An Roinn Sláinte
DEPARTMENT OF HEALTH

HEALTH SERVICE CAPACITY REVIEW 2018

REVIEW OF HEALTH DEMAND AND CAPACITY REQUIREMENTS IN IRELAND TO 2031

MAIN REPORT

Glossary

ABF	Activity Based Funding
ACC	Adult Critical Care
AHPs	Allied Health Professionals
AL	Annual Leave
AMAU	Acute Medical Assessment Unit
AMD	Age-related Macular Degeneration
AMU	Acute Medical Unit
ANP	Advanced Nurse Practitioner
CHC	Children's Hospital Group
CHO	Community Healthcare Organisation
CIT	Community Intervention Team
COPD	Chronic Obstructive Pulmonary Disease
CQC	Care Quality Commission
CSO	Central Statistics Office
DAY	Day Case
DM	Dublin Midlands (Hospital Group)
DOH	Department of Health
DOSA	Day of Surgery Admission
DRG	Diagnosis Related Group
ED	Emergency Department
EL	Elective
ENT	Ear Nose and Throat
FA	First Appointment
FU	Follow-Up (Appointment)
GP	General Practitioner
GDP	Gross Domestic Product
GPC	General Practice Co-operatives
HCP	Home Care Packages
HDU	High Dependency Unit
HG	Hospital Group
HHH	Home Help Hours
HIPE	Hospital Inpatient Enquiry database
HIQA	Health Information and Quality Authority
HPO	Healthcare Pricing Office
HSE	Health Service Executive
ICGP	Irish College of General Practitioners
ICU	Intensive Care Unit
IE	Ireland East (Hospital Group)
IHCP	Intensive Home Care Packages
IP	Inpatient
KPI	Key Performance Indicator
LOS	Length of Stay
MAU	Medical Assessment Unit
MIUs	Minor Injury Units
MDTs	Multidisciplinary Teams
NQAIS	National Quality Assurance Improvement System
NEL	Non-Elective
NHQRS	National Healthcare Quality Reporting System
NHS	National Health Service
NHSS	Nursing Homes Support Scheme
NTPF	National Treatment Purchase Fund
OECD	Organisation for Economic Co-operation and Development
OOH	Out of Hours
OPD	Outpatient Department
OT	Occupational Therapist
PN	Practice Nurse
PHN	Public Health Nurse
PET	Patient Experience Times
POD	Point of Delivery
PHY	Physiotherapist
RC-STB	Residential Care Short Term Beds
RC-LTB	Residential Care Long Term Beds
RCSI	Royal College of Surgeons Ireland (refers to the Hospital Group)
SAU	Surgical Assessment Unit
SG	Steering Group
SL	Sick Leave
SUHC	Saolta University Health Care (Hospital Group)
UL	University of Limerick (Hospital Group)
WHO	World Health Organization
WTE	Whole Time Equivalent
SG	Steering Group
SIVUH	South Infirmary Victoria University Hospital
SL	Sick Leave
S&LT	Speech & Language Therapist
SUHC	Saolta University Health Care (Hosp Grp)
UL	University of Limerick (Hospital Group)
WHO	World Health Organization
WTE	Whole Time Equivalent

CONTENTS

1 Introduction 1

1. Introduction 2
1.1 Terms of Reference 2
1.2 Background 2
1.3 Scope 3
1.4 Exclusions 3
1.5 Guiding the Review 4
1.6 Structure of the Report 4

2 Health Service Review Methodology 5

2.1 Definitions of Metrics 6
2.2 Framework for Modelling Demand and Capacity 8
2.3 Model Outputs 11
2.4 Approach to International Benchmarking 11
2.5 Policy Assessment 12
2.6 Stakeholder Consultation 12
2.7 Limitations 13
2.8 Summary 13

3 International Benchmarking of Health Services 14

3.1 International Benchmarking Exercise 15
3.1.1 Resourcing 17
3.1.2 Activity 21
3.1.3 Health Indicators and Drivers 27
3.2 Summary 32

4 Baseline Scenario: Demand and Capacity Projections 33

4.1 Demographic Changes 34
4.2 Non-Demographic Changes 36
4.3 Profile of Current and Forecast Demand by Sector Type 37
4.3.1 Profile of Current and Forecast Demand within the Acute Sector 37
4.3.2 Profile of Current and Forecast Demand within the Primary Care Sector 51
4.3.3 Profile of Current and Forecast Demand within the Services for Older Persons Care Sector (Residential and Home Care) 54
4.4 Profile of Current and Forecast Capacity for Resources by Sector Type 59
4.4.1 Profile of Current and Forecast Capacity against Required Capacity in the Acute Sector 59
4.4.2 Profile of Current and Forecast Capacity against Required Capacity in the Primary Care Sector 62
4.4.3 Profile of Current and Forecast Capacity against Required Capacity in the Services for Older Persons Care Sector 64
4.5 Private Hospital Acute Activity 66
4.6 Summary 71

5 Policy Analysis 73

5.1 Analysis and Refinement of Applicable Policies 74
5.2 Key Policy Themes and Considerations 74
5.3 Summary 75

6 Stakeholder Engagement 76

6.1 Summary of Wave 1 Workshop Findings 77
6.2 Summary of Bi-Lateral Engagements 81
6.3 Summary of International Peer Review Engagement 84
6.4 Identification of Potential Scenarios 86
6.5 Summary of Wave 2 Workshop Findings 86
6.6 Summary of Public Consultation Process 87
6.7 Summary 88

7 Impact Of Alternative Care Models 89

7.1 Scenario 1: Improved Health and Wellbeing 91
7.2 Scenario 2: Improved Model of Care Centred around Comprehensive Community- Based Services 98
7.3 Scenario 3: Hospital Productivity Improvements 107
7.3.1 Scenario 3A: Hospital Group / National Care Pathway Improvements 107
7.3.2 Scenario 3B: Improvements to Patient Flow through Hospitals 113
7.4 Summary 117

8 Conclusions and Recommendations 119

8.1 Conclusions 120
8.1.1 Baseline Conclusions 120
8.1.2 Scenario Conclusions 122
8.1.3 General Conclusion 123
8.2 Recommendations 124
8.2.1 Baseline Recommendations 124
8.2.2 Scenario Recommendations 125
8.2.3 General Recommendations 127
8.3 Summary 128

Appendices 129

Appendix A Longlist of Reviewed Policies 130
Appendix B Shortlist of Reviewed Policies 132
Appendix C Final List of Reviewed Policies 133
Appendix D List of Data Sources 158
Appendix E Model Technical Overview 162
Appendix F Scenario Approaches 187
Appendix G Stakeholder Engagement 201
Appendix H Membership of Steering Group 204
Appendix I Members of the International Peer Review Group 205
Appendix J List of Submissions to Public Consultation Process 206

Index of Tables

Table 1: Definitions of Metrics 6

Table 2: Model Approach: Generation of Demand Forecast 8

Table 3: Model Approach: Generation of Capacity Forecast 10

Table 4: Modelled Policy Scenarios 11

Table 5: International Benchmarking Countries 15

Table 6: Current and forecasted age structure of the Irish population 35

Table 7: Age Profile of Service Users in 2016 36

Table 8: Key Assumptions Made in Private Demand and Capacity Assessment 66

Table 9: Summary of Forecast Capacity by Sector Point of Delivery (POD) with percentage changes from baseline 72

Table 10: Data Quality and Accessibility 77

Table 11: Improvements Within and Across the System 78

Table 12: Unmet Demand and Unmet Need 79

Table 13: Ireland's Ageing Population 79

Table 14: Non-Demographic and Epidemiological Trends 80

Table 15: Prevention Initiatives 80

Table 16: Summary of Public Provider Feedback 81–82

Table 17: Summary of Private Provider Feedback 83

Table 18: Summary of International Peer Review Group Meeting 84–85

Table 19: Overview of scenarios considered for further analysis 86

Table 20: Summary of Wave 2 Comments on Baseline Results 86

Table 21: Summary of Department of Health Public Consultation 87–88

Table 22: Overview of POD Capacity for Baseline and Scenario 1 93–94

Table 23: Summary of Evidence for Scenario 1 97

Table 24: Overview of POD Capacity for Baseline and Scenario 2 101–102

Table 25: Summary of Evidence for Scenario 2 105–106

Table 26: Overview of POD Capacity for Baseline and Scenario 3A 109

Table 27: Summary of Evidence for Scenario 3A 111–112

Table 28: Overview of POD Capacity for Baseline and Scenario 3B 115–116

Table 29: 118
Summary forecast of capacity for all Points of Delivery

Table 30: 124
Summary of Capacity Requirements with no Service Reconfiguration

Table 31: 127
Impact of Scenarios on Capacity Requirements

Table 32: 130–132
Long list of Policy Documents Reviewed

Table 33: 132–133
Short list of Reviewed Policies

Table 34: 133–150
Final Reviewed Policies

Table 35: 151–152
Analysis of International Best Practice

Table 36: 158
Demographics and Regions Data Sources

Table 37: 158–159
Primary Care Data Sources

Table 38: 159–160
Acute Hospital Data Sources

Table 39: 161
Social Care Data Sources

Table 40: 162
Universal Dimensions used within the Model

Table 41: 163
Model Dimensions by Care Sector

Table 42: 164
Model Calculations

Table 43: 165
Acute Care Sector Specialty Mapping

Table 44: 167
Activity Data Incorporated into the Model for all Three Care Sectors

Table 45: 171
Acute Care Non-Demographic Forecasts

Table 46: 173
Services for Older Persons Care Non-Demographic Forecasts

Table 47: 174
Waiting Lists Incorporated for all Three Care Sectors

Table 48: 175–179
Historic Activity and Waiting Lists Methodology – All 3 Sectors

Table 49: 179–182
Historic Resources Methodology – All 3 Sectors

Table 50: 183
Acute Care: Levels of Resource Efficiency

Table 51: 184
Acute Care: Levels of Resource Efficiency by Site, Specialty, and Age Band (source: HIPE data)

Table 52: 185
Primary Care: Levels of Resource Efficiency

Table 53: 185–186
Services for Older Persons Care: Levels of Resource Efficiency

Table 54: 187
List of Modelling Approaches for each Scenario

Table 55: 200
List of Scenario-related Modelling Assumptions

Table 56: 203
List of Workshop Participants

Table 57: 203
List of organisations engaged through bi-lateral meetings

Table 58: 204
Steering Group Members

Table 59: 205
International Peer Review Group Members

Table 60: 206
List of Submissions Received

Index of Figures

Figure 1: Elderly Population (aged 65 and over) as a % of Total Population 16

Figure 2: GPs per 1,000 Inhabitants (head counts) 17

Figure 3: Nurses per 1,000 of Population 18

Figure 4: Hospital Beds per 1,000 Inhabitants 19

Figure 5: Nursing and Residential Care Beds per 1,000 over 65 Population 20

Figure 6: Average LOS Rates for Inpatient Acute Care 21

Figure 7: Occupancy Rate of Curative (acute) Care Beds in 2013 (or nearest year) 22

Figure 8: Day Case Hospital Discharges per 100,000 Inhabitants 23

Figure 9: Congenitive Heart Failure Hospital Admission in Adults in 2013 (or nearest years) 24

Figure 10: COPD Hospital Admission in Adults, 2013 (or nearest year) 25

Figure 11: Long-term Care Recipients as a % of Population 26

Figure 12: Persons Reporting a Chronic Disease as % of Population, 2014 27

Figure 13: Daily Smokers as % of Population (aged 15+) 28

Figure 14: Alcohol Consumption (litres per capita, aged 15+) 29

Figure 15: Obese Population as a % of Total Population 30

Figure 16: Percentage of Population Performing Physical Activities 31

Figure 17: Forecast population of Ireland and relative growth to 2031 by age band (relative to 100% in 2016) 34

Figure 18: Summary of Non-Demographic Demand Drivers 36

Figure 19: Current and Forecast Demand in Acute Care by ED attendances 37

Figure 20: Current and Forecast Demand in Acute Care by AMU 38

Figure 21: Current and Forecast Demand in Acute Care by Day Case procedures 39–40

Figure 22: Current and Forecast Demand in Acute Care by IP EL 41–42

Figure 23: Current and Forecast Demand in Acute Care by IP NEL 43–44

Figure 24: Current and Forecast Demand in Acute Care by ACC 45–46

Figure 25: Current and Forecast Demand in Acute Care by OPFA 47–48

Figure 26: Current and Forecast Demand in Acute Care by OPFU 49–50

Figure 27: Current and Forecast Demand in Primary Care by GP appointments 52

Figure 28: Current and Forecast Demand in Primary Care by GP PN appointments 53

Figure 29: Current and Forecast Demand in Services for Older Persons Care by Residential Care Long Term 54

Figure 30: Current and Forecast Demand in Services for Older Persons Care by Residential Care Short Term 55

Figure 31: Current and Forecast Demand in Services for Older Persons Care by Home Care 56

Figure 32: Current and Forecast Demand in Services for Older Persons Care by Intensive Home Care 57

Figure 33: Current and Forecast Demand in Services for Older Persons Care by Home Help 58

Figure 34: Current and Forecast Capacity in Acute Care 60

Figure 35: Current and Forecast Capacity in Primary Care 62

Figure 36: Current and Forecast Capacity versus Required Capacity in Primary Care (AHPs) 63

Figure 37: Current and Forecast Capacity in Services for Older Persons Care (Residential Care) 64

Figure 38: Current and Forecast Capacity in Services for Older Persons Care (Home Care) 65

Figure 39: Private Acute Day Case Demand 67

Figure 40: Private Acute Day Case Beds 68

Figure 41: Private Acute Inpatient Elective Demand 69

Figure 42: Private Acute Inpatient Elective Capacity 70

Figure 43: Summary of Reform Scenario 1 92

Figure 44: Summary of Reform Scenario 2 99

Figure 45: Summary of Reform Scenario 3A 108

Figure 46: Summary of Reform Scenario 3B 113

Figure 47: Map of Hospital Group and Community Health Organisations 162

Figure 48: Non-Demographic Growth Trend Methodology 169

Figure 49: 2-Step Estimation of Non-Demographic Forecasts 170

1 INTRODUCTION

The Department of Health (DoH) commissioned PA Consulting (PA) to undertake an independent capacity review of the evolving Irish healthcare landscape covering the period 2017 to 2031. This involved assessing current levels of activity/ utilisation of services, and drivers of demand in order to identify future demand and capacity requirements across these health services until 2031. It does this for both the current baseline of service provision as well as for a number of alternative configurations (scenarios). This document is the final report of the Health Service Capacity Review and summarises the work conducted, including the methodology, analysis and key findings.

Due to the volume and complexity of the work undertaken, an executive report has been produced (separate to this report), which provides a summary overview of the approach, findings, conclusions and recommendations.

1.1 Terms of Reference

The Review was established to address the following four objectives:

a. To determine and review current capacity, both public and private, in the health system and benchmark with international comparators

This will include:

i. Mapping of current capacity and analysis of existing activity at national and regional level.

ii. Examination of relevant efficiency and effectiveness trends achieved by the sector.

iii. Identification and estimation of unmet demand.

iv. Mapping of patient pathways to identify connections of care and bottlenecks and to provide an analysis of implications for capacity.

v. Benchmark against international comparators.

b. To determine drivers of future demand and estimate impact on capacity requirements to 2031.

This will include current unmet demand, demographics, health status, health innovations and health behaviours and rising expectations.

c. To consider and analyse how key reforms to the model of care will impact on future capacity requirements across the system.

This will include:

i. Expansion of services in primary care, including management of chronic disease.

ii. Provision of suitable post-hospital care, including long-term and short stay beds and home care supports.

iii. Optimising use of acute care to maximise patient flow and health outcomes for patients.

iv. Operational efficiencies.

d. To provide an overall assessment, including prioritisation and sequencing, of future capacity requirements on a phased basis for the period 2017 – 2031 at a national and regional level, cognisant of resource availability.

1.2 Background

The past decade has seen significant change in Ireland and the health sector is no different in this respect. The entire system is coming under increased pressures as it faces a series of interlinked challenges. Included in these challenges have been substantial budgetary pressures, a hospital-centric model of care, long waiting lists in each setting, a growing population and a rise in the incidence of chronic illnesses. These long-term challenges will continue over the coming years and will be exacerbated by demographic factors as Ireland's population is forecast to age rapidly. This will see increased demand for health services and the system will have to respond in line with these increased pressures.

In response to this situation, and to facilitate effective planning for the health system, periodic and systematic analysis of capacity requirements is needed with a medium to long-term focus. This requirement has been reflected in the Programme for a Partnership Government. One of the identified focus areas for the current partnership Government is to address the pressing challenges within the health sector. The Programme sets out to develop an enhanced primary care system, to build capacity in emergency services and to improve waiting times. To achieve this, the Government committed to undertaking a national hospital bed capacity review "to establish the number, type and location of beds required into the future recognising the need for a range of beds including critical care, palliative and day case bed stock".

The scope for this Review was subsequently broadened, by the Minister for Health, beyond hospital beds to take account of primary care and services for older persons so as to take a whole system view of capacity. Therefore, there is recognition of the requirement to balance investment in hospital capacity with investment in other models of care. It was also signalled that this Capacity Review would form part of the preparations for the Government's mid-term review of the Capital Plan 2016-2021 and feed into the new 10-year National Development Plan.

This is not the first capacity review conducted in Ireland, as two have been undertaken since 2000. The DoH undertook a review itself in 2002, while the Health Service Executive (HSE) commissioned a review in 2007 and this was also completed by PA. Each of these, however, focused on the acute setting only and the widened remit of this Capacity Review is designed to give a more complete picture to the DoH.

1.3 Scope

In recognition of the interdependencies that exist within the healthcare system, this Capacity Review is taking a broader approach than the previous reviews (of 2002 and 2007) which focused on acute bed capacity only. The Review will examine future demand and capacity requirements within the key areas of primary care and services for older persons in addition to the acute hospital setting. By doing so it recognises the linkages between different settings and how changes in one service area can have an impact (intended or unintended) on demand for services in another.

This Review does not cover every aspect of demand and capacity but considers those key areas which have the most direct impact on meeting future healthcare needs. It is a top down national level Review so it does not offer detailed site-by-site or pathway-by-pathway assessment of performance and capacity. While there is a requirement to include certain human resources in the assessment of capacity within certain settings, a full workforce capacity review was not within the scope of this work.

The following aspects of the health service, covering both public and private provision, have been identified as key aspects of capacity that are to be considered in the Review:

- Acute Hospitals: acute beds (inpatient and day case beds, adult critical care beds, AMUs, and emergency and outpatient activity). Data in relation to private hospitals is included in the Review but reviewed separately (see Section 4.5) from data relating to the 49 public acute hospitals in the 7 Hospital Groups, due to data limitations outlined.
- Primary Care: GPs, practice nurses, public health nurses, and allied health professionals (physiotherapists, occupational therapists, and speech and language therapists).
- Services for Older Persons Care: long and short stay residential care beds in public and private nursing homes, and home care/home help.

A list of exclusions and limitations to this Review can be found in Sections 1.4 and 2.7 respectively.

1.4 Exclusions

Given the timeframe, it was not possible for the review to examine all aspects of the health and social care system. In particular, mental health and disability services were not considered as part of the analysis as there are significant policy development processes underway in these areas. Other areas were not considered including some elements of primary care, palliative care and the ambulance service. Finally, in general workforce capacity has not been considered except in those areas of primary care that were within the scope of the Review.

1.5 Guiding the Review

The review was commissioned by the Department of Health. It was overseen and guided by the following governance mechanisms and engagement activities:

- A Steering Group met periodically throughout the review to oversee its development. The membership included senior officials from the Department of Health, Department of the Taoiseach and the Health Service Executive (HSE), as well as experts with a clinical and academic background.
- An independent International Peer Review Group was established by the Department to provide advice on, and validate, the methodology and approach.
- Two sets of stakeholder workshops were conducted with over 50 participants from across the health system. These drew on a range of experiences from different sectors, professional groups and patient interests:
  - The first set of workshops tested baseline assumptions and identified potential areas for consideration as alternative scenarios for the future system.
  - The second set of workshops reviewed in detail the potential future scenarios to validate the hypothesis for each scenario and identify potential evidence to support the assessment of impact.
- A number of stakeholders within the system were engaged through bilateral meetings to gather more detailed perspectives.
- A public consultation exercise was undertaken by the Department, involving a call for submissions from interested stakeholders.

1.6 Structure of the Report

This report will:

- Outline the approach and methodology used in developing and refining the model (Section 2).
- Compare Ireland's performance to comparator countries across a number of benchmarks (Section 3).
- Address the current and forecast demand for resources within the acute and primary care, and services for older persons settings (Section 4).
- Summarise relevant policy considerations and how changes could impact on the model of care (Section 5).
- Detail the approach to and the outcomes of the stakeholder engagement exercise (Section 6).
- Project how the various scenarios will affect the Irish health system (Section 7).
- Present the conclusions and recommendations (Section 8).

2 HEALTH SERVICE REVIEW METHODOLOGY

In this section the model approach adopted to deliver on the Review's objectives is outlined. Given the multidisciplinary approach to deliver this Capacity Review, a series of methodologies were utilised to build a model that functions to assess the current and future capacity within the acute and primary care sectors, and services for older persons.

This section:

- Defines the key capacity metrics that were considered as part of the Capacity Review.
- Outlines the methodology for forecasting demand and capacity.
- Charts the approach taken towards benchmarking and policy assessment.
- Summarises the stakeholder engagement process.
- Details the limitations and exclusions of the Capacity Review.

2.1 Definitions of Metrics

The following table provides definitions for the key capacity metrics that are used throughout this Capacity Review, across the acute and primary care settings, and services for older persons.

Table 1: Definitions of Metrics

Name	Definition
Adult Critical Care (ACC): Intensive Care Unit (ICU) / High Dependency Unit (HDU) Bed	The definition of ACC beds is Level 2 (HDU) or Level 3 (ICU) or Level 3+ (ICU). These are critical care beds where the patient requires a more extensive level of care and more intensive observation, treatment and nursing care than is possible in a general inpatient bed. ACC beds have been analysed separately in this Review as the activity and beds data provided was the most robust for these categories. For Neonatal (NICU) and Paediatric (PICU) data, the data supplied was not granular enough and could not be validated in time.
Inpatient (IP) Bed	Allocated for inpatient use, staffed and resourced 24 hrs per day and may be used on a seven day (Mon – Sun) or five day (Mon – Fri) basis, may be used for elective or non-elective admissions who are expected to stay one or more nights. For the purposes of this Review, acute beds were analysed on the basis of "beds available", rather than beds occupied or bed capacity. The OECD's widely-applied definition of bed availability is: "An available bed is a bed which is immediately available to be used by an admitted patient or resident if required. A bed is immediately available for use if it is located in a suitable place for care and where nursing and auxiliary staff are available, either immediately or within a reasonable period." [https://stats.oecd.org/glossary/search.asp]
Day Case Bed	Includes Day Beds (a bed available for a planned attendance that is staffed and resourced for a set period each day, where the patient is not expected to stay overnight) and Day Places (e.g. dialysis).
Acute Medical Unit (AMU) / Acute Medical Assessment Unit (AMAU) / Medical Assessment Unit (MAU) Bed	An AMU / AMAU / MAU is a facility with beds separate from ED whose primary function is the immediate and early specialist management of acutely unwell adult patients who present to, or from within, a hospital requiring urgent medical care. AMU/AMAUs enable appropriate streaming of patients away from ED to improve clinical care and the patient experience. These have collectively been labelled AMU throughout the report. Surgical assessment Units (SAUs) have been established in some hospitals variously co-located as part of an ED or AMU. Where they exist, the facilities involved have been counted within the totals for the host facility.
General Practitioner (GP) WTEs	Doctors working in primary care in group practices, primary care centres, single practices and health centres, who provide a broad service to their patients on all health issues, and may refer patients to see hospital consultants if more specific investigation or treatment is required.

Name	Definition
GP Practice Nurse (PN) WTEs	Registered general nurse who is privately employed by a GP to provide a holistic nursing model of care to the population of a general practice. The PN reports clinically to the GP and is responsible for her/his individual scope of practice.
Allied Health Professionals – Physiotherapists (PHY), Occupational Therapists (OT) and Speech and Language Therapists (S&LT)	Physiotherapists, Occupational Therapists and Speech and Language Therapists are members of Primary Care Teams. Only HSE services were considered. Physiotherapists help to correct dysfunction and injury and restore health and well-being to people following injury, pain or disability. Occupational Therapists help to enable people to engage in activities of everyday life when faced with illness, injury, disability or challenging life events. Speech and Language Therapists work with people with communication and swallowing disorders.
Community Intervention Team (CIT)	Specialist, nurse led health professional team which provides a rapid and integrated response, in the home, residential setting or in the community, to patients with an acute episode of illness who require enhanced services/ acute intervention for a defined short period of time.
Public Health Nurses (PHN)	Nurses based in local health centre and assigned to cover specific geographical areas, who provide a range of health care services in the community. For the purposes of the Review, other types of community nurses have not been considered due to data limitations.
Residential Care Long Term Beds (RC LT)	Beds primarily engaged in providing residential long-term care in public and private nursing homes from multidisciplinary teams that combines nursing, supervisory or other types of care as required by patients.
Residential Care Short Term Beds (RC ST)	Beds primarily engaged in providing residential short-term care in public and private nursing homes from multidisciplinary teams that combines nursing, supervisory or other types of care as required by patients.
Home Care Packages (HCP)	Administrative scheme, operated by the HSE, which aims to help older people who need medium to high caring support to continue to live at home independently as long as possible.
Intensive Home Care Packages (IHCP)	A more intensive set of services provided by the HSE to help an older person to be cared for in their own home as long as possible.
Home Help Hours (HHH)	Unit of calculation for the provision of care in the community to older persons with a focus on providing personal care services including support with personal hygiene, washing and dressing. HSE funded services considered only.

2.2 Framework for Modelling Demand and Capacity

The overall approach adopted in the modelling of demand and capacity is summarised below. A much more detailed description can be found in Appendix E of this report.

The analysis was undertaken using a purposely designed demand and capacity model. This involved drawing on a range of data sources to develop forecasts in two distinct stages: (i) establishing demand, and then (ii) assessing capacity implications. 2016 has been used as the base year and projections were developed for the period to 2031.

The demand forecast approach, illustrated in Table 2, is based on an analysis of historic annual activity and, where possible, unmet demand depending on the availability and consistency of data. Using CSO reports and forecasts for the population, measures of demographic and non-demographic growth have been defined for the forecast of future demand. Where appropriate, non-demographic growth has been adjusted to take account of known policy impacts. Unmet demand (where applicable) has been based on the annual change in the length of waiting lists, and the final demand forecast is further adjusted to accommodate the clearance of the backlog of demand held on waiting lists.

Table 2: Model Approach: Generation of Demand Forecast

Stage	Title	Description
1	Identify Annual Demand for period 2012 – 2016	Annual demand is comprised of two elements – reported annual activity in a given year and unmet demand. For the purposes of the review, waiting list data have been used as a proxy for unmet demand and it has been calculated as the annual year-on-year change in the size of the waiting list. Given data availability, a more solid assessment of unmet need was not possible but it has to some extent been addressed in the reform scenarios. Data was analysed at the lowest level of disaggregation possible by age, sex, specialty group and region (CHO/HG). Activity data was drawn from sources such as HIPE, HSE, NHSS and surveys, while waiting data list was drawn from NTPF and HSE.
2	Project Future Demand for period 2017 – 2031	2016 is taken as the base year and projections are made for each year for the period 2017 – 2031 taking into consideration demographic and non-demographic factors:
2a	Demographic Factors	Future demand for healthcare services will be impacted by changes in the size and structure of the population. Demand was forecast forward on the basis of national population projections. CSO regional projections were used (M2F2 scenario), adjusted for recent CSO population data. The analysis allowed the application of demographic growth through the lens of a specific service or specialty. The impact of changes in demography will be different for each area depending on the age profile of people using the service. For example, if a service has an age profile with older patients who have a higher prevalence of need, then it will have a higher demographic pressure than a service which has an age profile with more middle age adults.

Stage	Title	Description
2b	Non-demographic factors	Future demand will also be impacted by a variety of factors other than demographics. These include: • Epidemiological trends (e.g. prevalence of chronic diseases). • Lifestyle risk factors impacting health status (e.g. smoking, alcohol, physical inactivity). • Changes to modes of healthcare delivery (e.g. ambulatory emergency care reducing admissions from ED, shift to day case surgery). • Technological developments (e.g. new drugs or operative technologies). • Changes in the socio-economic structure of the population (education level, income, employment) and changes in people's expectations. • Proportion of the population with private health insurance. • Supply-induced demand eg additional funding allocated to service provision. For the purposes of this review, non-demographic growth (NDG) is derived from an analysis of demand over the period 2012 – 2016. Growth in demand is compared with demographic growth for the same period to derive a value for non-demographic growth – the change in demand that cannot be explained by demographic growth. This can be positive or negative i.e. demand for a service increased at a greater or lesser rate than would be expected given the demographic changes over the period. This gives a non-demographic growth factor for 2012-2016. Future demand is projected forward on the basis of this factor. In some cases, this factor has been adjusted to take account of known discrepancies in the data, or likely changes in demand trends over the projection period. For instance, there was a sharp rise in demand for day case services from 2012 – 2016 as a result of a concerted shift from in-patient to day services. This leads to a high NDG factor. It is unlikely that growth in demand will continue at the same rate, so the NDG factor has been adjusted down based on international norms.
3	Waiting List Reduction	While the annual change in the size of the waiting list has been accommodated in the annual demand estimate, the current waiting list (end 2016) represents a backlog of additional work. The demand profile is adjusted to reduce the waiting list to zero over a period of four years. In practice, there will always be some level of waiting list within a performing health system that is seeking to balance clinical outcomes, patient experience and cost. However, as the waiting list reduction is spread over a number of years in the model, using an assumption of zero enables a reasonable estimate of the additional short term demand.
4	Demand forecast	The resulting demand forecast is then used to develop the next stage – the assessment of capacity.
5	Scenario Analysis	Assumptions within the model are adjusted to generate demand forecasts for alternative scenarios. For example, adjustments to non-demographic growth are used to model improvements in public health initiatives, and movements (or substitutions) of activities between PODs are modelled to show future patient pathways under revised models of care.

Using demand calculations (generated from the process as summarised above) as a basis, estimations of **capacity forecasts** for each of the sectors are then conducted following the approach summarised in Table 3. Information relating to the Irish health services in terms of the resource usage, availability, and utilisation is essential to the forecasting of capacity that is needed to meet demand.

The average length of time using a given resource (e.g. LOS, length of appointment) was applied to demand forecasts. Taking this into account along with the percentage of resources utilised (e.g. occupancy rate, patient facing time) and annual availability of the resource, capacity forecasts were calculated for each of the sector Point of Delivery (POD) metrics being modelled in this Review. For further detail on the levels of efficiency parameters input into the model, refer to Table 50, Table 51, Table 52, and Table 53 in Appendix E.

The data applied in these calculations were gathered through extensive secondary research. Sources are outlined in Appendix D. Certain assumptions were however necessary for estimating these capacity forecasts. These assumptions, along with other baseline calculations, were tested by various internal and external stakeholders at a series of workshops, bilateral consultations, and at International Peer Review Group and Steering Group meetings (see Section 2.6 and Section 6 for additional detail). This served to validate or update assumptions essential to the modelling of capacity forecasting.

Table 3: Model Approach: Generation of Capacity Forecast

Stage	Title	Description
1	Demand forecast	The starting point is the baseline forecast of future levels of demand.
2	Resource usage	The average length of time using a resource was identified. This is typically in terms of a length of stay, or duration of appointment. Resources represent the building blocks of capacity, and in most cases relate directly to a POD (See table 41). Resource usage measures were drawn from sources such as HIPE (for patient bed days), and published reports and stakeholder consultation (for typical appointment lengths).
3	Resource availability	The annual availability of a resource was identified. This takes account of days of operation, opening hours, staff working hours. These metrics were drawn from published reports and stakeholder consultation.
4	Resource utilisation	The proportion of resource time available for direct patient contact was identified. This will include the occupancy rate for beds, and patient-facing time for clinicians. These metrics were drawn from a combination of analysis (for bed occupancy) and published reports and stakeholder consultation (for patient contact time).
5	Capacity forecast	Projected demand for each year combined with metrics for resource usage, availability and utilisation give annual capacity forecasts.
6	Scenario analysis	Assumptions within the model are adjusted to generate forecasts of capacity for alternative scenarios. For example, adjustments to resource usage and availability reflect changes in productivity, and the impact of improved occupancy rates can be assessed by adjusted resource utilisation.

Note: Further detail on all model inputs by sector is presented in Appendix E.

2.3 Model Outputs

The model reports on a range of both common dimensions[1] (Table 40 in Appendix E) across all sectors and dimensions unique to the acute and primary care sectors, and services for older persons (Table 41 in Appendix E).

For the purposes of the Review, the model was then used to develop two main sets of outputs.

Baseline Projection

This is the "status quo" scenario. It provides an assessment of future capacity requirements across the system should no further changes or improvements be made. It also assumes that as demand increases the current patterns of activity continue, and it assesses the capacity needed given the same levels of resource availability and utilisation. This is discussed in detail in Section 4 of this report.

Impact of Future Policy Reforms

The future policy scenarios are based on an analysis of current policy, known healthcare system deficiencies, and international practice. Included in this is the feedback from engagements with stakeholders, a public consultation process, the Steering Group and the International Peer Review Group. A number of policy scenarios have been modelled to reflect potential changes that impact upon both demand and how that demand is addressed across the system. This is discussed in detail in Section 7 of this report. These scenarios are listed in the table below.

Table 4: Modelled Policy Scenarios

Reform Scenario	Description
1	Improved Health and Wellbeing
2	Improved Model of Care Centred around Comprehensive Community-Based Services
3	Enhanced hospital productivity. This has been assessed in two parts: • 3A Hospital Group / National Care Pathway Improvements • 3B Improvements to Patient Flow Through Hospitals

More generally, the working model has been handed over to the Department of Health. Data inputs, assumptions and scenarios can be adapted for future use.

2.4 Approach to International Benchmarking

International benchmarking has been used to compare Ireland's performance across a number of key performance indicators (KPIs) with that of international counterparts. This exercise can highlight certain areas where other countries may perform better than Ireland and it may be possible for Ireland to learn from their experience. Although caution must always be exercised due to the different configuration of healthcare services by nation and the complex system interrelationships that may not be immediately apparent when looking at individual measures in isolation.

In conducting the international benchmarking exercise, research was undertaken on healthcare systems from a series of comparator countries. These countries were selected on the basis of their levels of economic development being similar to Ireland and that the size of country was approximately equivalent. It was also important to have a representative number of European states within the countries examined. Research was carried out searching for data that was available in order to compare performance

[1] Universal dimensions include age bands, the public/private care type, and regional site

across the acute and primary care settings, and services for older persons. From the research conducted, a number of benchmarks indicating best practice internationally across a range of indicators were identified where comparable data was available internationally. In turn these benchmarks have been used to both inform commentary on the current baseline, and on scenarios in terms of the shifts in healthcare provision witnessed in other countries. These benchmarks were separated out into three categories, as outlined in Section 3 of this report.

2.5 Policy Assessment

The purpose of the policy assessment work carried out was to identify and analyse policies that could have a potential impact on demand and capacity out to 2031. Policy assessment began with an initial review of a long list of healthcare strategies and policies relating to the Irish healthcare system. A full list of these documents is outlined in Appendix A of this report. Following this initial review, a short list of policies and strategies was developed (see Appendix B) and a detailed analysis was undertaken. This detailed analysis involved the identification of key policy considerations – including those which are currently being implemented and those which are planned – that will have a potential impact on demand and capacity into the future. These policy considerations were then tested in a workshop with a group of key stakeholders from across the Irish healthcare system and consensus was reached with regard to the final list of considerations that should be considered in a future model of care (see Appendix C). This is further examined in Section 5 of this report.

2.6 Stakeholder Consultation

As this Capacity Review incorporates acute hospitals, primary care, and services for older persons, it was acknowledged at an early stage that a broad range of stakeholders would have a keen interest in both the inputs and outputs of the Review. This would require engagement at various intervals throughout the Review process. As such, stakeholder consultation was seen as a key component of this Capacity Review. In parallel to the work undertaken by PA as summarised below, the DoH separately undertook a broader public consultation involving a call for submissions from interested parties regarding the Health Service Capacity Review.

Stakeholders were consulted in the form of one-to-one consultations, group workshops or through individual involvement in the Capacity Review Steering Group (see Appendix G and Appendix H for lists of participants). Whilst the role of the Steering Group was in part to provide oversight and guidance in relation to the approach and process of the Review, the individuals within the Steering Group also contributed to testing and validating data inputs and outputs.

Stakeholders were engaged for three main purposes: to obtain support for the data collection process; to test and validate assumptions that were made to address identified data gaps; and, to garner insight and feedback on potential scenarios of a future model of care. A summary of the key findings from this exercise is presented in Section 6 of this report.

2.7 Limitations

Any review of this nature has its limitations and conclusions drawn must be interpreted and considered in the context of these limitations. Projections in the report represent the potential levels of future demand and capacity, and include rounded point estimates. There is a plausible range within which these points sit, based on uncertainty about the future, various data issues and choices regarding assumptions and parameter setting.

There were specific limitations in relation to the availability of and timely access to data, and consistency in the data captured, which had an impact on the development of the demand and capacity model.

Data challenges presented in a number of ways, including:

- Lack of available data in specific areas, especially non-acute sectors.
- Gaps in available datasets.
- No standardised approach to data within each of the primary, social and/or acute care setting.
- Lack of integrated approach to data collection, storage and dissemination across the healthcare system.
- Data available but involved a significant lead time to source.
- Data collected but not made publicly available.
- Numerous data sources for the same metrics but with variations in figures reported.
- Variation in data format across various years.
- Variation in data format at hospital level due to different IT systems in operation.

The challenges above resulted in the data collection processes extending significantly beyond the four-week time period that was envisaged at the outset. On a more significant level, such limitations resulted in the need for a number of assumptions being made where data gaps were identified. While these assumptions have been tested and validated with a broad range of relevant stakeholders (including clinicians) to the maximum extent possible within the time limitations of this review, the fact that these assumptions were required is an obvious limitation.

Furthermore, It is not possible to predict the capacity impact of policy and productivity reforms with any real certainty. The approach has drawn on international and national evidence in as far as possible, and provides valuable guidance on what the potential impact of these measures could be. As with all forecasts, there will remain assumptions that will need to be tested through careful evaluation of performance and outcomes as any improvements or reforms are implemented.

2.8 Summary

This section has outlined the approaches that have been taken for various elements of the Capacity Review. A more detailed assessment, including a clear articulation of all data sources and assumptions used, policies reviewed and stakeholders involved, can be found in the Appendices of this report.

3 INTERNATIONAL BENCHMARKING OF HEALTH SERVICES

To provide some additional input and context into how the performance of the Irish healthcare system relates to that of international peers, a number of key benchmarks have been identified to enable comparisons to be drawn between Ireland and other developed western economies of a comparable size.

It is however important to note that due to the variable and complex nature in which healthcare is configured and measured, variations between countries on individual metrics can often be accounted for. It is also the case that some of the measurements reported for Ireland within this section do not correlate with the data collected during this Review, highlighting the validity of the point made in Section 2.7 with regard to data. The comparisons shown in this section should therefore be considered with this in mind and should not be considered definitive.

3.1 International Benchmarking Exercise

The benchmarking exercise uses published OECD and Eurostat data as the sources for internationally comparable data. In total six countries were selected as the primary comparators for the benchmarking exercise on the basis of their similarities to Ireland, although in some instances other countries are also included due to the availability of data. In some cases, data was not available for the six countries selected and the countries are therefore absent from the relevant graphs. The six countries included are as follows:

Table 5: International Benchmarking Countries

Comparator Countries	
Australia	Norway
Denmark	New Zealand
Finland	Sweden

While Australia is a larger country, it was chosen as a comparator country as it has a similar mix to Ireland regarding public and private healthcare provision and it is frequently held as an international exemplar. As a result, significant learnings can be gleaned from Australia's experience.

Denmark, Finland and Sweden were selected as they are within the cohort of smaller EU states within the same band of GDP per capita.

Norway and New Zealand were also picked for comparison given their similar levels of economic development and similar population levels. New Zealand is also a country that has recently undertaken significant healthcare reform, with a shift in focus towards non-acute provision as a preference. As a result, it is hoped that some useful insight could be gained from their inclusion. While it is useful to compare Ireland's performance against Norway across the indicators, it must be noted that Norway is an outlier in terms of health spend per capita; the OECD's Health at a Glance 2015[2] report notes that "in 2013 Norway spent more public money on health than any other OECD country".

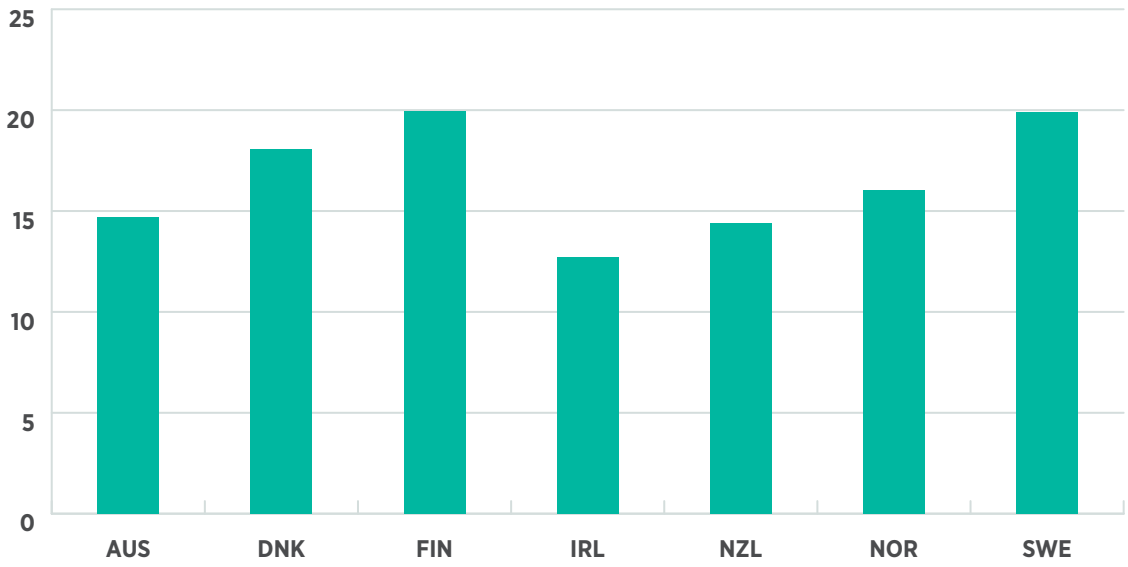
Benchmarks were selected, across a range of indicators where internationally comparable data is available. This section highlights Ireland's performance on the international stage relative to peer countries for a number of KPIs. Benchmarks are broken into the following categories:

1. Resourcing.
2. Activity.
3. Health indicators and drivers.

Before examining health sector specific indicators, it is important to draw out some demographic observations, which will give context to the international benchmarking exercise.

[2] More recent data was published by the OECD since this analysis was undertaken – see OECD Health Statistics 2017

Figure 1: Elderly Population (aged 65 and over) as a % of Total Population



Source: OECD Health Statistics 2016
Note: Where 2014 data is not available 2013 data was utilised

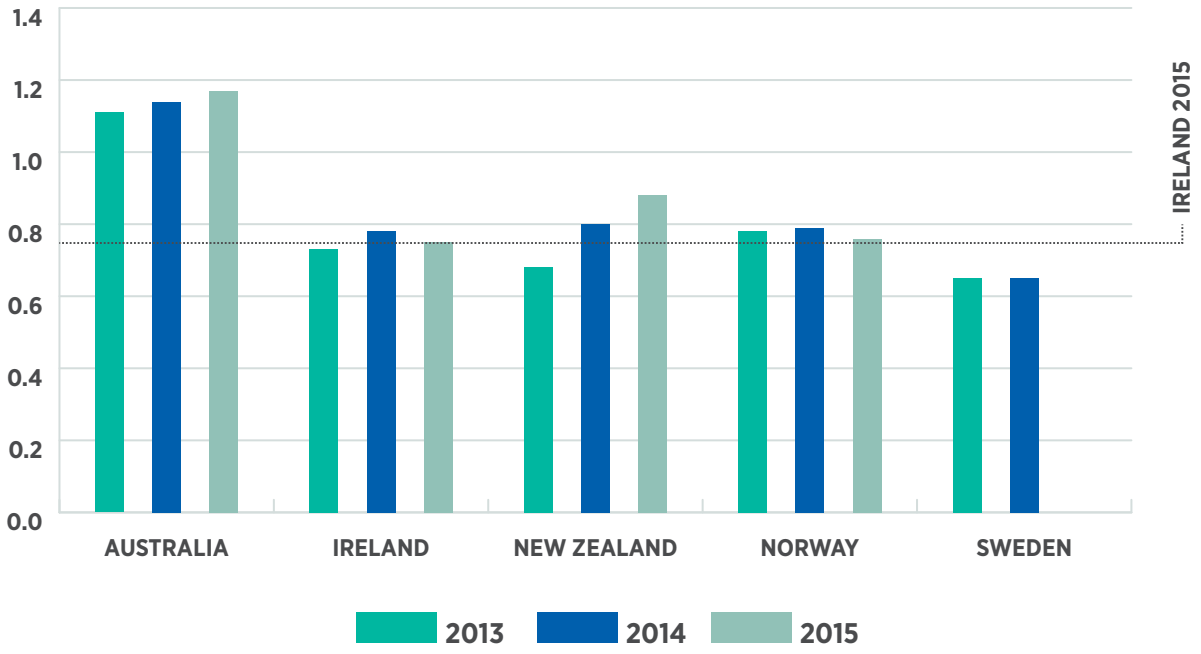
Link: https://data.oecd.org/pop/elderly-population.htm#indicator-chart

As can be observed from the chart above, in 2014 Ireland had the lowest proportion of population aged 65 years and above out of all comparator countries. While Ireland may have the most rapidly ageing population, as it stands the demographics are relatively favourable when compared to international peers. It is reasonable to hypothesise that (1) the current level of resource per head of population can be expected to be lower than other countries as a result of our younger population, and (2) the impact of future demographic ageing on demand and capacity requirements will be more keenly felt in Ireland than in those other nations.

3.1.1 Resourcing

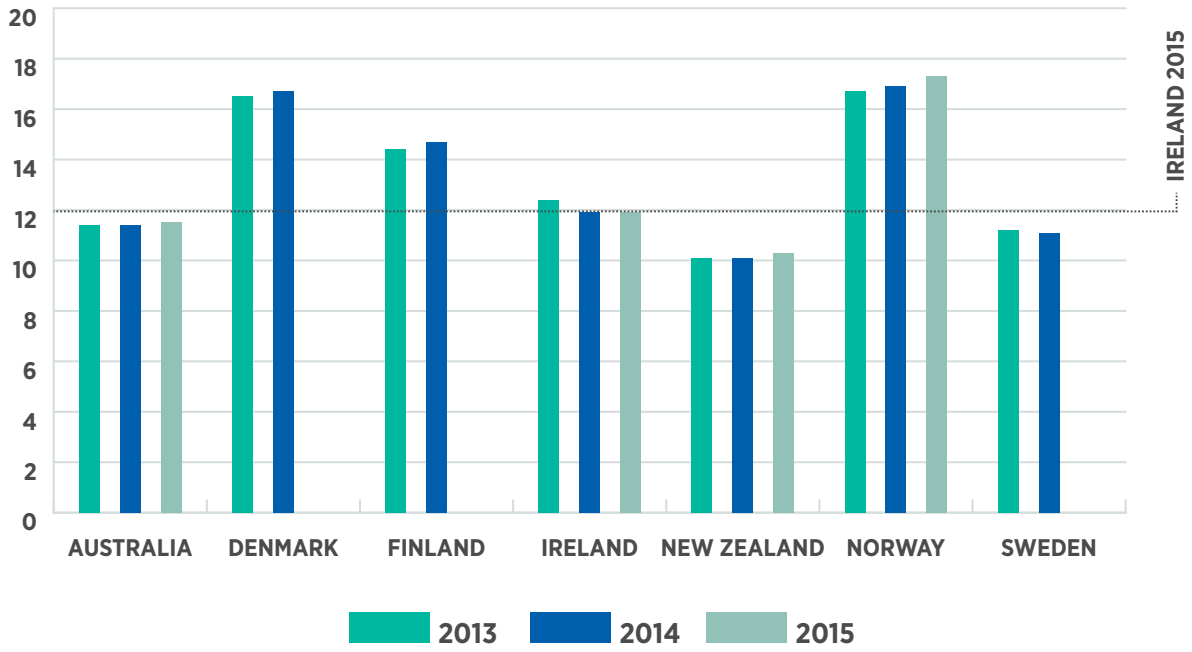
This section looks at some key metrics across the acute and primary care sectors and services for older persons settings in each country that is being examined. Originally it was anticipated that spend would form part of this resourcing analysis, but upon initial assessment of figures it quickly became apparent that countries use very different assumptions of what forms of healthcare expenditure are to be included in these figures, making direct comparison impossible.

Figure 2: GPs per 1,000 Inhabitants (head counts)



Within the primary care setting the first point of contact is often with GPs. When Ireland is compared to international peers for GP numbers, it is in line with the level of resource in the other countries examined. While European countries have shown a stabilising trend with GP numbers per head of population, both Australia and New Zealand have increased the amount of GPs as a proportion of the population over the three year period, significantly so in New Zealand. It is reasonable to hypothesise that this is as a result of or indeed an enabler for their recent shift to increased primary care. This, coupled with a rapidly ageing population in Ireland, suggests that should Ireland wish to follow the enhanced primary care model, then a significant increase in GP resources shall be required.

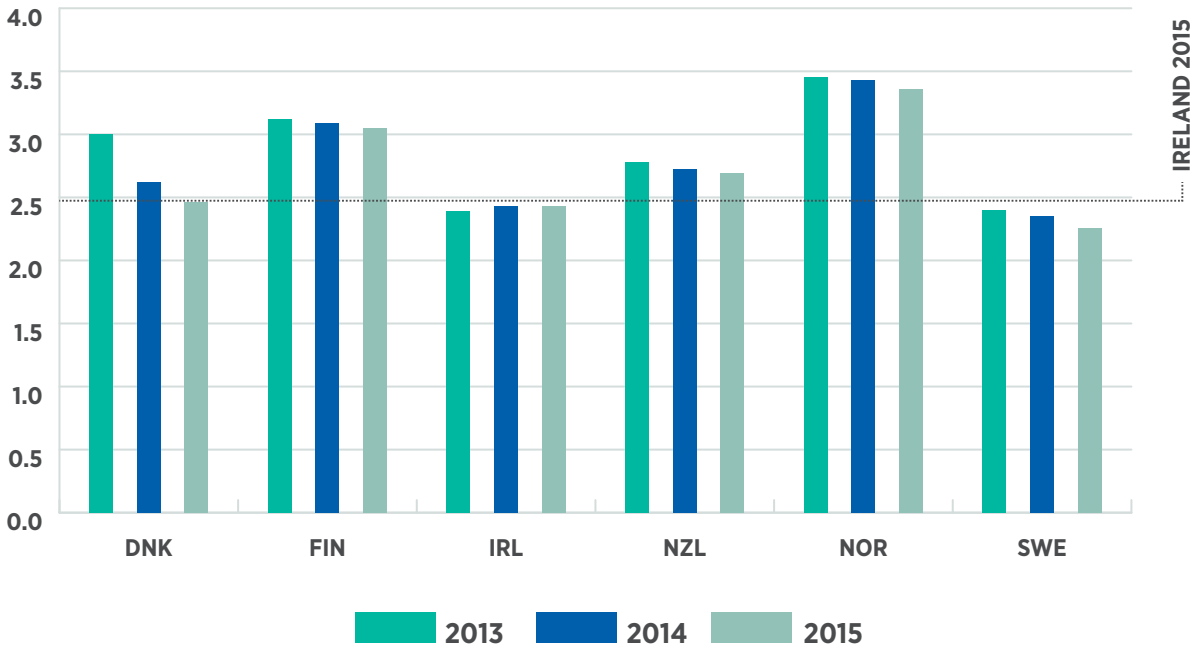
Figure 3: Nurses per 1,000 of Population



Ireland is the median performer as it lags behind Denmark, Finland and Norway in numbers of practicing nurses per head of population. Within the benchmarking cohort countries the range between the highest and lowest numbers of nurses per inhabitant is significant. It must be noted that Ireland's figure for this indicator may be inflated as it refers to professionally active nurses which may also include qualified nurses who are involved in other posts (e.g. teaching, administration, training). Nurses are a key resource across the acute and primary care sectors and services for older persons settings.

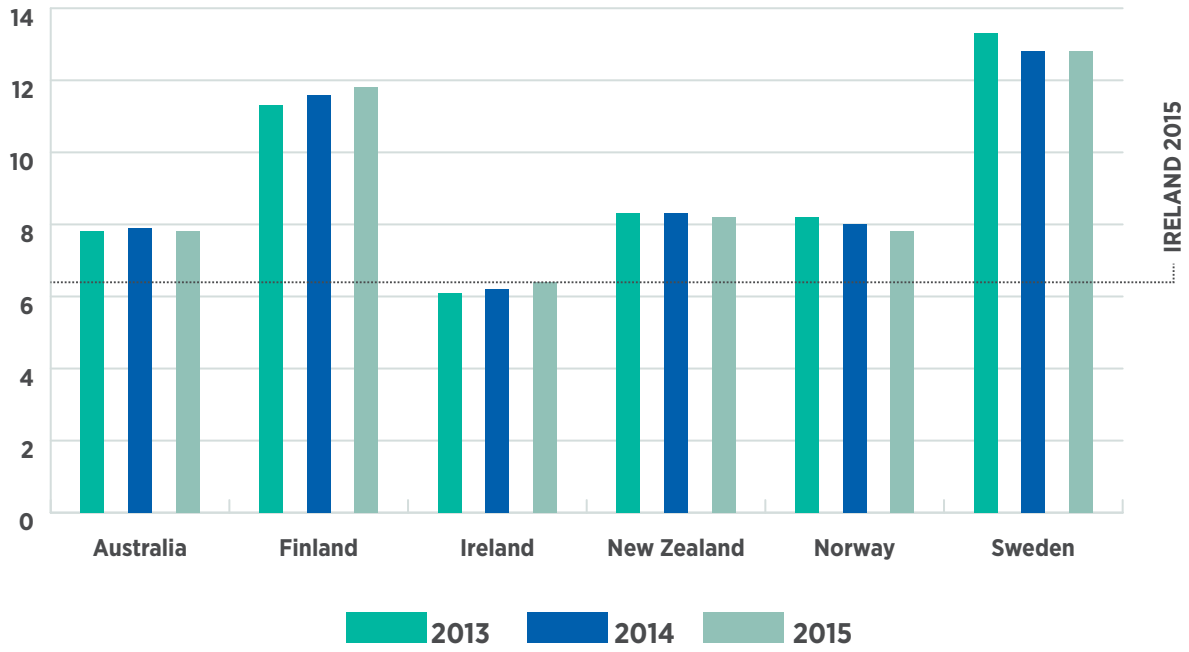
Ireland displays a ratio of nurses per 1,000 inhabitants that is above the EU average (837 in 2013), however these figures don't take account of which setting these nurses work in. Without understanding the breakdown of nurses over each setting it is not possible to identify where Ireland's nursing levels fall short of international benchmarks. However, any shift of care from acute hospitals to a primary care setting will require a significant investment in additional nursing resources for primary care.

