

Chapter 4

Renfrewshire Council Exploratory Project

4.1 Introduction

As described in Chapter 3, the Social Care Survey (SCS) is collected annually by the Scottish Government and provides a snapshot of individuals receiving social care in all 32 Scottish local authorities during a census week - usually including the date the 31st of March [Scottish-Government, 2017d]. The cross-sectional nature of this data means it does not identify every individual that receives social care in any given financial year. This has implications for research projects using the SCS and the statistical analyses that can be applied to SCS data when linked with other sources of information. For example, predictions of unscheduled health care use are only likely to be accurate in a short time-window close to the census week.

In order to gain a better understanding of the data the SCS captures (and the data it does not) an exploratory study was conducted to analyse social care data for individuals from one local authority only. This project aimed to analyse complete social care data for all individuals over a ten-year period to compare individuals receiving care in the census week with individuals who receive care in the same financial year but would not have been captured by the SCS census.

As social care data in Scotland has rarely been used for research purposes, this exploratory project also offered the opportunity to assess the format, content, and

suitability of the data from a research perspective. Ideally, data would be analysed from a number of local authorities for comparison however, as described below, acquiring sensitive data of this nature is a lengthy and complicated process relying heavily on the goodwill of the participating local authority. Despite early intentions to approach multiple local authorities practical considerations limited the project to data collected from Renfrewshire Council.

4.2 Background

The decision to approach Renfrewshire council as a potential source of data was due to convenience given previous cooperation between the council and UBDC on other projects. Glasgow City council were also approached but preliminary discussions suggested that whilst the purpose of proposed research was supported, the council was unlikely to be able to provide sufficient resource to facilitate data sharing. Preliminary meetings with data analysts from Renfrewshire council confirmed that data could be provided to facilitate the proposed research and the formal process of obtaining data using UBDC's controlled data service was instigated in April 2016.

Renfrewshire council area accounts for 3.2% of the total population of Scotland and has a slightly larger proportion of individuals aged over 60 compared to the rest of the country (24.4% v 24.2%) [NRS, 2015]. The mortality rate is also higher than recorded for the rest of Scotland (10.9% v 10.3%) with the main causes of death being cancer, circulatory diseases, and respiratory diseases [NRS, 2015]. Life expectancy at birth is lower than the Scottish average in the Renfrewshire council area for both males and females (75.9 v 77.1 & 80.6 v 81.1) [NRS, 2015]. Sixty-three percent of dwellings in Renfrewshire fall into the lowest council tax bands A-C [NRS, 2015] which is a higher than the ratio seen in the whole country (61%) [NRS, 2016]. Of all datazones in the Renfrewshire council area, 37.3% fall into the most deprived 30% of Scottish datazones - the ninth highest rate out of 32 local authorities [Scottish-Government, 2017f]. Datazones in the Renfrewshire council area show marked differences in SIMD scores with some of the most and least deprived datazones in the whole of Scotland [Scottish-Government, 2017f].

In terms of social care, the 2017 SCS [Scottish-Government, 2017g, supp.charts] shows that the proportion of over 65s receiving home care provided or administered by

CHAPTER 4. RENFREWSHIRE COUNCIL EXPLORATORY PROJECT

Renfrewshire dipped a little between 2011 and 2015 but has nearly returned to 2010 levels (52.4 per thousand in 2010, 49.4 per thousand in 2017). Historically, this is lower than levels seen across Scotland as a whole although national levels are now very similar to those seen in Renfrew (60.8 per thousand in 2010 to 48.9 per thousand in 2017). The absolute numbers of over 65s receiving home care in Renfrewshire in the 2010 census week was 1812 versus 1603 in the 2017 census [[Scottish-Government, 2017g](#), [supp.charts](#)].

More recent versions of the SCS collect information on home care (such as personal care or reablement), housing support and meals services provided during the census week. In addition, data on services such as community alarm, telecare, social worker, and self-directed support that are provided at any time during the financial year is also collected [[Scottish-Government, 2017g](#)]. The purpose of the exploratory project was to compare service provision of those services collected in the census week. As the vast majority of this data is focussed on home care services the analysis concentrates on this service only. Home care refers to services received in the home such as personal care or reablement (described in section [2.2.1](#)).

4.2.1 Research Question

- How does home care use vary within and across financial years 2006/07 - 2015/16 in the Renfrewshire council area?

