Date: 5th September 2018
Revised: 15th November 2018

Dear Member

SELECT COMMITTEE - LONELINESS AND SOCIAL ISOLATION - MONDAY, 10 SEPTEMBER 2018

I am now able to enclose, for consideration at next Monday, 10 September 2018 meeting of the Select Committee - Loneliness and Social Isolation, the following documents that were unavailable when the agenda was printed.

Agenda Item No

3 **Public Health - Gerrard Abi-Aad (Head of Intelligence), Rachel Kennard (Senior Intelligence Analyst), Amber Povey (Kent Graduate Programme) (Pages 3 - 110)**

(Note: presentation on Social Isolation updated version 15 November 2018)

Yours sincerely

Benjamin Watts
General Counsel

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Kent County Council kent.gov.uk

Social Isolation – scale and scope in Kent

Gerrard Abi-Aad, Head of Health Intelligence, Kent County Council, August 2018

Social isolation a working definition

- Social isolation has been defined as a ‘loss of place within one’s group’. A person who is socially isolated may experience psychological and physical distancing from his or her network of desired or needed relationships’[1]

[1]Biordi and Nicholson Social isolation

Impact of social isolation

- Social isolation, "constitutes a major risk factor for health—rivalling the effect of well established health risk factors such as cigarette smoking, blood pressure, blood lipids, obesity and physical activity[2]"

[2]House, Landis, and Umberson; Science, 1988

How does social connectedness compare in relative terms with other forms health interventions?

- Good levels of social connectedness outstrips mortality risk reduction[3] for:
  - smoking less and smoking cessation for people established CHD
  - Cardiac rehabilitation for people with CHD
  - Reducing Physical inactivity
  - Drug treatment for high blood pressure (>59)

[3]Social Relationships and Mortality Risk: A Meta-analytic Review, Julianne Holt-Lunstad, Timothy B. Smith, J. Bradley Layton

How generalisable are these impacts?

- Good levels of social connectedness outstrips mortality risk reduction[3] for:
  - overall effect remained consistent across a number of factors, including age, sex, initial health status, follow-up period, and cause of death, suggesting that the association between social relationships and mortality may be general, and *efforts to reduce risk should not be isolated to subgroups such as the elderly*.

[3]Social Relationships and Mortality Risk: A Meta-analytic Review, Julianne Holt-Lunstad, Timothy B. Smith, J. Bradley Layton

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How did we identify the scale of social isolation in Kent?

Wellbeing Acorn types with a high isolation index

- Type 1: Limited living
- Type 2: Poorly pensioners
- Type 3: Hardship heartlands
- Type 5: Countryside complacency
- Type 6: Dangerous dependencies
- Type 7: Struggling smokers
- Type 9: Everyday excesses
- Type 10: Respiratory risks
- Type 11: Anxious adversity
- Type 12: Perilous futures
- Type 14: Rooted routines

"Health challenges… oldest people… prescribed medicines… high blood pressure… diabetes, heart problems and asthma… smokers… low alcohol consumption… social renting… routine occupations…"

"Retired people… social rented… poor diet… heart attack or angina… smokers… health hinders daily activities… inadequate heating… in receipt of benefits…"

"Rural and semi-rural areas… income below £20,000… rented homes… damp walls… illnesses typical of older populations… obesity, very high cholesterol… good mental wellbeing…"

The Report

Using Acorn Wellbeing & the Kent Integrated Dataset (KID) to identify and analyse older people more likely to be experiencing social isolation and loneliness

September 2018

Produced by

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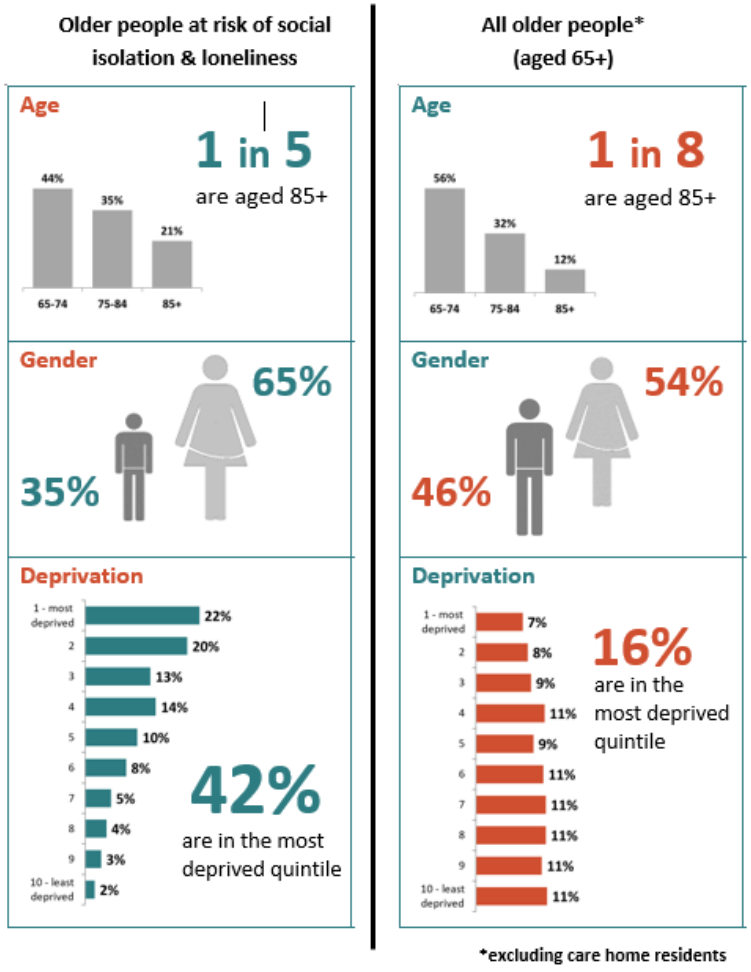
Status: Draft

Kent residents aged 65+ who live alone and who fall into a Wellbeing type more likely to be socially isolated/lonely.

Wellbeing Acorn type	Total population (KID)	Aged 65+ (KID)	Aged 65+ and live alone (KID)
1 Limited living	12,628	7,577	5,094
2 Poorly pensioners	31,545	8,377	3,753
3 Hardship heartlands	55,640	7,941	3,443
5 Countryside complacency	54,542	9,214	2,677
6 Dangerous dependencies	11,060	1,218	412
7 Struggling smokers	36,133	2,382	558
9 Everyday excesses	157,184	17,403	5,766
10 Respiratory risks	21,106	3,408	985
11 Anxious adversity	58,587	6,037	1,551
12 Perilous futures	34,242	4,207	1,428
14 Rooted routines	85,948	12,802	3,810
Total	558,615	80,566	29,477

This represents 9.5% of the 65+ population of Kent (2017). Independent research by the Campaign to End Loneliness estimated that around 10% of over 65's are lonely all or most of the time .

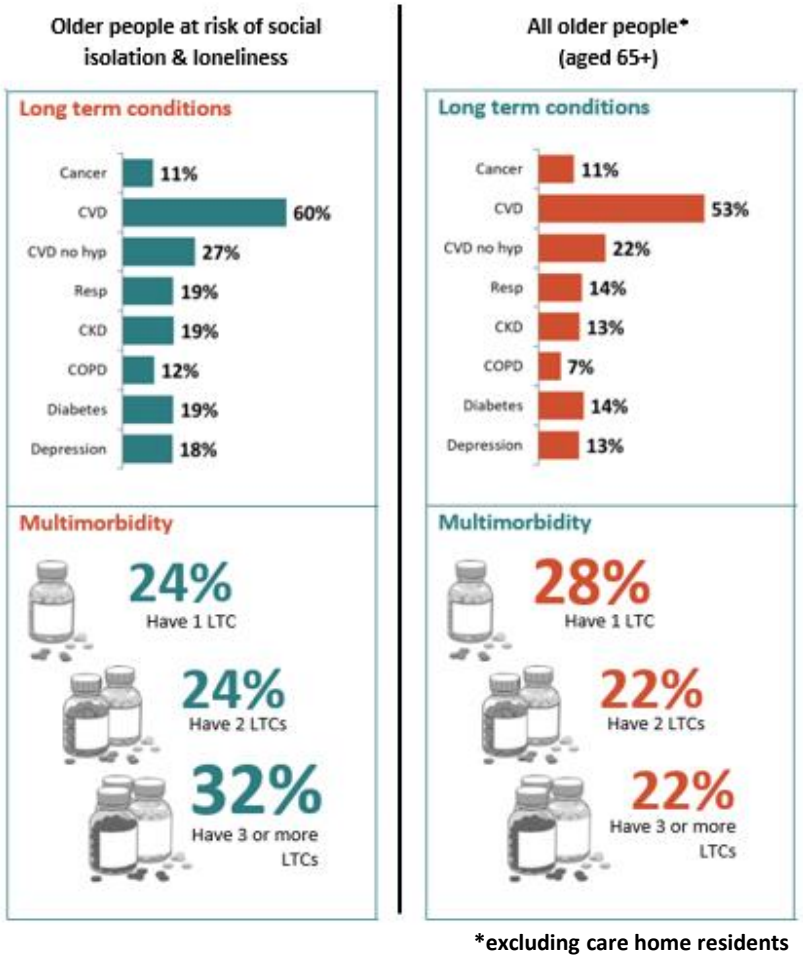
Profiling older people at risk of social isolation and loneliness (socio-demographics)



People with a higher probability of being socially isolated are:

1. older than the overall 65+ population of Kent,
2. more likely to be female,
3. and much more likely to be living in a deprived neighbourhood

Profiling older people at risk of social isolation and loneliness (long term clinical conditions)



*excluding care home residents

Older people in Kent identified as being at risk of social isolation and loneliness are:

1. more likely than the overall 65+ population of Kent to have a range of long term conditions , including

cardiovascular disease (AF, CHD, heart failure, hypertension, PAD and stroke combined),

respiratory disease (COPD and asthma combined),

chronic kidney disease,

diabetes,

and depression,

1. more likely to be multimorbid (i.e. have two or more long term conditions).

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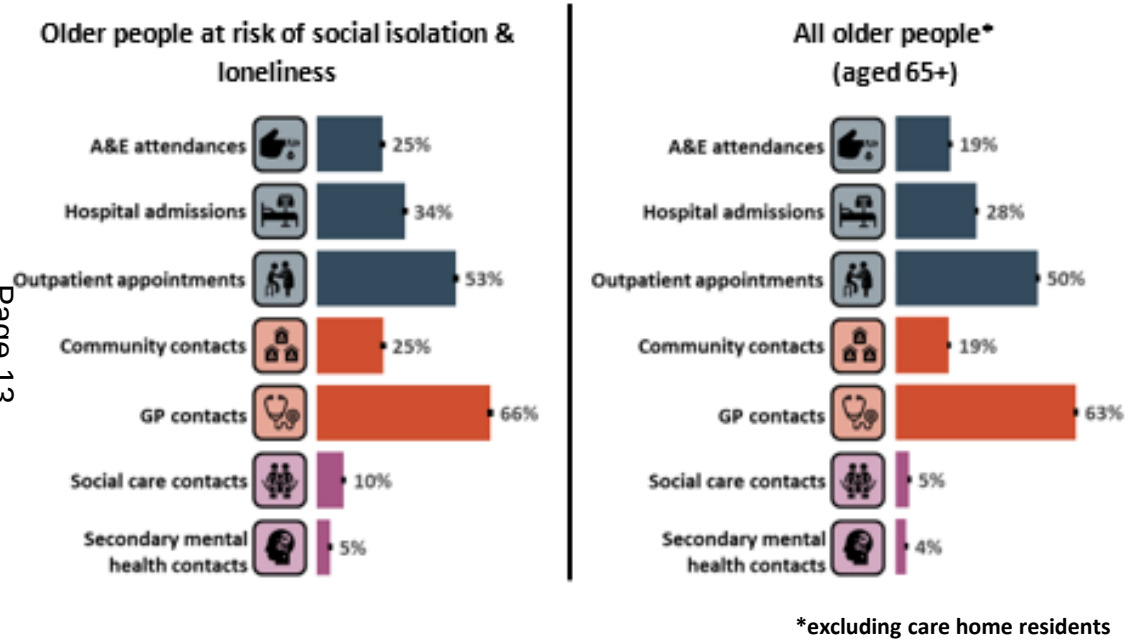
Profiling older people at risk of social isolation and loneliness (service utilisation)



Older people in Kent identified as being at risk of social isolation and loneliness are more likely than the overall 65+ population of Kent to:

1. have attended A&E,
2. have been admitted to hospital,
3. have had contact with community health services and, social care

Profiling older people at risk of social isolation and loneliness (risk of NEL admission and frailty)

Older people in Kent identified as being at risk of social isolation and loneliness are:

1. more likely to be assessed as being in a high risk score group ,
2. more likely to have characteristics recorded by their GP that place them in the 'severe' or 'moderate' frailty groups of the Electronic Frailty Index (EFI)

Social isolation and mortality risk

- US research shows that older people who are socially isolated have a mortality risk that is 31% higher when compared to people who are not socially isolated[1].
- This level of risk was present even after controlling for socio-demographic, health and functional status.

[1]Jonathan G. Shaw et al., "Social Isolation and Medicare Spending: Among Older Adults, Objective Isolation Increases Expenditures while Loneliness Does Not," Journal of Aging and Health, Volume 29, No. 7, October 2017

The cost of social isolation

- The London School of Economics[2] estimates (conservatively) that over a 10 year period the cost of health and social care costs of SI could be in excess of £1,700 per person over a ten year period.
- Furthermore, the costs for older people who are most severely lonely could be in excess of £6,000 lonely older person could cost health and social care services up to £6,000 over 10 years.
- In Kent, assuming the total estimated cohort (29,477) survived a ten year horizon and assuming the lower threshold cost, this would equate to around £50m over a ten year period or £5m per year.

[2]Making the economic case for investing in actions to prevent and/or tackle loneliness: a systematic review. September 2017, David McDaid, Annette Bauer and A-La Park, Personal Social Services Research Unit, London School of Economics and Political Science

What to do?

What is return on investment?

- Method that monetises the benefits gained from running a PH intervention and expresses them relative to the initial investment
- For example, for every £1 that is spent on a specific public health intervention, how much of a return can be expected?

Conclusions

1. Using a linked data approach based on the Kent Integrated Dataset (KID), circa 30,000 people have been identified as having higher SI propensity.
2. As a proportion of the over 65's in Kent, this figure is similar to the findings established in independent research.
3. When compared with persons aged 65 and over who are not living in a socially isolated context they are more likely to be older, female, deprived, multimorbid, more intense users of acute and community health services, have higher NEL readmission risk and frailty severity.
4. The financial consequences of even moderately isolated people are significant and for people who are more profoundly isolated are potential huge (£6k per person per year).

SI interventions and their potential ROI

- **Befriending (face to face and telephone services)**
  - Mixed cost-effectiveness evidence
  - A befriending initiative for family carers of people with dementia in England was found to be highly cost ineffective[1]
  - An intergenerational befriending scheme was found to have a return on every £1 invested of up to £4.56[2]
- **Participation in social and healthy lifestyle activities**
  - Cost-effectiveness evidence is also mixed
  - In a study in Finland where lonely older people participated in group activities, costs avoided were greater than the costs of delivering the intervention[3]
  - Another study looking at the impacts of participation in a programme to promote better health and wellbeing reduced costs but led to poorer quality of life outcomes[4]
- **Signposting/navigation services**
  - Encouraging evidence of cost-effectiveness
  - Study evaluating the signposting of those who self-identify as lonely reported a modest return of £1.26 for every £1 invested[5]
  - Increases to £2-£3 for every £1 invested when benefits linked to improved physical health are considered

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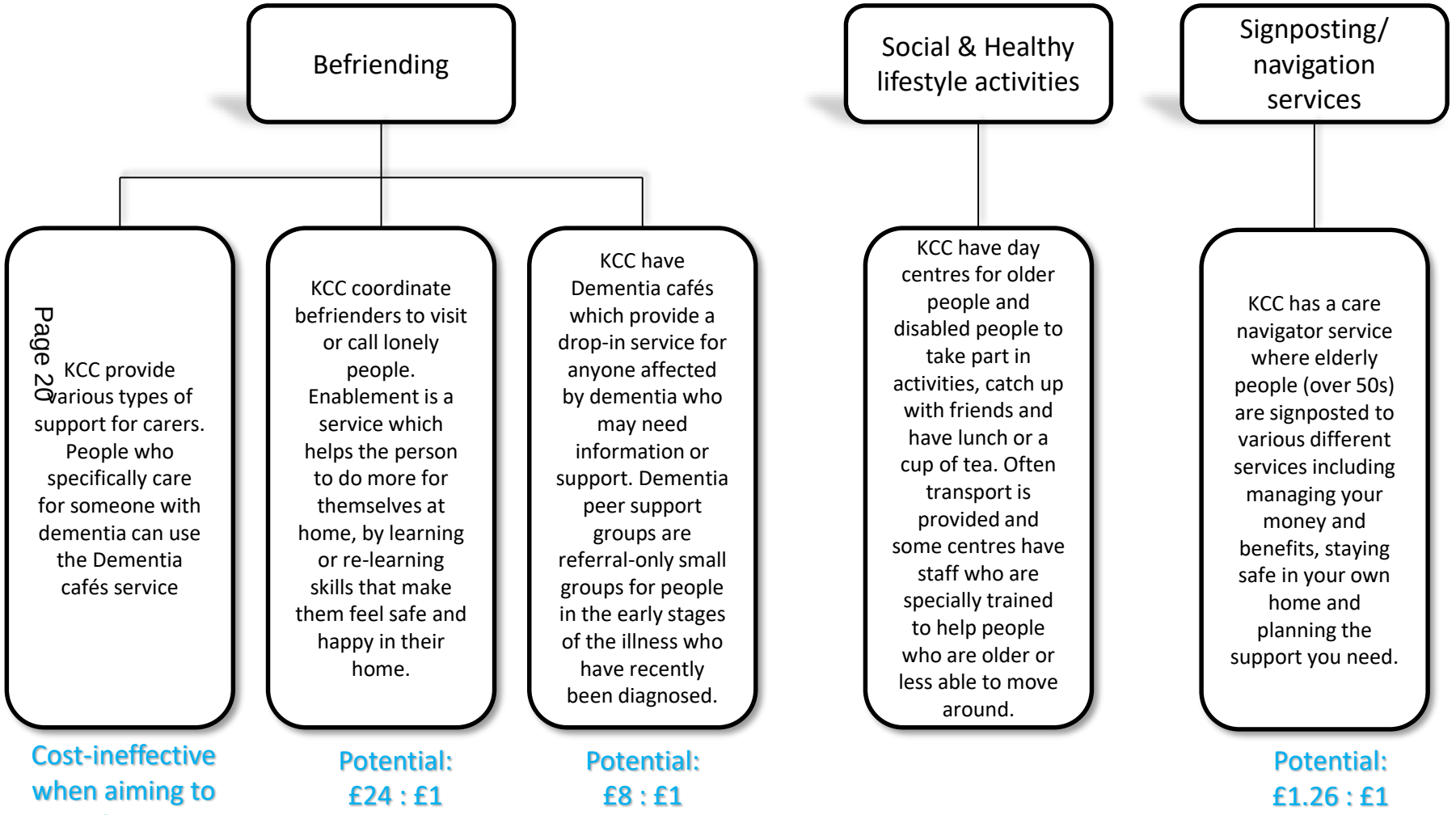
Current Kent context



SI interventions and their potential ROI

- Current evidence shows signposting and navigations service are more likely to be cost-effective
- Mixed evidence of the return on investment of befriending services and group activities
- Those interventions which were able to effectively target people who are lonely and/or socially isolated showed to highest potential for cost-effectiveness

ROI Caveats

- Kent context is not the same as the studies shown, therefore ROI is likely to vary when applied to Kent
- Some ROI figures here are based on small-scale qualitative data and should therefore be treated with caution
- Different assumption used in different studies mean estimate for ROI can vary and need to be applied carefully in a Kent context to have meaning.

The human cost of being socially isolated

Acknowledgements

- Rachel Kennard, Amber Povey, Gaetano Romagnuolo,

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Return on Investment for public health interventions:

social isolation, sexual health, health visiting, mental health and NHS Health Checks

September 2018

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1. Executive Summary

2. Introduction & Background

2.1 ROI in a public health context

The return on investment (ROI) of a public health intervention is a method that monetises the benefits gained, if any, and expresses them compared to the initial investment. For example, for every £1 that is spent on a specific public health intervention, how much of a return can be expected? Some of these benefits are expressed in terms of health, e.g. diagnoses averted, but some are expressed in a social gain context, such as a productivity gain. ROI allows the returns from different interventions to be compared and gives merit to those that are not necessarily cost-saving, but that result in societal benefits.

This report will also talk about the cost-effectiveness evidence of public health interventions which compares the relative costs and outcomes of two or more courses of action. In health economics, the most common way to assess cost effectiveness is to complete cost-utility analysis, where the benefits are expressed in terms of quality-adjusted life years (QALYs) gained. A QALY is equivalent to one year of life in perfect health and is calculated by estimating the years of life a person has left after an intervention and weighting every year with a quality of life score from 0 to 1. This is based on the persons ability to carry out daily activities and freedom from pain and mental disturbance. NICE recommends that any treatment under the threshold of £20,000 to £30,000 can be considered cost effective[1].

It is important to consider ROI in a public health context alongside other methods of appraisal. Using ROI as a measure of an interventions effectiveness allows consideration to be given to the effectiveness – how well an intervention works in a specific setting, the time period over which the benefits will materialise, the initial cost of setting up the intervention as well as the running costs and the 'perspective' of the analysis which details the costs and benefits included and who these are attributed to. The advantage of this the ability to attribute any benefits to different sectors of society, for example the local authority or central government[2].

This review of economic evidence focuses on six types of public health intervention; social isolation, sexual health, health visiting, mental health, smoking & tobacco, and health

[1] NICE Glossary. https://www.nice.org.uk/glossary?letter=q
[2] NICE, Incorporating health economics. https://www.nice.org.uk/process/pmg4/chapter/incorporating-health-economics

checks. These areas have been identified as important from a Kent perspective, therefore a summary of the cost effectiveness evidence would be beneficial.

2.2 Health economics: evidence resource

The main basis of the economic evidence presented in this report is Public Health England's (PHE) Health Economics Evidence Resource (HEER)[3]. This resource is a collection of the latest cost-effectiveness and return on investment evidence for several public health interventions. The HEER was published in September 2017 and all the evidence included had been quality assured by PHE.

The HEER holds evidence related to interventions across activities in the ringfenced public health grant and contains relevant, localised cost-effectiveness evidence. In order to ensure the evidence presented is of a good quality, PHE have only included sources that:

- Have been published in the last five years
- Are widely referenced in public health research
- Have been quality assured by the PHE Health Economics team and policy teams

The whole of the HEER has also been quality assured by external academics to ensure the validity of the evidence included.

When studying the evidence included in the HEER, PHE recommend that it is important to consider:

- Where the study was conducted
- The target population
- The costs and benefits included
- How costs and benefits are discounted
- How long the intervention lasted and was evaluated for
- The similarity of the setting of the study to the target setting

Consideration of these factors will ensure that any cost-effectiveness analysis or return on investment estimate translated well to the chosen setting. For example, these things would need to be taken into account when looking at the evidence provided in a Kent context.

[3] Public Health England, Health economics: evidence resource. https://www.gov.uk/government/publications/health-economics-evidence-resource

3. ROI Evidence

3.1 Social isolation

Social isolation and loneliness have been shown to have an adverse effect on both physical and mental health. Many studies demonstrate the link between social isolation and depression. Loneliness is also a risk factor for physical health conditions such as coronary heart disease and stroke with some studies reporting evidence of an increased risk of premature mortality in people who identify as being highly lonely.[4] Table 1 shows some of the available evidence related to the prevalence of social isolation and/or loneliness. The prevalence varies from study to study but most evidence agrees that loneliness is an issue that needs focus in the UK. One of the main risk factors is shown to be age, with older people much more likely to be socially isolated or identify as lonely. As Kent faces an aging population, it is important to analyse the cost effectiveness evidence for interventions that target social isolation.

Table 1

Evidence Source	Location	Date	Prevalence	Risk Factors
An overview of systematic reviews on the public health consequences of social isolation and loneliness	Worldwide	29th July 2017	Difficult to gather precise estimates of social isolation prevalence because of variation across the life course, cultural and gender differences, and the use of many different measurement scales. Surveys in Europe and the USA estimate that in the elderly, the prevalence of loneliness ranges from 5% to 43%. The figures are similar for China.	Loneliness may be more common in the elderly, although the included reviews were inclusive. Effect of ethnicity on social isolation and loneliness was also inconclusive.

[4] McDaid, D., Bauer, A. and Park, A. (2017). Making the economic case for investing in actions to prevent and/or tackle loneliness: a systematic review.

