possible values	Value meanings
C2_Male_65_74	Males in houshold (65-74)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Male_75_84	Males in houshold (75-84)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C2_Male_85_plus	Males in houshold (85+)	TRUE	-9	Not applicable
		TRUE	-2	No answer
C301	Working Status - Working 30 + hours per week	TRUE	-9	Not applicable
		TRUE	-2	No answer
C302	Working Status - Working less than 30 hours per week	TRUE	-9	Not applicable
		TRUE	-2	No answer
C303	Working Status - Not Working - long term sickness or disability	TRUE	-9	Not applicable
		TRUE	-2	No answer
C304	Working Status - Unemployed but seeking work	TRUE	-9	Not applicable
		TRUE	-2	No answer
C305	Working Status - Student	TRUE	-9	Not applicable
		TRUE	-2	No answer
C306	Working Status - Retired / at home / not seeking work	TRUE	-9	Not applicable
		TRUE	-2	No answer
C307	Working Status - Other	TRUE	-9	Not applicable
		TRUE	-2	No answer
C4	How many people in household hold a degree or higher qualification	TRUE	-2	No answer
		TRUE	-1	Don't know / Prefer not to say
C5	Does household have plug in electric vehicle	FALSE	-2	No answer
		FALSE	-1	Don't know

Survey field	Approximate question	Freetext option	Possible values	Value meanings
		FALSE	1	Yes
		FALSE	2	No
C6	When does household charge electric vehicle at home	FALSE	-9	Not applicable
		FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Mostly overnight (8pm to 7am)
		FALSE	2	Mostly during the day (7am to 4pm)
		FALSE	3	Mostly in the evening (4pm to 8pm)
		FALSE	4	Varies - whenever it's needed
		FALSE	5	Not applicable, charging is not done at home (e.g. at work)
Collection_Method	Data collection method	FALSE	1	Online
		FALSE	2	Offline
D1	Age Group	FALSE	-9	Not applicable
		FALSE	-2	No answer
		FALSE	1	Under 18
		FALSE	2	18-24
		FALSE	3	25-44
		FALSE	4	45-64
		FALSE	5	65-74
		FALSE	6	75-84
		FALSE	7	85+

Survey field	Approximate question	Freetext option	Possible values	Value meanings
D2	Gender	FALSE	-9	Not applicable
		FALSE	-3	Prefer not to say
		FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Male
		FALSE	2	Female
		FALSE	3	In some other way
D3	Current Employment Status	FALSE	-9	Not applicable
		FALSE	-3	Prefer not to say
		FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Working (paid or unpaid): 30 hours a week or more
		FALSE	2	Working (paid or unpaid): less than 30 hours a week
		FALSE	3	Not working because of long-term sickness or disability
		FALSE	4	Unemployed but seeking work
		FALSE	5	A student
		FALSE	6	Retired/at home/not seeking work (including looking after the home or family)
		FALSE	7	Other

Survey field	Approximate question	Freetext option	Possible values	Value meanings
D4	How well do you manage financially	FALSE	-3	Prefer not to say
		FALSE	-2	No answer
		FALSE	-1	Don't know
		FALSE	1	Living comfortably
		FALSE	2	Doing alright
		FALSE	3	Just about getting by
		FALSE	4	Finding it quite difficult
		FALSE	5	Finding it very difficult

Added and derived survey data fields

In addition to the data fields described in the table above, the survey data also contains the following columns. Some of these are participant information columns, some have been computed from the survey response data to aid analysis, and some which attempt to clean the survey data for certain questions.

Table 3: Data field for those fields that are not survey question responses and those that are calculated from survey question response fields.

