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Healthcare Capital Investment in Ireland

Analysis of Historical Capital Investment in Healthcare

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This paper has been prepared by IGEES staff in the Department of Health. The views presented in this paper do not represent the official views of either the Department or the Minister for Health.

IGEES
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Paper Summary

1. This is the first of 3 papers in the series, "Healthcare Capital Investment in Ireland".

2. The paper provides a historical overview of public capital investment and public healthcare capital investment trends in Ireland, from early state provision of healthcare, including the reliance on religious and voluntary organisations, through membership of the European Union, up to the present day.

3. The paper then examines the level of public capital investment relative to overall expenditure trends of the state, including the balance of capital investment to current expenditure within the health budget, the relationship with the macroeconomic cycle and the position of the public finances.

4. The paper also compares the performance of Ireland's healthcare capital investments relative to international comparators on capital output metrics, including hospital occupancy rates, waiting lists/times and acute care beds per 1,000 inhabitants.

Key Findings

1. The paper indicates a lack of centralised strategic direction for healthcare historically, with investment policy not aligned with reports recommending a re-design and consolidation of the fragmented Irish hospital network.

2. The paper highlights the strong pro-cyclicality of Irish capital investment decisions historically, limiting the extent to which longer-term strategic investment decisions could be made. This pro-cyclicality is also evident in healthcare investment trends.

3. While there are limitations to direct comparison of international health expenditure, available data indicates that Irish healthcare capital spending equated to 66% of the investment made by EU peers from the 1970s up to 1996. While the gap in spend has closed in recent years, it is likely that this has left a legacy of lower capital stock in Ireland relative to international comparators.

4. Within the total available health budget, growth in current expenditure has been prioritised over capital expenditure, which has historically equated to a small proportion of the total spend.

5. Ireland is behind European comparator performance on various capital related health metrics. These include:
    a. High average acute care occupancy (90% average acute care occupancy in Ireland, versus 79% average occupancy in the EU15 in 2018).
    b. Record highs in outpatient waiting list numbers (622,963 in Jan 2021), close to record highs for inpatient and day case waiting list numbers (81,456 in Jan 2021).

c. Ireland has the 3rd to the 6th longest wait times for various procedures in comparison with other countries considered.

d. Low acute care bed capacity, with an average of 3 beds per 1,000 inhabitants in Ireland 2019, versus 3.9 beds in the EU15, and 4.7 beds in the OECD.

While these indicators can be driven by a wide range of factors, the direct relevance of healthcare capital stock to each motivates a further exploration of whether greater healthcare capital investment can be used to improve Irish performance in this context.

Policy Implications

1. To reduce historic pro-cyclicality, capital investment should be implemented in a more consistent and steady-state manner, where large fluctuations in expenditure programming are avoided.

2. Within available resources, both the level capital investment in healthcare, and the balance between the current and capital expenditure, should be re-examined.

3. This could be achieved through the development of a Strategic Investment Framework for Healthcare**.** This would identify the most efficient and effective use of capital resources, incorporating the existing capital stock profile and population needs by care setting and region. This would enable project selection to be based on longer-term strategic priorities over shorter-term considerations.

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Please note, the group is made up of personnel from a number of organisations, but the individuals and/or their critical review do not represent the views of their organisations.

All errors are the authors' own.

1 Background

Public healthcare capital expenditure has become an increasing priority in Ireland due to the immediate healthcare capacity pressures of COVID, longer term capacity pressures related to demographic change, and the strategic investment requirements related to the implementation of Sláintecare and the NDP. Between 2013 and 2020, annual total public healthcare expenditure rose from €14bn to €18.3bn (31% increase), with public healthcare capital expenditure rising from €0.35bn to €0.854bn (144% increase) in the same period. An additional €4bn was provided in budget 2021 for healthcare in response to the COVID-19 pandemic, with €500m of this expenditure dedicated to the expansion of acute care capacity. The National Development Plan 2018 - 2027 has also committed €10.9bn for new healthcare capital projects over the decade, highlighting the ambition and need in this sector.[1]

To ensure effective delivery of healthcare projects going forward, a paper series entitled "Healthcare Capital Investment in Ireland" has been authored, aiming to provide an evidence base identifying the key lessons, objectives and risks associated with healthcare capital investment in Ireland. The series is set out as follows:

- **Analysis of Historical Capital Investment in Healthcare** aims to provide a historical overview of healthcare capital investment in Ireland, as well as provide a comparison for capital related health metrics versus other EU countries.
- **Strategic Considerations for Future Capital Investment in Healthcare** offers lessons for the development of Ireland's 'Strategic Investment Framework for Healthcare' and examines the composition of healthcare investment under NDP 2018-2027, describing the contrast between targeted and actual allocations by region and care setting.
- **Dealing with Uncertainty & Risk: The Application of Reference Class Forecasting to Future Capital Investment in Healthcare** investigates a unique dataset demonstrating variances in forecasted costs for healthcare capital projects in Ireland between 2018 and 2021, offering lessons learned for the development and management of future investments in this sector.

[1] Analysis completed prior to the publication of NDP 2021-2030. This new NDP allocates €5.7bn to health investment from 2021 to 2025, though no figure for investment to 2030 is specified.

The analysis provided in this first paper adds value to the existing evidence base in three ways:

1. It explores the progression of the public capital expenditure budget in Ireland over time, summarising the impact of the macro-economy and government policy on historic public investment.
2. It provides an overview of public healthcare capital investment policy to date, identifying consistent themes influencing the direction and provision of healthcare capital expenditure over time.
3. It provides an analysis of many significant health investment related metrics, providing clarity on the performance of Ireland relative to international peers in this area.

2 Literature Review

2.1 How has Irish capital investment changed over time?

2.1.1 EU Entry, Fiscal Policy & EU Structural Funding

Fiscal policy between 1970 and 1990 in Ireland is characterised by a period of expansion in the 1970s, and a period of consolidation in the 1980s. The introduction of current budget deficits as an explicit policy measure in 1972 marked the beginning of government spending being used to directly impact economic activity (Bradley, et al. 1985). Particularly in the latter half of the decade, the government began to run large current account deficits in a "dash for growth" policy, ultimately putting Ireland's public finances in a wholly unsustainable position (Fitzgerald 1999).

A global recession in the 1980s revealed the extent of fiscal imbalance built up in the previous decade in the Irish economy. The result was almost 10 years of fiscal consolidation in the 1980s, with the government running eight deflationary budgets between 1980 and 1989 (Fitzgerald 1999). The impact of public investment (that is, government capital expenditure) on Ireland's long-run capital stock during this era was moderated by the small size of the Irish economy. As Morgenroth (2009) highlights, Real public capital expenditure between 1970 and 1990 maintained a level of €1.5bn and €2.5bn per year. This compares to the €6bn invested in real terms per year between 2000 and 2008, highlighting the importance of the latter period post 2000 in determining the composition of Ireland's capital stock.

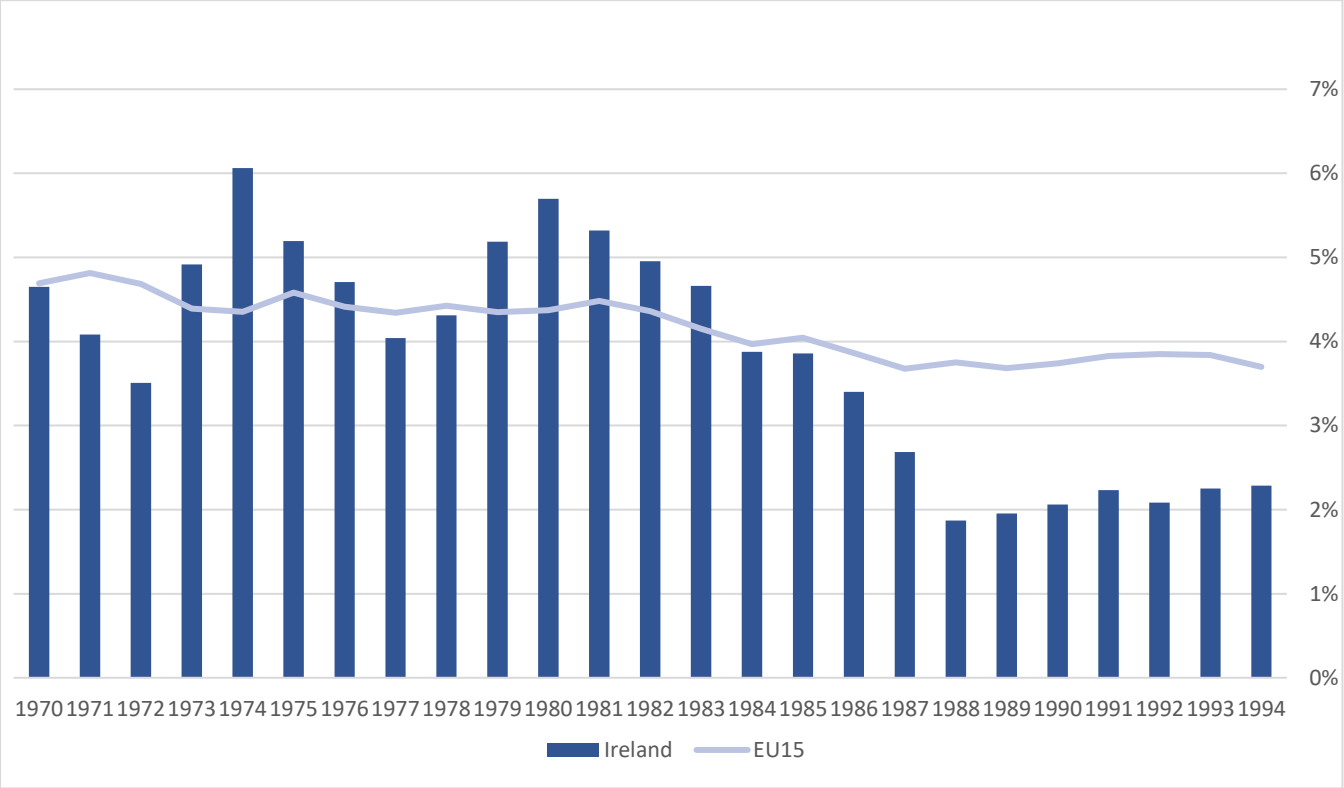
Towards the beginning of the 1990s, the fortunes of the Irish economy changed. The fiscal adjustment Ireland experienced throughout the 1980s allowed for a stabilisation of public finances towards the end of the decade. In addition, the need to meet public debt, public sector deficits and inflation criteria as part of the entry into the EMU provided additional cause for discipline in Ireland's economic and budgetary policies. Moreover, the expansion of EU Structural and Cohesion funding in this period led to a number of additional improvements to Ireland's economy, including the direct funding impact, improvements related to labour force participation, supports to private businesses and improved infrastructure (Fitzgerald 1998).

