Profile of Long Term Conditions in Swindon: Overview of Prevalence, Co-Morbidities, Costs and Deprivation

Swindon Borough Council/Swindon Public Health

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Glossary of Terms and Abbreviations

Abbreviated Term	Full Term	Short Definition
BMI	Body Mass Index	A person's BMI (calculated as kg/m^2) is a guide to how that person's weight can be classified.
CHD	Coronary Heart Disease	A group of conditions characterised by narrowing of the coronary artery, which supplies blood to the heart, e.g. heart attack (myocardial infarction) and angina.
CKD	Chronic Kidney Disease	Long-term impairment of renal (kidney) functioning.
COPD	Chronic Obstructive Pulmonary Disease	Damage to and/or narrowing of the lungs resulting in coughs, breathlessness and infections. Chronic bronchitis and emphysema are types of COPD.
CVD	Cardiovascular Disease	Over-arching term for disease affecting the heart and/or circulatory system. The most common forms are angina, myocardial infarction and stroke.
DSR	Directly Standardised Rate	A statistical rate which is standardised to allow for differences in the structures of the different populations which are being examined, so allowing fairer comparisons.
HES	Hospital Episode System	The national database recording patient activity in English hospitals.
HF	Heart Failure	Impairment and weakness in the pumping action of the heart.
HNA	Health Needs Assessment	The systematic approach in Public Health to assessing the health needs of a population, usually entailing published reports on specific topics.
ID/IMD	Indices of Deprivation/Indices of Multiple Deprivation (English)	A measure of deprivation at small area level across England. Areas are ranked from least to most deprived on seven different dimensions of deprivation and an overall measure of multiple deprivation.
LSOA	Lower Super Output Area	A small area below electoral ward level; there are about 32,000 LSOAs in England and 37 in Swindon UA.
LTC(s)	Long Term Condition(s)	Condition(s) which cannot be cured, but which can be controlled for extended periods. However, there is no definitive method of measuring the extent of LTCs in a population.
LTHP&D (or LTH)	Long Term Health Problem or Disability	The focus of a question in 2011 Census, (with some affinity to a LTC).
LVD	Left Ventricular Disease (or Failure)	Form of Heart Failure where the left ventricle does not pump blood satisfactorily.
	Period Prevalence	Rate of cases of a disease existing within a given period (e.g. 10 per 1,000 in 2015).
	Point Prevalence	Rate of cases of a disease existing at a given point in time (e.g. 5 per 1,000 on 31st March 2016).

MI	Myocardial Infarction	An acute condition, commonly known as a heart attack, involving blockage of the coronary artery, which supplies blood to the heart.
QOF	Quality and Outcomes Framework	A payment system for GPs recording the prevalence of certain LTCs.
SBC	Swindon Borough Council	The Council providing local services in the Swindon area.
Swindon CCG	Swindon Clinical Commissioning Group	The statutory authority commissioning primary and secondary health services for patients registered with its GPs. Swindon CCG broadly speaking, covers Swindon UA and Shrivenham ward.
SMI	Severe Mental Illness	A psychosis such as schizophrenia or Bipolar Disorder.
Swindon UA	Swindon Unitary Authority	The Unitary Authority established as Swindon Borough Council.
TIA	Transient Ischaemic Attack	Sometimes called a “mini-stroke”, a stroke which does not last longer than 24 hours. In QOF and Symphony TIA figures are included within stroke figures.
MM	Multi-Morbidity (Morbidities)	Status where a person has two or more LTCs. (Thus, one disease can be “co-morbid” with another one.)

Executive Summary: "Profile of Long Term Conditions in Swindon"

(i) Introduction

Improvements in medical treatment and success in public health interventions have resulted in people having longer lives, often with some form of long-term morbidity (illness) or disability. In England, the Department of Health estimates that over a quarter of the population has a Long Term Condition (LTC). An increasing number of these people also have a co-morbidity (or co-morbidities) and so are in a state of Multi-Morbidity (MM). The on-going management of LTCs and Multi-Morbidity is now a central task of the NHS and care services.

In this profile for Swindon, we have drawn upon existing data sources (such as the 2011 Census and QOF registers) to estimate the "LTC prevalence pool" in Swindon UA. We have also applied the Symphony Model to the Swindon population to estimate the magnitude of groups of LTC patients and impute their activity in our local health and social care system. Symphony is a record-linkage project, which has used "real life" health and social care data from Somerset to identify patterns of activity in a population. We also used the model to investigate other issues relating to LTCs within Swindon, such as Multi-Morbidity, costs and the effects of deprivation.

(ii) Demographic Background

The population of Swindon UA was 217,160 people at mid-2015. Even if current forecasts of rapid growth have to be revised, its population is predominantly middle-aged and these people will inevitably move into Older Age. Although Swindon is less deprived than the average Local Authority, many different grades of affluence and poverty are present within it. About 15.4% of the Swindon UA population belong to a Black or Minority Ethnic Group.

(iii) Using Socio-Demographic and Epidemiological Measures to estimate the "LTC Prevalence Pool"

Disability data from a national survey suggest a prevalence of 18% (in the adult population only), while measures from the 2011 Census for Swindon UA indicate slightly lower proportions, 15.4% ("Limited in daily activities") and 16.6% ("Less than Good Health") (in people of all ages). For both these census measures older people and less affluent people tended to report higher levels

of impairment. People from ethnic minorities in Swindon reported relatively low levels of impairment, probably because these groups are younger, on average, than non-BME groups. The primary care QOF registers record numbers for specific health conditions and are medically verified. A robust measure extracted from QOF, (based on a selected group of LTCs) which we have named "Proxy from QOF" records a prevalence of 22.2%. However, a plausible approach which we have called "Credible QOF" indicates that a percentage of about 30% is probably more realistic.

(iv) The "LTC Prevalence Pool" estimated from the Symphony Model

Outputs from the Symphony model suggest a LTC prevalence of 32.2% for Swindon UA, a value in accord with the "Credible QOF" figure. This amounts to 69,820 persons in 2015, that is 32,518 males and 37,301 females. In all, 21.0% had only one condition 7.2% had two conditions, while 3.9% had three or more conditions. The greatest numbers of cases (people with at least one LTC) in Swindon were to be found in middle-aged people, because the middle-aged predominate in the Swindon population. These middle-aged people will have a noticeable impact on health and care services as they move into the ranks of older people in the coming years.

The Symphony model suggests a prevalence rate among people aged 65+ years of 69.3%. These people (totalling 22,915), though not as numerous as cases among the middle-aged, are likely to cost the health and care services more per person than younger people. (The Symphony model is one way of estimating LTC prevalence and models with other assumptions could produce different estimates.)

(v) Multi-Morbidity estimated from the Symphony Model

About one third of people with any recorded condition were in a state of Multi-Morbidity. The presence of co-morbidities is common, and physical co-morbidities often exist alongside mental ill-health conditions, such as depression and dementia. In the instances of stroke and COPD, for example, multi-morbidity could be described as the norm.

(vi) Costs and Deprivation Effects estimated from the Symphony Model

There was a notable, yet modest difference between the most deprived group and the least deprived group in Swindon in terms of the rates of LTCs in Symphony, LTCs being more prevalent amongst the most deprived. In contrast, in the census measures the reporting of limitation and health problems increased much more sharply as deprivation increased. We suggest this is because more affluent people, though still having LTCs, have less severe problems, have fewer LTCs and/or cope better with their LTCs.

In a hypothetical exercise, we lowered the LTC prevalence rates of the two most deprived quintile groups, (Groups I and II) by a few percentage points, to the more favourable rates of the Middle group (Group III) in order to see how the picture would change if the health of more deprived people could be improved. This relatively modest hypothetical improvement resulted in a reduction of 3,182 cases in the two most deprived groups, most of this reduction being in middle-aged people.

(vii) Lifestyle Factors and LTCs

A central component of a strategy to prevent LTCs will be the improvement of lifestyle across the population. The overall smoking prevalence in adults in Swindon in 2015 was 18.7%, an encouraging reduction from 21.5% in 2012, although this meant that about 31,400 people were still smoking. National surveys indicate that smoking is becoming a less frequent occurrence in people in old age, with only about 12% of those aged 65 to 69 years in England and 3% aged 90 years or more in England maintaining the habit. With regard to conspicuous harm resulting directly from alcohol misuse, in the years 2014 to 2015, 1,358 people in Swindon were admitted to hospital with this type of problem, an indication of the way misuse of alcohol can dramatically affect a person's health. With respect to overweight or obesity, Swindon faces a considerable challenge, having a comparatively high percentage of people with excess weight. In the period 2012 to 2014, 69.5% of adults in Swindon had excess weight, that is, they were categorised as being either overweight or were in the more extreme category of being obese. This was significantly higher than the figure for England as a whole which was 64.6% .

(viii) Recommendations in Brief

We recommend that the LTC Profile and the "Ageing Well" JSNA Report be accepted as providing complementary pictures of LTCs, health resilience and coping throughout the life-course in Swindon, and that the main prevalence estimates of LTCs in this Profile be accepted as working estimates of the size of the LTC prevalence pool in Swindon. A literature review should be conducted to find evidence of which interventions have been shown to be effective in different parts of a population, with regard to preventing LTCs, and to find evidence of how resilience and coping skills can be enhanced in people with existing LTCs. The literature review should include the health of carers and also ways of exploiting IT and telecare to support people with LTCs. Further statistical work on LTCs should include mapping data held by Swindon Borough Council and Swindon CCG at small area level, to understand better the need for health and social care in different parts of the population. Interventions should be targeted appropriately in the Swindon population, using geo-demographic segmentation and consultation with Healthwatch. People with LTCs should be supported through "joined-up" or "accountable care", that is services which are combined and co-located, and/or co-ordinated by care managers. Partners in the local health and care community should co-operate to maintain a health-promoting physical environment, including housing for people with LTCs. (Full recommendations are in section 10.4).

(ix) Main Conclusions

There are different ways of estimating LTC prevalence, so this Profile should be regarded as offering pragmatic, working estimates rather than precise, definitive answers. 32.2% of all people in Swindon and 69.3% of people aged 65 years or more in Swindon may have one or more LTCs. LTCs are most numerous in middle-aged people, although rates and severity are higher in Old Age (65+ years). For many conditions, it is usual to have additional co-morbidities. Affluent people tend to have fewer co-morbidities and may cope better than more deprived people. Even in Old Age many people seem to cope well with LTCs, and together with people who have no LTCs, can be said to be "Ageing Well" (a combined group of at least 48.9% of people aged 65+). A key task of the Health and Care community is now to help more and more older people into the "Ageing Well" segment, and to prepare middle-aged people for a later life which builds on "Ageing Well" principles.

1. Introduction and Background

1.1 The Significance of Long Term Conditions

Improvements in medical treatment and success in public health interventions have resulted in people having longer lives, but often with some form of long-term morbidity (illness) or disability. In England, the Department of Health estimates that 15 million people (over a quarter of the population) have a Long Term Condition (LTC) and an increasing number of these also have a co-morbidity (or co-morbidities) and so actually have more than one LTC[1]. This latter status is sometimes described as one of "Multi-Morbidity" (MM). The number of people with three or more co-morbidities in England is expected to increase from 1.9 million in 2008 to 2.9 million in 2018[2]). The Department of Health defines Long Term Conditions (LTCs) as "those conditions that cannot, at present, be cured, but which can be controlled by medication, and other therapies"[2]. Nevertheless, it should be noted that this can be interpreted in different ways, and in practice, NHS bodies pragmatically employ various criteria according to the situation. In fact, the term "Long Term Conditions" is best considered as a new approach to thinking about the health of the population, rather than something that can be described with exactitude.

The group of LTCs encompasses (but is not limited to) asthma, Coronary Heart Disease (CHD), most cancers, Chronic Obstructive Pulmonary Disease (COPD), Chronic Kidney Disease (CKD), dementia, diabetes, epilepsy, and stroke. The disease group denoted as Severe Mental Illness (SMI), which includes psychoses such as schizophrenia and severe depression, is also conventionally regarded as a form of LTC. People with LTCs are, of course, entitled to support with their problems and thereby use a significant proportion of health care services. Their care utilises 70% of hospital and primary care budgets in England, making up 50% of GP appointments and 70% of inpatient days, for example[2]. This utilisation takes place across the spectrum of care settings, including primary care, emergency care, hospital inpatient and outpatient care, rehabilitation, social care and community health care. Despite their many strong points, the NHS and social care services were not originally

[1] www.KIngsfund.org.uk/time-to-think-differently/trends/disease-and-disability/long-term-conditions-multi-morbidity.
[2] Department of Health 2012. Long Term Conditions Compendium of Information. 3rd edition.

set up to deal with the often complex, multi-faceted scenario of the LTCs and the latter is presenting a considerable challenge.

1.2 The Policy Situation

The current NHS Outcomes Framework[3] notes that the management of LTCs is now a central task of the NHS, requiring a longer term approach rather than the provision of single, unconnected episodes of care, and also an ongoing partnership with patients who need to be involved in their care. Suggested strategies include multi-disciplinary team-working, case-finding and risk stratification, and personalised care and support planning.

The policy reviews and guidance on LTCs have been various and not straightforward, but landmarks have included the "*Quality, Innovation Productivity and Prevention*" (QIPP) workstreams (emphasising appropriate modalities of care) produced by the Department of Health[4]. The "*Better Care Fund*" allows further pooling of health and social care funding and integration of services[5]. "*The NHS Five Year Forward View*"[6] has reprised some of these themes, and mentioned (though it did not prescribe) the "*Multi-specialty Community Provider*", a proposed centre which could provide a wide spectrum of care, but outside a hospital setting. "*The Long Term Conditions Year of Care Programme Implementation Handbook*"[7] advocates the creation and analysis of a "whole population database", tracking patients' movements through the health and social care system. The hope is that such a database could serve as the basis for remodelling services, with the emphasis on meeting the many needs of the individual patients, rather than on merely expanding the existing pattern of services in their current form. A further development in 2016 is a move to five year plans ("*Sustainability and Transformation Plans"* or STPs) developed by clusters of health communities, and taking a strategic approach to pressures on the NHS.[8]

[3] NHS Outcomes Framework, England May 2016.
[4] www.networks.nhs.uk/nhs-networks/qipp-network/ltc.
[5] Better Care Fund Policy Framework. Dept of Health, Dept for Communities and Local Government. 2016/2017.
[6] Five Year Forward View, NHS, October 2014.
[7] Long Term Conditions Year of Care Implementation Programme, NHS, May 2016.
[8] www.england.nhs.uk/ourwork/futurenhs/deliver-forward-view.

1.3 The Need for Prevention

The challenge of managing LTCs also entails the issue of preventing people from falling into poor health in the first place. **"***A Call to Action: Commissioning for Prevention"* was launched in 2013 by the Department of Health[9], and provides a case for prevention and a framework for local action. Any preventive approach will need to consider the human life-course following the principles of starting well, living well and ageing well. To impact on prevention, programmes need to support successful ageing from middle age onwards rather than simply aiming to support elderly people in preventing the worsening of chronic conditions. Successful ageing should enable people to have the knowledge to develop the behaviours and acquire the skills as they grow older to avoid the development of disease and stay active and positively healthy until a short time before death.

1.4 Using Intelligence to Understand LTCs

Thus, a cardinal question is: how large is the pool of people with LTCs in our population, who is in this "LTC prevalence pool", with which pattern of conditions, which services do they use, and at what cost? There is, however, as we have implied, no definitive way of measuring the prevalence of LTCs in a population, and different approaches may produce differing, but equally valid perspectives. Although comprehensive patient analysis based on a large database of linked patient data, (as recommended by the Department of Health) is an expensive undertaking, a number of health communities in England have attempted this, in order to answer such questions. In the West Country, a project of this nature has been developed in the form of Somerset CC's "*Symphony Project*". Their stated aim was to see which groups of patients might benefit most from integrated care. The Symphony Project has used "real life" health and social care data, which is not usually linked in any way, to identify patterns of activity in its population. Meanwhile, the academic partner involved in the project, the University of York, has stressed the importance of multi-morbidity (MM) in driving service use and costs[10].

[9] A Call to Action: Commissioning for Prevention. NHS, Public Health England. Nov 2013

[10] The importance of multimorbidity in explaining utilisation and costs across health and social care settings: evidence from South Somerset's Symphony Project. Kasteridis P, *et al.* University of York Centre for Health Economics, CHE Research Paper No.96. Feb 2014.

Because of the difficulties in creating a linked database, the Devon CCGs have not created their own, but have used a statistical model derived from the Symphony Project, and have applied it to their own populations.[11] The rationale for this is that the patterns of health conditions and service usage (which make up the model) are likely to be broadly similar across populations; thus, if the Devon CCG analysts can adjust for differences in the age, sex and deprivation status between the Somerset and Devon populations, they should be able to make inferences about the "LTC pool" in the Devon population.

In a similar vein, therefore, in this profile for Swindon, we utilise existing data sources to estimate the prevalence of LTCs in Swindon, the LTC pool of people, and then we also follow the Devon CCGs and draw upon the Symphony Model; the Symphony Model can help us go beyond the limits of our data-sets which cannot be quickly linked into one integrated picture. We apply the Symphony Model to the Swindon population to envisage how groups of LTC patients are using the health and social care system; the assumption is that Swindon patients have activity rates and patterns which are similar to those in Somerset and so we can make inferences about the numbers of Swindon patients involved in such patterns of activity. This approach can use data to provide an impression of the size and salient features of the landscape, and how they sit together, rather than an exact assessment of what is happening in Swindon. In other words, it can offer pragmatic useful, working estimates rather than precise answers. A further step would be to produce projected estimates of LTCs to show how they might impact on Swindon in the future, but this is not attempted in the present Profile.

1.5 Objectives of the Profile

(i) To provide an initial statistical profile of people with LTCs in the Swindon population over one year, a quantitative basecamp for future work on how services might be remodelled and people supported.

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[11] Long Term Conditions: Health Needs Assessment. Public Health Devon, Devon County Council, Plymouth City Council. 2015

(ii) To estimate the prevalence of and numbers of people likely to have LTCs, to be in the "LTC prevalence pool" in the Swindon population, by using existing data sets, such as Census returns and QOF disease registers from primary care.

(iii) To estimate, by imputation, the prevalence of and numbers of people likely to be in the "LTC prevalence pool" in the Swindon population, by using the Symphony Model, and applying it to the Swindon population.

(iv) To describe the health conditions imputed in (iii), and the way these morbidities occur together as co-morbidities (in a state of multi-morbidity).

(v) To ascertain the services likely to be received by people according to their health condition.

(vi) To calculate approximately the costs of these services.

(vii) To calculate approximately the difference that deprivation is making to the extent of LTCs in our population.

1.6 Methods used in the Profile

(i) Most of the data used in the Profile relate to the Swindon UA resident population, although data for the registered Swindon CCG population are also used and comments are made about the relationship between the two populations.

(ii) Data are presented for the most recent year available. This involves data from different years being used, but the sets are still broadly comparable for our purposes.

(iii) After a demographic review of Swindon, we use existing Swindon data to depict parts of the picture and then enhance this by applying the Symphony Model, adjusting for age, sex and deprivation level to the Swindon UA population as at mid-year 2015, which allows us to

make inferences about the epidemiology of LTCs in Swindon, (i.e. impute figures for Swindon). More details of the methods used to create the Symphony database are given in Appendix Two.

(iv) We review all sources of data, including outputs of the Symphony Model applied to Swindon UA, as a way of triangulating perspectives and gaining extra insights on the "LTC pool".

(iv) There is a focus in the profile on asthma, cancer, CHD, Chronic Kidney Disease, COPD, dementia. Depression, diabetes, epilepsy, stroke/Transient Ischaemic Attack, Heart Failure, hypertension (raised Blood Pressure), and Severe Mental Illness, while other conditions are given less emphasis, (e.g. Learning Disability, high cholesterol, end-of-life care, chronic pain, bone health, arthritic conditions). This is mainly because profiles and health needs assessments have already been published for these latter conditions.

(v) "National data" or "national figures" refers to statistics at an all-England level. Swindon data are rounded to whole numbers or one decimal place, so some component data may appear not to sum correctly.

(vi) Where percentages relating to Swindon are presented, these proportions always refer to the population in question; "percentages of percentages" are not presented anywhere.

2. The Demographic Background

2.1 Overall Population Structure and Projections

The population of Swindon UA, that is the resident population of the Swindon Borough Council area, was estimated by ONS for the mid-year point of 2015 at 217,160, and consisted of 108,199 males and 108,961 females[12]. Swindon UA is one of the fastest-growing populations in the South West. Swindon BC's population projections are forecasting a growth curve of about 14% from 2011 to 2021 and a further 10% from 2021 to 2031[13]. Though it is probable that these forecasts will have to be revised downwards due to economic circumstances, the projections are still a guide to the way the town is likely to expand at some point in the future. The population pyramids in Figures 1 and 2 illustrate how the structure of the population is currently forecast to change between 2015 and the year 2031. In 2015 the population is dominated by its "middle-aged spread" in the 30 to 54 age-groups, while by 2031 the numbers of younger and older people have grown considerably, and the middle-aged have graduated to Old Age.

Even if the physical expansion of Swindon is delayed, it is certain that its present middle-aged population will age. In the 2015 pyramid there are 33,066 people aged 65+ years, making up 15.2% of the population, there are 14,930 people aged 75+ years, making up 6.9% of the population, while people aged 85+ years number 4,356, making up 2.0% of the population. In the 2031 pyramid of 265,430 people, the respective counts and proportions are for 65+, 54,976 (20.7%), for 75+, 26,774 (10.1%) and for 85+ 9,039 (3.4%) of the population.

Thus, between these two pyramids, the population growth for these age-groups is likely to be 66.3 % for 65+, 79.3% for 75+ and 107.5% for 85+ Since the prevalence of LTCs increases steadily with age, these demographic indicators are suggesting an increasing challenge to the health and care services in the short to mid-term future.

[12] www.ons.gov.uk. Local authority population estimates from Office for National Statistics, 2015.
[13] Swindon Borough Council Population Projections to 2031 (Policy Led). Castellino A. SBC 2013

Figure 1: Swindon UA Population Structure in 2015. Source ONS

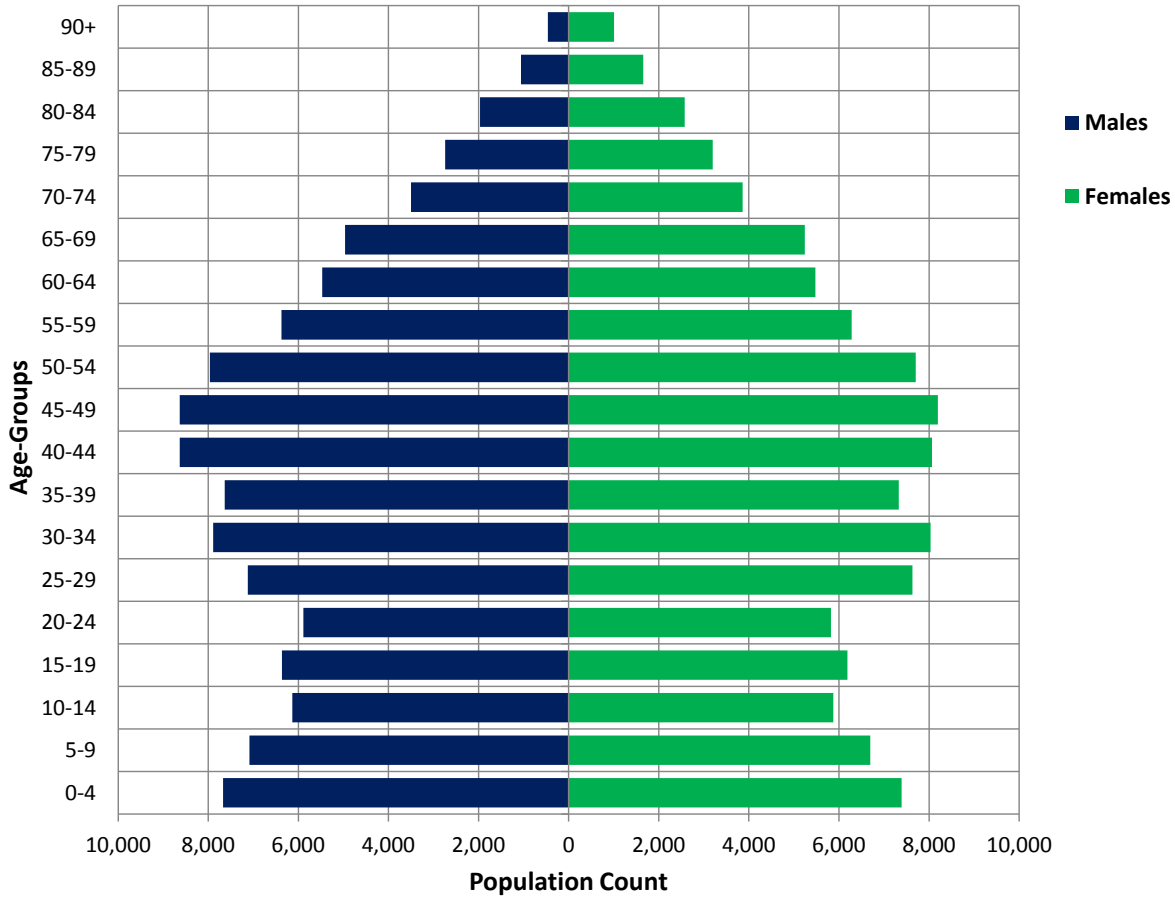


Figure 2: Swindon UA Population for 2031. Source: SBC Projections

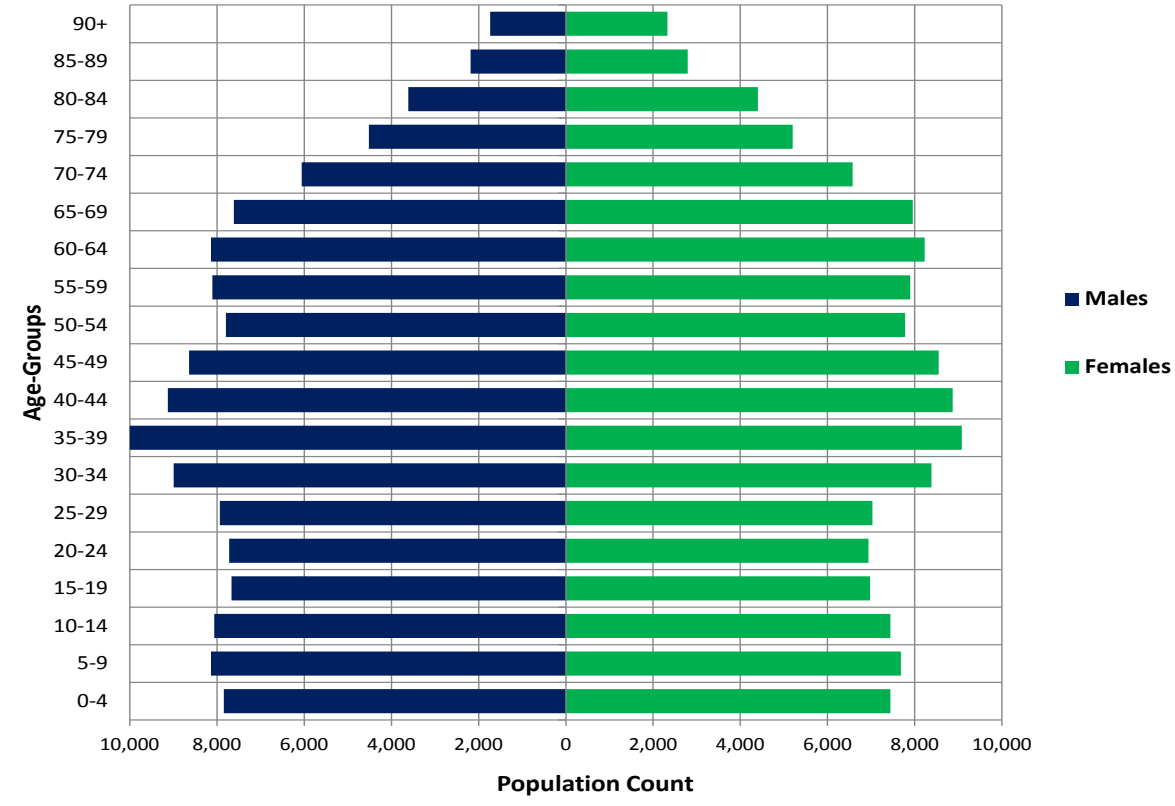
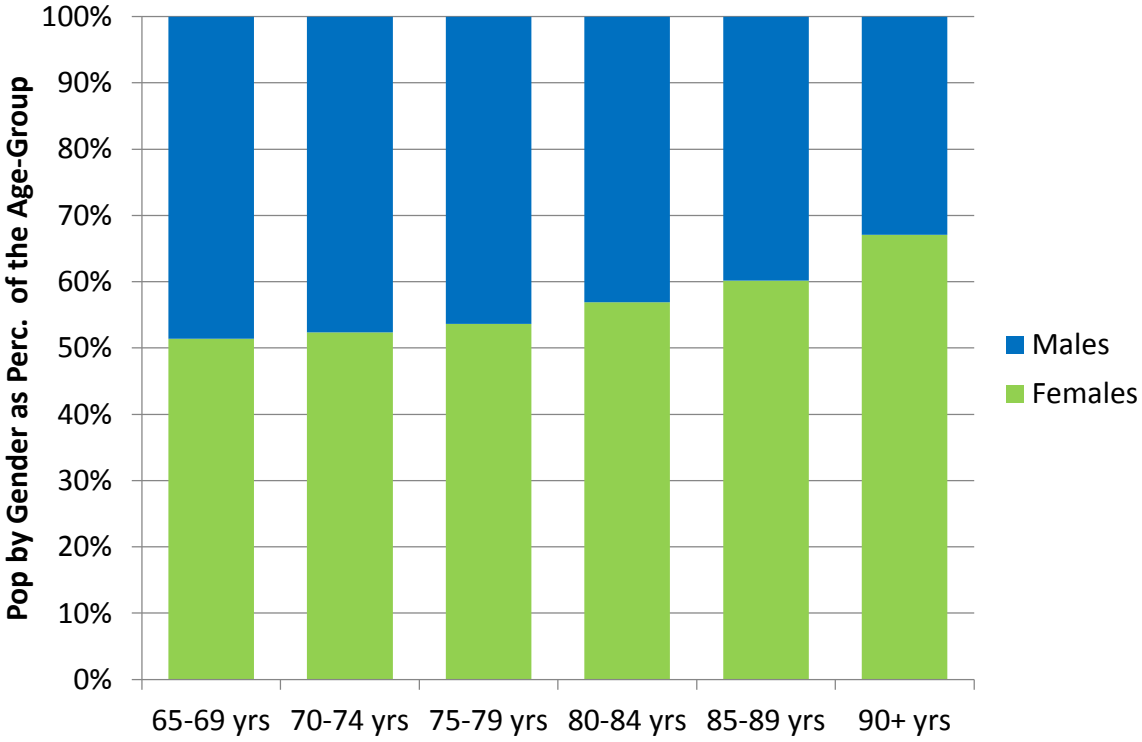


Figure 3 depicts the respective proportions of men and women making up the older age-groups in Swindon UA in 2015. The proportion of older people that is female is about one half in the 65 to 74 age-group, but in the oldest group, aged 90 years and above, it is about two-thirds. Although this disparity may diminish to some degree in the future, women are still likely to outnumber men in the older age-groups for the foreseeable future.

