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Self-isolation confidence, adherence and challenges:

Behavioural insights from contacts of cases of COVID-19 starting and completing self-isolation in Wales

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Contents

1. Executive Summary

1.1 Rationale

Self-isolation by contacts of a confirmed case of COVID-19[1] is a key intervention to stop transmission.

Surveys have found that adherence to self-isolation guidance in the UK is around 15-25%[1,2], with lower adherence amongst men[3] and older adults[4]. Adherence to self-isolation is associated with a range of factors, including feeling confident to self-isolate, understanding government guidance and having the support of family, friends and employers to self-isolate[1,2,5]. Understanding the barriers and enablers of self-isolation amongst contacts and the differences experienced across population groups is also important to help inform the content of public health messaging and to direct support.

However, evidence on factors which influence self-isolation amongst contacts of COVID-19 in Wales is limited. Data tends to be retrospective, based on self-reported status as a contact both introducing recall and response biases. Whilst there have been a number of UK-wide studies the number of Welsh participants is too small to draw meaningful conclusions for the Welsh population, and the studies do not always reflect different policy approaches across the UK. It is essential that Welsh evidence informs Welsh action.

This report shares evidence about confidence to self-isolate and the challenges of self-isolation among contacts of COVID-19 in Wales, and makes recommendations for public health communication and interventions to support self-isolation adherence. This insight provides vital information to help inform communications, policy and supportive interventions which can be targeted towards the groups at highest risk of non-adherence and address the challenges people face whilst self-isolating. Action to support adherence to self-isolation will be more important during the next phase of the pandemic when vaccine coverage increases and lockdown measures ease as it may become increasingly difficult to encourage citizens to continue to self-isolate.

1 (Severe Acute Respiratory Syndrome, Coronavirus 2 (SARS-COV-2))

1.2 Methodological overview

Public Health Wales' Research and Evaluation Division are leading two studies to provide rapid real time insights into the underlying drivers of individual behaviour, considering the capability, opportunity and motivation amongst contacts asked to self-isolate, and differences between groups.

This short report highlights the key findings from both studies from November 2020 to January 2021, addressing the perceived and actual barriers and enablers of self-isolation:

- **ACTS (Adherence Confidence Text Survey)** – a text message survey amongst contacts, delivered immediately after notification of the need to self-isolate (from 15th November 2020 to 9th January 2021, total 13,531 responses).
- **CABINS (Contact Adherence Self-isolation Behavioural Insights Survey)** – an in-depth telephone survey amongst a representative sample of contacts who have completed self-isolation (from 12th September 2020 to 22nd October 2020, total 18,568 contacts).

Both studies are continuing, and figures from the ACTS study are available at a national level on the Public Health Wales' website.

1.3 Key Messages

1.3.1 Insights from contacts starting a period of self-isolation

Between 15th November 2020 and 9th January 2021, 42,763 text messages were sent to contacts in the ACTS study. This represents a fifth (20.0%) of all contacts in-touch with Test, Trace, Protect (TTP) over this period. Of those, 13,531 provided feedback on their confidence to self-isolate (response rate = 31.6%) and 3,679 completed the Behavioural Insights Survey (response rate = 27.2%).

A higher proportion of those who responded were women, of older age, white ethnicity and living in less deprived areas. This means that the sample is not representative of all contacts in Wales and as such the results may not be reflective of the experiences of all those who isolated during this period. Section 2 outlines the ACTS study methodology and full results can be found in sections 3.1 to 3.4.

Confidence in knowledge to self-isolate

- **Over 90% of contacts reported they were confident they understood what was required of them during their self-isolation period.** This figure is consistent over the 8-week period.
- Women and contacts over 50 years old are significantly more likely to feel confident to self-isolate.

Challenges to self-isolation

- Despite high levels of confidence, **1 in 5 felt self-isolation will be a challenge (18.5%)**.
- And there were important difference between social groups as to the challenges they thought they would face:
  - » For men and those aged 40 to 49 years, the top concern was the impact on work and business.
  - » For women and young people aged 18-29, the top concern was anxiety or mental health problems.
  - » For those from Black, Asian and Minority Ethnic (BAME) groups and those aged 30-49 the top concern was looking after children.
  - » For adults aged 60 or over, the top concern was suffering from an underlying health condition or disability.
  - » Contacts living alone and those who think COVID-19 poses a greater risk to them are more likely to say that self-isolation will be a challenge.
- Contacts who take steps to plan for self-isolation and have people who can support them through self-isolation are less likely to say that self-isolation will be a challenge.

The top 5 challenges contacts thought they would face during self-isolation were:

1. **Suffering from anxiety or mental health problems (11.7%),**
2. **looking after children (11.2%),**
3. **being concerned about the impact isolation will have on work or business (9.5%),**
4. **experiencing financial problems (9.3%),**
5. **caring for vulnerable people who cannot stay with friends or family (8.2%).**

Reflections on planning for self-isolation

- 68.5% of people had pre-planned for a potential period of self-isolation, and planning tended to increase over the 8 week period from 56.6% in Week 1 to 67.1% in Week 8.
- Amongst contacts entering a period of self-isolation, reported levels of preparing for self-isolation were greater in the older age groups.

Support for self-isolation

- 89.3% reported they had support from others available to them as they entered their period of self-isolation. Support has remained relatively constant through the 8 week period with a minimum of 84.9% to a maximum of 88.1%.
- Amongst contacts entering a period of self-isolation, reported levels of having support from friends and family increased with age.

1.3.2. Reflections after completing a period of self-isolation

For the CABINS study, contacts who were in-touch with TTP between 12th September and 22nd October, 2020 were surveyed. These dates were of interest as the schools and Higher Education establishments were returning for a new term and the end of this period was the start of the Firebreak in Wales. Sampling for interviews was based on age, gender and Welsh Index of Multiple Deprivation (WIMD). Of the 18,568 individuals eligible to be included, 5,092 were approached to take part in a 15-minute telephone interview and 1,011 agreed to take part (response rate = 19.8%). Section 2 outlines the CABINS study methodology and full results can be found in sections 3.5 and 3.6.

Adherence to self-isolation guidance was high, with **78% of contacts in the sample saying they did not leave home during self-isolation;** 8.2% left their home once, and 4.1% said they left every day.

Planning for self-isolation

- Amongst those who had recently completed a self-isolation period, women and those who lived alone or in rural areas were more likely to say they had planned for self-isolation.

Support for self-isolation

- Amongst those who had recently completed a self-isolation period, women were more likely to say they had support and people living alone were less likely to have support.

Adherence to self-isolation

- Contacts who had higher levels of **confidence** in their ability to self-isolate and had people who could **support** them during self-isolation were significantly more likely to adhere to self-isolation.

The top 3 reasons why contacts left their home during self-isolation were:

- **Exercising,**
- **getting a COVID-19 test,**
- **shopping for essentials (including groceries)**

- Contacts in **less deprived areas** were more likely to say that they had left home for exercise.
- Contacts with high levels of **income precarity** were significantly more likely to say they left home to collect food and medications.

Challenges experienced during self-isolation

- Overall, the 5 most commonly reported challenges experienced by contacts during self-isolation were: **Wanting to see family (66.7%)**, **wanting to see friends (60.6%)**, a **lack of exercise (58.6%)**, **loneliness (31.2%)**, and **mental health difficulties (24.6%).**
- But, there were important differences between social groups:
  - **Women** were more likely to report that **wanting to see family**, **being lonely**, **mental health difficulties** and **caring responsibilities for vulnerable adults outside the home** were a challenge during self-isolation.
  - Contacts who **lived alone** were more likely to report that **loneliness** was a challenge during self-isolation.
  - Individuals with high levels of income precarity were also experiencing considerable financial, employment and mental health challenges to self-isolation. Contacts with high levels of **income precarity** were more likely to report **financial concerns**, **mental health difficulties**, **work not supporting self-isolation** and having **no access to food** or **medication** during self-isolation.

1.4 Key considerations for future action

The two innovative studies reported here are the first systematic approach to collating in depth insights from contacts of COVID-19 in Wales. The findings provide valuable and timely insight into the factors supporting individuals to self-isolate and challenges to adherence - many of which reflect underlying inequalities in population health and society. The findings are directly relevant to the national action and presented below as key areas for future action to support adherence to self-isolation amongst contacts of COVID-19 in Wales, and minimise the harms of self-isolation on specific population groups.

1.4.1 Reinforcing national communications that Keep Wales Safe

- Confidence to self-isolate and adherence to self-isolation among contacts in Wales is high. Maintaining this high level of confidence is important because those who were more confident in their ability to self-isolate were more likely to adhere to self-isolation. Careful and clear communication of the high levels of confidence and adherence in Wales could reinforce existing messaging to Keep Wales Safe and promote a social norm that reinforces this positive pro-social behaviour. Doing this is particularly important during vaccine roll-out when the need for continued self-isolation will likely become more challenging for people to understand and support.
- Contacts who had not planned for self-isolation and were not able to access support were more concerned that self-isolation would be a challenge. Messages should be developed that emphasise the importance of being prepared for self-isolation. These could encourage people to take time to identify people and services that can provide local support if they are identified as a contact in future.

1.4.2 Developing and targeting support for those experiencing challenges whilst self-isolating

Provide mental wellbeing and social support

- Across both studies concerns about the impact on mental health, lack of social support, and experienced loneliness and mental health difficulties were evident.
- When initially contacted by TTP, contact tracers should take the opportunity to signpost all contacts to sources of mental wellbeing support. This offer should include online and telephone support, recognising that not all contacts may have access to the internet.
- Alongside this, identifying sources of support to specifically address loneliness in women, young people, those from BAME backgrounds and contacts living alone who experienced this challenge during self-isolation should be prioritised during initial calls. Mapping local resources and sources of support from, for example, voluntary and community organisations offering peer support through daily phone calls to those living alone, would create a valuable asset for contact tracers to use to identity and direct support.

Increase financial support and access to food and medications for those with precarious incomes

- People who had high income precarity were experiencing considerable financial challenges to self-isolation, a lack of employer support, and were the only group to significantly experience a greater likelihood of not being able to access food or medication.
- People with precarious incomes should be identified at first contact with TTP and directed to both financial support and practical support to enable the delivery of food and medications. The use of income precarity questions as a screening tool to direct financial and practical support may minimise the potential health and economic harms of self-isolation.

Direct contacts to exercise at home and dog walking services

- Amongst those who reported leaving their home during self-isolation, over 40% stated this was for exercise, and 10% for dog walking. Specifically, people from the least deprived areas were more likely to leave home for exercise and to walk the dog than those in more deprived areas.
- There may be some confusion in the messaging as exercise is allowed during periods of wider lockdown, acknowledging the beneficial impact on mental wellbeing. But contacts of COVID-19 are not permitted to leave home to exercise. Reinforcing this message, and supporting people – especially those living in the least deprived areas – to access alterative home-based forms of exercise may increase adherence to self-isolation guidance.
- Contact tracers should take the opportunity during initial conversations to ask if contacts have a pet and, if so, reinforce the message that dog walking is not a permitted reason for leaving home.

Enhance social care provision at home for older adults and those living alone

- Older adults and those living alone were more likely to say that physical health difficulties were a challenge and those aged 40-59 were more likely to say that caring for vulnerable adults outside their home would be a challenge during their self-isolation period.
- Close working between social care services and NHS Wales TTP teams would enable early identification of individuals with care needs or responsibilities during initial conversations with contact tracers. Integrated working is vital to ensure that older adults and those living alone and their family members are directed to an available and appropriate support offer during initial conversations with a contact tracer.

Population group most likely to need support [1]	Proposed Intervention			
	1. Provide targeted mental wellbeing and social support	2. Increase financial support and access to food and medication	4. Exercise at home options and dog-walking services	5. Enhance social care provision at home
Women	✔			
BAME groups	✔			
Younger people (aged 18-29 years)	✔			
Older adults (70 and over)				✔
People living alone	✔			✔
People with high income precarity	✔	✔		
People living in the most deprived areas		✔		
People living in the least deprived areas			✔	

Note: (1) Identified through the integration of findings from both ACTS and CABINS. Representativeness of both studies should be considered and is explained in Appendix 2.

2. Approach

Public Health Wales' Research & Evaluation Division are leading a behavioural insights programme exploring the experiences of contacts of cases of COVID-19. The programme includes two projects:

ACTS – a real-time daily text message survey of contacts at the start of their period of self-isolation.

