



Supporting Paper A

National and International Research

Supporting research for the Future Pharmacy Practice in
Ireland – Meeting Patients’ Needs Report, 2016

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Introduction

The following document has been produced by PricewaterhouseCoopers(PwC) to support the 'Future of Pharmacy Practice' report, outlining the principle supporting research in the following areas:

- 1. The Irish Healthcare Landscape** – offering context for factors in the healthcare environment and beyond which are influencing policy including the structure and interaction of both the public and private healthcare sector, public finances, care setting changes in the acute sector and recent developments in primary care.
- 2. Selected Demographic and Disease Trends** – a non-exhaustive overview of key population health trends that are likely to have a significant impact on care models over the next five to ten years including ageing demographics.
- 3. Public Policy Developments** – a high level review of most important available policy documents that are driving change in the Irish health system, and by extension dictating the role of pharmacy.
- 4. Pharmacy in Ireland Today** – an update on the current range of service delivered by Irish pharmacists today, and a review of the most recent relevant changes in practice.
- 5. International Review** – a high level review of pharmacy in six pre-selected peer economies, identifying the role of the pharmacist in that jurisdiction, how this role is structured, and the innovative services provided by pharmacists.

The aim of this report is to provide adequate context about the changing healthcare environment in Ireland, to identify those patient health imperatives where pharmacists can be part of the solution.

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1. Irish Healthcare Landscape

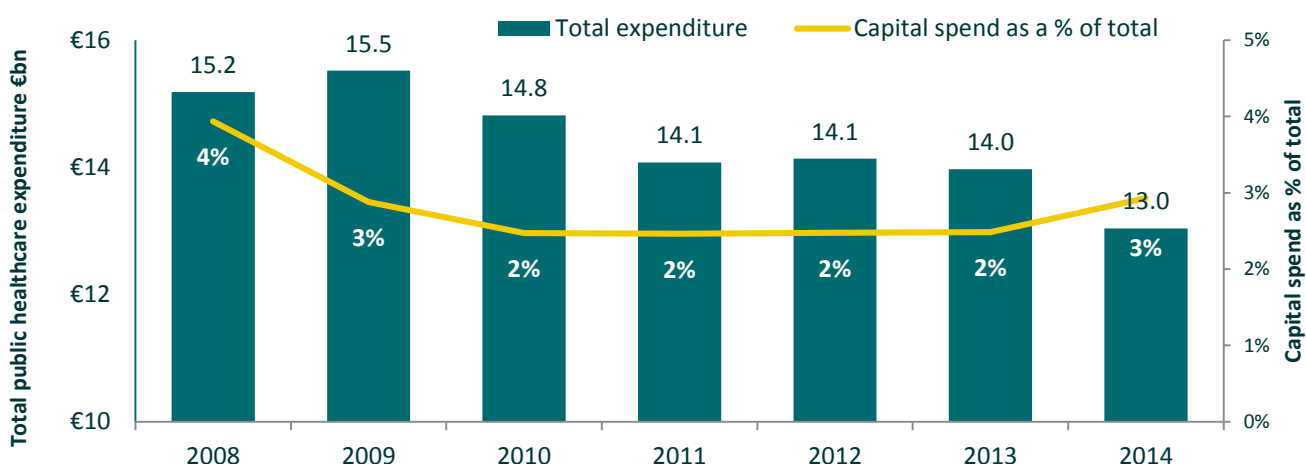
1.1 Irish Healthcare background

The Health Act of 2004 established the Health Service Executive (HSE) with a remit for providing health and personal social services for all those living in Ireland. This public structure has been in place for the past decade and represents 66%¹ of all health expenditure. Remaining health services are privately funded, both in the form of out-of-pocket spend, and through claims made against pre-paid private health insurance (PHI) plans. Acute care is divided into public and private in terms of provision.

While the HSE continues to be the core structure of Irish public healthcare, there are a series of reforms, whose implementation is underway, which would restructure future healthcare landscape in Ireland – these are detailed in section 3.

1.2 Public Healthcare Finances

Figure 1: Total Public Health Expenditure 2008-14 (€bn)²



Irish healthcare spending grew rapidly in the 2000s, with per capita infrastructure, staffing and pharmaceutical spending reaching high levels when compared with other EU economies. Average spending in the Organisation for Economic Cooperation Development (OECD) countries in 2013 was 9 % of Gross Domestic Product (GDP), compared with 12.4 % of GDP in Ireland. Public spending in Ireland was 8.8 % of Gross National Income (GNI) in 2013. Health spending in Ireland appears to be relatively high by international standards. This is particularly so given our relatively young population. The OECD data shows that 12.7 % of the population in Ireland was over 65 compared to an EU average of 18 % when the Irish population age structure is taken into account³. The financial crisis of 2008 led to a dramatic tightening of public finances, with successive austerity budgets requiring the hiring of moratoriums, spending freezes and spending cuts, including initiatives to reduce drug spending.

This reduction in public health spending comes at a time when public demand for health services is increasing, and the population over the age of 75, a key driver of health spending, is growing rapidly. The outcome of these factors is a system with areas of ongoing severe resource constraint, and a focus on achieving “more for less” in terms of increased quantity of treatment and quality of patient outcomes in a manner that is most cost effective.

While the macroeconomic outlook for Ireland is generally positive the residual debt burden and competition with other government departments, for spending increases, will continue to challenge the public health budget.

1.3 Private acute healthcare

Private healthcare has been a structurally significant element of the Irish healthcare landscape since the 1950s. An estimated 44% of the Irish population holds Private Health Insurance (PHI). This feature of the market is largely due to the desire to gain access to care and avoid real and perceived waiting times in the public health system.

Figure 2: Number of people with private health insurance in-patient cover 2013-14 (m)⁴



From the period 2008-14 there was a dramatic fall in the numbers of people holding PHI due to affordability. This attrition in the member base occurred disproportionately in the younger, healthier age categories with a tendency for lower claims. As a result, the remaining member base claims volume continued to grow despite a decline in total premium income for the health insurance companies. This has led to substantial claim cost cutting measures from private health insurers in both private and public settings. These cost savings initiatives have been a key driver in shifting treatment settings to lower acuity and lower cost settings.

The continuing attrition in the PHI member base appears to have been arrested by the introduction of the Lifetime Credit Rating in May 2015, which applied a loading to the premiums of individuals over the age of 35 who sign up to PHI for the first time. Despite this stabilising of the fundamentals of the market, increased competition in the PHI market has meant that downward pressure on costs continues, with many of the innovative changes in care setting led by private initiatives (e.g. Hospital in the Home).

1.4 Major public acute healthcare constraints

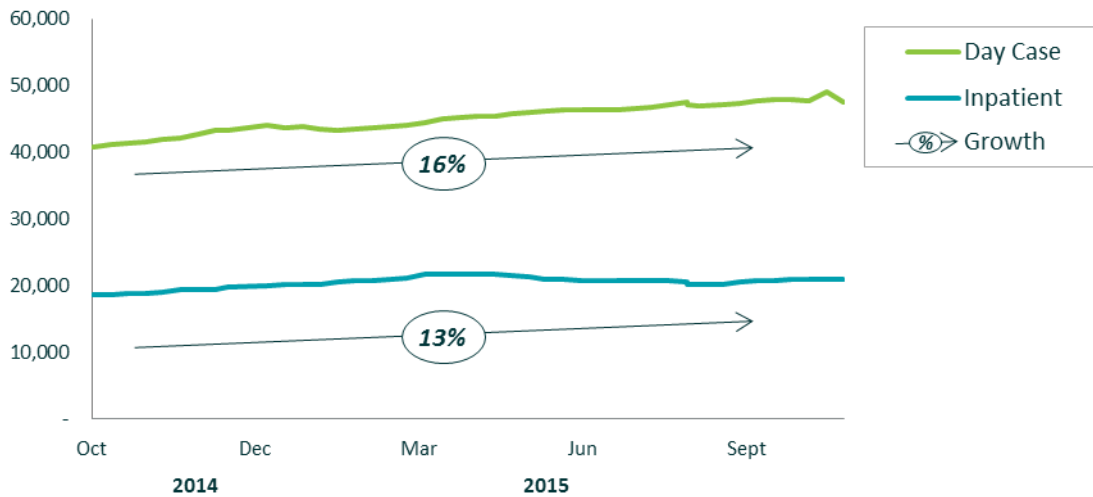
The financial pressure in the public health system, along with ageing demographics, has led to a number of high profile system constraints, which have worsened with the implementation of multiple austerity budgets. Available in-patient beds have declined in the last five years.

Figure 3: Irish public hospital bed stock and average length of stay^{2,5}

	2009	2010	2011	2012	2013	Annual growth
Day patient beds	1,774	1,859	1,938	2,051	2,023	3%
In-patient beds	11,751	11,417	11,113	10,766	10,825	-2%
In-patient beds per 1000 pop.	2.5	2.4	2.4	2.3	2.3	-2%
Average length of stay	5.96	5.90	5.72	5.43	5.43	

This reduced bed stock causes capacity constraints on the number of procedures which can be carried out, which, when combined with other inefficiencies in the acute system, causes escalating waiting lists for day and in-patient procedures which have been gradually growing

Figure 4: Elective in-patient and day case waiting list development 2014-5⁶



The problem has been exacerbated by individuals whose discharge is often delayed. These delayed discharges are a cause of substantial inefficiency in the acute hospital sector, as friction in transitioning the care setting of patients' causes backlogs throughout the hospital, which often result in long waiting times in emergency departments. Emergency department overcrowding and patients being treated on trolleys has become a major public policy issue.

Figure 5: Public reaction to access constraints

Waiting lists and capacity constraints as a public policy issue

While a number of initiatives to contract public health services to private providers have been implemented via the National Treatment Purchase Fund to try and reduce waiting numbers for elective treatment and overcrowding in emergency settings, waiting times continue to be a major issue.

Special HSE task forces have been implemented and it remains a government priority to alleviate constraints in the system.

Irish Independent
Hospital waiting lists soar as 470,000 people are left waiting for care

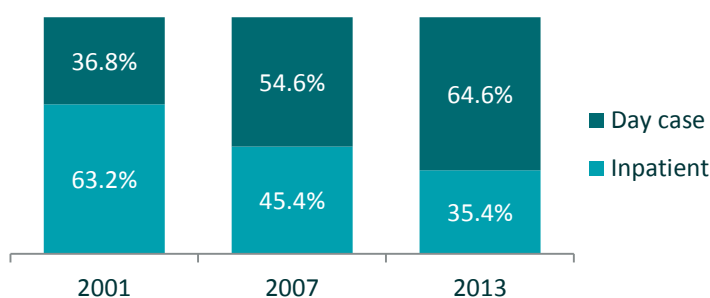
Irish Examiner
7,700 patients waiting on trolleys in May

THE IRISH TIMES
Leo Varadkar admits A&E crisis likely to 'get really bad' next week

1.5 Shift in care setting and average length of stay

Improvements in treatment technology and evidence of improved patient outcomes have driven procedure settings from in-patient to day case, and considerably reduced the length of stay for many procedures. The drive towards lower acuity treatment settings has been well implemented in the acute sector, supported by a greater level of community supports, as attempts are made to increasingly treat people in the community and allowing elderly people to remain in their homes for as long as possible. Policy implemented so far has focused on moving many patient cohorts out of institutional settings, and for them to be cared for in the community.

Figure 6: Mix of procedure treatment setting in Irish Public Hospitals 2001-13⁵



1.6 Primary Care

A range of health professionals delivers primary care in Ireland; however, this care has traditionally centered on the estimated 2,954 full time equivalent GPs. This number of GPs is lower on a per-capita basis when compared with other OECD countries such as Australia, the UK or Canada, albeit Ireland has a younger population profile than those countries.

Primary care services are going through a re-organisation of delivery through the opening of dedicated Primary Care Centres (PCCs). With a stated ambition of 95% of healthcare delivered in the community, these centres are central to government health policy and, along with GP services, provide some or all of the following:

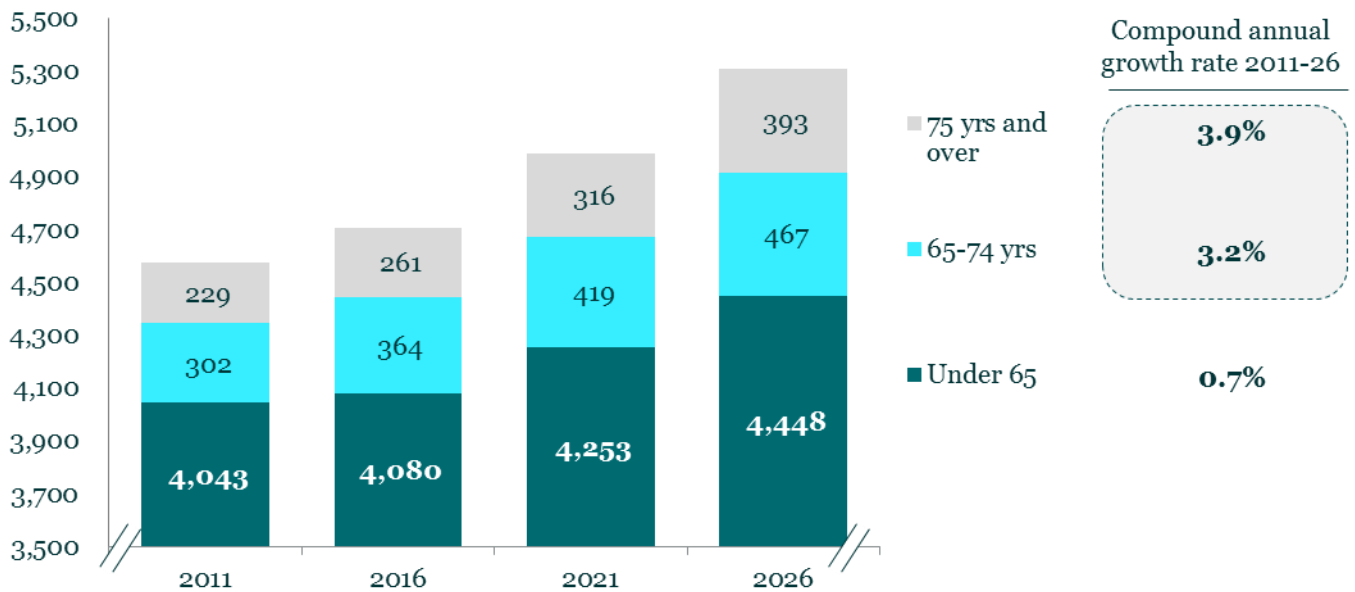
- Dental,
- Occupational therapy,
- Physiotherapy,
- Social work,
- Speech & language,
- Home help,
- Mental health,
- Counselling,
- Nutrition.

Recent results of studies conducted around General Practice in Ireland indicate that the long waiting times in Irish hospitals may have spread to general practices. Recent research indicates that the waiting time for a patient looking for a routine appointment with their GP had increased from an average of less than 10 hours in 2010 to over 34 hours in 2015. These capacity issues may be worsened by induced demand following the announcement of the plan to extend the recent under-6 free GP care to include all children under the age of 12. In particular, there is an increasing lack of supply of GPs in many rural areas, and thus capacity issues increasingly become unevenly spread across the country.

2. Demographic and Disease trends

2.1 Ageing demographics

Figure 7: Ireland population projections 2011-2026⁷

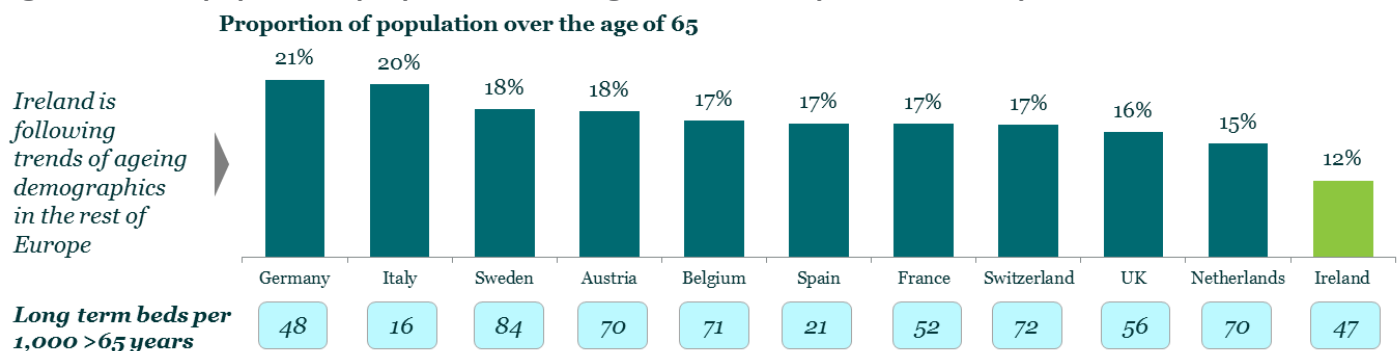


CAGR: Compound annual growth rate

In line with other developed economies, Ireland is embarking on a period of rapid population ageing, largely because of increasing life expectancy and the advance of the baby boomer generation into old age. The population over the age of 75 is expected to experience a 72% growth between 2011 and 2026. This growth will create significant challenges for Ireland's health system.

In addition to exacerbating strains in acute and primary services, this over 75 cohort makes up 83% of all of the Long Term Residential Care (LTRC) residents at present. An increased female labour participation rate coupled with a change of social structures means that older people are likely to require more formal care structures in the future.

Figure 8: Older population proportion and long term bed comparison of European countries⁸



Ireland's current younger demographics mean that the country is ageing at a faster rate than other European countries. This pace of change will require innovative solutions to provide adequate care to the elderly.

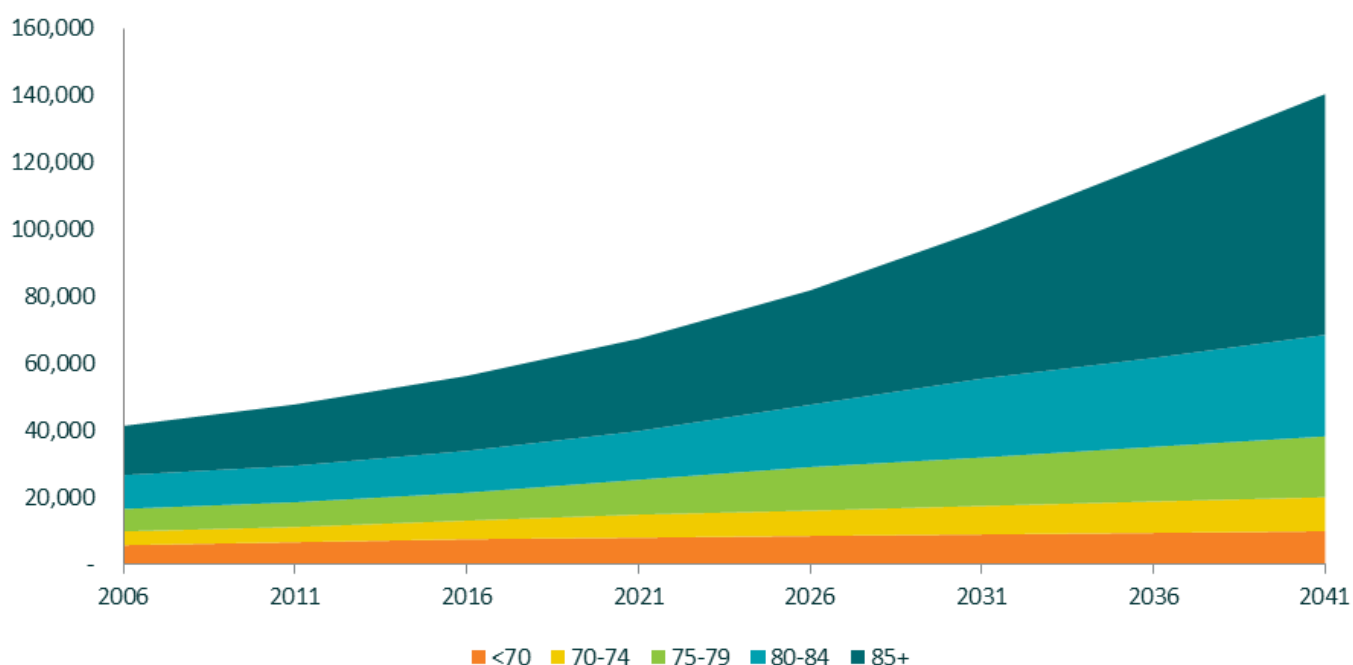
This demand for LTRC is likely to put significant strain on the number of nursing home beds. As a result, home care – both publicly provided by the HSE and to outsourced private companies are likely to experience significant growth in the coming years.