Insights into Loneliness, Older People and Well-being	Great Britain	1st October 2015	29.2% of people aged 80 or above report high levels of loneliness (loneliness score of 6 or more out of ten). This is much higher than levels reported by younger people, with 14.8% of 16-64 year olds and 15.5% of 65-79 year olds reporting high levels of loneliness. The average loneliness rating for over 80s is 3.3 out of 10 compared to 2.1 out of 10 for 16-64s and 1.9 out of 10 for 65-79s. Because 1 in 12 of the population is predicted to be aged 80 and over by 2017, loneliness is going to become more of a problem over time.	People who live on their own are more than twice as likely to report feeling lonely (30.8% compared to 12.6%). People who report bad or very bad health are 2.5 times more likely to report feeling lonely (34.7% compared to 13%). People who are widowed are much more likely to report feeling lonely than people who are married (34.7% compared to 9.6%). People who rent from a local authority or housing association are more likely to report feeling lonely than others (21.8%).
Loneliness in Older Persons: A predictor of functional decline and death	United States	23rd July 2012	Prevalence rates of loneliness may be higher in the elderly. Loneliness was defined as consisting of three elements, feeling left-out, feeling isolated and lacking companionship. 43.2% of participants reported feeling lonely (reporting one of the loneliness items at least some of the time). 13% reported that they felt lonely often.	Age is stated as the main risk factor for being lonely, as prevalence rates have been shown to be higher. Lonely participants were more likely to live alone. Lonely participants were more likely to be depressed.
Measuring National Well-being - Older people and	England	11th April 2013	Loneliness is widely prevalent throughout society among people in marriages or relationships and among those who have families and successful careers.	A higher percentage of women than men reported feeling lonely some of the time or often in each age group. Those with a long standing illness which

<table>
<tr>
<td>loneliness</td>
<td></td>
<td></td>
<td>Frequency of feeling lonely: by age group, 2009–10
<table>
<tr><th></th><th>Some of the time</th><th>Often</th></tr>
<tr><td>52–59</td><td>26%</td><td>8%</td></tr>
<tr><td>60–69</td><td>23%</td><td>6%</td></tr>
<tr><td>70–79</td><td>24%</td><td>8%</td></tr>
<tr><td>80 and over</td><td>29%</td><td>17%</td></tr>
<tr><td>Total 52+</td><td>25%</td><td>9%</td></tr>
</table>
Loneliness is more prevalent in women than men for all age groups.</td>
<td>limits them in some way were shown to have much higher reported loneliness levels (27% of people with no long standing illness reported feelings on loneliness compared to 45% of those with long standing illness with limitations.)

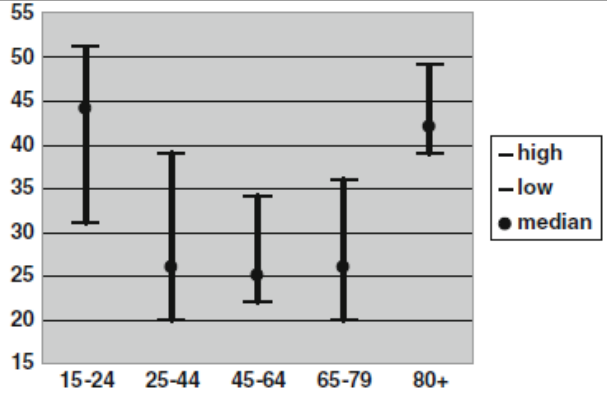
Marital status, household size, health status and disability all has an impact on prevalence of loneliness in over 52s.</td>
</tr>
<tr>
<td>Older adult loneliness: myths and realities</td>
<td>Europe</td>
<td>4th April 2009</td>
<td> 

Fig. 1 Reports of loneliness, by age (%). Based on findings reported in De Jong Gierveld (1998), Perlman and Peplau (1984), Pinquart and Sörensen (2001)

Percentage of age groups reporting that they are often</td>
<td>Table 1 Older adults who often feel lonely, by country (%)
<table>
<tr><td>Denmark</td><td><5</td></tr>
<tr><td>Finland, Germany, Netherlands, UK</td><td>5–9</td></tr>
<tr><td>Belgium, France, Ireland, Luxembourg, Spain</td><td>10–14</td></tr>
<tr><td>Italy, former Yugoslavia</td><td>15–19</td></tr>
<tr><td>Greece, Portugal</td><td>>19</td></tr>
</table>
Based on findings reported in Jylhä and Jokela (1990), Walker (1993)

Loneliness prevalence varies hugely by geography.</td>
</tr>
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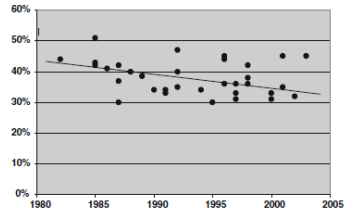
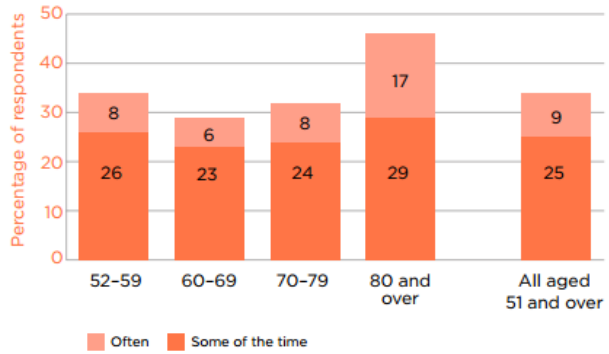
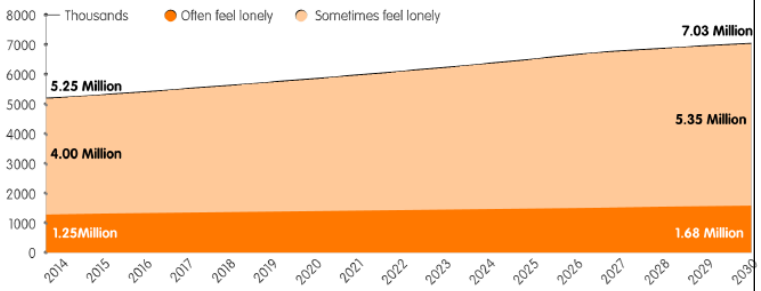
			lonely.	 Fig. 3 Repeated cross-sectional assessments of loneliness in the Netherlands (% lonely). Based on findings reported in Van Tilburg (2005) Loneliness appears to shown a slight downward trend from 1980 to 2005.
Response to call for evidence on age and social isolation from the Equal Opportunities Committee	Glasgow, Scotland	12th March 2015	Looked at areas of urban deprivation, with 40% of respondents reporting occasional or frequent feelings of loneliness in the preceding fortnight compared to 45% of people in a national survey. However frequent loneliness is higher in the areas of urban deprivation in both men (17% compared with 11%) and women (15% compared with 10%). Loneliness was most common for people living alone or with long-term conditions or disabilities (25% of single adults and 20% of single people over 60 years old were frequently lonely) and those of working age, those with no qualifications and those not in employment, training or education.	Those living in the most deprived 20% of neighbourhoods reported higher levels of social isolation (10%) in comparison with those living in the least deprived neighbourhoods (6%). People who used less local amenities and those who rated their neighbourhood environment as lower quality were more likely to report occasional or frequent loneliness. Those who reported more antisocial behaviour problems in their area, or felt unsafe walking at night, were more likely to report loneliness. Those who had contact with family members once a month or less were 90% more likely to feel frequently lonely than those who had contact most days.

Social isolation and loneliness in the UK with a focus on the use of technology to tackle these conditions	United Kingdom	21st April 2017	 Source: *English Longitudinal Study of Ageing*, Wave 5, 2009-10. Frequency of loneliness in people in the UK. More prevalent in the older generations, however can occur at all staged of life-course. Forecast of Numbers of 60s suffering loneliness, 2014-2030: 	People aged over 80 are more than twice as likely to suffer severe loneliness when compared to younger age groups. 4% of those married and aged over 50 reported being regularly lonely, 22% of widows are often lonely. Low income is an important predictor of loneliness: lower levels of mobility, less access to technology and reduced ability to participate in leisure activities. 23% of disabled people feel lonely most days, rising to 38% for young disabled people.
The Lonely Society?	United Kingdom	2nd May 2010		Pensioners are more at risk due to bereavement, ill health and poverty. Elderly people may be less socially engaged than previously.

	Gender			Age			
	Total	Male	Female	Total	18-34	35-54	55+
Base	2256 100%	1098 100%	1158 100%	2256 100%	650 100%	798 100%	808 100%
Often	239 11%	119 11%	121 10%	239 11%	75 12%	90 11%	74 9%
Sometimes	778 34%	332 30%	446 38%	778 34%	290 45%	280 35%	209 26%
Rarely	752 33%	352 32%	400 35%	752 33%	203 31%	256 32%	293 36%
Never	486 22%	295 27%	192 17%	486 22%	82 13%	172 22%	232 29%

			11% say they feel lonely often, 10% don't have company when they want it. 24% worry about feeling lonely, this is more commonly felt by those aged 18-34 (36%, compared to 17% of those over 55).	Social isolation can lead to feelings of loneliness but people who are socially isolated are not necessarily lonely.

Table 2 shows the evidence for different interventions targeting social isolation, taken from a systematic review of the evidence conducted by the LSE Personal Social Services Research Unit.[5] The review looks at three types of intervention; befriending, participation in social and health lifestyle activities and signposting/navigation services. In general, the cost effectiveness evidence is mixed, with signposting and navigation services offering the most promising ROI figures when robustness of the evidence is considered.

Table 2

Intervention programme	Type of intervention	Location	Scale of return on investment	Evidence Source
Provide friendship to recently bereaved widows and widowers	Befriending	The Netherlands	Cost per QALY gained of less than £6,390, well under the conventional threshold of £20,000 per QALY gained. When assumptions around the level of effectiveness and costs were varied, 70% of the interventions were still cost effective.	Onrust et al., 2008

[5] McDaid, D., Bauer, A. and Park, A. (2017). Making the economic case for investing in actions to prevent and/or tackle loneliness: a systematic review.

Initiative for family carers of people with dementia	Befriending	United Kingdom (Norfolk, Suffolk, and the London Borough of Havering)	Highly cost ineffective - The mean incremental cost per incremental QALY gained was in excess of £100,000. Uptake of befriending services was not high.	Charlesworth et al., 2008
'GoodGyms' programme brings together runners and older non-runners	Befriending	United Kingdom (Areas across London and Bristol)	Cost per QALY gained of less than £8,000, under the conventional threshold of £20,000 per QALY gained. Conservative return on every £1 invested of up to £4.56 which only looks at health and economic benefits for runners and doesn't consider additional benefits if loneliness is reduced.	Ecorys, 2017
Befriending and Re-ablement Service (BARS) including the utilisation of BARS officers	Befriending	United Kingdom (Merseyside)	Potential return on investment estimate of up to £24 for every £1 invested. However, estimates are based on small scale qualitative data and use different assumptions on potential benefits of befriending rather than actual impacts on health or utilisation of other services	McGoldrick, Barrett and Cook, 2017
Community café targeting lonely and isolated people	Befriending	United Kingdom (Glasgow)	Evaluated using social return on investment approach which estimated a return of more than £8 generated for every £1 invested, however this is an unconventional approach focussing on subjective concepts.	Social Value Lab, 2011
Participation in a range of group activities by lonely and isolated older people in day care centres. These included therapeutic writing, group psychotherapy, group exercise and discussions	Participation in social and healthy lifestyle activities	Finland	Costs avoided were greater than the costs of delivering the intervention; however, the study did not specifically measure any changes in loneliness. The intervention group showed a significant improvement in subjective health, thus resulting in significantly lower health care costs during the follow-up	Pitkala et al., 2009

and art activities				
Participation in a programme to promote better health and wellbeing	Participation in social and healthy lifestyle activities	United Kingdom (rural North Wales and a large urban city in Northern England)	Costs were reduced but the programme led to poorer quality of life outcomes than routine access to health advice. The intervention was designed to improve mental wellbeing rather than tackle loneliness and loneliness was a secondary outcome measure	Mountain et al., 2017
Signposting to various activities targeted at older people who self-identify as lonely	Signposting / navigation services	United Kingdom (different areas in England)	Reported a modest but positive return on investment of £1.26 for every £1 invested over a five-year period when only benefits to related to better mental health are included. When a range of benefits linked to improved physical health and potential delay in cognitive decline are included, return on investment varies between £2 and £3 per £1 invested.	McDaid, Park and Knapp, 2017

3.2 Sexual health

It is important to understand the ROI evidence about sexual health, due to the cost of treatment and complications associated with late diagnosis of sexually transmitted diseases. It has been estimated that the cost to the NHS of unplanned pregnancies is around £240m per year[6], so the evidence surrounding contraception provision is also incredibly relevant. From a Kent viewpoint, it would be beneficial to look at the evidence related to sexual health interventions. This is because of the complexity of the services provided from a local authority perspective, including the variety of different interventions and providers.

Table 3

Intervention	Evidence Source	Details	Benefit-cost ratio?
Contraception –	Bayer HealthCare -	Local authorities are responsible for commissioning most	£11.09: £1

[6] Public Health England (2016). Local Health and Care Planning: Menu of preventative interventions.

Provision of contraception by local authorities, CCGs and NHS England.	Contraception Atlas, 2013	contraceptive services and all prescribing costs, but not GP additionally-provided contraception. Using existing methodology, it is possible to estimate that, based on up-to-date costs of the different contraceptive methods and the proportion of women using each method, for every £1 invested in contraception over £11.09 is saved, whilst that rises to £13.42 for every £1 invested in LARC methods of contraception. The total saving for the NHS in England as a direct result of investment in contraception has been estimated at £6.2 billion in averted outcomes when compared to no contraception. These figures take into account the healthcare costs saved due to unplanned pregnancies avoided in terms of terminations, antenatal and maternity care for NHS England.	For contraception £13.42: £1 For LARC methods of contraception
Contraception - School based group education	Matrix Insight - Prioritising investments in preventative health, 2009	School based group education for increasing rates of condom use and reducing STIs and unwanted pregnancy which cost £157.15 per person. Intervention involved weekly lessons following a health curriculum that highlights the impacts of drug and alcohol use, violence, and sexual behaviour on health. Teaching staff were trained to deliver the program. This resulted in an increase in condom use in sexually active 14-year-old pupils of 9.36 per cent compared to no intervention. Benefits were an additional 0.156 QALYs per sexually active 11-16-year-old receiving the intervention and cost savings of £934 per sexually active 11-16-year-old receiving the intervention due to reduced transmission of chlamydia and associated complications. Cost per QALY gained is £4,965; however, this evidence has been rated as low quality and benefits are assumed to occur more than 5 years after the intervention.	Cost £157.15 per person. Saving of £934 per sexually active 11-16. £5.94: £1 *Provided only sexually active 11-16-year olds are targeted.*
Contraception – Provision of long-acting reversible	Mavranezouli I - The cost-effectiveness of long-acting reversible	Evaluates cost effectiveness of the implant (most effective LARC method) versus the IUD (cheapest LARC method). Costs were estimated from the perspective of the NHS. They included the cost of	ICER of implant versus IUD is £13206 per

contraception	contraceptive methods in the UK, 2008	contraceptive provision and costs associated with outcomes of unintended pregnancy. The overall effect of each evaluated method was determined by its clinical effectiveness and its discontinuation rate. All LARC methods were more effective and less costly than the combined oral contraceptive pill. The incremental cost-effectiveness ratio of implant versus IUD was £13 206 per pregnancy averted at one year of use.	pregnancy averted
Contraception – Intervention to encourage women to use LARC instead of the oral contraceptive pill	Public Health England - Local Health and Care Planning: Menu of preventative interventions, 2016	An integrated commissioning team was set up between Wigan Borough CCG and Wigan Council. They utilise pooled and aligned budgets to commission services effectively, including sexual health. Significant savings to the CCG have been realised since the collaborative commissioning arrangements began, with improvements in uptake of LARC. Provision of LARC for one user over five years costs £514; the oral contraceptive pill costs £456 over the same time period. The intervention would cost around £12 per year per woman moving to LARC from the oral contraceptive pill, plus training costs of £8 per year per woman. For every 1000 women switching to LARC, 291 unplanned pregnancies could be avoided. This represents an average net saving to the NHS of £143 per woman over five years.	Intervention costs £100 per woman over five years with a net saving of £143 *£1.43: £1* *Savings by unplanned pregnancies averted*
Sexual health advice, promotion and prevention activities – Contraception provision to avert Teenage Pregnancy	Teenage Pregnancy Associates - Teenage Pregnancy: The Evidence, 2012	For every £1 the NHS spends on contraception, £11 is saved in abortion, ante-natal and maternity costs. The evidence doesn't go into any further detail about where this figure comes from so might be difficult to attribute this to anything commissioned in Kent. http://teenagepregnancyassociates.co.uk/tpa-evidence.pdf. TPA site no longer exists therefore unable to report any more detail than the above.	£11: £1
Sexual health	NERA Economic	Local authorities commission specialist services, including young	Various different

advice, promotion and prevention activities – Counselling	Consulting - Economic Modelling of Interventions to Reduce the Transmission of Chlamydia and other Sexually Transmitted Infections and to Reduce the Rate of Under Eighteen Conceptions, 2006	people's sexual health, teenage pregnancy services, outreach, HIV prevention, sexual health promotion, services in schools, college, and pharmacies. Various counselling methods were looked at and a cost-utility analysis was performed. • Tailored Skill Sessions, there was an incremental cost for 1000 people receiving the intervention of £16,000 which averted a total of 50 STIs, 5 QALYs were gained. This means an incremental cost per QALY gained of £3,200. • Information and Behaviour Skills, there was an incremental cost for 1000 people receiving the intervention of £72,000 which averted a total of 70 STIs, 7 QALYs were gained. This means an incremental cost per QALY gained of £10,286. • Brief Counselling, there was an incremental cost for 1000 people receiving the intervention of £32,000 which averted a total of 26 STI infections, 3 QALYs were gained. This means an incremental cost per QALY gained of £12,194. • Information, motivation and behaviour skills, there was an incremental cost for 1000 people receiving the intervention of £72,000 which averted a total of 70 STI infections for woman (gaining 7 QALYs) or 40 STI infections for men (gaining 4 QALYs). This means a median estimated cost per QALY gained of £14,143. • Intensive counselling, there was an incremental cost for 1000 people receiving the intervention of £96,000 which averted 40 STI infections. This means a cost per QALY gained of £24,000. • Enhanced Counselling, there was median cost per 1000 people receiving the intervention of £159,200 which averted a median estimate of 36 STI infections, 3.5 QALYs gained. This means an incremental cost per QALY gained of £45,606 • Behavioural Skills Counselling, there was an incremental cost for	QALY costs for the counselling methods.

		1000 people receiving the intervention of £192,000 which averted 20 STI infections, 2 QALYs gained. This means a cost per QALY gained of £96,000. All the benefits (STI aversion) are expressed over a lifetime.	
STI Diagnosis and Treatment – HIV testing	PLOS ONE – The Cost-Effectiveness of Early Access to HIV Services and Starting cART in the UK 1996–2008, 2011 PHE – Local Health and Care Planning: Menu of preventative interventions, 2016.	Local authorities commission sexually transmitted infections (STI) testing and treatment, chlamydia screening and HIV testing. Study based in the UK 1996-2008. Pre-cART HIV services for patients diagnosed early are cost effective with a cost per life year gained of £1,776. Early diagnosis provides better outcomes for cART treatments and is cost effective with a cost of £4,639 per life year gained. Annual costs for cART treatment are around £2,758 for early diagnosis and £6,407 for late diagnosis. Cost savings accrue due to prevented onward HIV transmission and reduced, expensive late diagnosis. Care costs for late stage diagnosis are estimated at £12,800 per patient per year whereas costs for early stage diagnosis are estimated at £10,500. The menu of interventions estimates costs of a HIV test as part of a general hospital admission as £12 per persons per test or £20 in a GP setting. As a result, increasing HIV screening in GP surgeries and hospitals could save £278 million over a 10 year period.	£4,639 cost per life year gained. Menu of interventions estimates £278 million of savings by increasing HIV screening in the 66 LAs with highest diagnosed HIV prevalence.
STI Diagnosis and Treatment – HIV testing	PLOS ONE – Expanded HIV Testing in Low-Prevalence, High-Income Countries: A Cost-Effectiveness Analysis for the United Kingdom, 2014	Annual HIV testing of all adults could avert 5% of new infections, even with no behaviour change following HIV diagnosis because of earlier ART initiation, or up to 18% if risky behaviour is halved. This strategy costs £67,000–£106,000/QALY gained. Providing annual testing only to MSM, PWID, and people from HIV-endemic countries, and one-time testing for all other adults, prevents 4–15% of infections, requires one-fourth as many tests to diagnose each PLHIV, and costs £17,500/QALY gained. 4-15% of new infections	£17,500 per QALY gained for universal high-risk testing and one time low-risk testing.

		averted. A quarter as many tests are required to diagnose people living with HIV. £0.75 per test; 42,900 QALYs gained. Augmenting this program with increased ART access could add 145,000 QALYs to the population over 10 years, at £26,800/QALY gained. 23% of new infections averted. £0.75 per test; 145,000 QALYs gained.	£26,800 for QALY gained as above with increased ART
STI Diagnosis and Treatment – HIV testing	Hutchinson et al. Return on Public Health Investment: CDC's Expanded HIV Testing Initiative, 2012.	The expanded HIV testing initiative increased health department funding for HIV testing, early diagnosis and linkage to care and prevention services. Health departments were required to focus 80% of their activities on promoting opt-out HIV screening in high morbidity clinical settings and 20% of resources could be used to test high-risk populations in nonclinical settings. Used expenditure and outcome data over three years of the program and a mathematical model of HIV transmission to estimate number of transmissions averted based on number of people tested, diagnosed and linked to care. The total amount invested in the programme was $599m, of which £24m was additional funding from sources such as state and local government. Medical care costs from averted infections were estimated at $1,170m resulting in net benefits of $570m. 2.7 million Persons were tested for HIV over 3 years, there was a newly diagnosed HIV positivity rate of 0.7%, and an estimated 3,381 HIV infections were averted. The lifetime HIV treatment cost (used for each transmission averted) was $367,134. The ROI ranged from $1.46 to $2.01 for the 1-year to 5-year alternative testing intervals. ROI values remained above $1, a positive return on investment, with a prevalence of undiagnosed HIV infection as low as 0.12% and with a 25% reduction in transmissions averted.	$1.95: $1
STI Diagnosis and Treatment –	Low et al. Chlamydia control in Europe:	This literature review looks at different studies from around Europe and found that 9 out of 10 of them said chlamydia screening was cost-effective. The study conducted in the UK was "The cost	Chlamydia screening programmes found

Chlamydia screening	literature review, 2014.	effectiveness of opportunistic chlamydia screening in England" and looked at annual opportunistic screening for men and women under 25 years old. Results were dependent on different PID progression probabilities. This is why the research is under review, the higher the estimated probability, the more QALYs lost and benefits may be overstated. The main finding was that opportunistic chlamydia screening is only cost-effective for under 20s or women under 25. The cost per QALY gained when offering: • Annual screening to women under 20 was £9204 • Annual screening to woman under 20 who have changed partners in last 6 months was £13,640 • Annual screening to woman and men was £14,371 • Annual screening to women under 25 was £18,476 These results were when PID progression probability was estimated to be 10%, anything lower than this and screening is no longer cost effective.	to be cost-effective in 9 out of 10 studies.