ACTS (Adherence Confidence Text Survey) sends up to four text messages to contacts aged over 18 years old up to two days after they have been successfully reached by a contact tracer and told to self-isolate. Data is extracted from the NHS Wales TTP database which means that all participants are confirmed contacts of a positive case of COVID-19. The first text participants receive is a bilingual opt-in which invites them to select their preferred language, followed by three more texts in their chosen language asking them about their confidence to self-isolate and experiences of the contact tracing service. A final text message invites contacts to take part in a short bilingual online behavioural insights survey that takes approximately two minutes to complete. Participants only received the next text message if they responded to the previous one. Socio-demographic information about age, gender, ethnicity, and living alone is collected. This enables analysis by different population groups.

In this report we include data from the first 8 weeks of the ACTS study between **15 November 2020 and 9 January 2021**. During this time 42,763 contacts were sent an initial text and 13,531 responded providing information about their confidence to self-isolate (response rate: 31.6%) and 3,679 went on to complete the online survey (response rate: 27.2%).

CABINS – a telephone survey with contacts who have completed a period of self-isolation.

CABINS (Contact Adherence Self-isolation Behavioural Insights Study) is a mixed-methods study that includes two waves of a telephone survey followed by focus groups with contacts aged 18 years or older who have been successfully reached by TTP and told to self-isolate. The telephone survey included questions on whether people adhered to self-isolation guidance, the challenges they faced during their period of self-isolation, and – if they left home – the reasons for doing so. We also gathered socio-demographic information including age, gender, ethnicity, living alone, deprivation, income precarity, and rurality to examine responses between different population groups.

In this report we include data from the first wave of the CABINS telephone survey with contacts who were asked to self-isolate for up to 14 days between **12 September and 22 October 2020** (the day before the start of the 17-day Welsh 'firebreak'). During this time, 18,568 contacts were eligible to take part. Quota sampling based on age, gender and Welsh Index of Multiple Deprivation (WIMD) quintile was used and data then weighted so that the final sample was representative of all eligible contacts over this period. Between 12 November 2020 and 1 December 2020, 5,092 contacts were telephoned to achieve a sample of 1,011 (response rate: 19.9%).

Full details of the ACTS and CABINS study designs and statistical analysis used in this report in the **Appendix 2**.

3. Results

3.1 Confidence to self-isolate

Over the 8 week period from 15th November 2020 to 9th January 2021, 13,531 contacts entering a period of self-isolation engaged in the ACTS study. Overall, 9 in 10 contacts (92.2%) were 'very confident' or 'confident' they knew what to do after talking to a contact tracer.

Confidence was above 93% in the first three weeks of the study period, decreased in Week 4 to its lowest level of 89%, and has increased since to 94% in Week 7 and Week 8 (Figure 1). The drop in confidence level in Week 4 was significantly lower compared to baseline week (Adjusted Odds Ratio [aOR] 0.59, 95% Confidence Interval [CI] 0.44-0.77) and Week 5 (aOR 0.65 (95% CI 0.49-0.87)).

Confidence was slightly higher among **women** compared to men (92.9% vs 91.4%, p=0.002) and **older age groups**. There was a gradient of increasing confidence across age groups ranging from 91.1% in 18-29 year olds to 94.3% in contacts aged 70 and over (p=0.005). There was no significant difference in confidence by deprivation or ethnicity.

After adjusting for age, gender, deprivation and reporting week, **women were 1.3 times more likely than men to report confidence to self-isolate after talking to a contact tracer** (aOR 1.26 (95% CI 1.10-1.45)). Confidence was higher among older adults (50-59 years (aOR 1.35 95% CI 1.10-1.65; 60-69 years (aOR 1.45 (95% CI 1.13-1.86)), 70 years or older (aOR 1.53 (95% CI 1.04-2.26)) compared to contacts aged 18-29 years. In a separate model including the sub-set of contacts with ethnicity data recorded (n=5,715), ethnicity was not significantly associated with confidence after adjusting for age, gender, deprivation and reporting week.

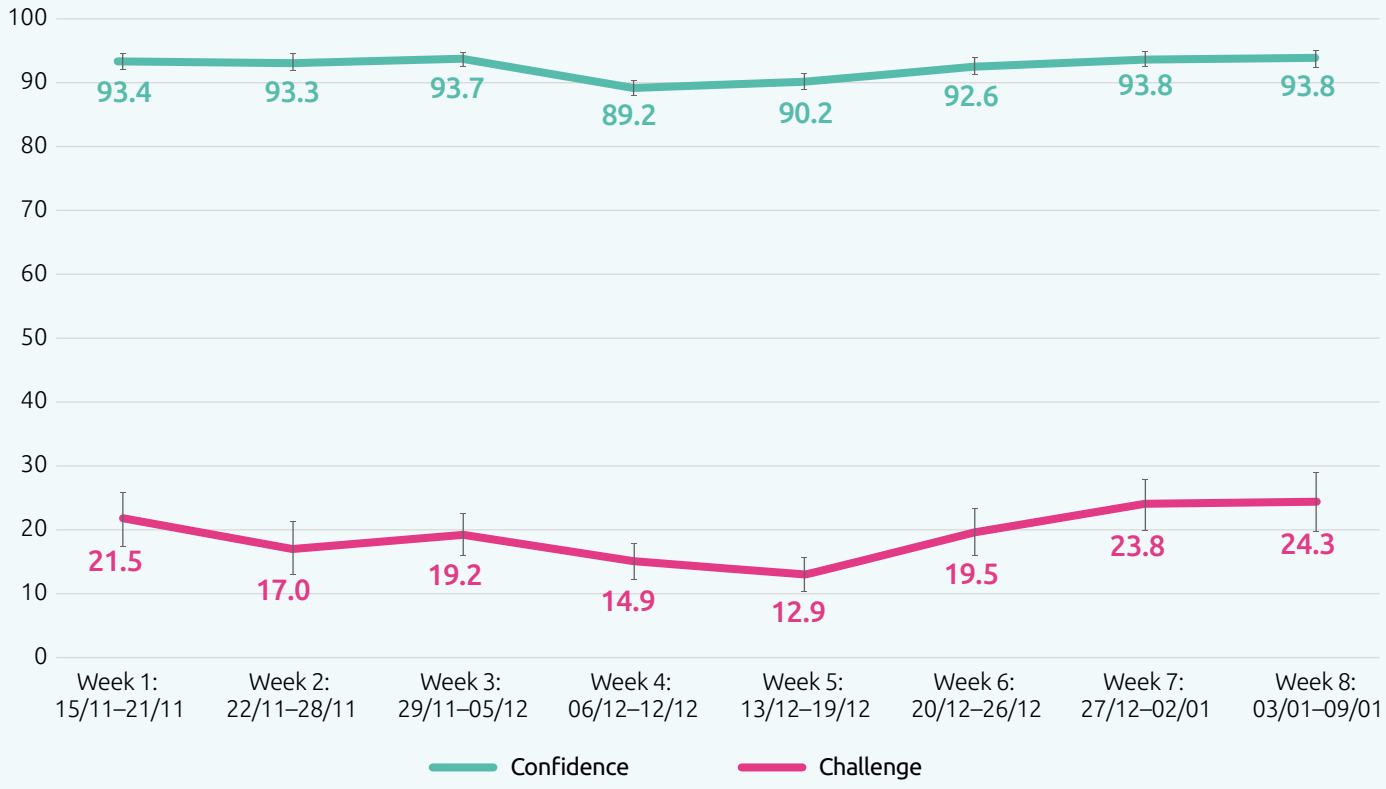
3.2. Challenges to self-isolation

Whilst confidence is high, 1 in 5 contacts who responded to ACTS thought it would be a challenge not to leave their home during self-isolation (18.5%).

The percentage of contacts who thought self-isolation would be a challenge decreased from 21.5% in Week 1 of the survey in early-November 2020 to reach a low of 12.9% in Week 5 in mid-December 2020 and increased to 24.3% at the start of January, 2021 (Figure 1).

The proportion who thought self-isolation would be a challenge was higher amongst those living alone (31.4% vs. 17.7%, p<0.001) (see Appendix 1: Table 1). A higher proportion of contacts aged over 70, and those from a Black, Asian and Minority Ethic (BAME) groups also thought self-isolation would be more challenging, but these differences were not significant (Appendix 1: Data Table 1).

Figure 1: ACTS – Percentage of surveyed contacts who say they are confident to self-isolate [(1)] and perceived that self-isolation will be a challenge [(2)] at the start of a period of self-isolation between 15th November 2020 and 9th January 2021 (All Wales)
(Confidence: 13,531 respondents; Challenge: 3,679 respondents)



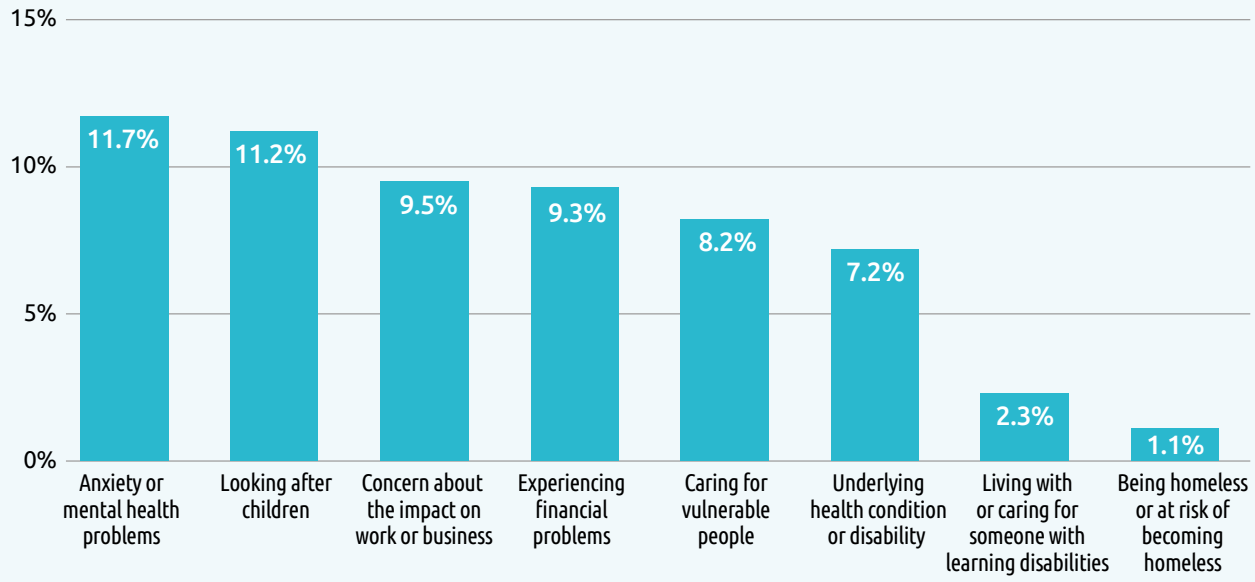
Notes: (1) Percentage responding 'very confident' and 'fairly confident' to the question 'How confident are you that you know what you need to do now?' with 95% Confidence Interval (CI); (2) Percentage responding 5 or more to the statement 'It will be a challenge to not leave my home during my self-isolation period' on a 7 point scale ranging from 1 'not at all' to 7 'very much so' with 95% CI.

3.2.1 Factors contributing to perceived challenge to self-isolate

Data from 27.2% (3,679/13,531) contacts in the ACTS study who completed the online behavioural insights questionnaire showed that as people entered self-isolation, the top five concerns expressed were:

1. Suffering from anxiety or mental health problems (11.7%)
2. Looking after children (11.2%)
3. Concern about the impact of isolation on work or business (9.5%)
4. Experiencing financial problems (9.3%)
5. Caring for vulnerable people (8.2%) (Figure 2, see Appendix 1: Table 2).

Figure 2: ACTS – Perceived challenges when entering self-isolation (3,679 respondents)



Men were most concerned about the impact isolation could have on work or business (13.0%). Women were more worried that anxiety or mental health problems would be the main barrier to self-isolation (13.1%) (Figure 2, Table 1).

Amongst BAME groups looking after children was the main perceived barrier to self-isolation (21.6%) (Figure 3, Table 1).