Figure 4: Hospital Beds per 1,000 Inhabitants



While the number of hospital beds is only one element of hospital capacity, it is informative to see how the countries rank against each other. This graph shows that Ireland operates on the lower end of the scale relative to international peers in terms of beds within the acute hospital setting. Interestingly, Ireland is the only country examined where the number of beds per inhabitant takes on a marginally positive trajectory over the three year period – in the other five countries examined, bed numbers per head of population reduced. This trend means that while in 2013 Ireland has the lowest number of acute beds per head of population, by 2015 it is ahead of Sweden and has a similar performance to Denmark. It must be noted though that data for Ireland excludes beds in private hospitals and therefore the number, as shown above, is under reported when compared to the other countries with less extensive private provision. The EU average number of acute hospital beds per 1,000 inhabitants was 3.96 in 2014, indeed Ireland had the fourth lowest rate within the twenty eight EU countries meaning acute bed levels were significantly behind what was observed elsewhere in Europe. Acute bed ratios also do not account for occupancy rates which are significantly higher in Ireland. In summary, **comparing Ireland to the EU average would suggest that Ireland still lags behind the other countries on this measure.**

Figure 5: Nursing and Residential Care Beds per 1,000 over 65 Population

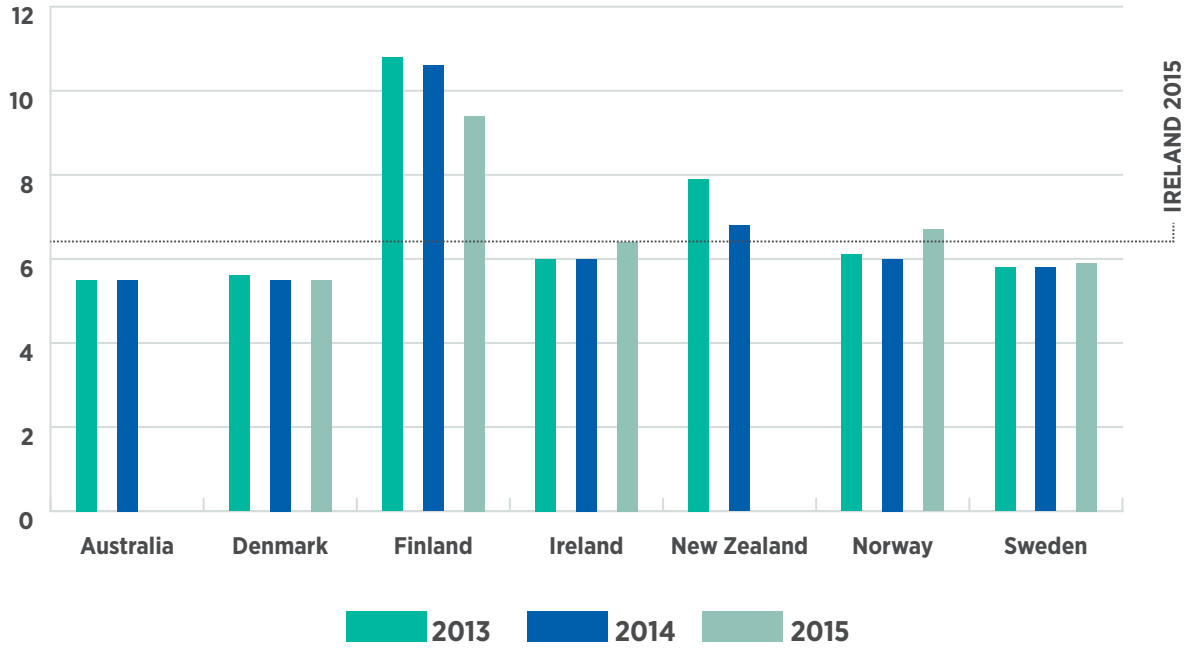


The availability of nursing and residential care beds is a key component of an integrated care model. Throughout the 2013-15 period Ireland reported a significantly lower number of beds in nursing and residential care facilities than the other countries considered, indeed, less than half the number in Sweden. It is possible to justify this, to an extent, by Ireland's lower proportion of elderly people relative to the comparator countries. However, **regardless of current favourable demographic factors, Ireland lags behind the comparator countries with regard to nursing and residential care bed provision on a per inhabitant basis.**

3.1.2 Activity

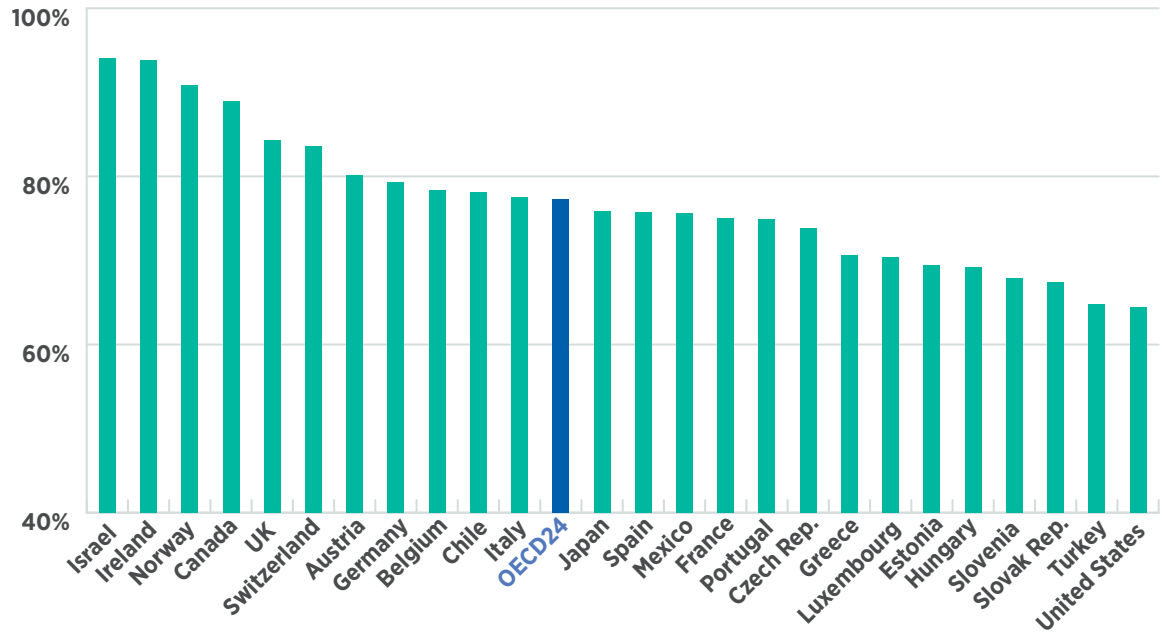
This section shows the relative activity within the acute and primary care sectors, and services for older persons settings within the benchmark countries.

Figure 6: Average LOS Rates for Inpatient Acute Care



While average LOS varies by location and by condition, it remains a useful indicator of the performance of the health system as a whole. In this regard Ireland compares relatively favourably to international peers and is the median performer over the 2013 to 2015 period. In 2014, Ireland had an average LOS figure that was similar to Norway and Sweden and only marginally higher than Australia and Denmark. Irish average LOS for inpatients increased in 2015 by almost half of a day, in a pattern that mirrored that of Norway, while other countries stayed static or saw a small reduction in average LOS. In summary, whilst **this would suggest that there remains some scope for improvement in average LOS in Ireland, the margin may not be that significant.**

Figure 7: Occupancy Rate of Curative (acute) Care Beds in 2013 (or nearest year)



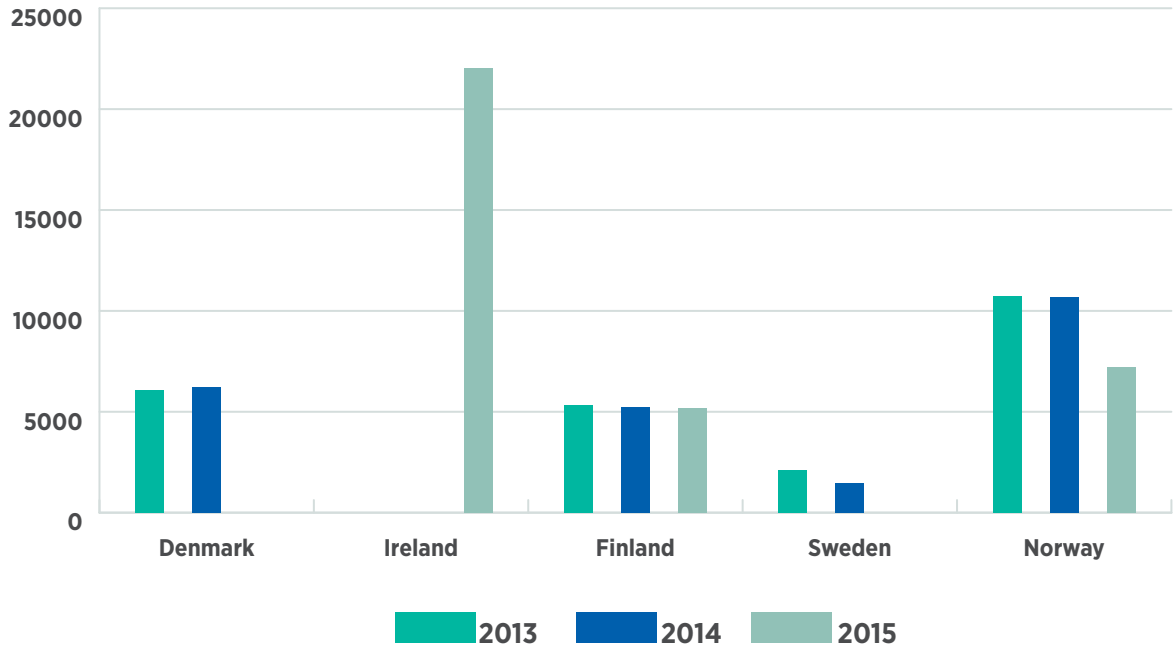
Source: OECD Health Statistics 2015

Source : http://dx.doi.org/10.1787/health_glance-2015-graph77-en

Curative (acute) bed occupancy[3] rates can be informative to ascertain the volume of work being conducted within the acute setting. As data was not available for the majority of selected comparator countries, it was necessary to show Ireland's performance in a wider context, namely that of the available OECD countries. It is clear that Ireland has among the highest acute bed occupancy rates (94%) in the developed world, significantly ahead of the OECD average of 77.3%. This is a key indicator of system pressure as acute beds become a buffer. Given that the occupancy rate (of 94%) is a figure averaged out over the entire health system it is clear that many departments within the acute setting must be working at full capacity, if not over full capacity. **This would suggest that the current number of beds in the Irish acute hospital system is not sufficient to meet demand.**

[3] The percentage of beds available that are occupied at any time.

Figure 8: Day Case Hospital Discharges per 100,000 Inhabitants



A comparison of day case discharges rates among European countries was also undertaken (data was unavailable for Australia and New Zealand). As the 2015 figures show, Ireland appears to be a significant outlier in terms of day case activity. Indeed, the EU average for day case discharges was 7,031 per 100,000 inhabitants in 2013; far lower than levels seen in Ireland. Clearly **this data raises questions as to its validity, and this is examined in more detail subsequently in the report. While there has been a significant shift from inpatient to day case, the high level may also reflect that there may be issues with some cases being coded as day cases in Ireland that in other counties would be coded as outpatient appointments or undertaken in the primary care setting.**

Figure 9: Congenitive Heart Failure Hospital Admission in Adults in 2013 (or nearest years)

Source: OECD Health Statistics 2015

Link: http://dx.doi.org/10.1787/health-data-en

When examining congestive heart failure hospital admission rates in 2013 Ireland performs well relative to international peers. Admission rates for this condition were considerably lower in Ireland than the OECD average (244 per 100,000 inhabitants). Reducing these rates further, where possible and appropriate, with more structured chronic disease management, anticipatory care and self-management support in primary care and greater provision of cardiac rehabilitation services would clearly assist in reducing pressure on the acute care sector by reducing hospital admissions. **It could be hypothesised that for congestive heart disease, the model of care is performing well in Ireland.** However, it must be cautioned that hospital admissions rates on their own are not a robust measure of model of care performance.

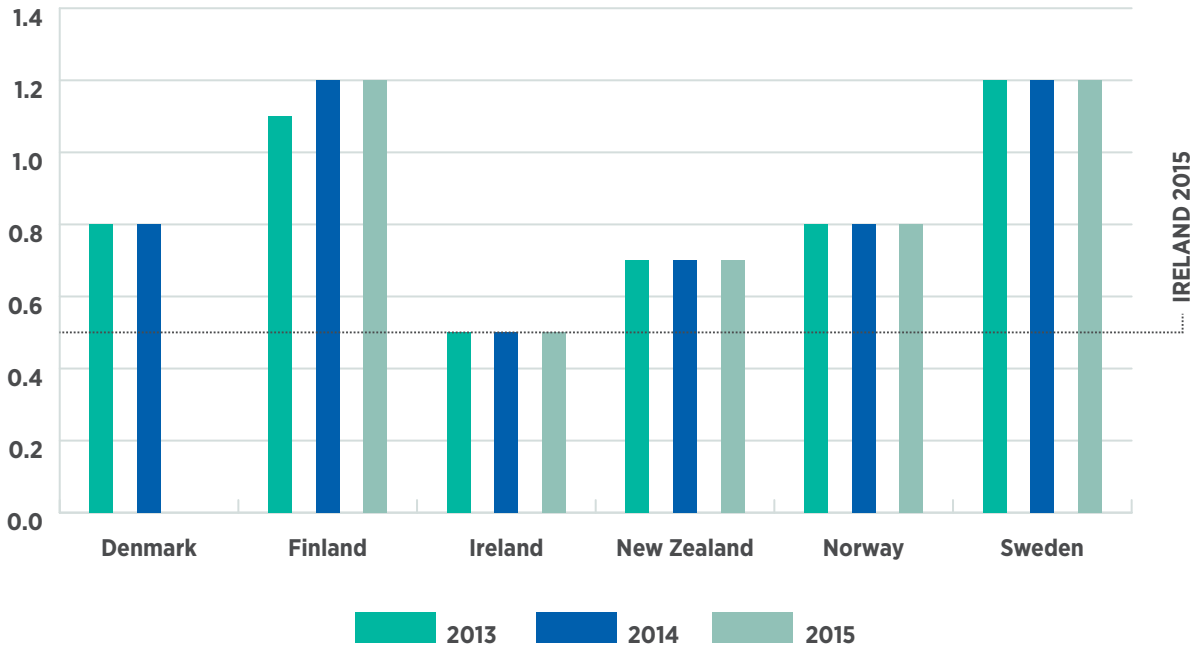
Figure 10: COPD Hospital Admission in Adults, 2013 (or nearest year)

Source: OECD Health Statistics 2015

Link: http://dx.doi.org/10.1787/health-data-en

Unfortunately the same cannot be said for other chronic diseases, such as COPD. The graph above highlights that Ireland had the highest rate of COPD hospital admissions in 2013 of the countries examined. In 2013 Ireland's rate of 395 per 100,000 inhabitants was double the OECD average of 198 per 100,000. Hospitalisation is required for patients when symptoms are severe but otherwise can they can be treated effectively within the primary care setting. This graph indicates that **Ireland may have the potential to reduce avoidable hospital admissions for a proportion of patients with COPD. This would require more structured chronic disease management, anticipatory care and self-management support at the primary care level and greater provision of pulmonary rehabilitation services.**

Figure 11: Long-term Care Recipients as a % of Population



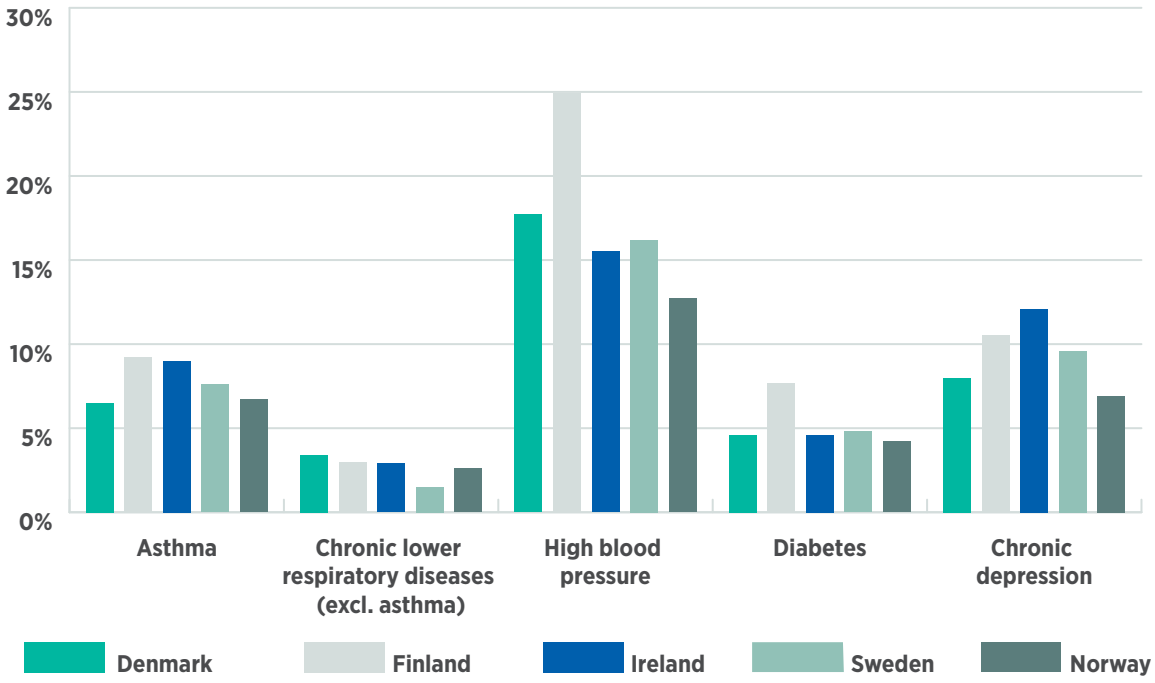
While increased demand for long-term care is largely driven by an ageing population, the elderly are not the only age cohort seeking long- term care. The graph alongside indicates the number of long-term care recipients who receive care in residential care facilities as a percentage of the overall population. As can be observed, **Ireland has a considerably lower proportion of the population** utilising long-term care facilities. It may be possible to explain part of this trend at a national level due to the lower proportion of elderly people within Ireland relative to other comparator countries. While this may be so, Ireland's proportion of long-term care recipients is less than half the proportion observed in Finland and Sweden. It must also be noted that this data does not include nursing home residents who privately fund their own care.

3.1.3 Health Indicators and Drivers

Having examined Ireland's performance with respect to health inputs, this section reviews the relative health status of the population. The demand for, and pattern of consumption of, healthcare is driven by several factors, including the age structure of the population and the prevalence of chronic conditions. The development of chronic diseases can be offset, somewhat, by adoption of healthier lifestyles.

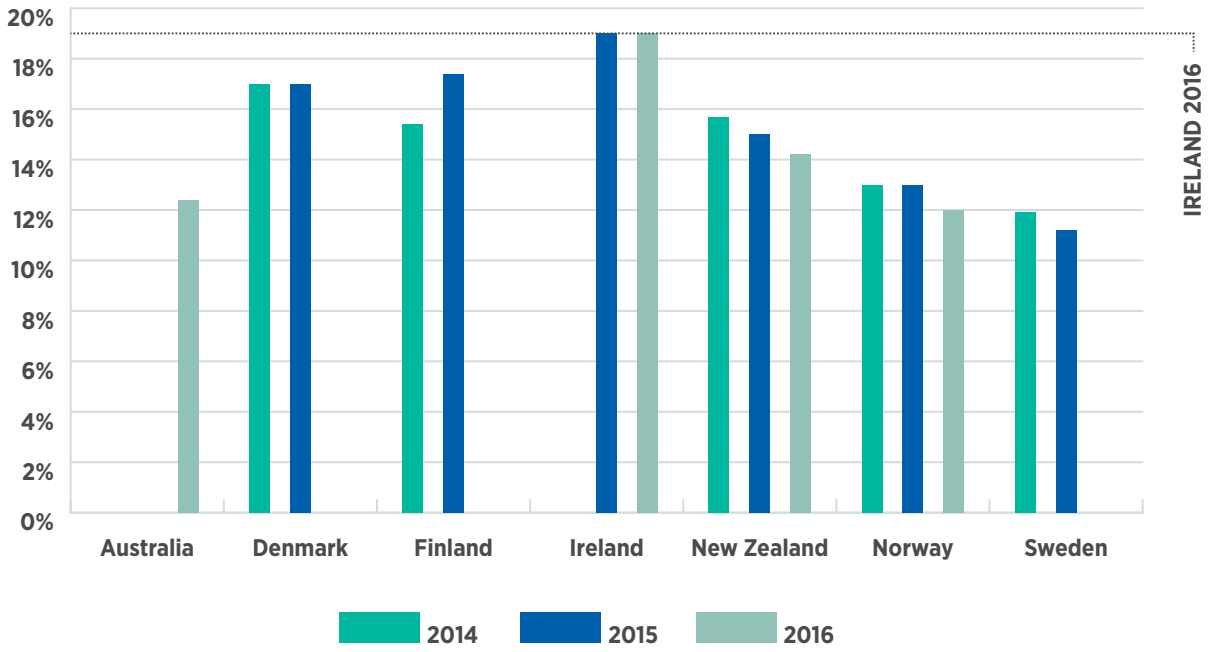
This section examines the prevalence of chronic disease and lifestyle determinants of health among the international comparator countries.

Figure 12: Persons Reporting a Chronic Disease as % of Population, 2014



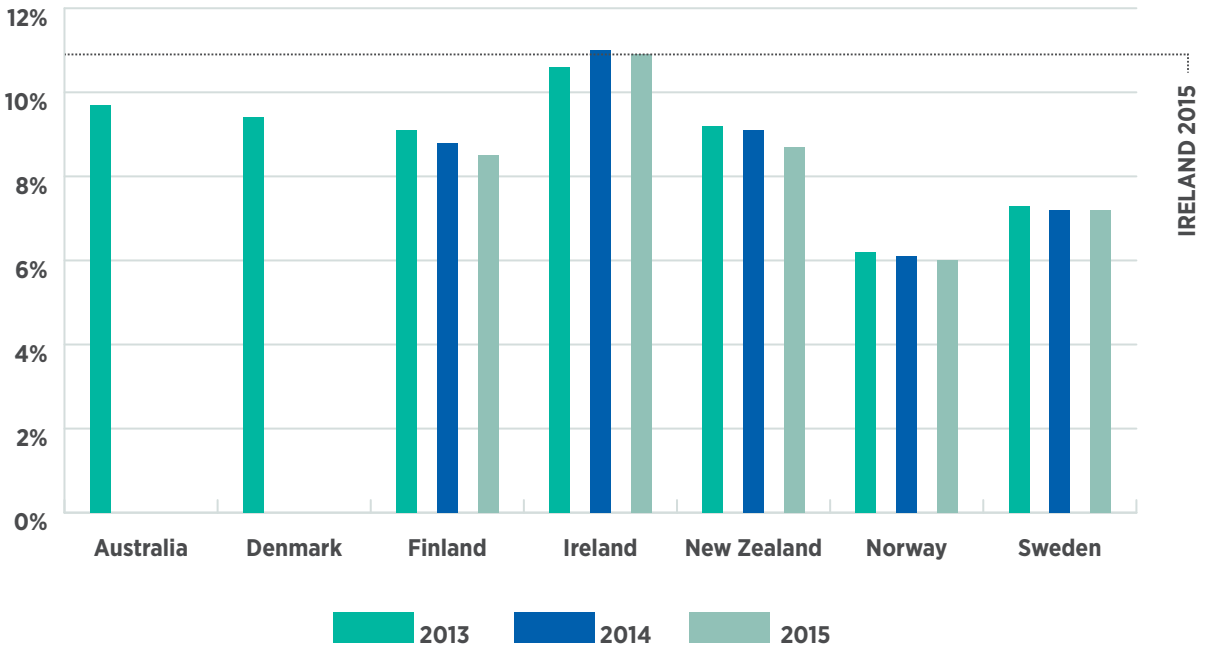
High chronic disease prevalence in a population will lead to increased demands being placed on a health system. The graph above illustrates the prevalence of self-reported chronic disease in each of the comparator countries. Ireland reports among the highest levels of asthma per capita relative to international peers. Chronic respiratory diseases (excluding asthma) are in line with most comparator countries but well behind Sweden. While a significant proportion of the population report high blood pressure levels, Ireland performs on the lower end of the scale of benchmark countries for this chronic condition. Diabetes levels appear to be in line with most comparator countries but are well behind that in Finland. **Given Ireland's relatively favourable demographics, as shown in Figure 1, lower levels of persons reporting chronic disease as a percentage of population is to be expected, but conversely as the population ages it is reasonable to assume significant growth.** For this graph it must be noted that only 'reported' rates are accounted for, it is thought that in many cases the actual prevalence of chronic diseases may be higher but people may be unaware of the fact.

Figure 13: Daily Smokers as % of Population (aged 15+)



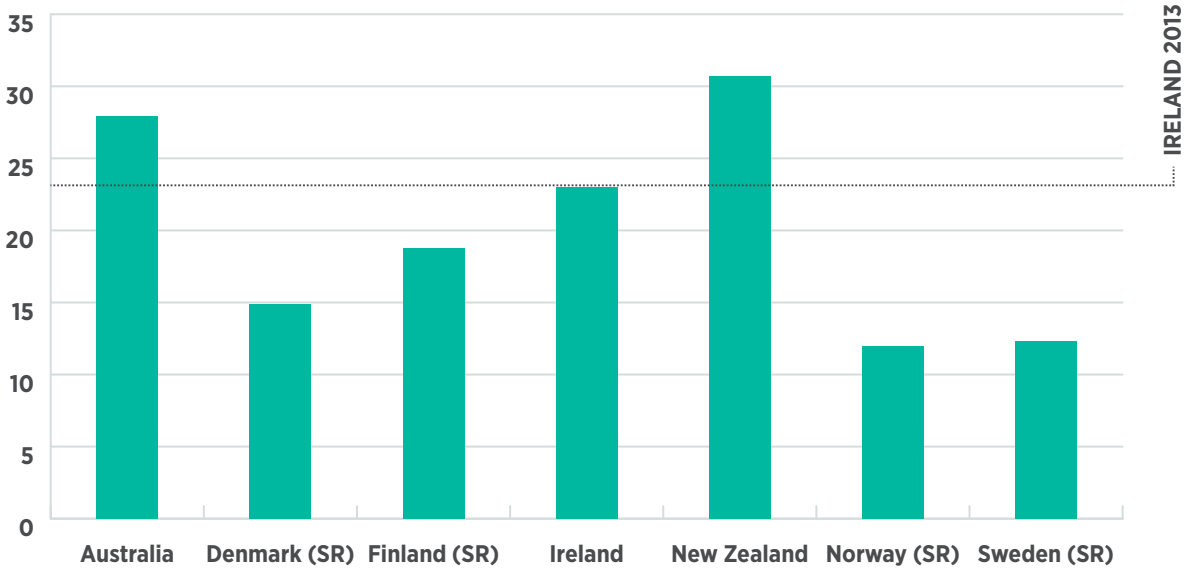
Smoking tobacco is considered a risky health behaviour and is a significant driver of poor health and chronic disease prevalence. It is associated with nearly 6 million deaths annually across the world. Smoking is a major risk factor for a series of diseases, particularly certain forms of cancer (including lung, mouth and of the larynx), cardiovascular diseases (e.g. heart attack, stroke) and respiratory diseases (such as COPD). As can be noted from the graph alongside, **Ireland has the highest rates of daily smokers in the countries examined at 19% of the population. Successive governments have pursued anti-smoking policies and whilst the prevalence has fallen, smoking rates remain at OECD average levels.**

Figure 14: Alcohol Consumption (litres per capita, aged 15+)



As can be observed from the graph, **Ireland has the highest rate of alcohol consumption among the countries studied** at 10.9 litres per capita. This rate is notably higher than in Norway, at 6 litres per capita, and Sweden, at 7.2 litres. While high levels are evident in Ireland, alcohol consumption has declined over the past 15 years. However, this decline has not been consistent throughout those years, with changing levels of affordability related to excise duty and economic factors, having a direct and immediate impact on population consumption patterns. It is reasonable to assume that promoting healthy lifestyle choices and lowering Ireland's alcohol consumption rates would lead to a reduced risk of alcohol dependency, liver disease, some forms of cancer, cardiovascular disease, diabetes, obesity, accidents and injuries, mental health difficulties, foetal alcohol disorders and other conditions, thereby reducing demand for health services.

Figure 15: Obese Population as a % of Total Population



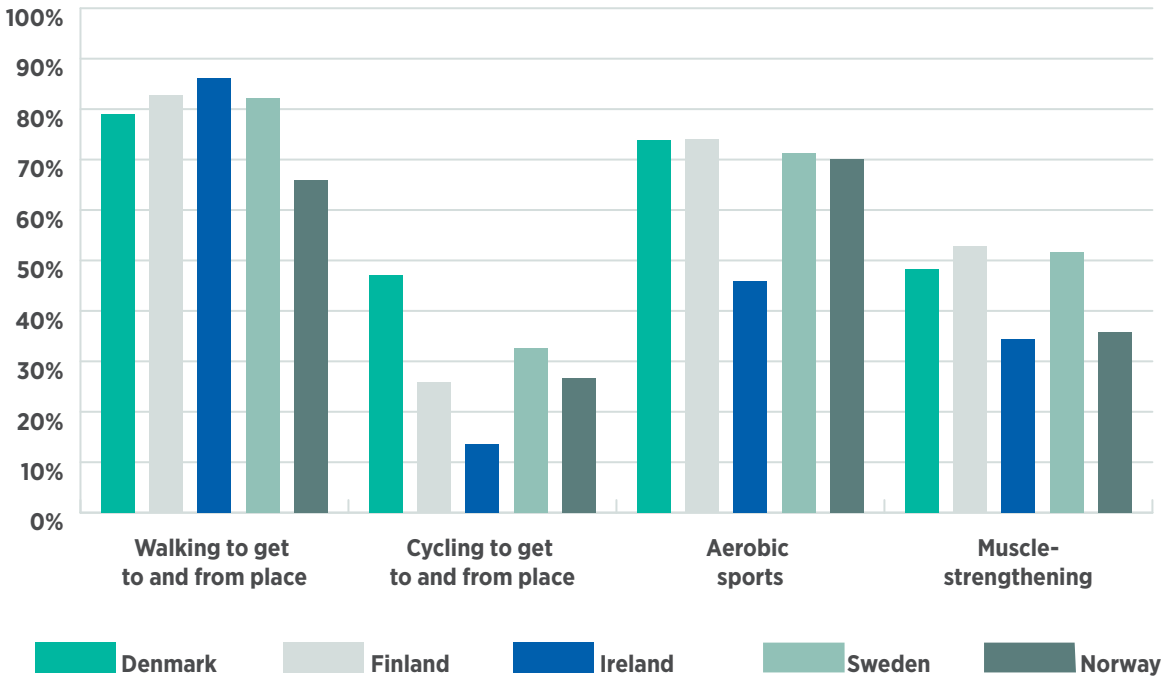
Source: OECD Health Statistics 2017 Link: http://stats.oecd.org/Index.aspx?DataSetCode=HEALTH_LVNG

Note (SR) Indicates the level of obesity that are self-reported as opposed to measured rates.

While both rates of smoking and alcohol consumption have fallen over the past 15 years, obesity rates have risen considerably. Obesity is a known risk factor for chronic illnesses (such as diabetes, cardiovascular diseases, high cholesterol and hypertension) and for particular forms of cancer. It also increases the risk of respiratory diseases (e.g. asthma) and arthritis. As shown in the graph alongside, Ireland's obesity rates are behind those of Australia and New Zealand but well ahead of the OECD average (19.5%).

Beyond the comparator countries, Ireland does report lower obesity levels than in the UK (26.9%) and marginally less than those reported in Germany (23.6%), but higher rates than in France (16.9%) and Belgium (18.6%). Data based on self-reported body weight tend to provide lower prevalence estimates compared with data based on physical body measurements. The Irish data here are based on physical measurements.

Figure 16: Percentage of Population Performing Physical Activities



Insufficient physical activity is one of the major risk factors for chronic disease and mortality. Regular physical activity can be seen as a positive lifestyle factor and promotes healthier outcomes for the population. It contributes to the reduction of risk for diabetes, heart disease, stroke, hypertension and several forms of cancer. As can be observed from the graph above, **Ireland fairs relatively poorly in relation to its European peers over three of the four activity types.** Cycling levels are a fraction of that of the comparator countries, half the rate of Finland and Norway, and a third of the rate observed in Denmark. In terms of both aerobic sports and muscle-strengthening, Ireland is behind most of the countries examined. Given the positive outcomes that result from increased activity levels it would be advisable for Ireland to focus on increasing physical activity levels at a national level.

3.2 Summary

This section has identified a number of key benchmarks that serve as a guide to understanding Ireland's current performance against that of other countries. Many of these findings shall be revisited in the context of both the baseline and scenario assessments, when confirming and/or explaining the findings, conclusions and recommendations.

Summary of Resourcing Benchmarks

Despite a relatively high investment in healthcare in comparison to other countries, Ireland performs poorly across most resource types on a per capita basis and has an average or below average level of resource across the majority of metrics considered.

In particular, the level of capital resources, i.e. beds in acute hospitals and residential care are significantly lower than other countries considered. What is also apparent, is that in those countries that have recently undertaken system reconfiguration exercises, it has been supported by a significant investment / change in their resource profiles. Ireland performs particularly poorly on services for older persons care metrics so it is reasonable to assume that increases in demand will require significant investment.

Summary of Activity Benchmarks

Ireland performs reasonably well in relation to ALOS for inpatient activity, but there may still be scope for further improvements.

In terms of chronic disease management, Ireland appears to have a mixed performance and COPD hospital admission rates are particularly high when compared to the benchmark countries. Reducing these, and other chronic diseases, hospital admission rates to international best in class rates through the **treating of patients within the primary / community care setting could alleviate significant pressure on the acute demand.**

With regard to services for older persons care, activity levels are low, mirroring the position with residential beds.

Summary of Health Indicators and Drivers

Currently Ireland exhibits relatively low levels of chronic diseases prevalence in comparison to the comparator countries, possibly as a result of a relatively younger population. However on many of the indices that increase the likelihood of future chronic disease (smoking, alcohol consumption, obesity, physical inactivity) Ireland performs poorly, and it is reasonable to assume that this, coupled with an ageing population, could translate into **a significant increase in chronic disease in the future, which in turn would present an associated rise in demand pressures across the healthcare system.**

4 BASELINE SCENARIO: DEMAND AND CAPACITY PROJECTIONS

This section sets out baseline projections for demand and capacity on the basis of a continuation of the system as it currently operates, i.e. a continuation of the status quo. It assumes that as demand increases the current patterns of activity continue, and it assesses the capacity needed given the same levels of resource availability and utilisation. It assumes that there will be no changes in the way care is delivered and no improvements in productivity.
This section:

- Gives an overview of demographic and non-demographic changes.
- Sets out the current and forecast demand in each of the three sectors to 2031.
- Sets out the current and forecast capacity requirements, based on this demand in each of the three sectors to 2031.

It should be emphasised again that the demand forecast is based upon met demand (activity) and unmet demand (using waiting lists as a proxy).

The reader is referred to Appendix E of this report for a detailed breakdown of the methodology and assumptions used to generate this analysis.

As with any future assessment of need, it is important to caveat these figures in terms of absolute numbers and accuracy. Instead it is the quantum of the demand and capacity requirements that should form the basis for analysis and interpretation.

4.1 Demographic Changes

Overall, population growth in Ireland is currently forecast to be on average 0.75% per year over the period to 2031. The following graphs present an overview of the current demographic composition of Ireland and charts the growth of individual cohorts through to 2031.

Figure 17: Forecast population of Ireland and relative growth to 2031 by age band (relative to 100% in 2016)

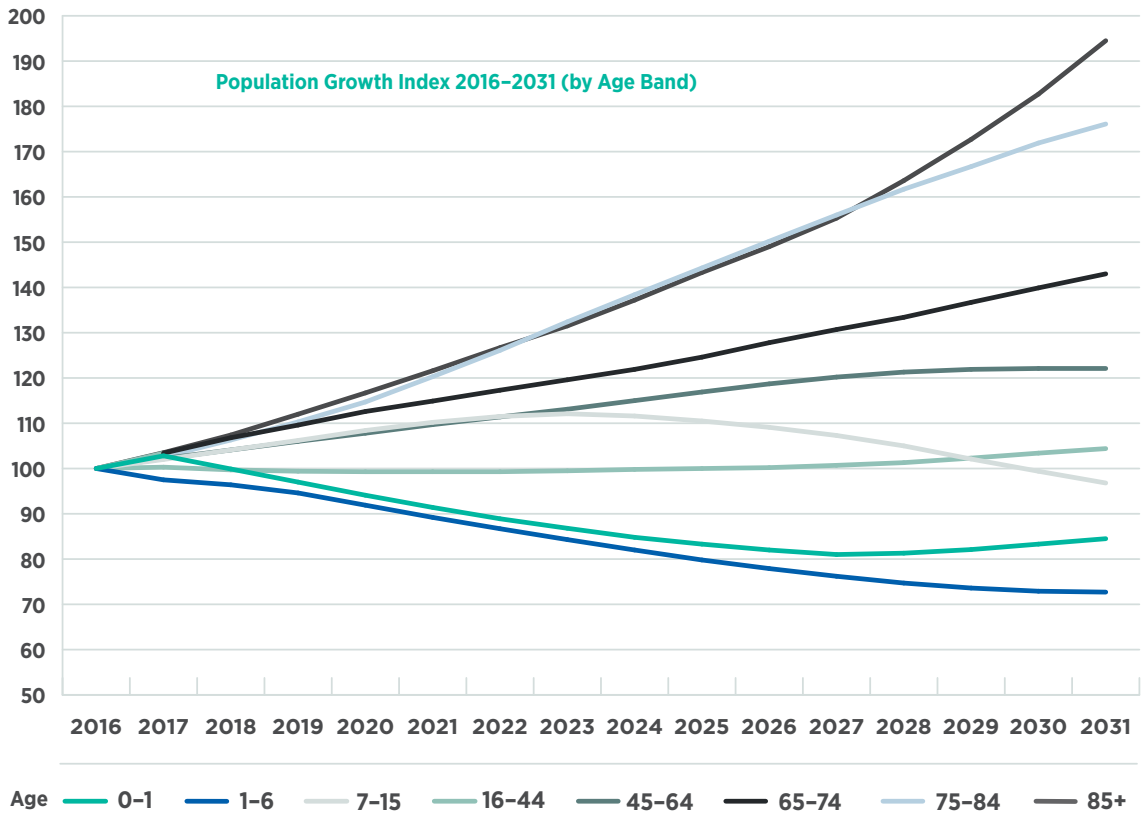


Table 6: Current and forecasted age structure of the Irish population

Age Band	Current and Forecast Population Count of Ireland (1,000s)					
	2016	2021	2026	2031	Change 2031 +/- (1000s)	% Change 2031
0-1	62	57	51	53	-9	-14.5%
1-6	414	369	322	301	-113	-27.3%
7-15	590	650	644	571	-19	-3.2%
16-44	1,915	1,901	1,919	1,999	84	4.4%
45-64	1,128	1,237	1,339	1,377	249	22.1%
65-74	368	423	470	526	158	42.9%
75-84	195	234	292	343	148	75.9%
85+	67	82	100	131	64	95.5%
Total	4,740	4,954	5,139	5,301	561	11.8%

Over and above the growth forecast in the overall population which in and of itself will increase the demand on health services, the changes forecast for the over 65 age cohort are of particular significance. The graphs and table above show that a large increase is forecast, both in absolute numbers and as a proportion of the overall population, for the over 65 age cohort.

Each of the three over 65s age cohorts, 65-74, 75-84, and 85+ years, show strong increases in absolute numbers by 2031. Using 2016 as the base year, these three age cohorts display dramatic population growth over the 15 year period, none more so than the 85+ age cohort, which is expected to almost double in the next 15 years. The 75-84 age cohort is not far behind in growth projections as the cohort is expected to rise by approximately 75% by 2031. While the growth rates may be lower for the 65-74 age cohort, this age band has a higher base in 2016 meaning that, in absolute numbers, this age cohort will be a significant segment of the population by 2031.

These age groups are more intensive users of health and social care services, as is detailed in the table below. For example, in 2016 even though they represented only 13% of the population, 39% of people who had a day case procedure were over the age of 65. Within older person services, those aged 85 and over represented 40-50% of those receiving care. This means that the increases in these age cohorts will greatly compound the impacts on demand and not just have additive impacts. These demographic trends are anticipated to put significant additional strain on acute and primary care sectors, and services for older persons services in Ireland over the next 15 years and this is reflected in the baseline forecast of demand detailed below.

Table 7: Age Profile of Service Users in 2016

AGE GROUPS	ED	AMU	DAY	IP EL	IP NEL	ACC	OPFA	OPFU	GP-GP	GP-PN
0-15	22%	0%	4%	11%	14%	0%	15%	11%	10%	12%
16-64	59%	55%	57%	49%	55%	45%	65%	60%	65%	56%
65+	19%	45%	39%	39%	31%	55%	21%	28%	25%	31%
AGE GROUPS	**AHP-PHY**	**AHP-OT**	**AHP-S&LT**	**PHN**	**CIT**	**RC-LT**	**RC-ST**	**HC**	**IHC**	**HH**
0-15	13%	28%	80%	9%	0%	0%	0%	0%	0%	0%
16-64	46%	23%	12%	21%	0%	5%	5%	15%	15%	15%
65+	41%	50%	8%	69%	0%	96%	96%	86%	84%	86%

4.2 Non-Demographic Changes

In addition to demographic growth changes, there are also multiple additional drivers of demand. These can be collectively referred to as non-demographic growth. Figure 18 presents a summary of these key factors. Clearly their impact can either be positive or negative on future demand and capacity requirements depending upon how they are assumed to develop in the future.

For the purposes of the Capacity Review, trends in demand over the recent period have been used as a means of estimating non-demographic impacts. Further detail on the methodology and values used is outlined in Appendix E.

Figure 18: Summary of Non-Demographic Demand Drivers

Non-demographic demand drivers include:
- Epidemiological trends (e.g. prevalence of chronic diseases).
- Lifestyle risk factors impacting health status (e.g. smoking, alcohol, physical inactivity).
- Changes to models of healthcare delivery (e.g. ambulatory emergency care reducing admissions from ED, shift to day case surgery).
- Technological developments (e.g. new drugs or operative technologies).
- Changes in the socio-economic structure of the population (education level, income, employment) and increased expectations.
- Proportion of the population with private health insurance
- Supply-induced demand e.g. additional funding allocated to service provision.

4.3 Profile of Current and Forecast Demand by Sector Type

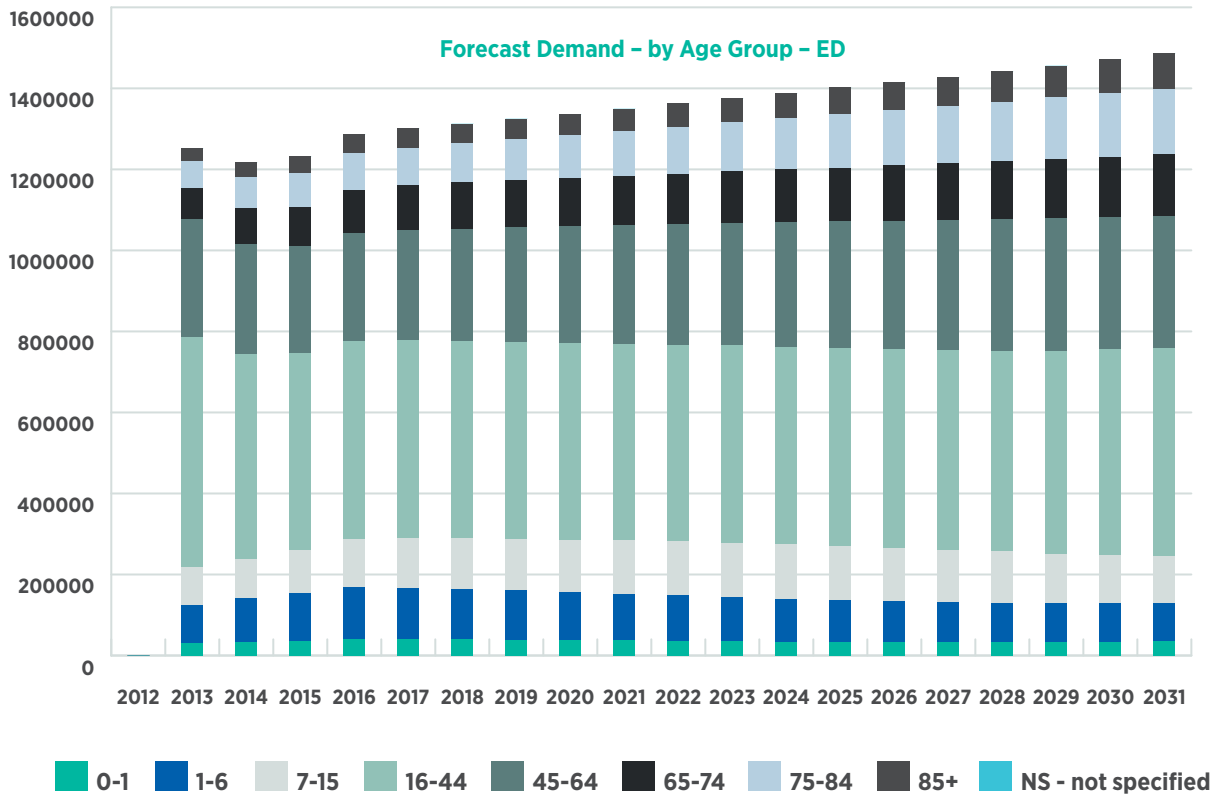
This section sets out the baseline results from the model regarding the current and forecast demand to 2031. The results are presented separately for the acute and primary care sectors, and services for older persons.

4.3.1 Profile of Current and Forecast Demand within the Acute Sector

In summarising acute demand through to 2031, it is reasonable to expect a significant increase in demand across almost all PODs. Notable increases can be observed for adult critical care, and for day case procedures, although as noted below the impact of switching current activity from day case to an outpatient setting must be considered. Finally, outpatient activity, AMU, inpatient non-elective and, to a lesser extent, ED also show large increases in demand through to 2031. As an exception, increases in demand for inpatient elective is more modest, due to an anticipated switch of this activity to day cases, although it is projected to increase in initial years to address waiting list backlogs.

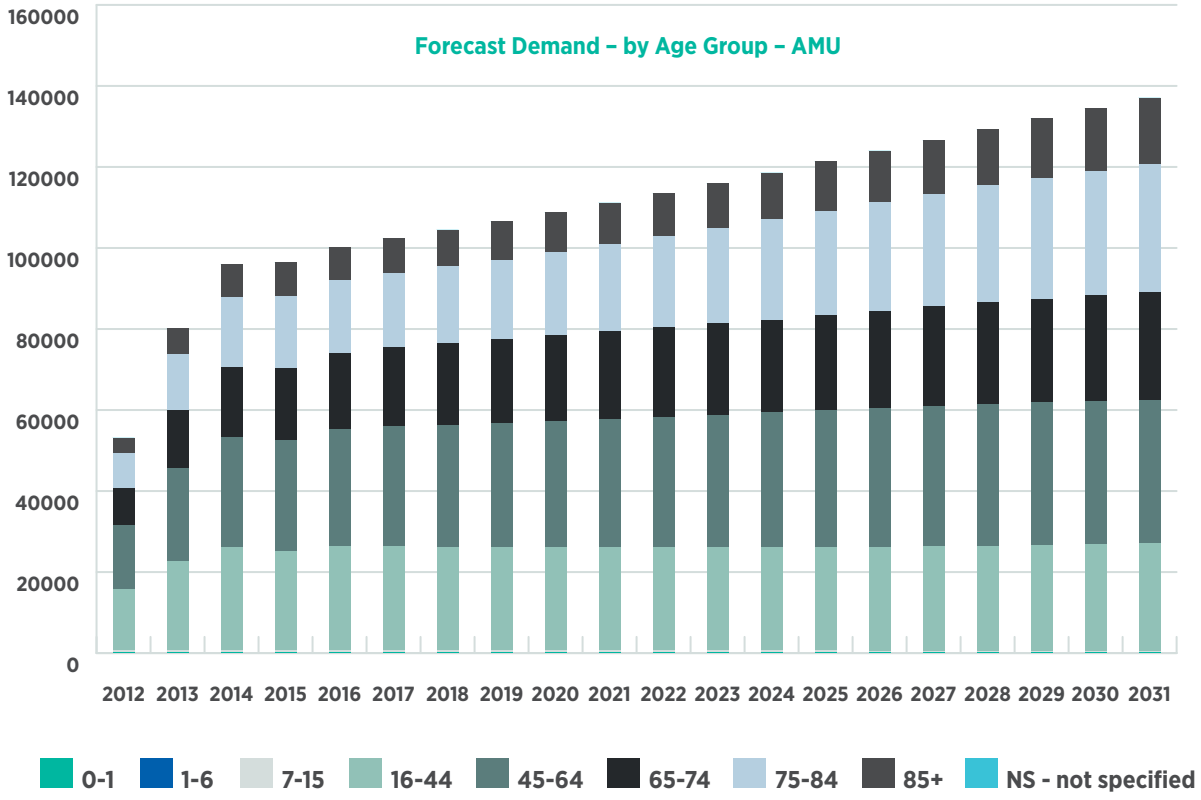
The graphs below illustrate the current and forecast level of demand within the public acute sector at POD level to 2031, based on the current baseline of service provision. From these, the following observations can be made:

Figure 19: Current and Forecast Demand in Acute Care by ED attendances



ED attendances: Reported ED attendances (2013 to 2016) display a small fluctuation in demand up to 2016 and currently sit at approximately 1.3 million attendances. Using current activity as a basis, and overlaying demographic and non-demographic trends, it is anticipated that demand is likely to increase gradually to 2031 resulting in an annual attendance of approximately 1.5 million by 2031. Forecasts by age bands indicate that this rise in demand is predominantly driven by the increase in elderly people attending the emergency departments for medical conditions, with particular focus on the 75-84 years old cohort. It is possible that some of this demand could be otherwise met in the community if appropriate services were developed. *(Data Source: HSE ED Attendance data & PET. Minor injury clinic and AMU activity is not captured in ED attendances.)*

Figure 20: Current and Forecast Demand in Acute Care by AMU



AMU: AMU activity increased sharply from 2012 to 2014 as a result of the phased roll-out of AMU facilities. Thereafter, the rate of growth has tapered off with a current baseline of approximately 100,000 attendances, although the extent to which this is constrained by limited capacity should be considered. Using current activity levels as a basis however, AMU activity is likely to experience a substantial increase in demand to approximately 37% above current levels by 2031, reaching approximately 140,000 attendances. Similarly to ED demand forecasts, the graph above indicates that this significant increase over the next 15 years can be attributed to the over 65s cohort and more specifically, the 75-84 years old grouping. It is possible that some of this demand could be otherwise met in the community if appropriate services were developed. *(Data Source: HIPE – includes AMUs, AMAUs, MAUs (and where relevant, SAUs)).*

Figure 21 (A): Current and Forecast Demand in Acute Care by Day Case procedures

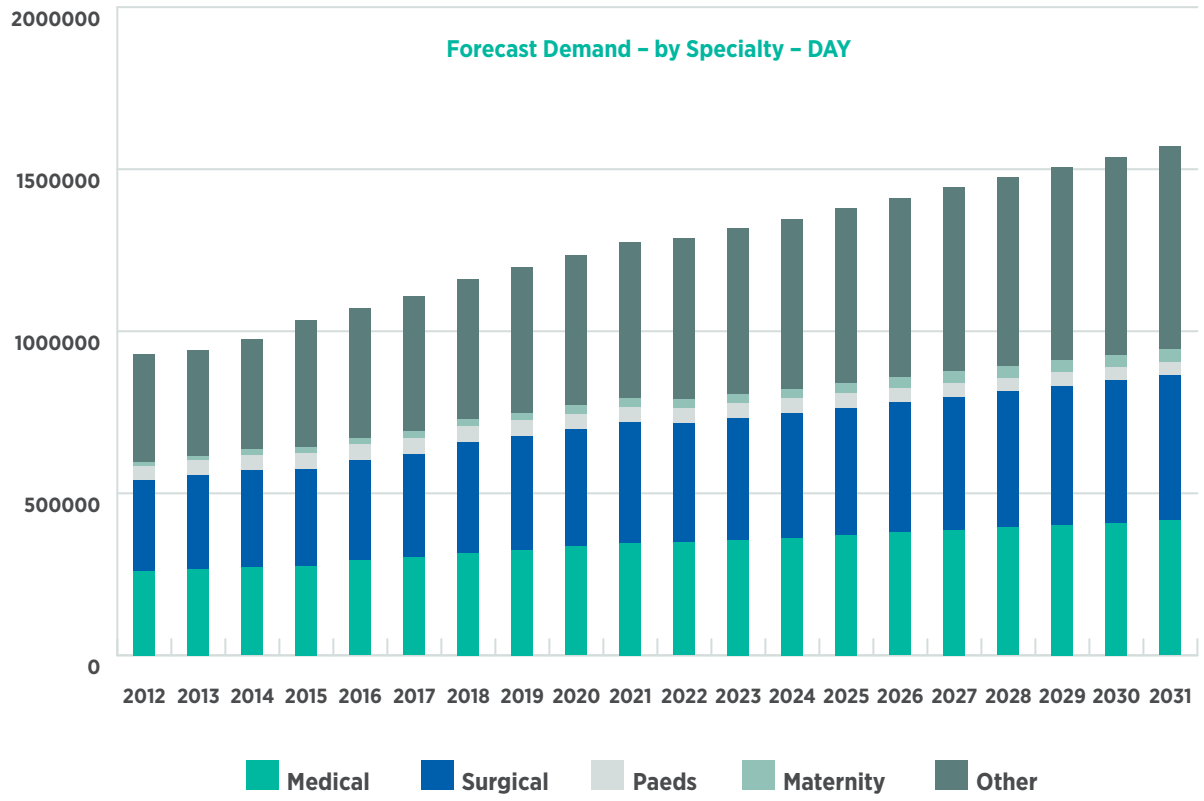
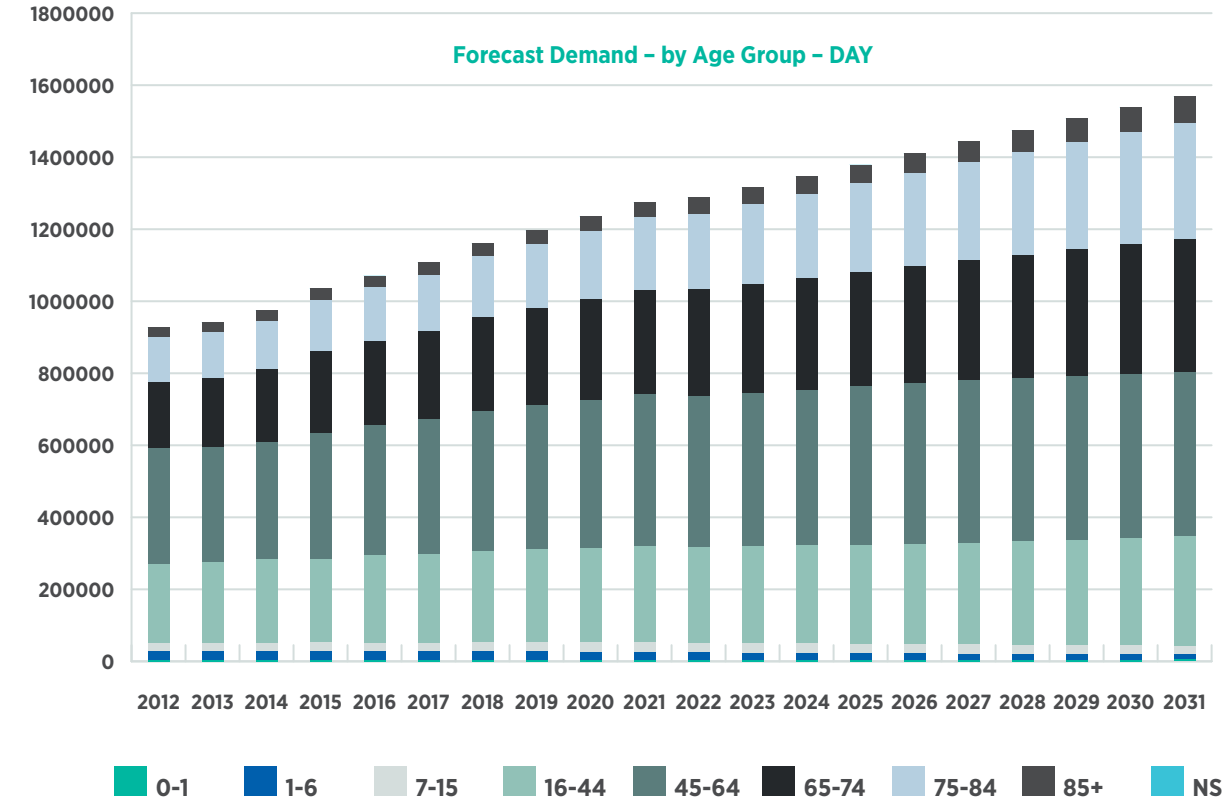


Figure 21 (B): Current and Forecast Demand in Acute Care by Day Case procedures



Day Case procedures: Demand for day case procedures (including unmet demand) has reported a steady year-on-year increase between 2012 and 2016 and it is anticipated to account for approximately 1.1 million attendances in 2017. Projecting current trends forward, demand for day case procedures could increase steadily to 2031, rising by approximately 47% on the baseline figures. By 2031 this would translate to almost1.6 million day case procedures. However, as can be seen above a significant cause of this growth in demand is attributed to the 'Other' specialty category that includes dialysis, chemotherapy and radiotherapy. As referenced in Section 3, this has a major role to play in the benchmarked performance of Ireland in terms of day case procedures as in many other countries this activity is recorded as outpatient activity. In terms of this baseline assessment however, it is assumed to continue as day case, but in scenario 3 the impact of removing this to an outpatient setting is assessed. (Data Source: HIPE, NTPF)

The higher level of increase for the years 2018 – 2021 is as a result of modelling a wind-down in the waiting list backlog.