While the direct impact of EU Structural Funding is seen as a small contributor to growth in Ireland in the 1990s, the effect of this funding on capital investment is undeniably large (Barry, Bradley and Hannan 2001). Structural Fund receipts increased from below €400m prior to 1990, to €800m - €1bn per year between 1990 and 1999. Structural Funding received by Ireland in this period amounted to over 2% of GNP per year (Honahan 1997). In addition, received structural funding had additional impacts over and above the funding commitment. As Fitzgerald (1998) explains, the funding also had a broader effect on public administration and government prioritisation.

> *"In preparing for how Ireland would spend the structural funds, successive governments stressed the importance of allocating the money to investment to ensure that the EU funds made a lasting difference to the productive capacity of the economy".*

This shift in policy ultimately led to large investments in physical infrastructure in this period[2], as well as the formulation of the first National Development Planning Framework in 1989 (Fitzgerald 1998).

Figure 1: Public Investment Ireland vs EU 1970-1994[3]



Source: AMECO Database

2.1.2 Celtic Tiger Onwards

By the late 1990s, Ireland was experiencing rapid growth driven primarily by rising export demand. Even still, infrastructure constraints were acknowledged as a possible drag on further growth, with the stock of infrastructure deficient relative to contemporary economic activity (Fitzgerald 2002).

While the continued importance of tackling Ireland's infrastructure deficit had been recognized, and successive 'Investment Planning Frameworks' sought to address the issue, the level of investment in Ireland over this period was inconsistent. Morgenroth & Fitzgerald (2006) describe the investment

[2] The increase in infrastructure investment during this period was likely also influenced by the need for projects in receipt of EU structural funding to also be co-funded by domestic governments (Barnett and Borooah 1995)

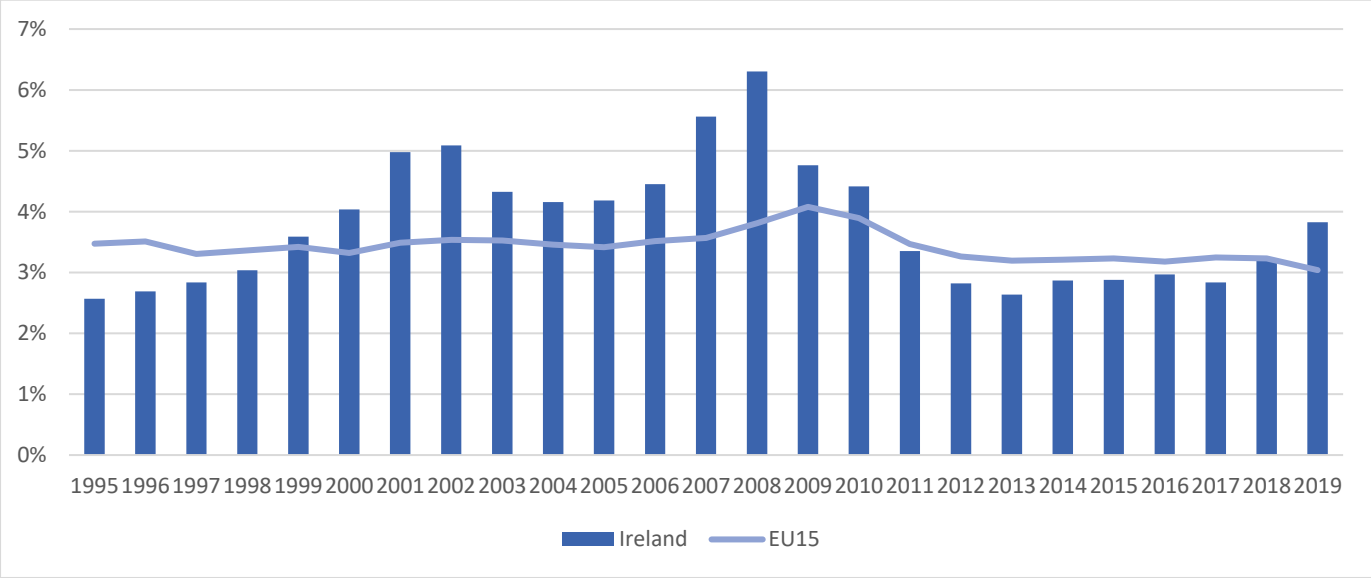
[3] AMECO Data omits UK, therefore EU-15 excluding the UK is used in this case.

priorities put forward in the second NDP from 1994-1999 as "not sufficiently adventurous". In contrast, they acknowledge that investment in physical infrastructure prompted by the third NDP from 2000-2006 was ramped up too rapidly, leading to significant inflationary pressures in the construction sector which markedly increased the cost of delivering investments during this period. The authors also express concern in relation to value for money, advocating for cost benefit analysis to ensure that project prioritisation and selection decisions were being made appropriately. These concerns intensified throughout this period up until the financial crisis. It is now widely acknowledged that the level of public investment during this period was too high, with inflationary pressures, particularly in the construction sector being a significant contributor to the severity of the subsequent economic crisis (see Lane (2015)).

Looking at recorded public investment during this period paints a similar picture. Government expenditure as a percent of GNI[4] climbs from below 3% in 1995 to above 5% by 2002. Investment is then sustained at this level, peaking at 6% of GNI in 2008.

The comparison relative to the rest of the EU-15[5] is also informative, with investment rising above the EU average as a percent of GNI for the first time in this era in 1999 and continuing to be above the EU average for the entirety of this period to 2008. As GDP was also rising rapidly in the Celtic tiger era, public investment during this period was very substantial, rising in real terms from €1.5bn in 1988 to €9bn in 2008 (Morgenroth 2013). This means that investments made during the Celtic Tiger era are a very important component of Ireland's overall current capital stock.

Figure 2: Public Investment Ireland vs EU 1995-2019



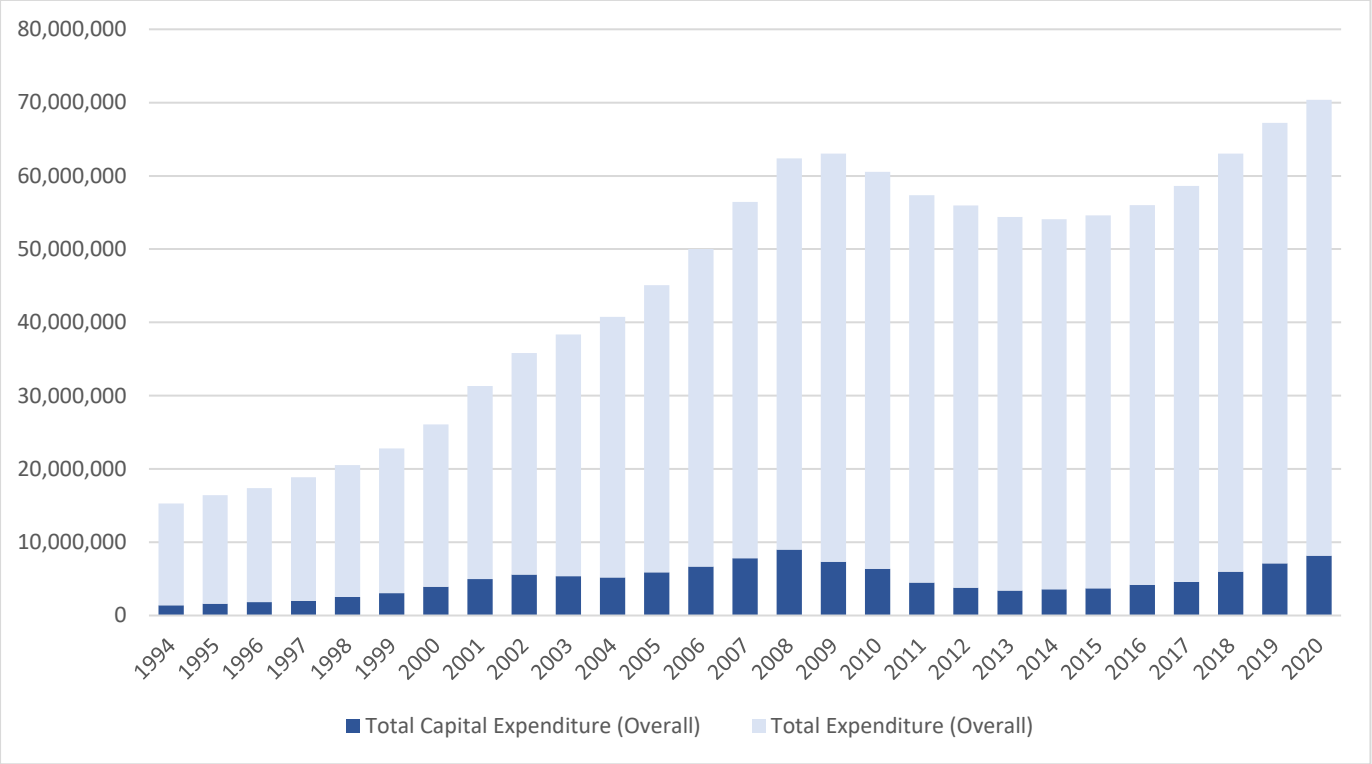
[4] For Ireland, Modified GNI from the CSO rather than GNI is used.
[5] EU-15 data includes UK