The most commonly reported perceived challenge to adhering with the self-isolation period varied across the age groups. Amongst the youngest (18-29 years) age group suffering from anxiety or mental health problems was the most commonly reported challenge (23.4%). Amongst the middle age groups, looking after children was the most common challenge (31.4% in 30-39 year olds, 19.9% in 40-49 year olds). Concern about the impact isolation would have on work or business was the main barrier in contacts aged 40-49 years (12.1%). Suffering from an underlying health condition or disability was the main barrier to self-isolation in contacts aged 60 and over (9.1% in 60-69 year olds, 15.4% in contacts aged 70 and older) (Figure 2, Table 1).

Table 1: ACTS - Population groups significantly* more likely to express specific challenges at the start of self-isolation (3,679 respondents) (Full data in Appendix 1, Data Table 2).

Challenge	Gender	Ethnicity	Age	Household
Suffering from anxiety or mental health problems	Women	-	18-29 year olds	-
Looking after children		BAME	30-39 year olds	Living with others
Being concerned about the impact isolation will have on my work or business	Men	BAME	40-49 year olds	-
Experiencing financial problems	Men	BAME	30-39 year olds	-
Caring for vulnerable people who cannot stay with friends or family	Women	-	40-49 year olds	-
Suffering from an underlying health condition or disability	Men	-	70 year olds and older	Living alone
Living or caring for someone with learning disabilities	-	BAME	-	-
Being homeless or at risk of becoming homeless	Men	BAME	-	-

Note: - Dash represents no statistically significant difference between groups. * Significant differences determined by Chi-square test.

After adjusting for socio-demographic characteristics, psychological variables and reporting week, people living alone were 1.9 times more likely to report that self-isolation would be a challenge (aOR 1.87 (95% CI 1.37-2.54)).

People living alone were 1.9 times more likely to report that self-isolation would be a challenge.

Contacts who thought the risk of COVID-19 to them was high were more likely to think self-isolation would be a challenge (aOR 1.17 (95% CI 1.12 – 1.22)). Whereas, contacts who said they planned for self-isolation or had support to self-isolate were less likely to say that self-isolation would be a challenge (Planning (aOR 0.92 (95% CI 0.88-0.96)); Support: aOR 0.87 (95% CI 0.82-0.92)).

3.3 Planning for self-isolation

The ACTS study collected views as people started a period of self-isolation, and showed that 6 in 10 contacts had planned for a period of self-isolation (60.9%). From November 2020 to January 2021 the proportion reporting planning for self-isolation increased (from 56.6% to 67.1% consecutively (Figure 3)). Planning for self-isolation increased with age from 42.6% of 18-29 year olds to 77.8% of contacts aged 70 or older ($p<0.001$). There were no differences in planning for self-isolation by gender, ethnicity or living alone (Appendix 1: Data Table 1).

Planning for self-isolation increased, from 56.6% in early-November 2020 to 67.1% in early-January 2021.

Insights from CABINS amongst 1,011 contacts who completed a period of self-isolation supported these findings, with almost 7 in 10 contacts saying they had planned for their self-isolation (68.5%). **Women** were more likely than men to have planned for self-isolation (74.1% vs. 62.1%, p=0.001) and contacts who **lived alone** were more likely to have planned for their self-isolation, compared to those who lived with other adults (76.7% vs. 66.3%, p=0.004). Planning for self-isolation was higher in rural compared to urban areas (76.8% vs. 66.2%, p=0.013) (Appendix 1: Data Table 3).

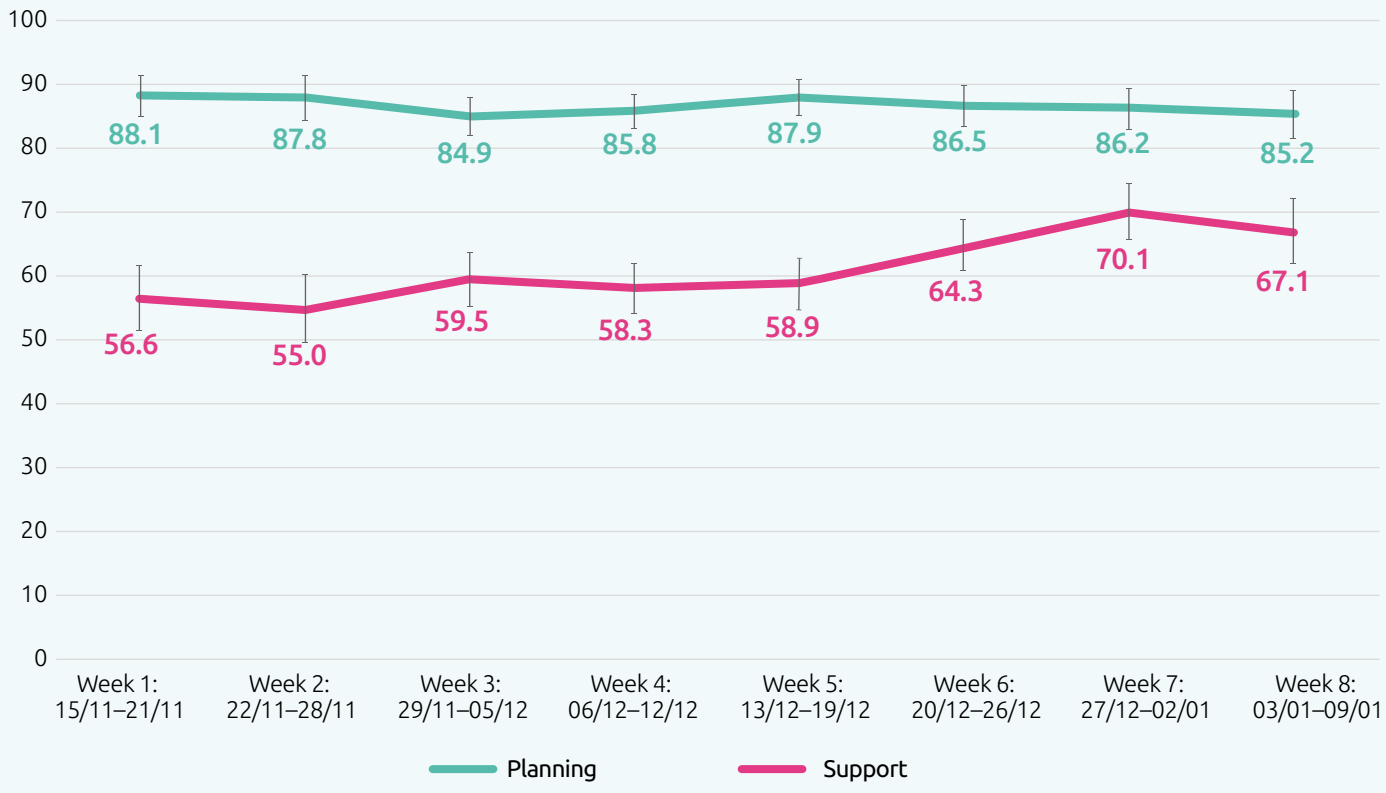
Women were more likely to have planned for, and have access to support, during self-isolation.

3.4 Support for self-isolation

ACTS data from 3,679 contacts entering a period of self-isolation showed that almost 9 in 10 contacts had informal support to self-isolate from friends or family (86.2%). Support to self-isolate has remained constant at ≥85% since early-November 2020 (Figure 3). Having support to self-isolate from friends and family increased with **age** from 83.1% of 18-29 year olds to 90.6% of contacts aged 70 or older (p=0.007). Contacts who **lived alone** (81.6% vs. 86.8%, p=0.022) and those from **BAME backgrounds** (77.8% vs. 86.7%, p=0.040) were less likely to think they would have support compared to contacts who lived with others or were from white backgrounds, respectively. There was no differences in support by gender (Appendix 1: Data Table 1).

Insights from CABINS (amongst 1,011 contacts who completed a period of self-isolation) **confirmed that support to self-isolate was high, with 9 in 10 contacts saying that they had support to self-isolate** (89.3%). **Women** were significantly more likely to have support during their self-isolation than men (92.5% vs. 85.8%, p=0.001). Contacts who **lived alone** were significantly less likely to have support during self-isolation than those who lived with others (79.8% vs. 91.7%, p<0.001) (Appendix 1: Data Table 3).

Figure 3: ACTS – Percentage of contacts who say they have planned for self-isolation [(1)] and have access to support during self-isolation [(2)] at the start of a period of self-isolation between 15th November 2020 and 9th January 2021 (All Wales) (3,679 respondents)



Notes: (1) Percentage responding 5 or more to the statement 'I had already made plans so that I was prepared for self-isolation, before being contacted by a contact tracer (e.g. having enough food/ medicine, collecting telephone numbers)' on a 7 point scale ranging from 1 'not at all' to 7 'very much so' with 95% Confidence Interval (CI); (2) Percentage responding 5 or more to the statement 'I had people who supported me during my self-isolation period' on a 7 point scale ranging from 1 'not at all' to 7 'very much so' with 95% CI.

3.5 Adherence to self-isolation guidance

Insights from CABINS, amongst 1,011 contacts who had completed a period of self-isolation, showed that 77.8% of contacts said that they did not leave their house during self-isolation (95% CI 75.2%-80.4%); 8.2% left their home once (95% CI 6.5%-9.9%), and 4.1% said they left every day (95% CI 2.9%-5.3%).

Adherence was lowest in the most deprived areas (70.9%) but also low in the least deprived two quintiles (74.6% and 76.2%, respectively); adherence was highest in the second and third highest deprivation quintiles (82.6% and 84.2%, respectively) (Table 2). Those who lived with others were more likely to adhere to self-isolation guidance over those who lived alone (79.3% vs. 71.4%, p=0.016). There were no differences in adherence between age, gender, ethnicity, income precarity, rurality, key worker status, having symptoms in the household, or receiving a letter to shield in the household (Table 2).

After adjusting for age, gender and deprivation, contacts who had higher **confidence** in their abilities to self-isolate were 1.3 times more likely to adhere to self-isolation (aOR 1.28 (1.10-1.49)). Contacts who reported high levels of **support** for self-isolation were 1.2 times more likely to adhere to self-isolate (aOR 1.16 (1.05-1.27)).

Age, gender, and deprivation were not independently associated with adherence. High levels of planning for self-isolation, risk perception, belief that self-isolation was effective in reducing the spread of COVID-19, and understanding why self-isolation was necessary were not associated with adherence (Appendix 1: Data Table 4).

Table 2: **CABINS – Self-reported adherence to self-isolation by socio-demographic characteristics (1,011 respondents)**

	Self-reported adherence to self-isolation		
	%	n	Sig.[1]
Gender			
Men	75.4	356	0.087
Women	79.9	426	
Ethnicity			
White	78.0	753	0.271
BAME	70.7	29	
Age			
18-29	75.8	244	0.835
30-39	80.4	144	
40-49	79.1	129	
50-59	76.5	150	
60-69	80.0	72	
70 and over	77.2	44	
Lives Alone			
Yes	71.4	145	**0.016**
No	79.3	641	
Children in household			
Yes	82.1	243	**0.036**
No	76.1	544	
Household member developed symptoms			
Yes	76.4	275	0.441
No	78.5	511	
Household member received shielding letter			
Yes	75.9	129	0.532
No	78.1	648	
Key Worker			
Yes	79.3	469	0.271
No	75.7	230	
Level of Income Precarity			
Very high/High	73.5	216	0.112
Moderate	80.2	276	
Low	78.6	180	
WIMD Quintile [2]			
1 – Most deprived	70.9	158	**0.004**
2	82.6	190	
3	84.2	165	
4	74.6	132	
5 – Least deprived	76.2	141	
Rurality			
Urban	80.1	121	0.726
Rural	78.8	428	

Note: (1) Chi-square test. (2) Welsh Index of Multiple Deprivation.

3.5.1 Reasons for non-adherence to self-isolation

For individuals who reported they did not adhere to self-isolation guidance (n=225), **exercise** was the highest reported reason for this non-adherence (42.3%), followed by **getting a COVID-19 test** (17.0%) and **shopping for essentials/ groceries** (16.6%) (Figure 4, Appendix 1: Data Table 5).