Figure 3: Percentages of Men and Woman in older Age-Groups in Swindon UA in 2015



Source: ONS MYE

2.2 The Swindon CCG Population

The focal population for this profile is the Swindon UA resident population as in 2015. Some consideration must also be given to the Swindon CCG registered population, however. The latter population is composed of people registered with a Swindon CCG primary care doctor. The Swindon CCG population was enumerated by NHS Digital at 230,844 in March 2016[14]. The CCG registered population is thus currently about 12,000 greater than the population of Swindon UA. About 5,000 of these 12,000 people are resident in the ward of Shrivenham, Oxfordshire (recently renamed as Watchfield and Shrivenham ward) and most of the remainder live in the counties of Wiltshire and Gloucestershire. The magnitude of the difference can vary between years, i.e. it was about 2% in 2014 and about 6% in 2015. Nevertheless, the CCG population is likely to increase at a broadly similar rate to the UA population which forms its core. The renamed ward has 7,228 residents (2015 figures) and is likely to experience a small fall in population by 2026[12].

2.3 Age Structure by Electoral Ward

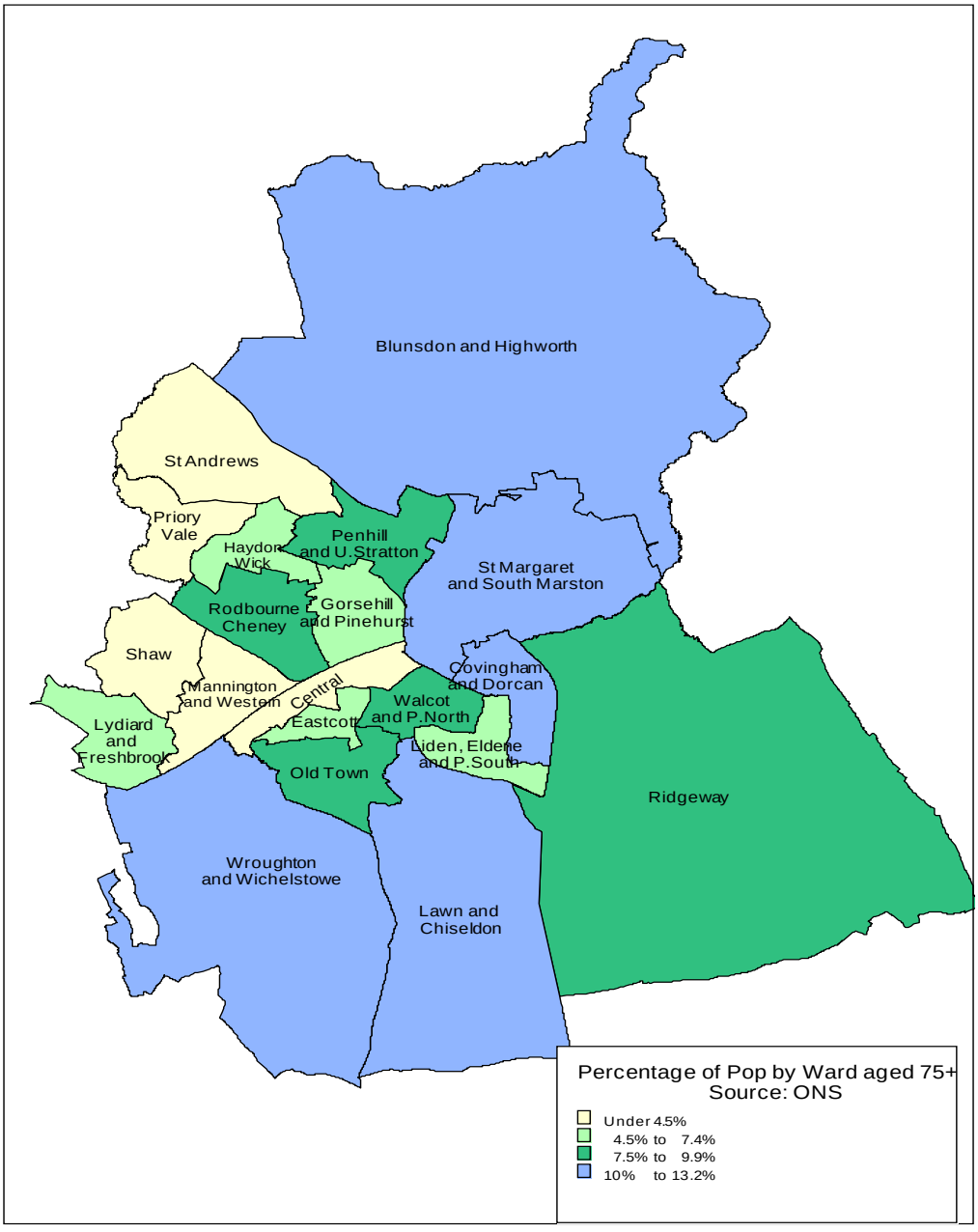
The age structure varies considerably across Swindon UA according to electoral ward (as shown in Figure 4). According to ONS figures for 2015[15], the largest numbers of people aged 75+ years were in St Margaret & South Marston (1,291), Blunsdon and Highworth (1,149) and Covingham and Dorcan (1,106), followed by Wroughton and Wichelstowe (1,059) and Penhill & Upper Stratton (1,047). In percentage terms, however, Lawn & Chiseldon had the largest proportion with 13.2%, closely followed by Wroughton and Wichelstowe (13.1%), St Margaret and South Marston (11.1%) and Blunsdon & Highworth (10.4%). Right at the other end of the scale, Priory Vale ward had only 1.5% of its people in the 75+ category, and St Andrews had only 2.2%. In Swindon UA as a whole 6.9% of people were aged 75 years or more.

[14] www.nhs.digital.nhs.uk. CCG population estimates from NHS Digital, 2015.
[15] www.nhs.digital.nhs.uk. Small Area Population Estimates (SAPE 2015) from ONS

Shrivenham ward, (covered by Swindon CCG), has a similar proportion of older people in the 75+ years age-group . According to ONS figures for 2015, 7.4% (534 out of a total of 7,228) were aged 75 years or more and 2.0% (numbering 144) were aged 85 years or more. These proportions will probably increase by 2026, however, although the actual numbers of people involved are not large. (2011 Census data for this and other socio-demographic topics can also be queried on the Nomis website[16].)

Figure 4

Percentage of Population aged 75+ Years by Ward in Swindon UA in 2015



[16] www.nomisweb.co.uk

2.4 Distribution of Deprivation

Although Swindon is less deprived than the average Upper Tier Local Authority according to the Indices of Deprivation (ID) 2015[17], the levels of deprivation vary considerably across the town, and many different grades of affluence and poverty are present within the population. Table 1 ranks each electoral ward in Swindon UA according to the average ID score of that ward's small areas (known as Lower Super Output Areas or LSOAs), which total 132 across Swindon UA as a whole). According to this averaging schema, Walcot & Park North, Penhill & Upper Stratton, Gorse Hill & Pinehurst are the most deprived wards in Swindon UA, while St Andrews, Priory Vale and Ridgeway are the most affluent.

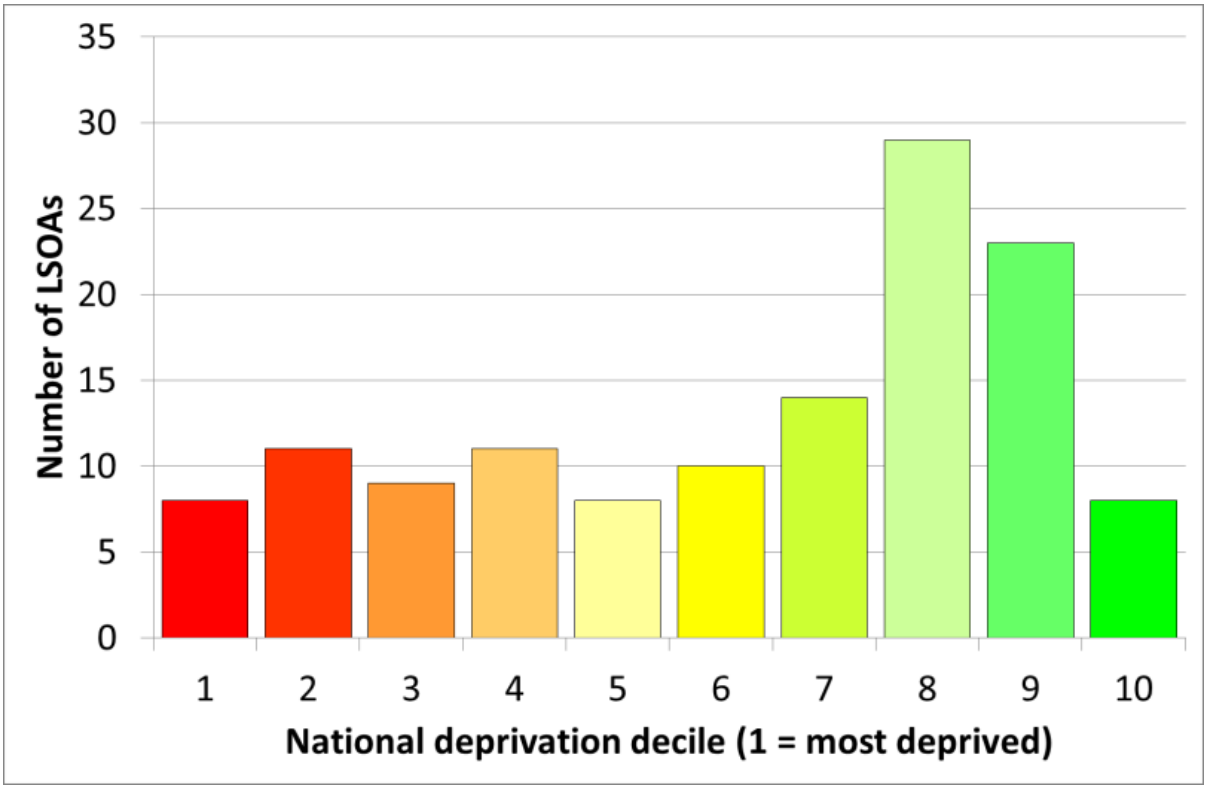
Table 1: Electoral Wards in Swindon UA by local Deprivation Ranking within Swindon UA, derived from average LSOA score on ID 2015.

Ward Name	Deprivation Ranking
Walcot and Park N	1 = Most Deprived
Penhill & Upper Stratton	2
Gorsehill & Pinehurst	3
Liden, Eldene &Park S	4
Central	5
Rodbourne Cheney	6
Mannington & Western	7
Lydiard & Freshbrook	8
Eastcott	9
Covingham & Dorcan	10
Wroughton & Wichelstowe	11
Blunsdon & Highworth	12
St Margaret & S Marston	13
Old Town	14
Haydon Wick	15
Lawn & Chiseldon	16
Shaw	17
St Andrews	18
Priory Vale	19
Ridgeway	20 = Least Deprived

[17] www.gov.uk/government/statistics/english-indices-of-deprivation-2015

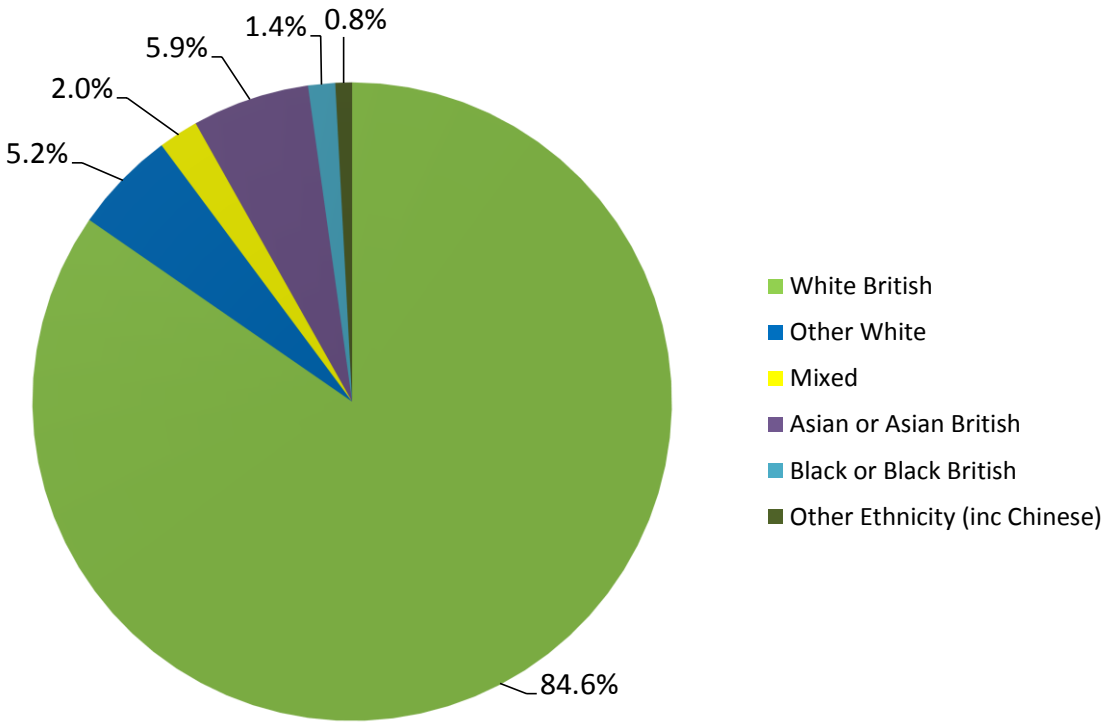
With regard to the small areas within the wards, Swindon's most deprived LSOA is "Penhill North" in Penhill and Upper Stratton ward. It is ranked as the 1,049th most deprived LSOA in England (out of 32,844); only about 3% of LSOAs in England are more deprived. The least deprived LSOA in Swindon is "Elsham Way" in Haydon Wick ward. It is the 206th least deprived LSOA in England (out of 32,844); only about 0.6% of LSOAS in England have a more favourable status. In all, eight Swindon LSOAs are in the most deprived 10% nationally, but as Figure 5 indicates, the Swindon LSOAs correspond to the whole range of deprivation across England. Shrivenham ward has four LSOAs all of which can be described as affluent. The ward as a whole is comparable to St Andrews, Priory Vale or Ridgeway in Swindon UA.

Figure 5: Swindon LSOAs by National Deprivation Decile, ID 2015. (Swindon LSOAs are classified here according to ten national grades of deprivation.)



2.5 Ethnicity and Age-Groups

Figure 6: Broad Ethnic Groups as Percentages in Swindon UA in 2011



Source: 2011 Census on NOMIS website

The various ethnic groups in Swindon UA are displayed in Figure 6. The proportion of people in Swindon who reported being from a non-White British group in the 2011 Census was 15.4% (32,128 people). The proportion in Shrivenham ward was 9.5% percent. The largest Black and Minority Ethnic (BME) group was Asian/Asian British with 5.9% (12,411 people), closely followed by White, non-British people, (mainly Europeans) at 5.2% (10,870 people). At present, BME groups in Swindon UA are relatively young. BME groups accounted for 8% of all people aged 65+ years in the 2011 Census , but in younger age-groups, the proportion was higher, 10% of people aged 50 to 64 years, 18% of people aged 16 to 49 years and 18% of people aged 0 to 15 years. The Asian/Asian British Group was at its greatest extent (8%) in people aged 0 to 15 years and in people aged 16 to 49 years, but it made up only 2% of the population aged 65+ years. It would therefore be wise always to view age-group together with ethnic group, when considering matters of ethnicity in the population.

3. Three Socio-Demographic Measures of Health

3.1 Introduction to the Three Measures

In this section we examine three different general, socio-demographic measures that reflect, to some degree, the extent of LTCs in the population. As these are self-reported, (or we have to impute Swindon figures from national figures) they cannot be regarded as exact measures, only as being suggestive of the extent of the "LTC pool" in Swindon. However, these measures may provide useful insights as to the nature of that pool.

3.2 Moderate to Severe Disability (2001 Health Survey for England)

Prevalence estimates for "Moderate and Serious Disability" in people aged 16 years and over in England as a whole have been calculated in the "Health Survey for England 2001"[18]. (The question was asked in private households, which make up the vast majority of the national population, and not in care homes.) The disability questions in this survey covered limitations in functional activities (seeing, hearing, communication, walking and using stairs) and in activities of daily living (getting in and out of bed or a chair, dressing, washing, eating and toileting). These were grouped into five disability types, namely locomotion, personal care, seeing, hearing and communication. To cite one example, not being able to go up and down twelve stairs without holding on and taking rests counted as a moderate disability, while not being able to achieve this at all was counted as a serious disability. The disabilities measured were all physical and issues of mental health did not form part of the schedule. (More recent data are available in the 2005 Health Survey for England[15]. The latter survey did not include activities of daily living and was restricted to people aged 65 or over, and so it was less comprehensive than the 2001 survey.) In the all-England sample, 18% of males and females of all ages reported having at least one of the five types of disability. (Results were reported rounded to whole numbers.) In all, 5% reported having a serious disability. As Table 2 shows, the prevalence and severity of disability increased with age for both men and women, with the mean age of those reporting at least one disability being 62 years. About a quarter of men and women aged 55 to 64 years reported some level of disability, (mostly moderate), while in the 85+ age-group, the prevalence had reached over 70%, (the respective rates of serious disability being 33% in men and 42% in women.)

[18] www.digital.nhs.uk/article/191/Find-data-and-publications

The most commonly reported type of disability was locomotor disability. Overall, 12% of men and 14% of women reported having locomotor disability, and of these one in four men and one in three women reported a serious disability. Among those aged 75 and over, the prevalence of serious locomotor disability was higher for women than men. 32% of women aged 85 and over had serious locomotor disability as compared to 22% of men in the same group. The second largest prevalence was in personal care disability, though with rates almost half those of locomotor disability for both sexes (men 6%, women 7%), followed by hearing disability (respectively 6% and 4%) and sight disability (respectively 2% and 3%). Few people reported having communication disability and it was also the least variable across the age groups

Table 2: The Prevalence of Disability in England by Age and Sex in People aged 16+ years.

Age-group	Males Percentage	Females Percentage
16-24 years	4%	5%
25-34 years	5%	6%
35-44 years	8%	9%
45-54 years	14%	14%
55-64 years	25%	23%
65-74 years	34%	32%
75-84 years	43%	51%
85+ years	72%	73%
All Ages	18%	18%

Source: Health Survey for England 2001.

A comparable survey has not been carried out in the Swindon population, but these prevalence rates can be applied to the Swindon UA population aged 16 years or more in 2015. This suggests that about 31,000 Swindon adults in total, might have a physical disability according to the national survey's criteria. About 8,700 of these Swindon adults

(about 5% of the adult population) would have serious disability. There is probably some value in making these inferences from national rates, since Swindon is often deemed to be "average" and representative of the national population. However, the straightforward calculation does not allow for the deprivation profile of Swindon, which may be different to the national situation, and besides, both the English and Swindon population might now contain older people in the highest age-group with problems more complex than was the case in 2001. In short, though this approach sheds light on highly specific categories of disability, it must be regarded as offering an under-estimate of the size of the "LTC pool" in Swindon UA.

3.3 Long-Term Health Problem or Disability (2011 Census)

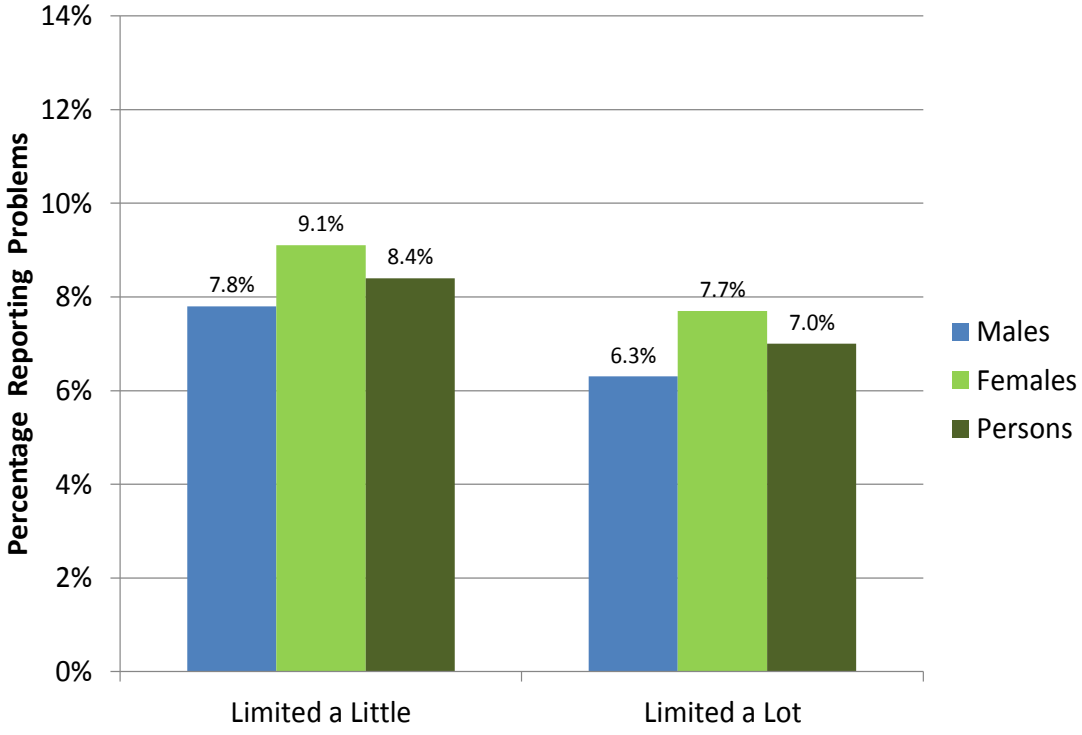
In the 2011 Census, Long-Term Health Problem or Disability ("LTH") was defined as a state or issue that *"limits a person's day-to-day activities, and has lasted, or is expected to last, at least twelve months. This includes problems that are related to old age. People were asked to assess whether their daily activities were limited a lot or a little by such a health problem, or whether their daily activities were not limited at all."* Although this is a broad question, is not clinically-based and can be interpreted by census respondents as they wish in their self-report, the question is conventionally accepted by the health community in the UK as a useful measure of health status, referring to a greater or lesser degree of impairment. This question was asked of people living in private households, as distinct from care homes. (The care home population is relatively small, however, 1,298 Swindon UA people in the 2011 Census, 0.62% of the census population.)

Figure 7 shows that 14.1% of males and 16.8% of women in Swindon UA, 15.4% of persons of all ages, reported a LTH of some degree in the 2011 Census. These were slightly lower levels than in England as a whole. The higher prevalence in women (in both Swindon and England) is probably due to the greater proportion of women in the older age-groups (see Figure 3.) These prevalence figures in Swindon UA equate to 15,256 men and 18,305 women, 33,443 people in total in terms of the 2015 population. (In Shrivenham ward in 2011, 577 people (12%) reported some degree of impairment.)

Figure 7: Prevalence of LT Health Problems & Disability in England and Swindon UA by Sex in 2011

Source: 2011 Census on Nomis website. All Ages Included.

Figure 8: Prevalence of LT Health Problems & Disability in Swindon UA, with Severity, by Sex in 2011

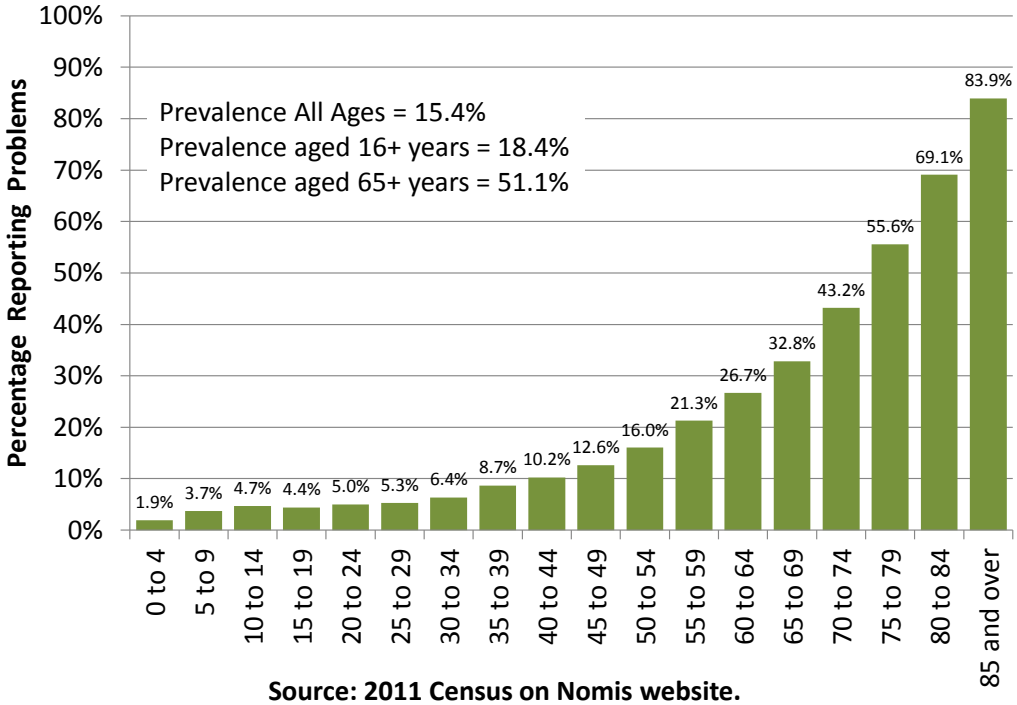


Source: 2011 Census on Nomis website. All Ages Included.

The degree or severity of LTH was measured in a straightforward way in the census by asking if the respondent was “limited a little” or “limited a lot” and the corresponding prevalences for Swindon UA are depicted in Figure 8. In all, 8.4% of people said they were limited a little and 7.0% of people said they were lot. Again, women had higher proportions at both levels of impairment. In terms of numbers of people in Swindon UA in the 2015 population this amounts to 18,241 limited a little and 15,201 limited a lot, although there is not a standard definition or interpretation of what these levels mean.

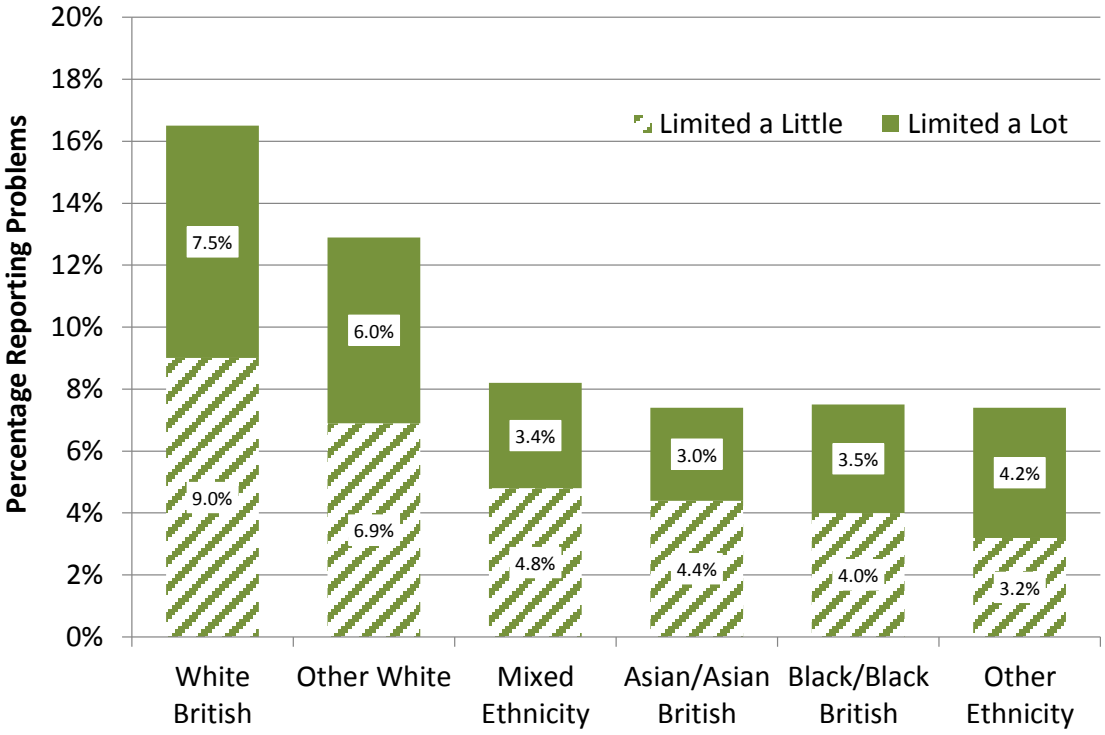
The prevalence of LTH in Swindon UA is strongly associated with age (Figure 9). It rises from 1.9% in the first five years of life, increasing in each five year age group in turn, to reach 83.9% in people aged 85 years or more. To summarise the situation for adults, the prevalence is 18.4% in people aged 16 years or more and 51.1% for people in the retirement zone, aged 65 years or more. The differences between ethnic groups as regards LTH is also marked (Figure 10), 16.5% of White British reporting LTH, for example, as compared with 7.5% of Asian/Asian British people. Although we must allow for different patterns of health in different cultural groups, it is likely that a significant amount of this “inverse gradient” (membership of a BME group being associated with a lower prevalence of LTH compared with White British people) is due to the relative youth, on average, of people in BME communities in Swindon, as discussed above in Section 2.5.

