



power to
change

business in
community
hands

Empowering Places?

Measuring the impact of community businesses at neighbourhood level

Technical Appendix

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1. Survey design

Power to Change commissioned Kantar to run hyperlocal versions of the Department for Digital, Culture, Media and Sport (DCMS) Community Life Survey (CLS) in six specific locations. Each of these locations covered the operational area of one catalyst organisation seeking to increase opportunities to reduce poverty and inequality through community businesses:

- Abram Ward Community Charity in Wigan
- Action for Business in Bradford
- B-Inspired in Leicester
- Centre4 in Grimsby
- RIO in Plymouth
- Wharton Trust in Hartlepool.

For the purpose of the survey, each organisation's operational area was defined with reference to the Office for National Statistics (ONS) Census Output Area (OA) geography and was formed of a contiguous combination of whole OAs (the smallest unit in the ONS hierarchy). The boundaries were agreed with each organisation in 2018 and replicated in 2020.

The number of OAs in an operational area varied from 19 (Wharton Trust, in Hartlepool) to 50 (RIO, in Plymouth) and covered populations (as of 2011) ranging from 4,952 (Wharton Trust) to 19,983 (Action for Business, in Bradford). Table A.1 shows the number of OAs and the 2011 Census population for each operational area.

Table A.1: Size of each operational area

Operational area	Number of OAs	2011 Census population
Abram Ward Community Charity, Wigan	42	12,664
Action for Business, Bradford	46	19,983
B-Inspired, Leicester	45	15,585
Centre4, NE Lincolnshire	39	11,769
RIO, Plymouth	50	13,478
Wharton Trust, Hartlepool	19	4,952

2. Sampling of addresses

Within each operational area, Kantar drew a systematic random sample of addresses from the Royal Mail Postcode Address File, aiming for 300 completed questionnaires and maximum geographical dispersion. The number of addresses sampled in each operational area was calculated via a statistical method of response probability, using data from the 2018-20 CLS.

Table A.2: Address samples in each operational area

Operational area	Total sample of addresses
Abram Ward Community Charity	1,075
Action for Business, Bradford	1,598
B-Inspired	1,151
Centre4	1,314
RIO, Plymouth	924
Wharton Trust	1,202
Comparison sample for Action for Business	1,101

2.1 Sampling within addresses

At each address, all adults aged 16 plus were invited to complete the questionnaire, either online or on paper. A small minority of the sampled addresses will have contained more than one household (probably <3% although this share will have varied in an unknown fashion between operational areas). Multi-household addresses like this cannot be reliably identified in advance. Consequently, the 'sampled' household at each of these addresses was the household of whoever picked up the letter. This is unlikely to have caused meaningful sample bias.

2.2 Identification of comparison samples

Kantar identified comparison samples for each operational area from respondents in Quarter 1 and Quarter 2 (April to September 2020) of the CLS 2020-21 survey. There was one exception – the Action for Business operational area in Bradford – which required its own bespoke comparison sample. The original plan was to use the 2019-20 CLS whole-year dataset to identify comparison samples. However, there was a concern that the COVID-19 pandemic would make data collected in 2020 (the operational areas) different from data collected in 2019 (the CLS) in a way unrelated to the Empowering Places programme. Consequently, data was used from the first half of the CLS 2020-21 survey year – contemporary with the data collected in the operational areas – to source comparison samples. With one exception, the comparison sample is the subset of 2020 CLS respondents who live in the 10% of English neighbourhoods that are most similar to the operational area.

Kantar used lower-level Super Output Areas (LSOAs) as a proxy for neighbourhoods. There are 32,844 LSOAs in England and each contains an average of six OAs. They are smaller than the operational areas, which ranged in size from 19 to 50 OAs, and somewhat more homogeneous. However, the use of LSOAs as proxy neighbourhoods – rather than larger aggregations – ensures that the 10% most similar neighbourhoods to each operational area are genuinely similar in absolute and not just relative terms. A similarity score was computed for each LSOA in England with reference to each operational area.

The profile of each LSOA was represented by a set of six Census-derived ‘principal component’ scores, each reflecting a different aspect of that LSOA. One of these principal components is strongly correlated with the neighbourhood’s index of multiple deprivation, one is correlated with the proportion of accommodation units that are flats, one with the presence of students, one with the share of the population aged 65+, and two are correlated with different aspects of the ethnic mix.¹

These ‘principal component’ scores were also computed for each operational area as a population-weighted combination of the relevant LSOA scores. Kantar then calculated – for each LSOA in England – a Euclidean distance score relative to each operational area. The lower this score is, the more similar that LSOA is to the particular operational area.