It was people living in less deprived areas and older adults who were more likely to leave their home for exercise (Table 3, Appendix 1: Data Table 5). After adjusting for gender, age, deprivation, income precarity and living alone, people aged 60-69 were 4 times more likely to say that they left home for exercise (aOR 3.99 (95% CI 1.20-13.30). People living in less deprived areas were 5 times more likely to say they left home for exercise than those in the most deprived areas (quintile 4: aOR 4.73 (95% CI 1.73-12.99) (Table 3).

Contacts who lived alone were more likely to leave home because they had caring responsibilities for a vulnerable adult who did not live with them (p<0.001).

Contacts with high or very high levels of **income precarity** were more likely to report that they left home during self-isolation to **shop for groceries** (p=0.017) or **collect medication** (p=0.012). Almost a quarter (24.4%) of contacts with high income precarity reported leaving home to shop for food, compared to 8.2% of people with low income precarity (Appendix 1: Data Table 5).

Urban residents were significantly more likely to report shopping for essentials than their rural counterparts (p=0.028) (Table 3, Appendix 1: Data Table 5).

Figure 4: CABINS – Reasons for non-adherence to self-isolation (225 respondents)

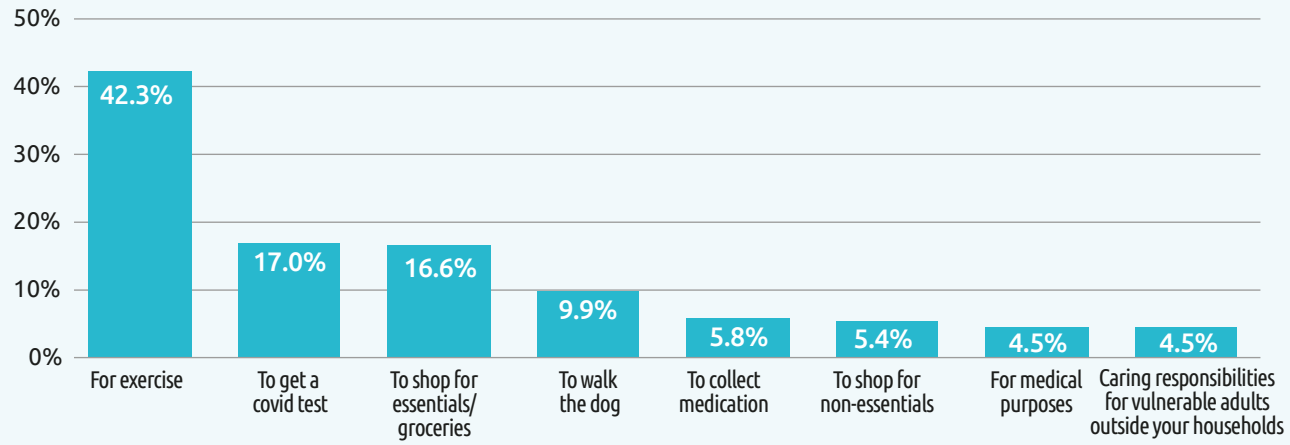


Table 3: CABINS - Population groups significantly more likely to report a specific reason for non-adherence to self-isolation (225 respondents)

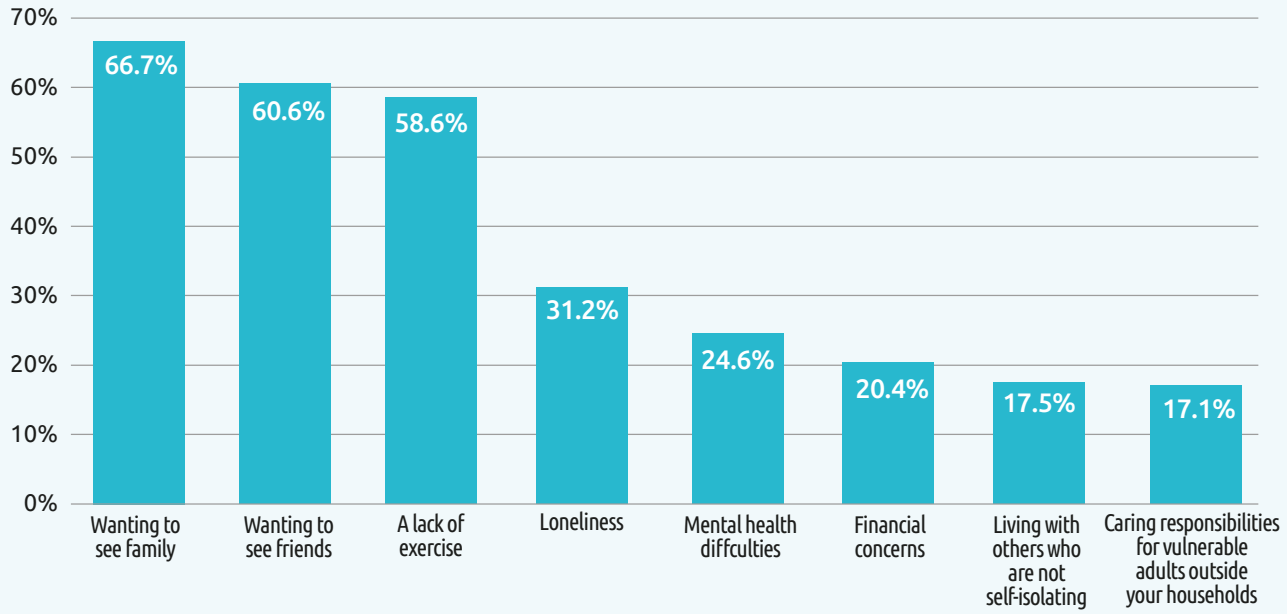
Reasons	Gender	Ethnicity	Age	Household	Deprivation	Level of income Precarity	Geographical areas
For exercise	-	-	**60 years old and older**	Lives with others	**Less deprived**	Moderate	-
To get a COVID-19 test	-	-	-	-	-	-	-
To shop for essentials/ groceries	-	-	-	-	-	High / Very High	Urban
To walk the dog	-	-	-	-	-	-	-
To collect medication	-	-	-	-	-	High / Very High	-
To shop for non-essentials	-	BAME	-	-	-	-	-
For medical purposes	-	-	-	-	-	-	-
Caring responsibilities for vulnerable adults outside your household	-	-	-	**Lives alone**	-	-	-

Note: - Dash represents no statistically significant difference between groups. **Bold** text indicates associations are significant after adjusting for age, gender, deprivation, income precarity and living alone. No significant differences between groups for: 'loneliness', 'mental health difficulties', 'childcare commitments', 'for work', 'to get fresh air/smoke'.

3.6 Challenges experienced by contacts during self-isolation

The **main challenges** experienced by contacts during self-isolation was **wanting to see family** (n=1,011, 66.7%), followed by **wanting to see friends** (60.6%), **lack of exercise** (58.6%), **loneliness** (31.2%), and **mental health difficulties** (24.6%) (Figure 5, Appendix 1: Data Table 6).

Figure 5: CABINS – Challenges experienced during self-isolation (1,011 respondents)



Younger people aged 18-29 experienced the greatest challenge in wanting to see friends (p<0.001), a lack of exercise (p<0.001), loneliness (p=0.004), and mental health difficulties (p=0.001). Financial concerns were highest among contacts aged 30-39 (p<0.001) (Table 4, Appendix 1: Data Table 6).

Women were significantly more likely to report that wanting to see family (70.9% vs. 62.3%, p=0.004), being lonely (35.1% vs. 26.8%, p=0.004), mental health difficulties (30% vs. 18.5%, p<0.001) and caring responsibilities for vulnerable adults outside the home (60.5% vs. 39.5%, p=0.032) were a challenge during self-isolation, compared to men (Table 4, Appendix 1: Data Table 6).

Contacts who **lived alone** were significantly more likely to report that loneliness (45.1% vs. 27.7%, p<0.001) and physical health difficulties (15.2% vs. 8.0%, p=0.002) were challenges during self-isolation compared to those who lived with others (Table 4, Appendix 1: Data Table 6).

Contacts with very high or high levels of **income precarity** were significantly more likely to report financial concerns (36.3%, p<0.001), mental health difficulties (36.3%, p<0.001), that work had not supported self-isolation (13.9%, p=0.006), and having no access to food (13.2%, p=0.002) or medication (7.8%, p=0.034) were challenges during self-isolation. Financial concerns during self-isolation were also higher in contacts living in the most deprived areas (23.0% vs. 15.7%, p=0.024) (Table 4, Appendix 1: Data Table 6).

After adjusting for age, gender, deprivation, income precarity, and living alone:

- **Women** were 1.8 times more likely than men to have experience mental health difficulties during self-isolation (aOR 1.75 (95% CI 1.25-2.46)) and 1.6 times more likely to say that seeing family was a challenge (aOR 1.56 (95% CI 1.16-2.10));
- **BAME groups** were 2.1 times more likely than people from White ethnic backgrounds to say that they had experienced loneliness (aOR 2.05 (95% CI 1.02-4.13));
- **Young people aged 18-29 years old** were 2.6 times more likely than older adults aged 70 or older to say they had experienced loneliness (aOR 2.60 (95% CI 1.09-6.13)) and 3.3 times more likely to say lack of exercise was a challenge (aOR 3.29 (95% CI 1.63-6.87));
- People aged **40-59 years** were more likely to say that they had caring responsibilities for vulnerable adults living outside their household compared to older adults aged over 70 years (40-49: aOR 5.94 (95% CI 1.29-27.31)); (50-59: aOR 7.20 (95% CI 1.56-32.81));
- People **living alone** were 2.3 times more likely than those who lived with others to say loneliness was a challenge during self-isolation (aOR 2.29 (95% CI 1.58-3.33));
- People with **high or very high income precarity** compared to those with low income precarity were:
  - » **7.8 times** more likely to experience **financial challenges** (aOR 7.79 (95% CI 4.46-13.59)). (People with moderate income precarity were 2.0 times more likely to say they had financial challenges (aOR 2.04 (95% 1.15-3.60)));
  - » **2.2 times** more likely to say that **work had not supported self-isolation** (aOR 2.22 (95% CI 1.16-4.24));
  - » **2.6 times** more likely to experience **mental health difficulties** (aOR 2.62 (95% CI 1.25-2.46));
  - » **2.1 times** more likely to experience **physical health difficulties** (aOR 2.08 (95% CI 1.05-4.11));
  - » **1.8 times** more likely to experience **loneliness** (aOR 1.78 (95% CI 1.17-2.70)).

Table 4: CABINS - Population groups significantly more likely to report experiencing a specific challenge during self-isolation (1,011 respondents)

Reasons [1]	Gender	Ethnicity [2]	Age	Deprivation	Level of Income Precarity	Household	Geographical areas [3]
Wanting to see family	**Women**	-	-	-	-	-	-
Wanting to see friends	-	-	18-29 year olds	-	High / Very High	-	Urban
A lack of exercise	-	-	**18-49 year olds**	-	High / Very High	-	Urban
Loneliness	Women	**BAME**	**18-29 year olds**	-	**High / Very High**	**Lives alone**	-
Mental health difficulties	**Women**	-	18-29 year olds	-	**High / Very High**	-	Urban
Financial concerns	-	-	30-39 year olds	Most deprived	**Moderate / High / Very High**	-	-
Living with others who are not self-isolating	-	-	40-49 year olds	-	-	Living with others	-
Caring responsibilities for vulnerable adults outside your household	**Women**	-	**40-59 year olds**	-	Low	-	-
Physical health difficulties	-	-	70 year olds and older	-	**High / Very High**	Lives alone	Urban
Work not supporting you to self-isolate	**Men**	-	-	-	**High / Very High**	-	-
Caring responsibilities for children outside your household	-	-	60-69 year olds	-	-	-	-
No access to food	-	-	-	-	High / Very High	-	-
Lack of support from family/ friends	-	-	-	-	-	**Lives alone**	-
No access to medication	-	-	-	-	High / Very High	-	-

Notes: (1) Dash represents no statistically significant difference between groups. No statistically significant differences between groups for: 'Not feeling safe to isolate at home'. **Bold** text indicates that associations are significant after adjusting for age, gender, deprivation, income precarity, and living alone. (2) Ethnicity included in loneliness model only. (3) Rurality was not included in models due to high levels of missing data.