Source: OECD, CSO data

2.1.3 Fiscal Consolidation (2008-2014)

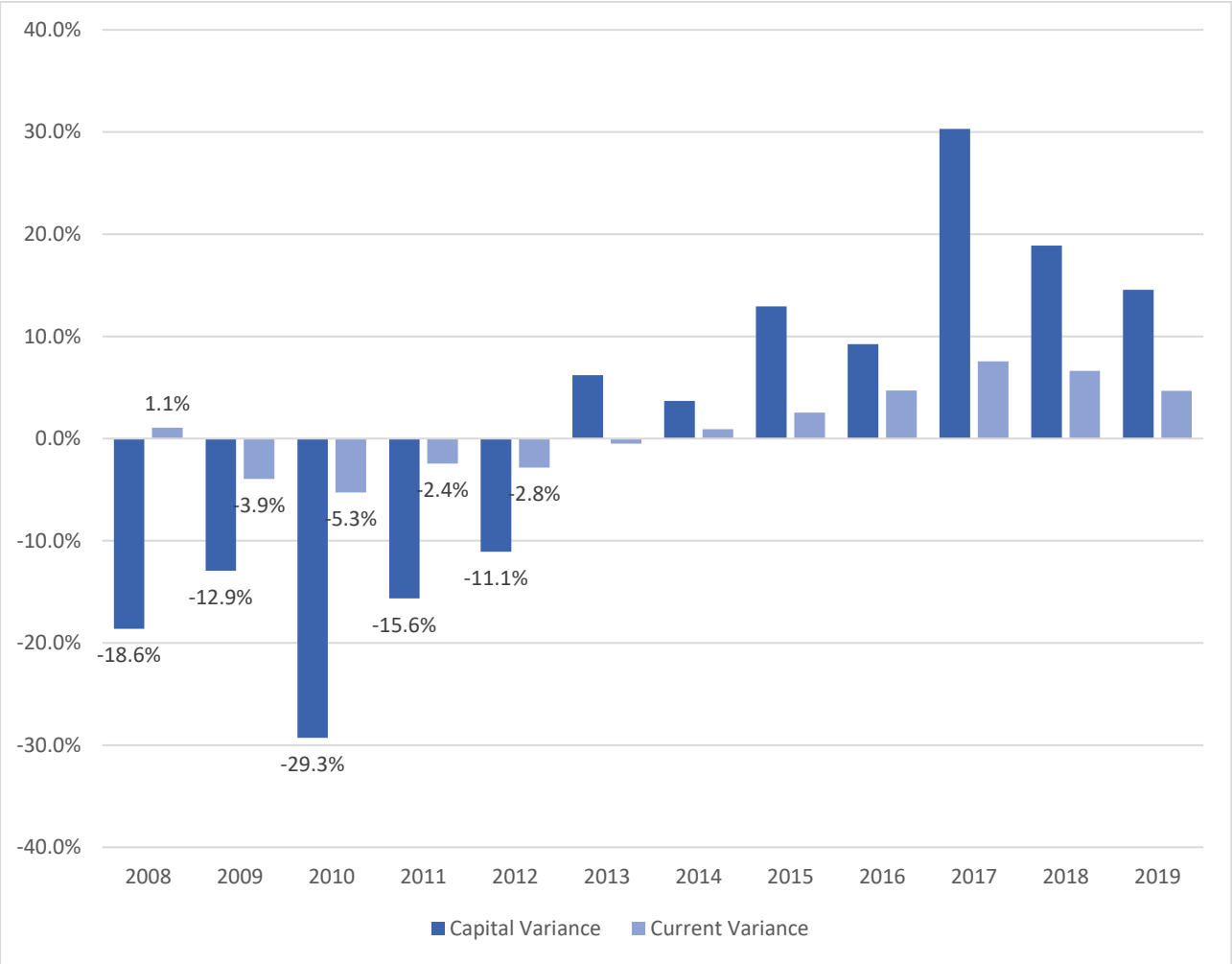
The onset of the Great Recession brought with it an unprecedent need for fiscal consolidation in Ireland. The bursting of the property bubble combined with unsustainable fiscal policies undertaken in the decade leading up to the crisis caused Ireland's finances to be in need of immediate reform (Scott and Bedogni 2017). The need to adjust public expenditure resulted in a severe and disproportionate reduction in public investment from 2009 onwards. While both current and capital expenditure faced progressive reductions between 2009 and 2013, the fall in capital investment was significantly sharper.

Figure 3: Total Irish Government Expenditure – Capital & Non-Capital €000



Source: Department of Public Expenditure & Reform Databank

Figure 4: Capital versus Current Expenditure Variance (2008-2019)



Source: Department of Public Expenditure & Reform Databank

Between 2008 and 2014, the annual capital budget fell from just over €9bn to €3.3bn, a 60% reduction. Over the same period, current expenditure fell from €53.3bn to €50.5bn, a reduction of just 5%. As Scott and Bedogni (2017) explain, the motivation to focus on reductions in capital expenditure were twofold: Firstly, reductions to capital expenditure were seen as less politically sensitive than reductions to current expenditure, allowing the government more room to manoeuvre in this space. Secondly, capital envelopes in this period were not subject to the same expenditure pressures as current in terms of unemployment and demographics. Nonetheless, the substantial cuts in the capital envelope during this period likely had a large impact on the strategic balance of infrastructure projects undertaken. Most notably, actual capital expenditure between 2007-2013 of €42.2bn constituted a 77% decline from the €183bn of planned expenditure detailed in the NDP for 2007-2013 (Irish Government 2006).

While a similar decrease in government expenditure was experienced throughout Europe, the contraction in Ireland was comparatively severe. Government investment as a % of GNI fell below the EU-15 average from 2011 onwards and had remained below the EU-15 throughout until 2019.

This period also materially impacted Ireland's capital stock. Decreased public investment, combined with the depreciation of state-held assets nullified net investment during this period. According to Kennedy (2016), the nominal value of capital stock flatlined between 2008 and 2013, contrasting with the continuous growth observed since the mid-90s.

2.1.4 2015-2021 Long-term Investment Planning

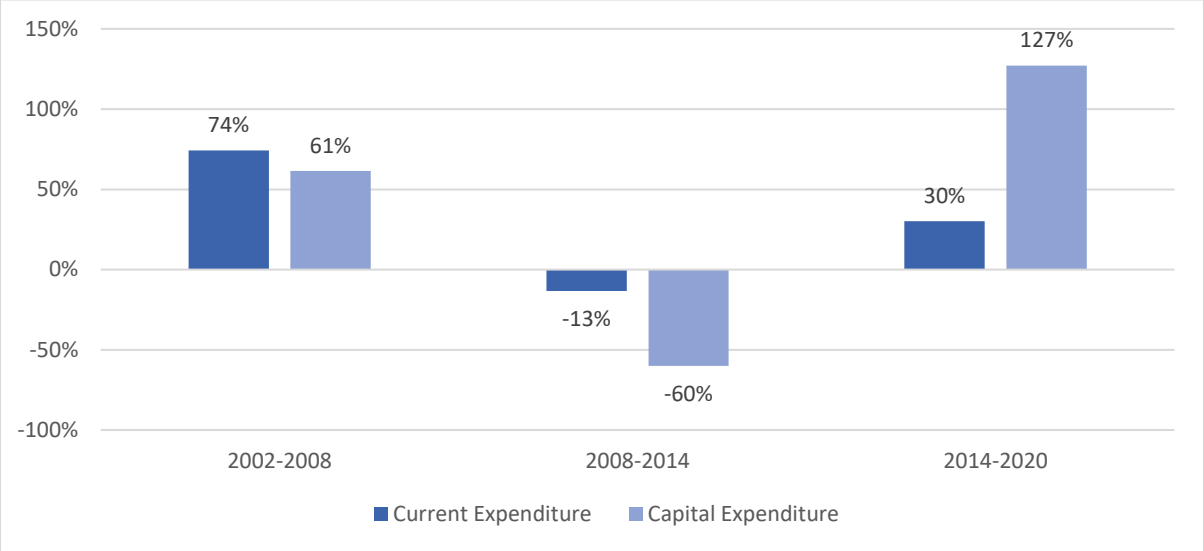
A reduction in public investment during the great recession was a feature of many developed countries' budgets, leading to a renewed interest in the long-term effect of this policy on growth post-crisis. In response to this, many governments have now begun to more actively target large public investment programmes as a source of growth and improved public services. In the UK, for example, the government has committed to a five year £640bn public sector investment plan [6](UK Government 2020). Similarly, in the United States the Biden administration has outlined plans for a string of federal investments worth more than $3tn in areas such as infrastructure, climate, childcare, healthcare and education (Financial Times 2021). The pandemic has also strengthened calls for enhanced public investment, as it offers the prospect of speeding up the economic recovery. The IMF for example has encouraged governments to scale up public investment projects in light of the pandemic, creating jobs and a more resilient and inclusive global economy (IMF 2020).

The gradual improvement in Ireland's economic position after the crisis allowed for a scaling up of public investment. While the 2012-2016 Infrastructure and Capital Investment framework was written in the context of *"lower levels of resources available for capital investment"* the plan for 2016-2021 promised to *"build on the recovery"* dedicating €27bn of exchequer funding to infrastructure projects over five years (DPER 2015). The mid-term review of the 2016-2021 capital plan identified several important changes to be made to long-term public investment planning. First, the increasing strength of the Irish economy in this period allowed for an additional €6bn to be allocated for public investment between 2018 and 2021. Secondly, the capacity and demand analysis conducted as part of the review allowed for the identification of historical deficits in certain investment areas. Finally, the review committed the government to the delivery of a 10-year National Investment Plan that is integrated with Project Ireland 2040 and the National Planning Framework (Irish Government 2017).

[6] In the case of the UK, the recent increase in public investment may have been influenced by the idiosyncratic economic shock they received following their departure from the EU.

The publication of the National Development Plan 2018-2027 constitutes a marked change in the approach to public investment in Ireland. Notably, the plan provides a ten rather than five-year approach to public capital investment, enabling longer term strategic prioritisation than its predecessors. In addition, it commits to multi-annual funding of capital projects, culminating in an estimated investment of €116bn over a ten-year period. The plan also commits to funding public capital investment at 4% of GNI, versus the historical average of 3% within the EU.

Figure 5: Change in Irish Capital and Current Expenditure (%) 2002-2020 by period



Source: Department of Public Expenditure and Reform Databank

The prioritisation of public investment after the recession is also clear when current and capital expenditure is examined in each period. While the boom period saw rapid increases in both capital and current expenditure, the post-crisis period demonstrates a much greater focus on public capital investment. Since 2014, budgeted capital investment has increased by 127%, versus a 30% increase in current expenditure.

In response to the COVID pandemic, the Irish government embarked on a massive spending programme aiming to protect jobs and stimulate demand. Overall, the government ran a budget deficit of €21.6bn for 2020. In spite of this change to Ireland's financial position[7], no downward revisions were proposed to the targeted levels of public investment outlined in the National Development Plan 2018. The government has further committed to the protection of capital investment spending in Budget 2021 (IFAC 2020), with the positive forecasts for growth and Ireland's fiscal balance contained in the Stability Programme Update 2021 allowing for flexibility in addressing

[7] Ireland's Debt to GNI* ratio is estimated to have risen from 96% in 2019 to 108% in 2020 (Government of Ireland 2021)

the fiscal deficit resultant from spending during the pandemic. The recently published National Development Plan 2021-2030 further commits Ireland to a focus on long-run capital expenditure, investing €165bn over the period bringing public investment to 5% of GNI*.

2.2 How has Irish *Healthcare* Investment (current and capital) changed over time?

2.2.1 Historical Overview

Healthcare capital expenditure priorities in Ireland throughout the 20th century were greatly influenced by the hospital network established in the 19th century. Voluntary hospitals typically run by religious orders provided virtually all healthcare provision prior to the foundation of the Free State (Wren 2003). As a consequence of the provision of care in this way, both hospital location and the extent of healthcare capital investment in an area had no centralised or strategic direction. While additional hospitals were built by public authorities in the early half of the 20th century, the expansion and maintenance of voluntary hospitals constituted a large part of public investment in the sector, with the ample funding available for hospitals at the time through the Hospital Sweepstakes programme preventing consolidation and reform of the existing network (Daly 2012).

