

## Introduction

Multi-morbidity is defined as the presence of two or more long-term (chronic) medical conditions in a patient. The analysis presented in this report on the multi-morbidity of Jersey residents is based on data recorded by GPs in Jersey and held as at 31 December 2019 (the reference date)

## Definitions

- Prevalence: the proportion of a population having a condition at a given point in time
- Morbidity: the state of having a long-term medical condition

## Morbidities

Multi-morbidity analysis depends on the number and type of morbidities considered. The Government of Jersey incentivises GPs working in the Island to record patients with 12 long-term conditions through the Jersey Quality Improvement Framework (JQIF).

These 12 long-term conditions, which form the basis of the multi-morbidity analysis presented in this report, are:

- Atrial Fibrillation (AF)
- Asthma (AST)
- Coronary Heart Disease (CHD)
- Chronic Kidney Disease (CKD)
- Chronic Obstructive Pulmonary Disease (COPD)
- Dementia (DEM)
- Diabetes (DIA)
- Heart Failure (HF)
- Hypertension (HYP)
- Mental Health Problems (MH)
- Obesity (OB)
- Stroke and Transient Ischemic Attack (STIA)

The data for each person registered with a GP in Jersey is recorded and held on the General Practitioner Central Server (GPCS)<sup>1</sup>. For the purposes of this report, the population considered was that of 'active' patients – that is, any patient registered with a Jersey GP practice who had had a consultation within the previous five years, or who had registered with a GP surgery in the previous six months. See Annex 1 for the definitions of the criteria and codes used in order to identify patients recorded as having any of the above conditions.

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<sup>1</sup> The access of Statistics Jersey to the data held on the GPCS is governed by a data sharing agreement, under the auspices of the Data Protection (Jersey) Law, 2017

## Summary

On 31 December 2019, there were more than 30,860 people<sup>2</sup> who had one of the 12 long-term conditions considered in this report who were registered, and considered active, with a GP in Jersey.

Of these registered patients:

- 18,170 individuals had a single long-term condition
- 12,690 individuals had two or more long-term conditions
- three-quarters (78%) of individuals with at least one long-term condition had either hypertension, obesity, diabetes or a combination of these conditions
- multi-morbidity increased with age: the mean age of a patient having only one of the long-term conditions was 54 years; two conditions: 65 years; three conditions: 71 years; and four or more conditions: 76 years
- patients with one long-term condition saw a GP 6 times per year and had 31 medication issues per year, on average; patients with four or more long-term conditions saw a GP 13 times per year and had 121 medication issues per year, on average

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<sup>2</sup> Throughout this report counts of individuals are rounded to the nearest 5. Counts of less than 10 individuals are suppressed in order to avoid disclosure, and are indicated as “~”.

## All patients - number of long-term conditions

On 31 December 2019, there were more than 30,860 individuals who had at least one of the 12 long-term conditions considered in this report who were registered, and considered active, with a GP in Jersey:

- 18,170 individuals had a single long-term condition
- 12,690 individuals had two or more long-term conditions

Of those individuals having two or more long-term conditions, progressively fewer had a higher number of long-term conditions:

- 7,625 individuals had two conditions
- 3,210 individuals had three conditions
- 1,855 individuals had four or more conditions

Figure 1 shows the numbers of patients having one or more long-term conditions broken down by sex.

**Figure 1: Count of patients registered with GPs in Jersey having 1, 2, 3 or 4+ conditions; by sex**

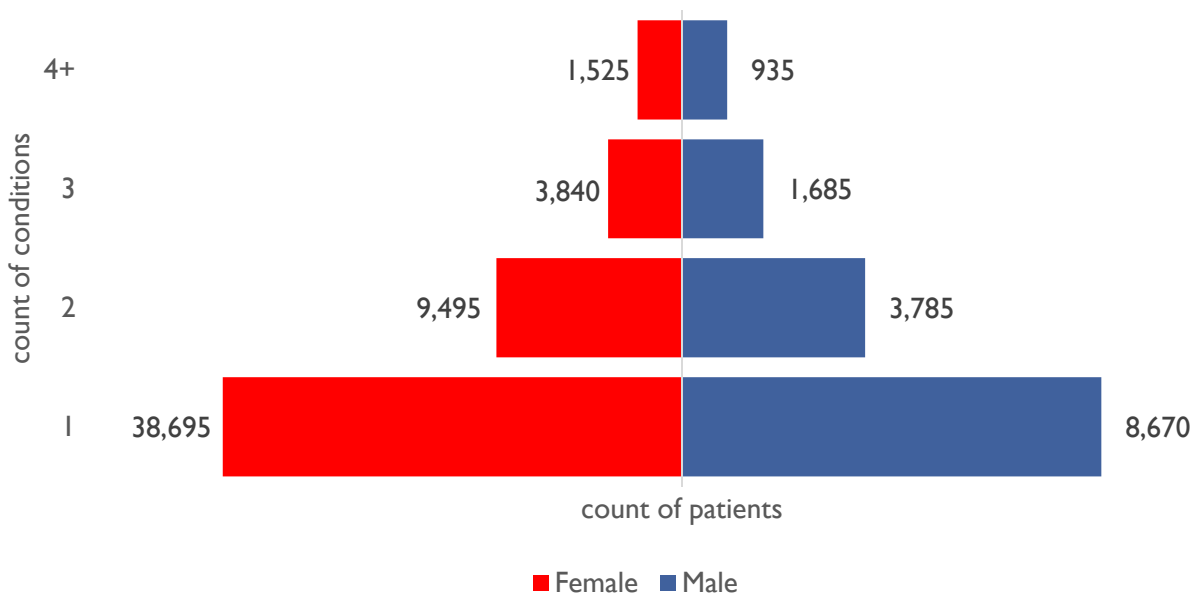
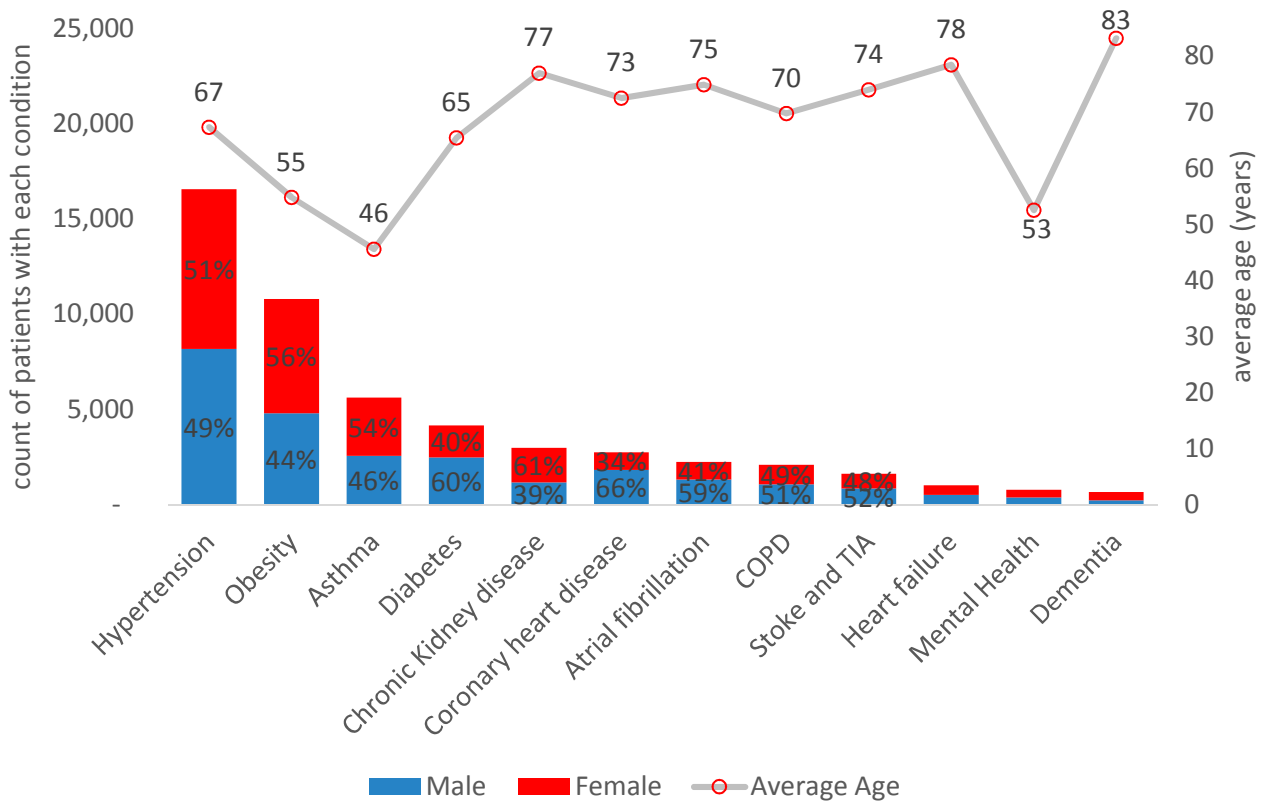


Figure 2 shows that hypertension was the most prevalent of the 12 long-term conditions considered in this report (16,560 patients recorded as having the JQIF hypertension criteria), and dementia the least prevalent (670 patients recorded as having the JQIF dementia criteria).