Figure 22 (A): Current and Forecast Demand in Acute Care by IP EL

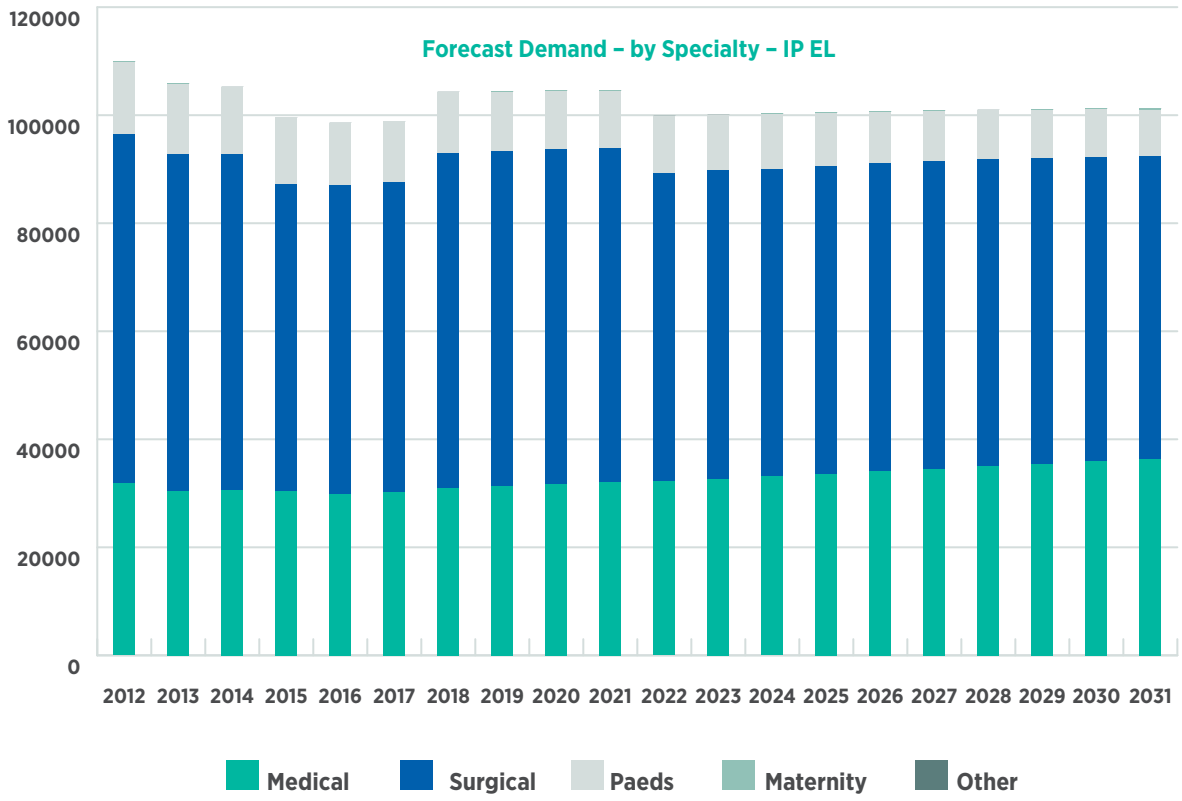
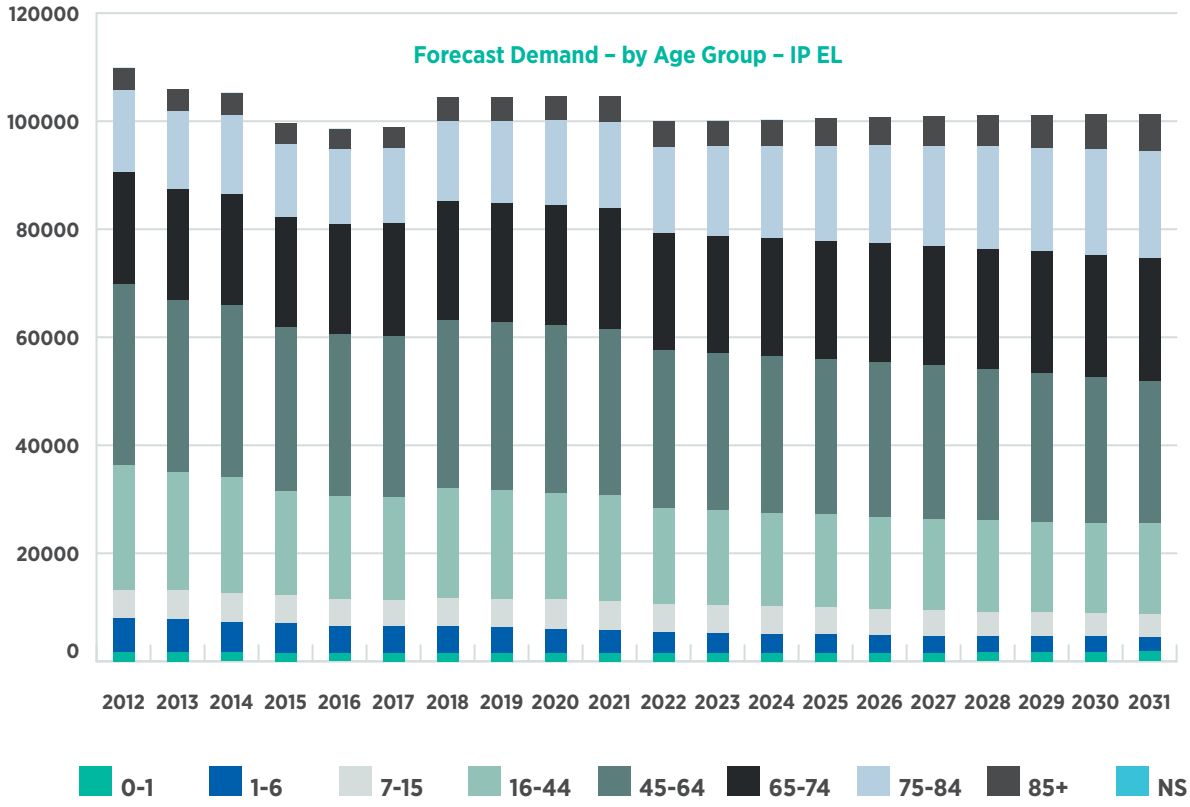


Figure 22 (B): Current and Forecast Demand in Acute Care by IP EL



Inpatient Elective: 2012 to 2016 demonstrated small fluctuations in demand for inpatient elective activity with an overall decline, albeit marginal, over the period. Demand figures presented take account of unmet demand (waiting lists). The current baseline demand stands at approximately 99,000. The sustained shift from inpatient to day case activity is likely to account for this pattern of demand.

As outlined in Table 45 in Appendix E, it is projected that demand for inpatient elective services will increase slightly over the projection period. While demographic changes will increase pressure on demand, this will be offset by a continuation of the trend from inpatient to day case services, albeit with a tapering of the trend. An immediate uplift in demand is projected for the period to 2021 to reflect the need to reduce current waiting list backlog. Projecting forward, demand for inpatient elective appointments is thus expected to increase marginally through to 2031, resulting in demand for approximately 101,000 attendances in this year. *(Data Source: HIPE, NTPF)*

Figure 23 (A): Current and Forecast Demand in Acute Care by IP NEL

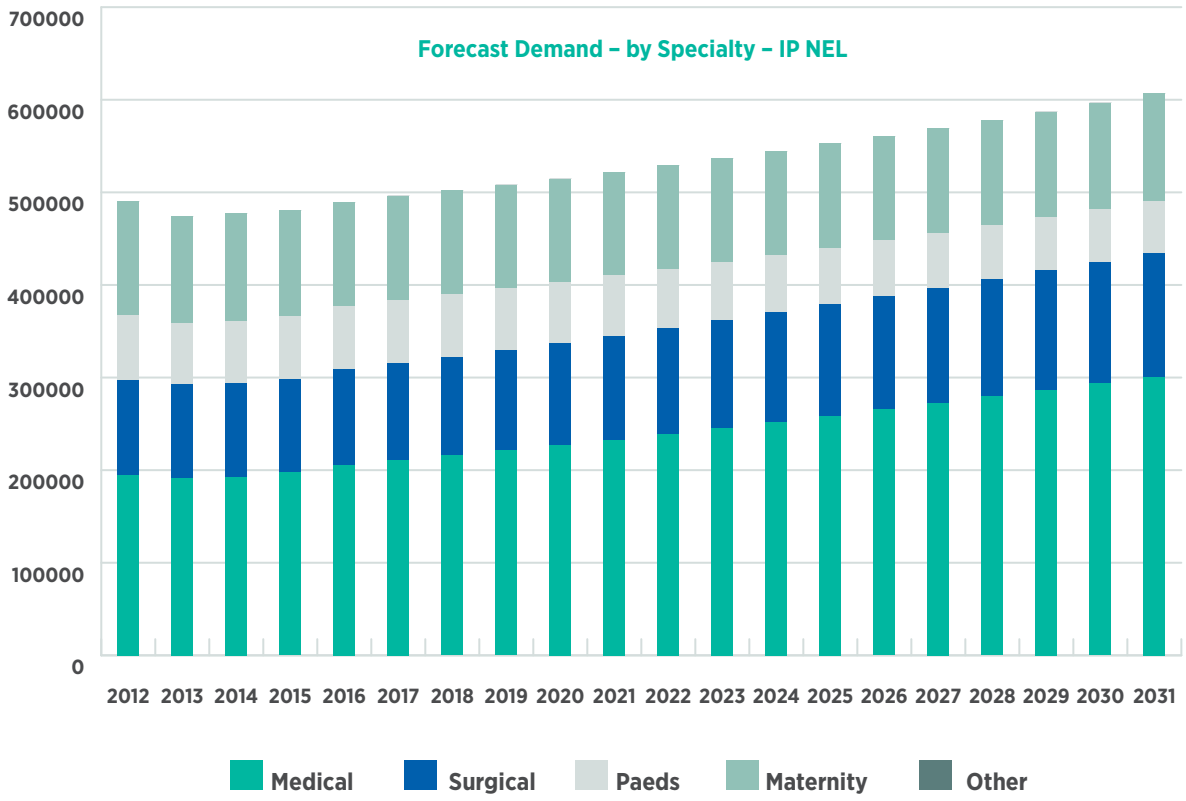
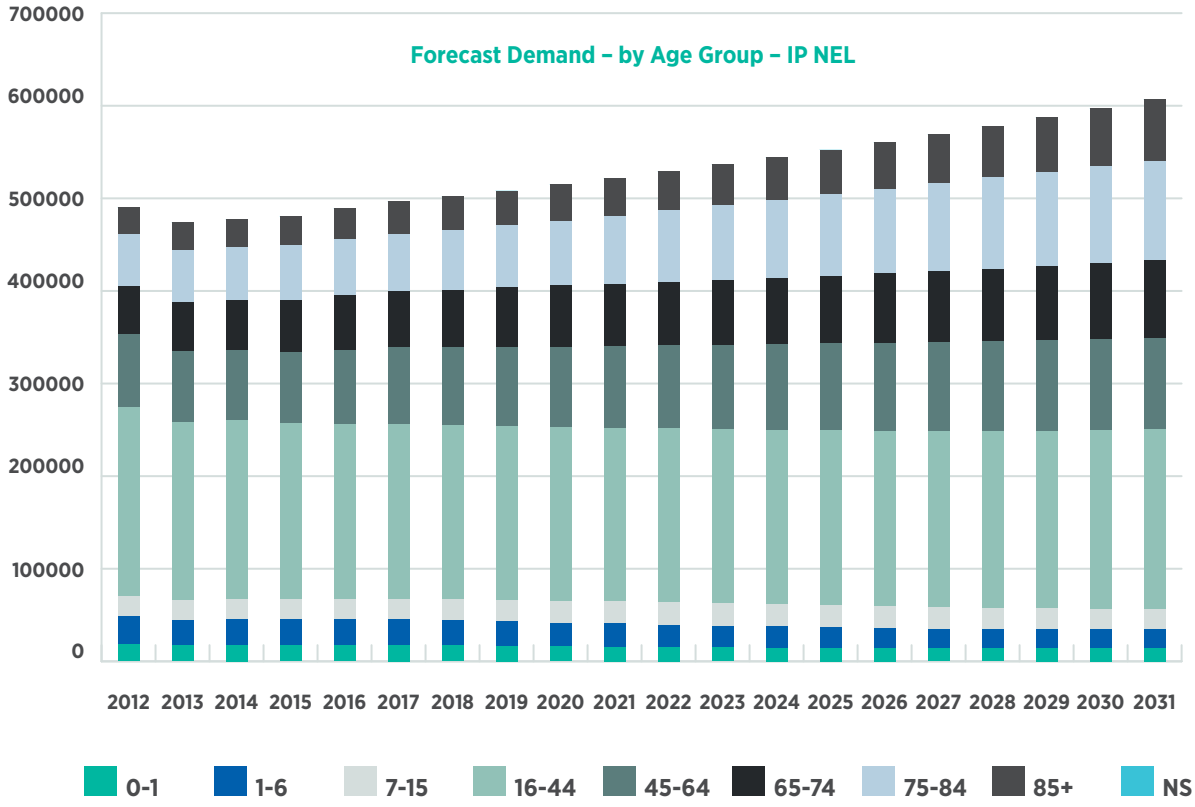


Figure 23 (B): Current and Forecast Demand in Acute Care by IP NEL



Inpatient Non-Elective: From 2012 to 2016 increases in demand recorded across inpatient non-elective, as shown above, is relatively modest with a current baseline of approximately 490,000 attendances. Projecting current trends forward, demand is expected to increase steadily to 2031 reaching approximately 610,000 attendances per annum. While there may be a slight decrease in the number of non-elective inpatients aged 16-44 years during this time period, there is a noticeable upward shift in the number of inpatients over 45 years, with elderly people in the 75-84 years age bracket, in particular, driving this expected upward trend. As seen with day case projections, inpatient non-elective demand is expected to be mostly a result of an increase in medical specialty cases which highlights the greater need for better ambulatory and anticipatory care management in the community. *(Data Source: HIPE)*

Figure 24 (A): Current and Forecast Demand in Acute Care by ACC

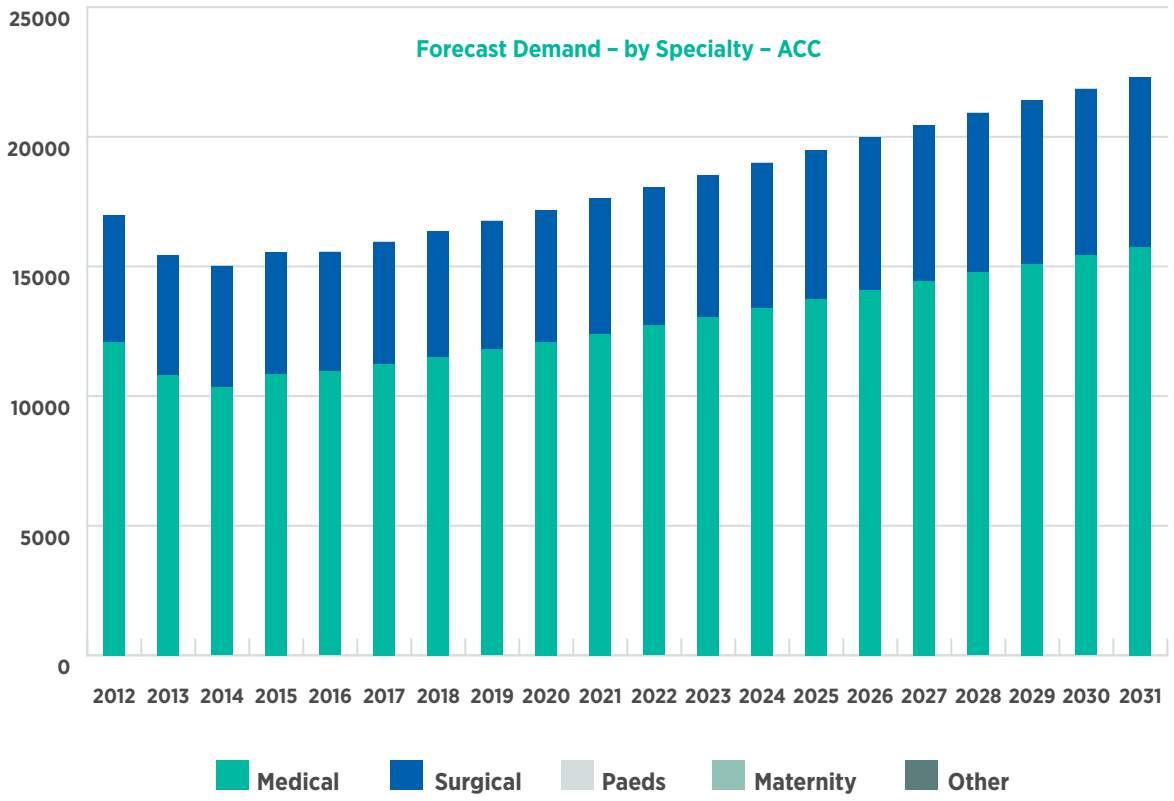
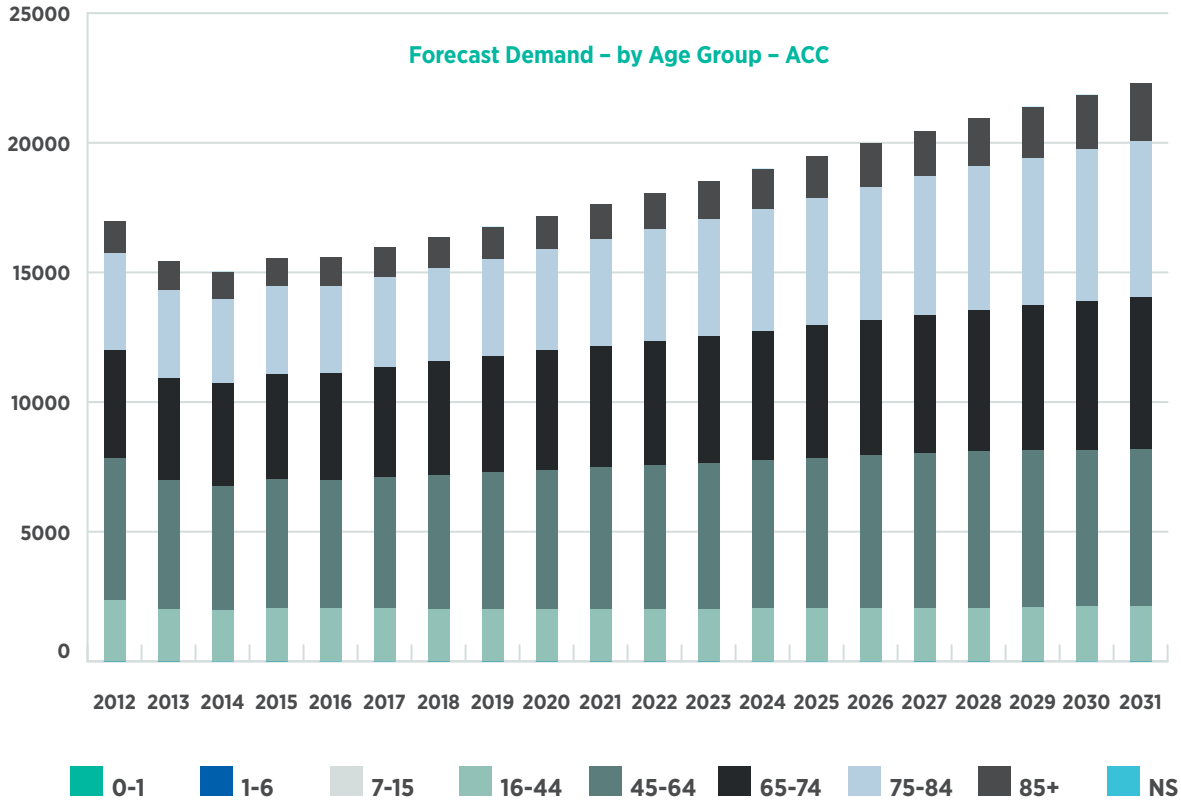


Figure 24 (B): Current and Forecast Demand in Acute Care by ACC



Adult Critical Care: Adult critical care (including patients in ICU/HDU bed types noted* below) activity levels have remained static in recent years with a current baseline of approximately 15,600 attendances. However, it is likely that this flat demand has been due to significant capacity constraints in critical care facilities across the hospital system. Growth has been projected on the basis of demographic growth only, which is high given the age profile of the service. ACC activity is forecast to have the largest rate of increase (43%) in demand from current levels, from an admittedly low base, to approximately 22,300 in 2031. *(Data Source: National Adult Critical Care Capacity and Activity Census 2016 – HSE Acute Hospitals Division Critical Care Programme; National Adult ICU Activity Estimate 2016 – National Office of Clinical Audit (NOCA). HIPE data was not used.)*

* The definition of ACC beds is Level 2 (HDU) or Level 3 (ICU) or Level 3+ (ICU). These are critical care beds where the patient requires a more extensive level of care and more intensive observation, treatment and nursing care than is possible in a general inpatient bed.

Figure 25 (A): Current and Forecast Demand in Acute Care by OPFA

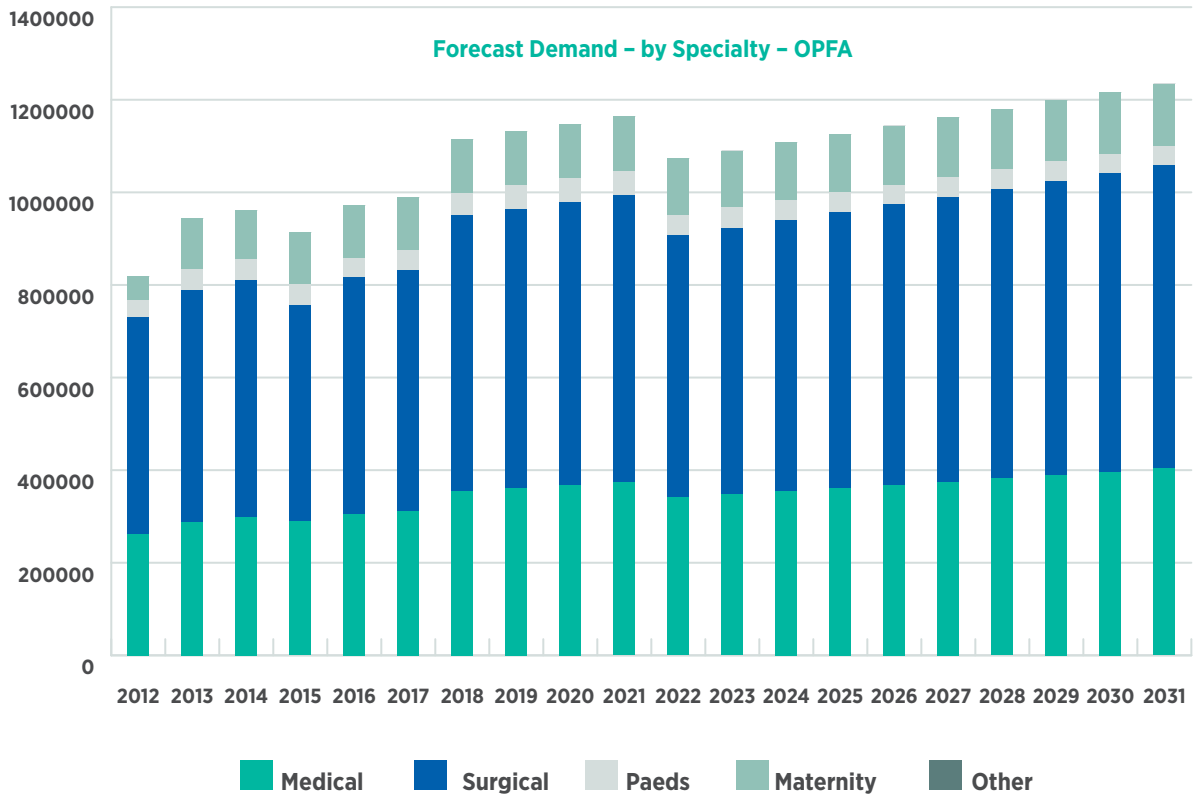
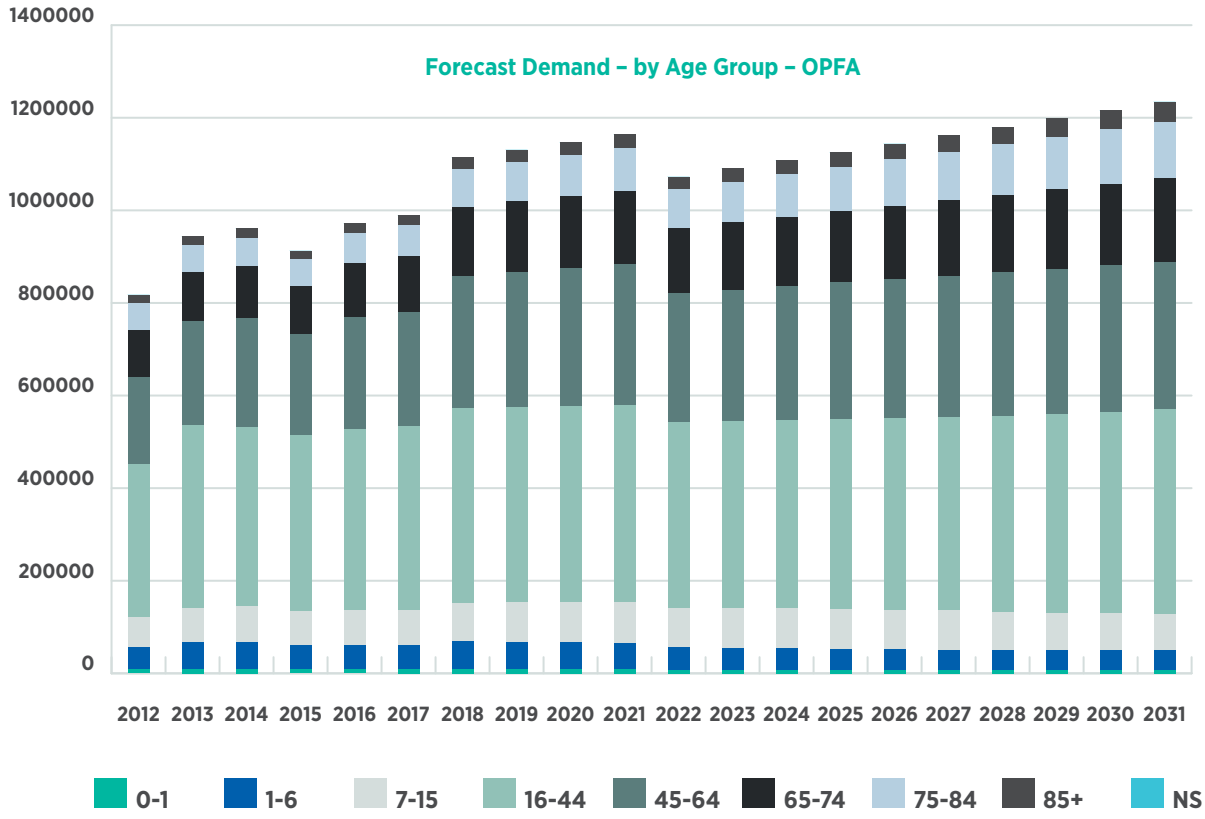


Figure 25 (B): Current and Forecast Demand in Acute Care by OPFA



Outpatient First Appointments: Outpatients first appointments have fluctuated in demand with a modest growth rate over the four years from 2012 – 2016, with a current baseline of just under 1 million appointments (unmet demand included). 2012 data was excluded from the trend analysis as nurse led clinics and maternity hospitals were not included in the dataset until 2013. Using current activity trends to project forward, it is anticipated that there will be demand for approximately 1.2 million outpatient first appointments by 2031. Demand for outpatient first appointments is expected to be driven by people aged 16-64, largely due to surgical and, to a lesser extent, medical specialty case; however, there is also an upward trend in maternity specialty cases, which is having a positive impact on the projected demand for first appointments. There is a significant uplift in demand projected for the period 2018 to 2021 to reflect the need to reduce the current waiting list backlog. *(Data Source: HSE, NTPF).*

Figure 26 (A): Current and Forecast Demand in Acute Care by OPFU

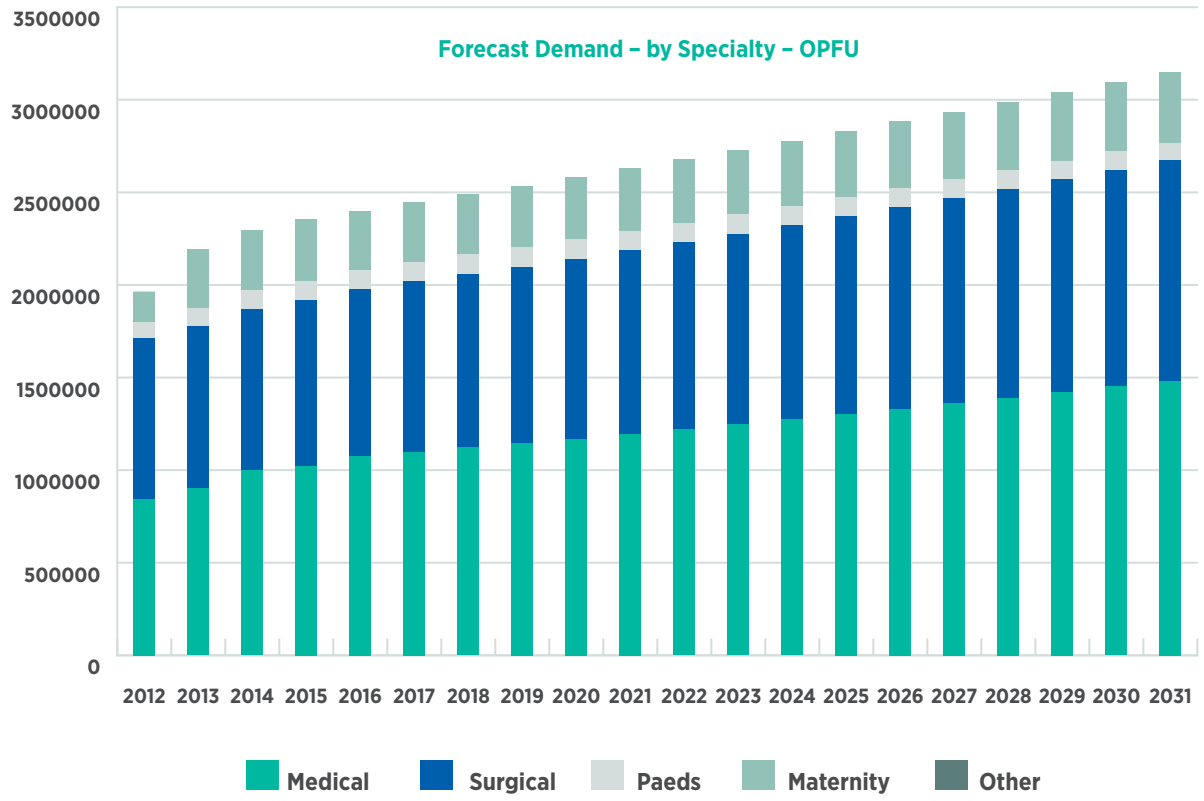
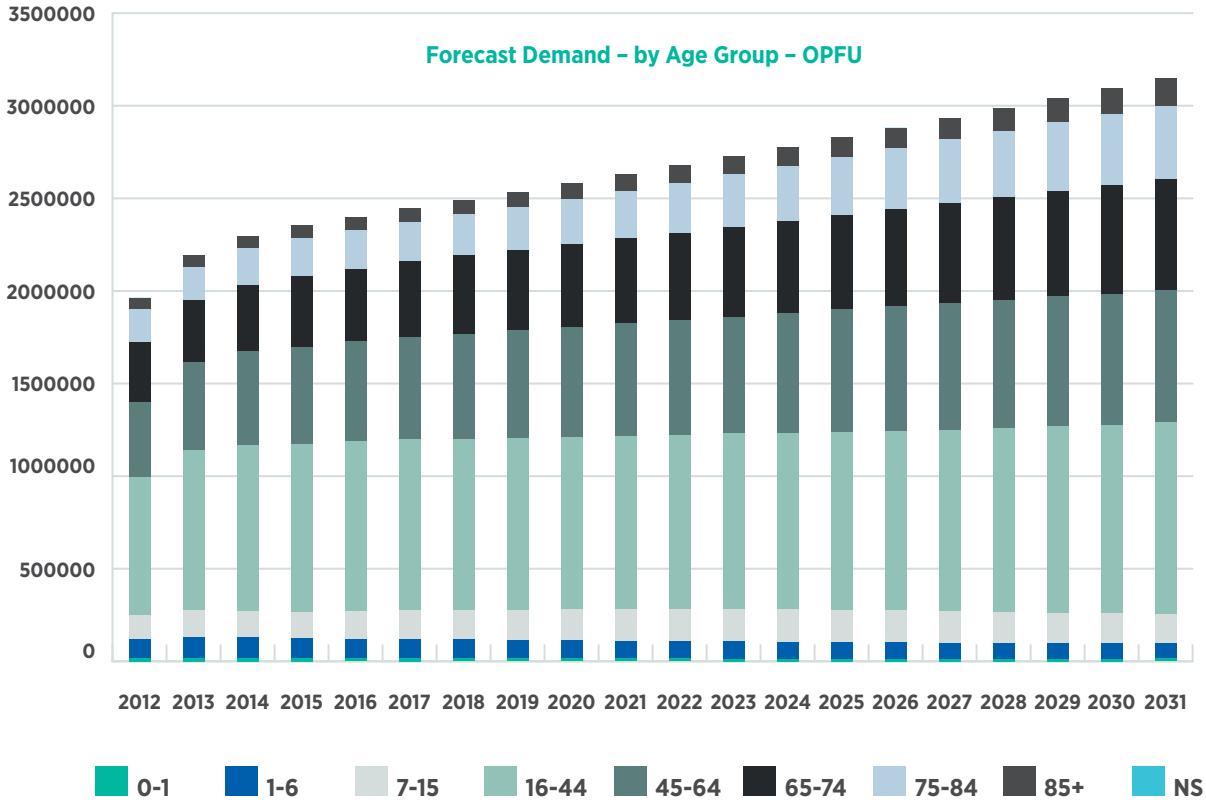


Figure 26 (B): Current and Forecast Demand in Acute Care by OPFU



Outpatient Follow-Up Appointments: Outpatient follow-up appointments show a steadier year-on-year increase over the baseline period and currently account for approximately 2.4 million appointments per annum. 2012 data was excluded from the trend analysis as nurse led clinics and maternity hospitals were not included in the dataset until 2013. Projecting this activity forward, demand is forecast to rise to approximately 3.1 million for outpatient follow-up appointments by 2031. Similarly to OPFA, the expected rise in the demand for follow-up appointments is mainly due to people aged 16-64 years; however, there is also an increase, albeit not as significant, in the number of elderly people, which is positively affecting this demand forecast. Additionally, while OPFA is driven by medical, surgical, and maternity related specialty cases, it is predominantly medical specialties driving OPFU demand in the next 15 years. *(Data Source: HSE, NTPF)*

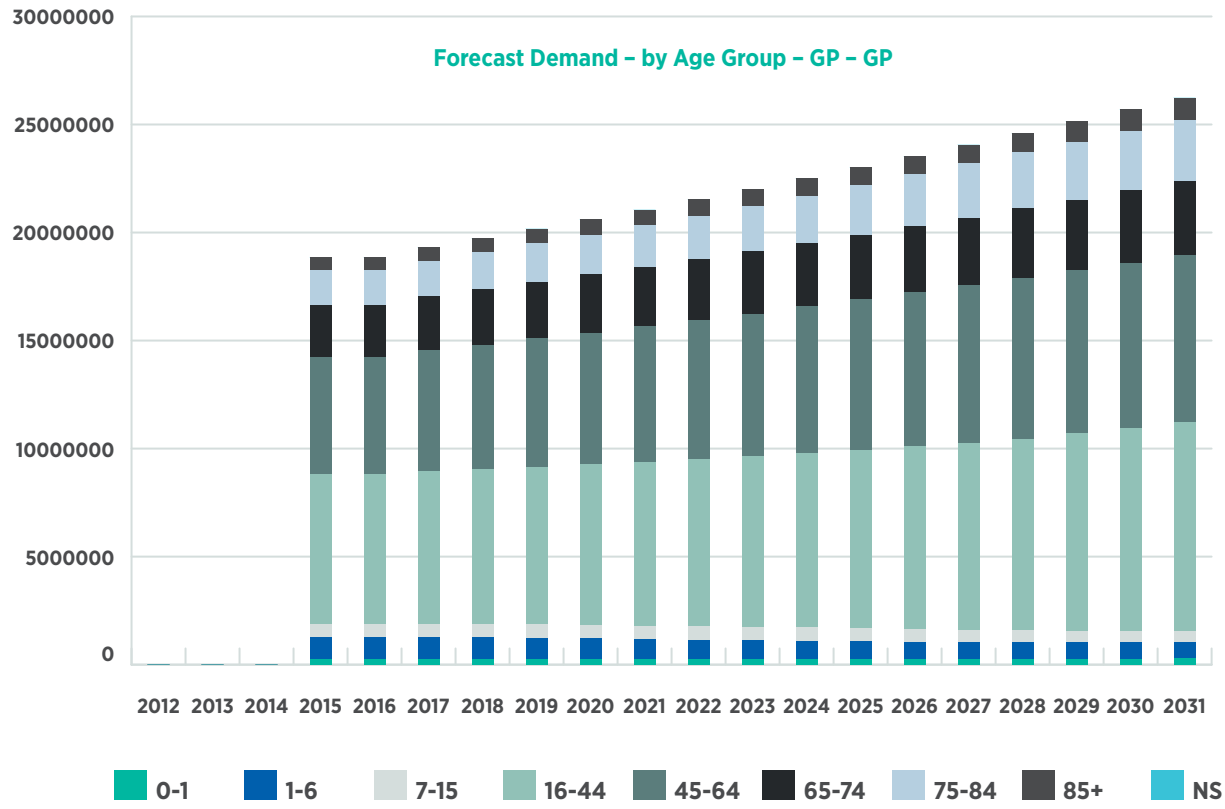
4.3.2 Profile of Current and Forecast Demand within the Primary Care Sector

Data on primary care activity are much less available than for acute hospital activity and services for older persons. Data for general practice activity and privately provided allied healthcare services aren't publicly available and data for primary care services provided by the HSE has much improved in recent years but gaps remain and trend analysis wasn't possible. This limits the robustness of the analysis and projections, and additional caution on the interpretation of these figures is advised.

Note A: The methodology for forecasting future demand and capacity for AHPs and PHNs was altered as a result of difficulties in identifying comprehensive activity levels, and data with regard to average length of appointments.

Note B: Although activity data was obtained for appointments by AHPs, it proved challenging to map this back to the AHP WTE numbers via appointment times (as had been done for other PODs). In the time available it was not possible to determine whether this was due to a need for further activity data in terms of other appointments for AHPs, or whether there were other non-patient facing activities which needed to be fully accounted for in the working time of an AHP. Due to these disparities the modelled demand for AHPs was not included in case there turned out to be missing activity data. However, the AHP capacity was modelled in terms of WTEs by using the 2016 WTE data for AHPs and then applying the demographic growth as calculated on the population profile of the obtained AHP activity data, and the non-demographic growth assumptions for primary care, to achieve a WTE forecast. As such, demand graphs for AHP PODs have not been presented in this section. This was also the approach taken for Public Health Nurse.

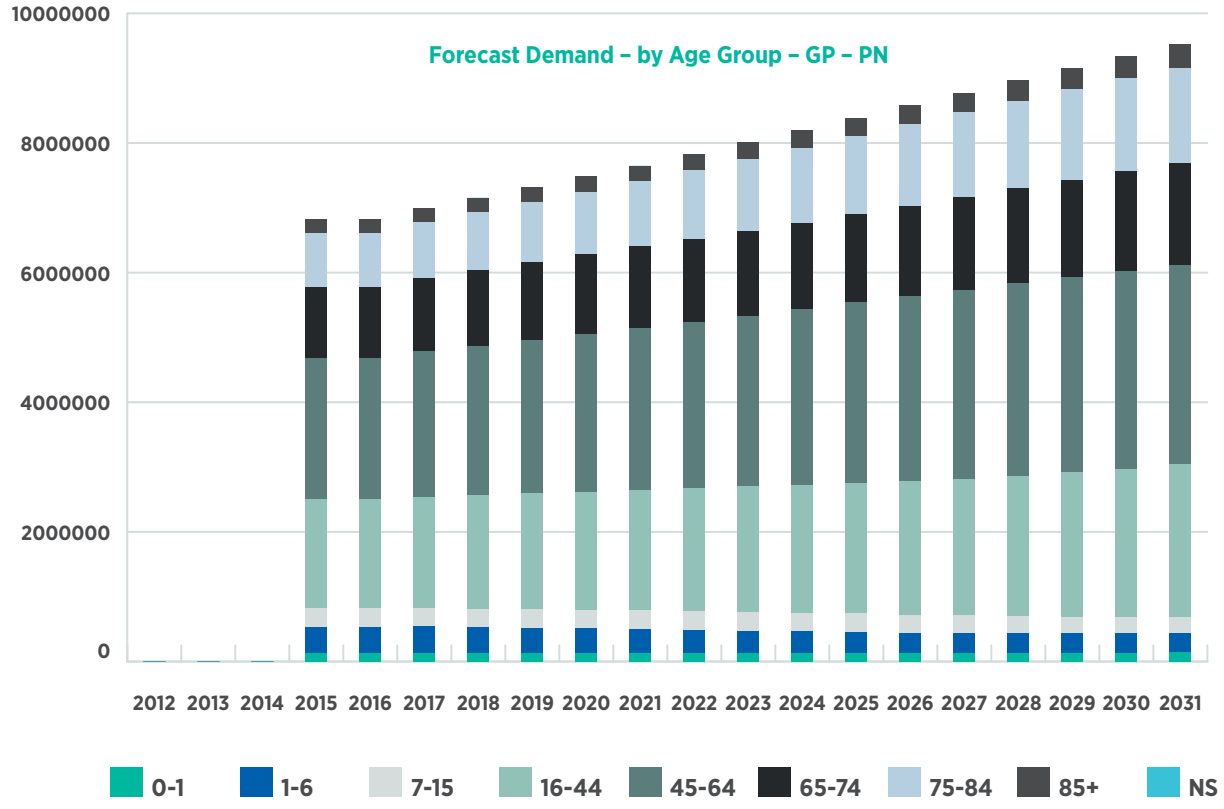
Figure 27: Current and Forecast Demand in Primary Care by GP appointments



GP appointments: Using survey data, it is estimated that there were approximately 18.9 million GP visits in 2016. Looking ahead to 2031, demand for GP visits is projected to reach over 26 million. A number of factors could impact future demand including a greater role for general practice in the management of chronic disease, changes in the operating model for general practice, in particular the role of practice nurses, and any changes to eligibility arrangements.

Data Sources: Healthy Ireland and Growing Up in Ireland Surveys. The use of survey data as opposed to real activity data is an obvious limitation. Each survey has its own caveats, and the projections in this report must be considered as indicative, It is also worth noting that a range of figures are cited for GP activity as a result of various survey data and interpretation of these data, ranging from 18 million to 22 million visits.

Figure 28: Current and Forecast Demand in Primary Care by GP PN appointments



GP Practice Nurse appointments: The graph above shows that as of 2016, almost 7 million GP practice nurse visits took place and projections suggest that this number could reach over 9.5 million by 2031. Similar to that of GP visits, these projections will be impacted by any changes in the role of general practice and the role of the practice nurse within general practice or eligibility to general practice services.

Demand for Primary Care Services: : As stated above, the methodology for forecasting demand and capacity for physiotherapists, occupational therapists, speech and language therapists and public health nurses had to be adapted. On the basis of activity data analysed, the following changes in demand are forecast:

- Physiotherapist (PHY) visits to increase by 38%
- Occupational Therapist (OT) visits to increase by 32%
- Speech & Language Therapists (S&LT) visits to reduce slightly by 6%
- Public Health Nurses (NHN) visits to increase by 46%

The magnitude of demand increases is in line with projections for general practice, apart from speech and language therapists where a reduction in demand is forecast.

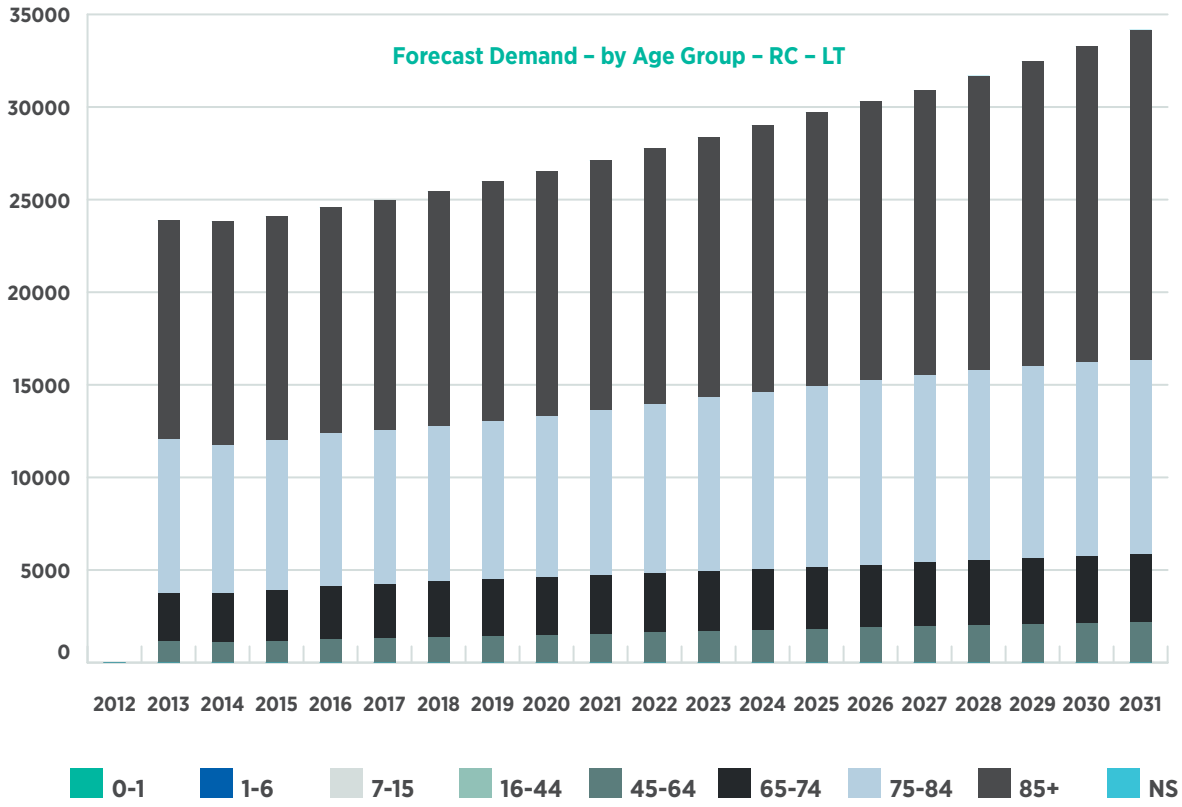
In summary, demand for primary care services is set to increase significantly across the majority of services over the projection period. The only area where a decrease in demand is projected is for speech and language services. This arises because the core focus of the service at present is children and this population group will decrease in size over the period. However, caution is advised in interpreting this projection as demand is likely to arise from other population groups in the future. It is reasonable to assume that these demand levels may further increase with a reorientation to community-based care, including primary care, and this is explored further in the scenario analysis section of the report.

4.3.3 Profile of Current and Forecast Demand within the Services for Older Persons Care Sector (Residential and Home Care)

The graphs below illustrate the current and forecast level of demand within the services for older persons care sector.

Residential Care Long Term: Reported demand (including unmet demand) between 2013-2016 demonstrated a 3% increase for long term residential care which represented approximately 700 additional people in this care setting during this time period. This is much lower than the growth in population of the relevant age cohorts and is reflective of the recent trend of people entering residential care later in life and staying in care for shorter periods, driven in part by increased access to homecare.

Figure 29: Current and Forecast Demand in Services for Older Persons Care by Residential Care Long Term

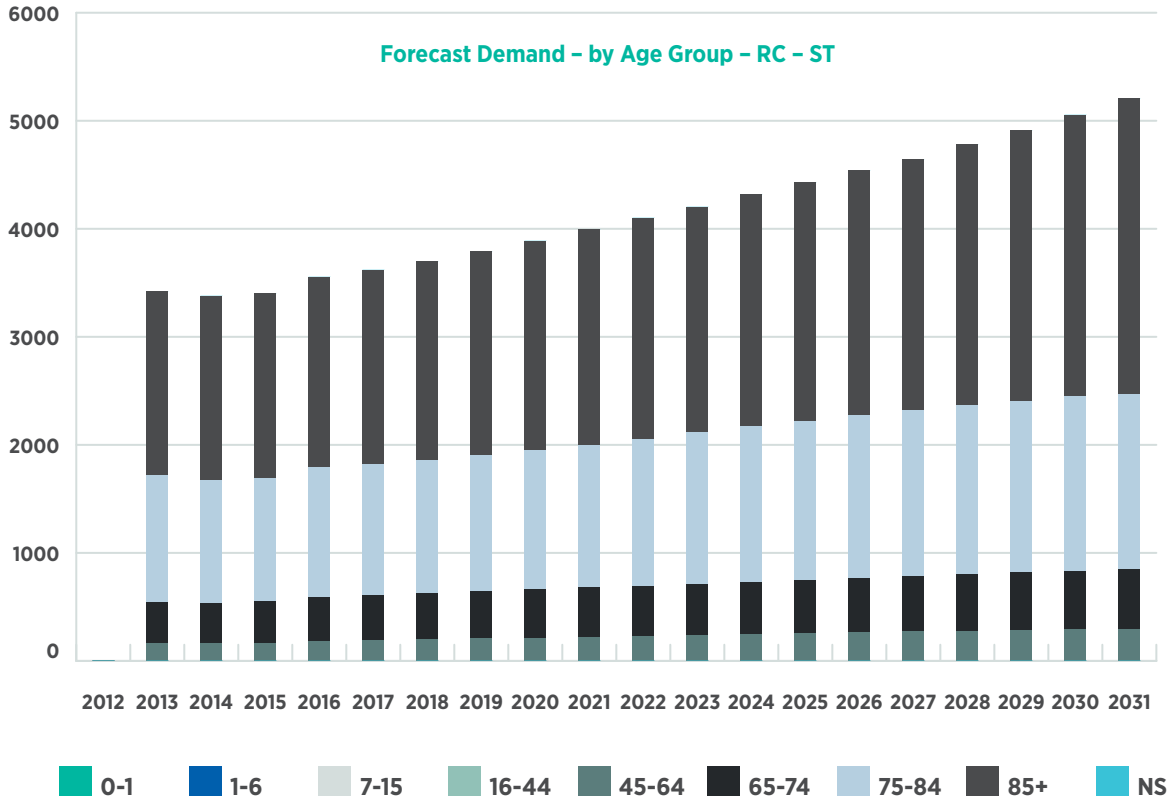


The projections assume a continuation of these trends, although they have been tapered slightly to reflect that there is a limit to the possible substitutability of residential care with homecare. Growth in demand will equate to a need to cater for approximately 34,000 long-term residents. From the graphs above, it is expected that older people mostly in the age range of over 75 years will account for this additional demand placed upon the system. *(Data Source: NHSS, HSE Legacy Schemes, NHI Survey)*

Residential Care Short Term: There is no dataset for the numbers of people availing of short term care in any given year. Instead, data are only available on the number of short terms beds available. Even with this, beds in private nursing homes are not designated as long stay or short stay and are generally interchangeable. This makes analysis of demand for short stay residential care particularly difficult. Finally, there is no waiting list in place, so demand may be under-estimated.

