



# BMJ Open Variation in coded frailty syndromes in secondary care administrative data: an international retrospective exploratory study

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## ABSTRACT

**Objectives** Challenges with manual methodologies to identify frailty, have led to enthusiasm for utilising large-scale administrative data, particularly standardised diagnostic codes. However, concerns have been raised regarding coding reliability and variability. We aimed to quantify variation in coding frailty syndromes within standardised diagnostic code fields of an international dataset.

**Setting** Pooled data from 37 hospitals in 10 countries from 2010 to 2014.

**Participants** Patients ≥75 years with admission of >24 hours (N=1 404 671 patient episodes).

**Primary and secondary outcome measures** Frailty syndrome groups were coded in all standardised diagnostic fields by creation of a binary flag if the relevant diagnosis was present in the 12 months leading to index admission. Volume and percentages of coded frailty syndrome groups by age, gender, year and country were tabulated, and trend analysis provided in line charts. Descriptive statistics including mean, range, and coefficient of variation (CV) were calculated. Relationship to in-hospital mortality, hospital readmission and length of stay were visualised as bar charts.

**Results** The top four contributors were UK, US, Norway and Australia, which accounted for 75.4% of the volume of admissions. There were 553 595 (39.4%) patient episodes with at least one frailty syndrome group coded. The two most frequently coded frailty syndrome groups were 'Falls and Fractures' (N=3 36 087; 23.9%) and 'Delirium and Dementia' (N=221 072; 15.7%), with the lowest CV. Trend analysis revealed some coding instability over the frailty syndrome groups from 2010 to 2014. The four countries with the lowest CV for coded frailty syndrome groups were Belgium, Australia, USA and UK. There was up to twofold, fourfold and twofold variation difference for outcomes of length of stay, 30-day readmission and inpatient mortality, respectively, across the countries.

**Conclusions** Variation in coding frequency for frailty syndromes in standardised diagnostic fields are quantified and described. Recommendations are made to account for this variation when producing risk prediction models.

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ A large cohort of >1.4 m patient episodes from 37 hospitals across 10 countries are included.
- ⇒ Variation in frequency of coding for frailty syndromes are quantified in multiple ways, namely between countries, over time and between frailty syndromes.
- ⇒ The dataset was frailty complete with only 0.17% missing data.
- ⇒ The frailty measurement model used has had validation in multiple settings.
- ⇒ Institutions contributing to the dataset are self-selected academic tertiary centres and the findings may not be generalisable to other secondary care institutions.

## INTRODUCTION

Population ageing is often associated with increased chronic illness and functional dependence, leading to a state of poor resilience and heightened vulnerability, namely frailty.<sup>1</sup> Frailty is a multidimensional syndrome characterised by loss of physiological reserve and the accumulation of deficits, resulting in heightened vulnerability to external stressors.<sup>2</sup> Frailty is associated with excess mortality, morbidity, disability, emergency hospital admission and resource utilisation.<sup>3,4</sup>

There is mounting evidence that frailty (or at least its complications) can be prevented or delayed.<sup>5</sup> Robust, reliable and widespread identification of frailty remains problematic. Existing instruments to measure frailty are manually intensive, require specialised apparatus, are often clinically unfeasible, susceptible to operator error or have yet to demonstrate clinical utility for improving quality of patient care or clinical outcomes.<sup>6</sup>

What characteristics would make an ideal dataset to measure frailty?<sup>7</sup> It would have complete capture of the target population and be linked at patient level to provide



the ability for observation across different settings (eg, community to hospital). It would collect longitudinal data, allowing for tracking of information over time. It would be continuously collected, direct from contemporaneous records to reduce sampling error or duplication. There would be embedded data validation processes to ensure reliability and accuracy. Financial and human resource costs to maintain and curate this database would be low and affordable. It would contain variables suitable for measuring performance of healthcare organisations, are standardised and conform to high health informatics standards.<sup>8–10</sup> It would allow for rapid feedback to participating organisations.

While there are currently no datasets that fulfil all these criteria completely, routinely collected administrative data do fulfil many of these criteria, making an attractive case for secondary uses in identifying frailty such as population segmentation, case-mix adjustment or clinical registries. Consequently, there is increasing interest in using these data for the purposes of widespread frailty identification,<sup>11–14</sup> often using standardised diagnostic codes. There have been some limitations noted with this methodology. The accuracy of diagnostic coding has been challenged, with potential under capture, for example, functional dependence codes. Though rich, many administrative datasets do not contain variables previously identified to be associated with frailty. Administrative data have rigorous processes for cleaning and validation, which occur after the acute hospitalisation episode. While this ensures high data informatics standards, these processes are time-consuming, limiting contemporaneousness of the information. There are diverse methods for standardising diagnostic codes which limit generalisability between populations and settings. Frequency of diagnostic coding has been known to shift overtime.<sup>15</sup> Understanding data heterogeneity and variation in frequency of coding for frailty using standardised diagnostic codes is therefore a research priority.

This study aims to quantify potential variation in frequency of coding for frailty in standardised diagnostic codes. We use a previously published methodology of grouping standardised diagnostic codes into frailty syndromes.<sup>12</sup> It will compare and contrast diagnostic coding frequency and variation of coding between countries, over time and between frailty diagnostic archetypes within a pooled international secondary care dataset spanning 10 countries over 5 years. Additionally, it will explore the relationship of coded frailty to important clinical outcomes, namely in-hospital mortality, non-elective hospital admission and long length of hospital stay.

## METHODS

### Data sources

The Global Comparators programme was an international hospital collaborative which ran from 2011 to 2017. Participating secondary care institutions contributed and pooled administrative data for the purposes of

benchmarking performance in order to better understand variations in clinical practice and outcomes, with the aim of disseminating international best practice. This dataset was then enriched with administrative data from National University Hospital (NUH) in Singapore for completion. This final dataset pooled secondary care data from 37 hospitals in 10 countries from 2010 to 2014. Data were extracted from the Dr Foster Global Comparators dataset and NUH data systems using established methods for data cleaning and anonymisation.<sup>16</sup>

### Study population

All patients  $\geq 75$  years old with admissions of  $>24$  hours who had both elective or non-elective hospital admission were included in the analysis. Patient spells were excluded if the age, sex or length of stay was recorded as missing or invalid, or the admission was planned and the patient discharged home on the same day, or the admission was unplanned but no procedure was undertaken and the patient went home after a recorded length of stay less than 2 days. This was to exclude records with inadequate quality data, and patients admitted into observations units or day-case attendances, which are outpatient based. Overall, only 0.17% of data were missing.

### Variable definitions

Frailty syndromes are clinically recognised states which occur disproportionately more frequently in vulnerable older persons. They are high-order phenomena, resulting from the interaction of accumulating deficits and environmental factors. They confer a higher risk of death, institutionalisation, disability and poor quality of life. National expert consensus and guidelines recommend the use of frailty syndromes as a possible methodology for frailty identification, particularly in the acute hospitalisation setting.<sup>17–20</sup>

Individual patient cases correspond to a spell covering a patient's total length of stay at a hospital. At this data level, seven groups of frailty syndromes were coded within International Statistical Classification of Diseases, Injuries and Causes of Death (ICD) diagnostic coding groups, and within all available diagnostic fields, namely Dementia and Delirium, Mobility Problems, Falls and Fractures, Pressure Ulcers and Weight Loss, Incontinence, Dependence and Care, as well as Anxiety and Depression.<sup>12</sup> These diagnostic codes are collated by clinical coders for administrative purposes after completion of the acute hospitalisation episode. As the Global Comparators data set comprised hospitals which used different revisions of ICD (revision 9 and 10). ICD-10 is the more recent iteration of the coding framework, and has character length, allows alphabets (while ICD-9 is purely numeric) and has added emphasis on modern technology to allow better coding for procedures. The equivalent diagnostic codes for both versions were compiled (online supplemental appendix 1).

The dataset contained flags for all-cause in-hospital mortality and 30-day non-elective readmission. Length

of hospital stay was calculated as the difference date of discharge from date of admission and calculated in days. Previous risk prediction models using this methodology for coding frailty syndromes have demonstrated significant predictive capacity for the outcomes above, after adjustment for age, gender, country and comorbidity.<sup>12</sup>

### Statistical analysis

For descriptive statistics, the volume and percentages of coded frailty syndrome groups by age, gender, year and country are tabulated. For temporal analysis, percentages of coded frailty syndrome by country by monthly aggregate are plotted as line charts.<sup>21</sup> To explore variation, the range and mean between countries for coding of frailty syndromes by yearly aggregate are plotted as line charts. Coefficient of variation (CV) is a standardised measure of data dispersion around the mean. This was calculated by country and frailty syndrome group. Unadjusted In-hospital mortality and median length of hospital stay by country and frailty syndrome are plotted on bar charts for comparison of outcomes. The readmission rate presented in this study represents any non-elective readmission to the respective hospital within 30 days, with index admission episodes that ended with in-patient mortality excluded. Comparison of categorical variables for significance are calculated by  $\chi^2$  test. All analyses were done on Microsoft SQL Server and Microsoft Excel.

## RESULTS

### General descriptive statistics

A total of 1 404 671 patient spells were included in the analysis, from 37 hospitals across 10 countries. The top four contributors were UK, USA, Norway and Australia, accounting for 75.4% of the volume of admissions. The two most frequently coded frailty syndrome groups were group 3 Falls and Fractures, and group 1 Delirium and Dementia. There were 553 595 (39.4%) patient episodes with at least one frailty syndrome group coded. There was variation between countries in the frequency of coding for having at least one frailty syndrome, from 2871 (11.9%) to 108 491 (56.5%). **Table 1** displays the total volume and percentage of coded frailty syndromes by country and frailty syndrome group. The top five countries with highest frequency for frailty syndrome coding (at least one frailty syndrome coded) in descending order were Australia, USA, UK, Belgium and Singapore.

For the year 2013, the percentage of patients with at least one frailty syndrome coded increased with age, with 31% of patients between the age of 75–79 being coded with at least one frailty syndrome group compared with 59% over the age of 90. There were 164 508 (54%) females included in the analysis, and there were 76 712 (47%) females with at least one frailty syndrome group coded compared with 50 284 (22%) males ( $p < 0.001$ ). Non-elective admissions comprised of 231 054 (76%) patient episodes, and 110 395 (48%) of the non-elective admissions had at least

**Table 1** Volume and percentage of coded frailty syndromes in admission spells

Country/( no of hospitals	Total spells contributed N (%)	Group 1 dementia and delirium N (%)	Group 2 mobility problems N (%)	Group 3 Falls and fractures N (%)	Group 4 Pressure ulcers and weight loss N (%)	Group 5 urinary incontinence N (%)	Group 6 Dependence and care N (%)	Group 7 Anxiety and depression N (%)	At least one frailty syndrome coded N (%)
Australia <sup>4</sup>	192 105 (13.7)	44 804 (23.3)	8427 (4.4)	67 263 (35.0)	19 471 (10.1)	24 457 (12.7)	10 220 (5.3)	9836 (5.1)	108 491 (56.5)
Belgium <sup>1</sup>	56 016 (4.0)	9437 (16.8)	660 (1.2)	15 348 (27.4)	5416 (9.7)	3194 (5.7)	2460 (4.4)	3451 (6.2)	24 989 (44.6)
Denmark <sup>1</sup>	80 869 (5.8)	3290 (4.1)	67 (0.1)	12 940 (16.0)	642 (0.8)	176 (0.2)	157 (0.2)	775 (1.0)	16 626 (20.6)
Finland <sup>1</sup>	96 301 (6.9)	4798 (5.0)	96 (0.1)	10 323 (10.7)	375 (0.4)	78 (0.1)	7 (0.0)	1248 (1.3)	15 781 (16.4)
Italy <sup>1</sup>	24 052 (1.7)	681 (2.8)	131 (0.5)	1969 (8.2)	101 (0.4)	4 (0.0)	0 (0.0)	150 (0.6)	2871 (11.9)
Netherlands <sup>4</sup>	49 574 (3.5)	3412 (6.9)	147 (0.3)	6587 (13.3)	603 (1.2)	307 (0.6)	105 (0.2)	419 (0.8)	10 040 (20.3)
Norway <sup>7</sup>	269 214 (19.2)	26 477 (9.8)	1722 (0.6)	50 130 (18.6)	3065 (1.1)	555 (0.2)	453 (0.2)	5345 (2.0)	74 228 (27.6)
Singapore <sup>1</sup>	38 484 (2.7)	5443 (14.1)	450 (1.2)	9559 (24.8)	1694 (4.4)	195 (0.5)	1041 (2.7)	1289 (3.3)	14 829 (38.5)
UK <sup>6</sup>	384 682 (27.4)	77 995 (20.3)	23 635 (6.1)	113 179 (29.4)	21 954 (5.7)	12 648 (3.3)	14 383 (3.7)	25 992 (6.8)	177 775 (46.2)
USA <sup>9</sup>	213 374 (15.2)	44 735 (21.0)	4594 (2.2)	48 789 (22.9)	14 581 (6.8)	8858 (4.2)	509 (0.2)	40 516 (19.0)	107 965 (50.6)
Total spells	1 404 671 (100)	221 072 (15.7)	39 929 (2.8)	336 087 (23.9)	67 902 (4.8)	50 472 (3.6%)	29 335 (2.1)	89 021 (6.3)	553 595 (39.4)

one frailty syndrome group coded, compared with 16 601 (22%) elective patient episodes ( $p < 0.001$ ).

### Trend analysis of coded frailty syndromes by country

Online supplemental appendix 2 displays the percentage frequency of each frailty syndrome group by country aggregated at monthly units from 2010 to 2014. This was calculated as volume of admission for month coded with frailty syndrome divided by the total volume of admission for the month. Frequency of coding for at least one frailty syndrome was fairly stable for this time period except for the Netherlands, which showed a decreasing trend from 2010 to 2011, sharp rises at the beginning and end of 2012, which was not sustained in 2013 to 2014.

There was some coding instability over time noted for each of the frailty syndrome groups. The top five countries for frequency of coding of 'Delirium and Dementia' were Australia, UK, USA, Belgium and Singapore in descending order, accounting for 83% of coding volume for the group. There was a gradual increase in frequency of coding in UK (17.5% to 25.1%) and Norway (5.2% to 11.9%) from 2011 to 2014.

The top two countries for frequency of coding of 'Mobility Problems' were UK and Australia, accounting for 80% of coding volume for the group. Sharp increases in coding frequency were noted in UK (4.2% to 9.9%) from 2011 to 2013, but this was not sustained in 2014. There was a gradual decline in coding frequency in Australia occurred from 5.3% to 3.6% from 2010 to 2014, while a gradual and sustained increase in coding frequency in USA (1.2% to 3.4%) was noted for the same time period.

The top five countries for frequency of coding of 'Falls and Fractures' in descending order were Australia, UK, Belgium, Singapore and USA, accounting for 76% of the volume of coding for the group. There was a gradual increase in coding in UK (26% to 33.4%) from 2010 to 2013 but unsustainable in 2014. There were fluctuating levels of coding in the Netherlands, with a decrease from 11.7% to 8.4% from 2010 to 2011, followed by a sharp increase to 19.3% from the end of 2011 to 2013, which was unsustainable.

The top five countries for frequency of coding for 'Pressure Ulcers and Weight Loss' in descending order were Belgium, Australia, USA, UK and Singapore, accounting for 93% of the coding volume for the group, where there was a clear demarcation of coding frequencies from the rest of the countries. There was a sharp increase in frequency of coding in Belgium (7.9% to 14.1%) and UK (4.2% to 8.1%) from 2011 to 2013, but unsustainable subsequently.

Australia had the most frequent coding for 'Incontinence' by a large margin, accounting for 48% of the volume of coding for the group, followed by Belgium, USA and UK in descending order. These top four countries accounted for 97% of the volume of coding for the group, with a clear demarcation of coding frequencies from the rest of the countries.

The top four countries for frequency of coding of 'Dependence and Care' in descending order were Australia, Belgium, UK and Singapore, accounting for 96% of volume of coding for the group, with a clear demarcation of coding frequency for the rest of the countries. Australia (6.1% to 4.9%) and UK (4.4% to 2.5%) demonstrated a slow decline in frequency of coding from 2010 to 2014. There was an increase in frequency of coding in Belgium 4.9% to 6.9% from 2010 to 2013 that was unsustainable.

USA had the most frequent coding for 'Anxiety and Depression' by a large margin, accounting for 46% of the volume of coding for the group, followed by UK, Belgium, Australia and Singapore in descending order. These top five countries accounted for 91% of volume of coding for the group. The frequency of coding gradually increased in USA (17.9% to 21.4%) and UK (4.6% to 8.8%) from 2010 to 2014.

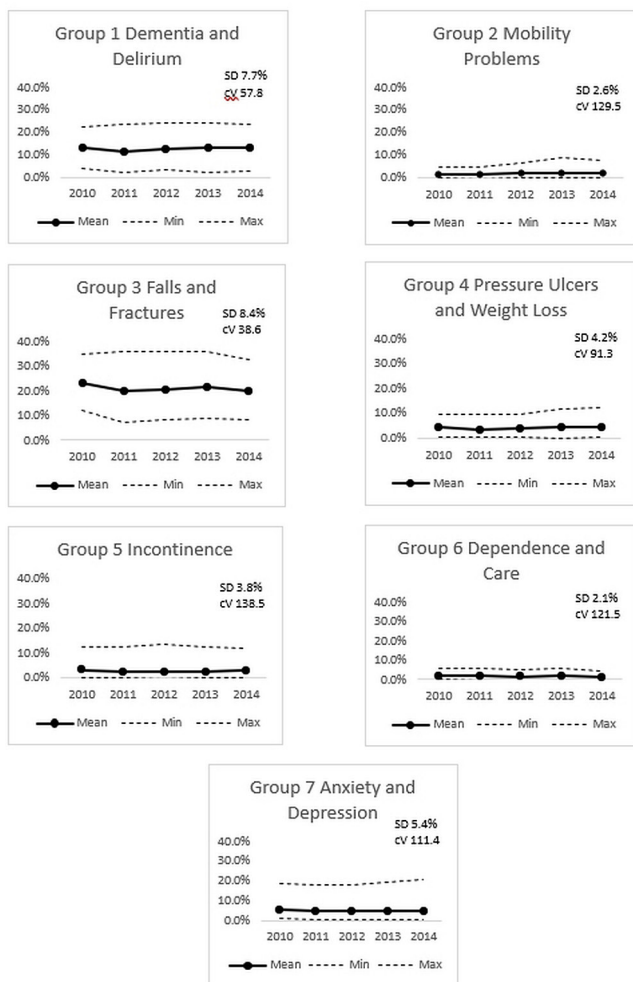
### Trend analysis of coded frailty syndromes within country

Online supplemental appendix 3 displays the percentage frequency of coded frailty syndrome groups aggregated monthly for each country. Generally, 'Falls and Fractures' and 'Dementia and Delirium' were the most frequently coded frailty syndrome groups across all the countries, accounting for 39.7% of all coded frailty syndrome groups overall, with 23.9% and 15.7% of overall volume, respectively. There was also a sustained gradual increase in coding for 'Anxiety and Depression' (4% to 8%) in all countries.

There was a sustained increase in coding for 'Pressure Ulcers and Weight Loss' from 7% to 13% from mid-2012 to 2014 in Belgium. Between 2011 to early 2013, there was large baseline variation of coding frequency in Italy, mainly due to fluctuations in coding for 'Falls and Fractures' and 'Dementia and Delirium'. In the Netherlands, there were sharp increases in coding for 'Falls and Fractures' and 'Dementia and Delirium' from the end 2011 to 2014. In the USA, the top three coded groups were 'Falls and Fractures', 'Dementia and Delirium' and for 'Anxiety and Depression' with 21%, 22.9% and 19% of overall volume of coding, respectively.

### Variation of coding for frailty syndromes between countries

Figure 1 displays the range and of percentage coded frailty syndrome groups across the countries aggregated yearly, and SD and CV for 2013. The largest overall range was from 'Dementia and Delirium', 'Falls and Fractures' and 'Anxiety and Depression' with average range of 20.6%, 26.1% and 18.2%, respectively. The smallest overall range was from 'Mobility Problems' and 'Dependence and Care' with average range of 6.6% and 5.4%, respectively. However, 'Dementia and Delirium' and 'Falls and Fractures' had the highest frequency of coding compared overall (mean of 12.8% and 21.1%, respectively), while 'Mobility Problems' and 'Dependence and Care' were the least frequently coded groups (mean 1.7% and 1.8%, respectively). The range increased for 'Mobility Problems



**Figure 1** Range and mean of percentage coded frailty syndrome groups across the countries from 2010 to 2014, with SD and coefficient of variation (CV) for 2013.

from 2011 to 2013 and ‘Pressure Ulcers and Weight Loss’ from 2012 to 2014, with little effect on mean, and mainly due to increases in maximum range. ‘Dementia and Delirium’ and ‘Falls and Fractures’ had the least variation across the countries with CV (SD divided by mean) of 57.8 and 38.6, respectively. Group 5 Incontinence, group 2 Mobility Problems and group 6 Dependence and Care had the highest variation with CV of 138.5, 129.5 and 121.5, respectively.

#### Variation of coding for frailty syndromes within countries

Figure 2 displays the mean and range of coded frailty syndromes for each country aggregated yearly from 2010 to 2014, and SD and CV for 2013. The four countries with overall highest mean across frailty syndrome groups coded were Australia, UK, USA and Belgium with mean of 13.7%, 10.9%, 10.8% and 10.2%, respectively. The countries with the largest overall range across the frailty syndrome groups were Australia, UK, Belgium, Singapore and USA with range of 30.6%, 26.3%, 26.2%, 24.6% and 22.7%, respectively. The Netherlands showed a sharp rise in range across frailty syndrome groups between 2011

and 2013 with an associated gradual increase in mean as frequency of coding increased. There was a gradual increase in maximum range (26.9% to 32.9%) with associated increase in mean (9.1%–12.7%) from 2010 to 2013.

The four countries with the lowest variation of coding for frailty syndrome groups were Belgium, Australia, USA and UK with CV of 77.6, 80.5, 82.3 and 82.6, respectively. These countries also had the highest overall mean level of coding for frailty syndrome groups. The countries with the highest variation of coding for frailty syndrome groups were Denmark, Italy and Finland with CV of 166.1, 164.4, 147.5, respectively, and lowest overall mean level of coding for frailty syndrome groups.

#### Outcomes

Online supplemental appendix 4 displays the outcomes by country and frailty syndrome group, namely length of hospital stay, 30-day non-elective readmission and in-hospital mortality. The distribution of length of stay for all countries was very positively skewed. A twofold difference between countries for overall mean (5.6–11.5 days) and median (4–7 days) length of hospital stay was noted. Generally, a longer median length of hospital stay was observed across all frailty syndrome groups compared with all  $\geq 75$  years old across the countries.

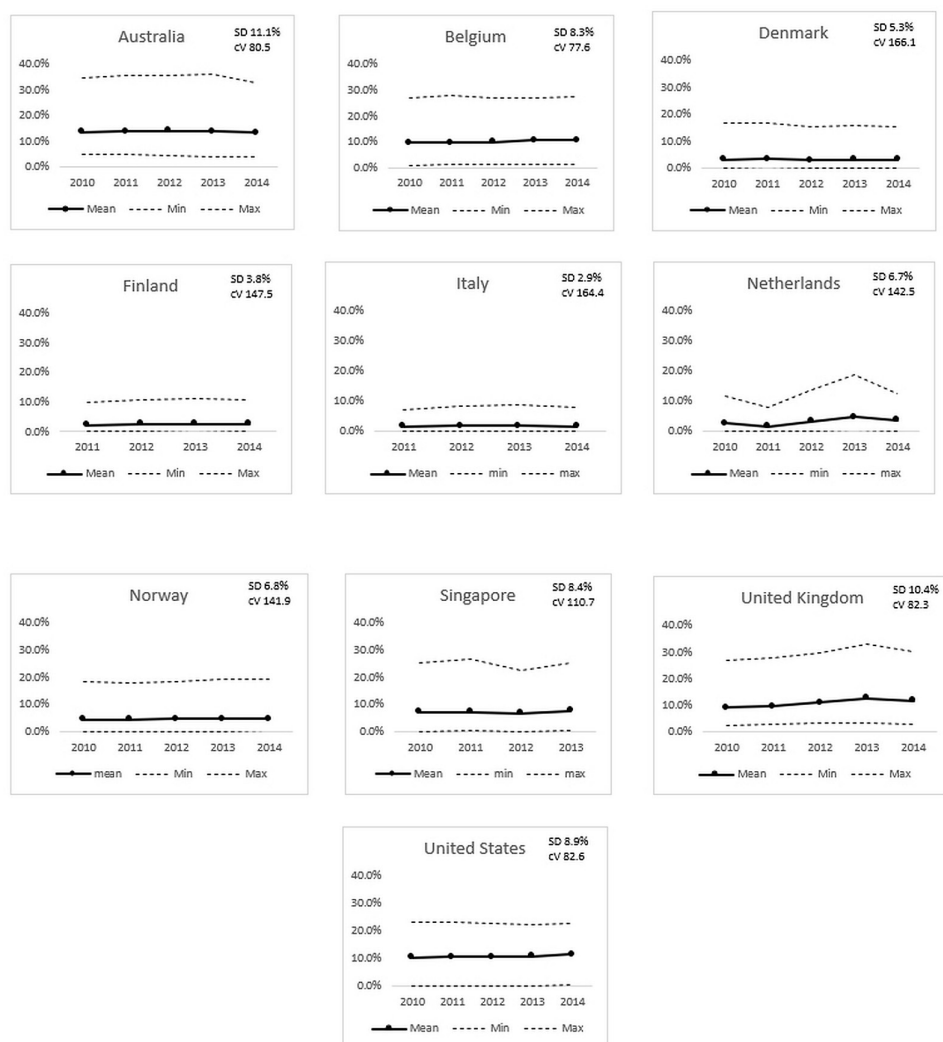
A fourfold difference in 30-day non-elective hospital readmission rate (4.7%–18%) was noted between the countries. Generally, 30-day non-elective readmission rate was not visibly higher in frailty syndrome groups compared with all  $\geq 75$  years old across the countries, with some exceptions. For example, in Italy and Belgium, 22.2% and 8% of patient episodes coded with ‘Pressure Ulcers and Weight Loss’ were associated with hospital readmission compared with 4.7% and 6.8% of all  $\geq 75$  years old, respectively. In Finland, 18.8% of patients coded with ‘Mobility Problems’ compared with 9.4% of all  $\geq 75$  years old and 20% of patients coded with ‘Incontinence’ compared with 9.4% of all  $\geq 75$  years old was associated with hospital readmission.

A twofold difference of in-hospital mortality was noted between the countries (8.5%–3.8%). Higher mortality rates were seen in those coded with ‘Dementia and Delirium’ and ‘Pressure Ulcers and Weight loss’ compared with all  $\geq 75$  years old, but not the other frailty syndrome groups. This effect was seemingly greater for those coded with ‘Pressure Ulcers and Weight Loss’.

Table 2 describes the CV across all frailty syndrome groups within country for each outcome for the year 2013. There was no correlation or association between variation across all frailty syndrome groups within country to outcomes (online supplemental appendix 5).

#### DISCUSSION

This study finds that coded frailty syndromes within the standardised diagnostic fields of an international secondary care administrative dataset retain many features that make it a valid measure for identifying frail older



**Figure 2** Range and mean across frailty syndrome groups for countries by year. CV, coefficient of variation.

persons. In keeping with the literature on frailty, these coded frailty syndromes increase with age and are more common in females and those with emergency admissions to hospital, and have been shown to be related to

comorbidity,<sup>15</sup> thus demonstrating construct validity. It is multidimensional, dynamic over time and computationally tractable, demonstrating content validity. It is associated with important clinical outcomes such as mortality

**Table 2** Coefficient of variation across all frailty syndrome groups and outcomes for year 2013 within country

Country	Coefficient of variation across frailty syndrome groups within country	Average mortality rate across frailty syndromes	Average length of hospital stay (days) across frailty syndromes	Average readmission rate across frailty syndromes
Australia	80.5	8.9%	18.4	11.5%
Belgium	77.6	9.2%	20.4	8.7%
Denmark	166.1	7.6%	8.7	15.5%
Finland	147.5	3.4%	8.8	11.2%
Italy	164.4	7.0%	16.6	6.2%
Netherlands	142.5	6.3%	12.1	8.0%
Norway	141.9	5.1%	5.8	17.3%
UK	110.7	11.9%	11.2	18.7%
USA	82.3	5.7%	17.7	14.5%
Singapore	82.6	5.1%	9.8	21.9%

**Table 3** Prevalence of frailty syndromes in observational studies in the secondary care setting

Frailty syndrome	Lakhan et al, 2011 <sup>26</sup>	Buurman et al, 2011 <sup>27</sup>	Edmans et al, 2013 <sup>28</sup>	Bell et al, 2016 <sup>29</sup>	Soong et al, 2015 <sup>11</sup>	This study
Anxiety/depression		21.1%		29.9%	2.4%	6.3%
Functional dependence	59.8%	50.9%	47%		1.0%	2.3%
Falls	41.9%	23.3%	31%	39.2%	8.7%	23.9%
Incontinence	36.7%	22.2%		38.6%	1.1%	3.6%
Mobility problems		58.5%	12%		2.0%	2.8%
Pressure ulcers	4.9%			14.9%	1.1%	4.8%
Cognitive impairment	34.3%	40.1%	16%	25.5%	9.0%	15.7%
Polypharmacy		60.7%				
Malnutrition		51.5%		32.8%		4.8%

and long length of hospital stay, demonstrating criterion validity.<sup>22</sup>

However, between-country and within-country variation in frequency of coded frailty syndromes are noted, as well as some coding instability over time. Overall, this study finds that there is a 5-fold difference between countries for having at least one frailty syndrome group coded (11.9%–56.5%), and 10-fold difference between the coded frequency of frailty syndrome groups (2.1%–23.9%). Trend analysis for volume of coded frailty syndromes reveal demarcation between the countries for at least 3 of the frailty syndrome groups. This difference in coding volume between countries could either be a result of coding inconsistencies or, less likely, actual difference in prevalence.

