RAF032/2223

Home energy advice services in England: Current state of play and meeting the needs of hard-to-reach and digitally excluded consumers

Annex 1: Technical report

Views expressed in this report are from the relevant research agencies, based on data collected from research participants and other evidence, and not necessarily those of the UK government.

Contents

1. Overview

The aim of this research is to develop a comprehensive understanding of current advice provision across England and to identify the locations, needs and preferences of hard-to-reach (HTR) and digitally excluded (DE) consumers. The five objectives of the research are to: (1) identify the information being provided via advice services; (2) identify the methods and modes being used to deliver advice; (3) map current advice provision and delivery in a comprehensive way; (4) define hard-to-reach (HTR) consumers in the context of energy advice and comprehensively model and map HTR and digitally-excluded (DE) consumers; and (5) detail engagement approaches best-suited to the preferences of HTR and DE consumers.

A mixed-methods approach was taken to answer each of the key research questions and could be largely distinguished into:

- **Strand 1**: a review of existing energy advice provision in England which involved evidence review, semi-structured informant interviews, online survey of energy advice providers.
- **Strand 2**: understanding and engaging the HTR and DE consumers to improve home energy advice and information, which involved an online workshop with advice providers to define the characteristics of HTR and DE consumers, consumer profiling, HTR/DE consumer interviews and deliberative workshop.

2. Strand 1 research methodologies

A key output of Strand 1 was an energy advice service database. The database involved desk-based research to identify energy advice providers in England, with several main sources used[1][2][3][4]. Informant interviews and a questionnaire provided additional entries and further information to populate database fields. Information contained within the database informed the development of advice archetypes and interactive mapping.

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[1] https://energyredress.org.uk
[2] https://britishgasenergytrust.org.uk
[3] https://www.communityenergysouth.org/member-groups-business-friends
[4] https://www.leeds.gov.uk/leedsmic/debt-and-money-advice

2.1. Evidence review

The first step to developing the energy advice service database was undertaking a desk-based evidence review. Through the review, around 150 energy advice providers were identified. Database fields were discussed and agreed with DESNZ. Parameters included types of advice, delivery channels, target groups and geographical coverage (including region).

A description of the main database fields are described below.

Table 1: Types of advice and category examples

Advice type	Examples
Energy saving behaviours and tips	Switch off standby, draught-proofing, turn off lights
Financial advice in energy supply	Managing bills, energy tariffs, meters, payment options, switching suppliers
Financial advice in government support and grants	Government loan or grant schemes
Financial support for energy bills	Fuel vouchers
Financial support for energy efficiency and/or renewables	Loans or grant funding
Home improvement advice in energy efficiency measures	Insulation, ventilation, appliances, glazing
Home improvement advice in renewables	Solar panels, solar thermal, biomass, heat pumps, batteries, and installation
System operation and maintenance	How to operate the thermostat or boiler

Energy advice delivery channels included in the database are:

- Home visits
- Face-to-face in other (non-home) venues
- Telephone
- Online channels (such as email, online contact form, web chat)
- Virtual visits (Facetime, WhatsApp, Teams)
- Referral
- Signposting
- Other

For energy advice services targeting specific groups who may be vulnerable, marginalised and/or disadvantaged, the following categories are included in the database:

- Carers
- Disabled people
- Hospital or health care patients
- LGBTQIA+ people
- Older people
- People experiencing or at risk of homelessness
- People from/belonging to minority ethnic groups
- People in fuel poverty
- People in or at risk of debt
- People on low incomes
- People experiencing mental health problems
- People with limited access to technology
- People with long-term mental or physical health conditions
- People working in health care
- Pregnant women
- Refugees
- Single parents
- Students
- Tenants

- Victims/Survivors of domestic abuse

- Women

- Young people

There are several geographical fields included in the database:

- Region(s) covered by energy advice providers as indicated on their website and/or during an interview

- Scale (national, regional, local, hyperlocal)

- Councils in England

2.2. Informant interviews

The database was used to identify candidates for informant interviews. Researchers contacted energy advice providers listed in the database on an iterative basis. Fifteen interviews were completed between 18 November and 1 December 2022. Information collected through the interviews were used to refine the database fields and inform the design of an online survey that would be sent to energy advice providers in England to collect data for populating the database.

Researchers sought to ensure that the providers recruited were across England's regions, and of various sizes, organisation structures and governance (Table 2). While providers in North East England, North West England and Yorkshire were approached, we were unable to secure interviews with organisations operating across these areas. However, providers from these regions were represented in the online questionnaire, with seven out of the twenty organisations that responded to the questionnaire operating in these regions.

Table 2: Key informant interviews – geographical spread of advice provision

Region	No. interviewees	Type(s) of organisations
Midlands	2	Charity (2)
South West	5	Charity (3); Community Benefit Society (1); Community Interest Company (1)
England-wide	1	Other (1)

Region	No. interviewees	Type(s) of organisations
South East	4	Community Benefit Society (2); Community Interest Company (1); Local authority (1)
London	1	Local authority (1)
East of England	2	Charity (1); Local authority (1)

The topic guide covered: i) views and experiences of energy advice provision; ii) energy advice services offered by the organisation; and iii) customer requirements and demand.

Topic guide for informant interviews

Section 1 – Experience of existing energy advice provision (10 mins.)

This section will help us to understand your view(s) and experience(s) of energy advice services and provision more broadly (i.e. outside of your organisation).

1.   Please can you confirm your name, organisation and/ or project.

If organisation, please confirm type e.g. charity, private-sector, community-led, local government, housing association, regulator

If project, please confirm funding source(s) and longevity.

2.   What role do you hold in your current organisation?

If applicable, what other role, or roles, have you held in your current and/ or other energy advice organisation(s)? Please state organisation name, type, and role(s) held

3.   Broadly speaking, what is your view on existing coverage of energy advice in England? Prompt: Overall sufficient, insufficient, neutral

4.   If any, what are the existing gaps in energy advice provision in England? Prompt: locations, delivery type, additional support, beneficiaries/ target groups

Section 2 – Your current organisation (20 mins.)

This section will help us to understand characteristics of your organisation and the energy advice service(s) it provides.

5.   We will now discuss the energy advice service(s) and support provided by your organisation.

6.   What is the objective of your organisation? Prompt: climate change, fuel poverty, other

7.   What is the organisation's size? Prompt number of paid employees and volunteers

If local branch of a wider organisation, provide relevant local statistics.

8.   What is your organization's coverage? Prompt: National, regional, local (towns and cities), hyperlocal (neighbourhoods)

9.   What types of energy advice does your organisation provide? Prompt energy supply, renewable installations, energy efficiency measures, energy saving behaviours, retrofit, other

10.   Does your organisation provide advice in areas beyond energy? Prompt debt advice, transport, water, other

11.   What channels do you use for the provision of energy advice? Prompt home visits, face to face in other venue, virtual visits (e.g. Facetime), telephone, various online channels

12.   What qualifications and training do advisors have to provide energy advice? There may be several qualification and training requirements for the different types of advice provided e.g. specialist renewables advisors

13.   Is the energy advice provided by your organisation intended for a specific group or groups? Prompt general public, elderly, disabled, benefits recipients, low-income, families, tenants, other

14.   Is the advice you provide generic and/ or personalised?

15.   Does your organisation offer direct financial support? Prompt fuel vouchers, grants, energy efficiency loans, other

16.   Does your organisation signpost to available financial support? Prompt government schemes, fuel vouchers, grants, energy efficiency loans, other

17.   Does your organisation signpost to other organisations? Prompt debt advice, mental health, other

18. Does your organisation make and/ or accept referrals to other organisations?

19. What are the impacts of the energy advice service(s) and support you provide? Prompt monitoring and reporting activities

20. Do you collect user feedback?

Section 3 – User needs and behaviours (10 mins.)

This section will help us to understand user demand for your energy advice service(s)

21. Do users of your energy advice service(s) and support typically initiate contact or are they approached and/ or referred by other organisation(s)?

If contact is initiated by users, how do they typically do this?

22. What do users of your energy advice service(s) and support typically, and in the current situation, require help with? Prompt information on energy saving behaviours, energy efficient appliances, financial supports, debt advice, other

23. Are certain type(s) of your energy advice service(s) and support in greater or lesser demand than others? Prompt type of advice, channels

24. Given the focus of your organisation on [insert target group(s)] what features of the energy advice service(s) and support have been successful and less successful?

Section 4 – Additional comments (5 mins.)

25. Other than what we have already discussed, do you have any other comments on energy advice provision in England? Prompt other relevant organisations that we may want to contact and/ or include in our database.

2.3. Online survey of energy advice providers

A questionnaire was developed to capture data on energy advice provider services to populate the database. During the week commencing 5 December 2022, the questionnaire was circulated to Energy Saving Trust redress contacts including registered/eligible applicants and grantees (803 organisations) and posted on relevant Energy Saving Trust social media channels (LinkedIn, Facebook, Twitter). It was also shared with those invited to an interview and unable to participate due to capacity and time constraints. In addition, British Gas Energy Trust (BGET) agreed to share the questionnaire via its newsletter issuing on 15 December; recipients include BGET-funded organisations.

The survey was live from 5 December 2022 until 6 January 2023. It received responses from 47 organisations, covering 110 energy advice services/ projects that they were implementing.

Due to the relatively low response rate (around a third of energy advice providers identified in the initial desk review), researchers at Energy Saving Trust further populated the database through desk-based research using the list of organisations identified in the initial desk review.

The final database consists of 141 organisations, delivering 236 energy advice services/ projects. Information obtained through desk-based research was not as detailed as those elicited from the online questionnaire, but we were able to capture key parameters such as types of advice provided, channels of advice provision and target customer groups.

Online questionnaire

About your organisation

If you are a local branch of a wider organisation, please provide relevant local statistics.

1) * What is your organisation name?

2) * What is your organisation type?

- Charity (all forms, including incorporated or unincorporated, charitable company)
- Community benefit society
- Community interest company
- Cooperative society (other than a community benefit society)
- Local government/ local authority
- NHS body
- Private limited company
- Public limited company
- Regulator
- Registered social landlord
- Sole trader
- Unincorporated association (eg community group)
- Other, please specify:

3) What is your role in the organisation?

4) How many paid employees or volunteers does your organisation have?

- Number of paid employees

- Number of volunteers

5) * Does your organisation require their advisors to have specific qualification(s) or training? If yes, please list the qualifications or training below.

- Yes

- No

6) If your organisation requires their advisors to have specific qualification(s) or training, please list the qualifications or training below.

7) What are the projects that your organisation delivers that provide energy advice to customers? If your organisation delivers more than five projects, please prioritise your largest projects and/or those that will be running beyond March 2023.

- 1
- 2
- 3
- 4
- 5

About your project

(Respondent has to fill in the following information for each of the projects they have listed in Q7).

8) * What is the objective of the project? Please select all that apply.

- Community and social welfare (eg fuel poverty, financial and wellbeing support)

- Environment (eg climate change, net zero transition, ecology)

- Other, please specify:

9) * What types of energy advice or support are being provided under the project? Please select all that apply.