This shift in the increasing level of care being given in both nursing homes and in the home creates a number of challenges related to medicines adherence. The Health Information and Quality Authority (HIQA) reviews in 2014 found that 57% of nursing homes had some level of non-compliance in relation to medicines management.

Home care is currently unregulated in Ireland, and there is currently no similar review of the suitability of medicine management or regimes that elderly people who are resident in the home may be following. Evidence from other countries such as Netherlands suggests this format of care is increasingly likely to be utilised to cater for the ageing population; there may be a significant role in ensuring appropriate adherence to medicines as part of the wider multi-disciplinary community team who conduct domiciliary visits.

In line with the projected rapid growth in the population over the age of 75, the outlook for the population suffering from dementia and Alzheimer's – (both of which have a high incidence in these older age categories), is also for significant future growth. The implications of the growth in this cohort, who frequently have complex polypharmacy requirements is significant.

Figure 9: Projected number of people with dementia 2006-2041⁹



2.2 Chronic illnesses

A number of chronic illnesses have been identified by the Department of Health (DoH) as requiring specific treatment strategies.

By 2020, the number of adults with chronic diseases will increase by around 40%, with relatively more of the conditions affecting those in the older age groups. Chronic conditions are responsible for a significant proportion of premature deaths in Ireland – the outlook for a number of these illnesses is detailed below.

Coronary Heart Disease (CHD)

Over the next five years, the number of adults with clinically diagnosed CHD is expected to rise to more than 103,000. This represents a 31% increase (an additional 24,000 adults) in ten years. Approximately one-quarter of this increase is due to increases in the size of the population and three-quarters is due to population ageing.

In 2010, it was estimated that more than 79,000 (2.4%) adults aged 18+ years in Ireland had been told by a doctor in the previous 12 months that they have CHD. Clinical diagnoses of CHD are more common among older people, with almost 9% of adults aged 65 years or over having clinically diagnosed CHD.

Cancer

Cancer is the second major cause of death in Ireland, after cardiovascular disease, accounting for over 8,000 deaths per year².

Averages of nearly 30,000 new cases of cancer are diagnosed each year¹⁰. This is 50% more per year than in the mid-1990s. The number of newly diagnosed cancers is increasing by 6-7% annually and unless a major reversal of trends occurs in the near future, the number is likely to double in the next 20 years¹¹. The underlying risk of developing cancer is increasing by less than 1% annually and the expected increase is primarily due to the higher proportion of elderly people in the population but may also be influenced by the projected growth in the total population. This is the biggest predicted rise in the 27 European Union (EU) Member States¹². With the growth in cancer rates and the strain this may put on public

health services, the treatment for cancer may be increasingly provided for in the home.

Chronic Obstructive Pulmonary Disease (COPD)

By 2020 the number of adults with clinically diagnosed COPD is expected to rise to almost 101,000 (2.8%). This represents a 23% increase (an additional 19,000 adults) in ten years.

Approximately one-third of this increase is due to increases in the size of the population and two-thirds is due to population ageing (including the increases in risk factor levels associated with ageing).

In 2010, it is estimated that more than 82,000 (2.5%) adults aged 18+ years in Ireland had been told by a doctor in the previous 12 months that they have Chronic Airflow Obstruction (CAO).

Asthma

It is estimated that 450,000 of the population have asthma, with an annual cost of 0.5 billion euros. Ireland has the fourth highest prevalence of asthma globally, with 5,000 hospital admissions a year and 20,000 asthma related Emergency Department attendances per year. Asthma results in one death per week in Ireland¹³.

Diabetes

The total number of people living with diabetes in Ireland is estimated to be 225,840.

Between 2010 and 2020, the number of adults with diabetes is expected to rise by 30%. This means the number of adults aged 45+ years with diabetes is expected to rise by an additional 40,000 people over a ten year period.

It is estimated that there are 207,490 people with diabetes in Ireland in the 20–79 age group (prevalence of 6.5% in the population) which is in line with previous estimates that by 2020 there would be 233,000 people with the condition and by 2030 there would be 278,850 people with the condition.

The cost of treating diabetes in Ireland has been estimated to be approximately €1.3bn, with 57% of all amputations (nominally costing €30,000 in in-patient care) being attributable to diabetes –

80% of which could have been avoided with earlier diagnosis and treatment.

Figure 10: Chronic disease statistics in Ireland

Chronic Disease	Population	Estimated Cost	Annual Growth
Coronary Heart Disease ^{14,15}	182,000	€2.3 billion	3.75%
COPD ^{16,17}	110,000	€0.4 billion	2.3%
Diabetes ¹⁸	225,000	€1.3 billion	3%
Asthma ^{13,19}	450,000	€0.5 billion	N/A
Cancer ²⁰	129,000	€1.5 billion	6.5%

Case Study: Diabetes in Ireland

Between 2010 and 2020 the number of adults with diabetes is expected to rise by 30%. This means the number of adults aged 45+ years with diabetes is expected to rise by an additional 40,000 people in ten years.

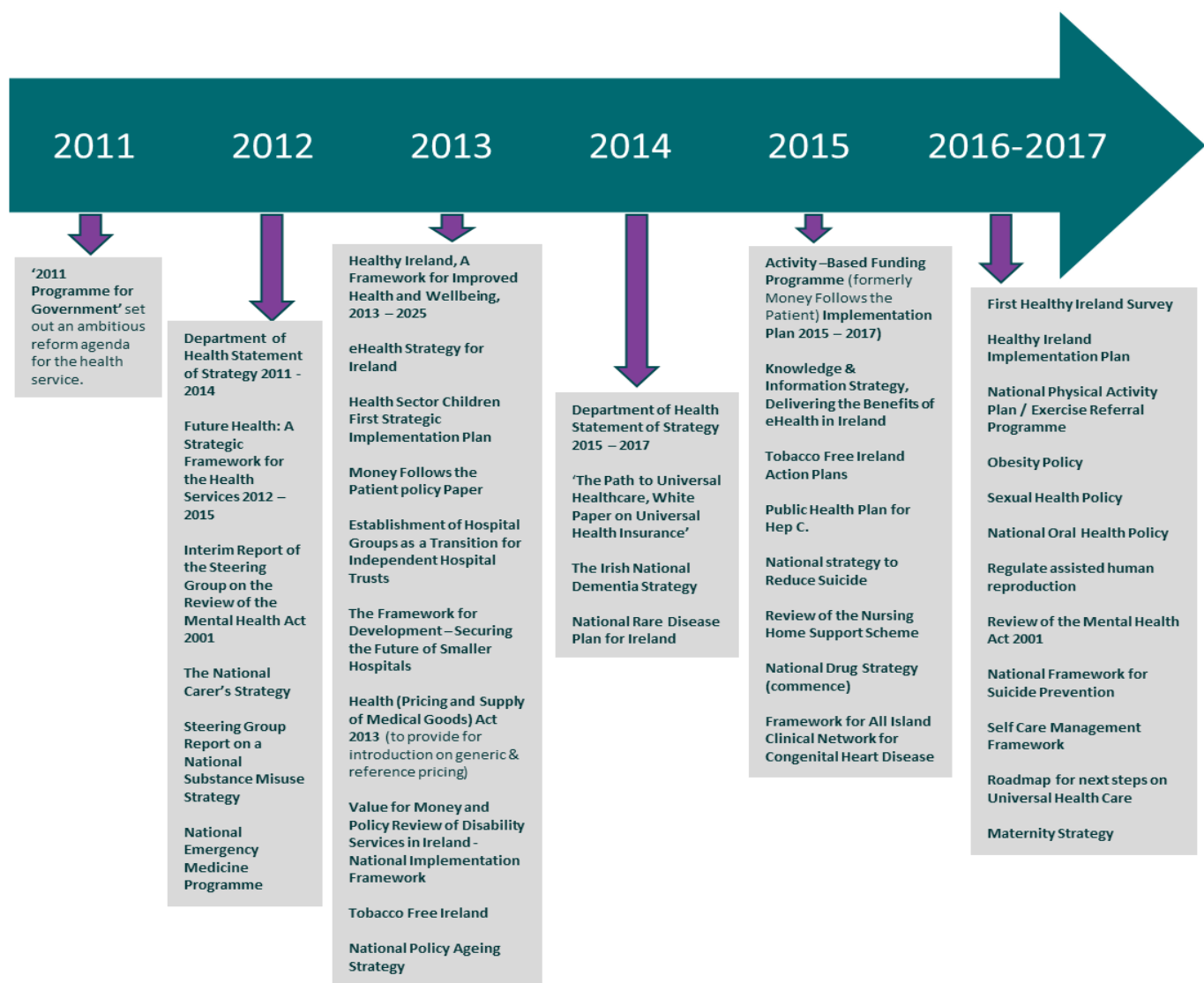
The cost of treating diabetes in Ireland has been estimated to be approximately €1.3bn, with 57% of all amputations (nominally costing €30,000 in inpatient care) being attributable to diabetes – 80% of which could have been avoided with earlier diagnosis and treatment.

3. Public Policy Developments

3.1 Public Health Policy Overview

The following section outlines the most important healthcare policy documents that have been released by the Department of Health (DoH) and the Health Service Executive (HSE) in the last number of years. Many of these policies have been implemented to date in a climate of significant financial difficulty for the State, and thus some initiatives may not have been achieved due to a series of austerity budgets which were implemented in the years until 2015. The trajectory of policy in the public health system, both in terms of structure and service delivery is critical to the consideration of the Future Role of Pharmacy.

Figure 11: Overview of Health Documents released since 2011

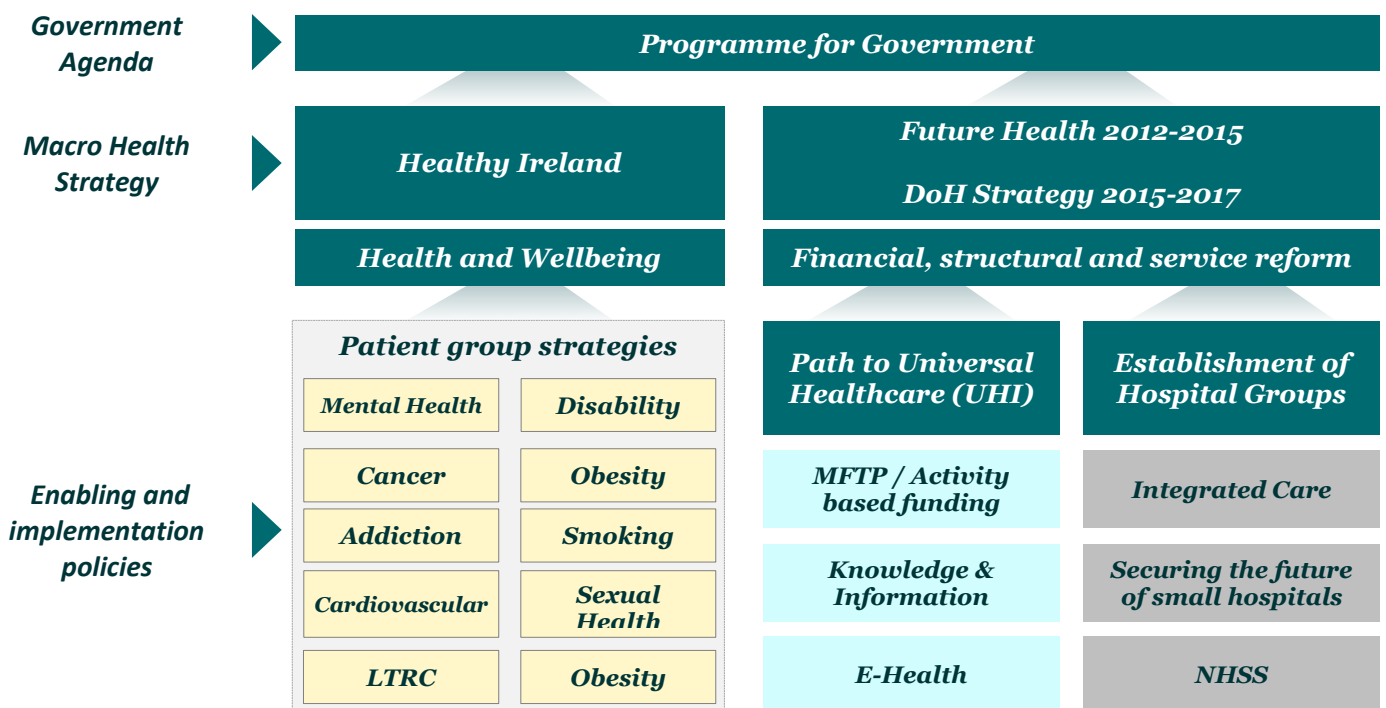


The above diagram outlines the various relevant policy documents, released since 2011, which determine the trajectory of public health services in Ireland. Of these, there are a number of core strategies and policies that are of particular relevance – which are detailed in the following sections.

While there are a number of other significant policy papers released, they are largely supplementary to these core policies and are thus considered to be either specific to a patient group or chronic disease (e.g. ‘The National Dementia Strategy’) or further enablers for implementation for one of the core policies (e.g. ‘Establishment of Hospital Groups as a Transition for Independent Hospital Trusts’). These policies are therefore critical for the evaluation of individual services provided by pharmacists, and should be considered on a case-by-case evaluation of potential sub-services.



Figure 12: Overview of the structure of core Public Health Policy and Developments



Key: LTRC= Long term residential care; MFTP=money follows the patient; NHSS=Nursing Home Support Scheme 'Fair deal'

3.2 Department of Health Statement of Strategy 2015 – 2017

The Department’s Strategy highlighted four main priorities and the steps that have been taken to date since Future Health was launched (2012 to 2015).

Figure 13: Priorities of Statement of Strategy 2015-2017.



The view supporting this strategy is that “every touch point with the patient counts” in terms of maintaining healthy patient cohorts.

Specific reforms in place or being delivered since Future Health (2012 – 2015)

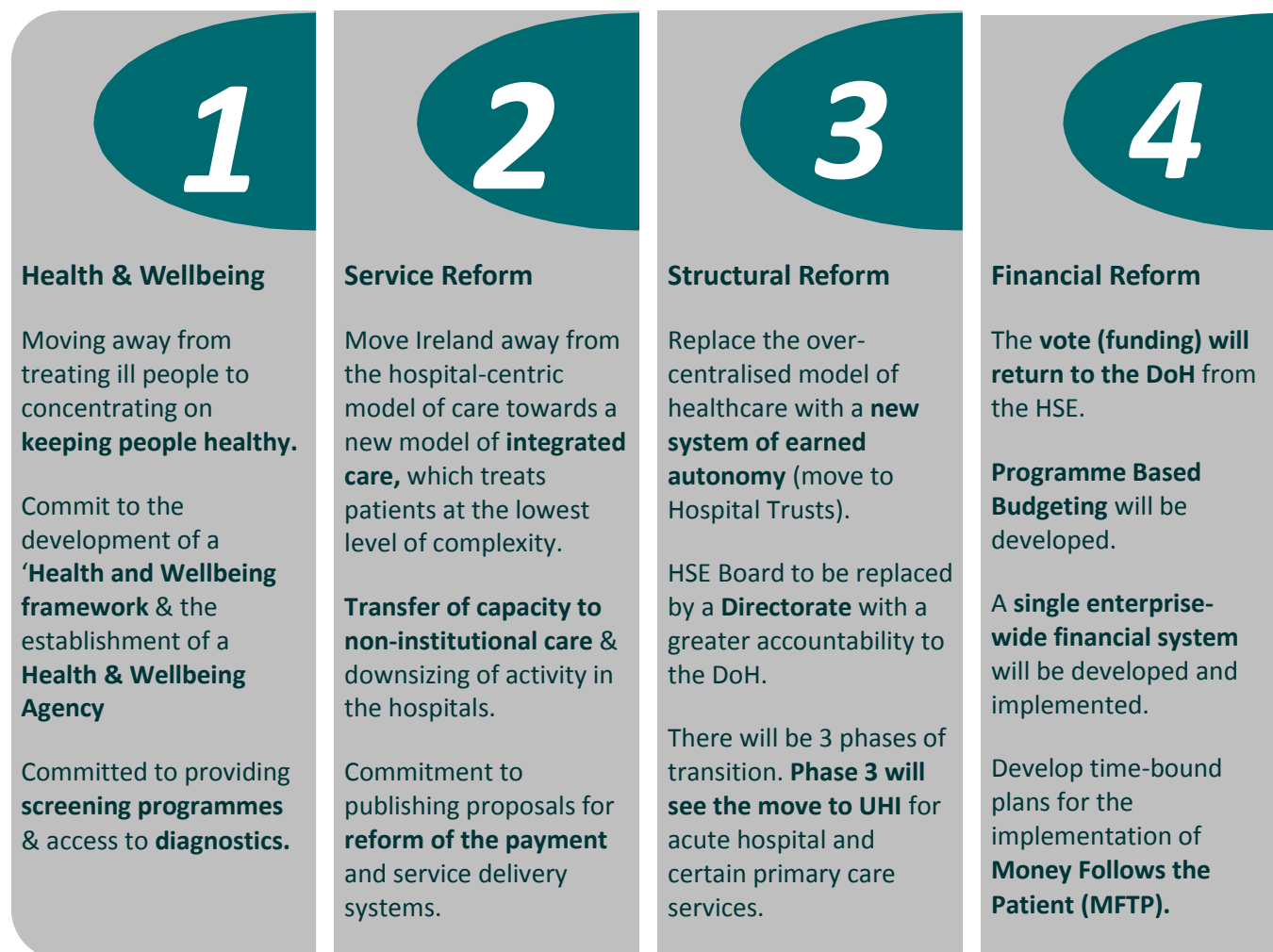
- ✓ The White Paper for Universal Health Insurance (UHI) is now being costed and the road map for next steps developed;
- ✓ The legislation to provide GP care without fees to all children under six years of ages and over 70 years of age is in place - this has been supplemented in the 2016 budget with the announcement that all children under the age of twelve will be eligible for free GP care;
- ✓ Measures are being put in place to improve the private health insurance market including a new Risk Equalisation Scheme, Lifetime Community Rating and more attractive rates for young adults. This appears to have stemmed the outflow of young private health insurance members and stabilised the private health insurance market in Ireland;
- ✓ Implemented key patient safety and quality reforms through HIQA and the HSE; these have led to a substantial increase in monitoring levels of safety throughout a range of care settings which include medicines management;
- ✓ The HSE vote (funding allocation) was returned to the DoH to enhance accountability and efficiency in the provision of healthcare in Ireland;
- ✓ The HSE Directorate has been established, replacing the previous HSE board. This directorate ensures the HSE has increased accountability to the DoH;
- ✓ A policy paper has been published on Activity Based Funding (also known as Money Follow the Patient) and its implementation will be overseen by the HSE. The implementation of this initiative is critical to the progression of UHI and a number of other system-wide reforms. In September 2015, an Economic and Social Research Institute (ESRI) paper identified that the estimated cost of the UHI model of financing generally exceeds the estimated costs to address unmet need in a universal system;²¹
- ✓ Government has approved a plan for reforming primary and continuing care and the implementation of the new Community Healthcare Organisations has commenced;
- ✓ Hospital Groups have been established with new CEOs and Chairs of Boards appointed to all of the regions. Many of these groups are now in the progress of defining their five year strategy.

3.3 Future Health – A Strategic Framework for Reform of the Health Service 2012 – 2015

“Future Health” proposes a single-tier health service, supported by Universal Health Insurance (UHI). The programme lists 48 actions for reform. A key action is the development of greater Primary Care structures and ongoing Chronic Disease Management supported by screening services.

The actions for reform revolve around the following four pillars of reform:

Figure 14: Four Pillars of reform, Future Health 2012 – 2015



This strategic framework is expected to be updated with a new strategy in the near future*.