The highest mean ages of patients were for dementia (83 years), heart failure (78 years) and chronic kidney disease (77 years).

The conditions with the lowest mean ages of patients were asthma (46 years) and mental health (53 years).

**Figure 2: Count and mean average age of Jersey GP patients with each type of morbidity (note: patients with multi-morbidity are included in more than one condition)**



While many long-term conditions affected males and females relatively equally, some conditions affected one sex more than the other.

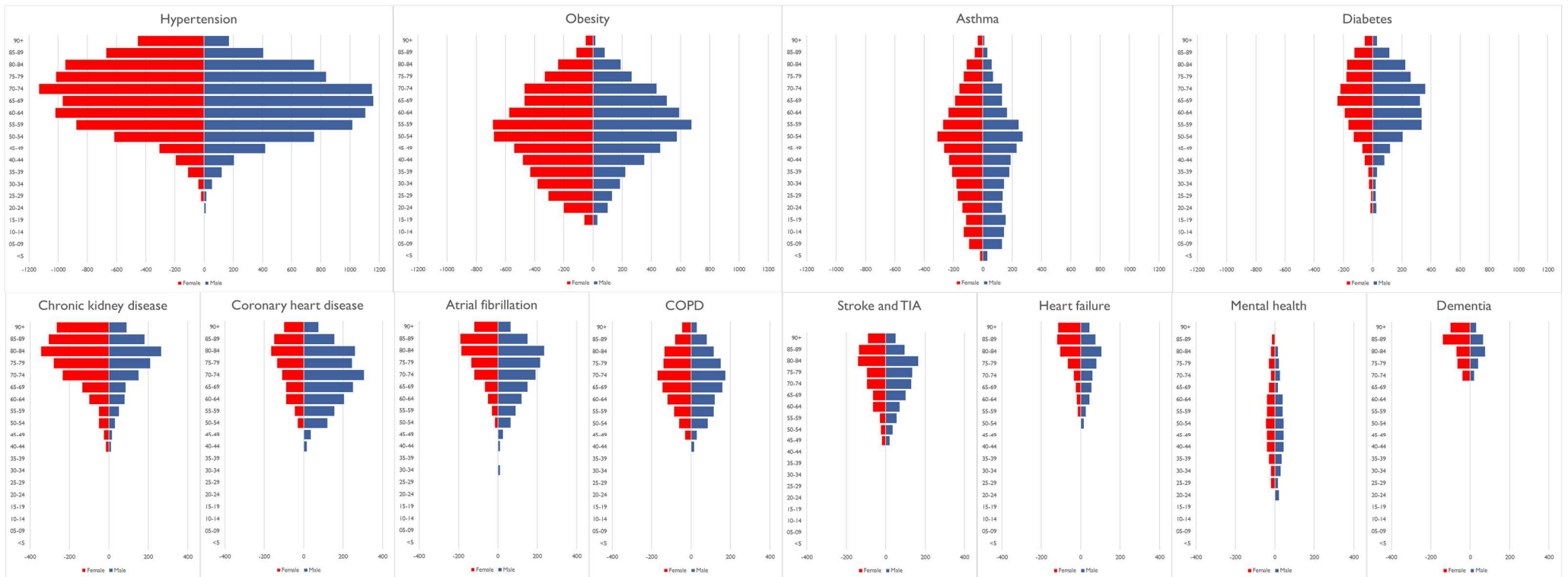
Of the 12 conditions considered:

- those conditions that were more likely to affect female patients were dementia (63% female and 37% male) and chronic kidney disease (61% female, 39% male)
- those conditions that were more likely to affect male patients were: coronary heart disease (66% male, 34% female), diabetes (60% male, 40% female) and atrial fibrillation (59% male, 41% female)

For some conditions, the sex difference was largely attributable to the age profile of the condition. For example, dementia and chronic kidney disease were most prevalent amongst older patients, in age groups in which there were more females than males.

Figure 3 shows the age-sex profile for each long-term condition. Asthma affected patients in all age bands from 0-90+ years, with a relatively equal split between males and females. In contrast, chronic kidney disease generally became prevalent after the age of 40, peaking in the 80-84 year age band, and affected more females than males.

Figure 3: Age and sex profiles of patients – per condition (note: includes both single condition and multiple condition patients)



Counts below 10 have been suppressed, and all counts rounded to the nearest 5: see the data in Annex 2

## Patients with a single morbidity

The majority (58%) of patients with one of the 12 conditions considered had only one condition (a single morbidity). However, some conditions were more likely to occur in isolation than others. Figure 4 shows the percentage of patients with each condition having only that condition (i.e. they were singly morbid). For example, 60% of patients with asthma, only had asthma, whereas 4% of patients who had heart failure had no other conditions.

**Figure 4: Percentage of patients with each condition having no other conditions**

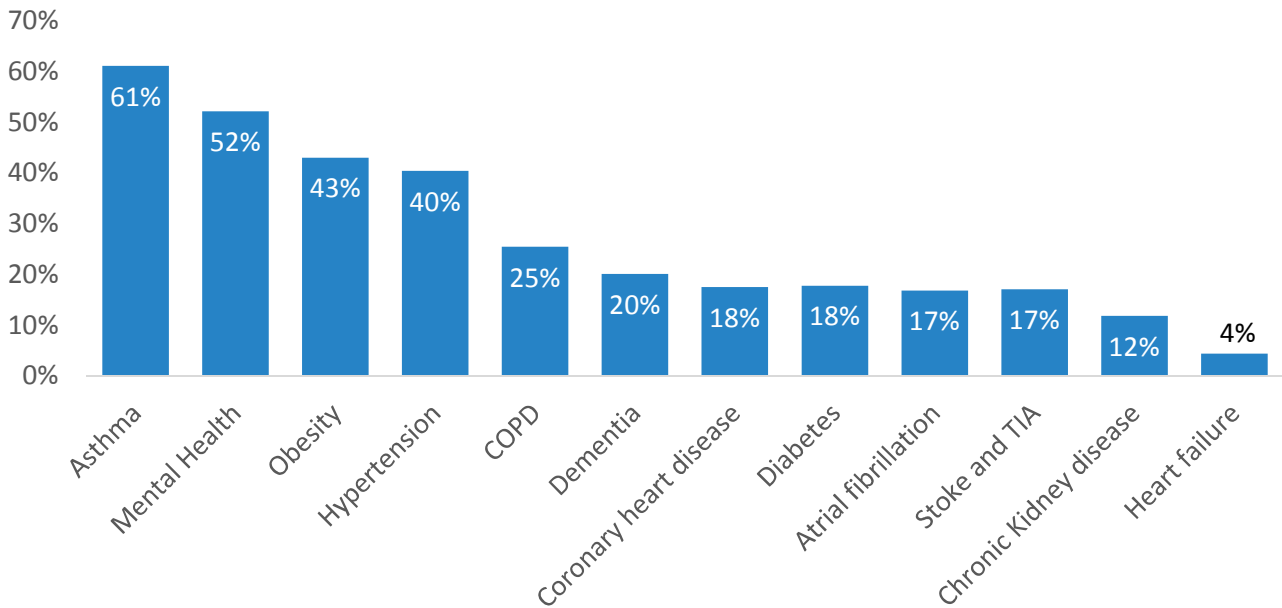


Figure 5 shows the counts and mean ages of patients with each condition and having no additional conditions. 6,400 patients had hypertension only, more than any other single condition; 50 patients who had heart failure had no other conditions. The age-sex profiles of single conditions are shown in Figure 6.