Working within these data constraints, it is projected that there could be a demand to cater for approximately 1,600 additional individuals at any one time in this care setting by 2031. *(Data Source: HIQA, HSE Public Bed Register, NHI Survey. The HSE greatly increased the purchase of "transitional care" beds since 2016, these will not be reflected in the analysis.)*

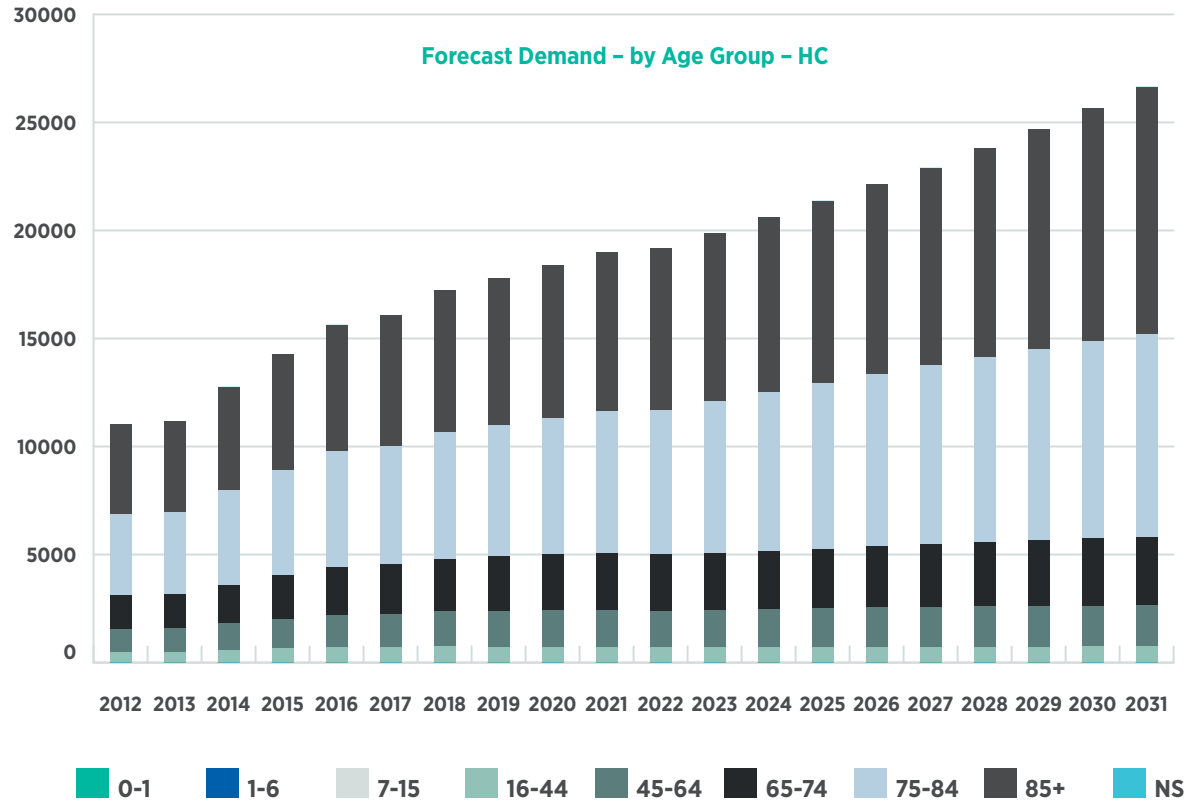
Figure 30: Current and Forecast Demand in Services for Older Persons Care by Residential Care ShortTerm



Note: It is worth noting that it is difficult to forecast long term and short term beds separately as these beds can be interchangeable. Therefore, the split between long and short term beds should be treated with caution. In light of this, multiple data sources were used to disaggregate this split.

Home Care Packages: Demand for home care has increased steadily in the period 2012-2016 with a current baseline demand of approximately 15,600 people receiving HCPs per month on average. Using current demographic trends to project forward, demand for home care is set to increase strongly over the projection period. By 2031, it is anticipated that the number of people receiving HCPs will sit at approximately 26,600 per month. This increase in demand will be driven mainly by the over 75 age cohort. 2016 waiting list data was included. *(Data Source: HSE – activity and waiting list)*

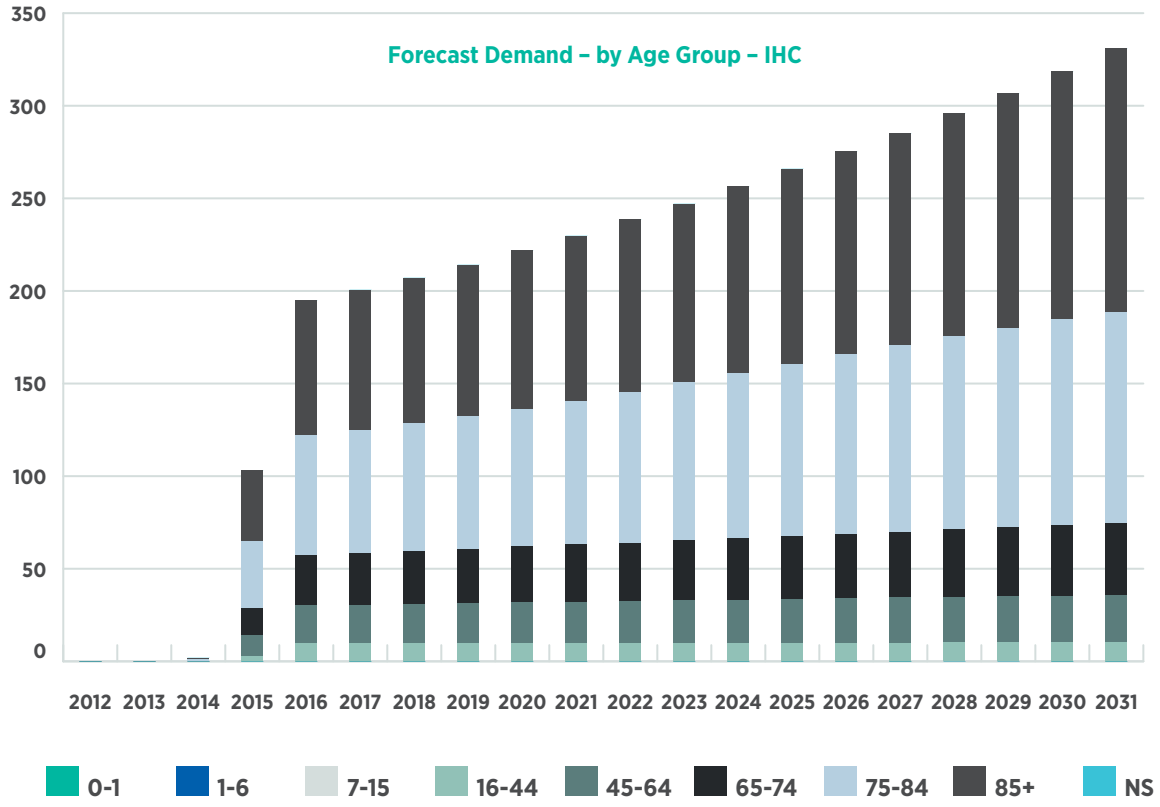
Figure 31: Current and Forecast Demand in Services for Older Persons Care by Home Care



Note A: It should be noted that all home care and home help projections are based on current publicly funded activity, and do not take into account unmet need or privately funded homecare, which is potentially an area of significant unmet need in the healthcare system. This unmet need will be addressed in the scenarios.

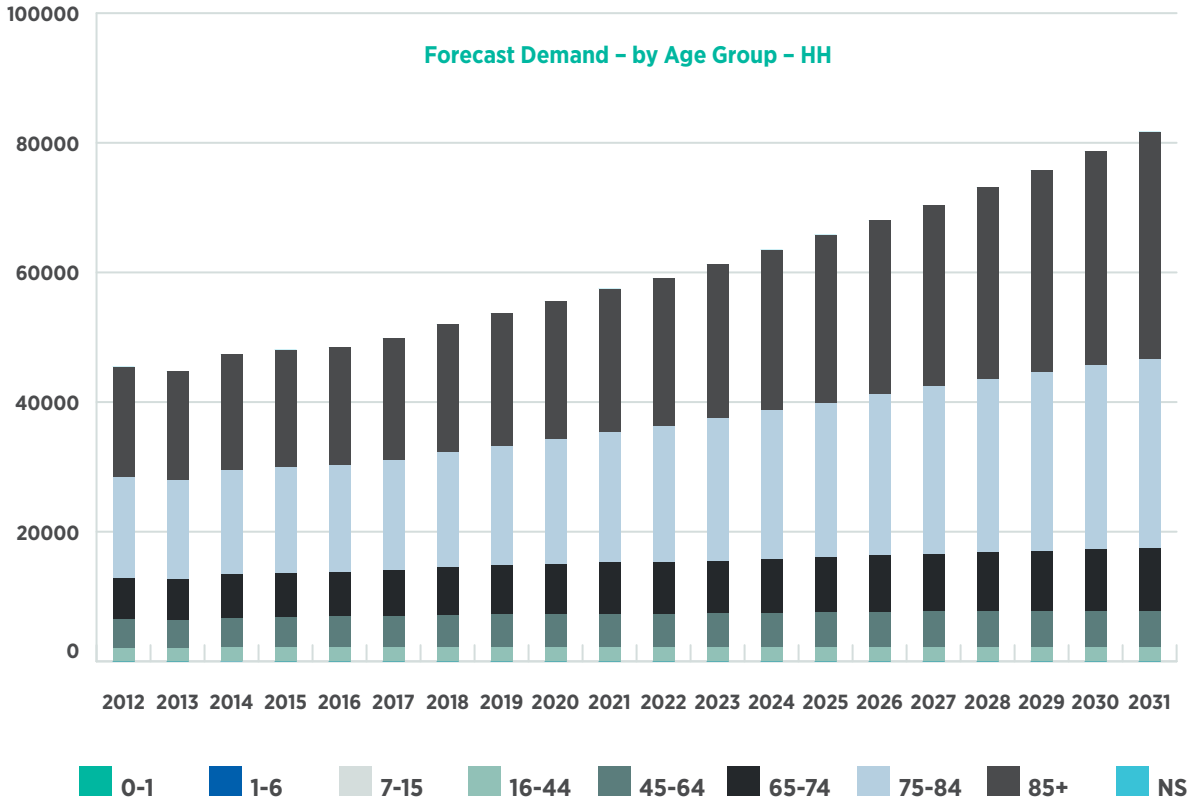
Note B: In 2018, Home Care services will be delivered through a single funding model for home care services, combining the home help and home care budget and improving the availability, accessibility and experience of these services for older people and their families.

Figure 32: Current and Forecast Demand in Services for Older Persons Care by Intensive Home Care



Intensive Home Care Packages: Intensive home care packages are targeted in particular at people with dementia and those with complex needs. They were introduced during the baseline period but provision remains relatively low. Using current activity levels to project forward, demand for intensive home care is forecast to increase from approximately 200 (2016) to 330 people receiving IHCPs by 2031. However, given the low level of base provision and potential high levels of unmet need, it is advised that this projection is interpreted with care. *(Data Source: HSE).*

Figure 33: Current and Forecast Demand in Services for Older Persons Care by Home Help



Home Help: Demand for home help has shown an overall increase between 2013 and 2016 with a current baseline of approximately 48,000 people receiving HHHs, and this demand is set to increase to approximately 82,000 people by 2031. There is an expected steady rise in this increase driven primarily by the expected increase in older people aged 75 and over. To a lesser extent, there is also an expected rise in the number of people aged 65-74 years receiving HHHs. *(Data Sources: HSE – activity and waiting lists. Cautionary notes above for homecare apply to home help services also. In addition, there may be further levels of unmet need as the hours being made available per recipient were reduced in recent years.)*

In summarising the future projected demands in the residential and home care services settings for older persons, all elements of these services are expected to see strong growth in demand over the coming 15 years, with a particularly steep demand increase projected for non-residential supports. As with primary care, should any net shift of care from the acute sector occur during this timeframe, then the extent of this demand will further increase.

4.4 Profile of Current and Forecast Capacity for Resources by Sector Type

This section presents an outline of current and forecast resource capacity requirements within the acute and primary care sectors, and services for older persons, using as a basis the demand projections outlined in Section 4.3 above.

4.4.1 Profile of Current and Forecast Capacity against Required Capacity in the Acute Sector

The graph below illustrates the current and forecast level of capacity requirements within the acute sector. Where appropriate, two set of figures are quoted – those based on current levels of occupancy, and those based on planned occupancy rates, which reflect more appropriate and internationally accepted clinical levels.

Bed occupancy is running at around 95% across the hospital system and in a number of cases individual hospitals are running at close to 100%.

International evidence indicates that high bed occupancy is associated with a number of adverse factors including increased risk of healthcare associated infections such as MRSA, increased mortality, increased probability of an adverse event, risks to staff welfare.

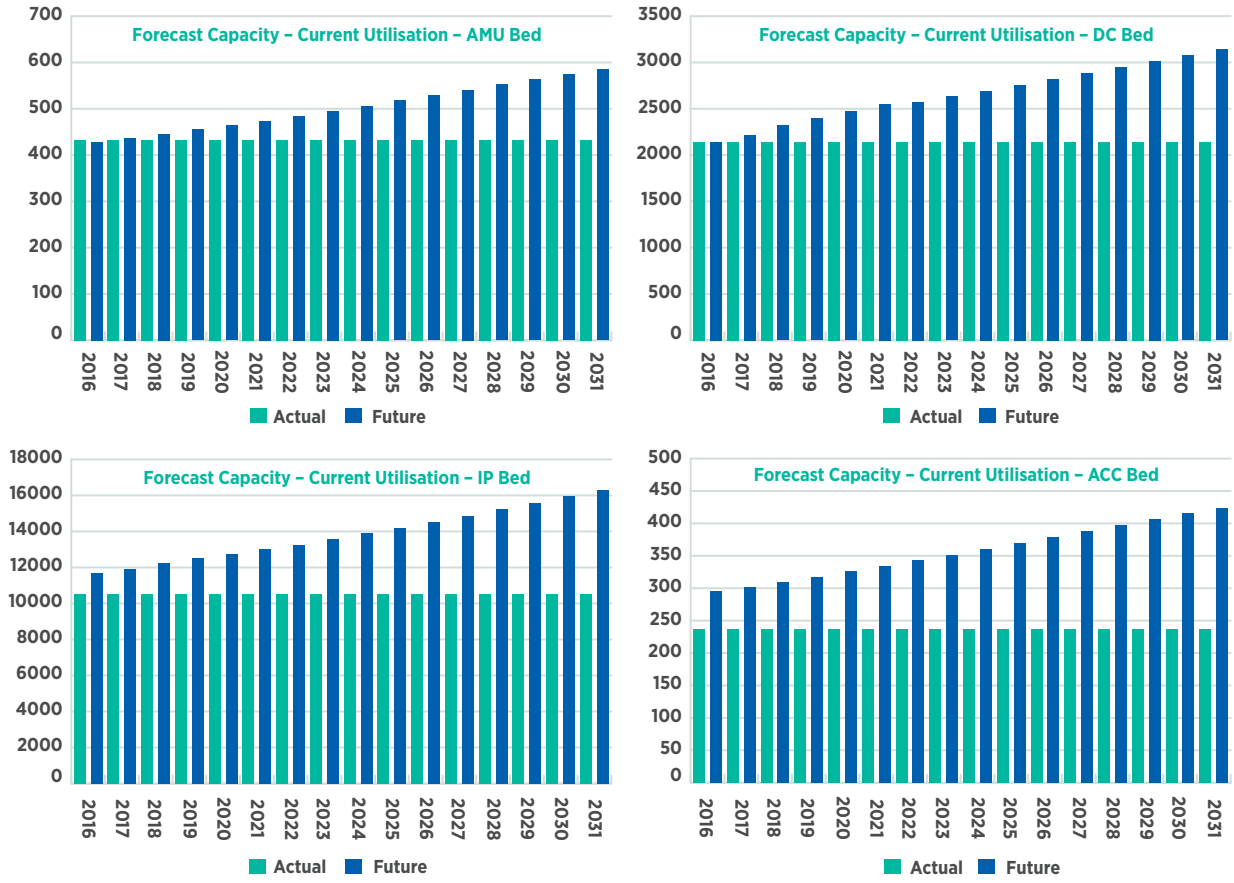
At an operational level, high occupancy restricts efficiency in patient flow. Put simply, it is difficult to be efficient when operating at or near maximum occupancy. This is true for any sector. It can lead to longer lengths of stay and cancelled elective care. Therefore, reducing average bed occupancy will be a key enabler for the hospital level productivity improvements in Scenarios 2 and 3.

An adjustment to the baseline has been modelled to highlight the immediate and ongoing need for additional hospital capacity to address potentially unsafe occupancy levels and is based on two adjustments:

- Reducing inpatient bed occupancy levels from 95% to international norm of approx 85%[4].
- Reducing adult critical care bed occupancy from 100% to 80%[5].

[4] Noting that a further adjustment to this is made for elective inpatients in Scenario 3A.
[5] As used for "Review Of Adult Critical Care Services In The Republic Of Ireland", Prospectus, Sep 2009

Figure 34 – Current and Forecast Capacity in Acute Care



Each graph above illustrates the currently reported actual capacity (red line) versus required capacity based on demand, taking into consideration length of stay, resource availability and occupancy over the 15 year period, 2016-2031. As one would expect, as demand is calculated using as a basis reported activity levels, which in turn are delivered by current levels of system resource, in all instances current capacity and required capacity in the base year of 2016 are closely aligned at the beginning of each timeframe – this confirms that the model is working correctly and assumptions made on resource utilisation are reflective of the on-the-ground situation. However, due to demographic and non-demographic pressures it can be seen that in all instances, required capacity quickly outstrips current capacity, and when more appropriate occupancy rates are introduced 'Forecast Planned Occupancy' are introduced the gap is immediately and significantly further widened.

AMU Beds: Caution must be taken in interpreting the above graph. Stakeholder consultations have indicated that AMU beds may sometimes be used to cater for ED overflow, meaning that AMU activity data isn't a full reflection of the throughput of an AMU bed.

On the basis of the activity and resource utilisation data available, there will be an additional requirement for 160 AMU beds by 2031.

Day Case Beds: Assuming current activity, resources, and utilisation rates (average of 2 patients per day), it is anticipated that there will be a shortage of day case beds of the magnitude of approximately 1,000 by 2031.

Inpatient Beds: The graph above illustrates that current inpatient beds are at capacity. This is based on 94.2% occupancy and, even with this level of occupancy remaining the same, required capacity for inpatient beds could significantly exceed current capacity levels by approximately 4,100 beds by 2031.

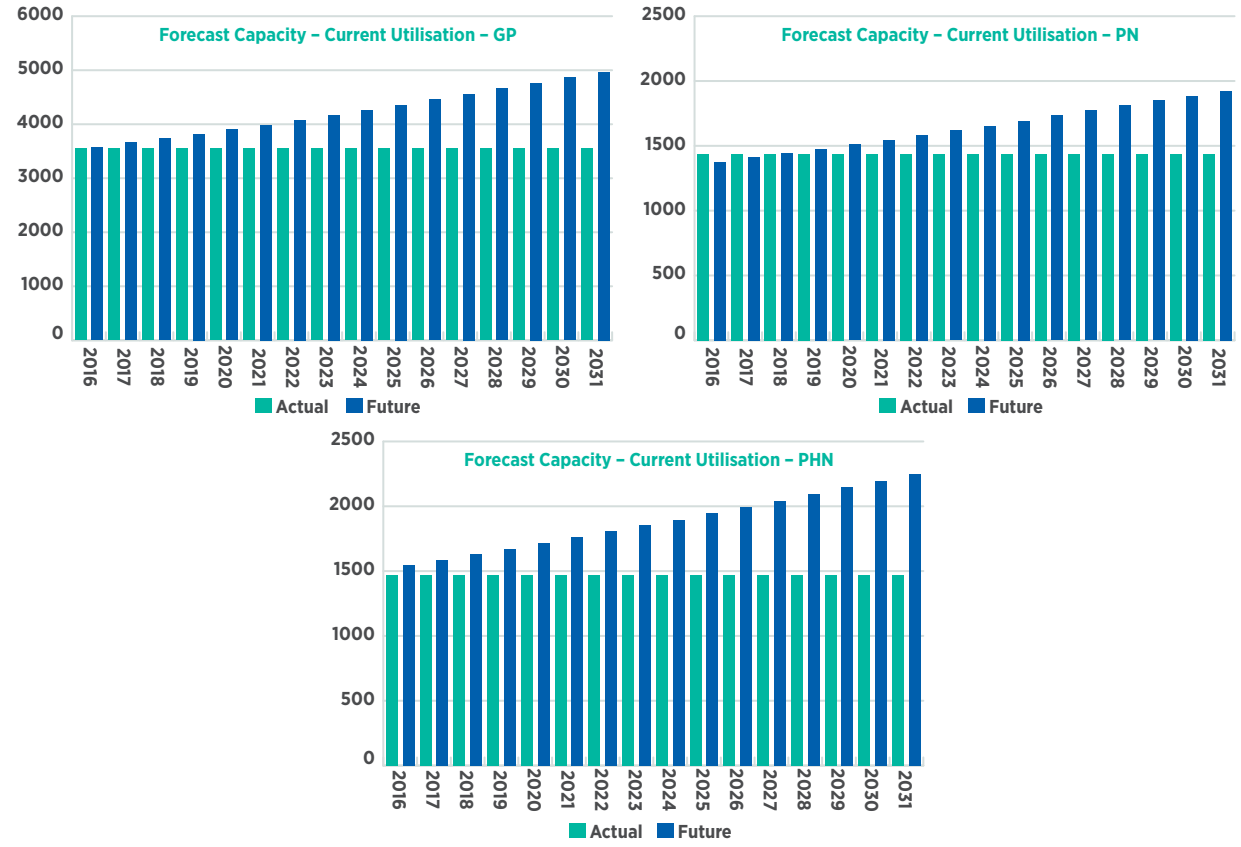
As already noted, this occupancy rate is abnormally high, and should a more acceptable occupancy rate of 85% be achieved, then the current situation would show **an immediate shortage of approximately 1,200 inpatient beds** within the acute system, growing to approximately 5,800 by 2031.

ACC Beds: From the graph above we see that the number of ACC beds are at capacity based on a current occupancy rate of 100%. Whilst we were unable to capture precise theatre usage data, it has been noted in various stakeholder engagements carried out as part of this review that a constraining factor in the relatively low utilisation rates for theatres in Ireland is the lack of ACC beds, and this would suggest that activity is currently capacity constrained. Using current activity to project forward, it is estimated that there will be a shortage of ACC beds of the order of 100 by 2031 if occupancy remains the same.

As with inpatient beds, should an occupancy rate of 80% be achieved for ACC beds, this would suggest an immediate shortage of approximately 60 ACC beds within the system. Using an 80% occupancy rate to project forward, there is likely to be a further increase in the shortage of ACC beds, resulting in a potential shortage of approximately 190 ACC beds by 2031.

In summary, in the baseline scenario, there is a significant increased requirement for all types of acute beds. By 2031 there could be the need for a further 5,360 beds approximately in the system as currently configured, and if planned occupancy rates of 85% are incorporated, this number grows to approximately 7,150.

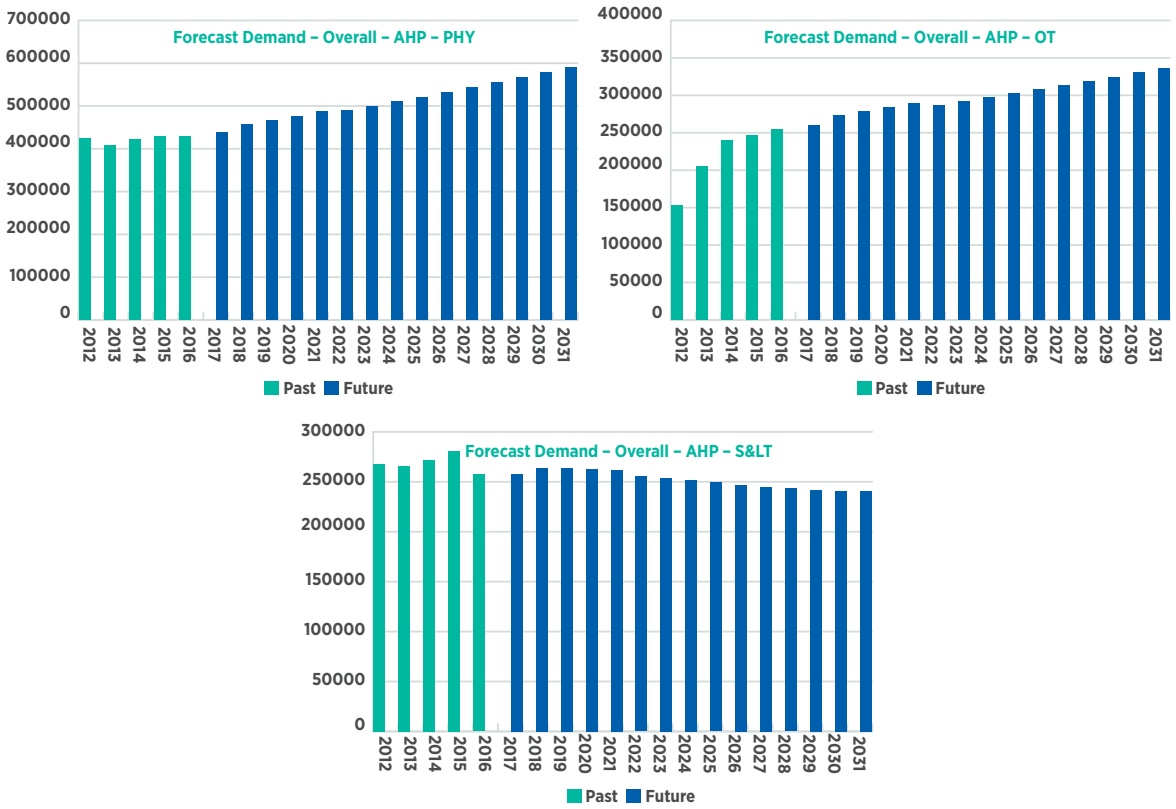
Figure 35: Current and Forecast Capacity in Primary Care



4.4.2 Profile of Current and Forecast Capacity against Required Capacity in the Primary Care Sector

The graph below illustrates the current and forecast level of capacity requirements within the primary care sector. It should be noted that the extent to which activity, resourcing and utilisation is recorded in this sector is less robust than that in the acute sector, so more caution must be exercised when interpreting the results.

Figure 36: Current and Forecast Capacity versus Required Capacity in Primary Care (AHPs)



GP WTEs: Projecting forward, it is anticipated that there will be a need for an additional 1,400 GP WTEs by 2031. Note that this figure does not account for any additional shift of activity from the acute to primary care sector, nor indeed the large number of GPs anticipated to retire in the coming years so the net requirement may be significantly bigger.

(Data Source: There are a range of different sources of information on the numbers of doctors working in General Practice in Ireland and estimates from these sources can vary considerably. A broad range of sources were reviewed. The number of GPs in 2016 as shown in the graph was calculated using the assumptions set out in Appendix E. This figure correlates very well with the number of GPs reported through an analysis by the HSE's Health Intelligence Unit which combined HSE Service Directory, Healthlink accounts and IMC registration data. The 2016 figures used for the purposes of this Capacity Review were GP headcount: 4,226, GP WTE: 3,570.)

GP Practice Nurse WTEs: As reflected in the second graph of Figure 35, it is expected that there will be an additional requirement for approximately 500 Practice Nurse WTEs by 2031. It should be noted that this figure does not take into account any additional shift of activity from the acute to the primary care sector or from GPs to Practice Nurses. *(Data Source: HSE)*

Public Health Nurse WTEs: By 2031 it is anticipated that there could be a demand for an additional 700 Public Health Nurse WTEs. If initiatives, such as greater national coverage of community intervention teams, increased early childhood intervention programmes and progressive implementation of the objectives of the national clinical programmes for older people are to be achieved, the projected increase in PHNs would be greater. *(Data Source: HSE)*

PHY WTEs: Projecting forward, the required number of Physiotherapists is anticipated to increase from current levels

[6] Caution is advised in interpreting these results due to difficulty with AHP data.

of 540, to 740 by 2031, which equates to an increase of 200 in this AHP specialty.

OT WTEs: The number of OTs required to meet future capacity is also anticipated to increase from a current level of 500, to 660 by 2031, an increase of 160 from current levels.

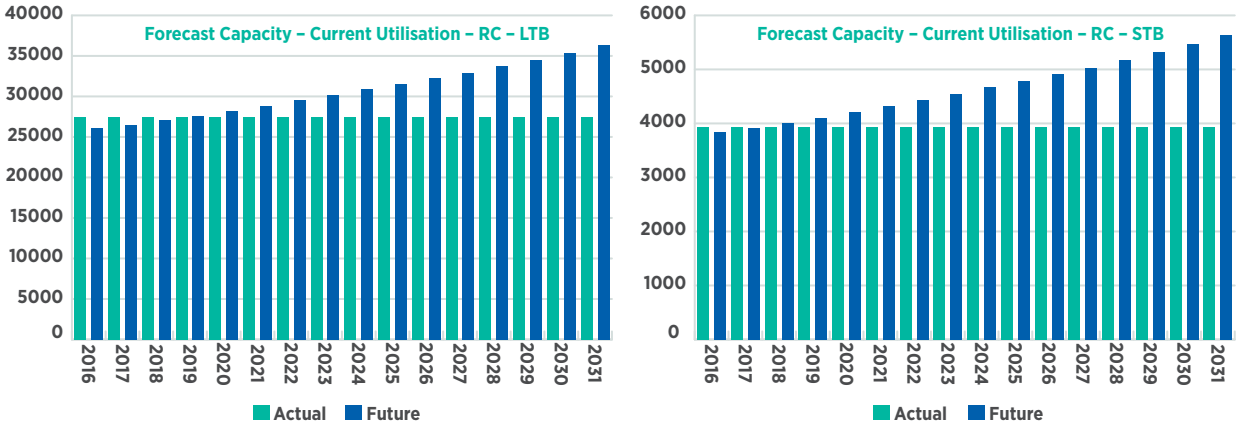
S&LT WTEs: Somewhat uniquely, demand for S&LT services is anticipated to decline somewhat between now and 2031, and this translates into a somewhat reduced capacity requirement of 440, down 30 from current levels of 470. As referenced elsewhere in the report, this results from a decrease in younger age cohorts that are currently the primary users of these services. *(Data Source: HSE)*

In summary, primary care capacity is expected to experience significant constraints by 2031 unless additional workforce is added to the system. The analysis in this scenario does not include consideration of possible changes within the Irish health system, including the impact of a greater orientation of health services to community-based care, including primary care, and changes to population eligibility for community based services. These will further increase capacity requirements within the primary care system. This is examined in some of the scenarios modelled in Section 7 of this report. Regardless of the extent of reform measures, the primary care system is set to come under significant resource pressure in the coming 15 years.

4.4.3 Profile of Current and Forecast Capacity against Required Capacity in the Services for Older Persons Care Sector

The graph below illustrates the current and forecast level of capacity requirements within the services for older persons care sector. As with the primary sector, the extent to which activity, resourcing, and utilisation is recorded in this sector is less robust, so more caution must be exercised when interpreting the results.

Figure 37 – Current and Forecast Capacity in Services for Older Persons Care (Residential Care)



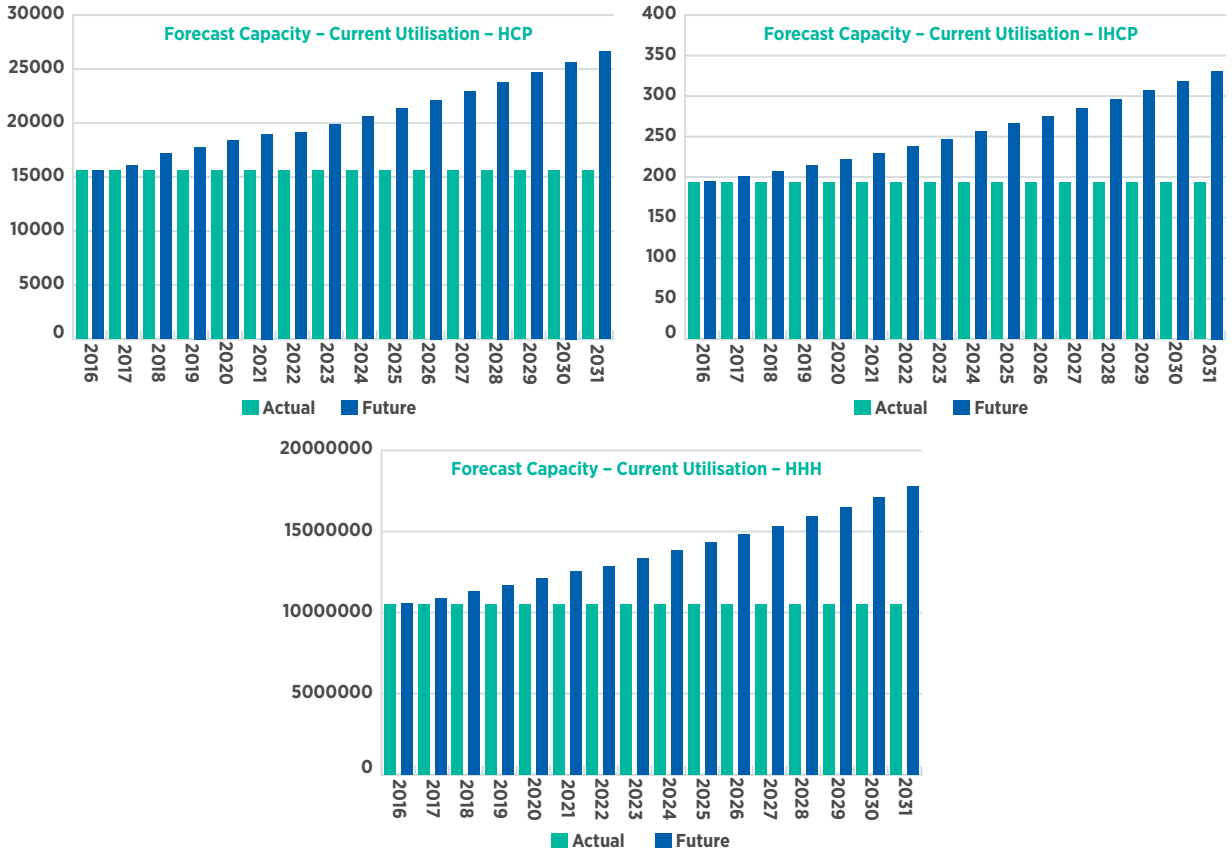
Residential Care Long Term Beds: The graph above illustrates that the supply of long term residential care beds is slightly in excess of current capacity requirements (by approximately 1260 beds). This is to be expected as occupancy has been assumed to be 100%, but this will never be the case. It is more likely to be around 95%. It is projected that an additional 10,100 beds could be required by 2031.

Residential Care Short Term Beds: As already stated, caution needs to be taken when considering the analysis on short term beds. Based on the data available, it is projected that approximately 1,800 additional short term residential beds will be needed by 2031.

Due to the lack of available granular data for residential care, the above graphs are based on blended data comprising

long-term and short-term public and private residential care. As such, the graphs above should be interpreted with caution. It should be noted that in a recent report published by the HSE, it was highlighted that in 2017, there would be a deficit of 1,460 long stay and 2,650 short stay beds, suggesting that the deficit will increase to 5,910 long stay and 3,600 short stay by 2022[7]. Whilst the timeframes under examination in the HSE report and this analysis may be somewhat different, both sources highlight the growing capacity challenges within the residential care setting in the future.

Figure 38: Current and Forecast Capacity in Services for Older Persons Care (Home Care)



Home Care Packages: Required capacity is expected to increase by approximately 70% by 2031, resulting in the need to deliver of the order of 11,000 additional HCPs.

Intensive Home Care Packages: Based on the current level of provision, there will be a need for an additional 130 IHCPs by 2031. As mentioned earlier in the report, these projections are off a very low base that is unlikely to be in any way reflective of real demand/need for this type of service.

Home Help Hours: There will be a need for an additional 7.2 million home help hours per annum by 2031.

[7] Healthy Ireland: *Planning for Health 2017*, HSE

In summary, our analysis and stakeholder feedback would indicate that all elements of both residential and home care services for older persons are currently capacity constrained and as such reported activity levels may not reflect actual demand or need. However, even if one assumes that current activity levels are appropriate, demographic and non-demographic pressures will also have a significant impact on the demand for all forms of residential and home care provision.

4.5 Private Hospital Acute Activity

The terms of reference for this Capacity Review specifically called for an assessment of capacity in both the public and private sectors. However, accessing robust, reliable data on activity levels and resources in the private hospital sector proved challenging. The DOH undertook a survey of private hospitals in 2017 to collect a variety of data on activity and resources. Data as received were provided to PA for the purposes of this Capacity Review on an aggregate basis, and the figures confirmed by Private Hospitals Association[8]. Because only a single year's activity was provided, it was impossible to make any assumptions about non-demographic growth, and the following table presents a summary of the main assumptions used in undertaking an assessment of future capacity requirements.

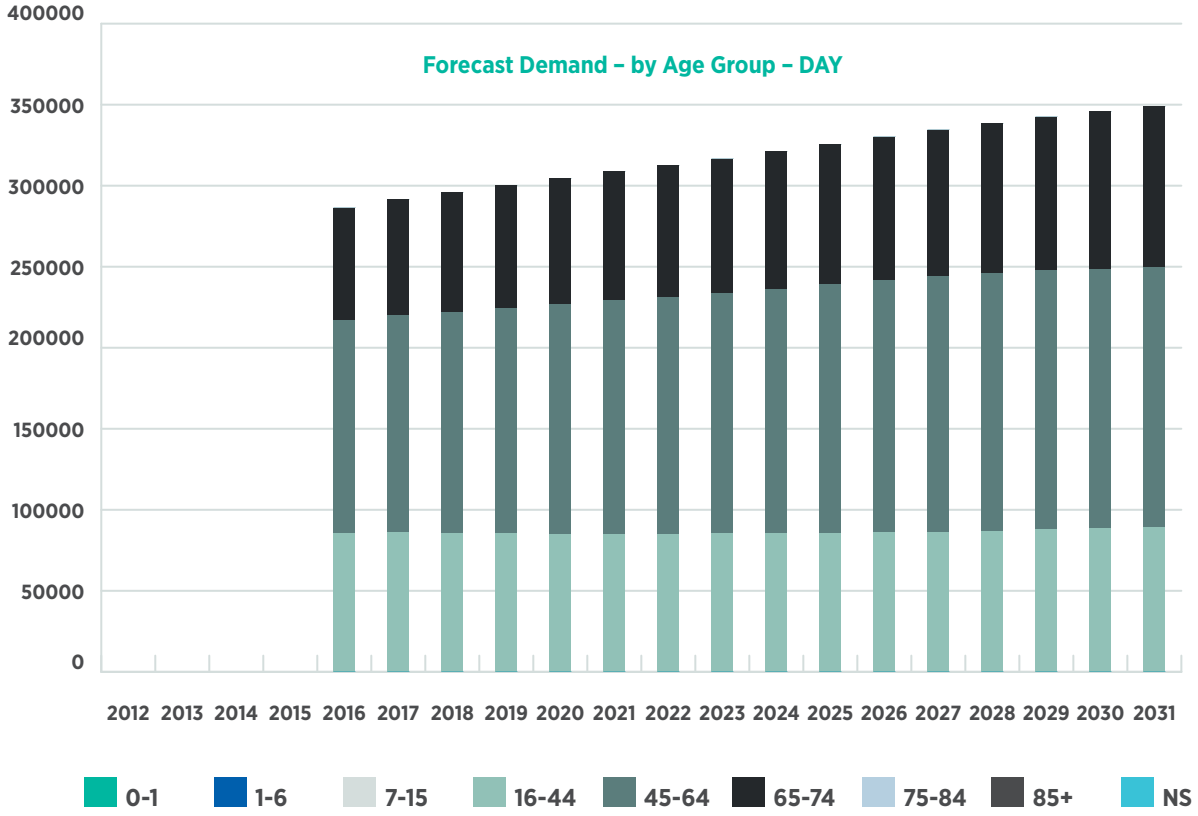
Note: Apart from those contained within this Section (4.5) the private hospitals data has not been included in any other tables, charts, modelling or analysis within this Capacity Review. All other acute hospital data shown throughout the report (excluding Section 4.5) relates to public hospital data only.

Table 8: Key Assumptions Made in Private Demand and Capacity Assessment

Variable	Assumption Made
Activity Trend	Trended forward using demographic growth only
Age Split	Same age split as that of public hospitals
Specialty Split	10% Medical and 90% Surgical
Availability	6 days per week, 50 weeks per year
Inpatient LOS	4.8 days
Inpatient Occupancy	80%
Day Case LOS	0.6 days
Public Funded Activity	Assumed to be in the reported private activity figures

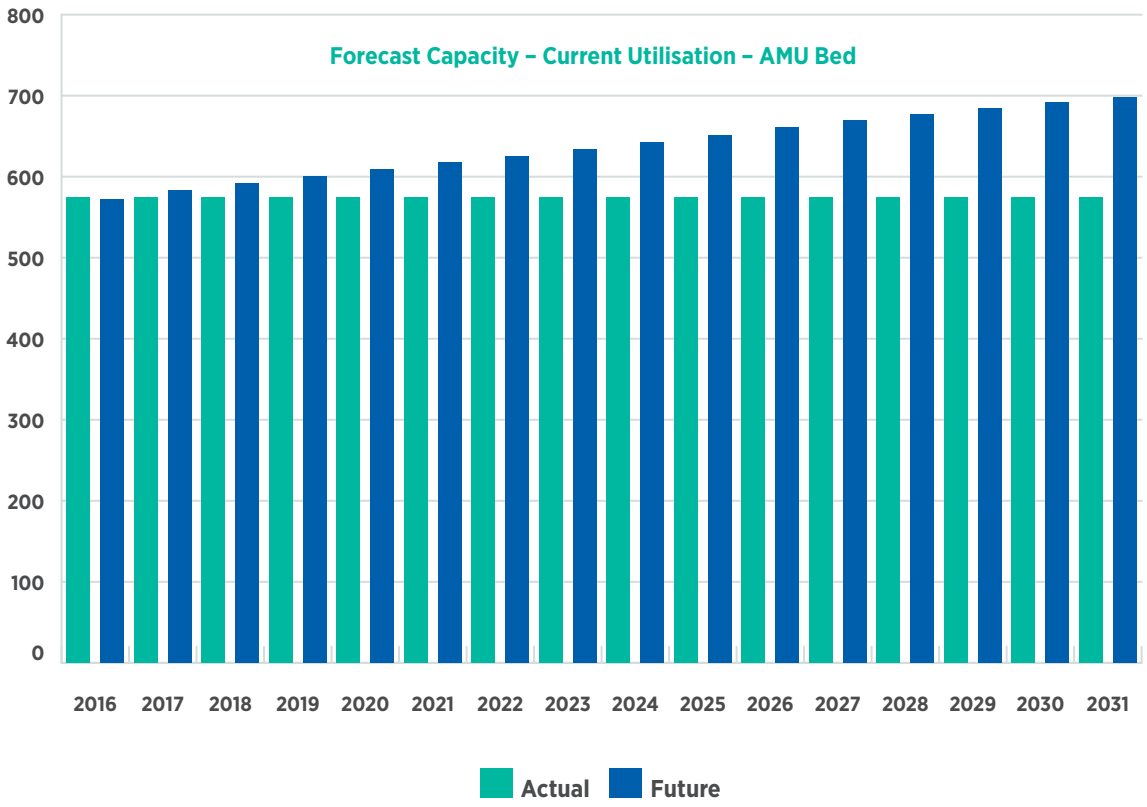
[8] Based on estimates and survey data received by the Department of Health in mid-2017, private hospitals in Ireland had at that time an estimated 2,500 acute beds (approximately Inpatient 1,900 and Day Case 600) .

Figure 39: Private Acute Day Case Demand



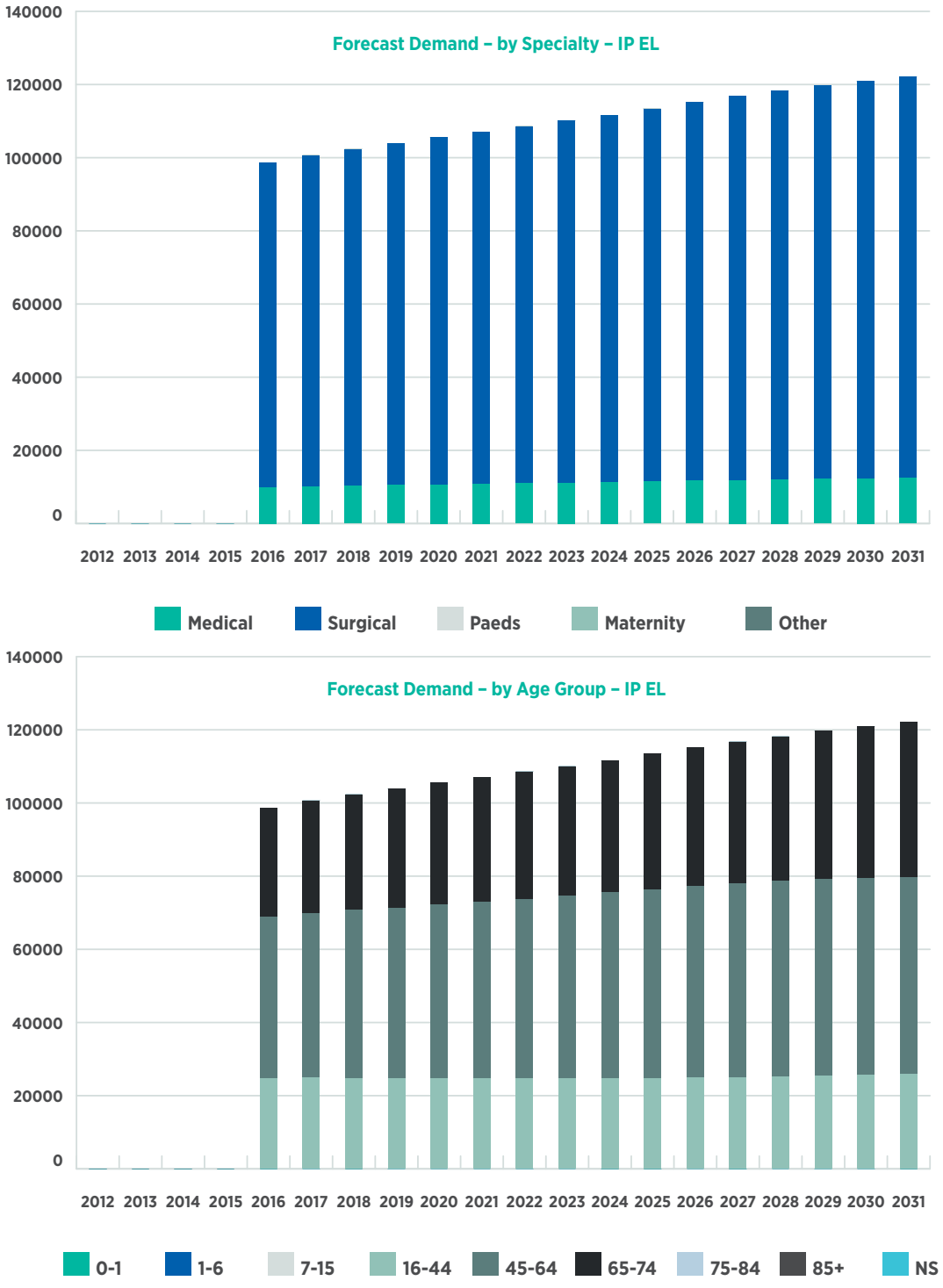
With regard to private acute day case demand, the graph shows demand for day case activity set to increase from approximately 290,000 procedures per annum (2016), to 350,000 procedures per annum by 2031. This implicitly assumes the proportion of activity between the public and private hospitals remains constant.

Figure 40: Private Acute Day Case Beds



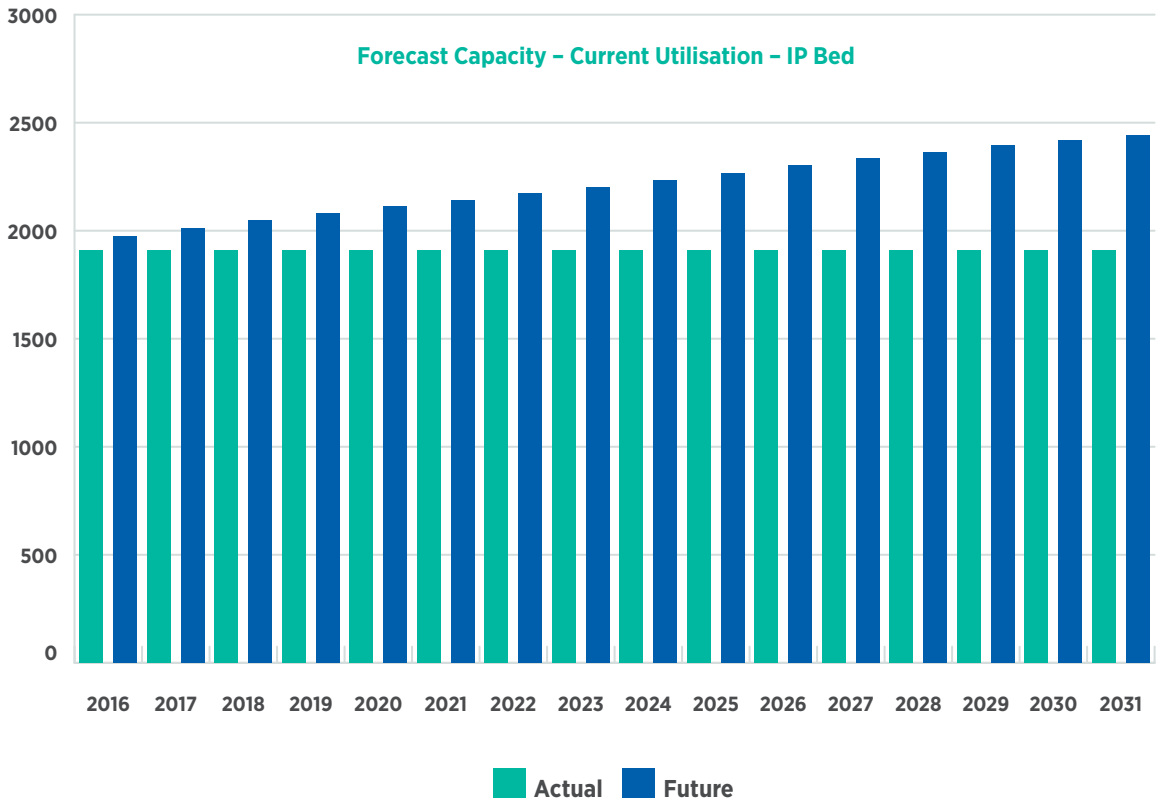
This future demand translates into capacity requirements in the manner as summarised above. This shows that this increased activity is likely to lead to the need for an additional 120 day case beds. It is worth noting that it might be the case that currently some day case activity might be undertaken in beds designated as inpatient, and this being the case, then clearly the number of additional day case beds required would be more significant.

Figure 41: Private Acute Inpatient Elective Demand



The figures above show a steady increase in annual IP elective demand from a current level of approximately 100,000 per annum, to 120,000 per annum by 2031.

Figure 42: Private Acute Inpatient Elective Capacity



Translating IP demand into capacity translates to additional capacity of approximately 500 IP beds by 2031.

In summary, based on the limited information on current levels of activity across the private acute hospital sector, there is the potential requirement for private providers to add in the region of 120 day case and 500 inpatient beds over the next 15 years. Clearly these figures are based on a trending forward of current activity, and make no assumptions as to the impact of policy shift, including recommendations made in the Sláintecare report about removing private activity from public hospitals, or the more extensive use of NTPF to address current waiting lists, both of which could have a potentially significant impact on future demand and capacity requirements in private hospitals. As already stated, this analysis has been based on very provisional and incomplete data and should not be considered in anyway definitive.

4.6 Summary

4.6.1 Summary of Current Demand

Current demand for acute care has recorded the greatest recent increase in outpatient first appointments, outpatient follow-up appointments, and day case procedures. In the primary care setting, demand for GP and practice nurse visits remains the highest among the various PODs while in the services for older persons care setting, the greatest area of demand lies in the areas of home help, long-term residential care and home care. It should be noted that for many of these PODs however, it is reasonable to assume that the reported demand levels are supply constrained, and thus any unmet need is not being reflected – this is addressed separately when we assess some scenarios for alternative models of care in Section 7 of this report.

4.6.2 Summary of Forecast Demand

Forecasts to 2031 suggest that demand is set to increase across almost all PODs in the acute sector. Notable increases can be observed for critical care and for day case procedures. Outpatient, AMU, inpatient non-elective and, to a lesser extent, ED also show surges in demand through to 2031. Meanwhile, demand for inpatient elective looks set to increase slightly, especially in early years as waiting list backlog is addressed.

Within the primary care sector demand for GPs, GP practice nurses, public health nursing and most allied health professional appointments is set to grow significantly over the next 15 years and will place significant pressures on the primary care sector. It is also likely that if greater orientation of health services to community-based care, including primary care, and changes to population eligibility for community based services occur, further increases in demand for community and primary care services will occur.

In the services for older persons care sector, all areas will see significant increases, the steepest occurring for home care and home help services.

4.6.3 Summary of Current Capacity

As it currently stands, with the possible exception of AMU and Day Case beds, where it is suspected that actual activity is not being fully represented in the data, capacity at all other PODs is at or in excess of 100%. This is further exacerbated when current occupancy rates are examined, as these are in excess of international comparators, suggesting that in fact there is already a capacity deficit here. Indeed, it could be argued that there is also similar capacity deficits in the primary and services for older persons care settings, as this is where unmet need is most likely to be manifested.

4.6.4 Summary of Forecast Capacity

Over the coming 15 years, based on the current levels of utilisation, capacity requirements are set to increase across almost every aspect of acute and primary care, and services for older persons. This has significant implications for resource requirements in terms of infrastructure, equipment and staff (at all levels), as summarised in the following table.

Table 9: Summary of Forecast Capacity by Sector Point of Delivery (POD) with percentage changes from baseline

Sector	POD	2016	2021	% Δ	2026	% Δ	2031	% Δ
	GP WTEs	3,570	3,990	12%	4,460	25%	4,970	39%
	PN WTEs	1,400	1,500	12%	1,700	26%	1,900	40%
	PHN WTEs	1,500	1,800	14%	2,000	29%	2,200	46%
	AHP–PHY WTEs	540	610	14%	670	24%	740	38%
	AHP–OT WTEs	500	570	13%	610	21%	660	32%
	AHP–S&LT WTEs	470	480	2%	450	-4%	440	-6%
	RC LT Beds	26,200	28,900	10%	32,200	23%	36,300	39%
	RC ST Beds	3,800	4,300	12%	4,900	28%	5,600	46%
	HCP	15,600	19,000	22%	22,100	42%	26,600	70%
	IHCP	200	230	18%	280	41%	330	70%
	HHH (million)	10.6	12.5	19%	14.8	40%	17.8	69%
	AMU Beds	430	470	11%	530	24%	590	37%
	Day Case Beds	2,140	2,550	19%	2,820	32%	3,140	47%
	IP Beds	10,500	11,700	12%	13,000	24%	14,600	39%
	ACC Beds	240*	270	13%	300	29%	340	43%

* Rounded from 237 (actual 2016 figure). Source: Critical Care Programme

It is also worth noting that this assessment of future capacity requirement makes no consideration of the need to replace current capacity (e.g. outdated estate, equipment, retirement of staff etc.) in this timeframe, nor indeed the significant lead time that is in many instances required to bring this capacity on-stream.

Indeed, the nature (size and scope) of the capacity required to meet future demand is such that it is reasonable to conclude that a continuum of the current model of care is unsustainable, a point that has been reflected in various policy documentation, and indeed most recently in the Sláintecare Report. As such, in the rest of this report we investigate what the potential impact and implications for some of these alternative care models could be, and assess the key considerations that must be made if their implementation is to be considered.

POLICY ANALYSIS

As an input to identifying potential future models of care, it is necessary to review existing policies that reflect intentions in this regard.
This section: Presents a summary of the policy analysis undertaken.

Sets out the key policy considerations to inform the identification of future models of care.
Gives examples of international best practices that were identified from the research conducted (see Appendix C).

5.1 Analysis and Refinement of Applicable Policies

From an initial review of policy, 93 documents were identified as being of relevance for more detailed assessment. These documents comprised policy, strategy and analyses, pertaining to one or a combination of sectors (acute care, primary care, and services for older persons) within the Irish healthcare system. A full list of these documents can be found in Appendix A. Following their review, 24 documents were identified as being of significant importance to the Review and they formed a key input to the identification and selection of scenarios of alternative care models. Appendix B outlines this short list of documents and the rest of this section summarises their relevance.

5.2 Key Policy Themes and Considerations

There are 30 national clinical programmes underway in Ireland at present; each of which is led by teams involving relevant clinical specialists. Whilst these programmes are at various stages of maturity in terms of model of care design and implementation, there is significant evidence of strong overlap in the direction of travel of these programmes, particularly with regard to focusing on patient needs and providing integrated services along the care pathway in order to ensure that these needs are being met in the most effective and efficient manner.