4.3 Methods

4.3.1 Data

As with all services provided by Renfrewshire council, home care data is collected to ensure efficient management of the service and as evidence of service provision [[Renfrewshire-Council, 2015](#)]. Recording of individual episodes of care also helps with budgetary management of the service.

Data provided for the purposes of this exploratory study detailed anonymised information on; how many days per week, how many hours per day, service provider (e.g. local authority or independent provider), type of care (e.g. mainstream or reablement), start

CHAPTER 4. RENFREWSHIRE COUNCIL EXPLORATORY PROJECT

Table 4.1: Definitions of home care types

Type of home care	Definition
Care at Home (Mainstream)	The aim of care at home is to help vulnerable people of all ages live independently and securely in their own homes by providing personal and housing support services. Care at home services are provided very much on each individual's own circumstances and needs.
Reablement	Provides support and encouragement to help keep up or increase the skills and confidence needed to be able to return home after a stay in hospital or after an illness. Most people referred for care at home will receive a reablement service in the first instance to help support and improve independence. Long term services can be provided following reablement if ongoing support is needed.
Rapid Response	
Community Mental Health	

date, and end date for every episode of home care delivered to individuals in the Renfrewshire council area between April 2006 and April 2017. Demographic information detailing gender and year of birth was also provided.

As all episodes of home care were delivered over a period of time, data was provided for some packages where the care was first delivered as early as 2004 or as late as Summer 2017 (e.g. a home care episode starting in December 2005 and running to December 2006 was included in the data transfer). Data detailing information on community alarm and telecare services provided by Renfrewshire council were not analysed as part of this project.

The research questions of the main thesis are concerned with adults over the age of 65 in Scotland. For that reason analysis of the exploratory project was subset to also include this age bracket only. An unexpectedly large number of individuals ($n = 112$) had a year of birth recorded as 1900 (compared to $n = 68$ born between the years 1901 and 1910). A similar phenomenon was reported in the SCS linkage process (described in chapter 5) with the deduction that 1900 was a code for missing data. In this analysis these records were omitted. To protect anonymity individual month and day of birth were not shared meaning age was calculable from year of birth only.

A number of episodes of care ($n = 3604$) were found to have the same start and end date - considered to be data entry error when queried with a Renfrewshire council data analyst - and these records were also omitted from analysis.

As described in section 3.3.1, from 2013 onwards a change in the types of service the SCS accepted as home care took place [Scottish-Government, 2016a]. Previously “housing support services” and services provided 24-hours-7-days-a-week had been included as home care. From 2013 onwards these services were collected separately as “housing support”. As these types of services are provided to a very small number of individuals

CHAPTER 4. RENFREWSHIRE COUNCIL EXPLORATORY PROJECT

episodes of care with these types of service were not included in the analysis. The SCS requests information on the total hours of home care each individual received during the census week. To replicate this information every episode of care in the exploratory dataset was summarised. For each episode of home care the number of hours per day was multiplied with days per week to give a weekly total of home care hours for each episode. To identify *packages* of home care, episodes of home care with the same start and end date, and of the same home care type, were added together. For example, an individual receiving home care of the type “Care at Home (Mainstream)” with an episode of care lasting 1 hour in the morning for 3 days a week, an episode of care lasting 45 minutes at lunchtime 7 days a week, an evening episode of 30 minutes 7 days a week, and nighttime episode of 45 mins 7 days a week, would have a total weekly home care hours count of 17 hours per week for that home care type. Finally, the totals for all types of home care were summed to give an overall weekly total.

4.3.2 Analysis

Descriptive statistics of the study cohort measured mean, standard deviation, and median for continuous variables and counts with frequency and percentage for categorical variables.

To enable comparison of packages at different time points a time-series was created for the study period 27th March 2006 to 28th March 2016 at weekly intervals. The value of total hours of home care each individual was receiving at each weekly interval time point was identified. From this time series weekly counts of the total number of individuals receiving home care were calculated. Maximum and minimum values, measures of central tendency, and range of these weekly values were compared to the total number of individuals receiving home care in each financial year and visualised. Comparison was also made to the figures returned by Renfrewshire council to the SCS for numbers of individuals receiving home care.