3.3 Health visiting

Health visiting is a type of support offered to families with a new baby or a child under 5 years old to offer advice and guidance. The service can be delivered at home, or interventions are delivered in a different setting, such as a children's centre. This included initiatives such as the family nurse partnership. Recent studies have found that investment in early childhood development can lead to long term benefits, both for the child and for wider society, lasting beyond childhood.[7]

Table 4

[7] The institute of health visiting (2016). The economics of health visiting: a universal preventative child and family health promotion programme

Intervention	Evidence Source	Details	Benefit-cost ratio?
Pre-school programmes	Department for Education – Conception to age 2-the age of opportunity report, 2013.	ROI on well-designed early years' interventions significantly exceed their costs. Nine UK studies showed a similar pattern of results. Social Return on Investment studies showed returns of between £1.37 and £9.20 for every £1 invested (with an average of £3.65).	£1.37-£9.20: £1
Intervention to help young mothers adopt breastfeeding	C4EO – Grasping the nettle: early intervention for children, families and communities, 2010.	903 young mothers from disadvantaged areas in Blackpool were helped to adopt breastfeeding throughout 12 children's centres. This partnership between the PCT and children's centres led to a 16% increase in Blackpool's breastfeeding rates over a three-year period at a cost of £29,811 or £33 per mother per year. This indicates a social return on investment of £1.56 for every £1 invested, with estimated savings to the Department of Health of £57,500 over a two-year period.	£1.56: £1
Intervention to support young people with severe speech, language and communication needs.	C4EO – Grasping the nettle: early intervention for children, families and communities, 2010.	I CAN Early Talk was a targeted, multi-agency approach to supporting young children with severe speech, language and communication needs, so that they could participate in everyday activities and attend their local primary school – empowering parents as co-educators in a programme that could be delivered in a nursery, children's centre or home in Ashford. In 2008-09, 92 per cent of the children supported attended their local primary school and made good progress, rather than requiring specialist language provision. The success of the programme has led to the development of a peripatetic approach in another part of the county, and to a new partnership between the Council, NHS and I CAN to roll out the full Early Talk model in three other areas of Kent. The programme was delivered to 37 children at a project cost of £46,300, indicating a social return on investment of £1.37 for every £1 invested. This	£1.37: £1

		translates into estimated savings of £17,131 over the anticipated extra costs for these children in the absence of this intervention.	
Children's centre supporting children to achieve goals of 'Every Child Matters'	Action for Children and New Economics Foundation - Backing the Future: why investing in children is good for us all, 2009.	Wheatley Children's Centre in Doncaster provides preventative universal services, more specialized services for referred children, and parenting courses to ensure every child is healthy, safe, enjoying and achieving, making a positive contribution and achieving economic well-being. Predictions for the Wheatley Children's Centre shows that this service is expected to generate £4.60 for every £1 invested. The initial investment used to fund these interventions was recouped within two to three years. (Due to data limitations the SROI calculated on Wheatley Children's Centre is predictive, based on intended outcomes. The principal beneficiary group are low needs children, accounting for 41 per cent of the share of social value. 27 per cent of the total benefit generated by the work of the Centre is for high-needs children. Parents and the state benefit in approximately the same measure from the work of the Centre.	£4.60: £1
Support for families in crisis within children's centres	Action for Children and New Economics Foundation - Backing the Future: why investing in children is good for us all, 2009.	East Dunbartonshire Children's Centre provides short-term, focused and flexible support for children, young people and families in crisis to reduce the number of children being looked after and accommodated, support parents to better meet their children's needs, help children and young people address issues that may be affecting their lives and wellbeing and contribute to assessments of children's needs and parents' capacity to meet these. For every £1 invested in the East Dunbartonshire Family Service – targeted intervention designed to catch problems early and prevent problems from reoccurring – £9.20 worth of social value is generated. Approximately 93 per cent of the benefits to the state	£9.20: £1

		come about through reduction in foster care costs. A further four per cent are saved in other children's costs, resulting in 97 per cent of state savings being gained by the Children, Young People and Social Care sub-division of the Education department. A further three per cent of savings are gained by Justice, Backing the Future 49 with negligible proportions of the savings being gained by the health service or through increased tax revenues and decreased benefits payments.	
Support groups targeted at families with particular needs, such as English as an additional language.	Mason, Salisbury, Mathers – The Value of Early Intervention: findings from Social Return on Investment research with Barnardo's children's centres, 2012.	Stay and Play is a service that is commonly delivered in Barnardo's children's centres, in this case in Bournemouth. Stay and Plays' are play and family support groups for parents and carers with their children. They form part of the universal (open to all) provision to support family learning and offer parents opportunities to: build networks of support with their peers; receive parenting and childcare advice and guidance from Children's Centre staff; and, receive signposting to other services. The social return on investment generated by the Stay and Play service is around £2 for every £1 invested. The estimated value of outcomes over five years (around £135,000) is more than double the value of investment by Bournemouth Borough Council (of approximately £63,000). Financial proxies were reported for the outcomes of the service which included; improved confidence of parents, improved knowledge of parenting strategies, improved English language skills for children with English as a second language, improved diet, increased access to physical activities, improved progress in child's learning and development and reduced isolation of families.	£2: £1

Intensive one-to-one support provided to families with children under 5 who have additional needs.	Mason, Salisbury, Mathers – The Value of Early Intervention: findings from Social Return on Investment research with Barnardo's children's centres, 2012.	Family Support Workers (FSWs) provide families with children under 5 years old who have additional needs with intensive one-to-one support. This service is offered in Barnardo's children's centres in Warwickshire. After families are referred, an initial assessment takes place with two members of staff visiting the family in their home to identify their needs and match them with a FSW. The FSW will then offer a tailored package of support to the family including home visits, group sessions and signposting. The approximate social return on investment generated by the FSW service is around £4.50 for every £1 invested. Over five years the value of benefits produced by the FSW service is around £419,000. Financial proxies were reported for the outcomes of the service which included; improved parenting skills, improved confidence, safe home environment, reduced number of families accessing high level services, less family isolation and improved family relationships.	£4.50: £1
Support for expectant teenage and young mothers and their babies.	Mason, Salisbury, Mathers – The Value of Early Intervention: findings from Social Return on Investment research with Barnardo's children's centres, 2012.	Tiny Toes is a service provided by Hazlemere and Loudwater Children's Centre in Buckinghamshire and provides support for expectant teenage and young mothers and their babies, aiming to improve their outcomes. Weekly half-day session at the children's centre where mothers take part in activities such as supported play, training and talks from professionals about various topics. Approximate social return on investment generated by Tiny Toes is around £3.50 for every £1 invested. Total value of benefits produced by the service over five years is around £73,700. This is likely an underestimate of the value of the service, as it was not possible to establish financial values for a number of outcomes. Financial proxies were reported for the outcomes of the service which included; improved parenting skills, less family isolation, families	£3.50: £1

		receiving necessary healthcare, increased confidence, reduction in level of risk/harm, improved resource management by parents, improved diet and parents being supported in accessing employment, education and training.	
Parenting programme to manage their child's behaviour	Mason, Salisbury, Mathers – The Value of Early Intervention: findings from Social Return on Investment research with Barnardo's children's centres, 2012.	Triple P is a service provided in Brock House children's centre in Somerset which gives additional support to parents to help them manage their child's behaviour. Families are referred to the service and a crèche is provided during weeks where group sessions are delivered. Programme is delivered by a Project Worker from the children's centre in partnership with a Parenting and Family Support Advisor (PFSA) from a local school. During the course, parents are asked to; Monitor and record behaviour at home; Attempt to implement parenting techniques in between group sessions; and, Provide feedback on their successes and difficulties. Approximate social return on investment generated by the Triple P programme at Brock House Children's Centre is around £2.50 for every £1 invested. The total estimated value of outcomes over five years is around £9,293, produced for a very small investment of £3,583 (when the programme is run once a year). Financial proxies were reported for the outcomes of the service which included; improved parenting skills, families feeling less isolated and receiving necessary health care, increased confidence, reduction in level of risk/harm, improved resource management by parents, improved parenting, improved diet and parents supported in accessing employment, education and training.	£2.50: £1
Professionally delivered, intensive home visiting	Barlow, Davis, McIntosh, Kirkpatrick, Peters, Jarrett, Stewart-Brown – The	The Oxfordshire Home Visiting Study evaluated the effectiveness of a professionally delivered, intensive home visiting programme beginning during the antenatal period and continuing for one year	£1.27: £1

programme beginning during the antenatal period to improve parenting and child outcomes including the prevention of abuse and neglect.	Oxfordshire Home Visiting Study: 3 Year Follow-up, 2008.	after birth. It thus lasted approximately 18 months, compared with 30 months for the Family Nurse Partnership programme. Designed to improve parenting and child outcomes, including the prevention of abuse and neglect. Not necessarily focused on first-time parents, just looked at high-risk mothers. In the three-year follow-up report, the results suggest that intensive home visiting improved maternal sensitivity at 12 months and better enabled health visitors to identify infants in need of further protection at an incremental cost of £3,985 per woman over 36 months, The present value lifetime cost of child abuse and neglect in the United States as being US $250,000-285,000. This equates at a November 2012 exchange rate to £166,864 in UK money. There were two fewer child deaths in a cohort of 66 mothers receiving the home visiting intervention, and six more children (7%) about whom concern has been registered. This represents a 27% return on investment but ignores the benefits to all other children from improved quality of parenting, or of the value of the health benefits of reducing adverse childhood experiences in the children's lives.	
The Nurse Family Partnership – Registered nurses visit mothers and children in their homes to provide health and parenting information.	Zero to Three – The Dollars and Cents of Investing Early: Cost-Benefit Analysis in Early Care and Education, 2006.	The nurse family partnership (NFP) included home visits by registered nurses for parents and children beginning in the womb and continuing to age 2 providing mothers with health and parenting information. Recipients were assessed up until age 15 and compared to a control group. The parents and children who participated in these studies were from disadvantaged families, such as families with low-income and parents with less than a high school education. The findings show that the participant group compared with the control group have: decreased rates of arrest, convictions, probation violations and alcohol use for child by age 15, reductions in welfare costs, child maltreatment, substance abuse and convictions for	$5.06: $1

		mothers, higher earnings for mothers. The economic benefits were mainly attributed to increased earnings of participants (and resulting tax revenues) and public savings due to reduced crime, averted crime victim costs and reduced need for rehabilitation and treatment. The NFP substantially reduces crime and builds earning capacity among mothers and children as they grow up. The NFP had average total costs of $7,572 and average total benefits of $38,296 (cost of benefits listed above), resulting in net benefits of $30,724. This translates to a benefit-cost ratio of $50.06 to $1. This evaluation of the NFP takes place when the child is age 15 and may therefore reveal even higher long-term benefits. Although the children and parents participating in the NFP benefitted from free childcare and higher earning, the nonparticipating public benefited more so due to higher tax revenue, reduced crime costs and reductions in special education and grade retention in schools. The internal rate of return (IRR) is the annual interest rate received for an investment consisting of payments and revenue that occur at regular periods. The IRR is useful when comparing returns among dissimilar public and private investments. The IRR for the NFP was 23% which means it compares favourably with the US stock market which earns, on average, between 5% and 7%. Disadvantaged youth are a better social investment than stock market equity.	

The Nurse-Family Partnership – Intensive visitation by nurses during a woman's pregnancy and the first two years after birth.	Washington State Institute for Public Policy – Benefits and costs of prevention and early intervention programs for youth, 2004.	The Nurse-Family Partnership provides intensive visitation by nurses during a woman's pregnancy and the first two years after birth. The goal is to promote the child's development and provide support and instructive parenting skills to the parents. Designed to serve low-income, at-risk pregnant women bearing their first child. This programme has been implemented in the UK. The measured benefits per youth were $26,298 and the measured costs per youth were $9,118. Benefits were estimated from the reduction in child maltreatment and criminal behaviour. Benefits per dollar of cost were $2.88. Savings are the greatest when NFP is targeted at high risk groups.	$2.88: $1

The Place2Be is an integrated, responsive and flexible school-based mental health service.	The Place2Be – Cost Effective Positive Outcomes for Children and Families: An economic analysis of The Place2Be's integrated school based services for children, 2010.	The Place2Be is a whole school mental health solution which includes 1-1 counselling and a self-referral service for children and young people. It also provides support for teaching and non-teaching school-based staff, parents and carers. Seeks to enhance the emotional literacy of the school environment. There are teams based in 172 primary and secondary schools across the UK supporting 58,000 children up to the age of 13, often in areas of great deprivation. Services help children cope with: bereavement, family breakdown, alcohol and drug misuse, domestic violence, physical and emotional abuse, trauma and bullying. Economic analysis shows that counselling services cost £2 million. Benefits were in the form avoidance of long-term mental disorders and mental health problems over their lifetime (estimated at 112 cases), with a consequent saving of some £15 million in health and welfare spending, lost productivity and other costs to the national economy. CBR of 7.5:1 includes reduced costs associated with social services, welfare benefits and the criminal justice system. Costs of the intervention are repaid after 5 years, with cost savings accruing in the years after. These results must be interpreted with caution, as some of the evidence is necessarily speculative and there are gaps in the data.	£7.50: £1

3.4 Mental health

The wider societal costs of mental health problems are estimated to be around £100bn per year, with around £14bn of that cost being associated with the NHS. Physical and mental health have been shown to be linked, with people who have suffered from severe and prolonged

mental illness dying on average 15-20 years younger than the general population.[8] For this reason, it is important to properly understand the ROI and cost effectiveness of mental health interventions in a Kent context.

Table 5

Intervention	Details	ROI
School based programme (KiVa) supporting young people with the impacts of bullying and cyberbullying. It includes classroom-based lessons to raise awareness and promote strategies supporting the victim as well as targeting specific incidents of bullying.	Model follows 200 hypothetical year 3 pupils, running for four years until the end of primary school. Evidence on effects and costs are taken from previous evaluations in Finland and Wales. For example, impacts on use of CAMHS for victims of bullying. Assumes only children who are intensely bullied would use CAMHS services. Short-term impacts such as absence from school are considered as well as depression, self-harm, and suicide. The costs of implementing the programme will be to the local authority or to the school itself and are taken from the cost of implementing KiVa at a school in Wales. Cost also included GP consultations and parents taking time off work. Net increased costs of £4658 for 4-year programme or £23.39 per child. Conservative ROI of £1.58 for every £1 invested. This is short-term ROI and doesn't include long-term benefits such as higher educational attainment leading to an increase in potential earnings. When loss of earnings for those who have been bullied is factored in, ROI increases to between £3.97 and £16.79.	£1.58: £1 (four years)
School-based social and	Model follows 150 hypothetical year 7 pupils for seven years, until they reach school leaving	£5.05: £1

[8] Public Health England (2016). Local Health and Care Planning: Menu of preventative interventions.

emotional learning programme. Version of the Penn Resilience Programme, aiming to prevent depression by teaching pupils cognitive-behavioural and social problem-solving skills. Delivered by trained school staff classrooms.	age. Assumed the intervention is offered as part of PHSE lessons, with 18 one-hour sessions being delivered a year. All pupils are assumed to be depression-free at the start. The model looks at ROI associated with reduction in new cases of depression after 6 months. After this it is assumed that there is no further impact on risk of developing or remaining in a state of depression. The costs included are A&E and hospital contact, GP services, school nurse/councillor, CAMHS, social workers, other professionals, and absenteeism cost to families. As the programme has no long-term impact on depression, the ROI after year one is only slightly more. Intervention is not cost saving from an education perspective, but additional benefits of importance to schools cannot be easily monetised, for example better school atmosphere and better academic outcomes. In the future, costs of delivering the programme could potentially be much lower as teachers have already received training, provided they stay at the school. There is a lack of long-term evidence of impacts as well as evidence of how well the programme would work in different socio-economic environments.	(one year)
Workplace mental health promotion programme, consisting of a health risk appraisal questionnaire, web portal encouraging healthy lifestyle behaviours, paper-based information packs and seminars.	Deterministic decision tree based on impacts for the business of employees having poor wellbeing was used. Impacts on productivity and potential avoided GP consultation were included in the model. Costs and productivity gains were derived from an evaluation of a programme delivered in one white-collar branch of a multinational UK company. This intervention looked at the costs and savings of rolling out the programme in a white-collar workplace with 500 employees. The programme cost £82.10 per employee per year, and it has been conservatively estimated that 10% of employees will make use of the intervention. The intervention was found to reduce sickness absence by more than four days per year and presenteeism by more than six hours every four weeks. Assumed that reducing absence by four days a year will also mean one GP visit can be avoided.	£2.37: £1 (one year)
Provision of a workplace cognitive behavioural therapy (CBT) service to all employees identified by occupational health	Structure of the intervention, resource use and costs averted are based on observed experience of a workplace CBT programme in a Welsh City Council with 11,000 employees. CBT was conservatively assumed to reduce risk of stress by 13%. From the Welsh Council programme, positive impacts on mental health were observed in 46% of those who received CBT. Based on a workforce of 1000, considering prevalence of workplace stress and the likelihood of being identified by occupational health services, estimated that five individuals	£2: £1 (two years)

services as being stressed.	will be offered CBT in any one year. When impacts on health services are considered, the ROI by the end of year 2 is £2 for every £1 invested.	
Protecting the mental health of people with long-term physical health problems. Trained nurses in primary care settings improve coordination between different healthcare professionals and deliver CBT.	Co-morbid depression has been shown to significantly increase the costs of eleven chronic health problems. Costs related to diabetes, coronary heart disease and congestive heart failure for people with depression were around double the costs of non-depressed individuals. The model compares usual care with collaborative care delivered in primary care for individuals with diabetes and/or coronary heart disease. A population of 100,000 was looked at, and the cost per QALY gained of under £10,000 suggests that the intervention is highly cost effective. Over two years, societal ROI is at least £1.52 for every £1 invested. This underestimates the benefits as it assume there are none after the first year and the model does not consider the long-term impacts of better physical health management.	£1.52: £1 (two years)
Signposting service for people aged 65 and older to address loneliness and protect the mental health of older people.	Signposting leading to a potential assessment to identify opportunities for participation in social activities to reduce the risk of social isolation and loneliness. Model assumes the intervention covers a population of 100,000 people aged 65 and over, some of who self-identify as being lonely. Signposting services may be in GP surgeries, shopping centres or libraries. Looks at impacts on GP and nurse contact, risk of self-harm and avoidance of psychological therapy to treat depression. Also considered benefits of people volunteering because of the signposting and navigation service. Over five years, from a societal perspective, there is a ROI of at least £1.26 for every £1 invested. This doesn't consider additional benefits such as improved physical health and the protection of cognitive health. Potential costs included restricted to those that can be linked with loneliness and poor mental health.	£1.26: £1 (five years)
Volunteer delivered debt advice in a GP surgery as a potential preventative action for mental health problems.	Substantial evidence on the association between debt and poor health. Those whose financial situation deteriorates are at higher risk of mental health problems. Debts have been associated with an increased risk of suicide. Debt advice provided to those without a diagnosable mental health problem and at risk of unmanageable debt, with the aim of alleviating financial debt and reducing the risk of mental health problems as well as reducing the impact on health services. Debt advice services are normally funded through not-for-profit organisations or the Money Advice Service. Model assumes a rate of 16.1% of problematic	£2.60: £1 (five years)

	debt in the adult population. Use of the services is compared to a no action alternative over a five-year period, considering the impact of debt related stress and depression on health and legal systems as well as productivity. For a population of 100,00 adults there is a ROI of at least £2.60 from every £1 invested in face-to-face debt advice services. Highly conservative estimate as doesn't consider additional health benefits and broader economic benefits.	
Increasing the use of psychosocial assessment when individuals present at hospital for deliberate self-harm to prevent suicide.	Previous work has estimated that the average cost of a suicide for those of working age in the UK is £1.67m, including intangible costs, lost output, police time and costs of coroner inquests. Nonfatal suicide events also have a substantial cost to health services. Model runs over a ten-year period using a hypothetical cohort of 100,000 working age adults. Most of the cost and effectiveness data are drawn English studies. Model accounts for costs including ambulatory transport, attendance at A&E, inpatient care, police/coroner activities, productivity loses, and intangible costs related to the premature loss of life. At the end of the ten-year period, there is an estimated ROI of £39.11 when productivity and intangible costs avoided are considered. From a narrower health, local authority and police perspective, the ROI is £2.93.	£39.11: £1 (ten years)

3.5 Smoking cessation

Smoking is responsible for 17% of deaths in people over the age of 35 and is the largest cause of health inequality and premature mortality.[9] For this reason, the evidence around smoking cessation interventions is especially relevant and needs to be properly understood in a Kent context.

Table 6

Intervention	Evidence Source	Details	Benefit-cost ratio?
Assessment, very brief advice, and referral in hospitals.	Public Health England – Local Health and Care Planning: Menu of	Every patient who is hospitalised, regardless of diagnosis, is assessed for smoking status using CO monitoring and then offered very brief advice (VBA) about smoking cessation and immediate access to	Net savings of £119 per quitter over first 5 years to

[9] Public Health England (2016). Local Health and Care Planning: Menu of preventative interventions.

	preventative interventions, 2016. ↓ London Health Observatory – Stop before the op: A briefing on the short term benefits of preoperative Smoking Cessation in London, 2006.	nicotine replacement therapies (NRT). Smokers should leave hospital with a clear treatment plan to address their tobacco dependence. The quit rate for patients who want to quit is 3% to 4% but increased to between 15% and 20% for those who want to quit and take up a referral. Total costs of the intervention are estimated to be around £690 per successful quitter, with the NHS incurring a one-off cost of £190 for delivery of nicotine replacement therapy and follow-up and a potential one-off cost off setting up an electronic referral system (ERS) of £11k with annual maintenance costs £3.5k. Local authorities could incur £500 of costs per successful quitter through commissioning local stop smoking services. Net savings were a cumulative minimum of £119 per quitter over the first 5 years to NHS (average savings of £24 p.a.) assuming costs are phased and excluding the ERS investment. The intervention can become net saving in year 5 after implementation, NB this is a conservative estimate. ↓ Smoking causes higher post-operative complications. If London patients admitted for planned surgery were to stop smoking prior to operation 2,500 - 5,300 fewer post-operative complications would be avoided each year, and the NHS could save 2,600 - 4,000 bed days, £0.5 - £1.1 million each year across London's PCTs, £0.9 - £2.8 million across London's hospital trusts.	NHS.
Various smoking cessation services.	York Health Economics Consortium – Cost-effectiveness of interventions for smoking cessation, 2007.	Economic model for the evaluation of smoking cessation treatments, background quite rate was assumed to be 2%. Smokers and former smokers were shown to have a chance of five co-morbidities: • Lung cancer • Coronary heart disease (CHD)	All but one intervention dominates no intervention.

		• Chronic obstructive pulmonary disease (COPD) • Myocardial infarction (MI) • Stroke The likelihood of developing one or more of these diseases was based on age and the probability of being a smoker / former smoker / non-smoker. Each disease has a yearly cost and utility determined by research from published data which is used to calculate the ICER. The following smoking cessation interventions were modelled: • No intervention • Brief advice (BA) • BA + self-help material • BA + self-help material + NRT • BA + self-help material + NRT + specialist clinic • Counsellor and bupropion • Bupropion + less intensive counselling (LIC) • Bupropion + more intensive counselling (MIC) • Nicotine patch • Nicotine patch + group counselling • Nicotine patch + individual counselling • Nicotine patch + pharmacist consultation • Nicotine patch + pharmacist consultation + behavioural program The costs for each intervention are for the average smoker included in the model and also include the costs of co-morbidities and their treatment, therefore the cost of no intervention is substantial and all but one of the interventions has a lower cost value than no intervention. All of the interventions apart from one (BA + self-help material + NRT) are less costly and more effective (higher quit rate) than no	

		intervention and therefore dominate. The intervention with the highest quit rate is MIC and bupropion which also has the lowest net cost (additional costs less cost savings from lower NHS treatment costs), meaning it dominates all the other interventions.	

Brief intervention by GPs with additional services.	Centre for Health Economics – Cost-effectiveness of brief intervention and referral for smoking cessation, 2006.	Background quit rate assumed to be 1%. Brief intervention by GPs is defined as five minutes of a GPs time, assessing current and past smoking behaviour, providing information on consequences of smoking, providing options for support and providing advice on stop smoking medications. This advice on its own cost £10 per person for the GPs time and had an effectiveness rate of 1.7% over and above control. Using estimates for QALY gains and the quit rate, the average cost per QALY was £732. Brief intervention as above plus self-help material cost £12 per person (£10 GP time, £2 self-help material) and had an effectiveness rate of 2.7% over and above control. Using estimates for QALY gains and the quit rate, the average cost per QALY was £370. Brief intervention plus nicotine replacement therapy cost £82.56 (for 5 mins GP time, plus NRT, assuming 50% use full NRT course and 50% use one month's supply) and had an effectiveness rate of 3% over and above control. Using estimates for QALY gains and the quit rate, the average cost per QALY was £2110. In this case, brief GP intervention plus self-help had the smallest cost per QALY gained.	ICER of £370-£2110
Brief interventions delivered in GP practices and nicotine replacement therapy.	Matrix Insight. Prioritising investments in preventative health. Health England. 2009.	This report looked at various interventions and prioritised them using multi criteria decision analysis (MCDA). For each intervention, the benefits accrue as a result of reduced probability of five diseases associated with smoking – Lung cancer, stroke, coronary heart disease, heart attack and obstructive pulmonary disease. QALY gains and cost-savings estimated to occur in the long-run and costs associated with increased life expectancy (pensions, health care costs) are not included in the analysis. Net cost per QALY gained takes into account the cost savings as well as cost of intervention. The preventative health interventions are ranked using a variety of criteria, e.g. cost-effectiveness, benefits distribution and proportion	ICER of £1,151 and £2,388 respectively

		benefitting. The relevant smoking interventions looked were brief interventions delivered in GP practices and Nicotine replacement therapy and they ranked 4th and 8th respectively out of 14 interventions. Brief interventions cost £11 per person and the net cost per QALY gained was –£2,169. There was a 0.727% increase in quit rate producing 0.009 QALYs per person and £31.10 cost savings per person. NRT cost £57.30 per person and the net cost per QALY gained was -£933. There was a 1.86% increase in quit rate producing 0.024 QALYs per person and £79.70 cost savings per person.	
Various interventions to improve the uptake of smoking cessation among the general public.	National Institute for Health and Clinical Excellence. Cardiovascular disease: identifying and supporting people most at risk of dying early (PH15). Supplementary economic analysis on interventions to reduce health inequalities. 2008.	The cost per quality-adjusted life year (QALY) of smoking cessation interventions for disadvantaged groups is low or very low. It is rarely likely to exceed £6000. Smoking cessation interventions are generally cost effective, irrespective of the target audience, the methods used to identify and recruit adults or the type of service offered.	Wide range of ICER. From £50 for client centred smoking cessation. Up to £1593 for disadvantaged pregnant women.
Various interventions to promote smoking cessation in pregnant women.	Taylor M. Economic analysis of interventions for smoking cessation aimed at pregnant women. Supplementary report York Health Economics Consortium. 2009.	Various smoking cessation interventions were considered such as cognitive behaviour strategies, stages of change, feedback, rewards and pharmacotherapies. Cost implications were calculated by looking at the lifetime healthcare costs associated with a woman smoking in addition to the costs associated with the infant. Health benefits were estimated by adding the health benefits of the intervention of the mother and the child. Smoking in pregnancy can result in higher rates of sudden unexpected death in infancy, higher rates of mortality, breathing difficulties, prematurity, smaller birth weight, smaller stature when older, slower growth and head	Rewards intervention shown to be dominant. ICER of £1992 - £4005 for others.

		circumference, learning difficulties hyperactivity and behavioural problems and lower IQ. Smoking whilst pregnant can increase the probability of neonatal death. QALY gains are derived from the number of deaths averted as a result of each intervention.	

3.6 Health checks

The NHS health checks programme invites adults aged 40 to 74 for a check up to spot early sign of vascular diseases such as stroke, kidney disease, heart disease, type 2 diabetes, and dementia. Earlier research into health checks has indicated that they are likely to be cost effective. [10] For this reason, it is important to look specifically at the evidence surrounding NHS health checks and adapt this within a Kent context.

Table 7

Intervention	Evidence Source	Details	Benefit-cost ratio?
NHS health check – for adults aged 40-74 to spot early signs of stroke, kidney disease, heart disease, type 2 diabetes, or dementia.	Kerr, M – NHS Health Check costs, benefits, and savings, 2011	The 15-year average costs are £351m which includes the costs of risk assessment and risk management (monitoring, medications, lifestyle interventions). There will be an estimated 119000 QALYs gained a year in the first four years, leading to a cost per QALY of £2142. This comes from an estimated 1800 strokes and 1500 heart attacks prevented per year through statins, anti-hypertensives, and smoking cessation. Up to 9700 cases of diabetes prevention through non-diabetic hyperglycaemia detection and lifestyle interventions. Also 19000 cases of diabetes and 24000 cases of chronic kidney disease detected early, reducing the risk of disease progression and complications. Assumptions used around uptake, compliance, attribution, and relative risk reduction. Costs level off over time.	ICER of £2142, using no intervention as a comparator. Therefore, cost per QALY of £2142.

