

Kent Fire and Rescue Service, an evaluation of the health impacts of Safe and Well Visits

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Produced by

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| 1. Executive Summary

1.1 Introduction

The Public Health Observatory was commissioned by the Kent Fire and Rescue Service (KFRS) to evaluate the health impacts of the Safe and Well Visit programme which extends across Kent and Medway. The evaluation assumes that a systematic assessment of injury risk (including falls and burns) in a domestic setting *and* an assessment of wellbeing with the provision of onward referral opportunities to several health and well-being service providers, will impact positively on avoidable emergency (and other) care utilisation elsewhere in the system.

This assumption is based partly on evidence garnered elsewhere in published literature¹ and partly from an understanding that the Safe and Well Visit programme has undergone a significant overhaul to include a more systematic assessment of well-being alongside a multi-tier referral process where well-being deficits have been identified.

1.2 Key Findings

- Before and after trends covering A&E, Adult Social Care, Out of Hours and GP consultation volumes did not appear to change as a result of the Safe and Well Visit programme
- Comparisons with a randomly selected control group also failed to show significant differences in trend effects
- One explanation for this might be an insufficient post-hoc lag (see comments in discussion section). The KFRS cohort straddled the period Sept. 2016 to Sept. 2017. It may be the case that Safe and Well Visit effects are not ‘produced’ for considerable period post the visit. One way to properly assess this would be to follow-up the Safe and Well Visit cohort over a longer period
- A second important caveat to these findings is that the match cohort does not control for the ‘ecological’ context of the household. Matching was carried out on a one-to-one basis and takes no account of the fact that the KFRS cohort may constitute a more socially isolated cohort than previously understood. A significant element for identification of a Safe and Well Visit referral is bound up in “soft intelligence” as provided for example by family or close associates of the householder. Such tacit knowledge, such as an intimate understanding about frailty or sudden change in the personal circumstances of an individual that is perceived to increase their vulnerability, is simply not captured via routine data collection mechanisms. In this regard, even after matching, additional vulnerabilities are likely

¹ <https://www.gov.uk/government/publications/falls-prevention-cost-effective-commissioning>

not to be reflected in the control group rendering additional weaknesses to the match comparison.

- Poor quality of A&E coding (incident location and diagnostic information) is another cause for concern. So-called diagnostic coding is highly dependent on accurate transmission of contextual information covering the circumstances of the accident etc. not on controlled clinical tests as in the case of patients who are admitted for care. As such it has not been possible to gauge the sensitivity (ratio of false positives to false negative) of A&E clinical coding. We can at best assume that the sensitivity value for the intervention group is approximately equal to the control group.
- Poor coding overall and the cessation of transmission of incident location data from one of Kent's hospital trusts - East Kent Hospitals University Foundation Trust also contributed to a general degrading of the A&E attendance data. It is not clear how this may have affected the measurement of Safe and Well effect.
- An important element of the visit process is the opportunity for the KFRS Home Safety Officer to initiate referrals or signposting to other services for example social services, private sector housing, postural stability classes, falls service or third sector support organisations. This facet of the visit has the potential to positively impact on harm reduction however because it has not been possible to establish whether the referral was actioned by the recipient, no attempt was made to establish referral impact.
- An important factor not considered in this evaluation is the impact of a Safe and Well Visit on social isolation² and there may be some merit in following up on potential effects in a separate study.

1.3 Discussion

The results of this evaluation are disappointing but not surprising. From a methodological perspective, while sufficiently powered, the post hoc lag did not have sufficient follow-up data to provide a reasonable post-hoc cumulative period. For example, we might reasonably expect that the impact of Safe and Well Visits (S&WV) might begin to accrue shortly after the visit occurred.

Assuming an A&E attendance probability estimate of $P(A) = 0.31^3$ for people aged 0-5 and 70 plus and a constant impact rate over the entire period, the modelled reduction estimates across a range of impact effects sizes are provided in Figure 1.

² Loneliness and social isolation as risk factors for mortality: a meta-analytic review
Holt-Lunstad J, Smith TB, Baker M, Harris T, Stephenson D.

³ Based on the KFRS total attendance probability in Kent and Medway for people aged 0-5 and 70 plus (includes non-domestic attendances where attendance category = 1). G:\CED Public Health Department\Health Intelligence & Operational Research\KPHO\KMPHO Team\Gerrard\KFRS_2017\a&E_counts.xlsx

For illustrative purposes Figure 1 shows a range of probability reduction impacts ranging from 10% to 1%. Applying these impacts to the A&E utilisation volume for the KFRS cohort (5697 excluding repeat attendances) results in relatively small numerical reductions in avoided attendances i.e. 10% = 570, 5% = 285, 3% = 171, 1% = 57.

These numbers illustrate that even with a somewhat unrealistic impact expectation of 10% maintained constantly over the entire period, a cumulative total of 570 fewer attendances might be achieved. At the lower end of the impact spectrum (1%) 57 fewer attendances might be expected.

Bearing in mind that these probability impacts relate to total attendances not domestic incidents alone, the actual reductions relating to S&WV on domestic accidents alone (which also end up as an A&E attendance) would be considerably smaller and therefore liable to increased random variation. In short, a longer follow up period is probably required.