In terms of overall healthcare policy, the early healthcare system in Ireland was in a large part defined by the failure to introduce a single-payer system. After the publication of the UK Beveridge report in 1942, and the establishment of the UK NHS in 1948, health and political officials in Ireland aspired to establish a similar universally accessible healthcare service in Ireland. From the 1940s to the 1970s, several governments unsuccessfully attempted to integrate elements of a social insurance system into Ireland. The publication of a white paper in 1947 marked the first and one of the most radical of these attempts, proposing a free national health service for the whole population on a phased basis. Several revisions to the defeated 1950 Mother and Child bill allowed for the 1953 Health Bill to pass, providing for a major extension of free hospital care to the majority of the population excluding higher earners.

Political support for universal healthcare in Ireland ebbed and flowed throughout the 1960s and 1970s, with limited improvements made to the entitlements provided by the 1953 bill. The defeat of a scheme in the early 70s which aimed to provide free hospital services to the 25% of the population who were ineligible under the 1953 bill highlighted the resistance to change in the healthcare system throughout this period (Wren 2003).

The most important document from a strategic healthcare capital investment perspective published during this period is the 1968 Fitzgerald report. The report concluded that, because of the increasing complexity of hospital services, it was necessary to considerably reduce and consolidate acute hospital

services in Ireland (Irish Government 1968). In particular, the report recommended that there should be just 4 regional and 12 general hospitals, each with at least 600 and 300 beds respectively and a catchment area of 120,000[8]. All other community hospitals were to be converted into community health centres (Wren 2003). While in retrospect this report could be regarded as forward looking, at the time its recommendations proved to be unpopular, with the suggested closure of smaller hospital facilities proving to be a politically divisive issue.

While public provision of healthcare remained in the political sphere, reforms throughout the 1980s and 1990s established and strengthened the rise of a two-tier system. The 1981 consultant contract for example, allowed for publicly employed consultants to engage in unlimited private practice services on a fee-per-service basis, a seismic change given that previous private practice rights were very limited (Wren 2003). Appetite for reform faded further in the 1990s, with support for the two-tier system embedded into government policy. The 1994 health strategy committed to "maintaining the position of private practice" while a 1999 white paper expressed support for private hospital care as an "income stream to public hospitals" (Irish Government 1999).

In terms of healthcare capital investment, the worsening fiscal position of the Irish government up until the 1990s resulted in large reductions in expenditure. While the impact of cuts during this period are wide reaching, their effect on the healthcare capital stock in Ireland was particularly severe. Between 1980 and 1992, public hospital acute care beds fell from 17,655 to just 12,136 (Wren 2003). While the need to rationalise and consolidate the healthcare system in line with the Fitzgerald report continued to be argued, the cuts during this period were also not applied in a strategic manner. As Wren (2003) reports, "beds stayed in rural hospitals - while Dublin suffered the most".

As policy in the decades after the Fitzgerald report failed to consider healthcare investment in a strategic manner, the 1993 Tierney Report contained many of the same recommendations as those made in the 1968 report (Tierney 1993). In particular, the Tierney report recognized the key issue of small, regional hospitals, postulating that equitable hospital services could only be achieved through "hospitals with a critical mass of work to be done and sufficient staff and facilities available to do it" (Wren 2003). The report recommended that hospitals have a catchment population of 100,000 to reach this viability, though it was acknowledged that at the time, many areas with such a population had two hospitals in operation.

[8] A UK publication identifying an optimal hospital size of 600-800 beds is referenced in the report. The Fitzgerald report nonetheless advocated for a minimum hospital size of 300 beds on the basis that it would allow for provision of a basic range of services (general medicine, surgery, gynaecology, pathology, radiology) and would be of sufficient scale to justify a staffing complement that can adequately deliver these services.

While the recommendations of the report as they relate to economies of scale are clear, an alternative strategy was adopted as government policy to address the issue. Instead of the closure of any given hospital, different hospitals within a region would specialise in the provision of a particular service, thus expanding the range of care available in said region (Tierney 1993). While sensible on paper, issues related to the education and training of healthcare staff, and the under-utilisation of services in certain localities mitigated the impact of these reforms (Wren 2003). The issue of economies of scale of regional hospitals thus remained into the 2000s, with a 'value for money' audit of the hospital system in 2001 acknowledging that the "many smaller hospitals in the Irish system – raise questions of both quality of care and value for money" (Deloitte & Touche 2001).

2.2.2 Current Expenditure Health Trends

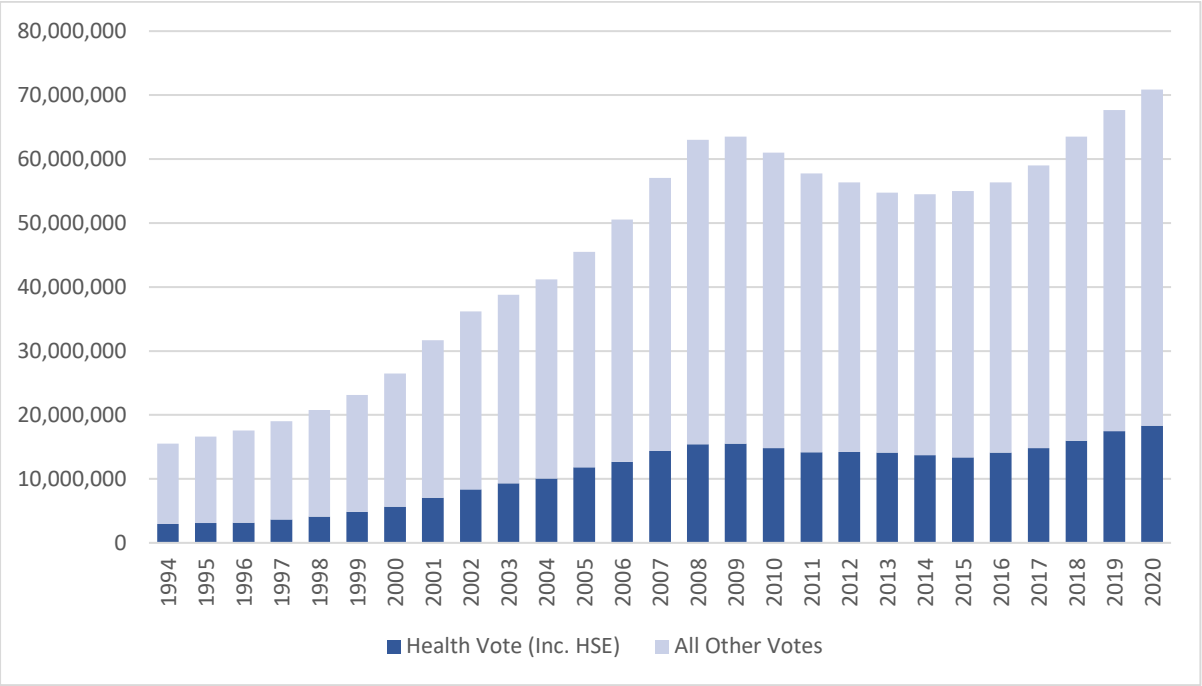
When reviewing comparisons of health expenditure, it is important to first qualify these comparisons and note the many potential distortions that can arise in this kind of data. Because of differences in relative prices, accountancy methods, and other factors, Ireland's ranking in health expenditures internationally can differ markedly depending on the specific construction of a given dataset. For example, Wren & Fitzpatrick (2020) identify that the ranking of Irish healthcare expenditure versus the EU15 can vary from 1st to 10th place, depending on the transformation applied to the data. International & domestic comparisons of healthcare expenditure can nonetheless be utilized to provide a broad understanding of health spend and performance.

2.2.2.1 Health vs Non-Health Expenditure

Expenditure on healthcare in Ireland has expanded significantly in the past two decades. While the 1980's fiscal contraction was associated with a 16% reduction in the proportion of GNP dedicated to non-capital health expenditure (McDaid, et al. 2009), since the mid-90s health expenditure has risen consistently. In nominal terms, overall health expenditure has increased from below €3bn in 1994, to over €18.3bn in 2020.[9] Over the same period, general government expenditure has risen from €15bn in 1994 to €70bn in 2020, facilitated in a large part by the dramatic improvement in Ireland's economic growth during the Celtic Tiger era.

[9] In real terms, health expenditure has risen from €4.5bn in 1994 to €18.0bn in 2020 (Base Dec 2016 = 100)

Figure 6: Total Irish Health Vote Expenditure vs Total Expenditure (non-Health) €000[10]



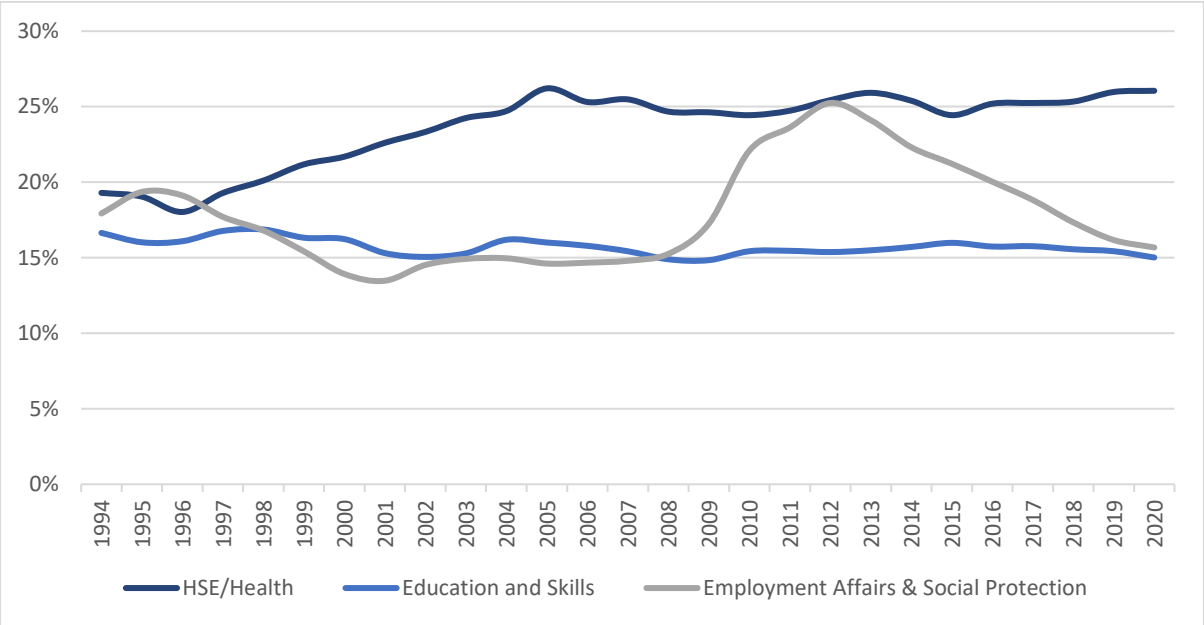
Source: Department of Public Expenditure and Reform Databank

2.2.2.2 Health Expenditure as a Proportion of Government Expenditure

The proportion of overall expenditure dedicated to health has also risen significantly. While in 1994 health expenditure made up just 19% of overall government expenditure, in 2020 it made up 26% of overall expenditure. This constitutes the largest rise in proportionate expenditure of any vote, surpassing even the rise in social welfare spending during the great recession. In 2020, expenditure on healthcare was the largest component of overall government expenditure, followed by Employment Affairs and Social Protection (16%), Education (15%), and Social Insurance (14%).