Figure 9: Prevalence of LT Health Problems & Disability in Swindon UA by Age-Group in 2011



Source: 2011 Census on Nomis website.

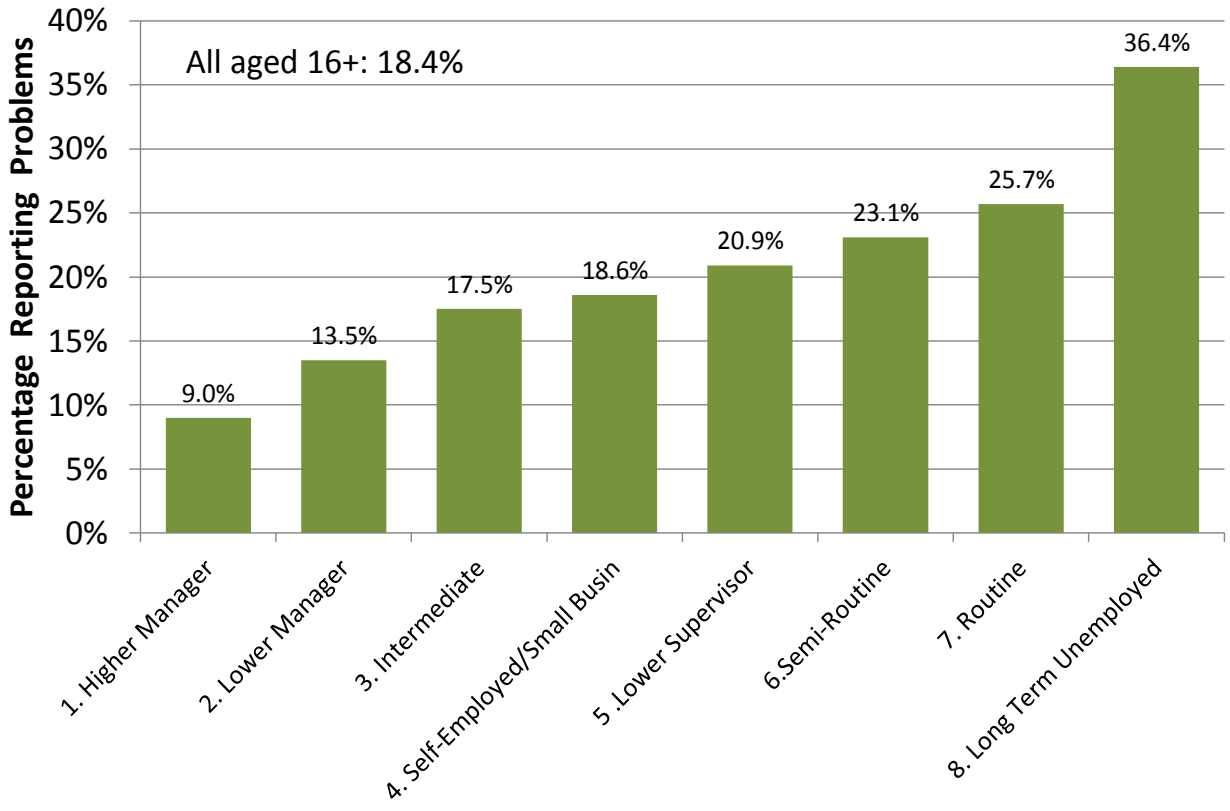
Figure 10: Prevalence of LT Health Problems & Disability, with Severity, in Swindon UA by Ethnic Group in 2011



Source: 2011 Census on Nomis website

However, the association between socio-economic group in adults in Swindon UA (as measured through the NS-SEC classification of employment[19]) and LTH prevalence, is not likely to be strongly affected by age and is more a manifestation of the effects of relative affluence and deprivation in a population. Figure 11 portrays a social gradient in which decreasing affluence is associated with higher prevalence of LTH, (Figure 11). In this categorisation, the least affluent employed group, (Category 7, Routine or unskilled workers) had a level of LTH that was nearly three times as great as that for the most affluent group (Category 1, Higher Manager.) (Category 8 had an even higher value than Category 7, as this group includes people who are long-term unemployed due to prior illness.)

Figure 11: Prevalence of LT Health Problems & Disability in Swindon UA by Socio-Economic Group, aged 16+ years in 2011



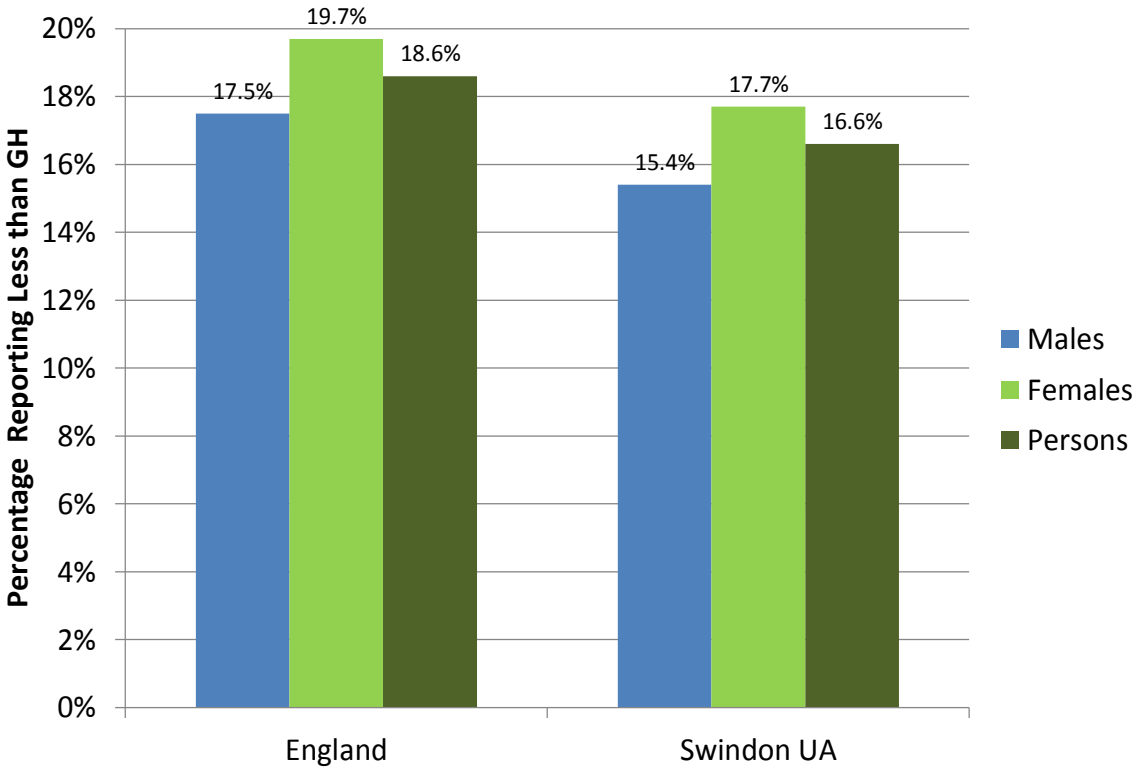
Source: 2011 Census on Nomis website. People coded to NS-SEC group.

[19] The National Statistics Socio-economic Classification User Manual, Office for National Statistics, 2005 edition

3.4 General Health (2011 Census)

Also in the 2011 Census, *"People were asked to assess whether their health was very good, good, fair, bad or very bad. This assessment is not based on a person's health over any specified period of time."* As with LTH there is not a standard approach to construing what responses to this question might mean, but it is common to regard it as a subjective health measure that might be more related to feelings of well-being as a result of physical and/or mental health status, and less to obvious impairment as in LTH. It can probably be regarded as similar to LTH, but with a different emphasis. In this analysis we have created a category of "Less than Good Health" that combines answers of "Fair", "Bad" or Very Bad"; thus, these were people who by choosing these responses, implied that their general health was not "Very Good" or even "Good." (This question was asked of people living in private households and also in care homes.)

Figure 12: Prevalence of "Less than Good Health" in England and Swindon UA by Sex in 2011

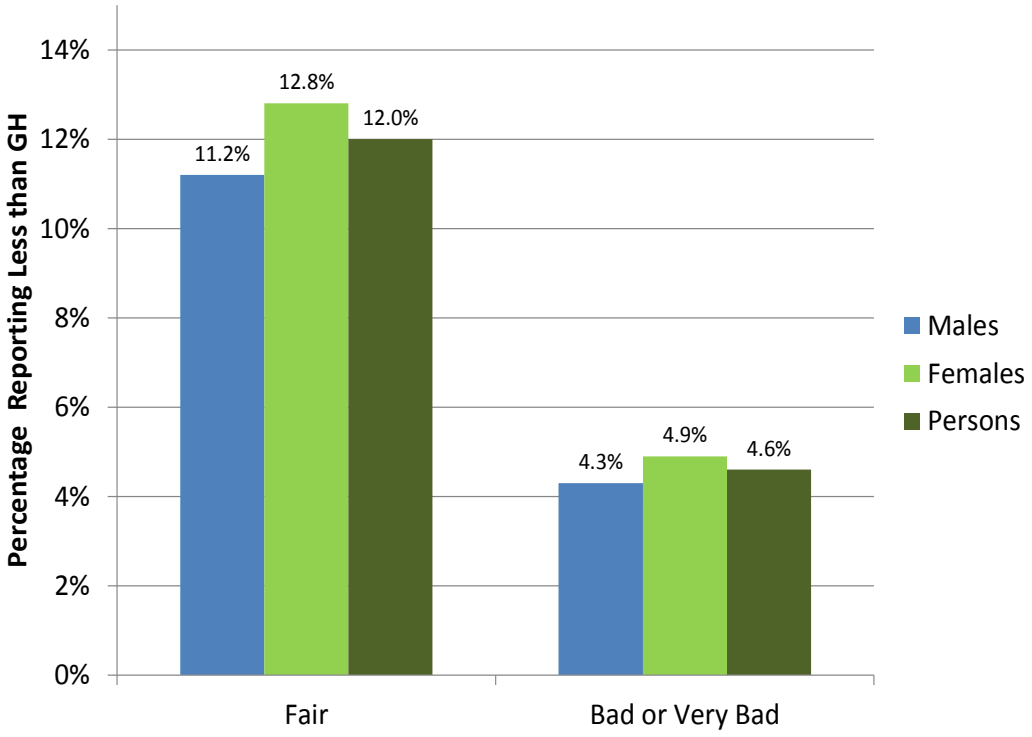


Source: 2011 Census on Nomis website. All Ages Included.

As with LTH, the proportions of people in Swindon UA with "Less than Good Health" were slightly lower than those for England as a whole (Figure 12). In Swindon UA 15.4% of males and 17.7% of females reported "Less than Good Health". This amounted to 16.6% of persons of all ages, (36,049 individuals in terms of the 2015 population). This was of a similar magnitude to the 15.4% people who reported some degree of limitation on the LTH question. (In Shrivenham ward the prevalence of "Less than Good Health was 11.7%, 585 people in 2011.)

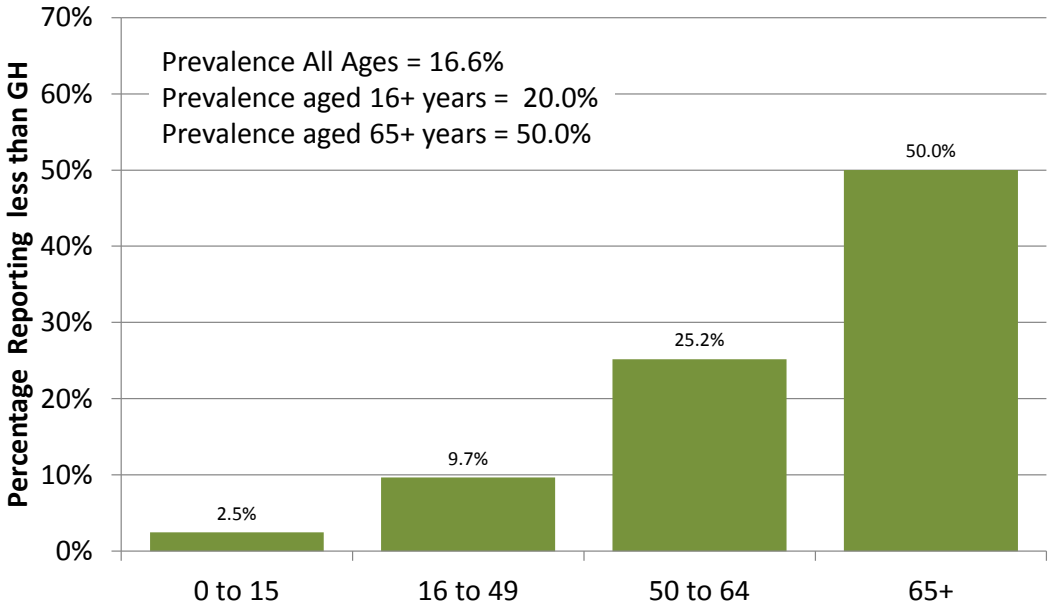
Despite this correspondence in magnitude between the prevalence of "Less than Good Health" and the prevalence of LTH, it is noteworthy that comparatively few people in Swindon reported that they were in "Bad" or "Very Bad" health as distinct from "Fair" health, respectively 4.6% as compared with 12.0% (Figure 13). Since the Good Health measure is a self-reported and subjective assessment of well-being, it does not necessarily correspond to what a physician would regard as very bad in a medical assessment; it seems more to reflect how well people are feeling.

Figure 13: Prevalence of "Less than Good Health" in Swindon UA, with Severity, by Sex in 2011



Source: 2011 Census on Nomis website. All Ages Included.

Figure 14: Prevalence of "Less than Good Health" in Swindon UA by Age-Group in 2011

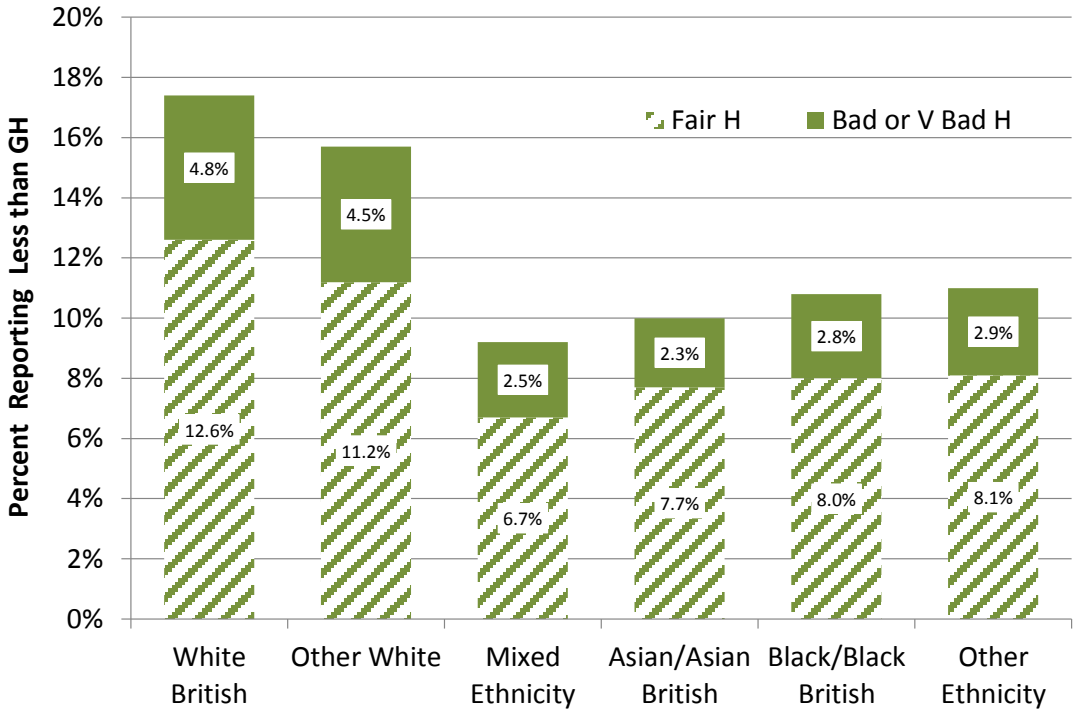


Source: 2011 Census on Nomis website.

As might have been expected, the prevalence of "Less than Good Health" in Swindon UA increased with the age-group of the respondents (Figure 14). For example, in people aged 16 to 49 years the proportion reporting this was 9.7%, but in people aged 65 years or more the proportion was 50%.

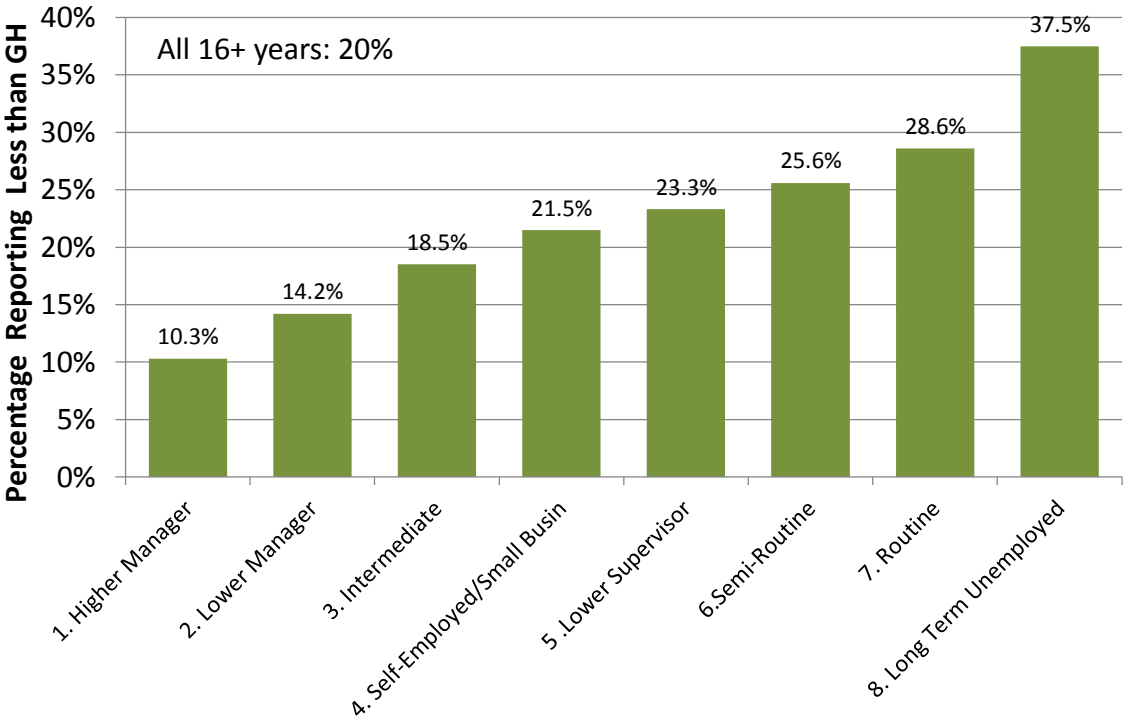
As with LTH, White British people tended to report the less favourable response, here "Less than Good Health" more frequently than other ethnic groups, 17.4% as compared with 10.8% in the Black/Black British group, for instance (see Figure 15). Again, this is likely to be a function of the age-profiles of these groups, that is to say, White British people were on average older than other ethnic groups in Swindon. An apparent exception can be found in the Other White group where 15.7% had "Less than Good Health", only slightly less than the White British level. The explanation for this would seem to be that the Irish population in Swindon is relatively old (about a third being aged 65 years or more.) If Irish people are extracted from the Other White group, the prevalence within the latter group is 12.5%, in line with the other BME groups.

Figure 15: Prevalence of "Less than Good Health" in Swindon UA by Ethnic Group in 2011



Source: 2011 Census on Nomis website

Figure 16: Prevalence of "Less than Good Health" in Swindon UA by Socio-Economic Group, aged 16+ years in 2011



Source: 2011 Census on Nomis website. People coded to NS-SEC group.

Figure 16, depicting "Less than Good Health" in Swindon by socio-economic group strikingly mirrors Figure 11 where the variation of LTH by socio-economic background is shown. Again, the gradient is one where higher prevalence of a more negative health status is associated with being from the poorer parts of the community. The range of values in Figure 16 differs only marginally from those in Figure 11, only by one to three percentage points in each social group. For instance, 10.3% of Higher Managers reported "Less than Good Health", while 9.0% of them reported LTH. At the other end of the socio-economic scale, 28.6% of Routine workers reported "Less than Good Health" and 25.7% reported a LTH. For Long Term Unemployed the respective proportions were 37.%% and 36.4%, although, being Long Term Unemployed may in many cases have been the result of ill-health rather than the cause of it.

3.5 Note on Frailty

The term "frailty" is now in clinical use (and increasingly in Public Health use) to denote the increased vulnerability that an individual can experience as he or she ages, although frailty is not an inevitable consequence of growing older. In a state of frailty, the person's functional reserves have become diminished and relatively minor problems can then have a substantial impact on them. A frail person therefore typically presents in crisis with the frailty syndromes of delirium, sudden immobility or a fall[20]. Frailty estimates are not available for Swindon UA, but based on evidence from a systematic review[21] NHS England regards about 10.7% of people aged 65 or more as being in the state of frailty and the frailty prevalence rises within that broad age-group. In terms of the 2015 population in Swindon UA, this amounts to 3,500 people,

[20] Safe compassionate care for frail older people using an integrated care pathway. Practical guidance for commissioners, providers and nursing, medical and allied health professional leaders. NHS England, 2014

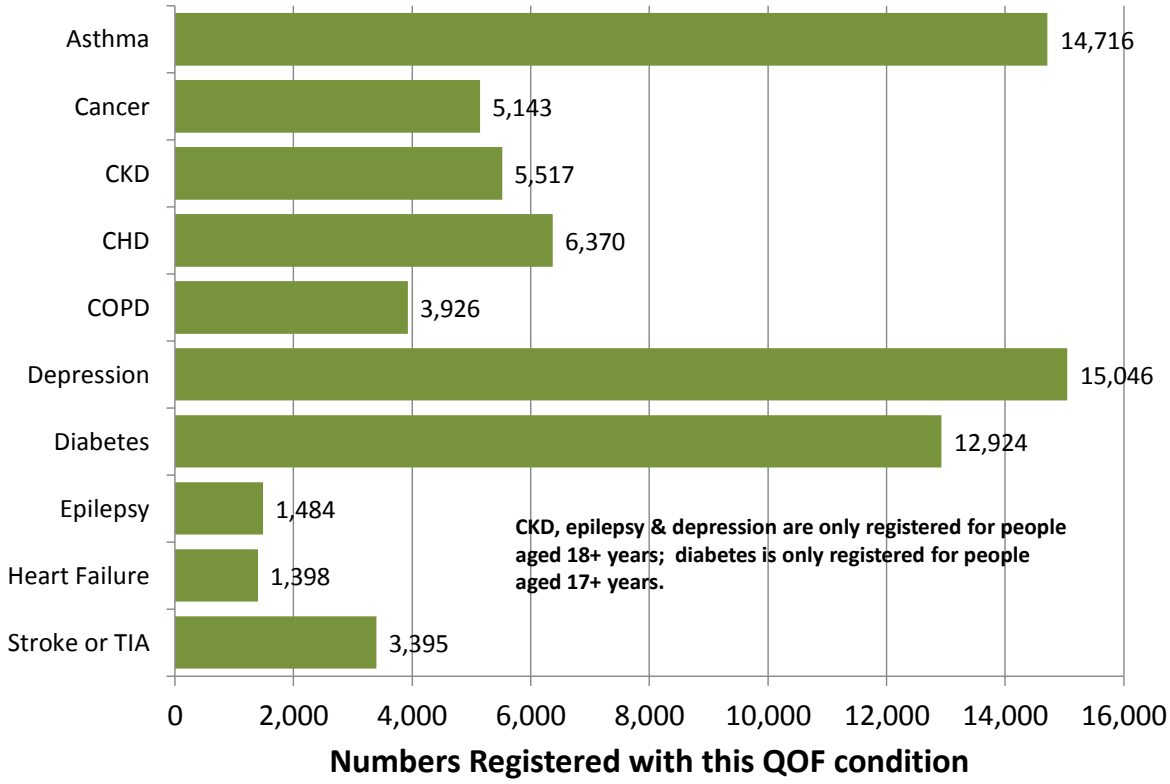
[21] Collard R, *et al*. Prevalence of frailty in community-dwelling older persons: a systematic review. Journal of the American Geriatrics Society, 2012. 60: 1487-1492.

Thus, “Frailty” represents another way of looking at problems in health and well-being, though with most relevance to people in later life. As frailty is not defined by specific conditions and is now the subject of a well-defined health-care pathway, we will not pursue it further here. Nevertheless, it is noteworthy that, according to the national estimates, the percentage of people aged 65 years or more who are in a state of frailty or of pre-frailty (approximately 50%) is of a very similar magnitude to the proportions of people in Swindon UA who reported “Less than Good Health” (Figure 14).

4. Epidemiological Measures (Primary Care, Secondary Care and Mortality)

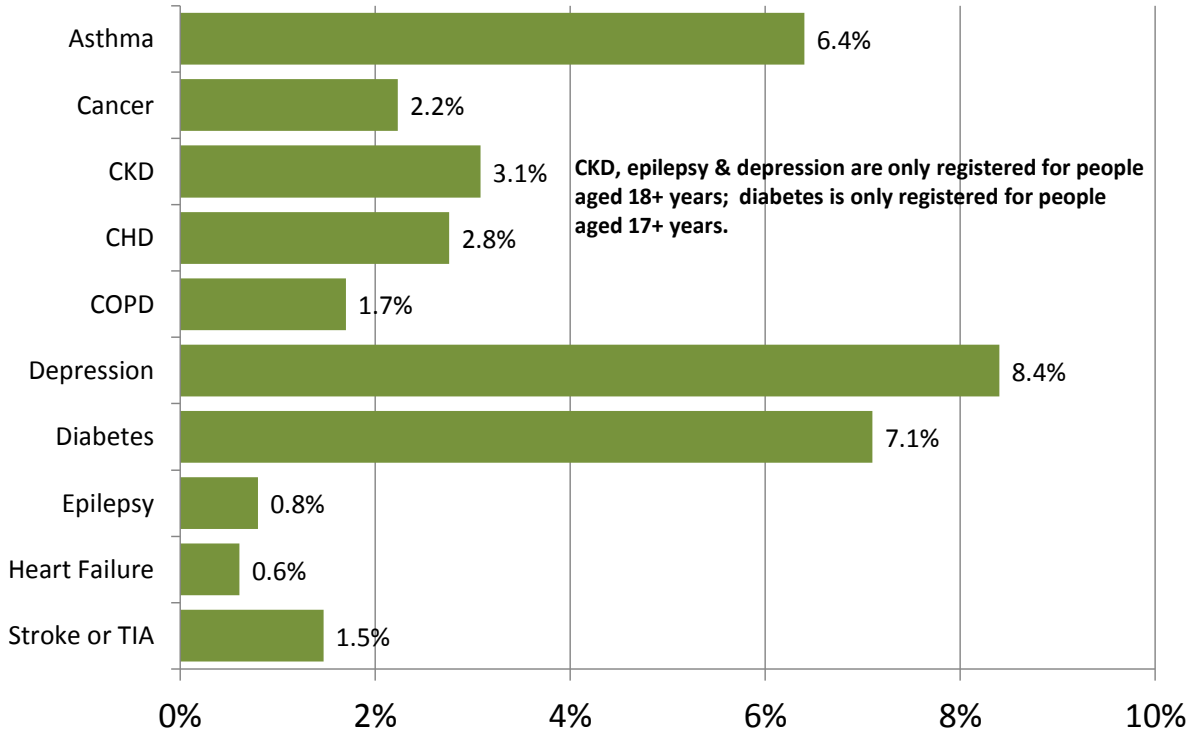
4.1 Primary Care (QOF Registers)

Figure 17: Number of People of all ages with Selected QOF Conditions in Swindon CCG at 31 March 2016



Source:2015-2016 QOF, NHS Digital

Figure 18: Point Prevalence of People of all ages with Selected QOF Conditions in Swindon CCG at 31 March 2016



Source:2015-2016 QOF, NHS Digital

The QOF (Quality Outcome Framework) Registers[22] , maintained by primary care doctors in England, record people with specific chronic diseases, and so form a valuable source of information for investigating the prevalence of LTCs in Swindon. A patient can be recorded in more than one register (e.g. be registered with diabetes as well as with CHD) and so can be count against a variety of diseases. QOF data are published for each primary care practice and also at CCG level. Thus, the data for QOF conditions in Figures 17 and 18, and in Table 3, are for Swindon CCG rather than Swindon UA. As an interpretative guide we need to bear in mind that the percentage prevalences in Figure 18 might be slightly lower than those in the Swindon UA population, given that the latter is slightly more deprived than the Swindon CCG population. These prevalences were extracted from the registers at the end of

[22] www.digital.nhs.uk/article/191/Find-data-and-publications

March 2016. (The prevalence estimates which are, strictly speaking, “point prevalences”, relate to people of all ages, except where indicated.)