The trend analysis within countries show generally consistent volume of coding of frailty syndrome groups, with two frailty syndrome groups being more prevalently coded compared with the rest, namely ‘Falls and Fractures’ and ‘Dementia and Delirium’. Table 3 displays a summary of the prevalence of frailty syndromes groups in observational studies within the secondary care setting. The prevalence of frailty syndromes in secondary care differs by setting (eg, emergency department vs geriatric ward). However, comparison with observational trials suggest possible under-reporting of frailty syndrome groups within the coded standardised diagnostic fields.

Some countries did exhibit fairly marked coding instability for specific frailty syndrome groups over time (eg, coding of ‘Falls and Fractures’ in the Netherlands). As standardised diagnostic codes are often used for the purposes of reimbursement, the coding instability may arise in response to changes in local payment structures (eg, Payment by Results), or change in coding processes (eg, the prevalence of coding for ‘Senility’ has decreased over time in UK<sup>23</sup>).

This study finds a 2.5-fold difference in CV between coded frailty syndrome groups, and 2-fold difference in CV for coding of frailty syndromes between countries. The countries UK, USA, Australia and Belgium appear to have similar variation statistics (table 2) for coded frailty syndrome groups. Though thresholds for CV are context

specific,<sup>24</sup> there does appear to be a natural grouping of coded ‘Delirium and Dementia’, Falls and Fractures’ and Pressure Ulcers and Weight Loss’. Generally, when frequency of coding for frailty syndrome groups or from countries was prevalent, the variation exhibited was lower.

This study finds a twofold, fourfold and twofold difference for outcomes of length of stay, 30-day non-elective readmission and in-hospital mortality, respectively, across the countries. These differences may be a result of patient factors, national health system peculiarities or quality of care provided. Specific coded frailty syndrome groups are associated with different outcomes (eg, ‘Pressure Ulcers and Weight Loss with in-hospital mortality’). Multi-variable adjustment for demographics and comorbidity has shown persistence of these associations, confirming coded frailty syndromes as an independent predictor for the outcomes.<sup>12</sup> However, there was no correlation between within country CV and outcomes, across the frailty syndrome groups seen in this study.

The findings of this study have implications for researchers wishing to use standardised diagnostic codes for the purposes of frailty identification. We recommend researchers undertake trend analyses described above to visualise coding frequency and temporal stability to be fully aware of heterogeneity between data groups (eg, countries) and changes in coding frequency over time. For the purposes of population segmentation, grouping countries with similar coding frequencies would remove some data heterogeneity, and improve accuracy of results. For the purposes of risk stratification, finding a period of coding stability for chosen variables is crucial to building a stable prediction model.

We recommend the descriptive statistics described above to quantify variation in the dataset. Researchers may wish to specify thresholds for acceptability of data quality, which can be contextualised to dataset and purpose of analysis. For instance, for a patient-level risk prediction model a CV threshold may be set quite low, where it may be set high or removed for the purposes of international benchmarking of prevalence.

## LIMITATIONS

Institutions contributing to the dataset are self-selected academic tertiary centres and the findings may not be generalisable to other secondary care institutions. Only one frailty measurement model was used, and this may not be generalisable to other models using similar datasets.<sup>25</sup> The score was developed on hospitalised populations of age  $\geq 75$  years as previous studies have found a larger frequency of coding for frailty syndromes within this age group. This score is, therefore, not validated in those who fall below 75 years of age.

## CONCLUSION

Frailty syndrome groups coded within standardised diagnostic fields of secondary care databases have many features making it a valid measure of frailty. Temporal and geographical variation for coding frailty groups can be quantified and may affect the accuracy and performance of risk prediction models based on this methodology. We recommend the descriptive statistics described above to quantify variation in similar datasets prior to building a risk prediction model.

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**Contributors** JTYS conceived study, designed analysis, interpreted results and wrote first draft. JM and SH-XN designed analysis, interpreted results and contributed to ongoing writing. AH and KXQT interpreted results and contributed to ongoing writing. JTYS acts as guarantor.

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**Competing interests** JM had an active role in the analysis of the data and participated in the design of the analysis of this manuscript. The company (Dr Foster Telstra Health) collected the data, but did not influence the study design and the data analysis. The company also did not have any influence on the decision to publish or the preparation of the manuscript.

**Patient consent for publication** Not applicable.

**Ethics approval** The data used in this study were collected for administrative purposes and anonymised. As per Governance Arrangements for Research Ethics Committees (GAFREC), research limited to secondary use of information previously collected in the course of normal care (without an intention to use it for research at the time of collection), provided that the patients or service users are not identifiable to the research team in carrying out the research. In Singapore, the study has been undertaken with Domain Specific Research Board approval under the National University Hospital System-National University Singapore Health Innovation Programme-Tackling High Cost Healthcare Users(2016/01011).

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**Data availability statement** No data are available. Unfortunately, data from the study cannot be made publicly available as the terms and conditions of the research collaboration restricted the availability of original data as follows: (1) Only certain categories of people are permitted to access and use the 'Analytical Tool' (ie, the software processing input data and generating output data for providing benchmarking to each hospital for quality improvements). These are defined as: 'Permitted Users' means the Participant's directors, employees and independent contractors who are authorised by the Participant to access and use the Analytical Tool for the purposes provided in this Agreement. (2) Access to and use of the Analytical Tool itself is granted only for the 'Term' and for specific purposes, being 'accessing and viewing the Output Data and to use the Output Data for the purpose of participating in and reviewing the results of the Project'. The restriction is related to the contract between the participating hospitals and Dr. Foster Telstra Health. There it was specified who has access to the data and that they may not be shared

with other people as described above. Other researchers can request access to the data as long as they fulfil the requirements of the contract. Contracting the responsible person in each individual hospital is possible, but the authors cannot guarantee that each hospital will provide the data. This is the responsibility of each hospital. It would be all administrative data of the according years in the participating hospitals. The data are owned by the participating hospitals.

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## Appendix 1: Frailty Syndromes by ICD-9 and ICD-10 codes

Group	ICD-10	Description (ICD-10)	ICD-10-AM	Description (ICD-10-AM)	ICD-9-CM	Description (ICD-9-CM)
<b>1 Dementia and delirium</b>	<b>F00</b>	<b>Dementia in Alzheimer's disease</b>	<b>F00</b>	<b>Dementia in Alzheimer's disease</b>		
	F000	Dementia in Alzheimer's disease with early onset	F000	Dementia in Alzheimer's disease		
	F001	Dementia in Alzheimer's disease with late onset	F001	Dementia in Alzheimer's disease with early onset (G30.0+)		
	F002	Dementia in Alzheimer's disease, atypical or mixed type	F002	Dementia in Alzheimer's disease with late onset (G30.1+)		
	F009	Dementia in Alzheimer's disease, unspecified	F009	Dementia in Alzheimer's disease, atypical or mixed type (G30.8+)		
	<b>F01</b>	<b>Vascular dementia</b>	<b>F01</b>	<b>Vascular dementia</b>	<b>2904</b>	<b>Arteriosclerotic dementia</b>
	F010	Vascular dementia of acute onset	F010	Vascular dementia of acute onset	29040	Vascular dementia, uncomplicated
	F011	Multi-infarct dementia	F011	Multi-infarct dementia	29041	Vascular dementia, with delirium
	F012	Subcortical vascular dementia	F012	Subcortical vascular dementia	29042	Vascular dementia, with delusions
	F013	Mixed cortical and subcortical vascular dementia	F013	Mixed cortical and subcortical vascular dementia	29043	Vascular dementia, with depressed mood
	F018	Other vascular dementia	F018	Other vascular dementia		
	F019	Vascular dementia, unspecified	F019	Vascular dementia, unspecified		
	<b>F02</b>	<b>Dementia in other diseases classified elsewhere</b>	<b>F02</b>	<b>Dementia in other diseases classified elsewhere</b>	<b>2941</b>	<b>Dementia in other diseases (End 2000)</b>
	F020	Dementia in Pick's disease	F020	Dementia in Pick's disease (G31.0+)	29410	Dementia in conditions classified

					elsewhere without behavioral disturbance
F021	Dementia in Creutzfeldt-Jakob disease	F021	Dementia in Creutzfeldt-Jakob disease (A81.0+)	29411	Dementia in conditions classified elsewhere with behavioral disturbance
F022	Dementia in Huntington's disease	F022	Dementia in Huntington's disease (G10+)		
F023	Dementia in Parkinson's disease	F023	Dementia in Parkinson's disease (G20+)		
F024	Dementia in human immunodeficiency virus [HIV] disease	F024	Dementia in human immunodeficiency virus [HIV] disease (B22.0+)		
F028	Dementia in other specified diseases classified elsewhere	F028	Dementia in other specified diseases classified elsewhere		
<b>F03</b>	<b>Unspecified dementia</b>	<b>F03</b>	<b>Unspecified dementia</b>	<b>2942</b>	<b>Dementia, unspecified</b>
				29420	Dementia, unspecified, without behavioral disturbance
				29421	Dementia, unspecified, with behavioral disturbance
<b>F05</b>	<b>Delirium not induced by alcohol and other psychoactive</b>	<b>F05</b>	<b>Delirium not induced by alcohol and other psychoactive</b>	<b>2930</b>	<b>Delirium due to conditions classified elsewhere</b>
F050	Delirium not superimposed on dementia, so described	F050	Delirium not superimposed on dementia, so described	2931	<b>Subacute delirium</b>
F051	Delirium superimposed on dementia	F051	Delirium superimposed on dementia	<b>V4031</b>	<b>Wandering in diseases classified elsewhere</b>
F058	Other delirium	F058	Other delirium		
F059	Delirium, unspecified	F059	Delirium, unspecified		

<b>G30</b>	<b>Alzheimer's disease</b>	<b>G30</b>	<b>Alzheimer's disease</b>	<b>3310</b>	<b>Alzheimer's disease</b>
G300	Alzheimer's disease with early onset	G300	Alzheimer's disease with early onset		
G301	Alzheimer's disease with late onset	G301	Alzheimer's disease with late onset		
G308	Other Alzheimer's disease	G308	Other Alzheimer's disease		
G309	Alzheimer's disease, unspecified	G309	Alzheimer's disease, unspecified		
<b>G311</b>	<b>Senile degeneration of brain, not elsewhere classified</b>	<b>G311</b>	<b>Senile degeneration of brain, not elsewhere classified</b>	<b>3312</b>	<b>Senile degeneration of brain</b>
				<b>2900</b>	<b>Senile dementia, uncomplicated</b>
				<b>2901</b>	<b>Presenile dementia</b>
				29010	Presenile dementia, uncomplicated
				29011	Presenile dementia with delirium
				29012	Presenile dementia with delusional features
				29013	Presenile dementia with depressive features
				<b>2902</b>	<b>Senile dementia with delusional or depressive features</b>
				29020	Senile dementia with delusional features
				29021	Senile dementia with depressive features
<b>G310</b>	<b>Circumscribed brain atrophy</b>	<b>G310</b>	<b>Circumscribed brain atrophy</b>	<b>2903</b>	<b>Senile dementia with delirium</b>
				<b>33119</b>	<b>Other frontotemporal dementia</b>

				33182	<b>Dementia with lewy bodies</b>
				2908	<b>Other specified senile psychotic conditions</b>
				2909	<b>Unspecified senile psychotic condition</b>
					<b>Other persistent mental disorders due to conditions classified elsewhere</b>
				2948	<b>Unspecified persistent mental disorders due to conditions classified elsewhere</b>
				2949	<b>Unspecified persistent mental disorders due to conditions classified elsewhere</b>
<b>F04</b>	<b>Organic amnesic syndrome, not induced by alcohol and other psychoactive substances</b>	<b>F04</b>	<b>Organic amnesic syndrome, not induced by alcohol and other psychoactive substances</b>	<b>2940</b>	<b>Amnesic disorder in conditions classified elsewhere</b>
		F0400	Post traumatic amnesia, unspecified		
		F0401	Post traumatic amnesia, duration < 24 hours		
		F0402	Post traumatic amnesia, duration >= 24 hours and <14 days		
		F0403	Post traumatic amnesia, duration >=14 days		
		F049	Amnesic syndrome, unspecified		
<b>R41</b>	<b>Other symptoms and signs involving cognitive functions and awareness</b>	<b>R41</b>	<b>Other symptoms and signs involving cognitive functions and awareness</b>		
R410	Disorientation, unspecified	R410	Disorientation, unspecified		

	R411	Anterograde amnesia	R411	Anterograde amnesia		
	R412	Retrograde amnesia	R412	Retrograde amnesia		
	R413	Other amnesia	R413	Other amnesia		
	R418	Other and unspecified symptoms and signs involving cognitive functions and awareness	R418	Other and unspecified symptoms and signs involving cognitive functions and awareness		
	<b>F440</b>	<b>Dissociative amnesia</b>	<b>F440</b>	<b>Dissociative amnesia</b>	<b>30012</b>	<b>Dissociative amnesia</b>
	<b>G454</b>	<b>Transient global amnesia</b>	<b>G454</b>	<b>Transient global amnesia</b>	<b>4377</b>	<b>Transient global amnesia</b>
<b>2 Senility</b>	<b>R54</b>	<b>Senility</b>	<b>R54</b>	<b>Senility</b>	<b>797</b>	<b>Senility without mention of psychosis</b>
<b>3 Falls and Mobility</b>	<b>R26</b>	<b>Abnormalities of gait and mobility</b>	<b>R26</b>	<b>Abnormalities of gait and mobility</b>	<b>7812</b>	<b>Abnormality of gait</b>
	R260	Ataxic gait	R260	Ataxic gait		
	R261	Paralytic gait	R261	Paralytic gait		
	R262	Difficulty in walking, not elsewhere classified	R262	Difficulty in walking, not elsewhere classified		
	R263	Immobility	R263	Immobility		
	R268	Other and unspecified abnormalities of gait and mobility	R268	Other and unspecified abnormalities of gait and mobility		
	<b>R296</b>	<b>Tendency to fall, not elsewhere classified</b>	<b>R296</b>	<b>Tendency to fall, not elsewhere classified</b>	<b>V1588</b>	<b>History of fall</b>
	<b>R298</b>	<b>Other and unspecified symptoms and signs involving the nervous and musculoskeletal systems</b>	<b>R2988</b>	<b>Other and unspecified symptoms and signs involving the nervous system</b>	<b>78199</b>	<b>Other symptoms involving nervous and musculoskeletal systems</b>
			<b>R2989</b>	<b>Other and unspecified symptoms and signs involving the musculoskeletal system</b>		

<b>4 Osteoporosis and FNOF</b>	<b>S32</b>	<b>Fracture of lumbar spine and pelvis</b>	<b>S32</b>	<b>Fracture of lumbar spine and pelvis</b>	<b>8054</b>	<b>Closed fracture of lumbar vertebra without mention of spinal cord injury Open fracture of lumbar vertebra without mention of spinal cord injury Closed fracture of lumbar spine with spinal cord injury Open fracture of lumbar spine with spinal cord injury</b>
	S320	Fracture of lumbar vertebra	S3200	Fracture of lumbar vertebra, level unspecified	<b>8055</b>	
	S3200	Fracture of lumbar vertebra - closed	S3201	Fracture of lumbar vertebra, L1 level	<b>8064</b>	
	S3201	Fracture of lumbar vertebra - open	S3202	Fracture of lumbar vertebra, L2 level	<b>8065</b>	
			S3203	Fracture of lumbar vertebra, L3 level		
			S3204	Fracture of lumbar vertebra, L4 level		
			S3205	Fracture of lumbar vertebra, L5 level		
	S321	Fracture of sacrum	S321	Fracture of sacrum	<b>8056</b>	<b>Closed fracture of sacrum and coccyx without mention of spinal cord injury Open fracture of sacrum and coccyx without mention of spinal cord injury Closed fracture of sacrum &amp; coccyx with spinal cord injury</b>
	S3210	Fracture of sacrum - closed			<b>8057</b>	
	S3211	Fracture of sacrum - open			<b>8066</b>	
	S322	Fracture of coccyx	S322	Fracture of coccyx	80660	Closed fracture of sacrum and coccyx with unspecified spinal cord injury

S3220	Fracture of coccyx - closed			80661	Closed fracture of sacrum and coccyx with complete cauda equina lesion
S3221	Fracture of coccyx - open			80662	Closed fracture of sacrum and coccyx with other cauda equina injury
				80669	Closed fracture of sacrum and coccyx with other spinal cord injury
				<b>8067</b>	<b>Open fracture of sacrum &amp; coccyx with spinal cord injury</b>
				80670	Open fracture of sacrum and coccyx with unspecified spinal cord injury
				80671	Open fracture of sacrum and coccyx with complete cauda equina lesion
				80672	Open fracture of sacrum and coccyx with other cauda equina injury
				80679	Open fracture of sacrum and coccyx with other spinal cord injury
S323	Fracture of ilium	S323	Fracture of ilium	<b>808</b>	<b>Fracture of pelvis</b>
S3230	Fracture of ilium - closed			8080	Closed fracture of acetabulum
S3231	Fracture of ilium - open			8081	Open fracture of acetabulum
S324	Fracture of acetabulum	S324	Fracture of acetabulum	8082	Closed fracture of pubis



S3240	Fracture of acetabulum - closed			8083	Open fracture of pubis
S3241	Fracture of acetabulum - open			8084	Closed fracture of other specified part of pelvis
S325	Fracture of pubis	S325	Fracture of pubis	80841	Closed fracture of ilium
S3250	Fracture of pubis - closed			80842	Closed fracture of ischium
S3251	Fracture of pubis - open			80843	Multiple closed pelvic fractures with disruption of pelvic circle
S327	Multiple fractures of lumbar spine and pelvis	S327	Multiple fractures of lumbar spine with pelvis	80844	Multiple closed pelvic fractures without disruption of pelvic circle
S3270	Multiple fractures of lumbar spine and pelvis - closed			80849	Closed fracture of other specified part of pelvis
S3271	Multiple fractures of lumbar spine and pelvis - open			8085	Open fracture of other specified part of pelvis
S328	Fracture of other and unspecified parts of lumbar spine and pelvis	S3281	Fracture of ischium	80851	Open fracture of ilium
S3280	Fracture of other and unspecified parts of lumbar spine and pelvis - closed	S3282	Fracture of lumbosacral spine, part unspecified	80852	Open fracture of ischium
S3281	Fracture of other and unspecified parts of lumbar spine and pelvis - open	S3283	Fracture of pelvis, part unspecified	80853	Multiple open pelvic fractures with disruption of pelvic circle
		S3289	Other and multiple pelvic fractures	80854	Multiple open pelvic fractures without

					disruption of pelvic circle
				80859	Open fracture of other specified part of pelvis
				8088	Closed unspecified fracture of pelvis
				8089	Open unspecified fracture of pelvis
				<b>809</b>	<b>Ill-defined fractures of bones of trunk</b>
				8090	Fracture of bones of trunk, closed
				8091	Fracture of bones of trunk, open
<b>S33</b>	<b>Dislocation, sprain and strain of joints and ligaments of lumbar spine and pelvis</b>	<b>S33</b>	<b>Disloc sprain and strain joint lig lumbar spine and pe</b>	<b>8392</b>	<b>Closed dislocation, thoracic &amp; lumbar vertebra</b>
S330	Traumatic rupture of lumbar intervertebral disc	S330	Traumatic rupture of lumbar intervertebral disc	83920	Closed dislocation, lumbar vertebra
S331	Dislocation of lumbar vertebra	S3310	Dislocation of lumbar vertebra, level unspecified	<b>8393</b>	<b>Open dislocation, thoracic &amp; lumbar vertebra</b>
		S3311	Dislocation of L1/L2 lumbar vertebrae	83930	Open dislocation, lumbar vertebra
		S3312	Dislocation of L2/L3 lumbar vertebrae	<b>83941</b>	<b>Closed dislocation, coccyx</b>
		S3313	Dislocation of L3/L4 lumbar vertebrae	<b>83942</b>	<b>Closed dislocation, sacrum</b>
		S3314	Dislocation of L4/L5 lumbar vertebrae	<b>83951</b>	<b>Open dislocation, coccyx</b>
		S3315	Dislocation of L5/S1 lumbar vertebrae	<b>83952</b>	<b>Open dislocation, sacrum</b>
S332	Dislocation of sacroiliac and sacrococcygeal joint	S332	Dislocation of sacroiliac and sacrococcygeal joint		

S333	Dislocation of other and unspecified parts of lumbar spine and pelvis	S333	Dislocation of other and unspecified parts of lumbar spine and pelvis		
S334	Traumatic rupture of symphysis pubis	S334	Traumatic rupture of symphysis pubis		
S335	Sprain and strain of lumbar spine	S3351	Sprain and strain of lumbosacral [joint] [ligament]	<b>846</b>	<b>Sprains &amp; strains of sacroiliac region</b>
S336	Sprain and strain of sacroiliac joint	S336	Sprain and strain of sacroiliac joint	8460	Sprain of lumbosacral (joint) (ligament)
S337	Sprain and strain of other and unspecified parts of lumbar spine and pelvis	S337	Sprain and strain of other and unspecified parts of lumbar spine and pelvis	8461	Sprain of sacroiliac ligament
				8462	Sprain of sacrospinatus (ligament)
				8463	Sprain of sacrotuberous (ligament)
				8468	Sprain of other specified sites of sacroiliac region
				8469	Sprain of unspecified site of sacroiliac region
				<b>8472</b>	<b>Sprain of lumbar</b>
				<b>8473</b>	<b>Sprain of sacrum</b>
				<b>8474</b>	<b>Sprain of coccyx</b>
				<b>8485</b>	<b>Sprain of pelvic</b>
<b>S42</b>	<b>Fracture of shoulder and upper arm</b>	<b>S42</b>	<b>Fracture of shoulder and upper arm</b>	<b>810</b>	<b>Fracture of clavicle</b>
S420	Fracture of clavicle	S4200	Fracture of clavicle, part unspecified	8100	Closed fracture of clavicle

	Fracture of clavicle - closed	S4200	Fracture of sternal end of clavicle	81000	Closed fracture of clavicle, unspecified part
	Fracture of clavicle - open	S4201	Fracture of shaft of clavicle	81001	Closed fracture of sternal end of clavicle
		S4203	Fracture of acromial end of clavicle	81002	Closed fracture of shaft of clavicle
		S4209	Multiple fractures of clavicle	81003	Closed fracture of acromial end of clavicle
S421	Fracture of scapula	S4210	Fracture of scapula, part unspecified	8101	Open fracture of clavicle
	Fracture of scapula - closed	S4211	Fracture of body of scapula	81010	Open fracture of clavicle, unspecified part
	Fracture of scapula - open	S4212	Fracture of acromial process	81011	Open fracture of sternal end of clavicle
		S4213	Fracture of coracoid process	81012	Open fracture of shaft of clavicle
		S4214	Fracture of glenoid cavity and neck of scapula	81013	Open fracture of acromial end of clavicle
		S4219	Multiple fractures of scapula	<b>811</b>	<b>Fracture of scapula</b>
S422	Fracture of upper end of humerus	S4220	Fracture of upper end of humerus, part unspecified	8110	Closed fracture of scapula
	Fracture of upper end of humerus - closed	S4221	Fracture of head of humerus	81100	Closed fracture of scapula, unspecified part
	Fracture of upper end of humerus - open	S4222	Fracture of surgical neck of humerus	81101	Closed fracture of acromial process of scapula
		S4223	Fracture of anatomical neck of humerus	81102	Closed fracture of coracoid process of scapula

		S4224	Fracture of greater tuberosity of humerus	81103	Closed fracture of glenoid cavity and neck of scapula
		S4229	Fracture of other and multiple parts of upper end of humerus	81109	Closed fracture of scapula, other
S423	Fracture of shaft of humerus	S423	Fracture of shaft of humerus	8111	Open fracture of scapula
S4230	Fracture of shaft of humerus - closed			81110	Open fracture of scapula, unspecified part
S4231	Fracture of shaft of humerus - open			81111	Open fracture of acromial process of scapula
S424	Fracture of lower end of humerus	S4240	Fracture of lower end of humerus, part unspecified	81112	Open fracture of coracoid process
S4240	Fracture of lower end of humerus - closed	S4241	Supracondylar fracture of humerus	81113	Open fracture of glenoid cavity and neck of scapula
S4241	Fracture of lower end of humerus - open	S4242	Fracture of lateral condyle of humerus	81119	Open fracture of scapula, other
		S4243	Fracture of medial condyle of humerus	<b>812</b>	<b>Fracture of humerus</b>
		S4244	Fracture of condyle(s) of humerus, unspecified	8120	Fracture of upper end of humerus, closed
		S4249	Other and multiple fractures of lower end of humerus	81200	Closed fracture of unspecified part of upper end of humerus
S427	Multiple fractures of clavicle, scapula and humerus	S427	Multiple fractures of clavicle, scapula and humerus	81201	Closed fracture of surgical neck of humerus
S4270	Multiple fractures of clavicle, scapula and humerus - closed			81202	Closed fracture of anatomical neck of humerus

S4271	Multiple fractures of clavicle, scapula and humerus - open			81203	Closed fracture of greater tuberosity of humerus
S428	Fracture of other parts of shoulder and upper arm	S428	Fracture of other parts of shoulder and upper arm	81209	Other closed fracture of upper end of humerus
S4280	Fracture of other parts of shoulder and upper arm - closed			8121	Fracture of upper end of humerus, open
S4281	Fracture of other parts of shoulder and upper arm - open			81210	Open fracture of unspecified part of upper end of humerus
S429	Fracture of shoulder girdle, part unspecified	S429	Fracture of shoulder girdle, part unspecified	81211	Open fracture of surgical neck of humerus
S4290	Fracture of shoulder girdle, part unspecified - closed			81212	Open fracture of anatomical neck of humerus
S4291	Fracture of shoulder girdle, part unspecified - open			81213	Open fracture of greater tuberosity of humerus
				81219	Other open fracture of upper end of humerus
				8122	Closed fracture of shaft or unspecified part of humerus
				81220	Closed fracture of unspecified part of humerus
				81221	Closed fracture of shaft of humerus
				8123	Fracture of shaft or unspecified part of humerus, open

	Open fracture of unspecified part of humerus
81230	
	Open fracture of shaft of humerus
81231	
	Fracture of lower end of humerus, closed
8124	
	Closed fracture of unspecified part of lower end of humerus
81240	
	Closed supracondylar fracture of humerus
81241	
	Closed fracture of lateral condyle of humerus
81242	
	Closed fracture of medial condyle of humerus
81243	
	Closed fracture of unspecified condyle(s) of humerus
81244	
	Other closed fracture of lower end of humerus
81249	
	Fracture of lower end of humerus, open
8125	
	Open fracture of unspecified part of lower end of humerus
81250	
	Open supracondylar fracture of humerus
81251	
	Open fracture of lateral condyle of humerus
81252	

				81253	Open fracture of medial condyle of humerus
				81254	Open fracture of unspecified condyle(s) of humerus
				81259	Other open fracture of lower end of humerus
<b>S43</b>	<b>Dislocation, sprain and strain of joints and ligaments of shoulder girdle</b>	<b>S43</b>	<b>Disloc sprain and strain of joints ligs of shoulder gir</b>	<b>831</b>	<b>Dislocation of shoulder</b>
S430	Dislocation of shoulder joint	S4300	Dislocation of shoulder, unspecified	8310	Closed dislocation of shoulder
		S4301	Anterior dislocation of humerus	83100	Closed dislocation of shoulder, unspecified
		S4302	Posterior dislocation of humerus	83101	Closed anterior dislocation of humerus
		S4303	Inferior dislocation of humerus	83102	Closed posterior dislocation of humerus
		S4308	Dislocation of other part of shoulder	83103	Closed inferior dislocation of humerus
S431	Dislocation of acromioclavicular joint	S431	Dislocation of acromioclavicular joint	83104	Closed dislocation of acromioclavicular (joint)
S432	Dislocation of sternoclavicular joint	S432	Dislocation of sternoclavicular joint	83109	Closed dislocation of shoulder, other
S433	Dislocation of other and unspecified parts of shoulder girdle	S433	Dislocation of other and unspecified parts of shoulder girdle	8311	Open dislocation of shoulder
				83110	Open dislocation of shoulder, unspecified
				83111	Open anterior dislocation of humerus