- Energy saving behaviours and tips

- Financial advice in energy supply (eg managing bills, energy tariffs, meters, payment options, switching suppliers)

- Financial advice in government support and grants (eg government loan or grant schemes)

- Financial support for energy bills (eg fuel vouchers)

- Financial support for energy efficiency and/or renewables (eg loans or grant funding)

- Home improvement advice in energy efficiency measures (eg insulation, ventilation, appliances, glazing)

- Home improvement advice in renewables (eg solar panels, solar thermal, biomass, heat pumps, batteries and installation)

- System operation and maintenance (eg how to operate the thermostat or boiler)

- Other, please specify:

What is the geographical coverage of the project?

10) * Regions covered: (Please select all that apply)

- West Midlands

- East Midlands

- Southeast

- Southwest

- London

- Northeast

- Northwest

- Yorkshire

- East of England

- Other (e.g. Wales, Scotland)

11) * Scale of coverage:

- Hyperlocal (neighbourhoods)

- Local (towns and cities)

- Regional (counties)

- National

It would be great if you could provide further information on the areas that the project covers by listing the local councils that the project affiliates with (list of council in England reference) or the area postcodes that the project serves.

12) Specific areas covered:

- Council
- Postcode

13) * What are the channels used for the provision of the energy advice or support? Please select all that apply.

- Home visits
- Face-to-face in other (non-home) venues
- Online channels (eg email, online contact form, webchat)
- Referral
- Signposting
- Telephone
- Virtual visits (eg Facetime, Whatsapp, Teams)
- Other, please specify:

14) If the channel includes telephone, please specify the telephone line operating hours.

15) * Is the project targeting any energy customers who could be vulnerable, marginalised and/or disadvantaged? Please select all that apply.

- The project is not targeting any specific groups who may be vulnerable, marginalised and/or disadvantaged
- Carers
- Disabled people
- Hospital or health care patients
- LGBTQIA+ people
- Older people
- People experiencing or at risk of homelessness
- People from/belonging to minority ethnic groups
- People in fuel poverty
- People in or at risk of debt
- People on low incomes

- People experiencing mental health problems
- People with limited access to technology
- People with long-term mental or physical health conditions
- People working in health care
- Pregnant women
- Refugees
- Single parents
- Students
- Tenants
- Victims/Survivors of domestic abuse
- Women
- Young people
- Other, please specify:

16) * Is the advice provided generic and/or personalised?

- Generic
- Personalised
- Both

17) * Is the advice provided in a language other than English language? Please select all that apply.

- The advice is provided in English language only
- Arabic
- Bengali (with Sylheti and Chatgaya)
- Chinese
- French
- Gujarati
- Polish
- Portuguese
- Punjabi
- Spanish
- Urdu
- Other, please specify:

18) * Does the energy advice include information on cost and/or carbon savings?

- Yes, both cost and carbon savings
- Yes, only cost savings
- Yes, only carbon savings

19) * Is the project being delivered in partnership with another organisation or in a consortium?

- Yes
- No

20) If the project is being delivered in partnership with another organisation or in a consortium, please list them here.

21) * When does the funding for the project end?

Closing section

22) * Does your organisation make and/or accept referrals to other organisations?

- Yes
- No

23) Finally, do you have any comments on energy advice provision in England? (For example, your view on existing coverage of energy advice in England, what are the gaps, or other relevant organisations that we may want to contact and include in our database.)

3. Strand 2 research methodologies

The aim of Strand 2 is to understand and engage with HTR and DE consumers to improve home energy advice and information. To achieve this aim, advice providers and HTR/DE consumers were engaged through workshops and semi-structured interviews. In addition, consumer profiling, which involved secondary data analysis, was also undertaken to identify, segment and local HTR and DE consumers in England.

3.1. Workshop with advice providers

An online workshop was held on 3rd November 2022, attended by six energy advice providers (referred to as "participants"). The group included both national and regional energy advice providers with a range of coverage across England, all of which offer "universal" advice, meaning that notwithstanding geography and restrictions based on caseload, their services are open to all rather than a particular target group. They provide advice across a range of channels including digital, telephone and in person, both in their own/community locations and in peoples' homes, and a range of advice types including financial and billing support, home adaptations and access to government grant schemes.

The workshop was designed to be discussion-based, encouraging participants to share their observations of the client groups that they work with, and build on, and question, each other's responses.

Discussion guide

Read to attendees:

We have been commissioned by UK Government's Department for Business, Energy & Industrial Strategy (BEIS) to conduct a review of energy advice provision in England. Research findings will inform a new telephone advice service and local, in-person advice provision procured by BEIS.

There are two strands to this work: one building an overview of energy advice provision in England, and a second focusing on ensuring any future advice service is inclusive and can be used by anyone who needs it. This second strand will include a series of interviews with specialist providers of support to target population groups and one-to-one interviews with citizens who may be users of an advice service.

The aims of today's workshop are to:

- Build our understanding of energy seeking behaviours and priorities

- Gain insights into what can prevent people seeking energy advice
- Develop our understanding of how to make any digital elements of energy advice as inclusive and accessible as possible
- Gather your suggestions of others we should speak to.

Your participation is voluntary, and you can change your mind and leave the workshop at any time. The information that you provide will be treated in confidence:

Only Energy Saving Trust will be able to identify you. Your organisation and/ or project will be included in a database of energy advice providers operating across England. The database is intended to understand the types of energy advice available, populations served, and to identify any gaps in existing provision.

BEIS expect to circulate research progress, updates, and findings internally. External publication of a final report will be subject to ministerial approval.

There is certain information you need to know as a legal requirement as a result of Data Protection laws. This information is contained within the Consent & Data Protection Form we sent along with the invitation to interview. Are you happy to proceed with the interview, as per this Privacy Notice?

We would like to record the discussion for analysis purposes to help us accurately collect findings for the research. The recording and auto-generated transcript will be securely stored in a password protected folder and retained by us and destroyed after the completion of the evaluation. Are you happy for me to record the interview?

NB. for interviewer – ensure to ask for consent and get agreement on the recording and start recording if/when consent is obtained.

Table 3: Advice providers workshop discussion guide

Timings / Section	Section Focus	Purpose/ rationale	Outline Questions / Content
10am (5 mins)	Overview	Working agreements (e.g. respect, confidentially) Encourage discussion rather than just direct question responses	Overview of Project and how this aspect fits in Who's involved and who else will be included in research (to show that potential users included) Purpose of this workshop and intended outcomes

Timings / Section	Section Focus	Purpose/ rationale	Outline Questions / Content
			Data protection
10.05 (5 mins)	Intros	So participants know who's "in the room"	Ask to cover name, organisation and position, to ensure we keep to time
10.10 (10 mins)	Motivations	To understand motivations for seeking advice and where they usually look for it to begin characterising advice seeking behaviour.	From your experience: What circumstances can lead to people seeking energy advice? What are the most frequent triggers? What types of advice are people looking for most often?
10.20 (15 mins)	User priorities and "ways in"	To understand what could be important to potential advice seekers and where they look for it, to build understanding of key characteristics.	From your experience: What is important to people when seeking energy advice? What do you know about the "ways in" or how people find your advice? What do you know about where else they have looked for advice? Probe source, medium, presentation/ format, synchronous/ asynchronous, personalisation
10.35 (25 mins)	Barriers and inclusion factors	To understand factors that might prevent or delay someone from seeking advice to	From your experience:

Timings / Section	Section Focus	Purpose/ rationale	Outline Questions / Content
		build understanding of key characteristics.	What factors might prevent someone seeking energy advice even if they need it? What can make people delay seeking advice? What might make them seek it sooner? Probe circumstances, geography, needs and preferences, attitudes/ beliefs/ expectations
11.00	Break		
11.05 (20 mins)	Data and knowledge	To gain insights on research/ data on groups not seeking advice and what has been tested to extend engagement, to inform persona development. To help inform any specialist interviews we should incorporate as a follow on.	From your experience and data, who is least likely to seek advice? If applicable, what have you tested to expand the reach of your advice or make it inclusive? What has worked well? What was less effective or didn't work at all? What else, if anything, are you planning to further expand your reach?
11.25 (20 mins)	Making digital advice inclusive	To identify any specific considerations to ensure digital can be as inclusive as	One key format for advice is likely to be digital. From your experience

Timings / Section	Section Focus	Purpose/ rationale	Outline Questions / Content
		possible for those who want to use it.	Who might not seek digital advice? (may have already come out in earlier sections) What challenges can people experience accessing/ using digital advice even if they want to? How can digital advice be adapted to ensure people who would like to use it can? Probe format, what makes information understandable/ readable, raising awareness of advice available.
11.45 (5 mins)	Crowdsource data suggestions	To identify additional data sources, specialist providers and potential routes to 1-1 citizen interviews.	We appreciate there has already been a lot of work done on energy advice and digital inclusion and want to ensure we build on this. Who has published research on advice seeking, digital exclusion and energy advice that might be useful to this research? Follow-on from this workshop will include some 1-1 interviews with both targeted advice services for particular population groups and with citizens who may be potential energy advice users: Who could we interview about specialist advice to a target group?

Timings / Section	Section Focus	Purpose/ rationale	Outline Questions / Content
			Who could be a good route to finding citizen interviewees for our user research?
11.50	Closing thoughts/ what next		At least one, unspoken thought/ closing comment from each attendee

Read to attendees:

Thank you for your time.

NB. for interviewer – stop recording

3.2. Specialist interviews

Qualitative interviews were conducted with 5 organisations who support consumers who are HTR and/or DE. The definition of HTR was influenced by a Rapid Evidence Assessment undertaken in the early stages of the project and comprised the following categories:

- Older people with limited social connections;
- Individuals with low income/in severe debt;
- Individuals without a job/claiming benefits;
- Individuals who struggle with mental or physical illness;
- Individuals with low educational attainment;
- Individuals whose first language is not English.

5 organisations were purposively selected to ensure a mix of categories were represented, with the final sample consisting of:

- A charity supporting older people
- A charity supporting people in, or at risk of, debt
- A charity supporting Deaf people

- A social enterprise supporting disabled people
- A charity supporting immigrants from Eastern Europe

Interviews lasted 45-60 minutes and covered the scope of the support offered by the organisation, and the organisations' understanding of the catalysts for consumers seeking support, barriers to consumers seeking support, and potential enablers or interventions that the organisation had trialled to increase their reach.

Topic guide for specialist interviews

Purpose of these interviews (not to read to interviewee) – to supplement discussions in the Strand 2 workshop considering inclusion aspects (including digital) and allow for deeper insights from specialist providers of support to groups of the population who may be excluded / less likely to access energy advice due to specific needs or preferences. Questions are less specifically focused on energy advice to allow for the potential that groups are not currently / minimally seeking energy advice, to allow for insights to be gathered on why this could be.

Questions mirrored those in the workshop but opened up beyond energy advice (focusing on "advice and support") and aim to allow for the interviewee to bring their specialist emphasis to the responses.

Read to interviewee:

Hi, my name is [NAME]. Thank you for agreeing to take part in our research.