In March 2016 the Swindon CCG registered population totalled 230,844 people. After the common condition of hypertension (raised blood pressure), the most common QOF condition in the CCG population was depression (registered for people aged 18+ years) with 15,046 people (8.4%). Asthma with 14,716 persons, and a prevalence of 6.4% was the second most common in terms of persons. Diabetes had a prevalence of 7.1%, but this was calculated for people aged 17+ years only, and so the number of actual cases was lower than for asthma, 12,924 persons in total. In all, 3.1% of the CCG population aged 18+ years were recorded as having CKD (Chronic Kidney Disease) (5,517 persons). Coronary Heart Disease (which encompasses angina as well as myocardial infarction or heart attack) had a prevalence of 2.8% (6,370 persons) and cancer had a prevalence of 2.2% (5,143 persons).

Table 3. Further Conditions from QOF registers Swindon CCG at 31 March 2016

Other Conditions	**Numbers**	**Prevalence Rate as Percent**
Atrial Fibrillation	3,476	1.5%
Dementia	1,395	0.6%
Hypertension	31,729	13.7%
Learning Disabilities	1,129	0.5%
Mental Health (SMI)	1,763	0.8%
Osteoporosis (50+ years)	305	0.4%
Peripheral Arterial Disease	1,285	0.6%
Rheumatoid Arthritis (16+ years)	1,271	0.7%
Obesity (16+)	19,553	10.9%
*Hypothyroidism**	5,241	2.3%

Source: QOF 2015/2016 except *Hypothyroidism, last included in QOF in 2013/2014

QOF data have the great strength of being medically confirmed conditions (rather than self-reports), although they carry the problem that one person can be counted many times in separate registers and it is difficult to work out the pattern of multi-morbidities (MMs) that might exist in the population. In other words, QOF counts cases of disease, not individual persons, who might each have their own unique set of health conditions and needs. A pragmatic, though not complete solution, to the issue of counting individual people can be found by using the QOF indicator for "recording smoking" (known as "SMOK002"). This indicator is calculated in QOF for people who have at least one of the following conditions (i.e. each person is only counted once): asthma, COPD, CKD, CHD, diabetes, hypertension peripheral arterial disease, stroke, Severe Mental Illness. At the end of March 2016, 51,227 such persons in the Swindon CCG population were recorded as eligible for this indicator. This produces a figure of 22.2%, which we will regard as a LTC "Proxy from QOF" prevalence.

Important QOF conditions such as Cancer (2.2%), depression (8.4%), hypothyroidism (2.3%, though not in the latest QOF registers), and obesity (10.9%) are not included in the "Proxy from QOF", as part of the primary care reporting process. If half of the people with these conditions had only one QOF condition, (i.e. were not already counted in the "Proxy from QOF") then they would amount to about 12% of the primary care population. These people would then bring the QOF estimate of the "LTC Pool" up to about 34%. Of course, a smaller proportion may have only one condition, so this would mean that 12% would be an over-estimate. However, what we are calling a "Credible QOF" value of about 30% seems a reasonable estimate.

(**Note on a "Proxy from QOF" for people aged 65 years or more**: There is no direct way of estimating the "Proxy from QOF" for people aged 65 years or over. When we applied national age and sex-specific rates of cardiovascular disease from the Health Survey for England 2011[23] to the Swindon population, we found that the rate of CVD in this older age-range would be about 2.5 times greater than the rate for people of all ages. When we used this as a guide and applied it to the QOF data, this produced a "Proxy from QOF" of 55.5% for this older age-range)

[23] www.gov.uk/government/publications/health-survey-for-England-2011. Health Survey for England 2011

4.2 Secondary Care (Hospital Admissions)

Table 4A. Hospital Admissions for population of Swindon UA in financial year 2015-2016, by selected primary diagnoses for a basket of LTCs. All Ages included.

	Elective (Planned)		Emergency (Not Planned)		All Admissions	
	Number	**Rate per 100,000**	**Number**	**Rate per 100,000**	**Number**	**Rate per 100,000**
Asthma	183	84.3	230	105.9	413	190.2
Bronchiectasis	6	2.8	43	19.8	49	22.6
Cancer	5,918	2,725.2	413	190.2	6,331	2,915.4
CHD	340	156.6	584	268.9	924	425.5
CKD	75	34.5	49	22.6	124	57.1
COPD	7	3.2	448	206.3	455	209.5
*CVD (Circulatory Diseases)**	1516	698.1	2209	1,017.2	3,725	1,715.3
Dementia	<6	_	27	12.4	_	_
Depression	38	17.5	32	14.7	70	32.2
Diabetes	17	7.8	193	88.9	210	96.7
Epilepsy	20	9.2	147	67.7	167	76.9
Heart Failure	19	8.7	279	128.5	298	137.2
Hypertension	<6	_	63	29.0	_	_
Hypothyroidism	<6	_	8	3.7	_	_
Mental Health	<6	_	22	10.1	_	_
Obesity	22	10.1	<6	_	_	_
*Stroke***	23	10.6	298	137.2	321	147.8
TIA	<6	_	36	16.6	_	_
Total of LTC basket	7,811	3,596.9	3,811	1,754.9	11,622	5,351.8
All Conditions	30,703	14,138.4	23,001	10,591.7	53,704	24,730.2

Source HES/SUS[24]. ***CVD (Circulatory Diseases) is a broad class of conditions which includes CHD, Stroke, TIA and Heart Failure, plus other conditions. ****Includes some cerebrovascular problems which are not strictly stroke. See Appendix One for ICD Codes and further notes. Small numbers have been suppressed to preserve confidentiality.*

[24] NHS HES (Hospital Episode System), Secondary Uses System.

Table 4B. Hospital Admissions for population of Swindon UA in financial year 2015-2016, by selected primary diagnoses for basket of LTCs (selection as in Table 4A), by aged under 65 years and 65 years and over.

	Aged Under 65 years					
	Elective (Planned)		**Emergency (Not Planned)**		**All Admissions**	
	Number	**Rate per 100,000**	**Number**	**Rate per 100,000**	**Number**	**Rate per 100,000**
Total of LTC basket	4,321	2,347.2	1,560	847.4	5,881	3,194.6
All Conditions	19,088	10,368.6	14,227	7,728.1	33,315	18,096.7
	Aged 65 years and over					
	Elective (Planned)		**Emergency (Not Planned)**		**All Admissions**	
	Number	**Rate per 100,000**	**Number**	**Rate per 100,000**	**Number**	**Rate per 100,000**
Total of LTC basket	3,490	10,554.7	2,251	6,807.6	5,741	17,362.3
All Conditions	11,615	35,126.7	8,774	26,534.8	20,389	61,661.5

Source HES/SUS. *See Appendix One for further notes*

Information relating to hospital admissions is systematically-recorded within the NHS at an individual patient level. The electronic Hospital Episode System captures detailed diagnostic information about patients' medical conditions, and of course, LTCs feature among the latter. The number of admissions to hospital for inpatient stays, and the rates of these per 100,000 population for residents of Swindon UA in one year, are shown in Tables 4A and 4B. Table 4A divides total admissions into elective (i.e. planned) admissions and emergency admissions, for patients of all ages, and highlights a basket of LTCs as potential primary reasons for admission.

The most common primary diagnosis on admission was cancer (with 6,331 admissions), followed by CVD (including both CHD and stroke, with 3,725 admissions), with COPD in a

distant third place (with 455 admissions). The rates of admission for these three LTCs were respectively 2,915.4 per 100,000, 1,715.3 per 100,000, and 209.5 per 100,000. (These rates can be converted into percentages for comparison with other measurements of LTCs by dividing by 1,000, although certain caveats must be borne in mind with this approach.) The majority of COPD admissions were emergencies, while most cancer stays were elective; for CVD conditions, though, the balance was more even, with emergency admissions being in the majority. If all the selected LTCs in the table are combined, the number of admissions was 11,622 and the admission rate was 5,351.8 per 100,000. The total number of admissions (whether for a selected LTC or not) was 53,704, so the basket of LTCs accounted for about one fifth of all hospital stays (11,622/53,704) and about one quarter of all elective stays (7,811/30,703).

In Table 4B total admissions for one year are divided by age, with people under 65 and people 65 years and over shown separately (without a detailed breakdown by condition.) With respect to the basket of LTCs, in people aged under 65 elective stays predominated, equating to just over 7 in 10 admissions, while for people aged 65 year or more elective admission was still the more common, but for 6 in 10 admissions.

Admissions for the LTC basket were much more frequent, as a population rate, in people aged 65 years or more, with a rate of 17,362 per 100,000 as compared with 3,194.6 per 100,000 in people aged under 65. However, although older people were more at risk of being admitted with a LTC, the actual numbers of admissions of younger (mainly middle-aged) people and older people were at similar levels, respectively 5,881 and 5741. This adds to the evidence that, in terms of case-numbers in Swindon UA, LTCs are very much a characteristic of middle-age, although older people are actually at higher statistical risk of having one or more LTCs.

Thus, hospital data can provide useful background for understanding the extent of LTCs, particularly in bringing to light certain patterns in the population, yet this approach has a notable limitation. Hospital admissions are not a record of the prevalence of an LTC (of the existing pool of people with the LTC), but a count of people who require the specialist

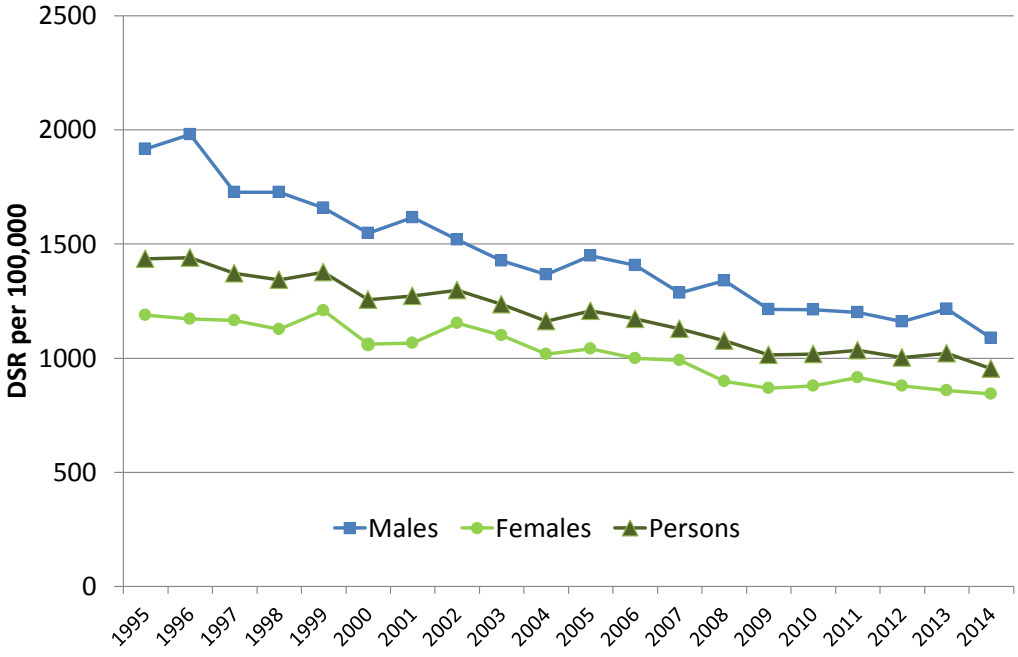
treatment, the secondary or tertiary care, that a hospital provides. For example diabetes is fairly common, with a prevalence of about 7% in the QOF register, but admission to hospital with diabetes as a primary reason is relatively infrequent. Diabetes is generally managed within the primary care service, although some people might also require outpatient advice and treatment. The value of 96.7 per 100,000 for admission with diabetes in table 4A equates to a percentage figure, at maximum, of 0.097 of one percent of the population (a maximum as some people might have had more than one admission each.) By the same token, 5,351.8 admissions per 100,000 for the basket of LTCs (in Table 4A) would equate to a maximum prevalence of 5.4% for LTCs in Swindon UA population, well below what we would be expecting, judging by levels in the QOF registers.

4.3 Life Expectancy and Mortality

Overall

In this section we consider briefly the subject areas of life-expectancy and mortality in Swindon UA. Although not providing a way of gauging the LTC pool, life expectancy and mortality provide additional context for assessing the state of health of people in Swindon, priorities for prevention and the proportions of lives that may be affected by ill-health.

Figure 19: All Age, All Cause Mortality by Sex as Directly Standardised Rate per 100,000 in Swindon UA 1995 to 2014



Source: ONS. Compendium of Public Health Indicators. NHS Digital.

The overall mortality rate in Swindon UA has been declining over the past two decades as in England as a whole. In fact, the directly standardised mortality rate for males in Swindon UA has decreased by about fifty percent in the period 1995 to 2014 inclusive[25], although the decrease for females has not been so dramatic (Figure 19). By 2012-2014, average life expectancy at birth in Swindon UA was 79.5 years for males and 83.0 years for females, which was similar to that in England as a whole. Current estimates are that males in Swindon will spend 80.7% of their lives in good health, whereas women will only spend 75.8% in good health, so not all of the "extra years" that have been attained are healthy ones. If we consider life expectancy by the time that an age of 65 is reached, life expectancy for males in Swindon is currently an additional 18.5 years compared to an additional 21.1 years for females, with healthy life expectancies at 65 of 9.4 years and 9.8 years respectively.[26]

The causes of premature mortality in Swindon UA are changing over time. In 2001-2003, in Swindon people under 75 years, 36% of deaths were from cancer and 30% from cardiovascular disease (CVD or circulatory disease) but by 2012-2014, 41% were from cancer and 23% from CVD. If all deaths are considered the cancers are still a more common cause of mortality than circulatory diseases[27] (Table 5), although by a smaller margin than in the younger people when considered separately. The main reasons for this would appear to be the increasing effectiveness of treatment of circulatory diseases and improvement in lifestyles.

[25] www.content.digital.nhs.uk/indicatorportal. Compendium of Public Health Indicators, Indicator Portal, NHS Digital.
[26] www.healthprofiles.info. Health Profiles, Public Health England. Accessed at 18.10.17
[27] www.content.digital.nhs.uk/indicatorportal. Compendium of Public Health Indicators, Indicator Portal, NHS Digital.

Table 5: Mortality by Primary Cause in Swindon UA in 2012-2014 inclusive.

Cause of Death	Number of deaths	Directly Standardised Rate per 100,000 p.a.
Asthma *(ICD 10, J45-J46)*	8	1.7
Cancer *(ICD 10, COO-C97)*	1,431.5	284.8
Circulatory Diseases *(ICD 10, I00-I99)*	1,323.8	270.7
CHD *(ICD 10, I20-I25)*	621.7	126.4
Stroke *(ICD 9, 430-438) adjusted, ICD 10, I60-I69)*	314.9	65.1
Other Heart Diseases* (*ICD 10 I26-I52)*	68.7	32.1
Chronic Kidney Disease *(ICD 10, N18)*	11.5	2.3
COPD *(ICD 10, J40-J44)*	281	57.4
Diabetes *(ICD 10, E10-E14)*	45.6	8.9
Epilepsy *(ICD 10, G40-G41)*	6.4	1.0
All causes *(ICD 10, A00-Y99)* <75 years All Ages	 1,690 4,914	 346.7 992.6

*Other Heart Diseases includes pulmonary heart disease, cardiomyopathy, heart failure, with crude rate per 100,000 given. Some Death numbers adjusted to have fractions, due to coding changes which happened retrospectively.

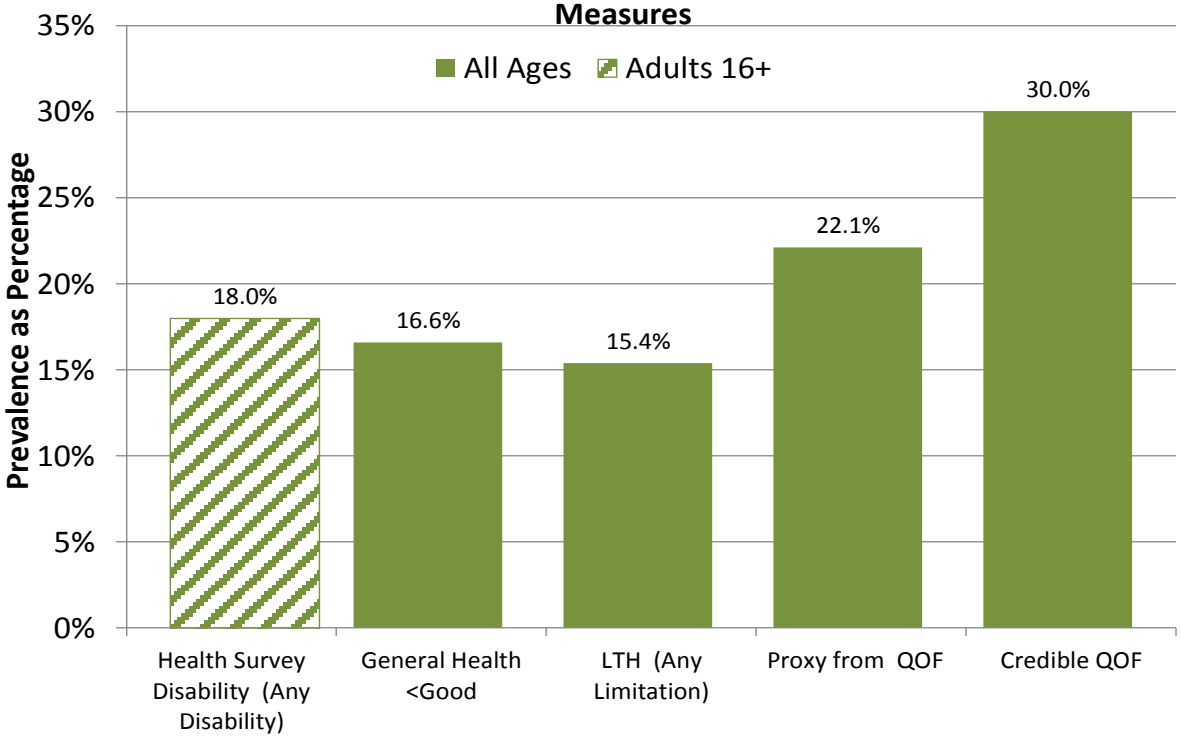
Source: NHS Digital, Compendium of Health Indicators

We have already noted how people from more deprived backgrounds are likely to report worse health and disability status than their more affluent peers. This comparatively poor health has its counterpart in higher mortality rates experienced in more deprived areas. The Slope Index of Inequality is a standard method of establishing the difference in life expectancy within the segments of a population. It divides a population into ten groupings (decile groups) according to level of deprivation, plots them graphically and then draws a line of best fit through them. In Swindon UA the difference by this method between the most deprived group and the least deprived group translated into life-expectancies that were longer in the least deprived group by 9.7 years for males and 4.0 years for women (in 2010-2012)[28].

[28]www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/datasets. Slope Index of Inequality, ONS.

5. Synopsis of Socio-Demographic and Epidemiological Measures

Figure 20: Approximated Prevalences of LTCs in Swindon UA, comparing Socio-Demographic Measures and Epidemiological Measures



Sources: Health Survey England 2001, 2011 Census, 2015-2016 QOF.

In this section we review the socio-demographic measures and epidemiological measures that relate to LTCs and ascertain whether or not they are providing us with a common story about the "LTC pool" in Swindon and discuss how that story can be interpreted. Prevalences from these measures are presented together in Figure 20, where possible for people of all ages.

The three socio-demographic measures (all self-reported) produce prevalences of a similar magnitude to each other, at a more credible level. The General Health measure and Long Term Health Problem or Disability measure (both from the 2011 Census) produce all-age percentages of 16.6% and 15.4% respectively. Overall, then, these three survey measures do indeed seem to have a common story: about 15% to 16% of people in Swindon UA might

have some form of LTC, while if we look at adults only, the range is higher, extending to about 18%.

Recent ecological analyses[29] support the hypothesis of a relationship in populations between the LTH measure, as used in the 2001 Census and the Health Survey Disability measure, even though these were not administered at the same time. The Health Survey Disability measure has a specific focus on the types of disability to be reported, while the LTH measure is general and non-specific, yet produce similar overall results. In other words, people answering the LTH question seem to be bearing in mind genuine disabilities and are probably not under-reporting their impairments to any significant extent.

Hospital admissions record people passing through just one part of the health and care system so is informative in some ways, but is not a reliable guide to LTCs in the population as a whole. The QOF disease measure, though, has the advantage of being medically confirmed and linked to specific diseases, rather than being a general self-report. The registers count diseases rather than people, however, and we have to use the best proxy measure for a combined count of individuals with one or more QOF diseases. Our "Proxy from QOF" measure gives 22.2% for all ages. These could be underestimates as QOF measurements of cancer and of depression are not included in the proxy, for example, and in any case, QOF is likely to underestimate levels of diabetes, obesity and dementia.

Why are the proxy QOF estimates noticeably higher than the three credible socio-demographic measures? Presumably people will know if they have an objectively diagnosed condition, so why do some people not evaluate themselves subjectively as having what their doctor might call a long-term health problem? The answer would seem to be that if people do not feel disabled or limited or feel a lack of well-being, they do not subjectively regard themselves as being in unfavourable health or impaired. (The percentages of people reporting themselves as at an extreme of poor health, that is, "limited a lot" or in "bad or very bad health", were even smaller, 7.0% and 4.6% respectively.) This distinction between

[29] Marshall A *et al.* Development of a relational model of disability. Cathie Marsh Centre for Census and Survey Research. CCSR Working Paper 2012-03.

a more objective measure of LTC status and people's subjective experience of having one or more LTCs has obvious implications in the assessment of need for services in our population. The QOF disease registers might be a clinically realistic (objective) assessment of the size of the "LTC pool", but (subjective) self-reports from the census suggest that a proportion of these people recorded in QOF ("Credible QOF"), perhaps about a third, are managing well with their conditions.

6. The "LTC Pool" in Swindon estimated from the Symphony Model

6.1 Deployment of the Symphony Model

The origins and use of the Symphony Matrix model are described in detail in Appendix Two, while an overview is given here. The Symphony Project[30] is based on a large data-set linking health and social care data for each individual in the Somerset population. The data cover twelve months from April 2012 to March 2013 and are anonymised, individual-level data about health conditions, care-settings used and associated costs. Demographic characteristics have been recorded for each individual, including age, gender, and deprivation level, characterised by ten levels of deprivation (decile groups) according to national standards. Somerset County Council has used the linked dataset to identify types of patients who might benefit from more integrated forms of care.

In a further development, Devon Public Health[31] has utilised these data to create a matrix model of rates of activity over one year at a group level (rather than at individual level) and applied the model to its own population. The groups are characterised by age (in five year age-bands) sex, deprivation level and a summary of the main chronic diseases or conditions experienced in that group (the Multi-Morbidities or "MMs".) The morbidities included are asthma, cancer, CHD, Chronic Kidney Disease, COPD, dementia, diabetes, epilepsy, Heart Failure, hypertension (raised Blood Pressure), stroke/Transient Ischaemic Attack and Severe

[30] Integrated Care Case: Who would most benefit from improved integrated care? Implementing an analytical strategy in South Somerset. Kasteridis P. *et al*. Int J Integr Care 2015; Jan–Mar;
[31] Long Term Conditions: Health Needs Assessment. Public Health Devon, Devon County Council, Plymouth City Council. 2015

Mental Illness. In the model these occur in a variety of combinations or as single morbidities and some groups do not have any diseases at all. Devon Public Health has also drawn upon the Somerset model to calculate an average cost for each condition in each care setting. (Note that in the matrix model, costs were mainly calculated based on patients with one disease, as it was not possible to summarise costs for each multi-morbidity group).

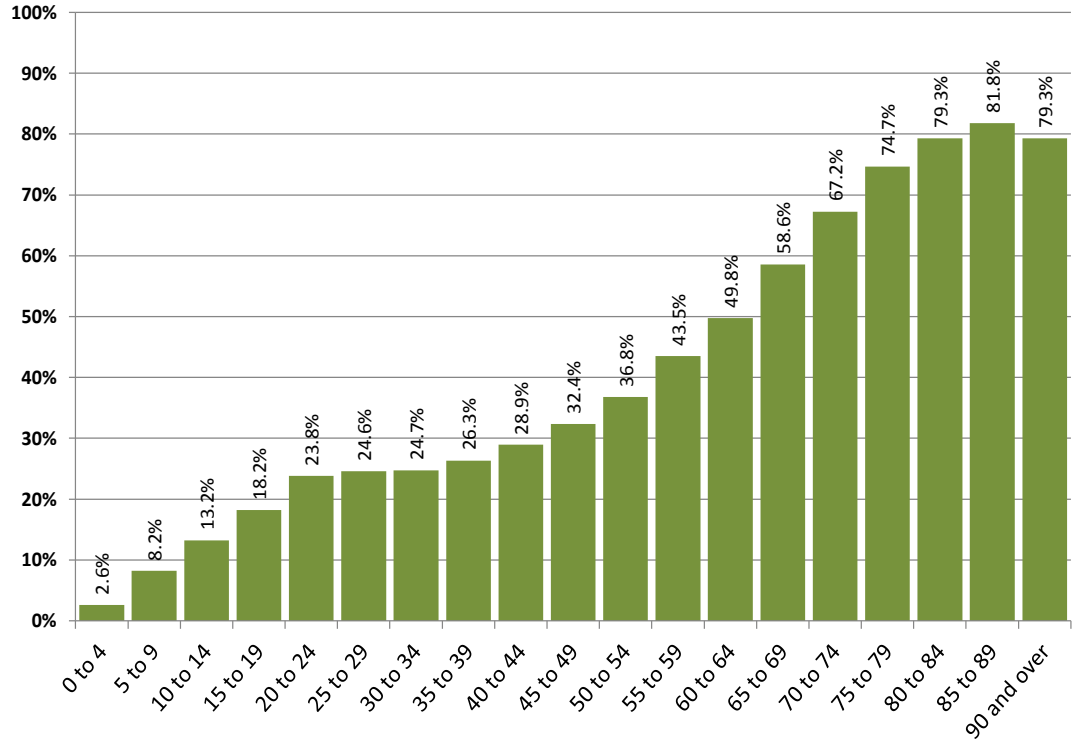
In deploying the Symphony model, we applied the disease rates and cost rates from the model to the socio-demographic structure of the Swindon UA population of 2015. This enabled us to calculate an expected number of people, by socio-demographic group, with no morbidities, with one morbidity and with various combinations of conditions in the Swindon population, and to make inferences about the care-settings which might be involved and the costs which might be incurred. For simplicity, in the following sections, we present the Symphony results, as a picture of LTCs in the Swindon population, although these estimates are imputations, so this is really a "virtual" picture. We also present results related to deprivation according to five levels of deprivation, quintile groups, (condensing our calculations from the ten decile groups.).

6.2 Overview of the Symphony Results for Swindon UA

In the Swindon UA population of 217,160 there were 69,820 people who had at least one condition, 32.2% in all. In the males, 30.1% (32,518) had at least one condition, and in the females 34.2% (37,301) had at least one condition. In all, 21.0% of people had only one condition (45,580), 7.2% (15,699) had two conditions, while 3.9% (8,540) had three or more conditions. Thus, approximately one third of people with any recorded condition were in a state of multi-morbidity, having co-morbidities alongside their main condition.

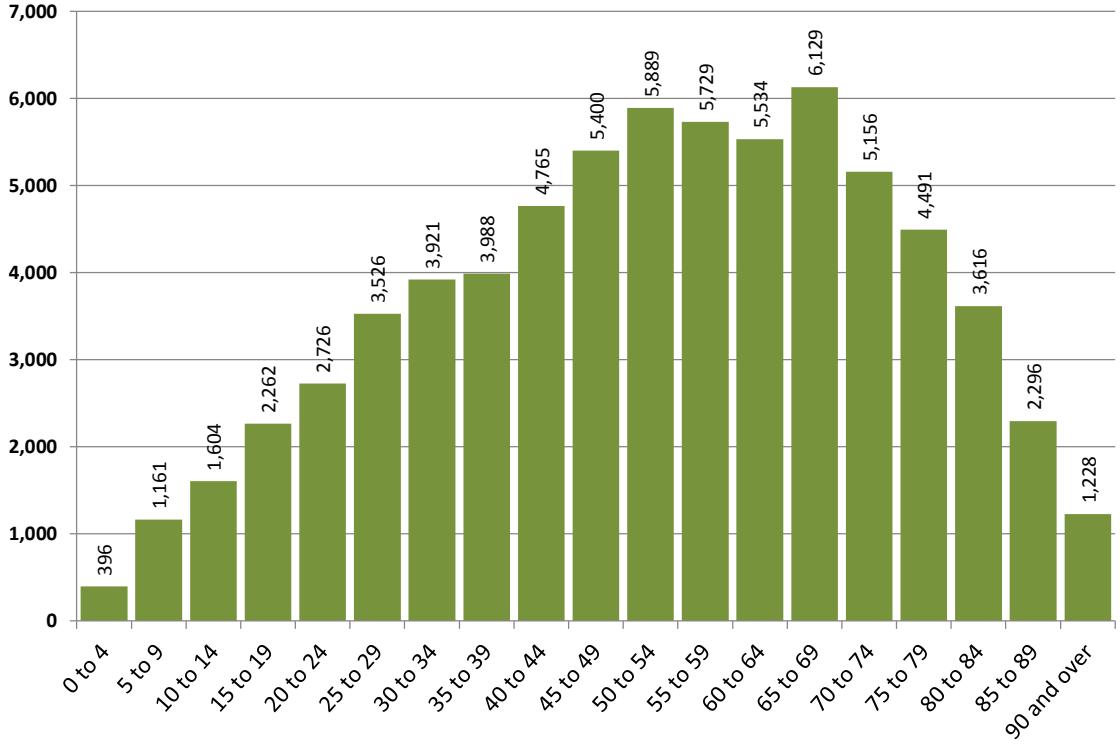
Amongst people aged 65 years or more (numbering 33,066 in all) 69.3% (22,917) had at least one condition, and the proportion was the same in both men and women. Figure 21A depicts how the prevalence of having at least one condition rises steadily with age. In the 65+ age-group, 30.7% (10,140) had one condition only, 21.2% (7,020) had two conditions and 17.4% (5,757) had three or more conditions. Thus, in approximate terms, just over one half of people aged 65 years or more with any recorded condition were in a state of multi-morbidity, having co-morbidities alongside their main condition.