[10] Schuetz, C., Alperin, P., Guda, S., et al. (2013). A Standardized Vascular Disease Health Check in Europe: A Cost-Effectiveness Analysis

		whilst savings increase. Estimated 70% of costs are recouped by year 15. There are very few health interventions where improvement in quality of life and survival can be achieved so cost effectively. Much lower cost per QALY than many other NICE recommended therapies.	
NHS health check – for adults aged 40-74 to spot early signs of stroke, kidney disease, heart disease, type 2 diabetes, or dementia.	PLOS ONE - A Standardized Vascular Disease Health Check in Europe: A Cost-Effectiveness Analysis, 2013	A model generated simulated population of individuals aged 40-75 eligible for health checks in the UK. The impact of health checks on incidence of major adverse cardiovascular events (MACE) can then be forecasted. The results showed that significant numbers of events, e.g. MACEs are averted, resulting in cost savings. An assumption was made that 50% of patients would comply to treatments triggered by a health check. Other scenarios were considered, with different methods of selecting the cohort to receive health checks. The health check programme remained cost effective in the UK.	Cost per QALY of £2426 when offering health checks to all 40-74-year olds.
NHS health check – for adults aged 40-74 to spot early signs of stroke, kidney disease, heart disease, type 2 diabetes, or dementia.	Department of Health – Economic Modelling for Vascular Checks, 2008.	A simulation model is used that is based on population equivalent to 50 GP lists. Scenario modelling carried out followed by sensitivity analysis. A take up rate of 75% was assumed for the model, however the average is currently 50% with variation between local authorities. Intervention offered included; brief exercise intervention, multi-component weight loss programmes, IGR intensive lifestyle management, stop smoking services, anti-hypertensives, and statins. The average cost of a health check was shown to be £23.70 and this was combined with the additional costs of any subsequent tests, e.g. for high blood pressure. The cost of the programmes is estimated between £180m and £243m per year. This equates to a cost per QALY gained of £3000, well under the threshold of £20,000.	Cost per QALY gained of around £3000.

4. PHE and NICE Cost-Effectiveness Tools

4.1 The use of ROI tools

A return on investment tool models the effects of a public health intervention on a chosen population group. The model estimates the costs and benefits of an intervention and translates this into a return on investment figure that can be used in conjunction with other evidence to make commissioning decisions. PHE have produced ROI tools based around the following:

- Colorectal cancer
- NHS Diabetes Prevention Programme
- End of life care
- Weight management
- Oral health in pre-school children
- Mental health service
- Musculoskeletal conditions
- Movement into employment
- Falls prevention
- Best Start in Life
- Air pollution
- Contraceptive services

In addition to this, NICE have produced the following ROI tools:

- Tobacco
- Physical activity
- Alcohol
- Social and emotional wellbeing
- Children, young people and pregnant women

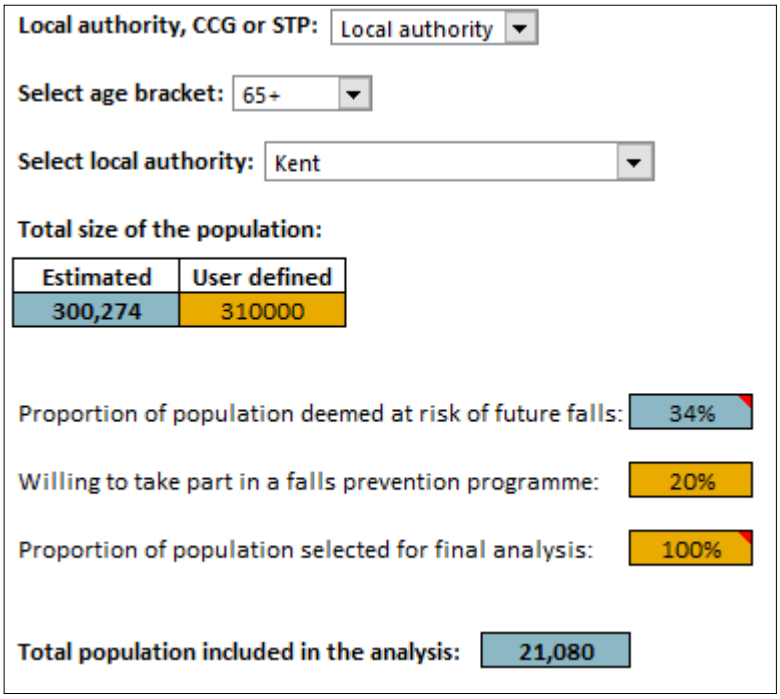
4.2 Kent application of the PHE ROI tool for falls prevention programmes

In the UK, 30% of people older than 65 and 50% of people older than 85 will have at least one fall within a year. This translates to over 3 million falls annually, with serious consequences such as injury, loss of confidence or independence and even death. Hip fracture is one outcome of a fall and has a high mortality risk of 9.4% at 30 days and 31.2% at 1 year. The total cost to the NHS of falls is estimated to be £2.3 billion per year, the largest part of this cost resulting in people being unbale to return home after a fall and needing social care support or admission to a nursing home.

Kent is facing an aging population, so it is therefore important to look at the evidence related to the ROI commissioning falls prevention initiatives. For this reason, it would be beneficial to populate PHEs ROI tool for falls prevention programmes.

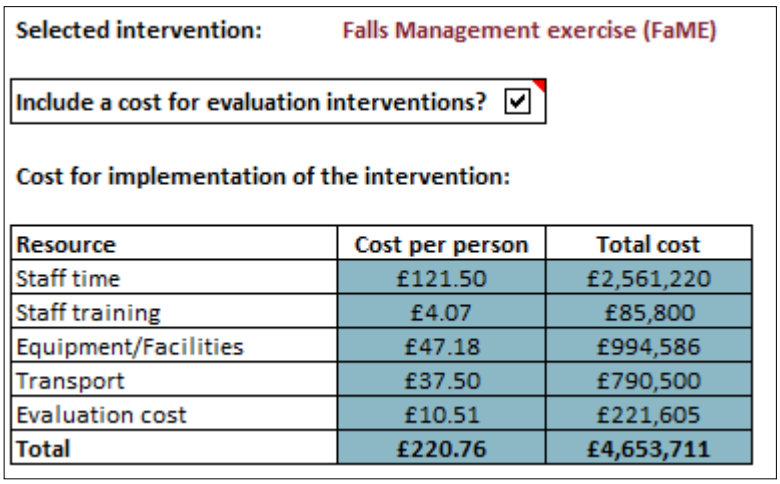
Figure 1 shows the population inputs of the ROI tool in a Kent context, using the population estimates for over 65s for Kent in 2017. Previous studies have found that 34% of this population is deemed at risk of future falls, with an assumption made that 20% of these people would be willing to take part in a falls management exercise (FaME) programme. This means that a sample population of 21,080 of 65s were included in the analysis.

Figure 1



The intervention costs were assumed to be £220.76 per person which can be broken down into various categories as seen in figure 2. As it is recommended that these figures should not be altered, they have been left as intended in the model.

Figure 2



Resource	Cost per person	Total cost
Staff time	£121.50	£2,561,220
Staff training	£4.07	£85,800
Equipment/Facilities	£47.18	£994,586
Transport	£37.50	£790,500
Evaluation cost	£10.51	£221,605
Total	**£220.76**	**£4,653,711**

Figure 3 shows the

primary and secondary care costs for all possible events related to a fall. It also shows the social care costs relating to a fall, specifically the cost of a new admission to a care home following a fall. These inputs will be used to work out any cost savings from falls averted due to the intervention.

When data around the rate of falls with and without the intervention as well as the severity of falls and the destination after discharge from hospital is considered, the mean cost per serious fall is estimated to be a total of £4,174. The model estimates that over two years, 4,371 falls could be in the chosen population.

Figure 4 shows the overall results produced by the tool. When a purely financial view is taken, the intervention appears to show a new loss, as shown in the financial ROI field. However, when the intervention is viewed from a societal perspective, for every £1 invested, it can be expected that there is a return of £2.28. This means that when the improvement in quality of life (QALYs) is included, the FaME intervention generates benefits of £2.80 for every £1 spent.

Figure 4

Impact on costs (by total population):

	FaME	*Usual care*	Difference
Intervention costs	£4,653,711	£0	**£4,653,711**
Primary/secondary care costs	£16,096,575	£19,746,231	**-£3,649,657**
Social care costs	£4,235,327	£5,195,624	**-£960,297**
Total	£24,985,613	£24,941,855	**£43,758**

Impact on costs (per person):

	FaME	*Usual care*	Difference
Intervention costs	£221	£0	**£221**
Primary/secondary care costs	£764	£937	**-£173**
Social care costs	£201	£246	**-£46**
Total	£1,185	£1,183	**£2**

Financial benefits of FaME	**£219**
Financial ROI - Benefits to cost ratio	**£0.99 : £1.00**

Impact on quality of life:

	FaME	*Usual care*	Difference
Total QALYs	59760	59660	**100.25**
QALYs per person	2.8349	2.8301	**0.005**
Value of QALYs per person	£170,094	£169,809	**£285**

Societal benefits of FaME	**£504**
Societal ROI - Benefits to cost ratio	**£2.28 : £1.00**

In a Kent context, KCC currently commission a postural stability service which is very similar to the FaME programme modelled in the ROI tool. There are some differences between the two programmes, for example cost and the number of people targeted in each class. However broadly speaking, if the results from the ROI tool are translated onto the Kent spend of £412,00 on the classes, we can expect a social return on investment of £939,360 with the money invested.

5.Conclusions

6. Recommendations

KENT PUBLIC HEALTH OBSERVATORY

Using Acorn Wellbeing & the Kent Integrated Dataset (KID) to identify and analyse older people more likely to be experiencing social isolation and loneliness

September 2018

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1. Executive Summary

The issue of social isolation is receiving increasing attention from a range of organisations, including local authorities. Kent County Council have formed a select committee to look at the issue of social isolation and loneliness, with a particular focus on older residents. Work to summarise return on investment for social isolation interventions and some current KCC initiatives suggests that the most effective tend to be those aimed at older people.

This report describes analysis conducted locally to both identify and profile older people likely to be at increased risk of social isolation and loneliness.

It has been possible to use Wellbeing Acorn in combination with the Kent Integrated Dataset to identify c.29,500 Kent residents aged 65+ who live alone and whose Wellbeing Acorn type suggests an increased risk of social isolation and/or loneliness.

The individuals identified have many of the characteristics expected based on other studies of social isolation. In comparison with all Kent residents aged 65+, the group identified as being at higher risk of social isolation or loneliness are:

- older,
- more likely to be female,
- much more likely to be living in a deprived neighbourhood,
- more likely to have a range of long term conditions, including
    - cardiovascular disease (AF, CHD, heart failure, hypertension, PAD and stroke combined),
    - respiratory disease (COPD and asthma combined),
    - chronic kidney disease,
    - diabetes,
    - and depression,
- more likely to be multimorbid (i.e. have two or more long term conditions).
- more likely to have attended A&E, have been admitted to hospital, have had contact with community health services and received social care services
- more likely to be assessed as being in a high risk score group,
- and more likely to have characteristics recorded by their GP that place them in the 'severe' or 'moderate' frailty groups of the Electronic Frailty Index (EFI).

The Kent residents identified as being at risk of social isolation/loneliness can be further segmented according to their Wellbeing Acorn type. Analysis by these segments suggests that older people living alone in Acorn Wellbeing types 1 (limited living), 2 (poorly pensioners) and 3 (hardship heartlands) are at the highest risk of social isolation and loneliness *and* have the highest levels of multimorbidity, depression, the highest usage of acute and social care services, and the highest levels of frailty.

2. Introduction & Objectives

The issue of social isolation is receiving increasing attention from a range of organisations, including local authorities. Research has shown that, in terms of negative health outcomes, lacking social connections is comparable to smoking 15 cigarettes a day, and has worse health outcomes than risk factors such as obesity and physical inactivity. It has been calculated that loneliness increases the likelihood of mortality by 26% in older people[1]. Research also suggests that social frailty has a stronger impact on the onset of depressive symptoms than physical frailty or cognitive impairment[2].

Kent County Council have formed a select committee to look at the issue of social isolation and loneliness, with a particular focus on older residents. Work to summarise return on investment for social isolation interventions and some current KCC initiatives suggests that the most effective tend to be those aimed at older people[3]. This report describes analysis conducted locally to both identify and profile older people likely to be at increased risk of social isolation and loneliness.

The work draws on previous work in this area conducted by Gloucestershire County Council[4], Essex County Council[5] and by the Business Intelligence team within Kent County Council[6]. In all of these examples, geodemographic segmentation tools were used to identify groups of households likely to exhibit characteristics associated with social isolation and loneliness. This analysis draws on CACI's Wellbeing Acorn segmentation tool to identify an initial pool of residents likely to have characteristics associated with social isolation and loneliness, which has then been overlaid onto person-level data within KID to further refine the cohort identified so that only those with particular demographic characteristics are included. The identified cohort have then been profiled in terms of their health characteristics, risk and service usage as well as geographical location.

[1] Holt-Lunstad, Julianne. Social Relationships and Mortality Risk: A Meta-analyic Review. 2010.
[2] Kota Tsutsumimoto et al. Social frailty has a stronger impact on the onset of depressive symptoms than physical frailty or cognitive impairment: A 4-year follow-up longitudinal cohort study. JAMDA. 19 (2018) 504-510.
[3] Return on Investment for public health interventions: Social isolation, sexual health, health visiting, mental health and NHS Health Checks.
[4] https://inform.gloucestershire.gov.uk/resource.aspx?resourceid=129&cookieCheck=true&JScript=1
[5] https://campaigntoendloneliness.org/guidance/case-study/essex-county-council-isolation-index/
[6] See Appendix A. This analysis also drew on the work conducted by Gloucestershire and Essex County Councils.

3. Identifying older people more likely to be experiencing social isolation and loneliness

A two-stage process is proposed to the identification of older people in Kent likely to be experiencing social isolation and loneliness. The aim is to identify a group of residents with a higher propensity to be experiencing social isolation and loneliness than a randomly generated list, for further analysis.

3.1 Stage 1 – Initial list of postcodes generated using Acorn Wellbeing[7]

It is proposed that an initial list of postcodes with an increased propensity for residents to be experiencing social isolation and loneliness is generated using the Wellbeing Acorn segmentation. This has been done by considering a number of variables (which CACI have profiled by Wellbeing Acorn Type) that may be indicative of 'social isolation' and possible 'loneliness'[8].

Impact of physical/mental health problems

- Last 4 weeks: physical or mental health interfered with social life

Social capital: community

- Belong to neighbourhood: Disagree
- Can borrow things from neighbours: Disagree
- Talk regularly to neighbours: Disagree
- I could go to someone in my neighbourhood for advice: Disagree

Social capital: networks

- Family understands the way I feel*
- Can rely on family*
- Can talk about worries with family*
- Friends understands the way I feel*
- Can rely on friends*
- Can talk about worries with friends*

Social capital: participation

- Member of tenants or residents group*
- Member of environmental group*
- Member of other community group*
- Member of social group*
- Member of voluntary service group*

*denotes a variable where a lower propensity score has been taken to indicate social isolation/loneliness.

[7] https://www.caci.co.uk/sites/default/files/resources/Wellbeing_Acorn_User_Guide.pdf

[8] Please note that variables solely indicating ill-health have not been used to drive the selection of the Wellbeing Acorn types.

A weighted average propensity score has been calculated for each Wellbeing Acorn type using the index values[9] provided by CACI to create an 'isolation index' for each Wellbeing Acorn type. Types with an isolation index above 102 have then been identified as having an increased propensity for residents to be experiencing social isolation and loneliness.

3.1.1 Weighting

Consideration has been given to different approaches to weighting the 16 variables listed above in the creation of the isolation index, and indeed to restricting the analysis to smaller subsets of variables. This sensitivity analysis suggests that a very similar list of Wellbeing Acorn types would be generated regardless of the weighting regime. The approach to weighting used in the analysis presented in this report is to give equal weight to each of the four domains of indicators (impact of physical/mental health problems, social capital: community, social capital: networks and social capital: participation) as follows:

Impact of physical/mental health problems

- Last 4 weeks: physical or mental health interfered with social life (6)

Social capital: community

- Belong to neighbourhood: Disagree (1.5)
- Can borrow things from neighbours: Disagree (1.5)
- Talk regularly to neighbours: Disagree (1.5)
- I could go to someone in my neighbourhood for advice: Disagree (1.5)

Social capital: networks

- Family understands the way I feel* (1)
- Can rely on family* (1)
- Can talk about worries with family* (1)
- Friends understands the way I feel* (1)
- Can rely on friends* (1)
- Can talk about worries with friends* (1)

Social capital: participation

- Member of tenants or residents group* (1.2)
- Member of environmental group* (1.2)
- Member of other community group* (1.2)
- Member of social group* (1.2)
- Member of voluntary service group* (1.2)

[9] An index value of 100 for 'belong to neighbourhood: disagree' for a particularly Wellbeing Acorn type would mean the proportion of households disagreeing is the same as the average for the UK. A value of 200 would illustrate that households belonging to this type are twice as likely to disagree.

3.1.2 Wellbeing Acorn types identified

The above approach identified 11 Wellbeing Acorn types[10] as having a higher than average isolation index.

Wellbeing Acorn types with a high isolation index

- Type 1: Limited living
- Type 2: Poorly pensioners
- Type 3: Hardship heartlands
- Type 5: Countryside complacency
- Type 6: Dangerous dependencies
- Type 7: Struggling smokers
- Type 9: Everyday excesses
- Type 10: Respiratory risks
- Type 11: Anxious adversity
- Type 12: Perilous futures
- Type 14: Rooted routines

[10] Type 8: Despondent diversity was also identified, but only one Kent postcode falls into this Wellbeing Acorn type and so it has not been included in the analysis.

3.2 Stage 2 – Enhancing the approach using data from KID

Kent residents falling within the above list of 11 Wellbeing Acorn types have been further refined by cross-referencing with demographic information contained within the Kent Integrated Dataset (KID). In this way, residents aged 65+ who live alone who also fall into a Wellbeing Acorn type identified as being more likely than average to be socially isolated/lonely have been identified.

Wellbeing Acorn type		Total population (KID)	Aged 65+ (KID)	Aged 65+ and live alone (KID)
1	Limited living	12,628	7,577	5,094
2	Poorly pensioners	31,545	8,377	3,753
3	Hardship heartlands	55,640	7,941	3,443
5	Countryside complacency	54,542	9,214	2,677
6	Dangerous dependencies	11,060	1,218	412
7	Struggling smokers	36,133	2,382	558
9	Everyday excesses	157,184	17,403	5,766
10	Respiratory risks	21,106	3,408	985
11	Anxious adversity	58,587	6,037	1,551
12	Perilous futures	34,242	4,207	1,428
14	Rooted routines	85,948	12,802	3,810
Total		558,615	80,566	29,477

This identifies c.29,500 Kent residents aged 65+ who live alone and are more likely than average to exhibit characteristics that might suggest social isolation; 9.6% of the 65+ population of Kent[11]. It is estimated that around 10% of over 65's are lonely all or most of the time[12].

[11] Source: ONS mid-year population estimates, 2016
[12] Source: Campaign to End Loneliness

4. Analysing older people more likely to be experiencing social isolation and loneliness

This section provides an analysis of Kent residents aged 65+ who have been identified as living alone and falling into one of the 11 Wellbeing Acorn types identified as having a higher than average isolation index.

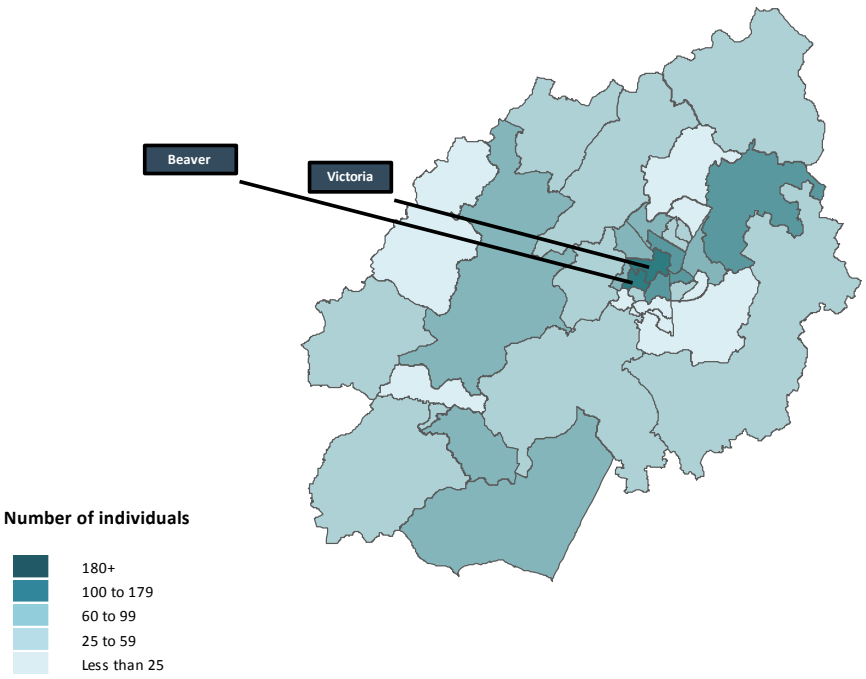
4.1 Geographic location: Numbers

The maps below show Wards with high *numbers* of individuals identified. Wards falling into the highest quintile are highlighted, i.e. the 20% of Wards with the highest numbers of older residents identified. Many of the wards identified cover the most deprived areas in Kent: 35 of the 57 wards with 165 or more older residents identified include at least one of the most deprived decile LSOAs in Kent[13].

4.1.1 Ashford CCG

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



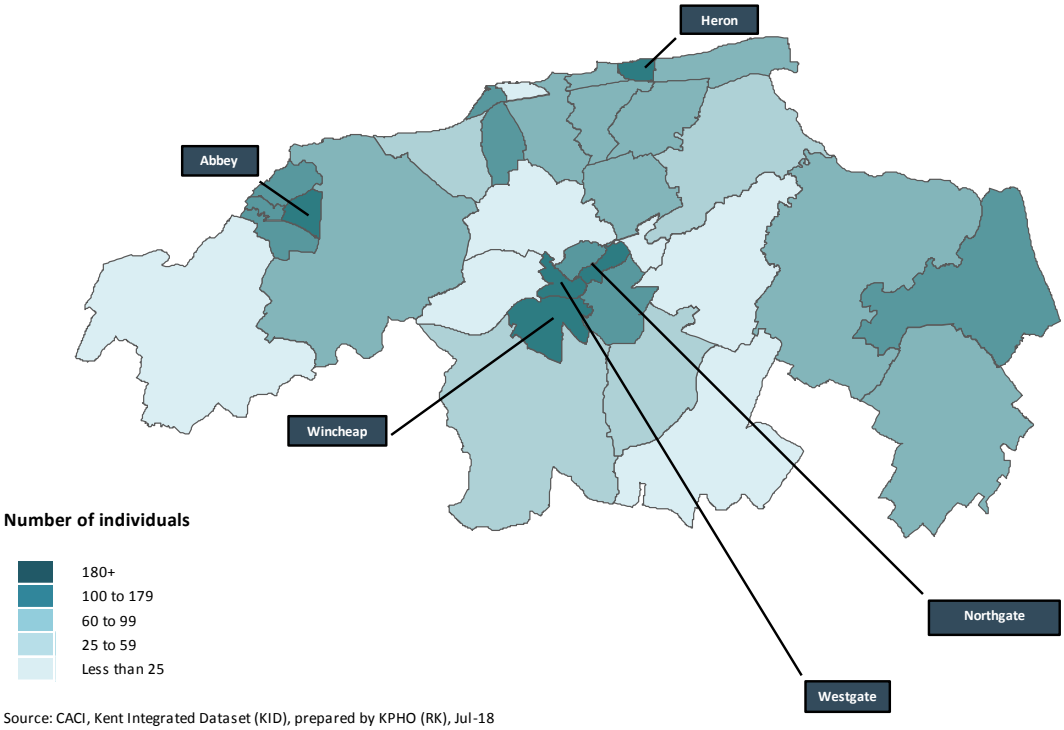
Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (RK), Jul-18

[13] https://www.kpho.org.uk/health-intelligence/inequalities/deprivation/mind-the-gap-analytical-report