Figure 1 Hypothetical S&WV cumulative impacts for the KFRS study cohort (10%, 5%, 3% and 1% probability reductions)

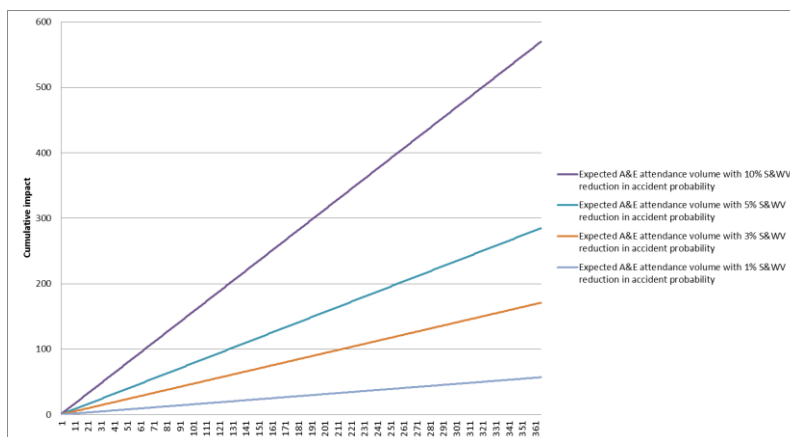
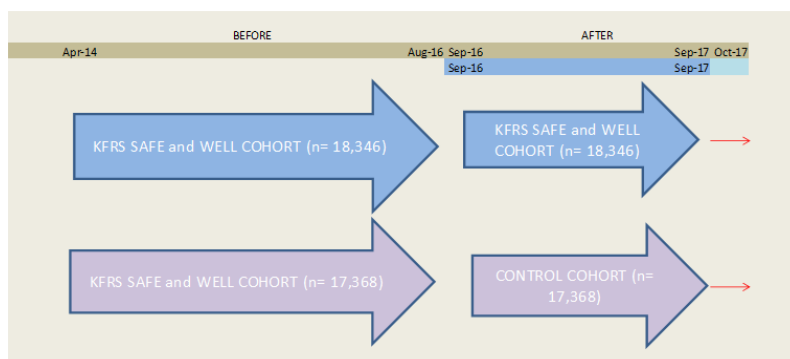


Table 1 Matched cohort schematic



1.4 Background

Home safety visits are a long established KFRS activity. In more recent times, the scope of the visit has been broadened and renamed 'Safe & Well visits' to take account of health and wellbeing issues. For example, visits now incorporate health advice and support to enable people to live safely and independently in their own homes. In this context the KFRS highlight that, 'older people have been identified as a priority as we know that over 70s are significantly more at risk from fire and other risks around the home, such as having a fall.

Local population data for Kent indicates that there are around 200,000 households with someone aged 70 or over living in Kent and Medway⁴.

1.5 Methodology

The original KFRS dataset of 9577 Unique Property Reference Number (UPRN) addresses supplied for the analyses resulted in a final UPRN code set of 8829 (92%). Duplicate codes were excluded from the analysis. This resulted in a KFRS cohort of 18,346 persons i.e. the total number of persons that we were able to identify as being associated with the final UPRN code set. This match rate equates to an average occupancy of 2.1 persons per UPRN.

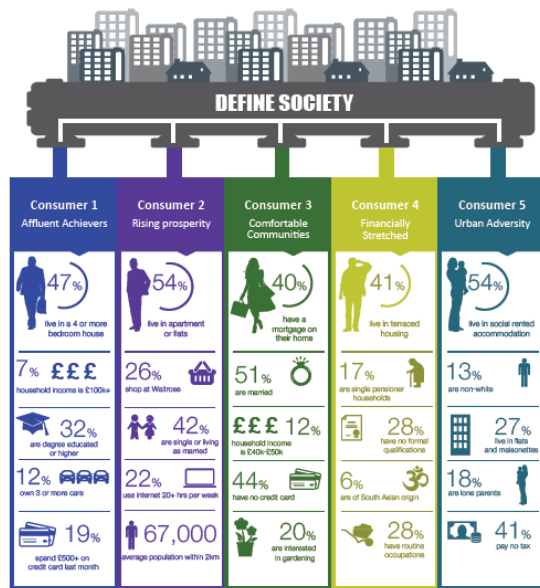
Match criteria used in the analysis were:

- Age (quinary age band)
- Gender
- CACI ACORN general segmentation types
- CACI ACORN Wellbeing segmentation types
- Index of Multiple Deprivation (2015) using the Kent and Medway weighted decile segments (1 most deprived, 10 least deprived)

These variables were selected on the basis that they provide a good spread of factors likely to impact on domestic accident propensity and would therefore serve as good balance in the context of cohort matching. The ACORN match variables have been introduced to provide a more nuanced perspective on wellbeing and socioeconomic status which may not be reflected accurately using Index of Multiple Deprivation (see Figures 1 and 2).