In addition to the national clinical programmes, there are a number of key policies and strategies in train. These include the Healthy Ireland framework and associated implementation plans, the Sláintecare Report 2017, HSE service plans and various other analyses and reports from across the system. Strategy documents have also been published for specific areas including cancer, maternity, integrated outpatient services, cardiovascular health, and dementia, among others. As with the national clinical care programmes, these policy and strategy documents are focused on keeping patient needs at the centre of any future model of care and in doing so, seek to deliver healthcare services as close to the patient's home, as possible. Overall, a number of key high-level themes emerged from the analysis, including the need:

- To continue to focus on prevention initiatives to enhance population health and wellbeing across the country.
- For cross-sectoral efforts in supporting health and wellbeing in areas such as smoking cessation, physical activity, healthy eating, reduced alcohol consumption, sexual health, obesity and positive ageing.
- To provide integrated care for patients (with long-term conditions) within and across acute, primary, and social care.
- To orientate services away from acute settings to community-based and home settings, including primary care, particularly for patients with long-term conditions.
- To increase diagnostics services in primary care, to alleviate capacity in acute hospitals.

- To enhance ambulatory care services in a way that supports patients, GPs and Primary Care Teams.
- To re-organise services within the acute sector to improve efficiencies and meet patients' needs more effectively. This includes the need to enable surgeons to switch to day case surgery where it is appropriate to do so.
- To increase hospital efficiencies overall across the various PODs, and to re-orient the nature of care services delivered within Model 2, 3 and 4 hospitals.
- To increase palliative care services within hospitals (inpatient units and specialists beds), the community and in the home.
- To increase the number of Early Supported Discharge programmes whilst also ensuring an increase in the availability of nursing home places for patients who cannot be discharged back to a home environment.
- To improve services for the elderly including within hospitals (specialist geriatric wards and community outreach services), the community and homecare services (including access to public health nursing services).

After an initial analysis of the above themes and the associated policy / documents pertaining to each, specific key considerations outlined in the documents were identified as having a potential impact on activity and capacity in a future model of care. These considerations were then explored with stakeholders with regards to their relevant impact. A full list of these policy considerations can be found in Appendix C of this report, along with an analysis of International Best Practice across these themes. Stakeholder feedback was combined with these considerations and this information was used to inform the scenarios for alternative models of care, as described in Section 7 of this report.

5.3 Summary

This section outlines the key themes and specific considerations that emerged from assessing and analysing the various policies and documents relating to the Irish healthcare system that have an important role in reconfiguring services and thus 'bending the curve' with regard to future demand and capacity requirements within the system.

These findings, along with the examples of best practice from other countries, were used as a basis to inform the stakeholder engagement exercise as detailed in Section 6.

6 STAKEHOLDER ENGAGEMENT

In order to obtain qualitative feedback and content on the system, to validate the outputs of the baseline assessment (including the assumptions used) and to identify the scenarios to be developed, an extensive stakeholder engagement exercise was conducted throughout the Capacity Review process. The relevant set of stakeholders for consultation were selected to provide the broadest possible representation from across the system, on both a clinical and operational level, spanning acute and primary care, and services for older persons settings (both public and private) within the resource and timeframe constraints of the report. These stakeholders were engaged in either a workshop environment, or via direct bi-lateral engagement and the full list of stakeholders consulted can be found in Appendix G of this report. These stakeholders were engaged in either a workshop environment, or via direct bi-lateral engagement and the full list of stakeholders consulted can be found in Appendix G of this report.

This section:

- Presents a summary of the outputs from the two workshop waves.
- Sets out the findings of bi-lateral meetings.
- Provides feedback from engaging the International Peer Review Group.
- Outlines a summary of submissions to the public consultation

6.1 Summary of Wave 1 Workshop Findings

Two waves of workshops were conducted as part of the Review with participants from across the health system with a range of sectoral experience. The primary objectives of the Wave 1 workshop were to:

- Test and validate the baseline assumptions.
- Outline areas for potential development and confirm key policy considerations for a future model of care.

The following tables present the key themes that were explored and the feedback that was generated by experts in the Wave 1 workshop.

It was widely recognised by the workshop participants that challenges to the health system in Ireland are vastly compounded by lack of access to consistent and comprehensive data, with the following specific points being raised.

Table 10: Data Quality and Accessibility

No.	Key Points with Regard to Data Quality and Accessibility
1	Large data gaps exist within the healthcare system.
2	Where data exists it is often recorded / stored in different part of the system, making it difficult to find. It also in some instances leads to discrepancies between the data.
3	There is a need for a data dictionary with standard classifications that enable a single common language across the system.
4	Electronic health records, telehealth and tele-medicine technologies provide an opportunity to enhance an integrated patient-centred data collection process.

A number of potential improvements to the health system were also identified by participants in the workshop as summarised in the following table.

Table 11: Improvements Within and Across the System

No.	Key Points with Regard to Improvements Within and Across the System
1	Switching to day case surgery will not be uniform across the system as hospitals operate differently from each other and in some cases, focus on different areas of specialist care.
2	Establishing AMAUs, AMUs, MAUs, Minor Injury Units and Local Injury units should enhance inpatient capacity.
3	Early discharge should also enhance inpatient capacity but this requires ready access to appropriate community services.
4	There must be a system-wide focus on workforce and training as this is a major constraint on capacity.
5	Re-orienting patients to the community requires GPs having better access to diagnostics, referral guidelines and specialist opinion.
6	Patients with co-morbidities resulting from chronic illness should have a single point of contact within the healthcare system to support them in managing their conditions.
7	Establishing elective-only hospitals should have a positive impact on capacity within the acute setting.
8	A significant number of strategies, care pathways, policies and models of care; all of which outline possible solutions to capacity issues, exist. However they are not being implemented in a consistent and coherent manner nationally.
9	Any new model of care should consider the impact of prevention measures as the initial step.
10	If activity is to be shifted from the acute setting, community-based services must be suitably reconfigured, resourced, and measured.

Discussions during the workshop highlighted the issue of current levels of unmet need and unmet demand within the Irish healthcare system, with the following points being raised.

Table 12: Unmet Demand and Unmet Need

No.	Key Points with Regard to Unmet Demand and Unmet Need
1	The introduction of the healthcare card, as envisaged in Sláintecare, is likely to translate unmet need into demand.
2	Disease registers are required to provide information that could inform the development of health services to meet the needs of the population. There is little available information to accurately quantify the level of unmet need for services.
3	Shifting diagnostics to the community is likely to translate unmet need into demand.

On the subject of demographic growth the following points were raised.

Table 13: Ireland's Ageing Population

No.	Key Points with Regard to Ireland's Ageing Population
1	The introduction of the healthcare card, as envisaged in Sláintecare, is likely to translate unmet need into demand.
2	Ireland has one of the fastest rates of population ageing in Europe so the impact here will be significant.
3	In the past decade, absolute bed numbers have decreased while the demand driven by an ageing population continues to increase.
4	Older people admitted to hospital with delirium / dementia have an impact on LOS and bed utilisation. Acute hospitals are also often not appropriate settings for the management of such patients. Dedicated resources should be prioritised to support this patient cohort and to enable more care to be provided outside the acute setting.

Non-demographic and epidemiological trends were also discussed with the key points raised including.

Table 14: Non-Demographic and Epidemiological Trends

No.	Key Points with Regard to Non-demographic and Epidemiological Trends
1	Migration has a significant impact on the health system as migrants tend to be higher consumers of health services in comparison to indigenous cohorts of the same age.
2	Improved survival rates from intensive care has resulted in an increased number of patients with a range of health problems; known as post-acute Syndrome (poor mobility / physical impairment / cognitive impairment / psychiatric illness). The number of these patients is likely to increase year-on-year.
3	Population health should be central to a model of care that is based on the needs of each demographic area.

Finally, prevention of demand was addressed and the points highlighted are summarised below.

Table 15: Prevention Initiatives

No.	Key Points with Regard to Prevention Initiatives
1	There is a need to educate society about diet and physical activity across all cohorts of the population.
2	A new model of care should have a health and wellbeing component at its centre.
3	The health and wellbeing agenda should be implemented on a cross-sectoral basis, reaching into more external networks such as education, recreation and transport.
4	The health and wellbeing agenda should deliver consistent messages regarding smoking cessation, health literacy, obesity and healthy eating, physical activity and sedentary lifestyles and screening, across all relevant external networks.
5	Considerations must be made with regard to the long-term impact of preventative measures that are currently being rolled out across the system.

6.2 Summary of Bi-Lateral Engagements

In parallel to the Wave 1 workshop activity, a number of bi-lateral meetings were also held with key stakeholders in the acute and primary care, and services for older persons settings – see Appendix G for a full list of those consulted. This engagement spanned both public and private stakeholder groups and the main points of feedback received are summarised in the following tables for each of these.

Table 16: Summary of Public Provider Feedback

No.	Key Points with Regard to the Provision of Public Healthcare
1	In the acute setting, the merits of having dedicated elective facilities should be explored as this should improve productivity by removing the impact that unscheduled care can often have. This is also the case with regard to specialist centres (e.g. Cancer centres of excellence).
2	In the acute setting, there are potential efficiencies to be gained by better utilisation of Hospital Group resources to ensure that patients are always in the most appropriate setting for their condition at a given time.
3	Referral pathways from the primary to acute setting for diagnostics must be examined as more could / should be done in the community setting.
4	Rehabilitation and the management of the young chronically ill is an area where emphasis should be placed.
5	The implications and net benefits of removing private activity from the public setting must be carefully examined before implementing any such measures. There is the very real risk of diminishing revenues in the public sector and losing large cohorts of staff to private providers, exacerbating the challenges that the public acute system faces.
6	There is a significant need for investment in services for older persons care provision – step down, short and long term care, HCP, etc.
7	Access to more timely diagnostics would be of benefit across the system. This could be achieved by extending access to public services (e.g. 6 day diagnostics) and/or leveraging private provider capacity.
8	The management of vulnerable, frail elderly patients should be a priority across the healthcare system.

No.	Key Points with Regard to the Provision of Public Healthcare
9	Much more should be done in managing the chronically ill in the community, and lower acuity hospitals.
10	The way in which the NTPF is currently being used is not optimal. It is piecemeal, small scale and focused on higher volume / lower costs procedures. Recording and reporting of activity in private hospitals and the use of the same administrative coding system would also enable more transparent work between public and private settings.
11	In order to maintain current levels of capacity, there will be the need to make significant investment across the system in terms of equipment, infrastructure and resources.
12	Attraction and retention of staff across all grades is becoming an increasingly significant issue. This is related to pay and conditions, but also a frustration within the system as to how care is currently delivered.
13	The demands (capacity, capability, short term impact) of making any change to the current system must not be underestimated. Any change must be carefully scoped, planned and implemented in an incremental manner, and ideally piloted in advance of any national roll-out.
14	The primary and acute systems need to work much more closely together to enable GP care to move from episodic to continual care. This is especially the case with regard to access to diagnostics and chronic disease management currently delivered in outpatient settings. In order to do so primary care needs to be better resourced and hospitals need to proactively reach out into the community.
15	Paramedics need to be given alternatives to ED – currently almost all ambulatory call-outs end up taking patients to the nearest ED.

Table 17: Summary of Private Provider Feedback

No.	Key Points with Regard to the Provision of Public Healthcare
1	There was general agreement with the Sláintecare recommendation to remove private activity from public hospitals but it will be difficult to achieve. If successful, the outcome would most likely be translated into private healthcare becoming largely elective with the benefit of insurance being related to faster access to private elective hospital services.
2	With regard to the redirection of care to a primary setting, there should be a role for private provision in this setting also. However, issues around accreditation, recording of activity and clinical governance would all need to be addressed.
3	Private hospitals are considered more efficient than public hospitals. As part of this efficiency gain physical resources (theatres, diagnostic equipment) are utilised much more extensively in the private setting.
4	There is a delicate balance to be struck between demand and capacity. Healthcare is a supply led system so any changes must be undertaken in a controlled manner than maintains an equilibrium.
5	Whilst impossible to model, the potential future impact of technological development on demand and capacity should not be forgotten. This could be positive in terms of capacity (e.g. simplifying procedures), but also negative (e.g. increasing survival rates with associated long term care requirements).
6	There is a need for certainty on the future direction of healthcare policy and its implementation if private providers are to play an optimal role.
7	The way in which NTPF operates could be improved. Better forward planning of requirements would enable the private providers to be in a better position to respond to this need.
8	In defining and implementing any new care models, a real understanding of the control levers and associated incentives across all key stakeholders is required as this is ultimately what defines behaviours.
9	More mature private provision markets (e.g. Germany) have a greater focus on disease prevention and primary care treatment than is the case in Ireland currently.
10	Minimum Care Guidelines should be implemented across the system and their implementation and impact monitored.
11	There should be consistent recording and coding of activity across both the public and private healthcare setting and this information should be made readily available. With the implementation of ABF and common coding it could then be possible for private provides to transparently compete for public work.

6.3 Summary of International Peer Review Engagement

The DoH established an independent International Peer Review Group (see Appendix I for details of the membership) to provide an independent validation of, and international perspective on, the Review and its methodology and findings. As part of this engagement a workshop was held with the Group to discuss the approach, baseline figures and potential scenarios for consideration and the following table summarises the key points made.

Table 18: Summary of International Peer Review Group Meeting

No.	Key points made by the International Peer Review Group
1	In order to significantly change the current model of care there is the need for significant technological enablement. The key driver of demand into the future will be technological change. The increased capabilities to deliver services due to technological advancements and innovations will lead to an increase in costs due to the increased demand from the population for new services. Technological change could be the biggest driver of costs moving into the future.
2	The approach to analysing non-demographic growth could be considered generic and specific attention should be given to health technology and innovation, not just epidemiological trends.
3	Good clinical leadership is critical and will become increasingly important as models of care become more specialised. Nurses and doctors need to change the way they work and this is the critical enabler to developing a better healthcare system with infrastructural capacity focussed on facilitating this change.
4	For primary care services to respond to the challenge and opportunity of providing more care in this setting, there is a need for GP practices to consolidate in order to provide holistic and 24hr services. 24hr GP group practices (some of which are co-located with hospitals) have been shown to reduce ED demand (even where a charge is involved). This in turn requires investment in equipment, practice nurse support etc. There is a need to improve the ratio between GPs and practice nurses, improve GP access to diagnostics (it was noted that in Canterbury NZ, diagnostic test turnaround time was the same for GPs as it was for hospital-based doctors). There is also a need for Ireland to reverse the migration trends for GPs by re-orienting the system and providing doctors and nurses with appropriate staff and infrastructural support. Part of this, is changing the role of GPs, where the management of patients with multi-morbidities is taken care of by a practice nurse allowing the GP to take on more complex work.
5	With regard to using historic activity as the basis for projecting forward estimates of future activity, caution should be exercised, especially where there is a lack of data.
6	In other jurisdictions such as NZ, there is significantly more empowerment of staff and capacity to deliver activity in the non-acute setting.
7	Disease based programmes tend to be compliance based – patient centric programmes are more outcome focused. Don't think of it as chronic disease management, think of it as person management. People are complex and have a variety of health needs.

Table 18 Continued: Summary of International Peer Review Group Meeting

No.	Key points made by International Peer Review Group
8	Dedicated elective centres work if there is a sufficient volume of activity. International experience shows that, in some cases, the answer wasn't extra capacity, but rather to better rationalise the services on offer.
9	The treatment of dementia patients in the acute setting should be minimised to the maximum extent possible.
10	Bed stock acts as a buffer when a hospital isn't working properly, or there are issues outside the hospital. Focusing purely on bed numbers as a unit of resource is therefore overly simplistic. There should be a strong focus on improving efficiencies within the hospitals rather than focussing on the number of beds. International experience indicates that there is still a lot of wasted capacity in hospitals. Additionally, there should be a focus on 'pulling patients' through the acute system as this puts the focus on the care pathway.
11	In modelling any scenarios it is important to note that there will be a cost of change; a transformation cost that could have a potential negative impact on care during the transition. Particularly important to take account of is the potential reconfiguration of current hospital capacity from multi-bed rooms to single bed rooms (to reduce infection risk etc.) and the associated cost of doing so.
12	Primary care data is lacking in Ireland. Good primary care data is key to gaining real efficiencies in the system. Additionally, it was noted that electronic health records in places like Canterbury, NZ led to a big productivity increase.
13	In other jurisdictions such as NZ, there is significantly more empowerment and capacity to deliver activity in the non-acute setting.
14	The international trend is to move away from increasing bed capacity. While this will lead to a degradation of acute capacity over time, it can be rationalised by building newer, more efficient replacement hospital capacity.
15	Capital investment in healthcare should not only take account of beds and buildings but should focus also on ICT capabilities and data. Further, investment infrastructure could be contingent on modernisation and reconfiguration of health processes and services.
16	In the medium term, Ireland should focus on reconfiguring hospitals, dealing with the public/private relationship and consultant contracts. In the longer term, the focus should then move to demand management.

6.4 Identification of Potential Scenarios

Based upon the outputs of the policy review, Wave 1 workshop, bi-lateral meetings, exchange with the International Peer Review Group and a provisional assessment of impact in terms of influencing baseline requirements, a total of three scenarios were selected for incorporation into this report. The table below summarises each of these scenarios.

Table 19: Overview of Scenarios Considered for Further Analysis

#	Scenario
1	Improved health and wellbeing.
2	Improved Model of Care Centred around Comprehensive Community-Based Services.
3	Improved Efficiency – both at hospital group and individual hospital level.

For more detail regarding each scenario, please see Section 7.

6.5 Identification of Potential Scenarios

These scenarios (along with some others that ultimately were not included in this report) were then further tested in a second (Wave 2) workshop, the attendance for which can be found in Appendix G of this report.

Initially an update of the baseline and modelling approach was presented and the following feedback received.

Table 20: Summary of Wave 2 Comments on Baseline Results

#	Key Points Made by Wave 2 Workshop on Baseline Results
1	ALOS figures derived from HIPE do not include trolley waiting times.
2	Critical Care activity data derived from HIPE is inaccurate. The national ISU audit has categorised 237 ICU beds instead of the estimated 419 initially reported in the Review workshop.
3	With regard to homecare resources, the number of hours per individual has been significantly reduced and this will not be reflected if the unit of measurement is number of recipients.
4	With regard to community home help, there are over 5,000 currently waiting for any form of support on this.
5	Unmet need is not reflected in the baseline.

Those present were then asked to test each scenario in terms of the following criteria and this was used to help inform and design the scenario analysis:

- Definition / hypothesis / enablers and challenges.
- Benefits to be derived and initiatives required to deliver these.
- Metrics that would be impacted.

This feedback has been reflected in the Alternative Care Models as presented in Section 7 of this report.

6.6 Summary of Public Consultation Process

The DoH carried out a public consultation on the Capacity Review which was open from 8th August to 15th September 2017. The goal of the process was to receive the experience of key stakeholders, including patients, service users and other interested parties, and to help inform the more detailed stakeholder engagement outlined above.

The DOH received 28 responses to its call for submissions. The table below contains a summary of the main themes arising from the submissions. For a full list of respondents, see Appendix J.

Table 21: Summary of Department of Health Public Consultation

No.	Key Themes from Department of Health Public Consultation
1	Shift the focus of the model of care to primary care: Almost all respondents supported an increase in primary care provision and the re-focussing of the health system around primary care. It was generally suggested that an increase in the number of GPs, the creation and continued funding of primary care centres, better access to diagnostics for primary care doctors and moving care as close to the community as possible would help to achieve this shift.
2	Focus on illness prevention and population wellbeing: Many respondents noted that the increasingly unhealthy lifestyles in Ireland, coupled with an increasing number of people with chronic diseases, required a focus on illness prevention and the promotion of healthy lifestyles. GPs, acting as gatekeepers to the health system, should have a central role in promoting wellbeing as well as good health practices which can reduce the risk of chronic health issues and infection.
3	Shift the health system focus to person-centred integrated care, particularly regarding patient flow: Almost all respondents explicitly noted that cross-sectoral working practices need to change in order to achieve an integrated person centred health care system. This could be achieved through new governance structures that incentivise integrated working practices among healthcare professionals. These integrated work practices could lead to improved patient flow and more efficient use of resources.

No.	Key Themes from Department of Health Public Consultation
4	Invest in ICT infrastructure and, in particular, eHealth: eHealth and ICT were generally viewed as critical enablers to developing a more efficient and integrated health system. This would also include improved data collection to better allow planning for population health needs.
5	Increase the number of acute hospital beds: It was generally recommended that, although the focus of the Irish model of healthcare should shift its focus to primary care, there was still a need to increase the number of acute beds in the system in order to bring Ireland in line with OECD standards. Reduced occupancy rates and reduced strain on resources would allow for better care and reduce the risk and prevalence of infections.
6	A significant increase in workforce and improved workforce planning: Increased recruitment, retention and utilisation of the skill mix of healthcare staff was also considered a critical enabler of an effective healthcare system. Many respondents argued for an increase in staff numbers, particularly doctors and nurses and noted that retention of staff is increasingly important in a borderless labour market. Equally, an increase in the training of staff and proper workforce planning would allow for a more effective utilisation of the skill mix of health staff.
7	Increased investment in mental health and services: While mental health services were outside the scope of the review, it is important to note that the Department received a number of submissions that advocated an increase in mental health infrastructure. It was recommended that more resources at a community level and care in more appropriate settings would lead both to better health outcomes for patients and service users, as well as reduced demand on emergency services.
8	Disability Services: Also outside the scope of this review, the need for investment in disability services was mentioned in several submissions. The main recommendations were the need to ensure that those with both physical and intellectual disabilities were not segregated from their community and that investment should be aimed at allowing those with disabilities to live at home (or as close to the community as possible). Further, the transition between child and adult funding needs to be smoother..

6.7 Summary

This section has provided an outline and details of key themes arising from the stakeholder engagement. Participants represented a broad range of stakeholders from across the Irish healthcare system, and this representation is reflected in the nature and extent of the key themes and feedback that emerged.

This input has formed the basis for much of the qualitative narrative in this report, as well as the basis for selecting, defining, refining and modelling alternative care scenarios detailed in Section 7.

7 IMPACT OF ALTERNATIVE CARE MODELS

There is general consensus that our health service and the current model of care is not fit for purpose. It developed at a time when episodic care was the norm and communicable diseases accounted for a large proportion of healthcare demand. The system and infrastructure was shaped around delivering this kind of care, resulting in a very hospital-centred system and a fragmentation and underdevelopment of community based services. The health system is now faced with an increasing population posing the very different challenges presented by ageing along with an increasing burden from non-communicable, mainly lifestyle related, diseases. There is no option but to reform.

There is also broad consensus that scaling the current system, as implied in the baseline scenario, is neither desirable nor likely to be feasible. Even if a massive investment in facilities were affordable, other constraints such as workforce would mean that the intended benefits – improved patient experience and outcomes – would prove elusive.

The Sláintecare report has set out an agreed vision and strategic plan to transform the Irish health service that involves the development of a more integrated health service, centred on a comprehensive community-based care model. This is a continuation but an acceleration of the direction of travel that has been set for the Irish health system over recent years, and in particular the need to shift the focus from treatment to prevention and early intervention outlined previously in both the Future Health (2012) and Healthy Ireland (2013) strategies. Sláintecare represents a commitment to healthcare reform that is unprecedented in the history of the State.

This section sets out an analysis of scenarios for future capacity needs that takes account of the potential impact of additional reforms to the system. The scenarios have been defined in a way that applies changes to different sections of the population and care pathways so that they can be combined to provide a total potential impact. **Together, the baseline and reform scenario perspectives provide the extremes for a range of possibilities for the capacity needed within the system.**

The baseline scenario involves a continuation of the current model of care, and does imply a significant investment of resource across all care settings. Most notably, the baseline scenario is capital intensive and represents the higher end of the scale for the additional investment in hospital capacity needed. The alternative scenarios all involve shifting care out of hospitals and, in that respect, represent a best case for the level of capital investment in hospital capacity needed. The three scenarios modelled in detail are:

- The impact of improved health and wellbeing, implemented through the Healthy Ireland framework.
- The shift towards an improved model of care centred on comprehensive community based services.
- Improvements in hospital (and hospital group) productivity arising from reconfiguration of services to support increased clinical specialisation, and general productivity improvements aided in part by improved availability of out-of-hospital services.

It was not possible to examine every potential change in the health system within the scope of this Capacity Review. In defining and selecting the scenarios that would be analysed, a range of additional possibilities was considered. These included considering the impact of an enhanced palliative care service, and improved provision of community based services for the under 65s with complex needs. Full consideration of these areas was not possible within the time constraints for the Review. The implications of proposals in the Sláintecare report to remove private practice from public hospitals were also not considered. This is subject to a separate review process[9].

This section provides a profile of each of the scenarios and presents the outputs generated by the modelling of each scenario. Details of the assumptions that have been made in modelling each scenario are presented in Appendix F. In the case of in-patient and adult critical care beds, the impact of reforms has only been modelled on the adjusted baseline for planned utilisation. Modelling of scenarios involved overlaying parameter assumptions for a given scenario onto baseline of service forecasts per POD. The combined impact of the three scenarios is presented in Section 7.4.

Finally, and as commented in the baseline assessment, caution as to the absolute figures must be exercised, and it is again recommended that a focus on the potential quantum of the shift in demand and capacity requirements is a more appropriate basis for interpretation.

[9]An independent impact assessment of the removal of private practice from public hospitals was announced by the Minister in October 2017.

7.1 Scenario 1: Improved Health and Wellbeing

The concept:
The scenario models the impact arising from the implementation of a broad range of health and wellbeing initiatives and policies and programmes under the Healthy Ireland framework. Rather than model specific impacts in different risk groups, especially where the evidence of impact is not sufficiently robust and scalable, the scenario takes a top-down approach and models a staged reduction in the non-demographic growth for both primary and acute care. While there may be an impact on social care, this was not modelled.

The chronic diseases cancer, cardiovascular disease (CVD), chronic obstructive pulmonary disease (COPD) and diabetes, account for 76% of deaths in Ireland. Most notably, 71% of premature deaths (under 65 years) are due to these conditions. Two out of five hospitalisations are due to cancer, CVD, respiratory disease (including COPD) and diabetes. These diseases account for three-quarters of all bed days used either directly or as a significant contributory factor.

These diseases are largely preventable. Almost 35% of cancer, 65% of cardiovascular diseases, and 80% of coronary heart disease are attributable to a number of known and preventable risk factors – smoking, high blood pressure, overweight and obesity, high cholesterol, alcohol use, physical inactivity and poor diet. Furthermore, tobacco exposure alone is responsible for 73% of COPD. Addressing the major risk factors will also have positive impacts on other health conditions, such as certain forms of dementia, falls in the elderly and other geriatric syndromes of a vascular origin.

Healthy Ireland survey results indicate the following prevalence of risk factors and unhealthy behaviours in the Irish population:

- 22% smoke
- 76% consume alcohol, over half of drinkers drink at least once a week, and 39% of drinkers binge drink on a typical drinking occasion
- 16% drink sugar sweetened drinks on a daily basis
- 62% are overweight or obese
- 32% undertake a sufficient level of physical activity
- 13% report doctor-diagnosed hypertension, 9% report doctor-diagnosed high cholesterol and 4% report doctor-diagnosed diabetes.

The Healthy Ireland framework was published in 2013 in recognition of the fact that the current health status of people living in Ireland was leading to a costly and unhealthy future. The framework is supported by all government departments. A whole-of-government, whole-of-society approach recognises that determinants of health are modified by measures that are managed by many government sectors as well as by other actors in society. Actions to bring about improved health and wellbeing are not only required across sectors and society but also at different levels, for example at the individual level and at the structural level.

Health and wellbeing initiatives improve health outcomes for people. For example there are many health benefits associated with smoking cessation and, although there is a considerable time lag in reduction of population levels of lung cancer incidence, many other health benefits of smoking cessation occur within a relatively short period of quitting. Evidence has already been gathered on the health benefits, including a reduction in hospital admissions, following reduced exposure to second-hand smoke (SHS) after the introduction of smoking bans. We have seen how public health initiatives have reduced the smoking prevalence in our national population and the prevalence of drink driving, and how vaccination programmes have reduced the incidence of vaccine-preventable diseases. Reducing the prevalence of binge drinking will immediately reduce the incidence of alcohol-related injuries, and avoiding smoking and alcohol use in pregnancy will prevent adverse pregnancy and neonatal outcomes. Early childhood intervention to prevent the accumulation of adverse childhood experiences will improve health and wellbeing across the life course and initiatives to prevent childhood obesity will reduce the risk, for example, of cardiovascular disease in adulthood. Initiatives aimed at reducing health inequalities will impact on the premature years of life lost amongst people in lower socio-economic groups. A summary of the scenario is set out in the figure below.

Figure 43: Summary of Reform Scenario 1

Sector of change: Primary and Acute	Timeline/phasing: Long Term, rising impact over time
Requirements include: • Continued implementation and increased investment in Healthy Ireland • Screening and brief intervention across all healthcare settings and appropriate staff training; implementation of the Making Every Contact Count (MECC) programme • Health promotion and other initiatives, including legislation, regulation and taxation aimed at unhealthy lifestyle behaviours • Smoking – cessation services and alcohol addiction and rehabilitation services • Specialist services for the management of obesity • Cardiac/pulmonary rehabilitation to patients with existing diseases • Population-based screening (eg cancer screening) and vaccination programmes	**Benefits include:** • Improved health outcomes and improved wellbeing • Reduction in population prevalence of disease risk factors such as smoking, obesity, inactivity and excess alcohol consumption • Reduction in lifestyle related diseases and co-morbidities • Increase in healthy life expectancy • Reduction in use of acute hospital and acute episodic primary care services • Improved mortality rates from lifestyle related diseases and reduction in premature years of life lost

What is already happening in Ireland:

Healthy Ireland, our national framework for improved health and wellbeing, recognises the fundamental value of health and wellbeing to individuals, communities and society as a whole and acknowledges that to achieve a healthy society where everyone can benefit, every section of society must play its part. One of its four goals aims to improve levels of health and wellbeing at all stages of a person's life, to decrease the prevalence of unhealthy behaviours that contribute to chronic disease and to increase the degree to which diseases and conditions are either prevented, or detected early to allow for successful intervention. By adopting a life course approach to promoting health and wellbeing – focusing attention on behavioural risk factors and effective interventions at key transition points in a person's life – *Healthy Ireland* seeks to impact positively on critical health indicators. Healthy Ireland also focuses on reducing health inequalities, recognising the real societal benefits that this would deliver.

The understanding of the potential of a whole-of-government and whole-of-society approach and the political commitment and collaboration shown to date have been acknowledged in the Sláintecare report (2017). To support the implementation of Healthy Ireland, the HSE published Healthy Ireland in the Health Services, a National Implementation Plan 2015-2017, and led to the development of seven National Priority Programmes. Health and wellbeing goals are incorporated in the service planning process and the HSE clinical strategy and programmes.

Figure 43: Summary of Reform Scenario 1

Modelling the scenario:

This scenario has been modelled using the following assumptions:

1. All age cohorts have been included in the modelling of this scenario.
2. The areas that were considered to benefit most from positive lifestyle interventions are:

Acute-

- In all PODs, except Adult Critical Care (ACC), reduce non-demographic growth by -0.5% in each of the years from year 6 to year 15.

Primary-

- In all PODs, reduce non-demographic growth by -0.5% in each of the years from year 6 to year 15.

The results of the forecast for Reform Scenario 1 and the baseline are shown in the table below. Note that only the key PODs that are impacted by the modelling of the scenario have been listed.

Table 22: Overview of POD Capacity for Baseline and Scenario 1

Baseline Scenario					
Year	2016	2021	2026	2031	2016-31
GP (WTE)	3,570	3,990	4,460	4,970	1,400
Practice Nurses (WTE)	1,400	1,500	1,700	1,900	500
Public Health Nurses (WTE)	1,500	1,800	2,000	2,200	700
AHP – PHY	540	610	670	740	200
AHP – OT	500	570	610	660	160
AHP – S&LT	470	480	450	440	-30
AMU Beds	430	470	530	590	160
Day Case Beds	2,140	2,550	2,820	3,140	1,000
IP Beds (85% Occupancy)	10,500	13,000	14,500	16,300	5,800
ED Demand	1.29m	1.35m	1.41m	1.49m	0.20m

Baseline Scenario					
Year	2016	2021	2026	2031	2016-31
OP – First Appt (OPFA)	0.97m	1.16m	1.14m	1.23m	0.26m
OP – Follow-Up Appt (OPFU)	2.4m	2.63m	2.88m	3.15m	0.75m

Reform Scenario 1 Improved Health and Wellbeing						
Year	2016	2021	2026	2031	Δ 2016-31	Sc 1 Effect
GP (WTE)	3,570	3,990	4,350	4,730	1,160	-240 ▼
Practice Nurses (WTE)	1,400	1,500	1,700	1,800	400	-100 ▼
Public Health Nurses (WTE)	1,500	1,800	1,950	2,100	600	-100 ▼
AHP – PHY	540	610	650	700	160	-40 ▼
AHP – OT	500	570	590	630	130	-30 ▼
AHP – S&LT	470	480	440	420	-50	-20 ▼
AMU Beds	430	470	520	560	130	-30 ▼
Day Case Beds	2,140	2,550	2,750	2,980	840	-160 ▼
IP Beds (85% Occupancy)	10,500	13,100	14,200	15,500	5,000	-800 ▼
ED Demand	1.29m	1.35m	1.38m	1.41m	0.12m	-0.08m ▼
OP – First Appt (OPFA)	0.97m	1.16m	1.12m	1.18m	0.21m	-0.05m ▼
OP – Follow-Up Appt (OPFU)	2.40m	2.63m	2.81m	3.00m	0.60m	-0.15m ▼

Enablers and Challenges to implementing this scenario:

Key whole-of-government actions and enablers range from legislative interventions and other actions with a specific focus on health outcomes such as tax on sugar sweetened beverages, minimum unit pricing for alcohol, plain packaging for cigarettes; and others such as educational curricula and active transport which have a focus on educational attainment and infrastructure as primary outcomes but in respect of which positive health outcomes may ensue.

Structural and implementation enablers include:

- The Healthy Ireland Network and the Healthy Cities and Counties Network.
- Full implementation of the Making Every Contact Count (MECC) programme, with health professionals using their routine consultations to empower and support people to make and sustain healthier choices.
- Wide breadth of staff trained to deliver screening and brief healthcare interventions across all settings.
- The HSE National Priority Programmes addressing:
  - Healthy Childhood; Healthy Eating and Active Living
  - Alcohol consumption
  - Tobacco use
  - Sexual Health and Crisis Pregnancy
  - Positive Ageing
  - HSE Staff Health and Wellbeing
- The National Screening Service (NSS), (BreastCheck, CervicalCheck, BowelScreen, Diabetic RetinaScreen) and the National Immunisation Programme.
- The HSE's Public Health Protection Service, and the Environmental Health Service

The challenges to implementing these programmes and initiatives include:

- sufficient and sustained focus on the broader health determinants across government and other relevant sectors and agencies.
- equitable access to prevention and treatment services
- capacity in primary care services.
- adequate number of appropriately trained staff and multidisciplinary teams.
- enactment of relevant legislative enablers, e.g. the Public Alcohol Bill and introduction of other measures such as tobacco taxation and spatial planning.
- awareness amongst the general population of the importance of health and wellbeing, participation in preventative services and the need for individual responsibility.

Evidence Summary:

Some of the key evidence sources include:

- a range of policy documents published under the Healthy Ireland umbrella, such as Tobacco Free Ireland, Get Ireland Active!, the National Physical Activity Plan, and A Healthy Weight for Ireland, the Obesity Policy and Action Plan.
- Better Outcomes Brighter Futures the Policy Framework for Improved Outcomes for Children and Young People.
- the National Cancer Strategy 2017-2026. The proportion of cancer incidence attributable to modifiable lifestyle and environmental factors is estimated to be in the 30% to 40% range.
- The National Dementia Strategy addresses the modifiable lifestyle and cardiovascular risk factors which can beneficially impact on risk and time of onset of dementia.
- The National Maternity Strategy 2016-2026: Creating a Better Future Together has identified how the maternity services can support behaviour change, in particular around reducing harmful lifestyle behaviours.
- The Wanless Report in 2002 in England stressed the possible benefits of increased investment in health promotion and disease prevention.
- The modelling of this scenario was informed by analysis undertaken by the HSE and the Department for the purposes of the Capacity Review.

Evidence set out below points to a population level impact on demand from a range of potential initiatives. Recognising that direct causality will be difficult to apply to activity data, and that some areas may have an overlapping impact, the analysis has modelled a general impact across the population that is consistent with the scale of impact from the individual studies.

Table 23: Summary of Evidence for Scenario 1

Area	Evidence	Source
Obesity	Overall, by lowering BMI by one unit across the population, in analyses of both genders combined, it is expected that there would be 28 fewer cases of chronic disease (here, chronic disease includes hypertension, raised cholesterol, lower back pain, osteoarthritis, diabetes, and asthma) per 1,000 population. Broken down by gender, it is expected that overall there would be a reduction in chronic disease of 26 (4%) and 28 (4%) cases per 1,000 population for men and women respectively.	Kearns K, Dee A, Fitzgerald A, Doherty E, Perry I. Chronic disease burden associated with overweight and obesity in Ireland: the effects of a small BMI reduction at population level. BMC Public Health. 2014;14(1):143.
Smoking	4.9% of admissions and 8.1% of bed days are attributable to smoking related disease. Based on a 25%-50% reduction in smoking, the absolute reduction in capacity requirement (based on bed days) would be of the order 0.5%-1%.	Sheridan, A and Kavanagh, P (forthcoming). State of Tobacco Control in Ireland. HSE Health and Wellbeing.
Alcohol	It was estimated that 13% of all discharges for partially attributable acute conditions and 17% of all discharges for partially attributable chronic conditions can be attributed to alcohol. It is estimated that if a 15% reduction in litres of pure alcohol consumption per capita was achieved there would be a 0.8% reduction in total hospital discharges.	Submission from CMO's Office, Department of Health.
Cancer	Combining four key protective lifestyle behaviours: being active, not smoking, drinking alcohol within the recommended guidelines and eating recommended amounts of fruit and vegetables could add up to avoid up to 90% of type-2 diabetes, 80% of coronary heart disease and at least 40% of cancers.	WHO. Gaining Health, The European Strategy for the Prevention and Control of Non-communicable Diseases. Copenhagen: WHO Regional Office for Europe, 2006. Peto R. The Fraction of Cancer Attributable to Lifestyle and Environmental Factors in the UK in 2010. British Journal of Cancer 2011;Volume 105(S2 (Si-S81)). Cited in the Healthy Ireland Strategy

7.2 Scenario 2: Improved Model of Care Centred around Comprehensive Community-Based Services

The concept:

This scenario considers the combined impact of a range of reforms aimed at improving the model of care. It is focused on the cohort of patients whose care needs are chronic and complex, and who would most benefit from an integrated model of care. This involves proactive care planning and shifting the focus of care provision to out-of-hospital settings.

This scenario aims to take a holistic view of care that can be provided to a distinct demographic. There are many patient groups to whom this may apply. It was decided to focus this scenario on the over-65 population given the high level of utilisation of healthcare services by this population. It considers the following:

- Increase in proactive management of chronic diseases in general practice
- Increase in provision of homecare, short term respite and step down care, and other community based services such as CITs and public health nursing
- Introduction of cohorted wards for older people in hospitals and comprehensive geriatric assessments

Figure 44: Summary of Reform Scenario 2

Sector of change: Cross System	Timeline/phasing: Medium Time
Required Initiatives: • Coherent reform strategy to enable a sustained shift in model of care • Development of and investment in comprehensive and integrated community based services • Greater role for general practice and community nursing in chronic disease management • Enhanced provision of timely homecare, short term residential care, AHPs and hospital-at-home type services (CIT, OPAT) • National adoption of ambulatory emergency care model • Increased use and coverage of comprehensive geriatric assessments • Improved access to specialist wards for older people and cohorted wards • Development of community-based diagnostic facilities • Increased access to social care; • Enhanced discharge planning	**Benefits include:** • More appropriate care, closer to home • Better experience for patients • Reduction in ambulance call outs • Reduction in emergency department (ED) attendances • Reduction in emergency admissions • Reduction in LOS • Reduction in delayed discharges

What is already happening in Ireland:

The move to an integrated model of care focused on meeting the needs of people with chronic conditions and co-morbidities has been a core part of health policy in Ireland for some years, and has been reaffirmed by the recommendations of the Sláintecare Report:

- Integrated models of care were one of the four pillars of the 2012 *Future Health* strategy and have been carried forward into the development of strategies for Primary Care and Services for Older Persons.
- The HSE's National Clinical Programmes include a set of four integrated care programmes, including one on older people and another on prevention/management of chronic disease.
- The Emergency Medicine (EMP), Acute Medicine, and Surgery National Clinical Programmes have been developing new joint models of care for the acute floor, which would incorporate interventions such as Rapid Assessment and Treatment and Ambulatory Emergency Care targeted at reducing admissions and improving patient flow.
- The National Clinical Programme for Older People has supported proposals for the introduction of a Comprehensive Geriatric Assessment, and validated the anticipated benefits from this approach in respect of proposals implemented in Tallaght Hospital.
- The Department is developing proposals on the future funding and regulation of home care.

- The Sláintecare report urges the development of a more integrated health service, centred on a comprehensive community-based care model and provides the framework within which health services should develop over the coming decade.

Modelling the scenario:

For the purposes of the Capacity Review, modelling of this scenario was confined to the 65+ age cohort. This group represents 13% of the population but accounts for approximately one third of recorded healthcare activity at present. By 2031, this cohort is expected to grow to 19% of the population and is anticipated to account for approximately one half (50%) of all healthcare activity.

This scenario has been modelled using the following assumptions:

1. Development of a Comprehensive Primary and Community Care Service (based on bringing capacity across the system up to the level available in the CHO with highest levels of activity per head of population (adjusted for significant outliers) by:
    - More proactive management of chronic disease in General Practice (this includes a 30% Increase in Practice Nurse activity, 2 scheduled GP appointments per year (risk stratified by age cohort), and a shift in some activity from GP to nurse)
    - 20% Increase in Public Health Nurse activity
    - 30% increase in Home Care
    - 20% Increase in Short term residential care
    - 30% increase in CIT services
2. Based on international evidence of the impact of the development of comprehensive community care services for older age cohorts, the following assumptions have been made:

15% reduction in ED admissions and Medical NEL admissions (for over-65s).

5% reduction in medical EL admissions (for over-65s)

3. Introduction of cohorted wards for older people via:

Cohorting older people on dedicated wards with enhanced staffing (Note that the associated hospital workforce requirements are not modelled).

Reduce LOS for 65–74 age cohort and 75+ age cohort to the national median for each hospital group (max 20% reduction); assume 5% further reduction in LOS for any HG already at median.

4. The baseline scenario for long-term residential care assumes a continuation of the trend of people entering care at later ages and shorter lengths of stay as a result of a continued move to alternative care models like homecare and telecare. No adjustments have been made to long-term residential care demand in the reform scenario over and above the trend projected in the baseline scenario.

The results of the forecast for Reform Scenario 2 and the baseline are shown in Table 24. Note that only the key PODs impacted by the modelling of the scenario have been listed.

Table 24: Overview of POD Capacity for Baseline and Scenario 2

Baseline Scenario					
Year	2016	2021	2026	2031	Δ 2016-31
GP (WTE)	3,570	3,990	4,460	4,970	1,400
Practice Nurses (WTE)	1,400	1,500	1,700	1,900	500
Public Health Nurses (WTE)	1,500	1,800	2,000	2,200	700
AHP – PHY	540	610	670	740	200
AHP – OT	500	570	610	660	160
Residential Care ST Beds	3,800	4,300	4,900	5,600	1,800
HCPs (per month)	15,600	19,000	22,100	26,600	11,000
HH Hours-public (millions p.y.)	10.6m	12.5m	14.8m	17.8m	7.2m
IP Beds (85% Occupancy)	10,500	13,000	14,500	16,300	5,800
ED Demand	1.29m	1.35m	1.41m	1.49m	0.20m

Reform Scenario 2 Improved Model of Care Centred around Comprehensive Community-Based Services						
Year	2016	2021	2026	2031	2016-31	Sc 2 Effect
GP (WTE)	3,570	3,930	4,320	4,820	1,250	-150 ▼
Practice Nurses (WTE)	1,400	1,900	2,400	2,700	1,300	+800 ▲
Public Health Nurses (WTE)	1,500	1,900	2,300	2,600	1,100	+400 ▲
AHP – PHY	540	650	750	830	290	+90 ▲
AHP – OT	500	600	690	750	250	+90 ▲
Residential Care ST Beds	3,800	4,500	5,400	6,200	2,400	+600 ▲
HCPs (per month)	15,600	21,500	28,000	33,800	18,200	+7,200 ▲
HH Hours-public (millions p.y.)	10.6m	14.1m	18.8m	22.6m	12.0m	+4.8m ▲
IP Beds (85% Occupancy)	10,500	12,400	12,900	14,400	3,900	-1,900 ▼
ED Demand	1.29m	1.33m	1.36m	1.43m	0.06m	-0.06m ▼

Enablers and Challenges to implementing this scenario:

There are multiple enablers for this scenario and it is possible that some components may be phased in or implemented separately. However, the overall impact is likely to require a coordinated approach which optimizes patient flow to avoid blockages that would limit the potential benefits. The key enablers for this change include:

- Investment in the redesign and implementation of integrated service provision for older people across primary care, acute hospitals and services for older persons – with a case management approach, a focus on caring for people outside of the acute setting and providing dedicated specialist teams / wards when in hospital.
- Increasing provision of support services in the community targeted at reducing admissions; including services for older persons, community care (e.g. public health nursing, OT and physiotherapy), and wellbeing activities.
- Multi-disciplinary teams in primary care focussing on supporting patients with chronic disease.
- Increased eHealth infrastructure including the ability to share care plans, share patient records and conduct risk stratification. It may also extend to include improving patient access to digital health services.
- Investment in promoting patient self-care and improving healthy behaviours, through information and education, e.g. pulmonary rehabilitation classes and expert patient programmes for diabetes.
- Increasing resources in acute wards for older people, upskilling the workforce to address the specific and comprehensive needs of older people and early identification and assessment of older patients, particularly the frail elderly.
- Enhancing social care provision to provide timely step down and home care support, including rapid response community intervention teams able to adopt a 'discharge to assess' approach to getting patients home promptly and with the right support. This will require strong links between acute and community care providers.
- As demand grows for residential care, there should be an expectation that some productivity improvements would be introduced. For long term residential care, the additional capacity is likely to involve a range of alternative service models such as sheltered housing and assisted living communities.

The scenario raises a number of potential implementation challenges:

- The scale of change envisaged will require reform across all aspects of our health services. The reform programme will need to be properly managed and financed, and front line staff will need to be supported in delivering these reforms. There will be significant impacts for workforce, both in terms of numbers and skills-mix.
- The shift of care into primary care settings will require a multi-disciplinary approach to provide a holistic services addressing complex needs, typically delivered from primary care centres that give GPs access to minor procedure rooms, diagnostic services and a range of therapies. For example co-locating podiatry, dietician and optometry services alongside GPs and specialist nurses would support a one-stop-shop approach to managing diabetes. This will require changed work practices.
- The precise impact and opportunity will vary by age/ location, especially in more remote areas.
- There are potentially significant workforce implications for the number and type of clinical staff needed in hospitals to deliver the new models of care, notably at the ED 'front door' and in cohorted older people's wards.

- Care planning and effective risk stratification are a key enabler and will be dependent on the successful introduction of national, integrated eHealth solutions.
- The impact of dementia on services may increase the challenge and need specific provision in the community where currently there is limited specialist mental health service capability.
- Progress may be difficult to identify, as improvements may be dwarfed by a backdrop of increasing demographic pressures.
- If Ireland is to follow other international health systems that aspire to address the same issues through models such as accountable care[10] and the primary care home[11], there will be a significant dependence on activity-based funding to be extended beyond hospitals, and ideally to population based localities incorporating acute, GP and community care services.
- The ability to recruit and retain staff in homecare services, as the economy in Ireland is returning to a full-employment, will be crucial to implementation.

Evidence Summary:

There is a broad range of international evidence to support the move to an integrated system of care. Much of the evidence points to changes in outcomes, with more limited information on the resource implications of the move. In particular there is evidence to support:

- Reduction in ED attendances and admissions by providing improved access to GPs and providing enhanced care packages to care home residents.
- Complex community-based interventions to improve physical function and maintain independent living for older people.
- Chronic disease management programmes leading to decrease in admissions, readmissions and ALOS.
- Cohorting of older people in dedicated wards leading to reduced ALOS and improved outcomes in terms of final destination on discharge (home vs residential care), and improved discharge planning, including 'discharge to access'.

Evidence below points to areas where the potential for improvements in performance from the better management of patients with complex co-morbidities can be found.

[10] Accountable Care is an approach where several healthcare organisations agree to provide all health and social care for a given population with the aim of improving outcomes while reducing the total cost of care.

[11] Primary care home is an innovative approach that brings together a range of health and social care professionals to work together to provide enhanced personalised and preventative care for their local community.

Table 25: Summary of Evidence for Scenario 2

Area	Evidence	Source
ED	Care home residents who received an 'enhanced' care package, which includes regular visits from a named GP, had 23% fewer emergency admissions and 29% fewer A&E attendances compared to people in other parts of the country	https://www.england.nhs.uk/2017/04/principia-vanguard-reduces-ae-attendances-by-29-per-cent-for-care-home-residents/
Admissions	Controlling for patient characteristics, the report estimated that if patients saw their most frequently seen GP two more times out of every 10 consultations, this would be associated with a 6% decrease in admissions.	*Briefing: Reducing hospital admissions by improving continuity of care in general practice" Sarah Deeny, Tim Gardner, Sally Al-Zaidy, Isaac Barker, Adam Steventon*
Admissions and ALOS	Complex interventions can help elderly people to live safely and independently, and could be tailored to meet individuals' needs and preferences. Interventions reduced the risk of not living at home, reduced nursing-home admissions, reduced risk of hospital admissions and improved physical function but did not change risk of death.	*Complex interventions to improve physical function and maintain independent living in elderly people: a systematic review and meta-analysis Andrew D Beswick, et al Lancet. 2008 Mar; 371(9614): 725–735. doi: 10.1016/S0140-6736(08)60342-6*
Admissions, ALOS	After both 12 and 18 months Chronic disease management program (CDMP), treatment members displayed decreases in admissions, readmissions, and ALOS after 18 months versus the comparison group; magnitude of impact increased over time for these 3 measures.	*Impact of a Chronic Disease Management Program on Hospital Admissions and Readmissions in an Australian Population with Heart Disease or Diabetes G. Brent Hamar, et al*
Admissions	The results of hundreds of clinical studies show a nearly 20 percent reduction in hospital admissions, and other benefits, with clear commonalities between successful programs.	*"The evidence for integrated care" – McKinsey & Co 2015*

Area	Evidence	Source
Community intervention	Evidence cited includes: Community Prevention of Admission Team – Less than 10% of patients assessed by the service are admitted to hospital while under the care of the service Rapid Response Services – 80-94% of patients referred avoided an admission	*"Avoiding A&E through Rapid Response Teams and See and Treat Models, A rapid review of existing evidence", October 2016, Michelle Woodward, Natalia Proctor*
Cohorting Older people	Patient admitted to an acute geriatric unit had a reduction in LOS (mean difference -1.01 days)	*"Efficiency of acute geriatric units: a meta-analysis of controlled studies". [Article in Spanish] Baztán JJ1, Suárez-García FM, López-Arrieta J, Rodríguez-Mañas L; Rev Esp Geriatr Gerontol. 2011 Jul-Aug; 46(4): 186-92. doi: 10.1016/j.regg.2011.02.005. Epub 2011 Jun 29.*
Cohorting Older people	A case for cohorting older people on a dedicated ward supported by the national Clinical Lead for Older People targeted a reduction in ALOS from 30 to 22.5 days	*"Review of the benefits of the Irish Hospital Redesign Programme at Tallaght", HSE Special Delivery Unit 2015*
Discharge planning	Assuming there is no overlap with the reductions in NEL LOS achieved through other in-hospital initiatives – discharge planning reduced LOS (mean difference – 0.91 days) and readmissions (RR 0.85, 0.74-0.97)	*"Discharge planning from hospital to home"; Shepperd S1, McClaran J, Phillips CO, Lannin NA, Clemson LM, McCluskey A, Cameron ID, Barras SL. ; Cochrane Database Syst Rev. 2010 Jan 20;(1):CD000313. doi: 10.1002/14651858.CD000313.pub3*
Discharge to assess	Discharge to assess reduced the NEL older patients' length of stay by three days in the acute setting and 17 days in the community (short term residential) setting	*"Case studies: Focus on improving patient flow", NHS Improvement, July 2017*

Scenario 3: Hospital Productivity Improvements

This scenario incorporates two related productivity improvement components, modelled separately and then combined to show the overall potential for change within the acute sector to deliver improved outcomes and more effective use of resources. The two components of this scenario are:

- ***Service reconfiguration*** to deliver care pathway improvements at a Hospital Group or national level. These improvements typically enable greater clinical sub-specialisation by bringing together demand from across the region/group, offering both improved outcomes and more efficient use of resources. Reconfiguration may also entail establishing elective specialist centres to enable those services to operate in isolation from the disruptive impact of non-elective demand. [*It is worth noting that a small number of elective hospitals exist currently, such as Cappagh Hospital and SIVUH; in other Model 2 hospitals such as Roscommon and Nenagh, elective care is protected given the fact that these hospitals do not have 24/7 EDs.*]
- ***Improvements to enhance patient flow*** through the hospital, with corresponding improvements where required in primary care services.

These may have similar outcomes but will have significantly different implications in terms of the change programme needed to deliver improvements.

7.3.1 Scenario 3A: Hospital Group / National Care Pathway Improvements

The concept:
The hospital group/national care pathway improvements scenario is focused on the potential for improvements in the acute model of care to deliver improved outcomes, quality of care and more efficient use of resources. This could involve the following:

- A move from a full range of services provided in all similar hospitals towards greater specialisation (or concentration of services), bringing together the larger case load needed to make greater specialisation viable, while also making better use of smaller more local hospitals for low complexity / high volume elective services and step down. It will also involve greater collaboration and coordination at the hospital-community interface of the care pathway. Typically, it will involve a clinical network that spans a hospital group or larger region. It is important to note that the main driver for change is patient safety and quality of care, but benefit may also be had in terms of using current and new capacity more effectively.
- Measures to ensure a better separation of elective and non-elective activity, including the development of new stand-alone elective acute care facilities.

Figure 45: Summary of Reform Scenario 3A

Sector of change: Acute care	**Timeline/phasing:** Medium to Long Term
Required Initiatives: • Continued implementation of Hospital Group policy • Reconfiguration of service into networks (major trauma centres, stroke, complex surgery, cancer) • Elective specialist centres – co-located with non-elective centres but separately managed (elective orthopaedics, ophthalmology, and oncology) • Better use of Model 2 hospitals for low complexity / high volume elective and step-down services	Benefits: • Improved quality outcomes, patient safety and better use of resources by strategic organisation of acute hospital capacity • Increased efficiency through split of scheduled and unscheduled care • Higher productivity by improved elective patient flow, isolated from the pressures created by the variations in urgent care • Reduced waste from cancellations • Knock-on effect of increased productivity in reducing waiting times and improving the availability of outpatient appointments

What is already happening in Ireland: The integration of national care pathways has long been a goal of the Irish healthcare system. Integrated care offers the potential for improved quality in terms of clinical outcomes and patient experience, as well as greater efficiency from economies of scale. The Hospital Groups Report and the Smaller Hospitals Framework provide a clear framework for overall hospital system development. Other recent policies have also set out more specialised roles for the Models 3 & 4 hospitals – most notably, the work done to establish stroke networks and ongoing changes outlined in the recent Cancer, Trauma and Maternity Strategies. These ongoing priorities were also reflected in the Sláintecare Report which also acknowledged the continuation of the HSE's National Clinical Programmes, including in particular stroke, trauma & orthopaedic surgery, and ophthalmology, which are progressing towards changing how care is delivered in specialist areas.