4.1.2 Canterbury and Coastal CCG

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018

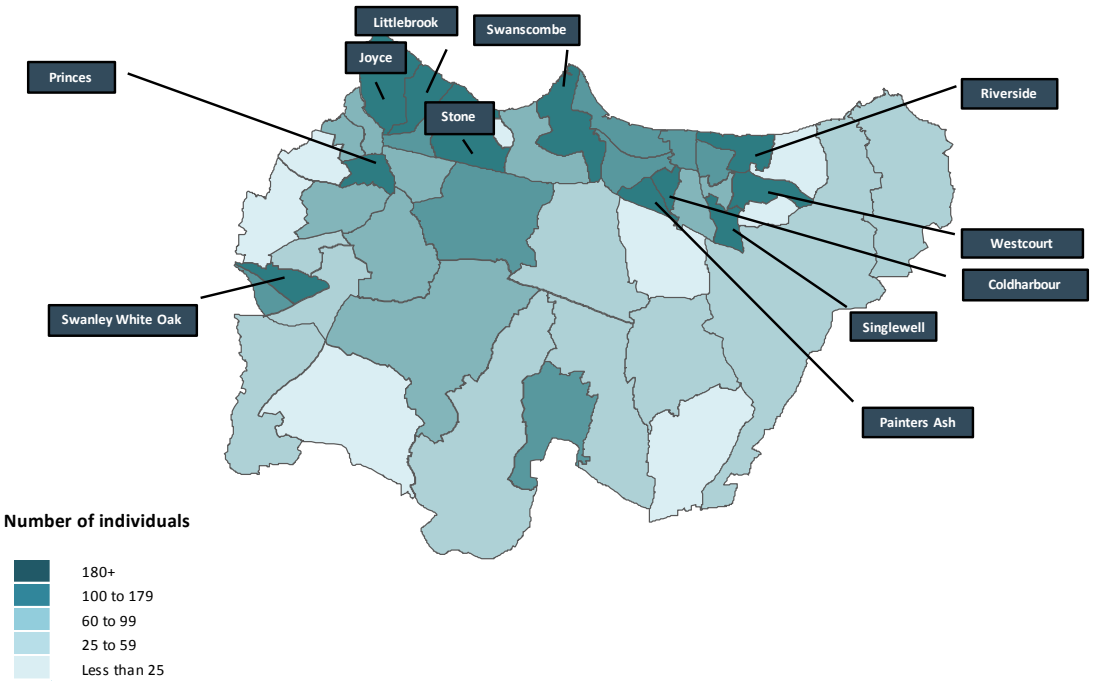


Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (RK), Jul-18

4.1.3 Dartford, Gravesham and Swanley CCG

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018

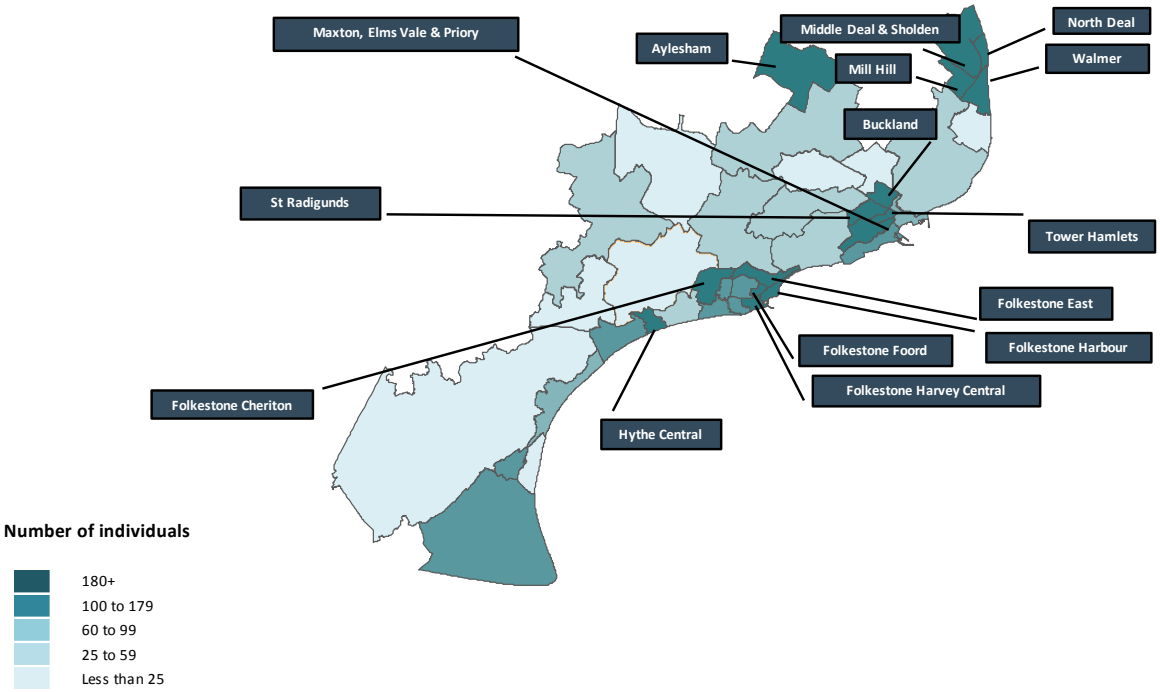


Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (RK), Jul-18

4.1.4 South Kent Coast CCG

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018

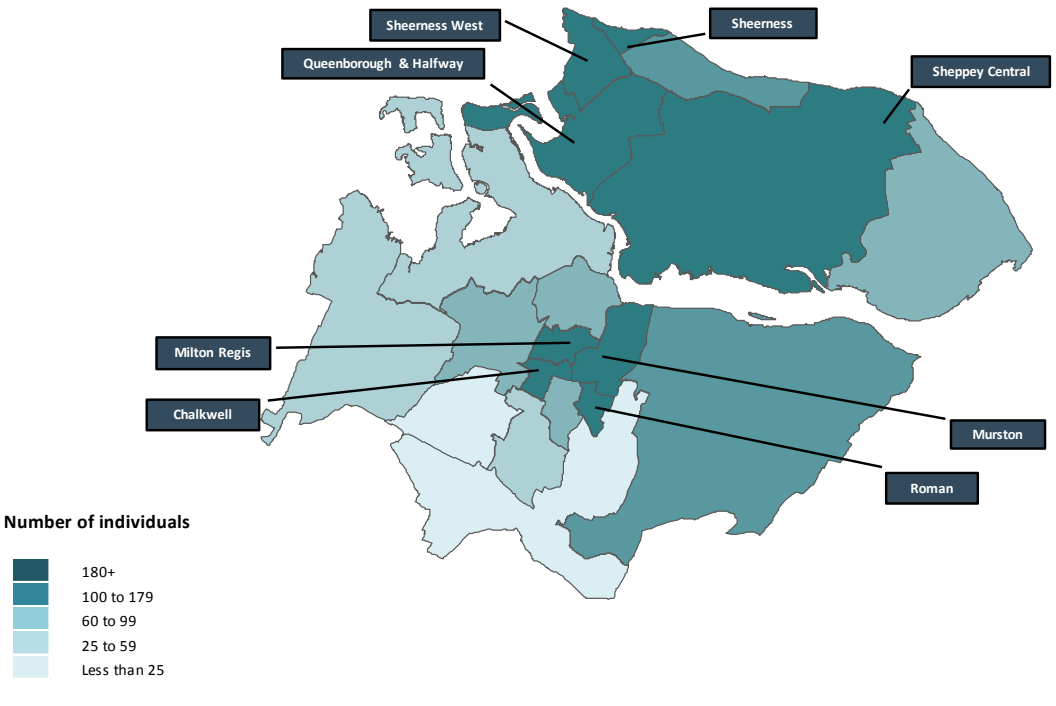


Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (RK), Jul-18

4.1.5 Swale CCG

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018

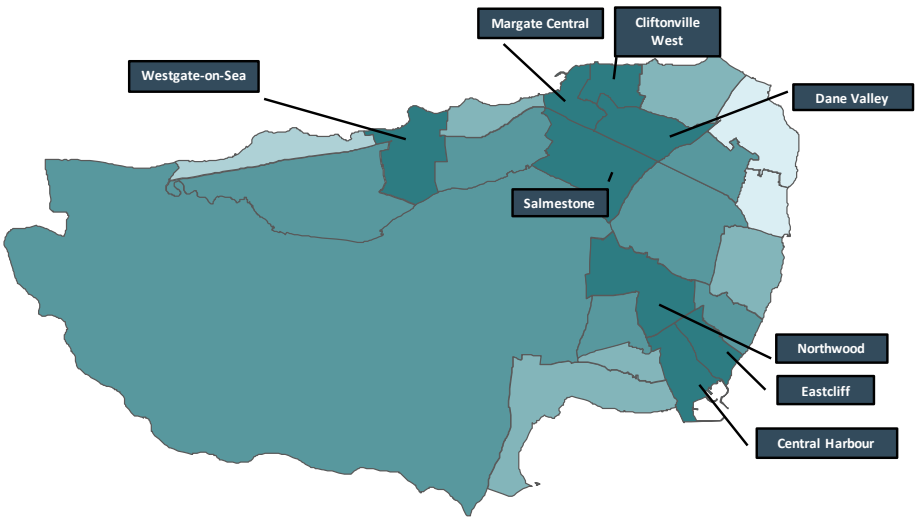


Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (RK), Jul-18

4.1.6 Thanet CCG

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Number of individuals

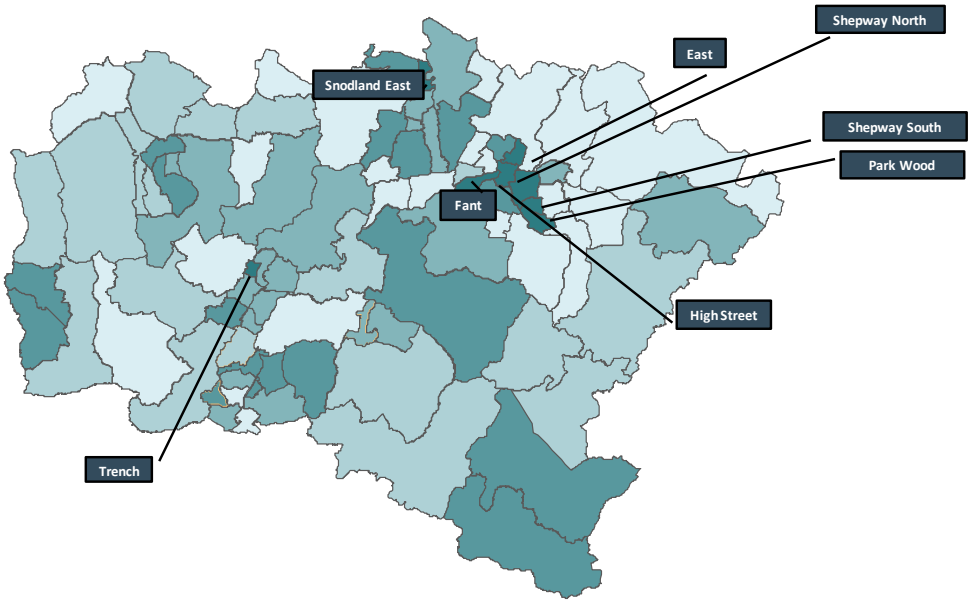
- 180+
- 100 to 179
- 60 to 99
- 25 to 59
- Less than 25

Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (RK), Jul-18

4.1.7 West Kent CCG

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Number of individuals

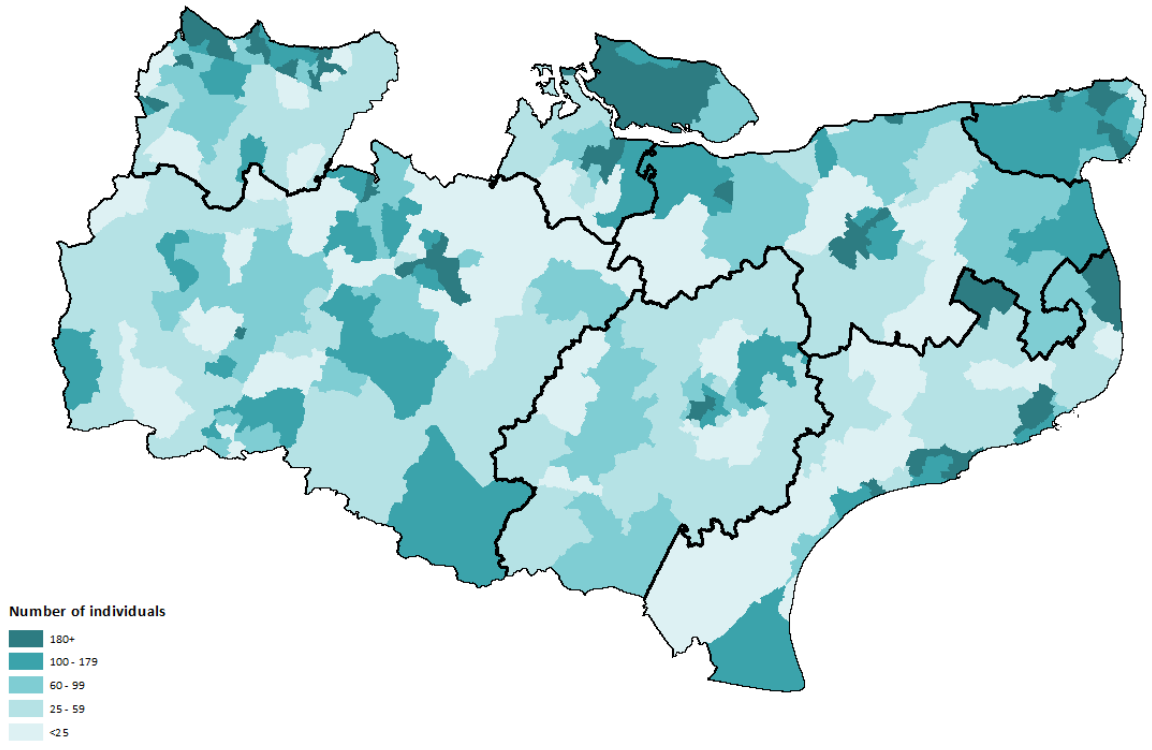
- 180+
- 100 to 179
- 60 to 99
- 25 to 59
- Less than 25

Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (RK), Jul-18

4.1.8 Kent

Older people more likely to be experiencing social isolation/loneliness: by electoral ward

Number identified belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (LLY), Aug-18

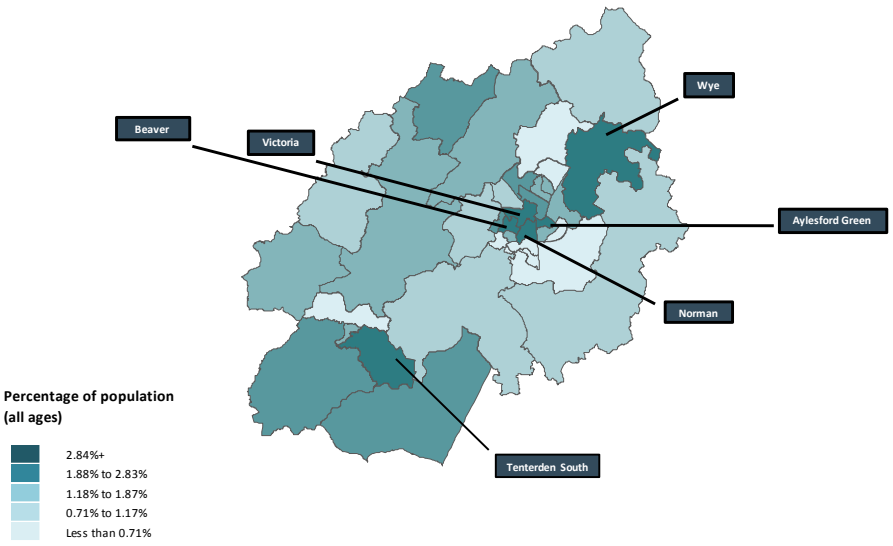
4.2 Geographic location: Percentages

The maps below show Wards with high *percentages* of their populations identified as being older people more likely to be experiencing social isolation or loneliness. Results are shown based both on the percentage of the total population identified as being at risk, and on the percentage of the population aged 65+. In each case wards falling into the highest quintile are highlighted, i.e. the 20% of Wards with the highest percentages of residents identified.

4.2.1 Ashford CCG

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward

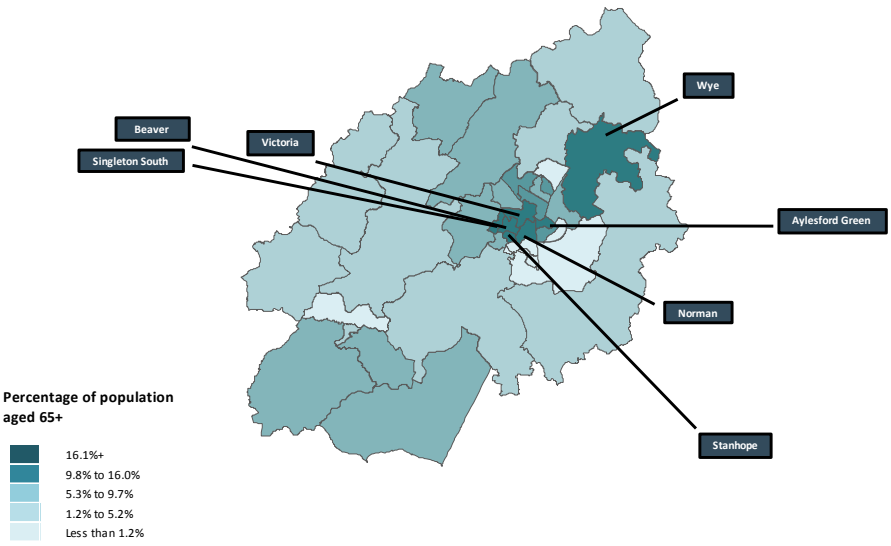
Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

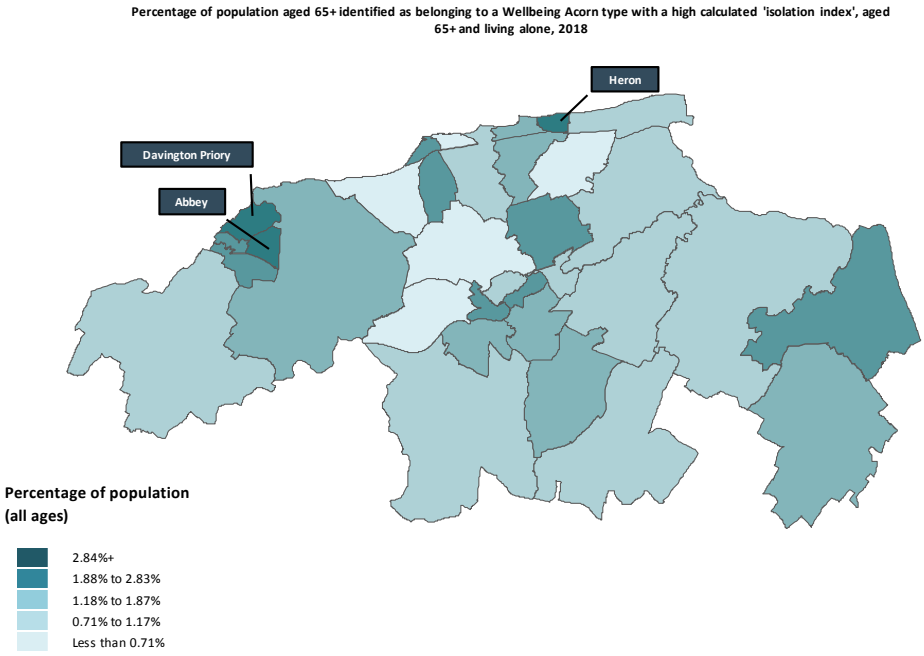
Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

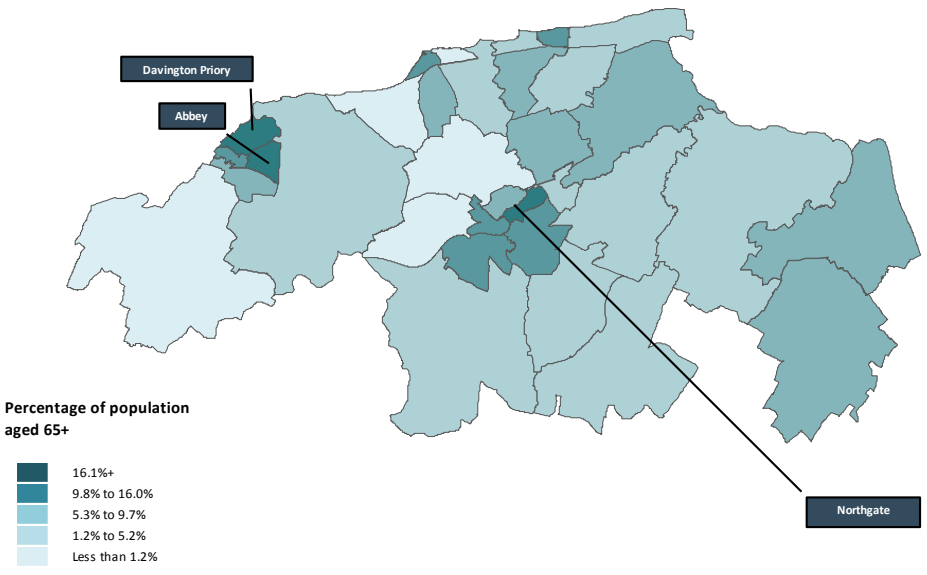
4.2.2 Canterbury and Coastal CCG

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward



Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

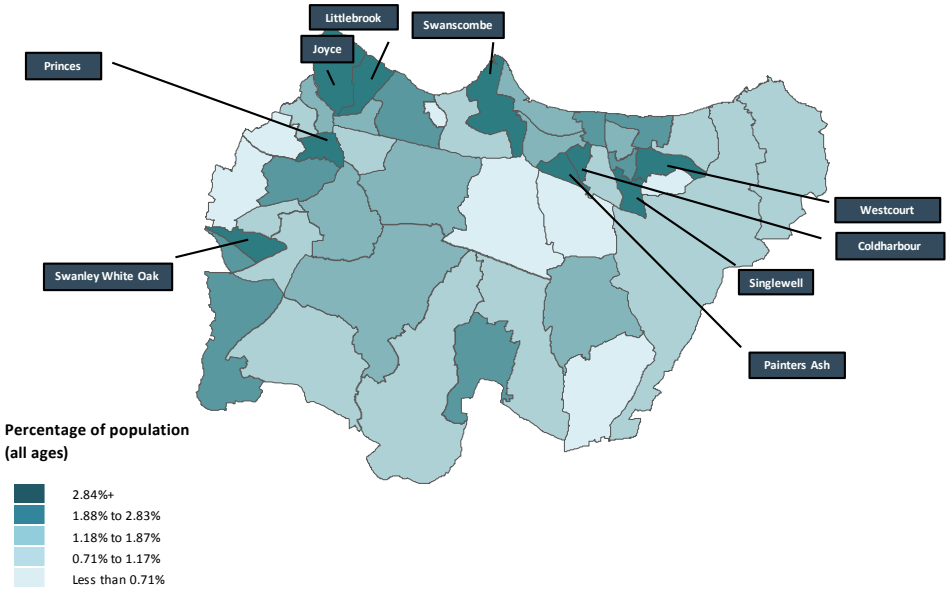


Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

4.2.3 Dartford, Gravesham and Swanley CCG

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



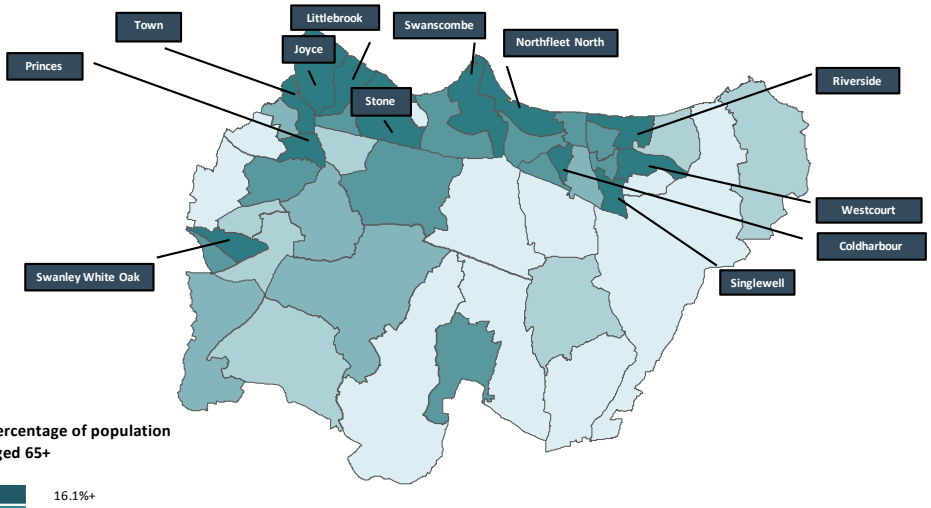
Percentage of population (all ages)

- 2.84%+
- 1.88% to 2.83%
- 1.18% to 1.87%
- 0.71% to 1.17%
- Less than 0.71%

Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Percentage of population aged 65+

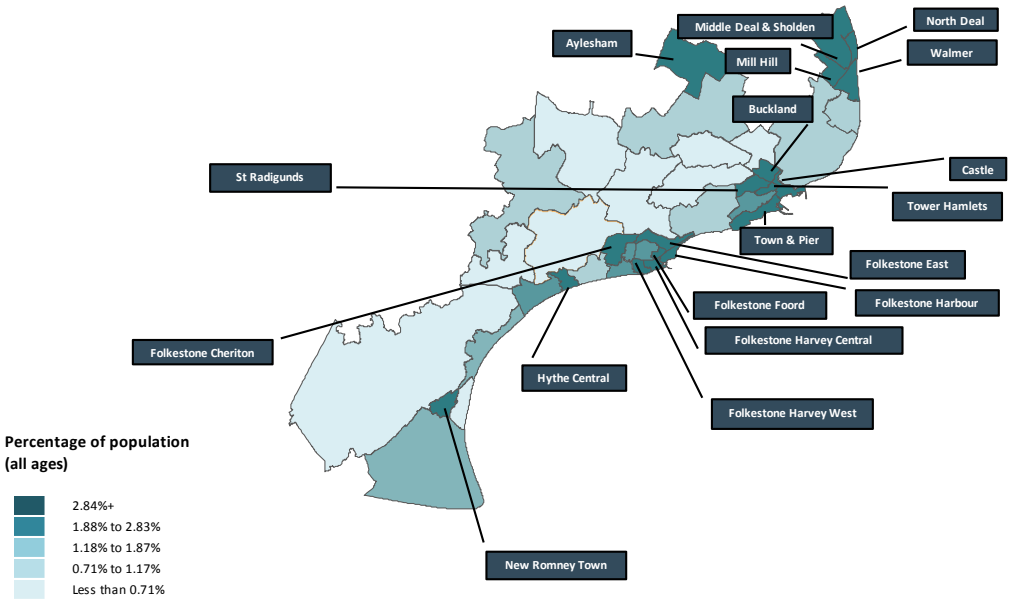
- 16.1%+
- 9.8% to 16.0%
- 5.3% to 9.7%
- 1.2% to 5.2%
- Less than 1.2%

Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

4.2.4 South Kent Coast CCG

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward

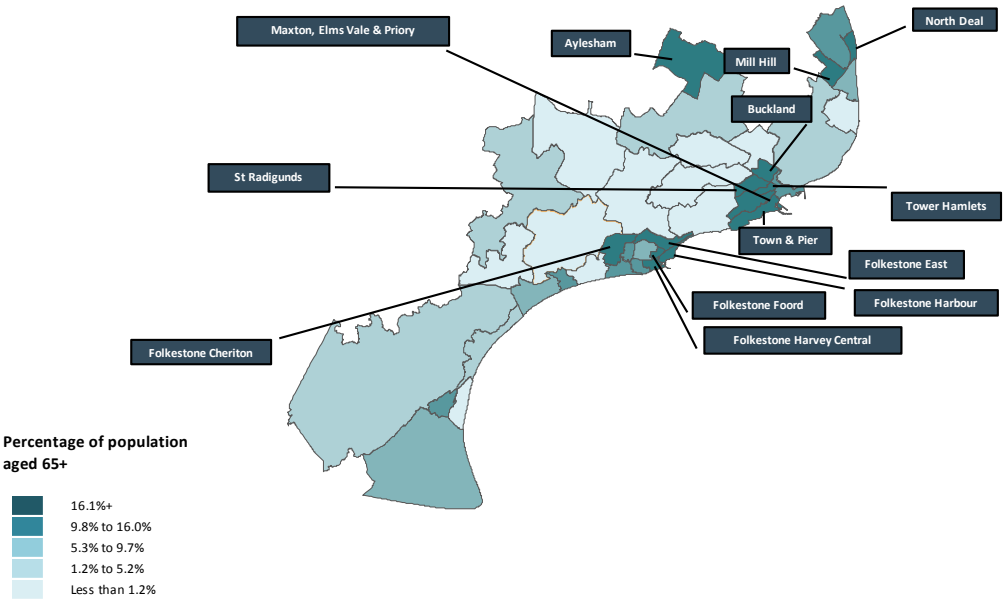
Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018

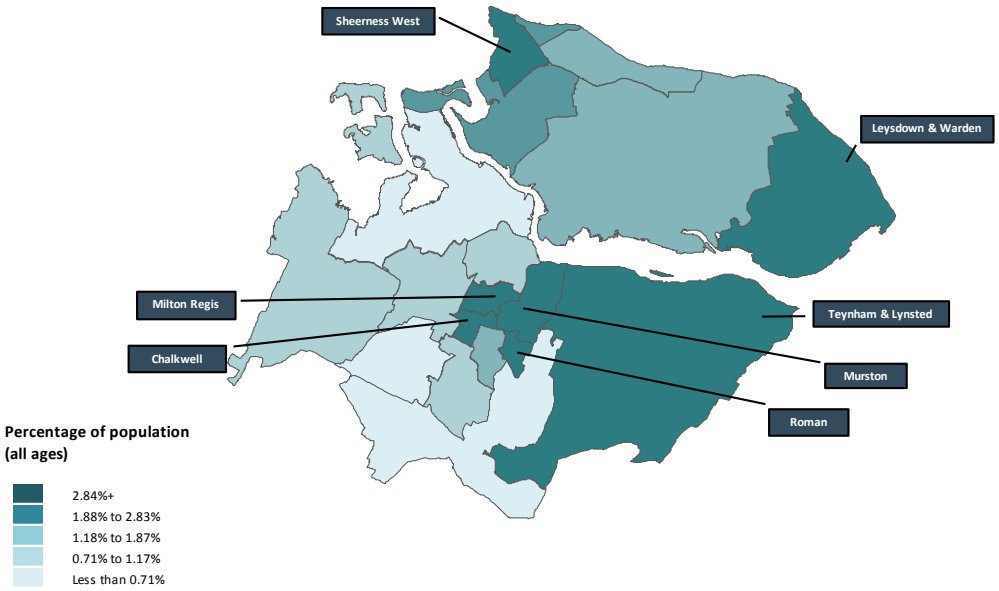


Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

4.2.5 Swale CCG

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward

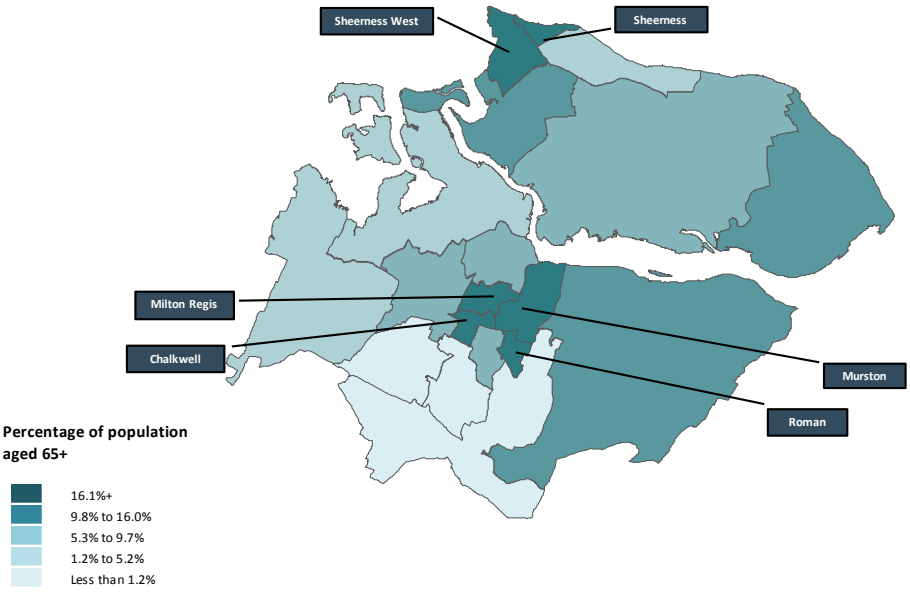
Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018

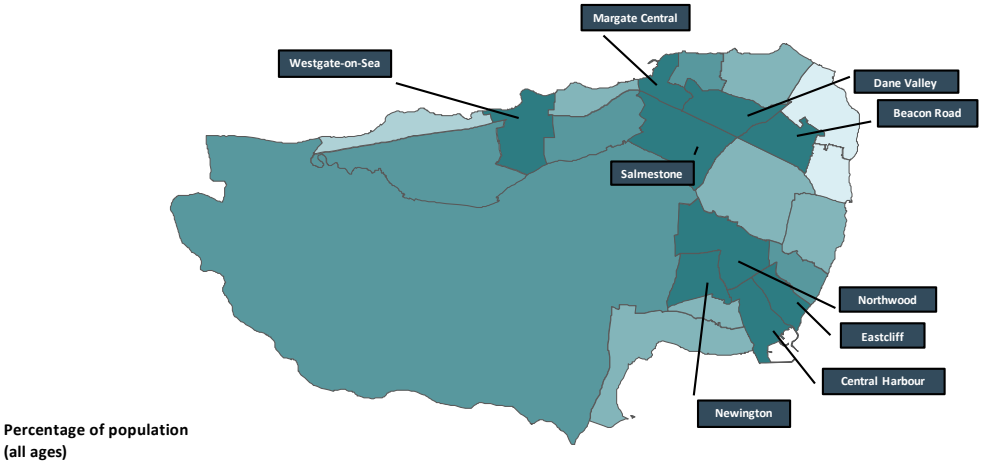


Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

4.2.6 Thanet CCG

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



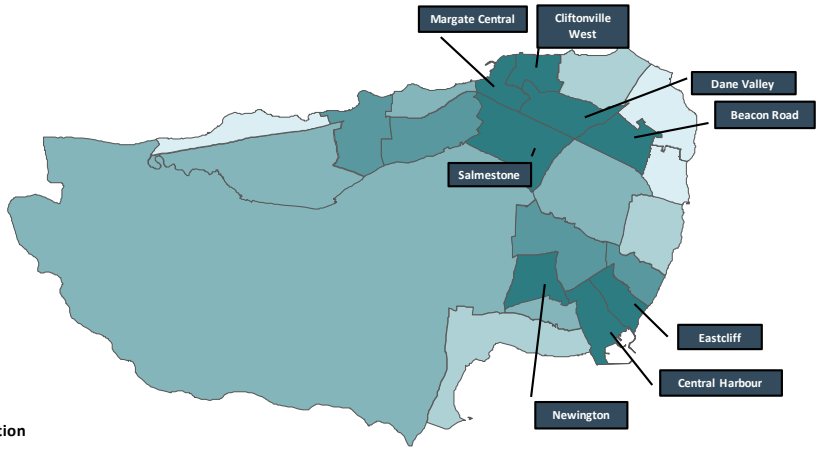
Percentage of population (all ages)

- 2.84%+
- 1.88% to 2.83%
- 1.18% to 1.87%
- 0.71% to 1.17%
- Less than 0.71%

Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Percentage of population aged 65+

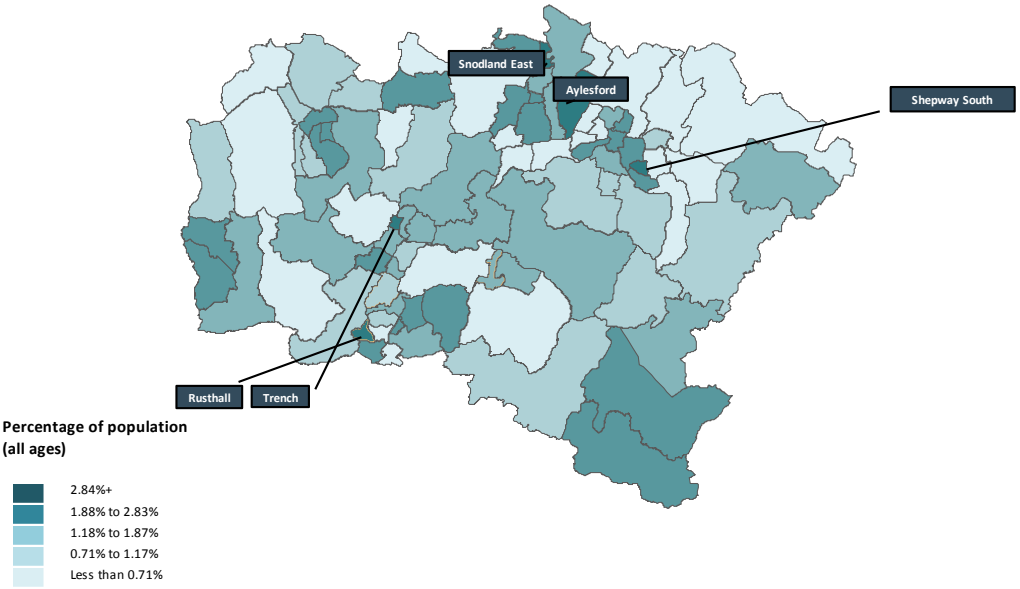
- 16.1%+
- 9.8% to 16.0%
- 5.3% to 9.7%
- 1.2% to 5.2%
- Less than 1.2%

Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

4.2.7 West Kent CCG

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward

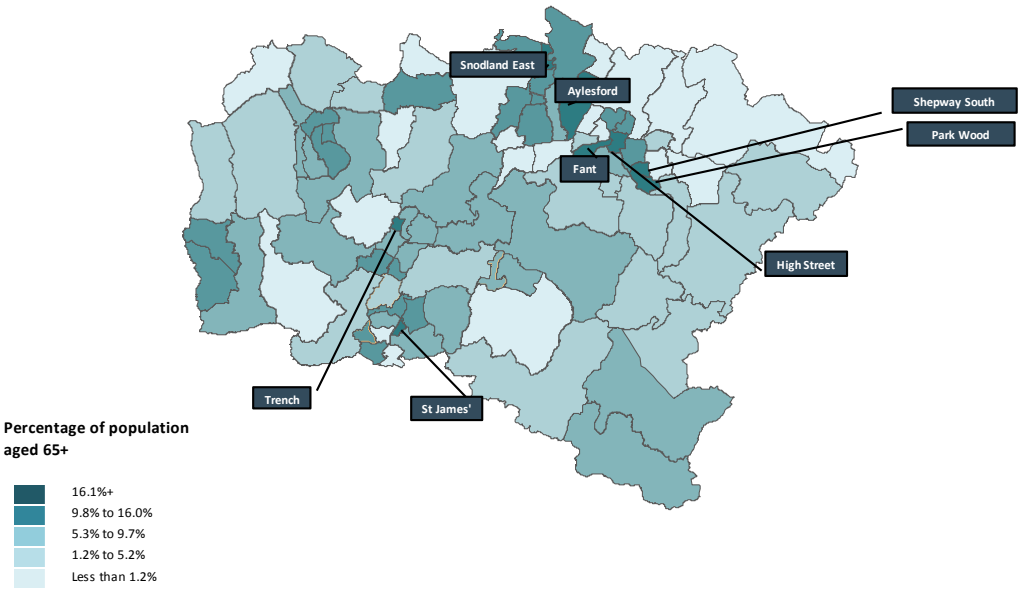
Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018

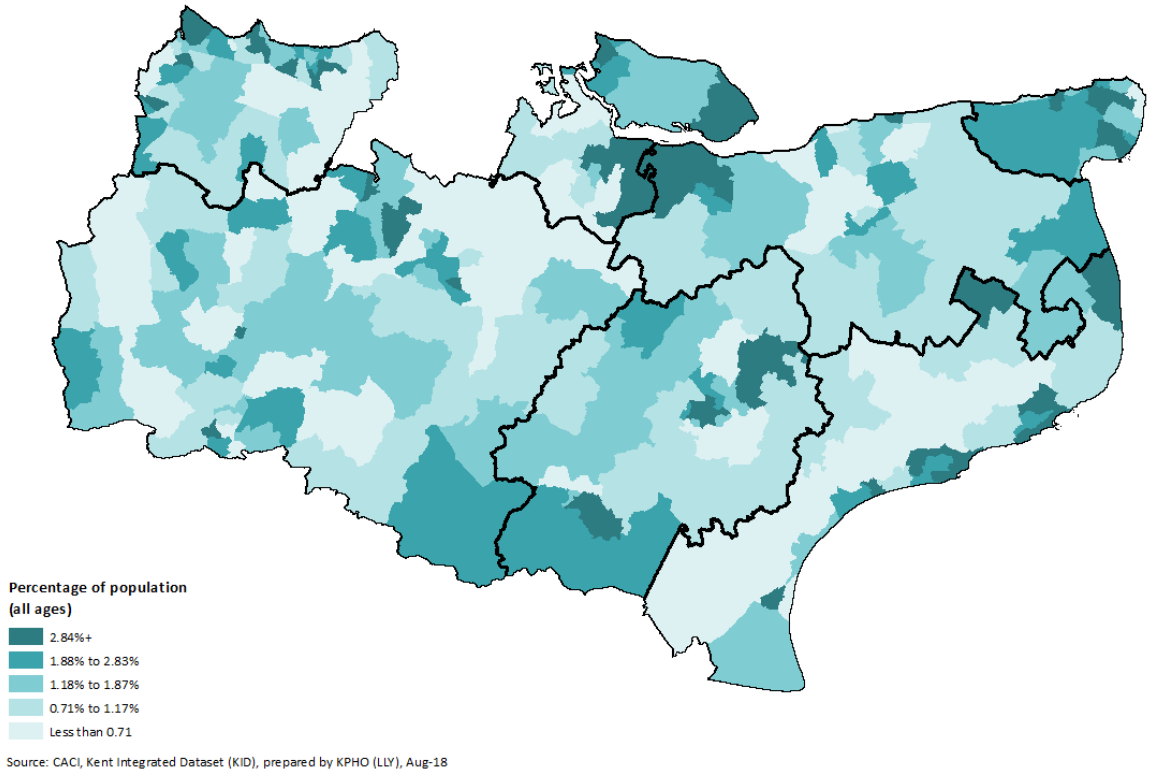


Source: CACI/Kent Integrated Dataset (KID), ONS, prepared by KPHO (RK), Jun-18

4.2.8 Kent

% of the population who are older people more likely to be experiencing social isolation/loneliness: by electoral ward

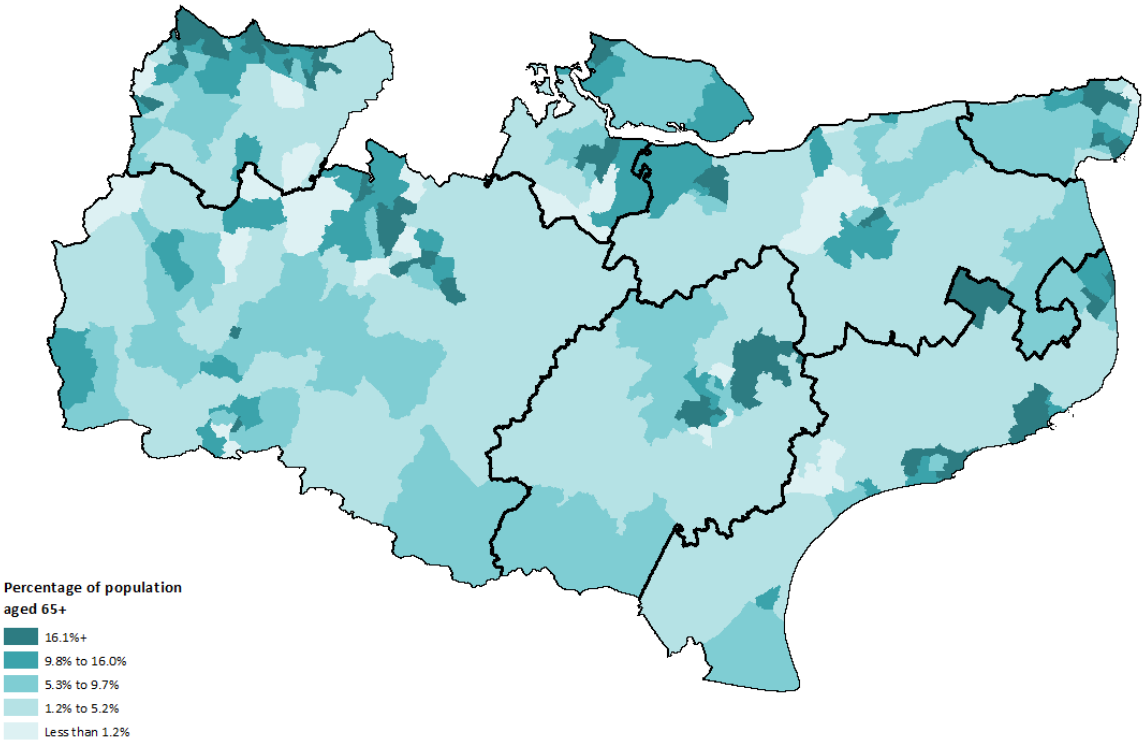
Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI, Kent Integrated Dataset (KID), prepared by KPHO (LLY), Aug-18

% of older people more likely to be experiencing social isolation/loneliness: by electoral ward

Percentage of population aged 65+ identified as belonging to a Wellbeing Acorn type with a high calculated 'isolation index', aged 65+ and living alone, 2018



Source: CACI, Kent Integrated Dataset (KID), ONS, prepared by KPHO (LLY), Aug-18

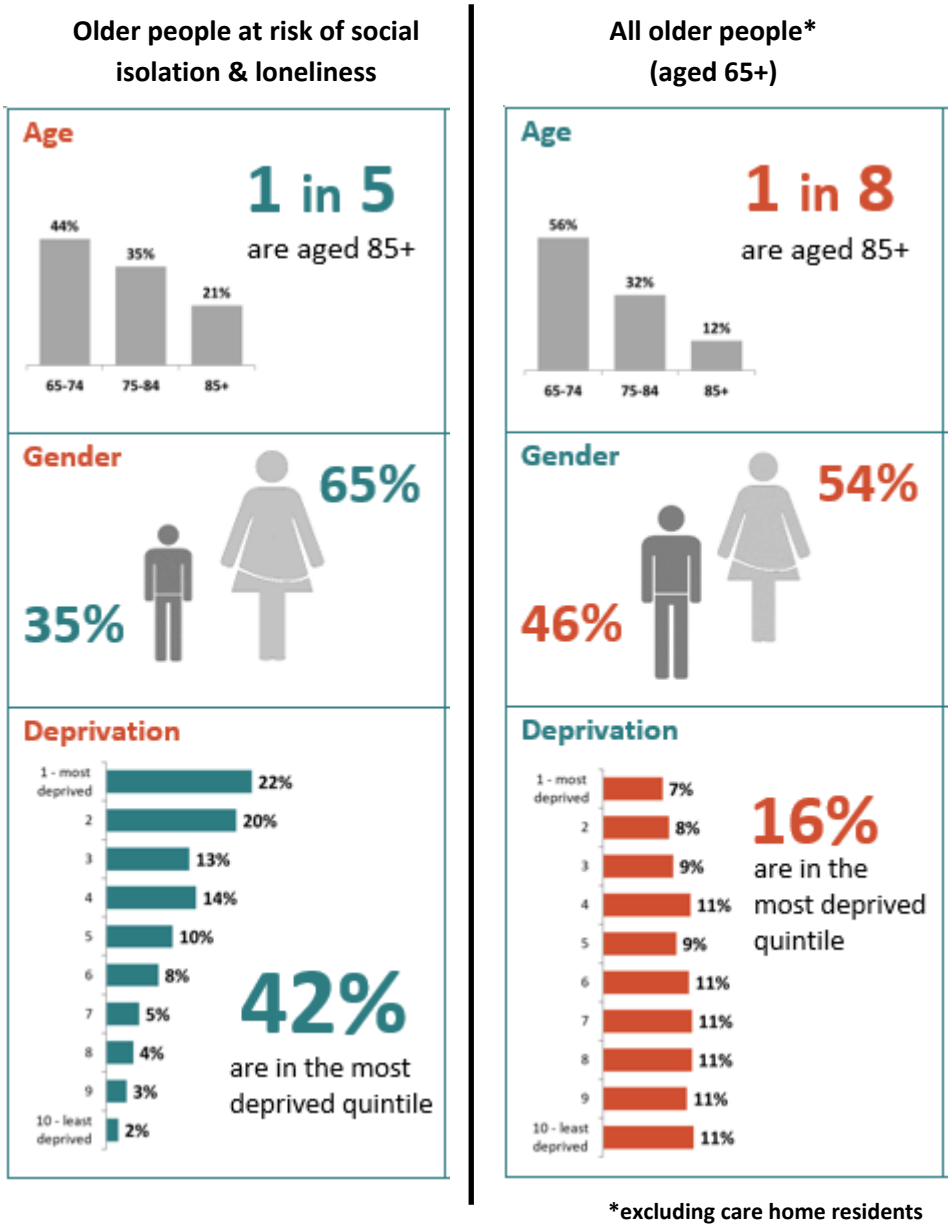
4.3 Profiling older people at risk of social isolation and loneliness

The analysis below compares the Kent residents at risk of social isolation and loneliness identified using the approach above with all Kent residents aged 65+[14].

4.3.1 Demographic profile

Older people in Kent identified as being at risk of social isolation and loneliness are:

- older than the overall 65+ population of Kent,
- more likely to be female,
- and much more likely to be living in a deprived neighbourhood.



*excluding care home residents

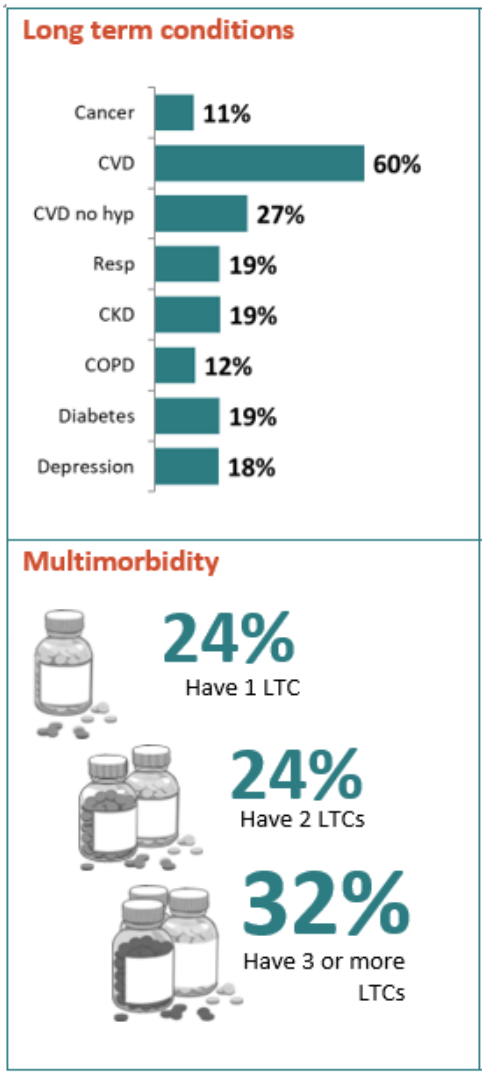
[14] Excluding care home residents

4.3.2 Heath profile: long term conditions

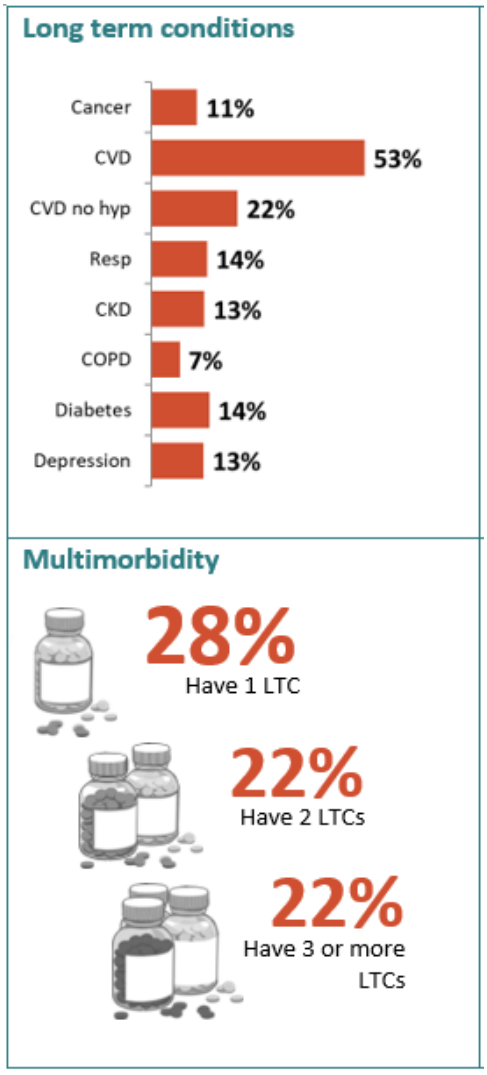
Older people in Kent identified as being at risk of social isolation and loneliness are:

- more likely than the overall 65+ population of Kent to have a range of long term conditions[15], including
  - cardiovascular disease (AF, CHD, heart failure, hypertension, PAD and stroke combined),
  - respiratory disease (COPD and asthma combined),
  - chronic kidney disease,
  - diabetes,
  - and depression,
- more likely to be multimorbid (i.e. have two or more long term conditions).