⁴ Case Study Safe and Well Visits, Kent Fire and Rescue service, Richard Stanford-Beale (17 August 2017)

Figure 1 CACI ACORN general segmentation types



Source: CACI

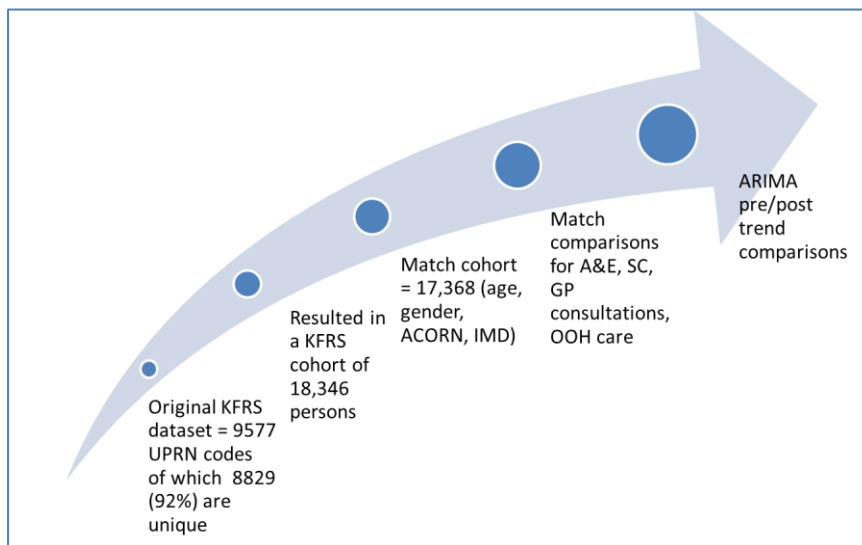
Figure 2 CACI ACORN general segmentation types



Source: CACI

Matching was carried out against a stratified random sample of 200,000 Kent and Medway residents who were not part of the S&WV cohort at the time the sample was extracted from the Kent Integrated Dataset (KID). A final matched control group of 17,368 persons was obtained for analysis.

Figure 3 Method schematic



Once the KFRS and control cohorts were matched, time series data were extracted for each group covering A&E attendances (1st attendance only), Adult Social Care packages, GP consultations and Out of Hours care. Trend analyses were then conducted to assess the extent to which the S&WV programme had impacted on service use. These analyses have been carried out on the 0-5 and 70+ groups only with the assumption that these age bands would be more sensitive to the S&WV activity. Only accident diagnoses 'relating' to Safe and Well Visit activities were included in the analysis (see Appendix 1).

1.6 Results

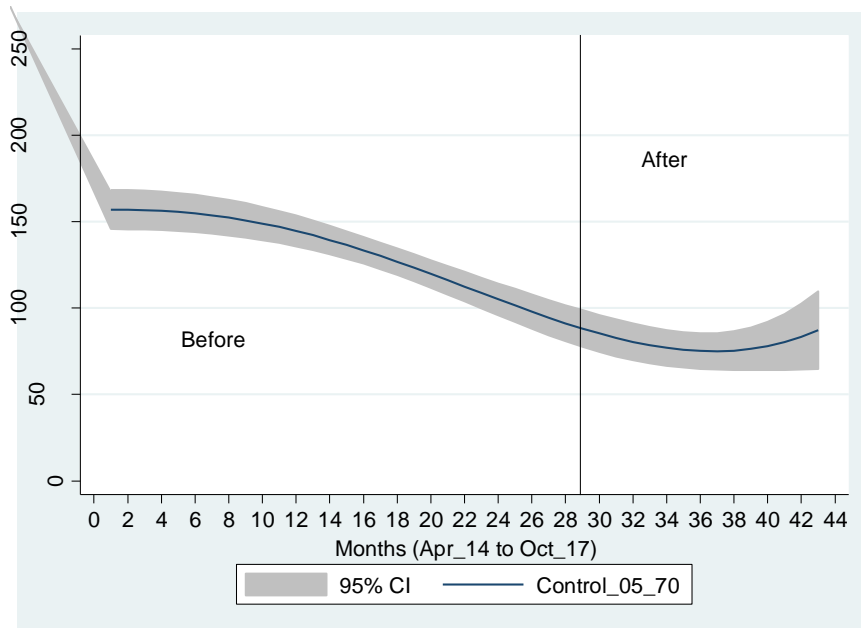
1.6.1 Accident and Emergency attendances

Figures 4 & 5 show the modelled trend data for the before and after S&WV accident and emergency attendances for the 0-5 and 70+ age groups. The most striking feature is the difference in attendance volume between the control and KFRS groups with KFRS exhibiting a lower overall volume in general. The modelled distribution is similar across the cohort period.

The large drop in attendance volumes is caused by one of Kent's hospital trusts discontinuing to submit 'incident location' in their A&E minimum data set. Because of this decision it is no longer possible to distinguish the location of the accident for patients treated at the affected trust.