For the financial years 2011/12 - 2015/16 (the study period of the main thesis project) data was subset to identify those packages of home care that were “live” during the week including the 31st of March and those that were not “live” i.e. (those that would not have been captured by SCS census). These subsets were then compared by visualising the duration, type, and amount of home care provided in each subset. As the home care type “Community Mental Health” accounted for less than one percent of episodes

of care - these episodes were omitted from the comparative variations.

All data cleaning and analysis was conducted using the R language and environment for statistical computing version 3.4.0 [R-Core-Team, 2017] with packages `tidyverse` v1.2.0 [Wickham, 2017], `tibbletime` v0.0.2 [Vaughan and Dancho, 2017], and `cowplot` v0.9.0 [O’Wilke, 2017] via the Integrated Development Environment RStudio v ??? [RStudio-team, 2016]. Data was held securely in the safe haven environment described in section 5.1.5

4.3.3 Project approvals and timeline

The exploratory project utilised the controlled data service provided by UBDC and therefore required approval from UBDC’s Research Approvals Committee (RAC). This process is more fully explained in section 5.1.1. Ethical approval for the study was gained from the University of Glasgow College of Social Sciences Research Ethics Committee on 24/05/2016 (*Appendix A*). Approval from RAC was gained on 01/06/2016 (*Appendix B*).

Following academic and ethical approval the process of obtaining a data sharing agreement (DSA) between the University of Glasgow and Renfrewshire council was instigated. This involved the production of an agreement in principal and privacy impact assessment as a basis for the DSA. This process involved the input of legal teams from both institutions as well as liaison with data analysts at Renfrewshire council and UBDC. The DSA was finally signed on 06/09/2017 with final transfer of data taking place on 21/09/2017.

4.4 Results

4.4.1 Descriptive statistics

After data cleaning information on 38,337 packages of home care received by 10,130 individuals during the period 2006 to 2016 were included in the analysis. Mean age of those in the dataset was 81.6 years and median age was 82.0 years. Sixty-four percent of individuals ($n = 6514$) were female. Detailed breakdown of age and gender groups is shown in table 4.2

CHAPTER 4. RENFREWSHIRE COUNCIL EXPLORATORY PROJECT

Table 4.2: Cross table of age and gender in renfrewshire analysis

	65-75	76-85	86-95	over 95	Total
Female	1442 (14.2%)	2965 (29.2%)	1985 (19.6%)	131 (1.3%)	6514 (64.3%)
Male	1107 (10.9%)	1644 (16.2%)	827 (8.2%)	34 (0.3%)	3612 (35.7%)
Missing data	2	1	1	0	4
Total	2551 (25.2%)	4601 (45.4%)	2813 (27.8%)	165 (1.6%)	10130 (100%)

Eighty-four percent of home care packages (n=32054) were provided for “Care at Home (Mainstream)” with “Reablement” type packages making up the majority of the remainder (Figure 4.1). Only 28 packages of care for over 65s were classified as being provided for “Community Mental Health” during the study period. “Reablement” packages were first coded as such in the financial year 2010/11 meaning “Care at Home (Mainstream)” made up an even larger proportion of care packages prior to this.