Older people at risk of social isolation & loneliness



All older people* (aged 65+)



Analysis is based on the following 19 long-term conditions as recorded by GPs: AF, asthma, cancer, CHD, CKD, COPD, dementia, diabetes, HF, hypertension, LD, palliative care, stroke, MH, Peripheral Arterial Disease, RA, osteoporosis, depression

***excluding care home residents**

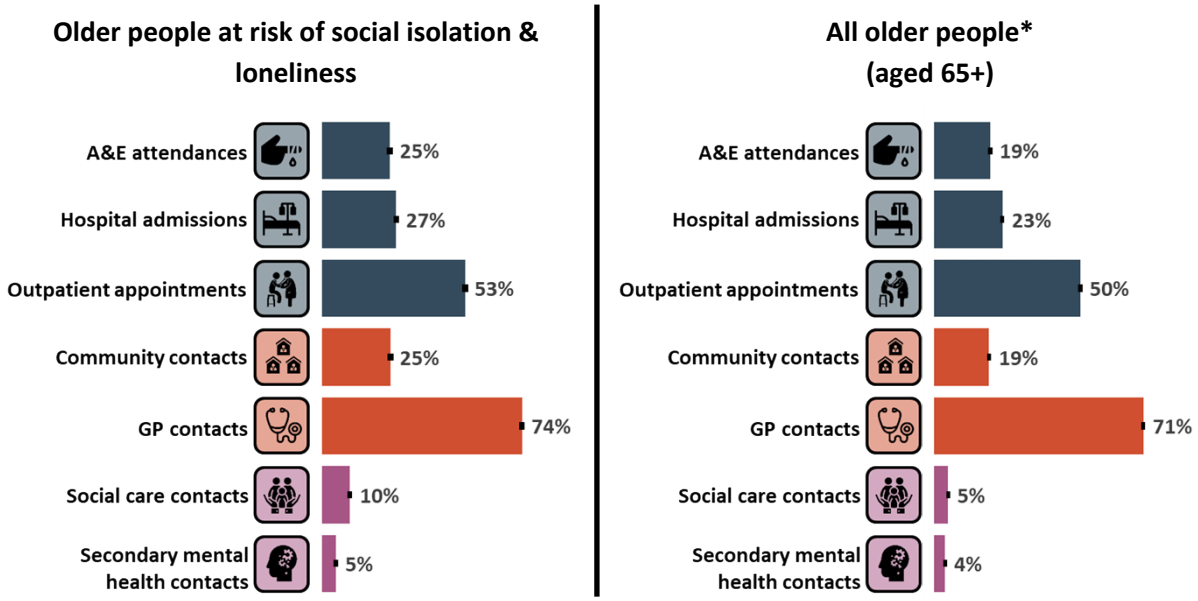
[15] Based on GP records.

4.3.3 Heath profile: Service Usage

The analysis below compares older people in Kent identified as being at risk of social isolation and loneliness and the overall 65+ population in terms of the proportions who have had any contact during 2017 with a range of key health and social care services.

Older people in Kent identified as being at risk of social isolation and loneliness are more likely than the overall 65+ population of Kent to:

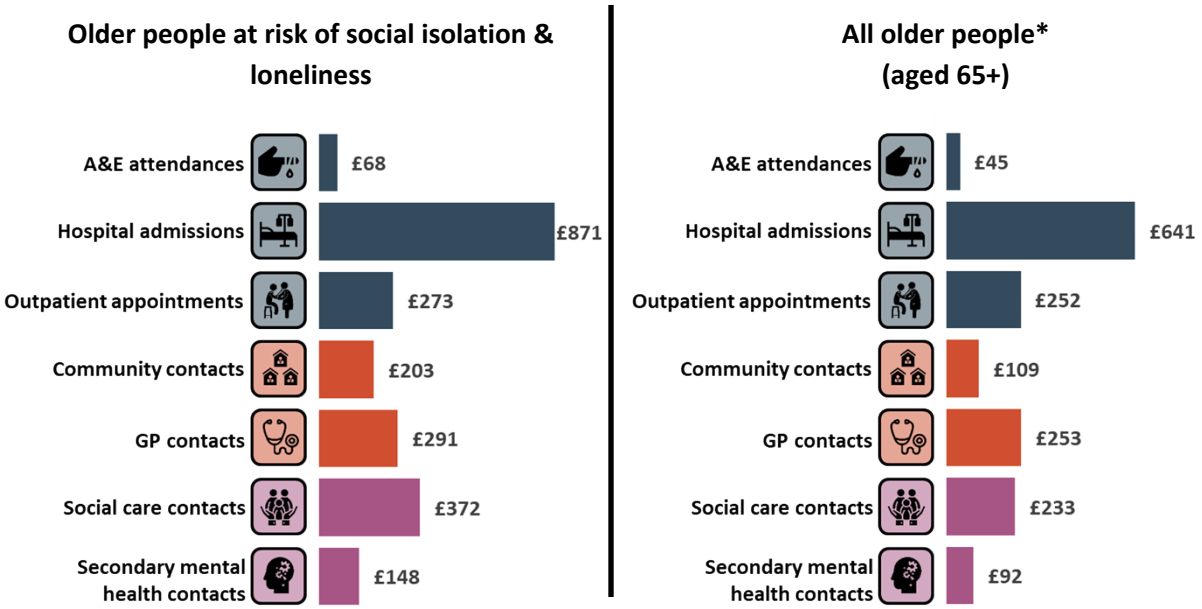
- have attended A&E,
- have been admitted to hospital,
- have had contact with community health services,
- and social care



Source: Kent Integrated Dataset (KID), prepared by KPHO (RK)
Analysis restricted to individuals registered with a GP flowing data to the KID
Images from Noun Project

***excluding care home residents**

The figure below provides a similar analysis, but with the total average per capita cost[16] of usage of key health & social care services shown. Again, the analysis covers service usage during 2017.



Source: Kent Integrated Dataset (KID), prepared by KPHO (RK)
Analysis restricted to individuals registered with a GP flowing data to the KID
Images from Noun Project

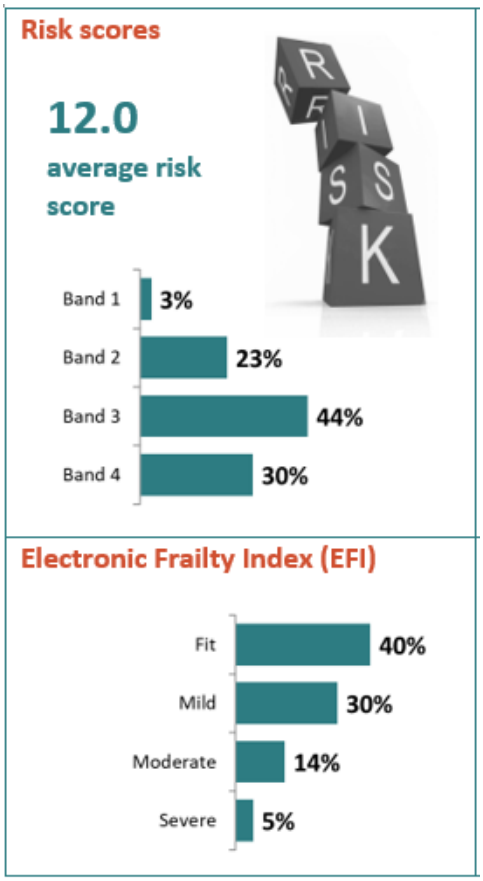
[16] Across all individuals in each group, not just those using each of the services.

4.3.4 Risk

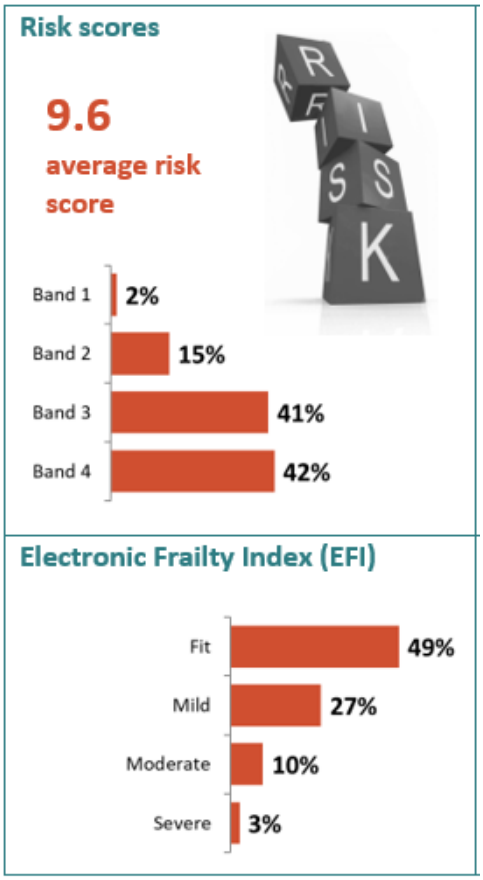
Older people in Kent identified as being at risk of social isolation and loneliness are:

- more likely to be assessed as being in a high risk score group[17],
- and more likely to have characteristics recorded by their GP that place them in the 'severe' or 'moderate' frailty groups of the Electronic Frailty Index (EFI)[18].

Older people at risk of social isolation & loneliness



All older people* (aged 65+)



[17] See https://www.kingsfund.org.uk/sites/files/kf/field/field_document/PARR-combined-predictive-model-final-report-dec06.pdf for further details on the risk scores used. Band 1 corresponds to 'very high relative risk', Band 2 to 'high relative risk', Band 3 to 'moderate relative risk' and Band 4 to 'low relative risk'.

[18] Development and validation of an electronic frailty index using routine primary care electronic health record data, Clegg *et al*, *Age and Ageing*, Volume 45, Issue 3, 1 May 2016, Pages 353–360, https://doi.org/10.1093/ageing/afw039

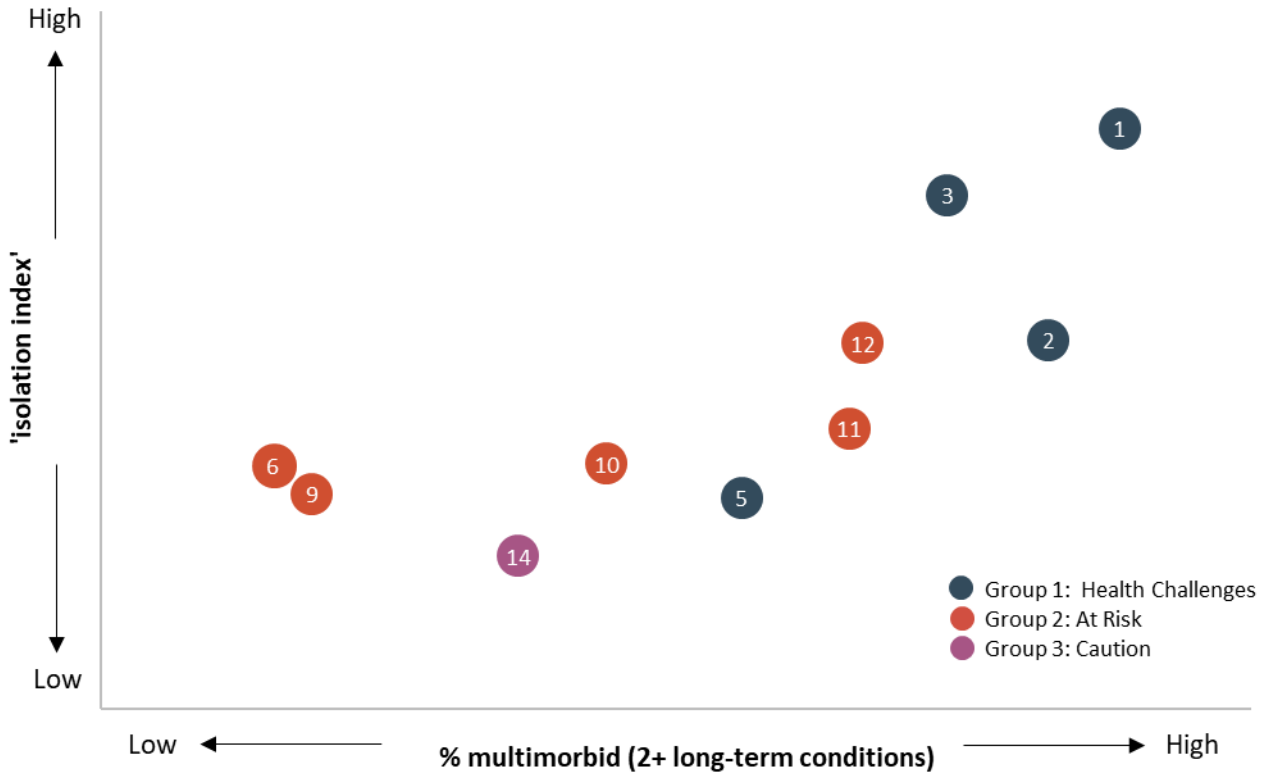
4.4 Segmenting older people at risk of social isolation and loneliness

The Kent residents identified as being at risk of social isolation/loneliness can be segmented according to their Wellbeing Acorn type. Analysis by these segments suggests that older people living alone in Acorn Wellbeing types 1 (limited living), 2 (poorly pensioners) and 3 (hardship heartlands) are at the highest risk of social isolation and loneliness *and* have the highest levels of multimorbidity, depression, the highest usage of acute and social care services, and the highest levels of frailty.

4.4.1 Multimorbidity

The figure below compares multimorbidity levels (% recorded as having 2 or more long term conditions) with the calculated 'isolation index' for 65+ year olds living alone in each of the 11 Wellbeing Acorn types identified.

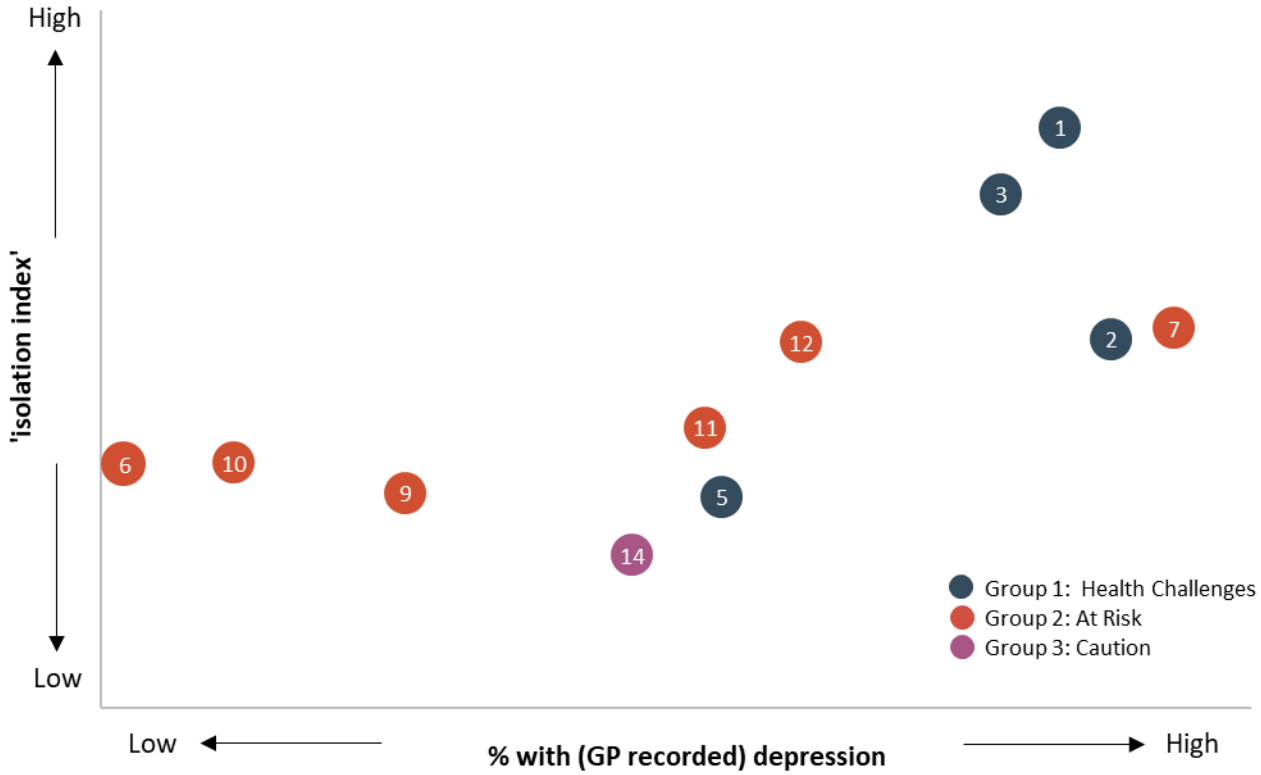
This analysis suggests that the Wellbeing Acorn types with the highest isolation indices (i.e. assessed as being at the highest risk of social isolation) also have the highest levels of multimorbidity. In particular, those aged 65+ living alone and in Wellbeing Acorn groups 1 (limited living), 2 (poorly pensioners) and 3 (hardship heartlands) are highlighted.



4.4.2 Depression

The figure below compares GP recorded depression with the calculated 'isolation index' for 65+ year olds living alone in each of the 11 Wellbeing Acorn types identified.

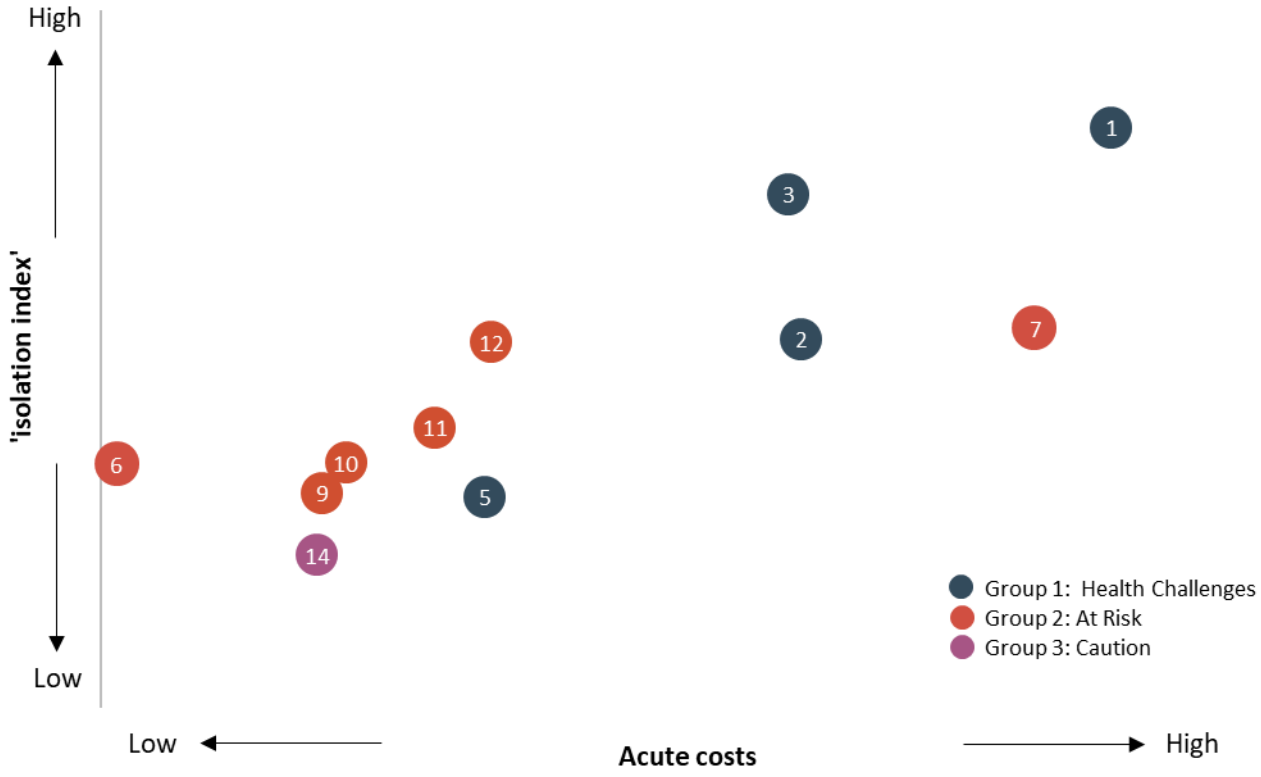
This analysis suggests that the Wellbeing Acorn types with the highest isolation indices (i.e. assessed as being at the highest risk of social isolation) also have the highest levels of recorded depression. In particular, those aged 65+ living alone and in Wellbeing Acorn groups 1 (limited living), 2 (poorly pensioners), 3 (hardship heartlands) and 7 (struggling smokers) are highlighted.



4.4.3 Service usage: Acute care

The figure below compares usage of acute services (A&E, hospital admissions and/or outpatient appointments) with the calculated 'isolation index' for 65+ year olds living alone in each of the 11 Wellbeing Acorn types identified.

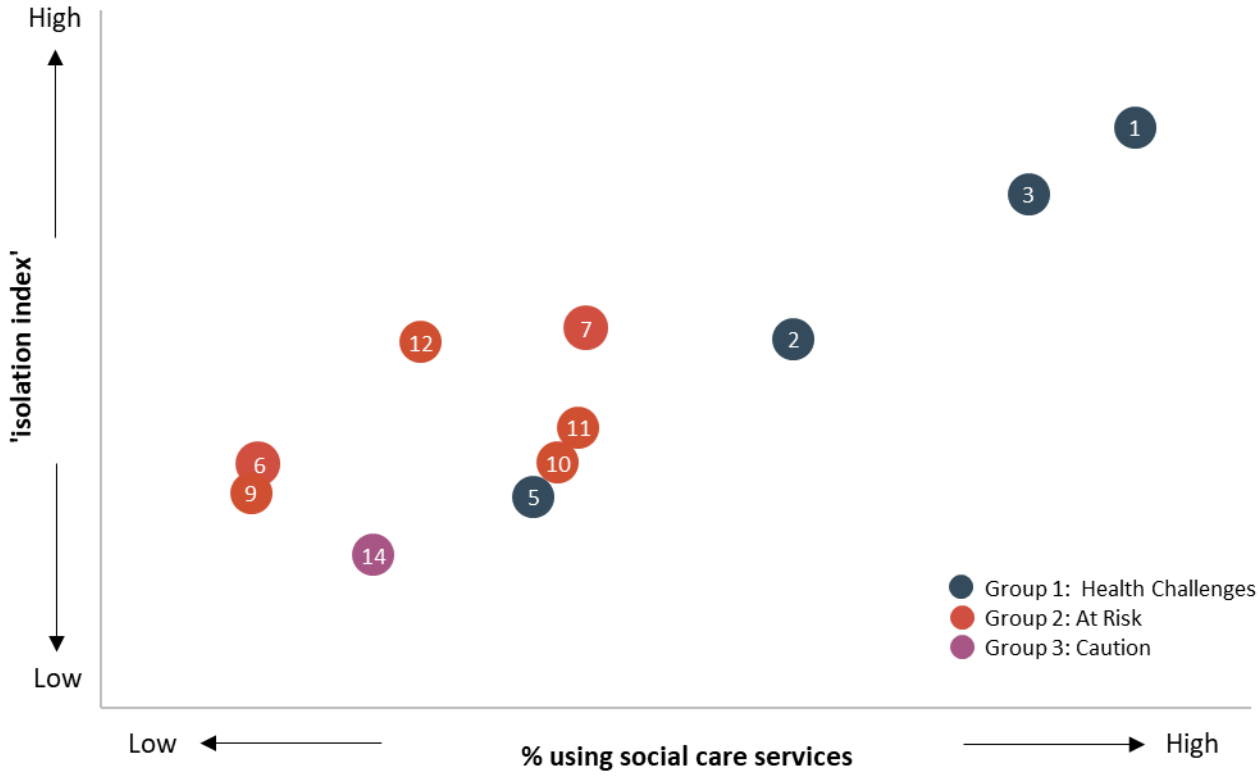
This analysis suggests that the Wellbeing Acorn types with the highest isolation indices (i.e. assessed as being at the highest risk of social isolation) also tend to have the highest levels of usage of acute services. In particular, those aged 65+ living alone and in Wellbeing Acorn groups 1 (limited living), 2 (poorly pensioners), 3 (hardship heartlands) and 7 (struggling smokers) are highlighted.



4.4.4 Service usage: Social care

The figure below compares usage of social care services with the calculated 'isolation index' for 65+ year olds living alone in each of the 11 Wellbeing Acorn types identified.

This analysis suggests that the Wellbeing Acorn types with the highest isolation indices (i.e. assessed as being at the highest risk of social isolation) also tend to have the highest levels of usage of social care services. In particular, those aged 65+ living alone and in Wellbeing Acorn groups 1 (limited living), 2 (poorly pensioners) and 3 (hardship heartlands) are highlighted.



4.4.5 Frailty

The figure below compares frailty levels (% categorised as severely or moderately frail under the Electronic Frailty Index[19]) with the calculated 'isolation index' for 65+ year olds living alone in each of the 11 Wellbeing Acorn types identified.