*Not available at time of print

Figure 15: Implications of reform for the population and pharmacy

What the reforms will mean for the population
Improved health and wellbeing – the reform will help people to protect and improve their health and help manage & identify their illness at an early stage.
Faster, fairer access to hospital care – waiting times significantly reduced.
Free access to GP care – on a phased basis
Better management of chronic illness – roll out of programmes for diabetes, cardiac, respiratory and neurological conditions.
More people cared for in their homes – through reforms in social care.
Improved quality and safety – increase quality of care for patients (outcomes and cost of achieving those outcomes).
Affordability – Under UHI (Universal Health Insurance) people will be insured for a comprehensive package of curative services – cost of insurance payments will be related to ability to pay, with the State subsidising for those who qualify.

3.4 Healthy Ireland – A Framework for Improved Health & Wellbeing 2013 – 2025

‘Healthy Ireland’ proposed a partnership approach (whole-of-government & society), to deliver the actions set out in the framework with specific goals, principals and actions for all delivery partners.

Figure 16: Healthy Ireland Framework

Goals	Goal 1	Address risk factors and promote protective factors at every stage of life (e.g. weight, mental well-being).
	Goal 2	Interventions to target particular health risks & focus on addressing the wider social determinants (e.g. health status).
	Goal 3	Being prepared to prevent, respond & rapidly recover from public health threats (e.g. infectious disease).
	Goal 4	Need for society wide engagement with health & wellbeing promotions.
Ethical Principles	Equity	All persons with a fair opportunity to attain their full health potential.
	Fairness	Just distribution of the likely benefits and burdens of the public health policies.
	Proportionality	Proposed interference in public policy is justifiable & appropriate in the circumstances.
	Openness & Accountability	People who are most effected should be involved in public health policy.
	Solidarity	Public health is a collective action, which aims to protect the health and welfare of all people.
	Sustainability	Conserve & improve economic, social & environmental systems for present & future populations.
Framework of Actions	Theme 1	A whole-of-government approach to legislation, regulation and policy direction.
	Theme 2	Achievement of goals depends on the participation of many sections of society.
	Theme 3	Essential to focus on effective ways to empower people & communities to take responsibility for their own health.
	Theme 4	Need for an effective health system & skilled, multi-disciplinary workforce.
	Theme 5	Resources will be directed to evidence based initiatives where possible.
	Theme 6	Excellent data monitoring, capacity & systems to track progress of the Healthy Ireland targets.
Implementation	Adherence	Guiding operational principles to be adhered to through all phases of implementation.
	New Health and Wellbeing Role	New Health and Wellbeing Directorate in the HSE will play a significant role in leading and directing many actions.
	Outcomes Framework	Outcomes Framework will set out specific indicators for each goal against which delivery partners will be required to demonstrate improvements.

'Healthy Ireland' also highlighted the key health issues in Ireland many of which pharmacists currently support through service provision.

Figure 17: Key Health Issues



3.5 Path to Universal Healthcare: White Paper on Universal Health Insurance

The Department of Health Path to Universal Healthcare: White Paper on Universal Health Insurance document outlines the plan for government to introducing a single-tier health system, supported by universal health insurance. With focus on integrated care, equal access for all and money following the patient. This will be achieved via a multi-payer model of universal health insurance (UHI), involving competing private health insurers and a State-owned voluntary health insurance (VHI). UHI will be gradually rolled out over several years, with full implementation by 2019 at the latest.

The single-tier, multi-payer model of UHI will cover both hospital and primary care, allowing equal access to healthcare for all and a continued strong role for the state. The services provided in the future comprises two major elements: services, which are funded via the UHI system as part of the standard UHI package and services, which are funded directly by the State and separately to the standard UHI package.

Figure 18: Key building blocks for the introduction of UHI

Structural	Formation of independent Hospital Trusts and new primary and community care organisations
Regulatory	New licensing regime for healthcare providers and a robust risk equalisation scheme for the private health insurance market
Financial	New financial mechanisms and processes which are required to prepare for the future insurance-based health system such as the introduction of programme based budgeting and Money Follows the Patient (MFTP) payment mechanisms which will cover both the public and private health systems
Information	New information systems, structures and governance requirements which are necessary to effectively manage and steer the UHI system, e.g. unique identifiers, Health Information Bill etc.
Integrated Care	New structures to deliver patient-centered integrated care

In September 2015, an ESRI paper identified that the estimated cost of the UHI model of financing generally exceeds the estimated costs to address unmet need in a universal system.²¹

3.6 The Establishment of Hospital Groups as a Transition to Independent Hospital Trusts²²

This report proposed the formation of Irish acute hospitals into six viable and sustainable groups and outlines how the establishment of these groups will; help the introduction of UHI, permit greater autonomy for providers of hospital care and allow hospitals to be more responsive to the needs of their locality. The report emphasises the transitional nature of the hospital grouping arrangements. The grouping of hospitals is a stepping-stone toward the total reorganisation of acute hospital services in Ireland, it is envisaged that these will be grouped into a smaller number of hospital trusts that are capable of providing the relevant services to its population. The objectives, enablers and supporting initiatives are shown in the figure 19.

Figure 19: Establishment of Hospital Groups

Objectives	1	Create a small number of hospital groups nationally to reduce the fragmentation of service delivery.
	2	Provide hospital groups with a governance and management system to maximise efficiency in a framework of managed competition and integration on a national level.
	3	Assign each group a primary academic leader to organise education, training, research and innovation activities.
	4	Recommend a process and criteria for the appointment of Chief Executives for hospital trusts.
Enablers	Common Identity	Hospital group names will reflect the realignment and improved quality of service.
	Common Business Platform	Hospital groups need to capture and share information to a common standard, which may be technological or procedural.
	Community Hospitals	Current utilisation of community hospitals need to be enhanced and should be discussed by hospital group management on a case-by-case basis.
	Education & Training	Each hospital group requires a university relationship to optimise synergy between academia medical function and clinical and service management.
	ICT Systems	Standardised systems across all hospitals for information exchange across the healthcare system and the development of electronic patient records.
	Transport & Retrieval	Integration system between all hospitals, ambulance services, air corps and coastguard helicopter.
Supporting Initiatives	National Clinical Programmes	Offer to bring efficiency and effectiveness to the operation of hospital groups.
	Money Follows The Patient (MFTP)	The alignment MFTP with National Clinical Programmes will give the hospital groups the incentive to provide their services within a national framework that will support the provision of local care through smaller hospitals, allowing hospital groups to re-orientate services more effectively.
	Comprehensive Care Integration	Hospital group policies must encourage integration between primary, personal, social and hospital care.
	Future Hospital Licensing	Proposals to be made to the Minister of Health regarding the licensing of healthcare providers. This would ensure hospital groups are complying with core legal standards.
	Theme 6	Excellent data monitoring, capacity & systems to track progress of the Healthy Ireland targets.

The process of assigning hospitals to groups follows the following criteria:

- Align hospitals in broadly contiguous geographical areas
- Groups consistent with existing acute hospital care pathways, emphasising availability of care locally.
- Combine varying model, size and speciality to maximise services available to population.
- Ensure groups form single cohesive entities that provide an overall balanced hospital system.
- Ensure a population base and infrastructure to maintain the viability of each group in relation to other groups.
- Create hospital groups large enough to gain efficiency from common business processes.
- Ensure cooperation and managed competition among groups.
- Create groups with robust academic linkages.
- Attract and retain sustainable numbers of high quality consultants, trainees and post-graduates across a full range of healthcare specialties
- Maximise cross-border health service arrangements in the best interests of patients.
- Deliver internationally comparable quality care for patients, regardless of geographical location.
- The recommended groups should be broadly comparable to facilitate competition under UHI.

Example Hospital Group: Ireland East

One of the proposed hospital groups is Dublin East; this can be seen in figure 20. As mentioned in the report, specialist and complex care is being centralised (such as the National Maternity Hospital) and there is an increasing use of day case procedures in all specialties. In addition, national clinical programmes have been established to improve and standardise patient care, by bringing together clinical disciplines and enabling them to share innovative ways of delivering greater benefits for patients. The Hospital Group is also under the one academic partner, ensuring cohesiveness across the group.

Figure 20: Structure of Ireland East Hospital Group

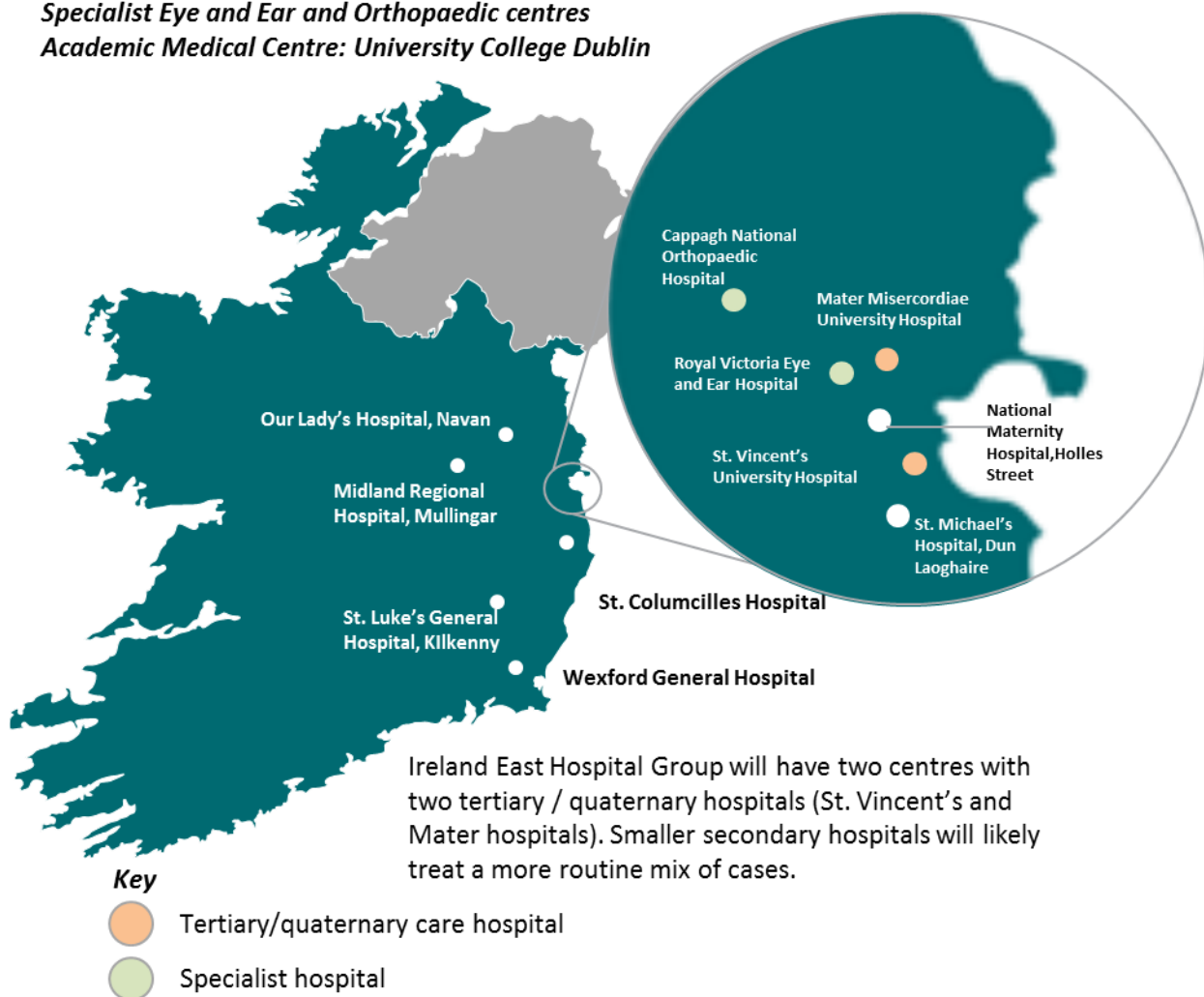
Example Hospital Group structure: Ireland East Hospital Group

11 Hospitals

2 Tertiary / Quaternary Hospitals

Specialist Eye and Ear and Orthopaedic centres

Academic Medical Centre: University College Dublin



3.7 Community Healthcare Organisations (CHOs)

The Report on Community Healthcare Organisations (CHO) provides a framework for the governance and organisation of all of Ireland's Community Healthcare services. When placed alongside the 2013 report on the Establishment of Hospital Groups, there is a new structure for the operational delivery system that interacts with the public every day.

The changes will allow the Health Service to focus on service delivery and decision making at local level to: provide better, direct accountability therefore giving more decision making back to local areas; and deliver services in the community through an integrated management structure.

Services will be improved in local areas by providing:

- Better access;
- Services that are close to where people live without reducing quality;
- Better local decision making; and
- Services in which communities have confidence.

The report recommended the establishment of nine Community Healthcare Organisations, which are the best fit to deliver an integrated model of care. There will be 90 Primary Care Networks set up, averaging 50,000 population to support groups of Primary Care Teams; and enable integration of all services for a local population. This structure places an accountable person as responsible for actual service delivery to a defined local population.

Social Care, Mental Health and Health and Wellbeing services will be reformed to better serve local communities through standardising models and pathways of care while delivering equitable, high quality services; and supporting primary care through delivery of rapid access to secondary care in acute hospitals and specialised services in the community.

3.8 eHealth Strategy for Ireland (2014-2020)

eHealth involves the integration of all information and knowledge sources involved in the delivery of healthcare via information technology based systems. This includes patients and their records, caregivers and their systems, monitoring devices and sensors, management and administrative functions. It is a fully integrated digital 'supply chain' and involves high levels of automation and information sharing.

The introduction and utilisation of eHealth will ensure the patient is placed at the centre of the healthcare delivery system and becomes an empowered participant in the provision and pursuit of their health and wellbeing, as outlined in figure 21 below.



Figure 21: Patient Centric Model in eHealth Strategy for Ireland



Priority eHealth projects have been identified and are illustrated in figure 22 below.

Figure 22: eHealth priority projects

Priority Projects
National Healthcare Identified Infrastructure
ePrescribing Systems – automation of medication prescribing process, including online repeat prescription ordering.
Online referrals & schedules
Telehealthcare – particularly relating to the management of chronic diseases. Devices (blood pressure monitors, glucometers) deployed to homes – data transmitted to monitoring base.
Development of Patient Summary Records
Online Access to Health Information - allow online access to healthcare systems including scheduling, prescription ordering, referrals and telehealth monitoring from the home environment (via a patient portal)
National Patient Portal

Healthcare in Ireland may be on the cusp of substantial change as a result of various demographic, organisational and resourcing factors, the increasing proliferation of technology and in particular the internet. These factors mean that future healthcare systems will need to be radically different in order to respond efficiently and equitably to forecasted demand. Demographic changes are occurring mainly because of ageing populations, rise of chronic diseases and increased demand and complexity of healthcare services. These changes will bring many challenges to an already-strained system. They will require the utilisation of innovative information-based eHealth solutions funded through a re-alignment of the national healthcare budget (Ireland's national healthcare ICT spend is 0.85% of the total healthcare budget relative to the EU range of 2-3%) and increased investment in eHealth systems and change management, process re-engineering and implementation support infrastructure.

3.9 Knowledge & Information Strategy (2015)

The Knowledge & Information strategy builds upon the eHealth Vision for Ireland, and outlines how integrated information and enabling technology will support the delivery of innovative, safe and high quality patient care to meet the needs of our population across all patient pathways and care settings.

The vision for the HSE is to move dramatically from the current way of delivering care to integrated care pathways underpinned by an information-enabled model. Some key characteristics of the future vision - “the direction of travel” - are highlighted in figure 23.

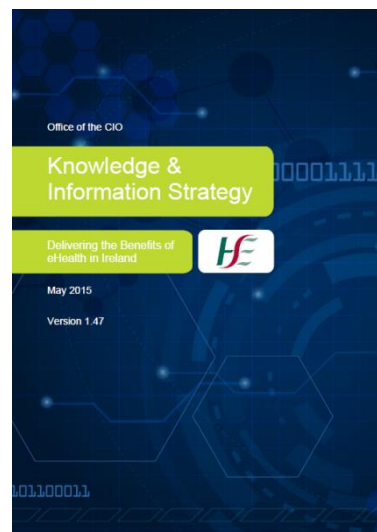


Figure 23: Knowledge and Information strategy, direction of travel, 2015 to 2020²³.



The core programme highlighted in the 'Knowledge & Information Strategy (2015)' is due to be delivered in the next five years, however national rollout activities for electronic medical records and for some of the clinical programmes is expected to stretch beyond 2020. Legislative changes will be required for some initiatives. The high-level roadmap is anchored to five priority focus areas:

- Care Delivery Enablement;
- Electronic Health Records;
- Cross Setting Information Integration;
- Health Service Insights; and
- National Support Systems.

The report notes that the high level roadmap represents an indicative, pragmatic but aggressive delivery vision, and will be refined in line with the evolving overall health reform programme and its timelines and priorities. The execution of the plan is in parts dependent on new legislation being passed. It is also subject to the appropriate funding being made available in a structured and informed manner. A more detailed Business Case & Planning Phase is required as a first priority. The core programme will be delivered over the next five years.

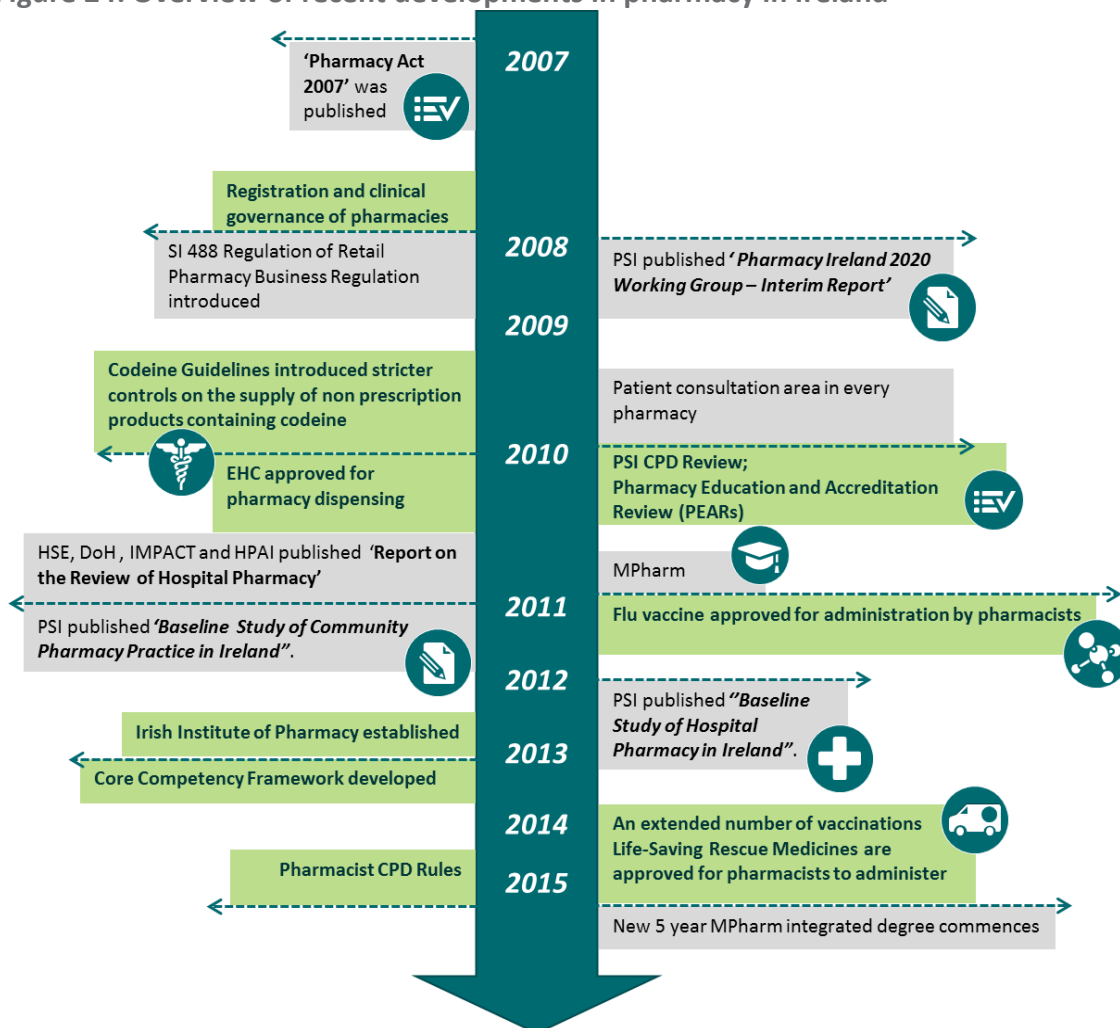
4. Pharmacy in Ireland today

4.1 Introduction

Pharmacy in Ireland has changed significantly in recent years. There are a greater number of medicines available to treat patients, consequently polypharmacy for the elderly is increasing, and treatments are becoming more tailored and individualised, particularly in cancer care²⁴, infectious diseases and certain chronic conditions. Pharmacists, as trained medicines experts are using their knowledge and judgement to ensure the safety of the patient in this increasingly complex healthcare environment. They work in many different areas e.g. in patient facing roles as community and hospital pharmacists but also in non-patient facing roles such as pharmacists in industry, research and development, pharmacovigilance, regulatory affairs, academia, public health policy and administration.