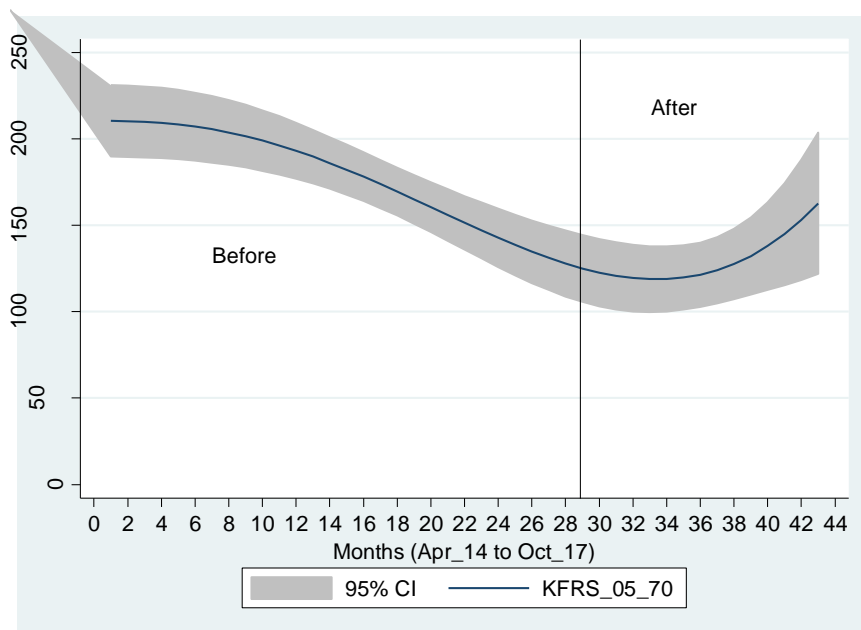
Slope gradient tests showed that there were no significant differences in gradient change before and after (Figure 7).

Figure 4 Modelled Accident & Emergency attendances before and after the Safe and Well Visit Programme (Control Group)



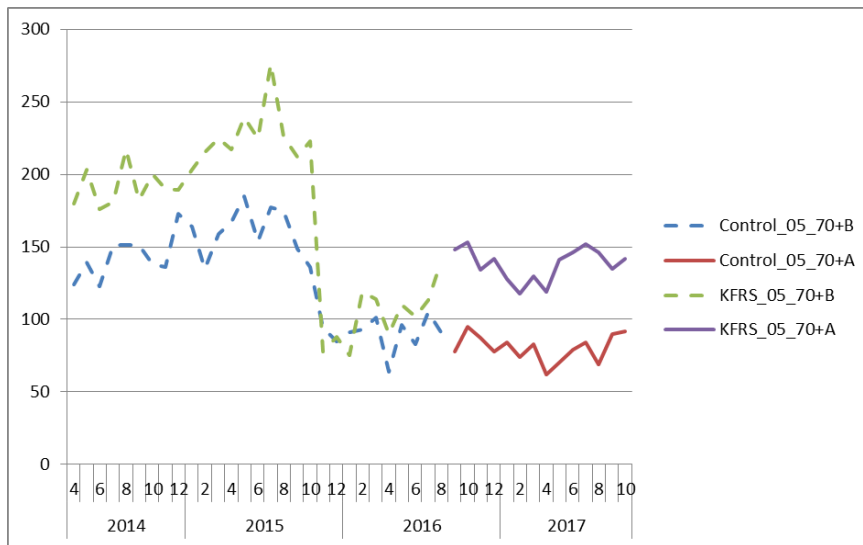
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 5 Modelled Accident & Emergency attendances before and after the Safe and Well Visit Programme (Control Group)



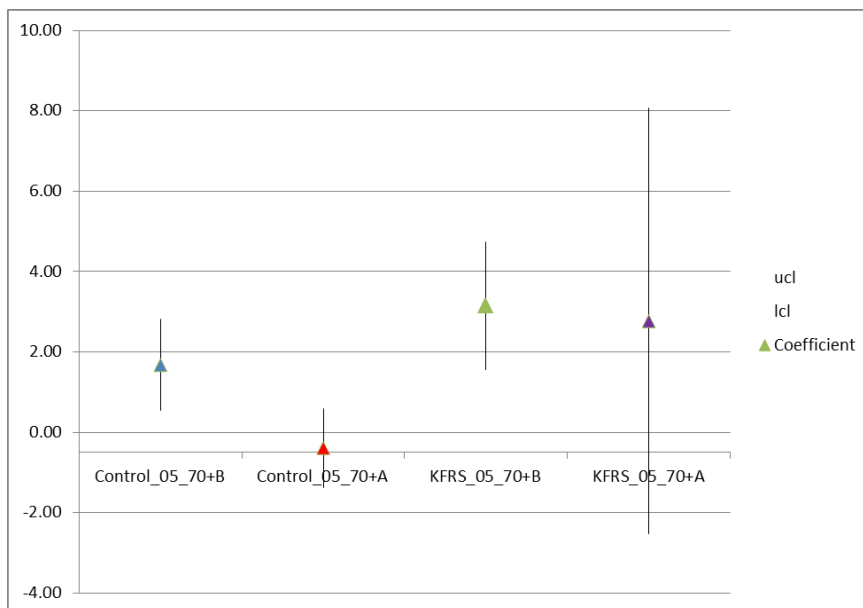
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 6 Unadjusted trend in Accident & Emergency attendances before and after the Safe and Well Visit Programme. KFRS vs Control



Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 7 Trend slope estimates with 95% CI (A&E). KFRS vs Control