4. Key considerations for future action

The two innovative studies reported here are the first systematic approach to collating in-depth insights from confirmed contacts of COVID-19 in Wales. The findings provide valuable and timely insight into the factors supporting individuals to self-isolate and challenges to adherence – many of which reflect underlying inequalities in population health and society. The findings are directly relevant to national policy and local intervention and presented below as considerations for future action to support adherence to self-isolation amongst contacts of COVID-19 in Wales, and minimise the harms of self-isolation on specific population groups.

4.1 Reinforcing national communications that Keep Wales Safe

… confidence to adhere to self-isolation at the start and reported adherence after a period of self-isolation were high …

Our studies identify two key areas of focus for communications with citizens across Wales. First, our studies found that both confidence to adhere to self-isolation at the start of a period of self-isolation and reported adherence to self-isolation after a period of self-isolation were high. This indicates that messages around the importance of self-isolation are being heard by contacts across Wales, and that the Test Trace Protect system is conveying confidence to those it reaches. Findings from our CABINS study also show that adherence to self-isolation is significantly higher among contacts who are confident in their ability to self-isolate. Maintaining high levels of confidence to self-isolate at the start of self-isolation is therefore important to encourage adherence.

Secondly, re-enforcing the narrative on planning for self-isolation remains important. Our studies showed that contacts who had not planned for self-isolation and who were unable to access support from friends and family were more concerned that self-isolation would be a challenge. Messages to the public should emphasise the importance of being prepared for self-isolation in line with British Psychological Society (BPS) Guidance[6]. These should include encouraging people to take time to identify people who can help them to self-isolate, and if they have limited access to support from friends and family, to find out what other services are available locally to help.

… re-enforcing the narrative on planning for self-isolation remains important …

Adherence to self-isolation in our sample of contacts in Wales was 78% and is considerably higher than the 15%-25% reported in previous UK studies[1,2]. Some difference will be accounted for in study design, and although ACTS was anonymous and individuals were made aware that the information was not linked to them in anyway, the challenge of response and social desirability bias remain.

Another consideration is that the UK studies have a very low proportionate representation of the Welsh population, and levels of adherence in ACTS was similar to the 80% adherence level found in a smaller study of contacts in Wales between December 2020 and January 2021[7]. There is a potential risk that low levels of adherence to self-isolation found in previous UK studies shared widely through national media has established a social norm that few people are adhering to self-isolation guidance, which may not accurately reflect the pattern in Wales.

4.2 Developing and targeting support for those experiencing challenges whilst self-isolating

Our studies identified several population groups at greater risk of experiencing the harms of self-isolation. Based on these findings, we address four key areas below to help direct evidence informed action through new or existing behaviourally informed approaches (summarised in Table 5).

4.2.1 Provide targeted mental wellbeing and social support

Across both studies concerns about the impact on mental health, lack of social support, and experienced loneliness and mental health difficulties were evident. The early identification of those who may struggle, and directing individuals to sources of support should be a priority.

When initially contacted by NHS Test Trace Protect, there is the opportunity to signpost all contacts to sources of mental wellbeing support. Scripts used by contact tracers could be tailored to sensitively identify specific concerns about the impact of self-isolation on mental wellbeing. Although contact tracers have limited capacity and time on each call, changes to scripts supported by further training on safeguarding could quickly identify people who may be experiencing immediate mental health challenges and prompt signposting to GPs. Mapping local resources and sources of support from, for example, voluntary and community organisations offering peer support, online and non-digital sources of support, would also create a valuable asset for contact tracers to direct contacts.

Self-isolation was found to have a disproportionate impact on the mental health of women, BAME groups, younger people, those who live alone, and those with high levels of income precarity. A significantly higher proportion of women reported mental health difficulties and loneliness.

Loneliness was also significantly higher among those who lived alone. Identifying sources of support to specifically address the needs of specific groups is needed. Identifying those living alone should be a priority as they were almost twice as likely to think self-isolation would be a challenge at the start of self-isolation and were significantly less likely to say they had adhered to self-isolation. Identifying those living alone at the start of a period of self-isolation through initial conversations with contact tracers would help to direct people to sources of local social support as well as national charities and agencies who run confidential help lines and support services.

In this study, people from BAME groups were more likely to report experiencing financial concerns, and poor mental health. Given the underlying prevalence of mental health difficulties is higher in this population, and the disproportionate number of deaths and hardships faced by BAME groups during the pandemic, specific interventions with adapted, targeted campaigns and advice are needed[8]. For example, the Birmingham Healthy Minds Programme provides focused support for BAME groups and ensures that any advice is culturally sensitive[9]. Engagement with community leaders and ambassadors in BAME communities will also be vital to ensure the broadest reach and engagement with these messages in communities across Wales.

Women and young people in particular would also benefit from signposting to supportive mental health services and sources of informal support during these initial calls with contact tracers. For example, in China, a nurse-led intervention, via the social media platform WeChat successfully aimed to improve mental health during isolation[10].

4.2.2 Increase financial support and access to food and medications for those with precarious incomes

People with high levels of income precarity were more likely to report that they had left home during their self-isolation period to shop for groceries or collect medication. They were also almost 8 times more likely than people with low income precarity to say they experience financial challenges during self-isolation, nearly 3 times more likely to have experienced mental health challenges, and 2 times more likely to say that work had not supported them. These associations were evident after adjusting for deprivation. People with high income precarity also reported challenges of accessing food or medication.

Financial support of £500 is available to contacts on up to three occasions if they meet a set of eligibility criteria[11]. However, it may be that financial support is not the only means through which those with high income precarity can best be supported through self-isolation. In our CABINS study the only significant difference between groups for access to food and medication was between those experiencing high income precarity and those with lower precarity. Alternative methods to support access to food and medication for this group should be considered to reduce the harms of self-isolation in the short and longer term.

A test-to-care model in San Francisco, USA, addressed many of the financial and social barriers to self-isolation faced by populations with precarious incomes. This model provided information about community resources and

home deliveries of groceries, medication, cleaning supplies and personal protective equipment. 95% of those who participated in the surveillance study were from a BAME group and 88% had an annual household income of less than $50,000 (c.£35,000). 67% of individuals requested support to self-isolate. The intervention not only helped individuals to self-isolate, but over time participants' trust in the system increased – resulting in individuals disclosing a greater number of their contacts[12]. Also in the USA, Vermont designed a response with the needs of high risk groups in mind. Its public health intervention included protection from eviction, meal deliveries and pop-up testing in high risk communities. Partly as a consequence of this intervention Vermont evidences one of the lowest transmission rates of the US states[13]. These interventions have led to high rates of test uptake, number of contacts identified, and adherence to self-isolation, contributing to reducing the total community transmission[14].

In order to direct this additional support in Wales, those experiencing high income precarity need to identified. Using the three short income precarity questions asked in CABINS as a screening tool to direct financial support to close contacts experiencing challenges to self-isolate may be helpful. These questions could be integrated into contact tracing scripts to ensure that those who require this support are quickly identified and directed to appropriate support provided through Test Trace Protect.

4.2.3 Direct contacts to exercise at home and dog walking services

Our CABINS study found that leaving home for exercise was the main reason why people left home during self-isolation; 4 in 10 left home for exercise and 1 in 10 left to walk the dog. The proportion of those who said they had left home to exercise during a period of self-isolation was highest in the least deprived areas, and almost double that of those in the most deprived areas.

There may be some confusion in the messaging as exercise is allowed during periods of wider lockdown, acknowledging the beneficial impact on mental wellbeing. It is likely that due to these messages around the importance of daily exercise to improve mental health that exercise may now be considered by contacts as an acceptable reason to leave home. Our studies suggest there is a need to direct people – especially those living in the least deprived areas – to exercise at home options and local dog walking services that would reduce the need to leave home either alone or with their pet. For example, a study from China highlighted the importance of sharing physical activity via online platforms, as it increased social connectedness during self-isolation[15]. The World Health Organisation, American Heart Organisation and the American College of Sports Medicine, also provide practical materials for home-based exercise[16]. A similar scheme to the test-to-care model in San Francisco was rolled out in New York City. Here, New York offers supportive services for people who have positive results to help them self-isolate at home or in a hotel, including dog walking services[17]. In the UK, a veterinary group has issued advice to pet owners suggesting alternatives to outdoor walks, such as indoor training to entertain pets[18]. Furthermore, the Welsh Government have released guidance on how to safely exercise pets during self-isolation[19]. Changes to contact tracing scripts to include some of these interventions or guidance could help to identify individuals in need of these services.

4.2.4 Enhance social care provision at home for older adults and those living alone

People aged 70 and older and those living alone were significantly more likely to say that physical health difficulties were a challenge during self-isolation in our CABINS study of contacts completing a period of self-isolation. CABINS also found that 1 in 20 contacts had left their home to care for vulnerable people outside the home, and those aged 40-59 were more likely to state that caring for vulnerable adults outside their home would be a challenge as they started self-isolation in our ACTS study and after a period of self-isolation in CABINS.

It is important that caring responsibilities both towards older adults and children are identified during initial calls with contacts to ensure that they are helped to consider potential alternative sources of support for the isolation period, including localised community support or routes to care support through primary or social care. This may involve directing people to their local authority to start the Carer's Assessment[20] or carers' charities such as Carers Wales or Carers Trust Wales.

Table 5: Recommended interventions to support groups at highest risk of harms from self-isolation

Population group most likely to need support [1]	Proposed Intervention			
	1. Provide targeted mental wellbeing and social support	2. Increase financial support and access to food and medication	4. Exercise at home options and dog-walking services	5. Enhance social care provision at home
Women	✔			
BAME groups	✔			
Younger people (aged 18-29 years)	✔			
Older adults (70 and over)				✔
People living alone	✔			✔
People with high income precarity	✔	✔		
People living in the most deprived areas		✔		
People living in the least deprived areas			✔	

4.3 Conclusion

The two innovative studies reported here are the first systematic approach to collate in depth insights from contacts of COVID-19 in Wales directly relevant to the national action to respond to the COVID-19 pandemic. The findings provide valuable and timely insight into the factors which support individuals to self-isolate and challenges to adherence, many of which reflect underlying inequalities in population health and society; and the differences between groups. These insights provide valuable considerations for future action to support adherence to self-isolation amongst contacts of COVID-19 in Wales, and minimise the harms of self-isolation on specific population groups.

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Appendix 1 – Data Tables

Data Table 1: ACTS – Behavioural insights at the start of a period of self-isolation (survey among 3,679 contacts of COVID-19)

			Gender			Ethnicity			Age							Live Alone		
			Men	Women		White	BAME		18-29	30-39	40-49	50-59	60-69	≥70		Yes	No	
Statement	**n**	**% High** [1]	% High	% High	Sig.[2]	% High	% High	Sig.[2]	% High	% High	% High	% High	% High	% High	Sig.[2]	% High	% High	Sig.[2]
It will be a challenge to not leave my home during my self-isolation period.	**682**	**18.6**	20.3	17.6	0.049	18.5	23.8	0.284	16.8	16.7	18.7	19.1	18.1	23.8	0.298	31.4	17.7	<0.001
I had already made plans so that I was prepared for self-isolation, before being contacted by a contact tracer (e.g. having enough food/ medicine, collecting telephone numbers)	**2,240**	**61.1**	62.3	60.5	0.293	61.3	52.4	0.152	42.6	53.8	57.5	63.0	71.6	77.8	<0.001	61.1	61.1	0.995
I had people who supported me during my self-isolation period.	**3,171**	**86.5**	86.5	86.6	0.911	86.7	77.8	0.040	83.1	82.7	85.7	87.6	88.3	90.6	0.007	81.6	86.8	0.022

Notes: (1) Percentage reporting high, defined as 5 or higher on a 7 point Likert scale ranging from 1 = 'not at all' to 7 = 'very much so'. (2) Chi-square test.