We have been commissioned by UK Government's Department for Business, Energy & Industrial Strategy (BEIS) to conduct a review of domestic energy advice provision in England. Research findings will inform a new telephone advice service and local, in-person advice provision procured by BEIS.

Interview set-up:

The interview will be conducted remotely via Teams and will last for approximately one hour.

Your participation is voluntary, and you can change your mind and terminate the interview at any time. The information that you provide will be treated in confidence:

Only Energy Saving Trust will be able to identify you from responses given.

Where relevant, your organisation and/ or project will be included in a database of energy advice providers operating across England. The database is intended to understand the types of energy advice available, groups served, and to identify any gaps in existing provision. Only Energy Saving Trust and BEIS will have access to the database. An anonymised report will be shared with BEIS. BEIS expect to

circulate research progress, updates, and findings internally. Your contributions and opinions will feed into a report which may be published subject to internal BEIS approval.

There is certain information you need to know as a legal requirement as a result of Data Protection laws. This information is contained within the Consent & Data Protection Form we sent along with the invitation to interview. Are you happy to proceed with the interview, as per this Privacy Notice?

Questions are aimed at specialist support providers in England. Our discussion will cover your insights into which needs and preferences of the people that you support might need to be considered when developing an inclusive energy advice service. There will also be a chance to share any other relevant comments that you may wish to. I would like to record the discussion for analysis purposes to help us accurately collect findings for the research. The recording and auto-generated transcript will be securely stored in a password protected folder and retained by us and destroyed after the completion of the evaluation. Are you happy for me to record the interview?

NB. for interviewer – ensure to ask for consent and obtain agreement on the recording, and start recording if/when consent is obtained.

Section 1 – Your current organisation and who you support (10 mins.)

Aim of the section: To confirm the main focus of their work, the target group they support and the broad areas of support they offer.

- Please can you confirm your name and organisation. Please confirm type of organisation e.g. charity, private-sector, community-led, local government, housing association, regulator
- What role do you hold in your current organisation?
- Please can you provide a broad overview of the types of customer you support through your organisation?
- And how do you support them?
- Prompt: key areas of activity including advice and any other services
- And do you specifically provide energy advice? If so, in what format?

Section 2 – Motivations (10 mins.)

Aim of the section: To understand motivations for seeking advice and where the people they support usually look for it to begin characterising advice seeking behaviour.

We will now discuss what you know about people's behaviour when it comes to seeking advice. Please speak from your experience or knowledge working with the people your organisation supports.

- What circumstances can lead to people seeking advice and support? Probe if the organisation/ project has relevant records/ statistics where there are a number of users/ circumstances.

- What are the most frequent triggers?

- What types of advice and support are people looking for most often?

- How frequently do people seek energy advice specifically? Probe if the organisation/ project has relevant records/ statistics on energy-related queries/ referrals.

Section 3 – User priorities and "ways in" (5 mins.)

Aim of the section: To understand what could be important to potential advice/ support seekers and where they look for it, to build understanding of key characteristics.

We will now discuss what is important to people when they are looking for advice and support and how they look for it. Please speak from your experience or knowledge working with the people your organisation supports.

- What is important to people when seeking advice and support? How do you know this? Probe source, medium, presentation/ format, synchronous/ asynchronous, personalisation

- What do you know about the "ways in" or how people find your advice and support?

- What do you know about where else they have looked for advice and support?

Section 4 – Barriers and inclusion factors (10 mins.)

Aim of the section: To understand factors that might prevent or delay someone from seeking advice and support to build understanding of key characteristics.

We will now discuss any potential barriers to seeking advice and support that may need to be considered to ensure any energy advice service is inclusive. Please speak from your experience or knowledge working with the people your organisation supports.

- What factors have you seen preventing people from seeking advice and support even if they need it? Probe circumstances, geography, needs and preferences, attitudes/ beliefs/ expectations

- What can make people delay seeking advice and support? How do you know this?

- What might encourage people not to delay seeking advice and support?

Section 5 – Data and Knowledge (10 mins)

Aim of the section: To gain insights on research/data on groups not seeking advice and support and what has been tested to extend engagement, to inform persona development.

We will now talk about your data and knowledge of who is least likely to seek advice and support and anything you have tried to expand access. Please speak from your experience or knowledge working with the people your organisation supports.

- From your experience and data who is least likely to seek advice and support? Probe where relevant: geography, additional needs, language, disability

- What, if anything, have you tested to expand the reach of your advice and support or make it more inclusive? Probe what has worked well/ what has been less effective or didn't work at all?

Section 6 – Making Digital Advice Inclusive (10 mins)

Aim of the section: To identify any specific considerations to ensure digital can be as inclusive as possible for those who want to use it.

Whilst this research aims to inform the development of a new telephone advice service and local, in-person advice provision procured by BEIS, it is important to allow that as many people as possible can access the online support currently available. We will now talk about what needs to be considered to ensure people who you support who would like to use digital services are enabled to do so.

- Who might not seek digital advice or support? (may have already come out in earlier sections)

- What challenges can people experience when accessing/using digital advice or support, even if they would like to use digital advice??

- How can digital advice or support be adapted to ensure that it can be used by people who would like to access it in digital format? Probe format, what makes information understandable/ readable, raising awareness of advice available.

Section 7 – Any other comments (5 mins)

Other than what we have already discussed, do you have any other comments on what should be considered when developing an advice service that would be meet the needs and preferences of the people you support?

Read to interviewee:

Thank you for your time. The information you have provided will directly feed into the design and development of a new telephone energy advice service procured by BEIS.

NB. for interviewer – stop recording

3.3. Consumer interviews

Qualitative interviews were conducted with 80 consumers who were individually identified as being HTR and/or DE. Respondents were recruited via organisations who support HTR and/or DE consumers. These organisations were identified either through desk research or from the database. To thank them for their time, both organisations and interviewees were given shopping vouchers; £100 for each organisation and £20 for each interviewee. Seventy-four interviews were conducted face-to-face – typically at the support organisation's premises. The remaining six interviews were conducted by telephone, based on the respondent's preference.

Interviews consisted of screening questions to capture demographic characteristics and their home and energy situation, followed by 30-minute qualitative interview covering topics on home advice including relevant touch points, usage of external advice organisations, and specific experiences of energy advice.

3.4. Deliberative workshops

Five deliberative workshops were conducted with participants identified as HTR and/or DE. The same definitions of HTR and DE were used as for the qualitative interviews with consumers. Table 4 provides a description of the types of consumers that were reached through the workshops. It is important to consider these when interpreting the findings.

Table 4: Types of HTR and DE groups that participated in the workshops

HTR or DE group criteria	Description of those attending the workshop
Individuals whose first language was not English (ESOL individuals)	A group of women whose first language is Punjabi and were learning to speak English and a group of individuals with a variety of first languages other than English.
Individuals with a mental or physical illness	Consumers who had suffered a brain injury, resulting in impaired cognitive function, specifically in comprehension and memory. For this reason, partners or carers also attended the workshop.
Older people	These consumers also live in a rural location, where access to broadband is relatively poor and they have limited connections.
Individuals with a low income and / or in severe debt	Across most groups, there were individuals with below average salaries and from low income households.
Digitally Excluded	Consumers who were accessing training to develop basic digital skills and consumers who were unable to use the internet effectively due to impaired cognitive function.
Low educational attainment	Some ESOL individuals reported their ESOL classes as their highest level of education, or that they had not received any education whilst in England.

This sample reflected a broad range of socio-economic groups and included both those able and willing to pay for energy saving measures and those who were less willing.

Organisations who were identified as supporting HTR and/or DE individuals hosted and recruited participants for each workshop. To thank them for their time, organisations were offered £100 and participants were offered £30 in shopping vouchers.

The deliberative workshops consisted of three activities to assess current awareness of advice and use of energy saving techniques, identify how to engage HTR and DE individuals in an energy advice service and deliberate how the service could be delivered to meet the needs of HTR and DE groups. Discussions were directed to inform the following research questions:

- How can the idea of energy saving behaviour and retrofit be introduced to consumers who may not be aware that it could benefit them?

- How could the service be promoted to raise awareness of energy saving solutions?

- How could the service be delivered to encourage take up of advice and retrofit solutions, and more specifically how could the telephone line and local service be as accessible as possible?

Limitations and considerations

It is important to note the following limitations of the workshops when interpreting the findings:

- There were significant barriers in engaging some of the groups during the workshop activities, with many of the participants having language or literacy barriers or issues with their cognitive function. Each workshop had to be tailored to the needs of the participants, and as a result some workshops were longer than others, and some of the tasks had to be presented and completed differently.

- Depth of engagement in deliberating the EAS scenarios also varied across groups, which reflects the varying points consumer were at on their customer journey, from being unaware of what they are able to do to already having installed clean energy measures.

- The workshops highlighted that many consumers face multiple and complex barriers, and do not necessarily just fit neatly into one category of HTR and/or DE. There are many types of consumers that fall under each of the HTR and DE umbrella categories, and therefore they cannot be viewed as one homogenous group. There are two implications associated with this:
  - Firstly, a one size fits all approach to the design of the energy advice service is unlikely to be effective.
  - Whilst we tried to gain coverage of different HTR and DE consumer groups, it is unlikely that the research has uncovered all needs of all consumers who could be considered as HTR and/or DE. Some workshops were of variable sample size, therefore there are limitations

of the extent to which insights from the workshops can be generalised and used as the basis for firm recommendations without further testing.

- HTR or DE individuals are not always the sole decision maker. For example, those whose first language is not English may rely on family members who are more fluent, those with disabilities may rely on care givers, and family units may make joint decisions with partners rather than alone. To mitigate this, for some of the groups care givers and/or partners also attended the group. However, the energy advice service may benefit from further investigation into the role others play here.

Deliberative workshops topic guide

Research Objectives & Questions

The overall aim of the research is to develop a comprehensive understanding of current advice provision across England and to identify the locations, needs and preferences of hard-to-reach (HTR) and digitally excluded (DE) consumers. The five objectives of the research are to:

- Identify the information being provided via advice services;
- Identify the methods and modes being used to deliver advice;
- Map current advice provision and delivery in a comprehensive way;
- Define HTR consumers in the context of energy advice and comprehensively model and map HTR and DE consumers;
- Detail engagement approaches best-suited to the preferences of HTR and DE consumers.

This research will inform the design and delivery of the Energy Advice Service (EAS). The deliberative workshops with consumers will specifically seek to answer the following research questions:

- How can the idea of energy saving behaviour and retrofit be introduced to consumers who may not be aware that it could benefit them?
- How could the service be promoted to raise awareness of energy saving solutions?
- How could the service be delivered to encourage take up of advice and retrofit solutions?
- How could the phone line and local service be as accessible as possible?

Exploration of these questions will take into account considerations about consumer needs and barriers that were identified through the interviews.

Baseline information about participants

The recruitment approach for the workshops was revised in light of findings from the interviews. It will now focus on home-owners in the audience groups identified in the 'Note on next steps'. This means that background information about participants will not always be available from the interviews, as originally anticipated. Background information helps the moderators to understand the participants' energy circumstances and thereby to guide conversations accordingly and with sensitivity.