				83112	Open posterior dislocation of humerus
				83113	Open inferior dislocation of humerus
				83114	Open dislocation of acromioclavicular (joint)
				83119	Open dislocation of shoulder, other
				<b>840</b>	<b>Sprains &amp; strains of shoulder &amp; upper arm</b>
S434	Sprain and strain of shoulder joint	S434	Sprain and strain of shoulder joint		Acromioclavicular
S435	Sprain and strain of acromioclavicular joint	S435	Sprain and strain of acromioclavicular joint	8400	(joint) (ligament) sprain
S436	Sprain and strain of sternoclavicular joint	S436	Sprain and strain of sternoclavicular joint	8401	Coracoclavicular (ligament) sprain
S437	Sprain and strain of other and unspecified parts of shoulder girdle	S437	Sprain and strain of other and unspecified parts of shoulder girdle	8402	Coracohumeral (ligament) sprain
				8403	Infraspinatus (muscle) (tendon) sprain
				8404	Rotator cuff (capsule) sprain
				8405	Subscapularis (muscle) sprain
				8406	Supraspinatus (muscle) (tendon) sprain
				8407	Superior glenoid labrum lesion
				8408	Sprains and strains of other specified sites of shoulder and upper arm
				8409	Sprains and strains of unspecified site of

					shoulder and upper arm
				<b>83961</b>	<b>Closed dislocation, sternum</b>
				<b>83971</b>	<b>Open dislocation, sternum</b>
				<b>8484</b>	<b>Sternum sprain</b>
				84840	Sprain of sternum , unspecified site
				84841	Sprain of sternoclavicular (joint) (ligament)
				84842	Sprain of chondrosternal (joint)
				84849	Sprain of sternum, other
<b>S62</b>	<b>Fracture at wrist and hand level</b>	<b>S62</b>	<b>Fracture at wrist and hand level</b>	<b>814</b>	<b>Fracture of carpal bone(s)</b>
S620	Fracture of navicular [scaphoid] bone of hand	S620	Fracture of navicular [scaphoid] bone of hand	8140	Closed fractures of carpal bones
S6200	Fracture of navicular [scaphoid] bone of hand - closed			81400	Closed fracture of carpal bone, unspecified
S6201	Fracture of navicular [scaphoid] bone of hand - open			81401	Closed fracture of navicular [scaphoid] bone of wrist
S621	Fracture of other carpal bone(s)	S6210	Fracture of carpal bone, unspecified	81402	Closed fracture of lunate [semilunar] bone of wrist
S6210	Fracture of other carpal bone(s) - closed	S6211	Fracture of lunate bone of wrist	81403	Closed fracture of triquetral [cuneiform] bone of wrist
S6211	Fracture of other carpal bone(s) - open	S6212	Fracture of triquetral bone of wrist	81404	Closed fracture of pisiform bone of wrist

		S6213	Fracture of pisiform	81405	Closed fracture of trapezium bone [larger multangular] of wrist
		S6214	Fracture of trapezium bone	81406	Closed fracture of trapezoid bone [smaller multangular] of wrist
		S6215	Fracture of trapezoid bone	81407	Closed fracture of capitate bone [os magnum] of wrist
		S6216	Fracture of capitate bone	81408	Closed fracture of hamate [unciform] bone of wrist
		S6217	Fracture of hamate bone	81409	Closed fracture of other bone of wrist
		S6219	Fracture of other and multiple carpal bones	8141	Open fractures of carpal bones
S622	Fracture of first metacarpal bone	S6220	Fracture of first metacarpal bone, part unspecified	81410	Open fracture of carpal bone, unspecified
S6220	Fracture of first metacarpal bone - closed	S6221	Fracture of base of first metacarpal bone	81411	Open fracture of navicular [scaphoid] bone of wrist
S6221	Fracture of first metacarpal bone - open	S6222	Fracture of shaft of first metacarpal bone	81412	Open fracture of lunate [semilunar] bone of wrist
		S6223	Fracture of neck of first metacarpal bone	81413	Open fracture of triquetral [cuneiform] bone of wrist
		S6224	Fracture of head of first metacarpal bone	81414	Open fracture of pisiform bone of wrist
S623	Fracture of other metacarpal bone	S6230	Fracture of other metacarpal bone(s), part unspecified	81415	Open fracture of trapezium bone [larger multangular] of wrist
S6230	Fracture of other metacarpal bone - closed	S6231	Fracture of base of other metacarpal bone(s)	81416	Open fracture of trapezoid bone [smaller multangular] of wrist

S6231	Fracture of other metacarpal bone - open	S6232	Fracture of shaft of other metacarpal bone(s)	81417	Open fracture of capitate bone [os magnum] of wrist
		S6233	Fracture of neck of other metacarpal bone(s)	81418	Open fracture of hamate [unciform] bone of wrist
		S6234	Fracture of head of other metacarpal bone(s)	81419	Open fracture of other bone of wrist
S624	Multiple fractures of metacarpal bones	S624	Multiple fractures of metacarpal bones	<b>815</b>	<b>Fracture of metacarpal bone(s)</b>
S6240	Multiple fractures of metacarpal bones - closed			8150	Closed fracture of metacarpal bones
S6241	Multiple fractures of metacarpal bones - open			81500	Closed fracture of metacarpal bone(s), site unspecified
S625	Fracture of thumb	S6250	Fracture of thumb, part unspecified	81501	Closed fracture of base of thumb [first] metacarpal
S6250	Fracture of thumb - closed	S6251	Fracture of proximal phalanx of thumb	81502	Closed fracture of base of other metacarpal bone(s)
S6251	Fracture of thumb - open	S6252	Fracture of distal phalanx of thumb	81503	Closed fracture of shaft of metacarpal bone(s)
S626	Fracture of other finger	S6260	Fracture of phalanx, part unspecified	81504	Closed fracture of neck of metacarpal bone(s)
S6260	Fracture of other finger - closed	S6261	Fracture of proximal phalanx	81509	Closed fracture of multiple sites of metacarpus
S6261	Fracture of other finger - open	S6262	Fracture of middle phalanx	8151	Open fracture of metacarpal bones
		S6263	Fracture of distal phalanx	81510	Open fracture of metacarpal bone(s), site unspecified

S627	Multiple fractures of fingers	S627	Multiple fractures of fingers	81511	Open fracture of base of thumb [first] metacarpal
S6270	Multiple fractures of fingers - closed			81512	Open fracture of base of other metacarpal bone(s)
S6271	Multiple fractures of fingers - open			81513	Open fracture of shaft of metacarpal bone(s)
S628	Fracture of other and unspecified parts of wrist and hand	S628	Fracture of other and unspecified parts of wrist and hand	81514	Open fracture of neck of metacarpal bone(s)
S6280	Fracture of other and unspecified parts of wrist and hand - closed			81519	Open fracture of multiple sites of metacarpus
S6281	Fracture of other and unspecified parts of wrist and hand - open			<b>816</b>	<b>Fracture of one or more phalanges of hand</b>
				8160	Closed fracture of one or more phalanges of hand
				81600	Closed fracture of phalanx or phalanges of hand, unspecified
				81601	Closed fracture of middle or proximal phalanx or phalanges of hand
				81602	Closed fracture of distal phalanx or phalanges of hand
				81603	Closed fracture of multiple sites of phalanx or phalanges of hand

				8161	Open fracture of one or more phalanges of hand
				81610	Open fracture of phalanx or phalanges of hand, unspecified
				81611	Open fracture of middle or proximal phalanx or phalanges of hand
				81612	Open fracture of distal phalanx or phalanges of hand
				81613	Open fracture of multiple sites of phalanx or phalanges of hand
			<b>817</b>		<b>Multiple fractures of hand bones</b>
				8170	Multiple closed fractures of hand bones
				8171	Multiple open fractures of hand bones
<b>S72</b>	<b>Fracture of femur</b>	<b>S72</b>	<b>Fracture of femur</b>	<b>820</b>	<b>Fracture of neck of femur</b>
S720	Fracture of neck of femur	S7200	Fracture of neck of femur, part unspecified	8200	Transcervical fracture, closed
S7200	Fracture of neck of femur - closed	S7201	Fracture of intracapsular section of femur	82000	Closed fracture of intracapsular section of neck of femur, unspecified
S7201	Fracture of neck of femur - open	S7202	Fracture of upper epiphysis (separation) of femur	82001	Closed fracture of epiphysis (separation)

					(upper) of neck of femur
			Fracture of subcapital section of femur	S7203	82002 Closed fracture of midcervical section of neck of femur
			Fracture of midcervical section of femur	S7204	82003 Closed fracture of base of neck of femur
			Fracture of base of neck of femur	S7205	82009 Other closed transcervical fracture of neck of femur
			Fracture of other parts of neck of femur	S7208	8201 Transcervical fracture, open
S721	Pertrochanteric fracture	S7210	Fracture of trochanteric section of femur, unspecified		82010 Open fracture of intracapsular section of neck of femur, unspecified
S7210	Pertrochanteric fracture - closed	S7211	Fracture of intertrochanteric section of femur		82011 Open fracture of epiphysis (separation) (upper) of neck of femur
S7211	Pertrochanteric fracture - open				82012 Open fracture of midcervical section of neck of femur
S722	Subtrochanteric fracture	S722	Subtrochanteric fracture		82013 Open fracture of base of neck of femur
S7220	Subtrochanteric fracture - closed				82019 Other open transcervical fracture of neck of femur
S7221	Subtrochanteric fracture - open				8202 Pertrochanteric fracture of femur, closed
S723	Fracture of shaft of femur	S723	Fracture of shaft of femur		82020 Closed fracture of trochanteric section of neck of femur
S7230	Fracture of shaft of femur - closed				82021 Closed fracture of intertrochanteric

					section of neck of femur
					Closed fracture of subtrochanteric section of neck of femur
S7231	Fracture of shaft of femur - open			82022	
S724	Fracture of lower end of femur	S7240	Fracture of lower end of femur, part unspecified	8203	Pertrochanteric fracture of femur, open
					Open fracture of trochanteric section of neck of femur, unspecified
S7240	Fracture of lower end of femur - closed	S7241	Fracture of femoral condyle	82030	Open fracture of intertrochanteric section of neck of femur
S7241	Fracture of lower end of femur - open	S7242	Fracture of lower epiphysis (separation) of femur	82031	Open fracture of subtrochanteric section of neck of femur
		S7243	Supracondylar fracture of femur	82032	Closed fracture of unspecified part of neck of femur
		S7244	Intercondylar fracture of femur	8208	Open fracture of unspecified part of neck of femur
S727	Multiple fractures of femur	S727	Multiple fractures of femur	8209	<b>Fracture of other &amp; unspecified parts of femur</b>
S7270	Multiple fractures of femur - closed			<b>821</b>	Fracture of shaft or unspecified part of femur, closed
S7271	Multiple fractures of femur - open			8210	Closed fracture of unspecified part of femur
S728	Fractures of other parts of femur	S728	Fractures of other parts of femur	82100	Closed fracture of shaft of femur
S7280	Fractures of other parts of femur - closed			82101	



S7281	Fractures of other parts of femur - open			8211	Fracture of shaft or unspecified part of femur, open
S729	Fracture of femur, part unspecified	S729	Fracture of femur, part unspecified	82110	Open fracture of unspecified part of femur
S7290	Fracture of femur, part unspecified - closed			82111	Open fracture of shaft of femur
S7291	Fracture of femur, part unspecified - open			8212	Fracture of lower end of femur, closed
				82120	Closed fracture of lower end of femur, unspecified part
				82121	Closed fracture of condyle, femoral
				82122	Closed fracture of epiphysis, lower (separation) of femur
				82123	Closed supracondylar fracture of femur
				82129	Other closed fracture of lower end of femur
				8213	Fracture of lower end of femur, open
				82130	Open fracture of lower end of femur, unspecified part
				82131	Open fracture of condyle, femoral
				82132	Open fracture of epiphysis. Lower (separation) of femur

				82133	Open supracondylar fracture of femur
				82139	Other open fracture of lower end of femur
<b>S73</b>	<b>Dislocation, sprain and strain of joint and ligaments of hip</b>	<b>S73</b>	<b>Dislocationsprain and strain of joint and ligaments o</b>	<b>835</b>	<b>Dislocation of hip</b>
S730	Dislocation of hip	S7300	Dislocation of hip, unspecified	8350	Closed dislocation of hip
		S7301	Posterior dislocation of hip	83500	Closed dislocation of hip, unspecified site
		S7302	Anterior dislocation of hip	83501	Closed posterior dislocation of hip
		S7308	Other dislocation of hip	83502	Closed obturator dislocation of hip
				83503	Other closed anterior dislocation of hip
				8351	Open dislocation of hip
				83510	Open dislocation of hip, unspecified site
				83511	Open posterior dislocation of hip
				83512	Open obturator dislocation of hip
				83513	Other open anterior dislocation of hip
S731	Sprain and strain of hip	S7310	Sprain and strain of hip, part unspecified	<b>843</b>	<b>Sprains &amp; strains of hip &amp; thigh</b>
		S7311	Sprain and strain of iliofemoral (ligament)	8430	Ilio-femoral (ligament) sprain

		S7312	Sprain and strain of ischiocapsular (ligament)	8431	Ischiocapsular (ligament) sprain
		S7318	Sprain and strain of other specified sites of hip	8438	Sprains and strains of other specified sites of hip and thigh
				8439	Sprains and strains of unspecified site of hip and thigh
<b>W0</b>	<b>Falls</b>	<b>W0</b>	<b>Falls</b>	<b>E88</b>	<b>Falls</b>
W00	Fall on same level involving ice and snow	W00	Fall on same level involving ice and snow		
W000	Fall on same level involving ice and snow - Home				
W001	Fall on same level involving ice and snow - Residential institution				
W002	Fall on same level involving ice and snow - School, other institution and public administrative area				
W003	Fall on same level involving ice and snow - Sports and athletics area				
W004	Fall on same level involving ice and snow - Street and highway				
W005	Fall on same level involving ice and snow - Trade and service area				
W006	Fall on same level involving ice and snow - Industrial and construction area				

	Fall on same level involving ice and snow - Farm				
W007	Fall on same level involving ice and snow - Other specified places				
W008	Fall on same level involving ice and snow - Unspecified place				
W009	Fall on same level from slipping, tripping and stumbling	W01	Fall on same level from slipping, tripping and stumbling	E885	Fall Slip Trip (End 2000)
W01	Fall on same level from slipping, tripping and stumbling - Home	W010	Fall on same level from slipping	E8859	Fall from other slipping, tripping, or stumbling
W010	Fall on same level from slipping, tripping and stumbling - Residential institution	W011	Fall on same level from tripping		
W011	Fall on same level from slipping, tripping and stumbling - School, other institution and public administrative area	W012	Fall on same level from stumbling		
W012	Fall on same level from slipping, tripping and stumbling - Sports and athletics area				
W013	Fall on same level from slipping, tripping and stumbling - Street and highway				
W014	Fall on same level from slipping, tripping and stumbling - Trade and service area				
W015					

W016	Fall on same level from slipping, tripping and stumbling - Industrial and construction area				
W017	Fall on same level from slipping, tripping and stumbling - Farm				
W018	Fall on same level from slipping, tripping and stumbling - Other specified places				
W019	Fall on same level from slipping, tripping and stumbling - Unspecified place				
W02	Fall involving ice-skates, skis, roller-skates or skateboards	W02	Fall involving ice-skates, skis, roller-skates or skateboards		
W020	Fall involving ice-skates, skis, roller-skates or skateboards - Home	W020	Fall involving roller-skates	E8851	Fall from roller skates
W021	Fall involving ice-skates, skis, roller-skates or skateboards - Residential institution	W021	Fall involving skateboard	E8852	Fall from skateboard
W022	Fall involving ice-skates, skis, roller-skates or skateboards - School, other institution and public administrative area	W022	Fall involving water ski		
W023	Fall involving ice-skates, skis, roller-skates or skateboards - Sports and athletics area	W023	Fall involving snow ski	E8853	Fall from skis
W024	Fall involving ice-skates, skis, roller-skates or	W024	Fall involving snow board	E8854	Fall from snowboard

	skateboards - Street and highway			
	Fall involving ice-skates, skis, roller-skates or skateboards - Trade and service area	W025	Fall involving ice-skates	
	Fall involving ice-skates, skis, roller-skates or skateboards - Industrial and construction area	W026	Fall involving scooter, nonpowered	E8850
	Fall involving ice-skates, skis, roller-skates or skateboards - Farm	W027	Fall involving baby carriage	Fall from (nonmotorized) scooter
	Fall involving ice-skates, skis, roller-skates or skateboards - Other specified places	W028	Fall involving baby walker	
	Fall involving ice-skates, skis, roller-skates or skateboards - Unspecified place	W029	Fall involving other and unspecified pedestrian conveyance	
W03	Other fall on same level due to collision with, or pushing by, another person	W03	Other fall on same level due to collision with, or pushing by, another person	E8860
	Other fall on same level due to collision with, or pushing by, another person - Home			E8869
	Other fall on same level due to collision with, or pushing by, another person - Residential institution	W031		

	Other fall on same level due to collision with, or pushing by, another person - School, other institution and public administrative area		
W032	Other fall on same level due to collision with, or pushing by, another person - Sports and athletics area		
W033	Other fall on same level due to collision with, or pushing by, another person - Street and highway		
W034	Other fall on same level due to collision with, or pushing by, another person - Trade and service area		
W035	Other fall on same level due to collision with, or pushing by, another person - Industrial and construction area		
W036	Other fall on same level due to collision with, or pushing by, another person - Farm		
W037	Other fall on same level due to collision with, or pushing by, another person - Other specified places		
W038	Other fall on same level due to collision with, or pushing by, another person - Unspecified place		
W039			Fall while being carried or supported by other persons
W04	Fall while being carried or supported by other persons Fall while being carried or supported by other persons - Home	W04	
W040			

	Fall while being carried or supported by other persons - Residential institution		
W041			
	Fall while being carried or supported by other persons - School, other institution and public administrative area		
W042			
	Fall while being carried or supported by other persons - Sports and athletics area		
W043			
	Fall while being carried or supported by other persons - Street and highway		
W044			
	Fall while being carried or supported by other persons - Trade and service area		
W045			
	Fall while being carried or supported by other persons - Industrial and construction area		
W046			
	Fall while being carried or supported by other persons - Farm		
W047			
	Fall while being carried or supported by other persons - Other specified places		
W048			
	Fall while being carried or supported by other persons - Unspecified place		
W049			
W05	Fall involving wheelchair	W05	Fall involving wheelchair
W050	Fall involving wheelchair - Home		



	Fall involving wheelchair		
W051	- Residential institution		
	Fall involving wheelchair		
W052	- School, other institution and public administrative area		
	Fall involving wheelchair		
W053	- Sports and athletics area		
	Fall involving wheelchair		
W054	- Street and highway		
	Fall involving wheelchair		
W055	- Trade and service area		
	Fall involving wheelchair		
W056	- Industrial and construction area		
	Fall involving wheelchair		
W057	- Farm		
	Fall involving wheelchair		
W058	- Other specified places		
	Fall involving wheelchair		
W059	- Unspecified place		
W06	Fall involving bed	W06	Fall involving bed
			Fall involving bunk
W060	Fall involving bed - Home	W060	bed
	Fall involving bed -		Fall involving special
W061	Residential institution	W061	purpose bed
	Fall involving bed -		
W062	School, other institution and public administrative area	W062	Fall involving cot
	Fall involving bed -		Fall involving
W063	Sports and athletics area	W063	bassinet
	Fall involving bed -		
W064	Street and highway	W064	Fall involving cradle
	Fall involving bed - Trade		Fall involving
W065	and service area	W065	hammock

	Fall involving bed - Industrial and construction area	W066	Fall involving conventional bed
W066			Fall involving other
W067	Fall involving bed - Farm	W068	specified bed
W068	Fall involving bed - Other specified places	W069	Fall involving unspecified bed
W069	Fall involving bed - Unspecified place		
W07	Fall involving chair	W07	Fall involving chair
	Fall involving chair -		Fall involving rocking
W070	Home	W070	chair
	Fall involving chair -		Fall involving folding
W071	Residential institution	W071	chair
	Fall involving chair -		
W072	School, other institution and public administrative area	W072	Fall involving revolving chair
	Fall involving chair -		
W073	Sports and athletics area	W073	Fall involving stool
	Fall involving chair -		Fall involving high-
W074	Street and highway	W074	chair
	Fall involving chair -		Fall involving bath
W075	Trade and service area	W075	chair
	Fall involving chair -		
W076	Industrial and construction area	W076	Fall involving commode chair
	Fall involving chair -		Fall involving lift
W077	Farm	W077	assistance chair
	Fall involving chair -		Fall involving other
W078	Other specified places	W078	specified chair
	Fall involving chair -		Fall involving
W079	Unspecified place	W079	unspecified chair
	Fall involving other		Fall involving other
W08	furniture	W08	furniture
	Fall involving other		Fall involving baby
W080	furniture - Home	W080	change table

W081	Fall involving other furniture - Residential institution	W081	Fall involving baby exerciser		
W082	Fall involving other furniture - School, other institution and public administrative area	W082	Fall involving table		
W083	Fall involving other furniture - Sports and athletics area	W088	Fall involving other specified furniture		
W084	Fall involving other furniture - Street and highway	W089	Fall involving unspecified furniture		
W085	Fall involving other furniture - Trade and service area				
W086	Fall involving other furniture - Industrial and construction area				
W087	Fall involving other furniture - Farm				
W088	Fall involving other furniture - Other specified places				
W089	Fall involving other furniture - Unspecified place				
W09	Fall involving playground equipment	W09	Fall involving playground equipment	E8840	Accidental fall from playground equipment
W090	Fall involving playground equipment - Home	W090	Fall involving tree house		
W091	Fall involving playground equipment - Residential institution	W091	Fall involving flying fox		
W092	Fall involving playground equipment - School, other	W092	Fall involving playground climbing apparatus		

	institution and public administrative area				
W093	Fall involving playground equipment - Sports and athletics area	W093	Fall involving slide		
W094	Fall involving playground equipment - Street and highway	W094	Fall involving swing		
W095	Fall involving playground equipment - Trade and service area	W095	Fall involving seesaw		
W096	Fall involving playground equipment - Industrial and construction area	W096	Fall involving trampoline		
W097	Fall involving playground equipment - Farm	W098	Fall involving other specified playground equipment		
W098	Fall involving playground equipment - Other specified places	W099	Fall involving unspecified playground equipment		
W099	Fall involving playground equipment - Unspecified place				
<b>W1</b>	<b>Falls</b>	<b>W1</b>	<b>Falls</b>		
W10	Fall on and from stairs and steps	W10	Fall on and from stairs and steps	E8809	Accidental fall on or from other stairs or steps
W100	Fall on and from stairs and steps - Home	W100	Fall on and from escalator	E8800	Accidental fall on or from escalator
W101	Fall on and from stairs and steps - Residential institution	W101	Fall on and from travelator		
W102	Fall on and from stairs and steps - School, other institution and public administrative area	W102	Fall on and from ramp		

W103	Fall on and from stairs and steps - Sports and athletics area	W109	Fall on and from other and unspecified stairs and steps		
W104	Fall on and from stairs and steps - Street and highway				
W105	Fall on and from stairs and steps - Trade and service area				
W106	Fall on and from stairs and steps - Industrial and construction area				
W107	Fall on and from stairs and steps - Farm				
W108	Fall on and from stairs and steps - Other specified places				
W109	Fall on and from stairs and steps - Unspecified place				
W11	Fall on and from ladder	W11	Fall on and from ladder	E8810	Accidental fall from ladder
W110	Fall on and from ladder - Home				
W111	Fall on and from ladder - Residential institution				
W112	Fall on and from ladder - School, other institution and public administrative area				
W113	Fall on and from ladder - Sports and athletics area				
W114	Fall on and from ladder - Street and highway				
W115	Fall on and from ladder - Trade and service area				

	Fall on and from ladder - Industrial and construction area				
W116					
	Fall on and from ladder - Farm				
W117					
	Fall on and from ladder - Other specified places				
W118					
	Fall on and from ladder - Unspecified place				
W119					
	Fall on and from scaffolding	W12	Fall on and from scaffolding	E8811	Accidental fall from scaffolding
W12					
	Fall on and from scaffolding - Home				
W120					
	Fall on and from scaffolding - Residential institution				
W121					
	Fall on and from scaffolding - School, other institution and public administrative area				
W122					
	Fall on and from scaffolding - Sports and athletics area				
W123					
	Fall on and from scaffolding - Street and highway				
W124					
	Fall on and from scaffolding - Trade and service area				
W125					
	Fall on and from scaffolding - Industrial and construction area				
W126					
	Fall on and from scaffolding - Farm				
W127					

W128	Fall on and from scaffolding - Other specified places			
W129	Fall on and from scaffolding - Unspecified place			
W13	Fall from, out of or through building or structure	W13	Fall from, out of or through building or structure	E882 Accidental fall from or out of building or other structure
W130	Fall from, out of or through building or structure - Home	W130	Fall from or through balcony or veranda	
W131	Fall from, out of or through building or structure - Residential institution	W131	Fall out of or through window	
W132	Fall from, out of or through building or structure - School, other institution and public administrative area	W132	Fall out of or through glass door	
W133	Fall from, out of or through building or structure - Sports and athletics area	W133	Fall from roof	
W134	Fall from, out of or through building or structure - Street and highway	W134	Fall through roof	
W135	Fall from, out of or through building or structure - Trade and service area	W135	Fall from or through floor	
W136	Fall from, out of or through building or structure - Industrial and construction area	W138	Fall from, out of or through other specified building or structure	
W137	Fall from, out of or through building or structure - Farm	W139	Fall from, out of or through unspecified building or structure	

	Fall from, out of or through building or structure - Other specified places				
	Fall from, out of or through building or structure - Unspecified place				
W138					
W139					
W14	Fall from tree	W14	Fall from tree		
W140	Fall from tree - Home				
W141	Fall from tree - Residential institution				
W142	Fall from tree - School, other institution and public administrative area				
W143	Fall from tree - Sports and athletics area				
W144	Fall from tree - Street and highway				
W145	Fall from tree - Trade and service area				
W146	Fall from tree - Industrial and construction area				
W147	Fall from tree - Farm				
W148	Fall from tree - Other specified places				
W149	Fall from tree - Unspecified place				
W15	Fall from cliff	W15	Fall from cliff	E8841	Accidental fall from cliff
W150	Fall from cliff - Home				
W151	Fall from cliff - Residential institution				
W152	Fall from cliff - School, other institution and public administrative area				
W153	Fall from cliff - Sports and athletics area				



W154	Fall from cliff - Street and highway				
W155	Fall from cliff - Trade and service area				
W156	Fall from cliff - Industrial and construction area				
W157	Fall from cliff - Farm				
W158	Fall from cliff - Other specified places				
W159	Fall from cliff - Unspecified place				
W16	Diving or jumping into water causing injury other than drowning or submersion	W16	Diving or jumping into water causing injury other than drowning or submersion	E8830	Accident from diving or jumping into water [swimming pool]
W160	Diving or jumping into water causing injury other than drowning or submersion - Home	W160	Diving or jumping into water striking or hitting bottom		
W161	Diving or jumping into water causing injury other than drowning or submersion - Residential institution	W161	Diving or jumping into water striking or hitting wall or diving board		
W162	Diving or jumping into water causing injury other than drowning or submersion - School, other institution and public administrative area	W162	Diving or jumping into water striking or hitting water surface Other and unspecified contact when diving or jumping into water causing injury other than drowning or submersion		
W163	Diving or jumping into water causing injury other than drowning or submersion - Sports and athletics area	W169	Diving or jumping into water causing injury other than drowning or submersion	E8842	Accidental fall from chair
W164	Diving or jumping into water causing injury other			E8843	Accidental fall from wheelchair

	than drowning or submersion - Street and highway Diving or jumping into water causing injury other than drowning or submersion				
W165	- Trade and service area			E8844	Accidental fall from bed
	Diving or jumping into water causing injury other than drowning or submersion -				
W166	Industrial and construction area			E8845	Accidental fall from other furniture
	Diving or jumping into water causing injury other than drowning or submersion				
W167	- Farm			E8846	Accidental fall from commode
	Diving or jumping into water causing injury other than drowning or submersion				
W168	- Other specified places				
	Diving or jumping into water causing injury other than drowning or submersion				
W169	- Unspecified place				
	Other fall from one level to another	W17	Other fall from one level to another	E8849	Other accidental fall from one level to another
	Other fall from one level to another - Home	W170	Fall into hole	E8839	Accidental fall into other hole or other opening in surface
	Other fall from one level to another - Residential institution	W171	Fall into quarry	E8831	Accidental fall into well
	Other fall from one level to another - School, other institution and public administrative area	W172	Fall into storm drain	E8832	Accidental fall into storm drain or manhole