**Figure 5: Number and mean average age of patients having one condition only**

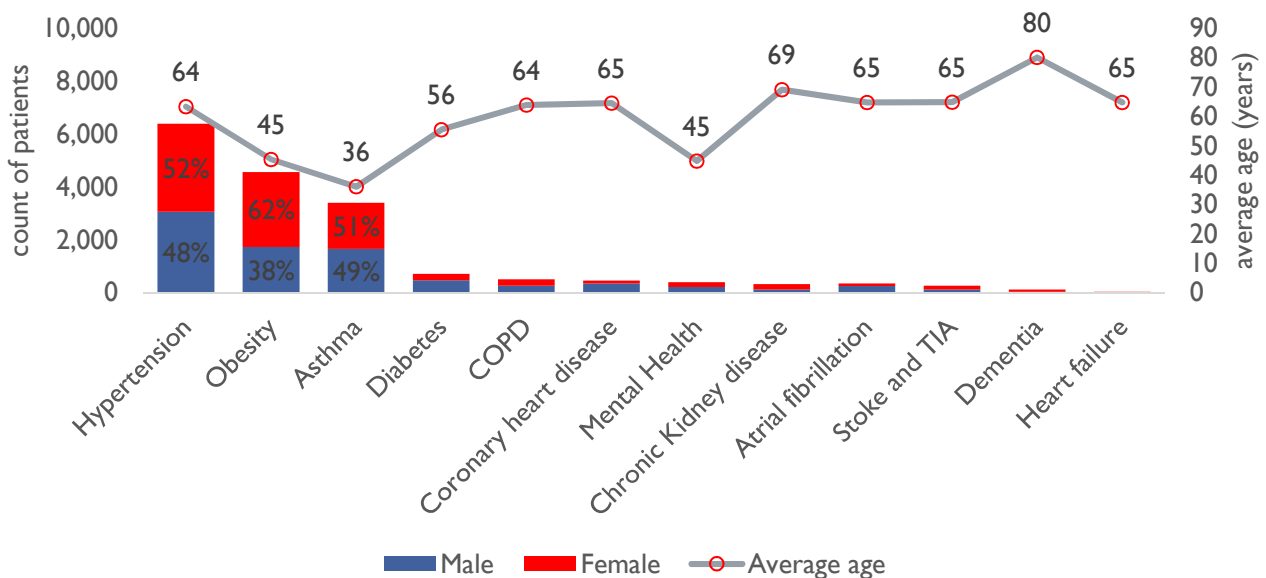
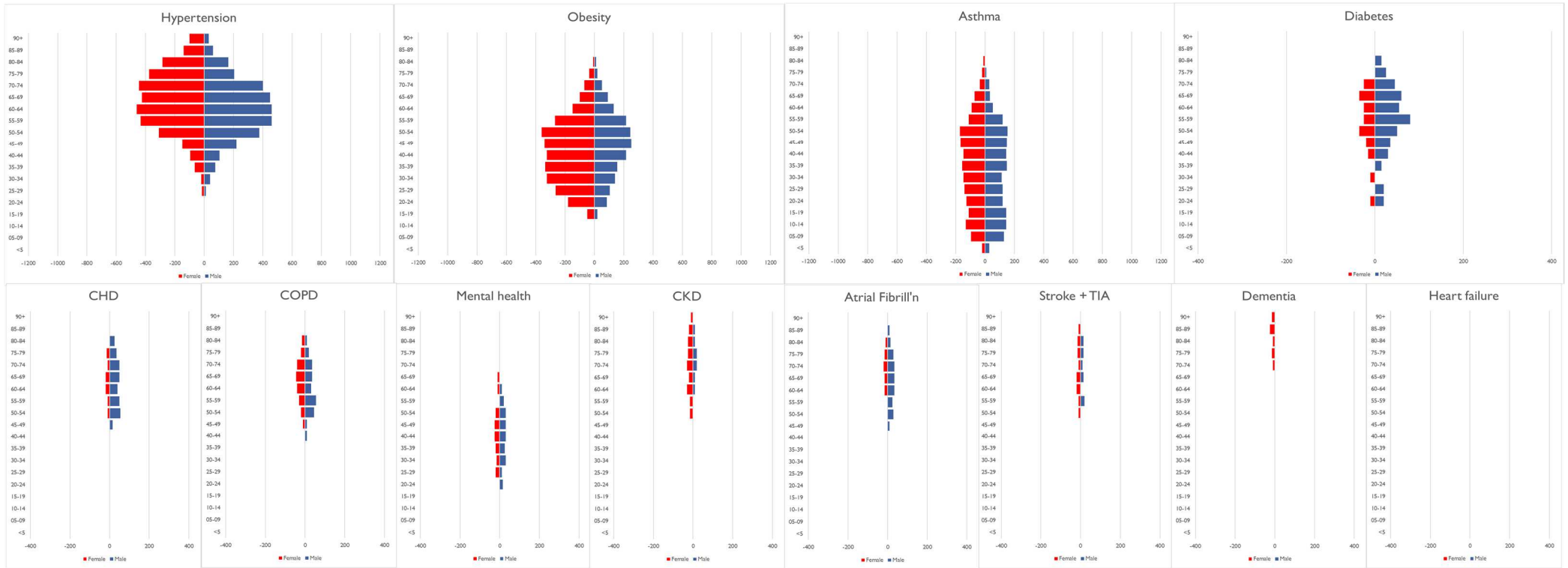


Figure 6: Age and sex profiles of patients with a single condition



Counts below 10 have been suppressed, and all counts rounded to the nearest 5: see the data in Annex 3

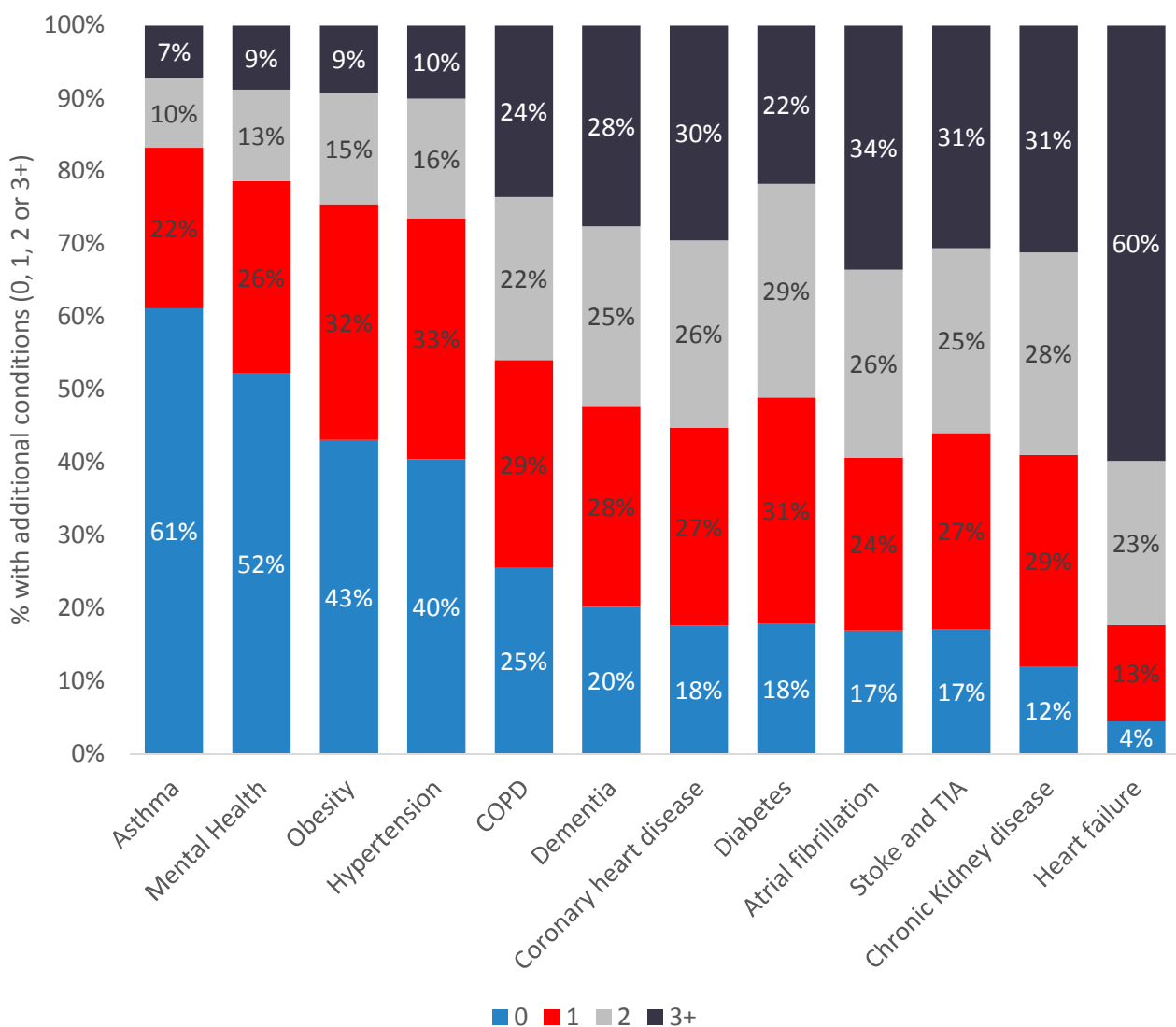
## Patients with more than one condition

### Conditions occurring in combination with other conditions

While some conditions were more likely to occur in isolation, others were more likely to occur in combination with at least one other.