When recruiting new participants, we will therefore collect a small amount of background information, using the following questions. Participants who have been interviewed before will only be asked the three new questions highlighted below.

- Do you live alone, or do you live with anyone else?

- Many people in the UK have caring responsibilities (for example, for younger people or for those who need extra support with things like moving and eating). Do you care for anyone else in your home? If yes, who?

- Some people have conditions that can impact their physical and mental wellbeing. Do you have any physical or mental health conditions that affect your day to day activities? Does your condition affect any of the following:

    o Mobility – moving about or lifting and carrying objects

    o Using your hands to carry out everyday tasks

    o Communication

    o Memory or ability to concentrate, learn or understand

    o Other

    o Prefer not to say

- Are you currently employed? If so, is that full or part time?

- Do have any difficulties in speaking, reading or understanding English? [Interviewer to probe carefully and use initiative as to what probes would be relevant but could include for example; Is that because English isn't your first language, or another reason? What are the reasons for these difficulties? Why do you say that?]

- Do you own or rent your home?

- What energy supply do you have at home? Is it gas, electric, coal, oil, or something else? [Clarify / confirm with respondent whether their home is connected to gas or an off-gas property, in which case flag in write up as hard to treat]

    o Are you the account holder for your electricity / gas?

    o Are you the bill payer for electricity / gas (wholly or partly)

- What is your home made of? For example, solid wall, cavity wall, other, don't know? [Interviewer to provide examples as the question is delivered. If solid wall, flag in write up as hard to treat]

    o Is your home a listed building or in a conservation area or an area with restricted planning laws? [Which might make the property hard to treat]

- Do you have internet connection at home?

    o If yes:

        ▪ Do you also have a device to access the internet? E.g. a smartphone, laptop or tablet?

        ▪ How often do you use the internet? E.g. daily / weekly/ monthly / less frequently?

        ▪ How confident do you feel using the internet?

    o [If respondent says they do not use the internet themselves, check whether they do via family / friends for example.]

- In the past two weeks have you used any of these? Ask **bold** items only if they use the internet.

    o **Personal email**

    o **A website to look up information**

    o A telephone helpline for advice or information

    o **Online chat on a website (e.g. a company, local council etc)**

    o **Social media – eg Twitter, Facebook, Instagram, Snapchat, Whatsapp etc.**

    o **Video calling – eg Facetime, Zoom, Microsoft Teams, Whatsapp etc.**

    o **You Tube self-help videos (where someone shows you how to do something)**

    o A public library in your local area

    o A local face-to-face advice service (e.g. Citizens Advice, local council, charity, Job Centre)

- When you are at home on a typical day in winter how long do you have the heating on for?

    o Never

    o Hardly ever

    o Just when I (or someone else in the house) feel cold

    o I /we stick to set times of the day (e.g. in the morning and/or evening)

- o   Most of the time

- o   All of the time

- o   Something else [ASK]

- Still thinking about when you are at home on a typical day in winter, are you {and anyone else in your household} warm enough?

  - o   Yes - Always

  - o   Yes - Most of the time

  - o   Yes - Sometimes

  - o   No – Hardly ever

  - o   No – Never

- Some people can easily afford to pay their bills, others find it more difficult to pay. Thinking about your household's current situation, in general, how easy or difficult is it for you to pay for your bills?

  - o   I/we are keeping up without any difficulty

  - o   I/we are keeping up, but struggle from time to time

  - o   I/we are keeping up, but it is a constant struggle

  - o   I/we are falling behind with payments

  - o   Don't know

Privacy notice

Thank you, before I ask you any questions, there are a few things I need to read out about how we will store and use the information you provide:

- The information we collect now (and in the interview) will be anonymised so that you personally cannot be identified. The information you provide will be combined with data from all of the interviews to produce a report.

- This call may be recorded, but this is for our own training and quality procedures and the recording will not be used for any other purpose.

- The information you provide will be stored securely in accordance with GDPR.

- You have the right to end the call at any point.

- I can provide you with the full privacy notice [https://www.winningmoves.com/privacy-notice]

Topic guide

Introduction (5 minutes)

Welcome and moderator introduce themselves.

Thank you for taking part today. We're going to be discussing how people in the UK can get advice about ways to save energy at home; and your views on how an Energy Advice Service for everyone in the UK should work.

Just as a reminder, the research is for the UK Government's energy department [that is, the Department for Energy Security and Net Zero].

This is one of several workshops we're running across the country. It's important for you to know:

- Your answers will not be linked back to you - they are confidential and anonymous.

- We'll add together your comments today with those from the other groups we are running to report on the main points from the discussions.

- In our report, we will quote particularly interesting things that people have said – we won't use your name, it will be anonymous, and it can't be traced back to you. It will say something like 'participant [Grimsby]' said…

- Remember there are no right or wrong answers so please just answer as honestly as you can.

- Feel free to disagree with each other (politely!). We want to hear everyone's views and we know you won't all have the same thoughts. Please try to give everyone time to speak.

- Please think of this as a conversation between you, rather than a Q&A session with me. I'll introduce a topic then we can discuss what you all think about it.

- If at any point you want me to explain something, or if I'm going too fast, or you want me to repeat something, please let me know.

- We would like to record the discussion to help us with making notes later on. The recording will not be shared or used for anything else. Would that be okay?

- Any personal information you gave us when we asked you to join the group will be stored securely in line with the General Data Protection Legislation (GDPR).

- If you'd like to read our privacy notice – which sets out how we look after and use the information you provide – please talk to [co-moderator] at the break or end of the workshop.

- We'll also be giving out the 'thank you' vouchers at the end of the workshop.

- Housekeeping

Do you have any questions before we start?

Now you've heard what we are going to be doing, is everyone happy to continue? If you no longer think it's right for you to take part in the workshop it's perfectly okay to leave now, before we begin – unfortunately we'll only be able to give out vouchers at the end to those who have been in the workshop.

Warm up (5 mins)

- Please introduce yourself – say who you are and one quick thing about why you wanted to take part in the discussion.
- Online groups – practice with hands up and chat. Make sure everyone is comfortable.

Grounding – thinking about homes and information sources (5 mins)

- Just to start us off, could you share whether you've had to get anything fixed in your home recently, or made any home improvements? It can be anything, not just to do with energy. Reassure that it doesn't matter if they haven't.
    - What was it?
- When you're looking for advice on things like home improvements where do you generally prefer to go to get information and advice / like the most? [Online, telephone, face to face, other]. Or does it depend?
    - Why do you like that best?

Ways to save energy at home & awareness of advice (15 mins)

CIRCULATE PHOTO PROMPT HANDOUTS We'd like to find out whether people would/wouldn't consider doing these home improvements that are to do with saving energy. You may already have done some of them! IMPORTANT There are no right or wrong answers – we're not expecting everyone to want to do all of them and we're as interested in those you wouldn't do as those you would do.

[ACTIVITY] Using the handouts, we want you to look at each picture of possible home improvements and mark on whether [SHOW DEMO SHEET]:

- You wouldn't consider doing / it would be too difficult for you to do – a cross
- You would consider doing – a tick
- You're not sure – a question mark
- You've already done it – a letter D

[Moderators: Tailor how long is spent on this section depending on how fast/slow the group is progressing: probe more items if the workshop is ahead of time].

Looking at these measures (SHOWCARDS 3 &4: Straightforward measures and Insulation/energy), please think about any you ticked (i.e. haven't done yet but would consider doing).

- Why did you decide you would want to do them?

- How do you know about it/them? [if not covered in previous discussion]

- Where would you go to find out more? To get advice on how to do it?

- Is there anything you think would be difficult about doing it?

- [If relevant] Would you do it yourself? Or would you get help from somewhere?

[SHOWCARDS AGAIN] Please think about ONE that you wouldn't consider (put a cross against):

- Why wouldn't you consider it? What puts you off?

- Is there anything that could persuade you to consider it? PROBE: eg information, advice – on what?, signposting

Thinking generally, if you wanted to get information or advice about any of these kinds of energy saving measures, who would you trust to provide the information?

- Why would you trust them? What is it about them that makes you trust them? [Important to capture whether their views are based on experience, or perceptions / beliefs. This is also an opportunity to see if there are things that organisations / services communicate / promote that helps to build trust].

- Is there anything that would make you not trust someone who is providing advice about energy saving?

Introducing an Energy Advice Service (20-25 mins)

Now thinking about ALL the energy saving changes we have been talking about – including everything from the simple actions to the big home improvements – I want you to imagine there is an England-wide Energy Advice Service that everyone can access.

This is where we want your input on how it could work.

Spontaneous reactions

Before we get into the detail of what the Service would look like, what is your immediate reaction about there being such a service?

- Is it of interest to you? Why? Why not?

- What would make you interested in using it?

- Would other people you know be interested in using it? Why / why not?

- Is there anything you might be worried about that could put you off contacting or using the service PROBE: barriers from interview insights – e.g. confidence, confusion, capabilities, knowing/tracking your case history

- Have you had any good or bad experiences of using other Government /official advice services that the EAS could learn from?

EXERCISE – how they want to engage with the service

We want to think about how the Energy Advice Service needs to work for you to want to use it. (SHOWCARDS 3&4 only – straightforward and Insulation/energy measures). Please look back at the sheets you marked earlier and keep in mind the ones you ticked – the measures you thought you'd consider doing. Please take a few moments to think about what information and advice you would need if you wanted to go ahead with installing this measure; and how you'd want to get it.

- What kinds of features or advice would the Service have to offer to make you want to use it? [CO-MODERATOR CAPTURE ON POST-ITS – lay out on table or wall]

- SHOWCARD – are there any others here that would encourage you to use the service? Why?

How do you think the Service should make the kinds of advice you've identified available to people? Thinking about one of the energy measures you would consider, can you describe how you'd want the Service to work? PROBES:

- How do you think you / people you know will want to access the Service to get the kinds of advice you want?
    - Channels – online, telephone, face to face, other; a mix?
    - Why those ways? Why not others?

- Would you want to use different ways of accessing the service for different kinds of help and advice (eg the different types of advice we just looked at [SHOWCARD])? PROBE: What aspects? Why?

- How detailed would the advice have to be to encourage you to use the service? To give you what you want? PROBE: e.g. getting initial information, getting detailed information, applying for finance, filling forms etc.

Promotion/finding out about the service

- How do you think you / people you know would find out that there is an Energy Advice Service?

- How could it be promoted to let people know about it? Where? When?

- How do you think it could it be promoted to people who might not be looking for energy advice, or who may not know they can save money from energy home improvements?

- What would capture people's attention?

This research is going to feed into how the Service will operate. It is likely it will be delivered through a mix of online information, telephone advice and access to local in person support. For the rest of the discussion [AFTER THE BREAK] we want to gather your thoughts on the telephone and local advisor aspects of the service.

BREAK – MINIMUM 15 MINS

Telephone advice service (10 - 15 mins)

Before we think about details of the Energy Advice Service, can you tell us generally what your experience of using telephone help and advice lines is, for things to do with your home (e.g. to pay bills, get things fixed, order things etc).