The Pharmacy Act 2007 brought many significant changes to the regulation of pharmacy in Ireland, including: a non-pharmacist majority Council; a formal complaints and fitness to practise system; new powers of inspection and investigation for the Pharmaceutical Society of Ireland (PSI); formal registration and regulation of retail pharmacy businesses, which includes a pharmacist management structure of superintendent and supervising pharmacists; a new registration system for pharmacists; a statutory Code of Conduct for pharmacists and mandatory continuing professional development for pharmacists.²⁵ Figure 24 below gives an overview of recent developments in pharmacy in Ireland.

Figure 24: Overview of recent developments in pharmacy in Ireland



Following the Pharmacy Act, in 2008, Regulations were published which included a requirement for all pharmacies to have a separate patient consultation area.²⁶ Each pharmacy premises must be registered with the PSI, and must meet a range of legislative criteria relating to storage of medicines, consultation areas, operational processes and certification of staff. All pharmacies are subject to inspection by PSI inspectors. Continued registration of each premises is required annually. This has resulted in the existence of a unique network of over 1,800 licensed premises throughout the country – the most prevalent centre for health advice and services in Ireland.

Each retail pharmacy business must identify the superintendent pharmacist who is in personal control of the management and administration of the sale and supply of medicinal products, either where such control is exercised in respect of a single retail pharmacy business or in respect of a number of such businesses. In addition, for each pharmacy premises a supervising pharmacist must be identified as the person who is in whole-time charge of carrying on the retail pharmacy business. Under the legislation, there are clear legislative responsibilities associated with the roles of superintendent and supervising pharmacists and the pharmacy owner. This structure provides clarity and assurance to patients and the public with regard to the responsibilities of the pharmacist and the management of medicines within a pharmacy.

In addition to the pharmacist structure in pharmacies, most pharmacies also employ pharmacy technicians and other staff to support the pharmacy functions. However, these roles are not currently regulated.

The professional role of a pharmacist in the pharmaceutical and therapeutic review of a patient's prescription and providing advice is enshrined in legislation in Regulation 9 of S.I. 488 of 2008, The Regulation of Retail Pharmacy Businesses, which provides for the review of medicine therapy and counselling of patients in the supply of medicines on foot of a prescription as described:

Regulation 9 of S.I. 488 of 2008, The Regulation of Retail Pharmacy Businesses:

- Ensuring the medicine is pharmaceutically and therapeutically appropriate
- Screen for
 - any potential interactions with other prescribed medicines, over the counter (OTC) medicines, herbal products, food etc.
 - adverse events
 - correct dose and duration
 - possible allergic reactions
 - potential clinical abuse/misuse
- Patient knows
 - how to take the medicine correctly
 - benefits expected
 - possible interactions/side effects/adverse events and what to do if they occur
 - what to do if a dose missed
 - importance of compliance and techniques for self-monitoring
 - correct disposal
 - any other relevant information the pharmacist feels is required

Pharmacy education and continuous professional development (CPD) has also been reformed in recent years. The qualification for registration is now a 5-year Master level degree and students are now transitioning to a new 5 year integrated Masters in Pharmacy degree with an increased clinical focus.²⁷ The Irish Institute of Pharmacy (IIOP) has also been established to support pharmacists in meeting their mandatory CPD. CPD for pharmacists focuses on application of knowledge and skill into practice, ensuring the learning and developmental needs of every pharmacist is implemented to their own requirements. The CPD system has a dual aim of advancing pharmacy practice and enhancing patient outcomes.²⁸



4.2 Pharmacy Practice in Hospital

Pharmacists, working in the acute sector of the health system, are embedded in many different roles in the hospital. There are no defined services, which are provided by all hospital pharmacists. Below are some of the services that are currently provided in some hospital pharmacies:

- Supply chain management of medicines including procurement for safety, and managing shortages of essential medicines;
- In-patient and Out-patient Dispensing;
- Procurement of medicines in a cost effective manner;
- Promoting the use of cost effective medicines throughout the hospital;
- Medicines advice and information to doctors, nurses and patients;
- Clinical pharmacists are independent practitioners who may also operate as part of the Multidisciplinary team, providing near patient pharmaceutical care. This can include medicines reconciliation, prescribed medication and clinical review, adverse drug reaction identification and reporting, patient specific medicines information, discharge counselling and liaising with primary care;
- Medication safety and risk management, reporting and analysing medication error trends, implementing action plans, audit of system changes to prevent future errors;
- Out-patient dispensing for human immunodeficiency virus (HIV) medicines, clozapine, Tuberculosis (TB) medicines, Hepatitis C Virus (HSV) medicines;
- Aseptic preparation and dispensing of intravenous medicines including cancer care treatment. Compounding of these medicines must be carried out under controlled aseptic conditions and strictly applied prescribing and manufacturing protocols and procedures;
- Managing Clinical trials involving medicines, as part of Good Clinical Practice (GCP), under delegation from the principal investigator;
- Education, training and research relating to pharmacy practice, therapeutics and medicines.

While these services fall under the remit of hospital pharmacists, according to a baseline study conducted by the PSI in 2012, there is significant variation in service levels across the country.²⁹ In addition to dispensing and distribution of medicines, pharmacists can also spend time in patient facing roles that can have measurable benefits to patient safety. The 'Report on the Review of Hospital Pharmacy, 2011' highlighted the need for a new structure in hospital pharmacy, to enable: a standardised approach across the whole system; pharmacists to contribute to national policy and implementation of such policies; and deliver clinical effectiveness (e.g. specialisation) and other efficiencies.³⁰ Antimicrobial Stewardship has been an area of notable advancement in specialisation in hospital pharmacy in Ireland, and is currently operating within International best guidelines. As of 2010, there are 22 whole-time equivalent (WTE) positions filled by 24 antimicrobial pharmacists in 25 public hospitals, and there are seven HCV pharmacists (6 WTE) in Ireland³¹. A report on antimicrobial resistance in Ireland indicated that all acute hospitals must have one or more clinical pharmacist with responsibility for antimicrobial stewardship and should have national training for this service.³² Advantages of antimicrobial stewardship have been demonstrated in Irish hospitals, with significant savings being shown at Temple Street Children's Hospital,³³ Galway University Hospital, and Our Lady of Lourdes, Drogheda.³⁴ There are pockets of specialisation seen throughout Irish hospitals, with some pharmacists travelling to the UK for training in a variety of

specialties, but without the structure, recognition and training, these specialties cannot be practised like their international colleagues, even though according to the Hospital baseline study, 75% of hospital pharmacists have completed post graduate qualifications.



Medicines Management and Pharmaceutical Care

Medicines management and pharmaceutical care is a service where hospital pharmacy is best placed to deliver positive patient outcomes. From reconciling patients' medicines on admission and discharge, providing in-patient clinical services involving checking clinical and therapeutic appropriateness, ensuring patients use their medicines correctly, to intervening when incorrect supply could cause adverse events. In Ireland, through the National Acute Medicines Programme, medicines reconciliation is immediately mandated on patient arrival into hospital (although resourcing currently does not allow).³⁵ Medicines reconciliation is a basic principle of good medicines management, there have been many studies to show the effects of medicines reconciliation, both in Ireland and internationally. It has been shown that clinical pharmacists contribute positively to admission medication reconciliation, in a study involving 134 patients with 1,556 medications, 59% of the medications reviewed experienced a medication change on admission, with 29% of medications warranting clinical pharmacy input to determine whether such changes were intentional or unintentional.³⁶ The advantage of having a patient's drug information is that adverse drug events become less of a possibility. In certain older populations it has been shown that a significant number of adverse drug events may have been avoidable due to the screening of an older person's potentially inappropriate prescriptions (Screening

Medicines Management in hospitals encompasses the entire way that medicines are selected, procured, delivered, prescribed, administered and reviewed to optimise the contribution that medicines make to producing informed and desired outcomes of patient care. (Source: NHS Spoonful of Sugar)

Tool of Older Persons Prescriptions (STOPP), meaning these admissions could have been avoidable³⁷. Adverse drug reactions (ADR) can also be reduced due to technological advancements, a randomised control trial using a clinical decision support software intervention showed that there are significant reductions in ADRs for acutely hospitalised older people.³⁸ Technology can also be an enabler in the dispensing area, for example, the Mater Misericordiae University Hospital (MMUH) has two pharmacy dispensing robots, which saves twelve hours of work time per week, and this has been shown to increase available capacity for clinical pharmacy services.

Pharmaceutical Care is the direct, responsible provision of medication-related care for the purpose of achieving definite outcomes that improve a patient's quality of life.
(Source: Hepler and Strand, 1990)

Many of the above medicines management duties fall into the remit of clinical pharmacy services. A large part of clinical pharmacy also centres on the education of other healthcare professionals. Prescribing patterns can cause concern as drug related admissions to hospital could be avoidable in many cases. It was shown that 8.8% of all admissions to an Irish hospital were drug related, where 57.3% of these could have been avoidable³⁹. Clinical pharmacy services that intervene can cause a significant cost saving to the health system as a whole. In a one-year study, clinical pharmacy interventions were graded and assigned a cost, a total cost avoidance of €708,221 was generated. Input costs were calculated at €81,942. This resulted in a net cost benefit of €626,279 and a cost benefit ratio of 8.64:1.⁴⁰

Pharmacist Prescribing

Previously, only doctors and dentists have been able to prescribe prescription-only medicines to patients. However, the Minister for Health and Children extended prescriptive authority to nurses and midwives in 2006,⁴¹ by including in primary legislation a provision for the prescriptive authority of nurses. Since the enactment of the Pharmacy Act, 2007 pharmacists are now subject to the most rigorous regulatory regimen in Ireland. International examples such as the United Kingdom show pharmacists are prescribing under the care of a doctor (supplementary) and also independently.⁴² Pilot schemes involving pharmacists working in multidisciplinary teams have shown how pharmacists in the hospital setting would have the necessary skills to prescribe. Under the Collaborative Pharmaceutical Care in Tallaght Hospital (PACT) service, pharmacists are creating medication lists that become a legal prescription once the prescriber signs it off, this shows that clinical pharmacists are interested and have the capability of prescribing.⁴³

Multidisciplinary Team Involvement

While there is no formal requirement for hospital pharmacists to be part of the clinical, face to face care of the patient, in practice pharmacists have been working with other healthcare professionals in hospitals as part of Multidisciplinary Teams (MDTs) for years. The advantages of working in a team aligned with a specialty is that knowledge from different healthcare professionals is available to all team members quickly, resulting in issues and problems being solved and benefitting the patient. Pharmacists in Ireland are currently working in MDTs, but the involvement is not consistent across all hospital settings. There are clear patient advantages to pharmacist involvement in MDTs. A recent study demonstrated how interdisciplinary collaboration, specifically in this case between the clinical pharmacist and the hospital doctor, could improve the completeness and accuracy of discharge prescriptions⁴⁴. Through submissions to the Innovation Portal for hospital pharmacy, pharmacist involvement in MDTs is seen but resources tend to be the main pitfall for these services continuing and expanding.

4.3 Pharmacy Practice in Community

A public and private model funds community pharmacy in Ireland. The HSE enters into contracts with community pharmacists to provide services to Medical Card holders, those qualifying for support under the Hepatitis C and Long-Term Illness (LTI) Schemes. For these service users, pharmacists receive a flat dispensing fee plus reimbursement for the costs of medicine from the HSE Primary Care Reimbursement Service. Private patients and families can avail of the Drugs Payment Scheme, under this service, an individual or family only has to pay €144 each month for approved prescribed drugs, medicines and certain appliances for use by that person or his or her family in that month. Community pharmacies have to claim any costs to the patient over the €144 monthly cap.

According to a baseline study conducted in 2011, 86% of pharmacists surveyed indicated the majority of their time is spent on dispensing prescriptions, followed by counselling patients on prescription and non-prescription medicines.⁴⁵ Some of the most prevalent (> 30%) community enhanced pharmacy services seen in the baseline report were:

- Disposal of Unwanted Medicines
- Monitored Dosage Systems
- Home Delivery Services
- Supervised Methadone Service
- Fertility Treatment Dispensing Services
- Palliative Care
- Structured Smoking Cessation Services
- Obesity / Weight Management
- Blood Pressure Screening
- Weight/Height/BMI Assessment

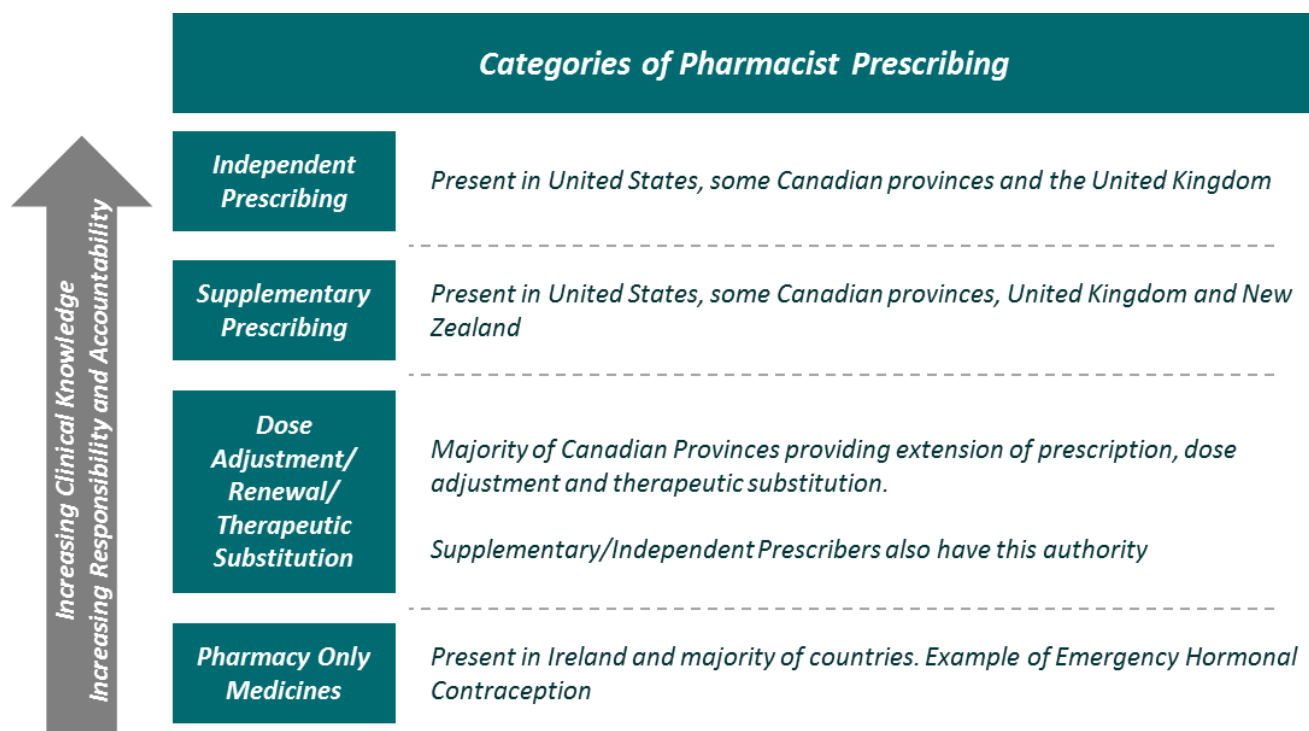


Chronic illness management is a high priority among health policy in Ireland. For instance in Ireland, the CODEIRE study (based upon a prevalence of 3.9% for Type 2 DM) estimated that the annual cost of managing diabetes was €377.2 million, which corresponded to 4.1% of total healthcare expenditure.⁴⁶ These numbers show that an integrated approach to chronic illness is needed. Systematic reviews of chronic conditions such as hypertension show that community pharmacist-led interventions can significantly reduce systolic and diastolic blood pressure. These interventions could be useful for improving clinical management of hypertension.⁴⁷ Structured services in the UK such as the New Medicines Service (NMS) are in place for managing chronic conditions⁴⁸, but currently there is no nationwide Irish plan. There were pockets of innovation seen in Ireland through the Innovation paper for community pharmacy supporting this project. A community pharmacy anticoagulation clinic in Ireland has shown that over 3,200 Internationally Normalised Ratio (INR) checks have been performed since 2010.⁴⁹

Pharmacist prescribing is not currently allowed in Ireland. In many international examples there is a wide spectrum of prescribing, from Independent prescribing, to dose adjustment and finally to reclassification of medicines to pharmacist-only. In Ireland, some medicines such as the Emergency Hormonal Contraception (EHC) have been reclassified allowing these medicines to be purchased under the care of the pharmacist. Recently, the new emergency medicines legislation allows pharmacists to administer emergency medicines to patients. A similar service to prescribing in parts of the UK is the Minor Ailment Scheme (MAS), this scheme has shown that minor ailments are being treated efficiently by pharmacists, the consultation is

more cost efficient, and the demand on General Practitioners decreased.⁵⁰ Figure 25 shows the categories of pharmacist prescribing, and where they are prevalent.

Figure 25 Variances of Pharmacist Prescribing



Medicines management and pharmaceutical care, which was mentioned in the hospital pharmacy area, is also a large part of community practice. Currently there is no structured medicines management systems in place in community pharmacy in Ireland. Information from the Innovation paper shows that some community pharmacies are creating the initiative but this service is not implemented nationally. In the UK, medication reviews have been formalized⁵¹. Results to the services have been mixed, with more specific patient cohorts being targeted in order for these to be effectively deployed.⁵² Pharmacists have a large role in the community setting towards ensuring patients are prescribed and dispensed correct medication, especially in vulnerable patients where ADRs can be more threatening than in other patient populations, reducing potentially inappropriate prescribing in the community setting would help lower the burden of Adverse Drug Events (ADEs), and associated healthcare use⁵³, there is also significant cost consequences associated with these inappropriate prescriptions with 9% of the overall expenditure on pharmaceuticals in patients aged greater than 70 years in 2007.⁵⁴

In current health policy, the imperative to prevent illness so that patients' entry into acute settings can be avoided, is strongly advocated.⁵⁵ It was seen that many innovations are being introduced in Ireland on an ad hoc basis, however studies that demonstrate that pharmacist involvement could lead to clear patient outcomes or cost savings have not yet been produced in Ireland. Pharmacist vaccination services have been implemented in Ireland since 2011, starting with the Influenza vaccine and recently expanded to pneumococcal and herpes zoster (shingles) vaccines. A study identified that pharmacist led vaccination services can lead to high vaccination rates in an Irish pharmacy chain⁵⁶. This service has been shown to have penetrated segments of the public, which had not previously received the vaccination. Of the 53,047 flu vaccinations given in pharmacies during the 2014/2015 flu season, 23% of people vaccinated had never been vaccinated before and 83% of those were in an at-risk group.

4.4 Medicines in Ireland

The successful use of medicines in treating illness combined with improvements in medical and scientific research have resulted in a dramatic increase in medication use in recent times. This increase in use has also brought with it an increase in hazards, error and adverse events associated with medication use (See figure 26). All staff involved in the use of medication thus have an ongoing responsibility to work together to minimize patient harm caused by medication use.