It is difficult to assess the capacity implications at a national level of reconfiguration or concentration of some hospital services or the implementation of all of the policies mentioned in the previous paragraph.

Modelling the scenario:
This scenario is based on the following key changes arising from reconfiguring services into networks:

- 10% of day case surgery moving to OPD and primary care
- A resultant reduction in LOS for IP surgery due to better patient flow arising from separation of IP EL and NEL
- Capability to operate IP EL at higher occupancy rates (i.e. 90% instead of 85%)

The results of the forecast for Reform Scenario 3A and the baseline are shown in the table below. Note that only the key PODs that are impacted by the modelling of the scenario have been listed.

Table 26: Overview of POD Capacity for Baseline and Scenario 3A

Baseline Scenario Year	2016	2021	2026	2031	Δ 2016–31
GP (WTE)	3,570	3,990	4,460	4,970	1,400
Day Case Beds	2,140	2,550	2,820	3,140	1,000
IP Beds (85% Occupancy)	10,500	13,000	14,500	16,300	5,800
OP FA (demand)	0.97m	1.16m	1.14m	1.23m	0.26m
OP FU (demand)	2.40m	2.63m	2.88m	3.15m	0.75m

Reform Scenario 3A Hospital Group / National Care Pathway Improvements Year	2016	2021	2026	2031	Δ 2016–31	3A Effect
GP (WTE)	3,570	4,000	4,470	4,990	1,420	+20 ▼
Day Case Beds	2,140	2,520	2,760	3,080	940	-60 ▼
IP Beds (85% Occupancy)	10,500	12,900	14,300	16,100	5,600	-200 ▼
OP FA (demand)	0.97m	1.17m	1.16m	1.25m	0.28m	+0.02m ▲
OP FU (demand)	2.40m	2.63m	2.88m	3.15m	0.75m	+ – 0

Enablers and challenges to implementing this scenario:

There are a number of distinct enablers for this scenario, some of which may be introduced individually or as part of a phased approach. These would require coordination and effective governance at both national and hospital group level to maximise the benefit of the changes. The key enablers for this scenario include:

- Co-operation of hospitals within Group structures to form an integrated service which optimises effectiveness and efficiency in care delivery across the Group.
- Increased specialisation, with individual hospitals focusing on specific services.
- Establishing further elective specialist centres co-located with, but separately managed to, non-elective centres, or achievement of better separation with current hospitals.
- Implementation of the recent national strategies in areas like cancer, maternity and the forthcoming policy on trauma.
- Appropriate funding incentives exist or are introduced and are aligned across acute, primary and social care settings.
- Better access to diagnostics through longer opening hours, and access from primary care.
- Integrated eHealth services to support sharing of patient information and enable effective transfers of care between settings.

This scenario raises the following potential challenges to its full implementation:

- There are limits to the extent that IP EL and NEL activity can be separated. Elective centres need access to a wider range of acute care services to deal with potential complications from co-morbidities. Furthermore, elective beds do provide "escalation" bed capacity during peak ED periods. Non-elective sites would lose some of the current benefit of having the flexibility to utilise elective beds to deal with pressures from the ED.
- Sites that provide undifferentiated ED services will have many specialities that need to respond to time-critical emergency presentations, for example trauma and orthopaedic surgery and interventional cardiology. Therefore to provide a safe and sustainable service, there is a need for sufficient consultants to provide a viable on-call rota.
- Resistance to the relocation of certain services from sites may arise from staff, patients and the public alike and will need effective supporting analysis, a clinically-led case for change and effective communication by system leaders.
- The precise quantification of improvements will be challenging in the near term due to the current inability to effectively track where patients are being treated (in the absence of full implementation of the planned Individual Health Identifier).
- Implementation will need to take account of the seasonal variations in emergency activity and potential short-term loss of capacity during transition.
- Securing the benefits from additional capacity may prove elusive as enhanced services may reveal previously unmet needs.
- Maintaining clarity on the role of smaller hospitals and those hospitals with historic difficulties attracting staff will be particularly important.

Evidence Summary:

- Although not modelled within this Review, there is good evidence for the transfer of major trauma from hospitals to major trauma centres resulting in a reduced LOS in the major trauma centre and increased need for rehabilitation outside of the centre.
- There is evidence that dedicated elective centres can operate more efficiently and at safe higher levels of bed occupancy (90%).
- There is limited evidence available in relation to the capacity impacts of whole-hospital reconfiguration. There are good arguments on quality grounds for centralising/concentrating some hospital services or at least providing services on a more networked basis. However, this does not necessarily lead to a reduction in LOS or an impact on capacity requirements at a system level.

Table 27 Summary of Evidence for Scenario 3A

Area	Evidence	Source
Elective orthopaedic	Specialising in particular services (e.g. elective orthopaedic surgery) to build up expertise and gain reputation. The main reason to concentrate these specific services is to obtain efficiency gains. Since there is no competition with unplanned care, these services can also be better carried out as planned (i.e. care is not postponed because of interruptions by unplanned care).	Required Hospital Capacity In 2025 And Criteria For Rationalisation Of Complex Cancer Surgery, Radiotherapy And Maternity Services, C VAN DE VOORDE et al, Belgian Healthcare Knowledge centre KCE Report 289Cs, 2017.
Trauma centres	Nathens and colleagues suggested that having minimum volumes of major trauma cases per year was associated with a significant improvement in outcome in terms of mortality and length of stay. The authors recommended the relocation of trauma to specific regional centres for those patients likely to have an adverse outcome.	The effect of introducing a Trauma Network on patient flow, hospital finances and trainee operating , D. Hipps et 196 al. / Injury, Int. J. Care Injured 46 (2015) 195–200 https://ac.els-cdn.com/S0020138315000285/1-s2.0-S0020138315000285-main.pdf?_tid=e1bf7378-c550-11e7-87b9-00000aacb362&acdnat=1510233863_8a0617d0d3a6691a4b2af69b3caef7f7
Trauma centres	A shorter LOS was observed in patients with penetrating abdominal injury (PAI) and New Injury Severity Scores of 16 or higher (difference in adjusted mean LOS, 1.6 days [95% CI, -1.5 to 4.7 days]) and in all patients with multisystem blunt trauma admitted to higher-volume centres (difference in adjusted mean LOS, 3.3 days [95% CI, 0.91-5.70 days]).	Nathens AB, Jurkovich GJ, Maier RV, et al. Relationship between trauma center volume and outcomes. JAMA 2001;285(9):1164–71. https://www.ncbi.nlm.nih.gov/pubmed/11231745
Hospital Reconfiguration	"Big is not necessarily better. Outcome measures for acute care are being developed but, with the possible exception of major trauma, we are not at the stage of providing robust evidence."	Academy of Medical Royal Colleges 2007, p v

Area	Evidence	Source
Hospital Reconfiguration	There is little evidence to guide whole hospital reconfiguration, and much of the evidence that does exist is out of date. The available evidence suggests that smaller hospitals in England are not inherently less safe or less efficient. However, there are good arguments on quality grounds for centralising some local hospital services or at least providing them on a more networked basis (see later sections). Active participation in clinical networks can help ensure that patients receive the best quality of care as close to where they live as possible while at the same time addressing workforce pressures. A major challenge for small hospitals is to move from a consultant-led to a consultant delivered model of care. The use of a national tariff disadvantages smaller providers. The current pressures to expand the number of consultant staff to provide higher-quality, consultant-delivered care will increase their fixed cost base and magnify this problem.	The reconfiguration of clinical services What is the evidence?, Candace Imison Lara Sonola, Matthew Honeyman, Shilpa Ross; King's Fund, London, November 2014
Stroke	Identify % of stroke patients that could be treated in a specialist centre (39-69%), reduce their average LOS by 75% (check against a 1.4d reduction in LOS in London and a 2d reduction in Greater Manchester after reorganisation.	"Reconfiguration of Acute Hospital Services Cork and Kerry, A roadmap to develop an integrated university hospital network"

7.3.2 Scenario 3B: Improvements to Patient Flow through Hospitals

The concept:

The patient flow improvement element of this scenario is focused on enhanced management within hospitals to deliver reductions in LOS. This could include the following:

- Patient flow and 'lean' approaches including measures such as ambulatory emergency care, day-of-surgery admission, improved ward management and discharge procedures.
- Improvements in elective services – operating theatre efficiency, shifting day cases to lower acuity settings and freeing up outpatient capacity by reducing the need for follow-up appointments.
- Increased throughput in day case and AMU beds.

Scenario 3B models the impacts mainly on the 16-74 age cohort in order to avoid double-counting changes impacting the cohort in Scenario 2, and for the same reason reductions in average lengths of stay are applied only to the under 65s. Improvements to outpatient appointments apply to all age cohorts. A summary of the scenario is set out in the figure below.

Figure 46 Summary of Reform Scenario 3B

Sector of change: Acute Care	Timeline/phasing: Short and Medium Term
Required Initiatives: • National adoption of ambulatory emergency care models to reduce non-elective admissions • Improved ward management – including 'Home by 11' and 'Discharge to assess' • Continue the trend for surgical inpatients to be treated on day case basis • Shift of day case procedures* to lower acuity settings – OPD and primary care • Improved management of outpatients, reducing ratio of follow-up appointments • Better throughput in day case and AMU • Improved operating theatre and diagnostic efficiency/throughput; reduced number of surgical patients discharged without having a procedure** • More appropriate care models for patients with complex needs that result in very long LOS in acute hospitals	Benefits: • Reduced ED waiting times • Reduction in emergency admissions / readmissions • Reduced LOS for patients • Reduction in delayed discharges • Greater throughput across existing capacity throughout the hospital • Movement of procedures to lower-cost settings including from day case to outpatients and primary care • Improved throughput in operating theatres and diagnostic services

* Examples include removal of skin lesions, cataract removal, therapeutic phlebotomy (for haemochromatosis) and nasal endoscopy.

** Note that patient flow initiatives for theatre and diagnostics usage/throughput were not examined due to a lack of data provided within the course of the Review.

What is already happening in Ireland: There has been a sustained focus on hospital level improvements over recent years. This has been the principal focus for the Special Delivery Unit, which has published a range of guidance related to patient flow. The HSE is currently running a pilot programme for improving patient flow, based on work in University Hospital Galway and University Hospital Limerick. There is a separate programme, Outpatient Services Performance Improvement Programme (OSPIP), focused on improving outpatient services. In addition, many of the National Clinical Programmes outline specific care models that contribute towards improved patient flows, such as the Surgery Programme's work to promote Day of Surgery Admission (DOSA), minimally invasive surgery techniques, and the Theatre Quality Improvement Programme ('TQIP'), building on the previous programme Productive Operating Theatres ('TPOT') to improve theatre efficiency and quality.

A common view provided by stakeholders in workshops is that many of the changes promoted by recent improvement programmes have not been sustained. The lack of funding mechanisms linked to productivity, together with constraints on workforce and facilities, are likely to have played a part. The lack of reimbursement coding for outpatient procedures contributes towards over-classification of some procedures as day cases. The expansion of activity based funding, the provision of national comparator information through systems such as the National Quality Assurance and Improvement System (NQAIS) and delegation of greater responsibility for managing resources to hospital leadership are expected to improve the situation.

Modelling the scenario:

This scenario is based on the following key changes and assumptions:

A Improved productivity/throughput, including:

- ALOS reduced to national median LOS (maximum reduction 20% per hospital group)
- 30% improvement in day case throughput (medical and surgical) from improved management of day case services. This equates to a change from 2.0 cases per bed per day to 2.6 cases.
- 40% improvement in AMU throughput (from 0.9 to 1.6 patients/bed/day).
- Reduce OPD First Appt: Follow Up ratio to the national median, or for those already at the median, to 1st quartile performance.

B Operating a better model of care including:

- 20% of medical day case activity moving to OPD
- 15% reduction in IP NEL activity and 5% increase in AMU activity (from improved use of ambulatory care)
- Increase in availability of comprehensive supports in the community for long-stay hospital patients with complex needs resulting in an impact of 0.5% reduction in medical activity in acute hospitals

The following table present the Baseline and Scenario 3B for the key PODs that are subject to change.

Table 28: Overview of POD Capacity for Baseline and Scenario 3B

Baseline Scenario					
Year	2016	2021	2026	2031	Δ 2016–31
Public Health Nurses (WTE)	1,500	1,800	2,000	2,200	700
AHP – PHY	540	610	670	740	200
AHP – OT	500	570	610	660	160
Residential Care LT Beds	26,200	28,900	32,200	36,300	10,100
Residential Care ST Beds	3,800	4,300	4,900	5,600	1,800
Home Care Packages	15,600	19,000	22,100	26,600	11,000
Intensive HCPs (per month)	200	230	280	330	130
HHH – public (millions p.y.)	10.6m	12.5m	14.8m	17.8m	7.2m
AMU Beds	430	470	530	590	160
Day Case Beds	2,140	2,550	2,820	3,140	1,000
IP Beds (85% Occupancy)	10,500	13,000	14,500	16,300	5,800
OP FA	0.97m	1.16m	1.14m	1.23m	0.26m
OP FU	2.40m	2.63m	2.88m	3.15m	0.75m

Reform Scenario 3B Improvements to Patient Flow through Hospitals						
Year	2016	2021	2026	2031	Δ 2016-31	3B Effect
Public Health Nurses (WTE)	1,500	1,800	2,100	2,300	800	+100 ▲
AHP – PHY	540	630	710	790	250	+50 ▲
AHP – OT	500	590	640	700	200	+40 ▲
Residential Care LT Beds	26,200	29,000	32,600	36,700	10,500	+400 ▲
Residential Care ST Beds	3,800	4,300	4,900	5,700	1,900	+100 ▲
Home Care Packages	15,600	19,400	22,900	27,400	11,800	+800 ▲
Intensive HCPs (per month)	200	350	550	660	460	+330 ▲
HHH – public (millions p.y.)	10.6m	12.8m	15.3m	18.3m	7.7m	+0.5 ▲
AMU Beds	430	420	410	460	30	-130 ▼
Day Case Beds	2,140	2,330	2,370	2,660	520	-480 ▼
IP Beds (85% Occupancy)	10,500	12,700	13,800	15,500	5,000	-800 ▼
OP FA	0.97m	1.19m	1.21m	1.30m	0.33m	+0.07m ▲
OP FU	2.40m	2.51m	2.61m	2.85m	0.45m	-0.30m ▼

Enablers and Challenges to implementing this scenario:

The realisation of this scenario (3B) depends heavily on multiple actions taking place, including:

- Recording in HIPE of procedures completed in outpatient settings, and expansion of activity-based funding for outpatient activity.
- Introduction of incentives towards productivity via activity-based and other funding models.
- Establishing HIQA standards including minimum thresholds for clinical procedures and regulating achievement of quality supported by information systems such as NQAIS.
- Extension of change programmes to support quality and productivity improvements: e.g. Ireland East "lean" academy, HSE integrated care programme for patient flow, productive theatre, and ward initiatives.
- Longer day case and AMU hours to facilitate throughput gains.
- Sustained focus on productivity measures and development of capabilities within hospitals.
- Better linkages between the acute care system and social care to enable quicker discharges.

This scenario has several potential implementation challenges attached:

- The extent to which complementary changes in the provision of primary care and services for older persons are needed to support improvements in the hospital.
- Continued pressure on services, such as from high occupancy rates, will impact on the capacity to design and implement change.
- Some changes will require a coordinated approach to improve models of care across multiple national clinical programmes, particularly for the acute floor.
- Lack of robust data systems for ED and outpatient activity, and lack of integration of information systems across services to fully understand patient pathways and flow.

Evidence Summary:

There is a wealth of evidence for the impact of quality improvement programs for improving clinical outcomes as well as patient flow, resulting in more productive hospitals. This includes:

- Reducing ED to IP conversion through increased use of ambulatory care means reducing the time it takes to see a consultant and re-directing patients to the most appropriate care, often bypassing the ED (Capio St Goran Hospital, Sweden).
- General reductions in LOS associated with improved clinical processes, such as more frequent consultant ward-rounding and delegated responsibilities for discharge (Healthcare Cost and Utilization Project US).
- Strong evidence supporting technology enabled changes that allow some procedures to happen in a less acute setting, including moving some inpatient procedures to day case, and some day case to outpatient or community (GP) settings e.g. cystoscopy (NHS Scotland).
- Have all hospitals performing at the upper quartile for the proportion of inpatient elective activity carried out as day cases (King's Fund).

There is evidence of significant unexplained variations in practice to support reductions in the proportion of outpatients receiving follow-up appointments. There is no 'one size', and the ratio will vary by service and complexity. ABF-type mechanisms are associated with driving down the ratio, and US evidence suggests that the clinical risk arising from financial levers may be moderated by financial penalties for avoidable readmissions.

7.4 Summary

In this section we have attempted to forecast the potential quantum of impact of care scenarios that are not currently being delivered, on the baseline demand and capacity figures. To the maximum extent possible these scenarios have been constructed and assessed in a mutually exclusive manner in order to ensure that there is no double-counting between them.

They show that collectively, by focusing on health and wellbeing, with better management of those with chronic disease and efficiency gains in the acute sector, it is possible to shift a significant proportion of care currently delivered in the acute sector to the primary and social care settings.

In doing so however, there is a significant need to bolster resources in these non-acute sectors and, regardless of success, there will still remain the need to also make a significant investment in acute capacity.

The following table presents an aggregate summary of this potential impact of the baseline and reform scenarios, highlighting the revised capacity requirements for the PODs affected.

Table 29 Summary forecast of capacity for all Points of Delivery.

Sector	POD	2016	Forecast Growth	Scenario 1	Scenario 2	Scenario 3A	Scenario 3B	2031 Forecast
Primary Care	GP WTEs	3,570	1,400	-240	-150	20	-	4,600
	PN WTEs	1,400	500	-100	800	-	-	2,600
	PHN WTEs	1,500	700	-100	400	-	100	2,600
	AHP–PHY WTEs	540	200	-40	90	-	50	840
	AHP–OT WTEs	500	160	-30	90	-	40	760
	AHP–S&LT WTEs	470	-30	-20	-	-	-	420
Services for Older Persons	RC LT Beds	26,200	10,100	-	-	-	400	36,700
	RC ST Beds	3,800	1,800	-	600	-	100	6,300
	HCP (per mth)	15,600	11,000	-	7,200	-	800	34,600
	IHCP (per mth)	200	130	-	-	-	330	660
	HHH (millions)	10.6	7.2	-	4.8	-	0.5	23.1
Acute Care	AMU Beds	430	160	-30	-	-	-130	430
	Day Case Beds	2,140	1000	-160	-	-60	-480	2,440
	IP Beds (85%*)	10,500	5,800	-800	-1,900	-200	-800	12,600
	ACC Beds (80%*)	240**	190	-	-	-	-	430

* Assuming 80% occupancy for Adult Critical Care, 85% occupancy for other inpatients.
** Rounded from 237 (actual 2016 figure). Source: Critical Care Programme.

8 CONCLUSIONS AND RECOMMENDATIONS

In this section we synthesise the findings of the Review into a concise set of conclusions and recommendations.

8.1 Conclusions

In general, Ireland's health system does not stand out as significantly out of line with comparator countries across a variety of metrics. This suggests that there is no single issue that is causing the current challenges facing the system.

The obvious and significant exception is the reported occupancy rates for acute beds, reflected in Figure 7 (Section 3). This shows that Ireland reported the second highest occupancy rate of those countries reporting to the OECD on this measure, with a figure of 93.6% quoted for 2013. Our analysis shows that the 2016 rate, was indeed somewhat higher at 94.2%, and reflects a system that is under pressure as acute bed stock typically acts as a buffer for pressure across the system. This issue is revisited again subsequently in these conclusions and recommendations both in terms of capacity requirements and the ability for reform to be realised in a system that is currently operating at or above capacity.

8.1.1 Baseline Conclusions

The baseline conclusions are based on forecasting capacity growing in line with demand trends and before any significant new changes in the models of care are made to the system. Overall between now and 2031, a significant increase in demand is likely to be felt across all facets of the healthcare system as a result of demographic growth in Ireland, as summarised in Section 4 of this document.

Conclusion 1: The demand for healthcare is expected to grow significantly across the primary, acute and social care settings in the next 15 years as a result of demographic and non-demographic change.

When this demand is translated into capacity requirements (current and future) the following conclusions can be drawn with regard to the current model of care for the acute setting:

Conclusion 2: The current system appears to be operating at or above capacity – acute bed occupancy, trolley waits and waiting lists point to an acute service under extreme pressure, while ED attendances, delays in hospital discharges, and growing waiting lists for HC indicate that both primary care services and community-based homecare services for older people are also under pressure.

This would be supported from benchmarking, which shows, in the case of the acute hospital system, that Ireland is operating at the lower end of the spectrum in terms of current bed numbers. It is worth noting that conclusion 2 underlines challenges in both day-to-day service delivery, and also with regard to the potential to reconfigure services.

Conclusion 3: Capacity requirements in the acute setting under the current model of care could potentially grow by an additional 5,360 beds (for all types) by 2031.

It is worth noting that this additional capacity requirement does not take into consideration any requirements to replace existing capacity during this timeframe, or a reduction in occupancy rates to levels more generally present internationally.

Conclusion 4: With regard to Day Case beds, the additional capacity required in 2031, in the absence of reform, could rise by 47% (i.e. of the order of 1,000 additional beds). Initiatives to mitigate this level of additional capacity include the shifting of day case services, as appropriate, to lower acuity settings such as OPD and primary care. These have the potential to reduce the additional capacity needed in 2031 to 300 additional day case beds.

Conclusion 5: If IP bed occupancy is reduced to 85% when calculating capacity, then it is estimated that there would be the immediate need for an additional 1,260 beds, approximately, in the system to meet current demand.

However, it is likely that even if this resource was made available the impact of reducing bed occupancy would not be as significant as expected due to broader system inefficiencies impacting on patient flow, leading to higher lengths of stay that would absorb any additional bed capacity.

With regard to primary care capacity requirements (current and future) the following conclusions can be drawn in relation to the current model of care.

Conclusion 6: The current primary care system appears to be operating at capacity across all services examined.

Again, international benchmarking would support this assessment, as Ireland's resources in the primary care setting are also at the lower end of the spectrum.

Conclusion 7: Capacity requirements across almost all staffing types are likely to significantly increase in number and percentage (in comparison to the current number) to 2031 with projections showing the need for an additional 1,400 (39%) GPs, 500 (40%) Practice Nurses and 700 (46%) Public Health Nurses, 200 (38%) Physiotherapists and 160 (32%) Occupational Therapists.

These capacity requirements do not take into consideration the level of recruitment / retention of staff needed to maintain the current level of capacity. In the case of GPs in particular, it is anticipated that a significant number are likely to retire in the next 15 years. It should also be noted that workforce availability is an international problem and that alternative solutions may need to be considered. In the case of Speech and Language Therapists, the anticipated reduction of 6% in the number required reflects the projected reduction in young children, as noted in Table 9.

With regard to community care capacity requirements (current and future) the following conclusions can also be made from this analysis:

Conclusion 8: Community-based services for older people appear to be operating at capacity both in terms of residential and home care provision.

This should not be surprising as both quantitative benchmarking analysis and qualitative feedback from our stakeholder engagement has indicated that these resources are particularly constrained by current supply. A further factor that needs to be borne in mind that is difficult to quantify is the role of informal carers in facilitating older people to remain at home.

Conclusion 9: The capacity requirement for residential care is set to grow by 10,100 (39%) long term and 1,800 (46%) short term beds by 2031. It is important also to bear in mind the potential for alternatives to residential care beds in nursing homes and community nursing unit facilities, including residential care places in various settings (e.g. sheltered housing, home care and use of telecare).

Conclusion 10: Capacity requirement for home care is set to experience significant growth to 2031, with an additional 11,000 (70%) HCP, 130 (70%) IHCP, and 7.2 million (69%) HHH anticipated.

It has been noted that the potential cost of IHCPs, which are a recent addition to community-based service provision, can be significant and and, in certain instances, may render the residential care setting a more cost effective option. The ability to increase staffing levels in homecare services may also be a constraining factor in increasing homecare provision.

8.1.2 Scenario Conclusions

Below we present some key conclusions extrapolated from the analysis of the potential impacts on baseline demand and capacity from the scenario analysis.

Conclusion 11: Policy, international comparison and stakeholder input all suggest that a shift in care, as appropriate, to a lower level of acuity, closer to home in a more continuous rather than episodic manner is preferable, and thus system reform in this direction should be implemented.

Changes in demographics (volume and ageing) and non-demographic (wellness, technology advancements etc.) mean that new models of care are not only possible, but necessary. These new care models should focus on the delivery of better patient experience and outcomes in a more cost effective manner than is currently the case.

Conclusion 12: The extent of reform in the Irish healthcare system to date has been relatively modest and, in a system that is currently working to capacity, the extent of future reform and the required investment in terms of capacity and capability to enable this must be realistic.

Whilst the need for and benefit of changing / reconfiguring existing services is obvious, achieving the changes can prove challenging, particularly in the context of the extent of reform envisaged in this report under the various policy scenarios modelled. However, work on the development of the implementation plan for the recommendations set out in the Sláintecare Report is at an advanced stage and this represents a good basis for advancing the necessary reforms.

With regard to Scenario 1, the following conclusions can be drawn:

Conclusion 13: A sustained and significant focus on improved health and wellbeing has the potential to deliver better health outcomes and reduce demand and capacity requirements in the primary and acute sectors over the medium term (years 6 to 15), with more significant benefits accruing in the longer term.

A focus on improved health and wellbeing initiatives has already been identified as a key pillar of future healthcare provision to improve health outcomes for individuals. Whilst the benefits of this are most likely to be felt in the longer term (outside the timeframe of this demand and capacity exercise), it is still reasonable to expect that the impact of this, in terms of non-demographic growth, can be anticipated to be in the region of 0.5% in the medium term (years 6-15).

Conclusion 14: In order to maximise the impact of this however, it must be viewed as one requiring cooperation and collaborative working across Government, key state agencies, the health system, communities and families in order to support achievement of better health and wellbeing.

Improved health and wellbeing can only be delivered via whole system change so it must not be viewed as, or limited to DoH / HSE programmes. Significant and targeted interventions are required across different population cohorts, with sufficient access to appropriate educational and support services/material made available. Early detection of risk factors and disease through early and proactive screening is another key enabler, as is the introduction of appropriate legislative enablers.

With regard to Scenario 2 the following conclusions can be drawn:

Conclusion 15: Management of patients with complex comorbidities currently places significant demand on healthcare services, especially on acute hospital care. This pressure on services is due to increase significantly as a result of demographic and non-demographic growth pressures. The over 65 population have the greatest prevalence of chronic conditions.

By 2031 it is estimated that the over-65 population will account for approximately one half of healthcare activity. As such, the way in which their needs are addressed is likely to have a significant impact on demand and capacity requirements across the system.

Conclusion 16: Better management of the over-65 population with complex comorbidities in more appropriate settings will require provision of more services in the primary and community-based care (residential and home care) sectors in addition to a reconfiguring of acute services to better meet patient needs. This alternative care model would require significant investment in general practice, PHNs, PHYs, OTs, Short Term Residential Care, HCP and HHH, but in turn could reduce future demand requirements for acute beds by up to 1,900 approximately by 2031.

This scenario represents the most ambitious and single largest shift of activity between sectors across the scenarios assessed. It is likely to be complex to plan for and realise, as it requires significant changes in terms of more integrated service provision for older people across primary, community and acute care services. This will involve a multi-disciplinary approach to providing enhanced services within primary care and community-based care (in the latter case involving additional step down and home care support) and dedicated specialist teams/wards in hospital settings.

With regard to Scenario 3, the following conclusions can be drawn:

Conclusion 17: Reconfiguration of hospital services presents opportunities for improved care pathways, better health outcomes and improved efficiency at both Hospital Group and national levels. Examples of reconfiguration that can potentially support better utilisation of resources include development of service networks (e.g. stroke, major trauma, cancer), better use of Model 2 hospitals for low complexity, high volume care and provision of dedicated elective centres. Reconfiguration could potentially reduce the future baseline capacity requirements across day and inpatient beds by approximately 60 and 200 beds, respectively, by 2031.

A key principle of this approach is hospital reconfiguration in ways that provide for better utilisation of hospital facilities with a view to ensuring that patients are treated at the lowest and most appropriate level of complexity possible that is safe and efficient. Another is the continued move towards specialist centres, including the separation of scheduled and unscheduled care, as the latter often has an impact on the formers ability to plan for and deliver its scheduled activity.

Conclusion 18: Improvements to patient flow through hospitals, involving better management of wards, outpatient services, day case and AMU throughput, operating theatres and diagnostic service throughput have the potential, if fully delivered) to reduce future baseline capacity requirements across day and inpatient beds by approximately 480 and 800, respectively.

8.1.3 General Conclusion

As touched upon in Sections 1 and 2 of this report, availability of and access to data for the purpose of this review presented challenges. As such the following conclusion can be drawn.

Conclusion 19: Availability of and access to high quality healthcare data proved to be problematic to varying degrees across the system, but was especially so in the case of primary care data.

8.2 Recommendations

Based upon the conclusions as detailed above, the following recommendations can be made.

8.2.1 Baseline Recommendations

Recommendation 1: There is a need to plan for and deliver increased capacity across the primary, community care (residential and homecare for older people) and acute care setting in almost all of the resource units assessed in this Capacity Review over the next 15 years.

The precise nature, scale and location of this investment will be a function of local need and the extent of ambitions and success of system reform across a number of care pathways. The following table presents a view as to the quantum of additional capacity that is likely to be required if current models of care (configuration and utilisation) are maintained until 2031.

Table 30: Summary of Capacity Requirements with no Service Reconfiguration

Sector	POD	2016	2031	% Δ
Acute Care	**AMU Beds**	430	590	+37%
	Day Case Beds	2,140	3,140	+47%
	IP Beds (85%*)	10,500	16,300	+56%
	ACC Beds (80%*)	240	430	+79%
Primary Care	**GP WTEs**	3,570	4,970	+39%
	PN WTEs	1,400	1,900	+40%
	PHN WTEs	1,500	2,200	+46%
	PHY WTEs	540	740	+38%
	S&LT WTEs	470	440	-6%
	OT WTEs	500	660	+32%

Sector	POD	2016	2031	% Δ
Social Care (Services for Older Persons)	**RC LT Beds**	26,200	36,300	+39%
	RC ST Beds	3,800	5,600	+46%
	HCP	15,600	26,600	+70%
	IHCP	200	330	+70%
	HHH	10.6m	17.8m	+69%

* Assuming 80% occupancy for Adult Critical Care, 85% occupancy for other Inpatients

Recommendation 2: Continuation of the current model of care is neither feasible nor appropriate and alternative scenarios of care offer the potential for a better way forward.

The figures quoted above state the requirements, assuming no reconfiguration of services from the current model in order to reduce demand, improve efficiency and deliver better outcomes. It is thus obvious from the uplift required that continuation of the current model of care is neither feasible or appropriate and thus it is necessary to set about, and be successful in, the reconfiguration of services from the current baseline.

8.2.2 Scenario Recommendations

Before making scenario specific recommendations as to how baseline services can be reconfigured, the following general recommendations can be made with regard to any form of healthcare reconfiguration of the existing system.

Recommendation 3: Overall health goals of delivering high quality health care, achieving better health outcomes and improving health service performance must underpin health system reform and reconfiguration. Leadership at senior management and clinician level must be identified, developed and harnessed to proactively drive and manage change within and across care sectors.

A key enabler for driving all system reform is engagement and leadership at a senior level including across management and clinicians across the health system. The most compelling case for change is better clinical outcomes, a prerequisite for which is buy-in and engagement by clinical leaders in the system.

Recommendation 4: Any reconfiguration activity must have the necessary level of planning and resources (capacity and capability) allocated to it. A phased approach with monitoring and evaluation is required in order to inform next stages of implementation.

It is often the case that the complexity, scale and challenge of reform are underestimated. In addition planning may not be sufficiently robust, with well-defined checkpoints and Key Performance Indicators, and resources allocated may not have the necessary capacity and/or capability. It is thus imperative that future system reform, including that resulting from the Sláintecare Report, does not make these errors.

With regard to Scenario 1, the following recommendation can be made:

Recommendation 5: A 'Whole of Government' responsibility to deliver the 'Healthy Ireland' strategy is necessary. Targeted interventions across those lifestyle factors most damaging to health is required, with sufficient resources (people and information) put in place. Health screening and early diagnosis, along with the provision of suitable legislative enablers should also be areas of particular focus.

With regard to Scenario 2, the following recommendation can be made:

Recommendation 6: Working as an integrated system within and across care sectors needs to be an underpinning strategy for health reform, over which are layered appropriately designed responses for complex patients. Specific focus should be given towards the enhanced role of primary care services, ambulatory emergency care and ward cohorting models in the acute sector.

With regard to Scenario 3, the following recommendation can be made:

Recommendation 7: In relation to service reconfiguration, Hospital Groups should look towards increased specialisation as a means to improve outcomes and efficiency. As part of this, and where appropriate, scheduled care should be separated from unscheduled care. Options to achieve this may include separation within the hospital or by means of separate stand-alone elective acute care facilities.

Recommendation 8: Improving Patient Flow within the acute setting should continue to be an area of focus. It is acknowledged that success in this area will require reform within care sectors outside the acute hospital setting. Specific areas for investigation include reducing the admission rates from ED, increasing efficiencies (including the usage of theatres and diagnostics), improved ward management (including discharge), shift of some DC activity to OPD and improved management of outpatients.

The following table presents a summary of the potential impact of the scenarios on the capacity requirements for the system at 2031. It shows that should successful reconfiguration be achieved, then capacity requirements for acute services should significantly reduce from the baseline, although it should be noted that investment in significant increased capacity is still required across all acute PODs, with the exception of AMU beds. In order to facilitate this reduction however, even greater additional investment shall be required in the primary care and services for older persons sectors.

Table 31: Impact of Scenarios on Capacity Requirements

Sector	POD	2016	2031	% Δ
Acute Care	**AMU Beds**	430	430	0%
	Day Case Beds	2,140	2,440	+14%
	IP Beds (85%*)	10,500	12,600	+20%
	ACC Beds (80%*)	240	430	+79%
Primary Care	**GP WTEs**	3,570	4,600	+29%
	PN WTEs	1,400	2,600	+89%
	PHN WTEs	1,500	2,600	+67%
	PHY WTEs	540	840	+58%
	S&LT WTEs	470	420	-11%
	OT WTEs	500	760	+50%
Social Care (Services for Older Persons)	**RC LT Beds**	26,200	36,700	+39%
	RC ST Beds	3,800	6,300	+62%
	HCP (p.mth.)	15,600	34,600	+122%
	IHCP (p.mth.)	200	660	+230%
	HHH	10.6m	23.1m	+118%

8.2.3 General Recommendations

Finally, in response to the general conclusions, the following general recommendations can be made.

Recommendation 9: A review of current data collection across the health service should be undertaken. The focus of this should be to identify the measures that are necessary to ensure that a single national record of resources and activity across the healthcare systems is established.

It is acknowledged that significant progress in terms of key enablers such as Individual Health Identifier, Electronic Health Record, Activity Based Funding and the National Integrated Medical Imaging System have been made in recent years. However, a clear articulation of a governance structure that centralises data ownership, ensures a common set of definitions for data that is collected, and has a clear understanding of the data that is required across the system for ongoing measurement and monitoring of performance spanning resource, activity and outcome is needed.

Recommendation 10: An assessment of the applicability and alignment of the current catchment areas adopted at a local, regional and national level across all aspects of the healthcare provision should be undertaken. This should consider a variety of needs including; a shift to more integrated models of care, maximisation of clinical efficiencies, improved measurement and performance reporting and more accurate future planning.

It is commonly known that nominal HG and CHO catchment areas are not aligned, but issues to be assessed in such an exercise are more extensive than a simple realignment of the two. For instance, it may be appropriate to define a number of local, regional and national catchment areas for various specialties (in terms of acute and primary care, and services for older persons). Other considerations could include patient flow, experience and preference, the extent to which clinical efficiencies can be maximised, the requirements of measurement and reporting and the ability to easily cross-reference with other national datasets of relevance. Boundary-based reconfiguration of services is an expensive and time consuming activity, so it is important that due consideration of the need for, and the benefit and optimum approach of any further adjustments be undertaken in advance of making any such change.

Whilst this report provides a number of answers to future capacity requirements, it also raises a number of issues that require further investigation.

Recommendation 11:
Further consideration should be given to:

- The feasibility of implementing the scenarios, particularly in meeting workforce needs and overcoming workforce constraints both in and out of hospital.
- The corresponding impact of other services that are out of scope – including mental health and disabilities.
- Wider implications of some changes, such as the reconfiguration of hospitals and public access to safe and high quality services.
- The development of clear evaluation frameworks to continuously monitor and assess the impact of reform initiatives as they are rolled out.
- How additional capacity should be planned and delivered at a regional level based on population need.
- Development of robust and comprehensive data systems.

8.3 Summary

This Review has served to highlight the scope and extent of the demand pressures that are likely to be placed upon the healthcare system in Ireland over the next 15 years, as a result of an increasing and increasingly ageing population. It presents a view of how these demand pressures may translate into capacity requirements under the current model of care, in a system that is already operating at or beyond capacity in most aspects, as well as examining the potential impact of different care models on this.

Clearly the extent to which these shifts can be implemented within the 15 year timeframe of this assessment, and the benefits that can be realised is unknown, but what is certain is that there is the need for the implementation of a much more integrated approach to the future delivery of healthcare across the acute and primary care settings, and services for older persons.

This integrated care model must focus on a continuum of care, whereby emphasis on disease prevention, early detection and management are to the fore, with care being delivered at the lowest possible level of acuity, closest to the home. In doing so however there must be a focus on ensuring that all activity is appropriately measured and recorded, and outcomes documented, in order to ensure that performance can be appropriately measured. The scale of this transition is significant, and whilst investment in resources is clearly part of the solution, it is not the whole solution. Fundamental changes in the way each sector operates is necessary and careful planning and piloting of reconfigurations must be undertaken.

APPENDICES

Appendix A Longlist of Reviewed Policies

Below is the long list of policy documents and reports that were analysed in the policy analysis workstream.

Table 32: Long list of Policy Documents Reviewed

#	Report name
1	Sláintecare Report 2017
2	NHQRS Annual Report 2017
3	2017 National Service Plan (HSE)
4	Healthy Ireland Implementation Plan 2015-2017
5	Potential Measures to Encourage the Provision of Nursing Home & Community Nursing Unit Facilities – Report to the Department of Health, (DKM Economic Consultants Ltd.) 2015
6	Trends in Public-Private Patient Activity (DOH) 2017
7	TILDA Irish Life Report – Wave 3
8	Analysis of Potential Measures to Encourage the Provision of Primary Care Facilities – Report presented to the Department of Health, (Indecon Economic Consultants) 2015
9	HIPE Report 2015-2016
10	Medical Workforce Planning 2015-2025
11	Health in Ireland Key Trends 2016
12	Planning for Health 2017
13	CSO Quarterly National Household Survey Q3 2010 (Health module)
14	Structure of General Practice 2016
15	Making Every Contact Count 2016
16	NHI Private Nursing Homes study 2009-2010
17	CHO Population Labour Force 2016-2046
18	Outpatient Action Plan (HSE) 2017
19	National Cancer Strategy 2017-2026
20	Strategy for the Design of Integrated Outpatient Services 2016-2020
21	Securing the Future of Smaller Hospitals: A Framework for Development
22	OECD Health at a Glance: Europe 2016
23	Better Health Improving Healthcare 2016
24	National Dementia Strategy 2014
25	Diabetes Prevention and Model for Patient Care
26	Changing Cardiovascular Health: National Cardiovascular Health Policy 2010-2019
27	National Maternity Strategy 2016-2026
28	Programme for Partnership Government 2016
29	Future Health 2012-2015
30	ABF Implementation Plan 2015
31	National COPD strategy 2008
32	Towards Earlier Discharge, Better Outcomes, Lower Cost: Stroke Rehabilitation in Ireland (ESRI-RCSI) 2014
33	Acute Hospital Expenditure Review (DOH) 2017
34	P4H 2030 Options Report FINAL (July 2017)
35	Growing Up in Ireland (Report 1) Lives of 9yrs old
36	Growing Up in Ireland (Report 4) Lives of 9yrs old
37	Growing up in Ireland (Report 2) Infant Cohort Wave 1 (9mos)
38	Growing Up Ireland (Report 5) Infant Cohort Wave 2 (3yrs)
39	GP Visits (CSO) 2015

#	Report name
40	NHI Private Nursing Homes Annual Survey 2014 2015
41	Social Care Division Operational Plan (HSE) 2016
42	Final Endoscopy Capacity Demand Analysis report for NPOG (HSE) 2016
43	Capital Requirements (Physical Environment) for Endoscopy Units 2017
44	Long-Stay Activity Statistics 2013
45	Final doc on Strategic Initiatives for Primary Care (for PA) 11 August 2017
46	Final doc on Palliative care (for PA 11) August 2017
47	Healthy Ireland Technical Report (Reissued 21 June 2016)
48	Healthy Ireland Survey 2015: Summary of Findings
49	Northern Ireland General Practice Workforce Survey Report 2016
50	Private Hospitals Association Submission 2016
51	SDU Technical Guidance Introducing Demand and Capacity Planning 2013
52	WHO Caredoc Case study 2016
53	National Alcohol Policy Ireland 1996
54	Strategy for Control of Antimicrobial Resistance in Ireland (SARI) 2016
55	Minor Surgery Accreditation Research Report August (ICGP) 2016
56	Adult Critical Care Capacity Census 2016
57	Palliative Care Services: Three Year Development Framework 2016-2018
58	Dementia Prevalence: Prevalence and Projections of Dementia in Ireland 2011-2046
59	Guide to Integrated T2D (ICGP) 2016
60	National Stroke Audit (Irish Heart Foundation-HSE) 2015

#	Report name
61	A WSO International Agenda for Stroke 2011
62	NCD Country Profiles, Ireland (WHO) 2014
63	World Health Statistics: Monitoring Health for the SDGs (WHO) 2017
64	Pre-Budget Submission (NGAP) 2017
65	Getting a handle on General Practice in Ireland 2014
66	A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016-2025
67	Department of Health Statement of Strategy 2016-2019
68	Chronic Obstructive Pulmonary Disease (Department of Social Protection)
69	Primary Care Division Operational Plan (HSE) 2017
70	Safer Better Healthcare Guide (HIQA) 2012
71	Tackling Chronic Disease: A Policy Framework for the Management of Chronic Diseases
72	National Acute Medicine Programme 2010
73	National Clinical Care Programme for Critical Care
74	National Emergency Medicine Programme
75	National Clinical Programme for Older People (Specialist Geriatric Services)
76	National Clinical Programme for Asthma
77	National Clinical Programme for COPD
78	National Clinical Programme for Surgery (Model of Care for Elective Surgery)
79	National Clinical Programme for Epilepsy
80	Health at a Glance (OECD) 2016
81	The Burden of Stroke in Europe (Kings College London)
82	National Stroke Audit Rehabilitation 2016
83	Diabetes in Ireland (Diabetes Ireland) 2015

#	Report name
84	Impact of Glycaemic Control on Healthcare Resource Utilization and Costs of T2D (AHD) 2013
85	Consultation paper: Development of a Community nursing and Midwifery Response to an Integrated Model of Care (DOH) 2017
86	Consultation paper: Improving Homecare Services in Ireland (DOH) 2017
87	Consultation paper: Graduate, Specialist and Advanced Nursing and Midwifery Practice (DOH) 2017
88	Taskforce on Staffing and Skill Mix (DOH) 2017
89	Global Strategy for Integrated Patient-centred Health Services 2016-2026 (WHO)
90	Acute Hospitals and Integrated Care (The King's Fund) 2015
91	Moving Care to the Community: An International Perspective (Royal College of Nursing) 2013
92	Specialists in out-of-hospital settings: Findings from six case studies (The King's Fund) 2014
93	Understanding Pressures in General Practice (The King's Fund) 2016

Appendix B Shortlist of Reviewed Policies

The table below lists those policy documents that were identified from the initial long-list as being most applicable to the scope and objectives of this review.

Table 33: Short list of Reviewed Policies

#	Report name
1	Sláintecare Report 2017
3	2017 National Service Plan (HSE)
4	Healthy Ireland Implementation Plan 2015-2017
5	Potential Measures to Encourage the Provision of Nursing Home & Community Nursing Unit Facilities – Report to the Department of Health, (DKM Economic Consultants Ltd.) (DOH) 2015
10	Medical Workforce Planning 2015-2025
15	Making Every Contact Count 2016
19	National Cancer Strategy 2017-2026
20	Strategy for the Design of Integrated Outpatient Services 2016-2020
21	Securing the Future of Smaller Hospitals: A Framework for Development
23	Better Health Improving Healthcare 2016
24	National Dementia Strategy 2014
26	Changing Cardiovascular Health: National Cardiovascular Health Policy 2010-2019
31	National COPD strategy 2008
32	Towards Earlier Discharge, Better Outcomes, Lower Cost: Stroke Rehabilitation in Ireland (ESRI-RCSI) 2014
33	Acute Hospital Expenditure Review (DOH) 2017
40	NHI Private Nursing Homes Annual Survey 2014 2015

#	Report name
51	Technical Guidance Introducing Demand and Capacity Planning (HSE SDU) 2013
55	Minor Surgery Accreditation Research Report August (ICGP) 2016
56	Adult Critical Care Capacity Census 2016
75	National Clinical Programme for Older People (Specialist Geriatric Services)
76	National Clinical Programme for Asthma
77	National Clinical Programme for COPD

#	Report name
85	Consultation paper: Development of a Community nursing and Midwifery Response to an Integrated Model of Care (DOH) 2017
86	Consultation paper: Improving Homecare Services in Ireland (DOH) 2017
87	Consultation paper: Graduate, Specialist and Advanced Nursing and Midwifery Practice (DOH) 2017
88	Taskforce on Staffing and Skill Mix (DOH) 2017

Appendix C
Final List of Reviewed Policies

The following table presents a summary of the key policy considerations incorporated in this review and the themes to which they have been grouped.