- Is telephone your main preference for getting advice and information? Why?

- Why do you use telephone rather than some other way of getting the same help or advice?

- What are good examples – where you have a good experience, and it meets your needs? What makes it good?

- What do you find annoying or frustrating about telephone helplines?

Thinking about an Energy Advice telephone helpline:

- In general, is this a good idea? Why? Why not?

- Who do you think will use a telephone advice service? What for?

- What kind of information and advice about energy measures would you want to get in this way? PROBE: topics; level of detail,

HANDOUT SCENARIO CARD This is one idea of how a telephone service would work and what it would offer

- Do you think you would use this kind of telephone service – eg for the energy saving measures you said you might consider?
  - o Why? What do you like about it?
  - o If you wouldn't use it, why not? What would put you / people you know off using it?

- o How willing would you be to share personal information so that the advisor can come up with the best solutions for you? What would reassure you?

- Would you trust the advice you could get through a telephone service? Why? Why not?

- Would you use it how it's described on the card – i.e. to help you use the online tool to work out which energy measures are best for your situation? PROBE: Why? Why not?

  - o How useful to you is the idea of an Action Plan being sent to you after the call?

  - o What do you need to know to be able to take the next steps to installing the measure (s)?

  - o What does the advice need to be like to make it easy to understand?

  - o Is there anything about the advice that could put you off or make you feel it's something you couldn't do?

  - o How would you follow-up information in your Action Plan? Which channels would you use? PROBE; willingness to follow-up online signposts; what happens if they can't

  - o What would put you off going ahead?

- What else (instead) would you want a telephone advice service to offer you?

- When would you want to use it? PROBE: Days/ times

- Would you use it on your own, or with someone else sitting in?

- How can a telephone service be made easy to use for everyone? What things should the designers take into consideration? PROBE: e.g. language, cost, available times, waiting times etc.

- How do you think you find out about there being such a service? And where to get the telephone number?

  - o Would you look for the number online?

  - o If not, how else might you get the number? What would work for you / people you know?

Local advisor service (35-40 mins)

Now imagine, instead, you could go and see an advisor who is based locally, who you can see on a one-to-one basis. The details of this are still being worked out but we'd like to get your feedback on three different ideas that have been put forward, then we'll pick up any other ideas you might have that are different to these three.

Please have in mind ONE of the energy measures you thought you would or might do when we looked at the pictures earlier (SHOWCARDS to remind).– [PROBE throughout: will they be doing it on their own / with someone else supporting – e.g. a family member, a carer, someone else who comes into their house to help out?].

MODERATOR: REMINDER TO VARY THE ORDER IN WHICH THESE ARE INTRODUCED IN DIFFERENT GROUPS

For each scenario in turn, common prompts:

CO-MODERATOR RECORD PROS/CONS ON FLIPCHART FOR EACH MODEL, FOR COMPARISON EXERCISE LATER

- Is this a good idea? Why? Why not?

- Do you think you would use it? What is attractive/encourages you to want to use it?

- Why wouldn't you / other people you know use it?

- Is there anything you might be worried about that would put you off using it? Or that you/someone you know might find difficult in using the service PROBEs:

    o Access issues (travel, time, mobility)

    o Features of the setting (the building, other people, privacy)

    o Personal issues (language, mental health, fear of judgement etc)

- What kind of advice would you want to get in this way? PROBE: topics (refer to 'building blocks'; level of detail

- Who do you think will use this service? What for?

- Would you visit on your own or with someone else?

- When would you want to use it? PROBE: Days/ times

    o When are the best times? When could you get there?

Scenario 1: Local energy café / Advisor visit to community group

Scenario 2: Home visits

Scenario 3: Door-knocking

ACROSS ALL SCENARIOS

- Would you prefer to drop in or make an appointment? Why?

- How long would you want to spend with an advisor?

- What gives you confidence that the advisor understands your needs? Would you trust the advice you could get through a local advice service? Why? Why not?

- Who do you think wouldn't be able to use a local advisor service? What could a service do to help them to access the service?

COMPARE SCENARIOS – SHOW FLIP CHART PROS AND CONS

- Out of the three different ways that a local advice service might be provided, which ONE do you – personally – prefer? WRITE NUMBER ON CARD. REVEAL.

- What features in particular made you prefer the one you picked?

- Are there any other ideas for a local service that we haven't covered that would make you more likely to use a local service?

- What do you think a visit to a local advisor could offer you that you wouldn't get from a telephone call?

- Which would be your personal preference – to use a telephone advice line or see an advisor in-person somewhere locally?

  - Would your preference depend on the kind of advice? Which would be better where?

  - Thinking specifically about the energy saving home improvements we have looked at, which would be better – telephone or local, or something else?

- [IF TIME] If the Energy Advice Service could offer the kind of local advisor support you've described, would it change how likely you are to consider any of the energy saving measures we have been talking about? Which ones? Why?

Close out (5 mins)

Take a minute to think then share: What is the ONE THING that would encourage you to use the Energy Advice Service?

Thank you – we shall take away everything you have said today and combine it with what is said in the other workshops we are running. We will be feeding back to the government's energy department what potential users like you would like to see in a national Energy Advice Service.

Incentives

3.5. Consumer Profiling

The consumer profiling activity aims to identify, segment and locate HTR/DE consumers. To do this, we requested and obtained access to the three most recent years of English Housing Survey (EHS) housing stock and household data (2018 to 2020) from the UK Data Service. We reviewed more than 250 variables and selected a subset of fields that were indicative of HTR/DE consumers. These fields included household age, income, employment status, ethnicity, household composition (i.e., the relationships between household members), illness/disability, tenure, deprivation, and rurality. After cleaning and linking the EHS data from different datasets and survey years, we used the relevant variables as inputs into a hierarchical clustering model.

Hierarchical clustering algorithms work by grouping individual data points, in this case households, into clusters, based on how similar the households are. As hierarchical clustering methods do not allow for missing data, we chose the EHS fields with most information available, while prioritising the variables that are more likely to be associated with HTR/DE consumers. These included: age of the Household Reference Person (HRP), weekly equivalised net income after housing costs, ethnic origin of HRP, whether the HRP or partner is in receipt of disability related benefits, index of multiple deprivation score, whether the household is overcrowded, number of dependent children, number of employed persons, number of economically inactive and unemployed persons, rural/urban classification, and tenure. The full list of the EHS variables selected for the analysis is presented in Table 1, along with their description and weights, which indicate how much each characteristic contributed to determining the final consumer profiles.

Table 1: Selected variables from the English Housing Survey

Name	Description	Weight
Agehrpx	Age of the Household Reference Person (HRP). Continuous, e.g., 32, 75, 50.	1.5
AHCinceqv5	Weekly net household income after equivalisation factors have been applied and certain housing costs have been deducted (banded). The first quintile relates to the households with the lowest 20% of AHC equivalised weekly incomes and the fifth quintile relates to the households with the highest 20% of AHC equivalised weekly incomes. Categories: • 1st quintile (lowest)	2

Name	Description	Weight
	• 2nd quintile • 3rd quintile • 4th quintile • 5th quintile (highest)	
Ethhrp4x	Ethnic origin of HRP. Categories: • Asian • Black • Other • White	2
Hhvulx	Whether the HRP and any partner are in receipt of at least one of the principal means tested or disability related benefits. Categories: • No • Yes	1.5
Imd1910	Deprivation deciles - Lower Layer Super Output Areas (LSOAs) scored and ranked by the 2019 Index of Multiple Deprivation (IMD). Categories: • Most deprived 30% of areas • Mid-deprived 40% of areas • Least deprived 10% of areas	1
Lhastdx	Whether household is overcrowded as measured by the bedroom standard (2011 definition). Categories: • Bedrooms: above standard • Bedrooms: at standard • Bedrooms: below standard	1

Name	Description	Weight
Ndepchild	Number of children in household that are dependents. Dependent children are classed as those aged under 16 or those aged 16-18 who are still in full-time education. Continuous, e.g., 2, 0, 1.	1
Nemp	Number of employed persons in household. This counts the number of people whose primary economic status is coded as one of the following: working full-time, working part-time or on a government training scheme. Continuous, e.g., 1, 0, 2.	1
Ninac + Nunemp	Number of economically inactive and unemployed persons in household. This counts the number of people whose primary economic status is coded as one of the following: not working/long term sick, not registered unemployed but seeking work, at home not seeking work, retired or registered unemployed. Continuous, e.g., 0, 2, 3.	1
Ru11morph	Rurality classification - morphology (2011 COA). Categories: • Village, hamlets and isolated dwellings • Town and fringe • Urban > 10k	1.5
Tenure4x	Tenure. Categories: • Social housing • Owner occupied • Private rented	1

The full EHS sample included records for 46,711 homes. Approximately 1.5% of the dataset (683 homes) were missing values for the fields of interest and were subsequently removed prior to clustering.

For our consumer profiling exercise, we used an agglomerative clustering approach, which is a bottom-up process that starts by considering each data point as if it was assigned to its own individual cluster and proceeding iteratively by combining the two most similar clusters at each step, until only a single cluster exists. Distances were estimated based on a dissimilarity matrix, which calculates pairwise distances between each household in the dataset.

Several statistical methods are available for determining how clusters should be combined at each step of the hierarchical clustering process, based on different metrics of distance between data points within and between clusters. We opted to use the Ward's method[5], which creates groups such that the total variability within clusters is minimised after merging.

The results of a hierarchical clustering analysis are presented as a dendrogram, a structure similar to a tree that visually depicts the relationship between the households included in the analysis and how they are combined to generate the clusters. An example of a very simple dendrogram built on randomly generated data can be seen in Figure 1.

Figure 1: Example of dendrogram built on randomly generated data
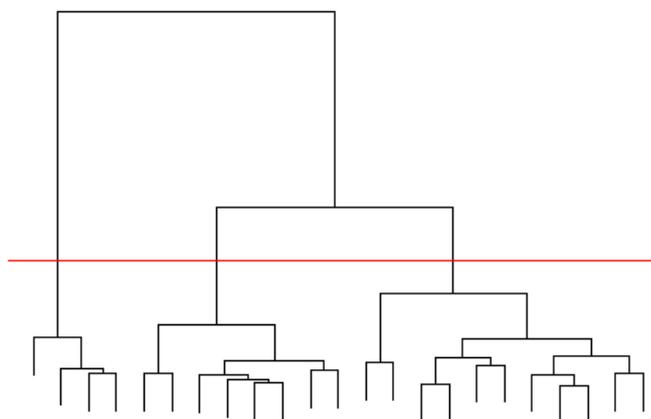
After performing the hierarchical clustering analysis on the EHS data using the weights in Table 1, we proceeded to determine the final number of clusters, which would correspond to the EHS consumer profiles. This step involved deciding where to "cut" the resulting dendrogram. For example, the red line in Figure 1 shows an example of how the dendrogram can be cut to generate three clusters, each one including all data points below the red line within the same main branch. After a dendrogram is built, there are two graphical methods – the elbow method and the silhouette method – that can be used to determine the ideal number of clusters.