Data Table 2: ACTS – Perceived challenges at the start of self-isolation (3,679 respondents)

			Gender			Ethnicity			Age							Live Alone		
		Total	Men	Women		White	BAME		18-29	30-39	40-49	50-59	60-69	≥70		Yes	No	
Rank	Challenge	% Yes [1]	% Yes	% Yes	Sig.[2]	% Yes	% Yes	Sig.[2]	% Yes	% Yes	% Yes	% Yes	% Yes	% Yes	Sig.[2]	% Yes	% Yes	Sig.[2]
1	Suffering from anxiety or mental health problems	**11.7**	9.2	13.1	<0.001	11.6	13.8	0.585	23.4	16.0	14.1	9.7	5.4	4.7	<0.001	14.2	11.5	0.201
2	Looking after children	**11.2**	10.3	11.6	0.215	10.9	24.6	<0.001	8.0	31.4	19.9	6.3	4.3	3.7	<0.001	4.6	11.6	0.001
3	Being concerned about the impact isolation will have on my work or business	**9.5**	13.0	7.5	<0.001	9.3	21.5	0.001	11.6	10.6	12.1	10.3	6.1	2.3	<0.001	8.8	9.5	0.713
4	Experiencing financial problems	**9.3**	11.4	8.1	0.001	9.0	21.5	0.001	14.8	17.9	12.0	7.9	3.3	1.9	<0.001	9.2	9.3	0.972
5	Caring for vulnerable people who cannot stay with friends or family	**8.2**	6.7	9.0	0.019	8.3	6.2	0.541	6.4	6.6	9.2	9.1	8.4	5.1	0.151	6.3	8.3	0.260
6	Suffering from an underlying health condition or disability	**7.2**	9.0	6.3	0.002	7.2	9.2	0.538	3.4	4.4	6.3	7.5	9.1	15.4	<0.001	10.5	7.0	0.046
7	Living or caring for someone with learning disabilities	**2.3**	2.1	2.4	0.531	2.2	6.2	0.036	2.7	2.0	2.9	2.2	2.3	0.5	0.428	1.7	2.3	0.514
8	Being homeless or at risk of becoming homeless	**1.1**	1.8	0.8	0.006	1.0	6.2	<0.001	2.0	2.0	0.9	0.8	0.9	0.5	0.143	1.7	1.1	0.394

Note: (1) Percentage reporting Yes to each perceived challenge of self-isolation. (2) Chi-square test.

Data Table 3: CABINS – Views on planning and support for self-isolation after completing self-isolation (survey amongst 1,011 contacts of COVID-19)

			Gender			Ethnicity			Age							Live Alone[3]		
			Men	Women		White	BAME		18-29	30-39	40-49	50-59	60-69	≥70		Yes	No	
Statement	**N**	**% High** [1]	% High	% High	Sig.[2]	% High	% High	Sig.[2]	% High	% High	% High	% High	% High	% High	Sig.[2]	% High	% High	Sig.[2]
I had already made plans so that I was prepared for self-isolation, before being contacted by a contact tracer (e.g. having enough food/ medicine, collecting telephone numbers)	**691**	**68.5**	62.1	74.1	<.001	68.3	72.5	.580	64.8	64.2	71.0	69.9	75.6	80.4	.078	76.7	66.3	.004
I had people who supported me during my self-isolation period.	**903**	**89.3**	85.8	92.5	.001	89.4	87.5	.700	91.9	87.7	87.7	86.3	91.1	91.2	.35	79.8	91.7	<.001

			WIMD				Income Precarity				Rurality		
			Most deprived	Moderately deprived	Least deprived		Low	Moderate	High/ Very High		Urban	Rural	
Statement	**N**	**% High** [1]	% High	% High	% High	Sig. [2]	% High	% High	% High	Sig. [2]	% High	% High	Sig. [2]
I had already made plans so that I was prepared for self-isolation, before being contacted by a contact tracer (e.g. having enough food/ medicine, collecting telephone numbers)	**691**	**68.5**	70.2	67.3	67.0	.581	67.0	71.1	66.8	.415	66.2	76.8	.013[a]
I had people who supported me during my self-isolation period.	**903**	**89.3**	89.2	86.7	90.9	.315	90.4	92.2	87.1	.105	89.1	91.4	.546[a]

Notes: (1) Percentage reporting high, defined as 5 or higher on a 7 point Likert scale ranging from 1 = 'not at all' to 7 = 'very much so'. (2) Chi-square test. (3) Living with no other adults in house.

Data Table 4: CABINS – Adherence to self-isolation Logistic Regression Model (1,011 respondents)

Variable	Adjusted Odds Ratio (95% Confidence Interval)
Gender	
Male	Reference
Female	1.20 (0.88-1.65)
Age	
18-29	Reference
30-39	1.40 (0.87-2.25)
40-49	1.18 (0.73-1.89)
50-59	0.98 (0.62-1.56)
60-69	1.17 (0.63-2.15)
70 and older	1.02 (0.50-2.09)
WIMD	
1 – Most Deprived	0.81 (0.51-1.29)
2	1.62 (0.98-2.67)
3	1.60 (0.95-2.69)
4	0.95 (0.58-1.56)
5 – Least Deprived	Reference
Household	
Lives with others	Reference
Lives alone	0.68 (0.46-1.00)
Planning for self-isolation	1.00 (0.93-1.08)
Support for self-isolation	**1.16 (1.05-1.27**)
Individual risk perception	1.03 (0.96-1.10)
Confidence in ability to self-isolate	**1.28 (1.10-1.49)**
Belief that self-isolation is effective	0.99 (0.87-1.12)
Understood why had to self-isolate	0.98 (0.81-1.19)

Note: **Bold** indicates significant associations.

Data Table 5: CABINS – Ranked reasons for not adhering to self-isolation (225 respondents)

		Total		Gender			Ethnicity			Age							Live Alone		
Rank	Reason for non-adherence	N	% Yes [2]	Men % Yes	Women % Yes	Sig.[2]	White % Yes	BAME % Yes	Sig.[2]	18-29 % Yes	30-39 % Yes	40-49 % Yes	50-59 % Yes	60-69 % Yes	≥70 % Yes	Sig.[2]	Yes % Yes	No % Yes	Sig.[2]
1	For exercise	**93**	**42.3**	44.3	39.3	.44	42.9	25.0	.22	41.0	38.2	35.3	31.9	66.7	76.9	.017	29.3	46.7	.021
2	To get a COVID test	**38**	**17.0**	15.5	18.7	.53	97.4	2.6	.41	15.6	22.9	14.7	23.9	5.6	-	.21	17.5	16.8	.89
3	To shop for essentials/ groceries	**37**	**16.6**	19.8	13.1	.18	25	16	.42	23.1	17.1	11.8	10.9	11.1	15.4	.79	20.7	15.0	.31
4	To walk the dog	**22**	**9.9**	8.6	11.2	.52	-	10.4	.24	5.1	5.7	14.7	17.4	11.1	7.7	.25	5.2	11.4	.17
5	To collect medication	**13**	**5.8**	6.1	5.6	.88	5.2	16.7	.098	7.7	5.7	2.9	6.5	-	7.7	.81	3.4	6.6	.38
6	To shop for non-essentials	**12**	**5.4**	7.8	2.8	.10	3.8	33.3	<.001	6.4	8.6	-	16.7	8.3	8.3	.69	8.6	4.2	.20
7	For medical purposes	**10**	**4.5**	4.3	4.7	.90	4.7	-	.44	2.6	5.7	2.9	8.5	5.6	-	.64	1.7	5.4	.24
8	Caring responsibilities for vulnerable adults outside your household	**10**	**4.5**	3.4	5.6	.44	4.7	-	.44	5.1	5.7	8.8	2.2	-	-	.59	13.8	1.2	<.001
9	Loneliness	**6**	**2.7**	3.4	1.9	.47	8.3	2.4	.21	1.3	5.7	2.9	2.1	-	7.7	.60	1.7	3	.61
10	Mental health difficulties	**6**	**2.7**	2.6	2.8	.92	2.8	-	.56	2.6	5.7	2.9	-	-	7.7	.51	1.7	3	.61
11	Childcare commitments	**6**	**2.7**	0.9	4.7	.079	2.8	-	.56	1.3	-	11.8	-	5.6	-	.013	3.4	2.4	.67
12	For work	**6**	**2.7**	4.3	0.9	.12	2.8	-	.56	2.6	2.9	-	2.1	11.1	-	.28	5.2	1.8	.17
13	To get fresh air/ smoke	**5**	**2.4**	1.7	2.8	.59											1.7	2.4	.77

		Total		WIMD				Income Precarity				Rurality		
Rank	Reason for non-adherence	N	% Yes [1]	Most deprived % Yes	Moderately deprived % Yes	Least deprived % Yes	Sig.[2]	Low % Yes	Moderate % Yes	High/ Very high % Yes	Sig [2]	Urban % Yes	Rural % Yes	Sig [2]
1	For exercise	**93**	**42.3**	29.5	46.9	56.2	.001	36.6	52.9	29.5	.016	36.5	43.3	.530[a]
2	To get a COVID test	**38**	**17.0**	19.0	6.5	19.1	.226	22.9	19.1	11.5	.217	15.7	17.2	.783[a]
3	To shop for essentials/ groceries	**37**	**16.6**	21.2	9.4	13.5	.182	8.2	10.3	24.4	.017	20.9	3.3	.028[a]
4	To walk the dog	**22**	**9.9**	6.7	9.7	13.6	.269	14.3	7.4	11.5	.471	11.3	13.8	.749[a]
5	To collect medication	**13**	**5.8**	7.6	6.5	3.4	.443	-	4.4	12.8	.012	7.8	3.3	.698[a]
6	To shop for non-essentials	**12**	**5.4**	8.6	6.5	1.1	.068	2.0	5.9	6.4	.521	6.1	6.7	1.00[a]
7	For medical purposes	**10**	**4.5**	3.8	6.5	4.5	.821	4.1	4.4	2.6	.817	6.1	3.3	1.00[a]
8	Caring responsibilities for vulnerable adults outside your household	**10**	**4.5**	7.6	3.2	1.1	.086	2.0	4.4	6.4	.518	6.1	3.3	1.00[a]
9	Loneliness	**6**	**2.7**	2.9	9.7	-	.016	-	1.5	1.3	.708	0.9	-	1.00[a]
10	Mental health difficulties	**6**	**2.7**	2.9	6.5	1.1	.281	-	4.4	2.6	.330	3.5	-	.581[a]
11	Childcare commitments	**6**	**2.7**	3.8	6.5	-	.096	4.1	-	5.1	.180	3.5	-	.581[a]
12	For work	**6**	**2.7**	2.9	3.2	2.2	.945	2.0	2.9	1.3	.780	3.5	3.3	1.00[a]
13	To get fresh air/ smoke	**5**	**2.4**	4.8	-	-	.052	2.0	1.5	2.6	.898	1.7	-	.1.00[a]

Notes: (1) Percentage reporting Yes to each reason for non-adherence. No responses have not been reported to increase clarity and minimise data redundancy.
(2) Chi square test (except [A] where Fisher's Exact Test).

Data Table 6: CABINS – Ranked challenges after completing self-isolation (1,011 respondents)