W173	Other fall from one level to another - Sports and athletics area	W173	Fall into shaft		
W174	Other fall from one level to another - Street and highway	W174	Fall into empty swimming-pool		
W175	Other fall from one level to another - Trade and service area	W178	Other specified fall from one level to another		
W176	Other fall from one level to another - Industrial and construction area	W179	Unspecified fall from one level to another		
W177	Other fall from one level to another - Farm				
W178	Other fall from one level to another - Other specified places				
W179	Other fall from one level to another - Unspecified place				
W18	Other fall on same level	W18	Other fall on same level	E8801	Accidental fall on or from sidewalk curb
W180	Other fall on same level - Home	W180	Fall from bumping against object		
W181	Other fall on same level - Residential institution	W181	Fall from or off toilet		
W182	Other fall on same level - School, other institution and public administrative area	W182	Fall in or into bath-tub or shower		
W183	Other fall on same level - Sports and athletics area	W188	Other specified fall on same level		
W184	Other fall on same level - Street and highway	W189	Unspecified fall on same level		
W185	Other fall on same level - Trade and service area				

	Other fall on same level - Industrial and construction area				
W186					
	Other fall on same level - Farm				
W187					
	Other fall on same level - Other specified places				
W188					
	Other fall on same level - Unspecified place				
W189					
W19	Unspecified fall	W19	Unspecified fall	E887	Fracture, cause unspecified
W190	Unspecified fall - Home			E888	Fall NOS (End 2001) Fall resulting in striking against sharp object
W191	Unspecified fall - Residential institution			E8880	
W192	Unspecified fall - School, other institution and public administrative area			E8881	Fall resulting in striking against other object
W193	Unspecified fall - Sports and athletics area			E8888	Other fall
W194	Unspecified fall - Street and highway			E8889	Unspecified fall
W195	Unspecified fall - Trade and service area				
W196	Unspecified fall - Industrial and construction area				
W197	Unspecified fall - Farm				
W198	Unspecified fall - Other specified places				
W199	Unspecified fall - Unspecified place				
<b>M80</b>	<b>Osteoporosis with pathological fracture</b>	<b>M80</b>	<b>Osteoporosis with pathological fracture</b>	<b>7331</b>	<b>Pathological fracture (End 1993)</b>

M800	Postmenopausal osteoporosis with pathological fracture			73310	Pathologic fracture, unspecified site
M8000	Postmenopausal osteoporosis with pathological fracture - Multiple sites	M8000	Postmenopausal osteoporosis with pathological fracture, multiple sites	73311	Pathologic fracture of humerus
M8001	Postmenopausal osteoporosis with pathological fracture - Shoulder region	M8001	Postmenopausal osteoporosis with pathological fracture, shoulder region	73312	Pathologic fracture of distal radius and ulna
M8002	Postmenopausal osteoporosis with pathological fracture - Upper arm	M8002	Postmenopausal osteoporosis with pathological fracture, upper arm	73313	Pathologic fracture of vertebrae
M8003	Postmenopausal osteoporosis with pathological fracture - Forearm	M8003	Postmenopausal osteoporosis with pathological fracture, forearm	73314	Pathologic fracture of neck of femur
M8004	Postmenopausal osteoporosis with pathological fracture - Hand	M8004	Postmenopausal osteoporosis with pathological fracture, hand	73315	Pathologic fracture of other specified part of femur
M8005	Postmenopausal osteoporosis with pathological fracture - Pelvic region and thigh	M8005	Postmenopausal osteoporosis with pathological fracture, pelvic region and thigh	73316	Pathologic fracture of tibia or fibula
M8006	Postmenopausal osteoporosis with pathological fracture - Lower leg	M8006	Postmenopausal osteoporosis with pathological fracture, lower leg	73319	Pathologic fracture of other specified site
M8007	Postmenopausal osteoporosis with pathological fracture - Ankle and foot	M8007	Postmenopausal osteoporosis with pathological fracture, ankle and foot		

M8008	Postmenopausal osteoporosis with pathological fracture - Other	M8008	Postmenopausal osteoporosis with pathological fracture, other site
M8009	Postmenopausal osteoporosis with pathological fracture - Site unspecified	M8009	Postmenopausal osteoporosis with pathological fracture, site unspecified
M801	Postoophorectomy osteoporosis with pathological fracture		
M8010	Postoophorectomy osteoporosis with pathological fracture - Multiple sites	M8010	Postoophorectomy osteoporosis with pathological fracture, multiple sites
M8011	Postoophorectomy osteoporosis with pathological fracture - Shoulder region	M8011	Postoophorectomy osteoporosis with pathological fracture, shoulder region
M8012	Postoophorectomy osteoporosis with pathological fracture - Upper arm	M8012	Postoophorectomy osteoporosis with pathological fracture, upper arm
M8013	Postoophorectomy osteoporosis with pathological fracture - Forearm	M8013	Postoophorectomy osteoporosis with pathological fracture, forearm
M8014	Postoophorectomy osteoporosis with pathological fracture - Hand	M8014	Postoophorectomy osteoporosis with pathological fracture, hand
M8015	Postoophorectomy osteoporosis with pathological fracture - Pelvic region and thigh	M8015	Postoophorectomy osteoporosis with pathological fracture, pelvic region and thigh

M8016	Postoophorectomy osteoporosis with pathological fracture - Lower leg	M8016	Postoophorectomy osteoporosis with pathological fracture, lower leg
M8017	Postoophorectomy osteoporosis with pathological fracture - Ankle and foot	M8017	Postoophorectomy osteoporosis with pathological fracture, ankle and foot
M8018	Postoophorectomy osteoporosis with pathological fracture - Other	M8018	Postoophorectomy osteoporosis with pathological fracture, other site
M8019	Postoophorectomy osteoporosis with pathological fracture - Site unspecified	M8019	Postoophorectomy osteoporosis with pathological fracture, site unspecified
M802	Osteoporosis of disuse with pathological fracture		
M8020	Osteoporosis of disuse with pathological fracture - Multiple sites	M8020	Osteoporosis of disuse with pathological fracture, multiple sites
M8021	Osteoporosis of disuse with pathological fracture - Shoulder region	M8021	Osteoporosis of disuse with pathological fracture, shoulder region
M8022	Osteoporosis of disuse with pathological fracture - Upper arm	M8022	Osteoporosis of disuse with pathological fracture, upper arm
M8023	Osteoporosis of disuse with pathological fracture - Forearm	M8023	Osteoporosis of disuse with pathological fracture, forearm
M8024	Osteoporosis of disuse with pathological fracture - Hand	M8024	Osteoporosis of disuse with pathological fracture, hand
M8025	Osteoporosis of disuse with pathological fracture - Pelvic region and thigh	M8025	Osteoporosis of disuse with pathological

			fracture, pelvic region and thigh
M8026	Osteoporosis of disuse with pathological fracture - Lower leg	M8026	Osteoporosis of disuse with pathological fracture, lower leg
M8027	Osteoporosis of disuse with pathological fracture - Ankle and foot	M8027	Osteoporosis of disuse with pathological fracture, ankle and foot
M8028	Osteoporosis of disuse with pathological fracture - Other	M8028	Osteoporosis of disuse with pathological fracture, other site
M8029	Osteoporosis of disuse with pathological fracture - Site unspecified	M8029	Osteoporosis of disuse with pathological fracture, site unspecified
M803	Postsurgical malabsorption osteoporosis with pathological fracture		
M8030	Postsurgical malabsorption osteoporosis with pathological fracture - Multiple sites	M8030	Postsurgical malabsorption osteoporosis with pathological fracture, multiple sites
M8031	Postsurgical malabsorption osteoporosis with pathological fracture - Shoulder region	M8031	Postsurgical malabsorption osteoporosis with pathological fracture, shoulder region
M8032	Postsurgical malabsorption osteoporosis with pathological fracture - Upper arm	M8032	Postsurgical malabsorption osteoporosis with pathological fracture, upper arm
M8033	Postsurgical malabsorption osteoporosis with pathological fracture - Forearm	M8033	Postsurgical malabsorption osteoporosis with



			pathological fracture, forearm
M8034	Postsurgical malabsorption osteoporosis with pathological fracture - Hand	M8034	Postsurgical malabsorption osteoporosis with pathological fracture, hand
M8035	Postsurgical malabsorption osteoporosis with pathological fracture - Pelvic region and thigh	M8035	Postsurgical malabsorption osteoporosis with pathological fracture, pelvic region and thigh
M8036	Postsurgical malabsorption osteoporosis with pathological fracture - Lower leg	M8036	Postsurgical malabsorption osteoporosis with pathological fracture, lower leg
M8037	Postsurgical malabsorption osteoporosis with pathological fracture - Ankle and foot	M8037	Postsurgical malabsorption osteoporosis with pathological fracture, ankle and foot
M8038	Postsurgical malabsorption osteoporosis with pathological fracture - Other	M8038	Postsurgical malabsorption osteoporosis with pathological fracture, other site
M8039	Postsurgical malabsorption osteoporosis with pathological fracture - Site unspecified	M8039	Postsurgical malabsorption osteoporosis with pathological fracture, site unspecified
M804	Drug-induced osteoporosis with pathological fracture		
M8040	Drug-induced osteoporosis with	M8040	Drug-induced osteoporosis with

	pathological fracture - Multiple sites Drug-induced osteoporosis with pathological fracture -		pathological fracture, multiple sites Drug-induced osteoporosis with pathological fracture,
M8041	Shoulder region Drug-induced osteoporosis with pathological fracture - Upper arm	M8041	shoulder region Drug-induced osteoporosis with pathological fracture, upper arm
M8042	Forearm Drug-induced osteoporosis with pathological fracture -	M8042	forearm Drug-induced osteoporosis with pathological fracture,
M8043	Hand Drug-induced osteoporosis with pathological fracture -	M8043	hand Drug-induced osteoporosis with pathological fracture,
M8044	Pelvic region and thigh Drug-induced osteoporosis with pathological fracture -	M8044	pelvic region and thigh Drug-induced osteoporosis with pathological fracture,
M8045	Lower leg Drug-induced osteoporosis with pathological fracture -	M8045	lower leg Drug-induced osteoporosis with pathological fracture,
M8046	Ankle and foot Drug-induced osteoporosis with pathological fracture -	M8046	ankle and foot Drug-induced osteoporosis with pathological fracture,
M8047	Other site Drug-induced osteoporosis with pathological fracture -	M8047	other site Drug-induced osteoporosis with pathological fracture,
M8048	Other site Drug-induced osteoporosis with pathological fracture -	M8048	other site Drug-induced osteoporosis with pathological fracture,
M8049	Other site Drug-induced osteoporosis with pathological fracture -	M8049	other site Drug-induced osteoporosis with pathological fracture,

	pathological fracture - Site unspecified		pathological fracture, site unspecified
M805	Idiopathic osteoporosis with pathological fracture		Idiopathic osteoporosis with pathological fracture, multiple sites
M8050	Idiopathic osteoporosis with pathological fracture - Multiple sites	M8050	Idiopathic osteoporosis with pathological fracture, shoulder region
M8051	Idiopathic osteoporosis with pathological fracture - Shoulder region	M8051	Idiopathic osteoporosis with pathological fracture, upper arm
M8052	Idiopathic osteoporosis with pathological fracture - Upper arm	M8052	Idiopathic osteoporosis with pathological fracture, forearm
M8053	Idiopathic osteoporosis with pathological fracture - Forearm	M8053	Idiopathic osteoporosis with pathological fracture, hand
M8054	Idiopathic osteoporosis with pathological fracture - Hand	M8054	Idiopathic osteoporosis with pathological fracture, pelvic region and thigh
M8055	Idiopathic osteoporosis with pathological fracture - Pelvic region and thigh	M8055	Idiopathic osteoporosis with pathological fracture, lower leg
M8056	Idiopathic osteoporosis with pathological fracture - Lower leg	M8056	Idiopathic osteoporosis with pathological fracture, ankle and foot
M8057	Idiopathic osteoporosis with pathological fracture - Ankle and foot	M8057	Idiopathic osteoporosis with pathological fracture, other site
M8058	Idiopathic osteoporosis with pathological fracture - Other	M8058	Idiopathic osteoporosis with pathological fracture, site unspecified
M8059	Idiopathic osteoporosis with pathological fracture - Site unspecified	M8059	

M808	Other osteoporosis with pathological fracture		
M8080	Other osteoporosis with pathological fracture - Multiple sites	M8080	Other osteoporosis with pathological fracture, multiple sites
M8081	Other osteoporosis with pathological fracture - Shoulder region	M8081	Other osteoporosis with pathological fracture, shoulder region
M8082	Other osteoporosis with pathological fracture - Upper arm	M8082	Other osteoporosis with pathological fracture, upper arm
M8083	Other osteoporosis with pathological fracture - Forearm	M8083	Other osteoporosis with pathological fracture, forearm
M8084	Other osteoporosis with pathological fracture - Hand	M8084	Other osteoporosis with pathological fracture, hand
M8085	Other osteoporosis with pathological fracture - Pelvic region and thigh	M8085	Other osteoporosis with pathological fracture, pelvic region and thigh
M8086	Other osteoporosis with pathological fracture - Lower leg	M8086	Other osteoporosis with pathological fracture, lower leg
M8087	Other osteoporosis with pathological fracture - Ankle and foot	M8087	Other osteoporosis with pathological fracture, ankle and foot
M8088	Other osteoporosis with pathological fracture - Other	M8088	Other osteoporosis with pathological fracture, other site
M8089	Other osteoporosis with pathological fracture - Site unspecified	M8089	Other osteoporosis with pathological fracture, site unspecified
M809	Unspecified osteoporosis with pathological fracture		

M8090	Unspecified osteoporosis with pathological fracture - Multiple sites	M8090	Unspecified osteoporosis with pathological fracture, multiple sites
M8091	Unspecified osteoporosis with pathological fracture - Shoulder region	M8091	Unspecified osteoporosis with pathological fracture, shoulder region
M8092	Unspecified osteoporosis with pathological fracture - Upper arm	M8092	Unspecified osteoporosis with pathological fracture, upper arm
M8093	Unspecified osteoporosis with pathological fracture - Forearm	M8093	Unspecified osteoporosis with pathological fracture, forearm
M8094	Unspecified osteoporosis with pathological fracture - Hand	M8094	Unspecified osteoporosis with pathological fracture, hand
M8095	Unspecified osteoporosis with pathological fracture - Pelvic region and thigh	M8095	Unspecified osteoporosis with pathological fracture, pelvic region and thigh
M8096	Unspecified osteoporosis with pathological fracture - Lower leg	M8096	Unspecified osteoporosis with pathological fracture, lower leg
M8097	Unspecified osteoporosis with pathological fracture - Ankle and foot	M8097	Unspecified osteoporosis with pathological fracture, ankle and foot
M8098	Unspecified osteoporosis with pathological fracture - Other	M8098	Unspecified osteoporosis with pathological fracture, other site

	Unspecified osteoporosis with pathological fracture - Site unspecified		Unspecified osteoporosis with pathological fracture, site unspecified		
M8099		M8099			
<b>M81</b>	<b>Osteoporosis without pathological fracture</b>	<b>M81</b>	<b>Osteoporosis without pathological fracture</b>	<b>7330</b>	<b>Osteoporosis</b>
M810	Postmenopausal osteoporosis			73300	Osteoporosis, unspecified
M8100	Postmenopausal osteoporosis - Multiple sites	M8100	Postmenopausal osteoporosis, multiple sites	73301	Senile osteoporosis
M8101	Postmenopausal osteoporosis - Shoulder region	M8101	Postmenopausal osteoporosis, shoulder region	73302	Idiopathic osteoporosis
M8102	Postmenopausal osteoporosis - Upper arm	M8102	Postmenopausal osteoporosis, upper arm	73303	Disuse osteoporosis
M8103	Postmenopausal osteoporosis - Forearm	M8103	Postmenopausal osteoporosis, forearm	73309	Other osteoporosis
M8104	Postmenopausal osteoporosis - Hand	M8104	Postmenopausal osteoporosis, hand		
M8105	Postmenopausal osteoporosis - Pelvic region and thigh	M8105	Postmenopausal osteoporosis, pelvic region and thigh		
M8106	Postmenopausal osteoporosis - Lower leg	M8106	Postmenopausal osteoporosis, lower leg		
M8107	Postmenopausal osteoporosis - Ankle and foot	M8107	Postmenopausal osteoporosis, ankle and foot		
M8108	Postmenopausal osteoporosis - Other	M8108	Postmenopausal osteoporosis, other site		
M8109	Postmenopausal osteoporosis - Site unspecified	M8109	Postmenopausal osteoporosis, site unspecified		
M811	Postophorectomy osteoporosis				

M8110	Postoophorectomy osteoporosis - Multiple sites	M8110	Postoophorectomy osteoporosis, multiple sites
M8111	Postoophorectomy osteoporosis - Shoulder region	M8111	Postoophorectomy osteoporosis, shoulder region
M8112	Postoophorectomy osteoporosis - Upper arm	M8112	Postoophorectomy osteoporosis, upper arm
M8113	Postoophorectomy osteoporosis - Forearm	M8113	Postoophorectomy osteoporosis, forearm
M8114	Postoophorectomy osteoporosis - Hand	M8114	Postoophorectomy osteoporosis, hand
M8115	Postoophorectomy osteoporosis - Pelvic region and thigh	M8115	Postoophorectomy osteoporosis, pelvic region and thigh
M8116	Postoophorectomy osteoporosis - Lower leg	M8116	Postoophorectomy osteoporosis, lower leg
M8117	Postoophorectomy osteoporosis - Ankle and foot	M8117	Postoophorectomy osteoporosis, ankle and foot
M8118	Postoophorectomy osteoporosis - Other	M8118	Postoophorectomy osteoporosis, other site
M8119	Postoophorectomy osteoporosis - Site unspecified	M8119	Postoophorectomy osteoporosis, site unspecified
M812	Osteoporosis of disuse		
M8120	Osteoporosis of disuse - Multiple sites	M8120	Osteoporosis of disuse, multiple sites
M8121	Osteoporosis of disuse - Shoulder region	M8121	Osteoporosis of disuse, shoulder region
M8122	Osteoporosis of disuse - Upper arm	M8122	Osteoporosis of disuse, upper arm
M8123	Osteoporosis of disuse - Forearm	M8123	Osteoporosis of disuse, forearm
M8124	Osteoporosis of disuse - Hand	M8124	Osteoporosis of disuse, hand

M8125	Osteoporosis of disuse - Pelvic region and thigh	M8125	Osteoporosis of disuse, pelvic region and thigh
M8126	Osteoporosis of disuse - Lower leg	M8126	Osteoporosis of disuse, lower leg
M8127	Osteoporosis of disuse - Ankle and foot	M8127	Osteoporosis of disuse, ankle and foot
M8128	Osteoporosis of disuse - Other	M8128	Osteoporosis of disuse, other site
M8129	Osteoporosis of disuse - Site unspecified	M8129	Osteoporosis of disuse, site unspecified
M813	Postsurgical malabsorption osteoporosis		
M8130	Postsurgical malabsorption osteoporosis - Multiple sites	M8130	Postsurgical malabsorption osteoporosis, multiple sites
M8131	Postsurgical malabsorption osteoporosis - Shoulder region	M8131	Postsurgical malabsorption osteoporosis, shoulder region
M8132	Postsurgical malabsorption osteoporosis - Upper arm	M8132	Postsurgical malabsorption osteoporosis, upper arm
M8133	Postsurgical malabsorption osteoporosis - Forearm	M8133	Postsurgical malabsorption osteoporosis, forearm
M8134	Postsurgical malabsorption osteoporosis - Hand	M8134	Postsurgical malabsorption osteoporosis, hand
M8135	Postsurgical malabsorption osteoporosis - Pelvic region and thigh	M8135	Postsurgical malabsorption osteoporosis, pelvic region and thigh
M8136	Postsurgical malabsorption osteoporosis - Lower leg	M8136	Postsurgical malabsorption osteoporosis, lower leg



M8137	Postsurgical malabsorption osteoporosis - Ankle and foot	M8137	Postsurgical malabsorption osteoporosis, ankle and foot
M8138	Postsurgical malabsorption osteoporosis - Other	M8138	Postsurgical malabsorption osteoporosis, other site
M8139	Postsurgical malabsorption osteoporosis - Site unspecified	M8139	Postsurgical malabsorption osteoporosis, site unspecified
M814	Drug-induced osteoporosis		
M8140	Drug-induced osteoporosis - Multiple sites	M8140	Drug-induced osteoporosis, multiple sites
M8141	Drug-induced osteoporosis - Shoulder region	M8141	Drug-induced osteoporosis, shoulder region
M8142	Drug-induced osteoporosis - Upper arm	M8142	Drug-induced osteoporosis, upper arm
M8143	Drug-induced osteoporosis - Forearm	M8143	Drug-induced osteoporosis, forearm
M8144	Drug-induced osteoporosis - Hand	M8144	Drug-induced osteoporosis, hand
M8145	Drug-induced osteoporosis - Pelvic region and thigh	M8145	Drug-induced osteoporosis, pelvic region and thigh
M8146	Drug-induced osteoporosis - Lower leg	M8146	Drug-induced osteoporosis, lower leg
M8147	Drug-induced osteoporosis - Ankle and foot	M8147	Drug-induced osteoporosis, ankle and foot
M8148	Drug-induced osteoporosis - Other	M8148	Drug-induced osteoporosis, other site

M8149	Drug-induced osteoporosis - Site unspecified	M8149	Drug-induced osteoporosis, site unspecified
M815	Idiopathic osteoporosis		
M8150	Idiopathic osteoporosis - Multiple sites	M8150	Idiopathic osteoporosis, multiple sites
M8151	Idiopathic osteoporosis - Shoulder region	M8151	Idiopathic osteoporosis, shoulder region
M8152	Idiopathic osteoporosis - Upper arm	M8152	Idiopathic osteoporosis, upper arm
M8153	Idiopathic osteoporosis - Forearm	M8153	Idiopathic osteoporosis, forearm
M8154	Idiopathic osteoporosis - Hand	M8154	Idiopathic osteoporosis, hand
M8155	Idiopathic osteoporosis - Pelvic region and thigh	M8155	Idiopathic osteoporosis, pelvic region and thigh
M8156	Idiopathic osteoporosis - Lower leg	M8156	Idiopathic osteoporosis, lower leg
M8157	Idiopathic osteoporosis - Ankle and foot	M8157	Idiopathic osteoporosis, ankle and foot
M8158	Idiopathic osteoporosis - Other	M8158	Idiopathic osteoporosis, other site
M8159	Idiopathic osteoporosis - Site unspecified	M8159	Idiopathic osteoporosis, site unspecified
M816	Localized osteoporosis [Lequesne]		
M8160	Localized osteoporosis [Lequesne] - Multiple sites	M8160	Localised osteoporosis [Lequesne], multiple sites
M8161	Localized osteoporosis [Lequesne] - Shoulder region	M8161	Localised osteoporosis [Lequesne], shoulder region

M8162	Localized osteoporosis [Lequesne] - Upper arm	M8162	Localised osteoporosis [Lequesne], upper arm
M8163	Localized osteoporosis [Lequesne] - Forearm	M8163	Localised osteoporosis [Lequesne], forearm
M8164	Localized osteoporosis [Lequesne] - Hand	M8164	Localised osteoporosis [Lequesne], hand
M8165	Localized osteoporosis [Lequesne] - Pelvic region and thigh	M8165	Localised osteoporosis [Lequesne], pelvic region and thigh
M8166	Localized osteoporosis [Lequesne] - Lower leg	M8166	Localised osteoporosis [Lequesne], lower leg
M8167	Localized osteoporosis [Lequesne] - Ankle and foot	M8167	Localised osteoporosis [Lequesne], ankle and foot
M8168	Localized osteoporosis [Lequesne] - Other	M8168	Localised osteoporosis [Lequesne], other site
M8169	Localized osteoporosis [Lequesne] - Site unspecified	M8169	Localised osteoporosis [Lequesne], site unspecified
M818	Other osteoporosis		
M8180	Other osteoporosis - Multiple sites	M8180	Other osteoporosis, multiple sites
M8181	Other osteoporosis - Shoulder region	M8181	Other osteoporosis, shoulder region
M8182	Other osteoporosis - Upper arm	M8182	Other osteoporosis, upper arm
M8183	Other osteoporosis - Forearm	M8183	Other osteoporosis, forearm
M8184	Other osteoporosis - Hand	M8184	Other osteoporosis, hand
M8185	Other osteoporosis - Pelvic region and thigh	M8185	Other osteoporosis, pelvic region and thigh
M8186	Other osteoporosis - Lower leg	M8186	Other osteoporosis, lower leg
M8187	Other osteoporosis - Ankle and foot	M8187	Other osteoporosis, ankle and foot

	M8188	Other osteoporosis - Other	M8188	Other osteoporosis, other site		
	M8189	Other osteoporosis - Site unspecified	M8189	Other osteoporosis, site unspecified		
	M819	Osteoporosis, unspecified				
	M8190	Osteoporosis, unspecified - Multiple sites	M8190	Unspecified osteoporosis, multiple sites		
	M8191	Osteoporosis, unspecified - Shoulder region	M8191	Unspecified osteoporosis, shoulder region		
	M8192	Osteoporosis, unspecified - Upper arm	M8192	Unspecified osteoporosis, upper arm		
	M8193	Osteoporosis, unspecified - Forearm	M8193	Unspecified osteoporosis, forearm		
	M8194	Osteoporosis, unspecified - Hand	M8194	Unspecified osteoporosis, hand		
	M8195	Osteoporosis, unspecified - Pelvic region and thigh	M8195	Unspecified osteoporosis, pelvic region and thigh		
	M8196	Osteoporosis, unspecified - Lower leg	M8196	Unspecified osteoporosis, lower leg		
	M8197	Osteoporosis, unspecified - Ankle and foot	M8197	Unspecified osteoporosis, ankle and foot		
	M8198	Osteoporosis, unspecified - Other	M8198	Unspecified osteoporosis, other site		
	M8199	Osteoporosis, unspecified - Site unspecified	M8199	Unspecified osteoporosis, site unspecified		
	<b>R296</b>	<b>Tendency to fall, not elsewhere classified</b>	<b>R296</b>	<b>Tendency to fall, NEC</b>	<b>V1588</b>	<b>History of fall</b>
	<b>R55</b>	<b>Syncope and collapse</b>	<b>R55</b>	<b>Syncope and collapse</b>	<b>7802</b>	<b>Syncope and collapse</b>
<b>5 Pressure ulcers</b>	<b>L89</b>	<b>Decubitus ulcer and pressure area</b>	<b>L89</b>	<b>Decubitus ulcer</b>	<b>7072</b>	

					70720	Pressure ulcer, unspecified stage
L890		Stage I decubitus ulcer and pressure area	L890	Stage I decubitus ulcer and pressure area	70721	Pressure ulcer, stage I
L891		Stage II decubitus ulcer	L891	Stage II decubitus ulcer and pressure area	70722	Pressure ulcer, stage II
L892		Stage III decubitus ulcer	L892	Stage III decubitus ulcer and pressure area	70723	Pressure ulcer, stage III
L893		Stage IV decubitus ulcer	L893	Stage IV decubitus ulcer and pressure area	70724	Pressure ulcer, stage IV
L899		Decubitus ulcer and pressure area, unspecified	L899	Decubitus ulcer and pressure area, unspecified	70725	Pressure ulcer, unstageable
					<b>7070</b>	<b>Decubitus ulcer</b>
					70700	Pressure ulcer, unspecified site
					70701	Pressure ulcer, elbow
					70702	Pressure ulcer, upper back
					70703	Pressure ulcer, lower back
					70704	Pressure ulcer, hip
					70705	Pressure ulcer, buttock
					70706	Pressure ulcer, ankle
					70707	Pressure ulcer, heel
					70709	Pressure ulcer, other site
<b>6</b>						
<b>Incontinence</b>	<b>R32</b>	<b>Unspecified urinary incontinence</b>	<b>R32</b>	<b>Unspecified urinary incontinence</b>	<b>7883</b>	<b>Incontinence of urine</b>
						Urinary incontinence, unspecified
					78830	
					78831	Urge incontinence