[10] Health Vote was previously known as the Health Vote Group, and included some functions now performed by the Department of Children, Equality, Disability, Integration and Youth

Figure 7: Proportion of Total Government Expenditure by Vote & Year



Source: Department of Public Expenditure and Reform Databank

2.2.3 Capital Expenditure Trends in healthcare

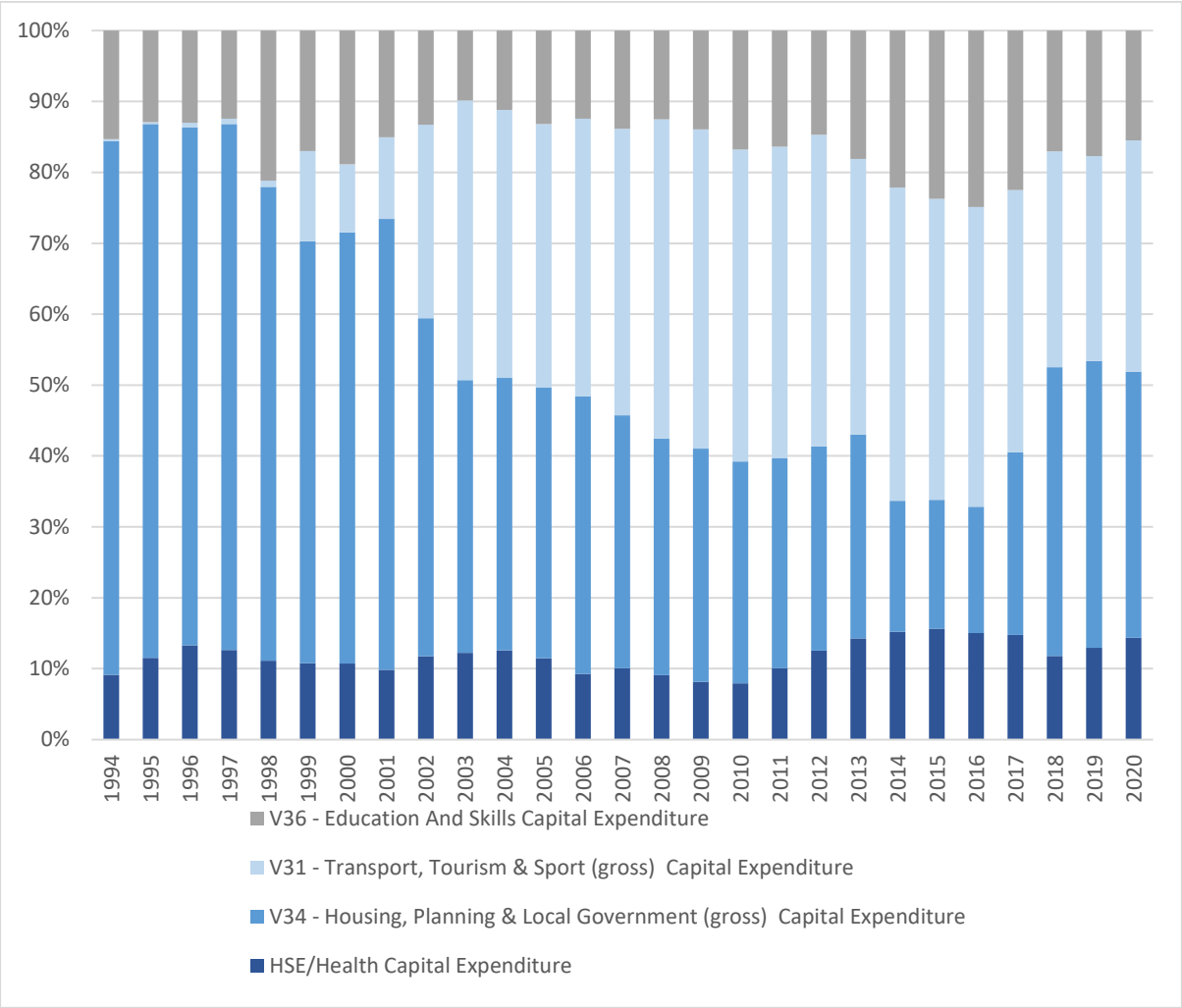
2.2.3.1 Expenditure by vote (Capital)

Historically, public capital investment in healthcare in Ireland has been low. While healthcare capital investment has been high in the last decade compared to the EU-15 (see figure 11), this investment should be viewed in the context of historic under-investment in healthcare capital in the preceding decades. According to Wren (2004), between 1970 and 1996, Irish healthcare capital investment averaged only 66% of the EU average. This low level of capital investment historically likely impacts the modern Irish health system both in terms of the structure and distribution of investment, and in terms of the capital stock currently held within the sector.

In contrast to the prioritisation of healthcare expenditure overall that we observe in recent decades, the growth in capital expenditure on healthcare has also been relatively muted. Capital expenditure on healthcare has varied between 7-10% of the overall capital budget from 1994-2020. In nominal terms, healthcare capital expenditure has risen from €83m in 1994 to €854m in 2020[11]. Capital expenditure on healthcare was also impacted by the recession, falling from €600m in 2008 to just €346m in 2013, before rising to a new peak of €854m in 2020.

[11] In real terms, health capital expenditure has risen from €129m in 1994 to €839m in 2020 (Base Dec 2016 = 100)

Figure 8: Government Capital Expenditure by Vote (%)



Source: Department of Public Expenditure and Reform Databank

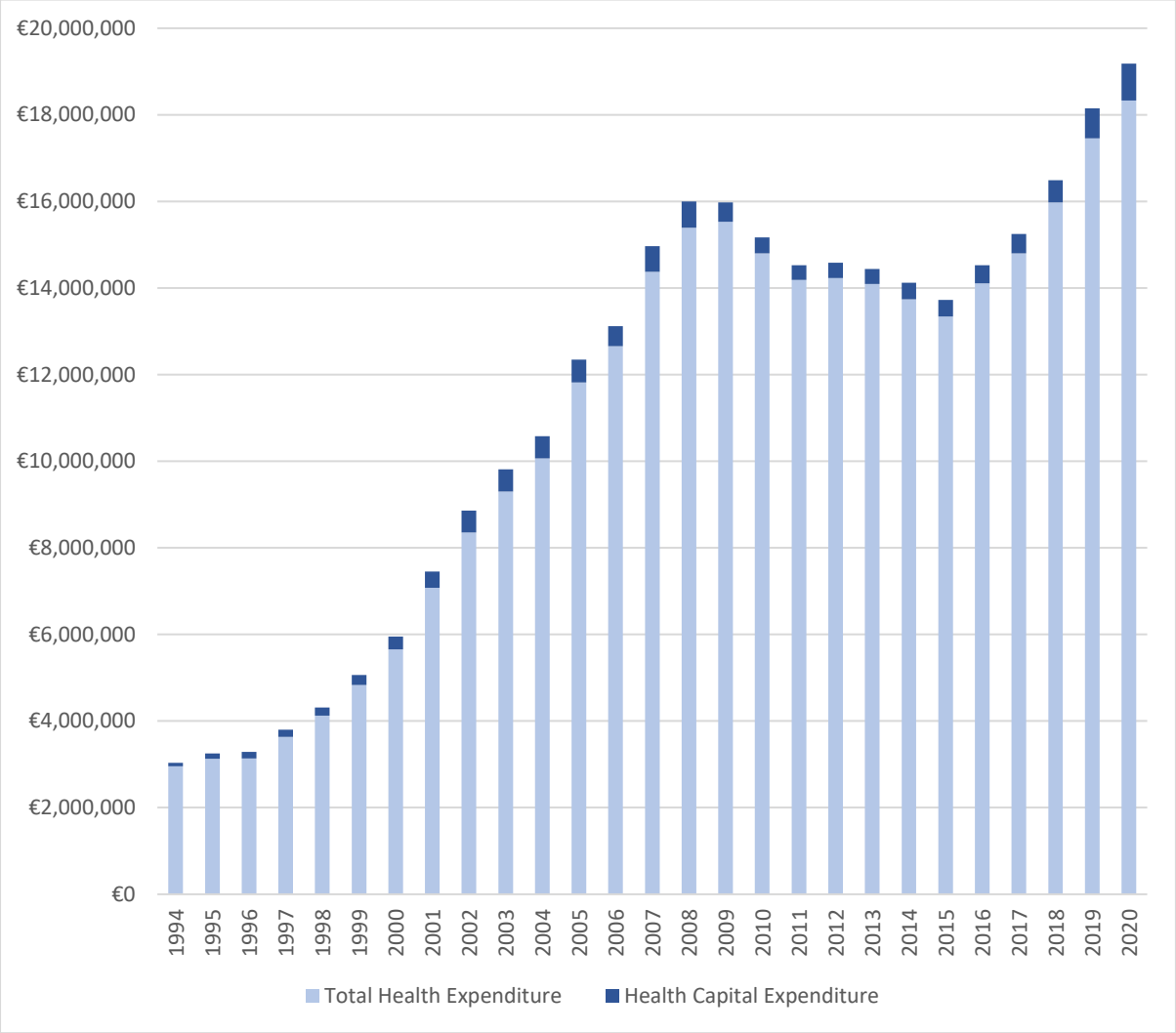
In 2020, healthcare capital expenditure was the fourth largest expenditure item in the capital budget, constituting 10% of total capital expenditure. Capital investment was higher in Education (11%), Transport, Tourism and Sport (24%) and Housing Planning & Local Government (27%).

