Reactive Response Evaluation

FINAL REPORT

Produced by NEA on behalf of the Cadent Foundation
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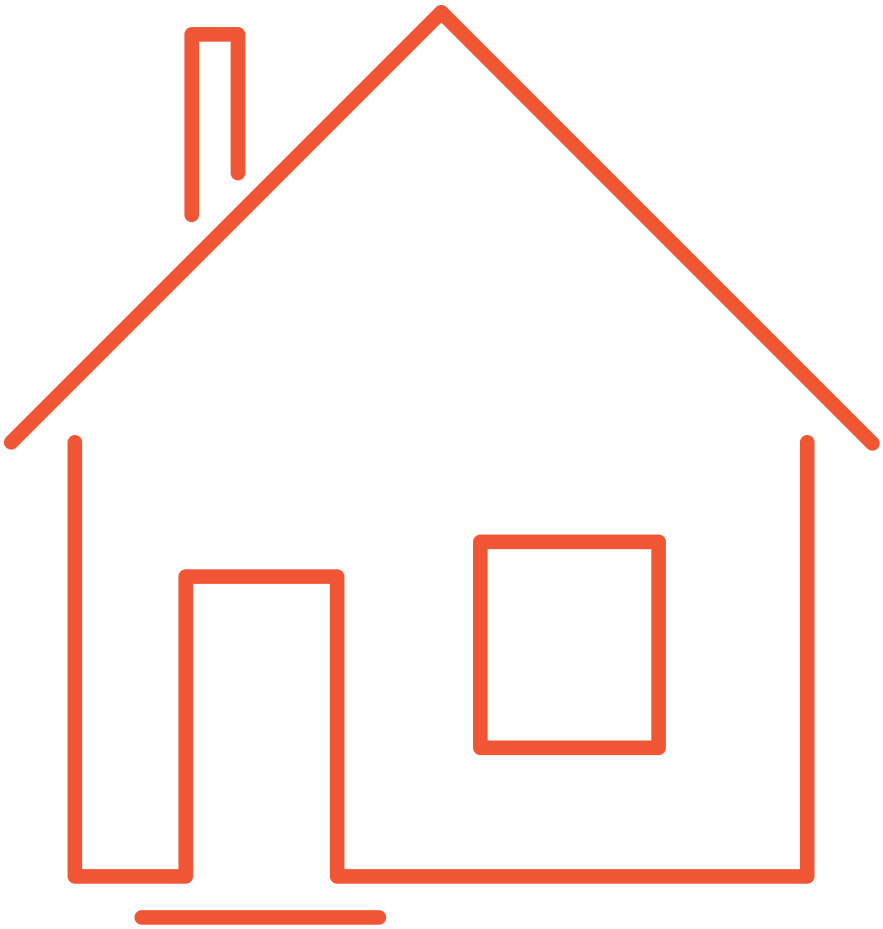

NEA
Action for Warm Homes

Cadent
Your Gas Network

Cadent Foundation

They were my gas heroes

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1. INTRODUCTION

1.1. "Bear with me mate": Inside a gas emergency

It was, almost, just another day for Terry.

Now in his mid-50s, Terry lives in a small single-story house just outside a large city in the Midlands. He used to work in the construction industry but lost his job during the Covid-19 pandemic. Referencing his employers, Terry said they made clear he wasn't going to come back – "after that, there's no more vacancies. So, they got shot of me, after I'd been there about eight, nine months." At the same time as he became unemployed, Terry's health deteriorated. Long-term issues with his shoulder flared up again, and he started to experience pain and discomfort in his bladder, which led to a long series of appointments and scans at his local hospital. Unable to work due to his illness, Terry was reliant on Universal Credit to help him pay his bills, including his energy bills.

Unfortunately, his redundancy and health issues collided with the malfunction of his gas boiler, his only means of keeping his home warm. Terry's boiler had been temperamental for some time.

> *"Each winter would come, and [the boiler] would take time to kick in. It wasn't igniting itself properly. In the end, it became a button problem where you switch it on and off. I was using the thermostat as well to control it, but it just wasn't kicking in properly. It got to the point where it wasn't even- it was sparking and stuff like that. It was becoming a bit dangerous."*

One evening, Terry knocked the boiler off before going to bed, and was immediately greeted with the faint smell of gas. Doubting himself, he went to sleep, but the smell was still there in the morning. He opened the windows, called the gas emergency number, and a few minutes later a gas engineer was permanently disconnecting and condemning his boiler as unsafe. Terry summarised his thoughts at the time, watching as his only means of heating – however dysfunctional – was switched off for good: "Well, I don't know what I'm going to do now because I can't afford a boiler. I've lost my job."

A few years ago, Terry would have found it close to impossible to afford a replacement boiler. With little income and little prospect of returning to work due to his health, he would have just "gone without", as he put it later. His boiler breakdown was an example of what is sometimes termed a life event, an event that "can plunge people into financial hardship, particularly those who are already struggling to make ends meet." It is estimated that at least 15mn people in the UK have experienced an event that was difficult or impossible to pay for, leaving them exposed to severe financial difficulties, including homelessness, destitution, and multiple forms of debt.[1]

In cases like Terry's, a boiler breakdown can result in all of this, but it can also result in winters spent trapped in a cold, unheated house, leading to significant physical and mental harm. Multiple life events within a short space of time – such as Terry's boiler breakdown, redundancy, and health deterioration – can also cause a parallel multiplication of financial difficulties, such as a drop in income at the very point some money needs to be spent.

1 This and the previous quote from Turn2Us (2021) *Life Events and Financial Insecurity*.

However, as the winter of 2021 approached, the engineer who disconnected the gas supply – an employee of the Gas Distribution Network (GDN) covering Terry's area, Cadent – had a tool in his toolbox that hadn't previously been there. Recognising that Terry was unwell, unable to work, and therefore unlikely to be able to arrange a replacement himself, the engineer contacted the Reactive Response Service to see if they could help. "Bear with me mate", Terry remembers the gas engineer saying, as he tapped some details into a tablet.

A couple of weeks later, Terry watched as a team of installers fitted a free replacement boiler in his home, delivered through the Reactive Response Service. By that point, he had also spoken to an expert energy advisor at National Energy Action and told them about his financial situation. His cupboards were empty, and his prepayment meter was close to zero. "At that time", Terry recalls, "I was just coming onto emergency credit. The money I had left in the bank would have to have gone on food." He remembers saying to the advisor: "to tell the truth, mate, I know it sounds like a bit of billy bullshit like, I am really skint. And I'm coming onto emergency credit with my gas and electric." Within a couple of days, Terry had two emergency top-up vouchers for his gas and electric. Reflecting on his new boiler and the money on his meters, he said simply "my winter is going to be a hell of a lot better."

This report is about the Reactive Response Service and the impact it has had on people such as Terry. The report narrates, discusses, and analyses the origins and implementation of the Reactive Response Service, based on a mixed-methods evaluation conducted alongside the delivery of the service itself between March 2021 and May 2022. The remainder of this section introduces the service in more detail before setting out the structure of the report in its entirety.

1.2. The Reactive Response service: A short history

Under the Gas Safety (Installation and Use) Regulations any gas appliance or fitting that is classified as 'immediately dangerous' must be isolated or disconnected from the gas supply and labelled 'Do Not Use.' The Reactive Response Service (or 'the Service') was developed by Cadent and National Energy Action (NEA) to target and support vulnerable households whose gas appliances and/or home gas infrastructures have been isolated or disconnected in this way. The Service began operation in September 2016 as a pilot before expanding into a wider area of Cadent's network in September 2017. The programme in this phase finished in March 2020 and was subsequently rolled out to Cadent's full network area from June 2020. Between March 2021 and May 2022, the service was funded by the Cadent Foundation, and at the time of writing is transitioning into delivery under Cadent's Vulnerability and Carbon Monoxide Allowance (VCMA).

The Service is based on a simple premise. In its role as a GDN, Cadent is responsible for responding to gas emergencies across the network area in which it looks after gas distribution to domestic homes. Cadent engineers therefore come into contact with people inside their homes on a daily basis, including customers in vulnerable situations or circumstances, such as Terry. The Service is based on making each of these points of contact count.[2]

Specifically, the Service enables Cadent engineers to identify households that are likely to be unable to arrange the necessary repair and/or replacement on their own and are likely to come to harm through being without heating and/or cooking facilities following their disconnection. In such situations, Cadent engineers make a referral, or support the householder to refer themselves, to NEA so that they can receive assistance to resolve their issue. If the household is deemed

2 The NICE NG6 guidelines (2015) on excess winter deaths and illness and the health risks associated with cold homes notes, as one of its recommendations, that heating engineers, meter installers and those providing building insulation should be trained and enabled to help vulnerable people to the cold at home. In turn, this recommendation is based on wider work that has been termed Making Every Contact Count (MECC), which stipulates that every contact point we have with vulnerable people is an opportunity to provide help and support that might otherwise not be accessed.

eligible to receive support, the household is passed to a third-party subcontractor (henceforth 'the subcontractor').[3] An initial survey is carried out, and the subcontractor arranges for the necessary repairs and/or replacements to be undertaken by a gas safe engineer so that the household can be reconnected to supply as soon as possible. Repairs or replacements can range from simple gas pipework repairs to the replacement of gas appliances and the installation of full central heating systems where appropriate.

Over the course of the Cadent Foundation funded period:

- 1467 referrals were received from Cadent engineers
- 186 boilers were repaired or replaced
- 28 gas fires were repaired or replaced
- 189 cookers were repaired or replaced
- 32 hobs were repaired or replaced
- 108 pipework repairs were carried out
- 7 first time central heating systems were installed
- 22 replacement central heating systems were installed
- 10 radiators were replaced
- 9 electric fires were installed
- 169 minor repairs were carried out at initial engineer visits
- 644 households were assisted in total

Initially, the Reactive Response Service sprang from a collective desire among Cadent staff – from engineers attending callouts to senior management – to do more to support vulnerable customers who would otherwise be left without heating and hot water following a gas emergency, and potentially suffer severe consequences as a result. It is well-established that living in a home that cannot be adequately heated is associated with several negative impacts on health and wellbeing. For example, previous research has consistently demonstrated the links between cold homes, ill-health, and wider social detriment, with a recent systematic review concluding that cold homes are associated with "poorer general health, poorer mental health, poorer respiratory health, more and worse controlled chronic conditions, higher mortality, higher use of health services and higher exposure to health risks, with worse results for vulnerable groups across dimensions of inequality."[4] In particular, cold homes are linked to the development and/or exacerbation of cold-related illnesses, especially in winter, and contribute directly to excess winter deaths, hospitalisations, and wider pressure on health and social care services.[5]

Furthermore, cooking facilities such as gas ovens and gas hobs are also considered essential services that, if disconnected, can deprive people of hot, healthy food. In other words, for people like Terry, going without heating, hot water, and cooking facilities can cause serious physical and mental harm – something the Reactive Response Service was created to avoid.

Once the initial crisis of gas disconnection has been resolved, NEA provides additional support to households in the form of energy advice. This support is not provided directly through Reactive Response, but instead uses a point of contact with the household (facilitated through their gas repair or replacement) to deliver energy advice funded through trusted and accredited programmes. This includes the 'One Number' pilot programme delivered by NEA on behalf of Cadent, which provides

3 Two subcontractors have worked on the Reactive Response Service in the time it has been funded by the Cadent Foundation. In agreement with project delivery staff, no attempt is made in this report to distinguish the impacts of service delivery between the tenures of each subcontractor. However, the second subcontractor delivering the project – Preferred Management Solutions (PMS) Ltd – agreed to be named in this report and agreed to take part in a focus group exploring their experiences of working on the project. Accordingly, throughout the report reference is made to 'the subcontractor' when discussing general findings of the evaluation, and reference is made to 'PMS' and 'PMS project delivery staff' only when discussing insights from the focus group conducted with PMS project delivery staff. The evaluation is extremely grateful for the time taken by PMS project delivery staff to engage with the research.

4 Ballesteros-Arjona, V. et al. (2022) What are the effects of energy poverty and interventions to ameliorate it on people's health and well-being?: A scoping review with an equity lens, Energy Research and Social Science 87: 102456, p.1.

5 NEA (2018) Under One Roof; and NEA (2017) Connecting Homes for Health: Phase 1 Review.

energy-related advice and support to Cadent customers. Through this and other programmes (e.g. Warm Home Discount Industry Initiatives), households receive energy advice and benefits entitlement checks, as well as wider forms of help, such as with energy trust fund applications or support resolving disputes with energy retail suppliers. Together, gas repair/replacement work and energy advice are intended to be delivered to households as a singular, streamlined service, and aims to address multiple drivers of fuel poverty (e.g. low household income, broken heating systems) in one intervention.

1.3. This report

NEA's research team undertook a prior evaluation of the pilot phase of the Service, producing an interim report in September 2017 and a final report in April 2020. The evaluation was renewed in July 2021, to establish whether the predominantly positive outcomes identified in the pilot evaluation have been maintained, and to explore the impact and operation of the programme following its scaling to Cadent's full network area. The evaluation was commissioned and funded by the Cadent Foundation but has operated independently from the delivery of the Service itself. This report details its full and final findings, based on a mixed methodology that has involved quantitative and qualitative research with beneficiary households and multiple engagements with the Reactive Response delivery team. Full details of the methodology can be found in Annex A.

The report is structured as follows:

- Section 2 analyses the socio-demographic, economic, and vulnerability related characteristics of households referred into the Service, with the aim of establishing if the approach to identifying vulnerability taken by the Service is reaching households at most risk of coming to harm following a gas supply disconnection. The section also analyses where referrals are being generated from in Cadent's network, to assess if the Service is reaching areas with high fuel poverty prevalence and with overlapping forms of deprivation and inequality.
- Section 3 details the impact of the service on beneficiary households. It firstly describes and discusses households' wider circumstances at the time of their disconnection. It subsequently focuses on the immediate impact of the Service by assessing the detrimental outcomes for households that would have potentially occurred if they did not receive support. It also identifies several additional longer-term impacts the Service has enabled, especially on households' ability to achieve affordable warmth, their energy costs, their physical and/or mental health, and their feelings on the safety and security of their gas appliances and/or infrastructures after receiving help.
- Section 4 moves on to identify lessons learned during the delivery of the scheme, with the intention of demonstrating how the successes and challenges experienced by the Reactive Response Service can inform the delivery of other schemes focused on supporting customers in vulnerable circumstances or situations with energy related issues.
- Section 5 discusses relevant findings of the evaluation for the energy regulator, particularly with regards to the design and delivery of the Vulnerability and Carbon Monoxide Allowance (VCMA).
- Section 6 summarises the key recommendations emerging from the report for energy networks, programmes such as Reactive Response, and BEIS and Ofgem.
- Annex A describes the methodology used in the research.

2. REACHING THE MOST VULNERABLE: THE WHO AND WHERE OF THE REACTIVE RESPONSE SERVICE

This section assesses the extent to which the Reactive Response Service has been able to successfully target households most in need of support after being disconnected from supply by a Cadent engineer. It does so in two steps.

The first subsection focuses on the socio-demographic, economic, and vulnerability related characteristics of households that were referred into the Service, based on data collected by delivery staff as part of the triage and referral process.

The second subsection widens the focus to assess the extent to which referrals are concentrated in areas of Cadent's network with relatively high levels of fuel poverty and deprivation. While geographical analysis can only ever be secondary to an assessment of the circumstances of individual households, it is a useful supplement because it can begin to examine if the Service was delivered consistently across the different regions covered by Cadent, or if there were any regions where referral volume was lower or higher than each area's fuel poverty prevalence or relative deprivation may suggest.

2.1. Who does the Reactive Response Service reach?

This section investigates the extent to which the identification and referral process enables households at particular risk of being without heating and hot water received support. More specifically, it examines the socio-demographic, economic, and vulnerability related characteristics of households receiving support from the Service. It is primarily based on an analysis of operational case data covering the Cadent Foundation funded period of the Service (1st March 2021-31st May 2022). In this time, the Service received 1467 referrals from Cadent engineers. Analysis of operational data is supplemented where necessary by findings from the quantitative and qualitative fieldwork with households, as well as insights obtained through focus groups with the delivery team.

2.1.1. Priority group data

The analysis presented in this section is anchored in a specific category of data collected by NEA entitled 'Priority Group'. Priority groups are best understood as relating specifically to personal or household characteristics that make individuals or families especially vulnerable to the harms associated with living in a cold home. Most prominently, the NICE NG6 guidelines on excess winter deaths and illness and the health risks associated with cold homes note that a wide range of people are vulnerable to the detrimental impacts of being unable to adequately heat and power their home.[6] Since the initial publication of the NICE guidelines a wider range of household circumstances and characteristics have been linked to vulnerability to cold homes, such as those with no or limited access to the internet, those who are lone parents or provide unpaid care, those in full-time education, and finally those who are from a minority ethnic group and/or do not have proficiency in the English language.[7]

6 NICE (2015) Excess winter deaths and illness and the health risks associated with cold homes.

7 Ofgem (2021) Consumer Protection Report: Autumn 2021; Robinson, C; Lindley, S. and Bouzarovski, S. (2019) The Spatially Varying Components of Vulnerability to Energy Poverty, Annals of the Association of American Geographers 109 (4): 1188-1207; Morris, J. and Genovese, A. (2018) An empirical investigation into students' experience of fuel poverty, Energy Policy 120: 228-237; Butler, D. (2021) Hard-to-Reach Energy Users: Subtask 2: Case Study Analysis United Kingdom. See also Public Health England (2020) Health Matters: cold weather and Covid-19 for an updated vulnerability to cold weather list.

Cold homes are also beginning to be associated with a wider range of detrimental social outcomes, such as relatively poor educational outcomes for children and young people.[8]

The Priority Groups used in Service data recording are as follows:

- Carer
- Children in non-advanced education
- Disabled
- Expectant parent
- Families with a child under the age of 5
- Families with a disabled child
- Long term illness
- Over 65 years old
- Unemployed

Where a Priority Group was recorded,[9] Figure 1 below shows that over half of valid cases (n=1222) involved households with long term illnesses (56%) and at least one household member over the age of 65 (67%). This correlates with the perceptions of Service delivery staff, who commented that "I think if you had a report on the age profile, you'd probably notice they're older rather than younger."

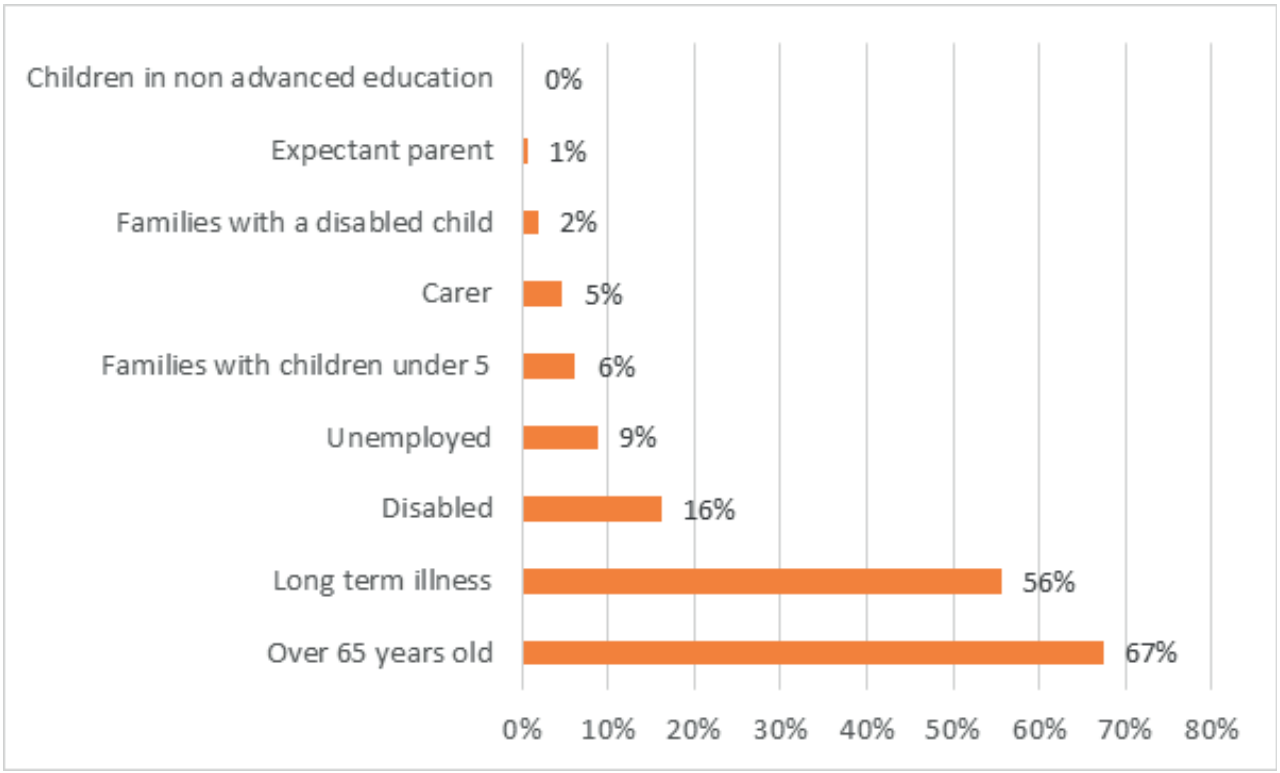


Figure 1: Most prevalent Priority Groups recorded in operational data (n=1222).[7]

This data suggests that the programme is generating referrals and cases among households that are among the most vulnerable to the health impacts of suddenly being deprived of heating, hot water, and cooking facilities; those over the age of 65 and/or with long term illnesses.

8 NEA and Food Foundation (2022) Impacts of Food Insecurity and Fuel Poverty on Child Health this Winter.

9 245 cases have no Priority Group recorded. This does not necessarily mean that the household did not fall into any group, only that no Priority Group was recorded by the NEA staff member when the case was created. The majority of these cases fall into the period where no eligibility criteria was in place. In this period, Priority Group data was recorded by NEA staff when volunteered by the household, but not requested specifically because it was not necessary to collect it for the purposes of establishing their eligibility for receiving support.

[7] Note that because households can contain multiple occupants falling into multiple Priority Groups, percentages to do not sum to 100.

2.1.2. Health-based vulnerabilities

Of 889 cases where a health condition was recorded,[10] Figure 2 below shows that the most common issues experienced by households were those that can be directly impacted by cold housing, especially cardiovascular, respiratory, and musculoskeletal conditions. In addition, there is evidence that cancer and dementia are indirectly affected by cold indoor temperatures.[11] In total, 1,850 health issues were recorded among these 889 cases, indicating that on average, there were approximately two health issues present per household.

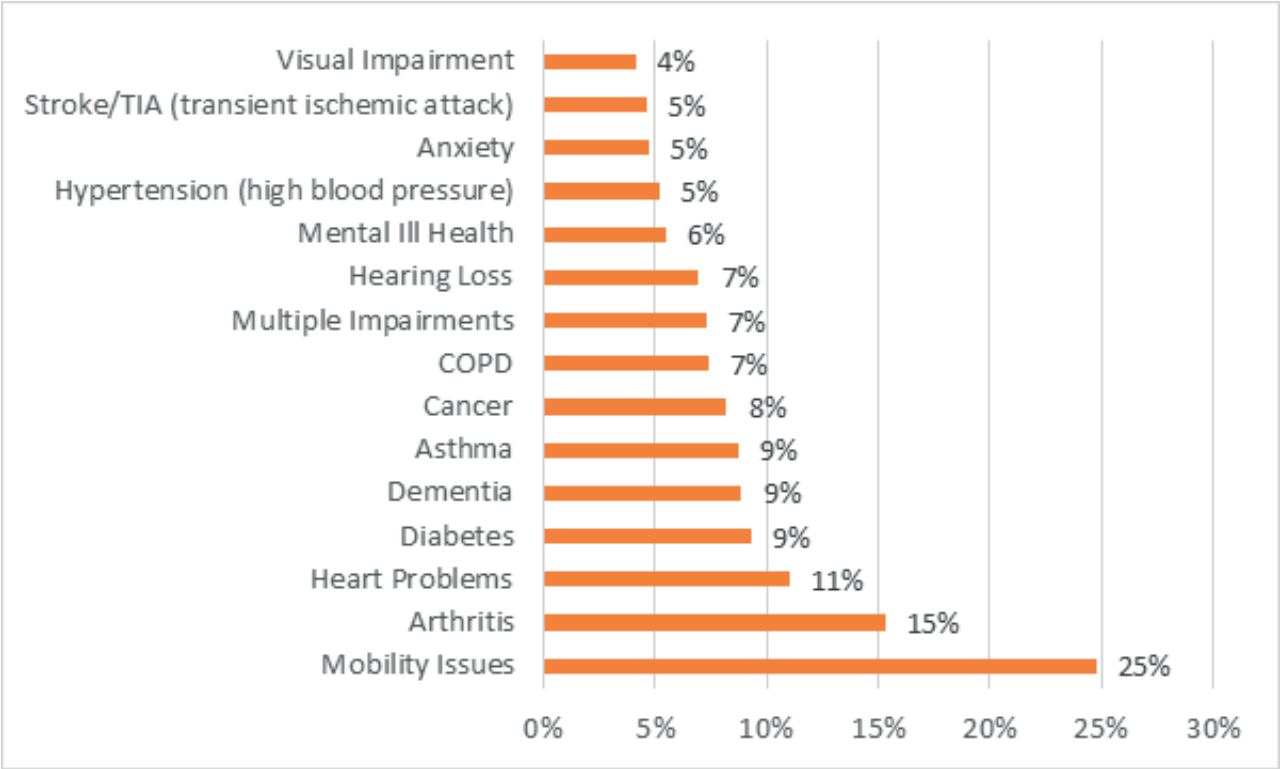


Figure 2: Most prevalent cold-related health conditions recorded in NEA operational data (n=889)

This is supported by findings from the qualitative interviews, where many narrated how the intersection of different health issues made them especially vulnerable to the loss of heating, hot water, and cooking facilities due to being disconnected from supply. For example, one interviewee narrated how his mother, who could not take part in an interview due to long-term illness, has "loads of illnesses like COPD and things [...] obviously, if it's a bit cold it can affect her chest a bit." Other examples demonstrated how ineffective or broken heating systems made coping with serious health conditions such as cancer and pulmonary fibrosis extremely difficult, reinforcing the key finding that the Service referral system effectively reached those at most risk of being without heating, hot water, and cooking facilities for a sustained period of time.

It is noteworthy that mental ill-health was recorded in a relatively small proportion of cases, 6% of referrals (see Figure 2). In contrast, delivery staff commented that "one of the things [...] I would say strongly [is] we are picking up people with mental health problems." As they continued, "my question

10 Similarly to Priority Group data, this does not necessarily mean that cold-related health conditions were not present in all other cases, only that no health conditions were recorded by the NEA staff member when the case was created. Prior to the imposition of eligibility criteria, health conditions were recorded by NEA staff when volunteered by the household, but not requested specifically because it was not necessary to collect it for the purposes of establishing their eligibility for receiving support.

11 NEA (2017) Connecting Homes for Health: Phase 1 Review.

would be, have they always had those mental health problems, or have the got them because of recent circumstances, the cost of living and all the rest of it?" There is a well-proven link between being unable to adequately heat and power a home and mental ill-health, with studies demonstrating links between depression, stress, social isolation, and fuel poverty on a consistent basis.[12] As the cost-of-living crisis deepens, it is possible that households experiencing mental ill-health will become more prominent among referrals into Reactive Response and similar services. It is also possible that mental ill-health is more difficult to recognise for engineers than other health conditions. In future, Reactive Response and similar schemes may wish to monitor more closely the proportion of referrals featuring mental ill-health, as well as ensuring engineers have the requisite training to identify callouts where isolating or disconnecting a gas supply may have negative mental health consequences.

> *"It was really terrible, to be honest. I think it would have been hard enough if I had been well, but to live in that cold, and whilst I was having chemo and I was being really sick, it was very tough. We did have, like, some electric heaters that we were given, and hot water bottles. But it would almost be that you would have to have it on full blast in the room, and then within a couple of hours it got really cold."*

> *"[My husband] is waiting for a lung transplant, so I'm just always worried that he's warm enough and stuff. It's pulmonary fibrosis. Part of that is like cold symptoms and he had a reduced immune system. So it's important that he doesn't get chills. He can catch things easily, so it's important to keep yourself warm and everything."*

2.1.3. Household composition

In terms of household composition, operational data suggests that the majority of households referred into the programme were single adult households without dependents.

Where a household composition was recorded (n=1264), 64% were single adult households with no dependents (e.g. children). 20% were couples without dependents, 9% were single adults with dependents, and 5% were couples with dependents. Latest fuel poverty statistics show that single parent households are consistently more likely to be in fuel poverty than any other household type, and that in 2020, 26.5% of single parent households were defined as fuel poor.[13] This correlates with the perceptions of delivery staff, who commented that through their work on Reactive Response, single and/or young parents were often among the most in need, but might not be identified as vulnerable by an engineer: "I worry there might be people who look alright, because they're young and they might work part-time. But actually, under the surface, they're drowning." Furthermore, children under the age of 5 can be especially at risk, as living in a cold home significantly increases the likelihood of the development of asthma and other breathing issues.[14]

12 NEA (2017) Connecting Homes for Health: Phase 1 Review.
13 BEIS (2022) Annual fuel poverty statistics report: 2022 (2020 data), p.36.
14 Institute of Health Equity (2022) Fuel Poverty, Cold Homes, and Health Inequalities in the UK.