					78832	Stress incontinence, male
					78833	Mixed incontinence (male) (female)
					78834	Incontinence without sensory awareness
					78835	Post-void dribbling
					78836	Nocturnal enuresis
					78837	Continuous leakage
					78838	Overflow incontinence
					78839	Other urinary incontinence
	<b>R15</b>	<b>Faecal incontinence</b>	<b>R15</b>	<b>Faecal incontinence</b>	<b>7876</b>	<b>Incontinence of feces</b>
					78760	Full incontinence of feces
					78761	Incomplete defecation
					78762	Fecal smearing
					78763	Fecal urgency
<b>7 Weight Loss</b>	<b>R634</b>	<b>Abnormal weight loss</b>	<b>R634</b>	<b>Abnormal weight loss</b>	<b>7832</b>	<b>Abnormal Loss of Weight</b>
					78321	Loss of weight
					78322	Underweight
	<b>R636</b>	<b>Insufficient intake of food and water due to self neglect</b>	<b>R636</b>	<b>Insufficient intake of food and water due to self neglect</b>		
	<b>Z724</b>	<b>Inappropriate diet and eating habits</b>	<b>Z724</b>	<b>Inappropriate diet and eating habits</b>	<b>V691</b>	<b>Inappropriate diet and eating habits</b>
<b>8 Dependence and Care</b>	<b>Z74</b>	<b>Problems related to care-provider dependency</b>	<b>Z74</b>	<b>Problems related to care-provider dependency</b>		

Z740	Need for assistance due to reduced mobility	Z740	Need for assistance due to reduced mobility		
Z741	Need for assistance with personal care	Z741	Need for assistance with personal care		
Z742	Need for assistance at home and no other household member able to render care	Z742	Need for assistance at home and no other household member able to render care	<b>V604</b>	<b>No other household member able to render care</b>
Z743	Need for continuous supervision	Z743	Need for continuous supervision		
Z748	Other problems related to care-provider dependency	Z748	Other problems related to care-provider dependency		
Z749	Problem related to care-provider dependency, unspecified	Z749	Problem related to care-provider dependency, unspecified		
<b>Z75</b>	<b>Problems related to medical facilities and other health care</b>	<b>Z75</b>	<b>Problems related to medical facilities and other health care</b>	<b>V63</b>	<b>Unavailability of other medical facilities for care</b>
Z750	Medical services not available in home	Z750	Medical services not available in home	V631	Medical services in home not available
Z751	Person awaiting admission to adequate facility elsewhere	Z751	Person awaiting admission to adequate facility elsewhere	V632	Person awaiting admission to adequate facility elsewhere
Z752	Other waiting period for investigation and treatment	Z752	Other waiting period for investigation and treatment		
Z753	Unavailability and inaccessibility of health-care facilities	Z753	Unavailability and inaccessibility of health-care facilities	<b>V630</b>	<b>Residence remote from hospital or other health care facility</b>
Z754	Unavailability and inaccessibility of other helping agencies	Z754	Unavailability and inaccessibility of other helping agencies	<b>V638</b>	<b>Other specified reasons for unavailability of medical facilities</b>
Z755	Holiday relief care	Z755	Holiday relief care		

	Z758	Other problems related to medical facilities and other health care	Z758	Other problems related to medical facilities and other health care	V639	Unspecified reason for unavailability of medical facilities
	Z759	Unspecified problem related to medical facilities and other health care	Z759	Unspecified problem related to medical facilities and other health care		
<b>9 Anxiety and Depression</b>	<b>F38</b>	<b>Other mood [affective] disorders</b>	<b>F38</b>	<b>Other mood [affective] disorders</b>	<b>2969</b>	<b>Other &amp; unspecified affective psychoses</b>
	F380	Other single mood [affective] disorders	F380	Other single mood [affective] disorders	29690	Unspecified episodic mood disorder
	F381	Other recurrent mood [affective] disorders	F381	Other recurrent mood [affective] disorders		
	F382	Other specified mood [affective] disorders	F382	Other specified mood [affective] disorders	29699	Other specified episodic mood disorder
	<b>F41</b>	<b>Other anxiety disorders</b>	<b>F41</b>	<b>Other anxiety disorders</b>	<b>3000</b>	<b>Anxiety states</b>
	F410	Panic disorder [episodic paroxysmal anxiety]	F410	Panic disorder [episodic paroxysmal anxiety]	30001	Panic disorder without agoraphobia
	F411	Generalized anxiety disorder	F411	Generalized anxiety disorder	30002	Generalized anxiety disorder
	F412	Mixed anxiety and depressive disorder	F412	Mixed anxiety and depressive disorder		
	F413	Other mixed anxiety disorders	F413	Other mixed anxiety disorders	30009	Other anxiety states
	F418	Other specified anxiety disorders	F418	Other specified anxiety disorders		
	F419	Anxiety disorder, unspecified	F419	Anxiety disorder, unspecified	30000	Anxiety state, unspecified
	<b>F43</b>	<b>Reaction to severe stress, and adjustment disorders</b>	<b>F43</b>	<b>Reaction to severe stress, and adjustment disorders</b>	<b>308</b> <b>309</b>	<b>Acute reaction to stress</b> <b>Adjustment reaction</b>



F430	Acute stress reaction	F430	Acute stress reaction	3084	Mixed disorders as reaction to stress
F431	Post-traumatic stress disorder	F431	Post-traumatic stress disorder		
F432	Adjustment disorders	F432	Adjustment disorders	3090	Adjustment disorder with depressed mood
				3092	Adjustment reaction with predominant disturbance of other emotions
				30924	Adjustment disorder with anxiety
				30928	Adjustment disorder with mixed anxiety and depressed mood
				30929	Other adjustment reactions with predominant disturbance of other emotions
F438	Other reactions to severe stress	F438	Other reactions to severe stress	3083	Other acute reactions to stress
F439	Reaction to severe stress, unspecified	F439	Reaction to severe stress, unspecified	3089	Unspecified acute reaction to stress
				3080	Predominant disturbance of emotions
				3081	Predominant disturbance of consciousness
				3082	Predominant psychomotor disturbance

				3093	Adjustment disorder with disturbance of conduct
				3094	Adjustment disorder with mixed disturbance of emotions and conduct
				3098	Other specified adjustment reactions
				30982	Adjustment reaction with physical symptoms
				30983	Adjustment reaction with withdrawal
				30989	Other specified adjustment reactions
				3099	Unspecified adjustment reaction
<b>F44</b>	<b>Dissociative [conversion] disorders</b>	<b>F44</b>	<b>Dissociative [conversion] disorders</b>	<b>3001</b>	<b>Hysteria</b>
F440	Dissociative amnesia	F440	Dissociative amnesia	30012	Dissociative amnesia
F441	Dissociative fugue	F441	Dissociative fugue	30013	Dissociative fugue
F442	Dissociative stupor	F442	Dissociative stupor		
F443	Trance and possession disorders	F443	Trance and possession disorders		
F444	Dissociative motor disorders	F444	Dissociative motor disorders		
F445	Dissociative convulsions	F445	Dissociative convulsions		
F446	Dissociative anaesthesia and sensory loss	F446	Dissociative anaesthesia and sensory loss		
F447	Mixed dissociative [conversion] disorders	F447	Mixed dissociative [conversion] disorders		

F448	Other dissociative [conversion] disorders	F448	Other dissociative [conversion] disorders		
F449	Dissociative [conversion] disorder, unspecified	F449	Dissociative [conversion] disorder, unspecified	30019	Other and unspecified factitious illness
				30010	Hysteria, unspecified
				30011	Conversion disorder
				30014	Dissociative identity disorder
				30015	Dissociative disorder or reaction, unspecified
				30016	Factitious disorder with predominantly psychological signs and symptoms
<b>F064</b>	<b>Organic anxiety disorder</b>	<b>F064</b>	<b>Organic anxiety disorder</b>		
<b>F32</b>	<b>Depressive episode</b>	<b>F32</b>	<b>Depressive episode</b>	<b>2962</b>	<b>Major depressive disorder, single episode</b>
F320	Mild depressive episode			29621	Major depressive affective disorder, single episode, mild
		F3200	Mild depressive episode, not specified as arising in the postnatal period		
		F3201	Mild depressive episode, arising in the postnatal period		
F321	Moderate depressive episode			29622	Major depressive affective disorder, single episode, moderate
		F3210	Moderate depressive episode, not specified as		

			arising in the postnatal period		
		F3211	Moderate depressive episode, arising in the postnatal period		
F322	Severe depressive episode without psychotic symptoms			29623	Major depressive affective disorder, single episode, severe, without mention of psychotic behavior
		F3220	Severe depressive episode without psychotic symptoms, not specified as arising in the postnatal period		
		F3221	Severe depressive episode without psychotic symptoms, arising in the postnatal period		
F323	Severe depressive episode with psychotic symptoms			29624	Major depressive affective disorder, single episode, severe, specified as with psychotic behavior
		F3230	Severe depressive episode with psychotic symptoms, not specified as arising in the postnatal period		
		F3231	Severe depressive episode with psychotic symptoms, arising in the postnatal period		
F328	Other depressive episodes				

			Other depressive episodes, not specified as arising in the postnatal period		
		F3280	Other depressive episodes, arising in the postnatal period		
		F3281			Major depressive affective disorder, single episode, unspecified
F329	Depressive episode, unspecified			29620	
			Depressive episode, unspecified, not specified as arising in the postnatal period		
		F3290	Depressive episode, unspecified, arising in the postnatal period		
		F3291			Major depressive affective disorder, single episode, in partial or unspecified remission
				29625	Major depressive affective disorder, single episode, in full remission
				29626	
<b>F33</b>	<b>Recurrent depressive disorder</b>	<b>F33</b>	<b>Recurrent depressive disorder</b>	<b>2963</b>	<b>Major depressive disorder, recurrent episode</b>
	Recurrent depressive disorder, current episode mild		Recurrent depressive disorder, current episode mild		Major depressive affective disorder, recurrent episode, mild
F330		F330		29631	
	Recurrent depressive disorder, current episode moderate		Recurrent depressive disorder, current episode moderate		Major depressive affective disorder,
F331		F331		29632	

					recurrent episode, moderate
F332	Recurrent depressive disorder, current episode severe without psychotic symptoms	F332	Recurrent depressive disorder, current episode severe without psychotic symptoms	29633	Major depressive affective disorder, recurrent episode, severe, without mention of psychotic behavior
F333	Recurrent depressive disorder, current episode severe with psychotic symptoms	F333	Recurrent depressive disorder, current episode severe with psychotic symptoms	29634	Major depressive affective disorder, recurrent episode, severe, specified as with psychotic behavior
F334	Recurrent depressive disorder, currently in remission	F334	Recurrent depressive disorder, currently in remission	29636	Major depressive affective disorder, recurrent episode, in full remission
F338	Other recurrent depressive disorders	F338	Other recurrent depressive disorders	29635	Major depressive affective disorder, recurrent episode, in partial or unspecified remission
F339	Recurrent depressive disorder, unspecified	F339	Recurrent depressive disorder, unspecified	29630	Major depressive affective disorder, recurrent episode, unspecified
<b>F204</b>	<b>Post-schizophrenic depression</b>	<b>F204</b>	<b>Post-schizophrenic depression</b>		
<b>F251</b>	<b>Schizoaffective disorder, depressive type</b>	<b>F251</b>	<b>Schizoaffective disorder, depressive type</b>		
<b>F31</b>	<b>Bipolar affective disorder</b>	<b>F31</b>	<b>Bipolar affective disorder</b>	<b>2965</b>	<b>Bipolar affective disorder, depressed</b>

F313	Bipolar affective disorder, current episode mild or moderate depression	F313	Bipolar affective disorder, current episode mild or moderate depression	29651	Bipolar I disorder, most recent episode (or current) depressed, mild
				29652	Bipolar I disorder, most recent episode (or current) depressed, moderate
F314	Bipolar affective disorder, current episode severe depression without psychotic symptoms	F314	Bipolar affective disorder, current episode severe depression without psychotic symptoms	29653	Bipolar I disorder, most recent episode (or current) depressed, severe, without mention of psychotic behavior
F315	Bipolar affective disorder, current episode severe depression with psychotic symptoms	F315	Bipolar affective disorder, current episode severe depression with psychotic symptoms	29654	Bipolar I disorder, most recent episode (or current) depressed, severe, specified as with psychotic behavior
				29650	Bipolar I disorder, most recent episode (or current) depressed, unspecified
				29655	Bipolar I disorder, most recent episode (or current) depressed, in partial or unspecified remission
				29656	Bipolar I disorder, most recent episode (or current) depressed, in full remission
<b>F341</b>	<b>Dysthymia</b>	<b>F341</b>	<b>Dysthymia</b>	<b>3004</b>	<b>Dysthymic disorder</b>
<b>F412</b>	<b>Mixed anxiety and depressive disorder</b>	<b>F412</b>	<b>Mixed anxiety and depressive disorder</b>		

<b>F432</b>	<b>Adjustment disorders</b>	<b>F432</b>	<b>Adjustment disorders</b>	<b>3090</b>	<b>Adjustment disorder with depressed mood</b>
					<b>Adjustment reaction with predominant disturbance of other emotions</b>
				<b>3092</b>	Adjustment disorder
				30924	with anxiety
					Adjustment disorder
				30928	with mixed anxiety and depressed mood
					Other adjustment reactions with predominant disturbance of other emotions
				30929	emotions
				<b>3091</b>	<b>Prolonged depressive reaction</b>
					<b>Manic-depressive psychosis, other &amp; unspecified</b>
				<b>2968</b>	Bipolar disorder, unspecified
				29680	Atypical manic disorder
				29681	Atypical depressive disorder
				29682	Other bipolar disorders
				29689	Disorders
				<b>2980</b>	<b>Depressive type psychosis</b>
				<b>3011</b>	<b>Affective personality disorder</b>
					Chronic depressive personality disorder
				30112	

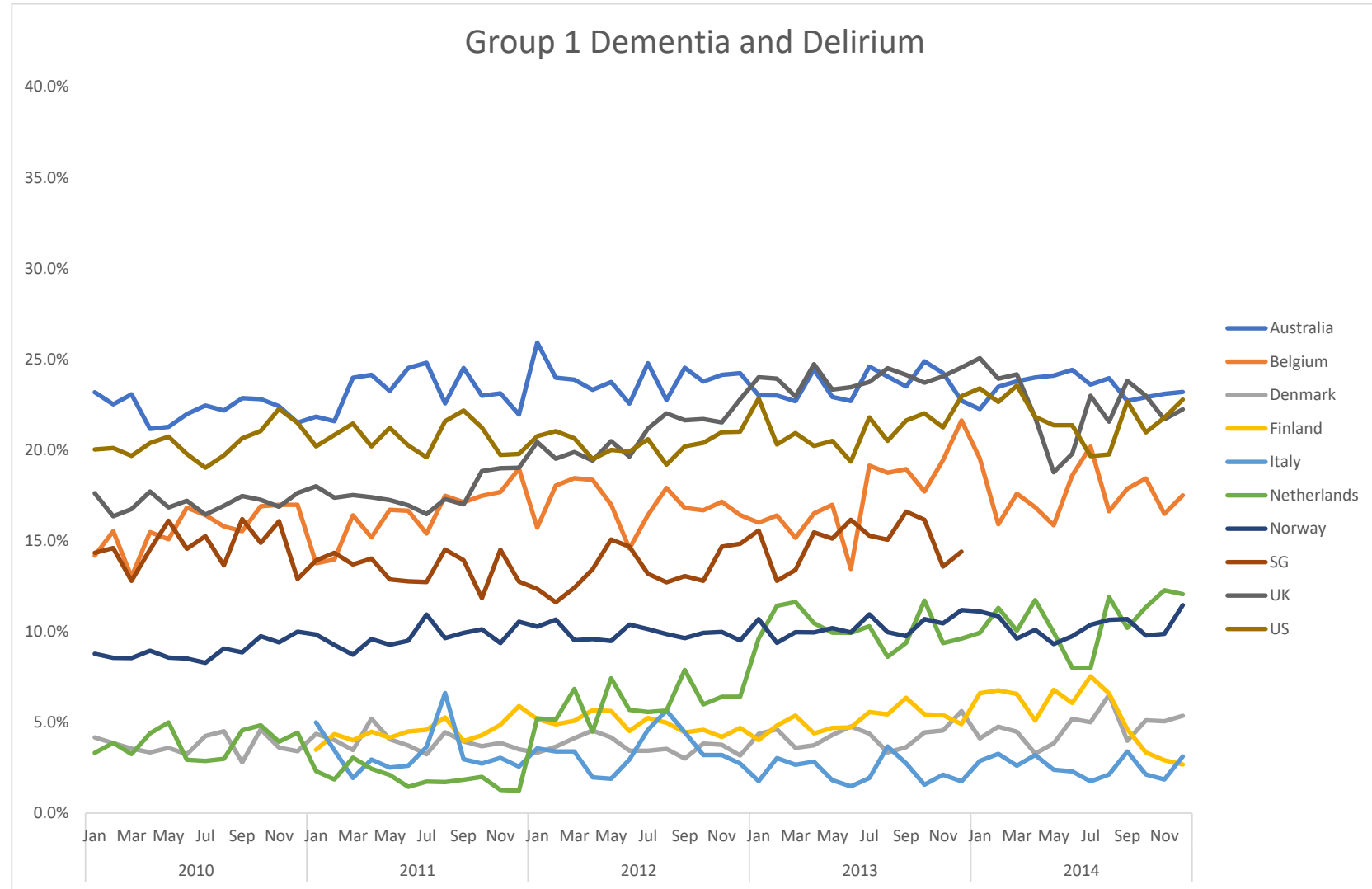


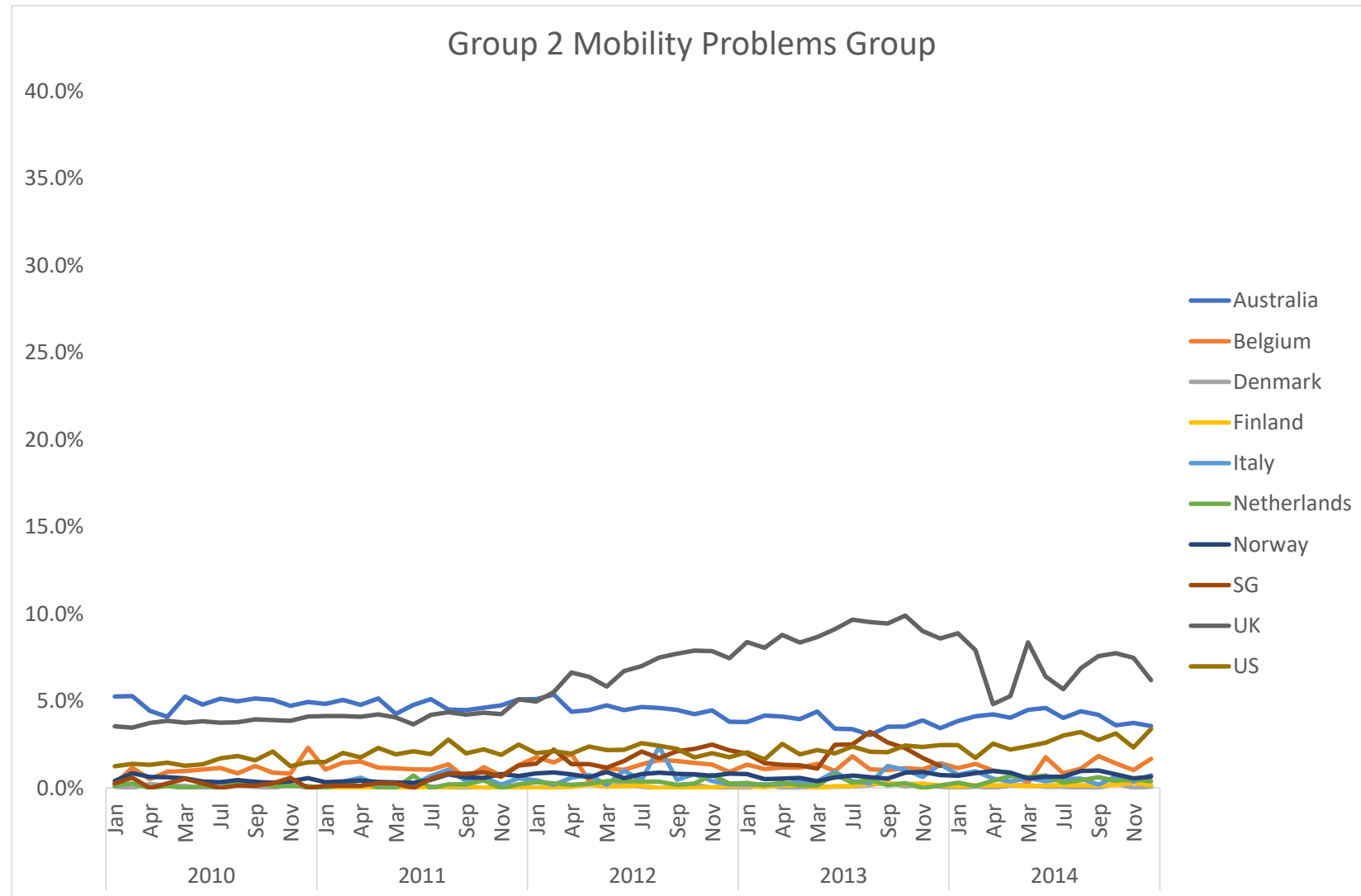
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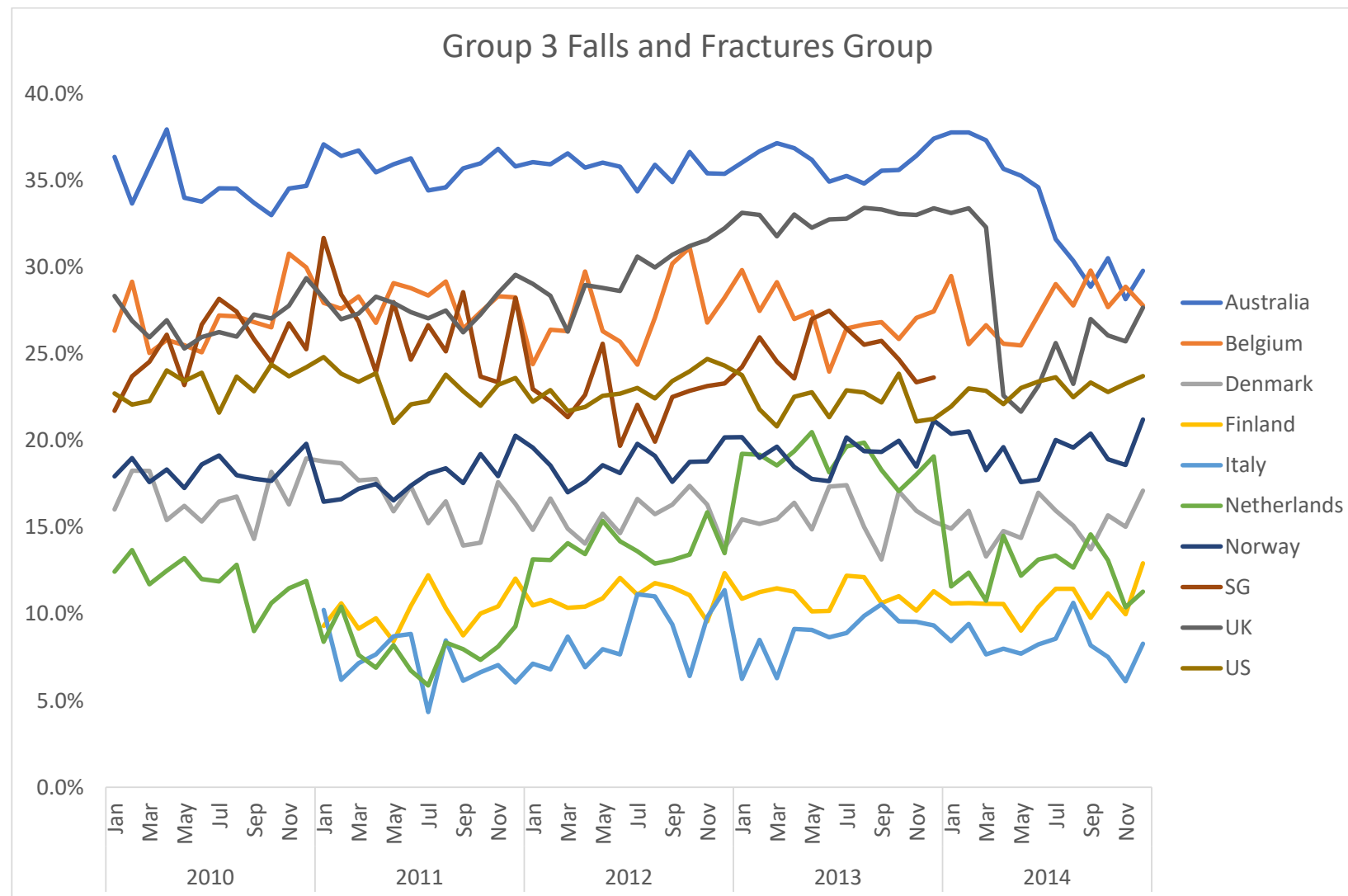
**311** **Depressive disorder,  
not elsewhere  
classified**

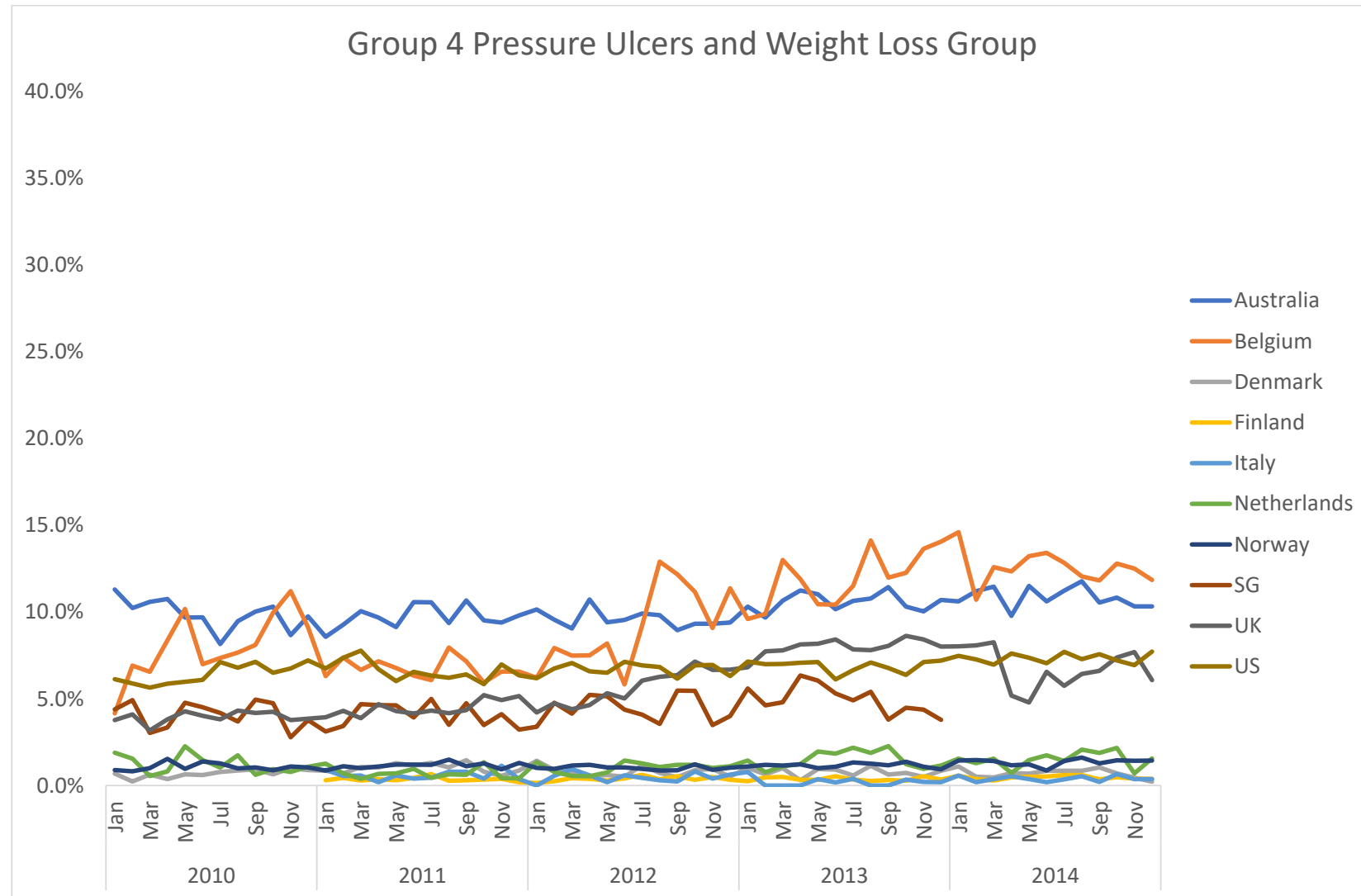
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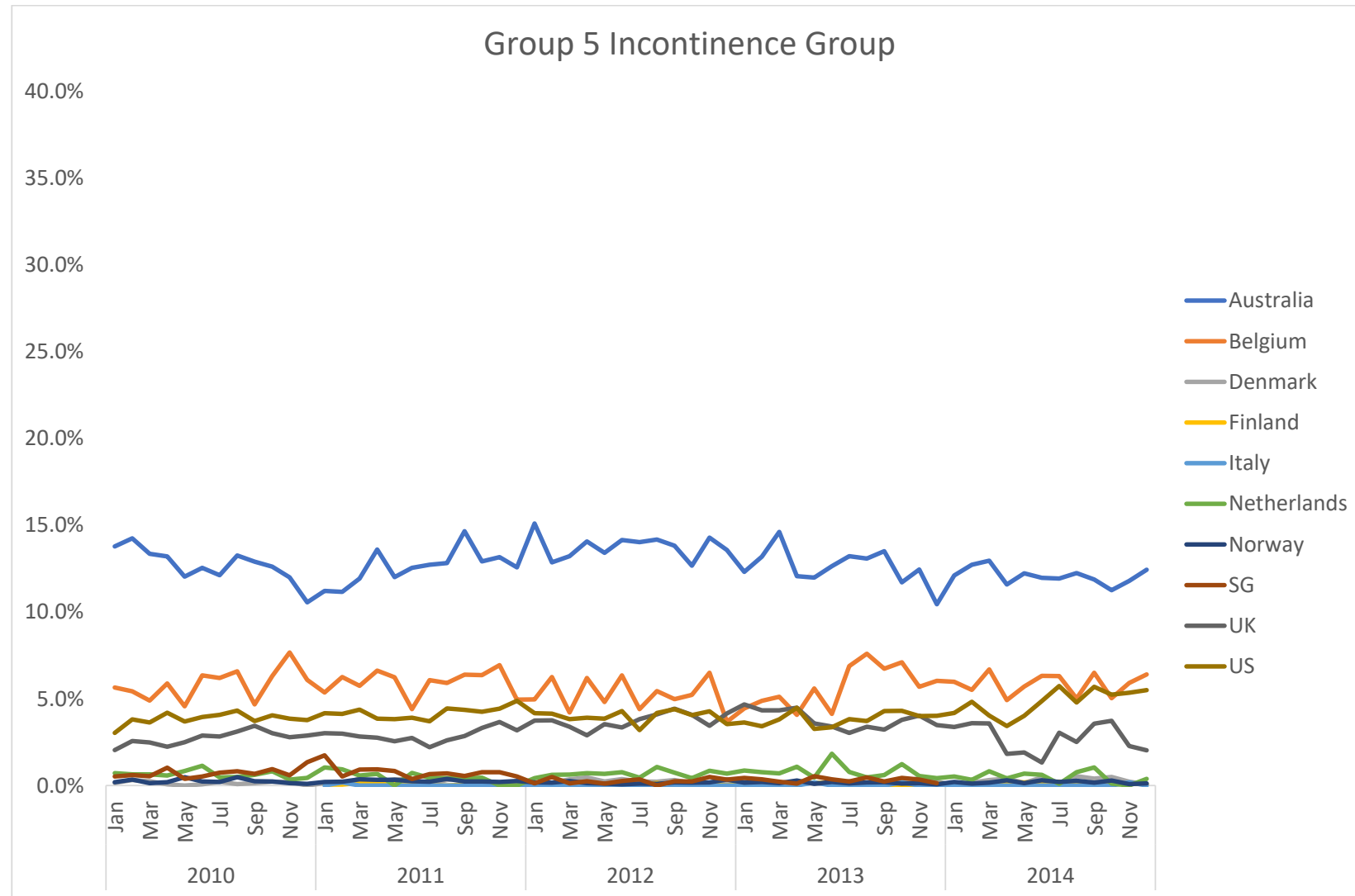
Appendix 2: Percentage frequency of coded frailty syndrome groups by country