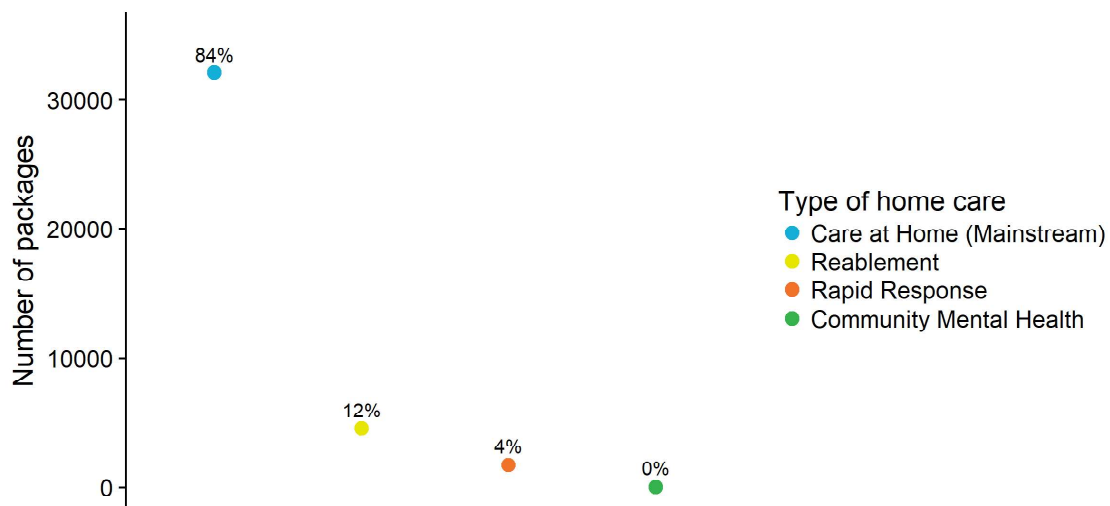


Figure 4.1: Number and ratio of packages of care by home care type

There was wide variation in the duration of home care packages which last from one week to over six years however greater than 90% of home care packages lasted less than one-year. The mean duration of home care packages was 22 weeks. The median duration was 11 weeks. The average number of hours of home care per week delivered as part of a package was seven. The median hours per week was six. Figure 4.3 shows the number of packages grouped by hours of care provided

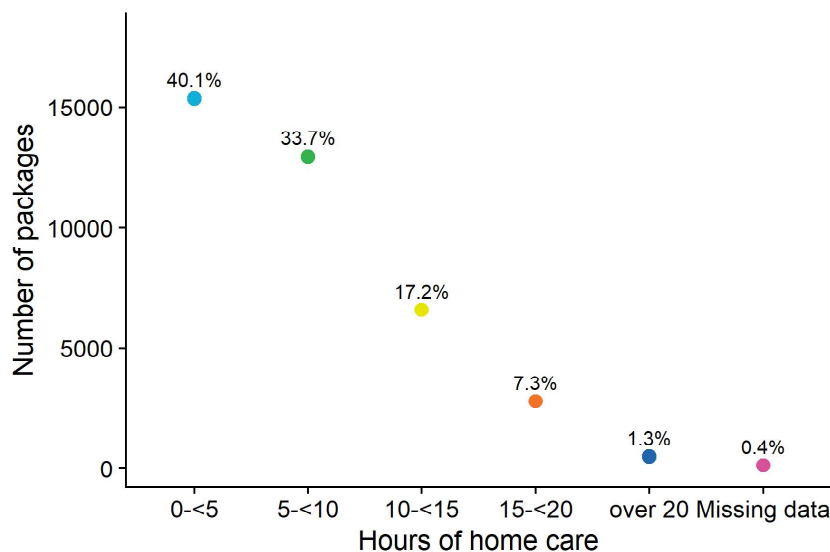


Figure 4.2: Number of packages of home care by hours of care grouping

4.4.2 Time series

Table 4.3 and figure 4.3 show the variation in the number of people receiving home care during each financial year. There is little weekly variation with the exception of financial year 2010/11 which saw a large drop in the total number of individuals receiving care (financial year 2006/07 has an outlying minimum data point likely to be a data entry error). The years following this show gradual increases and a return to pre-2010/11 levels.

Table 4.3: Variation in number of individuals receiving home care

Financial Year	Minimum	Maximum	mean	sd	median	range	Social Care Survey value	Yearly total of individuals
2006/07	1219	1515	1488.6	35.3	1493	296	1520	2419
2007/08	1476	1538	1498.5	15.5	1498	62	1490	2441
2008/09	1424	1480	1450.1	13.5	1449	56	1520	2376
2009/10	1416	1467	1438.8	11.8	1438	51	1530	2324
2010/11	1178	1442	1317.0	89.1	1289	264	1290	2066
2011/12	1121	1195	1155.5	14.7	1158	74	1300	2004
2012/13	1166	1286	1206.1	35.0	1192	120	1410	2284
2013/14	1256	1353	1321.8	20.2	1324	97	1520	2511
2014/15	1349	1488	1422.8	47.0	1415	139	1760	2662
2015/16	1467	1532	1505.2	14.2	1503	65	1740	2792

The boxplots and crosses indicating the SCS value in figure 4.3 show that the number of individuals receiving care in the census week is similar to the number receiving care