Figure 7 shows the percentage of patients with each condition that had 0, 1, 2 or 3 or more other additional conditions.

**Figure 7: Percentage of patients with each condition having 0, 1, 2 or 3+ additional conditions**



The proportions of patients having more than one condition (i.e. having multi-morbidity) ranged between:

- 39% of patients with asthma having at least one other additional condition
- 96% of people who had heart failure having at least one other additional condition



## Combinations of two conditions (pairs)

Considering 12 conditions gives 66 possible pairs of condition. Table 1 shows the number of patients with each pair of conditions.

This table includes patients with two or more conditions; therefore, patients with more than two conditions will appear multiple times in the table (*e.g. a patient having diabetes, obesity and hypertension will appear in the following pairings of conditions: diabetes / obesity; obesity / hypertension; and diabetes / hypertension*).

**Table 1: Count of patients with at least two morbidities (rounded to nearest 5)**

	Atrial fibrillation	Asthma	Coronary heart disease	Chronic Kidney disease	COPD	Dementia	Diabetes	Heart failure	Hypertension	Mental Health	Obesity	Stoke and TIA
Atrial fibrillation		165	440	515	190	105	335	480	1365	15	555	330
Asthma	165		190	200	420	35	315	105	1175	60	1035	100
Coronary heart disease	440	190		550	310	100	590	345	1680	25	640	305
Chronic Kidney disease	515	200	550		285	170	630	390	2135	55	680	325
COPD	190	420	310	285		50	260	190	1030	35	440	160
Dementia	105	35	100	170	50		105	70	390	20	55	110
Diabetes	335	315	590	630	260	105		250	2585	70	1640	270
Heart failure	480	105	345	390	190	70	250		685	10	285	165
Hypertension	1365	1175	1680	2135	1030	390	2585	685		170	4535	1035
Mental Health	15	60	25	55	35	20	70	10	170		160	20
Obesity	555	1035	640	680	440	55	1640	285	4535	160		305
Stoke and TIA	330	100	305	325	160	110	270	165	1035	20	305	

Highest number of patients



Lowest number of patients

**Note – patients with 3 or more conditions will be included in more than one cell**

## Combinations of three conditions (triads)

Considering 12 conditions gives 220 possible condition triads.

Table 3 shows the ten triads with the largest numbers of patients. These triads include patients who have three or more conditions. Patients with more than three conditions will appear in more than one triad (e.g. a patient with hypertension, obesity, diabetes and CKD will appear in four triad groups: hypertension / obesity / diabetes; hypertension / diabetes / CKD; hypertension / obesity / CKD; and obesity / diabetes / CKD).

**Table 2: Combinations of three conditions most likely to occur together**

Condition triad	Count of patients
hypertension, obesity, diabetes	1,115
hypertension, obesity, chronic kidney disease	540
hypertension, diabetes, chronic kidney disease	515
hypertension, obesity, coronary heart disease	440
hypertension, diabetes, coronary heart disease	425
hypertension, chronic kidney disease, coronary heart disease	420
hypertension, obesity, asthma	395
hypertension, chronic kidney disease, atrial fibrillation	395
hypertension, obesity, atrial fibrillation	390
hypertension, atrial fibrillation, heart failure	330

A list of all triads with patient counts of 100 or more can be found in Annex 5.

Figures 8, 9 and 10 (below and overleaf) show the three largest triads, together with the number of patients in each of the constituent conditions of that triad. In total, 23,890 patients had either hypertension, obesity, diabetes or any combination of these conditions, accounting for three-quarters (76%) of all patients with at least one condition.

**Figure 8: Patients with hypertension, obesity or diabetes**

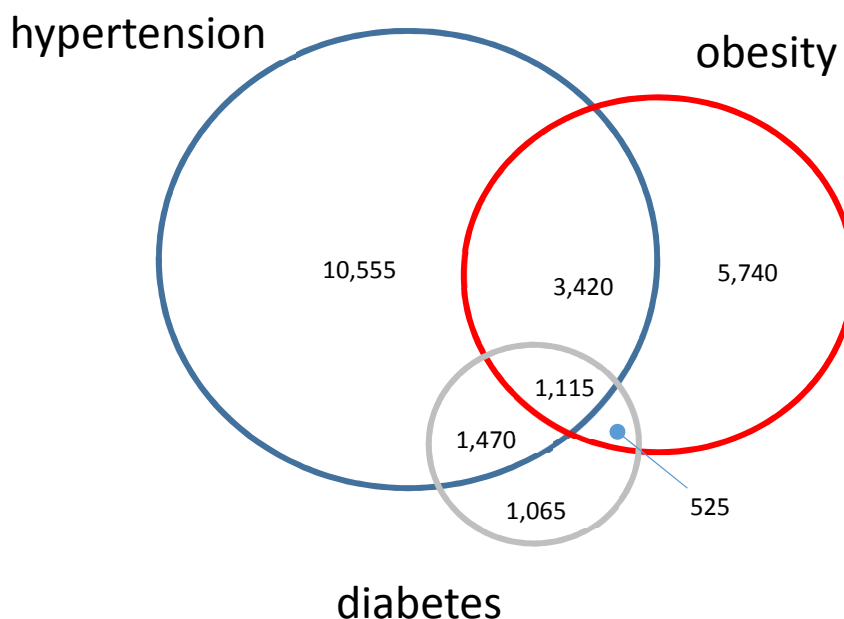


Figure 9: Combination of patients with hypertension, obesity or chronic kidney disease

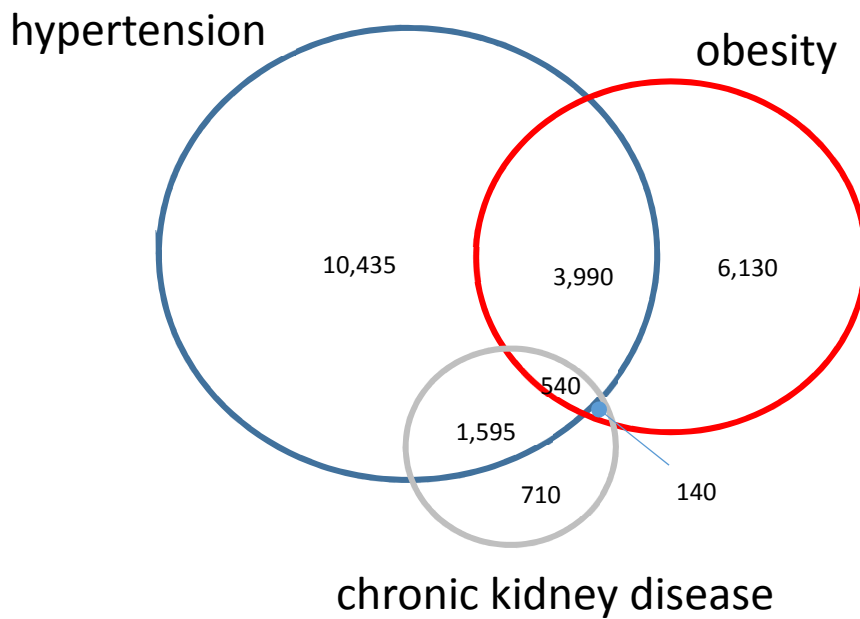


Figure 10: Combination of patients with hypertension, diabetes or chronic kidney disease