2.2.3.2 Health Capital Expenditure as a Proportion of Total Health Expenditure

Capital expenditure in healthcare makes up a small proportion of the total health budget. From 1994-2020, healthcare capital expenditure represented just 3-5% of the total health budget. This is despite considerable variation in both total government expenditure and total capital expenditure during this period. A spend of 3-5% of total health expenditure on capital is relatively in line with the EU-15 average for the same metric, at 4-5% of health expenditure over the same period (World Health Organisation 2018). In light of this, deficiencies in Irish healthcare capital stock relative to other

countries may be driven more so by historic under-investment in healthcare, rather than a compositional issue related to the proportion of health capital versus health current expenditure.[12]

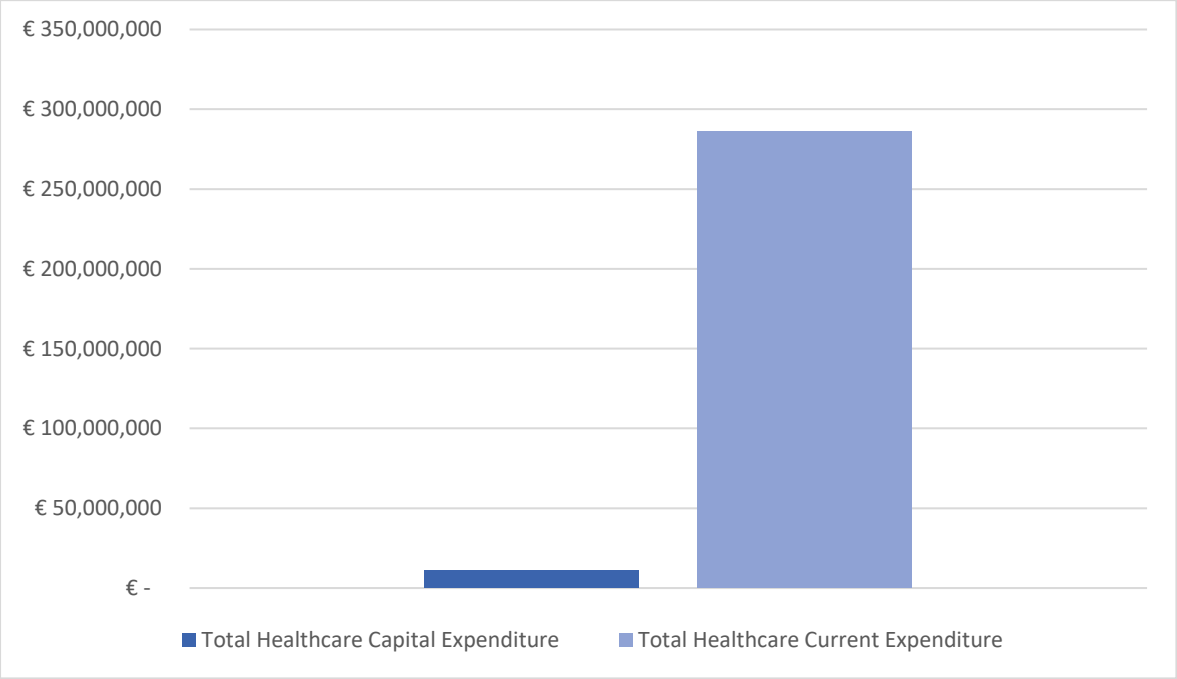
Figure 9: Current and Capital Health Expenditure per annum (€000)



Source: Department of Public Expenditure and Reform Databank

[12] Morgenroth (2014) identifies a number of additional explanatory factors for why the stock of infrastructure may lag behind international peers even in the event that expenditure is comparable. These relate to the price paid for infrastructure, and the lack of maintenance of existing capital stock. As will be highlighted in paper two of this series, the lack of detailed health capital stock data means cross country comparisons of health infrastructure cannot be formally conducted.

Figure 10: Total Healthcare Expenditure (Capital & Current) 2004-2020 €000



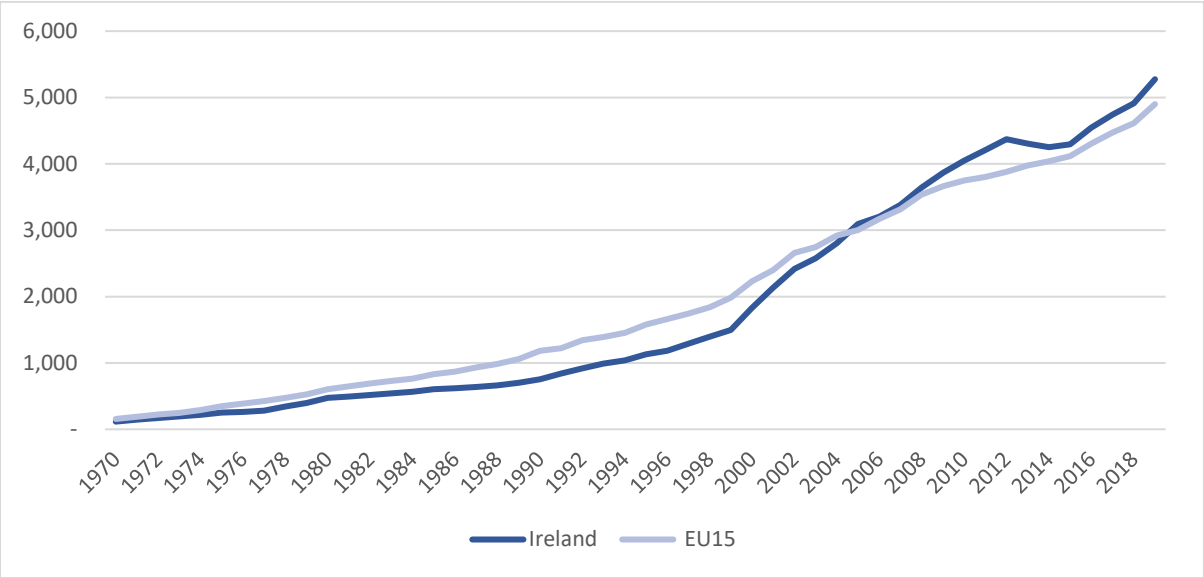
Source: Department of Public Expenditure and Reform Databank

2.2.3.3 Per Capita Health Expenditure, Current & Capital

In terms of international health expenditure comparisons, prior to the 1990s overall Irish healthcare expenditure had consistently lagged behind the EU. Between 1970-2000, Irish health expenditure per capita was just 73% of the EU15 average spend over the same period.[13] This is consistent with the earlier analysis presented from Wren (2004), with a prolonged period of under-investment in health services during this time likely materialising into a significantly lower level of funding versus the EU15. In contrast, Irish health expenditure per capita has since 2005 exceeded the EU15 average, with expenditure 6% higher on average between 2006 and 2019. While international comparisons for this metric are limited by the caveats mentioned in the preface and the historically different age profile of Ireland versus other European countries, the change in relative expenditure from 1970 to present nonetheless provides a broad overview of Irish versus EU healthcare spending over the period.

[13] Economy Wide PPPs are applied to per capita expenditure data to adjust for price differences.

Figure 10: Per capita health expenditure Ireland vs EU15 ($)[14]



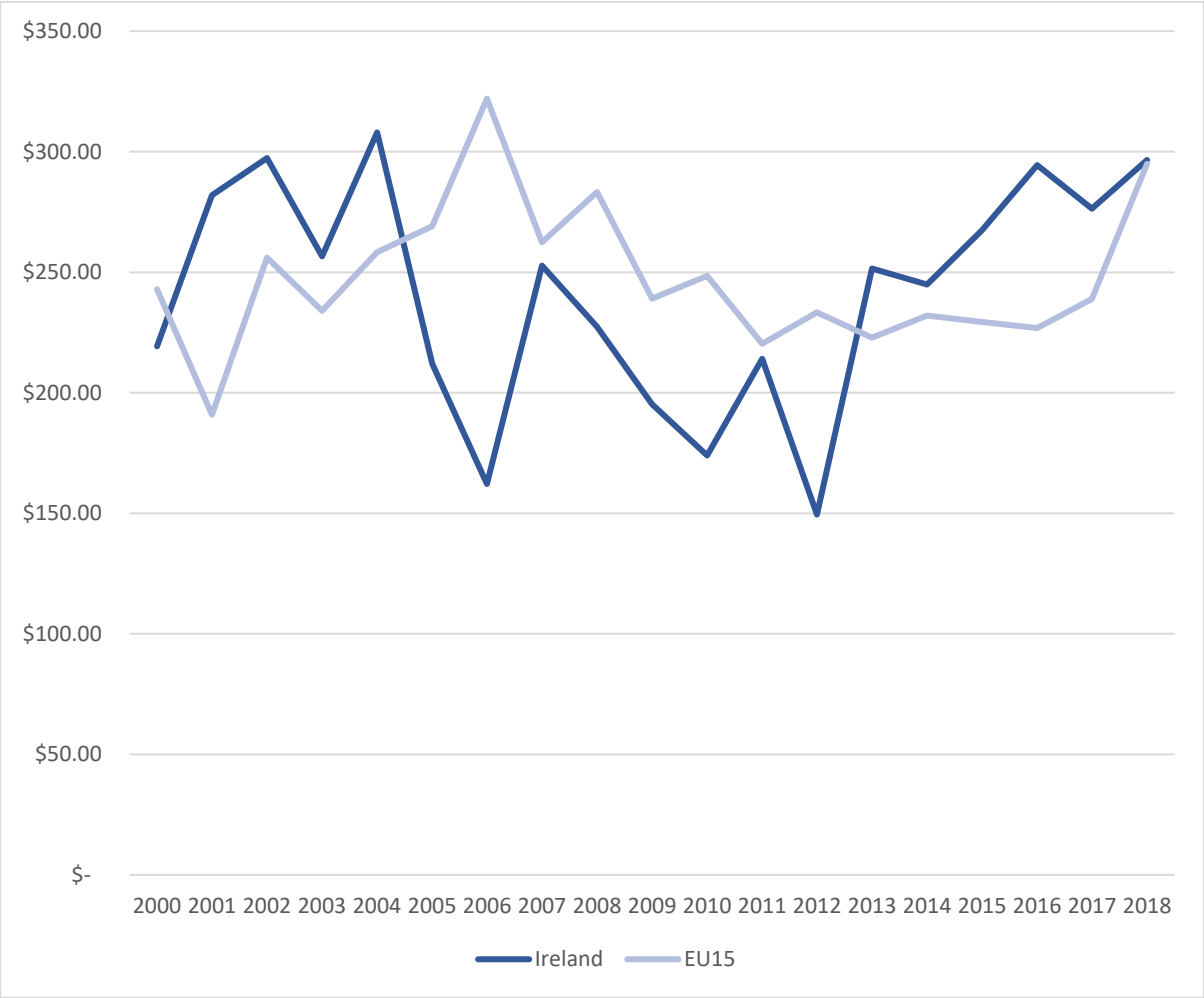
Source: OECD

In terms of health capital expenditure per capita compared to the EU, Ireland tracks closely to the EU15 average. Between 2000 and 2018, Ireland's health capital expenditure varied between $150 and $300 dollars per capita[15]. Over the same period EU15 spend varied between $200 and $300 dollars per capita. As a whole, Ireland's health capital expenditure was 7% below the EU15 average between 2000-2018. However, since 2013, Ireland has exceeded the EU15 average spend. In 2018, both EU15 and Irish spend were approximately $295 per capita. In spite of the recent increase in healthcare capital investment in Ireland, there is some indication that this level of funding is still too low relative to contemporary need. Most notably, the Slaintecare Report (2017) identifies a significant deficiency in expected versus actual healthcare capital investment:

"with actual capital funding falling short of planned funding by around €3 billion between 2008 and 2017" (Houses of the Oireachtas 2017).