Figure 21A: Prevalence of LTCs in Swindon UA in Symphony Model for 2015 Population (All Ages) As Percentage by Age-Group



Source: Symphony Model for Swindon UA 2015

Figure 21B: Numbers of People with LTCs in Swindon UA in Symphony Model for 2015 Population (Prevalent Cases by Age-Group)



Source: Symphony Model for Swindon UA 2015

A contrasting but complementary perspective is provided in Figure 21B. This shows the case-numbers, that is numbers of people with at least one condition, as opposed to rates or percentages, by age-group. From this viewpoint, that of counting cases or people, LTCs are more of a middle-aged phenomenon, that extends into early old age, with the peak in case-numbers occurring in an age range from 40 years to 74 years. This is in accord with the figures from HES in Table 4B. In all, 38,602 of the cases occurred in this age-range, that is 55.3% of all cases imputed by Symphony for the Swindon population. The health of middle-aged people has recently been discussed in a report of the Chief Medical Officer for England.[32]

[32] Annual Report of the Chief Medical Officer 2015. On the State of the Public's Health. Baby Boomers. Fit for the Future. Dept of Health (England).

Table 6. Percentage of People in Swindon UA with at least one condition in the Symphony Model 2015, by quintile group of national deprivation.

Quintile Group	Population (All Ages)	Number with at least One Condition	Percentage with at least one condition
I (Most Deprived)	32,685	11,658	35.7%
II	33,934	11,246	33.1%
III	28,851	9,338	32.4%
IV	71,758	22,548	31.4%
V (Least Deprived)	49,932	15,029	30.1%
All Swindon UA	217,160	69,820	32.2%

The percentage of people of any age with at least one condition clearly varied according to quintile group of deprivation, with the more deprived groups being more likely to have at least one condition. Nevertheless, this variation was moderate, rather than striking. As Table 6 shows, 35.7% of people in the most deprived group (Group I) had at least one condition, whilst in the least deprived group (Group V) the proportion was 30.1%. Thus Group I was about 19% higher, but this was a difference of only six percentage points. In a separate analysis looking at prevalence in ten deprivation groups within Swindon, the gradient was only slightly more pronounced. The "Most" deprived group had a proportion of 37% while the "Least" deprived group showed a proportion of 29.6%

6.3. People with Three or More (3+) Conditions, aged 65+ years, in the Symphony Model

Table 7 shows how, according to the Symphony model, the rate of having 3+ conditions in people aged 65 years or more, is associated with the level of deprivation in the population of Swindon, three or more conditions becoming more frequent as deprivation increases. The most cases (persons) are in Group 8, a relatively un-deprived group, because this has the largest population, although Group 8 has a relatively low rate. However, there are local indications that it is people with 3+ LTCs aged 65 years or more in deprived areas who are most likely to need state-funded social care.

Table 7. Numbers and Percentage Rates of 3+ Conditions in people aged 65+ by Decile Group of

Decile Gr. of Depriv	3+ Conditions Case Numbers	Total Pops 65+	Rate of 3+ (%)
1	395	1,555	25.4
2	668	2,785	24.0
3	491	2,421	20.3
4	391	2,107	18.6
5	417	2,385	17.5
6	442	2,580	17.1
7	559	3,636	15.4
8	1,300	8,331	15.6
9	838	5,398	15.5
10	254	1,868	13.6
All	5,757	33,066	17.4

Deprivation in Swindon UA, as imputed from Symphony Model.
1= Most Deprived Group.

Table 8 indicates how, although the rate of 3+ conditions is associated with deprivation, some relatively un-deprived wards have high case numbers, e.g. Covingham and Dorcan, St Margaret and South Marston, because of their large populations. The most common conditions, as proportions of all people with 3+ conditions, were: hypertension (high blood pressure) 83.2% (4,788 persons), CHD, 43.0%, (2,474 persons), diabetes 40.7%, (2,345 persons), cancer 37.1% (2,137 persons) and stroke 29.0% (1,672 persons).

Table 8. Numbers of People with 3+ Conditions for 65+ age-group by Electoral Ward, Swindon UA, as imputed from Symphony Model. Numbers aggregated from calculations at LSOA level. Wards in descending order of case numbers. 1 = most deprived ward.

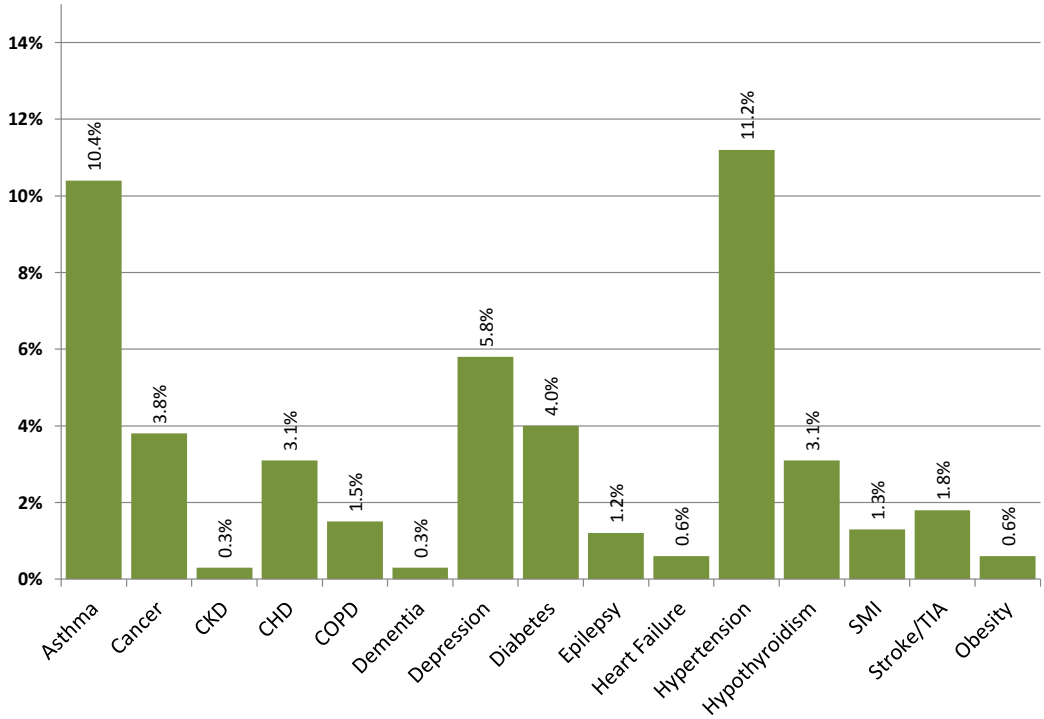
Electoral Ward	Aggregated Case Nos	Population aged 65+	Pop. Rate per 1,000 aged 65+	Deprivation ranking
Penhill and Upper Stratton	462	2,229	207.3	2
Rodbourne Cheney	450	2,096	214.7	6
Covingham and Dorcan	441	2,398	183.9	10
St Margaret and South Marston	416	2,422	171.8	13
Liden, Eldene and Park South	407	2,034	200.1	4
Gorse Hill and Pinehurst	393	1,938	202.8	3
Blunsdon and Highworth	377	2,684	140.5	12
Walcot and Park North	362	1,979	182.9	1
Wroughton and Wichelstowe	360	2,082	172.9	11
Haydon Wick	324	2,218	146.1	15
Lawn and Chiseldon	272	1,625	167.4	16
Central	233	1,134	205.5	5
Lydiard and Freshbrook	230	1,436	160.2	8
Mannington and Western	218	1,177	185.2	7
Old Town	180	1,468	122.6	14
Eastcott	172	1,094	157.2	9
Shaw	159	1,039	153.0	17
St Andrews	106	722	146.8	18
Priory Vale	97	665	145.9	19
Ridgeway	97	626	155.0	20

6.4 Symphony and the Census: A Binocular Approach

With regard to people aged 65 years or over, we might use Symphony data and Census data to draw the following inferences. 69.3% of people in this broad age-group were captured in Symphony with at least one LTC. However, in the Census, a lower proportion, 51.1% of people in this age-group reported limitations. This suggests that 18.2% of people (69.3% minus 51.1%) in this age-group had at least one LTC but were NOT limited.) If we combine these people (in Symphony, but not limited) with people who are not in the Symphony LTC figure at all (another 30.7%) , together they make up 48.9% of this age-group who might be said to be "Ageing Well", either with at least one LTC and not feeling limited, or without any LTCs at all. Of course, some people who are both estimated as having at least one LTC in Symphony and who report limitations in the Census, might also express the view that they are "Ageing Well". This is their subjective opinion and we cannot infer it from these datasets, yet this possibility suggests it might be better for us to refer to an "Ageing Well" group of "at least 48.9"%.

6.5 Symphony Results for Swindon by Condition

Figure 22: Prevalence of LTCs in Swindon UA in Symphony Model for 2015 Population (All Ages) by Condition as Percentage



Source: Symphony Model for Swindon UA 2015

The prevalences of conditions in Swindon in the Symphony model for 2015 are displayed in Figure 22. The most common condition was hypertension with 11.2%, closely followed by asthma with 10.4%. Depression was the third most prevalent condition, with a level of 5.8%. In all, 3.8% of people had cancer, 3.1% had CHD and 3.1% had hypothyroidism. These prevalences are broadly similar to those to be found in the QOF registers, yet there are also a number of notable differences. The differences between figures from these two sources, and how we might understand the relative value of these two sources, is discussed in detail in Section 6.5.

Table 9 (in Parts A, B and C) presents the prevalence levels for each of the specific conditions in the Symphony model, in a set of three comparisons, by sex, by age-group and by deprivation group. Overall, considering the 32.2% of people who had at least one condition in the model, females had a rate 14% higher than men, although this amounts to a difference of four percentage points (34.2% for females compared with 30.1% for males.) With regard to the specific conditions shown here, the female rates were higher than the male rates for approximately half of them, such as asthma, cancer and dementia. For some of these conditions, the disparity was probably due to women having longer lives (e.g. in the case of dementia and cancer), while for others (e.g. depression, and hypothyroidism) the difference might possibly originate in underlying gender differences, whether sociological and/or biological. Males tended to have higher rates than females for the cardiovascular conditions (such as CHD, and heart failure and for diabetes which has cardiovascular consequences). However, in the case of stroke the gender difference was small and women had a slightly higher rate for hypertension.

In terms of small age-groups, the peak age-range for having at least one condition was 85 to 89 years. The majority of conditions showed a marked positive gradient by age, with the prevalence of the condition increasing in step with ageing in the population. Notable exceptions included asthma, which was most prevalent at 20 to 24 years, though also featuring in later life. (Asthma can desist in some people in their teens, although it can also return in later life.) Mental health conditions (apart from dementia) were more a feature of youth and middle-age. Depression peaked at 45 to 49 years and Mental Health (Severe

Mental Illness) at an earlier point, namely 20 to 24 years, though with a late upturn (in terms of increased prevalence) in people aged 90+.

The most consistent socio-demographic pattern was to be found in the comparison of the five groups according to deprivation status. For all specific conditions examined here (with the exception of cancer) people in the "Most" deprived group (Group I) had a higher prevalence than people in the "Least" deprived group (Group V); this applied in the realms of both physical and mental health, sometimes with marked disparities between the deprivation groups. In the case of COPD, the "Most" deprived had a rate 125% higher than the "Least" deprived and for Mental Health (Severe Mental Illness) the "Most" had a rate 114% greater than the "Least".

Cancer was unusual on account of its inverted social gradient, with the prevalence of this disease group increasing as the level of deprivation decreased, (though the highest prevalence was in the "second Least" deprived group, (Group IV). The rates presented in this section have not been standardised to allow for the effects of age. Therefore it is likely that the higher cancer rates in the relatively affluent groups are a result of these people often avoiding (or surviving) the other types of condition and encountering cancer in later life.

However, as we have noted above, at the overall level, the deprivation gradient was not as steep as we might have been anticipated, judging by the Census results. This does not seem to be due to an ageing effect (more affluent people having longer lives, though they do) or due to the statistical influence of one common condition, such as hypertension. Hypertension did not follow a clear social gradient, perhaps because identification rates vary by primary care practice, but removing hypertension from the analysis did not accentuate the social gradient.

Table 9A. Summaries of Conditions as Rates in Swindon in 2015, as imputed from the Symphony Model (First Part).

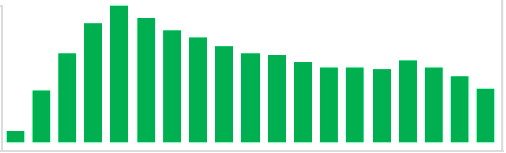
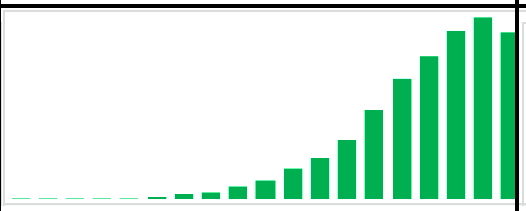
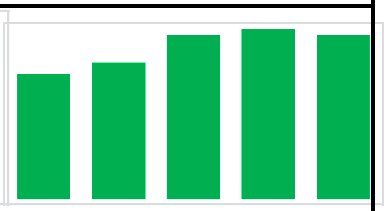
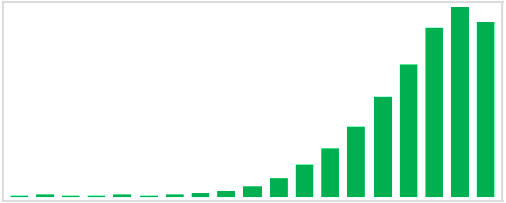
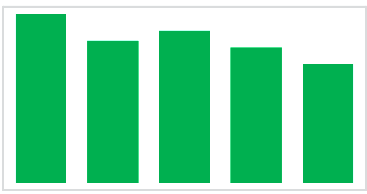
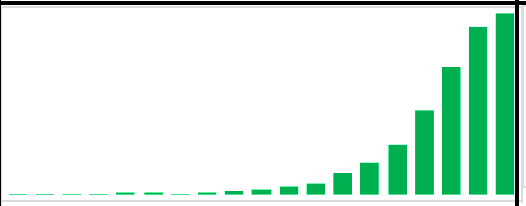
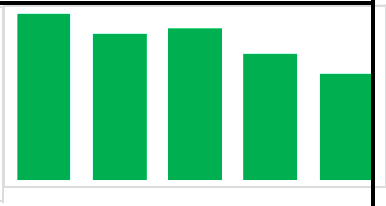
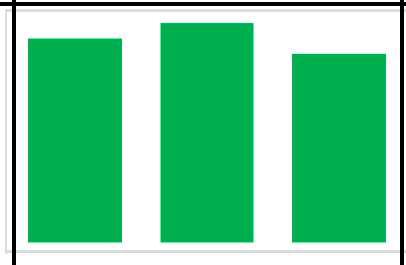
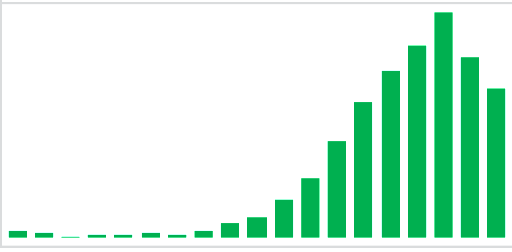
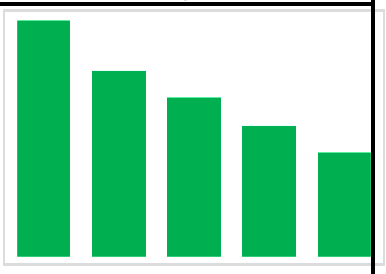
Condition With number and prevalence	By Sex People…. Males….Females	By Age Young…….to…… Old	Deprived Most……to……Least
Asthma 22,644 people 10.4%	 *Females 10% higher than Males*	 *Peak Age-group 20 to 24 years*	 *Most 18% higher than Least*
Cancer 8,297 people 3.8%	 *Females 20% higher than Males*	 *Peak Age-group 85 to 89 years*	 *Most 23% lower than Least*
CHD 6,742 people 3.1%	 *Females 38% lower than Males*	 *Peak Age-group 85 to 89 years*	 *Most is 43% higher than Least*
CKD 726 people 0.3%	 *Females 24% lower than Males*	 *Peak Age-Group is 90+ years*	 *Most is 52% higher than Least*
COPD 3,141 people 1.5%	 *Females 13% lower than Males*	 *Peak Age-group is 80 to 84 years*	 *Most 125% higher than Least*

Table 9B. Summaries of Conditions as Rates in Swindon in 2015, as imputed from the Symphony Model (Second Part).

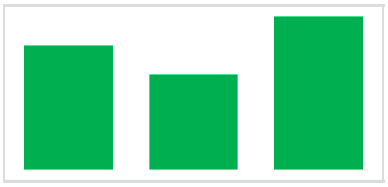
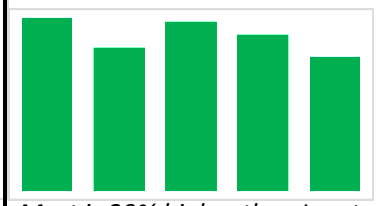
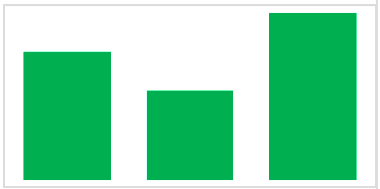
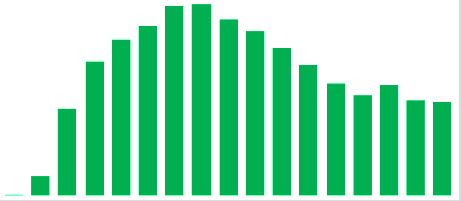
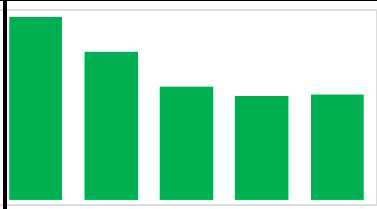
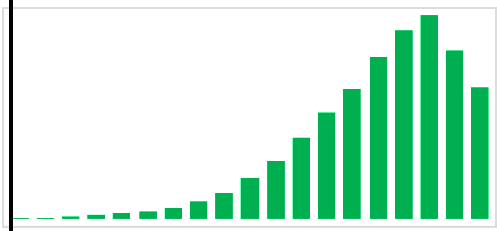
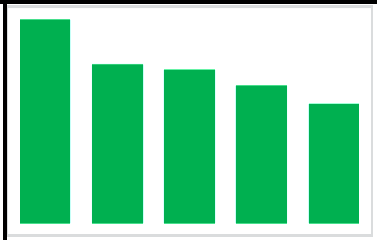
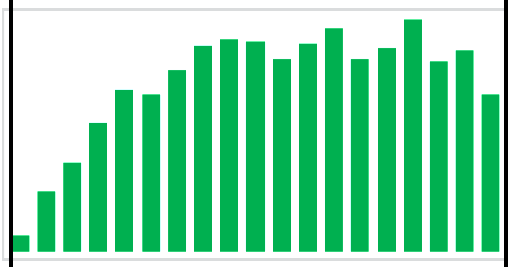
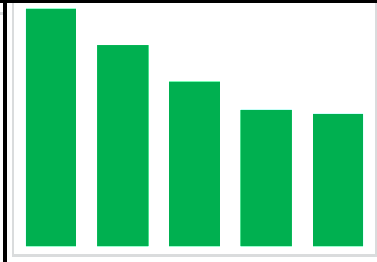
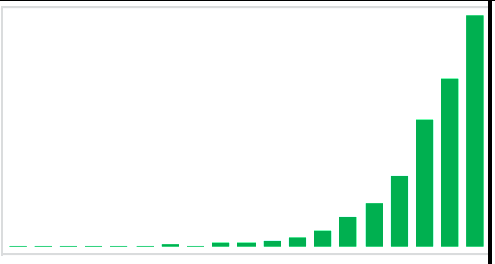
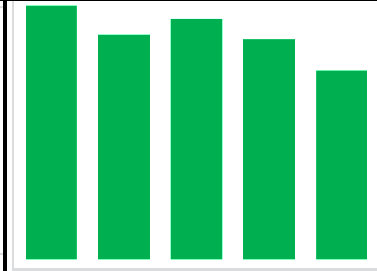
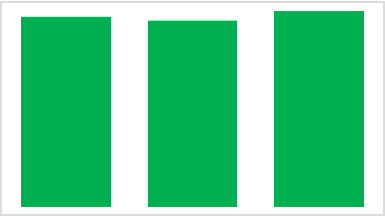
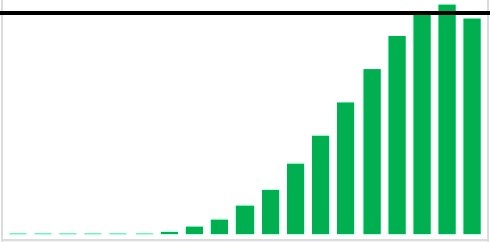
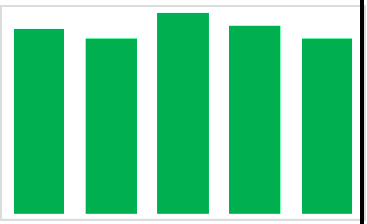
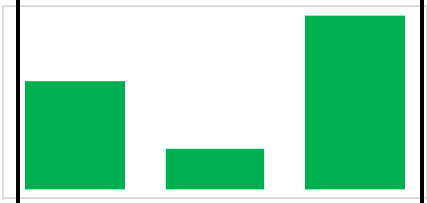
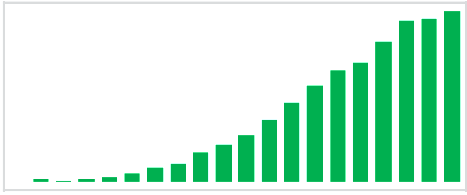
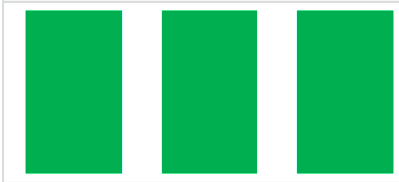
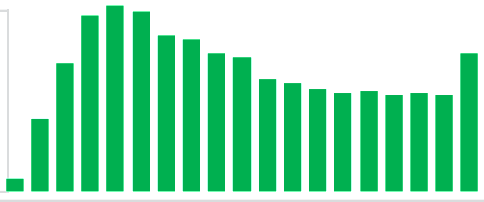
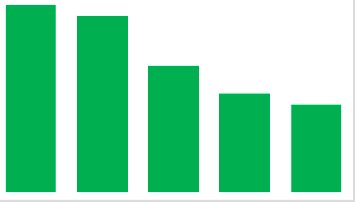
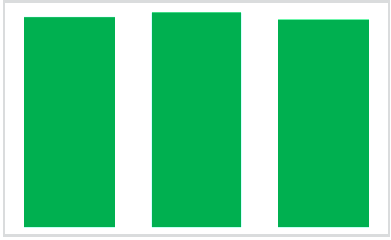
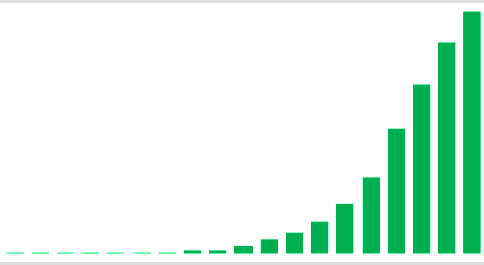
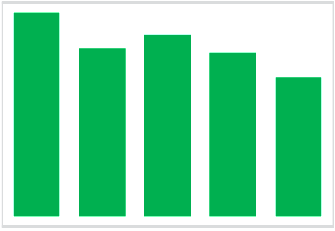
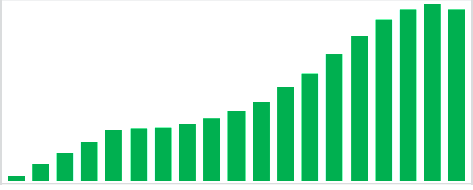
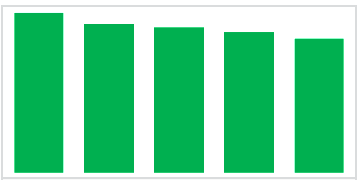
Condition With no. and prevalence	By Sex People…. Males….Females	By Age Young…….to…… Old	Deprived Most……to……Least
Dementia 685 people 0.32%	 *Females 63% higher than Males*	 *Peak Age-group is 90+ years*	 *Most is 29% higher than Least*
Depression 12,643 5.8%	 *Females 86% higher than Males*	 *Peak Age-group is 45 to 49 years*	 *Most is 73% higher than Least*
Diabetes 8,737 4.0%	 *Females 23% lower than Males*	 *Peak Age-group is 80 to 84 years*	 *Most is 68% higher than Least*
Epilepsy 2,623 people 1.2%	 *Females 8% lower than Males*	 *Peak age-group is 75 to 79 years*	 *Most is 79% higher than Least*
Heart Failure 1,306 people 0.6%	 *Females 19% lower than Males*	 ***Peak Age-Group is 90+ years***	 *Most is 35% higher than Least*

Table 9C. Summaries of Conditions as Rates in Swindon in 2015, as imputed from the Symphony Model. (Third Part).

Condition With no. and prevalence	By Sex People…. Males…..Females	By Age Young…….to…… Old	Deprived Most……to……Least
Hyper-tension 24,369 people 11.2%	 *Females 5% higher than Males*	 *Peak Age-group is 85 to 89 years*	 *Most is 6% higher than Least*
Hypo-thyroidism 6,626 people 3.1%	 *Females 316% higher than Males*	 *Peak Age-group is 90+ years*	 *Most 19% higher than Least*
Mental Health/SMI 2,839 people 1.3%	 *Females are in parity with Males*	 *Peak Age-Group is 20 to 24 years*	 *Most 114% higher than Least*
Stroke/TIA 3,830 people 1.8%	 *Females are 4% lower than Males*	 *Peak Age-Group is 90+ years*	 *Most 45% Higher than Least*
At Least One Condition 69,820 people 32.2%	 *Females 14% higher than Males*	 *Peak Age-Group is 85 to 89 years*	 *Most 19% higher than Least*

6.6 Discussion of Symphony Prevalences

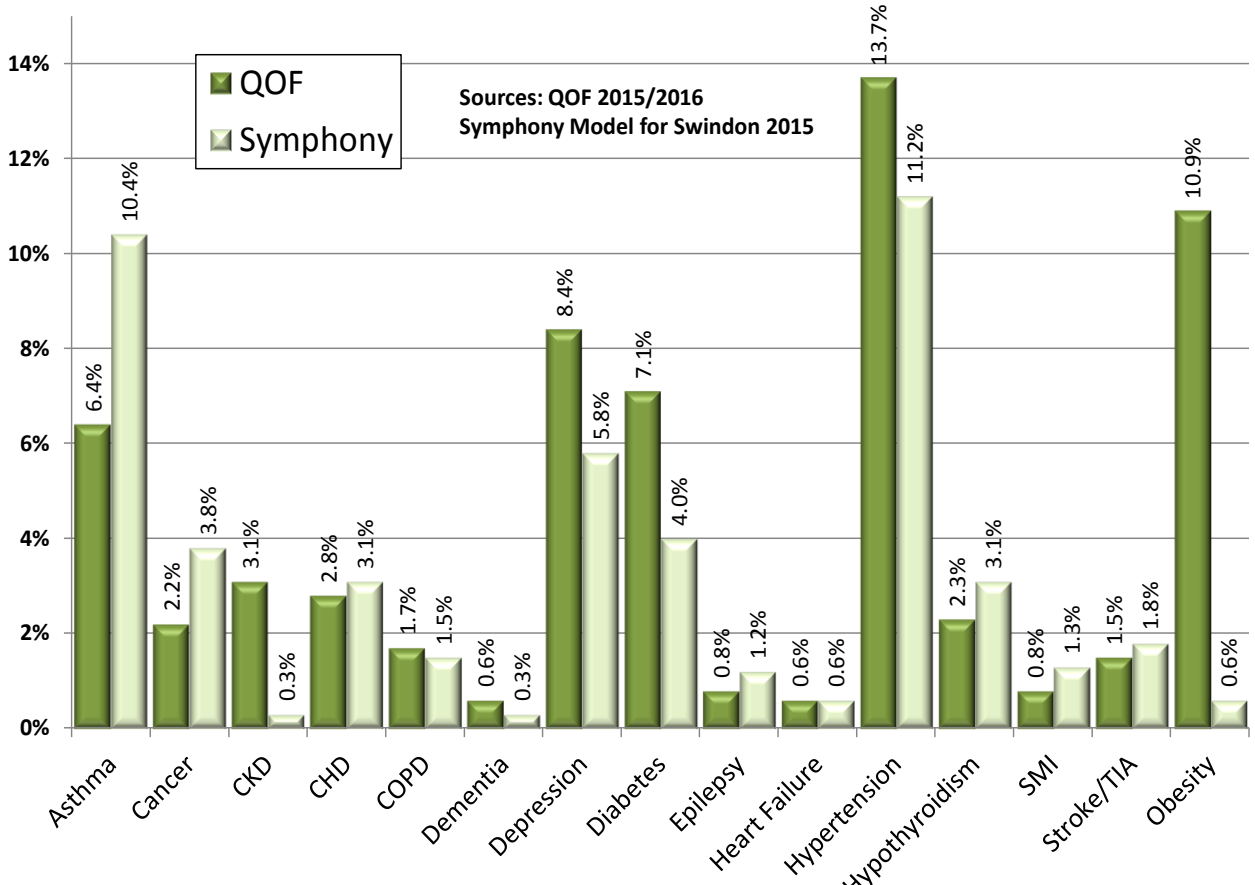
A comparison of prevalences for specific conditions from QOF and from the Symphony model are presented in Figure 23. The prevalences for Swindon produced in the Symphony model do not, with one exception, exactly match those we have cited from the QOF registers, and it is necessary to discuss why this might be so and what the implications are. Overall, the Symphony figures differ from the QOF figures by a mean of about 2 percentage points, which is only a moderate disparity. In a number of instances the figures are indeed very close (e.g. COPD with 1.7% in QOF and 1.4% in Symphony, stroke with 1.5% in QOF and 1.8% in Symphony.) However, for certain conditions Symphony has produced noticeably higher prevalences, such as 10.4% for asthma where QOF has 6.4%, and 3.8% for cancer where QOF has 2.2%.