In 2014, 18% of the total healthcare budget of €12.4 billion was spent on medicines in Ireland. The €2.25 billion expenditure on medicines is comprised of 80% public spending and the remainder with private spending. The expenditure of pharmaceuticals as a percentage of GDP in Ireland is in line with the OECD average of 1.4%.

Public expenditure on pharmaceuticals (see figure 27) has grown significantly in recent years rising from 9.9% of the total healthcare spend in 2000 to 14.5% in 2014. The reasons for this growth is due to; an increasing and ageing population, the introduction of new treatment methods/medicines and Government initiatives.²

The Primary Care Reimbursement Service (PCRS) scheme administers drug payments to healthcare practitioners. This funding is comprised of various State schemes, which cover general medicines to high tech and chronic medication.

Per capita expenditure on pharmaceuticals was €600 in Ireland in 2013, significantly higher than the OECD average of €474. However, the average annual growth in public pharmaceuticals expenditure per capita, in real terms, has decreased from 7.8% from 2005-2009 to -2.5% from 2009-2013.^{59,60,61}

Figure 26: Medication Related Risks^{57,58,43}

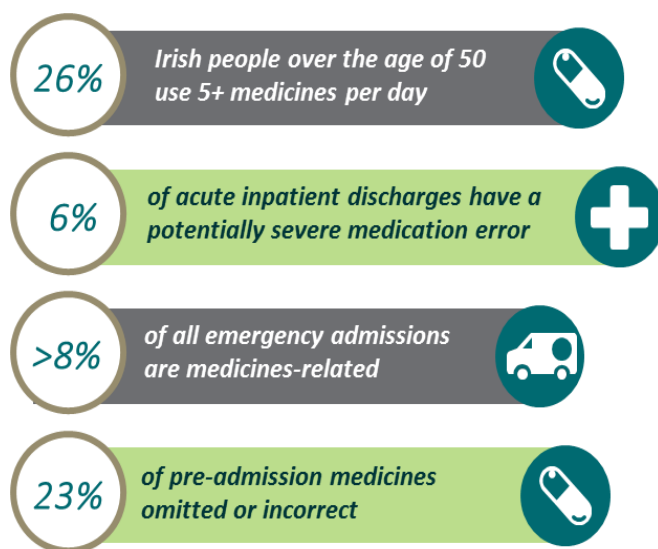
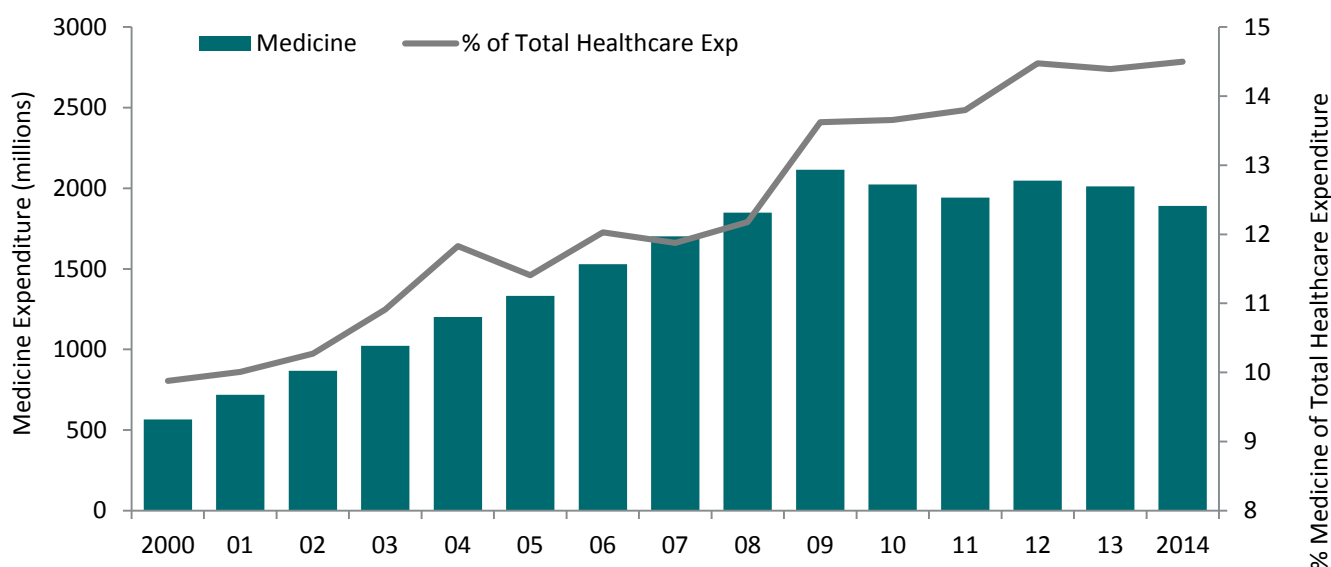


Figure 27: Medicine Expenditure in Ireland

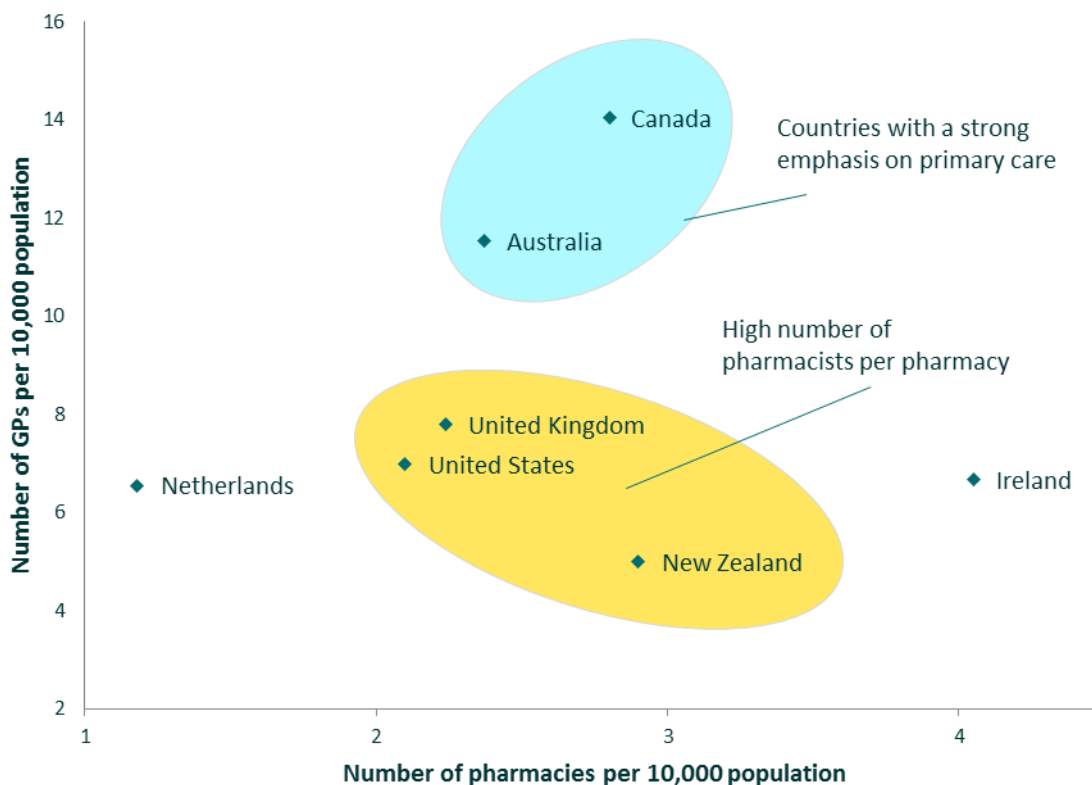


5. Development and evolution of pharmacy

Development of delivery models of pharmacy internationally

Pharmacy business is changing constantly. Ireland continues to have a large proportion of independently run pharmacies, which is unique when compared internationally. Generally, the more time a pharmacist has, means that they can take on more patient facing roles rather than the traditional dispensing role. Providing an advisory role is difficult if resourcing and staff numbers prevent pharmacists from leaving the dispensary. Below in Figure 28 shows the international comparison of GPs, pharmacists and pharmacies per capita.

Figure 28: International comparison: GPs and pharmacies per capita



Ireland has a lower number of pharmacists per pharmacy, with a large number of pharmacies per capita. Other economics have larger scale pharmacies with more pharmacists present, potentially allowing them to be better equipped to offer additional practice pharmacy services. The data seen in the PSI community pharmacy baseline study indicates that the majority of Irish pharmacist time is taken up by dispensing.

Other Healthcare Professionals in Pharmacy

Internationally, some larger chain pharmacies are incorporating health clinics into their offerings. Currently in the US and Canada, there are “wellness clinics” in certain pharmacy chains. In these separate rooms, nurse practitioners are hired by the pharmacy to prescribe medicines for a defined list of ailments (e.g. antibiotics for sinusitis). Large chains are trying to diversify their offerings to patients. There is also some innovations where technology is used, an example of this includes “telehealthcare” where a patient can go into a separate room in the pharmacy and have a consultation with a specialist over a video conference.

Implication of multiples

The majority of pharmacies in Ireland are owned independently, though large chains are opening new stores frequently⁶². In the UK, large chain pharmacies are commonplace and are starting to adopt the North American model that also sell a wide array of products, from beauty products to food products.

Various mergers and acquisitions were announced in the retail pharmacy industry in the US during 2013–2015. A number of these have been cases of vertical integration—retail pharmacies acquiring medical clinics and Pharmacy Benefit Management (PBM) companies (which process prescriptions for corporations and insurance companies, and negotiate prices with drug manufacturers and retailers). While the trend of retail pharmacies foraying into the PBM and medical clinics business is not new, the activity has picked up pace in the last few years⁶³.

E-prescribing - Netherlands example

In the Netherlands, 96% of GPs use a computer system, which has a basic e-prescribing module built in. It was cited that from 1998, 80% of prescriptions were e-prescriptions. A further system, which enabled prescribing on standard guidelines from the national payer, was introduced in 1998, which allowed for further cost savings. Proactive and well-organised local GP associations fostered the early adoption of this technology. Stakeholders were also aware of how this technology could benefit them, for the patient, the reduction in medication errors would allow for improved patient safety. For the GPs and pharmacists, there were few legal liabilities as less ADRs occurred due to reduced medication errors, the administrative burden was reduced, standardisation of the formulary, terminology and processes allowed for greater safety and faster processes, and finally there was improved communication through for example, pharmacies and laboratory systems allowed greater interprofessional communication and patient knowledge.

Though e-prescribing in the Netherlands is commonplace, the introduction of electronic patient records (EPR) has been more difficult. There is diverging opinions about its desirability. Opponents perceive that the current systems work adequately and regard the new developments as immature and risky, possibly causing significant disruption. Furthermore, GPs do not currently enter information consistently across the country. GPs have been registering information in their own systems for years. One of the interviewees said that if the current information available at the regional level were to be migrated to a national Electronic Health Care Record (EHCR), it would take GPs 20 minutes per patient to register the information into the nationwide system. Therefore, important changes and a significant amount of preparation still need to occur to migrate to a nationwide system.

There are also privacy concerns about the possible abuse of patient information. The information regarding the diagnosis and patient history is stored locally at GP level, and concerns were raised about other stakeholders being involved. Plans are currently in place to store patient records not centrally, but locally at the source, and access to the record would be by communication between local systems.⁶⁴

Impact of technology in pharmacy

Automation of dispensing in pharmacy has been around since the 1990's. There are many variations of automated dispensing from stock robots, unit selection automation, unit dose (patient supply) to the use of automated cabinets. Stock robot is the most prevalent in Europe, for instance 57% of hospitals in the UK have stock robot systems, along with 35.7% who have unit dose automation. This uptake in the UK is from a paper published in 2001⁶⁵ which recommended that dispensing be automated to improve the safety and efficient of the process, and release pharmacists' time for clinical care. According to the European Association of Hospital Pharmacists (EAHP), Ireland has one of the lowest uptake of automation in hospitals in Europe (as of 2010) at 3.3% using only stock robots, but this number is growing. This technology is not only prevalent in hospitals, but also in community pharmacies, some high volume dispensing pharmacies have invested in automation, though the uptake has been much slower. A

pharmacy in Manchester installed a dispensing robot, which speeded up their dispensing times, improved their stock control and saved space to enable the construction of three patient consultation rooms. The robot also released pharmacists' time to enable them to focus on more clinical services (weight loss clinics, new medicines service and medicines use reviews).⁶⁶

Healthy Living Pharmacies

Healthy Living Pharmacies (HLP) started in the South of England in response to a 2008 government policy document⁶⁷, which aimed to bring pharmacies beyond the classic dispensing role. HLPs were established to give out information and guide self-care and healthy lifestyles in the communities they serve. To be awarded HLP status pharmacies must demonstrate the suitability of their premises, systems and resources, and a commitment to a healthy living ethos illustrated by a proactive approach to self-care and healthy lifestyles in their community. Each HLP has a 'Health Champion' who is trained and accredited to provide health and wellbeing to customers. The pharmacy is also branded a 'Healthy Living Pharmacy' and is seen as the expert for a certain condition or health outcome. There is a need for increased focus on prevention and improvement of the public's health, which is seen in the Healthy Ireland document. As an integral part of their communities, pharmacies can position themselves as the most accessible source of information on healthy living, harm reduction and preventative health measures (see list of locally commissioned services in UK section). There is an increasing body of evidence to support the impact that Healthy Living Pharmacies have on the health of their communities and their model is being looked at in other countries.

Internet pharmacy: A new model

Internet and mail-order pharmacies are a new emerging model that is growing internationally. In Ireland, the supply of medicines by mail order is prohibited by legislation. In the UK, more than 2 million people buy drugs regularly over the Internet from online pharmacies. In 2008, the Royal Pharmaceutical Society of Great Britain (RPSGB) introduced a green cross logo to help identify accredited online pharmacies (from 2010 the internet pharmacy logo scheme is run by the General Pharmaceutical Council). The UK is a frontline leader in internet pharmacy since a change to NHS pharmacy regulations in 2005 that made it legal for pharmacies to fill NHS prescriptions over the internet.

Since July 2015, the Medicines and Products Regulatory Agency (MHRA) has required online sellers of medicines to adopt an EU wide logo and maintain an entry in the MHRA medicines sellers registry. There is also movement where online pharmacies are now linking up with online clinic doctors⁶⁸. Doctors carry out online consultations and issue prescriptions. In Ireland, a new app has been established which links patients to GP's over the internet, and prescriptions are faxed to their pharmacy with the original following by post. Mail order and internet pharmacies are allowed in Germany, but German consumers can also order medicines from Iceland, The UK, the Netherlands and Sweden, for example, DocMorris a Netherlands mail order pharmacy delivers to German consumers and is reimbursed by German insurers as the prices for medicines are considerably lower than in Germany.

The United States has had mail order and now internet pharmacy for quite some time. Generally, if the online pharmacy is shipping medicines to a particular state, it has to be licensed in that state. One state, Pennsylvania, recognises a pharmacy license in any other US state. It is illegal for non-US pharmacies to supply patients in the US. The National Association of Boards of Pharmacy (NABP) has an accreditation program for internet pharmacies called the Verified Internet Pharmacy Practice Sites (VIPPS) program. Canada is very similar to the US as the pharmacies need to be licensed in their relevant provinces but internet pharmacy is common. Canadian patients can also not obtain medicines from online pharmacies outside Canada.⁶⁹ Australia also allows online pharmacy, Australians can obtain a three-month supply of medicine from a non-Australian pharmacy for personal use but the importer must have a prescription from an Australian registered medical practitioner. In New Zealand, internet pharmacies must be accredited like regular pharmacies, and meet other requirements related to patient consultation, privacy and advertising.

Nascent Innovations

Recently introduced innovations may give an indication of the direction of change for pharmacy. Innovation has led to discoveries of how to prevent and cure many illnesses and allowed patients greater quality and access to care. Good pockets of innovation exist and continue to grow rapidly across the healthcare sector. Below is a brief outline of some of the medical innovations that are being developed globally.

The development of electronic drugs has been under clinical investigation recently. Autonomic Technologies Inc. in California have been examining the possibility of electronic Aspirin for migraine patients. (See “Electronic Aspirin”). The involvement of robotics in clinical activities are currently being developed. RP-VITA Remote Presence Robot produced jointly by iRobot Corp and InTouch Health is the first such robot to receive Food and Drug Administration (FDA) approval.⁷⁰

Frictionless Remote Monitoring is a major innovative initiative that allows patients to monitor numerous health indicators through wearable technology and apps. Pharmacists can leverage the data from mHealth apps and wearables to help patients stay on track and improve their outcomes. Diabetes was identified as a major area for such innovations. The iBG STAR glucometer tracks blood glucose readings, carbohydrate intake, and insulin doses, which connect with a phone or tablet and data can be shared. Similarly, needle free Diabetes care is being developed by Echo Pharmaceuticals in Philadelphia (See “Needle Free Diabetes Care”)

Clinical Robotics – These robots have the ability to patrol hospital hallways on more routine rounds, checking on patients in different rooms and managing their individual charts and vital signs without direct human intervention. The device is a mobile cart with a two-way video screen and medical monitoring equipment, programmed to manoeuvre through the busy halls of a hospital. (Source: ASME)

Electronic Aspirin – The system involves the permanent implant of a small nerve-stimulating device in the upper gum on the side of the head normally affected by headache. The lead tip of the implant connects with the Sphenoplatine ganglion (SPG) nerve bundle, and when a patient senses the onset of a headache, he or she places a handheld remote controller on the cheek nearest the implant. The resulting signals stimulate the SPG nerves and block the pain-causing neurotransmitters. (Source: American Society of Mechanical Engineers (ASME))

Heart health apps such as “My Heart Counts” and “AliveCor” can help track heart-related variables, such as blood pressure, pulse, and sodium intake. Similarly, CellScope is an app that works as an otoscope and guides users through the procedure and additional information through video and audio help.

The area of hypertension and multiple other conditions stemming from high blood pressure is a critical area for medical innovations. The monitoring of blood pressure from a patients home through tele monitoring functions has proven highly successful in the U.S.A and UK after various multifaceted trials and pilots.^{71, 72, 47}

Cancer screening innovations have developed a test that detects changes in the structure of certain blood proteins and may potentially diagnose many types of cancer. An additional cancer screening handheld tool was developed that optically scans lesions with electromagnetic wavelengths and compares them with thousands of images of melanoma and skin diseases.

Genomic Directed Clinical Trials is a major innovation for the healthcare sector. The process involves the genetic profiling of patients, which better matches them to clinical trials.

Specific regulations that accompany this nascent technology are in their infancy, but should not be ignored. Assuring the app complies with data protection and security requirements is very important, especially if transmitting personal data to third parties. Safety of the patient is paramount and care is required to assure that medical devices, which may lead to changing a patient's treatment, have completed a quality check, calibration and are compliant with local regulation requirements.

Needle Free Diabetes Care - The technology involves a handheld electric-toothbrush-like device that removes top-layer skin cells for analysis. The sensor collects one reading per minute and sends the data wirelessly to a remote monitor, triggering audible alarms when levels go out of the patient's optimal range and tracking glucose levels over time. (Source: ASME)

6. International Research

6.1 Overview of International Research

The following sections outline a review of Pharmacy practice in the following selected jurisdictions:

- Australia
- Canada
- Netherlands
- New Zealand
- United Kingdom
- United States of America

The review was conducted by means of a series of consultations with subject matter experts in the relevant territories and augmented with secondary research. The following areas were explored as part of the international research programme:

- The profile of pharmacists
- Contrasting / comparable environmental factors
- Community pharmacy system
- Hospital pharmacy system
- Uptake and effectiveness of pharmacy services
- Registrations, regulations and standards
- Evidence of innovation and good practice
- Evidence of integrated services

In comparing innovations during our international research piece, careful consideration needs to be taken in applying the models of other jurisdictions to Ireland. Different nations reflect different populations, national policy, healthcare structure and other factors. It therefore may not be possible to adapt an innovation from one country to Ireland without encompassing the related factors that were present in this country. Valuable lessons can be learnt even if some innovations may not be adaptable to Ireland but if an innovation has been shown to work in other jurisdictions, it will also make it more likely to be successful in Ireland.