More widely, research by the New Economics Foundation has suggested that certain types of families are likely to be particularly affected by the ongoing cost of energy crisis, with single parents seeing their bills rise 56% faster than the average.[15]

However, this does not mean that single adult households are not at risk; research by the Joseph Rowntree Foundation projected that from April 2023, some single adults would see the entirety of their household income funnelled into energy bills that make up almost 120% of their income after housing costs.[16]

2.1.4. Household income

With regards to household income, operational data suggests that the majority (two thirds) of households were living on very low incomes; with annual incomes of £12,000 or less at the point of their referral into the programme.

Where income data was recorded (n=1032), 11% of households had an annual income of £8,000 or less and 54% of households had an annual income of between £8,001 and £12,000. 23% of households were recorded as having an annual income of between £12,001 and £16,286 on their referral into the scheme, and 8% of households were recorded as having an annual income of £16,287 or above. This is significant because low household income is one of the core drivers of fuel poverty, and households with an annual income of £12,000 are considerably more likely to need to spend more than 10% of their annual incomes to maintain an adequate heating regime, which would place them in fuel poverty using the 10% definition.[17]

While income levels are dependent upon wider structural economic factors in England, qualitative interviews suggested there were a number of additional factors shaping households' low-income levels. Specifically, interviewees and survey respondents noted the following:

- The recent death of a member of the household, which had significantly reduced the overall household income.
- A recent job loss, especially in the context of redundancies resulting from the Covid-19 pandemic or a requirement to give up work to care for a family member.
- Low levels of income from state pension and the welfare system (benefits), including benefit sanctions.
- Low-paid, precarious, and insecure work.

> *"I lived with my husband in a house that had overnight storage heaters and we put them on from last Sept to our moving day in March 2021. He has now since died so I live on my own with gas central heating. My income is now £840 less per month due to [his] death."*

15 New Economics Foundation (2022) The unequal impact of the energy bill crisis.
16 JRF (2022) Stratospheric energy bills will completely wipe out incomes for low income households. Note that this modelling was conducted when the average annual energy price cap was forecasted to exceed £3,500 in October 2022, and does not reflect the Energy Price Guarantee subsequently imposed by the UK government to limit average annual energy bills to £2,500.
17 See NEA (2022) Fuel Poverty Statistics Explainer for more information on the 10% definition of fuel poverty, and how it is utilised in Scotland, Wales, and Northern Ireland.

> *"I had a good job, I worked hard for my job, so this was all new to me. I just accepted that I was meant to live on £300 a month and struggle to do so, whereas growing up I would earn £2,000/£3,000 a month and go on holidays."*

2.1.5. The bigger picture: intersecting vulnerabilities

The intersection of low incomes and multiple cold-related health conditions means that a large proportion of households supported by the Service will have higher required fuel costs than the average household, likely resulting in an inability to heat and power their home to the level they require for maintaining good health and wellbeing.

It is widely recognised that households with illnesses, disabilities, and cold-related health conditions require a more substantial level of heat and power than other households, and therefore have higher required fuel costs to stay warm and well. This is sometimes referred to as a 'satisfactory heating regime', which in one definition is "23°C in the living room (zone 1) and 20°C in other rooms (zone 2), for 16 hours every day" for households where at least one member is aged 75 or older, or at least one member has a long-term sickness or disability. In contrast, for households classified as non-vulnerable "21°C in the living room (zone 1) and 18°C in other rooms (zone 2) for 9 hours a day during the week and 16 hours a day during the weekend" is deemed to be satisfactory.[18] By these definitions, satisfactory heating regimes are more expensive to achieve for vulnerable households, all else being equal. Academic research further demonstrates that the wider circumstances experienced by households with disabilities and/or limiting illnesses can be associated with vulnerability to fuel poverty, such as spending more time at home, a lack of social relations in and outside of the home (e.g. friends, family), and a higher reliance on inadequate state provision of welfare.[19]

> *"I have got the heating on 24/7, and on a weekend, when [my daughter] does not go anywhere, it is on all day because she is prone to infections, because she has got a severe disability and children with disability needs suffer a lot more with a weaker immune system. She is forever getting chest and throat infections from cold. So I have got the heating on 24/7 and it is costing me an absolute bomb. I have just had a bill come in at £100 and I am like, 'Jesus Christ.' She can only eat pureed food so there are only certain foods that I can buy, fresh food and then having to blend food, so I am using a lot of electricity because she cannot chew. There are just loads of elements to it, which are very costly to me."*

In parallel, it is likely that low incomes make satisfactory heating (and cooking) regimes difficult to achieve for households supported by the programme. This suggests it is the combination of multiple factors, including low income, ill-health, and higher required fuel costs that renders households supported by Reactive Response especially vulnerable to experiencing a disconnection from supply following a gas leak.

18 Scottish Government (2020) Scottish house condition survey: 2019 key findings. Fuel Poverty.
19 Robinson, C; Lindley, S. and Bouzarovski, S. (2019) The Spatially Varying Components of Vulnerability to Energy Poverty, Annals of the Association of American Geographers 109 (4): 1188-1207.

2.1.6. Summary

In summary, this evidence data suggests that the main characteristics of households that were referred into the Reactive Response Service were older, single person households without dependents, living on low household incomes and experiencing multiple cold-related health conditions. Furthermore, data suggests that it is typically the intersection of two or more of these characteristics that shapes the acute vulnerability of referred households.

As discussed in the previous subsection, Reactive Response has a unique referral mechanism which is reliant on engineers' practices of identifying vulnerability. This analysis suggests that engineers are effectively identifying and referring household types that are some of the most likely to be exposed to harm by a disconnection leaving them without heating, hot water, and/or cooking facilities. The training and instruction being provided to engineers is evidently, in other words, resulting in good practices of identification and referral. However, more work may be required in future schemes to support engineers to identify and refer households in less represented Priority Groups, especially those with dependent children under the age of 5, those with poor mental health, and single, young, and/or expectant parents more effectively. This is because these groups are relatively underrepresented in the Service operational data, and are among the most at risk of being exposed to harm through disconnection. They are also groups that have been impacted particularly severely by the ongoing cost of living crisis.

2.2. Where in Cadent's network have referrals come from?

2.2.1. Focusing on geographical variance

This section broadens the focus to assess the extent to which referrals are concentrated in areas of Cadent's network with relatively high levels of fuel poverty, deprivation, and ill-health/disability. It is important to stress that geographical analysis of this kind is secondary to an analysis of specific household characteristics or circumstances, as presented in the previous section. This is because areas of relatively low fuel poverty and deprivation, as defined by official statistics, will always contain individual households that are living in fuel poverty or at serious risk if their gas supply was to be disconnected. Programmes focused on fuel poverty and vulnerability such as the Reactive Response Service are fundamentally about individual people, their homes, and their personal circumstances, not where they happen to live.

However, there are two reasons why a geographical analysis is a valuable supplement to the analysis presented in the previous subsection. Firstly, it would be expected that, all else being equal, more referrals would be generated from areas of Cadent's network that have relatively high levels of fuel poverty, primarily because more fuel poor households will be located in these areas, but also because fuel poverty is associated with other forms of deprivation and vulnerability that may serve as a trigger for an engineer making a referral: specifically child poverty, ill-health and disability, higher use of secondary heating appliances that may not have been serviced for some time, and lower income levels in general. If proportionately more referrals are being generated from areas of Cadent's network with higher levels of fuel poverty, deprivation, and ill-health/disability, this is further evidence that the referral mechanism is operating effectively.

Secondly and perhaps more importantly, geographical analysis enables a comparison of the performance of the referral mechanism across different areas of Cadent's network. Cadent's network is subdivided into regions and subregions. Subsequently, disaggregating geographical analysis by region can help to determine the extent to which the Service referral mechanism was implemented

consistently across all of Cadent's network areas. This is valuable because it may point to ways in which services such as Reactive Response may need to be designed or managed differently in future to ensure that the referral mechanism operates consistently across different geographies, avoiding potential 'postcode lotteries' in provision.

To conduct an analysis of this, the postcodes of all referred households (n=1463)[20] were extracted from programme data. The postcodes were sorted into their respective network areas (North Thames,[21] West Midlands, East Midlands, North West, and the East of England).[22] They were then merged with UK Government data at Lower Super Output Area (LSOA) level on fuel poverty, deprivation, and ill-health/disability. Fuel poverty data was taken from the Department for Business, Energy and Industrial Strategy's (BEIS) sub-regional statistics, the latest of which cover the year 2020.[23] Data on deprivation was taken from the Index of Multiple Deprivation (IMD). While the IMD's overall deprivation indicator is produced through the combination of what is termed 'sub domains' of deprivation (e.g. education, crime), the ill-health/disability indicator, defined as follows, is important to include separately because it links indirectly to cold-related ill-health:

> "The Health Deprivation and Disability Domain measures the risk of premature death and the impairment of quality of life through poor physical or mental health. The domain measures morbidity, disability and premature mortality but not aspects of behaviour or environment that may be predictive of future health deprivation."[24]

It is important to note that the IMD is a relative measure of deprivation that ranks all LSOAs in England by deprivation; 1 is most deprived, 33,000 is least deprived. This process reveals the prevalence of fuel poverty, deprivation, and ill-health/disability within each LSOA from which referrals have been generated. Aggregating this data together for referrals generated from each network area reveals what could be termed the distribution of referrals in each network area by fuel poverty, deprivation, and ill-health/disability. This can then be compared with the distribution of fuel poverty, deprivation, and ill-health/disability in each region as a whole.

2.2.2. Fuel poverty

Figure 3 below shows a comparison of the fuel poverty geography of referrals in each of Cadent's network regions to the fuel poverty geography of all LSOAs in each of Cadent's network regions. Each network area has been colour-coded for ease of interpretation. Each colour coded area appears as a 'couple', the left box plot represents the fuel poverty geography of each of Cadent's network regions as a whole while its partner box on the right represents the fuel poverty geography of Reactive Response referrals. A 'couple' is provided for each of Cadent's network regions. The box in the centre of each plot shows the middle 50% of the distribution, and the cross in the centre of each box shows the average (mean) value in each distribution.

20 Note that this number is lower than the total number of Reactive Response referrals (n=1467). This is because four postcodes could not be matched to fuel poverty or IMD data because they were newly created after the production of those statistics (i.e. through postcode churn).

21 Cadent's network area in the North Thames does not correspond to any geography used by the UK government. To approximate the LSOAs within the North Thames network area, the definition of North Thames used in the UK Government's Parliamentary Constituency Boundary Commission was used, and each Parliamentary Constituency mapped to its relevant LSOAs. According to the Boundary Commission, this area covers the constituencies of Barking and Dagenham, Barnet, Brent, Camden, Ealing, Enfield, Hackney, Hammersmith and Fulham, Haringey, Harrow, Havering, Hillingdon, Hounslow, Islington, Kensington and Chelsea, Newham, Redbridge, Richmond upon Thames (part), Tower Hamlets, Waltham Forest, and Westminster. See Boundary Commission for England (2018) The 2018 Review of Parliamentary Constituency Boundaries Volume one: Report, p.59.

22 Cadent's network also covers parts of the Yorkshire and the Humber region, primarily in South Yorkshire, and the South East of England, such as in High Wycombe. However, there has not been a sufficient number of referrals from this part of the network to enable this analysis.

23 BEIS (2022) Sub-regional fuel poverty data.

24 MHCLG (2019) The English Indices of Deprivation 2019 (IoD2019) Statistical Release, p.23.

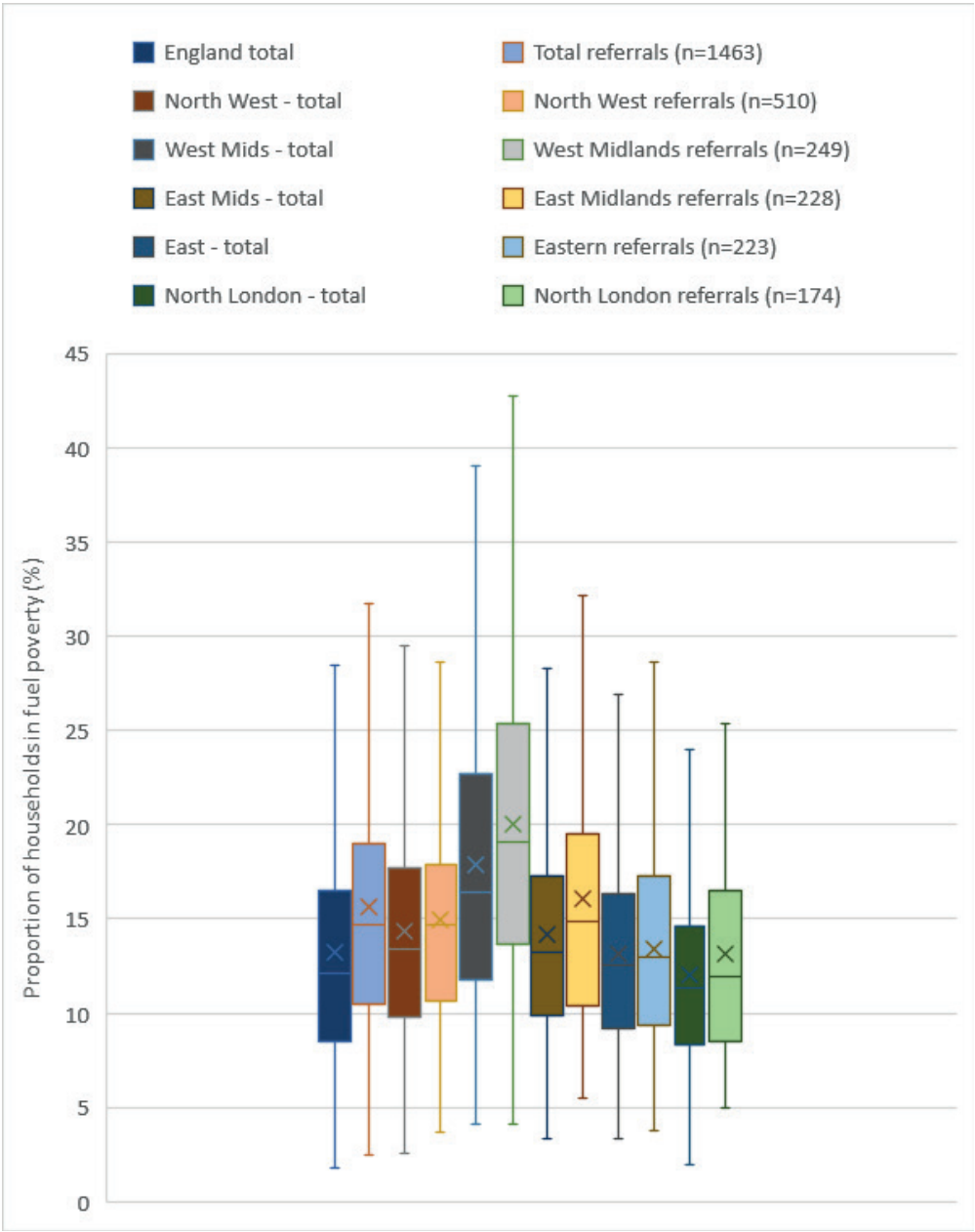


Figure 3: A comparison of the fuel poverty geography of referrals in each of Cadent's network regions to the fuel poverty geography of all LSOAs in each of Cadent's network regions

Figure 3 shows that for each colour code and therefore Cadent network region, the left box is further towards the bottom end of the distribution, and the right box is further towards the top of the distribution. These means that for all regions/network areas, proportionally more referrals are coming from areas of higher fuel poverty prevalence. In other words, more referrals have been generated from LSOAs with greater fuel poverty prevalence in each network region compared to the fuel poverty geography of each region as a whole. Furthermore, this is also the case when comparing the total referrals into the Service (n=1463) to the fuel poverty geography of English LSOAs as a whole. Accordingly, this shows that the referral mechanism is generating proportionally more referrals from areas of high fuel poverty prevalence at both a national and regional level.

2.2.3. Deprivation and ill-health/disability

This pattern also continues when examining the extent to which referrals have been generated from LSOAs with relatively high levels of ill-health and deprivation. Figures 4 and 5 below show that even though regional differences in deprivation and ill-health/disability are pronounced, with the North West of England significantly more deprived than the East of England and North London, proportionally more referrals are coming from areas of higher deprivation and ill-health/disability in each region, as well as nationally. Note that in Figure 4 and Figure 5, the left box is further towards the top end of the distribution, and the right box is further towards the bottom of the distribution. This is because 1 is most deprived, 33,000 is least deprived. In other words, the referral mechanism generated referrals more frequently from relatively more deprived LSOAs (both on the general deprivation indicator and the ill-health/disability indicator) than less deprived LSOAs.

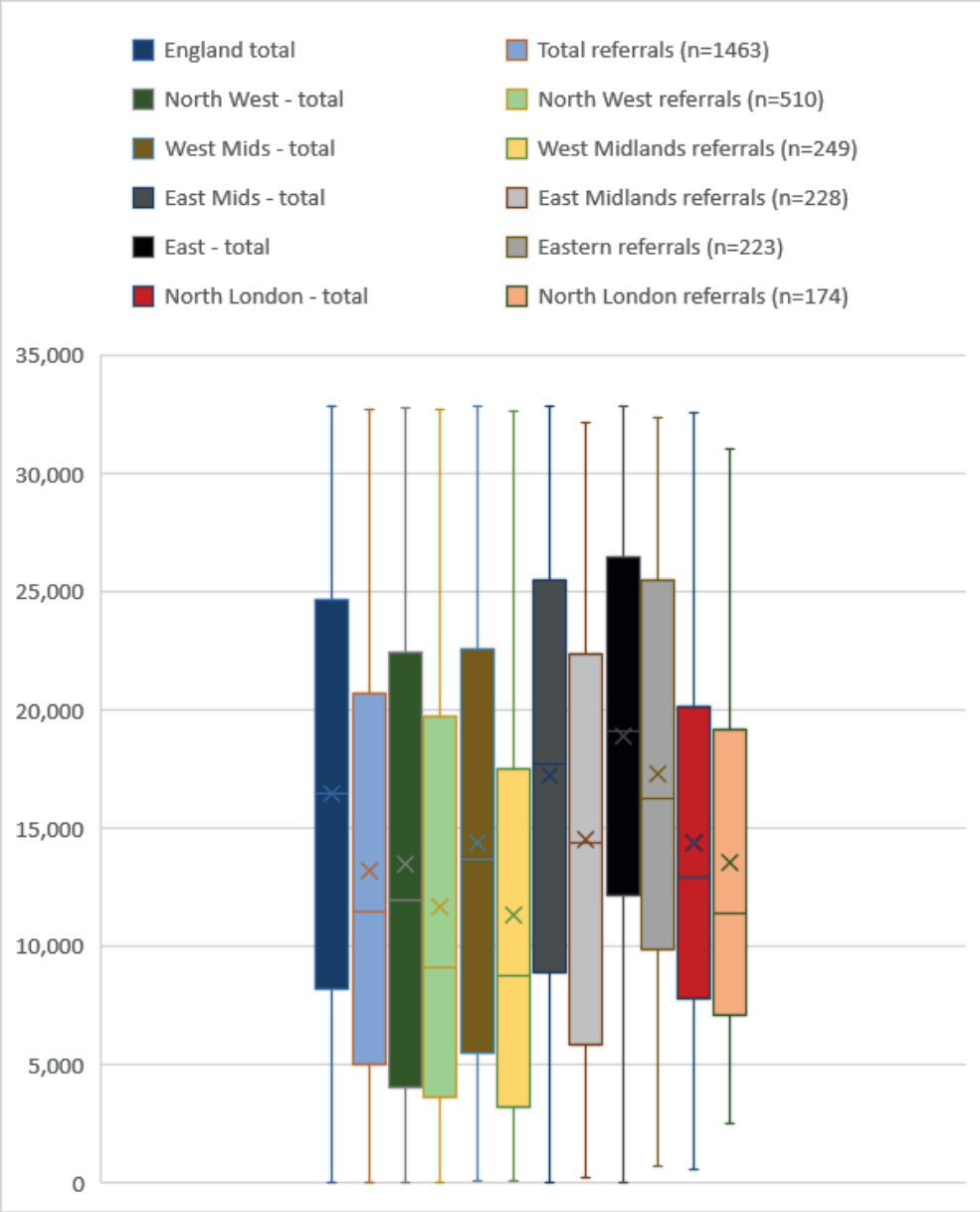


Figure 4: A comparison of the IMD geography of referrals in each of Cadent's network regions to the IMD geography of all LSOAs in each of Cadent's network regions. Note 1 = most deprived and 35,000 = least deprived.

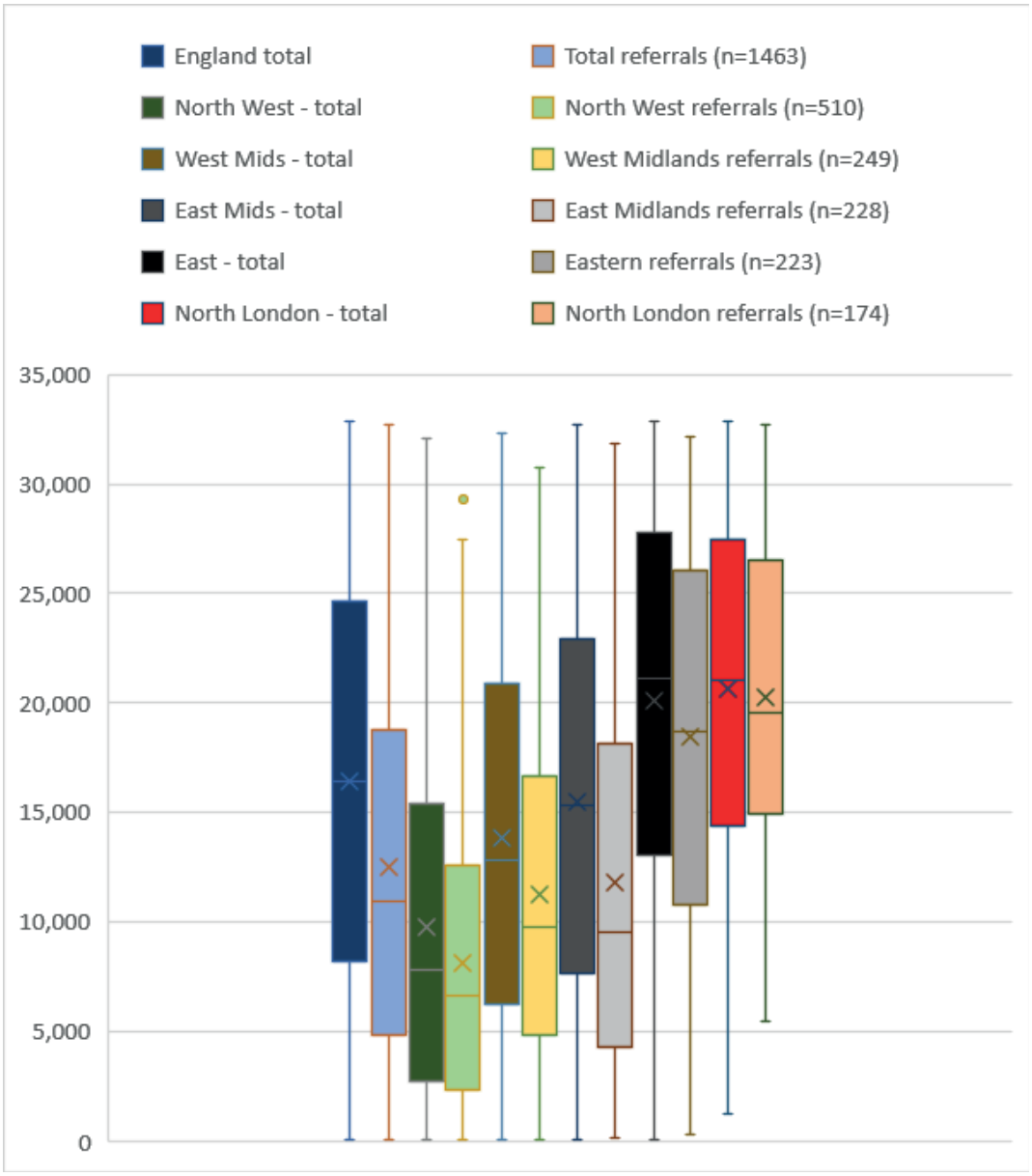


Figure 5: A comparison of the heath deprivation geography of referrals in each of Cadent's network regions to the health deprivation geography of all LSOAs in each of Cadent's network regions. Note 1 = most deprived and 35,000 = least deprived.

2.2.4. Summary

Overall, this analysis shows that throughout the life of Reactive Response, more referrals were generated from areas (LSOAs) with relatively higher levels of fuel poverty, deprivation, and ill-health/ disability, and that this was true across all of Cadent's network areas. This analysis therefore suggests that the Service referral mechanism operated consistently and as intended across Cadent's entire network area, and provides additional evidence that the Service referral mechanism was able to successfully target those households at most risk of coming to harm by being left without heating and hot water following a disconnection from supply.

3. "WITHOUT HELP FROM REACTIVE RESPONSE I REALLY DON'T KNOW WHAT I WOULD HAVE DONE": THE SHORT AND LONG TERM IMPACTS OF RECEIVING SUPPORT

3.1. "Oh well, no heating then, no water, simple, done": Before, during, and after a gas emergency

This section analyses the short- and long-term impacts for beneficiaries of receiving support from the Reactive Response Service. Before that, however, it takes some time to examine the lives and experiences of beneficiary households before they came into contact with the Reactive Response Service. This begins to show the extremely difficult circumstances beneficiaries were coping with before their gas emergency, and demonstrates the extent to which they were living in acute fuel poverty with several vulnerabilities to a cold home. Following this, the section examines the actions households might have taken if the Reactive Response Service was not available, which shows the range of pernicious circumstances that the Service has prevented from taking place.

3.1.1. Before Reactive Response

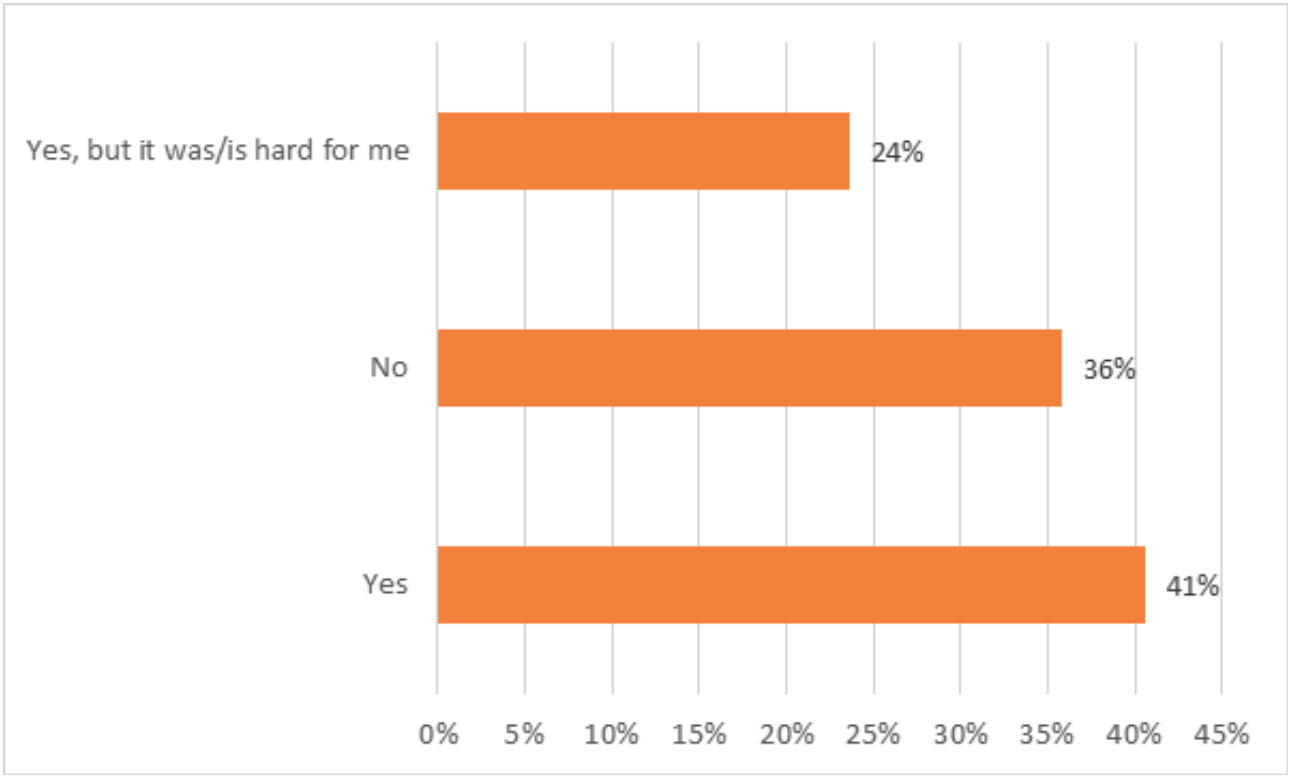


Figure 6: Before you received assistance from the Reactive Response Service, could you normally keep your whole house comfortably warm in winter or when it was cold outside? (n=165)

A key initial consideration is whether or not Reactive Response beneficiaries were living in fuel poverty prior to coming into contact with the Service. Establishing the formal fuel poverty status of households requires a complex technical and financial audit. In particular, under both the discontinued Low Income High Cost (LIHC) definition and the new Low Income Low Energy

Efficiency (LILEE) definition,[25] various calculations are undertaken to establish household disposable income after housing costs, including the value of all wages, benefits, and pensions received and the cost of rent or mortgage payments.[26] In addition, more granular factors are ascertained and accounted for, such as whether or not the household is in receipt of the Warm Home Discount rebate.[27] Because pre- and post-repair Energy Performance Certificates (EPCs) are not carried out as part of the Reactive Response Service, establishing the technical fuel poverty status of beneficiaries is not possible. However, a proxy indicator can be used to establish, from the point of view of the household, whether or not the home can be kept comfortably warm in winter or when it is cold outside. This is based on the definition of fuel poverty utilised in the Warm Homes and Energy Conservation Act of 2000, which states "a person is to be regarded as living 'in fuel poverty' if he is a member of a household living on a lower income in a home which cannot be kept warm at reasonable cost."[28]

To assess whether beneficiary households could keep their homes warm in winter or when it was cold outside, a subjective question was included in each questionnaire, worded as follows:

Before you received assistance from the Reactive Response Service, could you normally keep your whole house comfortably warm in winter or when it was cold outside?