				Gender[3]			Ethnicity			Age[4]							Live Alone		
		Total		Men	Women		White	BAME		18-29	30-39	40-49	50-59	60-69	≥70		Yes	No	
Rank	Challenge	N	% Yes [1]	% Yes	% Yes	Sig.[2]	% Yes	% Yes	Sig.[2]	% Yes	% Yes	% Yes	% Yes	% Yes	% Yes	Sig.[2]	% Yes	% Yes	Sig.[2]
1	Wanting to see family	**672**	**66.7**	62.3	70.9	.004	67.4	55	.10	69.3	64.8	58.9	66.8	77.8	64.9	.056	68.5	66.2	.54
2	Wanting to see friends	**608**	**60.6**	48.8	51.2	.13	61.2	51.2	.20	71.1	57.0	52.8	55.6	58.9	56.1	<.001	61.6	60.4	.76
3	A lack of exercise	**589**	**58.6**	58.7	58.5	.96	58.5	58.5	.99	66.1	63.1	61.6	53.6	43.3	36.8	<.001	55.4	59.4	.30
4	Loneliness	**313**	**31.2**	26.8	35.1	.004	30.6	47.5	.024	38.9	33.0	26.4	25.4	28.9	21.1	.004	45.1	27.7	<.001
5	Mental health difficulties	**247**	**24.6**	18.5	30.0	<.001	24.0	34.1	.14	31.4	27.4	22.7	20.3	15.6	10.5	<.001	30	23.3	.050
6	Financial concerns	**204**	**20.4**	19.7	20.8	.67	22.5	20.4	.75	20.5	29.1	22.1	19.8	13.3	1.8	<.001	22.7	19.7	.35
7	Living with others who are not self-isolating	**176**	**17.5**	15.1	19.7	.054	14.6	17.6	.62	17.4	21.8	23.2	14.7	13.3	1.8	.003	6.9	20.1	<.001
8	Caring responsibilities for vulnerable adults outside your household	**172**	**17.1**	39.5	60.5	.032	12.2	17.3	.39	9.9	15.1	25.8	28.1	15.6	5.3	<.001	21.1	16.1	.092
9	Physical health difficulties	**95**	**9.5**	9.5	9.4	.93	9.1	14.6	.24	5.9	7.3	12.8	11.7	13.3	14.0	.036	15.2	8.0	.002
10	Work not supporting you to self-isolate	**88**	**8.8**	10.0	7.7	.20	8.8	10	.80	9.9	8.9	8.0	10.2	7.8	-	.24	12.3	7.9	.050
11	Caring responsibilities for children outside your household	**84**	**8.5**	8.5	8.3	.90	8.4	10	.72	4.7	10.6	9.2	11.2	13.3	5.3	.029	8.9	8.4	.84
12	No access to food	**77**	**7.7**	8.5	6.9	.36	7.5	7.7	.97	10.9	7.8	6.7	5.6	6.7	1.8	.11	7.9	7.7	.92
13	Lack of support from family/ friends	**64**	**6.3**	7.4	5.4	.20	6.2	10	.34	26.6	25	18.8	21.9	6.3	1.6	.34	9.9	5.4	.021
14	No access to medication	**54**	**5.3**	5.5	5.3	.86	5.4	2.5	.42	5.6	5.6	4.3	6.6	3.3	3.5	.83	4.4	5.6	.52
15	Not feeling safe to isolate at home	**16**	**1.6**	1.7	1.5	.81	2.4	1.6	.66	37.5	25	6.3	18.8	12.5	-	.73	1.5	1.6	.89
	None of the above	**97**	**9.6**	9.5	9.6	.99	9.4	7.5	.68	7.1	6.1	9.8	10.2	12.2	24.6	.001	11.3	9.2	.35

Data Table 6 (Contd.)

		Total		WIMD				Income Precarity				Rurality		
Rank	**Challenge**	**N**	**%** Yes	Most deprived % Yes	Moderately deprived % Yes	Least deprived % Yes	Sig.(1)	Low % Yes	Moderate % Yes	High/ Very High % Yes	Sig [1]	Urban % Yes	Rural % Yes	Sig [1]
1	Wanting to see family	**672**	**66.7**	66.2	64.3	68.5	.579	65.9	67.4	68.8	.784	69.1	67.5	.766[a]
2	Wanting to see friends	**608**	**60.6**	44.6	18.6	36.8	.646	62.3	56.7	67.7	.017	63.3	50.0	.005[a]
3	A lack of exercise	**589**	**58.6**	55.8	58.2	62.2	.191	62.7	53.9	65.4	.008	60.6	48.7	.011[a]
4	Loneliness	**313**	**31.2**	33.3	30.6	28.7	.364	24.0	30.5	38.4	.002	33.5	25.3	.060[a]
5	Mental health difficulties	**247**	**24.6**	27.8	24.5	20.7	.065	14.9	21.2	36.3	<.001	28.0	14.6	.001[a]
6	Financial concerns	**204**	**20.4**	23.0	23.0	15.7	.024	8.7	14.8	37.1	<.001	21.2	19.9	.821[a]
7	Living with others who are not self-isolating	**176**	**17.5**	16.1	17.3	19.3	.484	21.5	15.7	18.6	.202	18.6	17.2	.812[a]
8	Caring responsibilities for vulnerable adults outside your household	**172**	**17.1**	17.2	16.3	17.7	.922	22.7	13.0	18.0	.010	8.1	8.0	1.00[a]
9	Physical health difficulties	**95**	**9.5**	10.2	9.2	8.8	.806	10.2	9.2	8.8	.806	11.1	5.3	.043[a]
10	Work not supporting you to self-isolate	**88**	**8.8**	10.8	9.7	5.8	.038	7.0	7.3	13.9	.006	10.1	9.3	.878[a]
11	Caring responsibilities for children outside your household	**84**	**8.5**	10.4	6.1	7.5	.137	8.3	8.4	10.8	.491			
12	No access to food	**77**	**7.7**	8.2	9.2	6.4	.435	7.0	5.5	13.2	.002	8.3	5.3	.228
13	Lack of support from family/ friends	**64**	**6.3**	7.2	7.7	4.6	.270	7.0	4.1	8.8	.048	7.0	4.7	.305
14	No access to medication	**54**	**5.3**	5.4	6.1	4.7	.755	5.3	3.2	7.8	.034	5.9	4.0	.357
15	Not feeling safe to isolate at home.	**16**	**1.6**	2.0	1.5	1.1	.604	-	0.9	3.7	.001	2.4	-	.055
	None of the above	**97**	**9.6**	9.9	13.2	7.1	.063	8.7	11.0	5.4	.040	9.0	10.6	.531[a]

Notes: (1) Percentage reporting Yes to each perceived challenge of self-isolation. (2) Chi square test (except [a] where Fisher's Exact Test).
(3) 6 people either answered as 'prefer not to say' or 'in another way' – data treated as missing. (4) 3 people chose prefer not to say, data treated as missing.

Appendix 2 – ACTS and CABINS Study Methodology

This report draws on data from the COVID-19 Behavioural Insights Research Programme led by the Research & Evaluation Division in Public Health Wales. This programme includes two projects:

- **ACTS** – a real-time daily text message survey of contacts at the **start** of their period of self-isolation.
- **CABINS** – a telephone survey and focus groups with contacts who have **completed** a period of self-isolation.

This Appendix describes the detailed design, participants, measures and analysis approach for each project.

ACTS (Adherence Confidence Text Survey)

Design

ACTS is a national daily text message survey of contact cases of COVID-19 in Wales. Since November 2020, Public Health Wales has used ACTS to gather real-time information on confidence to adhere to self-isolation guidance after discussion with a contact tracer and behavioural insights among contact cases. The study includes a SMS message survey to assess confidence with an embedded SMS push-to-web survey to gather behavioural insights.

Participants

Individuals were eligible to receive the initial text message if they were aged 18 or over and had been successfully reached by a contact tracer from NHS Wales Test Trace Protect (TTP) service after forward contact tracing, told to self-isolate, and preferred to receive follow-up by text message. During the reporting period of this report data from the TTP Citizen Relationship Management (CRM) database indicated that 36% of contacts expressed a preference for SMS follow-up. Successful contact by a contact tracer was determined through the CRM system. A field in the CRM indicated the date of the first daily check-up, which occurred the day after being successfully reached by a contact tracer and told to self-isolate. We excluded contact cases of index cases who had died from the survey to minimise personal distress.

Recruitment

We sent eligible contact cases up to four text messages up to two days after they had been notified by a contact tracer from NHS Wales TTP to self-isolate. Data were extracted from the TTP database daily and provided to an external provider (Healthcare Communications) who delivered the text messages using the same system as the NHS Friends and Family Test of patient experience (NHS, 2020). Box 1 shows the text messages that were sent.

- Text message 1 was a bilingual (Welsh/English) opt in. All messages from that point were sent in the participants' preferred language. Individuals only received the next text message if they respond to the previous one.
- Text message 2 collected quantitative data about contact cases confidence to adhere to self-isolation guidance.
- Text message 3 collected comments that could support service improvement. (Qualitative findings from the ACTS study will be reported separately.)
- Text message 4 invited participants to complete an online survey that gathered behavioural insights.

Box 1: SMS Survey Questions

SMS	Message Text
1 – Bilingual Opt-in	NHS Wales Test, Trace, Protect service for COVID-19 has contacted you. We'd like to ask two questions to help us improve. To continue in English reply YES. Contrary to any warnings, all replies are free. Mae Gwasanaeth Profi, Olrhain, Diogelu GIG Cymru ar gyfer COVID-19 wedi cysylltu â chi. Hoffem ofyn dau gwestiwn i chi er mwyn ein helpu i wella. I barhau yn Gymraeg, atebwch gyda'r gair CHANGE. Yn wahanol i unrhyw rybuddion, ni chodir tâl am ateb. To opt out of survey messages reply STOP. I roi'r gorau i dderbyn negeseuon yr arolwg, atebwch gyda'r gair STOP. Thanks/ Diolch.
2 – Confidence	Thinking about your recent experience with the NHS Wales Test, Trace, Protect: How confident are you that you know what you need to do now? Please reply 1 Very confident 2 Fairly confident 3 Unsure 4 Not very confident 5 Not at all confident
3 – Service Improvement	Thank you for your feedback. Please can you reply to tell us what was good about your experience and what we could do better?
4 – Survey Invitation	Thank you. Finally, we'd like to find out more about your experiences. Please complete our anonymous 2 minute online survey here: https://phw.nhs.wales/actscabins

Measures

SMS Survey

Confidence to self-isolate after contact by a contact tracer is the key measure for the ACTS SMS survey. Participants are invited to respond to the question 'How confident are you that you know what you need to do now?' on a five point scale where 1 is 'Very confident' and 5 is 'Not at all confident' (see Box 1).

Socio-demographic data on contacts' gender, age, ethnicity, Welsh Index of Multiple Deprivation (WIMD) quintile and Health Board was extracted from the TTP database and included in the data extract used to deliver text messages. This enabled these variables to be included in analysis of confidence for sub-groups of contacts. Analysis of survey non-response bias was also conducted as these variables were known for both those who did and did not respond to the initial SMS.

Push-to-web sub-survey

In the SMS push-to-web survey, we asked participants the extent to which a series of 9 statements applied to them. Participants responded to each statement using a 7 point scale where 1 was 'not at all' and 7 was 'very much so' to measure responses. Box 2 lists the statements. Statements were developed following guidance from the British Psychological Society (Arden, et al., 2020) and were informed by the COM-B model of behaviour change (Michie et al 2011). In addition to these statements we asked additional questions about what may stop people from being able to self-isolate (e.g., caring responsibilities, financial problems, mental health difficulties) and whether people were aware of, eligible for, or had applied for, the Welsh Government Income Support Grant.

Socio-demographic data on age, gender, ethnicity, local authority (used to derived Health Board) were collected to enable analysis for sub-groups of contacts. A variable "living alone" was derived from the response to the statement 'It will be a challenge to isolate from others in my household during my self-isolation period' which included the response option 'N/A – I live alone'.

Box 2: Online Survey Statements

	Category	Statement
1	Perceived challenge of self-isolation	It will be a challenge to isolate from others in my household during my self-isolation period.
2		It will be a challenge to not leave my home during my self-isolation period.
3	Risk Perception	If I got COVID-19, I would be at risk of developing serious side-effects.
4		Someone close to me is at risk of developing serious side-effects if they get COVID-19 (COVID-19)
5	Trust	I trust the authorities to give me the right information to keep me and my family safe.
6	Following guidance	I have followed recommendations from authorities to prevent the spread of COVID-19 (COVID-19).
7		People close to me have followed recommendations from the authorities to prevent the spread of COVID-19 (COVID-19).
8	Planning	I had already made plans so that I was prepared for self-isolation (e.g., having enough food/ medicine, collecting key telephone numbers).
9	Support	I have people who can support me during self-isolation (e.g., family, local friends).

Analysis

In this report we present data from the first 8 weeks of the ACTS study between **15 November 2020 and 9 January 2021**. Reporting weeks run Sunday to Saturday to align with Welsh Government reporting of TTP statistics (Welsh Government, 2021). During this time **42,763** contacts were sent an initial text and **13,531** responded providing information about their confidence to self-isolate (response rate: 31.6%) and **3,679** went on to complete the online survey (response rate: 27.2%).

Socio-demographic characteristics for the SMS survey sample are shown in Table A. Non-response bias was assessed using chi-square tests and a logistic regression model was built to determine independent predictors of survey response. After adjusting for age, gender, WIMD and health board, SMS survey respondents were statistically significantly more likely to be **women**, **older**, and from **less deprived backgrounds**. In a separate model with the sub-set of contacts with ethnicity recorded, these predictors remained significant and survey respondents were also more likely to be from **white** ethnic backgrounds. Socio-demographic characteristics for the online behavioural insights sub-survey sample are shown in Table B.