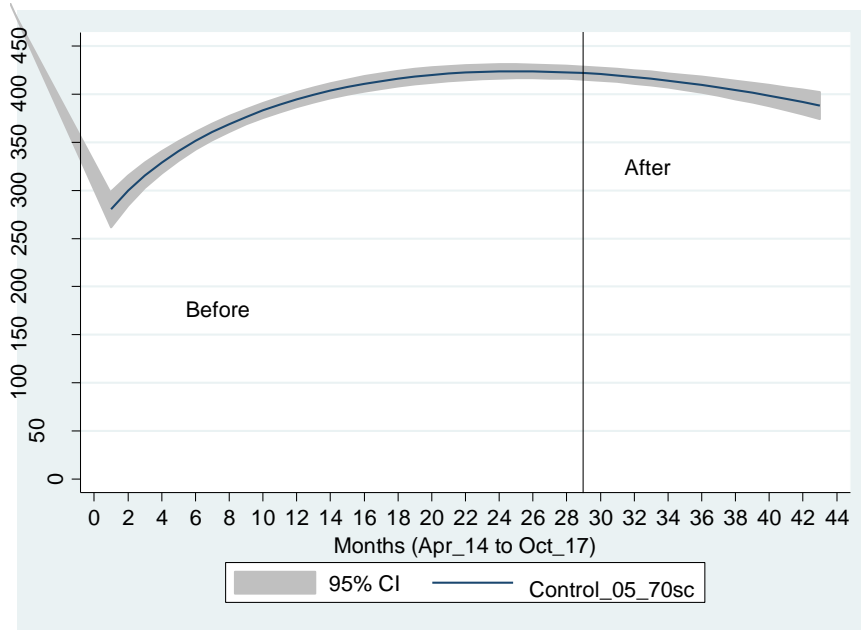


Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

1.6.2 Adult Social Care packages

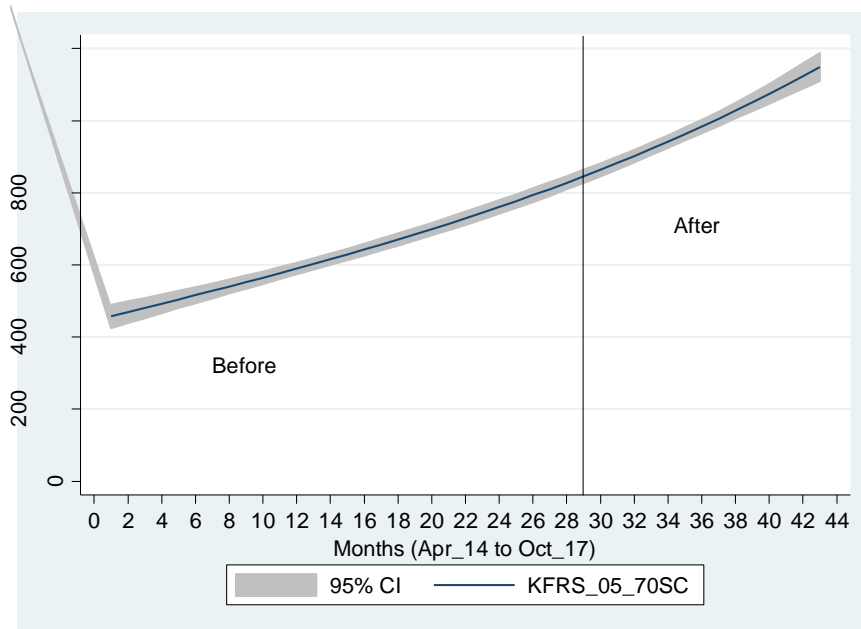
KFRS have significantly higher volumes of Adult Social Care (ASC) use and unlike the control group, this trend has increased over time with some indication of an increase in slope post the S&WV programme. Gradient tests showed that there was no significant change in trend in the post-hoc period.

Figure 8 Modelled Adult Social Care Package uptake before and after the Safe and Well Visit Programme (Control Group)



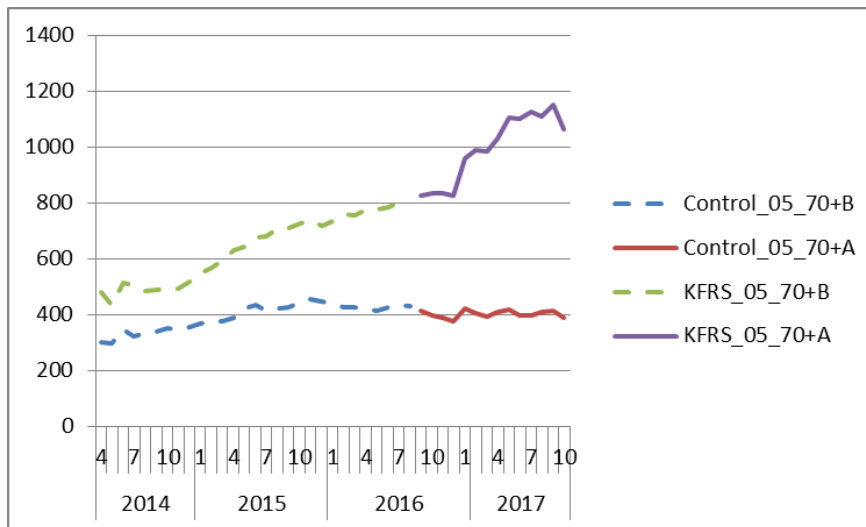
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 9 Modelled Adult Social Care Packages uptake before and after the Safe and Well Visit Programme (KFRS Group)