As shown in Figure 6, 41% of survey respondents replied yes, 36% of respondents replied no, and a further 24% of respondents replied yes, but that it was difficult or hard for them to do so – taken together a majority (59%) of households were unable to keep their homes comfortably warm. Figure 7 below shows that the most common single reason given by respondents for not being able to keep their homes warm was that their heating system was broken, closely followed by cost – though often it would be a combination of the two. A smaller but nonetheless significant number of respondents responded that it was because they house did not keep the heat in well – in other words, their home was not well insulated or thermally efficient. Overall, 98 respondents said they could not keep their homes warm prior to receiving support from the Reactive Response Service, or could only do so with difficulty.

25 Under the discontinued LIHC indicator, a household was considered fuel poor if they had required fuel costs that were above average (the national median level), and were they to spend that amount, they would be left with a residual income below the official poverty line. Under the LILEE indicator, a household is considered to be fuel poor if they are living in a property with a fuel poverty energy efficiency rating of band D or below and when they spend the required amount to heat their home, they are left with a residual income below the official poverty line. The new LILEE definition was adopted as part of the 2021 fuel poverty strategy in England.

26 See BEIS (2021) Fuel Poverty Methodology Handbook (Low Income Low Energy Efficiency), especially pp.14-26.

27 BEIS (2021) Fuel Poverty Methodology Handbook (Low Income Low Energy Efficiency), pp.59-60.

28 Warm Homes and Energy Conservation Act (2000).

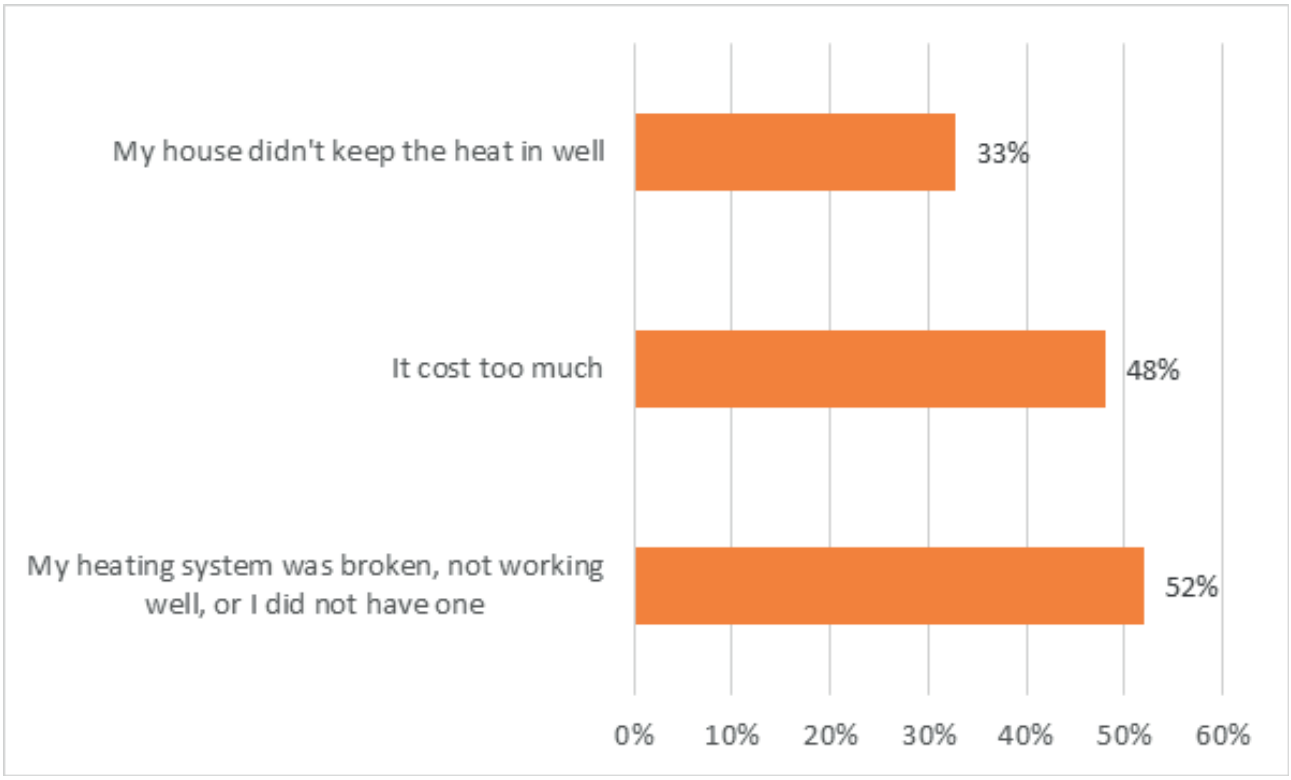


Figure 7: Please tell us why you answered 'no' or 'yes but it was hard for me' in the previous question. Note that because respondents could choose more than one option in response to this question, percentages do not sum to 100.

In interviews with beneficiaries, old, inefficient, and broken appliances were frequently referenced as a driver of being unable to keep the home warm, or of being unable to adequately light and cook inside their homes. Immediately prior to their gas emergency, interviewees described gas boilers and heating systems at different cycles of their lives. For many, their boilers had completely broken-down months beforehand; one, for example, said their boiler had "been on the blink off and on for about eight or nine months, but then it finally packed in after three months, and then we were without a boiler for six months at home." Even for those who had (partly) working boilers, they were discussed by interviewees as deeply worrying and temperamental, "as playing up for some time" or offering "no control of the heating and hot water." As a result, many interviewees had abandoned trying to use or fix their central heating systems altogether, and had adopted practices of using gas fires or plug-in electric heaters to warm the main rooms of the home. But this too was described as ineffective and unaffordable – "you would have to have it on full blast in the room, and then within a couple of hours it got really cold."

> *"There was the central heating, which was about 15 years old, that had not been used, but the boiler was condemned anyhow. All that mum had was this gas fire in the living room. Nothing upstairs whatsoever, and [we] just [had] to leave the door open and the heat would go upstairs. It was freezing upstairs."*

In addition to ineffective appliances, low household incomes – prevalent among Reactive Response beneficiaries, as the previous section demonstrated – also shaped the (in)ability of interviewees to keep their homes comfortably warm. Given the higher proportion of older beneficiaries helped by Reactive Response, it is unsurprising that low income from state pensions was frequently discussed by interviewees. Correspondingly, the high number of health conditions present among beneficiaries meant many were in receipt of some kind of disability benefit. However, income from these benefits was described as inadequate. One interviewee, for example, sought a private quote for their gas repair before accepting help from Reactive Response, stating that "I'm on PIP. I don't work. I've been unable to work. And my husband isn't in a very high-paid job, so we couldn't afford the quote [the private engineer] was asking." As discussed in the previous section, low paid work, redundancy, and other 'life events' leading to significant drops in household income, such as the death of an income earner, were also discussed as reasons why the home could not be kept warm at an affordable cost. In questionnaire responses returned and interviews undertaken after the rise in the energy price cap in April 2022, the rising cost and gas electricity was mentioned more frequently as a fundamental driver of being unable to adequately heat and power the home. In turn, this led to the adoption of coping tactics and energy rationing practices that are detrimental to mental and physical health, as discussed below.

Although not discussed as prominently as low incomes or broken heating systems, some interviewees also commented on the energy inefficiency of their homes. One interviewee described discovering that their home had, before they moved in, inadequate cavity wall insulation installed, noting that "I was getting a lot of damp and mildew around the window recesses [...] I've discovered that all [the insulation] amounts to is thousands of tiny little polystyrene balls." Later in the interview, they also commented on their loft insulation, saying that "I haven't even put my heating on at all. It's just pointless because it will suck straight out of the roof, which is really draughty." Aside from insulation, inadequate windows were also discussed by some interviewees. One said, "I do lose a lot of heat through the double glazing [and] there's cavities and things that need to be filled in", and another noted that as soon as they turn the heating off, "all my heat is out the window, the draughts all come through, and the window does not close properly." More generally, the standards of beneficiaries' housing was often described by interviewees as extremely poor. One had experienced problems with rodent infestations, and combinations of thermal inefficiency and poor heating system quality made it difficult for beneficiaries to consistently heat their homes even if they could afford to do so.

It is well established that fuel poverty and an inability to keep warm at an affordable cost are connected to what is sometimes termed the 'heat or eat' trade off. This trade off does not necessarily refer to a binary choice between heating or eating, but more commonly reflects a far more complex situation where household budgets and spending exist in a state of perpetual (or worsening) precarity, uncertainty, and scarcity. In this context, the 'heat or eat' trade-off is based on the notion that energy and food consumption have an inherent flexibility and elasticity, which is in contrast to more fixed costs such as rent and council tax. Energy and essentials such as food are therefore among the first forms of household consumption that are rationed to save money if a household is experiencing financial difficulty.

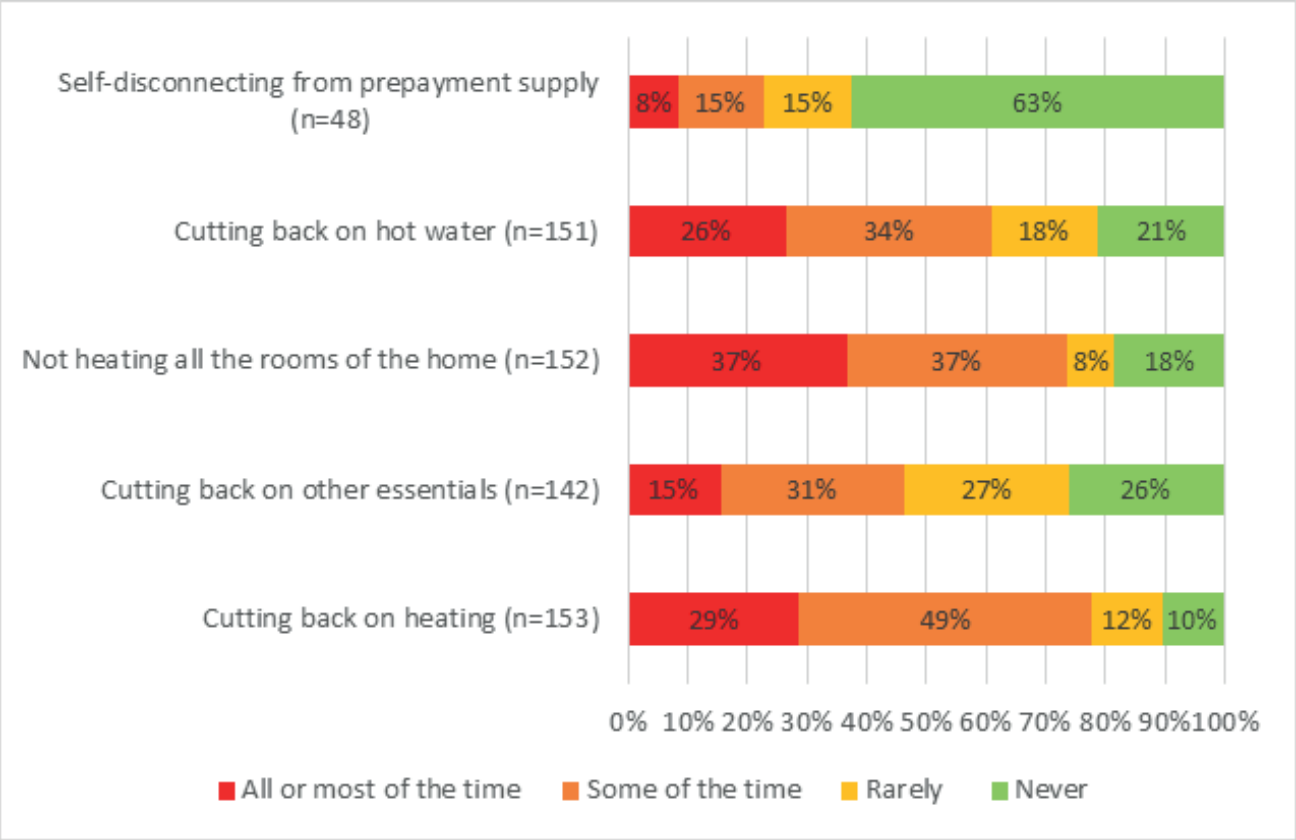


Figure 8: Thinking about before you received assistance from the Reactive Response Service, how often did you do any of the following?

Figure 8 above shows that rationing practices of this kind were common among Reactive Response beneficiaries. 78% of survey respondents were cutting back on heating all, most, or some of the time prior to coming into contact with the Service, and 74% of respondents were not heating all of the rooms of the home at least some of time. Just over 60% were cutting back on hot water at least some of the time. A slightly smaller proportion of 46% of respondents were cutting back on other essentials (such as food) all, most, or some of the time, and of those with a prepayment meter, 23% were self-disconnecting from supply at least some of the time. As Figure 8 shows, rationing practices associated with heating, either generally or with respect to different rooms of the home, were most common, with rationing practices related to hot water also prominent.

Rationing energy and essentials is typically accompanied by what is sometimes termed 'coping tactics' or 'coping practices', whereby households will attempt to find alternative means of keeping warm at home or accessing everyday essentials. With regards to heat and keeping warm, interviewees discussed several practices of coping, such as using duvets, blankets, and hot water bottles in an attempt to warm their bodies when they could not afford to heat their home. For others, these practices combined with visiting friends or family to warm up in the evening, or setting strict time limits on when they would turn the heating on and off. One interviewee, for example, described a winter evening routine where "we probably put the heating on around, say, five o'clock and switch it off at about seven o'clock [...] then we just use the electric fire in the evening, and we don't heat the back of the house at all." A second even described staying in hospital longer than necessary when undergoing chemotherapy; "I used to stay at the hospital a bit longer, just because, obviously, it was warmer in there than coming back here." As Figure 8 makes clear, not heating all of the rooms of the home was also a common coping tactic discussed by interviewees. Many were moving portable heaters from room to room as and when they were needed, or attempting to warm certain rooms

with a portable heater in advance of them needing to use it. For example, one interviewee described having "an electric fire in the front room, and sometimes it would be really cold and we took it to bed and put it on for a couple of hours while we got in bed, pulled the duvet back to warm the bed up."

> *"I used to sit here with a coat on the whole time, a big Parker that my son had, and then we would go to friends' houses to have baths and sit in their house for a couple of hours. But you felt guilty, or you did not want to intrude, so it was often just snuggling up on the sofa and going to the warmest part. I was at the top of the house, which was often a bit warmer than other parts. And sometimes just having a hot drink all the time really helped."*

In addition to heat, interviewees also discussed rationing hot water, and using different coping tactics when presented with necessary daily activities that required its use. In the interviews, practices of bathing and showering were frequently discussed. One interviewee, for example, said "I was actually having a bath before, using a kettle because I was worried about things." A second interviewee described using public showers at a local sports centre because their hot water was not working properly, saying that "fortunately [I] can just slope into the sports centre, which is only a five-minute cycle ride from my house, and they've got three showers, so I was just going over there and taking a free shower every day [...] I mean that's what I was reduced to [...] I went through the turnstiles as someone else was going through and just walked through." As noted previously, these tactics were often driven by a broken heating system or appliances that could not heat water quickly (or at all), at an affordable cost. But it was also linked to a deep, intensely felt fear that running hot water would immediately result in unaffordable bills, and it was therefore avoided entirely or wherever it was even slightly possible.

> *"I was so scared of running the hot water, I was so scared of doing the washing. I need clothes, you know. I'm thinking to myself, 'No, if I've got-' I had, yesterday, £2.98 or £2.99 I must have had yesterday. I'm thinking, 'Well that's got to last me until tomorrow. If she can't go tomorrow then I'm going to have to go until Thursday, which would mean I'm in a bit of a crisis.'"*

Other coping tactics were not linked directly to heating, but to other energy services in the home that required gas or electricity, such as cooking and lighting. One interviewee, who had a prepayment meter she struggled to keep out of emergency credit, described a constant and wearing vigilance she maintained regarding lighting and electricity use, saying that "I've found myself actually thinking, 'don't keep the lights on because...' I know lights don't take much but, 'Don't keep that on because it'll take up the electricity.' Then going round checking to see if there's anything in the house that's eating the electricity." A second interviewee similarly said that "I always turn the lights off, I wouldn't care if I never had a lightbulb again, to be truthful." Another interviewee described cooking on a "little electric heater", and typically only having pasta at mealtimes – "I sacrifice a breakfast or a lunch or whatever, and have more bowls of pasta, yes, without a doubt." As this hints at, cutting back on electricity and water is often closely related to cutting back on food consumption, or limiting the variety of food consumed to use as little electricity and water as possible.

Although Figure 8 shows that the extent to which survey respondents cut back on food and other

essentials was not as high as those who cut back on heating, some interviews described being in such limiting financial situations that they needed to cut back on everything wherever possible. One interviewee said that "I cut back on everything. I have no choice [...] food, heat everything. That's the way it is." A second interviewee described cutting back on food to try and prevent their electricity prepayment meter out of emergency credit and ultimately stop themselves from self-disconnecting, relaying that "you rob Peter to pay Paul. You've got to keep one thing going and something else has to give."

It should be emphasised that coping tactics of these kinds are often very damaging to the mental and physical health of households. Cutting back on heating, especially in certain rooms, can breed mould and damp, which can cause or exacerbate respiratory issues. For example, one interviewee described "black mould on the paper on the ceiling" of their home, with "the paper coming off in the back bedroom." Others narrated the links with musculoskeletal and cardiovascular conditions, as well as the impacts of continually needing to engage in coping tactics on their mental health and wellbeing. For example, one interviewee, who would often visit the homes of family and friends to try and stay warm in the evening, described feeling guilty and intrusive at how often they did this, which would sometimes lead them to stay at home despite it being extremely cold. Figure 9 below emphasises that the mental strain of worrying about money, household bills, and/or their household appliances breaking down was common among survey respondents. In turn, one interviewee described the intimate, interwoven link between mental and physical health whey they noted that the stress of their everyday life "has a really major effect on your breathing and your heartrate and stuff like that. I wondered why... I'm not saying it's because of my gas and electricity, I'm just saying that as a whole... I shouldn't be going through this, not at my age, either. I shouldn't be going through this kind of stress."

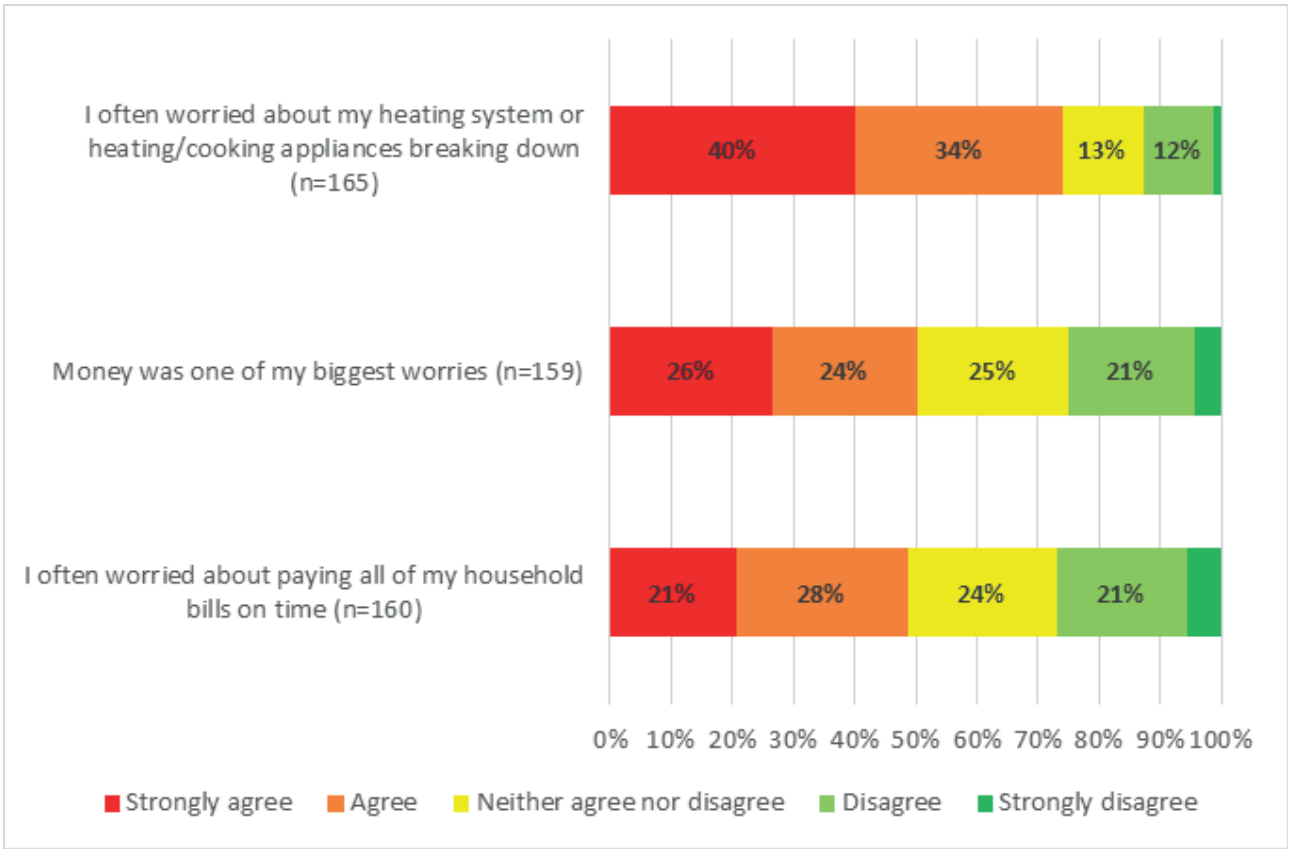


Figure 9: How much do you agree or disagree that each of these statements applied to you before you received assistance from the Reactive Response Service?

Ultimately, the circumstances of survey respondents and interviewees often prevented them from participating fully in society. In the classic Townsendian definition of poverty, individuals or households are defined as living in poverty if their "resources are so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs and activities."[29] The basic rights of a warm home, as well as access to hot water, food, and adequate shelter, were often inaccessible to interviewees before they came into contact with the Reactive Response Service. Furthermore, beyond a safe and warm home, beneficiaries were also often deprived of the key attributes necessary for living a dignified, happy life. The academic Elizabeth Shove defines the key components of everyday life as comfort, cleanliness, and convenience.[30] Few interviewees had access to these, and basically none had all three. And this was before they smelled gas.

3.1.2. The actions households might have taken if they had not received support

A key outcome of the evaluation is to understand the counterfactual question of what might have happened to households that experienced a gas emergency had the Reactive Response Service not been available. This question can be posed a different way: what situations and harms have been avoided by the Reactive Response Service?

The evidence from the household survey suggests that if a referral into the Reactive Response service had not been made, households would have taken a wide range of steps to try to resolve the issue, most of which were imagined by interviewees as damaging to their physical and mental health.

Figure 10 below shows that 44% of survey respondents said they would have used their own savings or money to pay for the necessary work to be carried out – though as is discussed below, this finding should be interpreted with care, and not be reduced to a simple interpretation that these respondents would have had money or savings to hand to pay for the work. 29% said they would not have been able to pay for the work, and would therefore have gone without heating and/or hot water for an unspecified and potentially unlimited period of time. 15% said they would have borrowed money to pay for the work, and 12% said they did not know what they would have done to resolve the issue.

29 See Bristol University (nd) Defining and Measuring Poverty.
30 Shove, E. (2003) Comfort, Cleanliness, and Convenience: The Social Organisation of Normality.

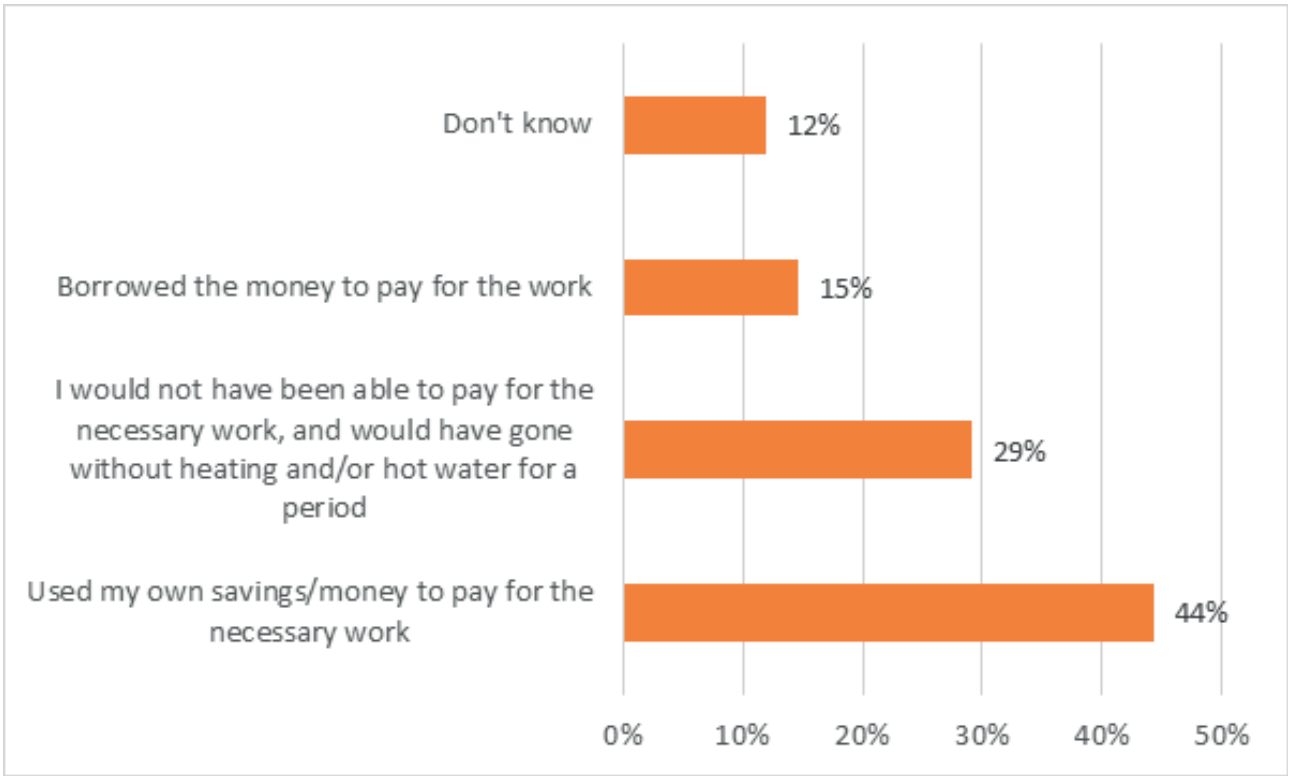


Figure 10: Responses to the counterfactual question: 'Had the Reactive Response Service not been available when my gas supply, heating appliance, or cooking appliance was disconnected I would most likely have done the following…' (n=151)

Findings also suggest only small differences in the proportion of respondents who said they would have used their own savings to pay for the necessary work when compared to the financial value of works carried out. Figure 11 shows the responses to the counterfactual question depending on if the total financial value of works carried out in each home, as recorded in operational data, was less than £1,000 or £1,000 and above.[31] Figure 11 shows that 44% of respondents said they would have used their own savings to pay for necessary work totalling £1,000 or more, while 45% of respondents said they would have used their own savings to pay for necessary work totalling less than £1,000.