Confidence (SMS survey)

In line with weekly reporting practice for ACTS, responses 1 (very confident) and 2 (fairly confident) to the confidence question were combined to derive the percentage of contacts who are confident to self-isolate after speaking with a contact tracer. We analysed confidence each week at an all Wales level and by Gender (Female

vs. Male), Age (in groups), Welsh Index of Multiple Deprivation (WIMD) quintile (1 – most deprived to 5 – Least deprived), and living alone (Yes vs. No). Each statement in the online survey was examined by Gender (Female vs. Male), Age (in groups) and Ethnicity (White vs. Black, Asian and Minority Ethnic (BAME) background). Chi-square tests were used to assess associations between sub-groups of contacts by socio-demographic characteristics. Logistic regression models, adjusted for age, gender, WIMD, and reporting week, were used to assess predictors of confidence of adherence to guidance after contact by a contact tracer. Separate models were built including ethnicity due to the high level of missing data for this variable (Table A).

Behavioural insights (online sub-survey)

In line with weekly reporting practice for the ACTS study, binary variables for each statement were created by grouping responses into '1 to 4' and '5 to 7'. Binary variables for each statement by grouping responses into low ('1 to 4') and high ('5 to 7'), where 'high' represents responses above the mid-point of the 7 point scale. The percentage of contacts reporting 'high' for each statement (e.g., confidence, support, trust, risk perception) was reported for the sample and by gender (female vs. male), age (in groups), ethnicity (white vs. BAME) and living alone (yes vs. no). Chi-square tests were used to assess significant associations between this derived binary variable and socio-demographic characteristics. Logistic regression models adjusted for age, gender, ethnicity, living alone and reporting week were used to assess associations between perceiving self-isolation to be challenging and socio-demographic and psychological factors (e.g., risk perception, planning for self-isolation, support to self-isolate).

Analyses were conducted in SPSS Version 24. Statistical significance was set at 0.05.

Ethics and Governance Approval

ACTS was reviewed by the Public Health Wales Research and Development Office and determined to be usual practice (in public health).

CABINS (Contact Adherence to Self-isolation Behavioural Insights Study)

Design

CABINS is a national mixed-methods study of contacts of cases of COVID-19 confirmed by NHS Wales Test Trace Protect (TTP) service. CABINS includes two consecutive waves of a cross-sectional telephone survey followed by online focus groups.

Participants

We used the NHS Wales Test Trace Protect (TTP) database to identify eligible contacts for the wave 1 telephone survey. Individuals were eligible to participate if they: (1) had been successfully reached by TTP after forward contact tracing and informed to self-isolate between 12 September 2020 and 22 October 2020 (the day before the start of the 17-day Welsh 'firebreak' (Welsh Government, 2020), (2) were aged 18 or over, and (3) had completed a period of self-isolation of up to 14 days in line with Welsh Government guidance at the time. Successful contact by a contact tracer was determined through the Citizen Relationship Management (CRM) system that supported contact tracing by TTP. A field in the CRM indicated the date of the first daily check-up, which occurred the day after being successfully reached by a contact tracer and told to self-isolate. Contacts of cases of COVID-19 who were currently self-isolating were ineligible and those who were contacts of cases who had died were excluded to minimise personal distress.

Recruitment

During the study period, 18,568 contacts were eligible to take part. Eligible participants were invited to take part in a 15 minute telephone interview between 12 November 2020 and 1 December 2020. Bilingual interviews were conducted in either Welsh or English by according to participant preference. An external market research company conducted interviews to ensure anonymity and minimise potential respondent bias if Public Health Wales made initial contact with participants. During the data collection period 5,092 contacts were telephoned to achieve **1,011** completed interviews (response rate = 19.9%).

Measures

Due to the lack of validated instruments to assess self-isolation, survey measures were developed in line with guidance on self-isolation issued by the British Psychological Society (BPS) guidance on self-isolation (Arden, et al., 2020) and informed by the COM-B model of behavioural change (Michie et al 2011).

We assessed adherence to self-isolation through a single 6-category item that asked respondents to recall the number of times they left the house during their self-isolation period ranging from 'none' to 'every day'. Individuals who reported that they had left home were asked to select a reason from a list of 16 possible reasons (e.g., childcare commitments, for exercise, to shop for groceries/ essentials), state another (specified) reason, or 'none of the above'. All participants were asked to recall the challenges that they faced during their self-isolation period and select from a list of 15 options (e.g., financial concerns, lack of support from friends and family, mental health difficulties).

Potential behavioural influences on self-isolation adherence were derived from BPS guidance on self-isolation including, risk perception, and availability of support from friends and family to self-isolate. Respondents were asked how much a series of statements applied to them (e.g., 'I felt confident in my abilities to self-isolate for the whole of my self-isolation period.', 'If I got COVID-19, I would be at risk of developing serious side effects.') on a 7-point scale ranging from 1 (not at all) to 7 (very much so). All statements used the same scale to minimise cognitive load and completion time and improve the survey experience. Statements were identical to those used in the ACTS (real-time) survey to enable comparison between contacts starting and completing a period of self-isolation. ACTS included a sub-set of statements used in CABINS covering the key domains of the COM-B model.

Socio-demographic characteristics collected included age, gender, ethnicity, living alone, income precarity, urban/rural classification (derived from postcode). WIMD quintile recorded in the TTP CRM was included in the final analysis dataset.

Analysis

In this report we present data from the first wave of the CABINS telephone survey with contacts who were asked to self-isolate for up to 14 days between **12 September and 22 October 2020** (the day before the start of the 17-day Welsh 'firebreak'). During this time, **18,568** contacts were eligible to take part. Quota sampling was applied based on age and gender (combined) and WIMD quintile. Data were then weighted so that the final sample was representative of all eligible contacts over this period. Analysis is presented of weighted data.

Socio-demographic characteristics for wave 1 telephone survey sample are shown in Table C. To ensure comparability with findings from ACTS, the same approach was used to create binary variables for each statement by grouping responses into low ('1 to 4') and high ('5 to 7'), where 'high' represents responses above the mid-point of the 7 point scale. The percentage of contacts reporting 'high' for each statement (e.g., confidence, support, risk perception) was reported for the sample and by gender (female vs. male), age (in groups), ethnicity (white vs. BAME), WIMD (quintiles), living alone (yes vs. no), rurality (urban vs. rural), and income precarity. Income precarity was measured using the income sub-scale of the Employment Precariousness Scale (EPRES) (Vives et al 2010). Respondents were first asked to self-report their gross income bracket, on a 7-point Likert scale (where 1 = less than £10,000 a year, 5 = £41,500 or more a year; 6 = Don't know, 7 = Prefer not to say). Participants were also asked to report, on a 7-point likert scale (where 1 = Always, 5 = Never; 6 = Don't Know, 7 = Prefer not to say), whether this income enabled them to cover their basic needs (e.g., food, heating, etc.) and whether it afforded them to cover unforeseen expenses (e.g., a car breakdown or broken boiler). The 5-point Likert Scale was then recoded onto a 0-4 scale (where 0 = Always, 4 = Never). Scores for each item on the scale was divided by 12, summed and multiplied by 4 to give a composite Precarious Income score. A composite score below 1 means an individual has low income precarity (or are more financially secure); a composite score between 1 and 2 is equal to moderate precarious income; and a score above 2 evidences high and very high precarious income.

Chi-square tests were used to assess significant associations between derived binary variables and socio-demographic characteristics. Logistic regression models adjusted for age, gender, deprivation, income precarity and living alone were used to assess associations between adherence to self-isolation and socio-demographic and psychological factors (e.g., risk perception, planning for self-isolation, support to self-isolate) as well as challenges to self-isolation and reasons for non-adherence to self-isolation.

Analyses were conducted in SPSS Version 24. Statistical significance was set at 0.05.

Ethics and Governance Approval

CABINS was reviewed and approved by the Health Research Authority (IRAS: 289377). Public Health Wales' Research and Development Office confirmed capability and capacity to conduct the study.

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Data Tables

Table A: ACTS – SMS Survey Sample Characteristics

	Respondent (n=13,531, 31.6%)		Non-respondent (n=29,232, 68.4%)			Total (n=42,763)	
Variable	%	n	%	n	Sig.[1]	%	n
Gender [2]							
Male	44.6	4,937	50.4	11,991	**<0.001**	48.6	16,928
Female	55.4	6,129	49.6	11,802		51.4	17,931
Total	100	11,066	100	23,793		100	34,859
Age [3]							
18-29	20.3	2,753	34.5	10,095	**<0.001**	30.0	12,848
30-39	16.0	2,163	19.9	5,824		18.7	7,987
40-49	19.1	2,587	16.5	4,811		17.3	7,398
50-59	26.2	3,544	17.9	5,222		20.5	8,766
60-69	13.6	1,838	8.2	2,388		9.9	4,226
70+	4.8	646	3.1	892		3.6	1,538
Total	100	13,531	100	29,232		100	42,763
Ethnicity [4]							
White	97.0	5,128	94.5	10,736	**<0.001**	95.3	15,864
BAME	3.0	159	5.5	623		4.7	782
Total	100	5,287	100	11,359		100	16,646
WIMD [5]							
1 (Most deprived)	18.5	2,485	21.7	6,305	**<0.001**	20.7	8,790
2	23.1	3,098	23.7	6,877		23.5	9,975
3	21.4	2,875	21.0	6,080		21.1	8,955
4	18.4	2,466	17.3	5,020		17.6	7,486
5 (Least deprived)	18.6	2,495	16.3	4,733		17.0	7,228
Total	100	13,419	100	29,015		100	42,434
Health Board [6]							
Aneurin Bevan	22.1	2,964	20.6	5,963	**<0.001**	21.0	8,927
Betsi Cadwaladr	16.4	2,200	15.6	4,518		15.8	6,718
Cardiff & Vale	8.3	1,113	8.6	2,508		8.5	3,621
Cwm Taf Morgannwg	23.6	3,166	24.4	7,081		24.1	10,247
Hywel Dda	14.0	1,879	14.7	4,268		14.5	6,147
Powys	2.6	353	2.4	695		2.5	1,048
Swansea Bay	13.0	1,744	13.7	3,982		13.5	5,726
Total	100	13,419	100	29,015		100	42,434

Note: (1) Chi-square test.

Table B: ACTS – Online Survey Sample Characteristics

	Respondent	
Variable	%	n
Gender		
Male	35.6	1,333
Female	64.4	2,415
Total	100	3,748
Age		
18-29	12.1	456
30-39	11.2	421
40-49	17.8	669
50-59	33.1	1,246
60-69	20.0	751
70-79	5.3	198
80 and over	0.5	18
Total	100	3,759
Ethnicity		
White	98.2	3,690
BAME	1.8	68
Total	100	3,758
Health Board		
Aneurin Bevan	22.1	734
Betsi Cadwaladar	16.1	536
Cardiff & Vale	9.7	323
Cwm Taf	21.5	714
Hywel Dda	14.2	473
Powys	2.9	97
Swansea Bay	13.5	450
Total	100	3,327

Table C: CABINS Wave 1 Telephone Survey Sample Characteristics

	Respondents (n=1,011)	
	%	n
Gender		
Male	46.9	472
Female	53.1	533
Age		
18-29	37.9	322
30-39	17.8	179
40-49	16.2	163
50-59	19.5	197
60-69	8.9	90
70 and over	5.7	57
WIMD [1]		
1	22.1	223
2	22.7	230
3	19.4	196
4	17.5	177
5	18.3	185
Health Board		
Aneurin Bevan	17.1	173
Betsi Cadwaladar	19.3	195
Cardiff and Vale	10.9	110
Cwm Taf Morgannwg	23.4	237
Hywel Dda	7.1	72
Powys	2.4	24
Swansea Bay	19.8	200
Ethnicity		
White	96.0	965
BAME	4.0	40
EPRES [2]		
Low	26.3	229
Moderate	39.7	344
High/ Very High	34.0	295
Living alone [3]		
Living alone	20.1	203
Living with others	79.9	808
Children in household		
Yes	29.3	296
No	70.7	715
Household member developed symptoms [4]		
Yes	35.6	360
No	64.4	651
Household member received letter to shield [5]		
Yes	17.9	181
No	82.1	830

Notes: [1] Welsh Index of Multiple Deprivation; [2] Employment Precariousness Scale; [3] Derived as no other adults living in household [4] Derived as either the respondent or someone in their household developed symptoms; [5] derived as either the respondent or someone in their household received a letter to shield . N/A – data missing from data-set.