There are obvious reasons why Symphony might produce higher prevalences: QOF provides a record by *point prevalence*, that is, the prevalence on one particular day of the year, whereas Symphony measures a *period prevalence*, that is activity over the period of a whole year and will capture new diagnoses which are made after the "QOF day" and include people who die before the "QOF day". Furthermore, Symphony covers Swindon UA rather than the Swindon CCG area covered in QOF and, as Swindon UA is slightly more deprived than Swindon CCG, the Symphony prevalences will reflect this, that is to say, they will be higher. Also, some QOF figures exclude children, where Symphony includes children. In addition, as Symphony has encompassed hospital data, it is possible that it has incorporated provisional diagnoses into the model; although the ICD coding system allows for provisional diagnoses, in practice when treatment is given in emergency situations on a "just in case" basis, this might appear in the electronic medical record as a firm diagnosis.

More perplexing are the instances where the Symphony model returned noticeably lower prevalences than QOF. QOF records a prevalence of 3.1% for CKD where Symphony has only 0.3%, apparently missing the majority of the cases. For dementia, QOF records 0.6% where Symphony has only 0.3%. As far as obesity is concerned, Symphony exhibits a major failure, returning an estimate of 0.6% for Swindon where Swindon's QOF figures have 10.9%. For this reason we have omitted obesity from Tables 7A, 7B and 7C. It is possible that, in its

construction phase, Symphony lost cases due to problems in linking up records from different sources or conceivably due to recording problems in QOF which existed in Somerset where the matrix was developed, but which do not exist in Swindon.

Figure 23: Prevalence of LTCs in Swindon UA in QOF and Symphony Model Compared by Condition



In QOF CKD, epilepsy & depression are only registered for people aged 18+ years, diabetes people aged 17+ years, and arthritis and obesity for 16+ years; hypothyroidism figure given is from 2013/2014

Despite these weaknesses, the distributions of prevalences by condition in Symphony, as set forth in Tables 9A, 9B and 9C, make intuitive sense and are generally in accord with existing knowledge about these conditions. The overall Symphony figure of 32.2% as an estimate of the period prevalence of people with at least one LTC is also credible. As a measure of people in the "LTC pool", it is likely to be nearer to the truth than the overall QOF figure of 22.2%, which we have evaluated as statistically robust, but less comprehensive and so conservative (see Section 5). The "Credible QOF" figure (30%) which we have calculated is more in line with the Symphony estimate. The comparative strengths and weaknesses of QOF and Symphony are set out in more detail in Appendix Three.

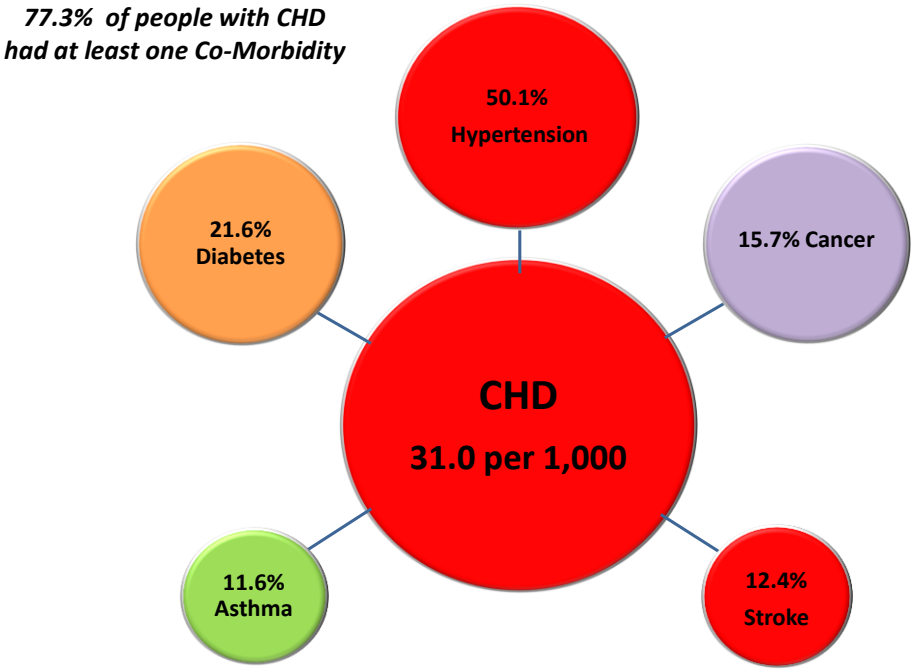
In short, we would argue that the Symphony figure of 32.2% provides our best "working estimate" of the size of the "LTC prevalence pool" in Swindon UA in 2015. For people aged 65+ years the corresponding figure in the Symphony model is 69.3%. There does not seem to be one exclusively correct, convenient or accurate way of measuring the level of LTCs. Different approaches have their own strengths and weaknesses and may provide their own insights. Symphony appears problematic as a guide to the prevalence of each of the individual conditions. While it performs well, on average, for some conditions it records fewer cases than QOF and is almost certainly inaccurate in such instances.

On the other hand, Symphony has strengths in its ability to be more comprehensive than QOF and being based on record-linkage project, it has the capability of showing how multi-morbidity manifests itself in a population. In Section 7 we turn to the issue of multi-morbidity and using the Symphony model, we examine how co-morbidities, both physical and mental, may exist with each other in the Swindon population.

7. Multi-Morbidity in Swindon, using the Symphony Model.

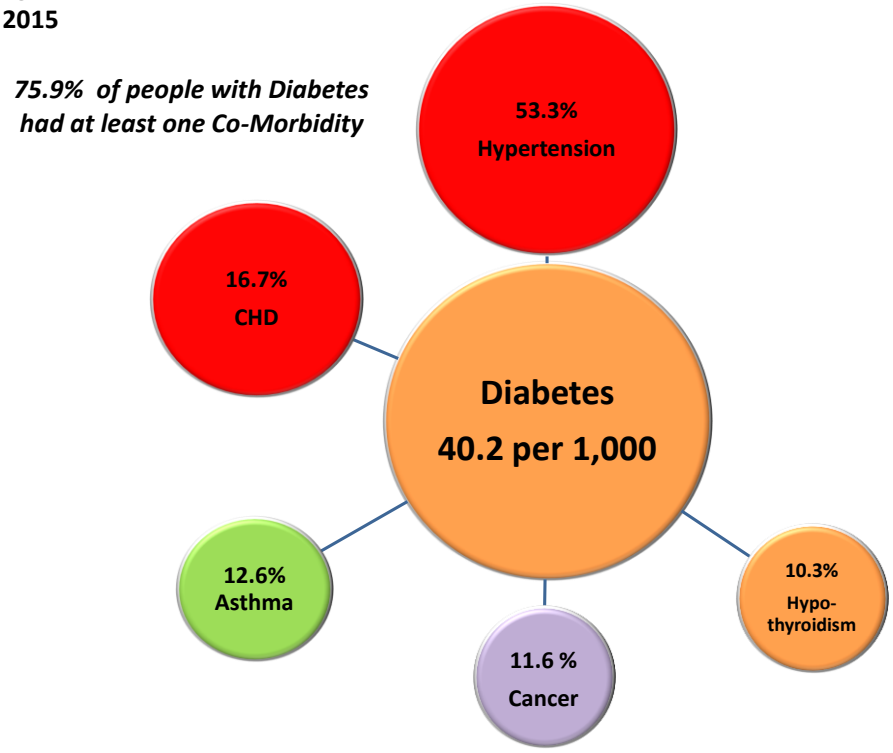
7.1 Physical Health

Fig 24: Period Prevalence of CHD with its five most common Co-Morbidities, in Swindon UA 2015



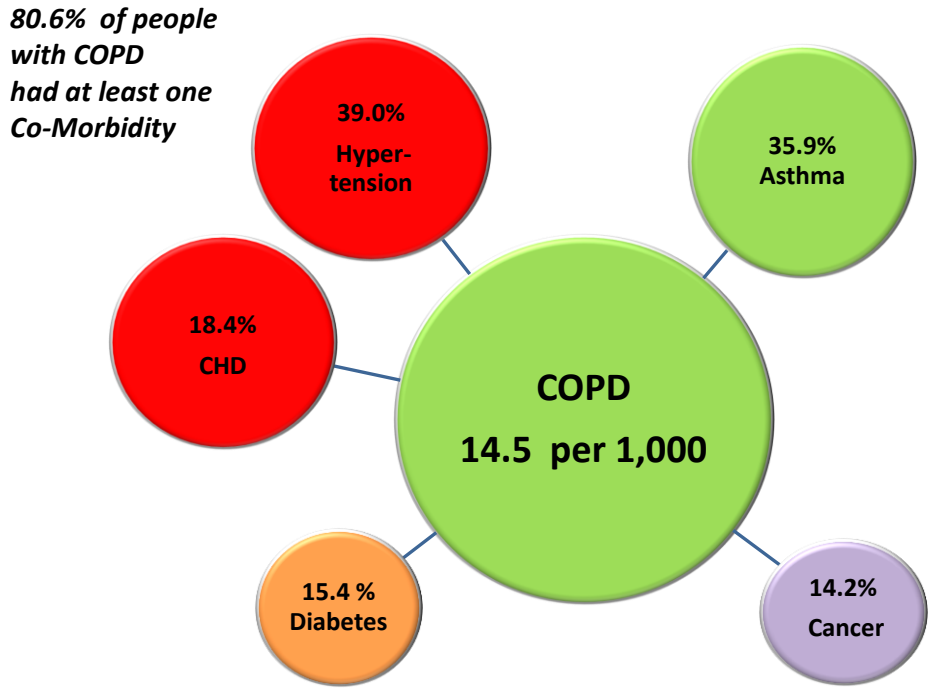
Source: Imputed through Symphony Matrix Model 2015.

Fig 25: Period Prevalence of Diabetes with its five most common Co-Morbidities in Swindon UA 2015



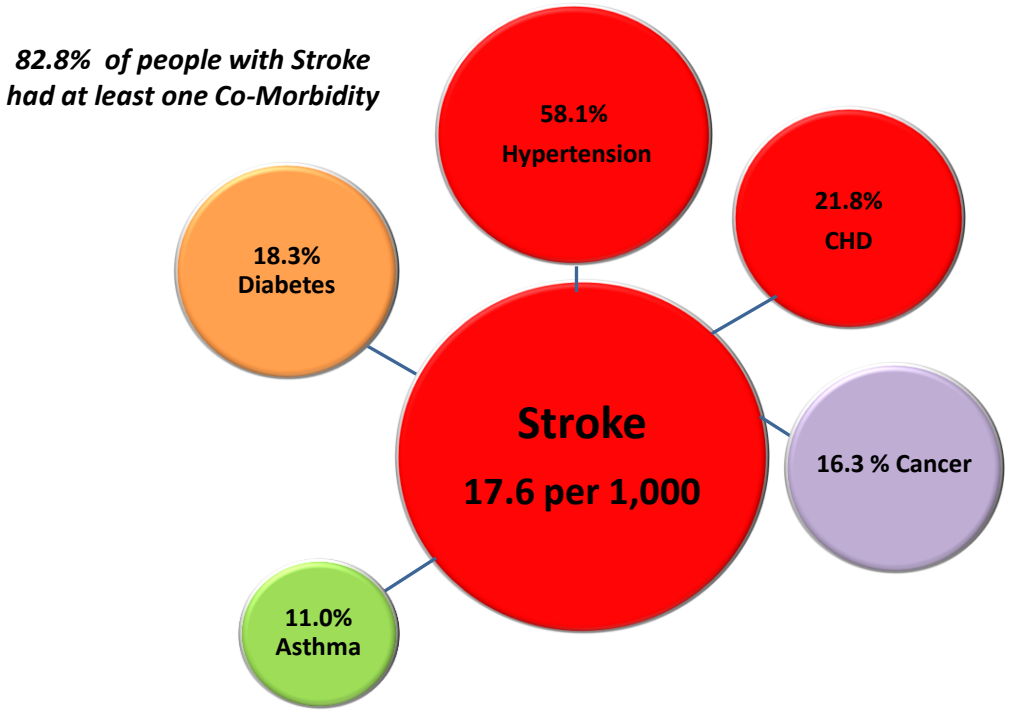
Source: Imputed through Symphony Matrix Model 2015.

Fig 26: Period Prevalence of COPD with its five most common Co-Morbidities in Swindon UA 2015



Source: Imputed through Symphony Matrix Model 2015.

Fig 27: Period Prevalence of Stroke with its five most common Co-Morbidities in Swindon UA 2015



Source: Imputed through Symphony Matrix Model 2015.

KEY to CO-MORBID CONDITION GROUPS

	Cardiovascular
	Endocrine
	Respiratory
	Cancer
	Mental Health/Neurological

Multi-morbidity was a common feature in the pattern of LTCs in Swindon UA in 2015 as imputed from the Symphony model. We estimated the prevalence of each co-morbidity as a percentage of the people with an index condition. Any condition could be an index condition for statistical purposes and this did not imply that this was the main condition for any of the people involved. (It just happened to be the particular condition which we made the centre of the analysis.) Likewise each co-morbidity could be present in a person with any number of other co-morbidities, but these combinations were too numerous to report here. In other words we have presented each co-morbidity for the index condition in question as if it exists discretely, whereas in reality it might overlap with other co-morbidities (see Figures 24 to 30).

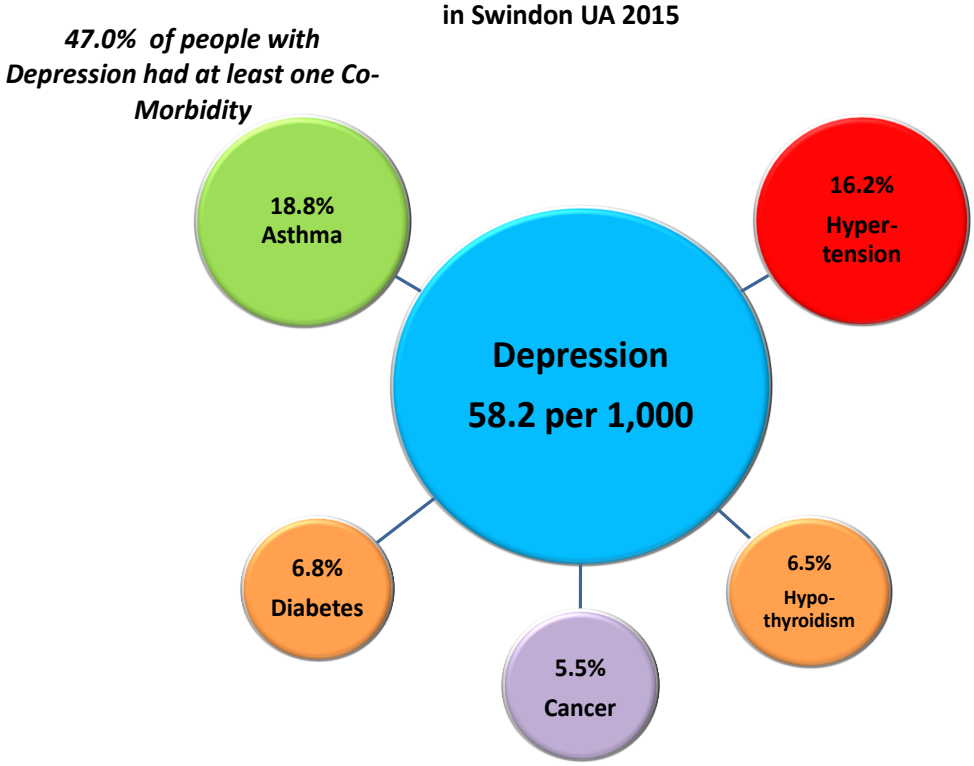
In the case of CHD, for instance, (Figure 24), most people had a co-morbidity, with 77.3% of people having at least one additional condition. In all, 50.1% of people with CHD also had hypertension, 21.6% had diabetes, 15.7% had cancer, 11.6% had asthma and 12.4% had stroke. Diabetes (Figure 25) followed a comparable pattern, 75.9% of people having a co-morbidity, although cancer was less common as a co-morbidity, and hypothyroidism was in the most common five co-morbidities. COPD (Figure 26) had its own structure of multi-morbidity, in which four-fifths of people had a co-morbidity, asthma being prominent among them. In the instance of cancer (not illustrated) the overall prevalence was 38.2 per 1,000 and 63.4% of these people had at least one co-morbidity. In all, 39.2% had hypertension, 12.7% had CHD, 12.2% had diabetes, and 10.7% had asthma.

The index condition that was most likely to have co-morbidities was Chronic Kidney Disease (CKD). In all, 91% of people with CKD had at least one other condition. CKD was followed by Left Ventricular Disease (LVD) which had co-morbidities for 88.2% of people and stroke which had co-morbidities for 82.8% of people. It is probable that co-morbidity percentages were high for these conditions because they tended to affect relatively old people.

For physical health then, the presence of co-morbidities is the norm rather than the exception and becomes even more common with increasing age. The charts displayed here present a strong argument for people with LTCs being treated in more comprehensive settings (e.g. a general cardiovascular/diabetes clinic whether in hospital or outside a hospital), as opposed to a series of discrete and condition-specific settings.

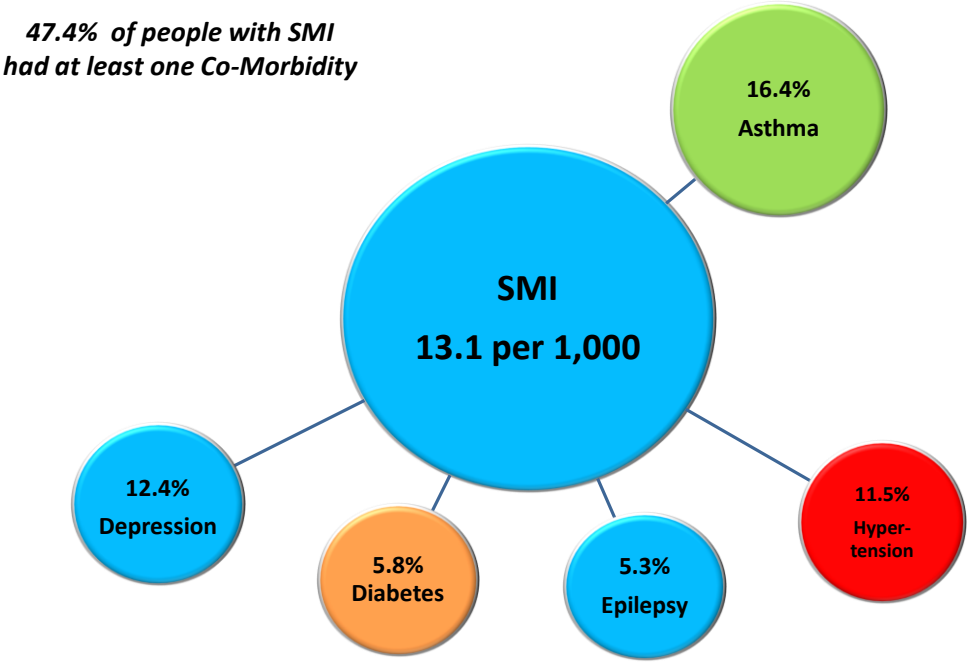
7.2 Mental Health

Fig 28: Period Prevalence of Depression with its five most common Co-Morbidities in Swindon UA 2015



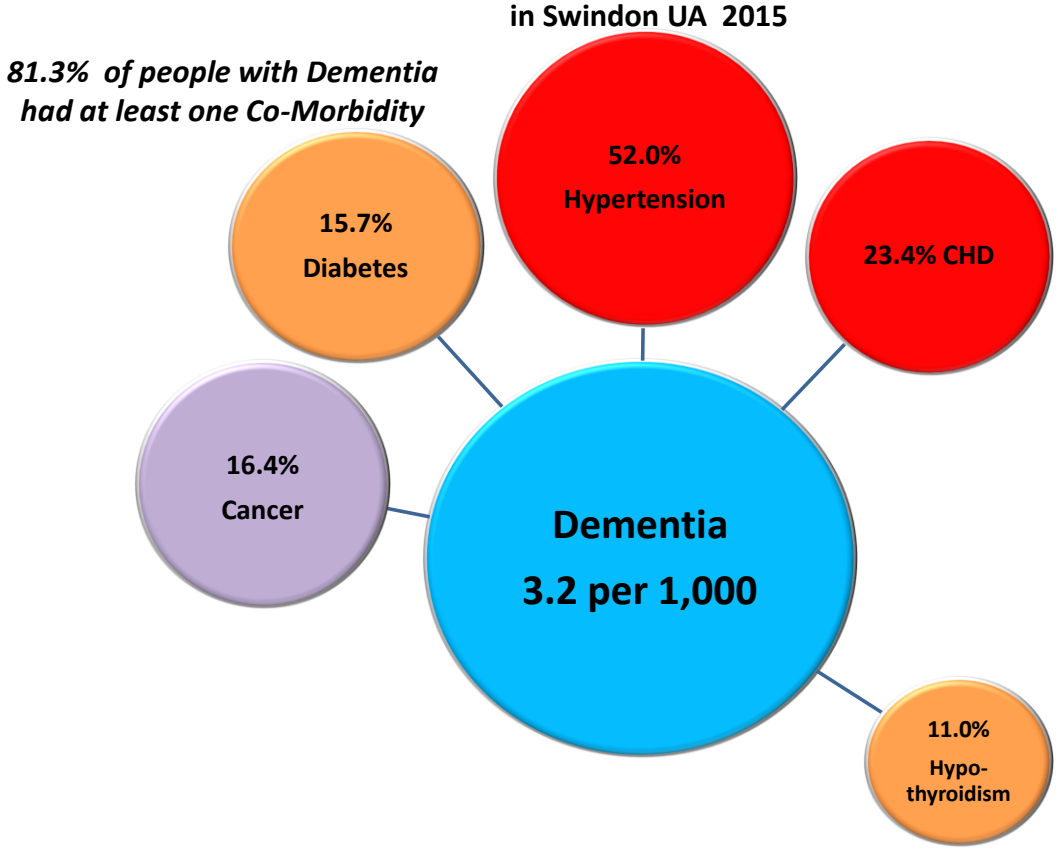
Source: Imputed through Symphony Matrix Model 2015.

Fig 29: Period Prevalence of Severe Mental Illness with its five most common Co-Morbidities in Swindon UA 2015



Source: Imputed through Symphony Matrix Model 2015.

Fig 30: Period Prevalence of Dementia with its five most common Co-Morbidities in Swindon UA 2015



Source: Imputed through Symphony Matrix Model 2015.

Figures 28, 29 and 30 suggest that Multi-Morbidity is significant in mental health conditions, but with the exception of dementia, it is present at a lower prevalence, that is, lower than 50%. Severe Mental Illness has a distinctive pattern. In all 47.4% of people with SMI had at least one co-morbidity, but with the exception of asthma, these appeared at low percentages, all below 13% of people with the index condition.

Among the mental health conditions, dementia (Figure 30) seemed to adhere to a more physical health configuration, with 81.3% of people having at least one co-morbidity. Dementia was co-morbid with four of the most common chronic diseases, namely cancer, diabetes, hypertension and CHD.

8. Costs and Deprivation Effects in Swindon estimated from the Symphony Model.

8.1 Combining Cost Data with Symphony Data

As part of the Symphony project, costs of treatment for one year were estimated for each condition and a mean cost per case within each condition group was calculated. Costs and mean cost per case (case is here equivalent to person) were also calculated for a range of treatment settings. (The averages were based on the number of persons receiving care, as distinct from costs per activity unit, e.g. per hospital stay.) We applied the Symphony cost data to the Swindon UA population and categorised it by the following care-settings: GP/prescribing, hospital inpatient, hospital outpatient, attendance at Emergency department, Community Health Services, Social Services and Continuing Care. (The original Symphony data-set separated GP attendance and primary care prescribing. It also had activity at community hospitals as separate categories, but as there are no community hospitals in Swindon UA, we merged the modelled community hospital costs with acute hospital costs.)

As the original costs in Symphony related to 2012, to update them to 2015 we increased the costs by 5.5% in line with the HM Treasury's GDP deflator estimates for three years[33]. Health care and social care inflation is likely to be greater than this, but this method provided a simple way of allowing for inflation that was not dependent on too many assumptions. Therefore, these cost estimates must be regarded as "resource indicators" or "resource proxies", demonstrating how costs vary by age, setting and condition, and deprivation status, rather than as precise accounts of money likely to be spent or as financial forecasts. Indeed, the costs represent only one aspect of the picture of resources which were likely to have been used, e.g. the asthma aspect, the cancer aspect and so on.

Costs were, in the main, estimated using data for people with one condition only, and we have extrapolated them to people with co-morbidities. Thus, figures for asthma are for people with asthma as one condition and for people with asthma plus co-morbidities; we have had to assume that the co-morbid people incur the same costs as a person with

[33] www.gov.uk/statistics. HM Treasury. GDP deflators at market prices.

asthma only and we cannot tell if having a co-morbidity increases costs (makes the asthma harder to treat) or decreases costs, (allows asthma and the co-morbidity to be treated in one health care appointment). When we look at the cancer aspect, the costs may include people also in the asthma aspect, so we cannot add the aspects together to create a Swindon-wide total. Thus, the aspects are a series of snapshots which overlap. We did not include obesity in the cost calculations as a separate aspect because of our conclusion that the Symphony model greatly underestimates the prevalence of obesity in Swindon.

8.2 Costs by Condition and Age-Group

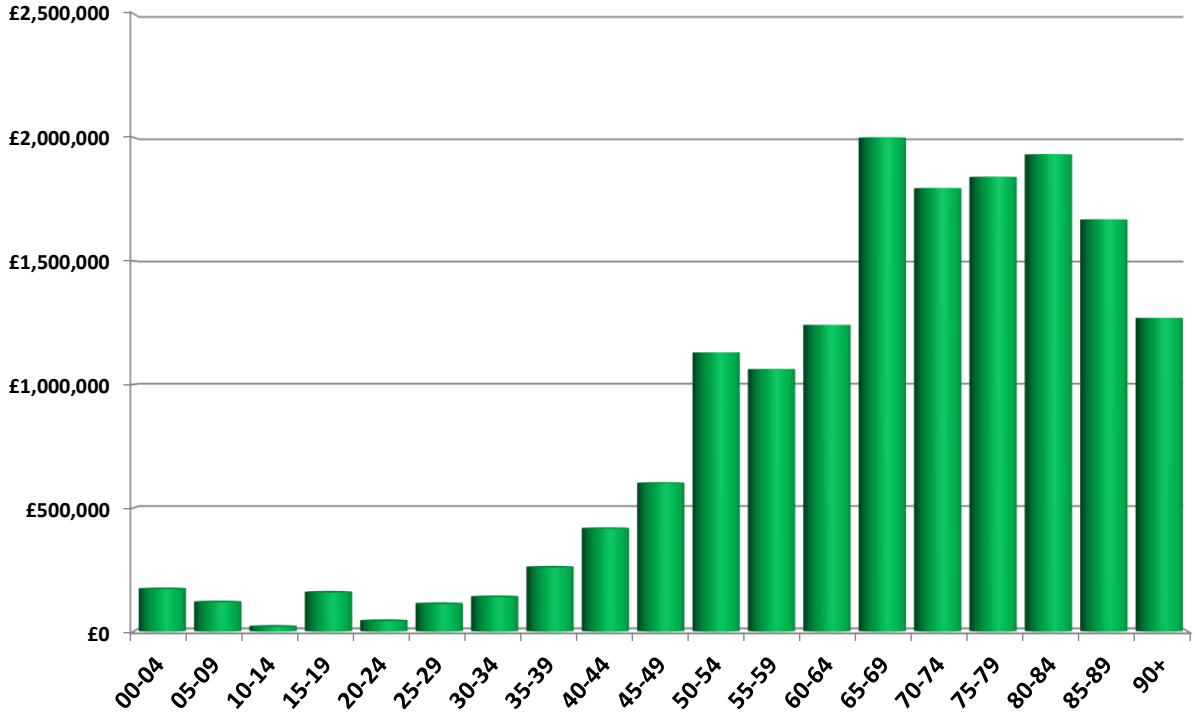
Table 10. Summary of Total Costs for each Condition in Swindon UA 2015; costs calculated for single morbidities and applied to all cases with condition. As conditions overlap with co-morbidities we cannot give a total cost for Swindon.

Condition	Total Cases	Total Costs by Condition (as 000s)	Costs per Person with Condition (as 000s)
Hypertension	24,369	£21,060	£0.86
Cancer	8,297	£15,979	£1.93
CHD	6,742	£13,820	£2.05
Asthma	22,664	£10,674	£0.47
Severe Mental Illness	2,839	£10,564	£3.72
Stroke	3,830	£10,509	£2.74
Depression	12,643	£10,213	£0.81
Diabetes	8,737	£9,892	£1.13
Dementia	685	£8,136	£11.9
Hypothyroidism	6,626	£5,646	£0.85
COPD	3,141	£4,943	£1.57
Epilepsy	2,623	£4,287	£1.63
LVD-HF	1,306	£3,405	£2.61
CKD	726	£2,443	£3.37
Obesity	Not shown	Not shown	Not Shown

Source: Symphony Model 2015.