A noteworthy difference, however, is that a larger proportion of respondents (34%) with work totalling £1,000 or over said they would have simply gone without heating and/or hot water for an unspecified amount of time, compared to those with work totalling less than £1,000 (24%). This suggests that those with condemned boilers that could not be economically fixed, and therefore required replacing, were marginally less likely to have borrowed or used their own savings to pay for the necessary work, and this is partially supported by qualitative interviews, where for example one interviewee who received a boiler replacement said they would have been without heating all winter had she not received support.

31 The choice of £1000 as a demarcating value is a largely arbitrary one, intended to broadly distinguish between a) repair jobs, or replacement jobs for cookers and heating appliances other than boilers, and b) boiler replacement jobs, including first-time central heating installations. According to a sample of operational data taken on 18/03/2022, the average cost of pipework jobs was £861.08. The average cost of all repair jobs, inclusive of boilers, pipework, hobs, cookers, fires, and other jobs listed as repairs, was £528,54. The average cost of appliances replacements, inclusive of cookers, fires, warm air units, hobs, pipework, radiators, and other jobs listed as replacements, but exclusive of boiler replacements, was £988.48. In contrast, the average cost of boiler replacements was £3601.52. £1000 is therefore an arbitrary but useful figure to use to examine whether questionnaire responses to the counterfactual question were different depending on the cost of the job.

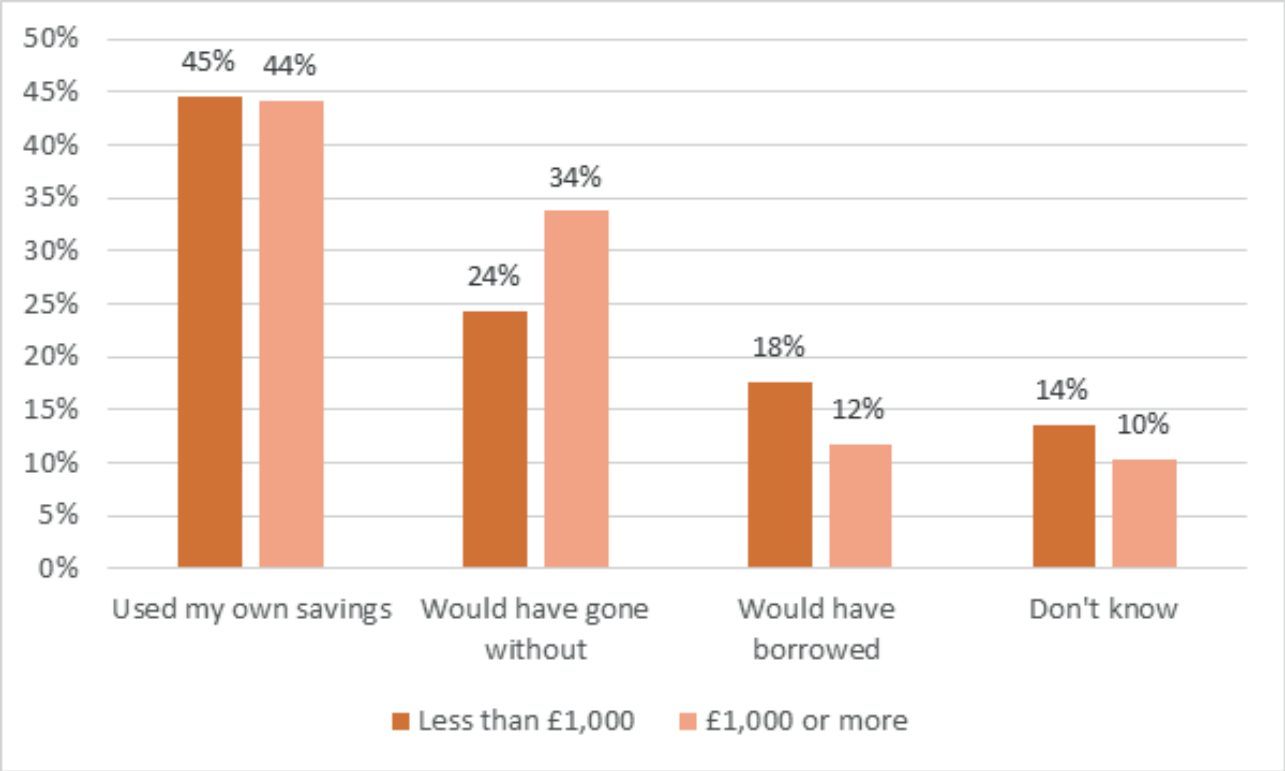


Figure 11: Responses to the counterfactual question disaggregated by whether the total value of works was less than £1,000 or £1,000 or more

3.1.3. Those who would have paid for the repair and/or replacement themselves

For those who said they would have paid for the work themselves, findings from qualitative interviews suggests that a much more complex series of situations would have occurred that are not reducible to a simple interpretation that all 44% of households would have had money or savings to hand to pay for the work.

For example, one interviewee, whose gas fire was condemned by an engineer, said they would not have been able to afford a repair or replacement but would have been able to afford a cheaper electric fire: "if it was going to cost an awful lot of money to get the fire repaired [...] we thought, when you work it out [...] it was a no-brainer, we would have an electric fire [...] we didn't want an electric fire, but we didn't think there was much choice, really." Moreover, the interviewee narrated that making this decision would have had a negative impact on their mental wellbeing because it would exhaust their savings for an appliance that they did not know would meet their heating needs: "it really was a worry as to what we were going to do for the best, because once you've made a decision maybe to have the [gas] fire out, and an electric fire put in, well, that's it. We were committed, weren't we?" A second interviewee who required a pipework repair described that they would have been able to save up to afford the work, but this would have meant severely cutting back on other essential expenditure: "I would have struggled. I would have had to cut down on something or another. It would have been a case of food money, or whatever it might have been." A third interviewee emphasised that while they could also have saved up to have works completed, the time it would have taken to save would have had a detrimental impact on the physical health of his ill mother: "it would have taken ages, and at the time mum needed some heating in the house as well."

This evidence suggests that even for households who thought they would have been able to pay for works themselves, some may not have been able to immediately, and it may have led to adverse consequences that would have negatively impacted on physical and mental health.

Katie

Katie lives in a small semi-detached house in North London. Initially, her gas leak was in her garage, a separate building to her home. She reported the leak to her energy supplier, who in turn contacted Cadent. An engineer inspected the leak and assessed that although it was mild, her supply would have to be disconnected.

It could not have come at a worse time for Katie. She was in the middle of chemotherapy, and was not working. Her ongoing treatment made it extremely important for her to stay warm, and her previous winter was an awful experience. "While I was having chemo and I was being really sick, it was very tough […] I used to sit here with a coat on the whole time, a big Parker that my son had, and then we would go to friends' houses to have baths and sit in their house for a couple of hours." She had experienced issues with her gas boiler in the past, and had often had to turn to plug-in portable radiators and huddle in the living room to stay warm.

Not being able to work during her chemotherapy, Katie could not have had the leak repaired herself. She described the thoughts flashing through her mind – going overdrawn at the bank, or loaning money from a friend of a friend. The thoughts worried her however: it worried her "that I was having to loan money from other people that I did not know that well, and I just felt embarrassed." The other alternative was simply going without heating and hot water, which would almost certainly have negatively affected her health and her recovery from cancer. The Cadent engineer understood this too, immediately telling her that "we have a charity and it is for people like you that we should be supporting and helping." Importantly, Katie said that it wasn't her who mentioned her illness to the engineer – "I never said to them, 'Can I get help?' because it is private and you do not want people to feel sorry for you." However, the engineer recognised that she was unwell and struggling, informed her of the Service, and a couple of days later, Katie's gas leak was fixed.

After receiving support from the Reactive Response Service, Katie still has to watch what she spends. Her income has not changed, and although she is hopeful that she will soon be in remission if her next couple of scans are all clear, she is not hopeful that she can return to work in the immediate future. However, her heating system is now one less worry on her mind, and she is confident that her piping and heating infrastructure is not going to leak again in the future. "At the end of the day", she summarised, "they came and helped me, they saved me…"

Katie's story shows the acute vulnerability and ill-health that many Reactive Response beneficiaries were living with prior to coming into contact with the Service. Had the Service not stepped in, she may have faced a winter struggling to recover from her chemotherapy with no heating system. Her story shows how using the contact point between an engineer and a vulnerable person following a gas leak can prevent the exacerbation of serious ill-health that would occur if they were left without heating and hot water. "It was real peace of mind for me", Katie said, "because I was really concerned."

3.1.4. Those who would have borrowed

For households that would have borrowed, the evidence suggests that the majority would have borrowed money informally from a friend or family member to pay for the necessary work to be completed. Specifically, for those that said they would have borrowed:

- 16 said they would have borrowed from an informal source, such as a friend or family member
- 2 said they would have borrowed from a finance or credit company
- 4 said they would have borrowed from a bank or building society
- 1 said they would have borrowed from a payday lender
- 1 said they would have borrowed from a Community Bank or Credit Union
- 5 said they would rather not say, or did not know where they would have borrowed from[32]

For interviewees who said they would have borrowed from friends and family to pay for their works, this was still viewed as deeply problematic and harmful. For example, one interviewee narrated how borrowing from a friend or family member would have made them feel ashamed and embarrassed, with potentially detrimental impacts on their mental wellbeing. Importantly, this was exacerbated because the source of the money would have been a friend of a friend, who the interviewee was worried about loaning money from: "one of my daughter's friend's father said that he would try and get some men together and he would loan us the money, and then we would have to pay him back. That was really kind, but then that worried me that I was having to loan money from other people that I did not know that well, and I just felt embarrassed."

A second interviewee described the intersection of their gas emergency with another life event, a death of a family member, and how this would have shaped their reluctance to try and borrow from her family. As they narrated:

> *"I would've had to have gone to my mum. But, like I say, my stepdad had just died on the Friday, so I would've felt although I could… I mean, she wouldn't have seen me without heating, but I just didn't have the money to have got it fixed. So I don't know, really. At a push I would've had to have asked my mum, but, as the circumstances stood at that time, it wasn't the best timing going to her."*

These examples demonstrate that informal borrowing from friends and family, even if involving no interest or formal agreement, was viewed by beneficiaries as difficult, worrisome, and embarrassing, potentially placing financial and mental strain on their family relationships.

In addition, one interviewee described that they would have likely used a credit card to cover the costs of their boiler repair, but that doing so would have plunged them into even further debt. Already struggling to pay household bills and a mortgage that they had inherited from their father, who had recently died, this interviewee noted that "I would've had to try and use credit cards or tried to borrow, that's the thing and put myself into more debt [...] everything was just high, you know, piling up and piling up. That's the problem isn't it, you use credit cards, but you haven't got any money to pay it back." In all of these interviews, borrowing from any source was seen as an impossible choice that might have solved their immediate situation, but would also have plunged them into financial and health difficulties at a later date. The significant consequences of debt (including informal debt, with

32 Note that this total is more than the total number of survey respondents who said they would have borrowed (n=22), because respondents could choose more than one option if they thought they would have borrowed from a combination of places.

little to no interest) on financial vulnerability, mental health, and ability to access essential services has been well documented,[33] and the prevention of these situations should be considered one of the primary outcomes of the Reactive Response Service for Cadent customers.

To quantify these findings, an estimate can be made of the amount of debt (formal or informal) that has been avoided as a result of the Reactive Response programme. This estimate can be made by taking the value of the works carried out by subcontractors (as recorded in operational data) and using this as a proxy for the amount of debt that would have been accrued by survey respondents who would have borrowed. Undertaking this calculation suggests that the Reactive Response Service has prevented the accrual of £36,190.39 of debt by survey respondents who would have borrowed to pay for their repair and/or replacement. There is not a reliable way of extrapolating this to total number of Reactive Response beneficiaries, but speculation can be made as follows. Of a total 644 households that received assistance, it could be estimated that 15% of these would have borrowed to pay for their repairs, or 96 households. Of the 22 survey respondents who said they would have borrowed to pay for their repair and/or replacement, the average value of works was £1,645. If this average was replicated across each of the 96 households, an estimate could be made that the Service has avoided household debt worth approximately £158,000 – not accounting for any interest (where applicable).

3.1.5. Additional implications of arranging the work themselves

Beyond the financial implications of arranging to have the works carried out themselves, interviewees also relayed a series of non-financial reasons why they would have struggled to have the work completed, or would only have been able to do so with a significant impact on their mental wellbeing.

Specifically, interviewees noted the following considerations:

- Finding a gas engineer or local tradesperson who would not have attempted to overcharge them for the work. One interviewee attempted to find an engineer to resolve the issue before finding out she was eligible for Reactive Response, but said they were appalled by the expensive nature of the quotes they were given: "the first thing he said was, 'Well, the price of copper has soared, you know,' and I thought, 'Oh, here we go.' He gave me a most ridiculous quote [...] So bearing in mind I could have got the piping and run it for less than £200, this bloke wanted £1,200. 'You've got to be joking.'"
- Finding a gas engineer or local tradesperson that would have been trustworthy, reliable, and able to complete the work to a necessary level of quality and safety. The mental stress and worry of attempting to find a reliable engineer themselves would have been significant, but were allayed by the certainty of knowing a qualified engineer had complete the work to a good standard.
- A reluctance to leave the house due to vulnerability to Covid-19, which would have left them unable to visit a shop to purchase a replacement appliance. In this situation, it is possible that the interviewee simply would not in the end have visited a shop for a replacement at all, due to their fear of contracting Covid-19 and passing it on to their vulnerable sister.

33 Cook, J. (2020) Surviving the wilderness: The landscape of personal debt in the UK.

> *"Who would we ask to come and do it? So, yes, we were in a dilemma, and we were really, really worried. And then, you stepped in, and that was it. Fairy Godmother. It really was. I'm not joking."*
>
> *We've had, like with the windows, a lot of bad workmen. I think they look at me- Because I'm 72 next week, they think I'm vulnerable and just take advantage of me, with roofers and everything. So, if we'd have had to get somebody to fit it, we'd have probably had problems getting a proper engineer and trusting them. Whereas this bloke [the subcontracted engineer] was just spot-on […] It was just so much worry taken away and so much peace of mind […] We knew that the job was done correctly."*

> *"I'd have had to go to a shop, like Curry's, Comet or something. But I hadn't been out the house, [so] I certainly wouldn't have been going to the shop, I'd have put it off and put it off […] I'm not the most healthiest person in the world. And any little things or infections seem to take… What can I say? It seems to take everything out of me […] and I was frightened of giving it to anybody else, if I did contract it […] My sister, she comes down most of the time, and she's got emphysema and different breathing troubles and that. And I think, if she'd have got anything, it would have been a lot more risk to her, sort of thing, with the breathing issues."*

As the quotations above indicate, all these considerations would have placed significant pressure on the mental health and wellbeing of interviewees. In many ways, this pressure would have been a result of the constant micro calculations of stress and worry associated with arranging and managing the replacement or repair of an appliance. For very vulnerable households, these micro calculations may simply prove too much to handle, leading to them sidestepping the issue entirely and going without heating and/or hot water as a result.

3.1.6. Those who would have gone without

Lastly, 29% of survey respondents said they would have not been able to afford or arrange to have their repairs carried out at all, and would therefore have gone without heating and hot water for an unspecified but potentially unlimited amount of time. For interviewees who discussed this option, it was described as a devastating and inevitable outcome of their wider financial circumstances, whether unemployment or a lack of savings. One interviewee summarised their initial response to being disconnected from supply as "I just thought, 'oh well, no heating then, no water, simple, done' […] I definitely wouldn't have any hot water or heating, for sure." This realisation was emotionally devastating – "I fully understood that [disconnecting the supply] was the safe thing to do, but I burst into tears." For this interviewee, it was on overwhelming feeling of dread that accompanied their disconnection, a realisation that the implications of disconnection were being without heating and hot water, combined with knowing that they had no way of affording to resolve the issue.

A second interviewee was left an electric fan heater by their Cadent engineer, and imagined the impacts of relying only on that heater in the winter if the Service had not been available. Importantly, this interviewee referred to their daughter, who suffered from respiratory infections that were typically worse in the winter, and explained that being without heating and hot water over the coming

winter period would likely have made her asthma and tendency to develop chest infections worse. Moreover, the interviewee believed that being without heating and hot water, even in warmer parts of the year, would have likely resulted in her daughter developing a chest infection. This example shows the considerable physical harm that the Service has potentially avoided by being able to quickly bring households with cold-related health conditions back onto supply.

> *"[My daughter is] asthmatic, and she does suffer a lot with chest infections in the winter and that's with heating on. I just thought, 'oh god', in the middle of winter and we haven't got any heating […] even in a normal winter she still suffers terribly with chest infections […] if [being disconnected] had been going on any longer, you don't know, she could've ended up with one."*

3.1.7. Summary

It is clear that the Reactive Response Service is preventing severe deteriorations in physical and especially mental health that would have occurred if the Service was not available or if a referral into the Service had not been made.

For many households, the health and financial implications of getting into debt, attempting to arrange and manage a repair or replacement on their own, or putting themselves (and others) at risk by leaving the house unheated was described as severely damaging. Moreover, households who, through one means or another, thought they would have been able to raise the money or savings to fix their issue themselves also indicated that they thought doing so would place significant pressure on their mental health. Given the high proportion of households supported through Reactive Response with multiple cold-related health conditions, such as Katie and others, it is likely that preventing these households from being without heating and/or hot water will have prevented the deterioration or exacerbation of their illnesses. This is not just significant for their own health, but potentially also on costs to healthcare services through preventing cold-related hospital admission and primary care attendance.

3.2. "Everywhere is warm": The longer-term impacts of the Reactive Response Service

In addition to the impact of the Reactive Response Service at the initial 'crisis moment' of disconnection and immediately afterwards, quantitative and qualitative findings suggest a range of longer lasting impacts that the Service has produced and enabled. This section broadens the focus to these longer-term impacts, demonstrating that services supporting vulnerable households at the moment of a gas emergency can produce multiple co-benefits for beneficiaries that exceed the initial support that is provided.

3.2.1. Impact on fuel poverty and thermal comfort

Although Reactive Response does not exclusively deliver the installation of heating system installations or replacements (e.g. first time gas central heating, boiler replacements), when these measures were installed, they led to significant improvements in the ability of households to

keep their homes comfortably warm at an affordable cost. Figure 12 shows that the proportion of respondents who reported being able to keep their homes warm after their Reactive Response case rose by 16% compared to before. The proportion of respondents who could not keep their homes warm was more than halved after their Reactive Response case. These outcomes were highlighted as among the greatest successes of the scheme by Cadent delivery staff, who would often receive feedback from customers. As they said, "hearing back off the customer[s], a lot of the work that we have done has been lifechanging for those customers, taking them out of fuel poverty and they can actually have the heating system on, and they can keep their home warm."

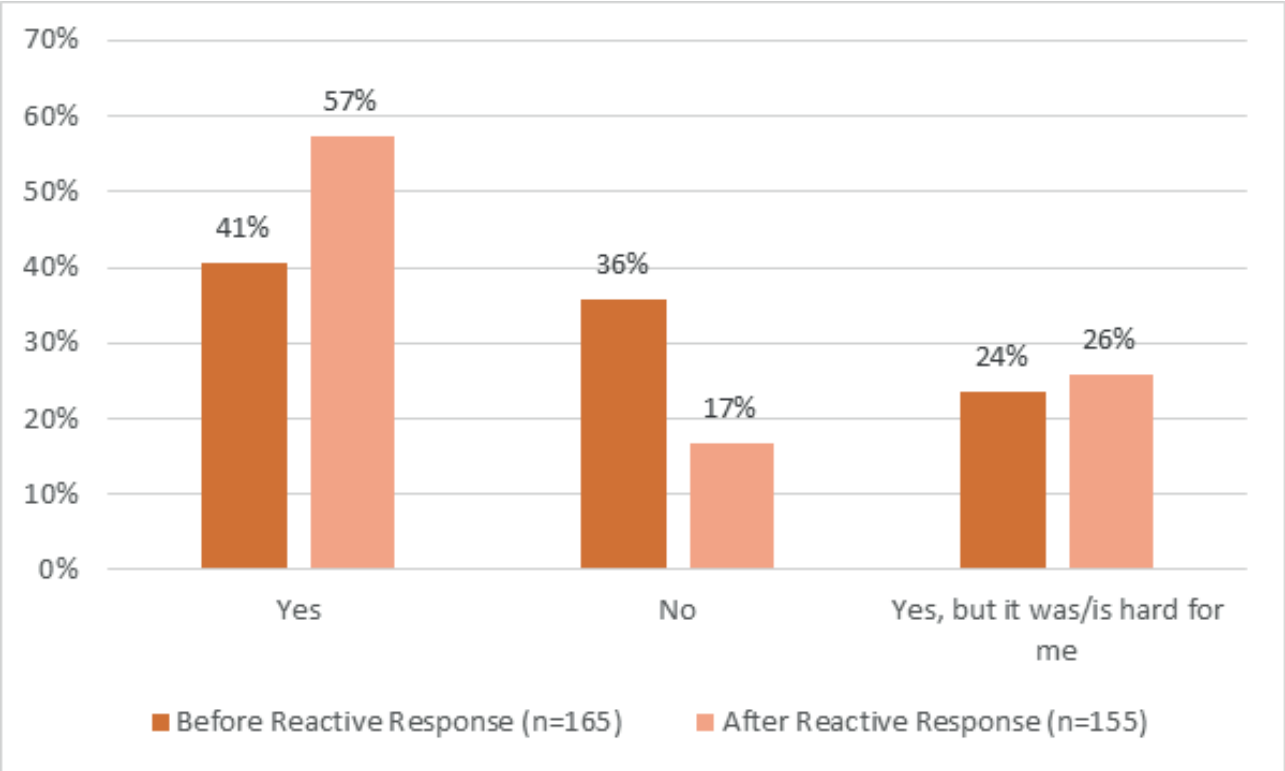


Figure 12: Responses to the question: 'Before and after you received assistance from the Reactive Response Service, could you / can you normally keep your whole house comfortably warm in winter or when it was cold outside?'

A closer analysis of the data indicates that, as may be anticipated, improvements in the ability of households to keep their homes warm have predominantly taken place in cases where heating measures have been installed. Figure 13 below shows that the proportion of respondents able to keep their whole homes warm after the installation of heating measures increased by 39 percentage points compared to before, with the proportion of respondents not able to keep their whole homes warm reducing from 52% to 12%. In contrast, households that did not receive heating measures (i.e. received pipework repairs, call outs, cooker repairs/replacements, or heating appliance and boiler repairs only) did not see significant improvements in affordable warmth on aggregate. Instead there was a small increase (8 percentage points) in those unable to keep their home comfortably warm.

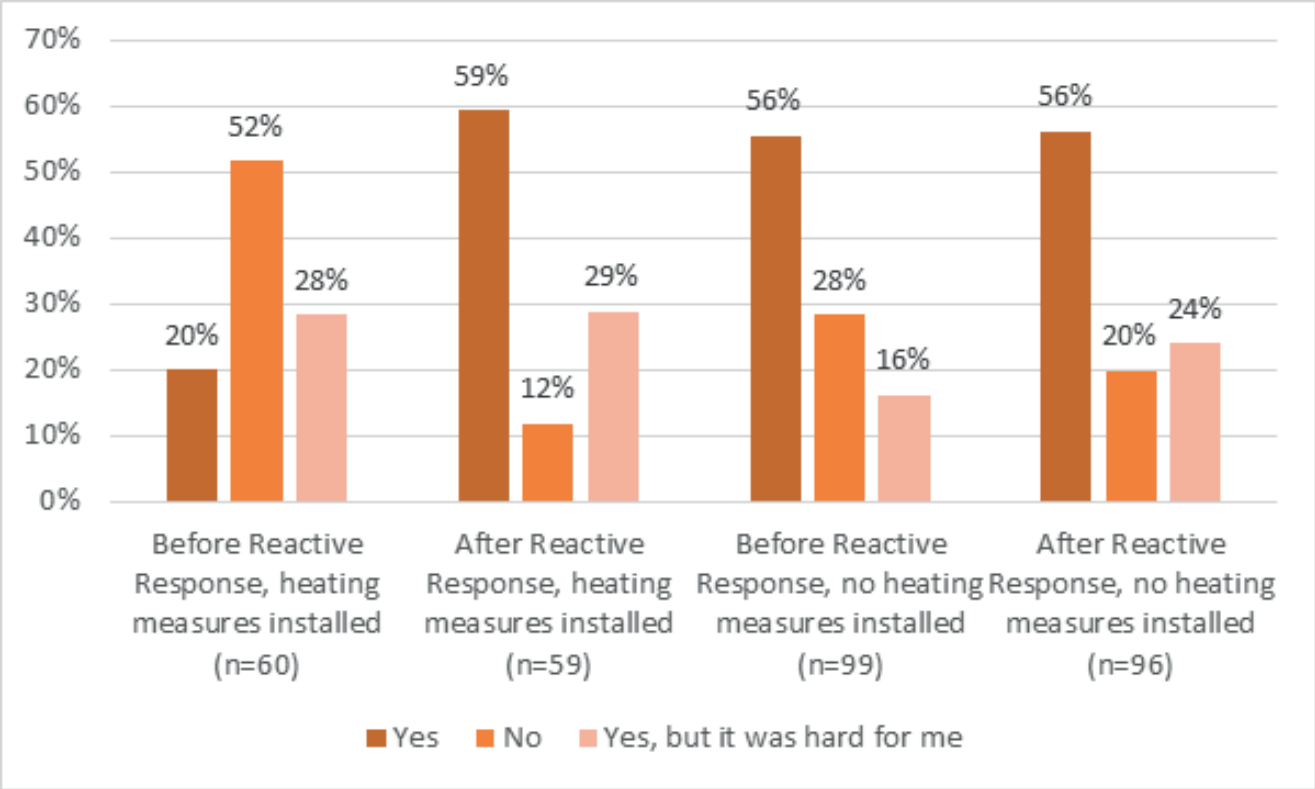


Figure 13: Responses to the questions: 'Before and after you received assistance from the Reactive Response Service, could you / can you normally keep your whole house comfortably warm in winter or when it was cold outside?', disaggregated by whether respondents received heating measures installations.

This finding is supported by evidence from the qualitative interviews, where households that received boiler replacements reported significantly positive impacts on their thermal comfort, energy affordability, and ability to keep their homes warm. One interviewee, for example, said of their new boiler that "it's warmer, it's more efficient. The old boiler was very noisy, and you never knew what it was going to bloody do." A second interviewee also said that "the main difference is the house has never felt so warm. It's easy to control with the thermostat and that. It's so good, it really is. Everywhere is warm as well, and I make sure that all the radiators are on, not just the one downstairs that mum wanted [...] the bathroom itself is warm. It did feel like a fridge in the bathroom." A third interviewee commented on how the energy efficiency rating of their new boiler was leading to affordability improvements, having realised her gas prepayment meter goes down slower than it did previously: "yes, it's [going down] a lot slower than it was with my old one. We don't have to put so much gas on as we did when the old gas boiler was working. It's a lot better, yes. More economical." Lastly, a fourth interviewee commented specifically on the efficiency of their new boiler when they needed access to hot water: "I don't have a bath too often because I worry about the money, but it's amazing how quickly it heats up, and [it] must be saving me a lot of money because it heats up very fast, the water, now. So, it's a comfort, for sure."

Moreover, interviewees looked forward into the future to discuss the imagined impact of their new heating measures during the winter. As discussed in Section 3.1, for many interviewees the winter was a bitter experience, driven by ill-health, low household incomes, and inefficient or broken heating systems. Reflecting on what their heating measures would mean in the future, some interviewees were much less worried about the winter to come and far more confident that they would be warm and well at home during the coldest months of the year. One interviewee, for example, said that "I'm not bothered about [the winter] now, whether it's cold or what, because at least we'll be warm in

the house. And you see, when your house is cold, there is no heating in, it took forever to get warm, in the beginning. But now, it's fine." Terry, in the example that opened this report, felt the same way, summarising that "my winter is going to be a hell of a lot better" than the previous ones he had endured with his old boiler.

Finally, there is evidence that the installation of new heating systems or appliances was well targeted at those that are struggling the most to keep their homes warm. Figure 14 below shows the proportion of respondents who reported being able to keep their whole homes warm pre-intervention depending on if they ended up receiving a heating measures installation. As it shows, those who could not keep their homes warm were far more likely to receive a heating measures installation that would improve the energy efficiency and affordability of their heating system. This suggests that engineers' (both Cadent and subcontracted) and delivery staff's practices of identifying households that are in most need of heating measures have been effective.