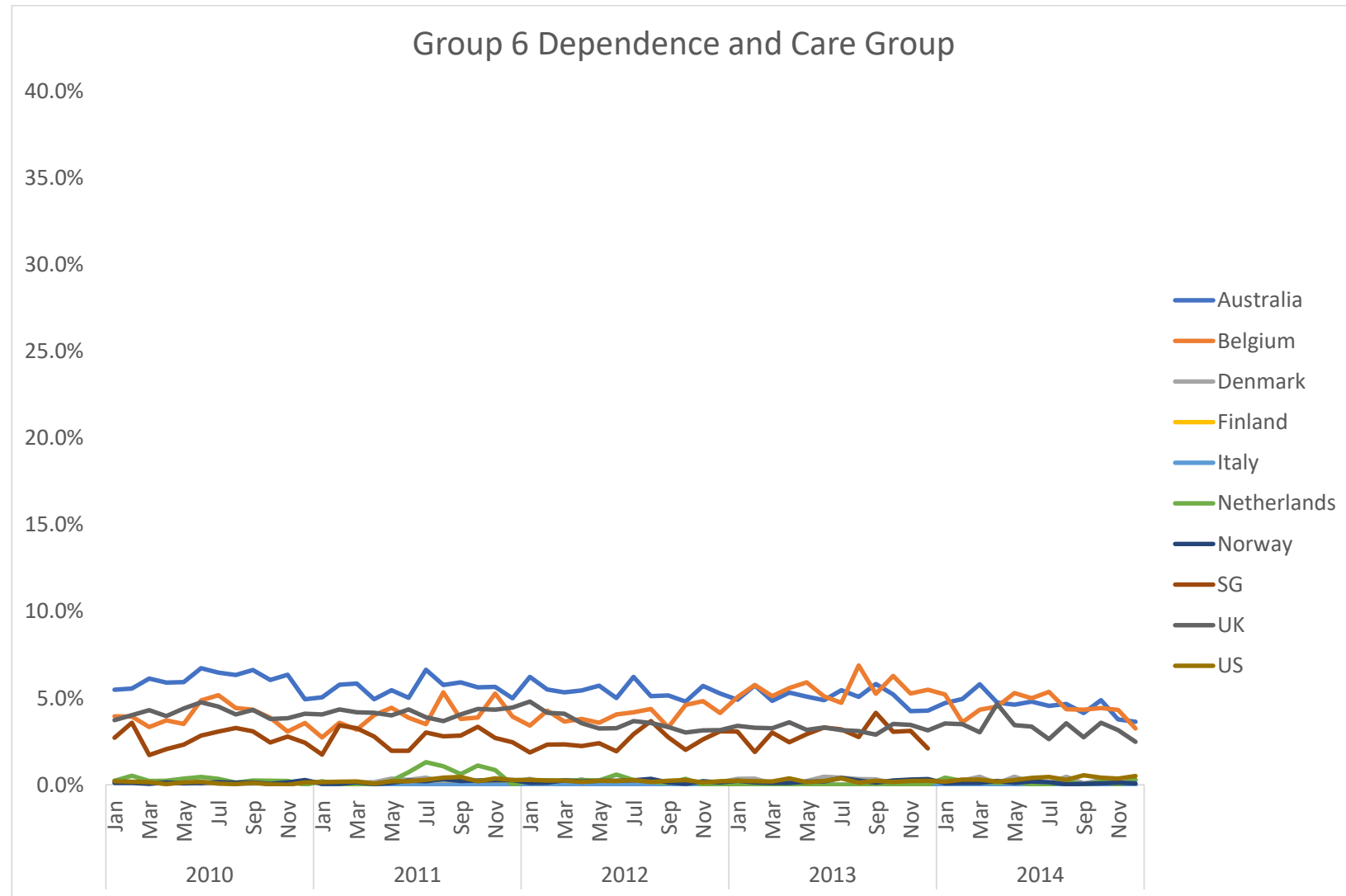


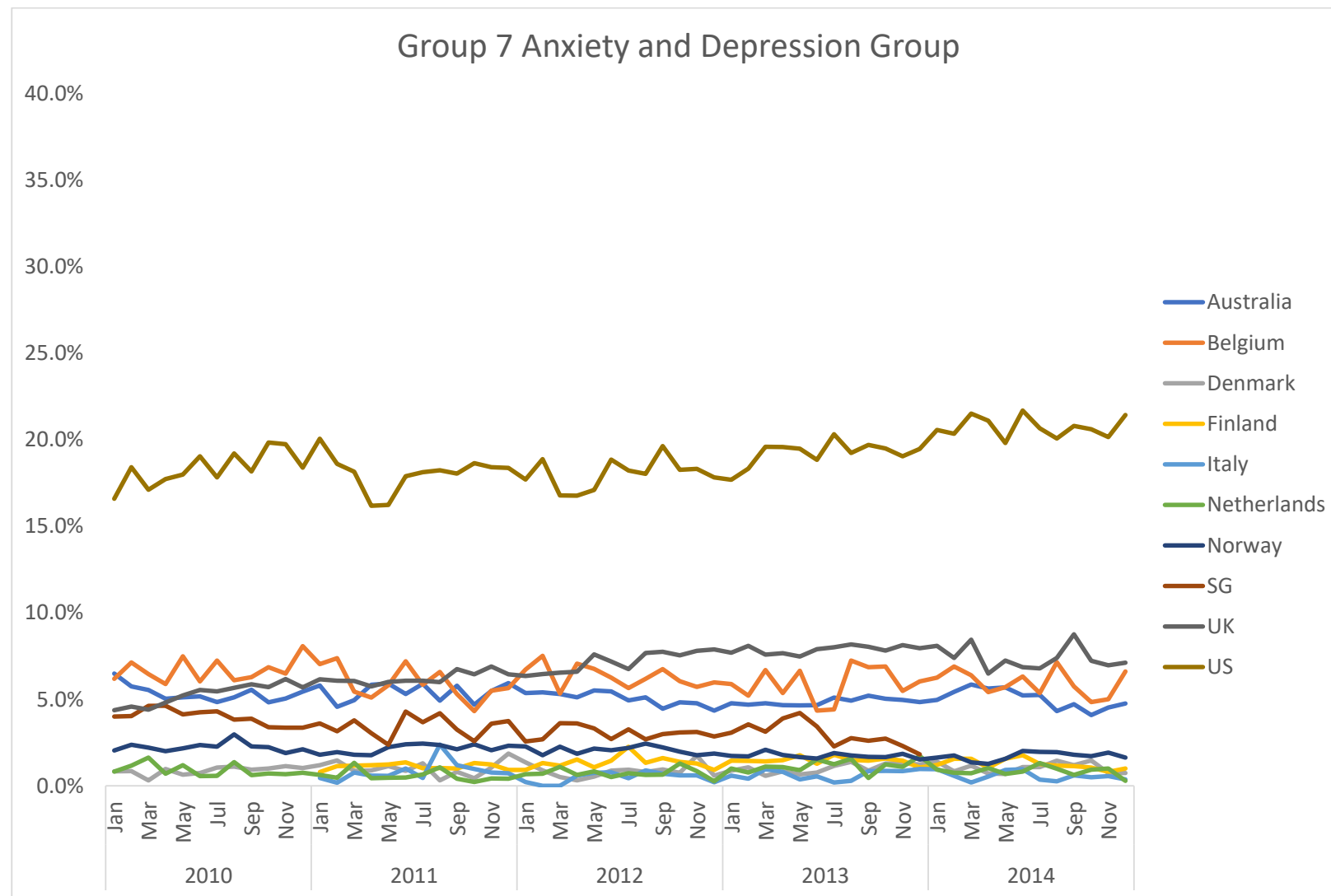




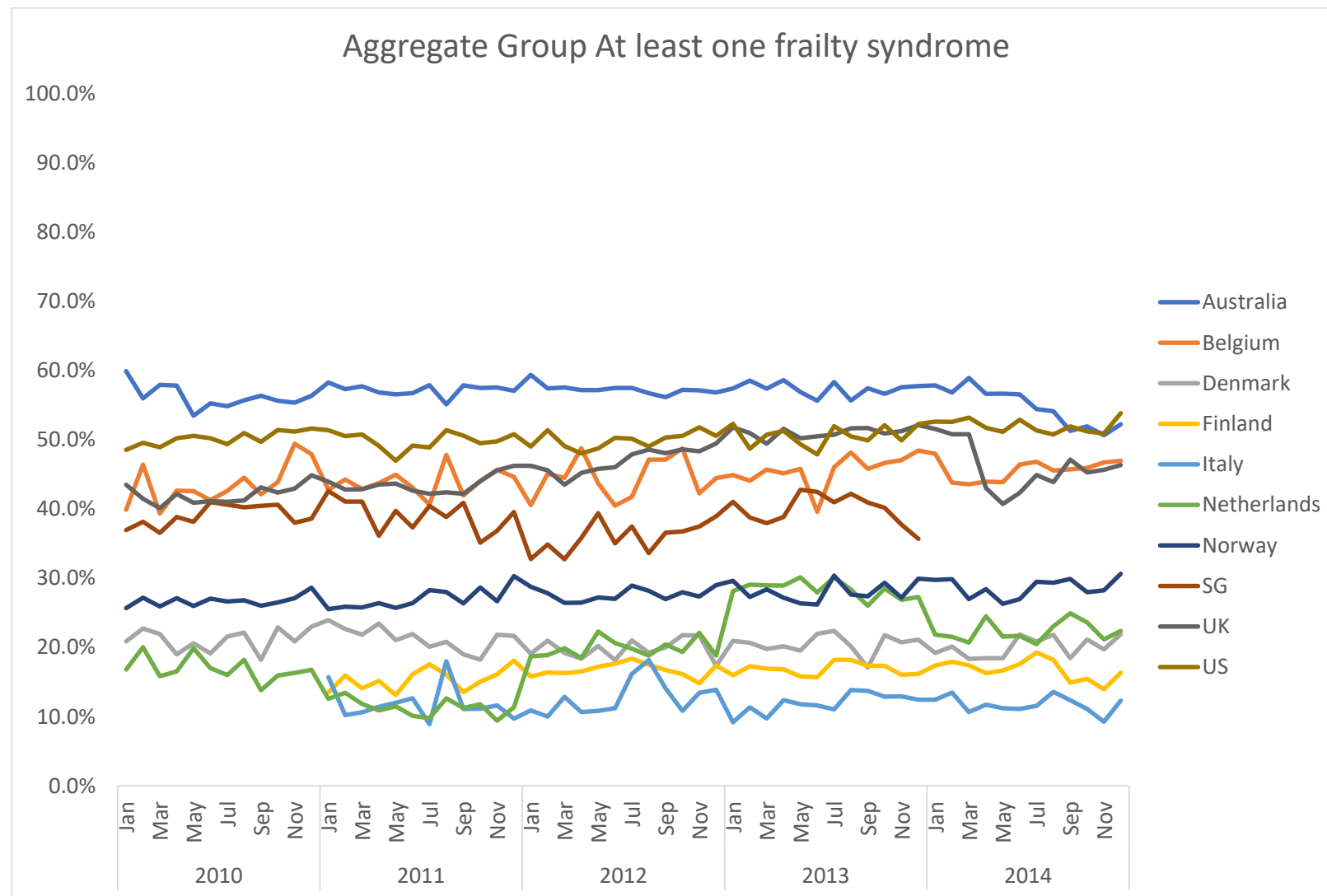




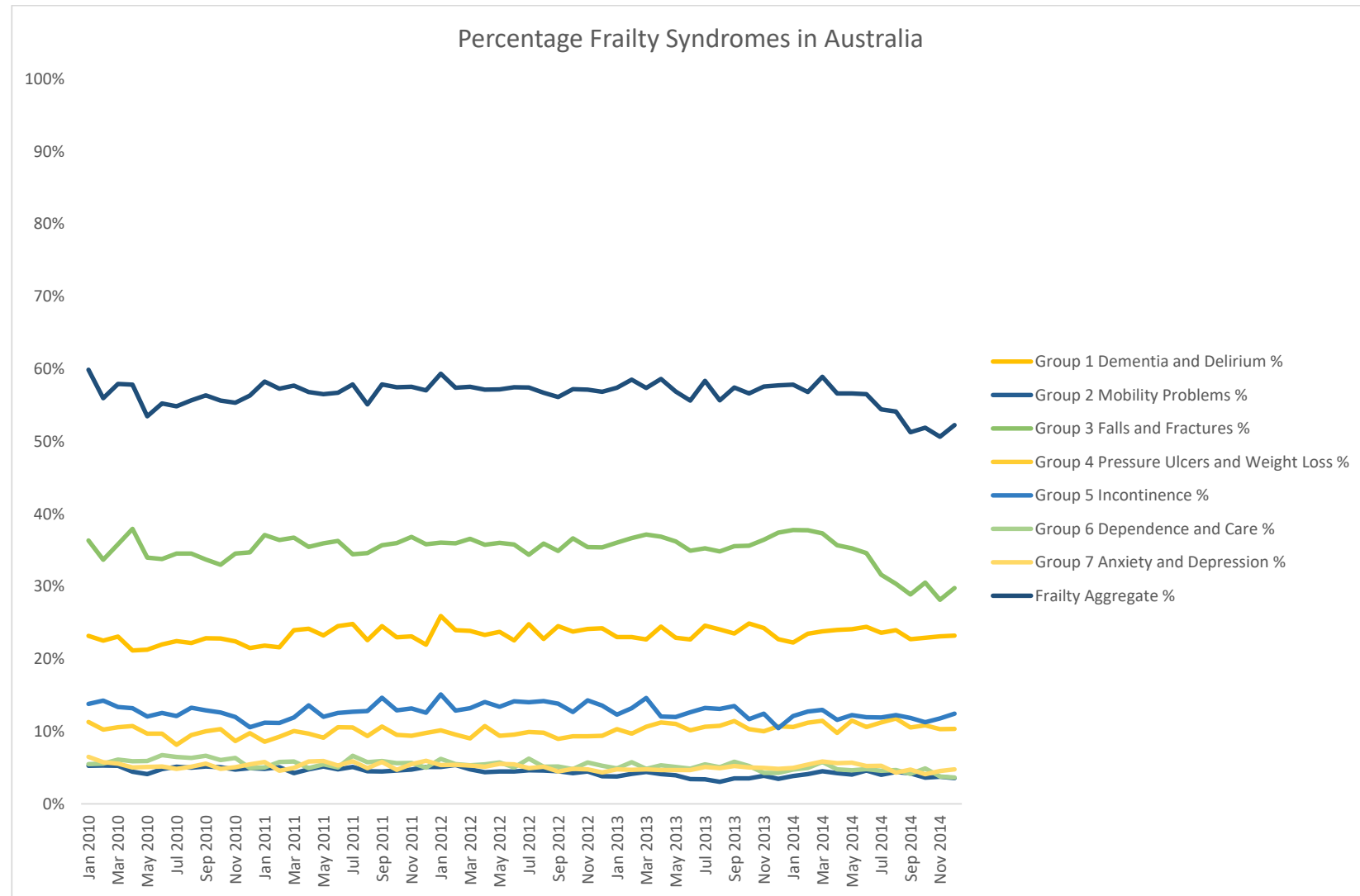




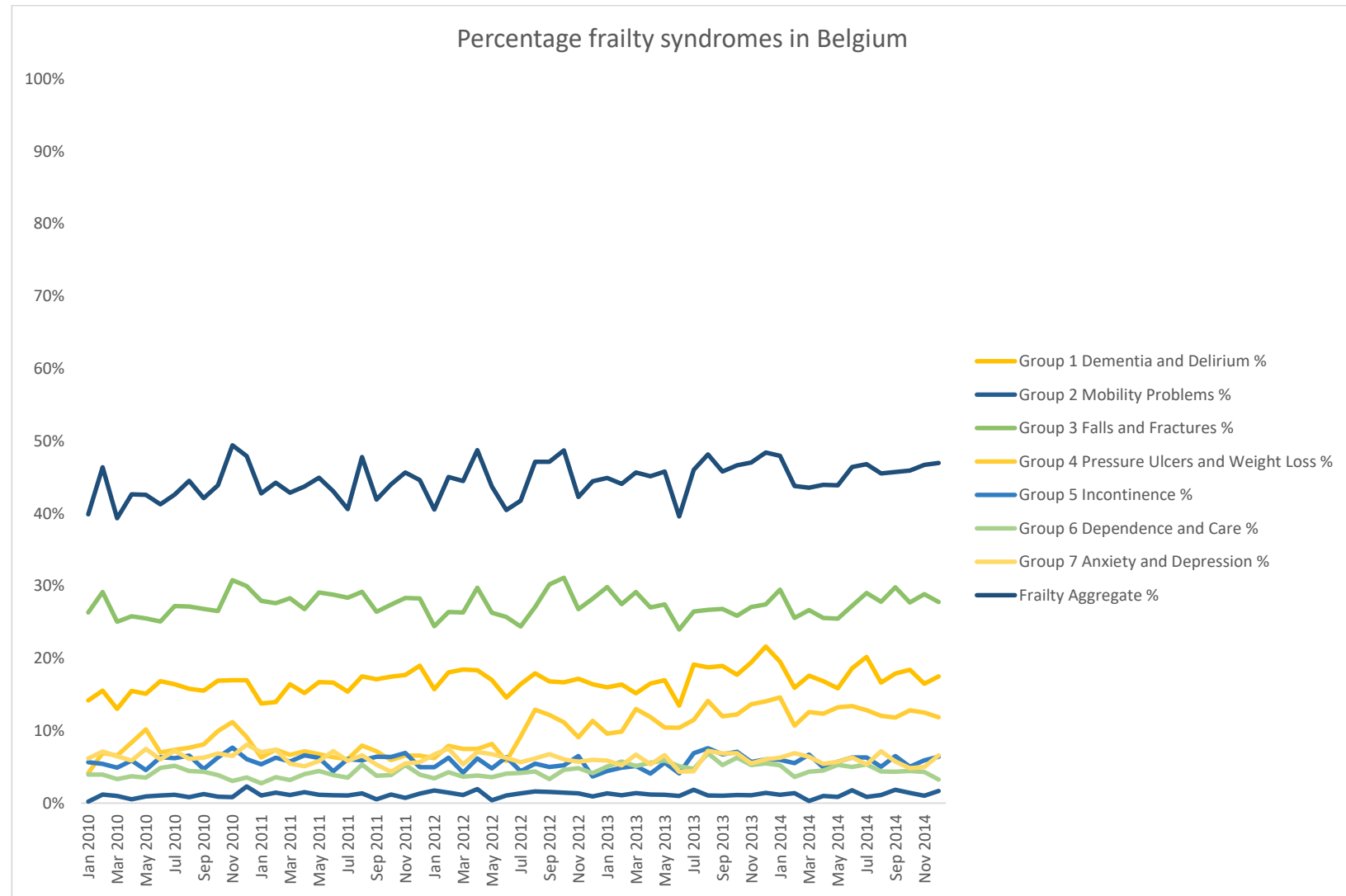




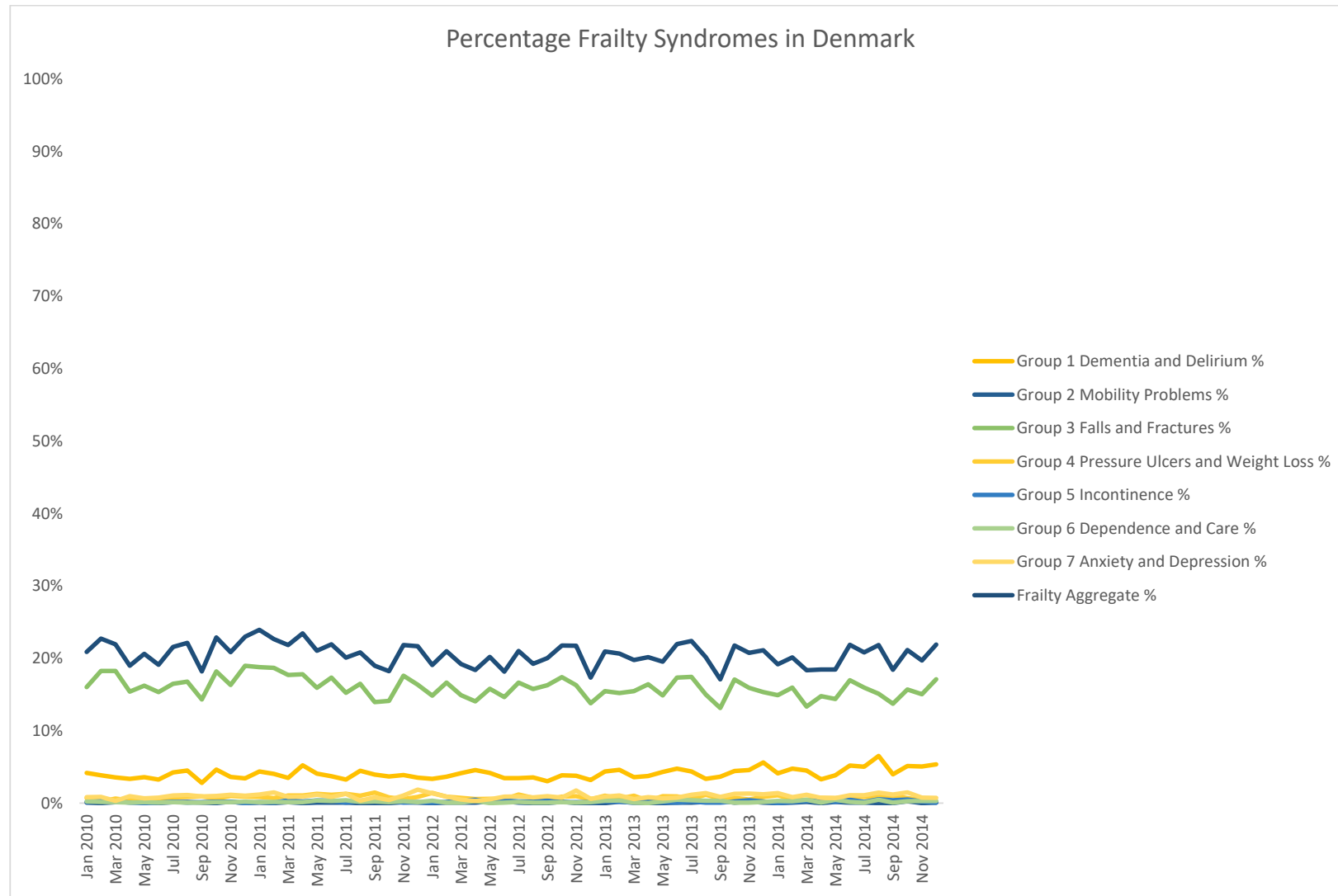
Appendix 3: Percentage frequency of coded frailty syndrome groups aggregated monthly by country



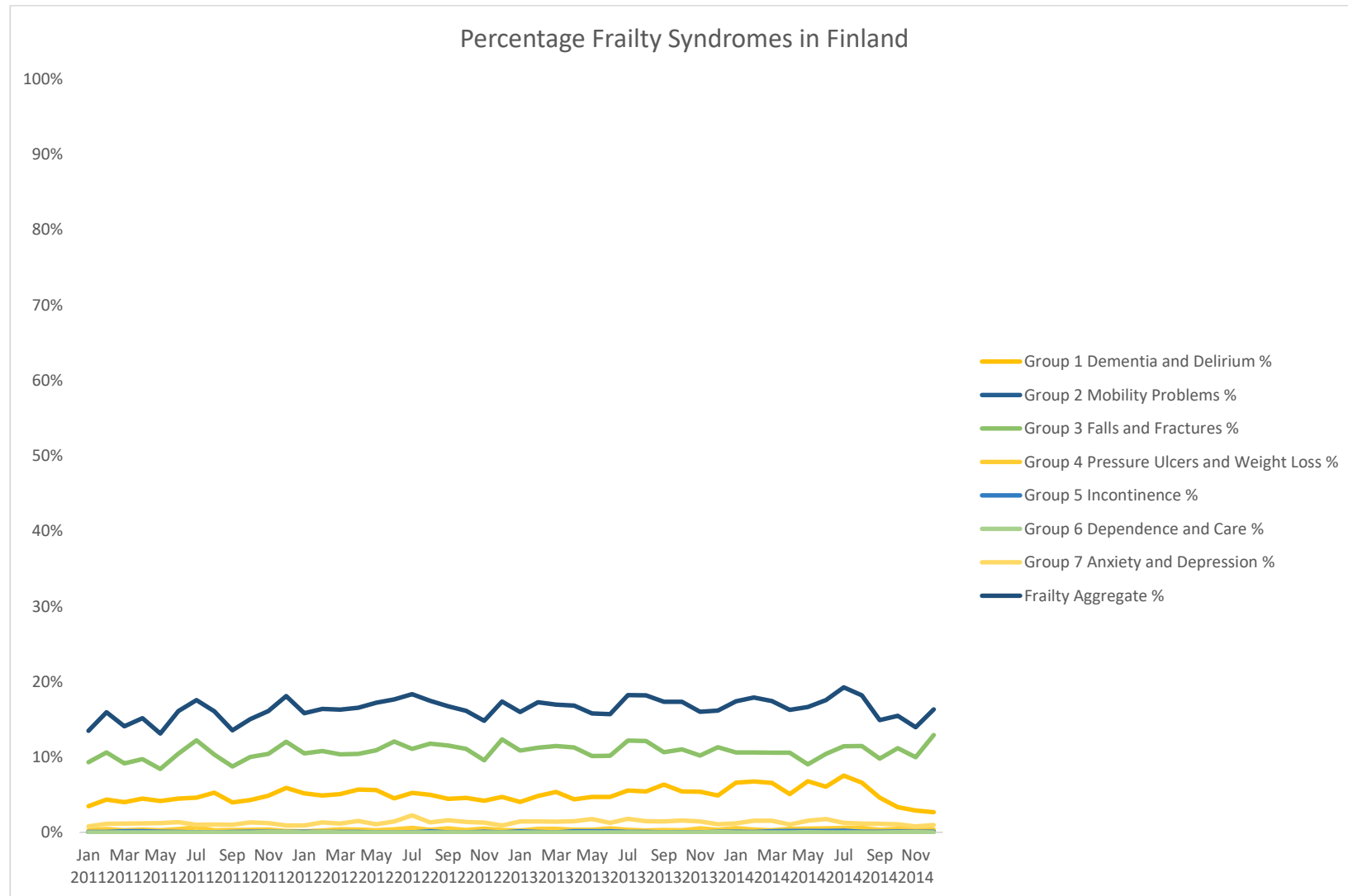
Frailty Aggregate % = At least one frailty syndrome %