Field	Description	Class	Example value
PUPRN	Pseudonymised participant identifier	character	1VUXXXF1
Cell	Pilot study test cell in 1:12	integer	7
Collection_method	1 if survey completed online, 2 if offline	integer	1
IMD_quintile	Index of Multiple Deprivation quintile (1 is most deprived, 5 is least deprived	integer	2
Region	Region in GB	character	East Midlands
LSOA	Lower Super Output Area in GB	character	E01015916
A3_sum	Number of response options selected for question A3 (ie the values of A301 + A302 + .. + A310)	integer	2
A3_err	A3 error flag: TRUE if 'No central heating' and some other type of central heating specified. Otherwise FALSE	logical	FALSE
A301_edit	TRUE if A301 was edited, otherwise FALSE	logical	FALSE
A4_sum	Number of response options selected for question A4 (ie the values of A401 + A402 + .. + A406)	integer	2
A4_err	A4 error flag: TRUE if 'none of these' was selected along with another option, otherwise FALSE	logical	FALSE
A401_edit	TRUE if A401 was edited, otherwise FALSE	logical	FALSE
A5_edit	TRUE if A5 response was very high and therefore assumed to be in Fahrenheit and converted to Celsius, otherwise FASLE.	logical	FALSE
A9_sum	Number of response options selected for question A9 (ie the values of A901 + A902 + .. + A907)	integer	4

Field	Description	Class	Example value
A12_Taps_sum	Number of response options selected for question A12 (taps)	integer	0
A12_Shower_sum	Number of response options selected for question A12 (shower)	integer	1
A16_sum	Number of response options selected for question A16 (ie the values of A1601 + A1602 + .. + A1610)	integer	2
A16_edit	TRUE if any A16 responses were edited, otherwise FALSE. If 'not applicable' or 'Not considering any changes' were selected, any other response was removed (except for 'other' which was kept to prevent deleting potentially useful notes).	logical	FALSE
B5_err	B5 error flag: TRUE if B5 < B6 (Number of rooms less than number of bedrooms) or if B5 == 0 (No rooms)	logical	FALSE
B6_err	B6 error flag: TRUE if B5 < B6 (Number of rooms less than number of bedrooms)	logical	FALSE
B10_sum	Number of response options selected for question B106 (ie the values of B1001 + B1002 + .. + B1014)	integer	12
C1_new	C1 after error correction.	integer	1
C2_sum	Number of response options selected for question C2 (ie the values all male and female age categories). Should be equal to C1.	numeric	4
C2_sum_diff	C2_sum - C1 (total number of occupants across the age and sex categories minus number of reported occupants	numeric	0
C2_error	C2 error flag: TRUE if C2_sum_diff is not equal to 0 (and both questions were answered) and if there isn't an obvious error easily corrected (case by case basis).	logical	FALSE
C2_tot_child	Sum of males and females aged 0-15 years.	numeric	1
C2_tot_adult	Sum of males and females aged 16+ years.	numeric	1
C2_tot_65_plus	Sum of males and females aged 65+ years.	numeric	1
All_65_plus	TRUE if all occupants are 65+, FALSE if any under 65, NA if unable to determine	numeric	TRUE
C3_sum	Number of response options selected for question C3 (ie the values of C301 + C302 + ... + C307	numeric	4

Field	Description	Class	Example value
C3_sum_diff	C3_sum - C2_tot_adult (total number of adults across the working categories minus number of reported adults across both sexes.	numeric	0
C3_error	C3 error flag: TRUE if C3_sum_diff is not equal to 0 (and both questions were answered) and if there isn't an obvious error easily corrected (case by case basis).	logical	FALSE
C3_edit	TRUE if C3 response was edited in order to correct obvious mistakes, otherwise FALSE	logical	FALSE
None_working	TRUE if no one in the working categories, FALSE if anyone in the working categories, NA if not able to determine	numeric	FALSE
C4_error	C4 error flag: TRUE if C4 > C1_new and C1 was answered (i.e. more occupants with a qualification than occupants.	logical	FALSE
D1_new	Backfill of D1 with C1 data since D1 was optional if the participant had already given their data as a single occupant when reporting for the household (of 1). See D1 description for details.	numeric	5
D2_new	Backfill of D2 with C2 data since D2 was optional if the participant had already given their data as a single occupant when reporting for the household (of 1). See D2 description for details.	numeric	2
D3_new	Backfill of D3 with C2 data since D3 was optional if the participant had already given their data as a single occupant when reporting for the household (of 1). See D3 description for details.	numeric	1