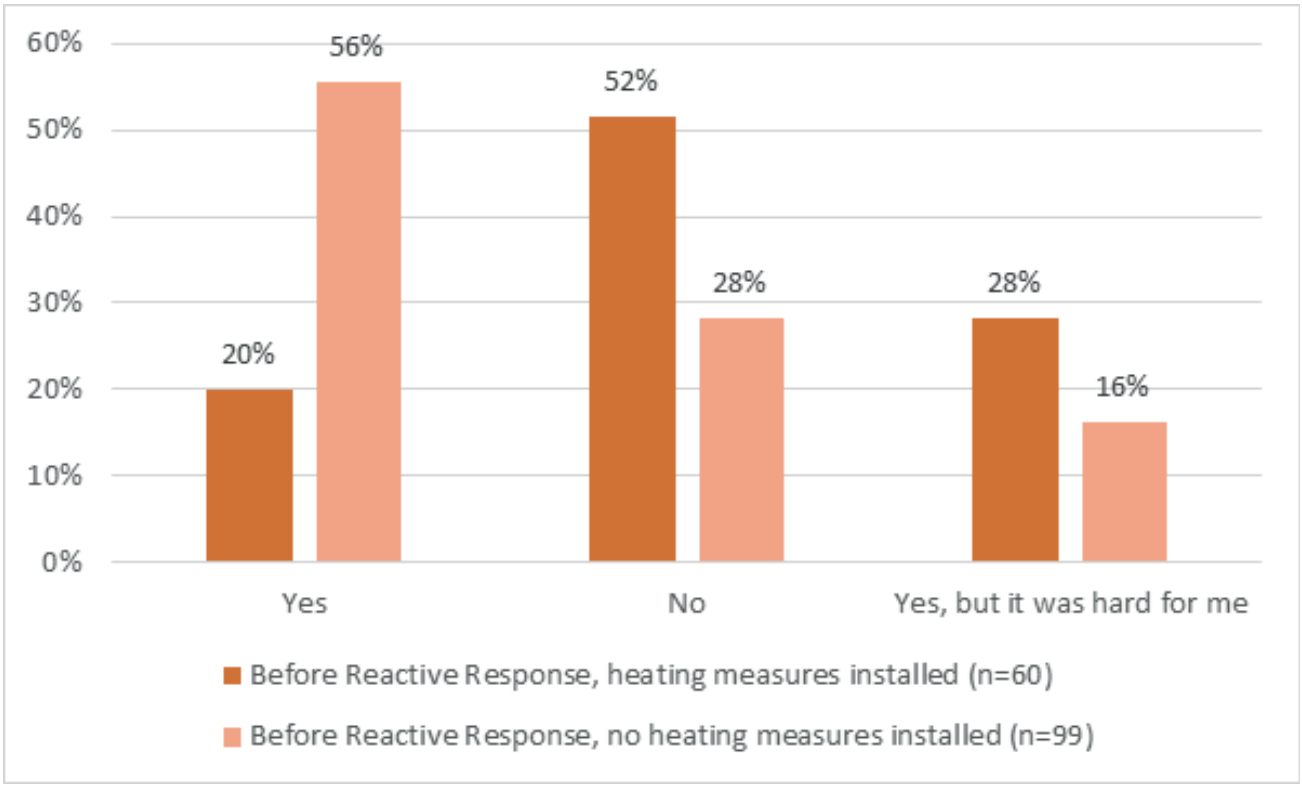


Figure 14: Responses to the question: 'Before you received assistance from the Reactive Response Service, could you normally keep your whole house comfortably warm in winter or when it was cold outside?', disaggregated by whether respondents eventually received heating measures installations.

3.2.2. Impact on mental and physical health

In addition to the immediate physical and mental impacts of supporting households to resolve a crisis moment that they would have struggled to resolve themselves, there is evidence that the programme has enabled longer term improvements to mental and physical health in some cases.

Figure 15 below shows that 37% of survey respondents reported better mental health now compared to before their Reactive Response case, and 34% of respondents reported better physical health now compared to before their Reactive Response case.

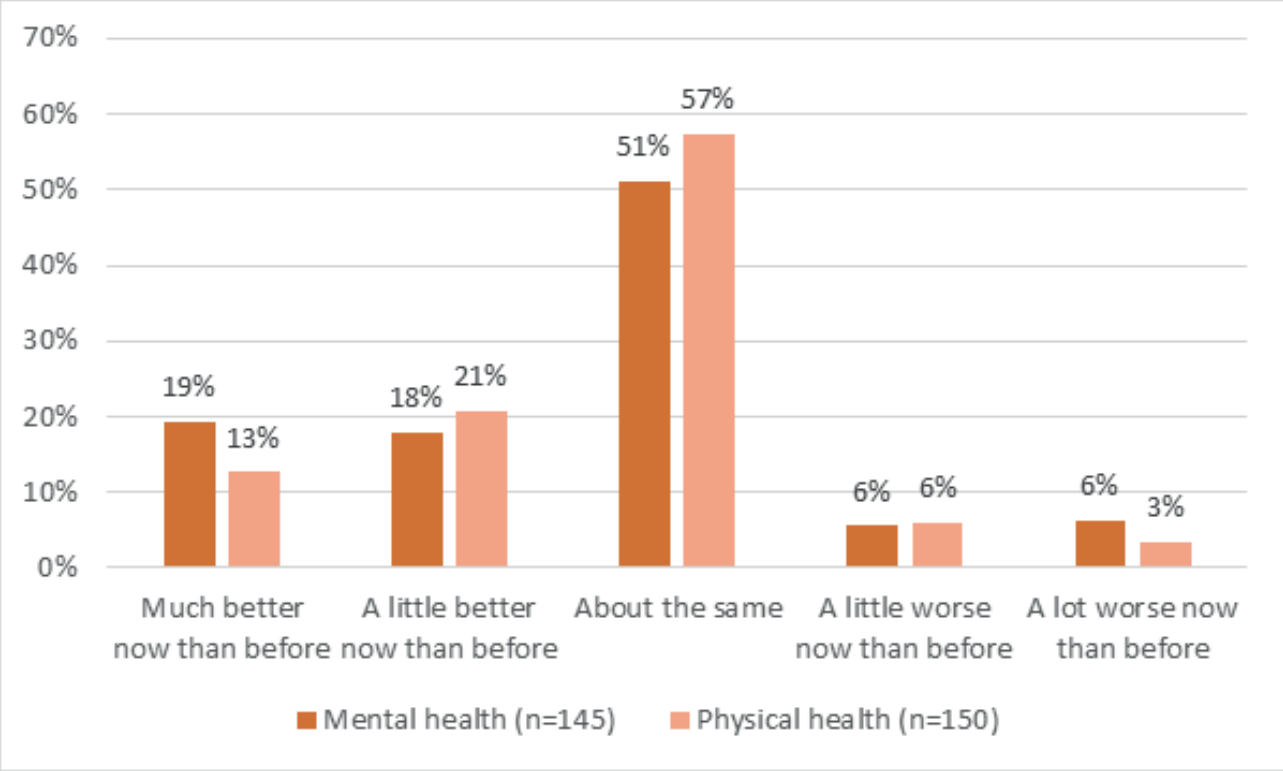


Figure 15: Responses to the questions: 'Compared to before you received help from the Reactive Response Service, how would you now describe the physical and mental health of your household in general?'

Moreover, the findings show that of those who reported better mental and/or physical health after their Reactive Response intervention, the majority thought it was probable or definite that this was attributable to the support they received. Figure 16 below shows the extent to which respondents who reported better physical and/or mental health thought it was attributable to the support they received through Reactive Response. It shows that 34 respondents who reported better mental health thought it was definite or probable that it was attributable to Reactive Response, with a further 11 responding it was possible. Figure 16 also shows that 26 respondents who reported better physical health thought it was definite or probable that it was attributable to Reactive Response, with a further 11 responding it was possible.

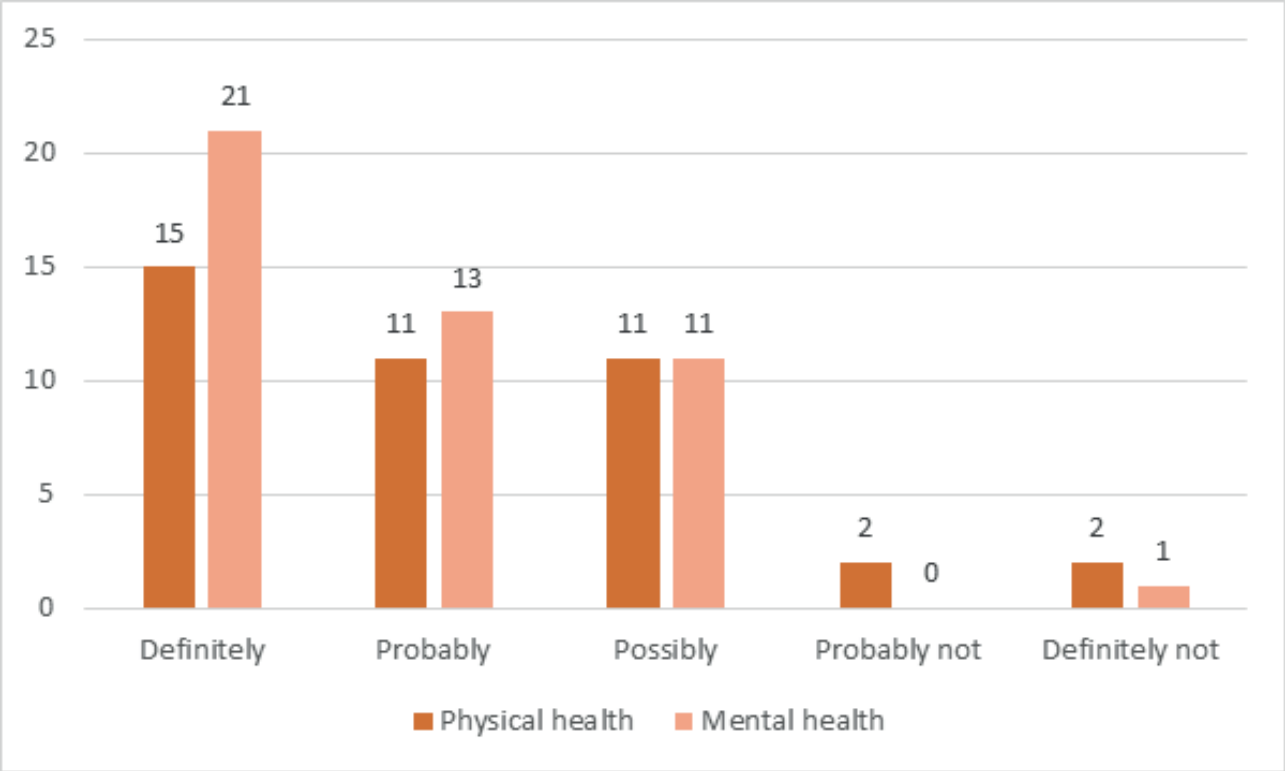


Figure 16: Responses to the question: 'Do you think any change in your or someone else's physical and/or mental health is related to the assistance you received from the Reactive Response Service?', from only those respondents who reported positive changes.

Interviewee testimony also supports this finding. One interviewee, for example, explained how receiving a boiler replacement had improved her physical and mental health. Living with a musculoskeletal condition, the interviewee described how she would previously wear numerous layers of clothing to stay warm enough to not inflame her condition. Now, however, "it's a lot better, compared to when we hadn't got any heating in the house. You don't have to walk around like a Goodyear man and woman, muffled up with clothes on. You can just wear your normal clothes and you are nice and warm." A second interviewee also discussed simultaneous improvements to physical and mental health. This interviewee disclosed suffering from depression, partly because his low income and physical health conditions meant that his home had fallen into disrepair. He relayed not just how receiving a boiler replacement improved his mental health, but also how it enabled his physical health, especially issues with his shoulder, to be less painful and more manageable: "it absolutely perked me up completely. It made me feel a bit more- not so depressed. Because it is depressing when you know that there's things that you need for the house, and you're just waking up to them every day, and you can't do them because there isn't the funds to do them." Responding to another question on if he thought his shoulder would be impacted by the cold in the coming winter, like it had been in the past, the interviewee replied "I think it will be better. I think it will be better because obviously, I haven't got them issues now because of the new boiler. So, that is going to help."

Taken together, evidence demonstrates that the programme is having positive impacts on the mental and physical health of some households in the longer-term, over and above the immediate impact of resolving the crisis caused by their gas leak.

3.2.3. Impact on control and confidence

Quantitative and qualitative evidence also shows that there have been significant impacts on beneficiaries' ability to control their heating systems effectively and have confidence that their heating appliances, cooking appliances, and heating systems are safe, secure, and reliable.

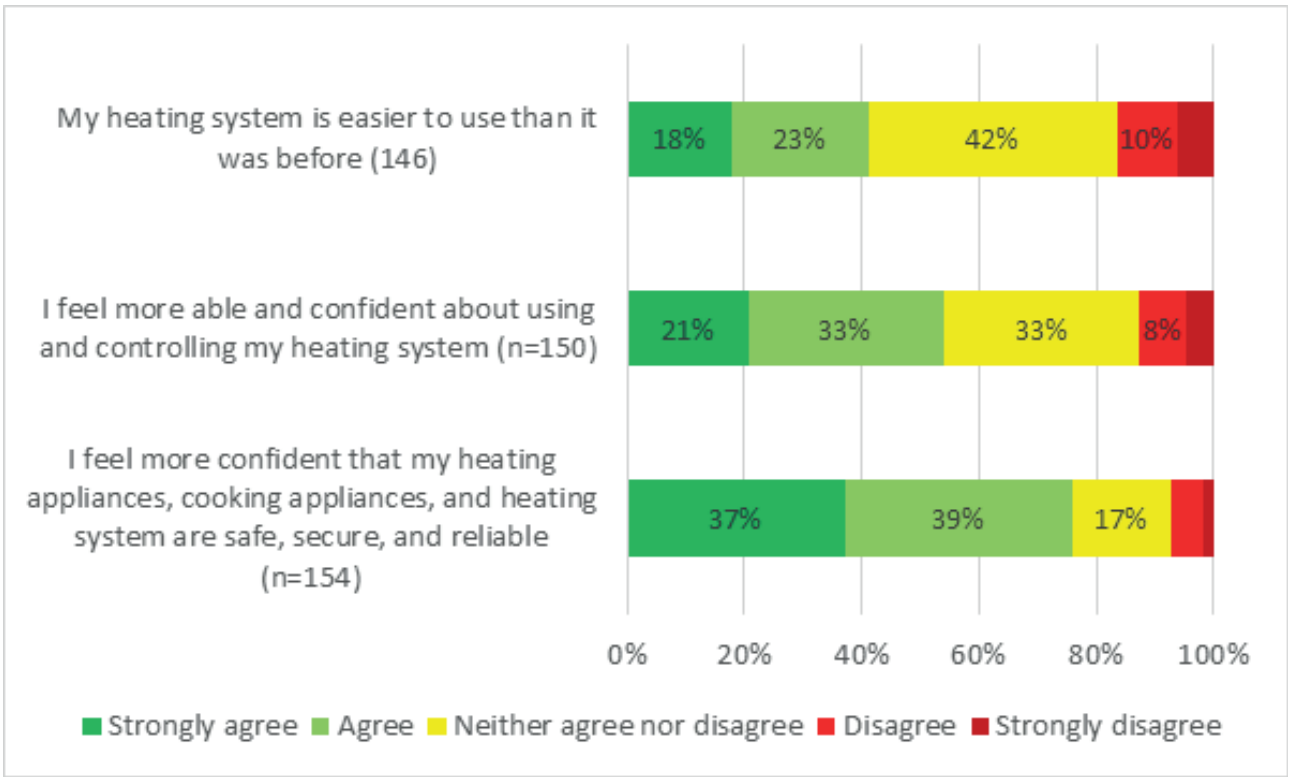


Figure 17: The extent to which survey respondents agreed or disagreed with three statements on control and confidence after their Reactive Response case.

Most notably, Figure 17 shows that 76% of respondents agreed with the statement 'I feel more confident that my heating appliances, cooking appliances, and heating system are safe, secure, and reliable', and qualitative interviews support the finding that the Reactive Response Service has enabled households to feel more assured that their gas appliances and piping are not a safety risk in their home. Qualitative interviews demonstrate that, prior to receiving support from the Reactive Response Service, some households regarded the safety and/or safe operation of their heating and/or cooking appliances as a frequent source of worry. One interviewee, for example, had experienced ongoing problems with their boiler prior to it eventually breaking down: "the boiler had been playing up for some time and my brother-in-law had come out to have a look at things now and again for me, and do his best." A second interviewee, speaking on behalf of his mother who could not take part in an interview due to long-term illness, described an old gas fire that was installed in 1986. The interviewee said that "it should have been condemned but we depended on that heat because it was good for mum." As discussed in Section 3.1., other interviewees had been without heating at home for a considerable period prior to their referral into the service.

Households were previously living with heating and/or cooking appliances that were old, potentially dangerous, or that had already stopped working prior to their referral into Reactive Response. Following their repair and/or replacement, interviewees commented on different ways in which they felt more secure, safer and more relaxed about their heating and/or cooking appliances, as well as the associated gas infrastructure in their home. One interviewee commented on the good quality of

the appliance that had been installed, suggesting that it made them feel confident that it would meet their needs and last for a long time: "a friend of mine had come around, and it's a Worcester boiler, and he told me, he said, 'They're very good boilers, Worcester boilers.' So, that, in itself, is something where I wasn't just fitted with a cheapo boiler. I was fitted with something that's going to last me some time, which is from a good company." Another interviewee who received a pipework fix also said that "I do not want to jinx anything. I suppose I am confident that the gas leak is hopefully not going to come back." As noted in previous sections, this had a positive mental health impact for interviewees who discussed it, with for instance one interviewee noting that "at the end of the day, it was real peace of mind for me."

Figure 17 also demonstrates that a majority of survey respondents (54%) agreed that they felt more able and confident with using and controlling their heating system specifically after their Reactive Response case. This was corroborated by interviewees, one of whom discussed in detail the enhanced control they now had over their replacement boiler, compared to their previous boiler.

> *"Sometimes when you put the old boiler on, you could hear that it was on, but all of a sudden, it would go on you, and you'd be like, 'Eh?' And the temperature would drop. And you were sitting here thinking, 'What the hell?' And you had to keep going and back and forth to keep boosting it, and putting it on and off again. Where this, obviously, now, I can put the boiler on, and I haven't got to worry about anything like that. I can programme it to the way I want to, when it is to come on, when I don't want it to come on. But with the thermostat and the boiler form last time, it was terrible. And not a nice way to live each year."*

A second interviewee also commented that "It's easy to control with the thermostat and that, it's so good, it really is", and contrasted this with the labour that was required to maintain and control different individual heaters (e.g., a gas fire, electric heaters) in different rooms. For these interviewees, feeling in control of their heating was important in itself; it gave them back a semblance of ownership and peace of mind that they were in charge of a key aspect of their own homes.

3.2.4. The additionality of including energy-related advice and support

Alongside the Reactive Response programme, a related but distinct programme of energy advice to Cadent customers is also delivered, known as the 'One Number' programme. Included within the delivery of this service is a wide range of energy advice topics, as well as income maximisation work. In addition, NEA as delivery agent for the service also has access to a range of other programmes that can support vulnerable households with energy-related advice and support, such as Warm Home Discount Industry Initiatives funding and other types of resource that are more specific to certain geographical locations (e.g., trust funds for vulnerable energy customers in different parts of the country). The One Number programme itself falls outside of the scope of the present evaluation. However, it is necessary to investigate the extent to which receiving a repair and/or replacement through Reactive Response and energy-related advice and support through One Number and/or wider energy advice programmes results in enhanced or additional outcomes for households. This is for two reasons.

Firstly, previous research and evaluation undertaken has shown that delivering energy-related advice

and support alongside 'hard' measures (e.g., insulation, new heating systems) tends to result in more optimal outcomes for households than delivering one or the other in isolation.[34] This is because it can address multiple drivers of fuel poverty in one intervention (e.g., low income through income maximisation and energy (in)efficiency through replacing inefficient boilers). Secondly, receiving a repair or replacement through Reactive Response and energy advice through One Number is intended to be delivered to and experienced by each household as a singular, streamlined service. Consequently, including energy advice within the evaluation to a degree can aid an understanding of the additionality advice provision brings to repairs and replacements.

This additionality was described as crucial by Reactive Response delivery staff, and a way of expanding to the greatest degree possible the support that could be provided to households in one customer journey. The evidence shows that taking this approach is tackling multiple drivers of fuel poverty in one intervention, and maximising the benefits that Reactive Response can enable and achieve.

> *"We've been able to provide not just the immediate service of repairs and replacements, but also energy advice, and in some cases benefits advice as well, which means that we've been able to really maximise that contact with somebody who, in a lot of cases has been struggling under very difficult circumstances for a long time and then is very unlikely to have actively sought help for any of those issues." – Reactive Response Service delivery staff member*

3.2.4.1. Prior beneficiary awareness of energy-related advice and support

An important initial finding is that some beneficiary interviewees described being previously unaware that any energy-related advice and support might be available to them, or that they were certain they would not be entitled to it even if it did exist.

This is important because one of the main principles of Reactive Response is taking advantage of the contact point between the household and the Cadent engineer to generate a referral into the service. In turn, the contact point between Reactive Response Service and the household acts as a further opportunity to deliver energy-related advice to a household that might otherwise not be aware of or seek out any support at all. One interviewee described, for example, historic occasions of being in debt to energy suppliers and their local council, and said they wished they had known of the advice service's existence then as they thought it would have helped them to resolve their issues more effectively. Two interviewees who received income maximisation support after losing their jobs narrated not being aware, either partly or wholly, of the welfare support that was available to them, and said they would not have been able to claim the benefits they were entitled to without the support. Another interviewee also commented that "[the Cadent engineer] said he would put me in touch with you people, which I had never heard about. Nobody has ever helped me in the last 30 years, so I was amazed."

34 Powells, G; Scott, M; Stockton, H; Jobson, K. and Robinson, C. (2021) Warm Homes Fund Programme Evaluation: Abridged second interim report.

> *"I think for me, it's really, one of the joys of this programme is that it finds people who would be very unlikely to seek help proactively themselves. They've come into contact with us because they've had a gas emergency and they've had to have Cadent come out to them." – Reactive Response Service delivery staff member*

As this final quote alludes to, these examples were underwritten by an at times implicit belief that forms of energy advice of the kind offered by the advice service were inaccessible to interviewees or simply non-existent, something that was also commented on by delivery staff. For some interviewees, this perception had been hardened by negative interactions with advice and support services in the past. One interviewee, who was supported by the One Number service to apply for benefits, described a previous interaction with another provider regarding benefits advice. They described how "they weren't great, and they don't give you any advice once you're on it [...] but if you ring [advice provider]35 because you have a problem with Universal Credit, they flatly refuse to help you [...] they won't help you deal with [the DWP] when they're not being very helpful." Another interviewee concurred that "the [advice provider], believe it or not, are an absolute joke. They gave me bad advice from day one."

The identity of these advice providers is not important, but what is important is that for both interviewees, their prior experiences dissuaded them from seeking out any other form of energy advice or support afterwards, even in situations where they needed it. The experiences also persuaded them that although energy advice and support provision did exist, it would be ineffective in supporting them with issues they might be experiencing. On the other hand, receiving support from Reactive Response followed by energy advice persuaded some beneficiaries that help, and support was there for them; as one NEA staff member described, "they feel so happy that somebody has taken an interest, somebody has bothered to phone them up and say 'Matt from Cadent referred you to us.'"[36]

In summary, evidence shows that for many beneficiaries, the chain of contact points and referrals between Cadent and the advice Service managed and delivered by the same Team as the Reactive Response Service, was efficient and effective at enabling households to receive energy-related advice about schemes and services they were entitled to but were not aware of, and which they would be unlikely to ever identify by themselves. In addition, the referral process is also enabling energy advice and support to be delivered to households who, due to previous negative experiences, may have believed that no organisation could provide the type of support that was relevant to their needs.

3.2.4.2. The impact of income maximisation services

Income maximisation work is recognised as a key means of addressing fuel poverty (as well as poverty in general). Low household income is one of the core drivers of fuel poverty, and it has been recognised for several years that a significant number of households are eligible to claim particular benefits but are either prevented from doing so by accessibility issues (e.g., digital exclusion), stigma, or because they are simply unaware of their eligibility. For example, statistics published by the Department for Work and Pensions (DWP) in 2020 suggested that over one million pensioner households (approximately two in five) were not claiming Pension Credit despite being eligible for

35 The specific organisations interviewees were referring to have been removed from quotations.
36 Note that this quotation does not refer to a specific Cadent engineer, but was a made-up name used by the NEA staff member to make their point.

it.[37] Estimates from the charity Turn2Us in 2019 also suggested 3.4 million people over the age of 65 were not claiming the Attendance Allowance they were entitled to.[38] This is important not just because it prevents households from claiming additional income, but because these benefits often function as 'passports' to accessing further support, such as the Warm Home Discount rebate or housing benefits.

Using a Reactive Response referral to conduct benefits entitlement checks and income maximisation work can therefore serve as a route to combatting a second driver of fuel poverty as part of one intervention. NEA operational data shows that the total confirmed financial gains for Cadent customers over the Cadent Foundation period of Reactive Response totals £107,515.19. Although this work was not funded directly by the Cadent Foundation through the Reactive Response Service, the Service functioned as the first contact point that enabled households to then receive benefits advice through another funded route. In other words, this is an example of how the delivery of Reactive Response has enabled the leveraging in of other funding streams to deliver additional value and benefit to Cadent customers.

Moreover, the evidence from the evaluation shows that income maximisation work is not only resulting in significant financial gains for households supported via a Reactive Response referral, but also that the One Number service is effectively supporting households through complex benefit application and maintenance processes that they would otherwise find difficult, if not impossible, to navigate themselves. Prior research has noted the complicated and labyrinthine nature of the present benefits system in England, and how this system makes it extremely difficult for vulnerable and low-income households to successfully apply for and receive the benefits they are entitled to. For example, one 2021 study conducted with benefits claimants concluded that "the benefits system was often described as confusing, with many new claimants highlighting a lack of understanding with regards to eligibility, uncertainty around which benefit to apply for in the first instance, and uncertainty around the amount of benefit that they would subsequently receive."[39]

Similarly, Figure 18 shows that the majority of the 26 households that received benefits advice via a Reactive Response referral would not have considered or been able to apply for benefits without the support they received, and that the service reassured them, took away some of the worry of applying, and ultimately made the application easier to complete.

Figure 18: Responses to the question: 'Thinking about the benefits support you received from the Reactive Response Service, to what extent do you agree or disagree with the statements below?'

One interviewee who received income maximisation support received an uplifted monthly benefits payment, which was also backdated, meaning they received a lump sum of several thousands of pounds.[40] Describing what this money meant, and how the advice was instrumental to accessing it, the interviewee narrated that

> *"[The NEA staff member] went through my application, she told me to write an email, and she did all these things. It was amazing, they backdated me, because she told me, 'Ask them to backdate the money.' And it was a huge help, because actually that money came in handy towards equipment for my daughter, bills, food, loads of things. And I was none the wiser what I should be getting, what I shouldn't be getting, what I should be entitled to, what I have missed out on and what I haven't. I just thought that that was right, because I have worked*

37 See Age UK's analysis of the statistics: Age UK (2020) Are older people missing out on money they're entitled to?
38 Turn2Us (2019) 3.4 million Pensioners are missing out on Attendance Allowance.
39 Summers, K. et al. (2021) Claimants' experiences of the social security system during the first wave of COVID-19, p.2-3.
40 To protect the anonymity of the householder, the exact gains are not reported on here.

all my life and I have never been on benefits or had to be in a situation where I have had to be on benefits. […] It was a few grand I got [backdated], which was really, really helpful, again. Like I said, it went towards bills, food, you know, my daughter needed a new wheelchair. It went towards things for living, our living, so, yes, it really came in handy."

Furthermore, this interviewee and a second interviewee who received income maximisation support both described additional impacts of the benefits advice they received. As the quotation above indicates, neither interviewee had an accurate understanding of their benefit entitlement, and would likely not have explored it without the support of advice service staff.

Overall, this evidence suggests that income maximisation work funded through a different revenue stream is supporting Reactive Response clients to apply for and receive benefits that they were entitled to but not previously aware of and enabling them to spend a larger proportion of a larger household income on energy, food, bills, and – as in the above quotation – essential medical and mobility equipment for disabled members of the household.

Cara

Cara lives in the Midlands. She received a replacement boiler and a replacement radiator from the Reactive Response Service. Later, however, she also received energy advice and support from NEA. Her story shows the benefits of combining the installation of energy efficiency measures with income maximisation support.

Cara receives Personal Independence Payment (PIP) because she is too ill to work. She has arthritis in her knees, hands, and hips, which were all made worse by the cold in winter: "I was having to wear extra clothing and pyjamas on top of my trousers", and she was constantly struggling to keep her prepayment meter out of emergency credit. Her young daughter lives with a disability, is prone to seizures, and suffers from delayed development, which limits the use of her arms and legs. For Cara, a new energy efficient boiler was a godsend, but did not tackle the core driver of her situation – her low household income and her higher than average required spending to keep her and her daughter warm and well at home.