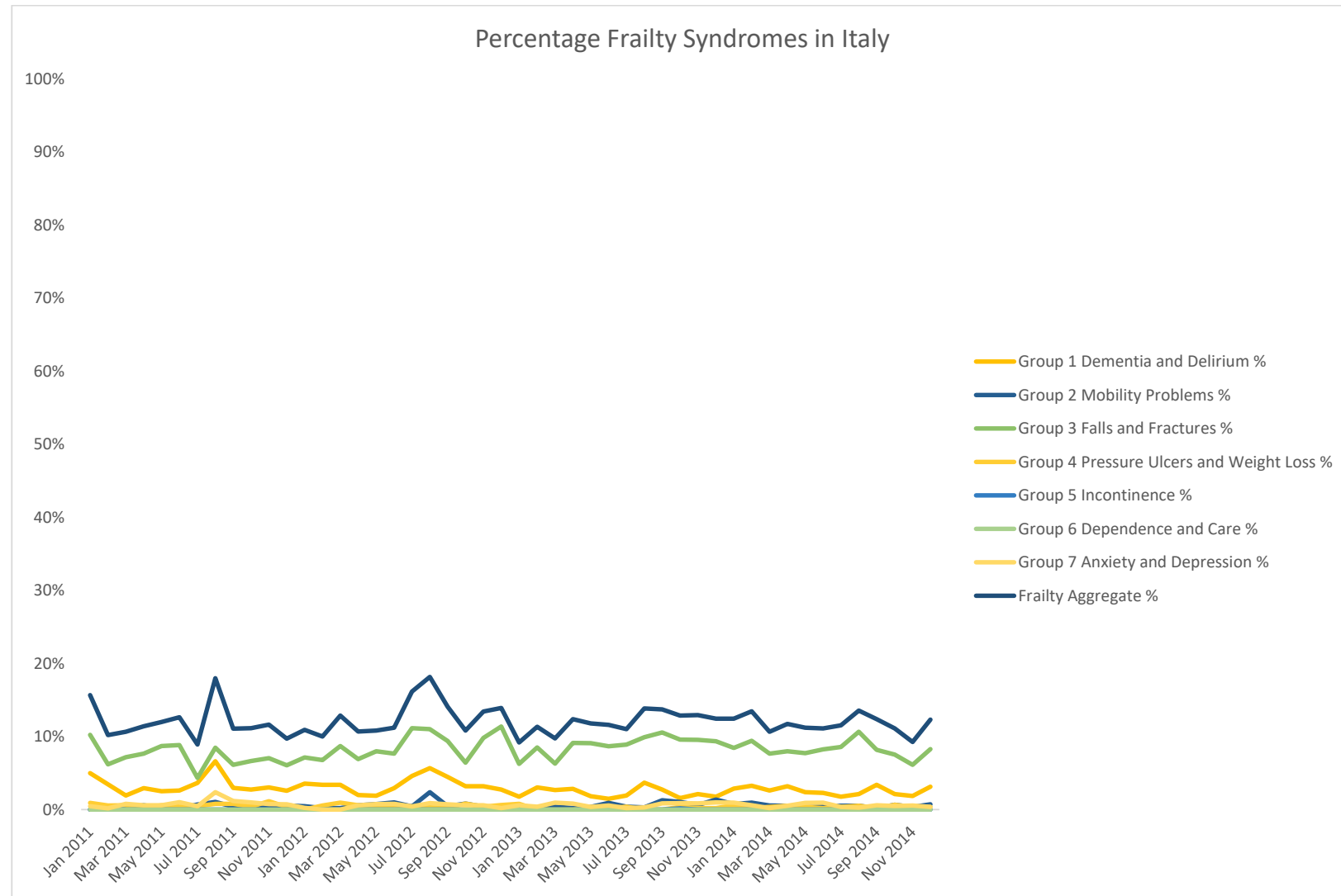
Frailty Aggregate % = At least one frailty syndrome %



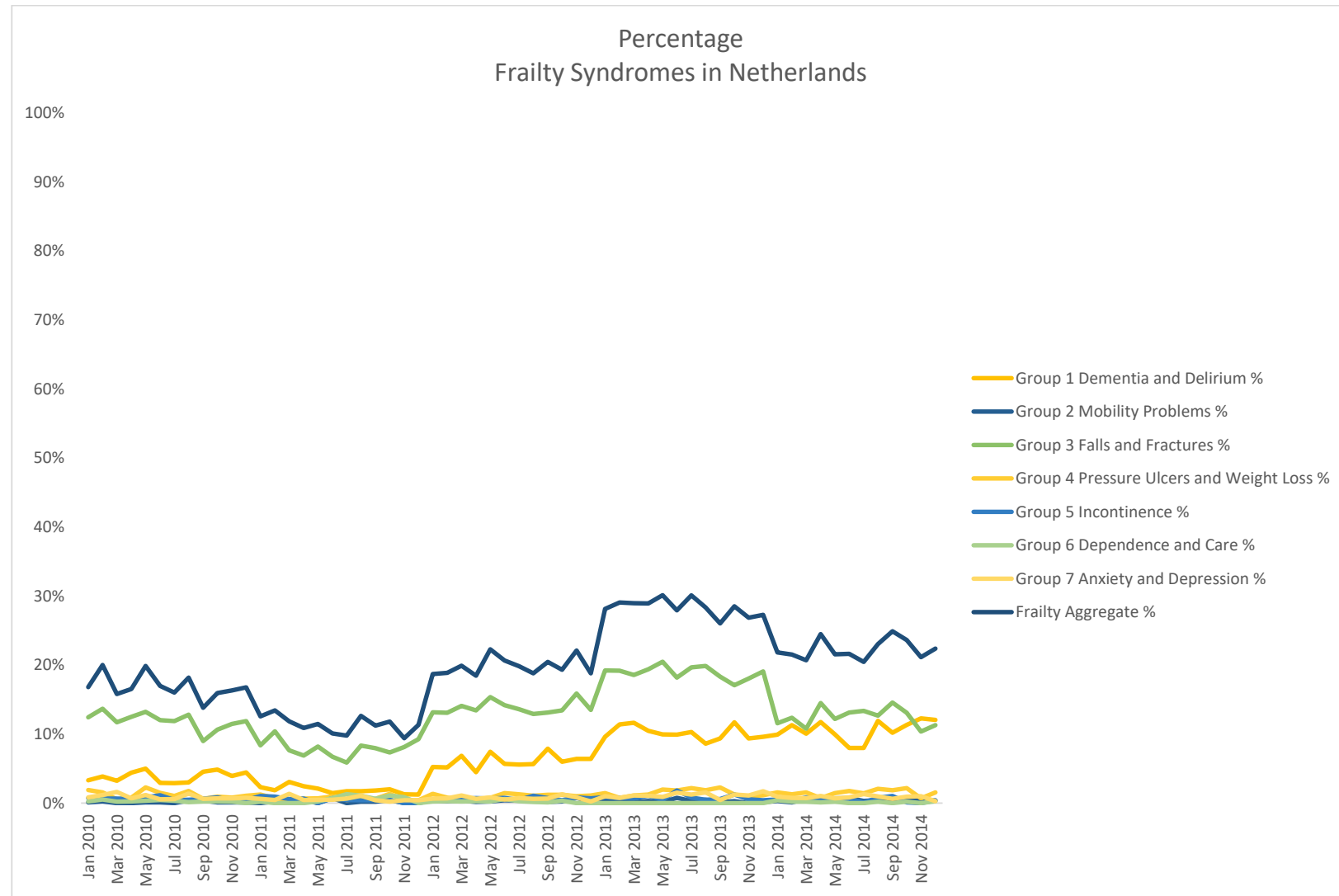
Frailty Aggregate % = At least one frailty syndrome %



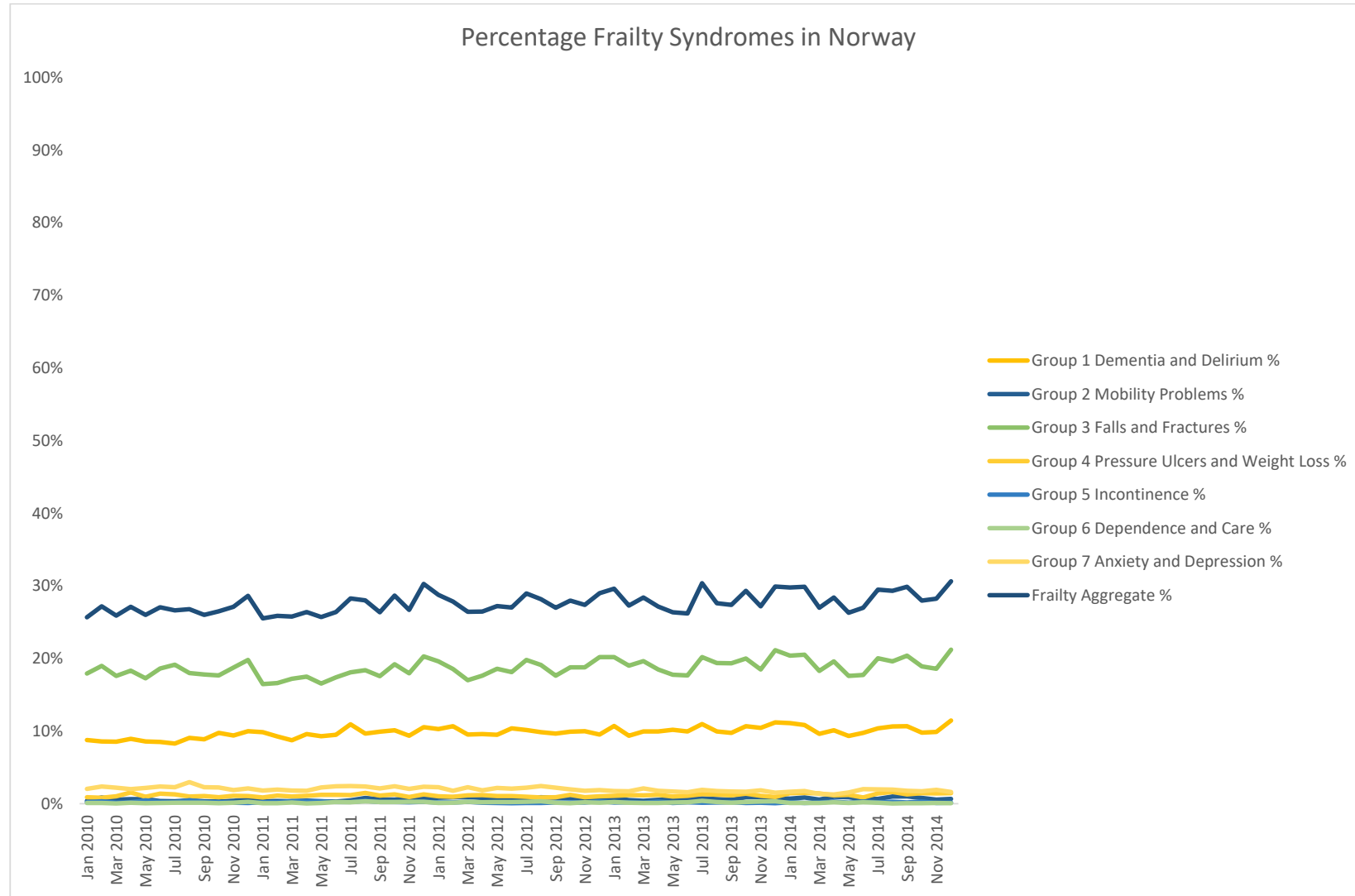
Frailty Aggregate % = At least one frailty syndrome %



Frailty Aggregate % = At least one frailty syndrome %

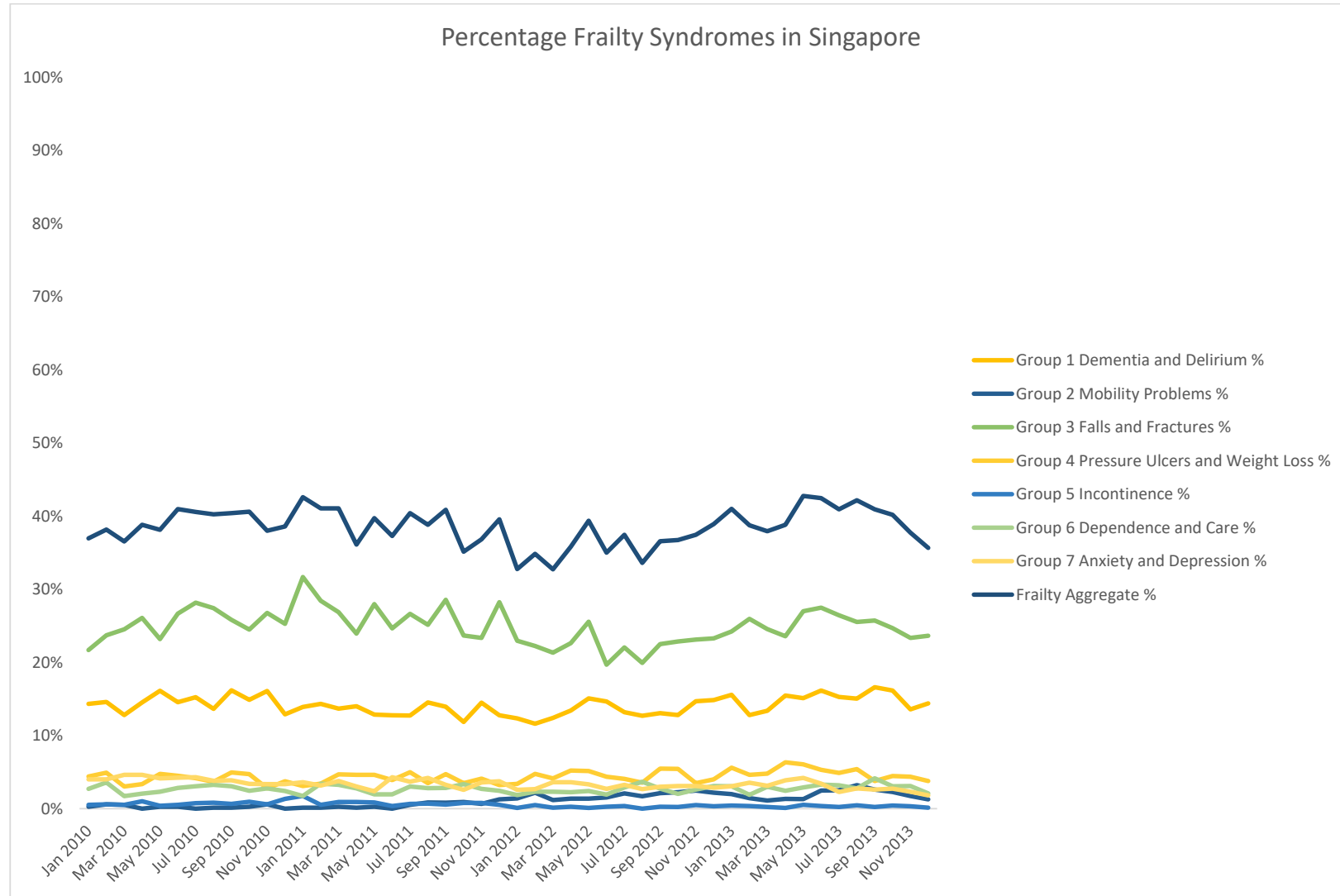


Frailty Aggregate % = At least one frailty syndrome %

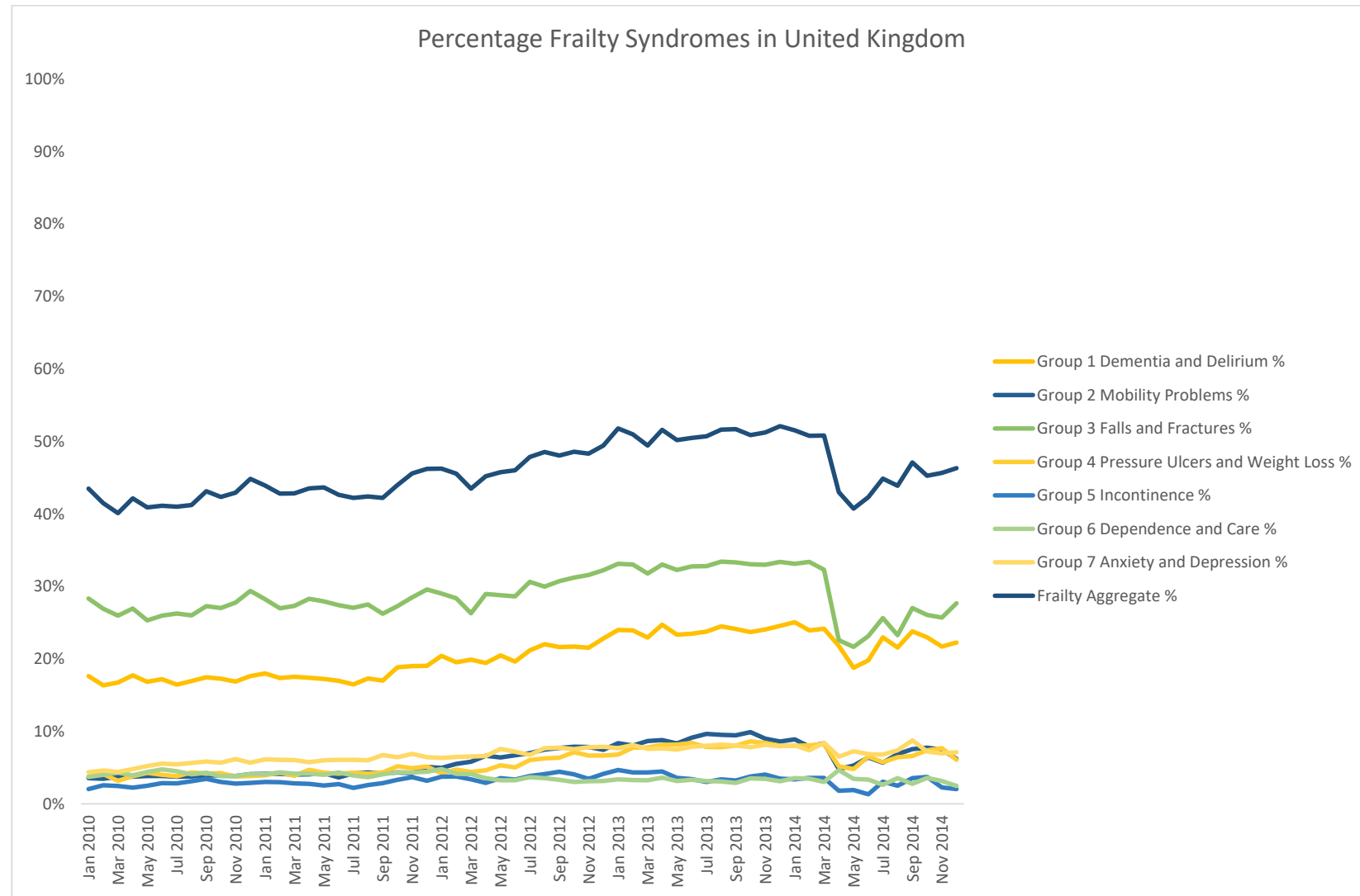


Frailty Aggregate % = At least one frailty syndrome %

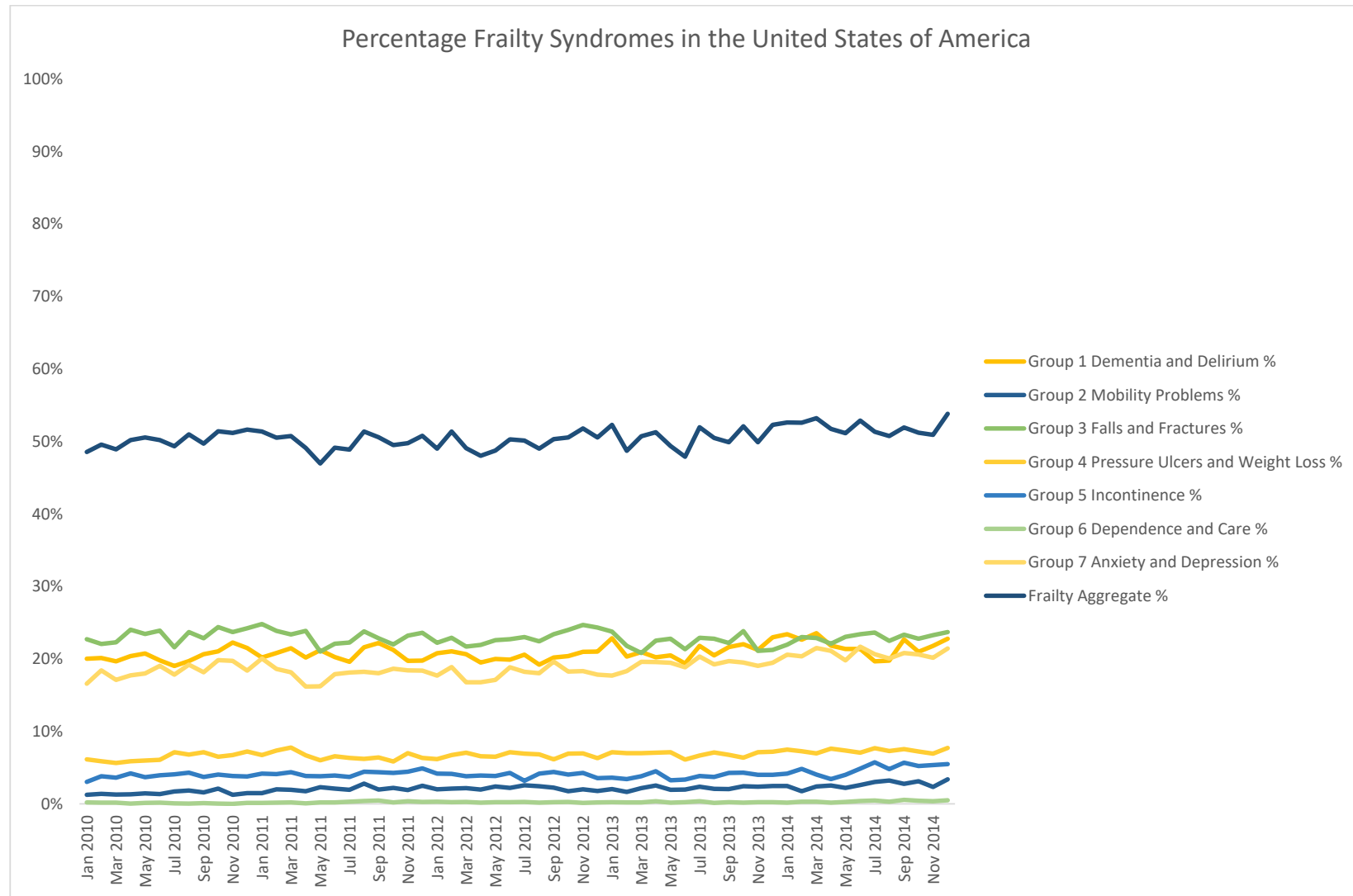




Frailty Aggregate % = At least one frailty syndrome %

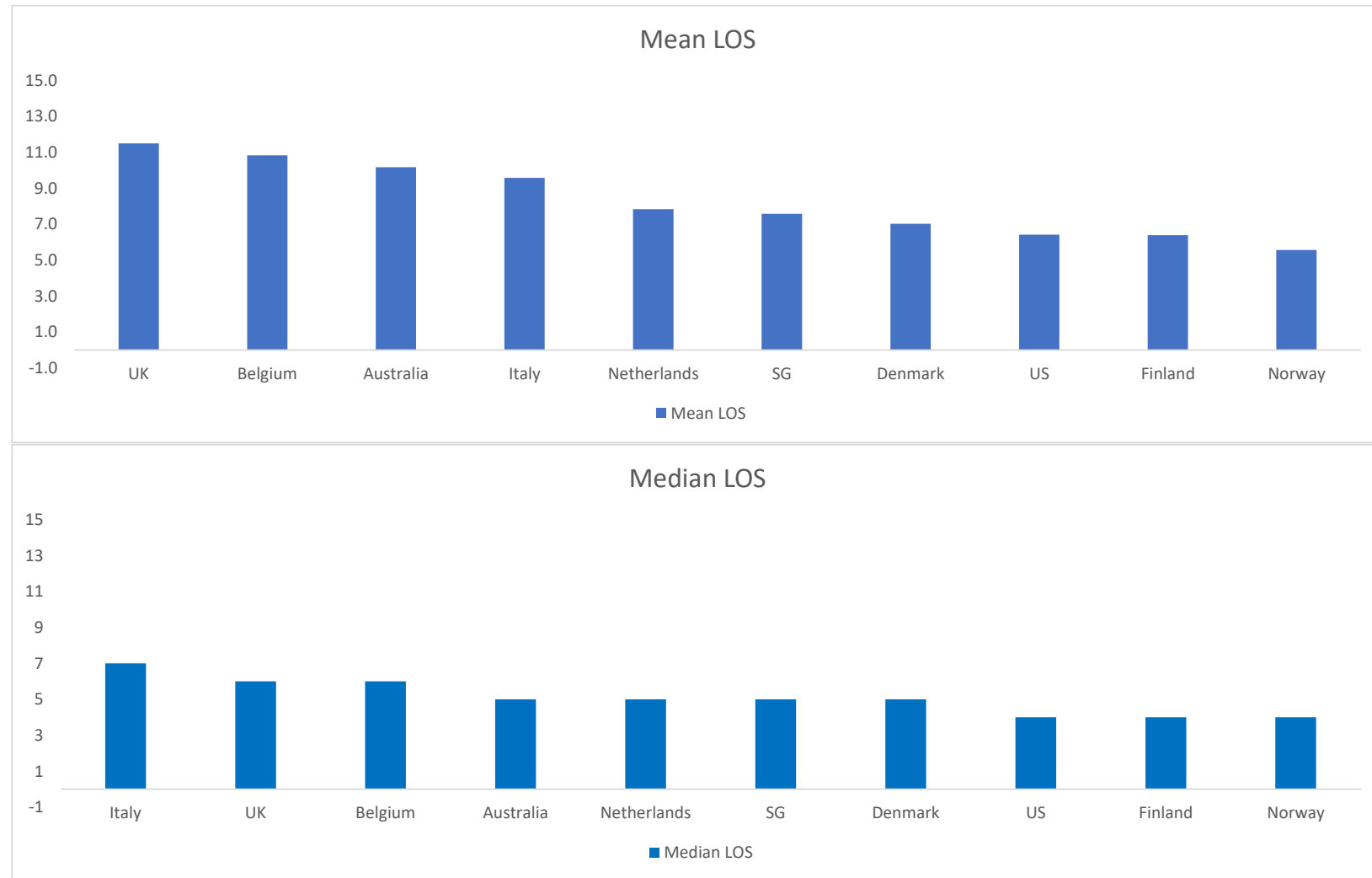


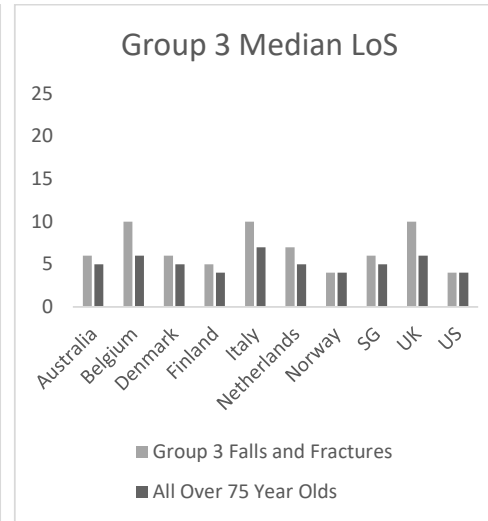
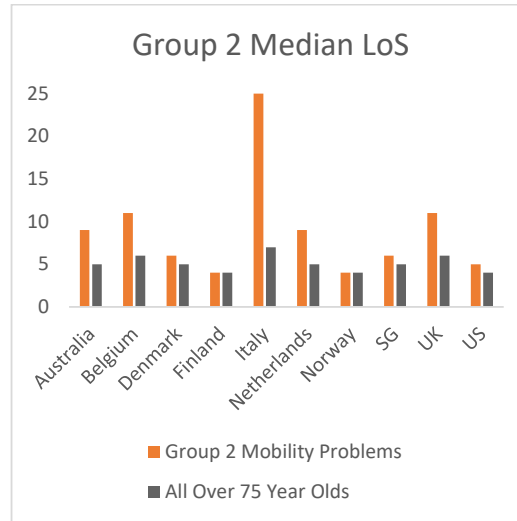
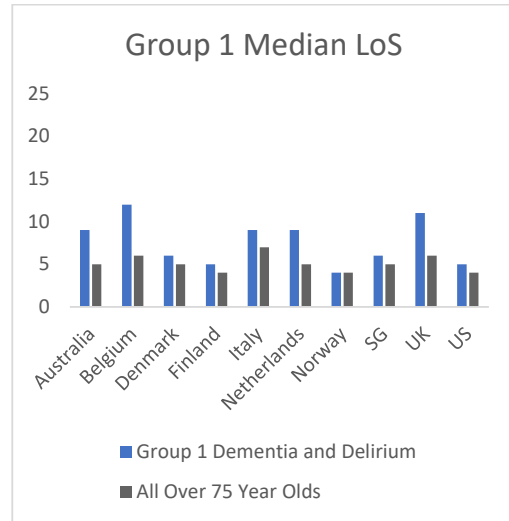
Frailty Aggregate % = At least one frailty syndrome %