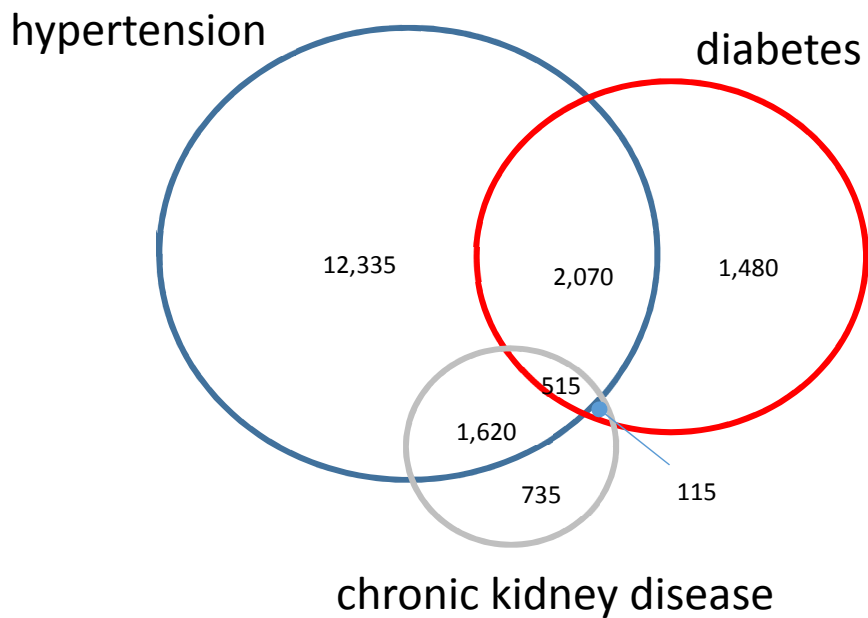
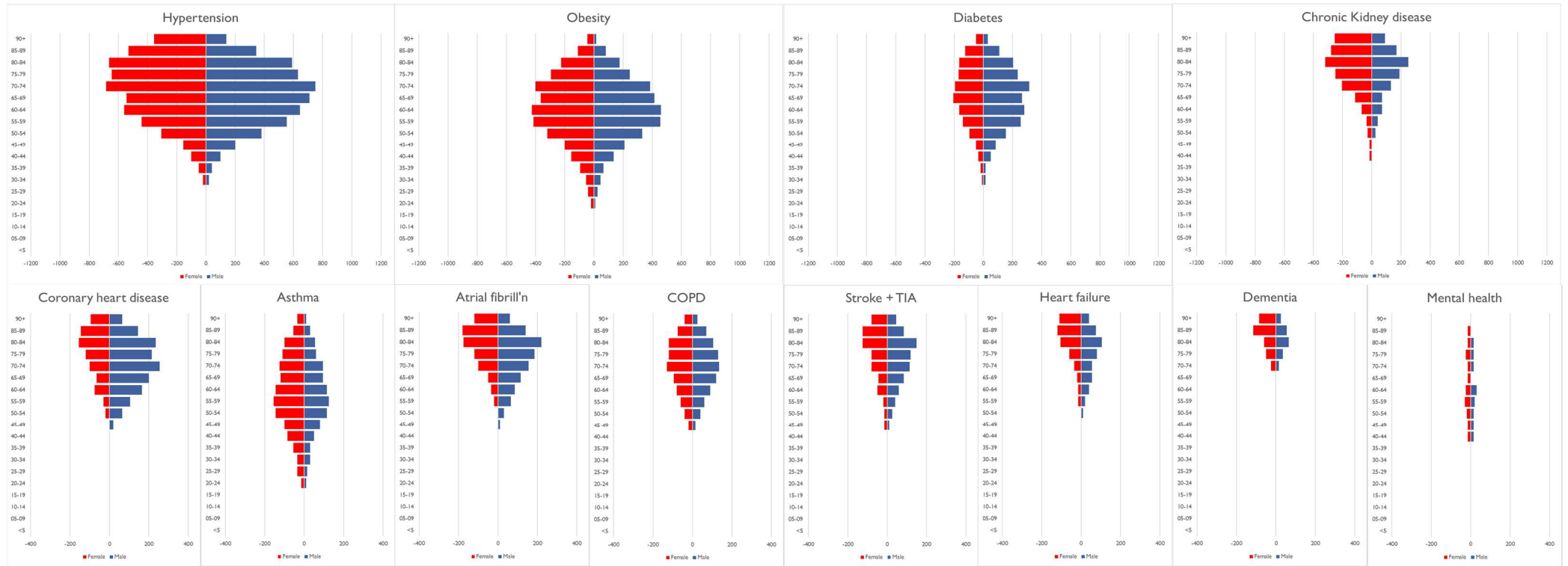


Figure 11 shows the age-sex profile for each condition, only for patients with two or more (multiple) conditions.

Figure 11: Age and sex profiles of patients with more than one condition only (i.e. excluding patients with just one of the conditions) – per condition



Counts below 10 have been suppressed, and all counts rounded to the nearest 5: see the data in Annex 4

## Patients with four or more conditions

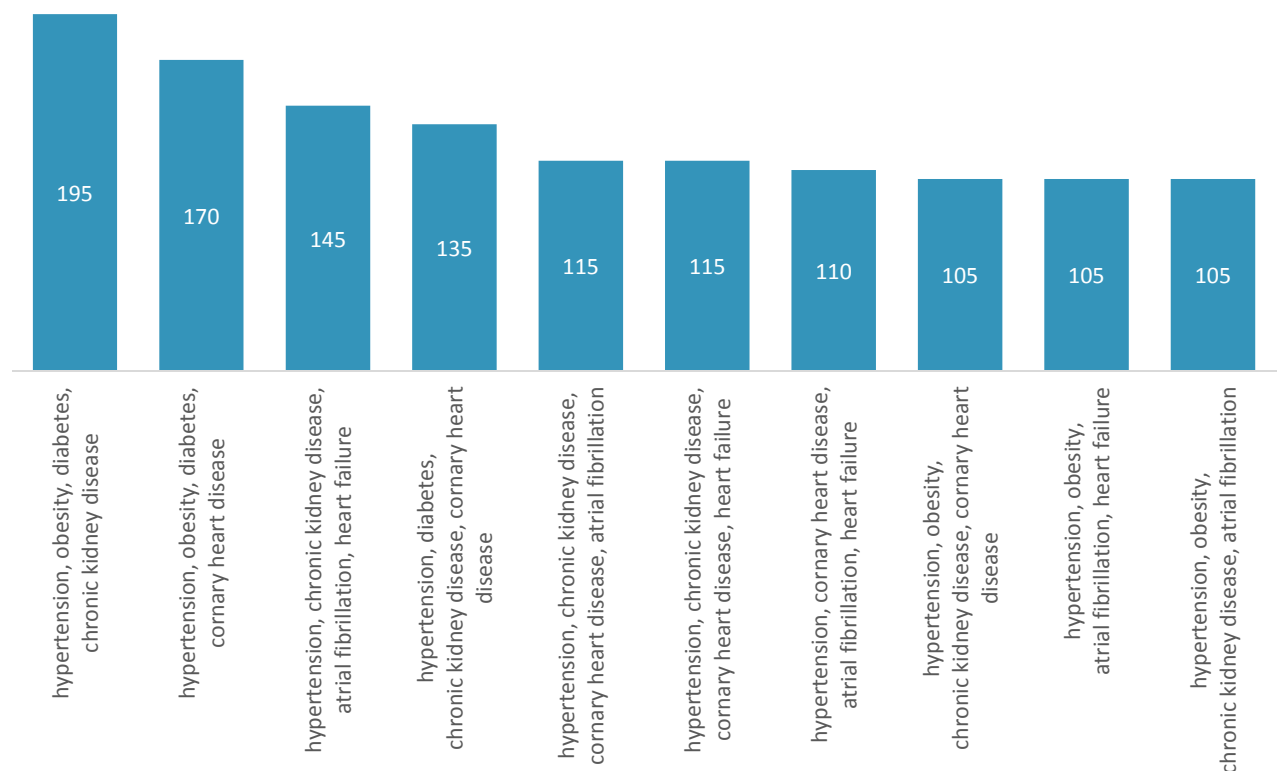
Around 1,855 patients had four or more of the 12 conditions considered in this report – see Table 3.

**Table 3: Number of patients with four or more conditions**

	Female	Male	All
Patients with 4 or more conditions	920	935	1,855

Considering 12 conditions gives 715 possible combinations of 4 conditions (quads); 561 of these ‘quads’ were found in at least one patient. Figure 12 shows the ten quad combinations with the largest count of patients. These quads included patients with four or more conditions so some patients (those with more than 4 conditions) will appear in more than one quad (*e.g. a patient with 5 conditions will appear in 5 quads, a patient with 6 conditions will appear in 15 quads*).