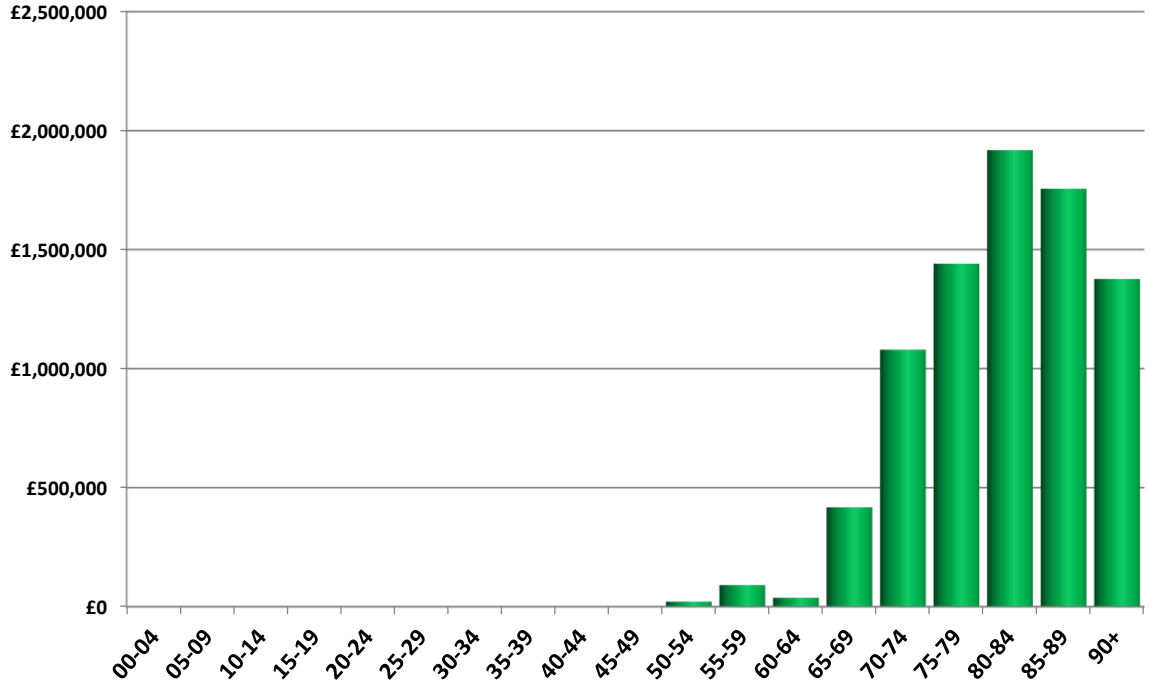
Table 8 shows the costs associated in the model with a particular condition. Hypertension was the most costly condition in aggregate terms and of course was the most common in terms of cases, usually being managed by the primary care service. In contrast, Cancer and CHD almost always involve hospital treatment, either as an outpatient or inpatient or both, and these came in second and third place respectively in the cost table. Asthma and Severe Mental Illness came next, with similar aggregate costs despite the fact that the asthma cases numbered just over ten times as many as the Mental Health cases. Figures 31 to 33 are examples of costings by age-group for three conditions. Cancer costs (Figure 31) mount as people age and costs become more substantial in late middle age and early old age. With dementia, as we might expect, costs grow only later in life, after retirement (Figure 32). Hypertension (Figure 33) has its own distinctive profile, with the cost curve starting to ascend in middle-age.

Figure 31 : Resource Indicators: Imputed Total Costs (in Pounds) of Cancer by Age-Group in Swindon UA in 2015



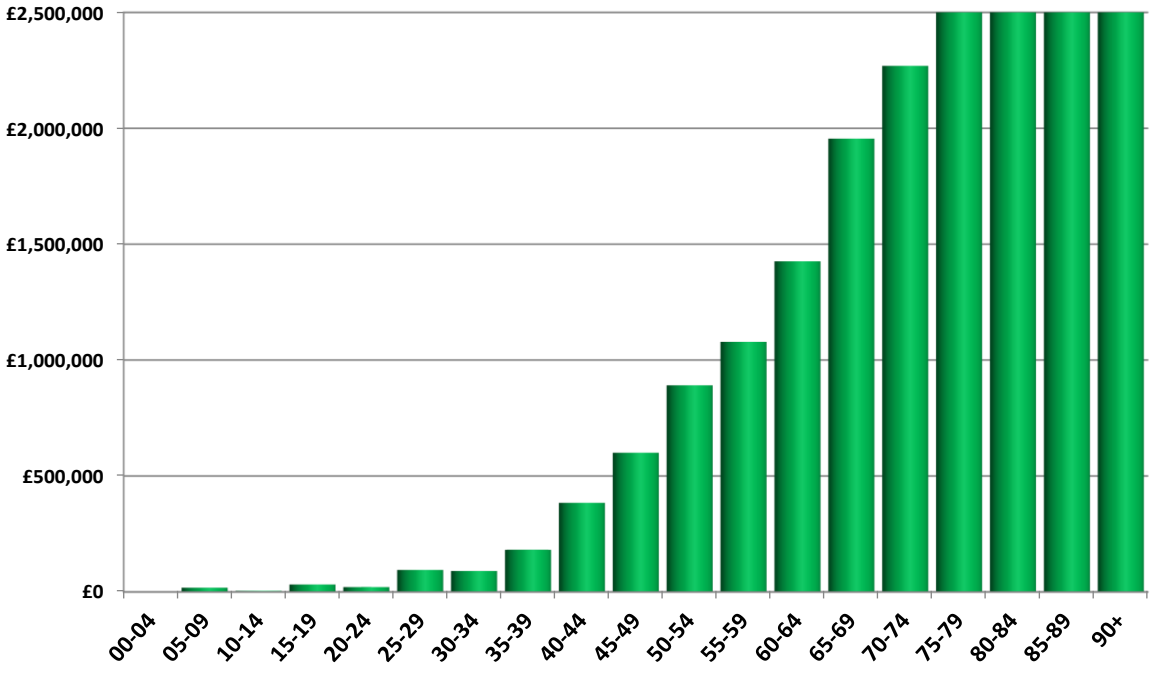
Source: Symphony Model for Swindon UA 2015

Figure 32 : Resource Indicators: Imputed Total Costs (in Pounds) of Dementia by Age-Group in Swindon UA in 2015



Source: Symphony Model for Swindon UA 2015

Figure 33: Resource Indicators: Imputed Total Costs (in Pounds) of Hypertension by Age-Group in Swindon UA in 2015

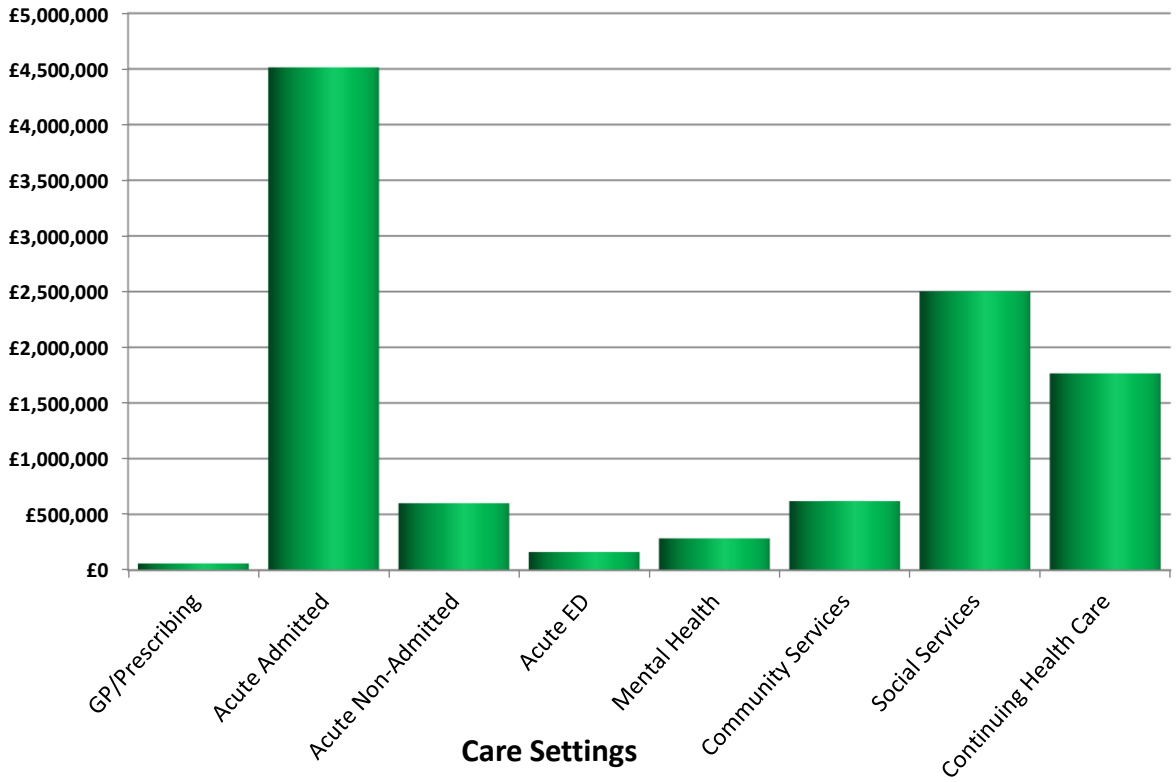


Source: Symphony Model for Swindon UA 2015

8.3 Costs by Care Setting

The results produced by the Symphony model for costings according to care setting were problematic and so are not presented at length here. A number of features were not in accord with other evidence and so these results must be regarded as of limited value. For example, GP costs (including prescribing) tended to be quite low for most conditions, although we would have expected relatively high costs in primary care for conditions such as asthma, hypertension and diabetes which are, on the whole, managed in the primary care service. Similarly, costs for social care seemed to be underestimated in the Symphony model by at least 50%.

Figure 34: Resource Indicators: Imputed Total Costs (in Pounds) of Stroke by Care Setting in Swindon UA in 2015

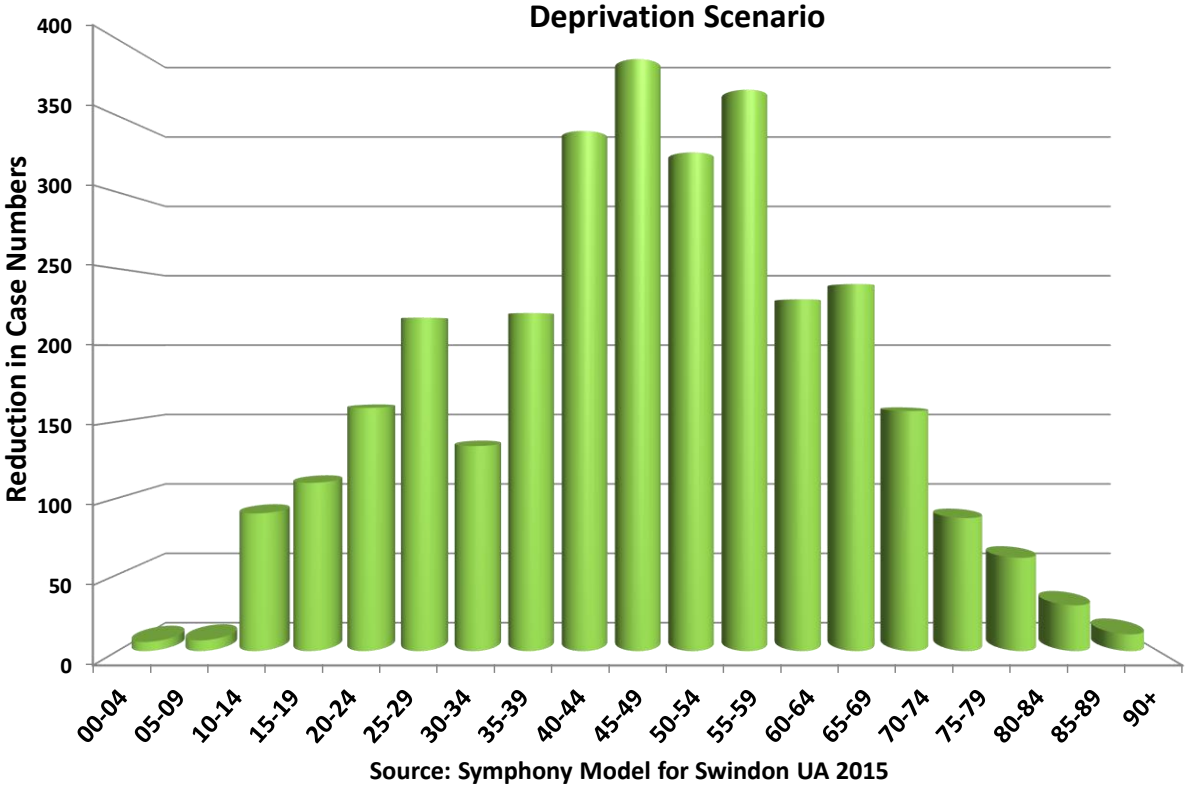


Source: Symphony Model for Swindon UA 2015

Stroke is an instance where the Symphony estimates made more intuitive sense. Figure 34 depicts a situation where high costs are incurred in a hospital inpatient setting ("acute admitted") and social services and continuing health care are also major sources of support. The contribution of primary care in terms of financial resources, does seem to be under-estimated here, however.

8.4 Effects of Deprivation

Figure 35: Reduction in Case Numbers (People with One Condition or more) by Age-Group in Swindon UA in 2015 in the Experimental Deprivation Scenario



Source: Symphony Model for Swindon UA 2015

Graph shows estimated reduction in case numbers which would occur if People in the two MOST Deprived Quintile Groups in Swindon moved to the same condition rates as People in the MIDDLE Deprivation group

Issues of deprivation are explored above in Section 3.3, Section 6.2 and Section 6.3. Because of the importance of deprivation as an influence on LTCs, we also devised an "Experimental Deprivation Scenario" in which people in the two most deprived Quintiles groups, (Group I and Group II) experienced the prevalence rates (for having at least one condition) which were present in the Middle deprivation group, (Group III, which might be regarded as "average" for Swindon). To aim to improve the rates of LTCs in the two most deprived groups to an average level would seem to be a potentially feasible public health objective, and this scenario predicts what the practical gains would be, if it were achieved. The more favourable prevalence rates of Group III, if attained in Groups I and II, would lead to a fall in the number of cases in Groups I and II, as portrayed in Figure 35. In this scenario the number of people with LTCs in the two most deprived groups would be reduced by 3,182 during a one year period, and this would amount to a percentage reduction in the total cases of LTCs in Swindon of 4.6% during a one year period (a 13.9% reduction in cases in Groups I and II). Most of the reduction would occur in people in middle-age and early old-age, the age band from 40 to 59 being salient in this respect, as Figure 35 shows. On the other hand, the reductions, in terms of case numbers at least, in people aged 65 years and over, would be relatively modest.

This increased benefit in middle-aged people is a direct result of the high numbers of people in middle age in Swindon who have produced, according to the Symphony model a high proportion of the LTC cases in Swindon UA. The "Experimental Deprivation Scenario" suggests that the following changes might result in these four specimen conditions: in asthma, a reduction of 766 cases, with a reduction in total case-load of 3.4%; in CHD a reduction of 466 cases, with a reduction in total case-load of 6.9%; in depression a reduction of 1,755 cases, with a reduction in total case-load of 13.8%; in diabetes a reduction of 895 cases, with a reduction in total case-load of 10.2%. To sum up, as the number of middle-aged people is high, even if the prevalence rates for them are moderate, if those rates could be reduced a large number of cases of LTCs could be prevented. Admittedly, it is likely that middle-aged people are less costly to treat and care for than older people, yet most people in the middle-aged cohorts will progress into old age and increase the ranks of older people in Swindon in a relatively short period of time.

9. Lifestyle Factors and LTCs

A central component of any strategy to reduce the level of LTCs and in particular to prevent LTCs developing in middle-aged people before and during the transition into the retirement period, would need to be the improvement of lifestyle across the population. A brief overview of lifestyle factors in Swindon, and their relationship with LTCs, is given in this section. Further information and details of the sources of data are given by topic area on the Swindon JSNA website[34]. In addition, the maintenance of health and well-being and the role of life-style factors in later life are considered in depth in the "Ageing Well JSNA Profile", [35] which provides a compendium of data relating to later life. (All figures in this section relate to Swindon UA unless stated.)

The overall smoking prevalence in adults in Swindon in 2015 was 18.7%, an encouraging reduction from 21.5% in 2012. The smoking prevalence for adults in England as a whole was 16.9% in 2015, although this was not different at a statistically significant level from the Swindon rate. In both Swindon and England, however, the rates of smoking in people in the most deprived groups were higher. In the period 2012 to 2014 inclusive, 856 people (aged 35 years and over) died in Swindon of a smoking-related illness, a directly standardised rate of 284.4 per 100,000 per annum, which was not different at a statistically significant from the rate for England as a whole. These types of cause of death are potentially avoidable in the future. National surveys indicate that smoking is becoming a less frequent occurrence in people in older people, with only about 12% of those aged 65 to 69 years in England and 3% aged 90 years or more in England maintaining the habit.

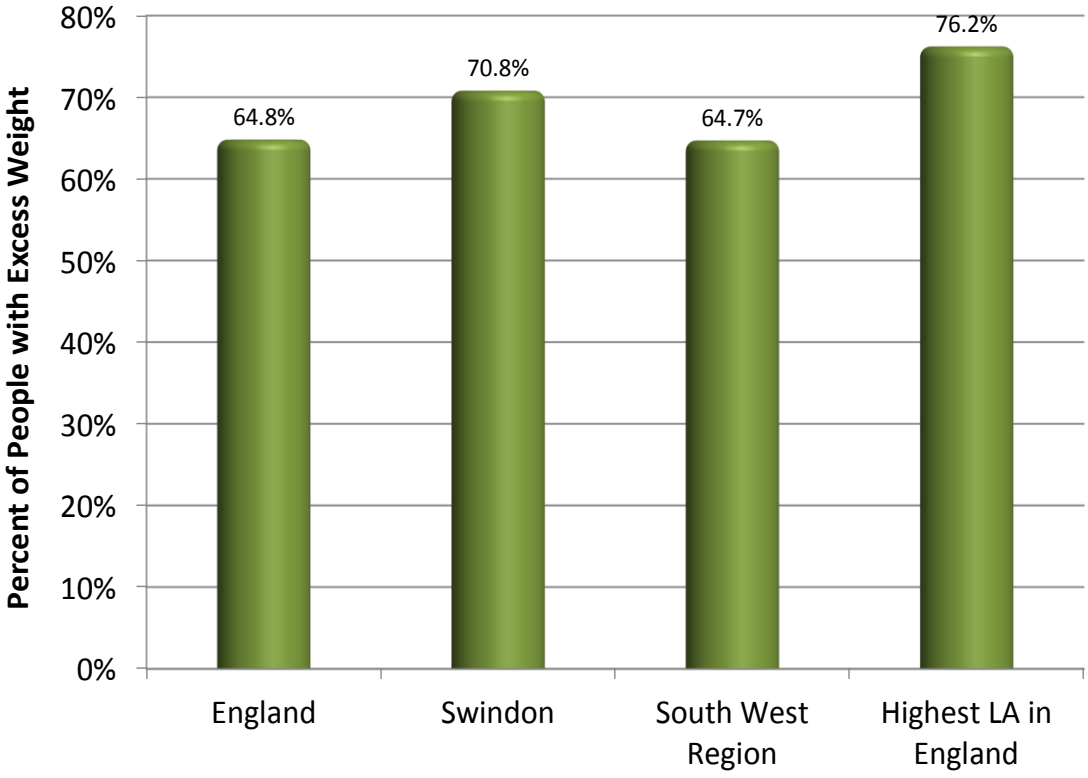
However, smoking is a factor in the development of a number of common conditions and if the level of smoking in people at every stage of life could be reduced further, which is a realistic public health objective, the prevalence of LTCs would also be likely to diminish accordingly. Swindon has a tobacco control strategy which sets out a range of measures to achieve this. With regard to conspicuous harm resulting directly from alcohol misuse, in the years 2014 to 2015, 1,358 people in Swindon were admitted to hospital with this type of

[34] www.swindonjsna.co.uk.
[35] Ageing Well JSNA Report. SBC 2016.

problem. The directly standardised rate was 674 per 100,000 per annum which was not significantly higher than the rate for England, but the numbers are an indication of the way misuse of alcohol can affect a person's health dramatically. Although people are less likely to drink alcohol as they age, at a national level, the proportion who drink almost every day is increasing; in 2014, 28% of men aged 85 years or more reported drinking almost every day compared to 4% of those aged 25 to 34 years, although 22% of men aged 85 years or more and 42% of women in that age-group had not drunk alcohol at all in the previous 12 months.

With respect to maintaining a healthy weight, and avoiding being overweight (BMI = 25 to 29.9) or obese (BMI = 30 or more), Swindon faces a considerable challenge, having a comparatively high percentage of adults who had excess weight. In the period 2013 to 2015, 70.8% of adults in Swindon were categorised as either overweight or obese. This was significantly higher than the figure for England as a whole which was 64.8% (Figure 36). A breakdown of the data indicates that the issue in Swindon is more to do with adults being overweight, than with being actually obese. In approximate terms, the levels of excess weight tend to be higher in less affluent groups, yet the full story is probably much more complicated than this. Relatively prosperous people with demanding jobs may also be neglecting this aspect of their health; also gender can affect socio-economic variations in excess weight. At national level, around two-thirds of women and three-quarters of men aged 65 years or over are overweight or obese, and the proportions increase further with age for men but decrease for women. It is likely that a similar pattern is present in people aged 65 years or more in Swindon.

Figure 36: Prevalence of Excess Weight in Adults in England, Swindon UA and South West Region in 2013-2015



Source: Active People Survey

In a similar vein, the Chief Medical Officer for England recommends that adults should undertake at least 150 minutes of physical activity per week. In Swindon in 2015 56.4% of adults achieved this, in comparison with 57.0% of adults in England as a whole, although these proportions were not significantly different. National data suggests that people living in the least prosperous areas are twice as likely to be physically inactive as those living in more prosperous areas. Identifying trends in physical activity is difficult because of changes in definitions, recommended levels and survey methodologies. However, figures from the Health Survey for England over time clearly indicate that a higher percentage of men aged 65 years or more are now meeting recommended minimum levels and fewer are inactive than in 1997. Similar trends are seen for women, but around four out of five of those aged 75 years or more are inactive. People in Swindon eat an average of 2.5 portions of fruit a day and just over 2 portions of vegetables. This is similar to the levels recorded for England as a whole. The Health Survey for England has found that there has been a small rise in the percentage of older people (65 years and over) who are eating five or more portions of fruit

and/or vegetables per day. If this trend could be maintained, by 2030 over a third of men (37%) and women (36%) aged between 65 and 74 years inclusive would be eating five portions a day, and over a quarter of men (31.8%) and women (29.1%) aged 75 plus would be consuming at this level.

Although the topic of lifestyle and its relationship to health is complex, it is clear that there are considerable gains to be made in health status in Swindon, in particular through a reduction in smoking and promotion of healthy weight and sufficient exercise. Smoking is associated with the development of cancers and cardiovascular diseases, while an unhealthy weight and relative immobility are factors in these, as well as being major factors in the onset of diabetes.

The "Ageing Well JSNA Profile" also stresses the importance of mental well-being, social contact and networks, participation and involvement in adapting to later life. Many of the people interviewed for the "Ageing Well JSNA Profile" expressed positive views of later life, even though they presumably would often have had the type of health problem which we have classified as a LTC in the present report. The general attitude was that chronic physical health problems could be managed and coped with, in a spirit of positivity, and that they became significant when they started to create barriers to mobility and social contact. We could say that the present report on LTCs emphasises a disease-based perspective, while the "Ageing Well JSNA Profile" emphasises a subjective wellness perspective, and of course, there is also overlap between the two perspectives and the two reports.

10. Summation, Discussion, Recommendations and Conclusions

10.1 Summarising the Findings

Intelligence of different kinds, including socio-demographic, epidemiological and modelled data has been used in this Profile to paint a picture of the" LTC prevalence pool" in Swindon UA in 2015. The picture cannot be regarded as precise or definitive, but it provides pragmatic, working estimates of the prevalence and pattern of LTCs (See Table 11.)

Disability data from a national survey suggest a possible prevalence of LTCs of 18% in the adult population, while measures from the 2011 Census for Swindon UA indicate slightly lower proportions, 15.4% (Limited in daily activities) and 16.6% (Less than Good Health.) Both these census measures are strongly associated with age and with deprivation status, older people and less affluent people reporting higher levels of impairment. At the same time, people from ethnic minorities in Swindon reported relatively low levels of impairment, probably because these groups are younger, on average, than the rest of the population in Swindon.

Unlike the census measures, the QOF registers, maintained in the primary care service in Swindon, record numbers of specific health conditions, and are medically verified. A robust measure extracted from QOF, which we have called "Proxy from QOF" records a prevalence of 22.2%. However, a more speculative, yet credible approach which we have called "Credible QOF" indicates that to assume a percentage of about 30% is more realistic.

Outputs from the Symphony model for Swindon UA, which is not limited to primary care (being based on linked records from another local health and social care system in the South West of England), indicate a LTC prevalence pool of 32.2%, which is a value in accord with the "Credible QOF" figure. In terms of persons, this amounts to 69,820 persons in 2015, that is 32,518 males and 37,301 females.

Table 11. Estimates of the "Prevalence Pool" of LTCs in Swindon UA from different sources. (Estimates cover people of all ages except for "Disability" measure.)

Source	Year of Origin	Population Prevalence as Percentage
Disability measure in Health Survey for England	2001	18% (People 18+ years)
Census: Limited in daily activities	2011	15.4%
Census: Less than Good Health	2011	16.6%
"Proxy from QOF"	2016	22.2%
"Credible QOF"	2016	Approx. 30%
Symphony Model	2015	32.2%

It was striking that the greatest numbers of cases (people with at least one LTC) were to be found in middle-aged people rather than amongst the elderly, primarily because middle-aged people predominate in the Swindon population. This is bound to have an impact on health and care services as these middle-aged people move into the ranks of older people in the coming years. With regard to people aged 65 years or over, 69.3% of people were captured in Symphony with at least one LTC (2,917 in all). However, the Census estimate suggests that 18.2% of people in this age-group were in the Symphony estimate but were NOT limited. If we combine them with people who were not in the Symphony prevalence figure at all (30.7%), together they make up 48.9% of the population aged 65 years or more who might be said to be "Ageing Well", either with a LTC(s) and managing, or without any LTC at all. (A further synopsis of the prevalence estimates for LTCs in Swindon UA for people of all ages and for people aged 65 years and over is given below in Figures 37A , 37B and 37C.)

In all, 21.0% of all people had only one condition (45,580), 7.2% (15,699) had two conditions, while 3.9% (8,540) had three or more conditions. Thus, approximately one third of people with any recorded condition were in a state of multi-morbidity, having co-

morbidities alongside their main condition. The presence of co-morbidities can thus be seen to be common. Physical co-morbidities often exist alongside mental ill-health, and this is particularly true with dementia. In the instances of stroke and COPD, for example, multi-morbidity could be described as the norm, with over 80% of people with these conditions having at least one other health condition. In the Symphony modelled data for Swindon, the rate of LTCs rose steadily with age, as we had anticipated. In contrast, although there was a gradient for deprivation, (LTCs becoming more frequent as level of deprivation increased) the slope was not as steep as we had anticipated after reviewing the Census data. However, in people aged 65 and over, the prevalence of three or more LTCs, rose sharply according to level of deprivation.

Results from the cost analyses that we conducted using the Symphony model were more problematic. Although the model predicted the high costs of inpatient care, which are known to be incurred by many LTCs, (such as CHD and cancer) the model's predictions for primary care spending were at a minimal level, (which is far from plausible for conditions such as hypertension and asthma). Also, the model's predictions for social care spending looked under-estimated by at least 50%. However, Symphony does demonstrate how aggregate costs rise by age-group, confirming that older people tend to require more extensive and expensive treatment and care, even if the actual numbers of cases of LTCs are greater in the middle-aged in Swindon.

In an “Experimental Deprivation Scenario”, we further tested the importance of deprivation status by taking the prevalence rates of the Middle deprivation quintile group in Swindon (Group III) and applying them to the two most deprived quintile groups, (Groups I and II) and in this way we hypothetically lowered their LTC prevalence rates. In the “Experimental Deprivation Scenario”, this relatively modest improvement (of a few percentage points in rates at group level) resulted in a reduction of 3,182 cases, that is a reduction of 4.6% of total cases. The majority of these “prevented” cases were in the middle-aged people where case numbers were most numerous in Swindon. In the “Experimental Deprivation Scenario”, the percentage reductions varied by condition. For example, in the instance of depression, the total case-load was reduced by 13.8%.