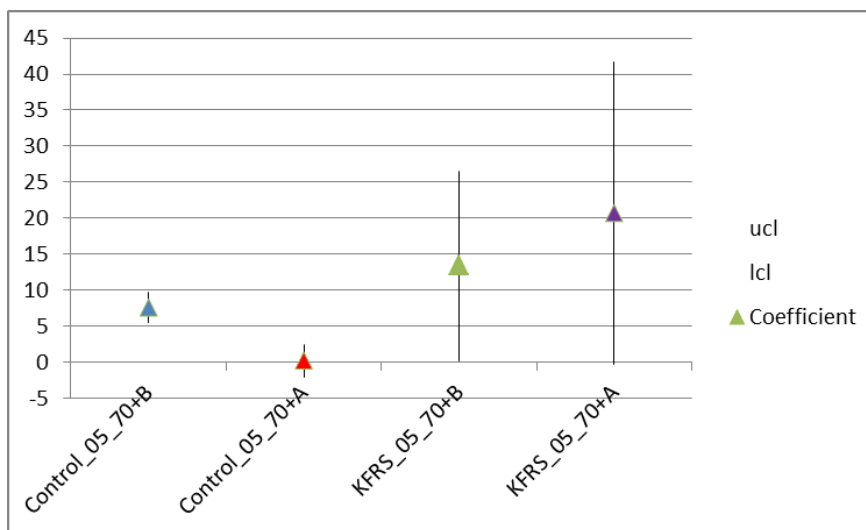
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 10 Unadjusted trend in Social Care Package uptake before and after the Safe and Well Visit Programme. KFRS vs Control



Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 11 Trend slope estimates with 95% CI (ASC). KFRS vs Control

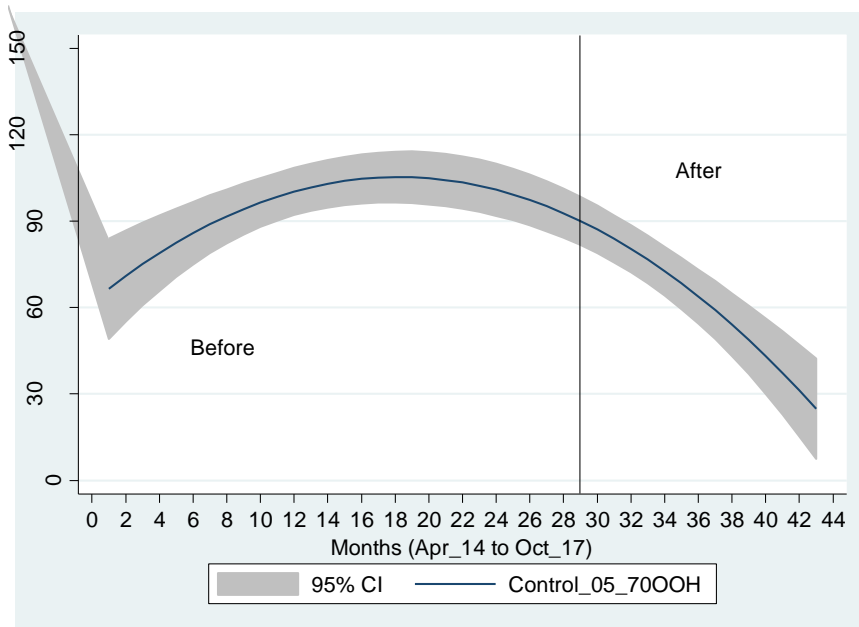


Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

1.6.3 Out of Hours care and GP consultations

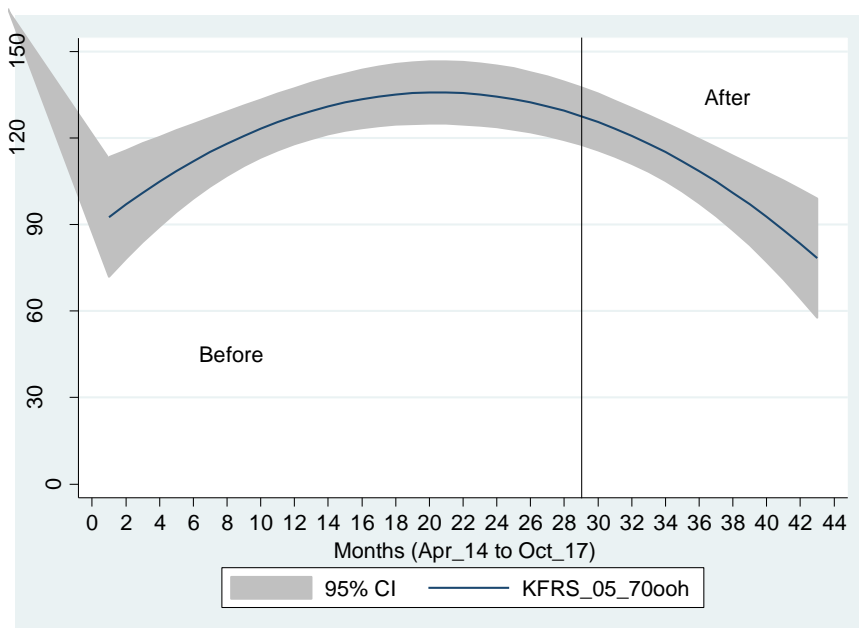
Figures 12-18 show the summary analyses Out of Hours utilisation and GP consultations. No significant difference in trend was observed in the post-hoc period for either service areas.