[14] Includes government, voluntary and out-of-pocket spending on healthcare for both Ireland and EU15.
[15] Base (2018 Constant US$)

Figure 11: Health Capital Expenditure per Capita ($) Ireland vs EU15[16]



Source: WHO Global Health Expenditure Database

[16] Data is not available on health capital expenditure broken down by public and private spending for some countries. This is noted as a limitation of System of Health Accounts 2011 (OECD 2012). As such, only an aggregated measure of health capital expenditure is used.

3 Healthcare Return on Investment, Outputs and Outcomes

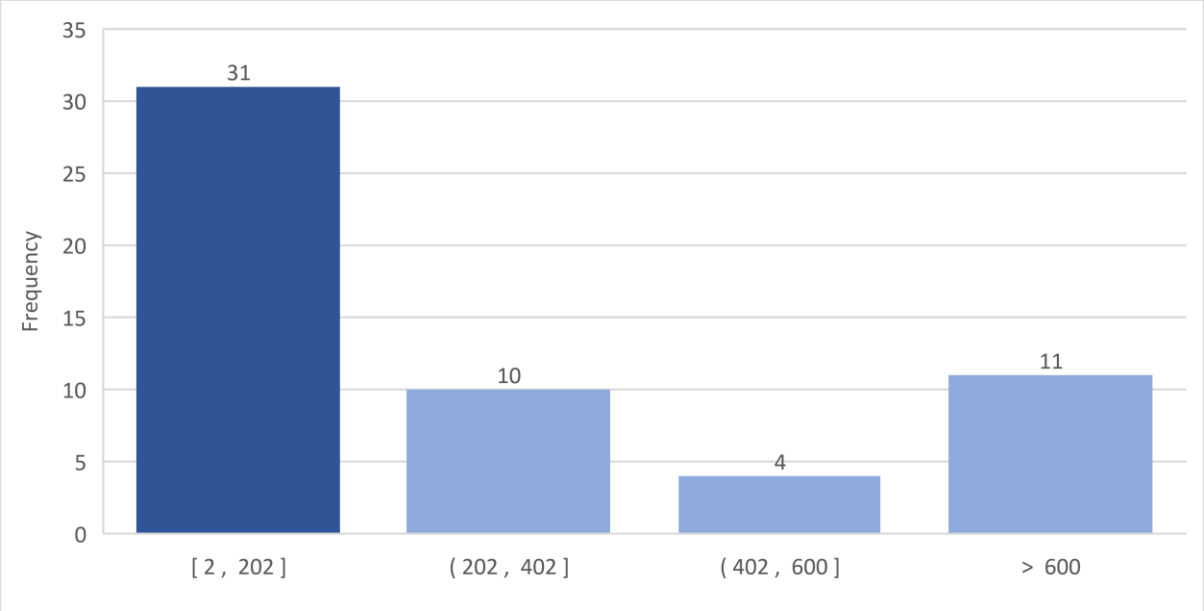
3.1 Motivation

While expenditure on healthcare capital is informative in evaluating Ireland's relative healthcare capital position, it is also important to present statistics related to the outputs of health investment. While healthcare capital investment makes up a low proportion of total health spending, it has an outsized influence on health outcomes, contributing to the type and location of care that takes place. Many of the metrics related to healthcare capital investment also are of material interest to policymakers in the sector, such as acute care beds, occupancy and waiting lists. Because of data availability, only high-level metrics related to healthcare capital investment are explored in this section. In addition, cross country comparison of health performance can also be limited due to differences in demographic, geographic or cultural factors.[17] Nonetheless, this analysis provides an initial impression for how better health investment could lead to better health outcomes.

3.2 Hospital Size & Acute Care Beds

In terms of hospital size, Ireland can be considered to have many small hospitals, with 61% of the 49 hospitals in Ireland having fewer than 200 beds.

Figure 12: Distribution of Hospital Size by Acute Beds, 2019 Average:



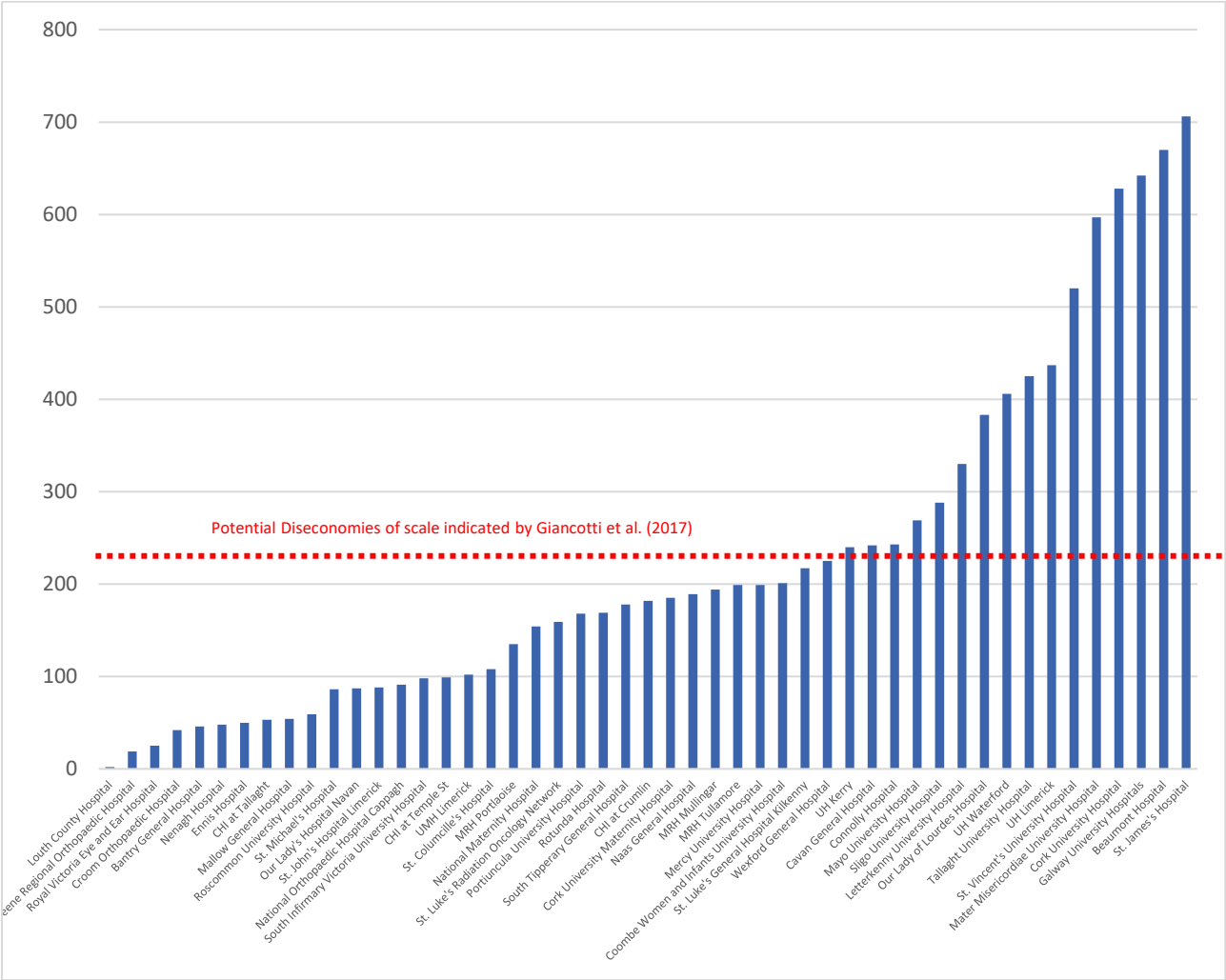
Source: HSE BIU Acute

[17] For example, Ireland's historically different age profile may limit comparability. In addition, Ireland has a lower population density than some other European countries which may influence investment decisions.

In a systematic review of the literature, Giancotti et al. (2017) identify the existence of economies of scale for hospitals as well as limits where these efficiencies occur. In particular, they identify economies of scale for hospitals with 200-300 beds, while diseconomies are identified for hospitals above 600 beds and below 200 beds. This may indicate that many hospitals in Ireland may suffer from diseconomies of scale.[18] Further analysis has also pointed to the same issue, with Campbell (2016) identifying that smaller Irish hospitals have lower bed utilisation rates and higher expenditure per patient treated. The general relationship between hospital size and efficiency in the literature is more complicated, with some authors highlighting the minute efficiencies gained from the closure of small or remote hospitals (e.g, see Vaughan and Edwards (2020)). Smaller hospitals can also be refocussed on the delivery of day surgery, ambulatory care and diagnostics which can compensate for their low levels of acute care beds. Nonetheless, the skewed distribution of acute beds by hospital in Ireland indicates that the issue of small regional hospitals originally identified in the Fitzgerald report remains a concern in 2020, warranting further investigation.

[18] Any closure of Irish hospitals would impact accessibility. Nonetheless, the advantages in terms of efficiency and scope of care delivery may outweigh this cost. Further analysis may therefore be necessary to balance fully the costs and benefits of hospital consolidation.

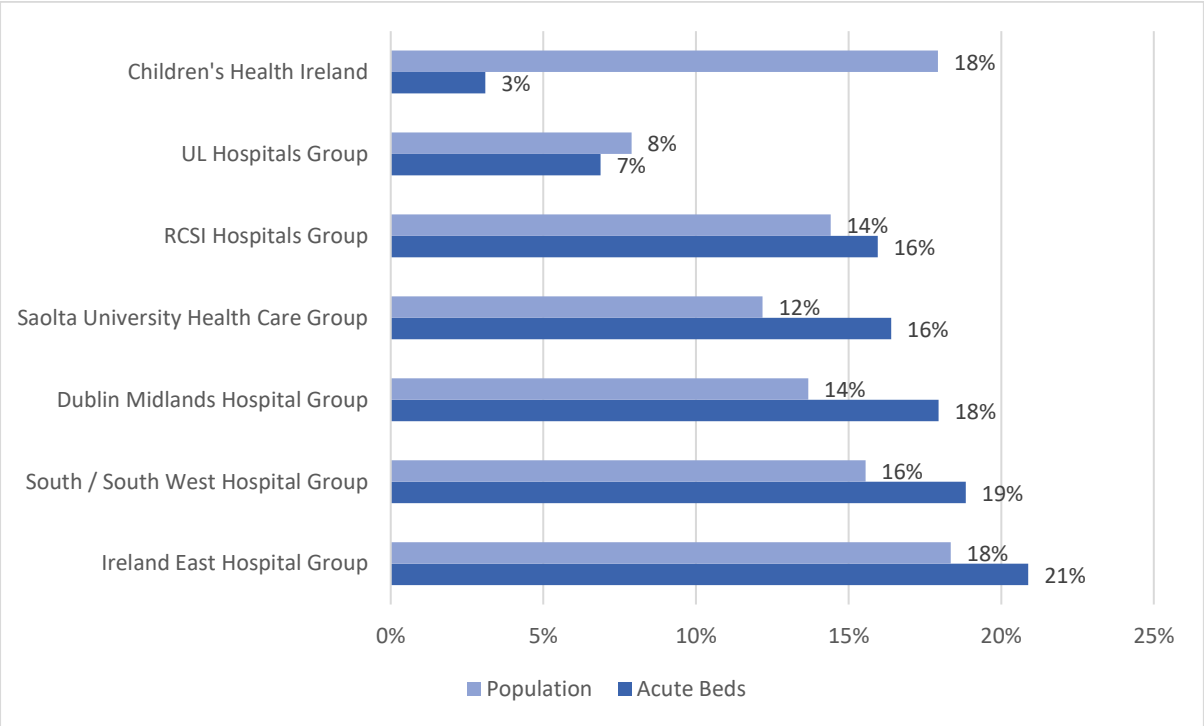
Figure 13: Acute Beds by Hospital, Ireland 2020



Source: HSE BIU Acute, Red Line represents dis/economies of scale threshold from Giancotti et al.