Overview of Ireland vs Peer economies

Figure 29: International comparison: Overview of pharmacy statistics in selected regions⁷³

Key Statistics	Ireland	Australia	Canada	Netherlands	NZ	UK	US
Population (million)	4.6	23.1	35.2	16.8	4.5	64.1	318.9
Number of Pharmacies (per 10,000 population)	4.05	2.37	2.8	1.18	2.1	2.24	2.1
Number of Community Pharmacies (per 10,000)	3.89	2.24	2.72	1.18	2.1	1.79	N/A
Number of Hospital Pharmacies (per 10,000)	0.16	N/A	0.08	N/A	N/A	0.05	N/A
Number of GPs (per 10,000)	6.67	14.03	11.53	7.22	6.98	7.8	6.55
Number of Pharmacists (per 10,000)	11.84	12.56	11	3.06	7.6	7.85	9.12
% of Pharmacists working in Community	64%	80-85%	62%	54%	62%	74%	63%
% of Pharmacists working in Hospitals	10%	15-20%	15%	N/A	11%	21%	24%
% of Pharmacists working in Industry	2%	N/A	11%	N/A	1%	4%	2%
% of Pharmacist Other	24%	N/A	12%	N/A	26%	1%	11%
Male/Female Ratio	0.4	0.6	0.7	0.5	0.6	0.7	0.7
Population per Community Pharmacy	2469	4225	3572	8481	5323	4452	4760
Number of Pharmacist per Pharmacy	2.9	5.3	3.9	1.4	2.9	2.1	4.3
Health Expenditure (% of GDP)	9%	9%	11%	13%	10%	9%	17%



6.2. Australia

Overview of Australian Healthcare Environment

Australia has a publicly and privately funded healthcare model; free healthcare is available to all Australian citizens through 'Medicare'. Medicare is funded partly by the government and through a 2% Medicare levy on the general population. The Medicare system has three parts: hospital, medical and pharmaceutical. The major elements of Medicare include free treatment for public patients in public hospitals, the payment of benefits or rebates for professional health services listed on the Medicare Benefits Schedule, and subsidisation of the costs of a wide range of prescription medicines under the Pharmaceutical Benefits Scheme. A person can have Medicare cover only, or a combination of Medicare and private health insurance.⁷⁴

Medicare Hospital services are provided by both public and private hospitals. Medicare offers free treatment and accommodation as a public patient in a public hospital, by a doctor appointed by the hospital. Medicare does not cover elective surgery and/or ambulance services.

In the community setting, Medicare covers GP visits, and 85% of fees for specialist consultations are covered (according to a set list of fees). Currently GP waiting lists are estimated at over 3 weeks. Community Pharmacies are owned privately and enter into a Pharmaceutical Benefits Scheme contract with the government, providing rates of reimbursement for medication and services. Due to the large land mass of Australia, the government prioritises programs to improve health services in rural and remote communities, and focuses specifically on chronic diseases in Indigenous Australians.

The Department of Health (DoH) has seven departments; each department has a representative at the Executive level. The 'Health Benefits' department has two divisions i.e. the 'Medical Benefits Division' and the 'Pharmaceutical Benefits Division', the latter of which has three branches namely; Pharmaceutical Policy; Pharmaceutical Evaluation; and Pharmaceutical Access.

Pharmacy in Australia - At a glance

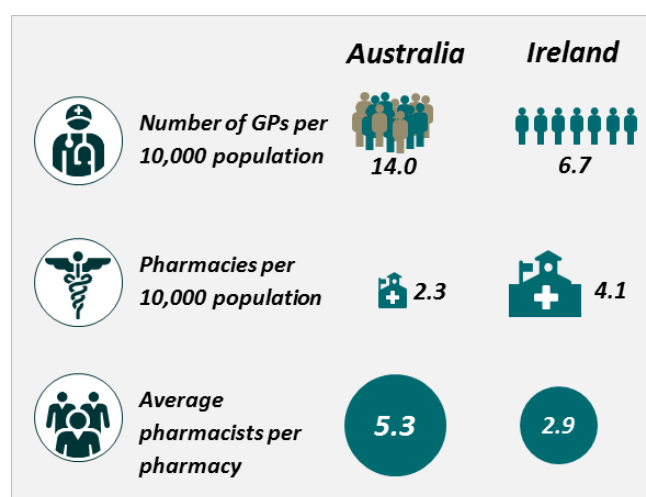
Mix of **Public and Private Healthcare**

Universal GP care with long waiting lists

Structured Pharmacy practitioner development

Innovations

- *Pharmacist Only Medicines*
- *Medscheck Service*
- *Expanded Vaccinations*
- *Innovation Fund for Pharmacy*
- *Nearly 20% of Emergency Depts have a Pharmacist*



Community Pharmacy services & innovations of note

Reclassification of 'Pharmacist Only Medicines'
Australia has reclassified some medicines as Pharmacist Only (S3) Medicines. These are

substances or preparations for therapeutic use, which are substantially safe in use, but require professional advice or counselling by a pharmacist. Types of medicines with Pharmacist Only categorisation include: Combination analgesics including codeine; famciclovir for

treatment of herpes labialis (cold sores); chloramphenicol for ophthalmic use; fluconazole for treatment of vaginal candidiasis; levonorgestrel for emergency contraception; orlistat for obesity in adults; prochlorperazine for nausea associated with migraine; proton pump inhibitors for the relief of heartburn and other symptoms of gastro-oesophageal reflux disease; and short-acting beta-agonists for bronchospasm.

Medicines Review

Medscheck (Medication Review Service) - In pharmacy review of a patient's medication, focusing on education and self-management. There is also a special Medscheck for Diabetes type 2 patients, focusing on their medicines management, monitoring devices, education and self-management. The Diabetes Medscheck aims to optimize a patient's effective use of medicine, blood glucose monitoring and blood glucose control. Pharmacists are paid a set fee for each Medscheck service they provide: e.g. Medscheck €39 and Diabetes Medscheck €58.

Vaccinations

Influenza vaccine administration is well integrated in Australian pharmacies. The Queensland Pharmacy Immunisation Pilot (QPIP) has expanded its pilot to deliver whooping cough and measles vaccines in over 200 pharmacies.

Innovation Fund

Community Pharmacy Agreement (CPA) number 6 sets out fees, reimbursement etc. DoH have set aside €382m for Community Pharmacy Programmes: of which €25m is for Aboriginal & Torres Strait Islanders Specific Programmes; a further €75m is for Rural Support Programmes; and Community pharmacy pilot programmes which can be submitted to the DoH for funding. Decisions will come down to factors such as increasing patient safety.⁷⁵

Preventative Medicine

Melanoma Screening Service - Community pharmacy in association with the Cancer Council of Australia provided a free Melanoma Screening Service to the public. Each participant was allowed three free pictures and an external dermatologist inspected and advised whether it

was cancerous or benign. This service was provided free in order to raise awareness on Melanoma in Australia.

Technology

National electronic health records in Australia, is currently in its infancy albeit, buy-in from all stakeholders is growing. E-prescribing has still not been implemented but will be in the near future, likely to be in line with when the National electronic records are fully implemented. Robotic dispensing is present in some larger pharmacies in Australia.

Hospital Pharmacy services & innovations of note

Clinical Pharmacy Services

- Specialisation - There is a nationally agreed Advanced Practice Framework in Australia, which describes practitioner development in all sectors of pharmacy practice, along a continuum, with three defined levels of advancement: L1 (Transition); L2 (Consolidation) and L3 (Advanced).
- Ward Based pharmacists – pharmacists are working on wards and other clinical areas such as emergency department and outpatient clinics to provide patient care alongside doctors and nurses
- Prescribing - The Society of Hospital Pharmacists of Australia supports extending prescribing rights to pharmacists provided that these are competency based. However, currently, pharmacists in Australia are not allowed to prescribe.
- Multidisciplinary Teams (MDTs) – pharmacists are embedded in MDTs in hospitals in Australia. 15-20% of pharmacists work in Hospitals⁷⁶
- Hospital in the home - some patients are treated as hospital 'in-patients' in their homes. Many are treated daily with intravenous medicines that are prepared and monitored by the hospital

pharmacist, who also provide a Drug Use Evaluation service.

- A major Australian hospital-based study found that for every dollar spent on a clinical pharmacist to initiate changes in medicines therapy or management, approximately \$23 (€15) was saved on length of stay, readmission probability, medicines, medical procedures and laboratory monitoring.⁷⁷

Emergency Department (ED) Pharmacist

ED pharmacists have an important role to play in maintaining the continuum of care from the community to the hospital environment and for patient's discharges directly from ED back to the community setting. Although it was found in 2010 that pharmacists worked in only 33 of the 184 EDs in Australia.

Technology

There is widespread use of Robotic dispensing in Australian Hospitals.

Ambulance Services

Pharmacists are beginning to be employed by ambulance services around Australia to improve medicines use and patient safety. 'Paramedics give medicines to patients in approximately half of all ambulance cases. Often these are high-risk medicines. South Australian Ambulance Service recognised a real need for pharmacists' clinical skills in this environment and advocated for the role.⁷⁸

Outpatient Clinics

There has been a shift to embed pharmacists in outpatient and admission clinics, e.g. pharmacist run diabetes clinics and lipid management clinics.

6.3 Canada

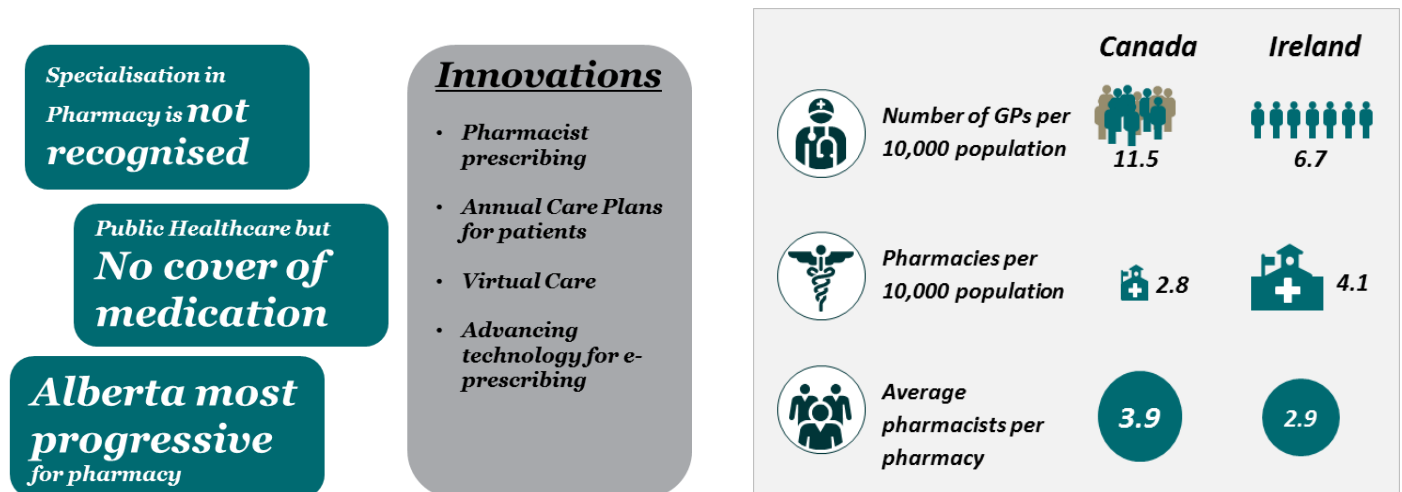
Overview of Canadian Healthcare Environment

Canada has a predominantly public healthcare system; funds are provided by both federal and provincial governments with individual provinces and districts running the individual health services. Federal government funding was traditionally 50% of funding but they have been limiting their contribution in recent years⁷⁹. All Canadian citizens have a public insurance policy from their respective province or territory. Most of the services provided through the publicly funded healthcare system are by private entities. There is some cover for prescription medication through the public health insurance (42% in 2014)⁸⁰, otherwise this is covered privately. In 2010, private health insurance contributed 12.8% of the total health expenditure, and is seen mostly as complementary to general medicare⁸¹

The majority of hospitals in Canada operate as private, non-profit entities. Even though they are private, provincial governments have considerable authority over their operation. Funding for hospitals has previously all been provided via a global budget (annual lump sum), but now some provinces, specifically Quebec, Ontario and British Columbia are implementing a new activity-based fund (ABF) model. General practitioner visits are also provided by the public health insurance. Community Pharmacies are privately owned entities and the majority of pharmacies are run by large chain organisations.

Pharmacists in Canada have taken on an expanded role over the last number of years; this has been driven by the need for improved patient care and ease of access to pharmacies. In 2001, the Pharmacy Mutual Recognition Board was set up in Canada, recognising that the practice of pharmacy has a high degree of commonality among jurisdictions across Canada. Since the 2008 'Blueprint for Pharmacy' report, pharmacists in Canada are taking on expanded roles and are increasingly being recognised as the medication management experts of the health care team.

Pharmacy in Canada - At a glance



Community Pharmacy services & innovations of note

Pharmacist Prescribing

Dependent or delegate prescribing is prescribing based on a collaborative therapy agreement with

a physician. This is the model favoured by most provinces.⁸² Independent prescribing is prescribing without a collaborative agreement with a medical practitioner. Mainly, prescribing is restricted to products for minor ailments, emergency contraception and smoking cessation;

these vary from province to province. Pharmacists can also renew/extend prescriptions, change the drug dosage/formulation and make therapeutic substitutions.⁸³

Technology

Many large pharmacies are investing in automation and dispensing robots in order to get the pharmacist out from behind the counter. Several jurisdictions have or are developing, Drug Information Systems (DIS), which will provide community and hospital pharmacists with point-of-care access to comprehensive patient health data to support enhanced clinical decision-making, prescribing and medication management. Work is underway to harmonise e-health standards across Canada for DIS and e-prescribing. To accelerate progress, Canadian Public Health Association and the Canadian Medical Association released a joint statement on e-prescribing, calling for it to be the means by which prescriptions are generated for Canadians by 2015.

Medicines Management and Pharmaceutical Care

Annual Care Plans - Alberta has a reimbursement program which includes funds for pharmacists to complete annual care plans with specific patients e.g. asthma and diabetes. The Comprehensive Annual Care Plan (CACP) (patients with two or more chronic diseases or one chronic disease and one or more risk factors) and Standard Medication Management Assessment (SMMA) (a patient must have one Chronic Disease and be taking four or more different medications) include initial and follow-up assessment fees. Pharmacists with Additional Prescribing Authorization (APA) will be compensated at a higher remuneration rate for providing these and other eligible pharmacy services. Pharmacists receive from CA\$60 (€40) to CA\$125 (€82) for an initial assessment and up to CA\$25 (€17) for a follow up consultation.⁸⁴ This is similar to the Medscheck service provided in Australia.

New Innovations

Virtual Care - In British Columbia there was a pilot programme where patients could have a virtual

consultation with a doctor in the pharmacy consultation room. The prescription was then faxed to the pharmacy for filling (if the patient requested). The primary benefit to the pharmacy was increased footfall.

Hospital Pharmacy services & innovations of note

Specialisation

Extended practice pharmacists and pharmacists with advanced prescribing authority exist in Canada; however there is no official definition for advanced practice or pharmacists' specialisation. Recognition for pharmacy specialisation has been largely driven by pharmacists themselves.^{85, 82}

Technician's Role/Supporting Staff

With funding from the Blueprint for Pharmacy, the Canadian Association of Pharmacy Technicians (CAPT) is looking at the concerns/needs from each province to advance the Pharmacy Technician profession in Canada. There are regulated pharmacy technicians in 9 out of 13 provinces in Canada. Pharmacy technicians are currently not regulated in Ireland.

Technology

Several jurisdictions have or are developing, Drug Information Systems (DIS), which will provide community and hospital pharmacists with point-of-care access to comprehensive patient health data to support enhanced clinical decision-making, prescribing and medication management.⁸⁶

6.4 The Netherlands

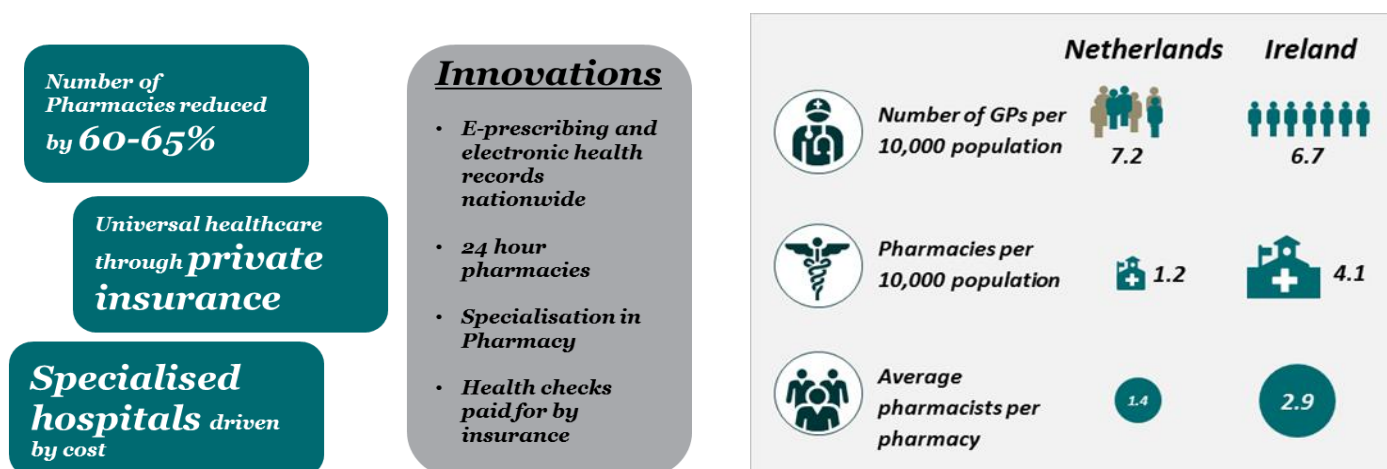
Overview of the Netherlands Healthcare Environment

Netherlands has a structure of Universal Healthcare Insurance (UHI) for all its population, achieved through a private insurance market that aims to be patient-focused and competitive. Health insurers can negotiate to a certain extent with health care providers on price, volume and quality of care; and are allowed to make a profit and pay dividends to shareholders. They are obliged to accept new applicants and they are not allowed to differentiate their premiums according to the risk profile of the applicants. The government changed its role from direct steering of the system to safeguarding the process from a distance. Responsibilities have been transferred to insurers, providers and patients. The government controls the quality, accessibility and affordability of health care.⁸⁷

The Dutch health insurance system is divided into three compartments. The first compartment consists of a compulsory social health insurance (SHI) scheme for long-term care. This scheme provides for those with chronic conditions continuous care that involves considerable financial consequences and is regulated. The second compartment also consists of a SHI system covering the whole population for “basic health insurance”. Basic health insurance covers essential curative care tested against the criteria of demonstrable efficacy, cost-effectiveness and the need for collective financing. The third compartment consists of complementary voluntary health insurance (VHI), which may cover health services that are not covered under the first two schemes.

Private insurers fund private hospitals, in some cases some services have been moved out of the community setting and into the hospital for cost reasons (e.g. chemotherapy and IV drug administration). All citizens are registered with a General Practitioner; they are also reimbursed via the private insurance companies. Community Pharmacies are privately held entities and are primarily used for dispensing prescription medications but also provide other services such as screenings for diabetes, hypertension and obesity for example. Private insurers are driving down drug reimbursement costs. The number of pharmacies has dropped 60-65% in the last number of years. Electronic prescribing and Electronic Health Records are available to all health practitioners in the Netherlands.

Pharmacy in The Netherlands - At a glance



Community Pharmacy services & innovations of note

Technology

Automatic vending machines in stores where Over-the-counter (OTC) medicines can be bought Dispensing robots in high volume community pharmacies. E-prescribing and Electronic health records are widely used. GPs can write a prescription and electronically send it to a pharmacy where it can be filled.

Preventative Medicine

Pharmacists can perform health checks e.g. diabetes, hypertension, obesity and other community problems on patients, results can be electronically sent to the doctor who can write an e-prescription. The insurance companies cover these health checks. Health checks provided in Irish community pharmacies are currently paid privately by patients.