Figure 12 Modelled Out of Hours care uptake before and after the Safe and Well Visit Programme (Control Group)



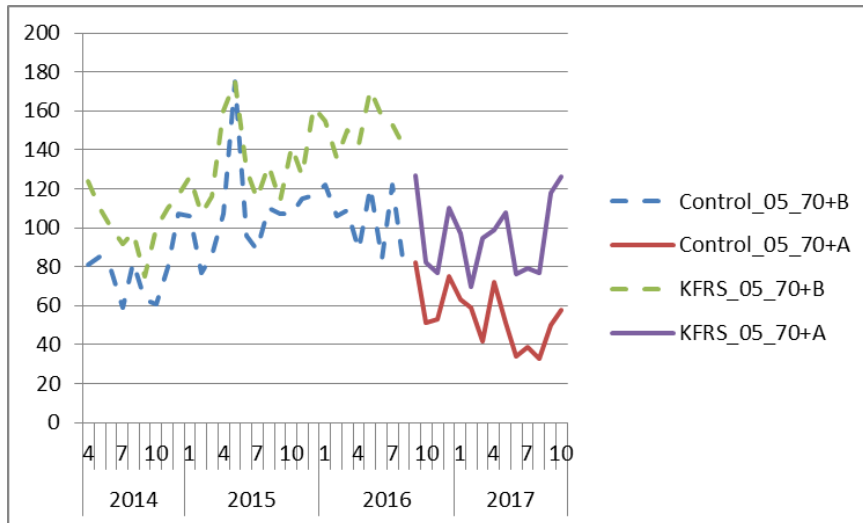
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 13 Modelled Out of Hours care uptake before and after the Safe and Well Visit Programme (KFRS Group)



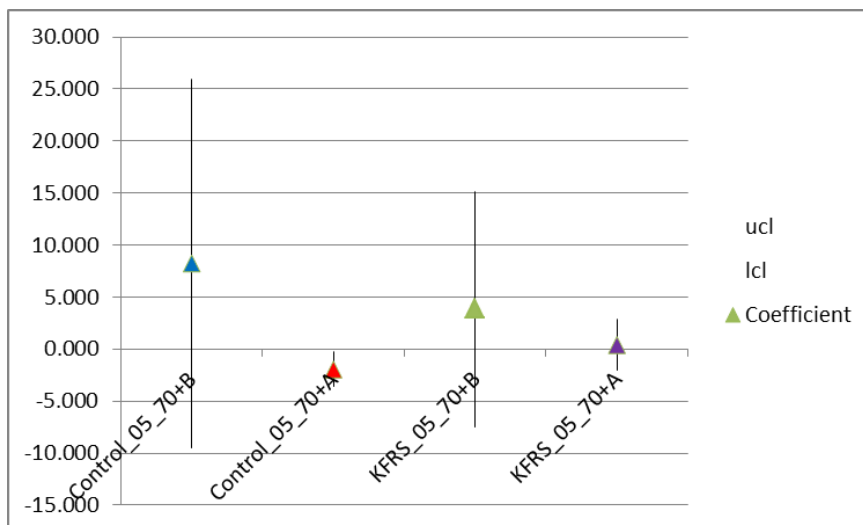
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 14 Unadjusted trend in Out of Hours care uptake before and after the Safe and Well Visit Programme. KFRS vs Control



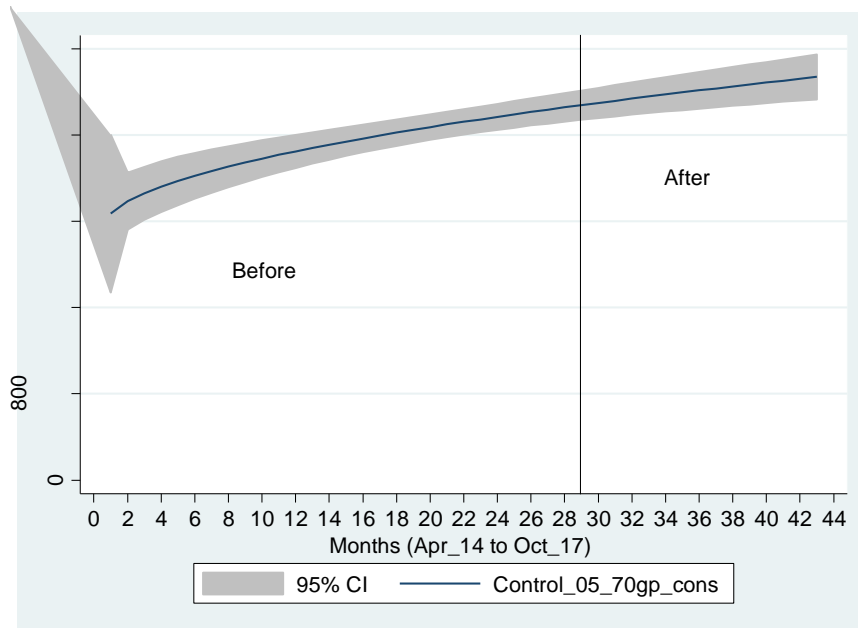
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 15 Trend slope estimates with 95% CI (OOH). KFRS vs Control