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[5] Ward Jr, J. H. (1963). Hierarchical grouping to optimize an objective function. Journal of the American statistical association, 58(301), 236-244.

The elbow method looks at how close the observations within each cluster are as the number of clusters changes. The ideal number of clusters is such that splitting the data further will not considerably reduce the variability within each cluster. Alternatively, the silhouette method is based on a score that estimates how close an object is to its assigned cluster, compared to the other clusters. The ideal number of clusters is the one that maximises the silhouette score.

Applying these methods to the results of the EHS clustering analysis suggested we cut the resulting dendrogram to generate ten final clusters, or consumer profiles (Figure 2). The relationship between the ten resulting consumer profiles is represented in the dendrogram in Figure 3.

Figure 2: Elbow and silhouette methods applied to the EHS hierarchical clustering analysis
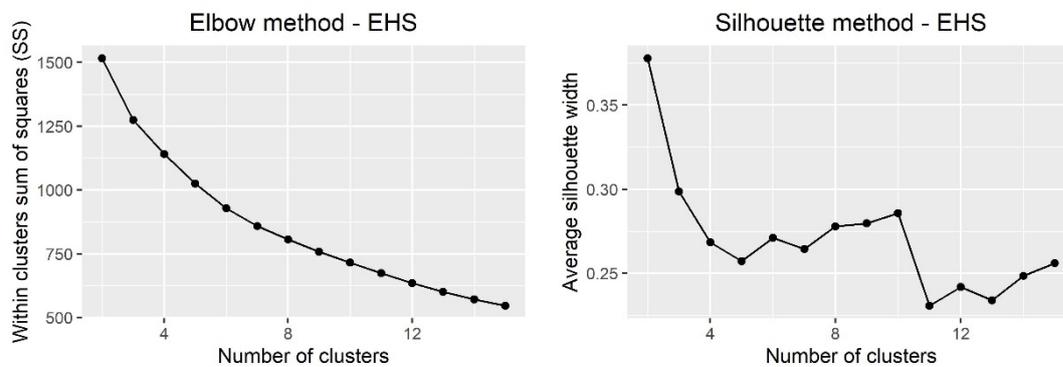
Figure 3: Dendrogram of consumer profiles based on EHS data

1 - Minorities in urban deprived areas
2 - Asians in deprived urban areas
3 - Young renters in urban areas
4 - Deprived in urban social housing
5 - Wealthy seniors in urban areas
6 - Rural wealthy homeowners
7 - Low-income unemployed and disabled
8 - Young low-income renters in deprived areas
9 - Disabled non-working seniors
10 - Low-income disabled minorities in social housing
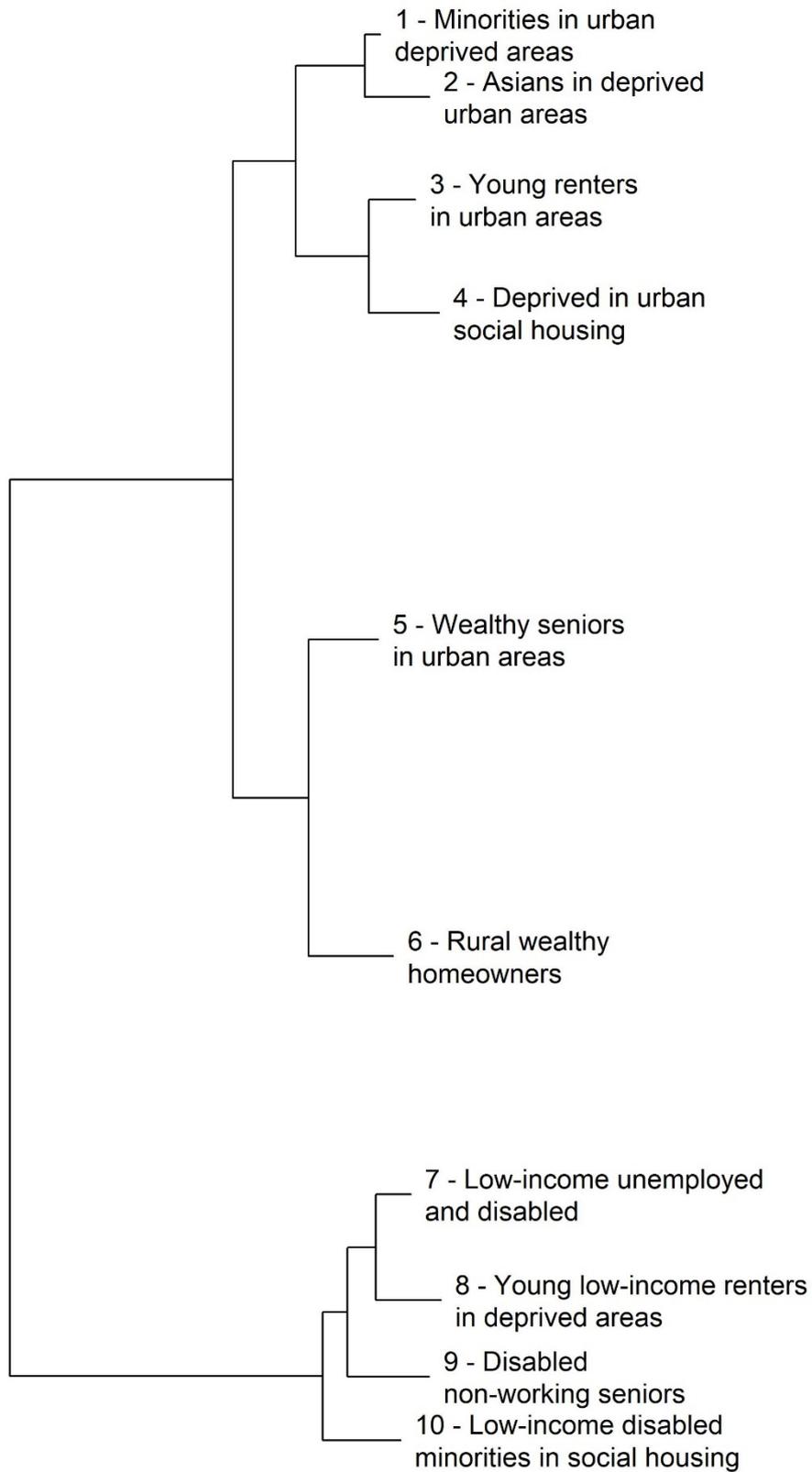
A brief description of each consumer profile is presented in Table 3 in the main report, focusing on some of the key characteristics[6] within each group that distinguish them the most from the average EHS household. A more detailed representation of each profile is available in Tables A1 to A10, each including a summary of every characteristic employed in the hierarchical clustering model for each individual consumer profile.

The ten EHS consumer profiles can help target areas as well as the type of advice service required. For example, based on their disability characteristics, consumer profiles 7, 9 and 10 could be more digitally excluded and might need to be prioritised as targets for bespoke energy advice services in England. For example, householders with limited mobility, vision impairment or mental health conditions might be unable to access digital advice through portable devices and would benefit from being reached in person at home or through alternative channels, such as audio and braille versions of written media. However, targets can change drastically based on the type of advice and delivery strategy. For example, advice that is tailored to the elderly might be delivered in person or over the phone and could be targeted to consumers in profile 9, whose members are senior homeowners. Alternatively, online energy advice translated in multiple languages could be targeted to profiles 1, 2 and 10, where a higher proportion of consumers identify with ethnic minorities.

In addition to the summary descriptions, the heatmap in Figure 4 provides a graphic representation of how each characteristic used in the analysis is distributed across different groups. A characteristic that is observed more frequently within a certain consumer profile is associated with a darker shade of colour, indicating a higher proportion of households in the dataset with that characteristic in that cluster. For example, the heatmap clearly shows that all households in profile 7 live in social housing units, while all principal householders in profile 2 identify as Asian.

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[6] The EHS groups ethnicity in 5 possible categories: Asian, Black, Mixed, Other and White. It is possible that only one category is represented within a consumer profiles, e.g., Asian is the only ethnicity in consumer profile 2 below.

Figure 4: Heat map of household characteristics across profiles

Distribution of characteristics across clusters
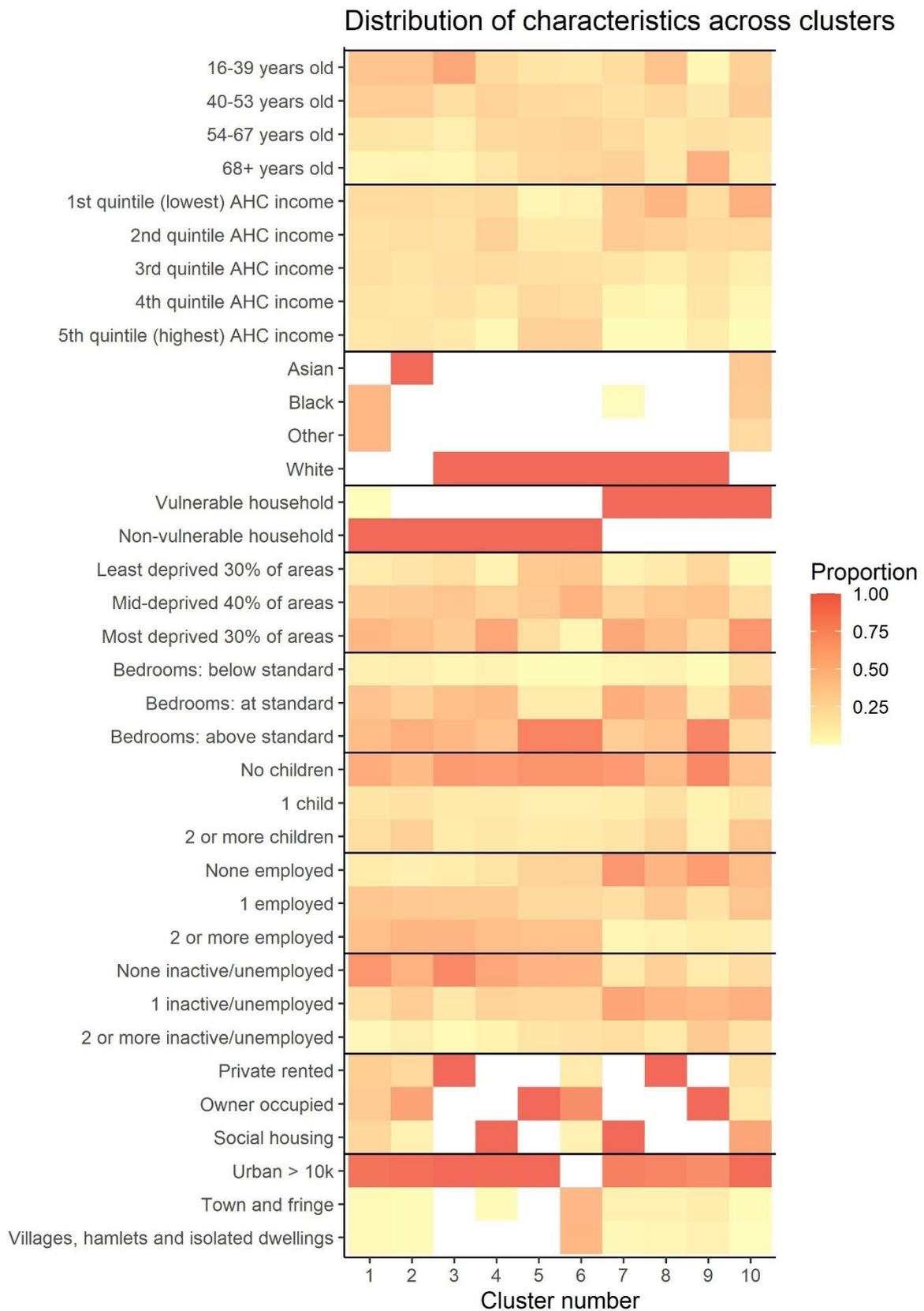
To enable users to quickly pinpoint the consumer profiles that could be potential targets of energy advice through different channels, further information about each group's ranking and summary for each characteristic used in the model is presented in Tables 2, 3 and 4. Table 2 shows the rankings for each characteristic used in the model and has been formatted so that darker shades identify higher rankings. This enables users to quickly pinpoint the consumer profiles that could be potential targets of energy advice through different channels. Table 3 reports the summary characteristics of each profile on which the rankings are based, while Table 4 shows the total number of households per EHS profile separated by regions of England. Regional totals were obtained by reproportioning the dataset to represent all households in England, using weights provided in the EHS dataset. While data from three consecutive years were used to model the consumer profiles, only the weights from the latest batch of data (2019-20) were used to obtain regional figures across England, which are likely to represent national distributions more realistically after the beginning of the COVID-19 pandemic.