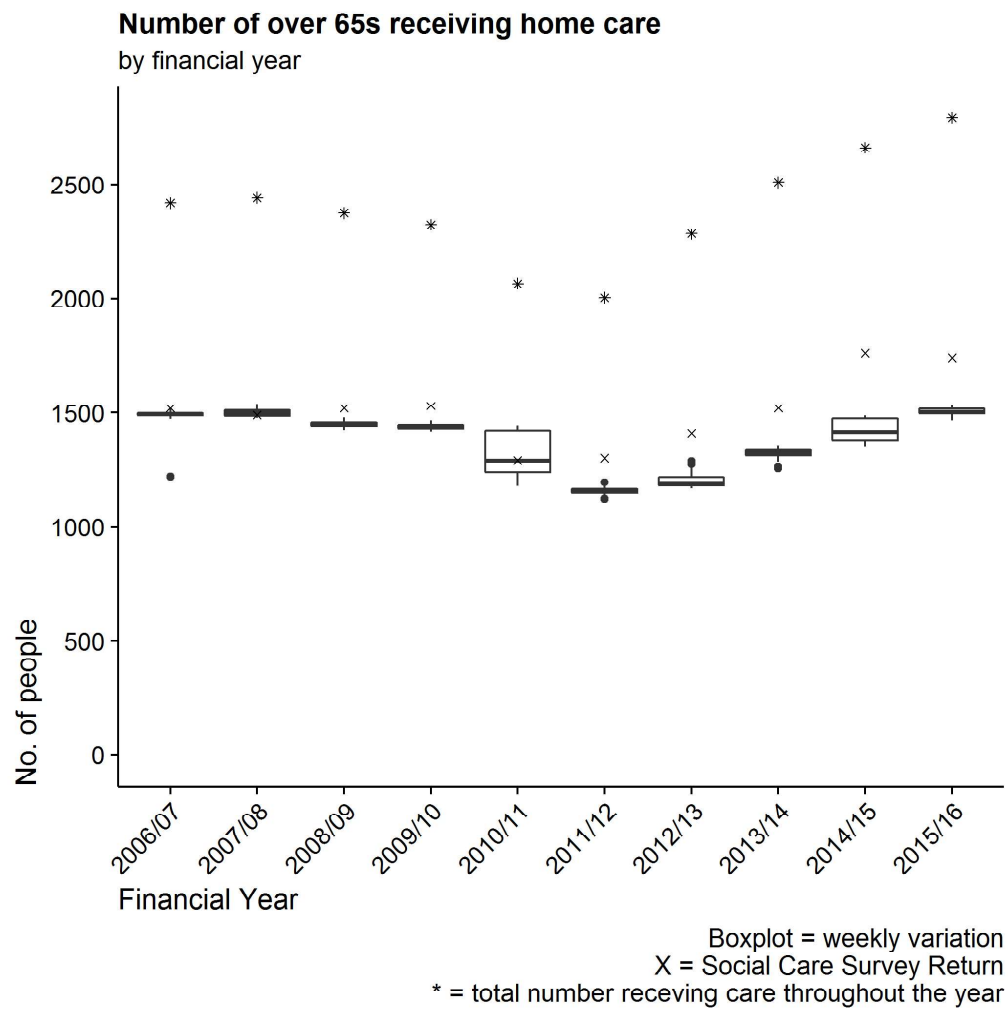


Figure 4.3: Variation in number of individuals receiving home care

CHAPTER 4. RENFREWSHIRE COUNCIL EXPLORATORY PROJECT

in any other week of the year. This is particularly true of the years 2006/07 to 2010/11. After this there appears to be a structural discrepancy between the numbers returned by Renfrewshire council to the SCS and those calculated in this analysis. The largest difference between the calculated maximum value and the value returned to the SCS is 272 individuals in financial year 2014/15.

Figure 4.3 and table 4.3 also indicate that in any financial year the average weekly number of individuals receiving home care is between 52% and 64% of the total number of individuals that will receive care in that year. The gap between the average and total number of individuals is wider in the years after 2010/11.