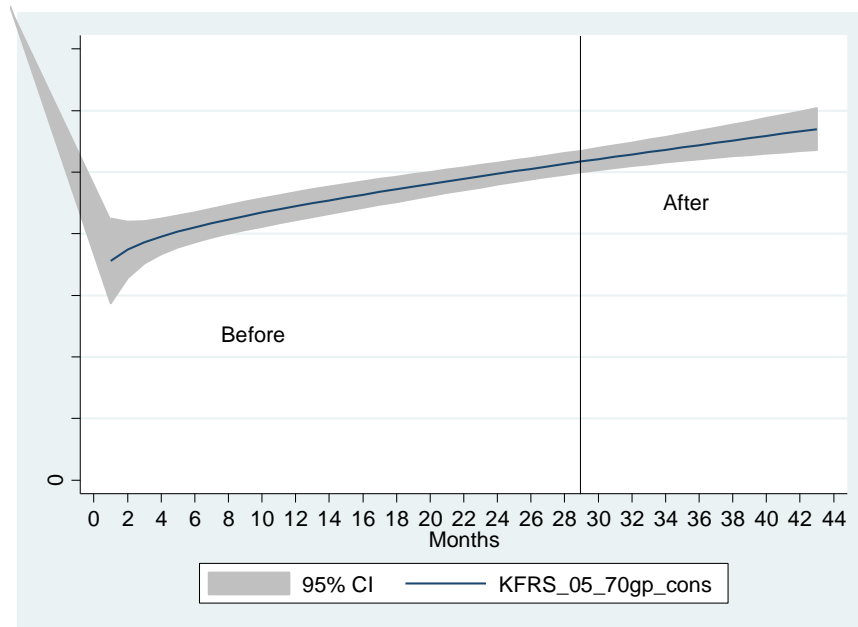
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 16 Modelled GP consultations uptake before and after the Safe and Well Visit Programme (Control Group)



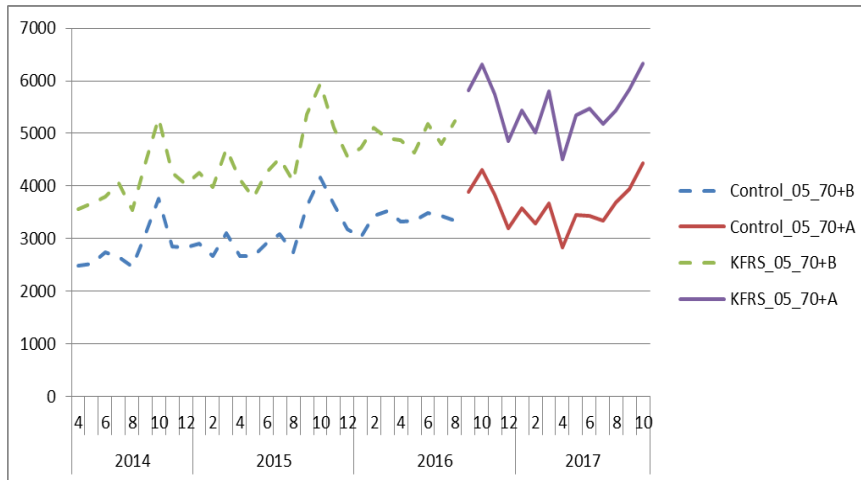
Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Figure 17 Modelled GP consultations uptake before and after the Safe and Well Visit Programme (KFRS Group)



Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

**Figure 18 Unadjusted trend in GP consultations uptake before and after the Safe and Well Visit Programme.
KFRS vs Control**



Source: Kent Integrated Dataset and Kent Fire and Rescue Safe and Well Visit programme

Appendix A

A&E diagnosis codes identified as being potentially amenable to reduction via Safe and Well Visits

Diagnosis Condition	Code	
Laceration	1	KFRS
Contusion/abrasion*	2	KFRS
Soft tissue inflammation	3	KFRS
Head injury*	4	KFRS
Dislocation/fracture/joint injury/amputation*	5	KFRS
Sprain/ligament injury	6	KFRS
Muscle/tendon injury	7	KFRS
Nerve injury	8	KFRS
Vascular injury	9	KFRS
Burns and scalds*	10	KFRS
Electric shock	11	KFRS
Foreign body	12	KFRS
Bites/stings	13	Reject
Poisoning* (including overdose)	14	Reject
Near drowning	15	Reject
Visceral injury	16	KFRS
Infectious disease*	17	Reject
Local infection	18	Reject
Septicaemia	19	Reject
Cardiac conditions*	20	Reject
Cerebro-vascular conditions	21	Reject
Other vascular conditions	22	Reject
Haematological conditions	23	Reject
Central Nervous System conditions* (excluding strokes)	24	Reject
Respiratory conditions*	25	Reject
Gastrointestinal conditions*	26	Reject
Urological conditions (including cystitis)	27	Reject
Obstetric conditions	28	Reject
Gynaecological conditions	29	Reject
Diabetes and other endocrinological conditions*	30	Reject
Dermatological conditions	31	Reject
Allergy (including anaphylaxis)	32	Reject
Facio-maxillary conditions	33	Reject
ENT conditions	34	Reject
Psychiatric conditions	35	Reject
Ophthalmological conditions	36	Reject
Social problem (includes chronic alcoholism and homelessness)	37	KFRS
Diagnosis not classifiable	38	Reject
Nothing abnormal detected	39	Reject