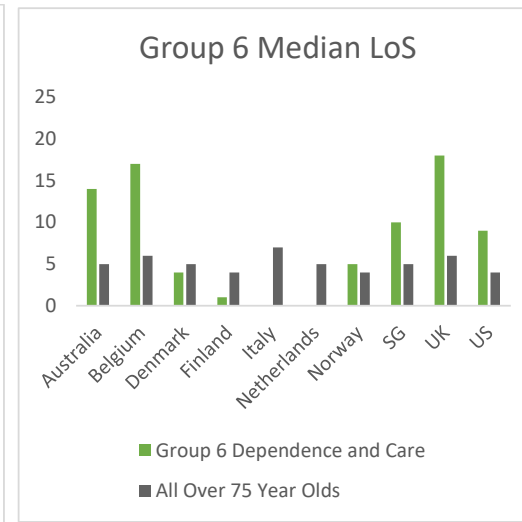
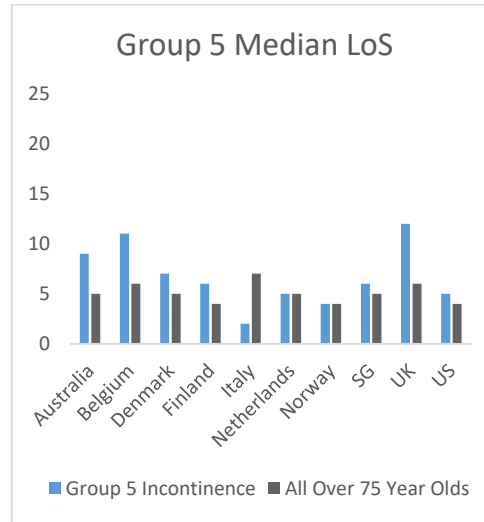
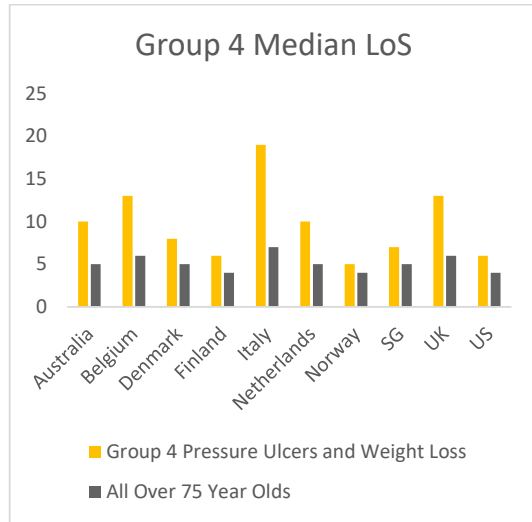


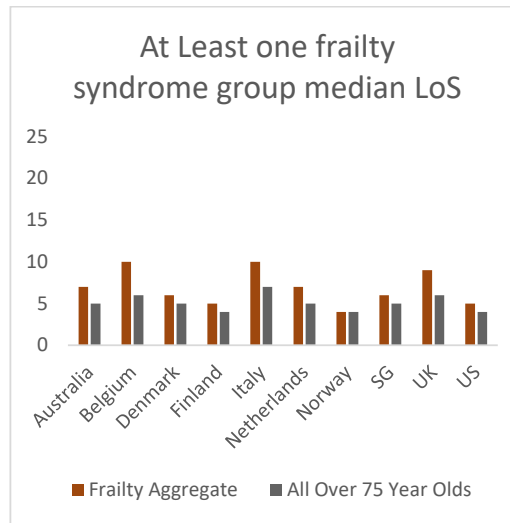
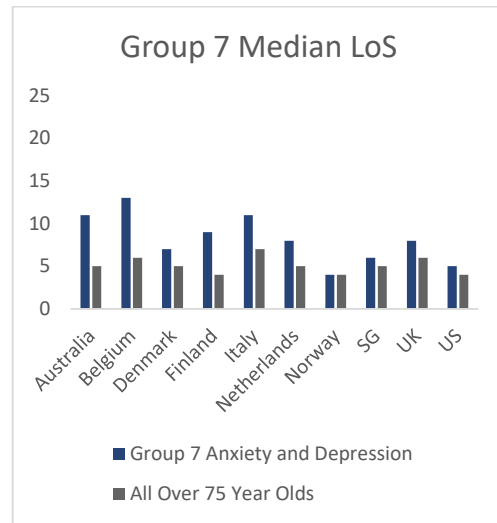
Frailty Aggregate % = At least one frailty syndrome %

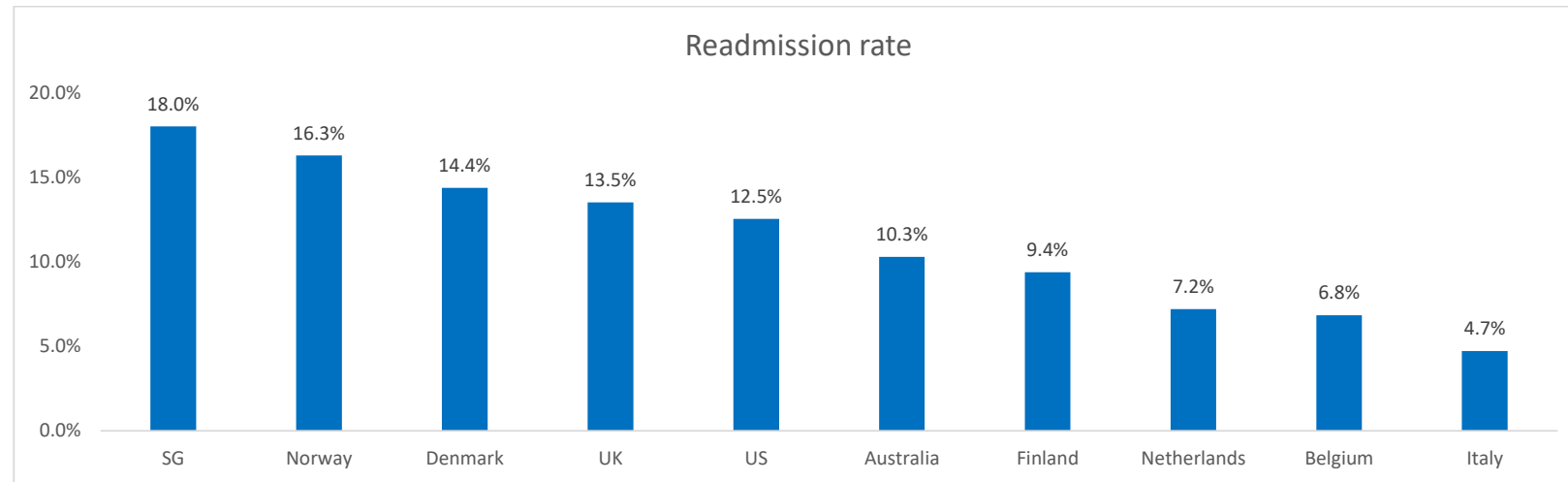
## Appendix 4 Outcomes by country and frailty syndrome group: Length of hospital stay, 30-D non-elective readmission and in-hospital mortality



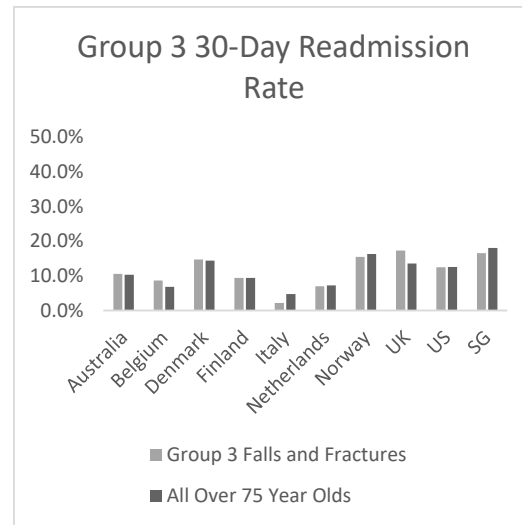
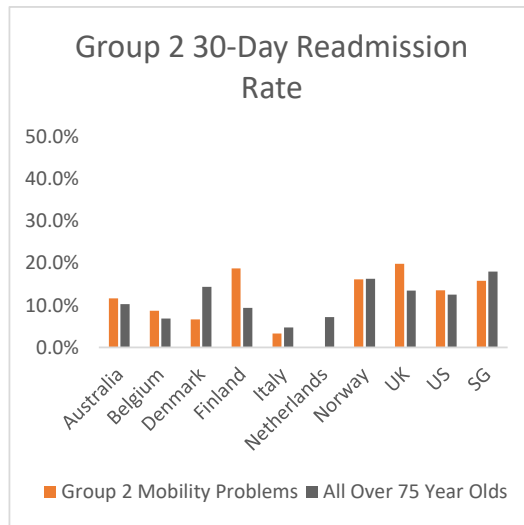
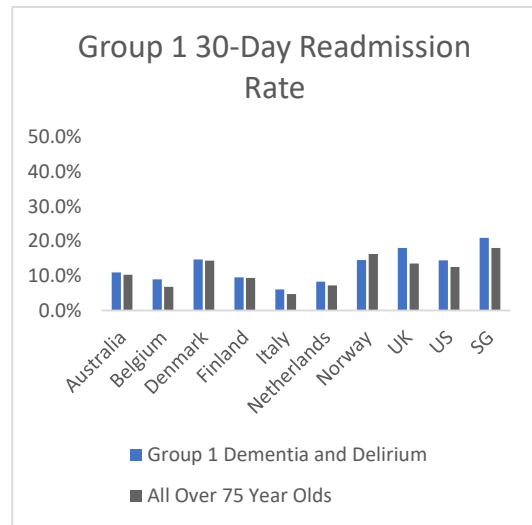


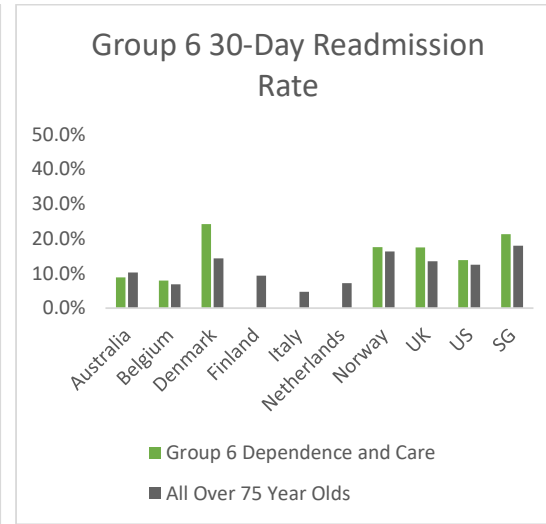
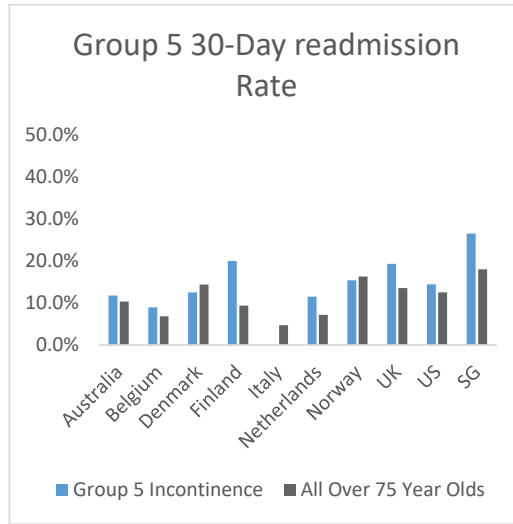
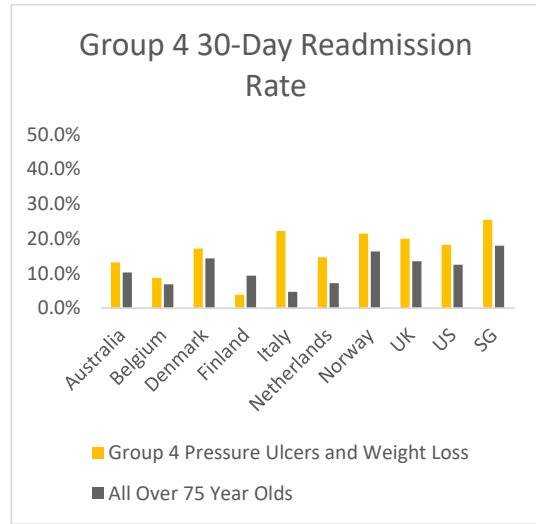


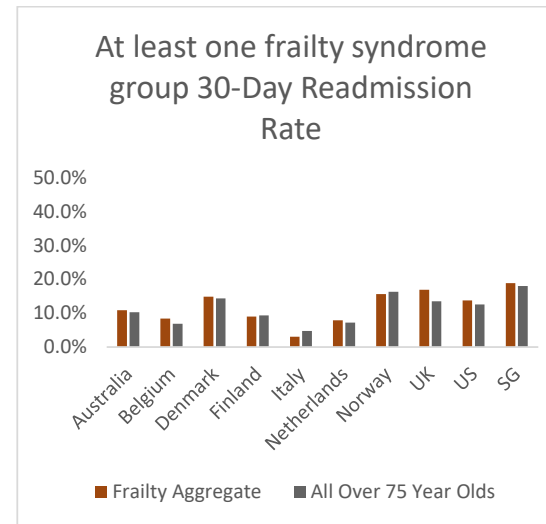
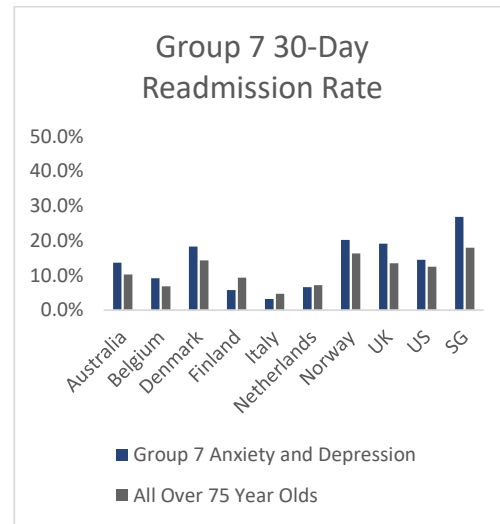


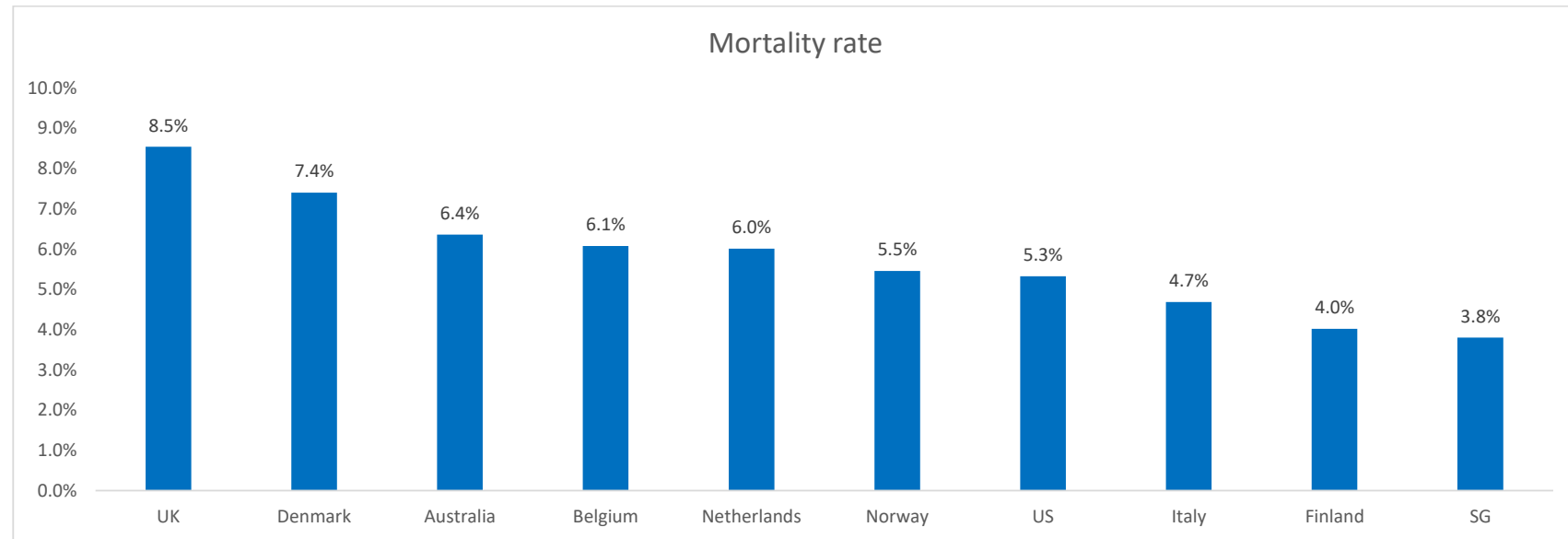


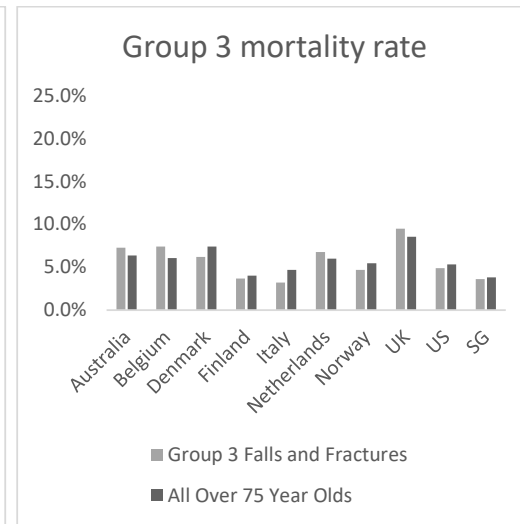
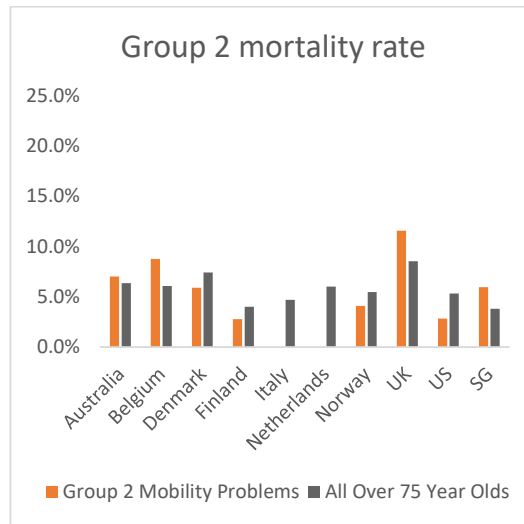
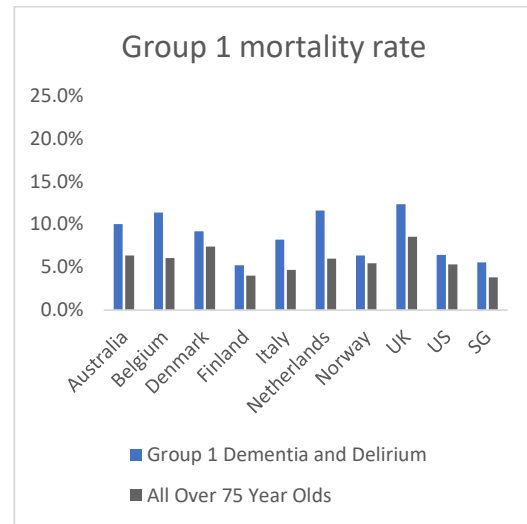


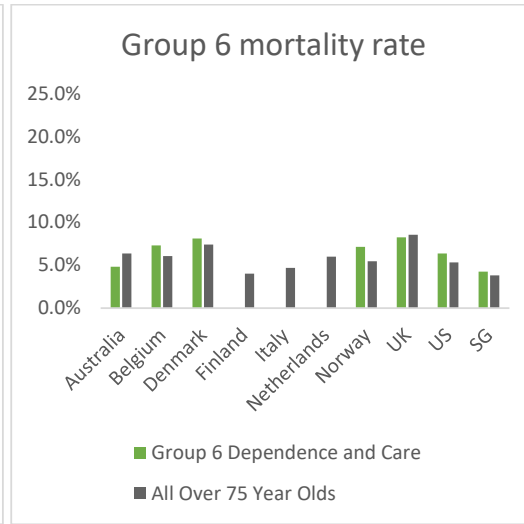
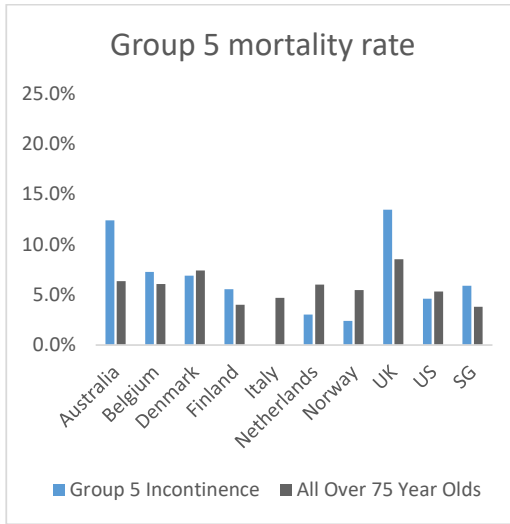
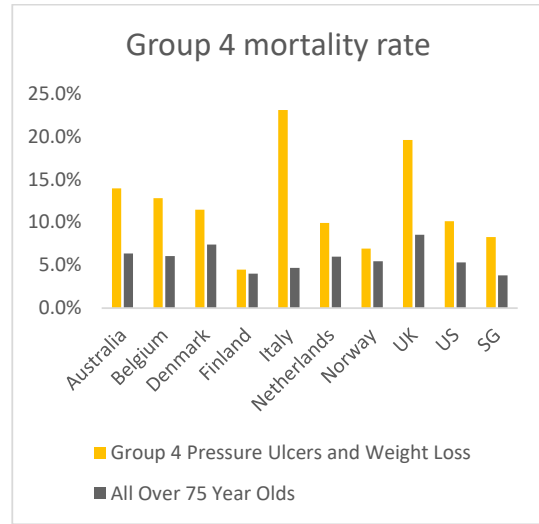


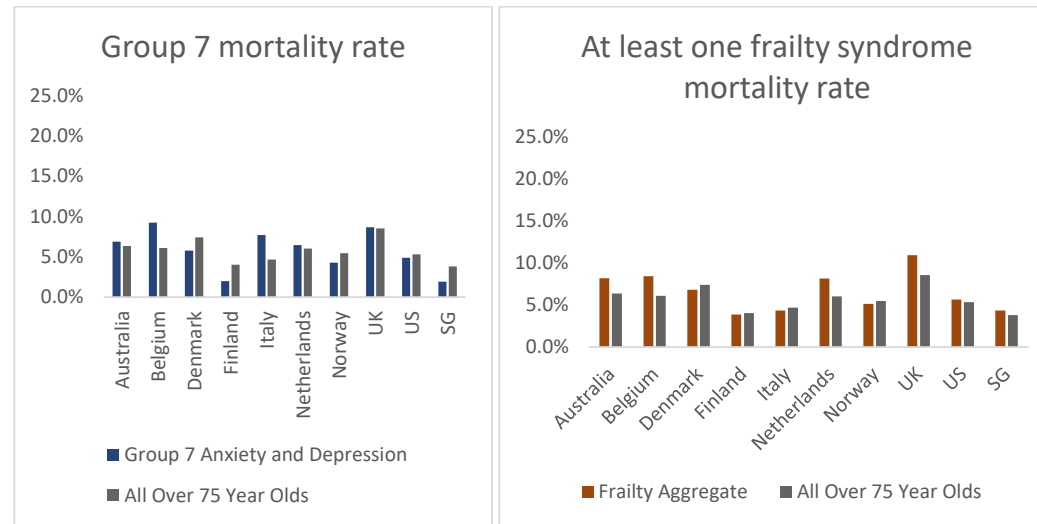








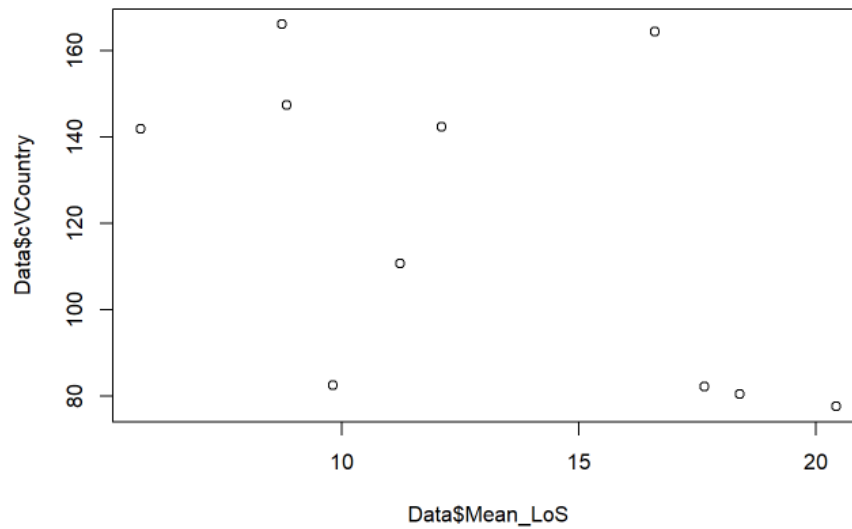




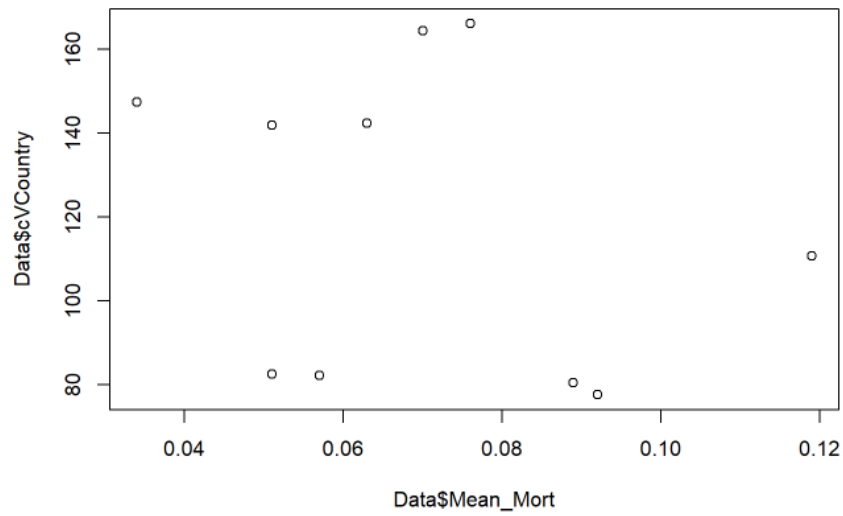
Appendix 5: Measures of association between coefficient of Variation (cV) across all frailty syndrome groups within country

Outcome	Pearson correlation (95% CI)	p-value	Linear regression coefficient (95% CI)	p-value
Length of hospital stay	-0.55 (-0.88, 0.12)	0.10	-0.0537 (-0.2354, 0.1280)	0.51
Mortality	-0.27 (-0.77, 0.43)	0.45	-0.0002 (-0.0010, 0.0005)	0.49
Readmission	-0.27 (-0.77, 0.43)	0.45	-0.0009 (-0.0018, 0.0001)	0.06

Plot of coefficient of variation to average length of hospital stay





**Plot of coefficient of variation to inpatient mortality****Plot of coefficient of variation to hospital readmission**