**Figure 12: Most prevalent combinations of four morbidities**



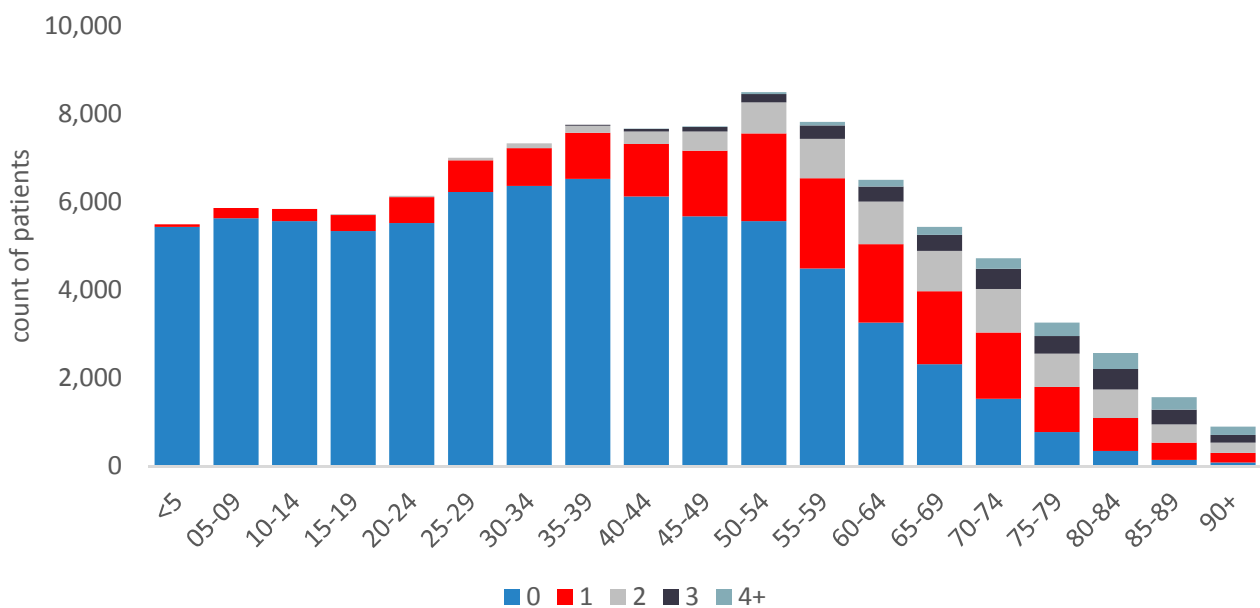
## Multi-morbidity by age

**Table 4: Mean age of patients with different numbers of long-term conditions**

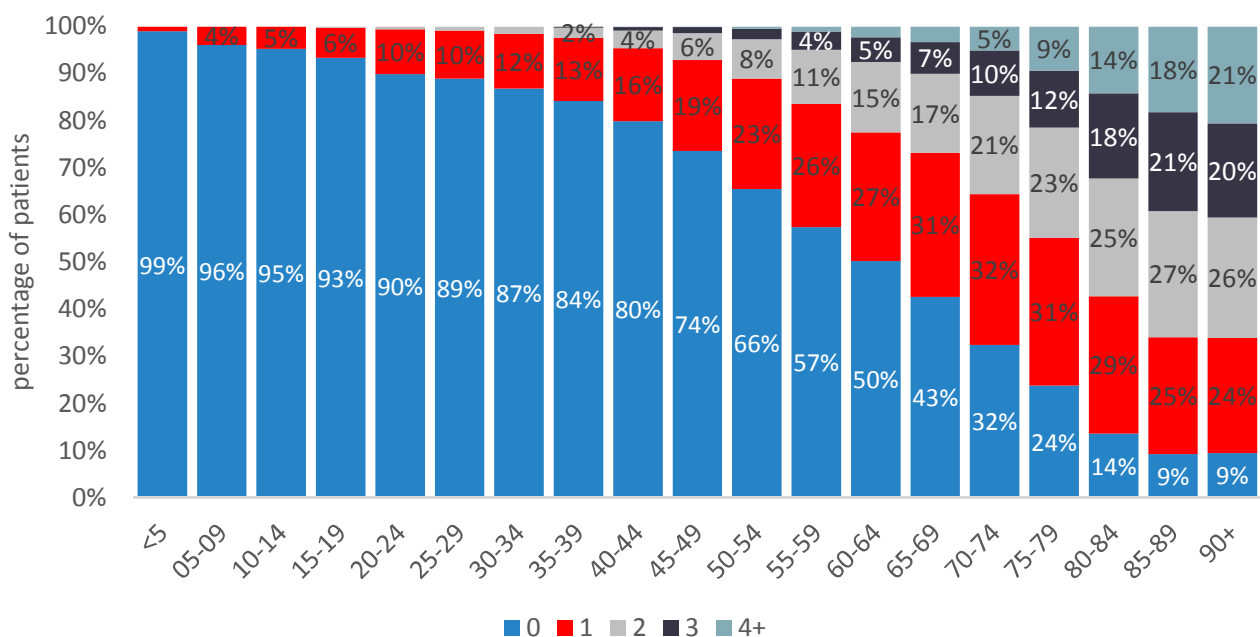
Number of conditions	0	1	2	3	4+
Mean average age (years)	34	54	65	71	76

Figures 13 and 14 show the distribution of multi-morbidity with age in five-year age bands, expressed in terms of the number of individual patients and as the percentage of each age band, respectively.

**Figure 13: Number of conditions by age; count of individual patients**



**Figure 14: Number of conditions by age; percentage of age band<sup>3</sup>**



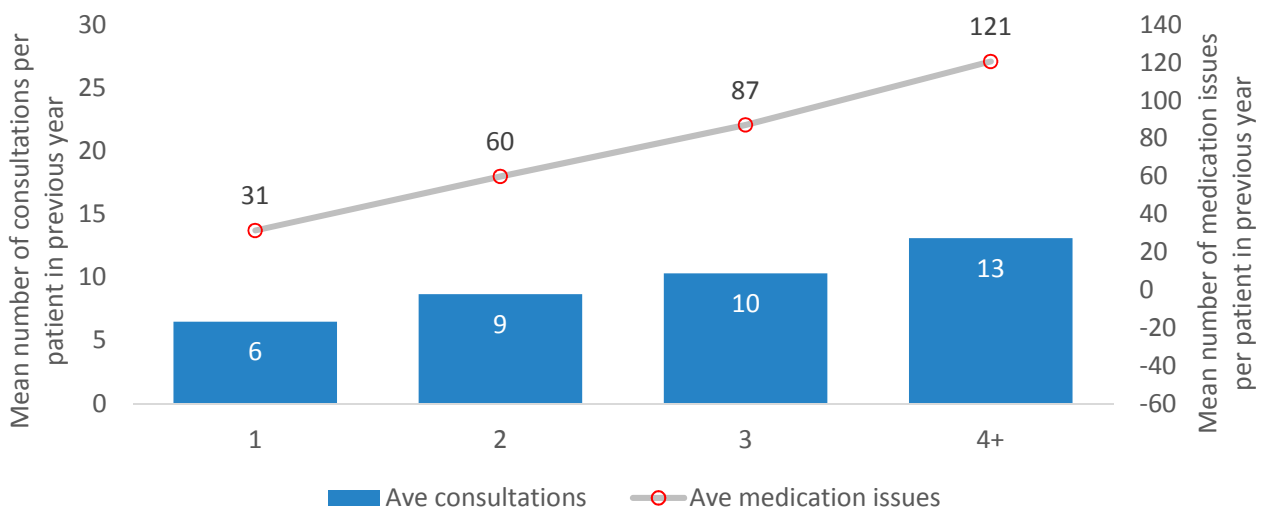
<sup>3</sup> The percentages of each age-band having different numbers of long-term conditions are derived from the age-band population estimates published for year-end 2019 by Statistics Jersey: *Jersey Resident Population – 2019 estimate*; published June 2020.

## GP consultations and medication by morbidity

The average (mean) number of face-to-face consultations that patients had with their GP, and the mean number of medication issues<sup>4</sup> to patients over the previous twelve months, were also analysed. See Annex 1 for the criteria used to define a consultation and issues of medication.

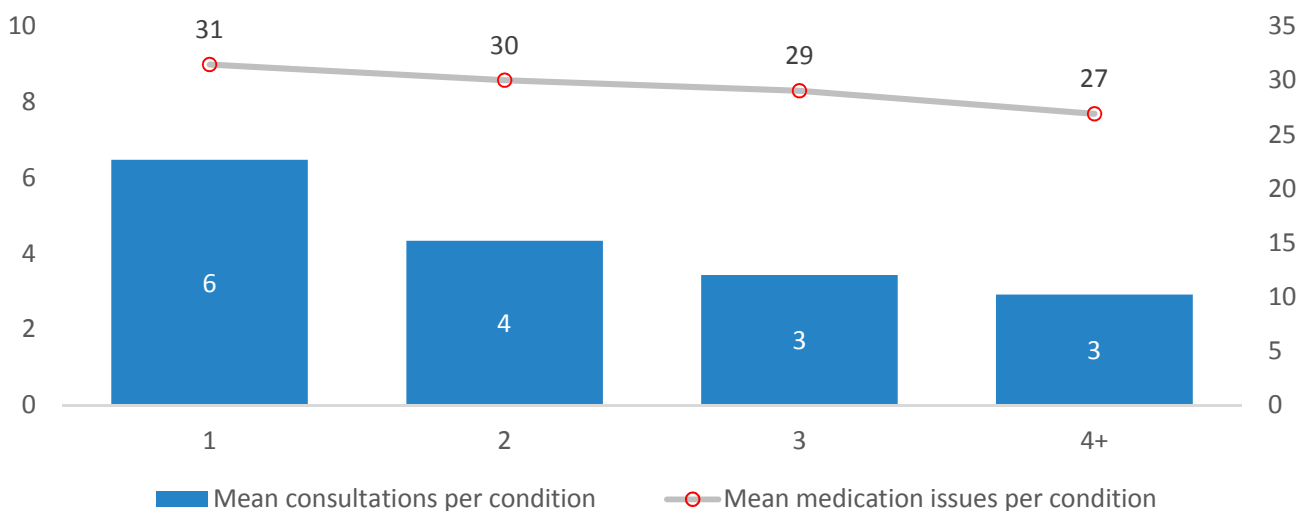
Patients with a greater number of long-term conditions tended to have more consultations with their GP and were issued more medication (Figure 15): patients with one long-term condition saw a GP 6 times per year and had 31 medication issues per year, on average; patients with four or more long-term conditions saw a GP 13 times per year and had 121 medication issues per year, on average.