Cara had thought from time to time that she must be eligible for more welfare support, but the benefits system had always confused her. Years earlier, when she stopped working, she was placed on Employment and Support Allowance (ESA) and was later moved to the lowest payment of PIP. She had tried to access additional welfare support in the past, "but they've never let me sign on. I could never understand why they wouldn't let me sign on." She was also turned down for the Warm Home Discount rebate because her energy supplier did not use PIP as a qualifier for the Broader Group.

Excluded from multiple forms of financial support and unsure how to access it even if she was eligible, the income maximisation team assessed her case. Working carefully with her, the team eventually enabled her to sign up for Universal Credit, which included the disabled child element and carer element for her daughter. The support has changed Cara and her daughter's life, to the point where "if we ever come to win the lottery, I'd do [NEA] a big cheque, put it into the charity. I think they are brilliant, what they do for people. We are so grateful." Her story is a perfect example of the transformation that can be achieved through services such as Reactive Response, from the initial referral and replacement boiler, to harnessing that contact point to provide further income-related support, tackling the core drivers of fuel poverty in one smooth customer journey.

3.2.4.3. The broader impacts of energy-related advice and support: financial gains and in-depth casework

Further to income maximisation work, the evidence suggests that the impact of energy-related advice and support on Reactive Response households was variable, with greater impacts being achieved in situations where a household received a) financial support and/or b) support with a specific issue through detailed casework undertaken by an advice team member.

Figure 19 shows that the most prevalent response of survey respondents who received advice was to neither agree nor disagree with three statements about the impact of the advice they received. These statements are designed to elicit the extent to which, through receiving energy advice, households are encouraged and enabled to engage more effectively in the energy market, better understand and manage their energy bills and wider household budgets and take steps to be more energy efficient at home while staying warm. However, as shown, advice has led to some improvements in around a third to two-fifths of cases. Indeed, almost a third said that they felt more confident about managing their wider household budget and other bills; over a third (37%) reported that they knew more and were more confident about keeping warm at home; while almost a third (32%) either agreed or strongly agreed that they were more confident about engaging in the retail energy market to check or switch their energy provider.

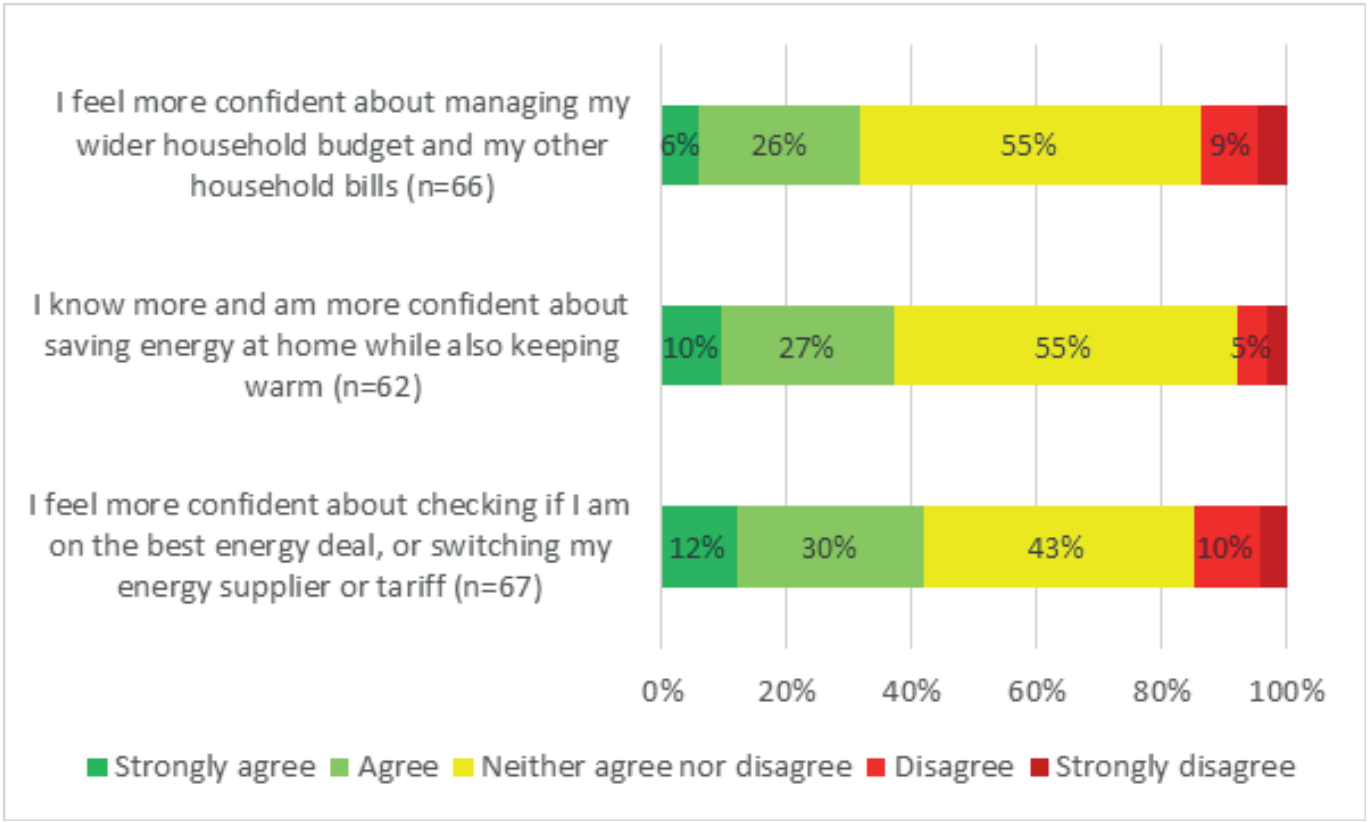


Figure 19: Responses to the question: Thinking about since you received your advice and support from the Reactive Response Service, to what extent do you agree or disagree with the statements below?

In qualitative interviews, energy related advice and support that delivered concrete financial gains was more often remembered and referred to as impactful by interviewees. In addition to the evidence on income maximisation above, two interviewees discussed the impact of receiving a free prepayment meter top up voucher as extremely important to temporarily alleviating a crisis in their ability to heat and power their home.

Terry, in the example that opened this report, was for instance on the brink of self-disconnection, describing how "I was just coming onto emergency credit, and that's the truth. I just didn't – the money I had left in the bank would have had to have gone on food. So, I [said to the NEA staff member] 'Well, to tell the truth, mate, I know it sounds like a bit of billy bullshit like, I am really skint. And I'm coming onto emergency credit with my gas and electric.' And he put some credit onto- sent it through the payers, PayPoint [...] it really, really helped me."

A second interviewee explicitly linked a top up voucher they received to an improvement in mental wellbeing associated with trying to top up her meter. She described how "I went weeks having to ask people to go to the Post Office or to the shop for me to top up my meters, you know, which I don't want to do. I know I've got to. I'm actually relying on other people, you know", but receiving the voucher meant "I don't have to worry for a little while." This testimony shows that the ability of advice personnel to leverage other funds to provide prepayment top ups was important to providing short-term relief to prepayment metered households approaching self-disconnection.

In addition, support provided with specific energy-related issues was flagged by one interviewee as vital. This interviewee had been attempting to have a smart meter installed in her home by her energy supplier for many months, something which she required as she could not leave the house to top up her legacy prepayment meter due to ill-health. However, due to the small size of her meter cupboard, she required a smaller than typical smart meter. With support from the advice service, it was agreed a smaller meter would be expedited after "we both spoke to [the energy supplier]. [The NEA advisor] tried to advocate on my behalf, you know? [...] [She] pushed [the energy supplier] and said, 'She can't get to the shop, it'd be better if she paid for gas and electricity online or by phone.' They agreed."

Subsequently, the energy supplier arranged an appointment but did not communicate to their installer that the agreed meter was required, which the interviewee described as follows: "I wanted to cry, I really did get upset because I can't keep asking people. I feel vulnerable, there's nothing worse than being vulnerable and feeling helpless. When you're having to get people to go to top-up your electricity and gas on a regular basis, people get fed up with it." It was clear that the support received had prevented her physical and mental health from deteriorating, and the interviewee suggested that if she had not, the issue would never have been resolved, leaving her reliant on others to top-up her meter and in a position of unrelenting poverty. "Without [NEA's] help, yes, who else is going to help me? No one is going to speak on my behalf, there is no one."

3.2.4.4. Knowing what to do in the future

In addition to the financial and other benefits of receiving direct support following a referral into Reactive Response, there is evidence that beneficiaries now feel more confident that they know what to do if they need energy-related advice and support in the future, and some interviewees described not needing any support at the time of their referral but would not hesitate to contact the advice service in the future if they needed to.

Specifically, nearly three quarters (72%) of survey respondents agreed or strongly agreed with the statement 'I feel more confident that I know what to do if I need help and support with energy in the future' (n=69). In qualitative interviews, some interviewees expanded on this by revealing that now they knew the advice service existed and could support them with energy-related issues, they would get in contact again if they required help in the future. Indeed, three interviewees had done so after their Reactive Response case was closed. For example, one interviewee contacted her previous NEA energy advisor after she was moved to a new energy supplier through the Supplier of Last Resort process, primarily because she was worried about what would happen to her Warm Home Discount rebate application. A second interviewee narrated that she did not accept the offer of energy advice at the time of her Reactive Response case, but "I was going to phone today" to receive some. A third interviewee said they had already received further support since their Reactive Response case;

"[NEA] still continue to help me out. For example, I'm on a low income, I only get a certain amount of money every few weeks which is very low. They actually sent me a voucher for my gas and electricity which helped me enormously, big time, really did, really did." These examples, show that households felt they had made an important ally in NEA as the advice service provider, and that NEA would continue to support them if and when they required help in the future.

In other words, this shows that households that may not previously have known where to go for support or would not have reached out even if they did, now perceive themselves as having established contact and a positive relationship with an organisation that can help them in the future should they require it. Put differently, this means that Cadent customers that may previously not have found support where they really needed it now know they can reach out for help from an organisation and service they trust and value.

3.2.4.5. Cadent engineers as trusted advice givers

Finally, it is noteworthy that some interviewees perceived the service they received from Cadent engineers at the point of disconnection as a form of energy-related advice and support, and which was described as extremely useful and beneficial.

For example, one interviewee described how their engineer "told us about the priority service and all the things that were out there, if we ever needed help in the future, which was very good of him, yes", and later in the interview, narrated how their engineer helped them look through their house insurance details to see if their repair might be covered (it was not, and a referral was made). Other interviewees, and those who provided written comments on questionnaires, evidently perceived the service they received at the point of disconnection as a form of gas safety advice, especially in cases where Cadent engineers talked them through exactly what they were doing with their pipes or appliances and why.

As noted in Section 3.3.1. below, this advice and narration was clearly perceived as useful precisely because of the trustworthy, professional, and reassuring relationships that engineers were able to establish with households while investigating a leak. This evidence supports the view that engineers are ideally placed to act as "ambassadors", as one interview described them, for services such as Reactive Response, and are also well placed to offer impactful, trustworthy advice on matters of gas safety and other services offered to vulnerable customers.

3.3. Customer satisfaction

A final set of questions out to households in the survey asked respondents about their satisfaction with various elements of the Reactive Response Service, as well as their overall satisfaction. As shown in Figure 20 below, findings show that 95% of survey respondents were satisfied with the service overall, while between 80% and 95% of respondents were satisfied with other parts of the programme. This shows that households are generally satisfied with the service they have received from Reactive Response. The remainder of this section explores the main points raised by interviewees when discussing their satisfaction or dissatisfaction with the Service.

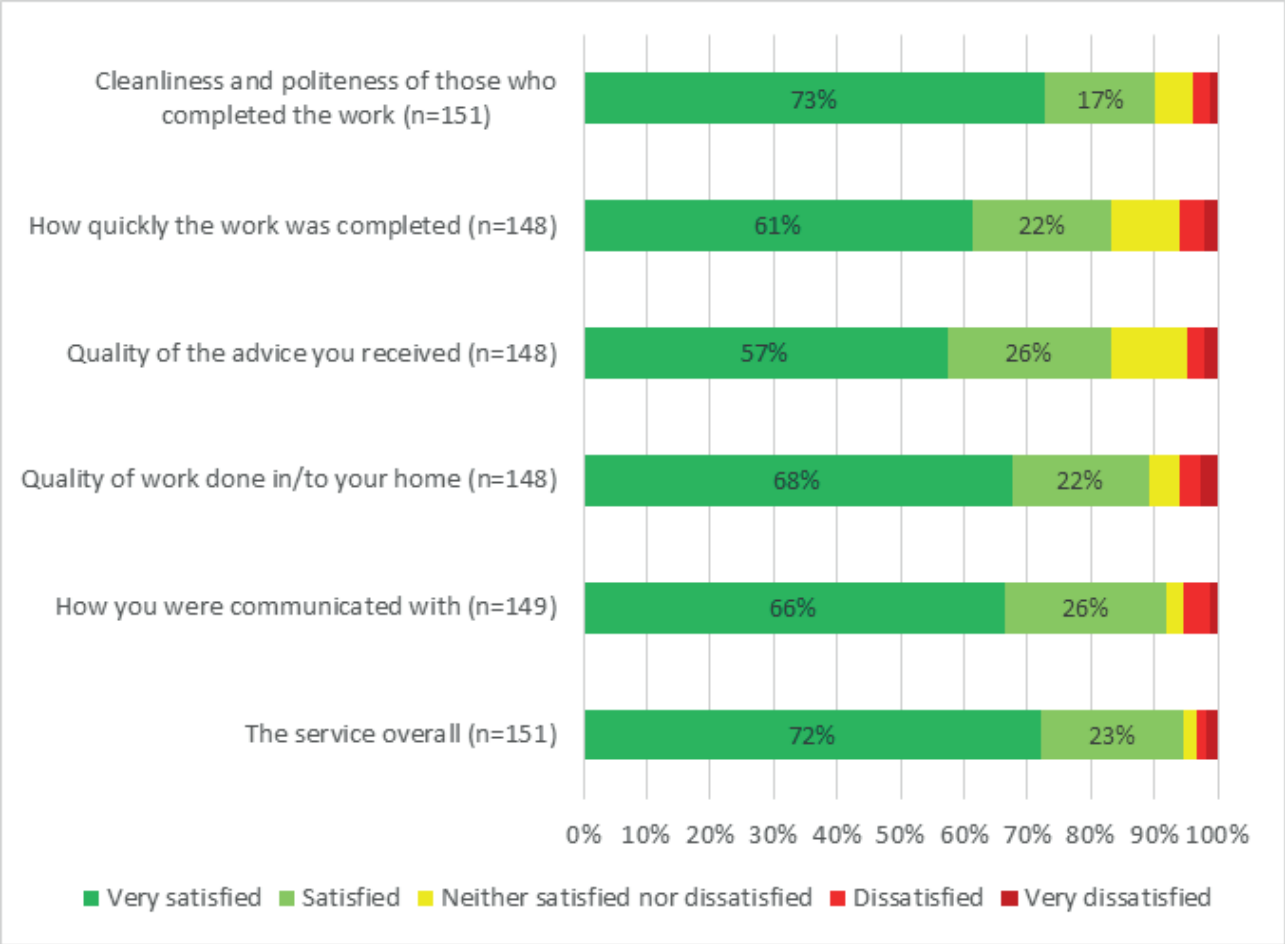


Figure 20: Responses to the question: Thinking about your overall experience of the Reactive Response Service, how satisfied or dissatisfied are you with each of the following?

3.3.1. Professional, friendly, reassuring: satisfaction with Cadent engineers

Interviewees were especially satisfied with the service that they received from Cadent engineers at the point of disconnection, describing them as friendly, professional, thorough, and reassuring. For example, one interviewee commented that their engineer "made a brilliant job. He disconnected the pipe, and he sealed it up, and it was very good. And he explained everything to us. And yes, he very, very thorough, yes. We were really, really pleased by how good he was." Interviewees also commented positively on the lengths Cadent engineers went to in order to explain the different steps they were taking to make their home safe, which is especially important given the fear and worry discussed by interviewees at the initial moment of smelling gas. Finally, there is evidence that Cadent engineers are not only identifying vulnerability appropriately, as discussed elsewhere in the report, but are going to extra lengths to ensure vulnerable households are protected, feel safe, and are reassured throughout a frightening experience. For example, one interviewee remembered how "he was here for about two hours. I kept apologising and I said, 'I am really sorry. I know you have probably got loads of other jobs to go to. If you want to go, you can go. I feel really bad.' He was just so lovely. He was like, 'No, it is fine. I am going to make sure that you guys are safe and secure.' And he really did. He really showed like he cared. So that was really good."

This evidence supports the experiences and perceptions of delivery staff, who have also relayed anecdotal examples of Cadent engineers taking extraordinary steps to support households in difficult situations over the course of the programme. For example, one NEA delivery staff member recalled an example where Cadent had been called to a gas emergency at a household suffering from severe anxiety. "When they went out to the van", the NEA staff member remembered, "she stood in the doorway like this, and wouldn't let them back in." Under the Gas Safety (Installation and Use) Regulations, the police can be called in such situations to force entry to ensure the potential risk to life is made safe. In this situation, as the NEA staff member continued, the Cadent engineers "resolved it in a very long and patient way [...] the way that they dealt with it was really, really good. Yes, so hats off to them, Cadent engineers, brilliant, absolutely brilliant." Moreover, this was not the only example relayed by delivery staff of Cadent engineers taking extraordinary steps to ensure very vulnerable households were kept safe and provided with an exemplary service.

3.3.2. Satisfaction with the referral process

Interviewees were satisfied with the referral process, and it is clear that the approach taken by Cadent engineers was pivotal to ensuring that households understood what was going to happen next and the likelihood that they would be eligible to receive support through the programme.

The two quotations below show the recollections of two different interviewees as to the conversations they had with Cadent engineers about their referrals. Importantly, evidence from these recollections and other interviews also suggests Cadent engineers are also being flexible with their method of referral depending on the needs of the household. Specifically, some households are being left a card with the telephone number, but the evidence suggests Cadent engineers are making most referrals directly through their form, possibly because they recognise this takes the onus off the household to act first. Given that many households referred into the programme may not have sought assistance for several years, it is likely this method is important to ensuring that a referral progresses successfully.

"Then when they [the Cadent engineer] came in, they said it was very mild, it was a slight smell, but they would have to switch off. At that time, there were two gentlemen, two engineers, and I was in the midst- I was really poorly, to be honest. I was concerned because I was not working, because I was in the middle of my chemo. They said, 'Gosh, do you know what, we can help you, we have a charity and it is for people like you that we should be supporting and helping. So I would like to give you the details. Could you phone them or we will get them to phone you, because we think that they may be able to help you get this gas leak repaired, particularly if you are not working and finances are tight.' So that is how I came into contact with them."

"I said, 'Well, I don't know what I'm going to do now then because I can't afford a boiler. I've lost my job. I'm on Universal Credit.' And he said, 'Bear with me, mate.' He went into his phone, he had some other thing with him, I don't know what it was. He went into that, and said, 'What's your postcode?' And give him my information, and he says, 'Right, you could be eligible here for someone to come out. They're not going to promise you that they're going to replace it. But they might replace the parts that you need. But if it is a thing that they can help you with, they will replace it for you.' I went, 'Really? Oh, right.' I said, 'Well, okay.' He said, 'But don't take my word that they'll replace the boiler.' But he said, 'They might be able to help me with parts for it.' I goes, 'That's great, mate. Thanks very much.' [...] In the end, a surveyor come out. Somebody had rang me first, and said, 'is it alright for this lad to come out to survey your boiler?' I said, 'Yes, no problem.' They come out and eventually, he said, 'No, mate. It's too old.' He said, 'It's only going to cause you problems.' Basically, he said, 'We're going to replace the boiler.' And I said, 'Thank you very much.' I give a good word for that lad that come around."

3.3.3. Satisfaction with subcontractors and NEA delivery staff

Subcontracted engineers were generally referred to by interviewees in similar ways to Cadent engineers – friendly, professional, and reassuring. One interviewee, for example, commented that "the lads that fitted the boiler were fantastic. I mean, they were so quick, they didn't leave a mess, it was unbelievable, really. I still tell people about it now, I'm a lucky lad." A second interviewee also commented that "they were brilliant, the workmen, they didn't make any mess, moved everything, like really good." Interviewees also made favourable reference to the support they received from NEA staff, often referring to how one named staff member had supported them with a specific issue. One interviewee, for example, who was supported through a successful income maximisation case, narrated that "[the NEA staff member] was really on point, she was very, very helpful, and she was determined to get results, which we did. So yes, she was amazing, she really was". Interviewees who commented on the quality of the work undertaken in their home and the time taken for the work to be completed were also generally satisfied, as Figure 20 shows. However, as Figure 20 also suggests, these positive experiences were not without exception, and this will be discussed below.

3.3.4. Subcontracted engineers and their discussions with households about suitable appliances

In the delivery of the programme, the type and cost of installed appliances was discussed by the delivery team, especially concerning the procurement and installation of relatively high-cost appliances (e.g., cookers) in some cases. Evidence from the evaluation suggests that on at least some occasions, engineers are consulting with households in advance of deciding which appliance to order for the job.

For example, one interviewee, speaking on behalf of his mother who could not take part in an interview due to long-term illness, described how "the cooker has been a lot better, because when [the subcontracted engineer] asked what she could have, I went for the high-level grill again, so she can see the grill now. Before, it was like a double oven, and that part was a grill. She had no idea, if she was putting something in, what was happening to it." In contrast, there is evidence from a separate interview that when this conversation does not take place prior to the order and installation of a new appliance, it can on some occasions result in an appliance being fitted that households find difficult to use in a way they would like.

A noteworthy example of this point was discussed in the focus group with PMS (the subcontractor for the second half of the Service delivery) staff. They described how in one case, the household in question was a traditionally observant Jew that would not adjust electrical devices or appliances over the Sabbath. Accordingly, they required a different kind of cooker "so that they cannot turn anything on, they just increase or decrease the heat." On this occasion, PMS attempted to use their own networks and resources to source a suitable cooker, but when one was found it was beyond the cost that, at that point in delivery, was permitted by the programme.

Clearly, households cannot be given unlimited choice over the appliances that are fitted in their homes, but this evidence suggests that subcontracted engineers should be encouraged and enabled to have proactive discussions with households about which specific appliance (within a cost cap) would be most suitable for meeting their heating and/or cooking needs. If no appliance on the list meets their needs, a mechanism could be introduced to give programme administrators discretion over approving an alternative. The evidence suggests that doing this may enable better outcomes for households, in addition to improved satisfaction.

3.3.5. Dignity

Poverty, and fuel poverty, are often associated with feelings of shame, stigmatisation, and embarrassment, feelings which can be amplified by interactions with services that offer 'free' support (e.g., the welfare system), which can have unintentionally negative impacts on mental wellbeing. However, in the delivery of Reactive Response, interviewees commented that they were respected and treated with dignity by different individuals and organisations that they interacted with.

One interviewee, for example, commented that "they knew what they were doing, and were friendly, gave confidence, and did not make me feel embarrassed, or anything like that because, obviously, if you have not got enough money to pay for stuff it is quite hard. Nothing was like that. So for me, from an emotional intelligence point of view, everybody was perfect." A second interviewee concurred that "basically, it was the care and attention that went into it. It wasn't like, 'Oh, you know, this guy's getting a bloody freebie, and he's probably having us in the neck.' It was just proper like- they really got stuck in, they were friendly, everybody was so helpful. It was just an excellent service."

Furthermore, it is possible that these dignified interactions not only shaped household satisfaction, but also influenced the willingness of some households to proactively contact the advice service for further support sometime after their Reactive Response case was concluded (see Section 3.2.4). In other words, providing a dignified service may have given households confidence that they would receive a similar service again in the future that they perceived other organisations might not provide.

3.3.6. Dissatisfaction

Finally, although small in number, Figure 20 shows that there were some aspects of their experience that questionnaire respondents were not satisfied with. In qualitative interviews, two themes were discussed by interviewees that are worth explicating. The ways in which these issues can be addressed in the future delivery of schemes such as Reactive Response are discussed in the next section.

Firstly, although interviewees generally acknowledged that complex works could not be undertaken immediately, some commented that they did not feel fully informed of the likely timescales for their repair or replacement. To quote one interviewee at length:

> "I think the challenge is, when you do that all you are thinking about is, "Can you give me a date so that I know when they are coming or not coming?" But her saying to me, "I can fill out the report this this afternoon, and I can escalate to my manager at four o'clock, but I do not know when they are going to be able look at it. It might be a few days." When you have the anxiety or if you are living in the cold, you know, whether you are well or not, it is very hard, because your life is almost on hold. So, to me, it would almost be good if, when you are speaking, as she is saying, "Okay, in our process, this can be signed off tomorrow morning, which then means that you should get an engineer in 48 hours or 72 hours or 90 hours." So, as an individual, you know what you are dealing with, because I was just trying to see if I could scrape the money together or do something or go and live elsewhere, because I could not live in this cold, and I did not know. When they said, 'Well actually, it could be another three weeks because they have got to order material,' I think by then I lost the will to live, to be honest. That is very crude, but I almost gave up because I thought, 'Would it have been easier just to have got into debt for £400, or whatever, because I cannot live three weeks in the freezing cold?'"

Evidently, it is often not possible to give households specific timeframes within which work can be carried out. However, as this quote demonstrates, providing this information as realistically as possible in advance can help inform household decision making concerning mitigating steps they could take

prior to the repair or replacement (e.g., going to live with a friend). Furthermore, as the final sentence of the quote shows, not providing realistic enough information regarding timescales may lead to a household attempting to 'scrape the money together' to undertake the repair themselves, which could lead to the accumulation of formal or informal debt.

Secondly, questionnaire respondents and interviewees relayed information about what could be termed 'cosmetic issues', or issues relating to the quality of works in their home that were not related to the gas repair or replacement itself. For example, interviewees mentioned stains that had been left on carpets, skirting boards that were damaged or required repainting after the completion of a job, or bricks that were removed to make room for pipework, which one interviewee considered unnecessary: "I mean, come on, who [removes] a bloody brick out to make a 22mm hole? So, there were lumps of bloody brick everywhere."

As Figure 16 shows, it is evident that these cases were in the minority, and as noted previously most comments made by interviewees about the quality of works carried out in their home were positive. However, these findings do emphasise the continuing need for robust quality assurance and audit processes to ensure that any issues are identified and corrected. Furthermore, there is evidence that these processes are particularly important for a service like Reactive Response, as households may be less likely to proactively communicate issues as they happen because they feel doing so would come across as ungrateful, considering the free repair or replacement they have received at a time of acute crisis. One interviewee put it thusly: "because [I] wasn't [paying for it] and I got these people because of the referral and because I wasn't paying, it was hard, really, to intervene, complain even or voice that I wasn't happy with certain things because I didn't want to come across as ungrateful."

3.4. The influence of the energy crisis and broader factors on the impact of support

Although the impacts of the Reactive Response Service on beneficiaries are demonstrably positive, there is evidence that the impact of the Reactive Response Service on affordable warmth, health and wellbeing, and wider household costs is being offset by the intensification and exacerbation of broader drivers of (fuel) poverty, especially low household incomes, inadequate welfare benefits, substandard energy efficiency of dwellings, rising fuel costs, tenure relations, and severe ill-health. This section discusses this finding and places it within the wider context of the energy and cost of living crises.

In focus groups with project delivery staff, it was stated that one of the implicit aims of the programme was to enable Cadent customers to make a "step change"; to build on the support provided to them by the service in a way that enables them to thrive and ultimately be lifted out of (fuel) poverty. The evidence collected by the evaluation suggests that this is not taking place in some situations. Figure 21 below shows that when asked how worried they felt about heating their home and affording their energy bills in future, the most common response to both questionnaire items was no change. However, approximately one in three respondents said they were more worried about heating their home and being able to afford their energy bills despite their Reactive Response intervention. Conversely, a third (33%) said that they were less worried than last winter about heating their home, so they were comfortable, while just over a fifth (22%) said they worried less about being able to afford their energy bills.