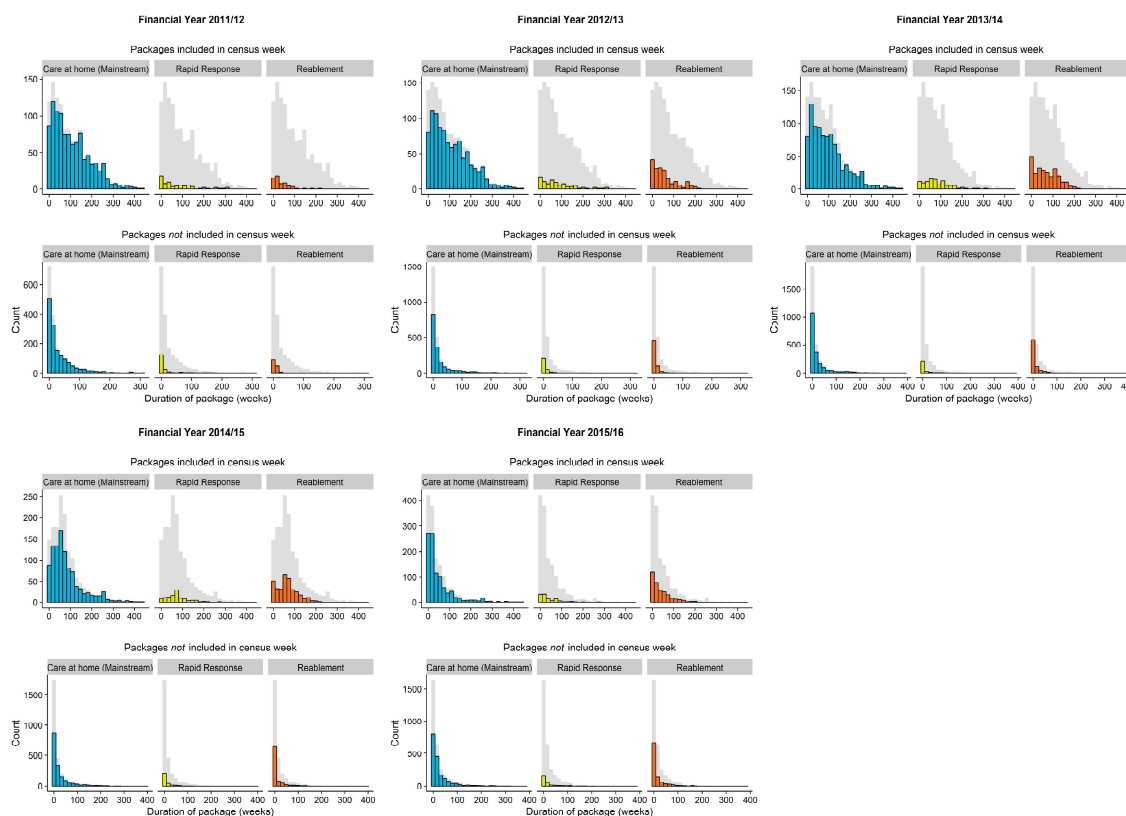


Figure 4.4: Duration of care packages by financial year

Comparison of the duration of home care packages captured in the SCS census week with those that are not (figure 4.4) shows that, for each financial year, packages not captured in the census week tend to be of a shorter duration with a more pronounced positive skew to the distribution.

Reablement packages not captured in the census week appear to be more intensive with