¹ A statistical technique called PCA was used to form uncorrelated linear combinations (‘principal components’) of 42 LSOA-level Census proportions (e.g., % of 16-24s with degree-level qualifications). The first principal component accounts for as much variance as possible across the 42 input variables. Successive components explain the – progressively smaller – residual variance and are all (by design) uncorrelated with each other. These principal components were then ‘rotated’ using the varimax algorithm which seeks to minimise the number of input variables that have high correlations with each of the first f factors (f is user-specified but should explain a high percentage of the total variance; $f = 6$ in this case, explaining 77% of the total variance). The varimax rotation method simplifies interpretation compared to other rotation methods and compared to the initial (un-rotated) principal components.

$$\text{Euclidean distance score} = \sqrt{[(PC1_x - PC1_t)^2 + (PC2_x - PC2_t)^2 + (PC3_x - PC3_t)^2 + (PC4_x - PC4_t)^2 + (PC5_x - PC5_t)^2 + (PC6_x - PC6_t)^2]}$$

... where PC1x is the principal component score 1 for LSOA x and PC1t is the principal component score 1 for operational area t (etc.).

From this, a rank order of similarity was constructed, and the 10% most similar LSOAs for each operational area were identified and acted as the comparison sample.

The one exception is the Action for Business operational area in Bradford. This area is majority Asian (77 per cent in the 2011 Census) – predominantly of Pakistani ethnic heritage – and has few natural partners within a national sample. Consequently, Kantar identified the most similar 300 LSOAs in England (approximately 1 per cent of the total, instead of 10 per cent) and drew a supplementary bespoke comparison sample of 1,101 addresses from across these LSOAs, treating them in the same way as the addresses drawn from the six operational areas.

Table A.3 shows the size of each comparison sample (number of respondents) within Quarter 1 and Quarter (April to September 2020) of the CLS. Due to the latter’s disproportionate sample design, the size of each comparison sample varies somewhat between operational areas.

Table A.3: Comparison samples within the April to September 2020 Community Life Survey sample

Operational area	Respondents in comparison sample	Effective sample size due to weighting = $n(1+s2w)$, where mean $(w)=1$
Abram Ward Community Charity	326	272
Action for Business, Bradford	90 (in CLS) + 312 (bespoke sample) = 402	363
B-Inspired	455	341
Centre4	349	281
RIO, Plymouth	581	427
Wharton Trust	352	285

3. Fieldwork

The standard model for the Community Life Survey is to send two reminders, each a fortnight apart, but with a third reminder in reserve. In the second reminder, two paper questionnaires are included for a targeted subset of addresses. The probability that the second reminder will contain the paper questionnaires is a function of the address's (expected) online response rate:

- ◆ In the 40% of England with the lowest expected online response, 80% of second reminders include two paper questionnaires while the remainder do not.
- ◆ In the 20% of England with mid-level expected online response, just over half (57%) of second reminders include two paper questionnaires, while the remainder do not.
- ◆ In the 40% of England with the highest expected online response, 20% of second reminders include two paper questionnaires, while the remainder do not.

In total, 76% of the sampled addresses in the operational areas were designated to have paper questionnaires included in the second reminder, with this share varying from 60% (Abram Ward in Wigan) to 80% (Action for Business in Bradford, and B-Inspired in Leicester).

Table A.4: The use of paper questionnaires in each operational area

Operational area	Addresses designated to receive no paper questionnaires with second reminder	Addresses designated to receive two paper questionnaires with second reminder	Total sample of addresses
Abram Ward Community Charity	426	649	1,075
Action for Business, Bradford	314	1,284	1,598
B-Inspired	221	930	1,151
Centre4	315	999	1,314
RIO, Plymouth	229	695	924
Wharton Trust	264	938	1,202
Comparison sample for Action for Business	248	853	1,101

The number of completed questionnaires (online and paper, after editing) is shown in Table A.5. Three operational areas totalled below the target of 325 Abram Ward (Wigan), B-Inspired (Leicester), and RIO (Plymouth). The comparison sample for Action for Business was also below its target of 354 completes.

Table A.5: Number of completed questionnaires

Operational area	Online completions (% of completions)	Paper completions (% of completions)	Total completions
Abram Ward Community Charity	193 (76%)	62 (24%)	255
Action for Business, Bradford	341 (78%)	96 (22%)	437
B-Inspired	183 (72%)	70 (28%)	253
Centre4	229 (64%)	128 (36%)	357
RIO, Plymouth	206 (70%)	90 (30%)	296
Wharton Trust	230 (65%)	122 (35%)	352
Comparison sample for Action for Business	253 (81%)	59 (19%)	312



4. Weighting

For analysis purposes, the respondents within each of the comparison samples identified within Quarter 1 and Quarter 2 (April to September 2020) of the national Community Life Survey retain their calibration weights as computed for that survey.