Table 34: Final Reviewed Policies

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Acute Care Services				
Acute 1	*Effective management of chronic disease*	Re-organisation of hospital services and operations	On base case, implementing Early Supported Discharge (ESD) in Ireland for stroke survivors with mild to moderate disability.	*Towards Earlier Discharge, Better Outcomes, Lower Cost: Stroke Rehabilitation in Ireland*
Acute 2	*Improvements in hospital services / patient flow*	Re-organisation of services at regional/ national level	The model of care being developed should facilitate the use of local or regional hospitals for routine or less complex diagnostics, as well as for the provision of systemic therapy services (medical oncology, haematology) where clinically appropriate	*National Cancer Strategy 2017 – 2026*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Acute 3	*More appropriate use of resources across the system*	Implementation of Telemedicine / new technologies	Reconceptualising services to deliver care through telemedicine and virtual clinics. These new types of clinic-delivery, designed by OSPIP in association with clinical programmes, will be enabled by an intelligent referral management system. These systems will enable timed appointment slots to replace the current practice of 'batch appointments' and will also link the hospital, community and the patient's home.	*Strategy for the Design of Integrated Outpatient Services 2016-2020*
Acute 4	*Improvements in hospital services / patient flow*	New model of ED care	All referred patients should be examined by a senior decision-maker from an on-call team within one hour of referral if not sooner, depending on clinical acuity. Assessments should be completed within 2 hrs of referral.	*National Emergency Medicine Programme*
Acute 5	*Improvements in hospital services / patient flow*	Re-organisation of services at regional/ national level	Improve access to GI endoscopy by developing guidelines and providing support via the endoscopy clinical programme	*HSE National Service Plan 2017*
Acute 6	*Improvements in hospital services / patient flow*	New model of ED care	Model 2 hospitals will have a daytime Urgent Care Centre comprising a Medical Assessment Unit and Local Injuries Unit which will be open where feasible 7 days a week	*Securing the Future of Smaller Hospitals*
Acute 7	*Improvements in hospital services / patient flow*	New model of ED care	The key interface between EM and Acute Medicine (AM) will be developed to ensure the provision of high-quality patient care for patients accessing both services and there will be coordinated implementation of the EMP and AMP.	*National Emergency Medicine Programme*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Acute 8	*Reorganisation of Emergency Care services*	New model of ED care	Patient registration should take place before or at the same time as triage. Patients should be able to access treatment cubicles on arrival and bedside triage and triage should be provided.	*National Emergency Medicine Programme*
Acute 9	*Improvements in hospital services / patient flow*	More efficient surgery procedures	Day Case surgery should be mandatory for most surgical disciplines. Hospitals should assist surgeons with the move to day surgery and should provide, where required, an option to change operating list scheduling to promote day surgery, the possibility of day surgery lists to replace inpatient lists and incentives to encourage clinicians to work in day surgery units.	*Model of Care for Elective Surgery (National Clinical Programme for Surgery*
Acute 10	*Improvements in hospital services / patient flow*	More efficient surgery procedures	Surgery will be delivered per productive theatre pathways. Elective surgery will be performed within national day of surgery, day surgery, and average LOS targets.	*National Acute Medicine Programme*
Acute 11	*Improvements in hospital services / patient flow*	New model of ED care	Local Injury Units will be open where possible from 08:00 to 20:00 followed by 2 hours of ongoing clinical work for the completion of patient care	*Securing the Future of Smaller Hospitals*
Acute 12	*More appropriate use of resources across the system*	Re-organisation of services at regional/ national level	Model 2 hospitals to provide the majority of hospital activity including extended day surgery, selected acute medicine, local injuries, a large range of diagnostic services (including endoscopy, laboratory medicine, point-of-care testing, and radiology), specialist rehabilitation medicine and palliative care	*Securing the Future of Smaller Hospitals*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Acute 13	*More appropriate use of resources across the system*	Re-organisation of services at regional/ national level	The HSE (through the National Clinical Programme for Transport Medicine) is implementing the National Adult Critical Care Retrieval Service, to ensure the timely 'hospital to hospital' transfer of Level 3 ACC critically ill patients, as required. The service will operate 7 days per week. 1. Intra-hospital transfer: a critically ill patient presenting to an ED should access the Critical Care Service within 1-6 hours. 2. Inter-hospital transfer: a critically ill patient presenting to an ED should access an appropriate supra-regional/ national Critical Care Service within less than 12 hours, as needed.	*National Clinical Care Programme for Critical Care*
Acute 14	*More appropriate use of resources across the system*	Re-organisation of services at regional/ national level	Features of the 'hub and spoke' model of care: 1. Critical care services in regional/supra regional 'hub' and sub-regional 'spoke' hospitals. 2. No critical care services in local hospitals. 3. Connections: Critical Care Retrieval, National Ambulance Service and National Transport Medicine Programme transport services. **Critically ill patients with multi-organ failure should be transferred to acute regional or supra-regional 'hub' hospitals using timely transportation systems (e.g. Critical Care Retrieval services as part of the National Transport Medicine Programme)*	*National Clinical Care Programme for Critical Care*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Acute 15	*More appropriate use of resources across the system*	New model of ED care	The EMP will work with the DOH, HSE, ICGP and other primary care organisations to develop new and sustainable roles for GPs who may wish to work on a sessional basis in EDs and other ECN units. The EMP will explore the potential for collaborative service and training development between EM, pre-hospital care and primary care, with the aim of improving the quality of patient care across this interface.	*National Emergency Medicine Programme*
Acute 16	*Private/public split*	Re-organisation of services at regional/ national level	Conduct a phased elimination of private care from public hospitals so that all patients will be treated on the same public basis in public hospitals	*Sláintecare Report (10-year strategy)*
Acute 17	*Reorganisation of Emergency Care services*	Re-organisation of services at regional/ national level	A designated acute floor (or area) should be developed to facilitate the seamless provision of patient-centred care across the range of specialties involved in the early management of acutely and critically ill patients	*National Acute Medicine Programme*
Acute 18	*Reorganisation of Emergency Care services*	Alternatives to ED	Establishing AMUs, AMAUs, MAUs, Minor Injury Clinics and Local Injury Units as a way of developing new alternative pathways to avoid patients waiting in ED waiting rooms or trolleys	*Sláintecare Report (10-year strategy) Securing the Future of Smaller Hospitals*
Acute 19	*Improvements in hospital services / patient flow*	Re-organisation of services at regional/ national level	The Oireachtas Committee recommends an appropriate number of hospitals be designated as elective only within each HG. This is so that emergency and urgent care cannot crowd-out elective care which makes waiting lists and waiting times longer.	*Sláintecare Report (10-year strategy)*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Acute 20	*More appropriate use of resources across the system*	Re-organisation of services at regional/ national level	HGs will secure the future of our smaller hospitals. Smaller and larger hospitals must work together in the provision of services. Services can be exchanged between sites. This will result in the maintenance of activity in smaller hospitals, but, will allow them to focus on the provision of care that is safe and appropriate	*Securing the Future of Smaller Hospitals*
Acute 21	*Improvements in hospital services / patient flow*	Re-organisation of services at regional/ national level	Operational grip (the extent to which there is clarity of purpose, predictability and accountability) will be enhanced by understanding demand at hospital and departmental level and consequently being able to match this with capacity. This usually requires process change while at the same time there is a need to enhance the status and visibility of operational management. *Current operational processes are usually largely invisible. A lot goes on 'behind the scenes' that is not systematized or over dependant on individual effort. Consequently there is a high potential for single points of failure (e.g. if a key staff member is on leave the system slows down).*	*Technical Guidance Introducing Demand and Capacity Planning*
Acute 22	*Re-design of new hospitals infrastructure*	Re-organisation of services at regional/ national level	All newly built acute hospital inpatient accommodation should be made up entirely of single patient rooms. All newly built non-acute hospital inpatient accommodation, when included within an acute hospital setting, should be made up of a minimum of 50% single patient rooms. The overall proportion within non-acute units may need to be higher, but should be based on risk assessment of the likely patient population, including likely future use, in consultation with the local infection prevention and control team.	*Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) 2016*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Acute Care, Primary Care & Services for Older Persons				
All 1	*Effective management of chronic disease*	Integrated patient care	A patient with a chronic condition e.g. Heart failure, epilepsy, stroke etc. will be taken directly to the appropriate chronic disease unit via direct GP referral, ambulance and ED triage, AMU assessment. Chronic disease management after an acute episode will be managed in an integrated way between the GP (chronic disease watch) and the speciality multidisciplinary team. Pharmacists will provide complementary medication management advice and guidance.	*National Acute Medicine Programme*
All 2	*Effective referral pathways*	Integrated patient care	Patients will be referred directly to AMUs/AMAUs/MAUs in most cases by GPs and in some cases after presenting to the ED. They will be assessed within one hour by a senior medical doctor and receive a same-day diagnosis. A decision regarding admission / discharge will be made within 6 hours, and will be facilitated by dedicated radiology, laboratory and other services, including therapy professionals and medical social workers. In the event of discharge, the relevant GP will be informed (on same day) of the decision, together with the relevant clinical details and care plans.	*National Acute Medicine Programme*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
All 3	*More appropriate use of resources*	Re-orientation of care from acute to the community	Capacity in hospitals will be freed up by shifting care into the community by integrating that care throughout primary, hospital and social care settings, through: > *Universal access to diagnostics in the community* > *Extension of counselling in primary care to whole population* > *Universal access to GP care without charge* > *Universal access to primary care*	*Sláintecare Report (10-year strategy)*
All 4	*More appropriate use of resources across the system*	Re-orientation of care from acute to the community	Patients will self-refer to the daytime Local Injury Unit of co-located GP out-of-hours services	*Securing the Future of Smaller Hospitals*
All 5	*More appropriate use of resources across the system*	Improving patient flow across the healthcare system	The National Cancer Control Programme (NCCP) will develop criteria by the end of 2018 for the referral of patients with suspected cancer, who fall outside of existing Rapid Access Clinics, for diagnostic tests. The NCCP will ensure, through these criteria, that GPs will have direct access to cancer diagnostics within agreed timelines	*National Cancer Strategy 2017 – 2026*
All 6	*More appropriate use of resources across the system*	Re-orientation of care from acute to the community	Generally, post-operative support and follow-up of patients should occur by telephone by day surgery staff in the first 24-48 hours. However, GPs and Community Care Nurses should, where necessary, help with the delivery of pain control or other medications, dressing etc. Community Intervention Teams (CITs) are available in some areas and are made up of a nurse lead supported by a variety of other health professionals and services, which provide enhanced services/ acute interventions in a rapid and integrated manner to a patient with an acute episode of illness appropriate for care in the home or community.	*Model of Care for Elective Surgery (National Clinical Programme for Surgery*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
All 7	*More appropriate use of resources across the system*	Integrated patient care	A GP will have a dedicated point of liaison with the hospital in order to consult on the best pathway for their patient. They will also be able to access a navigation hub where a case manager can discuss availability of beds and alternative patient services.	*National Acute Medicine Programme*
All 8	*More appropriate use of resources across the system*	Integrated patient care	Recommends the establishment of a navigation hub within each integrated service area (ISA) to support the streaming of patients to the most appropriate care setting. The navigation hub will also enhance communication between primary care, community service and hospital-based services. It will be staffed by a number of case managers who will be accessible to GPs and consultants through phone, fax, email or letter communication. The case manager (CM) will have contact with the on-call physicians for AMU/AMAU/MAU and other medical specialities, public health liaison nurses and clinical nurse managers (CNMs) to facilitate direct communication where necessary, between the GP and the on-call consultant or specialty physician and nursing services.	*National Acute Medicine Programme*
All 9	*More appropriate use of resources across the system*	Re-orientation of care from acute to the community	Establish a CIT in each ISA, whereby the CIT would provide a nurse-led multi-disciplinary integrated immediate care facility which enables an appropriate 'rapid' response to a patient with acute illness/care needs and who requires enhanced services for a defined period of time (ideally less than 72 hours) in the community/home, thus avoiding admission and/or supporting early discharge from hospital.	*National Acute Medicine Programme*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
All 10	*More appropriate use of resources across the system*	Integrated patient care	Development of Advanced Nurse Programmes to support the implementation of the integrated care programmes by the HSE, including: patient flow, chronic disease management, older persons care, children's care, midwifery and women's health	*Graduate, Specialist and Advanced Nursing and Midwifery Practice*
All 11	*More appropriate use of resources across the system*	Skills development	Establish a Taskforce to develop a framework to determine the staffing and skill mix requirements for nursing in general and specialist adult hospital medical and surgical care settings (Phase 1). Further phases will follow that will build on the learning from Phase	*Taskforce on Staffing and Skill Mix (Dept. of Health)*
Primary care services				
Primary 1	*More appropriate use of resources across the system*	Re-orientation of care from acute to the community	Introduction of a Healthcare card (universal healthcare) over a 5-year period (from when the Reform plan is initiated) entitling all Irish residents access to care based on need *People will be incentivised to access care in primary and social care settings as their Cárta Sláinte will ensure access in these settings is either free of charge or at a low cost; those entitled to access to care will be guaranteed access within a set period of time and therefore avoid waiting lists.*	*Sláintecare Report (10-year strategy); HSE National Service Plan 2017; National Clinical Programme for COPD*
Primary 3	*More appropriate use of resources across the system*	Expansion of diagnostics and services in primary care	An integrated model is required, providing greater GP access to diagnostics and advice, with sub-acute healthcare interventions being delivered in primary care settings	*Strategy for the Design of Integrated Outpatient Services 2016-2020*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Primary 4	*Effective management of chronic disease*	Reorientation of care from acute to the community	Structured anticoagulation services will have to be developed between and within primary care services and hospital anticoagulation clinics. This will necessitate appropriate resourcing being provided to participating practices	*Changing Cardiovascular Health – National Cardiovascular Health Policy 2010-2019*
Primary 5	*Effective management of chronic disease*	Reorientation of care from acute to the community	Specialist heart failure nurses will be deployed within an integrated system to maximise the value of these nurses to work with GPs and primary care teams	*Changing Cardiovascular Health – National Cardiovascular Health Policy 2010-2019*
Primary 6	*Effective management of chronic disease*	Reorientation of care from acute to the community	Other staff will be deployed to increase the capacity of primary care teams to support the community-based management of patients with heart failure, including specialist palliative care	*Changing Cardiovascular Health – National Cardiovascular Health Policy 2010-2019*
Primary 7	*Effective management of chronic disease*	Reorientation of care from acute to the community	Managed primary care will be delivered by GPs working with practice nurses and other community health workers with the support of Registered Advanced Nurse Practitioners (RANP) across the country, who will help manage patients with stable disease in the community, and will guide others less well-controlled through the health system providing them with the resources for self-management, point of contact and referral information for expert care in the epilepsy centres	*National Clinical Programme for Epilepsy*
Primary 8	*Effective referral pathways*	Improving patient flow across the healthcare system	A GP/primary care team may refer a patient to out-patients, outreach programmes or ambulatory care services using standardised pathways and guidelines	*National Acute Medicine Programme*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Primary 9	*Effective referral pathways*	Improving patient flow across the healthcare system	GPs will be able to refer directly to acute surgical assessment units.	*National Acute Medicine Programme*
Primary 10	*Effective management of chronic disease*	Prevention and self-management	Implement a national framework for self-care for the major cardiovascular, respiratory diseases and diabetes. Increase the proportion of patients utilising self-care and self-management services	*Healthy Ireland National Implementation Plan 2015-2017*
Primary 11	*Management of chronic disease*	Effective management of chronic disease	The NCCP, working with ICGP and the National Clinical Effectiveness Committee, will develop a three-year plan to enhance the care pathways between primary and secondary care for specific cancers. The plan will set out criteria for referral to diagnostics and incorporate the requirements for additional Rapid Access Clinics	*National Cancer Strategy 2017 – 2026*
Primary 12	*Effective referral pathways*	Implementation of Telemedicine / new technologies	The HSE will ensure that cancer referrals from a GP into hospital will be made electronically. Each HG will facilitate the phasing in of e-referral. This will be completed by the end of 2022.	*National Cancer Strategy 2017 – 2026*
Primary 13	*Integrated Patient Care*	Improving patient flow across the healthcare system	Within primary care services, a named key worker will be appointed to play a key role in coordinating each patient's care and promoting continuity and ensuring that the patient knows who to access for information and advice.	*The Irish National Dementia Strategy*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Primary 14	*More appropriate use of resources across the system*	Reorientation of care from acute to the community	There is potential within general practice, given proper resourcing, to contribute greatly to easing of hospital waiting lists for surgery given that up to 30% of patients who have surgery in hospital could have this performed in a general practice setting.	*Minor Surgery Accreditation Research Project, Final Report, ICGP (2016)*
Primary 15	*More appropriate use of resources across the system*	Reorientation of care from acute to the community	Deliver within the community, all nursing and midwifery care that does not need to be delivered in a hospital setting. This integrated model of care will be based and managed within the community with referral pathways of care that transit seamlessly into a hospital setting to be used only when required.	*Development of a Community Nursing and Midwifery Response to an Integrated Model of Care (Dept. of Health)*
Services for Older Persons Care Services				
Social 1	*Home care*	Improving services for the Elderly	Configure resources currently invested in HCP and respite care so as to facilitate people with dementia to continue living in their own homes and communities for as long as possible and to improve the supports available for carers.	*The Irish National Dementia Strategy*
Social 2	*Home care*	Improving services for the Elderly	Implement Older People Remaining at Home (OPRAH) in identified locations (via a support coordinator who will ensure the home is safe for the older person to remain living in the home).	*Healthy Ireland National Implementation Plan 2015-2017*
Social 3	*Home care*	Improving services for the Elderly	The HSE will consider how best to configure resources currently invested in HCP and respite care so as to facilitate people with dementia to continue living in their own homes and communities for as long as possible and to improve the supports available for carers.	*The Irish National Dementia Strategy*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Social 4	*Home care*	Improving services for the Elderly	The DoH is developing a new statutory scheme and system of regulation for home care services (and in the first instance, is seeking views on what is working well and what needs to be improved, and what the future scheme should look like)	*Consultation on Home Care, Dept of Health*
Social 5	*Palliative care*	Expansion of palliative care services	Introduce universal palliative care over a 5-year period	*Sláintecare Report (10-year strategy)*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Social 6	*Rehabilitation / Residential*	Improving services for the Elderly	Continue to implement an integrated comprehensive approach to the care of older people by reorganising the way that services for older people are provided, including: 1. Dedicated inpatient Specialist Geriatric wards with multi-disciplinary Geriatric teams (instead of within AMUs) 2. Dedicated inpatient Specialist Geriatric Rehabilitation – the National Clinical Programme for Older People (NCPOP) recommends that all hospital admitting acutely ill older adults have dedicated onsite and/or offsite rehabilitation wards 3. Dedicated Offsite Rehabilitation – the NCPOP recommends that all hospitals admitting acutely ill older adults have access to dedicated offsite rehabilitation wards 4. Community Outreach to nursing homes should support primary care services in nursing homes and extended care settings through specialist consultation 5. Ambulatory day hospital – the NCPOP recommends that the Day Hospital become the navigation hub for the coordination of the assessments of the frail older adult that requires a step-up in care from primary care team / PHN management in the community 6. Support and advice should be available through community-based services for the frail older person through specialist consultation.	*National Clinical Programme for Older People (Specialist Geriatric Services)*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Social 7	*Rehabilitation*	Improving services for the Elderly	The Specialist Geriatrics Service (SGS) unit will be based in the acute hospital site, linked to onsite rehabilitation and day hospital (DH) services. It will allow service reconfiguration of the current team of consultant geriatricians at the hospital to enhance delivery of care to the older adult.	*National Clinical Programme for Older People (Specialist Geriatric Services)*
Social 8	*Rehabilitation*	Improving services for the Elderly	Each hospital has access to onsite and off-site rehabilitation beds and delivers a structured rehabilitation programme for older people.	*Better Health, Improving Health Care*
Social 9	*Nursing home*	Improving services for the Elderly	It is assumed that 4% of the population aged 65 and over ('65+') will require long term residential care. Feedback on: How changes in demand for homecare will impact on demand on residential care?	*Potential Measures to Encourage Provision of Nursing Home & Community Nursing Unit Facilities,- Report to the Department of Health (DKM Economic Consultants), 2015*
Health and Wellbeing				
Health & Wellbeing 1	*Health and wellbeing*	Prevention	HSE staff to support smoking cessation (make every contact count) by screening, intervening and referring service users, as appropriate to cessation support services as a routine part of care delivery across all services	*Making Every Contact Count Framework*
Health & Wellbeing 2	*Health and wellbeing*	Prevention	HSE staff to support healthy eating policy (make every contact count) by recording BMI, assessing and referring service users to relevant specialists if necessary	*Making Every Contact Count Framework*
Health & Wellbeing 3	*Health and wellbeing*	Prevention	Better utilise new and existing health services contracts and grant aid agreements to grow social support networks for families and communities to better deliver Healthy Ireland objectives as part of service contracts	*Healthy Ireland in the Health services National Implementation Plan 2015-2017*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Health & Wellbeing 4	*Health and wellbeing*	Prevention	Develop a revised, evidence based universal child health screening and development programme	*Healthy Ireland in the Health services National Implementation Plan 2015-2017*
Health & Wellbeing 5	*Health and wellbeing*	Prevention	Identify mechanisms to incentivise the delivery of preventative activities as part of the Activity Based Funding framework	*Healthy Ireland in the Health services National Implementation Plan 2015-2017*
Health & Wellbeing 6	*Health and wellbeing*	Prevention	HSE staff to routinely assess levels of physical activity of patients and service users and promote increased participation in activities available in the local community. Record patients' and service users' activity and advice offered	*Healthy Ireland in the Health services National Implementation Plan 2015-2017*
Health & Wellbeing 7	*Health and wellbeing*	Prevention	Target high-risk groups through community development programmes that support healthy lifestyles, prevention and management of overweight and obesity in children and adults.	*A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016-2025*
Health & Wellbeing 8	*Health and wellbeing*	Prevention	Include obesity prevention and care as a requirement of GP contacts	*A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016-2025*

Code	Theme 1 *Primary Impact Theme*	Theme 2 *Secondary Impact Theme*	Policy Consideration	Policy /document
Health & Wellbeing 9	*Health and wellbeing*	Prevention	There is strong evidence that policies which influence access to alcohol, control pricing through taxation and other public health measures, can have a positive impact on curtailing the health and social burden resulting from drinking. Research is urgently required to identify attitudes and patterns of alcohol consumption across the population and within sub-groups of the population. Based on sound research, a sensible drinking message of Less is Better should form an educational empowerment programme with regional and local initiatives as a required and integral part of such a campaign. A health education programme in all schools should be part of the core curriculum. The availability and effectiveness of treatment services need to be established.	*A Healthy Weight for Ireland: Obesity Policy and Action Plan 2016-2025*
Health & Wellbeing 10	*Health and wellbeing*	Prevention	The NCCP will draw up a plan by end-2017 for the development of an integrated cancer control and surveillance service for defined population subgroups with an inherited familial predisposition to cancer (e.g. breast, ovarian and colorectal).	*National Cancer Strategy 2017 – 2026*
Health & Wellbeing 11	*Health and wellbeing*	Prevention	The HSE will ensure that the appropriate endoscopy capacity is provided in hospitals to allow for the expansion of the BowelScreen initiative to all aged 55-74 by end-2021.	*National Cancer Strategy 2017 – 2026*

Analysis of International Best Practices

Further research was then undertaken to identify examples of international best practice from healthcare systems in other countries that are aligned with these themes. PA's expertise informed the direction of the research and pointed to countries such as Norway, Sweden, Finland, the Netherlands and Spain, among others, where examples of best practice could be found in areas including:

- Alignment of specialists to primary care teams.
- Patient referral guidelines.
- General practice co-operatives for out-of-hours services.
- Model of care centred on patient needs.
- Expanding the role of primary care nurses and pharmacists.
- Establishing collaborative care teams.
- Timely discharge.
- Provision of nurses in the community.
- Increased specialisation and concentration of services.
- Patient assessment prior to hospital admission.
- Integrated consultant roles.
- GP telephone consultations.

Table 35 below describes these examples in further detail and highlights some example countries where best practice initiatives are underway.

Table 35: Analysis of International Best Practice

Theme	Initiative	Relevant policy consideration (Ireland)
Alignment of Specialists to primary care teams	Examples of specialist services attached to primary care include paediatricians, Ear Nose and Throat (ENT) specialists, obstetricians, geriatricians and ophthalmologists. These care models have the potential to reduce pressure on outpatient services and save costs, since more patients are treated within primary care and only the more complex cases would receive a referral to the specialist level hospitals and outpatient clinics. **Finland** – Primary care teams and specialists are co-located in newly integrated organisations which increasingly blur the boundary between specialists and primary care teams; all of whom are directly contracted by larger health centres. **New Zealand** – co-location of primary care nurses with Accident and Medical Services Clinics are in place to reduce the number of unnecessary urgent care utilisation rates in secondary care.	**Expansion of services and integrated support into primary care** **Policy:** *Sláintecare 2017 report* *Strategy for the Design of Integrated Outpatient Service 2016-2020* *Changing Cardiovascular Health – National Cardiovascular Health Policy 2010-2019*

Theme	Initiative	Relevant policy consideration (Ireland)
Patient referral guidelines	Some countries have guidelines in place to influence the referral behaviour of GPs: **Finland** – national guidelines developed by the Finnish College of Physicians are available that may be further developed into regional or local guidelines. **Netherlands** – at local level specific inter-professional or multidisciplinary collaborations are organised, some more structured than others. The general rule is that Dutch GPs only refer patients in exceptional circumstances. **Spain** – in addition to clinical guidelines that are used across the country, Andalusia has specific guidelines for specialist referral, covering almost 100 groups (one for each disease).	**Effective referral pathways to improve patient flow across the system** **Policy:** *National Acute Medicine Programme* *National Cancer Strategy 2017-2026*
General practice co-operatives for out-of-hours services	GP Co-operatives (GPCs) are one of the most effective means of securing safe and accessible primary care services outside normal working hours, resulting in patient satisfaction, a less demanding workload for primary care clinicians and reduction of unnecessary visits to hospital ED. GPCs are large-scale co-operatives in which primary care professionals work on a rotational basis to respond to health care needs outside normal working hours. **Netherlands** – GPCs are staffed by primary care providers who carry out both telephone and face-to-face consultations. Patients are first required to call the GPC for medical advice. Depending on the medical condition, the GP/assistant/nurse gives self-care advice so that the patient stays at home and can visit primary care during normal working hours. Another option is to ask the patient to call back if the condition deteriorates, or to make a home visit. Patients may also be advised to go to the GPC or directly to the hospital ED.	**Implement the recommendations of the GP Out of Hours, Primary Care Eye Service and Island Services reviews** **Reconceptualising the service to deliver care through telemedicine and virtual clinics** **Policy:** *HSE National Service Plan 2017* *Strategy for the Design of Integrated Outpatient services 2016-2020*

Theme	Initiative	Relevant policy consideration (Ireland)
Model of care centred on patient needs	Developing new models of shared care based on multi-disciplinary practice and modernising the role of health professionals to best meet complex health needs. **Belgium** – new integrated care models based on multi-disciplinary group practice and a horizontal governance model have been developed by primary care clinicians since 2016. A case manager is assigned responsibility for the shared-care model. Case managers are most often the primary care physician but can also be nurses, allied health professionals or social workers. They have responsibility for managing pathways of care within the health system. **Slovenia** – a similar model exists in the development of Family Medicine Model Practice. In this new approach, nurses with an advanced degree are taking on new roles to ensure care co-ordination and care continuity by assisting patients in navigating the health system. This model has demonstrated improved access, including access to broader preventive medical programmes and reduced care fragmentation. In addition, care coordination between primary care, hospitals and long-term institutions has significantly improved. **Norway** – intermediate care facilities are in place to bridge the gap between hospital and community care. The overarching objective is to ensure that the right community services are delivered to patients requiring further care after a hospital stay, and that they are well coordinated with hospital care. This model has demonstrated better health outcomes for the population and has also resulted in a reduction in avoidable hospitalisation. **Finland** – a new integrated care model linking acute care, primary care, and social care will be introduced country-wide in 2019.	**Developing a key interface between Emergency Medicine and Acute Medicine for the patient** **A patient with a chronic condition will be managed in an integrated way between the GP (Chronic Disease Watch) and the specialty multidisciplinary team** **Policy:** *National Emergency Medicines Programme* *National Acute Medicine Programme* *Strategy for the Design of Integrated Outpatient Services 2016-2020*

Theme	Initiative	Relevant policy consideration (Ireland)
Expanding the role of primary care nurses and pharmacists	Changing the scope of practice for nurses brings several advantages, specifically for managing long-term conditions. With appropriate training and ongoing support from primary care practitioners, nurses have been found to provide as high-quality of care as primary care doctors in the provision of care for acute and chronic conditions, and with higher patient satisfaction. **Sweden & Finland** – additional training is in place for nurses to be involved in post-discharge protocol, patient education and chronic disease management. Expanding the role of community pharmacists is another avenue to renew the focus on preventive health care. **Finland** – community pharmacists are actively involved in the treatment and prevention of major chronic diseases.	**On a base case, implement Early Supported Discharge for stroke survivors with mild to moderate disability** **Policy:** *Towards Earlier Discharge, Better Outcomes, Lower Cost*
Collaborative care teams	**UK** – Airedale NHS has established a single point of contact for all intermediate care services and can be reached on a 24/7 basis – a key component of this intermediate care is the establishment of collaborative care teams. These are multi-disciplinary teams that provide patients with step-up and step-down care, the majority of which is delivered in patients' homes in addition to supporting some patients in care homes. A key feature of this is that the model has been designed by clinicians who would be involved in delivering the services.	**Capacity in hospitals will be freed up by shifting care into the community and by integrating that care throughout acute, primary, and social care settings** **Establish a navigation nub, staffed by case managers to support the streamlining of patients to the most appropriate care setting** **Policy:** *Sláintecare 2017 Report* *National Acute Medicine Programme*
Timely discharge	US – New York University Langone Medical Center – establishing early morning discharges: in 2012 hospital leaders established daily meetings to identify patients who might be ready to leave the next morning and sent email reminders to all members of the care team, assigning tasks such as preparing prescriptions or informing family members etc. Staff were also educated about the importance of early discharge and a dashboard was built to track and monitor progress. One year later, more than 40% of patients were discharged in the morning and overall LOS and readmission rates have also dropped.	**On a base case, implement Early Supported Discharge for stroke survivors with mild to moderate disability** **Policy:** *Towards Earlier Discharge, Better Outcomes, Lower Cost*

Theme	Initiative	Relevant policy consideration (Ireland)
Provision of nurses in the community	**Norway** – Healthcare reform involved moving non-specialised care into community and primary health care sectors while offering specialised health care services in hospitals and specialist centres. An increased number of nurses were employed in the community and overall, primary care services improved while patients were also effectively moved away from hospitals. Although still early days, the financial tool has already delivered some positive results as delayed discharges from hospitals have reduced by nearly 50% in 2012.	**Hire 900 additional general nurses to work in the community, to free up public health nurses to focus on child health services** **Further develop Advanced Nurse Programmes to supported the implementation of the integrated care programmes by the HSE** **Policy:** *Sláintecare 2017 Report* *Graduate, Specialist and Advanced Nursing and Midwifery Practice*
Increased specialisation and concentration of services	**Sweden** – Focus on increased specialisation and concentration of services. 24/7 emergency care services were concentrated in larger hospitals, while smaller hospitals provided more specialised services like outpatient treatment and community care services. As the focus shifted away from acute, episodic care to primary and preventative care, the average LOS in Sweden is still lower compared to other European countries. **Results:** • 20% reduction in hospital admissions and a redeployment of resources to the community. • Reduced LOS for patients with heart failure. • Reduced wait times to see specialists	**Model 2 hospitals will not have ACC so the patient will be tracked using the national early warning score and where appropriate, this score will prompt an acute medicine response and if necessary, transfer to the associated model 3 or model 4 hospital** **Policy:** *Securing the Future of Smaller Hospitals*

Theme	Initiative	Relevant policy consideration (Ireland)
Assess before admission	**UK** – Leeds interface geriatrician service is working across the local health system to help prevent unnecessary hospital admissions. A geriatrician attends A&E five afternoons a week between 2pm and 5pm. Here they triage patients and provide a comprehensive geriatric assessment before patients are admitted to the hospital. GPs and allied health professionals in the city also have access to a Primary Care Advice Line that provides advice and allows direct admission to wards. Geriatricians also attend community based multi-disciplinary team (MDT) meetings and may also visit patients in their homes. The geriatric team's approach was recently highlighted as an area of outstanding practice by the Care Quality Commission (CQC).	**Patients will be referred directly to AMUS/AMAUs/ MAUs in most cases by GPs and in some cases after presenting at ED. They will be assessed within one hour by a senior doctor and a decision regarding admission or discharge will be made within 6 hours** **Policy:** *National Acute Medicine Programme*
Integrated consultant roles	**UK** – The Whittington respiratory service has developed an integrated respiratory consultant role in which two specialists spend two of their programmed activities per week working across primary, community and secondary care settings, to promote the co ordination and integration of care for respiratory patients. They provide medical leadership to the integrated community respiratory (CORE) team and other health professionals to deliver care in the community and encourage patients to manage their condition. This is done with consultant support in diagnosis and care. They also take on a strategic role developing and evaluating new services to enhance the management of patients in the community. The service has also developed an integrated specialist registrar role, which creates a career pathway for clinicians interested in working across care settings. In future the service hopes to broaden the scope of integrated respiratory physicians as long-term condition leads for patients with multiple co-morbidities.	**Establish a Taskforce to develop a framework to determine the staffing and skill mix requirements for nursing in general and specialist adult hospital medical and surgical care settings** **Policy:** *Taskforce on Staffing and Skill Mix*

Theme	Initiative	Relevant policy consideration (Ireland)
Telephone consultations – GP	**UK** – Between 2010/2011 and 2014/2015, the number of face-to-face consultations rose by 12.2% and the average number of face-to-face contacts with a GP per registered patient rose from 3.2 contacts to 3.67 contacts in this period. Telephone contacts with patients by GPs increased hugely by 68.5% in this same period. **Airedale NHS UK** currently supports approx. 6,000 people to support integrated care outside the hospital environment – particularly useful for linking care homes to expert advice. Care home staff can speak to senior acute care nurses based in the telehealth hub via secure video connection on a 24/7 basis. As of Feb 2015, the trust was contracted to more than 300 care homes, including those beyond the catchment area of the hospital. **Results:** • Admissions from care homes dropped by 37%. • Admissions to A&E have fallen by 45%. • Reduced ALOS has also been observed.	**Reconceptualising the service to deliver care through telemedicine and virtual clinics** **Policy:** *Strategy for the Design of Integrated Outpatient services 2016-2020*

In assessing the above, it is clear that many healthcare systems in other countries have experienced similar challenges in terms of capacity and have devised and implemented innovative solutions to overcome this challenge. Furthermore, many of these examples of success are reflected in some way or other in Irish policy at present. It must also be noted that some of these policies support performances in international benchmarks that are outlined in Section 3 of this report.

Appendix D – List of Data Sources

Table 36: Demographics and Regions Data Sources

File ID	File name	Description	Sector
d29	Projected Population by Regional Authority,Year (2011–2031, 5yrs bucket, 2016fcst)	Population by Regional Authority – 2011-2031 forecast, 5yrs bucket, updated in 2016	Demographics
d30	Projected Population (Thousand) by Sex, Age Group and Year (2011-2046, 5yr bucket, 2013fcst)	Population by Age group and Sex – 2011-2046 forecast, 5yrs bucket, updated in 2013	Demographics
d31	Population 2011 and 2016 by County and City, Age Group Sex and Census Year (2016fcst)	Population by County and City, and Age Group, 2011 and 2016 actual, updated in 2016	Demographics
d46	RPP2016-2031TBL5	Regional Population Projections by Age Gr, Region(2011-2031, 5yrs bucket, 2013 fcst)(RPP2016-2031TBL5)	Demographics
d53	LHO, CHOs, RHOs	Mapping of HSE Region, CHO and CCA	Regions
d116	Capacity Review Focus Diabetes 100817.docx	Capacity Review 2017 – Focus on Type 2Diabetesreport	Epidemiology trends

Table 37: Primary Care Data Sources

File ID	File name	Description	Sector
d7	PRCS portal – Primary Care Workforce count	(March 2017 only) Count of PCRS agreements with GP, Pharmacist, Dentist, Optometrist by CHO and LHO	Primary care
d9	CORU registrars	Registration statistics for the Health & Social Care Professionals Council of Ireland	Primary care
d12	Healthy Ireland Average_gp_visits	Consultation with GP survey data by age, gender, weightings	Primary care
d13	Healthy Ireland Wave 1 GP practice Nurse Use	Consultation with GP nurse survey data by age, gender, weightings	Primary care
d16	PCRS Contracted staff 2012 to 2016	Number of agreements with contractor groups, by HSE regions and group type, 2012-2016	Primary care
d32	CIT Data 2014 – 2016 6 July 2017	Primary care – KPIs – Community Intervention Teams: Activity, admission avoidance, hospital avoidance, early discharge, unscheduled referrals from community sources	Primary care
d33	GP OOHs 2012 – 2016 6 July 2017	Primary Care – KPIs – GP Out of Hours Service through Treatment Centres, Home Services, Triage and other	Primary care
d34	Physiotherapy Data 2012 to 2016 6 July 2017	Primary Care – KPIs	Primary care
d65	CHO Sept WTE-PrimaryCareDivision	Primary & Social care workforce breakdown	Primary care
d66	Audiology 2015 – 2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary care
d67	CIT 2014 2015 By Referral Source 18 July 20	Primary Care HSE KPIs – 2nd priority	Primary care
d68	Dietetics 2015- 2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary care
d69	Ophthalmology 2015-2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary care
d70	Orthodontics 2014 – 2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary care

File ID	File name	Description	Sector
d71	OT 2015 – 2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary Care
d72	Physiotherapy 2012–2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary Care
d73	Podiatry 2015 – 2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary Care
d74	Primary care data secondary priority.xlsx	List of Primary Care HSE KPIs (2nd priority), documents d66 – d76	Primary Care
d75	Psychology 2015 – 2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary Care
d76	SLT 2012 – 2016 20 July 2017.xls	Primary Care HSE KPIs – 2nd priority	Primary Care
d77	Health Atlas Ireland Export 31 Jul 2017 16.15.53	Number of GP practices and GP WTEs per county	Primary Care
d78	PA report (1) – No GP practices p. County, CHO	Number of GP practices per County and CHO	Primary Care
d79	PA report (2) – No GP OOH practices p. County,CHO	Number of GP OOH practices per County and CHO	Primary Care

Table 38: Acute Hospital Data Sources

File ID	File name	Description	Sector
d1	OECD/Eurostat/WHO IRL Physical Resources 2017	National count of acute resources (beds & equipment: CT, MRI, PET, Gamma, Engiography, Mammographs, Radiation therapy eq,Lithotriptors),2005-2016	Acute
d5	Beds Available by Specialty 2005-2015	Beds available and occupied, by specialty, by hospital group, 2005-2015	Acute
d6	Copy of theatres 2017	2017 theatre count (total and active) and Gamma equipment, by hospital 2017	Acute
d8	Individual Hospital Statistics by Region 2010	Hospital statistics by region , 2010	Acute
d10	Day Beds – Places Available 2012-2015	Number of inpatient beds by provider, by month, and by bed type, 2012-2015	Acute
d14	Inpatient Beds Available 2016	Number of inpatient beds by provider, by month, by specialty, and by bed type, 2016	Acute
d18	2016 Treatment capacity updated 30th June	Treatment capacity by provider, specialty, care area, bed category, bed function, bed type and bed count	Acute
d19	Day Beds Places Available 2016	Number of inpatient beds by provider, by month, and by bed type, 2016	Acute
d20	ED activity	Count of admissions to the ED by hospital, by month and year, admission type, 2012-2017 Acute	Acute
d21	ED treatment spaces	Cubicle capacity of ED by hospital	
d22	Inpatient Beds Available 2012-2015	Number of inpatient beds by provider, by month, by specialty, and by bed type, 2012-2015	Acute
d23	OPD Activity	Outpatient activity by year, Month, Hospital, Specialty, Patient category	Acute

File ID	File name	Description	Sector
D24	Operating Theatres	Theatre capacity by hospital and activity (open/closed), 2011-2017	Acute
d26	Troleygar	(Inpatient Waiting list) Number of patients admitted to the hospital via ED and awaiting	Acute
d51	Endoscopy rooms	Number of weekly endoscopy rooms by hospital	Acute
d52	Provisional / Aggregated Private Hospital Data	Number of workforce, beds and activity 2010-2016	Acute
d81	IPDC GI Endoscopy by Group Hospital 2014	Waiting list – Endoscopy by Group Hospital – Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d82	IPDC GI Endoscopy by Group Hospital 2015	Waiting list – Endoscopy by Group Hospital – Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d83	IPDC GI Endoscopy by Group Hospital 2016	Waiting list – Endoscopy by Group Hospital – Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d84	IPDC Waiting List By Group Hospital 2014	Waiting list – Inpatient & Daycase by Group Hospital – Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d85	IPDC Waiting List By Group Hospital 2015	Waiting list – Inpatient & Daycase by Group Hospital – Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d86	IPDC Waiting List By Group Hospital 2016	Waiting list – Inpatient & Daycase by Group Hospital – Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d87	OP Waiting List By Group Hospital 2014	Waiting list – Endoscopy by Group Hospital – Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d88	OP Waiting List By Group Hospital 2015	Waiting list – Outpatient by Group Hospital, Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d89	OP Waiting List By Group Hospital 2016	Waiting list – Outpatient by Group Hospital, Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in	Acute
d91	IPDC GI Endoscopy by Group Hospital 2017	Waiting list – Endoscopy by Group Hospital, Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in	Acute
d92	IPDC Waiting List By Group Hospital 2017	Waiting list – Inpatient & Daycase by Group Hospital, Hospital, Case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Monhts), Specialty	Acute
d93	OP Waiting List By Group Hospital 2017	Waiting list – Outpatient by Group Hospital – hospital, case type (IP or DayCase), Limited Age bands, Time Bands (Waiting time in Months), Specialty	Acute
d111	NTPF AP Perf Summary 28 July 2017	Patients treated by private hospitals vis the NTPF since the latest scheme started in week of 12 May 2017.	Acute
d112	Health Service Capacity Review Cancellations	OP and IP cancellations by hospital, specialty, date, cancellation reason	
d113	PET_DOH2	Patient Experience Time between arrival at the ED and admission to a bed or discharged	Acute
d115	HIPE Endoscopy Codes 2015.xlsx	HIPE endoscopy codes	Acute
d175	National adult ICU activity estimate 2016 NOCA.pdf	National adult ICU activity estimate 2016	Acute

Table 39: Social Care Data Sources

File ID	File name	Description	Sector
d9	CORU registrars	Registration statistics for the Health & Social Care Professionals Council of Ireland	Social care
d11	HCP.HHH	Count of home help hours provided by HCPs by month and year, by CHO (1-9), 2012-2017	Social care
d15	Longstay Data	List of long stay nursing facilities by type and bed count	Social care
d47	Delayed Discharges Data Dump	Details of Delayed Discharges by Hospital, Age, Date, Reason on DD list	Social care
d48	HIQA Older Persons register	List of all registered older persons services registered with HIQA	Social care
d49	Copy of TCB Approvals 2015 and 2016	Data of Transitionary care beds by CHO	Social care
d50	TCB 2017 Number of Clients Supported	Number of Transitionary care bed clients 2017 Year to date	Social care
d65	CHO Sept WTE-PrimaryCareDivision	Primary & Social care workforce breakdown	Social care
d95	DPER Feb Overview_170126.xlsx	NHSS and legacy patient counts, supported, approved, etc. 2012-2016. Number of beds NHSS funded (direct NHSS and indirect (legacy) NHSS)	Social care
d96	HCP 2012-2016 by CHO LHO (Dec Prelim Data).docx	Number of persons in receipt of a Home Care Package (KPI OP1).	Social care
d97	HH 2012-2016 by CHO LHO (Dec Prelim Data).docx	Home Help Hours provided (excluding Home Care Package Hours) (KPI OP*)	Social care
d98	Home Care Funding Allocation 2012-2017 .docx	HOME CARE FUNDING (HH/HCPs/ IHCPs) in millions for 2015-2017	Social care
d99	Long stay explanation.docx	Definitions and legends of the metric columns in d15. Longstay.xlsx	Social care
d100	NHSS No Supported and ALOS 2012 2016.xlsx	No. of people supported by NHSS with associated ALOS for 2012-2016	Social care
d101	Queries.pdf	Answers to questions put to ESRI	Social care
d102	Section 38 MAW.XLSX	HIQA section 38 and 39 beds 2015	Social care
d104	SUMMARY OF PUBLIC BEDS 2012-2016.xlsx	Public Bed Register Older People Services September 2012- 2016 : LS and SS	Social care
d105	Summary on Rehab Bed Demand and Suggested Supply 2017.docx	Capital Requirements for Mid- Term Review of Capital Plan – Older Person Services 30th January 2017. HAS LHO area breakdown of extrapolated population totals for 2017	Social care
d106	Waiting List 2016.xlsx	2016 NATIONAL WAITING LIST – HH & HCP	Social care
d107	NHSS Residents on the placement list 2014.xls	No. of NHSS clients on the National Placement List 2014 by age	Social care
d108	NHSS Residents on the placement list 2015.xls	No. of NHSS clients on the National Placement List 2015 by age	Social care
d109	NHSS Residents on the placement list 2016.xls	No. of NHSS clients on the National Placement List 2016 by age d116	Social care
d114	HIQA 2014 -2016.xlsx	No. of social care beds	Social care

Appendix E
Model Technical Overview

The following table presents a summary of the common dimensions used within the modelling of demand and capacity.

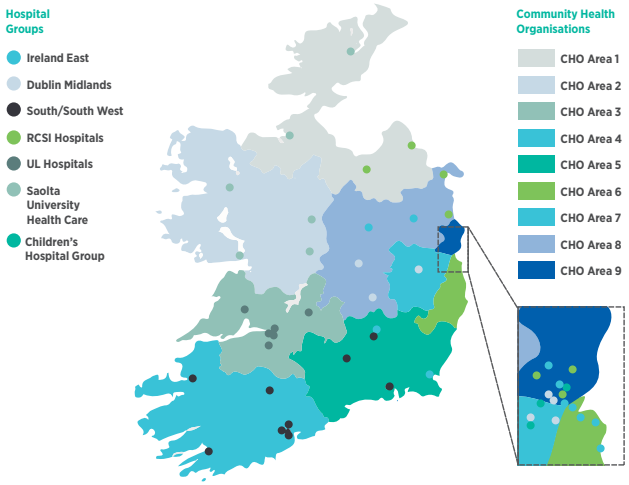
Table 40: Universal Dimensions used within the Model

Dimensions Across all Care Sectors		
Care Types	**Age Bands**	**Sites***
Public	0-1	Acute care – HG (mapped to counties)
Private	1-6	Primary care – CHOs (mapped to counties)
	7-15	Services for older persons care – CHOs (mapped to counties)
	16-44	
	45-64	
	65-74	
	75-84	
	85+	

* For a map of HGs and CHOs, please see Figure 47 for further information

The following figure presents a graphical summary of the hospital groups and CHOs. In the absence of defined geographical HG catchment areas, catchment areas for groups were defined using the location identified in the HIPE "discharged to" information from each hospital.

Figure 47: Map of Hospital Group and Community Health Organisations



The following table presents a summary of the specific model dimensions by care sector.

Table 41: Model Dimensions by Care Sector

Acute Care Sector Dimensions		
Specialty	**Points of Delivery (PODs)**	**Resources**
Medical Paediatrics Surgical Maternity Other	Emergency Department attendance AMU / AMAU / MAU Inpatient Elective Inpatient Non-Elective Day Case Adult Critical Care Outpatient appointment (First Appointment) Outpatient appointment (Follow Up)	AMU/AMAU/MAU bed Inpatient bed Day Case bed Adult Critical Care bed (see footnotes 12 and 13)
Primary Care Sector Dimensions		
Specialty	**PODs**	**Resources**
All	GP visits GP Practice Nurse visits 3 categories of Allied Health Professionals: Physiotherapists, Occupational Therapists, and Speech & Language Therapists	GP WTEs GP Practice Nurse WTEs Public Health Nursing WTEs Allied Health Professionals: Physiotherapist WTEs, Occupational Therapist WTEs, Speech and Language Therapist WTEs
Services for Older Persons Dimensions		
Specialty	**PODs**	**Resources**
Older people (over 65)	Residential Care Long Term Residential Care Short Term Home Care Intensive Home Care Home Help	Residential Care Long Term Beds Residential Care Short Term Beds Home Care Packages Intensive Home Care Packages Home Help Hours

[12] For the purposes of this Review, acute beds were analysed on the basis of "beds available", rather than beds occupied or bed capacity. The OECD's widely-applied definition of bed availability is: "An available bed is a bed which is immediately available to be used by an admitted patient or resident if required. A bed is immediately available for use if it is located in a suitable place for care and where nursing and auxiliary staff are available, either immediately or within a reasonable period." [https://stats.oecd.org/glossary/search.asp]

[13] In the case of ED and Outpatients, the Capacity Review only considered demand projections and did not quantify the capacity implications of projected demand as the appropriate unit of capacity is difficult to define.

The following table details the calculations used as a basis for the model.

Table 42: Model Calculations

	PAST (-5 to 0 Years)	
pn	Population	
dg	Demographic Growth	$dg_0 = (pn_0 / pn_{-1}) -1$
aa	Actual Activity	
wa	Unmet Demand (waiting list annual)	
td	Total Demand	$td_0 = aa_0 + wa_0$
ar	Activity Rate (Incidence)	$ar_0 = td_0 / pn_0$
nd	Non Demographic Growth	$nd_0 = (ar_0 / ar_{-1}) -1$
aa	Actual Activity	
rp	Resource Uptake	
rs	Resource Usage	
cw	Calculated Workload	$cw_0 = aa_0 \times rp_0 \times rs_0$
ry	Resource Availability	
rt	Resource Utilisation	
cc	Calculated Capacity	$cc_0 = cw_0 (rv_0 \times rt_0)$

	FUTURE (1 to 15 years)	
pn	Population	forecast
dg	Demographic Growth	$dg_1 = (pn_1 pno) -1$
nd	Non Demographic Growth (raw)	nd. = average(nd 4 to ndo)
na	Non Demographic Growth (adj)	$na_1 = func (nd_1)$
ar	Activity Rate (Incidence)	$ar_1 = aro \times (1 +$
ud	Underlying Demand	$ud_1 = pn_1 \times ar_1$
pi	Policy Impacts	
wr	Waiting list reduction	
ad	Adjusted Demand	$ad_1 = ud_1 + pi_1 + wr_1$
rp	Resource Uptake	
rs	Resource Usage	
fw	Future Workload	$fw_1 = ad_1 \times rp_1 \times rs_1$
ry	Resource Availability	
rt	Resource Utilisation	
fc	Future Capacity	$fc_1 = fw_1 (rv_1 \times di_1)$

Specialties Mapping Analysis

The mapping of HIPE specialties to model acute care specialties were driven by the data sources Appendix D and the HIPE identifier used for the mapping.

Mapping specialties from HIPE to the model was performed using a DoH-revised HSE mapping approach. This mapping contains a number of HIPE specialties that have a mapping to numerous model specialties ("mix"). The HIPE identifier used in this approach was a combination of consultant specialty for model specialties 'Medical', 'Surgical', 'Paediatrics', 'Maternity', and 'Psychiatry', and Diagnosis Related Group (DRG) codes for any mixed specialty mapping required in order to allocate the 'mix' group to one of the model specialties. These mappings are provided in the following table.

Table 43: Acute Care Sector Specialty Mapping

Medical	
100	Cardiology
300	Dermatology
400	Endocrinology
402	Diabetes Mellitus
700	Gastro-Enterology
800	Genito-Urinary medicine
900	Geriatric Medicine
1100	Haematology
1300	Neurology
1600	Oncology
1603	Radiation Oncology
1630	Brachytherapy
1640	Total Body Irradiation
1670	Oncology Extended Care
2203	Neuroradiology
2300	Nephrology
2400	Respiratory Medicine
2500	Rheumatology
2700	Infectious Diseases
2702	Tropical
3000	Rehabilitation Medicine
5000	General Medicine
6000	Audiological Medicine
6100	Public Health Medicine
6200	Clinical Neurophysiology
6300	Clinical Pharmacology
6400	Clinical Physiology
6500	GP Medicine
6700	Clinical (Medical) Genetics
6900	Nuclear Medicine
7300	Palliative Medicine
7500	Radiotherapy
7700	Metabolic Medicine
7900	Clinical Immunology
8003	Pain Relief
8400	Chemical Pathology
8500	Histopathology
8800	Immunology
8900	Microbiology
9001	Gold
9016	Heart Failure Clinic
9017	Chest Pain Clinic
9020	PKU Clinic
9029	Haematology Clinic
9037	Fracture Liaison and Dexa Scanning Clinic
9038	Anaemia Coordinator Renal Clinic
9048	Hypertension Clinic
9049	Cardiac Disease Management

Surgical	
600	Otolaryngology (ENT)
620	ENT / Ophthalmology / Plastics
1400	Neurosurgery
1503	Gynaecology
1620	Steereotactic Radiosurgery
1700	Ophthalmology
1800	Orthopaedics
1850	Acute Back Pain
2000	Plastic Surgery
2003	Maxillo-Facial
2010	Cosmetics
2600	General Surgery
2601	Breast Surgery
2602	Gastro-Intestinal Surgery
2603	Hepato-Biliary Surgery
2604	Vascular Surgery
2605	Breast Surgery
2614	Varicose Veins
7000	Dental Surgery
7001	Oral Surgery 7002 Orthodontics
7600	Cardio-Thoracic Surgery
7610	Open Heart Surgery
7800	Urology
7802	Renal Transplantation
8000	Anaesthetics
9004	Maxillofacial
9023	Orthopaedic Pre-Op Clinic
9026	Colorectal Clinic
9027	Stoma Care Clinic
9028	Colonoscopy Clinic
9035	Pre Op Assessment Clinic

Paediatrics	
601	Paediatric ENT
630	Paediatric Ortholaryngology (ENT)
1302	Paediatric Neurology
1402	Paediatric Neurosurgery
1802	Paediatric Orthopaedic Surgery
1802	Paediatric Orthopaedics
1900	Paediatrics
1902	Paediatric Cardiology
1903	Paediatric Oncology
1904	Neonatology
1905	Paediatric Endocrinology
1906	Paediatric Gastro-enterology
1907	Paediatric Haematology
1908	Paediatric A/E (ED) Medicine
1908	Paediatric A/E Medicine
1909	Paediatric Infectious Diseases
1910	Paediatric Metabolic Medicine
1911	Paediatric Nephrology
1912	Paediatric Respiratory Medicine
1915	Paediatric Dermatology
1916	Paediatrics Development
1917	Paediatric- General Medicine 1950 Paediatric Dentistry
1951	Paediatric Gynaecology
1952	Paediatric Ophthalmology
1953	Paediatric Urology
2202	Paediatric Radiology
7200	Paediatric Surgery
7803	Paediatric Urology
9021	Paediatric Incontinence Clinic

Maternity	
1502	Obstetrics
1516	Foetal Assessment
9031	Ultrasound Clinic
9042	Antenatal and Post Natal Clinic
9043	Maternity Day Unit
9047	Daily Fertility Clinic

Psychiatry	
2100	Psychiatry
2102	Child/adolescent Psychiatry
2104	Substance Abuse
2105	Old Age Psychiatry
2106	Rehabilitation Psychiatry
2100	Psychiatry
2101	Old Age Psychiatry
2110	Psychology

Use DRG code	
1500	Obstetric/Gynaecology
2200	Radiology
2800	Accident and Emergency
7400	Pathology
8002	Intensive Care
9000	'Other'

Model Inputs

Detailed below are the data that was used in the model as a basis to calculate the current and future demand and capacity of the healthcare system in Ireland.

Model Data Types and Sources

Health system data was collected and consolidated from multiple sources for the purpose of constructing a baseline view of the historic and current activities and resources within the Irish health system. This data was primarily sourced via the Department but also through other organisations within Ireland. Performance data was typically provided in database or tabular format. Where data was not available it was supported by the sector intelligence and analyses, government strategies and reports, and, where necessary, involved additional secondary research. This information also served to validate the data that was provided from other sources.

All data identified and collected through secondary sources was validated and augmented by key Department personnel and stakeholders through internal and external consultations. Further details with regard to these consultations are provided in the Sections 2.6 and 6. The list of sources is provided in Appendix D.

Modelling of Healthcare Current Activity

The first, if unexpected, major finding of this work was that all healthcare sectors were characterised by incomplete datasets. Of these sectors, the acute sector was the most complete but still not perfect.

Once collection of available data was complete through both secondary and primary sources, several data transformations and analyses were conducted, which involved multiple approaches depending on the nature of the data collected and the metrics being analysed. The list of metrics included in this model are presented in the table below.

Table 44: Activity Data Incorporated into the Model for all three Care Sectors

Sector	Model Activity Element	Model Resources Element
Acute Care	Inpatient Elective patients Inpatient Non-Elective patients ACC patients ED visits AMU visits Day Case patients Outpatient First Appointment visits Outpatient Follow-Up visits (Source: HIPE, HPO, HSE acute BIU, PET)	Inpatient beds Day Case beds ACC beds AMU beds (Source: HSE acute BIU, Critical Care Programme)
Primary Care	GP visits Practice Nurses visits (Source: Structure of General Practice 2015; Healthy Ireland Survey; Growing Up In Ireland; HSE Performance KPI data; CSO population)	GPs Practice Nurses Physiotherapists Occupational Therapists Speech and Language Therapists Public Health Nurses (Source: Structure of General Practice 2015; HSE General Practice Workforce Planning 2015-2025; HSE Health Intelligence Unit, ICGP General Practice fact sheet, Non-Acute Sector Workforce Staffing Groups 2014-2016)
Services for Older Persons Care	• HHH (people in receipt of publicly funded Home Help) • HCP and IHCP (people in receipt of publicly funded Homecare and IHCP) • Nursing homes long stay residents – Publicly and privately funded • Nursing homes short stay residents – Publicly and privately funded (Source: HSE Performance KPI data, NHSS 'Fair Deal', CSO population, Nursing Homes Ireland surveys)	• HHH (number of hours) – Publicly funded • HCP (number of) – Publicly funded • Nursing homes long and short stay beds – Public, Private & Voluntary homes (Source: HSE KPI on HCP and HHH provided 2012-2017; 'Social Care Operational Plan 2016' report data , HIQA Bed Register, SS non-HIQA beds, DoH Long Stay Survey, HSE Public beds register, Long Stay Activity Statistics 2013 Report)

Further detail on the modelling approaches and associated assumptions carried out to assess the acute and primary care sectors and services for older persons, for patient activity and resources is available in Table 48 and Table 49, respectively. Due to the incomplete nature of the data, underlying assumptions were necessary for certain metrics to permit analyses and subsequent input into the model. These assumptions were formulated and supported based on literature review and/or consultations with relevant stakeholders and DoH, and are documented in Table 48.

The overall growth in demand is predominantly a compound of both demographic and non-demographic growth trends. In order to project growth trends for the years 2017-2031, it was thus necessary to determine both demographic growth and non-demographic growth for use in future forecasts of healthcare demand.

Demographic Growth

Baseline population was taken from the latest 2012-2017 historic population estimate from CSO. The percentage change by year, and by Single Year of Age (SYOA) and region, was calculated as per CSO regional population projections (RPP) 2011. These annual percentage change was then applied to the baseline population by SYOA and region to create a 2017-31 forecast by SYOA and region. Regions were then mapped onto Counties ensuring that Tipperary was split between Mid-West (45%) and South-East (55%). The County level forecast was then mapped to a Hospital Group forecast using a mapping provided by DoH (based on 2015 HIPE data) and to CHOs based on a mapping provided by DoH based on latest population analysis.

The step-by-step approach is as follows:

Step 1: Baseline population data taken from Nuts3_ SYOA_April11_17 regional breakdown provided by CSO

Step 2: Annual percentage change by SYOA and region then taken from the CSO 2017-2031 regional population projection (M2F2)[14] which is based on 2011 Census data.

Assumption: That the percentage change by SYOA and region from the 2017-2031 RPP forecast still holds understanding there is a known divergence between the 2011-2016 forecast and the 2011-2016 actual.

Step 3: Use the baseline for 2017 and the percentage change from 2017 to 2031 to produce an updated forecast by SYOA and region.

Step 4: Map the regional forecast onto a County level forecast, accounting for Tipperary.

Assumption: Counties within a region will have the same population growth profile as the overarching region

Step 5: Map the County level forecast onto HGs using a mapping table provided by DoH (based on 2015 HIPE data)

Assumption: Mappings from county to HG are provided by Department of Health

Step 6: Map the County level forecast onto CHOs using a mapping table provided by DoH (based on Health Atlas data).

These steps ensured the generation of estimated demographic growth pressure forecasts based on the impact of future population growth and future activity levels within the given service (POD/specialty combination) for each of the age bands, and within the HGs and CHO areas necessary for the building of the model.

Non-Demographic Growth

In this report, "non-demographic" growth is considered to be growth within activity levels outside of population-related changes. This would include changes in activity due to a range of factors including epidemiological trends (e.g. trends in the prevalence of chronic diseases, wider economic and social factors (such as employment rates, levels of education and income, deprivation and health insurance coverage) or innovation in healthcare and technological developments.

As shown in Figure 48, modelling of non-demographic growth was captured by a combination of two steps:

1. Assessment of the historic change in incidence levels and adjusting for underlying population changes. This involved identifying demographic growth trends over this historic period (across individual age cohorts) and removing them from overall demand over the period. The remaining growth, which is unexplained by population changes, is considered "non-demographic", and using these historical trends from the previous 5 years (4 years of growth), this growth is trended forward in the baseline. Calculation of historic demand was dependant on data availability and quality, which varied across different areas.

[14] The forecast is based on a 2016 baseline position and an annual uplift on that position. The 2016 baseline position – from CSO – is Nuts3_ SYOA_April11_17, which is the 5 year historical view based on the 2011 census and 2016 census. The uplift is based upon the CSO 2017-2031 regional population projection (M2F2) which is based on the 2011 census data. (This forecast will be updated with 2016 census data during 2018.)

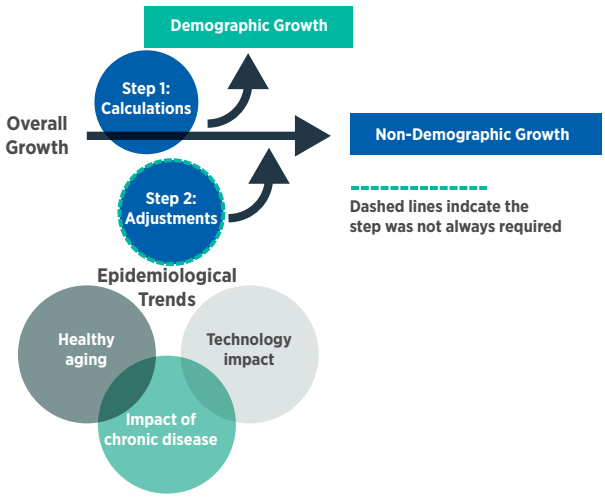
2. The main drivers of non-demographic growth are the underlying health of the population (determined to some extent by lifestyle behaviour choices), changing attitudes to using services, change in effectiveness and efficiency of services, funding/supply of services, technology impacts, prevalence of chronic conditions, and changes in care delivery. In order to ensure the model does not omit any non-demographic growth factors, calculated model output for non-demographic growth (Step 1) was adjusted, if needed, to reflect expected changes in future activity based on:
   - Expert knowledge.
   - Findings of a relevant review of the literature.
   - Past events that are not expected to continue in the future.

In order to do this, multiple sensitivity checks were carried out on calculated non-demographic growth trends, including:

- Comparing calculated non-demographic growth with non-demographic growth observed in similar services in other countries (mainly England and Scotland due to data availability).
- Comparing the activity rate (per 1,000 people) to determine whether Irish activity is currently vastly different.
- Interviewing key stakeholders to gauge their expert opinion on the reasons for current trends in the system, with a particular focus on AMU, Day Case, and IP EL.

All adjustments were POD-specific for the acute sector and services for older persons, while adjustments for primary care were based on age bands due to a lack of available trend data. A breakdown of these adjustments is presented in Table 45 and Table 46.

Figure 48: Non-Demographic Growth Trend Methodology



This approach analyses past non-demographic growth pressures at a granular level; namely by age cohort, by healthcare sector, by service area/point of delivery (POD), by gender, and by department/speciality group, where applicable.

Non-demographic growth assumptions include:
- There is no annual demand with less than 5 units included in non-demographic growth.
- Growth is calculated from 2013-2016 inclusive with the exception of AMU data which is for 2014-2016 inclusive due to low numbers in 2013.
- Annual non-demographic growth for any speciality/POD/age/gender/year combination is capped at 10%.
- The average annual non-demographic growth for any speciality/POD/age/gender is capped at 5%.
- Due to the lack of trend activity data for Primary Care, non-demographic growth for all Primary Care PODs is currently assumed to be 1% based on overall increase in activity in the acute sector.

There are inherent advantages and disadvantages to this approach, such as:

1. This approach accounts for wider non-demographic factors as they would have occurred in the past data and applies them to future data. However this approach precludes any flexibility to trend these forecasts in a different direction.
2. This approach doesn't account for potential longer-term healthier ageing trends, i.e. older people requiring less healthcare due to compression of morbidity.