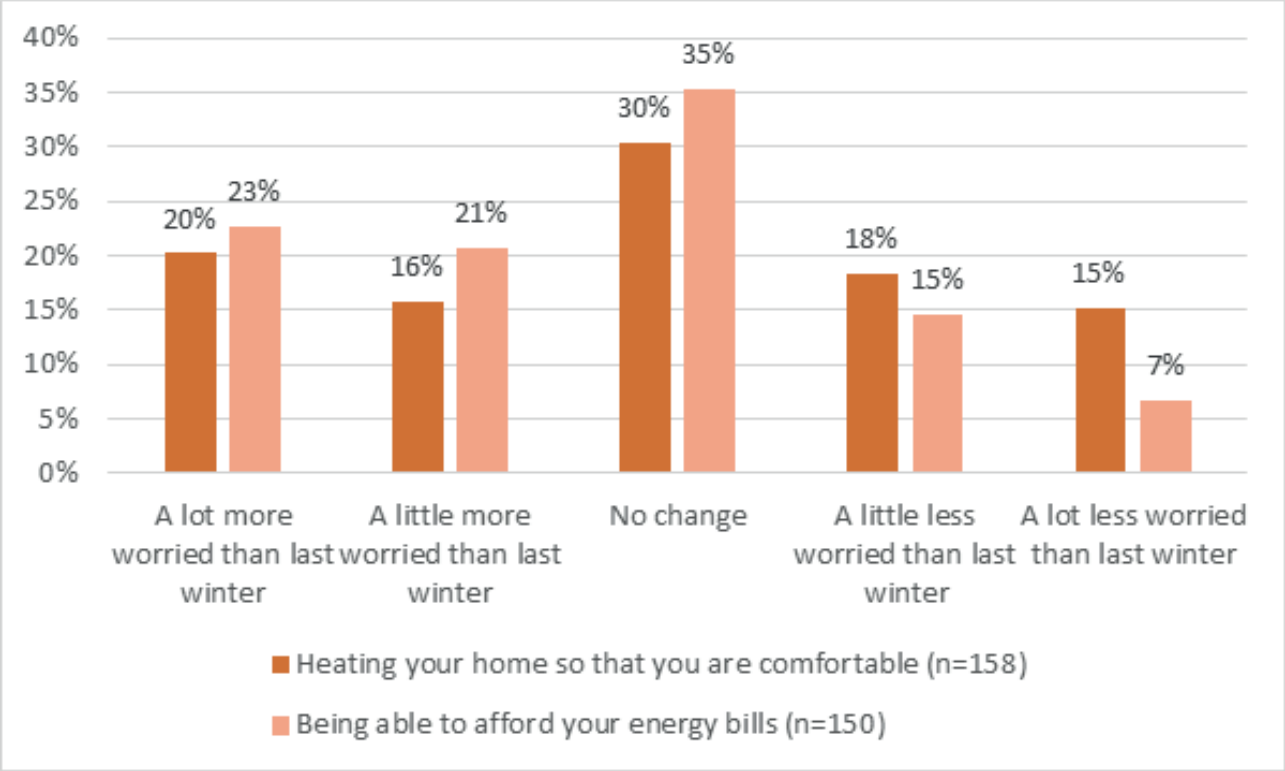


Figure 21: Responses to the question: Compared to last winter, and after having received assistance from the Reactive Response Service, how worried are you about the following things?

Qualitative interviews suggest increased levels of worry or concern are not directly related to the support received from Reactive Response but are reflective of wider circumstances that are mostly if not entirely outside the remit of the programme as currently designed. The key finding, which reflects the multiple vulnerabilities, health conditions, and income levels experienced by households, is that in some cases the positives impacts of the Reactive Response Service are being offset by a wider multiplicity of issues relating to the cost of living that, together, are keeping them in persistent (fuel) poverty.

For example, one interviewee discussed their attempts to navigate what they perceived as the punitive nature of the benefits system while struggling to manage multiple health conditions, and how, despite acknowledging the impact of the support of Reactive Response Service on their life, it was not enough to lift them out of poverty:

> *"The boiler, obviously, just totally- it did, it perked me up. I just thought, 'That is great.' It just shows what it can do when something- and you get the help off people like that, what it can do, and how it can perk you up. Like I say, it is very depressing when you wake up to things that need doing around the house, but the money's just not there at the moment. And some jobs I have applied for, but then am thinking, "Well, how am I going to get on with them with my shoulder?" I mean, I done a few hours cleaning, and I told Universal Credit about it, it's just a part-time thing, and it was ridiculous the mess I had with it. What Universal Credit had to give me, and then Council Tax went up, and I was like, "What's the point in starting a job?" If you're going to start doing that part-time, and it was just ridiculous. But when I got back home, my shoulder was hurting, and the thing in my bladder was hurting. So, these issues have got to be sorted before I can really get back into work properly."*

This example points to the complex intersection of rising living costs, physical ill-health, and inadequate welfare benefits, and the ways in which this combination was preventing this interviewee from being able to access work and, more broadly, to begin to make the 'step change' they evidently wanted to.

In interviews undertaken with beneficiary households in May and June 2022, after the energy price cap was lifted from £1,277 to £1,971, this increase and the prospect of even larger increases in the cost of energy in October 2022 were frequently mentioned. One interviewee, for example, commented that "I'm just paying £85 a month direct debit, at the minute [...] I know it's going to go up from £85, so I am panicking about that. Because I can see on Facebook all the horror stories, people have jumped up from £95 and they're all of a sudden paying nearly £200. I couldn't afford £200." A second interviewee also said that "I don't know what will happen when [the price cap] gets another big increase [...] of course I'm worried, but I don't think there's a lot I can do about it." Other interviewees were receiving conflicting information from their energy supplier about when, and by how much, their direct debit payments might be increased.

These quotations evidence that many respondents were struggling, and expecting to struggle in the future, because their incomes could not keep up with rises in the cost of energy, either because of low wages or because benefit levels were too low to meet their required fuel costs and wider living costs. However, this should not detract from the significant impacts the service is having on Cadent customers (as evidenced in this report).

4. WHAT SHAPED THE SUCCESS OF THE REACTIVE RESPONSE SERVICE? EXAMINING DELIVERY AND IDENTIFYING REPLICABLE ASPECTS OF THE DELIVERY MODEL

This section shifts the focus from the impact of the Reactive Response Service on beneficiaries to how the Service was implemented and delivered. It specifically analyses aspects of the design and delivery of the Service that can and should be replicated across similar services in the future.

Largely as a consequence of the development of the Reactive Response Service, rapid gas appliance repair and replacement services have been introduced by all the GDNs working in England, Scotland, and Wales. This work is being funded by and taking place through the Vulnerability and Carbon Monoxide Allowance (VCMA), which is administered by the energy regulator Ofgem. Accordingly, it is beneficial for the evaluation to examine the key factors that have shaped the success of the Reactive Response Service, as well as the challenges the Service has encountered and overcome, with the broader aim of developing recommendations for the successful implementation of rapid gas appliance repair and replacement services across the whole of Great Britain. To do so, this section draws on interviews and focus groups with Reactive Response delivery staff, as well as drawing in testimonies from households where appropriate, to identify the key learnings that should be considered by rapid gas appliance repair and replacement services moving forwards.

4.1. Eligibility criteria

A key learning from the implementation of the project to date is regarding eligibility criteria. Initially, and following the success of the pilot in the West Midlands, Reactive Response was designed to not have an eligibility criteria for beneficiary households. Instead, a referral from a Cadent engineer was

deemed to be a sufficient indication of vulnerability for a household to enter the project, similar to how referrals from health professionals often constitutes a bespoke eligibility pathway for other fuel poverty schemes (e.g., under ECO Flex statements). Put differently, the project was set up to rely on the vulnerability identification practices and training of Cadent engineers to generate a referral stream of eligible households.

Foregoing eligibility criteria was deemed by project delivery personnel to have at least two advantages for Reactive Response. Firstly, and most importantly, it enabled speed. In a situation where a vulnerable household is without heating and hot water, especially if the household has multiple cold-related health conditions (see Section 2.1), implementing a solution quickly is of considerable importance. In other fuel poverty schemes, checking that a household meets specific eligibility criteria can often be time consuming, requiring the collection and verification of documents (e.g., bank statements to verify an income threshold is met) by a staff member. This process can be complicated further by vulnerabilities that may be present in the household: for example, digitally excluded households, which delivery staff noted comprised a surprisingly large number of Reactive Response beneficiaries, may face difficulties photographing and/or sending bank statements and other documents to project staff members. Working through these complications can cause delays to the delivery of pipework fixes or replacement appliances, which can be detrimental to the household.

Secondly, foregoing eligibility criteria has advantages for the referral mechanism itself. Although Cadent engineers are trained to identify vulnerability effectively (see Section 2.1. and 4.3. below), project delivery staff agreed that asking or expecting engineers to verify eligibility typically fell outside the scope of their practice. One delivery staff member noted that, on rare occasions, engineers with whom they had a good relationship could be asked to photograph benefits letters, but they agreed that it was not feasible or desirable for engineers to be asked to do this as a matter of course. Accordingly, while engineers were trained not to state categorically that households would receive support through Reactive Response (this might not be the case if e.g., the property turned out to be social housing), foregoing an eligibility criteria gave engineers confidence that referrals they made would result in good outcomes for the household at speed. In turn, this promoted consistent practices of identification and referral across Cadent's entire network area and secured buy-in from engineers to refer into the project regularly.

However, the decision to forego eligibility criteria soon came up against an unstoppable force – the level of need and demand across Cadent's network area. The embedding of Reactive Response into Cadent's organisational culture (see Section 4.2) resulted in a level of referrals that the funding and resource capacity of the project struggled to meet, particularly in the autumn and early winter of 2021/22. Following discussions among the delivery team, eligibility criteria was imposed on 13th December 2021. Initially, the eligibility criteria were designed to mirror that used in Warm Home Discount Industry Initiatives delivery, and used the following criteria to ensure that most beneficiaries were in fuel poverty or at risk of fuel poverty:

- Receipt of a means-tested benefit
- A vulnerability factor putting customers in an at-risk group
    - Long-term unemployed
    - Disability
    - Over-65s
    - Long-term illness
    - Carer
    - Child under 5
    - Disabled child
    - Expectant parent
- A household income of below £20,000 per annum

Eligible households were required to have more than one criterion outlined above to be eligible for support, for example a long-term illness and a household income of below £20,000 per annum.

Under the funding provided by the Cadent Foundation, evidence of the above criteria was not required to process a household through the project. Instead, verbal confirmation, combined with the referral and associated identification practices of the engineer, were deemed to be sufficient to confer eligibility. Delivery personnel viewed this as critical to keeping the process as fast as possible for vulnerable households without heating or hot water. After the flow of eligible households into the project continued to grow despite the imposition of this criteria, the eligibility criteria were altered to focus on prioritising households that were at greater risk of coming to harm through being without heating and hot water for a sustained period of time. Under this criteria, a priority ranking system was implemented whereby households were deemed eligible for support if they were in receipt of means-tested benefits, and then prioritised accordingly:

- Priority One: An occupant of the household has a physical health condition that is directly affected by living in a cold home, and/or may be exacerbated to the point of being a risk to life if they are left without heating and hot water. For example, this could constitute a respiratory condition that may, in cold temperatures, develop into acute pneumonia, or a musculoskeletal condition that may, in cold temperatures, become a significant fall/trip hazard.
- Priority Two: An occupant of the household has a mental health condition or any other health condition that may be indirectly affected by living in a cold home.
- Priority Three: All other households, including those with non-cold related health conditions.

Evidence from the evaluation can point towards the extent to which the imposition of eligibility criteria led to the project being able to target support at those most-in-need. Although there were not a high enough number of referrals that took place under each criterion to accurately track changes in targeting, a distinction can be drawn at the moment eligibility criteria was introduced 13th December 2021. Most notably, Figure 22 below shows that proportionally more survey respondents who were referred into the programme after the imposition of eligibility criteria would not have been able to pay for the necessary work and would have gone without heating and/or hot water. Correspondingly, proportionally fewer survey respondents referred into the programme after the imposition of eligibility criteria said they would have used their own savings/money to pay for the necessary work. It is possible that this reflects changing external circumstances, primarily increases in energy prices from the winter of 2021/22, but it also signals that the imposition of eligibility criteria has possibly led to a more accurate targeting of resources on households unable to arrange or afford their repair/replacement themselves. This is important given that the funding of Reactive Response (and other rapid repair and replacement services implemented by other GDNs) is now under Vulnerability and Carbon Monoxide Allowance (VCMA), which stipulates that households who receive support cannot have the means to resolve their issue independently.

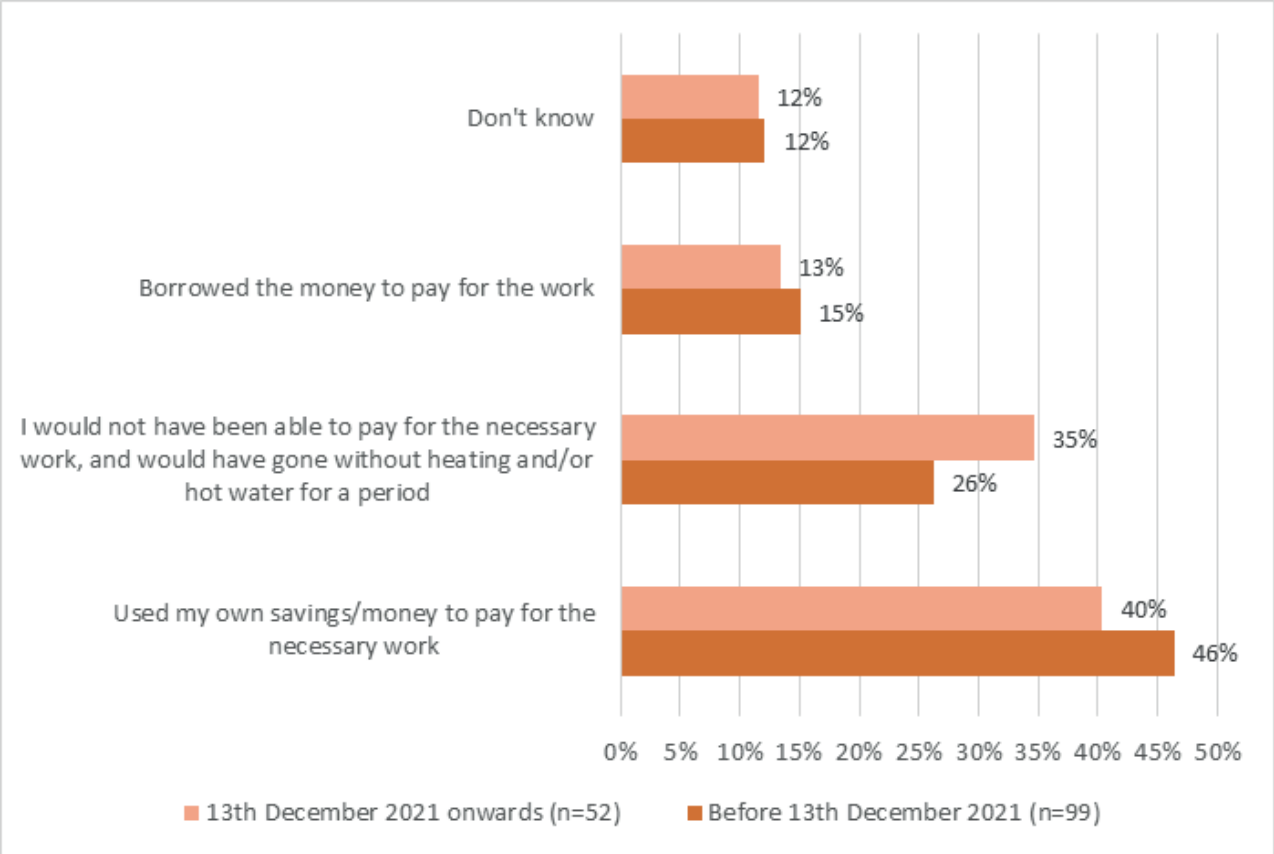


Figure 22: Responses to the counterfactual question: 'Had the Reactive Response Service not been available when my gas supply, heating appliance, or cooking appliance was disconnected I would most likely have done the following…', disaggregated by whether the respondent entered Reactive Response before or after the imposition of eligibility criteria (n=151)

What lessons can be drawn from the experience of Reactive Response with respect to eligibility criteria? Reflecting on the delivery of the project, delivery staff noted the strengths of not having an eligibility criteria when delivery commenced but continued that it had become essential for targeting limited resources at households most at risk from harm by being without heating and hot water for a sustained period. Moving forwards, the eligibility criteria utilised for a project such as Reactive Response should consider the following:

- Targeting support at those most at risk of physical and/or financial harm. This could include criteria on physical and/or long-term illness, mental illness, or financial vulnerability/ indebtedness.
- Balancing the need for verification of ill-health and/or financial circumstances with the need for quickly resolving the issue at hand.
- Incorporating a degree of flexibility to allow project managers to approve eligibility in cases where seeking verification may cause a considerable delay. This could include circumstances where a household has a cold-related physical illness but cannot easily produce documents to verify their eligibility due to certain circumstances or vulnerabilities (e.g., digital exclusion). Decision making processes on these cases should be collectively agreed by project delivery partners, the energy regulator, and fully documented for the purposes of audit and to ensure transparency.

Finally, regardless of the chosen eligibility criteria, projects like Reactive Response must have an alternative support pathway for households that are not eligible under the scheme itself. After eligibility criteria was implemented in Reactive Response, ineligible households would still be

supported by advice staff members to access alternative sources of funding and broader energy-related advice and support. This means that ineligible households were still supported to resolve their issue, and that engineers were not discouraged from referring into the project (e.g., because they are concerned a specific household might not be eligible, and that this could lead to detrimental impacts on the household).

This latter point is critical – if engineers do not have confidence in the referral mechanism, consistent practices of identification and referral may be jeopardised. One Cadent delivery staff member, who had previously worked as an engineer, described their own experiences of referring customers to onward support following a gas emergency. Being able to offer a customer energy advice and benefits advice, even if they could not guarantee their eligibility for a repair and/or replacement, was described as a key hook for ensuring vulnerable customers did not turn down support from the Service:

> *"When I was ever doing a referral for a customer, it was always very much a case of, 'Well we can do a referral, but you may not get help, depending on the criteria.' When you then [go] from there to say, you'll definitely get energy advice and you'll definitely get, they'll check over your benefit entitlement, that was always a massive plus for the customer. And it's something that they almost say yes, definitely, let's see where this journey can take us. And it almost swung it round from someone maybe umming and ahhing about the service, or [me] leaving them with a card so they could refer themselves, [to] almost certainly lead[ing] into us definitely doing a referral for the customer."*

This ensured, as the Cadent staff member continued, that "every interaction we have, whether we can repair their appliance or not, [we're] having that positive impact in people's lives. And that's what it's about."

This view was corroborated by advice and delivery staff members, who described situations where a household was not eligible to receive a repair and/or replacement through the Service but were still supported with additional issues once they came to light. As one NEA staff member put it, "as straightforward as the scheme sounds [...] there is nearly always something else you find out about the person that they could need help with." For example, an NEA staff member narrated one referral they had received for a household in the private rented sector. Not eligible for the Service due to the tenure of the home, NEA's staff member discussed the situation with the household. It transpired that the landlord of the property was denying that the appliance had been condemned and was refusing to fix it, after which the household was referred to Shelter by NEA to try and resolve the dispute. As the NEA staff member reflected, "this [household] had no idea that this kind of help existed. Without which, she'd still be [let down] by her landlady and sitting in the cold." As they put it later in the conversation, a household that is ineligible for support through Reactive Response never hears the words "'Oh well, never mind, we can't help you'"; instead, "it would be a case of, 'we need to find out where you can get help, so this can get sorted.'"

This testimony from the delivery team shows that offering repairs/replacements and energy advice as part of one single customer journey does not just add value in terms of the impact on beneficiaries (see Section 3.2.4), but it provides an alternative support pathway for households that are ineligible for measures through the primary funding pathway (in this case, Reactive Response). Ensuring that this pathway was built and resourced is a key accomplishment of Reactive Response, and one that must be replicated across GDN repair and replacement services moving forward.

4.2. Organisational cultures and Reactive Response as business as usual

Beyond the success of implementing Reactive Response as a distinct project, it is clear that one of the main successes of the programme was that it initiated and drove a wider cultural shift within Cadent's operations and business. In the prior pilot programme delivered in the West Midlands, the scale of delivery was far smaller, limited to a focused part of Cadent's network and reliant on a "handful of engineers who knew about the pilot and were referring", as one project delivery staff member described it. Scaling the project to Cadent's entire network area was described as requiring a broader cultural and organisational shift in business practices to ensure that Reactive Response had buy in from individuals and teams at all levels of Cadent's operations, from senior management to team leaders and individual engineers. Cadent delivery staff made clear that this shift had indeed occurred; as one said, "in the last two or three years, it's really grown and it's now becoming a massive part of the business [...] it's massively focused the business, and it's massively helped us keep vulnerability and what vulnerability truly means front and centre."

Cadent delivery staff described several factors that had successfully driven this shift, all of which are replicable across GDNs and other industry bodies delivering support to fuel poor and vulnerable customers. The qualities, determination, and creativity of individuals at management level was described as critical to delivering information about the programme to teams of engineers. As one Cadent staff member described, "they've been at the forefront, promoting this within the appropriate district meetings, within team talks, providing literatures [...] having a really slick engagement process [internally], as well as having a really easy process to follow, has been the best thing." This extended to continually developing and refining the referral process for engineers, and encompassed the development of feedback loops so that engineers could be informed about the positive outcomes of specific cases they had referred into the Service, which facilitated both personal and professional satisfaction ("it makes you feel this big", as one Cadent staff member put it, reflecting on the feeling of learning about a positive outcome for a customer). In turn, this reinforced the desire to refer more households in the future. "It builds that engagement," as one Cadent staff member put it, "you know, 'this is what we're doing, this is the outcome, keep doing that great work.' It just reinforces that message and makes it easier for all of us."

All this engagement was reinforced by two-way channels of communication and feedback between engineers and the delivery team. For example, the Cadent delivery team described how they would receive feedback from engineers on the usefulness of resources and methods used in vulnerability and project training (e.g., on slide decks cascaded to engineers). This feedback allowed the delivery team to maintain a sense of how training was being received by engineers, as well as alerting them to any areas where more information was required or where further engagement might be needed. For example, as noted in the previous paragraph, Cadent's delivery team continually revised and updated the tools engineers could use to refer, partly based on feedback received from the functionality and ease of referral methods throughout the programme. Previously, engineers reported concerns that they would occasionally call NEA to make a direct referral but would not be able to get through, which led to nagging anxieties as to when and how the message and referral would be picked up. Cadent and NEA's delivery team subsequently developed a referral form so that engineers could refer directly on their tablets. When it was reported by some engineers that filling in the form on their tablet was sometimes time-consuming, Cadent's delivery team developed an app and a video showing engineers how to pin the app to the home screen of their tablets and mobile phones, so that the referral form was easily accessible through multiple means (e.g. if a Cadent engineer had left their tablet in the van, they could easily refer on their phone).

This continual process of feedback and refinement not only led to quicker and easier practices of identification and referral for engineers, but the frequent two-way processes of communication and

engagement embedded the programme into the day-to-day work of engineers, driving referrals across Cadent's entire network. In addition, Cadent delivery staff also suggested that embedding Reactive Response into the day-to-day working practices of engineers was facilitated by the simple desire of Cadent employees to help vulnerable customers. Reflecting on their time, years previous, working as a frontline engineer, one Cadent delivery staff member said that it was typically extremely frustrating and upsetting having to leave a customer without heating and hot water following a supply isolation.

The outcome of this work was that Reactive Response became incorporated as business-as-usual in Cadent, even among some departments and teams that were described as initially sceptical as to the rationale and deliverability of the Service. An important example given by project delivery staff is how the Service became embedded not just in emergency callouts, but in other Cadent operations. A vital part of Cadent's and all GDN's business is the Iron Mains Risk Reduction Programme (IMRRP), which replaces iron mains piping within 30 metres of households. Cadent delivery staff described how the embedding of Reactive Response across all Cadent's operations was driving referrals from IMRRP works, which represented a huge shift in the mentality and culture of that work. In other words, referrals to Reactive Response were being generated not because of emergency callouts, but because "we're just in that street replacing the gas pipework." NEA delivery staff also commented that referrals had been generated through 'purge and relight' work, whereby gas supply is restored to a particular geographical area following a major supply emergency in winter conditions:

> "A couple I can remember quite clearly, were referred to us on the back of a purge and relight, following some mains replacement works in the street [...] I'm thinking about an old boy who'd been sitting in a house with no boiler for several years, and a hole in the roof. The only reason he came to our attention was because Cadent knocked on the door and said, 'We're digging up the street, we want to test your system.'"

In this example, a referral was made to Reactive Response after Cadent discovered the customer in this situation, "sitting in a house with no boiler". This speaks not only to how Reactive Response maximises every potential contact point between Cadent engineers and vulnerable customers, but how engineers have been supported and enabled to see every interaction they have with customers as an opportunity to identify vulnerability and refer someone to the support they need. As one Cadent delivery staff member summarised, "being able to shift that mentality in that environment has been even more successful."

Lastly, this cultural shift did not just enable the success of the programme, but it has also driven wider strategic and business priorities within Cadent. Cadent delivery staff described that through delivering the programme they had learned to be more proactive in their engagement and work with vulnerable customers, "through charity partnerships and different things, education, support [...] it's allowed us to understand our role in society a bit better, and probably change the way that we operate." Moreover, not only is Cadent continuing to deliver Reactive Response for the remainder of the RIIO-GD2 period, via VCMA funding, but implementing the project has embedded vulnerability and vulnerable customers even more firmly at the heart of their operations. And as one Cadent staff member noted, summarising how Cadent will seek to further this in the coming years, "I would like to see that continue, you know, RIIO three, four, whatever that is. That's my final take on it."

4.3. Vulnerability training

The Reactive Response service is premised on enabling Cadent engineers to identify households that are likely to be unable to arrange the necessary repair and/or replacement on their own and are likely to come to harm through being without heating and/or cooking facilities following a

supply isolation or disconnection. Following a referral to the Reactive Response delivery team, the household (if eligible) is passed to a subcontractor, which manages and facilitates a resolution to the issue. Throughout the process, therefore, households come into contact with multiple staff members across all three organisations. This could have presented several challenges associated with communication and continuity of service (for example). However, as demonstrated in Section 3.3., household satisfaction with this process is high. In interviews and focus groups with project delivery staff, it became clear that customer vulnerability training and knowledge was critical to facilitating positive outcomes and experiences for beneficiaries.

As the facilitators of the referral mechanism at the first point of contact, the training received by Cadent engineers was described as hugely significant for enabling them to make successful referrals into Reactive Response. Delivery staff explained that, at minimum, Cadent engineers would receive an initial training session four hours in length, which was then followed up by a more in-depth session eight hours in length. This training suite was informed by NEA as well as by different teams within Cadent, especially the customer-facing teams. Delivery staff described this training as crucial to ensuring engineers were working with a common set of vulnerability criteria and being trained to identify vulnerability in a consistent way across Cadent's entire network area. Cadent also utilised a cascade approach, whereby leaders in different teams across different parts of the country would attend a training session and then cascade information to members of their team.

Reflecting on the training provided to Cadent engineers, one Cadent delivery staff member referred to it as a process of equipping them with a varied toolbox to support vulnerable customers. This not only enabled engineers to "spot signs and scenarios, things to look out for", but also to have a range of options with which they could help vulnerable customers. Interestingly, Cadent's delivery staff member described working as a frontline engineer in years previously and commented that "engineers have never had this tool [Reactive Response] before. The amount of times I could have used this tool when I was out there."

More widely, Cadent delivery staff explained that training was not conceptualised as something that occurred once and never again. Instead, refresher sessions were commonly utilised, and over the course of the project it was clear that Cadent delivery staff were constantly exploring opportunities to enhance their engineers' knowledge and understanding of vulnerability. As demonstrated in Section 2.1, this training process has evidently been successful in enabling Cadent engineers to identify vulnerable customers consistently across Cadent's entire network area.

Reflecting on NEA's role in the project, one Cadent delivery staff member commented that "the ability to use a partner who has a real understanding of need and has a real comprehension of what the customers are going through, and continue to go through, has been a huge plus point." Across the project, NEA's ability to support vulnerable households through an extremely worrying experience was described as pivotal by delivery staff across both organisations. In an interview with the evaluation, one NEA delivery staff member commented that a significant asset to the programme was NEA's ability to deliver a service appropriate to the needs and requirements of each individual household. This was linked to NEA – and specifically NEA's frontline delivery staff – having longstanding expertise and training in fuel poverty and customer vulnerability, as well as how to respond empathetically to difficult customer circumstances and help customers navigate their journey through the project. In addition, NEA's frontline delivery staff were described as having substantial experience of supporting people through distressing and sensitive situations which, considering the multiple overlapping vulnerabilities of Reactive Response beneficiaries, were commonly encountered following referrals being made.

The benefits and value provided by NEA's expertise was described in interviews and focus groups with NEA delivery staff. One example is particularly pertinent. In one focus group, NEA staff members discussed the challenges of starting a conversation with households about broader energy-related advice and support at the exact moment they were extremely concerned about their gas supply

isolation or disconnection. As they continued, there was not one method or script for starting this conversation; "it's case by case", and always judged in a way that is appropriate to the household at the other end of the telephone. One example given by an NEA staff member was narrated as follows:

> *"'[There is] other support we can offer, if you're interested, and by the way, can you afford your bills now they're going up horribly?' That's a chance for them to have a moan. They go, 'Oh, it's bloody rubbish, isn't it?' You go, 'Yes, it is, isn't it? Are you managing?' Then, the conversation then goes into, 'Oh, yes, we've got a bit of a debt, actually.' 'Oh, blimey, have you? We can help.'"*

In this example, a conversation about rising energy costs led to a disclosure of energy debt that was later addressed by NEA's advice team. It illustrates one of the various ways advice staff members would construct relationships of trust and openness with Cadent customers, which in turn facilitated discussions of further support that households might require. It is worth stressing that delivery staff perceived this as a largely unscripted, open-ended process, whereby conversations with each customer were judged and tailored to their exact situations, circumstances, and needs. The example demonstrates the mix of expertise, experience, and empathy required to transform a difficult conversation about faulty appliances into an opportunity for providing tailored energy advice and smooth customer journeys through Reactive Response itself.