The results from the clustering analysis on EHS data were then extrapolated for all households in England and used to create maps showing how each profile is distributed across households within each region in the country, as shown in Figure 4 in the main report.

Table 2: Consumer profiles ranked by household characteristics from the EHS model

Consumer profile	Average age of the HRP (1 = highest)	Proportion of households in lowest 20% of AHC equivalised weekly income (1 = highest)	Proportion of household whose HRP identifies with an ethnic minority (1 = highest)	Proportion of households whose HRP/partner is in receipt of disability related benefits (1 = highest)	Proportion of households in most deprived 30% of areas (1 = highest)	Proportion of overcrowded households, with one or more bedrooms below standards (1 = highest)	Average number of dependent children in household (1 = highest)	Number of employed persons in household (1 = lowest)	Average number of economically inactive or unemployed persons in household (1 = highest)	Proportion of households in rural areas (1 = highest)	Proportion of households in social housing (1 = highest)
1. Minorities in urban deprived areas	9	5	1	5	4	3	4	8	9	5	4
2. Asians in deprived urban areas	8	6	1	6	6	2	2	10	7	6	5
3. Young renters in urban areas	10	8	5	6	7	7	7	9	10	10	7
4. Deprived in urban social housing	5	4	5	6	2	5	6	7	8	9	1
5. Wealthy seniors in urban areas	3	10	5	6	9	9	9	6	6	8	7
6. Rural wealthy homeowners	2	9	5	6	10	10	8	5	5	1	6
7. Low-income unemployed and disabled	4	3	4	1	3	6	5	1	2	4	1
8. Young low-income renters in deprived areas	7	2	5	1	5	4	3	3	4	3	7
9. Disabled non-working seniors	1	7	5	1	8	8	10	2	1	2	7
10. Low-income disabled minorities in social housing	6	1	1	1	1	1	1	4	3	7	3

Table 3: Household summary characteristics of consumer profiles from the EHS model

Consumer profile	Average age of the HRP	Proportion of households in lowest 20% of AHC equivalised weekly income	Proportion of household whose HRP identifies with an ethnic minority	Proportion of households whose HRP/partner is in receipt of disability related benefits	Proportion of households in most deprived 30% of areas	Proportion of overcrowded households (one or more bedrooms below standards)	Average number of dependent children in household	Number of employed persons in household	Average number of economically inactive or unemployed persons in household	Proportion of households in rural areas	Proportion of households in social housing
1. Minorities in urban deprived areas	44	25%	100%	0%	51%	11%	0.74	1.41	0.32	2%	28%
2. Asians in deprived urban areas	45	25%	100%	0%	45%	11%	0.99	1.55	0.58	1%	8%
3. Young renters in urban areas	39	23%	0%	0%	36%	5%	0.46	1.51	0.22	0%	0%
4. Deprived in urban social housing	51	25%	0%	0%	62%	9%	0.57	1.41	0.46	0%	100%
5. Wealthy seniors in urban areas	56	6%	0%	0%	23%	1%	0.42	1.23	0.65	0%	0%
6. Rural wealthy homeowners	57	9%	0%	0%	6%	1%	0.44	1.21	0.68	50%	8%
7. Low-income unemployed and disabled	56	37%	0%	100%	61%	7%	0.6	0.33	1.11	4%	100%
8. Young low-income renters in deprived areas	47	51%	0%	100%	46%	9%	0.98	0.58	0.84	6%	0%
9. Disabled non-working seniors	67	24%	0%	100%	29%	1%	0.3	0.46	1.26	9%	0%
10. Low-income disabled minorities in social housing	49	56%	100%	100%	74%	24%	1.33	0.69	1.02	0%	63%

Table 4: Number of households per profile by region in England

	Profile 1 – Minorities in urban deprived areas	Profile 2 – Asians in deprived urban areas	Profile 3 – Young renters in urban areas	Profile 4 – Deprived in urban social housing	Profile 5 – Wealthy seniors in urban areas	Profile 6 – Rural wealthy homeowners	Profile 7 – Low-income unemployed and disabled	Profile 8 – Young low-income renters in deprived areas	Profile 9 – Disabled non-working seniors	Profile 10 – Low-income disabled minorities in social housing
East Midlands	88,934	84,363	174,236	60,944	730,648	443,781	177,870	74,683	143,524	51,912
East of England	121,150	65,973	225,456	107,559	1,007,832	564,660	219,379	63,460	207,871	34,500
London	506,874	432,429	532,683	158,007	1,116,252	3,694	217,792	87,447	84,631	390,037
North East	18,213	27,944	56,922	63,066	523,518	132,858	183,866	75,717	89,811	19,339
North West	97,438	102,004	277,412	147,919	1,389,848	351,304	329,700	173,784	257,187	73,920
South East	144,263	96,299	331,784	127,405	1,672,100	799,529	298,552	118,023	195,827	51,215
South West	27,355	30,163	232,327	65,338	1,016,898	647,976	219,892	110,762	157,355	11,416
Yorkshire and the Humber	45,629	81,429	260,727	119,775	919,997	376,290	208,186	107,816	180,300	78,749
West Midlands	93,917	145,449	229,109	90,415	963,505	324,768	256,410	64,877	177,209	128,728

Consumer profiles based on the EHS model

Table A1: Summary characteristics of consumer profile 1 – EHS model

Descriptor	Profile 1 – Minorities in urban deprived areas	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 41.2% 40-53 years old: 34.3% 54-67 years old: 18.2% 68+ years old: 6.3%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 25% 2nd quintile: 20.3% 3rd quintile: 21.3% 4th quintile: 17.1% 5th quintile (highest 20%): 16.3%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 0% Black: 49.5% Other: 50.5% White: 0%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 99.95% Yes: 0.05%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 50.5%	Most deprived: 30% Mid-deprived: 40%

Descriptor	Profile 1 – Minorities in urban deprived areas	England statistics
	Mid-deprived 40% of areas: 35.8% Least deprived 30% of areas: 13.7%	Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 47.2% Bedrooms: at standard: 42.2% Bedrooms: below standard: 10.6%	Overcrowded households: 3.5%
Number of dependent children	No children: 58.7% 1 child: 18.1% 2 or more children: 23.2%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 13.9% 1 employed: 40.8% 2 or more employed: 45.3%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 73.2% 1 inactive/unemployed: 22.5% 2 or more inactive/unemployed: 4.3%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 2.5% Urban > 10k: 95.3% Village, hamlets and isolated dwellings: 2.2%	Population living in rural areas: 17%
Tenure	Owner occupied: 36.7% Private rented: 34.9%	Owner occupied: 64.9% Private rented: 18.5%

Descriptor	Profile 1 – Minorities in urban deprived areas	England statistics
	Social housing: 28.4%	Social housing: 16.6%

Table A2: Summary characteristics of consumer profile 2 – EHS model

Descriptor	Profile 2 – Asians in deprived urban areas	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 41.4% 40-53 years old: 35.4% 54-67 years old: 16.2% 68+ years old: 7%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 24.8% 2nd quintile: 22.7% 3rd quintile: 18.2% 4th quintile: 16.4% 5th quintile (highest 20%): 17.9%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 100% Black: 0% Other: 0% White: 0%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability	No: 100% Yes: 0%	Has long term illness or disability: 32.7%

Descriptor	Profile 2 – Asians in deprived urban areas	England statistics
related benefits		
Index of multiple deprivation	Most deprived 30% of areas: 44.8% Mid-deprived 40% of areas: 38% Least deprived 30% of areas: 17.2%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 57.2% Bedrooms: at standard: 31.5% Bedrooms: below standard: 11.3%	Overcrowded households: 3.5%
Number of dependent children	No children: 47.8% 1 child: 19.7% 2 or more children: 32.5%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 9.8% 1 employed: 38% 2 or more employed: 52.2%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 54.9% 1 inactive/unemployed: 34.2% 2 or more inactive/unemployed: 10.9%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 2.1% Urban > 10k: 97%	Population living in rural areas: 17%

Descriptor	Profile 2 – Asians in deprived urban areas	England statistics
	Village, hamlets and isolated dwellings: 0.9%	
Tenure	Owner occupied: 64.6% Private rented: 27.1% Social housing: 8.3%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A3: Summary characteristics of consumer profile 3 – EHS model

Descriptor	Profile 3 – Young renters in urban areas	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 62% 40-53 years old: 22.4% 54-67 years old: 10.9% 68+ years old: 4.7%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 23.1% 2nd quintile: 20.6% 3rd quintile: 22.4% 4th quintile: 19.4% 5th quintile (highest 20%): 14.6%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 0% Black: 0% Other: 0% White: 100%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3%

Descriptor	Profile 3 – Young renters in urban areas	England statistics
		Other 4.0%
In receipt of disability related benefits	No: 100% Yes: 0%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 36% Mid-deprived 40% of areas: 41.1% Least deprived 30% of areas: 23%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 49.9% Bedrooms: at standard: 44.7% Bedrooms: below standard: 5.4%	Overcrowded households: 3.5%
Number of dependent children	No children: 71.7% 1 child: 14.8% 2 or more children: 13.4%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 11.7% 1 employed: 36.8% 2 or more employed: 51.5%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 81.4% 1 inactive/unemployed: 15.8% 2 or more inactive/unemployed: 2.8%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%