In consideration of these limitations, additional methods were employed to strengthen the non-demographic forecasts:

1. Comparison with non-demographic growth and scenario impact analyses carried out by other national healthcare organisations in order to sense-check the magnitude of impact.
2. Key epidemiological trends (concerning disease risk factors, chronic disease, and other disease groups) were identified and reviewed to discern to what extent these trends are currently reflected in the baseline scenarios, and which indicated what adjustments, if any, needed to be made to sector-specific datasets.

Note: With regard to the acute sector, information from HIPE data on disease trends was used in conjunction with evidence from the literature and stakeholder engagement to appropriately understand healthy ageing trends within specific conditions and magnitude of impact going forward. Secondary research was performed to investigate how epidemiological trends are impacting the primary and social care activity.

3. Existing published research on the impact of wider economic factors on non-demographic growth was reviewed and considered for incorporation into scenarios (Section 7) and trending forward in the model.

Non-Demographic Changes

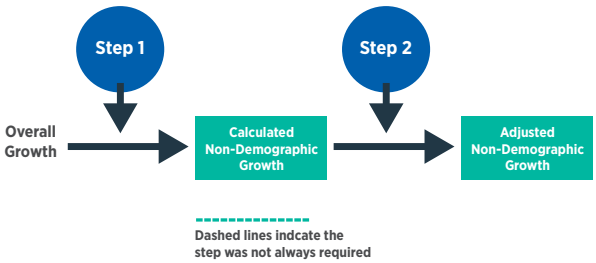
Note: Policy impacts were also overlaid on non-demographic growth trends, if appropriate, within each presented scenario in this report.

This section presents the non-demographic changes that were estimated for future growth.

As stated above, non-demographic growth forecasts were calculated in two steps:

- **Step 1:** Average non-demographic changes in demand over and above demographic changes were calculated.
- **Step 2:** Calculated forecasts were adjusted, where necessary, to reflect what was agreed to be reasonable assumptions for the future.

Figure 49: 2-Step Estimation of Non-Demographic Forecasts



Step 2 involved the application of various POD-specific changes to non-demographic growth forecasts. These changes were subsequently discussed with stakeholders and used in projections for 2017–2031. These forecasts are presented below for acute care (Table 45), primary care, and services for older persons (Table 46).

Acute Care

Table 45: Acute Care Non-Demographic Forecasts

POD	Growth Period		Demographic Growth	Non-Demographic Growth – Calculated Forecast	Non-Demographic Growth – Adjusted Forecast
	No. of years	Range of years			
ED	3	2013–2016	0.8%	-1.3%	0.0%
AMU	2	2014–2016	2.0%	0.3%	0.0%
Day Case	4	2012–2016	1.7%	1.3%	1.3% à 0.3% *
IP EL	4	2012–2016	1.5%	-4.0%	-1.5%
IP NEL	3	2013–2016	1.2%	-0.1%	0.0%
ACC	3	2013–2016	2.3%	-2.0%	0.0%
OPFA	3	2013–2016	1.0%	0.1%	0.5%
OPFU	3	2013–2016	1.2%	1.7%	0.5%

*During future years 1-5 (2017-2021), non-demographic growth is amended to the first activity growth percentage listed, and in the subsequent years 6-15 (2022-2031) non-demographic growth changes to the second percentage listed, reflecting potential saturation in shift from Inpatient to Day Case.

There were POD-specific changes applied to the calculated non-demographic growth forecasts for the acute care sector. These changes by POD are as follows:

- **ED:** While demographic pressure is assumed to continue, it is assumed that most additional non-demographic growth will be controlled by diversion to Minor Injury Units (MIUs) and other alternatives to ED, which is a similar trend to that seen in England. Overall growth will be reduced in a number of scenarios modelled.
- **AMU:** AMU activity ramped up in 2012 & 2013, yet it has recently been on a slower trajectory. As a result, the average calculated non-demographic growth is reduced by 0.3% to 0.0%.
- **Day Case:** Currently, there is high day case activity due to significant progress in shifting activity from IP EL to Day Case but with limited progress to date on shifting activity from Day Case to OP. It is assumed that non-demographic growth will remain steady for 5 years (2017-2021), followed by a reduction in growth due to achievement of maximised efficiency in converting inpatient to day case and day case to OPD procedures.
- **IP EL:** IP EL is currently experiencing negative NDG due to a lack of capacity in the system and the need to provide beds for emergency inpatients, and the shift referred to above from IP EL to Day Case. It is assumed that this non-demographic growth trend will reduce in the future as the system reaches maximised efficiency in converting from IP to Day Case. IP EL activity also incorporates public activity that has been funded in private hospitals.
- **IP NEL:** The trend in IP NEL has been steady in recent years, and reflects similar trends and activity rates in other countries (e.g. England & Scotland). A slightly stronger non-demographic growth rate than in recent years is assumed projecting forward for IP NEL.
- **ACC:** ACC services are currently severely capacity constrained, and have had the same activity levels for the last 5 years. It is assumed that overall growth aligns with demographic trends, which are high; resulting in an assumption that non-demographic growth is 0%.
- **OPFA:** Due to changes in outpatient activity reporting, 2012 data is not included for trend calculations. A non-demographic growth of 0.5% is assumed due to the continuing upward trend in OP and a move away from IP.
- **OPFU:** Similarly to OPFA, 2012 data is not included. Similarly to OPFA, 0.5% non-demographic growth is assumed due to the continuing upward trend in OP and a move away from IP.

Primary Care

Considering the lack of trend data for Primary Care, all non-demographic growth was assumed to follow general non-demographic growth pressure on health services across each age cohort. For this assumption, the acute sector was used as a benchmark. This resulted in a weighted non-demographic growth pressure of 1% overall for Primary Care, which is an average across all activities in the acute sector.

Services for Older Persons

Table 46: Services for Older Persons Non-Demographic Forecasts

POD	Growth Period		Demographic Growth	Non-Demographic Growth – Calculated Forecast	Non-Demographic Growth – Adjusted Forecast
	No. of years	Range of years			
Residential Care Long Term	3	2013-2016	3.9%	-2.1%	-1.6%
Residential Care Short Term	3	2013-2016	3.9%	-1.8%	-1.3%
Home Care (Packages)	4	2012-2016	3.5%	4.8%	0.0%
Intensive Home Care (Packages)	1	2015-2016	3.5%	4.9%	0.0%
Home Help (Hours)	4	2012-2016	3.5%	-1.2%	0.0%

Similarly, POD-specific changes were also applied to the calculated non-demographic growth forecasts for services for older persons.

Residential Care Long Term: Calculated non-demographic growth trends are consistent with a shift from residential care to home care. Negative projected trends reflect shortening LOS on long term beds. Adjustments are made to account for possible unmet need and an eventual saturation point in terms of impact of financing arrangements and of substitutability between residential care and home care.

Residential Care Short Term: The trend has been adjusted to account for possible unmet need and previous funding pressure.

Home Care (Packages): Calculated non-demographic growth trends are consistent with a significant increase in funding to the home care area in recent years. However, it is assumed that there will be some slowing down in the scale of funding increases, as such projections are on the basis of demographic growth only. Further adjustments will occur in the scenarios in Section 7.

Intensive Home Care (Packages): IHCP are relatively new and the calculated trend is representative of a new service coming on stream and ramping up in recent years. Projections are on the basis of demographic growth only. Further adjustments are reflected in the scenarios in Section 7.

Home Help (Hours): Calculated non-demographic growth trends are consistent with the decision to target increased investment at HCP; however this reduction in home help is expected to stop trending forward. Projections are on the basis of demographic growth only. Further adjustments are reflected in the scenarios in Section 7.

Estimation of Unmet Demand

In this model, unmet demand is assumed to be captured in data on waiting lists across the acute and primary care sectors and services for older persons. Relevant waiting list counts were taken as the count of patients waiting at the final day of a calendar year, i.e. 31/12/20XX and were taken to represent the waiting list status for a given year (20XX).

Overall Approach to Unmet Demand

The unmet demand for a given year was determined by calculating the annual difference in waiting list counts at the end of one year compared to the end of the previous year. The historic years of interest in this model are 2012-2016. However, as waiting list counts were not provided for 2011, an average of the 2012-2016 counts was estimated to represent 2011. These 2011 counts permitted calculation of the annual difference for 2012.

Following these calculations, estimated unmet demand figures (annual waiting list difference) were added to the past actual activity of a given year and trended forward using the demographic and non-demographic growth estimations. Table 45 lists the POD metrics whose activity was analysed with their waiting list data incorporated into the model. For further detail on the approach, along with assumptions made, for each POD across acute and primary care sectors, and services for older persons, refer to Table 46.

Reducing Waiting Lists

Within each waiting list included in the model, there is a "stock" count that represents the constant part of the yearly count that is carried forward to each subsequent year. However, in the model, a reduction in this "stock" over future years is forecast until the waiting list stock reaches zero ("waiting list reduction"). The total size of the waiting list at the end of 2016 represents the "stock" counts to be reduced.

This reduction was achieved by spreading the waiting list "stock" over a number of future years (2017 onwards), where it is represented by relevant additional activity. The number of years it would take to reduce the waiting list "stock" to null is one of the assumptions set by the user of the model and can vary by type of waiting list. For the purpose of this Capacity Review, the figures presented are based on reducing the waiting list over a four year period (2018–2021)

Table 47: Waiting Lists Incorporated for All 3 Care Sectors

Sector	Model Unmet Demand Element
Acute Care	Inpatient Elective Day Case Outpatient First Appointment (Source: NTPF, CSO population)
Services for Older Persons	Nursing Homes Long Stay HHH and HCP (Source: NHSS waiting lists, National Waiting Lists HH/HCP (Dec 2016), CSO population)

Table 48: Historic Activity and Waiting Lists Methodology – All 3 Sectors

Sector	Model Unmet Demand Element	Approach	Assumptions
Acute Care	**Elective Inpatients, Non-Elective Inpatients, ACC patients, Day Cases, AMU patients** (Source: HIPE, HPO, NTPF)	**Main source:** HIPE data **Patient activity:** • Past activity (patient discharges) are estimated by aggregating relevant HIPE data metric counts. • Specialties are allocated to the speciality groups based on Consultant Specialty and DRG codes. • Psychiatric specialties are excluded. **Inpatient:** Elective and Non-Elective patients are segmented by the ADMTYPE field . **ACC:** ACC visits are defined as any patient who has a non-zero length of stay in ACC. **EL IP/Non-EL IP/ICU:** LOS is calculated from HIPE data fields for private, semi-private and public beds and calculated for each type/POD/spec/age/site combination. **Day Case:** Day Case are separated from other patients by the IsDayCase flag. **AMU:** AMU attendance is found using the EMADM flag, and patients who only visit the AMU are removed from other inpatient counts. **Day Case/AMU:** LOS is assumed from expert consultation. **Waiting lists (Day Case, OPFA, EL IP) – unmet demand:** • Waiting lists across endoscopy and IP / Day Case were combined as these were provided separately. • Waiting list specialties are mapped to specialty groups using HSE outpatient specialty mapping. • HIPE data is aggregated by POD, age and gender. • Waiting lists were profiled with HIPE data to align with the model age bands.	**Assumption [1]:** Speciality Groups were assigned based on consultant specialty fields; in case multiple specialties are assigned to a specialty group, HIPE DRGs codes are used instead, All <16 assigned to Paediatrics. *NB: Specialty Group – HIPE Consultant Specialty and Specialty Group – DRG mappings are based on HSE mapping reviewed and revised by DoH due to need to provide more aggregated specialty groups for the model.* **Assumption [2]:** Psychiatry is excluded from counts. **Assumption [3]:** 2 patients per day in Day Case for Public Hospitals, 1.1 patients per day for Private Hospitals. **Assumption [4]:** 0.9 patient per day in AMU bed. **Assumption [5]:** HIPE is used to segment waiting lists by Gender and to adjust the age bands, assuming patients treated have the same age and gender profile as those waiting. **Assumption [6]:** End of 2013 waiting list is not available. Waiting list as at 30/01/2014 is used as 'end of 2013'. **Assumption [7]:** Waiting Lists assumed to be run down over next 4 years.

Sector	Model Unmet Demand Element	Approach	Assumptions
	OP First Appointment, OP Follow Up (Source: HSE acute BIU)	**Main source:** HSE BIU data **Patient activity:** • OPD activity is provided by Hospitals, Speciality and Age band. • Hospitals are mapped to HGs. • Outpatient specialties are mapped to the model specialties. • The provided age banding is higher than that used in the model, so this is adjusted using demographics. • Gender breakdown is not available, so these patients are apportioned on the basis of demographics. **Waiting lists:** • See IP EL / IP NEL / ACC / Day Case / AMU.	**Assumption [1]:** 'Did Not Attend' (DNA) are excluded from activity counts – due to the fact that OP sessions tend to be overbooked. **Assumption [2]:** The gender breakdown of OP activity is assumed to be the same as the gender profile of the population. **Assumption [3]:** OP age is trended by the four top level age bands, within these age bands it is assumed to follow population forecast.
	ED (Source: HSE, PET)	**Main source:** HSE attendance data and PET data **Patient activity:** • Historic ED activity taken from HSE data. • Age profile taken from ED data but at a more aggregated level than used in the model. Distribution within the top level age profile are based on 2016 PET data. • Patients are apportioned by gender on the basis of demographics.	**Assumption [1]:** The age profile of ED attendees within the four top level age bands is assumed not to have changed in the period 2012 – 2016, as the 2016 age profile from PET is applied across all years. **Assumption [2]:** ED attendance is assumed not to be related to gender, as patients are apportioned by gender on the basis of demographics.
Primary Care	**GPs Practice Nurses** (Source: Structure of General Practice 2015; Healthy Ireland Survey; Growing Up In Ireland)	**Patient Activity:** • Population by age cohort is taken from 2016 census. • Activity per person under 15 is taken from the following documents – Growing Up in Ireland (GUI) (9 months); GUI (0-3 years); GUI (9 years). • Activity per person over 15 is based upon the weighted numbers from the Healthy Ireland Survey, with manual adjustments to smooth across age bands (Wave 1 and 2 survey data was used for GPs; Wave 1 only was used for practice nurses). • Breaking down activity by CHO is currently done by population weighting (by age and gender). **Waiting lists:** Data is not applicable	**Assumption [1]:** Average GP appointment length is assumed to be 12 minutes based on Structure Of General Practice Survey 2015. **Assumption [2]:** Average nurse appointment length is assumed to be 15 minutes.

Sector	Model Unmet Demand Element	Approach	Assumptions
Older Persons Care	**HHH and (I)HCP – Public** (Source: HSE KPI on HCP and HHH provided 2012-2017 (d15); 'Social Care Operational Plan 2016' report data; d47. Delayed Discharges Data)	**Main source:** Activity – HSE Performance KPI data; Waiting list – HSE National Waiting List data (2016) People in receipt • No data is available for the private sector. • CHO breakdown of IHCP data was calculated using HCP CHO ratio distribution. **Waiting lists** • National Waiting List data from 2016 was used. • The data provided was split by CHO. Age band groupings were split using Age Profile of clients in receipt of Home Care Services: – <45years 5% 16-44 – 45-64 years 10% 45-64 – 65-74 years 14% 65-74 – 75-84 years 34% 75-84 – 84+ years 38% 85+	**Assumption [1]:** With regard to private sector provision of (I)HCP, the public:private ratio observed in the TILDA Wave 3 data holds true with the HSE Performance KPI data for Home Care and this ratio is used to calculate private sector activity. **Assumption [2]:** With regard to CHO breakdown for IHCP: it is assumed IHCP are distributed across CHOs in the same manner as for HCP. **Assumption [4]:** Waiting List split into HHH and HCP based on 50/50 assumption. **Assumption [5]:** Waiting List data split into age bands based on distribution shown.
	Residential Long Stay (Source: Activity: HSE NHSS 'Fair Deal', NHI Private Hospitals Survey 2014/15, DoH Long Stay Survey, HSE Public beds register, Long Stay Activity Statistics Report (LSAS); Waiting lists: NHSS waiting lists 2014-2016)	**Main source:** Activity – HSE NHSS data, DoH Long Stay Survey data, HSE Public Beds Register; Waiting list – HSE NHSS data **Activity:** **Long stay residents** • Public financed activity – The HSE NHSS 'Fair Deal' patient data includes publicly funded patients in public, voluntary and private nursing homes (data sources: d100 and d95). • Privately financed activity – There are no data available. Privately funded patients would reside in private and voluntary homes. – NHI Private Nursing Homes survey 2014/15 reported percentage of privately funded patients residing in private and voluntary nursing homes, i.e. 12%. (data source: NHI Private Nursing Homes Annual Survey 2014 2015). – As the total number of people in private and nursing homes is not known, the following approach has been applied: HSE NHSS Fair Deal data split by patient profile dataset was used, from which the volume of publicly financed patients residing in private and voluntary homes has been extracted. This volume represents 88% of all patients in private and voluntary nursing homes. The remaining 12% represents privately financed patients.	**Assumption [1]:** HSE NHSS 'Fair Deal' patients profile – it has been assumed "NHSS Private", Legacy-Contract", "Legacy-Subvention" and "Legacy Section 39" represents the publicly financed patients in the private and voluntary homes, which is 88% of the total long stay activity within the private and voluntary nursing homes (88% assumption comes from NHI Private Nursing Homes Annual Survey 2014 2015). **Assumption [2]:** The percent breakdown of publicly and privately-financed patients in private and voluntary nursing homes as reported by the NHI 2014/2015 survey holds true for the other historic years of interest to this model. **Assumption [3a]:** The LS:SS (Long Stay: Short Stay) ratio calculated following the Nursing Homes Resources Methodology M3 based on HSE Public Beds dataset holds true for the HSE NHSS data.

Sector	Model Unmet Demand Element	Approach	Assumptions
		Short stay residents • Calculated Long Stay activities were used as a base to estimate Short Stay activities. Long Stay to Short Stay beds ratios were used, with different ratios for Public Homes and different ratios for Private & Voluntary Homes. Prior to that, Long Stay activities were split by home type: Public Homes and Private & Voluntary Homes. **Activity mapping to Nursing Homes:** • The following mapping of patient types was used to allocate activities to Public Homes and to Private & Voluntary Homes: • Public Homes: – HSE reported: HSE NHSS Public patients + Legacy Schemes Public/ Section 38. • Private & Voluntary Homes: – HSE reported: HSE NHSS Private patients + Legacy Schemes Contracted + Legacy Schemes Subvention + Legacy Schemes Section 39. – Calculated Privately funded patients. • The ratio of Long Stay to Short Stay activity was calculated from 4 different data sources: 1. Following the Nursing Homes Resources Methodology M3 based on HSE Public Beds dataset. 2. Following the Nursing Homes Resources Methodology M1 based on DoH Long Stay Survey dataset. 3. Following the Long Stay Activity Statistics Report (LSAS) report (2013 metrics). 4. NHI Private Nursing Homes Survey stating that Long-stay residents accounted for 92% of all residents in respondents' nursing homes, i.e. private and voluntary nursing homes. Therefore the privately financed Short Stay activity was estimated to account for 8/92 = 8.7% of the calculated privately financed Long Stay activity.	**Assumption [3b]:** The LS:SS ratio calculated following the Nursing Homes Resources Methodology M1 based on DoH Long Stay Survey dataset holds true for the HSE NHSS data. Assumption [3c]: The LS:SS ratio calculated from the LSAS report (2013 metrics) holds true for the HSE NHSS data. **Assumption [3d]:** The combination of LS:SS ratio in Public Homes calculated following the Nursing Homes Resources Methodology M3 based on HSE Public Beds dataset and NHI Survey LS:SS ratio in Private & Voluntary Homes holds true for the HSE NHSS data. **Assumption [3e]:** The combination of LS:SS ratio in Public Homes calculated following the Nursing Homes Resources Methodology M1 based on DoH Long Stay Survey dataset and NHI Survey LS:SS ratio in Private & Voluntary Homes holds true for the HSE NHSS data. **Assumption [3f]:** The combination of LS:SS ratio in Public Homes calculated from the LSAS report (2013 metrics) and NHI Survey LS:SS ratio in Private & Voluntary Homes holds true for the HSE NHSS data. **Assumption [4]:** The HSE NHSS data CHO breakdown calculated based on 2015-16 applies to all years for both privately and publicly financed parts of the sector – for long and short stay beds.

Sector	Model Unmet Demand Element	Approach	Assumptions
		Based on the above **5 different approaches** have been used: a) All homes – [1] {results presented in this document are based on this approach}. b) All homes – [2]. c) All homes – [3]. d) Public Homes – [1], Private & Voluntary Homes – [4]. e) Public Homes – [2], Private & Voluntary Homes – [4]. **Waiting lists:** • Data selected based on "Referral category". 3 categories selected: • Private Nursing Homes – Not on Subvention. • Private Nursing Homes – On subvention. • Public / Voluntary Nursing Units. Actual activity data was used to split waiting lists data into Age Bands and CHOs.	**Assumption [5]:** Activity is expressed as the average per month activity. Activity to beds relationship is therefore 1:1. **Assumption [6]:** All 3 categories represent Public Waiting List. **Assumption [7]:** Waiting List data split into age bands and CHO based on Actual Activity distribution.

Table 49: Historic Resources Methodology – All 3 Sectors

Sector	Model Unmet Demand Element	Approach	Assumptions
Acute Care	Inpatient Beds, Day Case Beds, ACC Beds, AMU Beds (Source: HSE acute BIU, CCP)	**Main sources of bed capacity data:** • Beds count based on HSE bed data. Specialties are mapped to specialty groups and AMU and ACC beds tagged. • Paediatric ACC beds are based on HSE bed count data. • ACC beds are based on Critical Care Programme (CCP) study in 2016. • Other bed types e.g. day cases, inpatients etc. come from HSE BIU. **Resources:** • Specialties are mapped to specialty groups with AMU and ACC beds tagged.	**Assumption [1]:** Non-operational but funded beds recorded by CCP are included in ACC capacity. **Assumption [2]:** Temporarily closed beds are included in the bed count for other beds. **Assumption [3]:** Cardiac care beds are assumed to be inpatient beds.

Sector	Model Unmet Demand Element	Approach	Assumptions
Primary Care	**GPs** (Source: Structure of General Practice 2015; HSE General Practice Workforce Planning 2015-2025; Health Intelligence Unit – Health Atlas)	**Main source:** Structure of General Practice 2015 **Resources:** • The number of GPs was sourced from various documents and compared. • Additionally, GP numbers were also calculated independently from activity and working assumptions. • GP activity assumed to be 18.9 million appointments. • GP assumptions sourced from Structure of General Practice Survey – supported by other documents where required.	**Assumption [1]:** GPs spend 58% of their working time in direct contact with patients (from Structure of General Practice Survey 2015). **Assumption [2]:** GPs spend an additional 17% of their time writing up patient notes (from Structure of General Practice Survey 2015). This is assumed to be outside of the direct 12 minutes patient facing time. **Assumption [3]:** Average of 27 days annual leave per year, plus bank holiday and sick leave leaves 44 weeks per year working. **Assumption [4]:** 81% of GPs assumed to work full time (average taken of Structure of General Practice Survey and HSE General Practice workforce planning report). **Assumption [5]:** Part time GPs assumed to work 50% of the time (HSE General Practice workforce planning report).
	Practice Nurses (Source: ICGP General Practice fact sheet)	**Resources:** • Practice nurse headcount data was provided by 6 CHOs which had complete data for 2016, 3 CHOs uplifted from 2012 data.	**Assumption [1]:** Nurses spend 75% of their working time in direct contact with patients. **Assumption [2]:** Average of 27 days annual leave per year, plus bank holiday and sick leave leaves 44 weeks per year working. **Assumption [3]:** 50% of PNs assumed to work part time (from data provided). **Assumption [4]:** Part time PNs assumed to work 60% of the time (by email from HSE)

Sector	Model Unmet Demand Element	Approach	Assumptions
	Public Health Nursing and Allied Health Professionals (Physiotherapy, S&LT, OT) (Source: Non-Acute Sector Workforce Staffing Groups 2014-2016)	**Main source:** CHO Sept WTE-Primary Care Division (d65) **Resources:** • Resources data were provided for 2014-2016 but only 2016 data is broken down by CHO area. The 2016 CHO area split ratios were applied to national counts for 2014 and 2015 in order to calculate CHO counts for 2014-2015, based on the listed assumption. • Data includes the number of WTEs for various non-acute sector workforce staff: Public Health Nurses, Occupational Therapists, Physiotherapists, and Speech & Language Therapists. • No data prior to 2014 available – years before 2014 were not included. For PHN, data for 2014 and 2015 by CHO area is missing – gaps were estimated.	**Assumption [1]:** CHO split of resources counts for 2014 and 2015 were applied using 2016 CHO area ratios.
Services for Older Persons	**HCP and IHCP – Public** (Source: HSE KPI on HCP and HHH provided 2012-2017 (d15); 'Social Care Operational Plan 2016' report data)	**Main source:** Activity – HSE Performance KPI data **Resources:** • No direct data on the number of HCPs and IHCPs were available. • While Assumption (1) was used to estimate public sector count, there is no base data available for the private segment of the sector. • Activity data (source: HSE Performance KPI data) were multiplied by the Resource Use (number of people in receipt of packages) data to obtain Resource count for the public sector.	**Assumption [1]:** A 1:1 ratio between people receiving a home care package and the number of packages was assumed; therefore, the count of packages equals the number receiving them (activity). **NB:** Based on discussions with the DoH and HSE, it is assumed that one person can only receive one HCP or IHCP in their lifetime, i.e. 1:1 ratio – This assumption was refuted by social care stakeholders at the Wave 1 workshop.
	HHH – Public (Source: HSE KPI on HCP and HHH provided 2012-2017 (d15))	**Main source:** HSE Performance KPI data (2012-2017) **Resources:** • Number of HHH being provided by CHO for public sector only. • The total HHH count for a given year was taken for use in the model. • There is no data available for the private segment of the sector.	**Assumption [1]:** With regard to the private sector, the public:private ratio observed in the TILDA Wave 3 data holds true with the HSE Performance KPI data for Home Care and this ratio is used to calculate private sector activity.

Sector	Model Unmet Demand Element	Approach	Assumptions
	Nursing Homes Long and Short Stay Resources in Public, Private & Voluntary homes (Source: HIQA 2013-16, SS non-HIQA beds, DoH Long Stay Survey, HSE Public beds register 2012-2016, Long Stay Activity Statistics 2013 Report	**Main source:** HIQA beds data **Resources:** • Data includes all long stay beds and some short stay beds –alignment to CHOs. The breakdown between long stay and short stay beds is missing from some data. • Additional dataset on unregistered HSE and Section 38 Short Stay Beds provided by HSE Social Care was used to complement the HIQA dataset. The data are provided as per 2017. The Year-on-Year (YoY) change was calculated from the HSE Public Short Stay Beds dataset and applied to estimate 2012-16 Short Stay beds not registered with HIQA. • The SS to LL ratio was calculated and applied to the total estimated number of beds. 3 data sources were used: 1. M5a: HSE Public Beds dataset 2. M5b: DoH Long Stay survey (extrapolated to 100% using M1) 3. M5c: LSAS report • The CHO breakdown for Long Stay beds was based on which county each Nursing Home is located in.	**Assumption [1]:** HIQA data reports on all long term beds and part of short stay beds (source: HSE SC – "HIQA will have all HSE registered beds, (all long stay, and some short stay, private beds and Section 38 and 39 beds)". **Assumption [2]:** Complementary 2017 Short Stay beds file provides the missing part of the Short Stay Beds (source: HSE SC "list of the unregistered HSE and Section 38 Short Stay Beds (i.e. beds not registered with HIQA)". **Assumption [3]:** YoY change in SS public beds as reported by HSE holds for the Complementary Short Stay beds dataset. **Assumption [4]:** The assignment of CHOs to HIQA reported Nursing Homes is based on Nursing Home county. **Assumption [5a]:** SS to LS beds ratio calculated based on HSE Public Beds will hold true with the HIQA data. **Assumption [5b]:** SS to LS beds ratio calculated based on DoH Survey data will hold true with the HIQA data. **Assumption [5c]:** SS to LS beds ratio calculated based on LSAS report (2013 data) will hold true with the HIQA data for all years.

Estimation of Unmet Need

Unmet need is an important consideration but for obvious reasons it is very difficult to model with any level of certainty. As such, it has been excluded from any baseline considerations but, where appropriate, some consideration has been made of it in the scenarios in Section 7. Where this is the case, this has been clearly noted.

Levels of Efficiency

Calculations of capacity forecasts were generated by the model using demand forecasts in conjunction with assumptions or data for resource use. Specific aspects of resource use critical to the capacity forecast estimation include:

- Resource uptake.
- Resource usage / activity length (LOS).
- Resource availability.
- Resource utilisation.

While data was provided for LOS input into the model, assumptions were created for the other listed parameters. These assumptions were refined and agreed upon through consultations with the DoH, the International Peer Review Group, and multiple stakeholder engagement events (Section 2.6 and Section 6). A list of these assumptions is presented below in Table 50, Table 51, Table 52 and Table 53 for acute and primary care sectors and services for older persons. Resource uptake is assumed to be 100% for all resources across all three sectors.

Table 50: Acute Care: Levels of Resource Efficiency

Resource	Resource Use / Activity Length	Availability*	Utilisation
AMU	10 hours	• 12 hours/day • 7 days/week • 52 weeks/year	100% *
ACC	Please see Table 51 (Based on CCP information)	• 24 hours/day • 7 days/week • 52 weeks/year	100% **
Day Case	4 hours (Based on: • 2 patients per Day Case bed per day (this included high volume activities such as dialysis) – public hospitals; • 1.1 patients per Day Case bed per day – private hospitals	• 12 hours/day • 5 days/week • 52 weeks/year	100% *
IP EL	Please see Table 51 (Based on HIPE analysis)	• 24 hours/day • 6.9 days/week • 52 weeks/year	Site specific *** (average 95%)
IP NEL	Please see Table 51 (Based on HIPE analysis)	• 24 hours/day • 6.9 days/week • 52 weeks/year	Site specific *** (average 95%)

* Unless otherwise stated, acute care sector utilisation assumptions were based on expert consultation with project stakeholders

** ACC based upon Critical Care Programme findings

*** Based on DoH analysis of HIPE data. Analysis for EL and NEL were done separately and an average of 95% utilisation was calculated for modelling purposes of all inpatient resources.

Table 51: Acute Care: Levels of Resource Efficiency by Site, Specialty, and Age Band (source: HIPE data)

Site	EL LOS (Days)	NEL LOS (Days)	ACC LOS (Days)
All	6.3	5.8	5.5
IE	7.5	6.1	5.8
DM	9.2	6.7	5.9
SW	5.8	5.5	5.1
RCSI	5.8	6.1	6.3
UL	4.7	5.3	4.6
SUHC	5.1	5.2	5.0
CHC	3.7	3.5	2.5
Specialty	**EL LOS (Days)**	**NEL LOS (Days)**	**ACC LOS (Days)**
All	6.3	5.8	5.5
Medical	10.3	8.4	5.2
Surgical	4.9	6.0	6.2
Paediatrics	3.2	2.5	0.0
Maternity	2.8	2.6	0.0
Age	**EL LOS (Days)**	**NEL LOS (Days)**	**ACC LOS (Days)**
All	6.3	5.8	5.5
0-1	5.8	3.2	0.0
1-6	2.5	2.1	0.0
7-15	2.9	2.4	0.0
16-44	4.3	3.0	5.3
45-64	5.5	6.0	5.3
65-74	7.1	8.3	5.9
75-84	9.9	10.8	5.7
85+	15.6	13.0	4.9
Sector	**EL LOS (Days)**	**NEL LOS (Days)**	**ACC LOS (Days)**
Public	6.8	5.8	5.6
Private	5.1	5.7	5.2

Table 52: Primary Care: Levels of Resource Efficiency

Resource	Resource Use / Activity Length	Availability	Utilisation
GP WTEs	0.19 hours * • Assuming 12 min per visit / intervention time	• 8 hours/day (0.5 hour lunch) • 5 days/week (standard WTEs) • 44 weeks/year (Assuming 8 non-working weeks: 5 AL, 2 national holidays/training, 1 SL)	58% **
Practice Nurse WTEs	0.25 hours • Assuming 15 min per visit / intervention time	• 7.5 hours/day (0.5 hour lunch) • 5 days/week (standard WTEs) • 44 weeks/year (Assuming 8 non-working weeks: 5 AL, 2 national holidays/training, 1 SL)	75% **

* ICGP Library and Information Service, General Practice in Ireland, 2016, and PA assumption

** Validated in Wave 1 Workshop

Note: Unless otherwise stated, assumptions were based on standard WTE availability and utilisation.

Table 53: Services for Older Persons Care: Levels of Resource Efficiency

Resource	Resource Use / Activity Length	Availability	Utilisation
(Intensive) Home Care Packages	1 hour * • Assuming at least 1 hour of service is provided per (I)HCP. Actual activity length can vary hugely	• 1 hour/day • 1 day/week • 1 week/year (Assuming at least 1 hour of service is provided per (I)HCP)	100%
Home Help Hours	218 hours ** • Based on the figures reported in the "Social Care Division Operational Plan 2016" report – the number of people in receipt of HHH (47,800) and the number of HHH provided (10.4M)	• 1 hour/day • 1 day/week • 1 week/year	100%
Residential Care Beds – Public Nursing Homes (Long Term and Short Term Beds) ***	8,736 hours • Assuming the maximum number of hours for each bed resource in a 364-day year and 1:1 activity to resource ratio is maintained	• 24 hours/day • 7 days/week • 52 weeks/year (Assuming year-round bed availability throughout the year)	90.4%

Resource	Resource Use / Activity Length	Availability	Utilisation
Residential Care Beds – Private Nursing Homes (Long Term and Short Term Beds) ***	8,736 hours • Assuming year-round availability of each bed resource, where the maximum number of hours in a 364-day year	• 24 hours/day • 7 days/week • 52 weeks/year (Assuming around the clock bed availability throughout the year)	95.3%

* PA validated by DoH

** "Social Care Division Operational Plan 2016" report

*** Public Homes include Welfare Homes; Private Homes include Private Voluntary non-Welfare Homes

Note: Unless otherwise stated, assumptions were based on standard availability and utilisation.

Appendix F
Scenario Approaches

Forecasted Irish Health System Scenario Approaches

Table 54 presents the modelling approaches used to model each of the three scenarios.

Table 54: List of Modelling Approaches for each Scenario

Scenario	Approach
1. Improved Health and Wellbeing	• % of chronic disease patients within the population • % of population impacted by health and wellbeing interventions • Reduction in non-demographic growth
2. Improved Model of Care Centred around Comprehensive Community-Based Services	• Identification of patient cohorts • % of cohort affected • Reduction in acute usage applied to these cohorts • Increase in usage applied to services for older persons and primary care
3. Hospital Productivity Improvements • 3A: Hospital Group / National Care Pathway Improvements	• Identification of impacts at a disaggregated level i.e. specialty or pathway • Aggregated up to high level changes to simulate whole hospital redesign into elective and non-elective sites
• 3B: Improvement to Patient Flow through Hospitals	• Identification of benchmarks • Improvement of a number of hospitals to the benchmark

For each scenario a number of changes to the model were implemented which were supported by assumptions and evidence. They are presented in the following table:

Table 55: List of Scenario-related Modelling Assumptions

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 1: Improved Health and Wellbeing	**Non-Demographic Growth**	Tempering non-demographic growth will reduce pressure across the system	Acute, Primary	Non-demographic growth is defined at POD, Group and Age level. It will be necessary to temper this growth where activity is increasing. 35% of cancer deaths and cases and65% of cardiovascular disease deaths and cases are attributable to a number of known and preventable risk factors.		All cohorts and PODs Specialties that benefit most from lifestyle interventions Acute- • Except ACC: ▼NDG by -0.5% in each of the years 6-15 Primary- • ▼NDG by -0.5% in each of the years 6-15
				Includes, but is not limited to: Effectiveness and cost-effectiveness of alcohol control policies	The Public Health Burden of Alcohol and the Effectiveness and Cost-Effectiveness of Alcohol Control Policies. An evidence review. Public Health England 2016	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 1: Improved Health and Wellbeing				• 100c MUP in Ireland would give rise to an 8.8% reduction in consumption and a 10% reduction in alcohol-related hospital admissions	Model-based appraisal of minimum unit pricing for alcohol in the Republic of Ireland. ScHARR, University of Sheffield, 2014	
				• Influenza vaccination of healthcare workers has been shown to reduce flu-related deaths by 40%. Institutions with high levels of healthcare worker immunisation in Europe have shown reduced rates of flu-like illness, hospitalisation and deaths from flu in the elderly, and a reduction in healthcare worker sick leave. Influenza vaccination reduces the rate of stillbirth by over 50%. Among elderly persons living in long-term care facilities, the vaccine is 50-60% effective in preventing hospitalisation for all causes and 70-80% effective in preventing death	HSE National Immunisation Office Vamos et al. CMAJ 2016. DOI:10.1503 / cmaj.151059	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 1: Improved Health and Wellbeing				• In patients with type 2 diabetes, influenza vaccination was associated with significantly lower hospital admission rates for stroke, heart failure, pneumonia and influenza	Thomas SL et al. Vaccine 35 (2017) 680–686 | Paulo RLP et al. Rev Assoc Med Bras 2016; 62(6):506-512 | Asada K et al.	
				• Rotavirus vaccination has been shown to reduce GP visits, ED attendances and hospital admissions for acute gastroenteritis	Western Pac Surveill Response J. 2016 Oct-Dec; 7(4): 28–36 | Dey et al. MJA 2012 197 453-457	
				• Modelling studies have shown that interventions to reduce BMI levels in the Irish population would have a significant impact on the incidence and prevalence of coronary heart disease, stroke, type 2 diabetes, hypertension, raised cholesterol, lower back pain, osteoarthritis and asthma.	Keaver L et al. PLoS One. 2013; 8(11): e79827 Kearns K et al. BMC Public Health. 2014;14(1):143	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 1: Improved Health and Wellbeing				• It is expected that in Mexico a 10% sugar sweetened beverage tax will lead to a 2.5% reduction in obesity prevalence within 10 years of its introduction	Barrientos-Gutierrez T et al. PLoS One, May 2017, 12(5):e0176336	
				• In Ireland, the introduction of a 10% tax on SSBs is expected to reduce the prevalence of obesity by about 1.3%	Briggs et al. BMC Public Health. 2013 Sep 17;13:860. doi: 10.1186/1471-2458-13-860	
				• Dietary and physical activity interventions during pregnancy were associated with lower odds of Caesarean section	International Weight Management in Pregnancy Collaborative Group. BMJ. 2017 Jul19;358:j3119. doi:10.1136/bmj.j3119	
				• Reduced dietary saturated fat intake can decrease the risk of cardiovascular events by 17%	Hooper L et al. Cochrane Database Syst Rev. 2015 Jun 10;(6):CD011737	
				• Evidence of the effectiveness of smoking cessation measures	Ekpu VU, Brown AK. Tobacco Use Insights 2015:8;1-35	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 1: Improved Health and Wellbeing				• Health technology assessment of smoking cessation interventions.	Health Information and Quality Authority. March 2017	
				• Reductions in mortality and hospital admissions as a result of the 'smoking-ban' introduced in Ireland	Cronin et al. Clin Cardiol. 2012 Apr;35(4):205-9 | Stallings-Smith et al. PLoS ONE 2013;8(4) | Kent et al. Chest. 2012 Sep;142(3):673-679	
				• Brain health and dementia prevention	Cleary O & McAvoy H. Institute of Public Health in Ireland and the Alzheimer Society of Ireland 2015	
				• Review of a wide range of public health programmes that found them to be highly effective and cost saving	Masters R et al. J Epidemiol Community Health 2017;71:827–834	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 2: Improved Model of Care Centred around Comprehensive Community-Based Services	**ED** Increasing access to primary care, services for older persons care, the introduction of community emergency response teams and rapid access to diagnostics in primary care reduces ED attendances	Reduction in ED attendances	Acute	Reduction in ED attendances of 29% for care home residents	NHS vanguard	Cohort age over 65 yrs Not admitted Acute- • ▼ED attendances: avg. -15% (assume all Medical) • ▼IP NEL (Medical) activity: est. avg. -15% • ▼IP EL (Medical) activity: -5%
		Increase in primary care	Primary	If patients with ambulatory care sensitive conditions saw their **most frequently seen GP** 2 more times out of every 10 times seen, they would see a reduction in admissions of 6%	The Health Foundation	Cohort age 45+ yrs Primary- • ▲GP visits assume 2 appointments per patient cohort for care planning (5% for 45+, 20% for 65+, 50% for 75+, 100% for 85+) • ▲PN visits + 10% (2 of 3 main contributors to NEL reduction) • ▲PHN visits + 20%

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 2: Improved Model of Care Centred around Comprehensive Community-Based Services		Increase in services for older persons	Social	Increase in services for older persons packages in line with the number of reduced ED attendances Community based interventions reduce the risk of hospital admissions (0.94, 0.91-0.97) – Community based complex interventions reduced risk of not living at home (OR 0.95, 0.93-0.97) and reducing nursing home admissions (OR 0.87, 0.83-0.90)	NHS vanguard The Lancet	Cohort age over 65 yrs Services for Older Persons- ▲ *HCP receivers (based upon bringing all CHOs up to the highest activity per 65+ population)* *+ 30% (1 of 3 main contributors to NEL reduction)*

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 2: Improved Model of Care Centred around Comprehensive Community-Based Services	**In-hospital** Introduction of cohorted geriatric wards, comprehensive geriatric assessments, increased ward staffing and nurse therapists increases discharges and reduces LOS with the support of in-hospital reablement	Reduction in NEL LOS	Acute	Reduction in NEL LOS of 3 days or Tallaght example of cohort reducing LOS from 30 to 22.5 days	NHS improvement	Cohort age 75+ yrs Acute- ▼ IP NEL (Medical and Surgery) LOS: reverts to national median with a max. reduction of 20%
			Acute	Patient admitted to an acute geriatric unit had a reduction in LOS (mean difference -1.01 days)	Revista Española de Geriatría y Gerontología	Cohort age 75+ yrs For any HG already at median LOS Acute- ▼ IP NEL (Medical and Surgery) LOS -5% improvement
	Discharge Enhanced discharge planning and improved integration across health and services for older persons will reduce delayed discharges. Discharge to assess will reduce NEL LOS.	Reduction in delayed discharge	Acute	Delayed discharge data identifies delays where clinicians have identified patients are ready to be discharged, this underestimates the number of elderly patients that are in hospital and no longer benefiting from acute care. This is thought to be up to 2.7 times the delayed discharge number in the UK.	National Audit Office, UK	Cohort age 65+ yrs Services for Older Persons - ▲HHH *+30% (based upon brining all CHOs up to the highest activity per 65+ population)* 25% would bring activity to UK levels by 2014/2015 ▲Residential Care Short Term +20% (step up)
		Reduction in delayed discharge	Acute	In the UK there are targets that total delayed discharges should not be higher than 3.5 % of hospital beds and that the split between NHS and social care attribution should be 50/50 therefore each sector will have to improve by a different %.	UK Government	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 2: Improved Model of Care Centred around Comprehensive Community-Based Services		Increase in services for older persons	Social	To reduce the number of people experiencing a delay in discharge access to home help packages and hours needs to increase		
		Discharge to assess reducing NEL LOS	Acute	Discharge to assess reduced the NEL LOS for in-hospital patients, assuming there is no overlap with the reductions in NEL LOS achieved through other in-hospital initiatives – Discharge planning reduced LOS (mean difference -0.91 days) and readmissions (RR 0.85, 0.74-0.97)	Cochrane	
		Increase in services for older persons	Social	Services for older persons involved with discharge to assess pathways and rehabilitation packages at home for up to 6 weeks	Wester Sussex Hospitals FT	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 3A: Hospital Group / National Care Pathway Improvements	**Complex cancer surgery**	Transfer of elective spells across sites	Acute (bottom up)	Using ICD-10 codes to identify cohorts of patients at a hospital site level, using set volume thresholds to transfer patients across sites	Belgian Healthcare Knowledge Centre	Cohort age 16-74 yrs Acute- ▼ IP EL (Surgery) and IP NEL (Surgery) LOS -10%: improvement in Surgical LOS (-5% for CHC HG) ▼ Day Case (Surgery) activity -10% *(5% moved to Primary and 5% to OP)* ▲ OPFA (1 FA) activity +5% ▲ IP EL occupancy increases from 85% to 90% for all cohort Primary- ▲ Primary Care activity +5% (3 GP appointments)
	Radiotherapy	Increase in number of patients receiving radiotherapy	Acute (bottom up)	Identification of radiotherapy per head of population with an increase to Australian recommended benchmark if necessary	Belgian Healthcare Knowledge Centre	
	Maternity	Reduction in LOS	Acute (bottom up)	Identification of births in-hospital and a reduction in LOS through service redesign in line with US benchmarks	Belgian Healthcare Knowledge Centre	
	Stroke networks	Reduction in LOS	Acute (bottom up)	Identify % of stroke patients that could be treated in a specialist centre (39-69%), reduce their average LOS by 75% (check against a 1.4d reduction in LOS in London and a 2d reduction in greater Manchester after reorganisation.	HSE	

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 3A: Hospital Group / National Care Pathway Improvements	**Ophthalmology**	Pathway improvement reduces wait time, increases productivity, increased Day Case and reduces the number of follow-up appointments needed. The national clinician programmes directorate model of eye care identifies the introduction of a community based model to improve access to care	Acute (bottom up)	Identify cataract patients, reduce waiting times to less than 4 weeks, reduce the number of OP appointments pre-surgery to two, Day Case rates of 85-95%, and reduce patients to only have 1 follow-up appointment post-surgery. Applied to 70% of the cataract cohort who have no other eye problems and are therefore considered to be not complex.	NHS Executive – Action on Cataracts Good Practice Guidance	
	Trauma networks / major trauma centres	Reduction in LOS		Transfer of major trauma to major trauma centres, resulting in a reduced LOS in the major centre and increased need for rehabilitation outside of the centre.		
	Current hospitals	Decrease occupancy from 95% to 85% with subsequent increase in beds required	Acute (top down)	Reduce ALOS [7.9d 1992 to 5.7d 2009), benchmarked against Sweden who have one of the lowest LOS due to emergency care being the responsibility of the larger hospitals and elective and outpatient care that of the smaller hospitals, saving made are invested in community services.	DMC Healthcare - International comparisons	
	New elective hospitals	Transfer of % of elective care to elective hospital run at 90-95% occupancy	Acute (top down)		HIPE / Published literature	Orthopaedics, oncology (chemo), ENT, ophthalmology and scopes

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 3B: Improvement to Patient Flow through Hospitals	**ED**	Reduction in ED to IP conversion through increased use of ambulatory care	Acute	Reducing ED to IP conversion through use of ambulatory care (admitted LOS = 1d, not seen in AMAU) – Reducing the time it takes to see a consultant and re-directing patients to the most appropriate care often bypassing the ED	Capio St Goran Hospital, Sweden	Cohort age 16-64 yrs, if aggregating scenarios is required, if not all patients *(age cohort kept at 16-64 years to avoid double counting with Scenario 2)* Acute – ▼ IP NEL activity (Medical and Surgery): Adults: avg. -15% (removed through better use of ambulatory care) ▲ AMU activity (Medical and Surgery): Adults: avg. +5% (due to better use of ambulatory care) ▲ IP NEL LOS (Medical and Surgery): Adults: avg. +12% (due to the removal of 1 day LOS)

Scenario	Point of Delivery/ Model Parameter	Impact	Sector	Evidence	Reference	Scenario Changes to the Model
Scenario 3B: Improvement to Patient Flow through Hospitals	**Inpatient**	Reduction in elective and non-elective LOS through better ward management	Acute	Aim to have an ALOS in line with US hospitals at 4.5 days or with the top quartile within the Irish data	Healthcare Cost and Utilization Project US	Cohort age under 65 yrs, if aggregating scenarios is required. If not all patients Acute- ▼ IP EL & IP NEL LOS to achieve national median (max. 20% per HG)
		Continued trend for surgical inpatients to be seen as day cases	Acute	Have all hospitals performing at the upper quartile for the % day cases as a proportion of elective activity	King's Fund	
	Day Case	Medical day case that could be completed in an outpatient setting	Acute	Movement of surge to OP setting i.e. cystoscopy	NHS Scotland	Cohort age 16-74 yrs Acute- ▼ Day Case activity (Medical): Move 20% of Day Case (Medical) to OP (x3 appointments) ▼ Day Case LOS (Medical and Surgery): Improve throughput by 30% equating to a change from 2.0 cases per day to 2.6 cases
	Outpatients	Reduction in first to follow-up ratio	Acute	Have all hospitals performing at the top quartile for the proportion of first to follow-ups		All ages Acute- ▼ OP FU activity: Reduce OP FA:FU ratio to median, (or if already at the median, reduce to 1st Quartile) Cohort 16-74yrs Acute- ▲ OP FA activity +20% (1 FA and 2 FU)

Appendix G
Stakeholder Engagement

Table 56: List of Workshop Participants

Mr Peter Barrett, Office of the Chief Medical Officer, DoH

Mr Donal Buggy, Irish Cancer Society

Mr Brendan Cavanagh, National Clinical Programme for Acute Coronary Syndrome, HSE

Ms Aileen Colley, Community Healthcare Organisations, HSE

Mr Tim Collins, Irish Heart Foundation

Ms Blathnaid Connolly, National Acute Medicine Programme, HSE

Ms Eibhlin Connolly, Office of the Chief Medical Officer, DoH

Ms Sonya Cotter, Patient Flow, University Hospital Limerick

Prof. Garry Courtney, National Acute Medicine Programme, HSE

Mr Tadhg Daly, Nursing Homes Ireland

Dr Anne Dee, Health Technology Assessment Unit, HSE

Ms Muriel Farrell, Primary Care Division, HSE

Ms Berinei Finnegan, Public Health Nursing Division, HSE

Ms Angela Fitzgerald, Acute Hospitals Division, HSE

Ms Sinead Fitzpatrick, Integrated Care Programmes, HSE

Ms Mary Flynn, National Clinical Programme for Surgery, HSE

Ms Joan Gallagher, Office of Director General, HSE

Dr Una Geary, Quality and Safety Improvement, St. James Hospital

Dr Karena Hanley, ICGP Mr PJ Harnett, National Integrated Care Programme for Older People, HSE

Ms Ita Hegarty, Outpatient Performance Improvement, HSE

Ms Siobhan Horkan, National Clinical Programme for Paediatrics and Neonatology, and Paediatric Diabetes, HSE

Ms Teresa Keane, Healthcare Management and Operations, RCPI

Ms Michelle Kearns, Caredoc

Dr Siobhan Kennelley, Social Care Division, HSE

Ms Barbara Keogh-Dunne, Patient Flow, Beaumont Hospital

Mr Gary Killeen, National Clinical Programme for Cystic Fibrosis / Rheumatology, HSE

Mr Chris Lacey, Irish Heart Foundation

Dr Marie Laffoy, National Cancer Control Programme

Ms Mairead Mangan, ARC Cancer Support

Ms Ann Mason-Huntley, Public Health Nu rsing, HSE

Dr Gerard McCarthy, National Clinical Programme for Emergency Medicine, HSE

Ms Joan McCormack, National Clinical Programme for Stroke, HSE

Ms Vicky McDwyer, Private Nursing Homes

Mr Stephen McMahon, Irish Patients' Association

Ms Patricia McQuillan, Community Healthcare Organisation, HSE

Ms Kathy McSharry, National Clinical Programme for Stroke, HSE

Ms Evelyn Morris, Patient Flow, University Hospital Limerick

Mr Brian Murphy, Primary Care Division, HSE

Dr Deirdre Murray, National Cancer Control Programme

Ms Kellie Myers, National Clinical Programme for Palliative Care

Ms Breda Naddy, National Clinical Programme for Emergency Medicine

Ms Irene O'Connor, Patient Flow, University Hospital Limerick

Ms Edina O'Driscoll, National Clinical Programme for Epilepsy, Neurology, Rehabilitation Medicine

Dr Orlaith O'Reilly, Health and Wellbeing, HSE

Dr Michael Power, National Programme for Critical Care, HSE

Ms Una Quill, National Programme for Critical Care, HSE

Ms Geraldine Shaw, Office of Nursing and Midwifery Services, HSE

Ms Jo Shortt, Hospital Operations, Saolta HG

Dr Yvonne Smyth, National Clinical Programme for Acute Medicine, HSE

Ms Niamh Smyth, National Clinical Programme for Diabetes, HSE

Dr Breda Smyth, Social Care Division, HSE

Ms Catherine Whitty, Public Health Nursing Division, HSE

Table 57: List of organisations engaged through bi-lateral meetings

- Secretary General, DoH
- National Clinical Strategy and Programmes, HSE
- Laya Healthcare
- Ireland East HG, HSE
- Irish Life Health
- National Acute Hospitals Division, HSE
- ICGP
- Acute Hospitals Division, HSE
- Primary Care Division, HSE
- Health Intelligence Unit, HSE
- Private Hospitals Association
- VHI
- National Health and Wellbeing Division, HSE
- Saolta HG, HSE
- Irish Hospitals Consultants Association
- ESRI

Appendix H
Membership of Steering Group

Table 58: Steering Group Members

- Colm O'Reardon, Policy and Strategy Division, DoH (Chair)
- Tracey Conroy, Acute Hospital Division. DoH
- Sinead Donohue, Office of the Chief Medical Officer, DoH
- Angela Fitzgerald, Deputy National Director, Acute Hospital Division, HSE
- Michael Fitzgerald, Head of Operations & Service Improvement, Services for Older People, HSE
- Margaret Gleeson, Chief Director of Nursing and Midwifery, Limerick HG
- Fergal Goodman, Primary Care Division, DoH
- David Hanlon, GP and National Clinical Advisor and Group Lead for Primary Care
- Colm Henry, Consultant Geriatrician and National Clinical Advisor and Group Lead for Acute Hospitals
- Paul Kavanagh, Director of Public Health Medicine, Department of Public Health, HSE
- Eileen Kehoe, Social Policy Division, Department of the Taoiseach
- Muiris O'Connor, Research and Analytics Division, DoH
- Eamon O'Shea, Health Economist, Irish Centre for Social Gerontology, NUIG
- Frances Spillane, Social Care Division, DoH
- Maev-Ann Wren, Senior Research Officer, ESRI

Appendix I
Members of the International Peer Review Group

Table 59: International Peer Review Group Members

- Steve Wright, International Consultant in Health Policy and Finance (British, based in Luxembourg)
- Carolyn Gullery, General Manager Planning, Funding and Decision Support, Canterbury District Health Board, New Zealand
- Niek Klazinga, Professor of Social Medicine, University of Amsterdam; Coordinator Health Care Quality Indicator Program

Appendix J
List of Submissions to Public Consultation Process

Table 60: List of Submissions Received

- Irish Pharmacy Union
- Irish Medical Organisation
- Irish Nurses and Midwives Organisation
- Children's Hospital Group
- Community Healthcare Organisation 4 (Cork/Kerry)
- COPE (Galway)
- National Women's Council of Ireland
- National Federation of Voluntary Bodies
- Irish Society of Clinical Microbiologists
- Health Information and Quality Authority
- IBM Ireland
- CAMHS Team 1 HSE South (Clonmel)
- Child Health Advocacy Committee of Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)
- Irish Heart Foundation
- St Patricks Mental Health Services
- Irish Hospital Consultants Association
- Inclusion Ireland
- Irish Cancer Society
- Nursing Homes Ireland
- National Disability Authority
- Sibéal Carolan, HSE
- Maurice Power, HSE – CEO Saolta Group
- Maria Barry, HSE
- Emily O'Connor, HSE
- James Corbett, MUH – Cork
- Lisa Donlon, HSE
- Siobhán Creaton, RCPI
- Siobhán Doherty, HSE

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