24 hour Pharmacies

Community and Hospital Pharmacy Partnerships - Some community pharmacies have developed partnerships with hospital pharmacies to create 24 hours, 7 days a week pharmacies that are located near, or in some cases within the lobby of large hospitals.

Hospital Pharmacy services & innovations of note

Specialisation

In the Netherlands, there is a legally recognised specialisation, which is mandatory to work as a hospital pharmacist and as a hospital pharmacy manager. Since 2004, this 4-year postgraduate training program includes aspects such as clinical pharmacy, compounding, laboratory techniques, and logistics. Additionally research is a mandatory part of the specialisation.⁸⁸

Hospital Structure

There are approximately 100 hospitals in the Netherlands, with 65 departments of hospital pharmacy and 450 registered hospital pharmacists.⁸⁹ Insurance companies provide expensive medicines to approximately 15 specialised hospitals, so patients need to be transferred to the relevant hospital to be able to receive these expensive medicines.

Technology

E-Prescribing (iPads and computers) and automation is the norm in hospital pharmacies. Large scale dispensaries (dispensing robots) are also used. Small hospitals have come together to purchase robots. 54% of hospitals use 'unit selection by robot'.⁹⁰

6.5. New Zealand

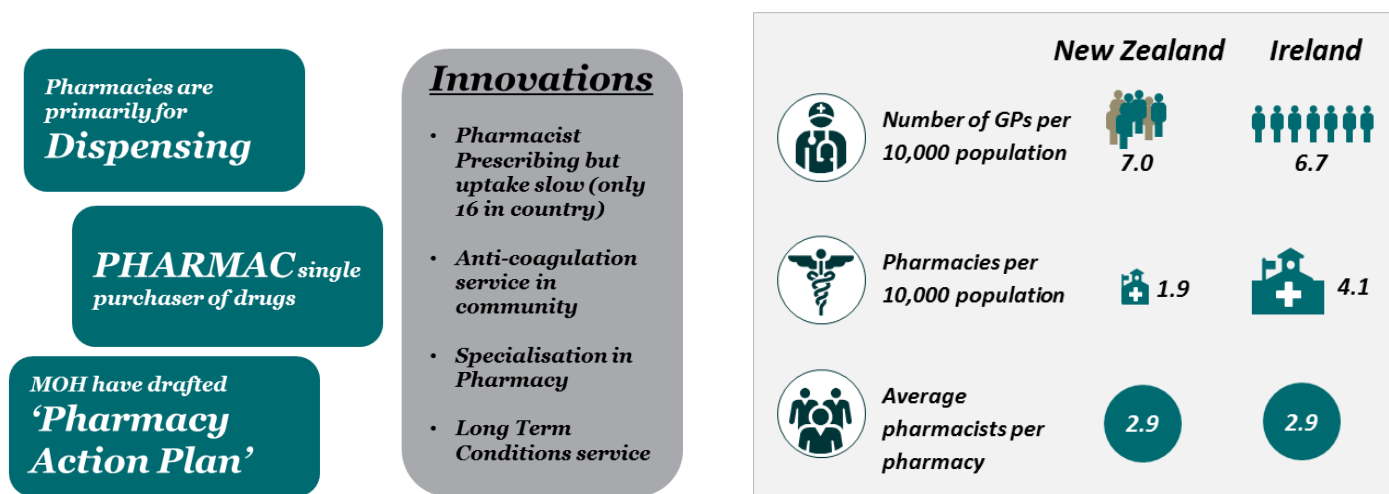
Overview of New Zealand Healthcare Environment

New Zealand has a predominantly publicly funded health system with services provided by public, private and nongovernmental sectors. The Ministry of Health (MoH) is responsible for the oversight and funding of the twenty District Health Boards (DHBs). National electronic health records have had some issues but the e-prescribing framework is well advanced and the uptake is proceeding as expected.

There are 40 public hospitals in New Zealand that are free to all citizens. Publicly owned hospitals provide most secondary and tertiary medical care, while the small private hospital sector specializes mainly in elective surgery and long-term care. Waiting times for surgery vary from hospital to hospital. Primary health care is coordinated through primary healthcare organisations (PHOs) which receive a capitation funding for their enrolled population. Co-payments for GP services are set by the GPs themselves and vary according to the funding arrangements the GP's PHO has with their DHB and according to how GPs wish to set fees.⁹¹ There are also some schemes to help reduce the fees for GPs, such as free GP visits for under-13s, a pharmaceutical subsidy card and a low cost access scheme.

Pharmacy has a subsidy budget of approximately €442 million, which was used to subsidise 41.8 million prescriptions issued to 3.4 million New Zealanders. PHARMAC (which is separate to the MoH) is the single purchaser of drugs for New Zealand, it negotiates the purchase of drugs from suppliers, and its main focus is on driving down prices. PHARMAC is also expanding their role to hospital pharmaceuticals and procurement of medical devices. Prescription medication is covered publicly but New Zealanders have to pay a co-payment of NZ\$5 (€3) per item (up to a maximum of 20 items). The MoH have published a 'Draft Pharmacy Action Plan (2015 – 2020) for Consultation', five focus areas have been identified that demonstrate how pharmacy services can contribute to implementing and delivering new models of care: population and personal health; pharmacists clinical services; acute demand management; dispensing and supply services and prescribing pharmacists.⁹²

Pharmacy in New Zealand - At a glance



Community Pharmacy services & innovations of note

Pharmacist Prescribing

This is covered by New Zealand legislation: Medicines (Designated Pharmacist Prescribers) Regulations 2013. Pharmacist Prescribers work in a collaborative health team environment with other healthcare professionals and are not the primary diagnostician. Pharmacists have a significant scope for a limited range of medicines. They can currently prescribe and sell Trimethoprim, Sildenafil, Morning after Pill etc. They can write a prescription for a patient in their care to initiate or modify therapy (including discontinuation or maintenance of therapy originally initiated by another prescriber). They can also provide a wide range of assessment and treatment interventions that includes, but is not limited to ordering and interpreting investigation (including laboratory and related tests); assessing and monitoring a patient's response to therapy; and providing education and advice to a patient on their medicine therapy. As of May 2015, there were 16 pharmacist prescribers, of which half were working in primary care or between primary and secondary care. Uptake of this role has been slow. This is reported to be for a number of reasons: no specific career structure or salary scale that recognises this role and or makes the role particularly attractive for pharmacists to undertake; and to fund the training and the position requires a hospital or GP practice to define the role and find funding for this new role. Hospital pharmacies in particular are very keen to promote the role of a pharmacist prescriber, they can see huge value for the hospital to use pharmacist prescribers in specific areas, but unless the health boards provide new funding, the pharmacy manager is left with providing the new service from existing resource.⁸²

Long Term Conditions

Currently funded under the Pharmacy Services Agreement. Pharmacists will assist in the focused management of eligible patients to optimise the supply and use of prescribed medicines and to support adherence. Eligible patients with chronic conditions who are prescribed regular medication

treatment will receive targeted assistance to ensure they know what medications they are prescribed, what they are prescribed for and the directions for taking them. The patient has available a range of services to assist the collection and organisation of prescribed medicines, and to manage any changes. The pharmacist is able to synchronise prescriptions and adjust the frequency of dispensing to suit the patient's needs and abilities.⁹³

Pharmacist-Only (Restricted) Medicines

Similarly to Ireland, New Zealand has reclassified some medicines to Pharmacist-Only medicines, these medicines are subject to prescription regulations except when dispensed under the care of the pharmacist e.g. cramp, eye infections, fungal infections of the toe or finger nails, hay fever or rhinitis, haemorrhoids, mouth ulcers, nausea caused by migraine, skin problems such as itching, rashes, inflamed fungal infections, thrush and warts.⁹⁴

Community Pharmacy Anti-Coagulation Management (CPAM) Service

The CPAM Service uses international normalised ratio (INR) point-of-care testing and adjusts warfarin doses with the aid of a decision support system in the pharmacy. The CPAM Service is an integrated care model providing an example of the pharmacist and GP working collaboratively for the benefit of the patient. All patients on the CPAM service must be referred by their doctor. The doctor will always have final responsibility for the patient treatment, the pharmacist assists them. The 2014 CPAMS application round brought the number of community pharmacists providing the CPAMS service to 149 with over 4,904 patients currently working directly with their local pharmacist to manage their warfarin levels. The provision of CPAM has funded pharmacists for the provision of an advanced service and the success of this initiative is opening further opportunities for additional service. There are currently pilot studies for anticoagulation clinics in some Irish community pharmacies, which are providing benefits to the patient and the health system⁹⁵.

Vaccination Services

In New Zealand, pharmacy vaccinations include influenza, varicella zoster virus, meningococcal, Tdap, cholera and E. Coli.⁹⁶

Hospital Pharmacy services & innovations of note

Clinical Pharmacy

Hospital pharmacists primarily dispensing, however it is standard practice to offer clinical pharmacy services. Clinical pharmacy services varies between hospitals and District Health Boards, the prevalence is driven by relationships between the clinicians and the pharmacists, and this type of situation is comparable to Irish hospitals. Other services provided in the hospitals are: medicines information; clinical trials; extemporaneous compounding; some do chemotherapy compounding and sterile compounding; medicines safety (advice, campaigns); guideline and protocol development and checking; implementation of medication safety software such as Guardrails® on pumps/syringe drivers; transition services – such as providing community liaison positions and or outreach services; targeting of patients with chronic conditions and or high readmission rates; medicine reconciliation; medication history taking in specific areas such as pre-admission clinics; some undertake anticoagulation clinics and smoking cessation counselling.

Specialisation

The Advanced Trainee Fellowship (ATF) Scheme provides financial assistance to help health professionals undertake advanced training, a specialist qualification or study overseas in priority specialist areas (Ministry of Health). Any professional recognition for advanced practice or specialisation usually relates to title e.g. 'Palliative Care Pharmacist' or 'Pharmacist Vaccinator.' This may or may not attract advanced remuneration, it depends on the employer. Pharmacists are funded for some specialised services e.g. Medicines Therapy Assessment (MTA), but there is no financial incentive to carry out these roles.⁸⁵ In Middlemore Hospital, there are pharmacists in the surgical pre-admission review clinics - this service resulted in reduced medication errors and is more efficient than previous processes.

Technology

A number of hospital pharmacies have rolled out electronic medication storage systems (such as Pyxis® or MedDispense®) throughout their hospitals but the actual hospital pharmacies are still fairly “manual”, however some hospitals have robotic dispensing for common medicines, this is similar to Irish pharmacies in terms of manual and lack of robotics.



6.6. United Kingdom

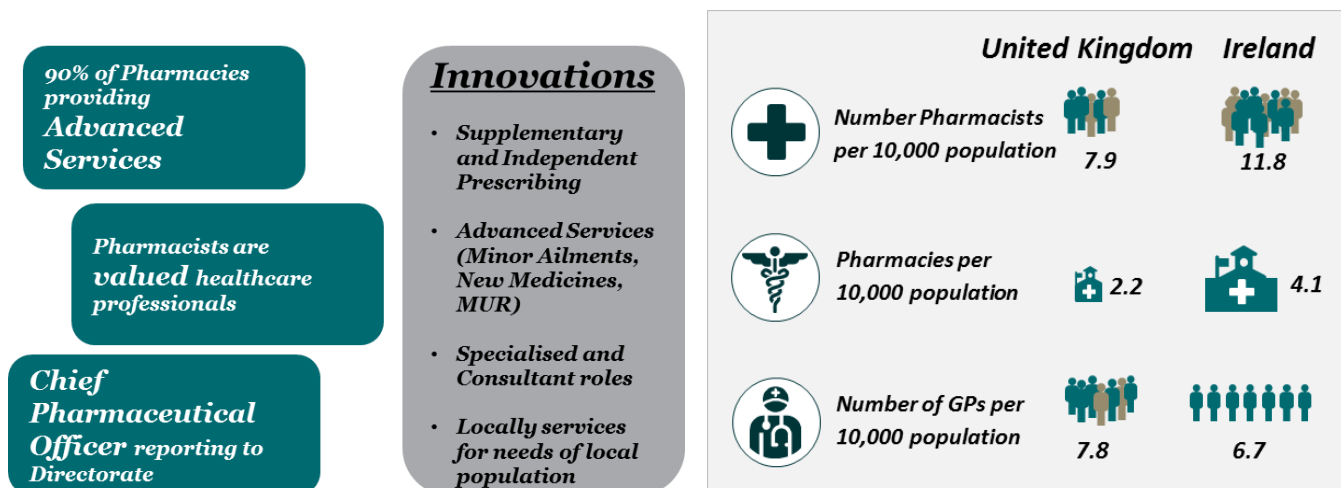
Overview of UK Healthcare Environment

Since 1999, responsibility for health services has been devolved to the administrations in Scotland, Wales and Northern Ireland. These administrations have powers to choose how much money to spend on health services, what their policy priorities should be, and how services should be delivered, as the UK Government does for England. The Department of Health (DoH) is the central government body responsible for setting policy on the National Health Service (NHS), public health, adult social care and other related areas. The majority of the DoH's budget is spent on the NHS. The NHS covers hospital visits. There is some private healthcare for other surgery such as elective procedures. Each NHS system uses GPs to provide primary healthcare and to make referrals to further services as necessary. GP shortages and accessibility issues in Scotland caused many services to be transferred to other health professionals e.g. pharmacists. It was noted that the pharmacy profession needed to engage with national policy makers for the strategic planning of healthcare⁹⁷. In England, Scotland, Wales and Northern Ireland, the Chief Pharmaceutical Officer is one of six Chief Professional Officers (CPO) who provide expert knowledge to the Health and Social Directorates. The role of the CPO incorporates policy decisions, which have had a profound effect on how pharmacy is now seen. IT challenges, e-prescribing and electronic health records did not take off as anticipated in the United Kingdom, however some hospitals are using e-prescribing.⁹⁸ Figure 30 below shows how community pharmacy services are contracted in England.

Figure 30: Contractual framework of Community Pharmacy Services in the England

Essential Services	Advanced Services	Locally Commissioned Services
Dispensing medicines, repeat dispensing, dispensing appliances/devices, disposal of medicines, referral to other healthcare, public health advice, national health promotion, support for self-care.	Pharmacist needs accreditation, consultation room etc. Flu vaccines, New Medicines Service (NMS), Medicines Usage Reviews (MURs), Minor Ailment Scheme (MAS).	Funded on the back of a Pharmaceutical Needs Assessment (PNA), provide services that are reactive to the needs of the local population (e.g. chlamydia, oral contraceptive prescribing, pneumococcal vaccines).

Pharmacy in UK - At a glance



England

In England, there are approximately 30 Advisory Boards that give expert advice to the Department of Health Boards and Committees, to help them inform their policies. The 'Rebalancing Medicines Legislation and Pharmacy Regulation Programme Board' reviews relevant pharmacy legislation and regulation to ensure it provides safety for users of pharmacy services reduces any unnecessary legislation and allows innovation and development of pharmacy practice. NHS England has set aside £15m to recruit pharmacists into GP practices. GPs submit a business case to the NHS and if successful the NHS pay 50% of the pharmacists salary in year 1, reducing over the following years. The Royal Pharmaceutical Society (RPS) and the Royal College of General Practitioners (RCGP) worked together to push this agenda.⁹⁹ Recently, NHS England has more than doubled funding from £15m to £31m for its clinical pharmacists in general practice pilot, due to an overwhelmingly positive response from GP surgeries.¹⁰⁰

The RPS in England, believes that utilising pharmacist led care of people with long-term conditions will deliver cost-effective services that will bring significant results to patients and the NHS. It is claimed that such services exist in pockets across England but there is no consistency. The RPS is calling for these services to be provided at a national level, across every clinical commissioning group.⁴⁸

Scotland

The Scottish government has published some profound reports on how pharmacy can help the health system in Scotland, in areas such as pharmaceutical care,¹⁰¹ review of public health issues,¹⁰² and integrated care¹⁰³. Some pharmacists in Scotland also have access to GP records as patients are registered with a community pharmacy as well as a GP. Pharmacists have been successfully working GP practices in pockets for years. There is now

pressure to get the professions to work better together and the RPS is pushing for more involvement.¹⁰⁴ Especially after announcing increased funding in England. In Scottish hospitals, the RPS is calling for resourcing to allow for seven-day NHS services in Scottish hospitals, though resourcing seems to be a barrier now.¹⁰⁵

Northern Ireland

Delivering care through pharmacies in primary care has been a strategic goal for the government of Northern Ireland, the government has said that they want to see the public being able to access advice and support from pharmacists in the community promoting health, self-care, improved health and wellbeing and preventing illness.¹⁰⁶ A review of integrated medicines management in Northern Ireland showed that the optimisation of the medicines process has led to benefits to patients in terms of morbidity and mortality in addition to a reduction in healthcare resource utilisation. Key findings include reduced length of stay, reduced readmission rates, improved Medicines Appropriateness Index, improved Medicines Administration Error rate, positive impact on Risk Adjusted Mortality Index and improved communication across the primary/secondary care interface with enabling technology solutions also implemented. A return on investment of £5-8 for each £1 was achieved.¹⁰⁷

Wales

The NHS in Wales underwent major change in 2009 to equip it to deliver better healthcare to the population of Wales in the 21st century. Healthcare is delivered through seven Local Health Boards (LHBs) and three NHS Trusts. In 2011, the National Assembly for Wales held an inquiry into the contribution of community pharmacy services, recommendations such as pharmacist access to summary patient records, more enhanced services and more cohesiveness across public health initiatives.¹⁰⁸

Examples of Locally Commissioned Services:

- Alcohol screening and intervention service
- Anticoagulant monitoring service
- Asthma support service
- Blood-borne virus testing
- Care home service/Care support
- Chlamydia screening and treatment service
- Condom supply service
- Chronic Obstructive Pulmonary Disease (COPD) support service
- Continence awareness service
- Dementia identification service
- Diabetes support service
- Direct referral for chest x-ray
- Domiciliary support service
- Emergency hormonal contraception (EHC)
- Falls prevention service
- Gluten-free food service
- H. pylori detection test
- Head lice management service
- Healthy Start vitamins
- Inhaler technique Service
- Medication review service
- Methicillin-resistant Staphylococcus aureus (MRSA) eradication
- Needle and syringe exchange service
- NHS Health Check
- Out-of-hours access to medicines
- Post-discharge support
- Pregnancy testing
- Sharps disposal service
- Stop smoking service
- Stop smoking voucher service
- Supervised consumption of prescribed medicines
- Tuberculosis (TB) support service
- Vaccination Service
- Weight management service

Minor Ailment Scheme

A study published in the British Journal of General Practice investigating people's attitudes towards managing minor illnesses found that self-care is likely to be the recommended course of action by health care professionals. The findings of the study indicated that people prefer to wait and pay less to manage symptoms.¹⁰⁹ The minor ailment scheme in the UK allows pharmacists to dispense medication for a defined list of minor ailments.

Medicines Use Review (MUR)

The Medicines Use Review (MUR) and Prescription Intervention Service consists of accredited pharmacists undertaking structured adherence-focused reviews with patients on multiple medicines, particularly those receiving medicines for long term conditions. National target groups have been agreed in order to guide the selection of patients to whom the service will be offered (these differ for England, Wales, Northern Ireland and Scotland).¹¹⁰

Pharmacist Prescribing

The only post registration annotation to the professional register in Great Britain is for independent pharmacists prescribers, these regulations came into effect in 2006. Pharmacists can be independent and supplementary prescribers in the UK and prescribe all types of medication with some small restrictions. In order to qualify as an independent prescriber pharmacists must complete an accredited programme.⁸²

Key Role of Hospital Pharmacist

Advice - work closely with medical and nursing staff on the wards to ensure patients receive the most appropriate treatments, and provide help and advice to patients in all aspects of their medicines. Advice on the selection of medicines as well as the dose and route of administration for individual patients, and many are qualified to prescribe in their own right (see below).

Medicines expert - provide advice to other healthcare professionals on the effects a medicine or combination of medicines may produce. Liaise with medical staff on the

potential problems patients may experience with their medicines.