Respondents to the Power to Change survey have been weighted in an aligned fashion. To do this, Kantar used a regression model to estimate the calibration weights that would have been applied to each case if it had been part of the national (CLS) sample. This gets around the problem of no contemporary population data for each operational area, as well as the relatively small samples obtained in each one. The same approach was used to generate a weight specific to the online subset of respondents in each area.

The weighted sample profiles were compared with relevant Census 2011 profiles and no clear distributional problems were apparent.

Naturally, there are differences between the operational area samples and their comparison group samples with respect to their demographic profiles (see Table A.5). However, they are similar enough for it to be reasonable to expect a similar trajectory-over-time for Community Life Survey variables if the operational area and its comparison areas were subject to broadly the same set of interventions and social pressures. This is the precondition for carrying out the difference-in-difference analysis.

Table A.5 also includes the effective sample size for each area and its comparison group. Note that the effective sample size only accounts for weighting the data and, even then, only in a general sense (the effect of weights will differ between questionnaire variables). Sample clustering (by household) also has an impact on the effective sample size and, again, this differs between questionnaire variables.

In this report, Kantar has used specialist statistical software (the Complex Samples module within SPSS) to estimate sampling errors that account properly for the survey design and the weighting of the data.



Table A.5: Weighted demographic distributions for operational areas and their comparison samples

		Abram Ward		Action for Business		B-Inspired		Centre 4		RIO		Wharton Trust	
		Area	Comparison	Area	Comparison	Area	Comparison	Area	Comparison	Area	Comparison	Area	Comparison
	Actual N	255	326	437	402	253	455	357	349	296	581	352	352
	Effective n (due to weighting)	235	272	403	363	235	341	334	281	266	427	333	285
Age	16-24	16%	12%	31%	27%	14%	15%	14%	16%	13%	14%	15%	15%
	25-34	20%	22%	18%	22%	18%	21%	17%	18%	26%	19%	23%	19%
	35-44	15%	19%	20%	16%	21%	18%	14%	16%	15%	18%	15%	16%
	45-54	12%	16%	17%	13%	18%	13%	15%	14%	10%	16%	13%	15%
	55-64	14%	16%	6%	12%	20%	14%	16%	12%	14%	16%	14%	13%
	65-74	15%	11%	5%	6%	5%	12%	11%	12%	13%	10%	14%	11%
	75+	9%	5%	3%	5%	4%	8%	13%	12%	10%	9%	6%	11%
Sex	Male	54%	49%	50%	49%	50%	49%	47%	47%	49%	52%	46%	46%
	Female	46%	51%	50%	51%	50%	51%	53%	53%	51%	48%	54%	54%
Household size	Mean	2.7	2.9	4.8	4.2	3.2	2.9	2.6	2.9	2.4	2.5	2.8	2.9
Live with u16s	u16 in HH	31%	36%	52%	58%	42%	36%	30%	35%	22%	28%	29%	34%
	No u16 in HH	69%	64%	48%	42%	58%	64%	70%	65%	78%	72%	71%	66%
Housing tenure	Owned	36%	28%	33%	37%	12%	24%	24%	24%	24%	23%	14%	24%
	Mortgaged	30%	41%	28%	23%	36%	33%	25%	31%	19%	30%	29%	33%
	Other (mainly rented)	35%	31%	39%	40%	52%	43%	52%	45%	57%	47%	58%	44%
Education	Degree educated 25-64	12%	17%	12%	14%	21%	15%	11%	15%	22%	19%	11%	14%
	Other 25-64	48%	55%	49%	48%	56%	50%	51%	45%	42%	48%	54%	49%
	16-24	16%	12%	31%	27%	14%	15%	14%	16%	13%	14%	15%	15%
	65+	24%	16%	8%	11%	9%	20%	24%	24%	23%	19%	20%	22%
Ethnic group	White	99%	97%	19%	30%	75%	90%	98%	92%	97%	87%	97%	92%
	Indian/Pakistani/Bangladeshi	0%	0%	67%	59%	8%	2%	1%	2%	0%	6%	0%	2%
	Black	1%	1%	3%	4%	9%	3%	0%	1%	1%	2%	0%	1%
	Other	1%	2%	11%	8%	8%	5%	1%	5%	2%	5%	3%	5%
Internet Use	16-64	76%	84%	92%	89%	91%	80%	76%	76%	77%	81%	80%	78%
	65+ use internet	16%	11%	4%	6%	4%	11%	10%	10%	15%	11%	12%	9%
	65+ does not use internet	8%	4%	3%	5%	5%	9%	13%	14%	8%	8%	8%	13%



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