10.2 Graphing and Discussing the Prevalence Findings (in simple steps)

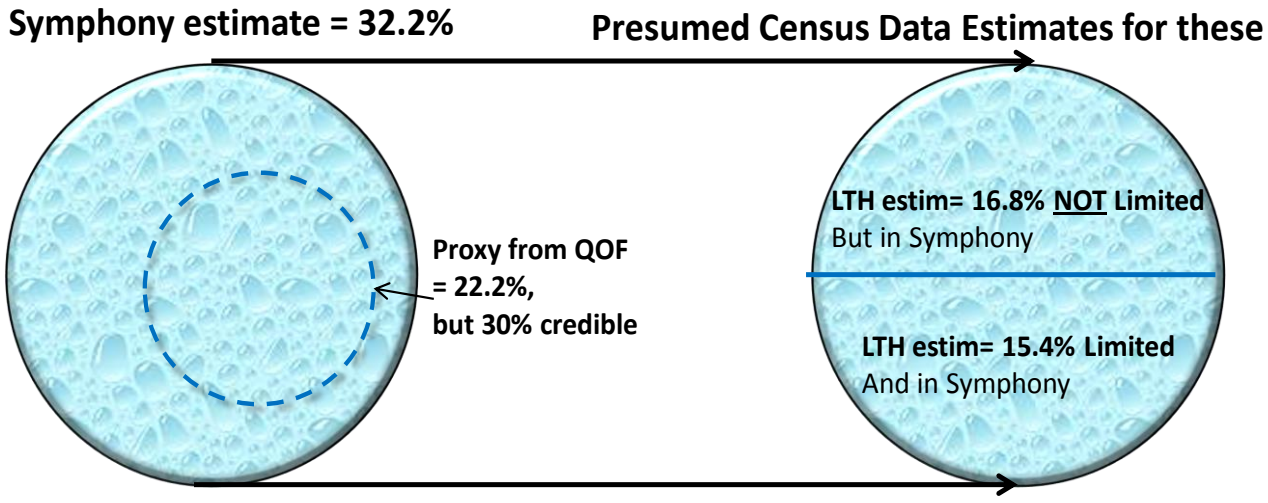
- Figures 37A, 37B and 37C display graphically our proposed working estimates for LTCs in Swindon UA, and a broad segmentation based around these estimates.

- Figure 37A depicts the “LTC prevalence pool”, here for All Ages, in the first, left-hand circle, with its Symphony estimate of 32.2%.

- The second, right-hand circle shows the same pool, but in terms of our proposed understanding of the Census measures.

- Here the pool can be viewed as divided into two halves: 15.4% of the population are within the Symphony estimate, and reporting impairment and limitation, while 16.8% of the population are within the Symphony estimate, but are NOT reporting impairment and limitation.

Figure 37A: Synopsis of Main Estimates of the LTC Prevalence Pool in Swindon UA in 2015. Proportions of Population ALL AGES (Totalling 217,160).



Symphony Persons = 69,820
QOF Persons = 48,210
But 65,148 credible

LT Health NOT Lim Persons = 36,377
LT Health Lim Persons = 33,443

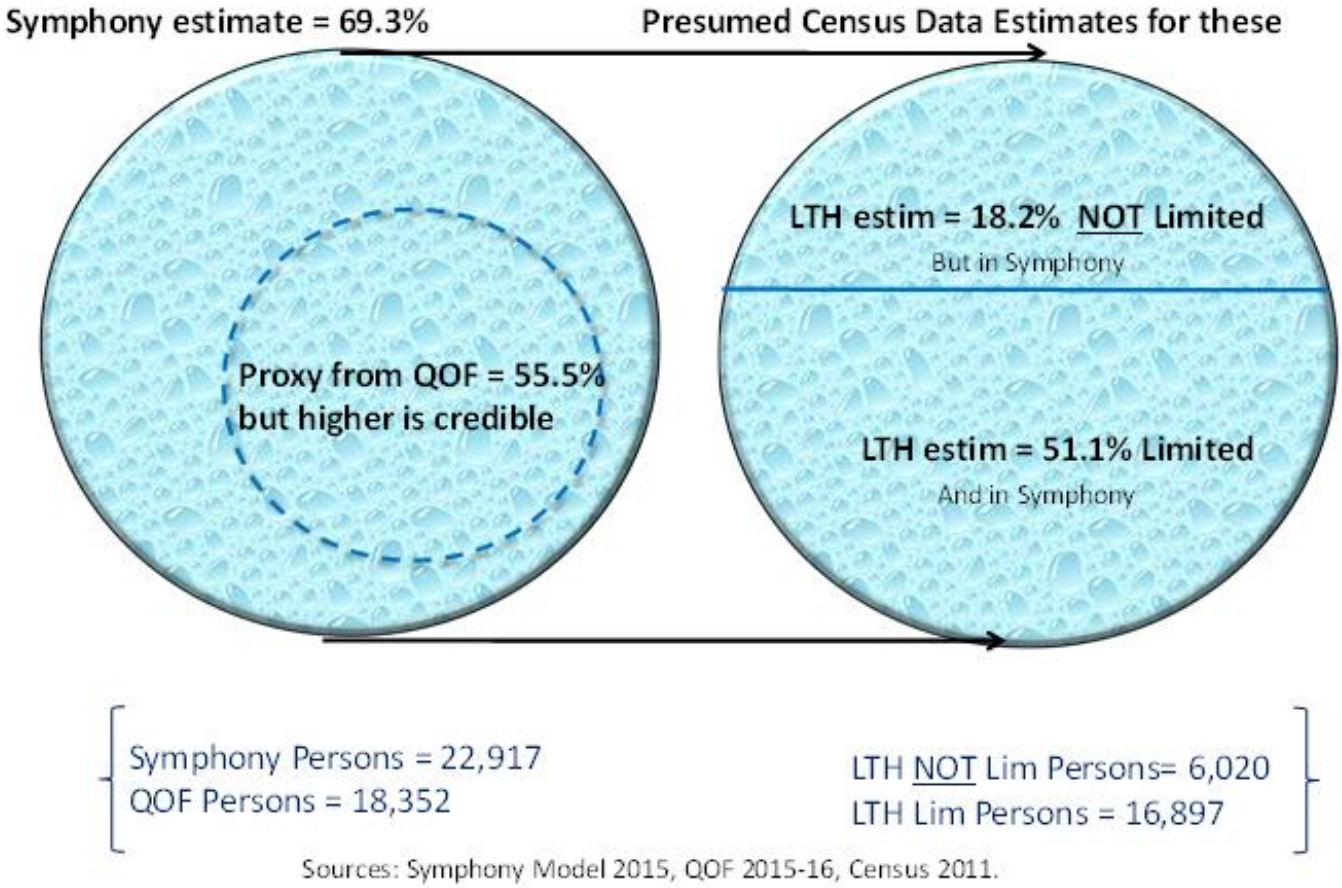
Sources: Symphony Model 2015, QOF 2015-16, Census 2011

- Figure 37B depicts the LTC prevalence pool, here for people Aged 65 years or more, with the Symphony estimate of 69.3% in the first circle.

- The second circle shows the same pool, but in terms of our proposed understanding of the census measures.

- Here the pool can viewed as divided into two portions, the large portion being three times as large as the smaller portion: in the larger portion 51.1% of the population are within the Symphony estimate, and reporting impairment and limitation, while in the smaller portion 18.3% of the population are within the Symphony estimate but are NOT reporting impairment and limitation.

Figure 37B: Synopsis of Main Estimates of the LTC Prevalence Pool in Swindon UA in 2015. Proportions of Population AGED 65+ YEARS (Totalling 33,066).



Sources: Symphony Model 2015, QOF 2015-16, Census 2011.

- Figure 37C explores this further for people aged 65 years and over: the first circle shows the 69.3% of people captured in Symphony with a LTC(s), while the second circle shows the same pool, highlighting the 18.3% of people who are in the Symphony estimate but who are NOT limited, and pairing them with people who are not in the Symphony prevalence figure at all (30.7%)

- Together they make up 48.9% of the population aged 65 years or more who might be said to be "Ageing Well", either with a LTC or LTCs and managing, or without any LTC at all. Some people with limitations might also regard themselves as "Ageing Well" so, strictly speaking, 48.9% is a minimum figure.

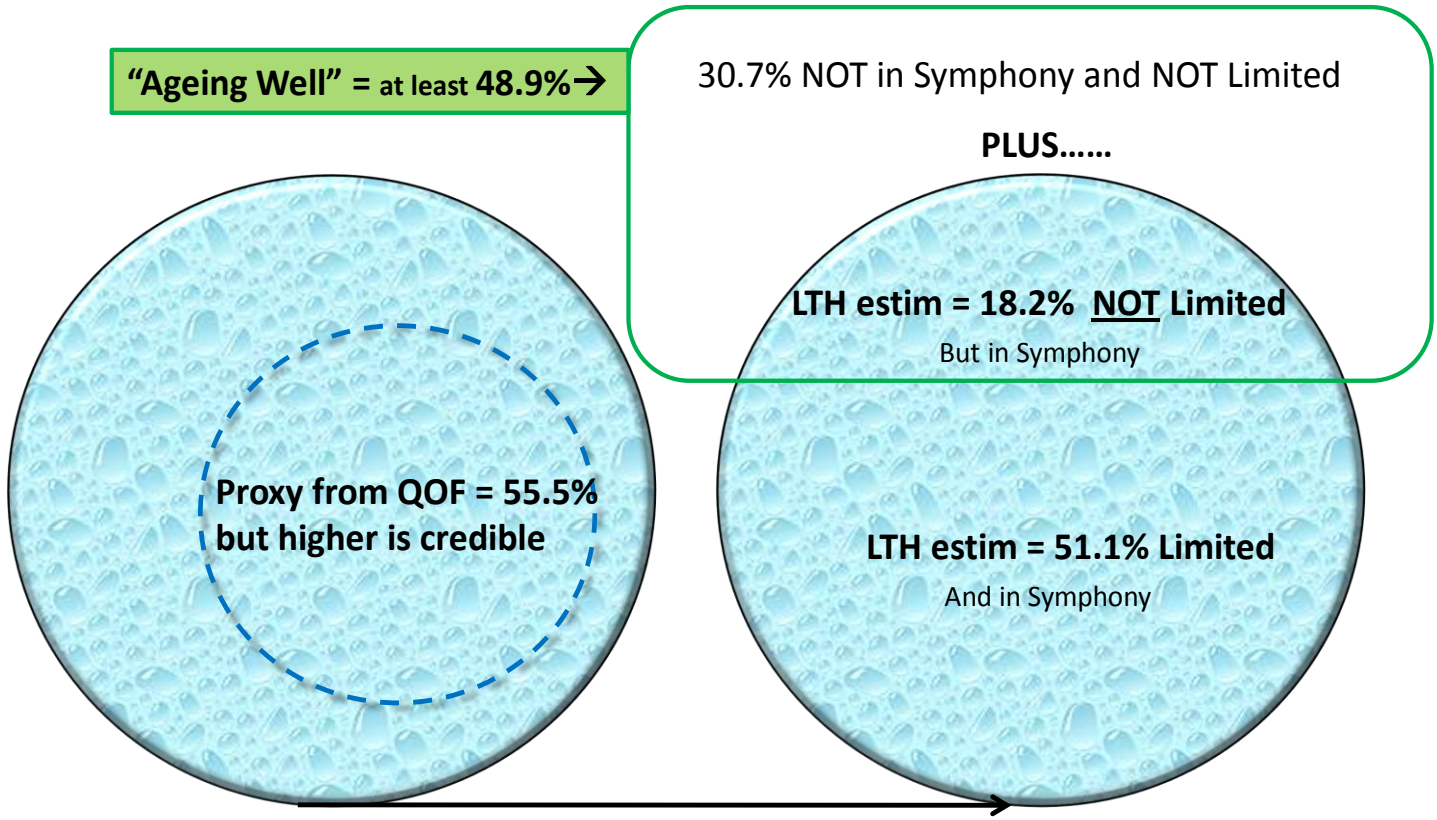
- This interpretation of the meaning of Census data as they relate to Symphony data might provide one possible key to understanding why census data have a much steeper social gradient than Symphony data (as revealed by a comparison of Figure 11 and Table 6). (We have also noted that older, deprived people are at higher risk of having three or more LTCs.)

- In this line of interpretation, more deprived people have a higher rate of LTC(s) than more affluent people, although to a moderate extent, while at the same time relatively deprived people report a much higher rate of limitation than relatively affluent people due to the following:

- Affluent people might have milder forms of LTCs, fewer co-morbidities and/or have better resilience, better coping strategies, better social and family networks and a greater ability to gain benefit from the health and caring services.

- Thus, affluent people do not necessarily avoid all the LTCs experienced by their less well-off peers, but they are more likely to be in the group of "Ageing Well" people, coping better with their situation (and sometimes without LTCs at all.)

Figure 37C: Synopsis of Main Estimates of the LTC Prevalence Pool in Swindon UA in 2015. Proportions of Population AGED 65+ YEARS (Totalling 33,066).



Symphony estimate = 69.3%

Symphony Persons = 22,917
QOF Persons = 18,352

Presumed Census Data Estimates for these

LTH NOT Lim Persons= 6,020
LTH Lim Persons = 16,897
"Ageing Well" = 16,169 or more

Sources: Symphony Model 2015, QOF 2015-16, Census 2011.

10.3 Strengths and Weaknesses of the Methods and Results

Symphony

The major weakness of using the Symphony model is that we cannot be sure whether the conditions in the population of Somerset exist in the same way in the population of Swindon. It is certain, for example, that the delivery of services will take place in different ways in the two areas, although within the same broad structures that exist throughout England. On the other hand the pattern of multi-morbidity is likely to be similar in the two populations, as human biology is not likely to diverge between Swindon and Somerset. We have been able to adjust the pattern to allow for the unique age, sex and deprivation make-up of Swindon, which is an epidemiologically accepted approach, but we were not able to adjust for the ethnic profile of Swindon; the Symphony model did not include any ethnic stratification. For convenience, we presented results by five deprivation groups, but we had set up the model for Swindon based on ten gradations of deprivation and affluence to make the model more realistic.

It was disappointing that the costs outputs for Swindon from the Symphony model were problematic, and often did not appear to be credible, and it is possible that this was the result of different understanding of costings in Swindon and Somerset. The results of the "Experimental Deprivation Scenario" were revealing of the importance of the middle-aged characteristic of LTCs in Swindon, and form part of a credible picture in which LTCs are more common numerically in middle-aged people in Swindon, while existing at a higher rate and with greater severity in older people in Swindon. The overall Symphony picture for Swindon is credible, even if some of the figures do not seem to be precise. Although we cannot guarantee that the numbers and prevalences of co-morbidities are exact in anyway, we would argue that these patterns exist in Swindon and merit further investigation.

QOF Registers

QOF has the great advantage of being recorded in clinical practice by GPs, but unlike the Symphony model, cannot range beyond primary care and, in theory, Symphony should capture cases which QOF misses. As regards the prevalence of specific conditions, although the average difference between Symphony and QOF was not large overall, some

divergences in the instance of specific diseases were noticeable, for example for diabetes, where Symphony under-estimated as compared with QOF. In short, QOF was more accurate on specific conditions, while Symphony was probably better for overall magnitude and co-morbidities. (We have noted in the course of the Profile that QOF records a *point prevalence* and Symphony a *period prevalence*. Because of this, even if QOF and Symphony operated perfectly and used precisely the same disease definitions, Symphony should capture more cases than QOF. Since the difference between the two kinds of prevalence would be at most a few percentage points, our broad working estimates can pragmatically be interpreted as referring to either a point in time or to a period of a whole year.)

Under-Estimated Conditions

Neither Symphony nor QOF include many neurological conditions. Epilepsy is an exception but conditions such as Motor Neurone Disease and Parkinson's Disease are omitted by both Symphony and QOF. This must be considered a weakness, because of the demands which these conditions place on the health and caring services, though the prevalences in Swindon are not likely to be high. Common arthritic conditions, such as osteoarthritis of the knee and/or hip are not included either in the Symphony model or the registers. Since these are relatively common conditions in later life it is conceivable that they would further raise the overall prevalence estimates we have reached in the foregoing work. These conditions pose a statistical problem, however, in that treatment such as surgery can often (though not always) greatly relieve the effects of osteoarthritis, to the extent that a person might no longer be considered a "case"; also, osteoarthritis will co-exist with other conditions in later life, so the number of overall LTC cases actually missed in an assessment of LTCs, might not be considerable. Given these considerations, our estimate of 32.2% as the prevalence of LTCs appears to be a credible estimate, and is not likely to be an over-estimate. In short, QOF has strength in identifying the extent of specific conditions, while Symphony is probably better for estimating overall magnitude of LTC prevalence and for describing relationships in multi-morbidity. Symphony also has the merit of allowing investigation of deprived groups.

Interpreting Census Results

Above we have proposed that affluent people may cope better with LTCs than deprived people. This is largely dependent on results from the census measures in which people were given the opportunity to report on being limited or in poor health. These reported rates were at a level much lower than the Symphony estimates for people of all ages, though for people aged 65 years and over, the census "limited" results were closer to the Symphony estimates. Is it possible that people are under-reporting their problems and giving an impression that they are coping well, when they are not? We have advanced arguments above to support a case against this view. However, it is worth noting that the census results will be influenced by people's ideas of what level of health and functioning is appropriate or normal for someone of their age. In other words the result will inevitably be influenced by people's expectations. Are people's expectations too low? It is unlikely that this is so for most people in the population. We might anticipate affluent people to expect more from public services and from life in general, and so be inclined to register a sense of limitation and need, but in practice they report lower levels of limitation. Conversely, we might anticipate more deprived people to be fatalistic and accept limitation as normal, but they report higher levels of limitation, so do not seem to accept it as entirely appropriate.

This said, coming to terms with increasing limitations as part of ageing would seem to be part of "Ageing Well", (just as knowing what has to be accepted and what can be changed would seem to be part of living well at any age.) Deciding on a personal level, what level of limitation is to be expected will also change throughout the life-course. Qualitative research for the "Ageing Well" report seems to indicate that maintaining mobility and access to facilities are of primary importance in later life for local people in Swindon; indeed maintenance of mobility and access seems to outweigh the issues of any particular diagnosis or diagnoses.

Swindon CCG

Above it has been mentioned that Swindon CCG registered population is a larger population than Swindon UA, though the size of the difference can vary from year to year. In this Profile we have concentrated on figures for Swindon UA. To what extent then do these estimates

have relevance for Swindon CCG registered population? We would suggest that the population rates which we report as findings are equally applicable to Swindon CCG, as these are “broad-brush” or “ball-park” figures. (The QOF rates and numbers already refer to Swindon CCG). To make judgements or adjustments the following should be borne in mind: the overall size of the CCG population is larger than that of Swindon UA; prevalences might be slightly lower in the CCG population, since the CCG population is slightly less deprived than the Swindon UA population overall, but the prevalence rates would have to be applied to the larger population.

10.4 Recommendations

The recommendations are as follows:

General

(i) Accept the LTC Profile and the "Ageing Well JSNA Report" as providing complementary pictures of LTCs, health resilience and coping throughout the life-course and particularly in Older Age, in the population of Swindon.

(ii) Accept the main prevalence estimates of LTCs in this Profile, (derived from the Symphony Model) to be used as pragmatic, working estimates of the size of the LTC prevalence pool in Swindon.

Knowledge and Intelligence

(iii) Conduct a literature review to find evidence of which interventions have been shown to be effective in different parts of the population, with regard to:

- The primary prevention of LTCs
- The secondary prevention of LTCs
- Self-management, resilience and coping skills in people with existing LTCs.

Best professional practice and horizon-scanning (of emerging thought and issues in managing LTCs) are also to be encompassed in the review.

(iv) The literature review also to include investigation of the resilience and coping skills of more affluent people, so that these skills might be extended in Swindon to more deprived people.

(v) The literature review to be conducted with respect to people at different stages of life, young adulthood, middle-age, and Older Age, people with different levels of health and people from different ethnic and socio-economic groups.

(vi) The literature to be investigated with regard to carers and the relationship of their own health to health events in the people for who they care, in support of a forthcoming "Carers' JSNA Report".

(vii) Explore further ways of exploiting IT, telehealth and telecare to improve and support the health of people with LTCs.

(viii) Conduct further statistical work on LTCs, particularly with a view to understanding social care needs, and include mapping Symphony model measures at the level of small-area geography. This could be complemented by the use of outputs from Swindon CCG's SOLLIS system (based on actual primary care patient data). The outputs could also include measures of:

- "Frailty",
- The various diagnostic, risk and resource groupings within SOLLIS.
- Groups identified in the literature as likely to be at high risk of requiring state-funded social care; such groups to include people with three or more LTCS, aged 65 years or more and living in deprived areas.

(ix) Consult Public and Patient groups through Healthwatch to gain insights into how local people cope with LTCs.

(x) Share emerging findings with representatives of the "Sustainability and Transformation Plan" (STP) Team which is taking a strategic view of health and care services in BANES, Swindon and Wiltshire.

Interventions

(xi) Employ appropriately the interventions in the Swindon population, as identified in the literature review.

(xii) Target these interventions in the population as appropriate. Further intelligence work to support this and MOSAIC geo-demographic segmentation to indicate which channels of communication should work best with different segments of the population.

(xiii) Improve and support the health of people with LTCs through "joined-up" or "accountable care", that is services which are combined and co-located. Joined-up services could include "one-stop shop" treatment and care facilities, for example, for diabetes and its cardiovascular co-morbidities. It could also include "care managers" or "care co-ordinators" (such as the community navigators) who support those patients who have to receive care from different facilities and specialties.

(xiv) Co-operate with partners to maintain a health-promoting physical environment, including housing for people with LTCs. (Recent guidance on this topic has been published by Public Health England.[36])

[36] Public Health England, Housing for Health Collection 2016. www.gov.uk/government/collections/housing-for-health

10.5 General Conclusions

Although with a subject such as LTCs (in which definitions are broad and various), it is not possible to give definitive and precise answers, we believe that this Profile provides useful and credible working estimates for use by the local Health and Care community. In total, 32.2% of all people and 69.2% of people aged 65 years or more in Swindon UA may have one or more LTCs. LTCs are numerically most common in middle-aged people, because there is a large number of middle-aged people in Swindon. The actual prevalence rates, the likelihood of having an LTC, however, are greater in older people, and the LTCs are likely to be more severe for them. For many conditions, it is usual, rather than exceptional, to have additional co-morbidities. Although affluence only modestly works against the development of LTCs, affluent people may cope considerably better than more deprived people, may have fewer co-morbidities and they seem to feel less limited by their health problems.

On a positive note, many people, whatever their background, seem to cope well with LTCs, or find they can manage their lives acceptably. About half of the 32.2% of people with LTCs do not seem to experience unacceptable limitations, while of the 69.3% of people aged 65 or over with LTCs, about a quarter do not seem to experience limitations. If, within the 65 and over group, we add together the people with LTCs (NOT limited) and the people who do not seem to have any LTC, then 48.9% of people aged 65 or more in Swindon seem to be "Ageing Well".

A key task of the Health and Care community is to help older people to move into the "Ageing Well" segment (while remaining there as long as possible), and to prepare middle-aged people for a later life which builds on "Ageing Well" principles. This task involves mental health as much as physical health. People in deprived areas probably have the most to gain from such initiatives.

Appendix One: ICD 10 Codes for Hospital Admissions

Table 12. ICD 10 codes for Hospital Episodes in Tables 4A and 4B (CB/SC codes 25.10.16)

Conditions (with ICD 10 Codes)
Asthma *(J45-J46)*
Bronchiectasis *(J47)*
Cancer *(COO-C97)*
CVD (Circulatory Diseases) *(I00-I99)* including CHD *(I20-I25)* Stroke (*I60-I69)** TIA *(G45.9)* Heart Failure *(I50)*
Chronic Kidney Disease *(N18)*
COPD *(J40-J44)*
Dementia (F00-F03)
Depression (F32, F33)
Diabetes *(E10-E14)*
Epilepsy *(G40-G41)*
Mental Health (SMI) (F20-F29, F30, F31, F39)
Obesity (E66)
Hypertension (primary only)(I10)
Hypothyroidism(E01.8, E03.4, E03.5, E03.9)

- Codes are from the International Classification of Diseases Revision 10 (ICD 10).
- Maternity activity was not included. Admissions were classified according to the main condition recorded as a primary diagnosis.
- Rates are crude rates, numbers of admissions per 100,000 of the relevant population and crude rates are not adjusted to allow for age and sex profile of the population.
- One person could have more than one admission during the year and so contribute to the figures more than once.
- Small numbers in the table have been amended or omitted in order to preserve confidentiality.
- CVD (Circulatory Diseases) is a broad class of conditions which includes CHD, Stroke, TIA and Heart Failure, plus other conditions.
- The stroke/TIA codes used here include some comparable cerebrovascular problems which are not strictly stroke.

Appendix Two: How was the Symphony Dataset produced?

Stage One:

The Symphony Project, administered by the South West Academic Health Service Network, has built a large data-set linking health and social care data for each individual in the Somerset population, which totalled 114,900 people at the time when the data-set was assembled. The data cover twelve months from April 2012 to March 2013 inclusive and are anonymised individual-level data about health status (diagnosed diseases or conditions), what care has been received and at what costs. Each individual's morbidity profile has been constructed using United Health's RISC tool. RISC is a patient-centric predictive modelling tool developed by United Health UK to assess the risk of patients having unplanned hospital admissions within a 12 month period. The main care settings included are as follows: primary care including prescribing, acute inpatient and daycase care (i.e. hospital-based), acute outpatient care (i.e. hospital-based), acute accident and emergency care, mental health care, community care, social care, and continuing care. Inpatient, outpatient and emergency activity at Community Hospitals are also covered. Costs have been calculated for each individual according to the type of care they have received in each setting. Demographic characteristics have been recorded for each individual, including age, gender, and deprivation level. Somerset has used the dataset to identify groups of patients who might benefit from more integrated forms of care.

Stage Two:

In a further development, Devon Public Health has utilised these data to create a matrix model of rates of activity over one year at a group level (rather than at individual level). The groups are defined by age (in quinary age-bands) sex, deprivation level in ten decile groups on ID 2015 and a summary of main chronic diseases or conditions experienced in each group (the Multi-Morbidities.) The morbidities included are asthma, cancer, CHD, Chronic Kidney Disease, COPD, dementia, diabetes, epilepsy, stroke/Transient Ischaemic Attack, Heart Failure, hypertension (raised Blood Pressure), and Severe Mental Illness. These occur in a variety of combinations or as a single morbidity or as being absent (i.e. a combination group of no diseases being present.) Devon Public Health has also drawn upon the Somerset data-set to calculate an average cost for each condition in each care setting. Note that in the

matrix model, costs were mainly calculated based on patients with one disease, as it was not possible to summarise costs for each multi-morbidity group.

Stage Three:

We applied the disease rates and cost rates from the Symphony matrix model to the Swindon UA population of 2015, as structured by age, sex and a measure of deprivation. This enabled us to estimate an expected number of people with no morbidities, with one morbidity and with various combinations of morbidity in the Swindon population, and to make inferences about the care-settings involved and the costs incurred. As there are not any community hospitals in Swindon which admit patients, run outpatient clinics or have an Emergency department, we allotted all community hospital costs to their corresponding departments in the acute sector. The major assumption of this method was that the health patterns of Swindon are broadly similar to those in Somerset and that Swindon people will utilise health and social services in a similar way. Being able to allow for the age and deprivation structure of the two different populations should compensate, to some degree at least, for any weaknesses in this assumption, however.

Appendix Three: Is the Symphony overall prevalence estimate the most useful?

The QOF prevalences have the advantage of being medically confirmed, systematically registered and linked to specific diseases. The QOF registers count diseases rather than people, however, and to gain an estimate of the overall "LTC prevalence pool", we had to use the best proxy measure (QOF indicator SMOK002). This gives a combined count of individuals with one or more QOF diseases, counting each person only once. This indicator is calculated in QOF only for people who have at least one of the following conditions: asthma, CHD, COPD, CKD, diabetes, peripheral arterial disease, stroke, hypertension, Severe Mental Illness.

Our "Proxy from QOF" measure gives 22.2% for all ages, somewhat lower than the Symphony estimate of 32.2%. Yet we would argue, for the following reasons, that the Symphony estimate is likely to be more accurate and most useful as a pragmatic estimate of the size of the "LTC Pool":

(i) It is likely that the Swindon UA prevalence of LTCs is slightly higher than that in the Swindon CCG population in which QOF is measured, since Swindon UA is a slightly more deprived population. This would suggest that, the 22.2% figure is too low, perhaps by one or two percentage points, though we cannot say by how much exactly.

(ii) It is widely assumed in the Public Health community in England that the prevalence of people with diabetes, and hypertension is under-estimated in QOF. This would suggest that (in addition to any consideration of (i)) the 22.2% figure is too low, though we cannot say by how much exactly.

(iii) Important QOF conditions such as Cancer (2.2%), depression (8.4%), hypothyroidism (2.3%, though not in the latest QOF registers), and obesity (10.9%) are not included in the "Proxy from QOF", as part of the primary care reporting process. If half of the people with these conditions had only one QOF condition, (and so were not already counted in the "Proxy from QOF") then they would amount to about 12% of the primary care population.

These people would then (even without including consideration of (i) and (ii)) bring the QOF estimate of the "LTC Pool" up to about 34%. Of course, a smaller proportion may have only one condition, so this would mean that 12% would be an over-estimate. Our "Credible QOF" value of about 30% seems a reasonable working figure.

(iv) QOF does not currently put emphasis on neurological conditions (although epilepsy is measured). Calculations based on national prevalences estimates that 2,900 people in Swindon UA are living with the neurological conditions of Multiple Sclerosis, Parkinson's, Motor Neurone Disease and epilepsy[37]. This would increase the "LTC Pool" in Swindon UA by 1.3 percentage points, if none of these people had a QOF condition that we have already counted in "Proxy from QOF" or "Credible QOF".

There is not likely to be a right answer to the size of the pool due to problems in making measurements and the fact that LTCs can be defined in many different ways. Nevertheless, in the light of all these points, the Symphony figure of 32.2% for the "LTC pool" seems to be a credible and reasonable working estimate. To use a metaphor at this point, Symphony can tell us something about the size of the LTC family and the relationships within it, even if it is not always exact about the ages, height and weight of the family members.

[37] National Mental Health Dementia and Neurology Intelligence Network (NMHDNIN.):www.yhpho.org.uk/mhdnin.

Further Sources of Data and Background Information

A comprehensive description of health and allied issues in Swindon can be found on the Joint Strategic Needs Assessment (JSNA) website: www.swindonjsna.co.uk

The panorama of health, health-care and social care issues in the UK, including needs and prospects for the future is covered by the King's Fund website: www.KIngsfund.org.uk

Information of the nature of health conditions, health improvement and treatments, from a consumer's point of view, can be found on the NHS Choices website: www.nhs.uk

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