Descriptor	Profile 3 – Young renters in urban areas	England statistics
Rurality	Town and fringe: 0% Urban > 10k: 100% Village, hamlets and isolated dwellings: 0%	Population living in rural areas: 17%
Tenure	Owner occupied: 0% Private rented: 100% Social housing: 0%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A4: Summary characteristics of consumer profile 4 – EHS model

Descriptor	Profile 4 – Deprived in urban social housing	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 26% 40-53 years old: 31.3% 54-67 years old: 25.8% 68+ years old: 16.9%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 25.4% 2nd quintile: 31.5% 3rd quintile: 24.1% 4th quintile: 14.4% 5th quintile (highest 20%): 4.6%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 0% Black: 0%	Black: 2.0% Indian: 2.1%

Descriptor	Profile 4 – Deprived in urban social housing	England statistics
	Other: 0% White: 100%	Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 100% Yes: 0%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 61.8% Mid-deprived 40% of areas: 30.9% Least deprived 30% of areas: 7.2%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 42.9% Bedrooms: at standard: 48.2% Bedrooms: below standard: 8.9%	Overcrowded households: 3.5%
Number of dependent children	No children: 69% 1 child: 14.2% 2 or more children: 16.8%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 18.6% 1 employed: 36.7% 2 or more employed: 44.7%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed	None inactive/unemployed: 62% 1 inactive/unemployed: 30.4%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%

Descriptor	Profile 4 – Deprived in urban social housing	England statistics
persons in household	2 or more inactive/unemployed: 7.5%	
Rurality	Town and fringe: 0.6% Urban > 10k: 99.4% Village, hamlets and isolated dwellings: 0%	Population living in rural areas: 17%
Tenure	Owner occupied: 0% Private rented: 0% Social housing: 100%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A5: Summary characteristics of consumer profile 5 – EHS model

Descriptor	Profile 5 – Wealthy seniors in urban areas	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 18% 40-53 years old: 26.1% 54-67 years old: 28.6% 68+ years old: 27.4%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 5.7% 2nd quintile: 14% 3rd quintile: 21.5% 4th quintile: 26.9% 5th quintile (highest 20%): 31.9%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%

Descriptor	Profile 5 – Wealthy seniors in urban areas	England statistics
Ethnic origin of HRP	Asian: 0% Black: 0% Other: 0% White: 100%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 100% Yes: 0%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 22.8% Mid-deprived 40% of areas: 38.9% Least deprived 30% of areas: 38.3%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 85.8% Bedrooms: at standard: 13.1% Bedrooms: below standard: 1.1%	Overcrowded households: 3.5%
Number of dependent children	No children: 75% 1 child: 11.4% 2 or more children: 13.6%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 30.5% 1 employed: 26.1% 2 or more employed: 43.5%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%

Descriptor	Profile 5 – Wealthy seniors in urban areas	England statistics
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 54% 1 inactive/unemployed: 27.9% 2 or more inactive/unemployed: 18.1%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 0% Urban > 10k: 100% Village, hamlets and isolated dwellings: 0%	Population living in rural areas: 17%
Tenure	Owner occupied: 100% Private rented: 0% Social housing: 0%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A6: Summary characteristics of consumer profile 6 – EHS model

Descriptor	Profile 6 – Rural wealthy homeowners	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 15.9% 40-53 years old: 25% 54-67 years old: 29.9% 68+ years old: 29.3%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 8.8% 2nd quintile: 14.9% 3rd quintile: 20.5%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20%

Descriptor	Profile 6 – Rural wealthy homeowners	England statistics
	4th quintile: 24.4% 5th quintile (highest 20%): 31.5%	4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 0% Black: 0% Other: 0% White: 100%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 100% Yes: 0%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 6.2% Mid-deprived 40% of areas: 53.6% Least deprived 30% of areas: 40.2%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 85.8% Bedrooms: at standard: 13.2% Bedrooms: below standard: 1%	Overcrowded households: 3.5%
Number of dependent children	No children: 74.9% 1 child: 10.9% 2 or more children: 14.1%	Households with children: 26.2% Households with no children: 73.8%
Number of employed	None employed: 31.1% 1 employed: 25.8%	Workless households: 13.4% Working households: 58.4%

Descriptor	Profile 6 – Rural wealthy homeowners	England statistics
persons in household	2 or more employed: 43.2%	Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 51.9% 1 inactive/unemployed: 28.3% 2 or more inactive/unemployed: 19.8%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 49.7% Urban > 10k: 0% Village, hamlets and isolated dwellings: 50.3%	Population living in rural areas: 17%
Tenure	Owner occupied: 78.7% Private rented: 13.3% Social housing: 8%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A7: Summary characteristics of consumer profile 7 – EHS model

Descriptor	Profile 7 – Low-income unemployed and disabled	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 23.5% 40-53 years old: 20% 54-67 years old: 24.7% 68+ years old: 31.8%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%

Descriptor	Profile 7 – Low-income unemployed and disabled	England statistics
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 37% 2nd quintile: 37% 3rd quintile: 17.2% 4th quintile: 7.6% 5th quintile (highest 20%): 1.2%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 0% Black: 0.01% Other: 99.99% White: 0%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 0% Yes: 100%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 61.4% Mid-deprived 40% of areas: 30.9% Least deprived 30% of areas: 7.7%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 35.3% Bedrooms: at standard: 57.6% Bedrooms: below standard: 7.1%	Overcrowded households: 3.5%
Number of dependent children	No children: 70.4% 1 child: 11.9% 2 or more children: 17.8%	Households with children: 26.2% Households with no children: 73.8%

Descriptor	Profile 7 – Low-income unemployed and disabled	England statistics
Number of employed persons in household	None employed: 73% 1 employed: 22.1% 2 or more employed: 4.9%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 14.8% 1 inactive/unemployed: 62.4% 2 or more inactive/unemployed: 22.8%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 8.7% Urban > 10k: 87.2% Village, hamlets and isolated dwellings: 4.1%	Population living in rural areas: 17%
Tenure	Owner occupied: 0% Private rented: 0% Social housing: 100%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A8: Summary characteristics of consumer profile 8 – EHS model

Descriptor	Profile 8 – Young low-income renters in deprived areas	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 42.7% 40-53 years old: 25.3% 54-67 years old: 16.1% 68+ years old: 15.9%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9%

Descriptor	Profile 8 – Young low-income renters in deprived areas	England statistics
		65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 51.1% 2nd quintile: 31.5% 3rd quintile: 11.9% 4th quintile: 4.4% 5th quintile (highest 20%): 1.1%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 0% Black: 0% Other: 0% White: 100%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 0% Yes: 100%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 46.3% Mid-deprived 40% of areas: 39% Least deprived 30% of areas: 14.7%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%
Whether household is overcrowded	Bedrooms: above standard: 42.8% Bedrooms: at standard: 48% Bedrooms: below standard: 9.2%	Overcrowded households: 3.5%

Descriptor	Profile 8 – Young low-income renters in deprived areas	England statistics
Number of dependent children	No children: 48.6% 1 child: 21.3% 2 or more children: 30.2%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 52.5% 1 employed: 37.9% 2 or more employed: 9.5%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 31.9% 1 inactive/unemployed: 52.9% 2 or more inactive/unemployed: 15.1%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 9.3% Urban > 10k: 84.7% Village, hamlets and isolated dwellings: 5.9%	Population living in rural areas: 17%
Tenure	Owner occupied: 0% Private rented: 100% Social housing: 0%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A9: Summary characteristics of consumer profile 9 – EHS model

Descriptor	Profile 9 – Disabled non-working seniors	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 5.5% 40-53 years old: 15.4% 54-67 years old: 21.7% 68+ years old: 57.4%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 23.7% 2nd quintile: 27% 3rd quintile: 19.9% 4th quintile: 17.4% 5th quintile (highest 20%): 12%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 0% Black: 0% Other: 0% White: 100%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 0% Yes: 100%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 28.6% Mid-deprived 40% of areas: 42.8%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%

Descriptor	Profile 9 – Disabled non-working seniors	England statistics
	Least deprived 30% of areas: 28.5%	
Whether household is overcrowded	Bedrooms: above standard: 84.2% Bedrooms: at standard: 14.3% Bedrooms: below standard: 1.4%	Overcrowded households: 3.5%
Number of dependent children	No children: 83% 1 child: 7.7% 2 or more children: 9.3%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 68.7% 1 employed: 19.6% 2 or more employed: 11.7%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 13.9% 1 inactive/unemployed: 48.4% 2 or more inactive/unemployed: 37.7%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 11.7% Urban > 10k: 79.1% Village, hamlets and isolated dwellings: 9.2%	Population living in rural areas: 17%
Tenure	Owner occupied: 100% Private rented: 0% Social housing: 0%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

Table A10: Summary characteristics of consumer profile 10 – EHS model

Descriptor	Profile 10 – Low-income disabled minorities in social housing	England statistics
Age of Household Reference Person (HRP)	16-39 years old: 31.5% 40-53 years old: 36.1% 54-67 years old: 17.8% 68+ years old: 14.6%	16-24 years old: 3.2% 25-34 years old: 15.5% 35-44 years old: 16.3% 45-54 years old: 18.5% 55-64 years old: 17.9% 65+ years old: 28.6%
Weekly AHC income (quintiles)	1st quintile (lowest 20%): 55.9% 2nd quintile: 27.5% 3rd quintile: 10.8% 4th quintile: 4.7% 5th quintile (highest 20%): 1%	1st quintile: 20% 2nd quintile: 20% 3rd quintile: 20% 4th quintile: 20% 5th quintile: 20%
Ethnic origin of HRP	Asian: 38.8% Black: 36.4% Other: 24.8% White: 0%	Black: 2.0% Indian: 2.1% Pakistani/Bangladeshi: 1.6% White: 90.3% Other 4.0%
In receipt of disability related benefits	No: 0% Yes: 100%	Has long term illness or disability: 32.7%
Index of multiple deprivation	Most deprived 30% of areas: 73.6% Mid-deprived 40% of areas: 22.6%	Most deprived: 30% Mid-deprived: 40% Least deprived: 30%

Descriptor	Profile 10 – Low-income disabled minorities in social housing	England statistics
	Least deprived 30% of areas: 3.9%	
Whether household is overcrowded	Bedrooms: above standard: 25.3% Bedrooms: at standard: 50.8% Bedrooms: below standard: 23.9%	Overcrowded households: 3.5%
Number of dependent children	No children: 41.9% 1 child: 17.4% 2 or more children: 40.8%	Households with children: 26.2% Households with no children: 73.8%
Number of employed persons in household	None employed: 46.7% 1 employed: 41.1% 2 or more employed: 12.2%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Number of economically inactive and unemployed persons in household	None inactive/unemployed: 24.3% 1 inactive/unemployed: 55.9% 2 or more inactive/unemployed: 19.8%	Workless households: 13.4% Working households: 58.4% Mixed households: 28.1%
Rurality	Town and fringe: 0.6% Urban > 10k: 99.1% Village, hamlets and isolated dwellings: 0.3%	Population living in rural areas: 17%
Tenure	Owner occupied: 15% Private rented: 22% Social housing: 63%	Owner occupied: 64.9% Private rented: 18.5% Social housing: 16.6%

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