**Figure 15: Mean number of consultations and issues of medication per patient per year, by number of conditions**



If the number of consultations and issues of medication are put *on a per condition basis* (by dividing by the number of conditions which the patient has), Figure 16 shows that the mean number of consultations per condition decreases as the number of conditions increases, whilst the number of issues of medication remains relatively flat as the number of conditions increases.

**Figure 16: Mean number of consultations and issues of medication per patient per year, per condition**



<sup>4</sup> “Medication issues” are the GPCS term for a course of medication being issued to a patient. The medication issues are restricted to a month’s course; a patient with ongoing prescriptions will have 12 medication issues per drug per year.

## Annexes

### Annex 1: GPCS search criteria

The GPCS search criteria used were as follows:

#### POPULATION

The search criteria for currently 'active' patients was

Practice list size estimate JQIF2019 (5 years):

Includes patients from within the 'Registered Patients' parent search where:

**EITHER** Patients have had a consultation in the 5 years before the search date

**OR** Patient has a **registration history** where **GP Links Registration Status** is patient has presented, medical card received etc... and the date status added is within 6 months before the search date (the reference date)

#### CONDITIONS

Atrial Fibrillation: AF001 - Patients are included on the atrial fibrillation register

Asthma AST001 - Patients included on the asthma register

CHD CHD001 - Patients are included on Coronary Heart Disease Register

CKD CKD005 - Patients are included on CKD register

COPD COPD001 - Patients on the COPD register

Dementia DEM001 - Patients on the Dementia Register

Diabetes DM017 - Patients on Diabetic Register

Heart Failure HF001 - Patients on Heart Failure Register

Hypertension HYP001 - Patients on hypertension register

Mental Health MH001 - Patients on Mental Health Register

Obesity OB002 - Patients on Obesity register

Stroke and TIA STIA - Patients on Stroke / TIA Register

Order by date and check that the latest date is after, or on, 5 years before the search date.

#### CONSULTATIONS and MEDICATION

Consultation Include **Consultations** where:  
**Date** is: after 1 year before the search date; and before the search date  
**AND**  
**Type of Consultation** is either: Emergency consultation; Extended hours consultation; face to face consultation; face to face consultation with relative / carer; GP surgery; Home visit note; or Routine Consultation

Medication Include **Medication Issues** where the **Date of Issue** is: after 1 year before the search date; and before the search date



## Annex 2: all morbidity profiles; by age and sex of patient

These tables contain the data behind the charts in Figure 3: they are counts of patients that have the 13 conditions under analysis (either as a single condition or one of a number of conditions). Counts below 10 have been suppressed and numbers rounded to the nearest 5.

STIA		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	20	35	55	70	100	130	135	165	95	50
Female	~	~	~	~	~	~	~	~	~	~	20	25	30	65	65	95	95	140	135	90	780
All	~	~	~	~	~	~	~	~	~	15	40	55	85	135	160	220	230	300	230	140	1640

OB		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	30	100	130	185	220	350	460	575	675	590	505	435	265	190	80	15	4800
Female	~	~	~	60	200	305	380	430	480	540	680	685	575	470	470	330	240	115	50	6005	
All	~	~	~	85	300	435	560	650	835	1000	1255	1360	1160	975	905	595	425	195	65	10805	

MH		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	20	15	30	35	45	45	45	40	40	15	25	20	15	~	~	395
Female	~	~	~	~	~	20	20	30	40	40	45	40	40	30	20	30	20	15	~	395	
All	~	~	~	10	25	35	50	60	80	80	85	80	80	40	45	45	35	15	~	790	

HYP		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	10	15	55	120	205	420	755	1015	1105	1160	1150	835	755	405	170	8180
Female	~	~	~	~	~	20	40	110	195	305	615	875	1020	970	1130	1015	950	670	455	8380	
All	~	~	~	~	15	35	95	230	400	730	1370	1890	2120	2130	2275	1850	1705	1075	625	16560	

HF		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	15	25	45	55	60	80	105	75	45
Female	~	~	~	~	~	~	~	~	~	~	~	~	15	20	25	35	65	105	120	115	505
All	~	~	~	~	~	~	~	~	~	~	~	15	40	65	80	95	145	210	195	155	1020

DIA		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	25	20	20	30	80	120	205	335	335	325	360	260	225	115	30	2490
Female	~	~	~	~	15	10	25	30	55	70	130	165	190	240	220	180	175	125	55	1685	
All	~	~	~	15	40	35	45	60	135	190	335	500	525	565	580	440	400	240	85	4180	

DEM		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	20	40	75	65	30
Female	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	40	65	70	140	100	425
All	~	~	~	~	~	~	~	~	~	~	~	~	~	~	15	60	105	145	205	130	670

COPD		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	15	30	85	115	120	160	175	150	115	80	30
Female	~	~	~	~	~	~	~	~	~	~	30	60	85	120	145	170	140	135	80	45	1025
All	~	~	~	~	~	~	~	~	~	25	60	145	200	240	300	345	290	255	160	75	2100

CKD		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	10	15	30	50	80	85	150	210	265	180	90
Female	~	~	~	~	~	~	~	~	~	15	25	50	50	100	135	235	280	345	305	265	1810
All	~	~	~	~	~	~	~	~	10	25	40	75	95	180	220	385	490	610	485	355	2985

CHD	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	15	35	120	155	205	250	305	245	260	155	75
Female	~	~	~	~	~	~	~	~	~	~	30	45	90	90	110	135	165	150	100	930
All	~	~	~	~	~	~	~	~	15	45	150	200	300	340	415	380	425	305	175	2760

AST	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	30	130	145	155	130	135	145	180	190	230	270	245	165	130	130	70	60	30	10
Female	20	95	130	115	140	170	180	210	230	265	310	270	235	190	160	130	110	55	35	3055
All	50	230	275	270	270	310	320	385	425	495	580	515	400	325	290	200	165	85	45	5635

AF	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	10	~	10	25	65	90	120	150	190	215	235	150	65
Female	~	~	~	~	~	~	~	~	~	~	15	30	50	65	120	135	185	190	120	920
All	~	~	~	~	~	~	10	~	20	30	80	120	170	215	310	350	420	340	185	2255

### Annex 3: single morbidity profiles; by age and sex of patient

These tables contain the data behind the charts in Figure 6: they are counts of patients that have the 13 conditions under analysis as a single condition only (patients with the conditions as one of a number of conditions are excluded). Counts below 10 have been suppressed and numbers rounded to the nearest 5.

STIA	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total	
	Male	~	~	~	~	~	~	~	~	~	~	~	20	~	15	10	15	15	~	~	125
Female	~	~	~	~	~	~	~	~	~	~	10	10	20	20	10	15	15	10	~	~	145
All	~	~	~	~	~	~	~	~	10	15	20	30	25	35	25	30	30	15	15	270	

OB	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	20	85	105	140	155	215	250	245	215	130	90	50	20	10	~	~
Female	~	~	~	50	180	265	325	335	325	340	360	270	150	100	70	35	10	~	~	2835
All	~	~	~	75	265	370	465	490	540	590	610	490	280	190	120	60	25	~	~	4575

MH	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	15	10	30	25	30	30	30	20	10	~	~	~	~	~	~
Female	~	~	~	~	~	20	15	20	25	25	20	~	10	10	~	~	~	~	~	180
All	~	~	~	10	25	30	40	50	50	50	50	30	25	15	10	~	~	~	~	405

HYP	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	10	40	75	105	220	375	460	460	450	400	205	165	60	30
Female	~	~	~	~	~	15	20	65	95	150	310	435	460	425	445	375	285	140	100	3320
All	~	~	~	~	10	25	60	140	200	370	685	895	915	880	845	580	450	205	130	6395

HF		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Female	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	20
All	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	45

DIA		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	20	20	~	15	30	35	50	80	55	60	45	25	15	~	~	~
Female	~	~	~	~	10	~	10	~	15	20	35	25	25	35	25	~	~	~	~	~	240
All	~	~	~	10	30	25	20	25	50	55	85	105	80	90	65	35	25	10	~	~	715

DEM		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~
Female	~	~	~	~	~	~	~	~	~	~	~	~	~	~	10	15	10	25	15	~	85
All	~	~	~	~	~	~	~	~	~	~	~	~	~	~	20	25	20	35	20	~	130