CHAPTER 4. RENFREWSHIRE COUNCIL EXPLORATORY PROJECT

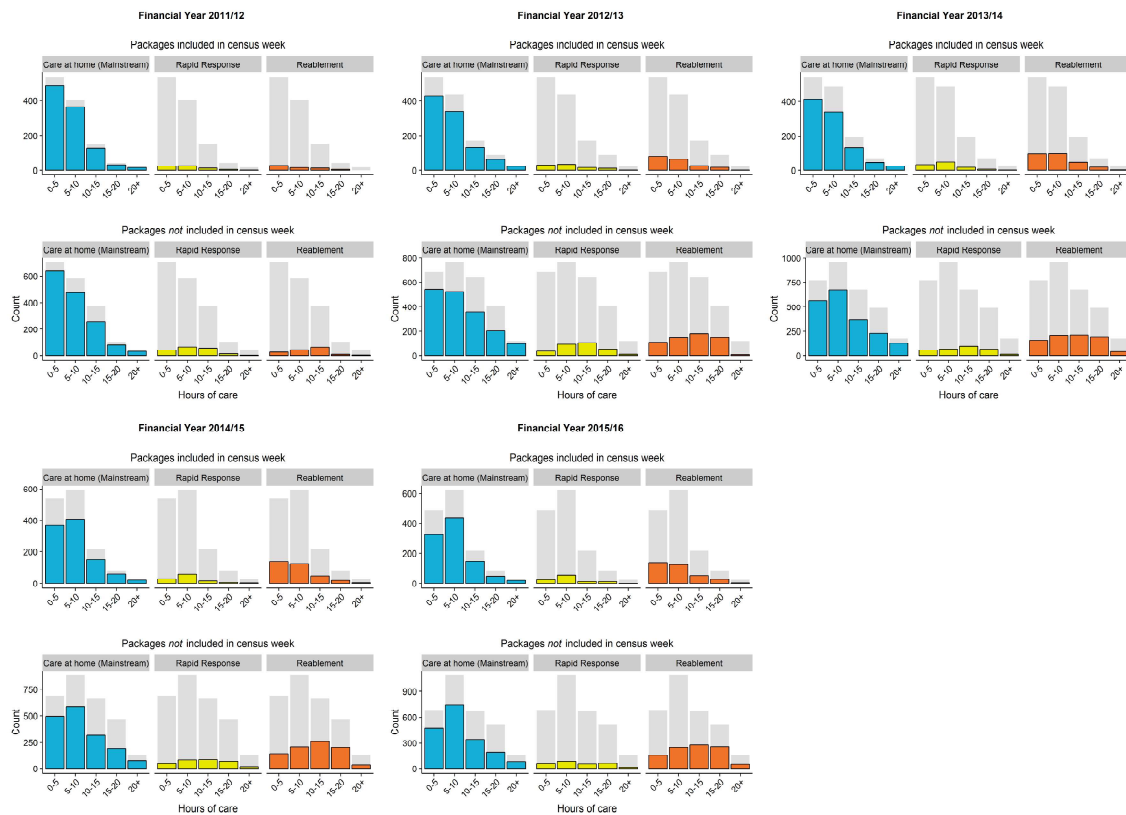


Figure 4.5: Weekly hours of home care by financial year

a greater proportion of these packages providing care for more than ten hours per week (figure 4.5). The distribution of hours of care for Care at Home and Rapid Response packages does vary much whether the package is “live” during the SCS census or not.

I need to go back to safe haven and fix the y-axis of both of the faceted plots

4.5 Discussion

This exploratory project has investigated the variation in packages of care from one Scottish local authority area. It has found that figures returned by Renfrewshire council to the SCS represent between 52% and 64% of the total number of individuals that the council will provide home care for in the financial years 2006/07 to 2015/16. This has implications for the main thesis project which aims to assess the difference in

CHAPTER 4. RENFREWSHIRE COUNCIL EXPLORATORY PROJECT

unscheduled care and mortality for those that do and do not receive social care. Using the SCS as a source to identify people receiving home care risks misclassifying up to 48% of individuals receiving home care.

When observing differences in packages captured in the census week with those that are not the most obvious differences are noted for Reablement type of home care. Packages of this type not captured in the census week tend to be more intense and have a much shorter duration. These characteristics are what would be expected from the definition of Reablement described in table 4.1. This raises the obvious question of why some Reablement packages captured in the census week have such long durations and small number of hours. This may be due to misclassification at the time home care is being assessed or failure to reclassify if the individual's care needs became more long-term. Given the length of some of these packages it is likely that they are being found in multiple years across figures 4.4 and 4.5.

Comparison of package duration and intensity across other home care types suggest there is little difference between packages captured in the census week with those that are not.

This analysis is limited by the fact that data was obtained from only one local authority area. It is impossible to know if the number of individuals captured or not by the SCS in the Renfrewshire area is indicative of numbers across the country. Given each of the 32 local authorities in Scotland have bespoke methods of delivering and recording social care the findings from this analysis can not be generalised to a national level.

Furthermore, the method of summarising data into packages of care is subjective and may differ from the method used by Renfrewshire council. There is some comfort in the similarity of results for some years shown in figure 4.3, however there are notable differences, particularly in later years, suggesting structural differences in methods.

Future work using this data should consider those individuals and packages of care captured in the census week. Quantifying if there are any differences, at the individual level, in the amount of home care received in the census week and throughout the rest of the financial year would be of significant interest. Such analysis would help validate if the hours of home care figure returned to the SCS is an accurate measurement of the hours of care an individual receives throughout the financial year.

4.6 Conclusion

Analysis of individual level social care data from Renfrewshire council area suggests that the number of people recorded as receiving home care by the Social Care Survey may only capture between 52% and 64% of the total number of people that will receive home care during a financial year. This has implications for the types of analysis that can be conducted with SCS in data linkage projects. Those individuals receiving care in the census week have packages of care that are broadly similar in duration and intensity. Some reablement packages of care may be misclassified.