The final part of the referral process begins when a case is approved by NEA and handed to the subcontractor to fulfil. In a focus group with PMS delivery staff, they likewise described how vulnerability training had been at the heart of their efforts to ensure repairs and/or replacements were delivered quickly to vulnerable customers. This was undertaken in two main steps. Firstly, vulnerable customer training was provided as standard to all PMS employees and was described by PMS delivery staff as "embedded in the vision and values that we have." As the conversation continued, the same staff member noted that "we had a new intake of five staff yesterday, first day and their training this morning is vulnerable customers. They learn about customers before they learn about our system". Vulnerable customer training was therefore described as central to PMS's practices of customer engagement and was integrated into their operations for all staff as a matter of course.

Secondly, PMS delivery staff described how they set up a bespoke, specialist team to handle Reactive Response cases. This recognised that households coming through Reactive Response were likely to have specific vulnerabilities that required a bespoke and appropriately briefed and trained team to manage. As one PMS delivery staff member put it, "we've realised this was vital and [this team] became real experts in NEA, how to deal with their customers, how to interact with [NEA's systems]." The benefits of this team were described as multiple, both for referred households and the team itself. Most importantly, it ensured that households had a single, named point of contact with PMS who would walk them through the different steps of the process (i.e., date of survey, name of engineer, date of installation, etc.). Avoiding multiple individuals managing multiple points of contact with the household prevented "that kind of merry go round that for particularly very vulnerable people can sometimes lead to them dropping off". Instead, "customers really like that they're speaking to [a single staff member] every single time, they're not speaking to forty different people which can then cause anxiety and exacerbate any issues they might have dealing with on the phone." Indeed, throughout conversations with PMS delivery staff it became clear that this small, bespoke team was critical to the successful way referrals, repairs, and replacements were managed. Members of the team essentially became experts in customer vulnerability and case management in a similar way to NEA delivery staff; as one PMS delivery staff member narrated, "each one's a very individual case, I wouldn't be able to write it down for you what I do, it's listening to a customer."

Across all three organisations involved in delivering Reactive Response, vulnerable customer training was therefore described as fundamental to delivering good outcomes for referred households. This training was not singular but reinforced through refresher sessions and the continual efforts of senior management at all three organisations to regularly identify and implement ways of upskilling delivery staff in their knowledge and awareness of vulnerability. Programmes such as Reactive Response should follow this approach, ensuring that all project staff members who encounter households throughout the customer journey are trained appropriately.

4.4. Specifications and project set-up

Finally, in interviews and focus groups, project delivery staff reflected on several additional challenges that were encountered over the course of Reactive Response. These challenges were often summarised in terms of what might have been done differently if the project was began again anew, or lessons learned from the project that would be taken forward into delivery under the VCMA. These lessons are summarised in this section, with the intention of providing guidance to other similar schemes in the future as to how they can be optimally set up and delivered.

Systems, processes, and communication: Reactive Response is designed to deliver repairs and replacements at speed to customers who might be at acute risk of harm if left without heating and hot water. As a result, the integration of systems and communications across Cadent, NEA, and the subcontractor to enable smooth transfers of information was recognised as critical. However, project delivery staff reflected that this had been a continual work in progress across the delivery of the programme. Developing and refining these processes occasionally caused delays in the approval of works, as aspects of a case were manually (e.g., over email) discussed and passed between the different organisations. Towards the end of the programme, PMS were undertaking a piece of work to integrate separate case management systems used by NEA, PMS, and PMS's subcontracted engineers, with the intention of automating as much of the communication and repair/replacement process as possible while enabling NEA delivery staff to retain oversight.

Moving forwards, it was intended that this would ensure frontline staff members, both at NEA and PMS, and PMS's subcontracted engineers had quick and easy access to relevant information that would enable customers to be processed smoothly through the journey. More broadly, the key lesson learned was that for a service to be as 'reactive' as possible, an integrated system that enables instantaneous transfers of referral data (with appropriate data protection), along with relevant accompanying information, must be in place and working effectively.

A "matrix of people": Over the course of the project, the project delivery team gradually grew to incorporate colleagues from multiple internal teams, including finance, contract management, and data control. This expertise was not required for the West Midlands pilot, but as delivery commenced across Cadent's network area at a much larger scale, it became clear that additional resource was required to manage the project in its entirety. A key learning, commented upon by both Cadent and NEA delivery staff, was therefore to ensure that project delivery teams have expertise in all these areas. Furthermore, project delivery staff also noted that moving into VCMA delivery, the project delivery team would also incorporate expertise on the technical aspects of gas infrastructure repair and replacement, in order to liaise with Cadent and the subcontractors more effectively on matters relating to the physical works carried out in customer homes. Having this broad and varied expertise in place – what one delivery staff member referred to as a "matrix of people" – for complex programmes such as Reactive Response was gradually seen as critical to effective decision making, project management, and case resolution.

Audit and quality assurance: Over the course of the project, audit and quality assurance was handled in different ways at different times. At the beginning of the project, quality assurance was primarily the responsibility of the subcontractor. However, as the project developed, Cadent took a more active role in the auditing and quality assurance of repairs and/or replacements. Reflecting on how audit and quality assurance processes had developed during the project, both Cadent and NEA delivery staff reflected that the correct balance had not entirely been struck.

To an extent, this was related to communication processes, discussed above. For example, one delivery staff member commented that in a hypothetical case, "if an audit report says, 'Clips are missing', and [the subcontractor] class that as an amber or a green, but then Cadent rightly said, 'Is it clips missing off a gas pipe?' because that's totally different than clips missing off a water pipe." As this quote shows, accepted quality assurance standards and technical languages may differ due to the differing statutory obligations of each organisation involved in the delivery partnership; in the above quote, clips missing off a gas pipe is ultimately a breach of regulations for a GDN. The lesson for future delivery is therefore that quality assurance and audit processes, including in what proportion of homes they are carried out and how detailed they are, should be agreed as early as possible in the delivery of a project, with the roles, responsibilities, and communication methods clearly outlined to the greatest degree possible.

Referral methods: Finally, as described in Section 4.2. above, projects should be able to equip engineers with a range of different methods for referring vulnerable customers. Each customer, and the way they entered Reactive Response, was different, and while there were certain methods (e.g., referral forms) that were used more prevalently by engineers than others, having a range of referral methods enabled engineers to make referrals differently depending on what was best for each customer and their situation. These methods should include an online form (a link to which can be pinned to the home screen of engineers' mobile phones and tablets), a telephone number, and a card that can be left with the household. Importantly, these methods should be in place as early as possible in the delivery of services such as Reactive Response, but also be continually refined based on feedback from engineers and households.

5. FUTURE DELIVERY UNDER THE VCMA

This final section widens the focus an examines learnings from Reactive Response that are relevant for the future delivery of vulnerability projects by GDNs under the VCMA. It focuses specifically on three points raised during delivery by delivery staff and is intended to point to ways in which VCMA guidance can be improved, and potentially adopted by other fuel poverty and vulnerability programmes. This is especially important due to the GB-wide rollout of rapid repair and replacement programmes by the GDNs – identifying ways in which the VCMA can be amended and improved will ultimately enable better outcomes for GDN customers supported through their programmes.

5.1. Enabling works under the VCMA

Firstly, project delivery staff highlighted a tension in VCMA guidance with regards to the repair and replacement of boilers and central heating systems. This can be summarised as a question over the extent to which 'enabling works' are permitted under VCMA rules. Project delivery staff commented that as the delivery of the programme transitioned into the VCMA, it was sometimes unclear as to what works were permitted by VCMA rules. For example, on one occasion a household was having a full central heating system fitted by Reactive Response. Under VCMA rules, project delivery staff

perceived radiators "as a bit of a grey area, and [we] weren't necessarily allowed to fund radiators through the programme." Evidently, a full first-time central heating system cannot be installed without radiators, and on this occasion, representations were made to Ofgem to ensure that radiators could be installed in this home (and in future) without penalty. However, the perceived lack of clarity in the VCMA guidance meant that this specific job was slightly delayed, which may in turn have had adverse consequences for a household without heating and hot water.

In other examples, project delivery staff described that the status of a wider range of 'enabling works' was unclear in VCMA guidance. This was most often linked to the vulnerability of individual customers and the states of disrepair their homes were often found in. As one project member put it, Reactive Response is "not just measures, it's loft clearances, wiring, joinery", and other issues with the physical state of the property such as pest infestation that must be resolved before a repair or replacement can safely take place. Under the funding of the Cadent Foundation, such works were able to be undertaken, leading to very vulnerable households in very poor-quality housing receiving measures that other programmes might have found impossible to deliver. However, under the VCMA funding, delivery staff perceived that there was a question mark over the extent to which these enabling works could be undertaken. If, in a hypothetical example, a home is not safe for subcontracted engineers to enter due to the presence of asbestos or a rodent infestation, but no funding is available to resolve these issues, an installation cannot take place and the household will be left in an extremely dangerous home with no heating or hot water. Accordingly, at the next appropriate review, Ofgem should consider introducing a mechanism to the VCMA whereby such enabling works can be funded and covered in situations where there is a serious risk to health and planned works cannot go ahead without their resolution.

5.2. Outputs and outcomes

Secondly, project delivery personnel reflected that a strength of Reactive Response is that it was driven primarily by the outcomes achieved for Cadent customers, rather than by targets or outputs. In focus groups and interviews with the evaluation, some project staff reflected that in other fuel poverty schemes, delivery is typically focused on accomplishing targets, outputs, and demonstrating that a certain value for money has been achieved. These are the primary criteria on which the success or failure of project delivery is judged. However, delivery personnel noted that this sometimes means the outcomes achieved for households, such as those demonstrated throughout this report, are not properly accounted for or recognised, either by funding bodies or by energy regulators. Specifically, one member of the project team observed that Ofgem is primarily concerned with monetary value when assessing the performance of fuel poverty schemes, and that this can lead to the under recognition of "broader impacts and outcomes, things like health and wellbeing, getting children to school…"

Accordingly, delivery personnel perceived that delivering Reactive Response through Cadent Foundation funding had enabled an outcomes-focused approach to be embedded into the programme. Furthermore, this was perceived as well-aligned to the transitioning of the programme into VCMA funding. VCMA delivery rules stipulate that GDNs must carry out assessments on the Social Return on Investment (SROI) delivered by their projects. This was perceived by some project delivery staff as a more effective way of measuring the impacts achieved by Reactive Response and by fuel poverty/vulnerability initiatives more widely. Moving forwards, methodologies for accurately measuring and reporting on outcomes – whether based on SROI calculations, evaluations such as this one, or alternative means – should continue to be prioritised as a way of demonstrating the impacts of programmes such as Reactive Response, and GDNs should continue to work collaboratively with Ofgem and government to define the parameters inside which this work is undertaken.

5.3. Scaling up resource

Finally, the demand experienced by the Reactive Response Service once the referral process was fully embedded in Cadent's operations points to the need to increase the level of funding to support fuel poor and vulnerable households with gas appliance repairs and/or replacements, as well as with energy advice and support. As touched on previously, the introduction of an eligibility criteria midway through Reactive Response resulted in some households being deemed ineligible for support. Eligibility criteria, as stipulated in VCMA rules, is essential for ensuring that public money is spent on households that are most in need of support. However, the experience of Reactive Response shows that the level of funding provided through the VCMA is insufficient to quickly support the sheer quantity of vulnerable households at risk of harm through supply isolations or disconnections.

Furthermore, it is clear that alternative funding streams that might be able to meet some of the considerable demand experienced by Reactive Response are unviable. In discussions with project delivery staff, it was discussed that some of the main alternative funding streams, especially the Energy Company Obligation (ECO), are not well placed to meet the need of households that are left without heating and hot water after being disconnected from supply by a GDN engineer. The primary reason for this is that ECO lead in times is typically too long to be an appropriate response for a household that may be at risk of immediate and significant harm following a supply isolation or disconnection. Accordingly, to best meet the significant demand that will likely be experienced by GDNs as they implement rapid repair and replacement services, mechanisms to deepen the funding envelope of the VCMA should be considered by Ofgem as a matter of priority.

6. CONCLUSIONS AND RECOMMENDATIONS

To conclude, the following sections outline implementable, evidence-based recommendations for future policy and practice, drawn from the findings of the evaluation. This section addresses in turn: a) general recommendations for energy networks, b) specific recommendations for organisations, especially energy networks but also suppliers and the wider industry, for successfully implementing rapid repair and replacement programmes, and broader programmes focused on customer vulnerability, and c) recommendations for Ofgem and the Department for Business, Energy and Industrial Strategy (BEIS) to enable and facilitate the success of schemes like Reactive Response in the future.

It should be noted that although Reactive Response (and subsequent parallel services developed by other GDNs) is premised on replacing broken or condemned gas appliances, there may be considerable value for electricity networks in replicating the programme delivery model. In the event of electricity supply interruptions, customers could be identified that have broken or unsafe electrical appliances. A list of eligible measures could include, inter alia, electric heating (e.g., storage heaters, portable plug-in radiators), white goods (dishwashers, washing machines, and fridges/freezers), or simply electrics that are unsafe to the point where they would be defined as a health hazard. Repairing or replacing these items, either with like for like replacements or upgrades (e.g., where no wet central heating system is present, and the home has storage heaters only, an air source heat pump), could have similar impacts on vulnerable customers to those outlined in this report. There may also be co-benefits to the electricity network of implementing such a programme, such as replacing energy inefficient appliances or heating with efficient alternatives, thus reducing the load on the electricity network.

Although further work would be required to set out how this might be done, the recommendations below are therefore intended to be applicable to energy networks in general, not just GDNs.

6.1. Energy networks

Recommendations for energy networks are as follows:

Recommendations for energy networks	
Identifying customer vulnerability	All employees who may encounter members of the public should be trained to identify customer vulnerability. This should not be restricted to staff entering people's homes or responding to supply interruptions, but expanded to all staff who work in the community or in customer-facing roles.
	Identifying and effectively responding to customer vulnerability should be embedded as a business priority across operations and strategic planning, and not restricted to areas of business focused specifically on customers or customer vulnerability. Ways of doing this should include, as a minimum: • Creating and continually refining a feedback loop between management and frontline staff to ensure practical challenges associated with identifying and responding to vulnerability are identified and acted upon. • Cascading examples of the positive outcomes and wider social value achieved for vulnerable customers across the organisation. • Creating a dedicated, skilled, and knowledgeable team who, through their expertise and delivery of vulnerability programmes, can drive cultural change across the organisation. • Sharing good practice, challenges, and creative ways of working across and between the energy networks, to drive the implementation of standards across the utilities sector.
Implementing a programme to support vulnerable customers	Energy networks that have not already done so should design and implement a programme to provide suitable support to customers who are identified as vulnerable through the work of frontline staff. In particular: • Gas and electricity networks should work together to identify how aspects of VCMA servicing, repair, and replacement work could be replicated across the electricity networks. This should include sharing best practice and exploring collaborative pilot projects. • Energy networks should work with BEIS and Ofgem to identify how funding streams for this work can be created and maintained, e.g., through the remainder of RIIO-ED2 and RIIO-GD2, early RIIO-ED3 and GD3 planning, or Network Innovation Allowance (NIA) funding.
	In the medium- to long-term, energy networks, along with BEIS and Ofgem, should consider working towards the devising of a cross-utility and cross-sector servicing, repair, and replacement programme. This would enable frontline staff to refer to a programme that can facilitate the servicing, repair, and replacement of gas and electricity appliances simultaneously, depending on the specific needs and circumstances of the household.

6.2. Replicating Reactive Response

Recommendations for how energy networks should replicate the success of Reactive Response in other programmes are as follows. The actions set out in the table fall on one or more of the energy network (the equivalent of Cadent in Reactive Response) delivery manager (the equivalent of NEA in Reactive Response); the subcontractor (the equivalent of PMS in Reactive Response); and all programme staff or all partner organisations (the equivalent of Cadent, NEA, and PMS together in Reactive Response).

Recommendations for replicating the success of Reactive Response in future programmes	
Customer vulnerability training	All programme staff at partners who communicate with households at different points in the customer journey should receive enhanced training on supporting vulnerable customers and understanding their specific needs and requirements. This should include staff at the subcontractor(s) and their subcontracted engineers.
	All programme staff should ensure that vulnerability training places requisite emphasis on identifying and supporting all groups defined as vulnerable by Ofgem and the NICE NG6 guidelines on cold homes. This must include groups underrepresented in Reactive Response referral data, especially those with dependent children under the age of 5, those with poor mental health, and single, young, and/or expectant parents.
	Training given to programme delivery staff across all partner organisations should be refreshed at regular intervals to ensure staff are best equipped to support vulnerable customers. On occasions where small programme changes are made that do not require full training sessions, information can be cascaded to frontline staff via team managers.
	The energy network should create feedback loops to enable engineers to provide (anonymised) feedback on vulnerability training and suggest ways in which training could be delivered more effectively to them.
Customer engagement and support	**The subcontractor** should consider creating bespoke, specialist teams to manage the cases of vulnerable customers that are passed to them by the delivery management organisation.
	The subcontractor should be supported and enabled to instruct their engineers to initiate discussions with households about which replacement appliances falling within a pre-approved cap or from a pre-approved list will be most suitable for their heating and/or cooking needs. If no appliance within the cap/on the list is judged by the subcontractor and/or the delivery team to meet their heating and/or cooking needs, a mechanism should be introduced to give the **delivery manager** discretion over approving an alternative.
	All partners organisations should work together to set out indicative but specific timeframes for the delivery of different measures that can be communicated to households on their entry to the programme. This communication should aim to give a household a realistic timeframe for the works in their home to be carried out and, if necessary, support the household with their choices and decision-making around any mitigatory steps they might wish to take in the meantime.
	The **energy network** and **delivery manager** should incorporate resource for delivering energy-related advice and support to customers, in addition to their service, repair, or replacement, as part of one streamlined customer journey. This should at minimum include resource for income maximisation, prepayment vouchers, and casework to support customers with e.g. disputes with energy suppliers, as well as broader energy efficiency advice.

Referral mechanisms and methods	The **energy network** should equip frontline engineers with a range of referral tools to refer households into the programme. These methods could include an online form (a link to which can be pinned to the home screen of engineers' mobile phones and tablets), a telephone number, and a card that can be left with the household. Importantly, these methods should be in place as early as possible in the delivery of services, but also be continually refined based on feedback from engineers and households.
Audit and quality assurance	Quality assurance and audit processes, including in what proportion of homes they are carried out and how detailed they are, should be agreed by **all partner organisations** as early as possible in the delivery of a project, with the roles, responsibilities, and communication methods clearly outlined to the greatest degree possible.
	Quality assurance and audit processes should include inspection and examination of any 'cosmetic issues' as well as core assurance of gas infrastructure work, and it may in such cases be necessary to include the household within audit processes to assist in the identification of issues that might not obviously appear to have resulted from their gas appliance repair or replacement. The scope of this should be agreed by **all partner organisations** at the beginning of programme delivery, or as soon as possible thereafter.
Eligibility criteria	In addition to complying with any eligibility criteria conferred by the funding body, the eligibility criteria devised by the **energy network** and the **delivery manager** for households should • Target support at those most at risk of physical and/or financial harm. This could include criteria on physical and/or long-term illness, mental illness, or financial vulnerability/indebtedness. • Devise a process for balancing the need for verification of ill-health and/or financial circumstances with the need for quickly resolving the issue at hand. • If allowed by the criteria of the funder, incorporate a degree of flexibility to allow the **delivery manager** to approve eligibility in cases where seeking verification may cause a considerable delay. This could include circumstances where a household has a cold-related physical illness but cannot easily produce documents to verify their eligibility due to certain circumstances or vulnerabilities (e.g., digital exclusion). Decision making processes on these cases should be collectively agreed by project delivery partners and fully documented for the purposes of audit and to ensure transparency.
	Regardless of the chosen eligibility criteria, the **energy network** and **delivery manager** must have an alternative support pathway for households that are not eligible under the scheme itself, even if this is just resource for making onward referrals to organisations that may be able to provide support.
Project management and governance	The **delivery manager** should construct a delivery team with expertise across finance, contract management, and data control, to enable the different aspects of the programme to be delivered and governed effectively. The delivery team should also include as a key member someone with knowledge and expertise on the technical aspects of network infrastructure servicing, repair and replacement, in order to liaise with the network and the subcontractors more effectively on matters relating to the physical works carried out in customer homes.
	All partner organisations should work together to design and implement a system that ensures frontline staff members, management staff, and subcontracted engineers have quick and easy access to relevant information that enables customers to be processed smoothly through the programme. This should be an integrated and secure system in place at the beginning of programme delivery that enables instantaneous transfers of referral data, along with relevant accompanying information, between all partners.

6.3. Ofgem and BEIS

Recommendations for BEIS and Ofgem are as follows:

Recommendations for BEIS and Ofgem	

VCMA governance	At the earliest opportunity, Ofgem should revise the governance protocols of the Gas Network Vulnerability and Carbon Monoxide Allowance (VCMA) to:
	• Work with GDNs to agree on a formal expansion of the definition of 'essential gas appliances' in 2.12. to include radiators, pipework, and any other 'enabling' gas infrastructures required to install a gas fuelled heating system in the home of an eligible household.
	• Consider inserting an additional clause in 2.12. to enable gas networks to carry out required 'enabling works' (e.g., rewires, asbestos works, de-infestation) where it can be shown that the household is eligible, but the repair or replacement works would not be able to safely or practicably proceed without the enabling works being undertaken. To ensure quality assurance and value for money is maintained, survey outcomes and decision-making processes for properties that require this should be maintained and made available to Ofgem for review.
	• Add a flexibility mechanism within 2.12. to enable project delivery managers to approve works for households that may technically fall outside of VCMA eligibility criteria, but who would be highly likely to be eligible but are unable to quickly produce documentary evidence of eligibility, and waiting for evidence to be produced would likely mean they come to serious harm or be at risk of death through being without heating and hot water for that period. This would prevent households that are eligible for but not claiming means-tested benefits to receive support without requiring them to wait for the outcome of a benefits application.
	• Add an additional flexibility mechanism within 2.12. to enable project delivery managers to approve works for households that may technically fall outside of VCMA eligibility criteria, but who would
	  • a) not have the capacity or capability to arrange the service, repair, or replacement themselves, even if they might be able to afford it (e.g., in cases of terminal illness or disability) and;
	  • b) are likely to come to serious harm or be at risk of death, either through the process of arranging a service, repair, or replacement themselves, or through the likelihood of them not independently arranging a service, repair, or replacement and consequently being without heating and hot water.
	To ensure this second flexibility mechanism is reserved for the most in need households, a stipulation could be set that such cases could amount to no more than a certain percentage of overall households supported through VCMA (e.g., 1%).
	Decision making processes and justifications under both flexibility mechanisms should be documented and made available to Ofgem for review.

Facilitating and supporting energy networks to deliver programmes like Reactive Response	Ofgem should deepen the funding envelope of the VCMA to respond to the need identified throughout the delivery of Reactive Response. This need is likely to become greater over the winter of 2022/23 and in subsequent winters if energy prices remain high.
	BEIS and Ofgem should work with energy networks and energy suppliers to determine how a positive, or forecasted positive, Social Return on Investment (SROI) can be embedded across a broader suite of energy efficiency, fuel poverty, and/or vulnerability focused projects, to enable the outcomes of projects to be captured and their value to wider society quantified accurately.
	BEIS and Ofgem should work with electricity networks to determine the feasibility of replicating reactive gas repair and replacement programmes such as Reactive Response, including how this could be funded and evaluated in a pilot setting.
	In the medium- to long-term, energy networks, along with BEIS and Ofgem, should consider working towards the devising of a cross-utility and cross-sector servicing, repair, and replacement programme. This would enable frontline staff to refer to a programme that can facilitate the servicing, repair, and replacement of gas and electricity appliances simultaneously, depending on the specific needs and circumstances of the household.

ANNEX A: METHODOLOGY

The findings presented in this report are based on a mixed methodology designed and implemented by NEA's evaluation team. The methodology was composed of four components, which are discussed individually in this annex.

A1: Beneficiary household questionnaires

To understand the range and extent of impacts on beneficiary households resulting from Reactive Response interventions, a structured retrospective questionnaire was used. The questionnaire featured items designed to measure the impact of each intervention, and any additional energy related advice or support delivered alongside, on; thermal comfort, physical and mental health, energy affordability, heating system control and confidence, and what they might have done to resolve their gas supply isolation or disconnection if the Reactive Response Service had not been available. The questionnaire also featured a series of items on beneficiaries' overall satisfaction with different elements of the customer journey. Households that received energy advice as well as a repair and/or replacement were distributed a slightly longer questionnaire which featured additional items on the impact of the energy and/or benefits advice they received. This was distributed to households referred into Reactive Response 1-3 months after their case open date. This was judged to be an appropriate juncture following an intervention to administer the questionnaire because it is long enough after for any impact to be experienced by the households and thus measured by the questionnaire, but not so long that beneficiary households cannot recall accurately their experience, or any difference made.

Of households referred into the Reactive Response Service, a sample was selected to receive a questionnaire. A total of 173 questionnaires were returned. To thank respondents for their participation, respondents who consented to provide personal information (i.e., name, address, and telephone number) were entered into a free prize draw to win one of three shopping vouchers. Due to the duration of delivery across multiple financial years, two separate prize draws were undertaken in financial years 21/22 and 22/23.

A2: Qualitative interviews with beneficiary households

Each questionnaire featured a section asking respondents to indicate whether they would be interested in taking part in a short semi-structured telephone interview to explore their experiences of the scheme in more detail. A total of 15 interviews were conducted with beneficiary households following this recruitment. The aim of the semi-structured interview method was to explore a few pre-selected themes with interviewees while simultaneously giving participants the freedom to discuss the parts of their intervention that they deemed the most important to them. Interviews were professionally transcribed and analysed thematically in qualitative analysis software NVivo.

In interviews, where it was deemed appropriate, consent was sought to include the stories of interviewees in this report and wider evaluation outputs as case studies. The case studies presented in this report are all real people who were supported by the Reactive Response Service. To protect their identities, their real names have been replaced with a pseudonym.

A3: Operational data analysis

The evaluation performed quantitative analysis on operational data provided by NEA's project delivery staff. Specifically, this included socio-economic data on household income, health-based vulnerabilities per household, household composition, and the Priority Group status of each household. This enabled an analysis of the socio-economic and vulnerability related characteristics of each household referred into the Reactive Response Service, which is presented in Section 2.

In addition, the evaluation performed analysis on data recording the outcomes for Reactive Response beneficiaries, specifically on the type of intervention undertaken in their home (e.g., pipework repair, boiler replacement, call out only) and the financial value of the intervention. This data was merged with household questionnaire data to understand how the range and type of impacts achieved by the Service differed depending on the specific intervention they received.

Finally, the evaluation performed spatial analysis on the postcode data of households referred into the Reactive Response Service. This enabled an understanding of the extent to which the Reactive Response Service reached areas of high fuel poverty and deprivation, as presented in Section 2.

A4: Project delivery team research

Four semi-structured focus groups were undertaken with members of the project delivery team at the conclusion of the Cadent Foundation funded period of Reactive Response. The attendees of each focus group were as follows:

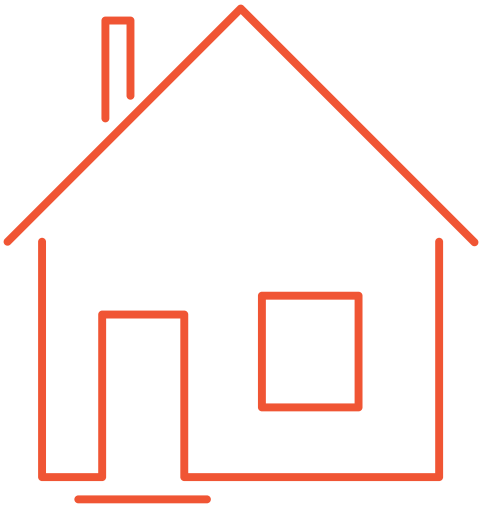
- Cadent project delivery staff
- PMS project delivery staff
- NEA project delivery staff (management)
- NEA project delivery staff (client liaison)

In addition, one interview was undertaken with a member of NEA's project delivery staff.

Further to the bespoke research activities noted above, the evaluation team attended biweekly project meetings to ensure that the evaluation remained cognisant of any operational issues or challenges as they arose. On three occasions, the evaluation team held rapid, semi-structured focus groups with the entire delivery team to gather feedback and insight on matters relating to the delivery of the programme. This allowed the evaluation team to understand project successes, challenges, and development on a continual basis. On several occasions, the evaluation team presented interim findings to the project delivery team, and incorporated feedback and discussions on findings into the design of other parts of the evaluation research.

Broadly, the intention of research with the project delivery team was to gather information on the factors shaping the success of the Reactive Response Service, as well as to identify and discuss any challenges or issues that the project had encountered during delivery.

Reactive Response Evaluation



Action for Warm Homes

National Energy Action
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