COPD		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	10	10	45	55	30	35	35	20	10	~	~
Female	~	~	~	~	~	~	~	~	~	~	10	20	30	40	45	40	20	15	~	~	240
All	~	~	~	~	~	~	~	~	~	15	20	65	85	70	85	80	40	25	10	10	510

CKD		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	~	~	10	10	20	20	10	10	~
Female	~	~	~	~	~	~	~	~	~	~	~	15	15	30	20	30	25	25	20	10	210
All	~	~	~	~	~	~	~	~	~	~	15	25	25	40	30	50	50	35	35	10	330

CHD	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	15	55	50	40	50	50	35	25	~	~
Female	~	~	~	~	~	~	~	~	~	~	10	10	20	20	10	15	~	~	~	115
All	~	~	~	~	~	~	~	~	~	20	65	60	60	75	65	50	35	10	10	465

AST	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	30	130	145	145	120	120	115	150	145	150	155	120	55	35	30	10	~	~	~
Female	20	95	130	110	125	140	145	155	145	165	170	110	90	70	35	20	10	~	~	1745
All	50	230	275	255	245	260	255	305	290	310	325	235	145	110	70	30	15	~	~	3405

AF	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	10	30	25	35	35	35	30	15	10	~
Female	~	~	~	~	~	~	~	~	~	~	~	~	15	15	20	15	10	~	~	105
All	~	~	~	~	~	~	~	~	15	15	40	35	50	50	55	40	25	20	~	360

#### Annex 4: multi-morbidity profiles; by age and sex of patient

These tables contain the data behind the charts in Figure 11: they are counts of patients that have the 13 conditions under analysis as part of a multi-morbidity (patients with only one condition are excluded). Counts below 10 have been suppressed and numbers rounded to the nearest 5.

STIA	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	10	25	40	60	85	115	120	150	85	45
Female	~	~	~	~	~	~	~	~	~	15	15	20	50	45	80	80	125	125	80	635
All	~	~	~	~	~	~	~	~	~	25	35	55	110	130	195	195	270	210	130	1365

OB	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	10	25	45	65	135	210	330	455	460	415	385	245	175	80	15
Female	~	~	~	~	20	40	55	95	155	200	320	415	425	365	400	295	225	110	45	3170
All	~	~	~	15	30	65	100	155	290	410	650	870	885	785	785	540	405	185	65	6230

MH	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	15	15	15	20	30	~	15	15	15	~	~
Female	~	~	~	~	~	~	~	~	15	15	20	30	25	15	15	25	15	15	~	215
All	~	~	~	~	~	~	10	15	30	30	35	50	55	25	35	40	30	15	~	385

HYP	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	20	40	100	200	380	555	645	710	750	630	590	345	140
Female	~	~	~	~	~	~	20	50	100	155	305	440	560	545	685	645	665	530	355	5055
All	~	~	~	~	~	10	35	90	200	360	680	995	1205	1255	1430	1275	1255	875	495	10165

HF		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	10	20	40	55	55	80	105	75	40
Female	~	~	~	~	~	~	~	~	~	~	~	~	15	15	20	35	60	105	120	110	485
All	~	~	~	~	~	~	~	~	~	~	~	15	35	60	75	90	135	210	195	150	975

DIA		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	15	15	50	85	155	255	280	265	315	235	205	110	30
Female	~	~	~	~	~	~	~	10	20	35	50	95	140	165	205	195	170	165	125	50	1445
All	~	~	~	~	~	~	~	25	35	85	135	250	395	445	470	510	410	375	230	85	3465

DEM		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	15	35	65	55	25
Female	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	25	50	60	115	85	340
All	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	40	80	125	170	110	545

COPD		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	15	40	60	90	120	135	130	105	70	25
Female	~	~	~	~	~	~	~	~	~	~	20	40	60	80	95	130	120	120	75	40	785
All	~	~	~	~	~	~	~	~	~	10	35	80	120	170	220	265	250	225	150	60	1590

CKD		<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	~	~	25	40	70	70	130	190	250	170	90
Female	~	~	~	~	~	~	~	~	~	15	15	30	35	70	115	205	250	320	280	255	1600
All	~	~	~	~	~	~	~	~	10	20	25	55	75	140	185	335	440	570	450	345	2655



CHD	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	20	65	105	165	200	255	215	235	145	65
Female	~	~	~	~	~	~	~	~	~	~	20	30	75	65	100	120	155	145	95	815
All	~	~	~	~	~	~	~	~	10	25	85	140	240	265	355	330	390	290	165	2295

AST	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	10	15	30	30	50	80	115	125	115	95	95	60	55	30	10
Female	~	~	~	~	15	35	35	55	85	100	145	155	145	120	125	110	100	55	35	1310
All	~	~	~	15	25	50	65	85	135	180	255	280	260	215	220	170	155	80	45	2230

AF	<5	05-09	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90+	Total
	Male	~	~	~	~	~	~	~	~	~	10	30	65	85	115	155	185	220	140	60
Female	~	~	~	~	~	~	~	~	~	~	~	20	35	50	100	120	175	180	120	815
All	~	~	~	~	~	~	~	~	~	15	40	85	120	165	250	305	395	325	185	1895

### Annex 5: Triad groups containing 100 or more patients

Triad combination	Count of patients
Hypertension, Obesity, Diabetes	1,115
Hypertension, Obesity, Chronic kidney disease	540
Hypertension, Diabetes, Chronic kidney disease	515
Hypertension, Obesity, Coronary heart disease	440
Hypertension, Diabetes, Coronary heart disease	425
Hypertension, Chronic kidney disease, Coronary heart disease	420
Hypertension, Obesity, Asthma	395
Hypertension, Chronic kidney disease, Atrial fibrillation	395
Hypertension, Obesity, Atrial fibrillation	390
Hypertension, Atrial fibrillation, Heart failure	330
Hypertension, Coronary heart disease, Atrial fibrillation	320

Triad combination	Count of patients
Hypertension, Chronic kidney disease, Heart failure	305
Hypertension, Obesity, COPD	275
Hypertension, Chronic kidney disease, Stroke and TIA	260
Hypertension, Diabetes, Atrial fibrillation	255
Hypertension, Coronary heart disease, Heart failure	245
Hypertension, Atrial fibrillation, Stroke and TIA	235
Obesity, Diabetes, Chronic kidney disease	230
Hypertension, Coronary heart disease, Stroke and TIA	230
Hypertension, Obesity, Stroke and TIA	225
Obesity, Diabetes, Coronary heart disease	225
Hypertension, Chronic kidney disease, COPD	205

### Annex 5: Triad groups containing 100 or more patients (continued)

Triad combination	Count of patients
Hypertension, Obesity, Heart failure	205
Hypertension, Coronary heart disease, COPD	205
Hypertension, Diabetes, Asthma	200
Hypertension, Diabetes, COPD	200
Hypertension, Diabetes, Stroke and TIA	200
Hypertension, Asthma, COPD	190
Hypertension, Diabetes, Heart failure	185
Chronic kidney disease, Atrial fibrillation, Heart failure	185
Diabetes, Chronic kidney disease, Coronary heart disease	160
Chronic kidney disease, Coronary heart disease, Heart failure	150
Hypertension, Chronic kidney disease, Asthma	145

Triad combination	Count of patients
Coronary heart disease, Atrial fibrillation, Heart failure	145
Chronic kidney disease, Coronary heart disease, Atrial Fibrillation	145
Obesity, Atrial fibrillation, Heart failure	145
Obesity, Diabetes, Asthma	145
Obesity, Diabetes, Atrial fibrillation	140
Hypertension, Chronic kidney disease, Dementia	130
Hypertension, Atrial fibrillation, COPD	130
Obesity, Chronic kidney disease, Atrial fibrillation	130
Hypertension, Chronic kidney disease, Coronary heart disease	130
Hypertension, Stroke and TIA, Heart failure	125
Hypertension, COPD, Heart failure	120

**Annex 5: Triad groups containing 100 or more patients (continued)**

Triad combination	Count of patients
Diabetes, Chronic kidney disease, Heart failure	120
Obesity, Chronic kidney disease, Heart failure	115
Diabetes, Atrial fibrillation, Heart failure	115
Obesity, Diabetes, COPD	110
Hypertension, Coronary heart disease, Asthma	110
Chronic kidney disease, Atrial fibrillation, Stroke and TIA	110
Diabetes, Chronic kidney disease, Atrial fibrillation	110

Triad combination	Count of patients
Hypertension, COPD, Stroke and TIA	105
Diabetes, Coronary heart disease, Heart failure	105
Obesity, Asthma, COPD,	105
Hypertension, Asthma, Atrial fibrillation	105
Obesity, Diabetes, Heart failure	100
Obesity, Coronary heart disease, Atrial fibrillation	100