This analysis suggests that the Wellbeing Acorn types with the highest isolation indices (i.e. assessed as being at the highest risk of social isolation) also tend to have the highest levels of frailty. In particular, those aged 65+ living alone and in Wellbeing Acorn groups 1 (limited living), 2 (poorly pensioners) and 3 (hardship heartlands) are highlighted.

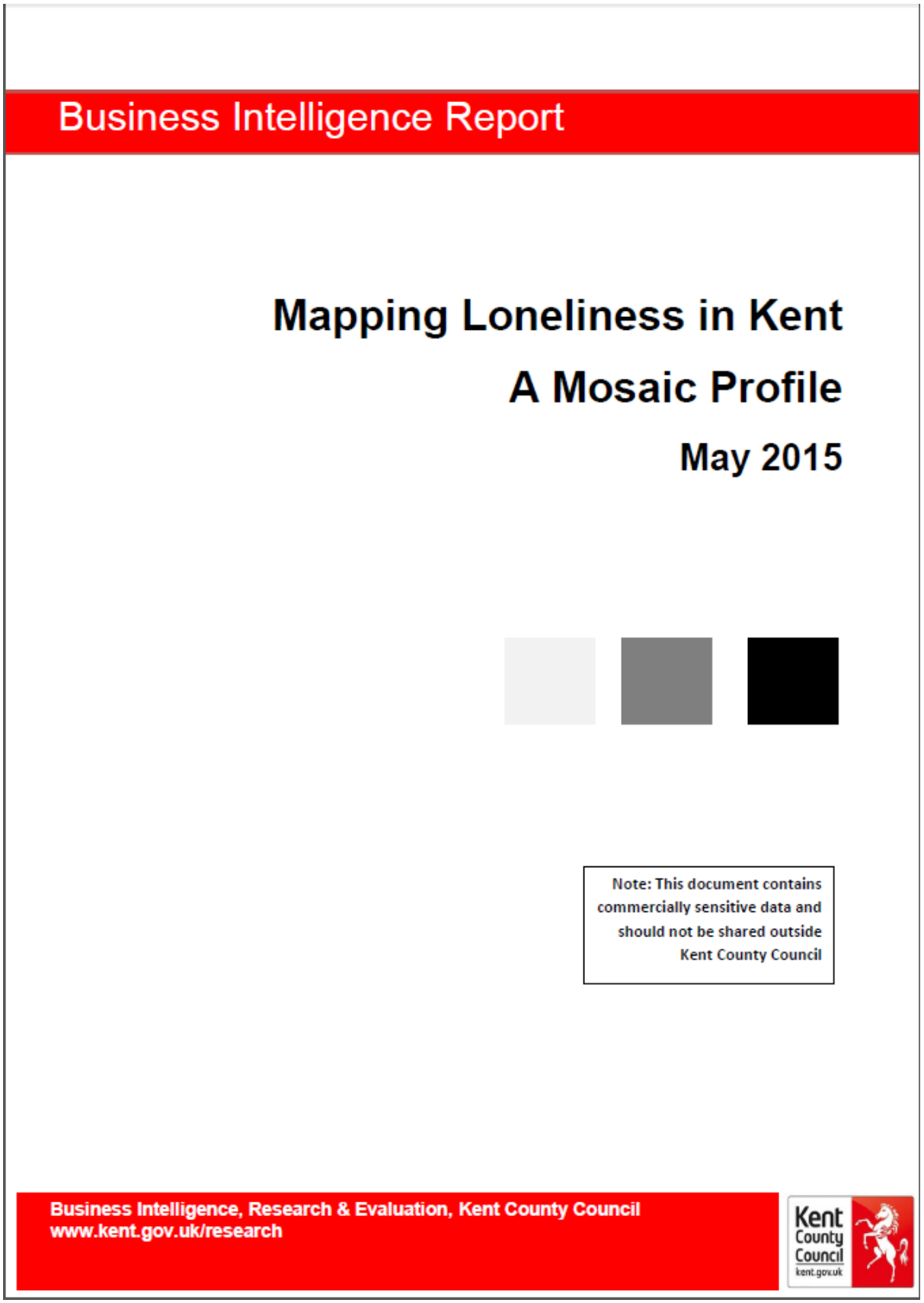
[19] Development and validation of an electronic frailty index using routine primary care electronic health record data, Clegg *et al*, *Age and Ageing*, Volume 45, Issue 3, 1 May 2016, Pages 353–360, https://doi.org/10.1093/ageing/afw039

5. Conclusions

It has been possible to use Wellbeing Acorn in combination with the Kent Integrated Dataset to identify c.29,500 Kent residents aged 65+ who live alone and whose Wellbeing Acorn type suggests an increased risk of social isolation and/or loneliness. The individuals identified have many of the characteristics expected based on other studies of social isolation.

The Kent residents identified as being at risk of social isolation/loneliness can be further segmented according to their Wellbeing Acorn type. Analysis by these segments suggests that older people living alone in Acorn Wellbeing types 1 (limited living), 2 (poorly pensioners) and 3 (hardship heartlands) are at the highest risk of social isolation and loneliness *and* have the highest levels of multimorbidity, depression, the highest usage of acute and social care services, and the highest levels of frailty.

Appendix A



Business Intelligence Report

Mapping Loneliness in Kent

A Mosaic Profile

May 2015

Note: This document contains commercially sensitive data and should not be shared outside Kent County Council

Business Intelligence, Research & Evaluation, Kent County Council
www.kent.gov.uk/research

Kent County Council kent.gov.uk

Loneliness and Social Isolation

Loneliness and social isolation affects an estimated 10% of all older people. There are many negative health outcomes associated with loneliness and social isolation. Indeed, the influence of isolation and loneliness on the risk of death is comparable with smoking / alcohol consumption and it exceeds the influence of other important risk factors such as physical inactivity and obesity. As loneliness can predicate negative health outcomes, which increases demand on services, it is appropriate to identify the areas where individuals are particularly at risk of loneliness. This in turn could inform the commissioning or development of services that would aim to reduce the volume of loneliness related health issues for KCC residents by intervening with at risk groups.

Essex County Council and Gloucestershire County Council have gained national attention by mapping the locations of those residents particularly at risk from loneliness and isolation. The model pioneered by Essex combined Mosaic customer segmentation data to create an index which determined the level of risk of loneliness for each Mosaic type. The households classified to one of the 'at risk' types were then plotted in order to ascertain the spatial distribution of the 'at risk' population and identify particular hot spots of loneliness. The Essex model used the following socio-demographic data in Mosaic in their loneliness index:

- Single pensioners
- Widowed
- Retired
- Unlikely to meet friends family regularly
- Unlikely to interact with neighbours
- Poor health
- Permanently sick
- Suffering from depression
- Suffering from poor mobility
- Visually impaired
- Hard of hearing
- Struggling financially
- Not employed (Part-time, Full-time, self-employed)
- Less educated (No further education, no degree)

Within Mosaic, each Mosaic group and type is assigned a score for each variable. A score of 100 indicates that this group is as likely as the national average to exhibit that particular characteristic. A score of under 100 indicates a less than average likelihood of exhibiting that characteristic whereas a score of over 100 designates a greater likelihood than the national average. Essex County Council combined the variables listed above to create an overall index score for each Mosaic type that indicated the likelihood of that type to be at

risk of loneliness and isolation. Different weightings were applied to each individual value during different scenarios, however this had little impact on which types were seen as at risk from loneliness.

Kent Loneliness and Isolation Map

The data used in the Essex County Council loneliness index was generated from a previous Mosaic segmentation. Not all of the data categories used to create the index are available in the latest segmentation. Accordingly, categories in the current Mosaic segmentation were selected to create a comparable loneliness and isolation index for Kent. These are as follows:

- Elderly and Single
- Retired
- Personal Income <10k
- Pension Credit
- Worry a lot about oneself
- There is little that can be done to change life
- Bad Health
- Very bad health
- Depression
- Hearing Aids

These variables were combined to generate a loneliness and isolation index score for each of the 66 Mosaic types. The variables were not weighted as this map is indicative only and is intended to demonstrate methodologies than can be used to identify areas of social isolation and loneliness. Similarly, other data and variables can be added to the index, as the model is refined over time. Six Mosaic types scored over 200 in the combined index, thus indicating a significantly greater than average likelihood of exhibiting the characteristics listed above. These were:

F23 – Solo Retirees

Solo Retirees are elderly singles still able to live independently, whose incomes, though reduced in recent years, give them a satisfactory standard of living. Well into their retirement, they live in their affordable but pleasant owned homes.

Solo Retirees are almost exclusively pensioners who are in their 70s or older. They have been married, raised a family and are now on their own. Two thirds are female and many have lived in their homes for a very long time, 27 years on average, perhaps even bringing up their children here.

These properties are reasonably priced three bedroom detached bungalows, terraces and semis of fairly standard design located in pleasant suburbs and now almost all owned outright.

Most Solo Retirees attained some qualifications, and working lives were mostly spent in lower managerial or intermediate roles that offered or allowed them to afford a small private

pension. This is now used to supplement their state pension and, although their income has fallen since they have been on their own, with modest outgoings they are able to live quite comfortably. One way they tend to keep their bills down is by switching things off when they are not in use and they will only rarely upgrade furniture or items such as fridges or washing machines.
Solo Retirees are not generally fans of new technology. Ownership of items such as smartphones and tablets is low as is any internet usage.
Solo Retirees are similar to their Senior Security counterparts in having a lower than average dependency on the state than people in general, despite their advancing years.
These older people do not tend to smoke, and their alcohol consumption is typical of the population overall, though a slightly higher proportion than average do drink every day. While they are more likely than average to follow a healthy eating regime, exercise and sport no longer feature in their day to day activities.
The crime rate in the pleasant suburbs where Solo Retirees live is low, but Solo Retirees are more likely than others in this group to think that both crime and anti-social behaviour in general has increased a lot in their neighbourhoods. However, they are personally only slightly more likely to worry about becoming a victim of crime.
Levels of environmental knowledge are lower than the norm in this type, but although they are less willing to make major lifestyle changes to benefit the environment, they are better than average at recycling and reducing energy.

N57 – Seasoned Survivors

Seasoned Survivors are deep-rooted elderly owners of low value terraces in communities in which they may have lived for much of their adult life. Now in their later retirement, the modest equity they have in their homes provides some security for their future needs.

Seasoned Survivors consists of elderly people, mainly in their 70s and 80s with an average age of 77, who are long-term residents of their local communities. Most are now living alone, and women outnumber men.
They have the longest length of residency of any type, having lived in their home, on average, for 29 years. Their neighbourhoods contain a mix of ages, and neighbours may well be younger families.
Their homes are traditional two or three bedroom terraced properties with some semi-detached homes which Seasoned Survivors own outright. Although properties are of low value, the modest equity Seasoned Survivors have built up over the years does give them some security and more options for care as time goes on.
Incomes are modest, most having long retired from routine and semi-skilled jobs, but Seasoned Survivors are careful with their money and manage to keep on top of their finances, getting by on their state pensions. They often shop at local markets and prefer paying for purchases with cash.
Seasoned Survivors rely on the state for a high level of support from a range of benefits. Like other less affluent elderly types, these old people suffer from an increasing number of health problems. However, health levels here are better than amongst some other older people and 75 per cent still consider themselves in very good or good health. Smoking and alcohol consumption are both well below average and a good proportion of Seasoned Survivors make sure they get their 'Five a day'.
The crime rate in Seasoned Survivors neighbourhoods is above average for most types of crime. Of all those in Vintage Values, this type is the most likely to think that crime is a major problem in their area. As a result they do worry about becoming a victim of crime, and are significantly more likely to feel unsafe when walking alone at night.
While not especially knowledgeable about environmental issues, Seasoned Survivors are greener than many others in this group, tending to recycle and re-use slightly more than the average.

N58 – Aided Elderly

Aided Elderly are people who live in specialised accommodation designed for elderly people, including retirement homes and small complexes of purpose built flats. Some require care while others live comparatively independently but value the reassurance of on-site assistance in case of need.

Aided Elderly are mostly aged in their late 70s or older with quite a few people in their 90s. Most are living alone, many are widowed, and there is a high proportion of single females. Homes are mostly purpose-built fairly modern flats with one or two bedrooms, within private communities. They can be of a reasonable value due to their location in good suburbs and the specific nature of their design which caters to the needs of a particular market. Two-thirds of residents are owner occupiers, having downsized from their own larger homes due to their advancing years.

Disposable incomes vary, with a number likely to enjoy income from an occupational pension in addition to their state pension. For these individuals the move to a smaller property was necessitated by declining health rather than financial factors.

Aided Elderly do not feel confident with technology and are the least likely to own a mobile phone. While some may go online it is usually when someone can show them what to do. They prefer to keep up-to-date with the world by watching TV news channels and reading newspapers.

Apart from their State Pension, Aided Elderly are far less dependent on the state than their old aged counterparts, being considerably less likely to access benefits, including those around incapacity and disability.

Levels of crime tend to be around or below average in the areas in which Aided Elderly live, and their fear of crime is significantly below average. Living as they often do in specialist accommodation in small private complexes, they do not experience much in the way of anti-social and nuisance behaviour and they are less likely than average and considerably less likely than other elderly people to worry about being a victim of crime.

Few in this type smoke, but they are more likely to drink more frequently than others – particularly when compared to other elderly types. Again, compared to their peers and indeed to people in general they are better at ensuring they eat five portions of fruit and vegetables a day.

Aided Elderly will make the effort to reduce their energy and water use, although this is probably driven by thriftiness as much as a concern for the environment, since they are average in terms of green behaviours such as recycling and minimising packaging.

N59 – Pocket Pensions

Pocket Pensions are penny-wise elderly singles living in small developments of compact social homes designed to meet the needs of elderly people. They are still able to live independently and are not yet in need of sheltered accommodation.

Pocket Pensions consists of single pensioners who rent their small homes from the council. Over 60 per cent of these pensioners are women. They live in small estates of low value housing with one or sometimes two bedrooms, designed with elderly needs in mind. Half of these homes are bungalows, and most of the remainder are low-rise flats.

There are fewer long term residents in these locations and most Pocket Pensions have moved in to this housing within the last ten years.

Incomes are low, often limited to the state pension and other benefits, after careers that were spent working in routine and semi-routine occupations. However, Pocket Pensions are inherently thrifty and most are able to manage on their tight budgets.

These people are most likely to say that they don't like new technology. Use of the internet and watching digital or cable TV is very limited but they are particularly keen viewers of ITV1. They prefer traditional contact methods from the banks and other organisations they deal with such as landline telephone calls or visiting branches.

Pocket Pensions mainly get by on their small State Pensions. Some access other benefits often associated with increasing age and decreasing health such as Disability Allowance and Incapacity Benefit. Overall, however their level of dependency on the state is only slightly above average.
Pocket Pensions are less likely than people on the whole to smoke and drink, but with their increasing age, they do little to keep in shape and levels of good health are below the norm.
Unlike some other people in old age, they are fortunate in living in neighbourhoods where the crime rate is well below average. Anti-social behaviour, speeding traffic, loitering teenagers and littering are all less common in these areas. Also, while they feel crime hasn't increased a lot in their area, they are more likely to feel it has increased across the country as a whole.
That said, their fear of becoming a victim of crime is above average and they are especially likely to feel unsafe being out and about alone after dark.
This type does not generally understand issues such as climate change or carbon offsetting, and they are no better than the average when it comes to adopting practices or doing things that would benefit the environment.

N60 – Dependent Greys

Dependent Greys are ageing social renters with high levels of need, living in tiny homes within small centrally-located developments of flats and terraces. Most are single and are pensioners or people close to retirement whose working lives have been spent in low wage jobs.
Dependent Greys are older people, mostly in their 60s and older, who now live alone in compact accommodation in urban areas, with high levels of need. Many Dependent Greys are widowed, have never married or are divorced.
Homes are very small, yet practical, one-bedroom flats which are rented from the council or a housing association, often purpose built in the mid 1950s to the 1970s in these city locations.
Education levels for Dependent Greys are particularly low, which has resulted in working lives spent in lower wage, high turnover jobs perhaps in construction, retail or manufacturing sectors. As a result, household incomes are low amongst those still of working age as well as those in retirement who rely on state pensions, and there is a need to depend on a range of benefits.
They are unlikely to spend time online though some have mobile phones to keep in touch.
Car ownership is low but their urban location means buses are a useful method of transport.
Although Dependent Greys are not the oldest type – their average age is 68 – they are nearly three times more likely to be in bad or very bad health. Many have disabled parking permits.
They are significantly more likely to be smokers and indeed heavy smokers than people in general, although their alcohol consumption is far lower than average. They tend not to exercise or get their 'Five a day'.
Dependent Greys are the most likely of all elderly people to need the support of the state, not merely for the State Pension. They are 74 per cent more likely to receive Disability Living Allowance and 86 per cent more likely to receive Incapacity Benefit. A number close to retirement also rely on various allowances to help people unable to find employment.
They do tend to live in areas with higher than average crime rates, particularly for shoplifting and public disorder. They are the type most likely to feel that their quality of life is affected by fear of crime and they are more likely than average to feel that crime in their areas has gone up a lot; they perceive drug dealing as one of the biggest problems. As a result they are amongst the most likely to feel unsafe walking alone at night.
Dependent Greys are neither green in their behaviour nor do they claim to particularly understand green issues.

N61 – Estate Veterans

Estate Veterans are elderly, long-standing social renters of council homes who are likely to have lived in council accommodation almost all their lives. Living in typical social housing rather than accommodation designed for the elderly, they have seen their neighbourhoods change over the many years they have been there.

Estate Veterans contains older people, whose average age is 75, many of whom have been council tenants all their lives and still live in the homes where they brought up their children. They have the second longest length of residency of any type and on average Estate Veterans have been at their present address for almost 25 years. These homes are two or three bedroom semi-detached or terraced properties with gardens.

They are often living alone on larger estates with some challenges. Their local communities contain people with a mix of ages and while many of their neighbours have purchased their council homes, Estate Veterans have not been able or inclined to become homeowners themselves, and instead remain long-term social renters.

These days they get by on a state pension supplemented by other statutory entitlements. They are careful with money, buying supermarket own brands and saving up for items when necessary.

Estate Veterans have largely been left behind by technology and can feel confused by computers. Apart from mobiles, ownership of technology items is low. They prefer to arrange insurance over the phone and like to be able to do one thing at a time.

Health levels amongst this type are moderate, and although naturally declining they are better than some others in Vintage Value. Although far fewer than average drink regularly, they are more likely to smoke. Their eating habits are fairly typical, particularly in terms of eating enough fruit and vegetables.

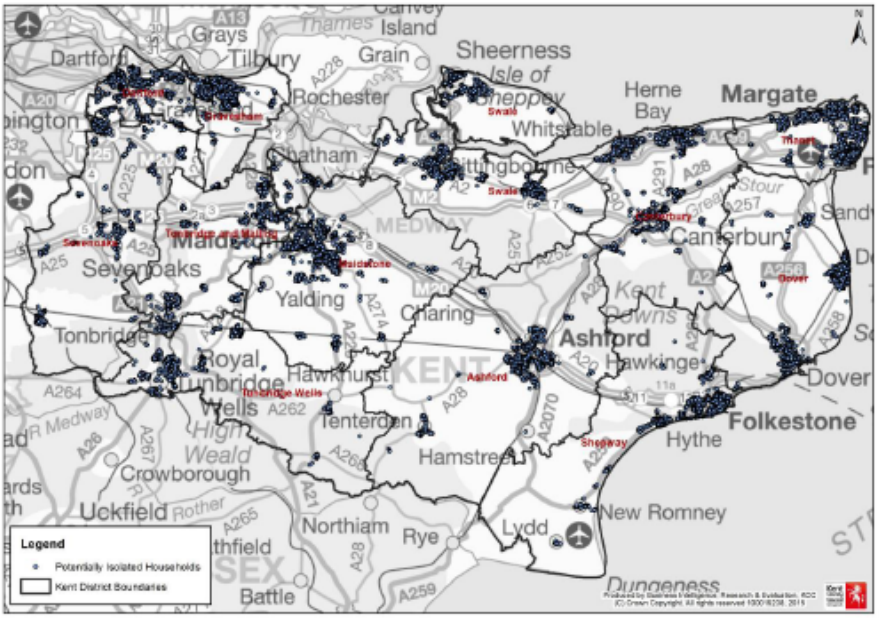
Crime is generally just a little above average on the estates where these old people live. They are the most likely type in this group, and more than twice as likely as the national average, to think that anti-social behaviour has increased a lot and is a major problem. In particular, they are concerned about drug use and drug dealing. Their fear of crime is greater than the crime rate might suggest, and they are more likely than average, and the most likely within Vintage Value, to worry about being a victim of crime.

Estate Veterans require higher levels of state assistance than average across a range of benefits.

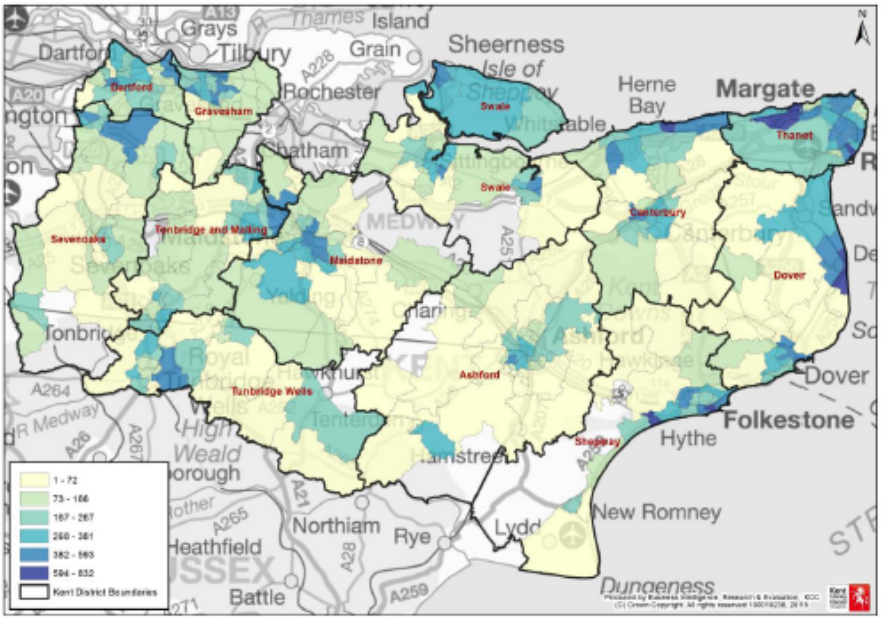
Their adoption of green practices and their level of understanding of green issues are both lower than amongst people in general.

There are 60,417 households in KCC classified to one of these Mosaic types and 98,086 residents according to 2013 estimates, this 6.6% of the KCC population. The 60,417 households are shown in Map 1. Map 2 shows the number of 'at risk' households by electoral ward. This indicates that whilst there are concentrations of potential loneliness and isolation across the county, there are particular hotspots in coastal areas of East Kent, such as Margate, Dover, Deal, Folkestone, Hythe and Herne Bay. However, there is a particular concentration in the Thanet district. The ward with the greatest number of 'at risk' households is Heron ward in Dover. Map 3 illustrates this data as a proportion of all households within each ward. Whilst this shows a similar pattern, it does highlight some areas of concentration that are not highlighted when examined as a total number of households, such as Tenterden South ward, in which 31.9% of households are at risk from loneliness and isolation.

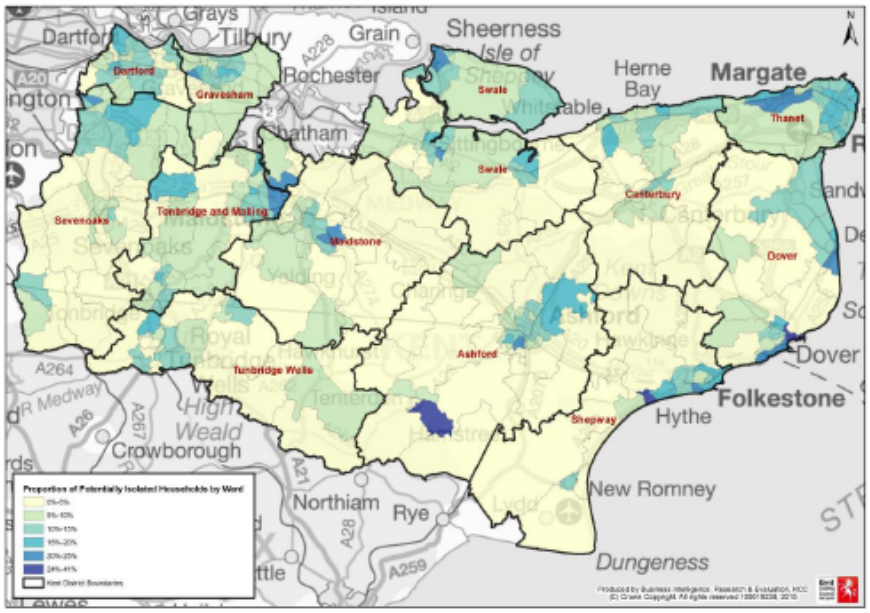
Map 1: Households at risk of loneliness and social isolation in KCC



Map 2: Households at risk of loneliness and social isolation by ward in KCC



Map 3: Proportion of households at risk of loneliness and social isolation by ward in KCC



Conclusions

This brief report has provided a background into the work undertaken by Essex County Council and Gloucestershire County Council in estimating the number of residents at risk form loneliness and isolation and to map their location. Their methodology has been updated to provide an indicative map and calculation of the number of residents and households in KCC that are at risk of loneliness. This methodology is an example of a tool that could be used and adapted in the future in order to more accurately identify 'at risk' households. Given the negative and resource intensive outcomes of residents suffering from loneliness and isolation, it may become an increasing priority in the future to provide services and support to such residents.