Specialist advice - hospital pharmacists offer specialist advice to patients with conditions such as heart, kidney or liver disease, and for pregnant or breastfeeding women.

Manufacture - pharmacists are also involved in manufacturing medicines when ready-made preparations are not available. For example, certain cancer treatments and intravenous feeding solutions need to be tailor made under sterile conditions for individual patients.

The 'Professional Standards for Hospital Pharmacy Services'¹¹¹ outlined the services for hospital pharmacists in the UK. The standards centre around three domains for hospital pharmacy services: patient experience, safe and effective use of medicines and delivering the service.

Putting patients first involves the underlying principle that patients (and their carers) are supported in their decision-making about medicines. Communication is a key aspect of this. The pharmacy team provide information about the medicines or the implications if choosing not to take them. Systems are in place to identify patients who may need adherence support¹¹², this might involve simplifying regimens, consulting with pharmacist and ensuring a correct transition to other care settings. Patients' medicines are reviewed on admission and first contact and this care is continued by a clinical pharmacist when they are transferred to a hospital bed, the clinical pharmacist ensures that the medicines are clinically appropriate and ensures optimum outcome from their medicines.

Safe and Effective use of medicines promotes a multidisciplinary approach to safe medication practices and a culture of continuous learning in the organization.

- Safe systems of care – all aspects of medicines use in organisations is safe;
- Culture of medicines safety;
- Correct Dispensing and Labelling;

- Correct distribution, storage and management of unused medicines.

Delivering the service involves pharmacy having a strong professional leadership and clear strategic vision.

- The pharmacy team recognises that they have a duty of care to patients and act in the patients' best interests;
- The Chief Pharmacist ensures that the organisation maintains a clear vision for pharmacy services and optimal use of medicines across the organisation;
- Pharmacy services are safe, put patients first, and are aligned with organisational priorities and the range and level of healthcare commissioned/purchased;
- The pharmacy team is recognised as leading on medicines issues in the organisation at all levels;
- Systems of work are established that are safe, productive, support continuous quality improvement, are regularly audited and comply with relevant regulations;
- Robust business planning, financial planning and reporting are undertaken;
- The pharmacy workforce is planned and appropriately resourced in order to support service quality, productivity and safety;
- Pharmacy has an effective performance management and personal development planning process linked to workforce planning;
- Induction and continued learning and development are provided for all members of the pharmacy team.

Advanced Practice & Specialisation

Pharmacists are recognised as specialists in the NHS e.g. Medicines Information pharmacist, Discharge Planning pharmacist, Clinical Standards pharmacist, Intensive Care Unit (ICU) Pharmacist, Antimicrobial pharmacist. The RPS provides a professional recognition programme for advanced practice across Great Britain and (starting in) Northern Ireland. The RPS Faculty provides resources and services to assist

practitioners' development by meeting competencies outlined in the Advanced Pharmacy Framework (APF).

There are three developmental stages of recognition and credentialing available to advanced practitioners based on a review of a submitted professional portfolio, peer-assessment evidence and scope of practice evidence. Specialist pharmacists in hospitals spend a majority of their time on clinical duties such as ward rounds, this has been enabled by automation in dispensing; and advances in

pharmacy technicians (being able to provide final check).⁸⁵

There is also a Consultant Pharmacist grade for pharmacists who meet particular expertise within an area. Consultant Pharmacists are mostly present in the hospital setting, working alongside medical consultants, but are also found in governing roles in clinical commissioning groups or NHS bodies, which look at particular issues within a local area. Consultant pharmacists are running outpatient clinics within hospitals for specialties such as anticoagulation and hypertension.

6.7. United States of America

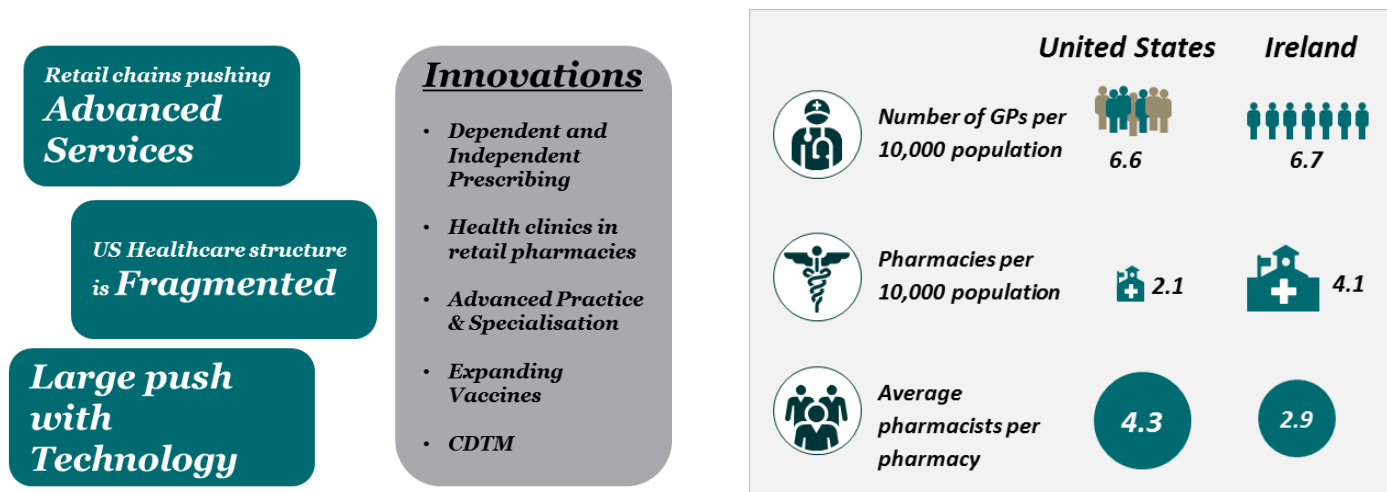
Overview of US Healthcare Environment

The United States health-care system can be thought of as multiple systems that operate independently and, at times, in collaboration with each other. Powers in the health sector are divided between the federal and state governments. Healthcare is very fragmented as each state has an individual medical board that sets local health policy, which can vary greatly from State to State. The United States has a private healthcare economy with numerous payers, including hundreds of private healthcare insurers and federal supported insurance schemes such as Medicare (insurance for over 65 and youth with disabilities) and Medicaid (insurance for low income families). Government programs directly cover 27.8% (83 million) of the population.

Primary and secondary health policy can differ from state to state. State Boards of Pharmacy regulate the scope of pharmacy practice at the state level. Services are being primarily innovated by large retail pharmacies to provide a similar service to physicians at a lower cost e.g. blood testing, health clinics and telemedicine. There is also some movement of dispensing away from pharmacists e.g. automated ward lockers in hospitals (where nurses can take common medicines without going to the hospital pharmacy) and dispensing machines in doctor's surgeries where 10 – 15 common drugs can be dispensed. These ward lockers are re-stocked and monitored by pharmacists.

Payment for health services in the United States depends on the service provided, the type of health provider making the service available, and the funder, as well as the type of facility and geographical location where the service is offered. Given this complexity, payment mechanisms for each type of health service (e.g. in-patient hospital care, prescription drugs) vary widely according to the payer involved.¹¹³

Pharmacy in USA - At a glance



Community Pharmacy services & innovations of note

Adjustment of Medication

Most States allow pharmacists to initiate, modify, and continue medication regimes through collaborative drug therapy management (CTDM) protocols e.g. pharmacists in some states have the power to adjust a patient's medication while under their care for certain chronic conditions such as diabetes. The pharmacist can adjust the patient to the optimum dose, from receiving information about symptoms and lab results. The physician remains the primary diagnostician. This is similar to the Canadian system, but in terms of Ireland, there is no adjustment of medication except for generic substitution.

Pharmacist Prescribing

There are two models of pharmacist prescribing in the United States – dependent or independent prescribing authority.

Dependent prescribing authority implies that the pharmacist prescribing authority is delegated by an independent prescriber, usually a physician, on the basis that the pharmacist is capable of performing the delegated duties. The two have shared responsibility for the patient's overall outcome usually defined through a collaborative drug therapy management (CDTM) agreement where the physician diagnoses and makes treatment decisions and the pharmacist selects, monitors, modifies or discontinues drug therapy as indicated in the agreement. The CDTM may take various forms such as general written protocols, policies or procedures or protocols for each specific patient.

Independent prescribing authority implies that the prescriber is authorised to prescribe all drugs without the supervision of another health care professional. The American College of Clinical Pharmacists (ACCP) argues that prescribing within current health-care systems can no longer be independent due to the complexity of drug regimens. It defines prescribing as encompassing a broader set of activities including selecting, initiating, monitoring, continuing, modifying and administering medications. The role of a

pharmacist within a CDTM is consequently advocated since this makes use of the expertise of both the physician and the pharmacist

The extent of the pharmacist prescribing authority depends on whether the setting they are practicing is within the remit of state or federal law. To ensure greater cohesiveness, it has been recommended that prescribing authority should be obtained on a national level. Examples of dependent prescribing authority may be found in both primary and secondary care.⁸²

In North Carolina, pharmacists with advanced training can become credentialed as a clinical pharmacist practitioner (CPP) allowing for expanded level of care including prescriptive authority.⁸⁵

Advanced Practice & Specialisation

There are many state based differences in the recognition of specialty and advanced pharmacy practice. The profession is advocating for federal recognition of pharmacists as healthcare providers, which would enable payment for cognitive and clinical services. Some States have developed innovative advanced practice models, and many pharmacists are pursuing board certification in a growing number of specialities. In New Mexico, these advanced pharmacists practitioners are called Pharmacists Clinicians, in Montana and North Carolina they are deemed Clinical Pharmacist Practitioners (CPP). While some pharmacists have these advanced designations, there is still a challenge for federal Government insurers and other stakeholders to recognise these titles from a reimbursement perspective for the patient care services they provide. Specialty services such as pharmacotherapy, oncology and ambulatory care pharmacists are on the rise in the United States.

Retail health clinics

Currently there is a primary care shortage in the US.¹¹⁴ Health clinics are on site in many pharmacies, staffed by nurse practitioners. Regulations have been passed in most states for them to write regular prescriptions for specific conditions e.g. can prescribe antibiotics but not controlled drugs. Advantages to patient are

decreased price, accessibility, decreased waiting times and convenience of accessibility to medication. Physicians have oversight of the nurse practitioners, though the degree of oversight is governed by regulations in each individual state.

Immunization

Influenza and single point travel vaccination services are prevalent in most US pharmacies. There are pilot programmes for additional vaccines e.g. paediatric and repeat vaccines (e.g. booster vaccines, and cold storage vaccinations).

Transition of Care

Some retail pharmacies are providing services for transitioning care from the hospital setting to the community setting upon discharge (medication alignment, medication delivery, patient counselling and clinical follow-up).¹¹⁵

Technology

Blood Testing - new technology for blood testing of 15-20 conditions have been incorporated in retail pharmacies.

Robotic dispensing is present in many large retail pharmacies.

Novel Innovations

Telemedicine – there are currently pilots for health clinics involving specialists. For example, in dermatology, a patient with a skin condition can go to the nurse practitioner (who refers to a physician/specialist in external location), the specialist can inspect video/photo of condition, diagnose and prescribe medication, which is then filled at the pharmacy.

Movement of Dispensing - in some areas dispensing has moved away from Pharmacists e.g. some physicians are investing in automated dispensing machines where 10-15 common drugs can be dispensed without ever visiting the

pharmacy; and some hospitals have introduced ward lockers, which allows nurses to take common medicines without going to the hospital pharmacy.

Apps - The American Society of Health-System Pharmacists (ASHP) recently released the Pharmacy Ambulatory Care Tracker (PACT), an app that allows pharmacists to easily record all patient encounters on their smartphones or tablets and report their data to a customizable dashboard. The app tracks pharmacists' patient encounters across 37 different disease states and then aggregates the data into a subscription-based dashboard.¹¹⁶

Hospital Pharmacy services & innovations of note

Specialisation

Applicable to community and hospital pharmacy and covered in previous sections.

Adjustment of Medication, Independent prescribing and Advanced Practice & Specialisation

Applicable to community and hospital pharmacy and covered in previous sections.

Pharmacists Technicians

It is hoped that pharmacy technicians will allow pharmacists to be freed up to expand patient care services.

Technology

A growing number of hospitals are deploying robots to dispense drugs. Increasingly, hospital pharmacists to provide reference information and enhance communication among providers are using mobile apps

6.8 International Conclusion

International development of pharmacy has happened in different aspects at varying times and there is not necessarily an evident linear “improvement” in pharmacy that each country could be seen to be at a distinct maturity level. More so many countries have developed aspects of pharmacy practice to directly address a deficit in their health system. For instance, many initiatives implemented in Scotland, Australia and Canada appear to have stemmed from primary care labour supply in particularly remote regions of those countries.

Innovation in the six countries considered, while significant, was largely existent in either pockets of trial / pilot schemes or confined to specific sub-regions (e.g. Alberta in Canada) rather than being entirely embedded in the health system.

Furthermore, many elements of successful implementation of pharmacy practice were introduced as part of healthcare models, which had outright universal healthcare (e.g. NHS in England), and where the funding environment was not as constrained by a change in healthcare provider funding based on the specific services that they provided to patients. Indeed remuneration policies that were led by improved patient care and outcomes rather than services

delivered were seen to foster multidisciplinary working arrangements more easily.

Generally acute sector specialisation was seen as a positive implementation in all of the countries reviewed, with improved skill mix of the resources allocated to patients improving overall efficiency in hospitals.

While technology was cited in all of the reviewed countries as a key enabler to improved pharmacy practice, in practice in almost all situations the IT infrastructure was incomplete with timeline slippage being a common theme. Advanced Technology implementation such as that seen in the Netherlands with a full e-prescribing system had actually led to a reduced role for the pharmacist as dispensing remained the core activity of the role but the number of pharmacists reduced dramatically.

While it is not the only defining factor, subject matter experts in the countries covered as part of this review indicated that the greatest improvements in the advancement of pharmacy practice in the respective countries came at times when there was either a particularly strong pharmacy representative as part of the DoH leadership team, or when there was a compelling level of evidence presented to the Health Department.

Abbreviation or Term	Full Description
<i>Acute care</i>	Healthcare that is generally provided for a short but severe episode of illness, such as emergency or other trauma, or during recovery from surgery. Acute care is usually provided in a hospital and it may involve intensive or emergency care.
<i>Adherence</i>	Adherence to (or compliance with) a medication regimen is generally defined as the extent to which patients take medications as prescribed by their health care providers.
<i>Antimicrobial stewardship</i>	Describes a system or collection of measures introduced in a healthcare setting that aim to improve the quality of antimicrobial usage across a patient population, to optimise outcomes, reduce adverse events, minimise emergence of antimicrobial resistance and reduce treatment costs.
<i>BMI</i>	Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m ²).
<i>Clinical governance</i>	In healthcare, the systems, processes and behaviours by which services lead, direct and control their functions in order to achieve their objectives, including quality and safety of services for patients.
<i>Clinical pharmacist</i>	A registered pharmacist who develops and promotes the rational, safe and appropriate use of medicines.
<i>Clinical pharmacy services</i>	The following 'core' activities are involved in providing clinical pharmacy services are:-prescription monitoring, prescribing advice, optimising therapeutic use of medicines, adverse drug reaction detection and prevention, patient education and counselling, inter-professional education about medicines. It may also involve some or all of the following: medication history taking, medicines reconciliation, specialist clinics e.g. HIV, clinical audit, protocol/guideline development.
<i>Co-morbidity</i>	The co-existence of two or more conditions simultaneously.
<i>COPD</i>	Chronic Obstructive Pulmonary Disease is a common clinical condition characterised by slowly progressive airways obstruction
<i>Domiciliary care</i>	Care delivered in the home environment
<i>E-prescribing</i>	The electronic prescribing of medicines is the secure creation and transmission of the prescription by an authorised prescriber to a pharmacist of the patient's choice.
<i>Fitness to Practise procedures</i>	Statutory complaints and disciplinary procedures.

Abbreviation or Term	Full Description
<i>Formal care</i>	Formal care in Ireland can encompass nursing homes for older persons and residential facilities for those with intellectual disabilities, as well as step down care from hospitals.
<i>Hospital models</i>	The acute medicines programme defines hospitals as Model 1 to 4 based on the type of activity. Model 1 hospitals are community hospitals where patients are currently under the care of resident medical officers, with no surgery or emergency care. Model 2 can provide the majority of hospital activity including extended day surgery, selected acute medicine, palliative care, some radiology. Model 3 will provide 24/7 acute surgery, medicine and critical care. Model 4 hospitals will be similar to model 3 but will provide tertiary care and in certain locations supra-regional care.
<i>Interchangeable medicines</i>	Under the Health (Pricing and Supply of Medical Goods) Act 2013, the role of HPRA is to establish, publish and maintain a list of interchangeable medicines on their website. Under this legislation, interchangeable medicines are defined as those medicines that (1) contain the same active ingredient in the same strength, (2) are in the same pharmaceutical form, and (3) have the same route of administration.
<i>Integrated care</i>	WHO definition: “The organisation and management of health services so that people get the care they need, when they need it, in ways that are user friendly, achieve the desired results and provide value for money”.
<i>Medical practitioner</i>	As used in this report, refers to any medical doctor e.g. GP, hospital consultant, non- consultant hospital doctors.
<i>Medicines management</i>	Encompasses the entire way medicines are selected, procured, delivered, prescribed, administered and reviewed to optimise the contribution that medicines make to producing informed and desired outcomes of patient care.
<i>Medicines optimisation</i>	A person-centred approach to safe and effective medicines use, to ensure people obtain the best possible outcomes from their medicines.
<i>Medication reconciliation</i>	Medication reconciliation is a process when each medication that a person is taking has been actively and appropriately continued, discontinued, held or modified at each point of transfer, and these details have been communicated to the patient and next care provider
<i>Multidisciplinary team</i>	A group of healthcare professionals who work together to provide integrated care for the patient by planning treatment and delivery of care for the patient or service user.
<i>Medicines review</i>	For the purpose of this report, medicines review is defined as a structured, critical examination of a person’s medicines with the objective of reaching an agreement with the person about their medicines, optimising the impact of the medicines, minimising the number of medication –related problems and reducing waste. The review should be with the patient and their current medication should be to hand. Ideally, the reviewer should have access to the

Abbreviation or Term	Full Description
	patient's notes. The review should be done in collaboration with the patient's medical practitioner.
OPAT	Outpatient Parenteral Antimicrobial Therapy is where select patients receive intravenous antimicrobials in their own homes
OTC medicines	Over the Counter medicines that can be bought, mainly in a community pharmacy, without a prescription.
Pharmaco economics	The scientific discipline that compares the value of one pharmaceutical drug or drug therapy to another. It is a sub-discipline of health economics.
Polypharmacy	is when patients are prescribed and are taking five or more medicines.
Primary care	Primary Care is all of the health or social care services that you can find in your community, outside of hospital. It includes GPs, Public Health Nurses and a range of other services.
Primary care centre (PCC)	They are purpose built centres that are designed to provide a one-stop unit for all of a patient's primary care needs such as a GP, physiotherapist, occupational therapist, counsellor and more.
Self-care	Is defined as "what people do for themselves to establish and maintain health, prevent and deal with illness"
Self-limiting conditions	An <i>illness or condition</i> which will either resolve on its own within a short period of time or which has no long-term harmful effect on a person's health.
Smart pump	An infusion pump equipped with IV medication error-prevention software that alerts operators when a pump setting is programmed outside of pre-configured limits.
STOPP	The Screening Tool of Older Persons' Prescriptions
Supplementary prescribing	A voluntary prescribing partnership between an independent prescriber (a doctor or dentist) and a supplementary prescriber to implement an agreed patient specific clinical management plan with the patients' agreement. (UK DOH definition)
Superintendent pharmacist	The superintendent pharmacist is essentially the person in overall control of the management of a pharmacy, including its professional and clinical management. While a superintendent pharmacist can act in respect of more than one pharmacy, a supervising pharmacist can only act in respect of one pharmacy.
Supervising pharmacist	The supervising pharmacist is in whole-time charge of the carrying on of the business and is essentially the person responsible for the day-to-day management and operation of the pharmacy.
Telemedicine	The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation.

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