In terms of distribution by hospital group, Ireland's hospital beds are evenly balanced with five out of the six groups holding between 15-20% of total acute beds. The exception is the UL hospital group, which holds just 7% of total beds. The population of each hospital group is also included, taken from each hospital groups operational plan. We can see that population is mostly aligned with the number of acute beds in a given hospital group, with the exception of the children's hospital group. This is to be expected, as the hospitalisation rate of children is low relative to the general population.

Figure 14: Hospital Group Acute Care Beds & Population % Total



Source: HSE BIU Acute

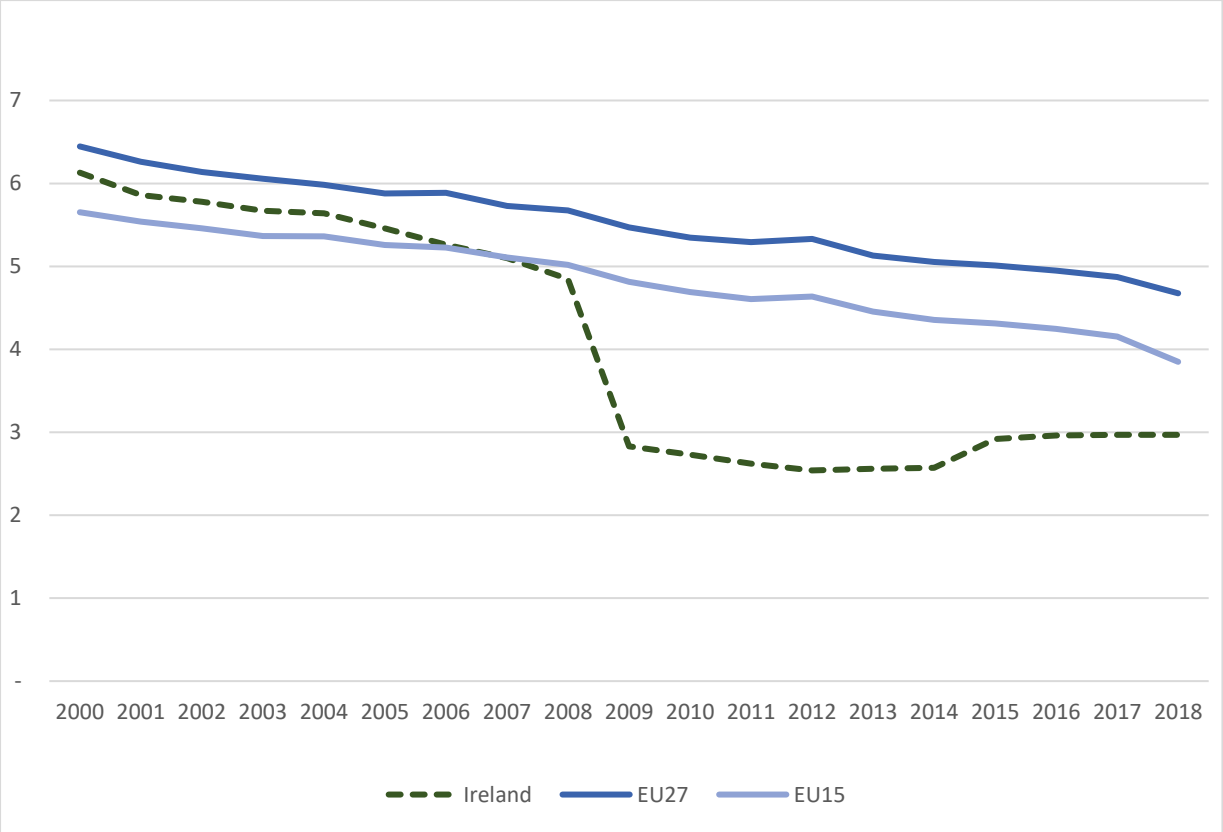
In terms of international comparison to the EU, the number of acute care beds in the system in Ireland is low. In the period before the financial crisis, Ireland's acute care capacity per 1,000 inhabitants trended only slightly below the EU average, with an average difference of less than 1 bed per 1,000 inhabitants between 2000-2008. The financial crisis and the need for fiscal consolidation altered this relationship, with the Irish government closing over a thousand beds in an effort to reduce expenditure (Irish Times 2010). From 2009 onwards, Ireland's acute beds have remained broadly stable, at between 2.5 to 3 beds per 1,000 inhabitants. In 2019, Ireland ranked significantly behind the EU average for acute care beds of 4.82 per 1,000 inhabitants. Ireland has the third lowest number of acute beds per 1,000 inhabitants in the EU, behind only Sweden and Denmark.[19]

In addition to the lower than average acute care beds in Ireland versus the EU, Ireland also faces an unusual demand for additional acute care facilities in the future. Whereas most countries are moving towards a healthcare system more focussed on primary care delivery, demographic pressures and a changing age profile mean that Ireland has a need to invest into additional acute care services. The 2018 Capacity Review, for example, recommends the provision of 2,590 – 7,150 additional acute care

[19] It should be noted that from 2009-2020, the average number of persons over 65 in Ireland was 12.7, while in the EU27 it was 18.9. This would be influential in determining the level of investment in hospital capacity over this period (Eurostat 2021).

beds by 2031[20]. Analysis by Keegan et al. (2018) meanwhile places the requirement at between 4,000 and 6,300 beds. While a need to invest in acute care does not necessarily threaten the implementation of Sláintecare, such pressures highlight the divergence between short run demographic needs and the long run strategy for care delivery.

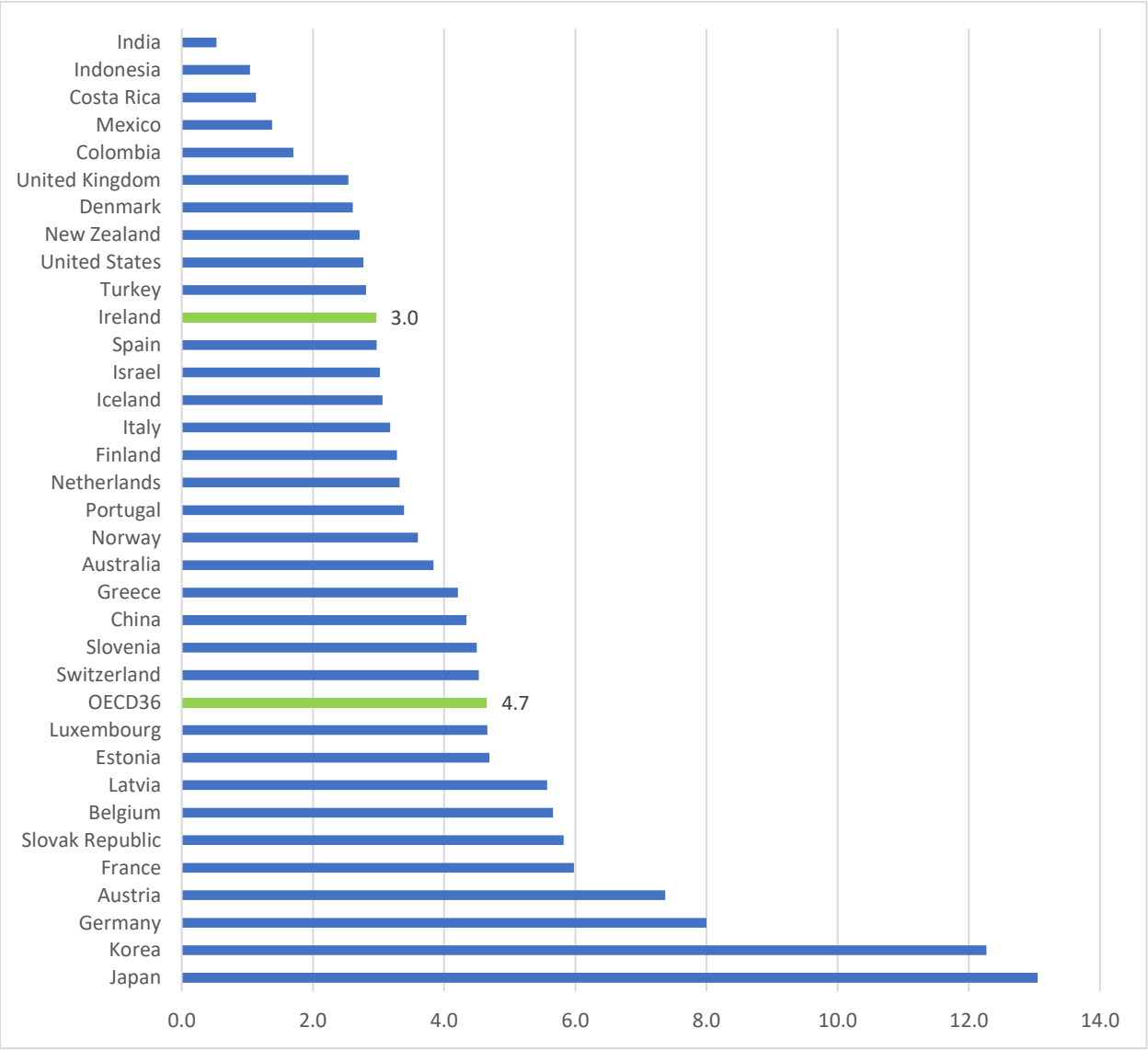
Figure 15: Acute care beds per 1000 inhabitants Ireland vs EU[21]



Source: OECD

[20] The number of beds required depends on whether there is greater levels of investment into primary and community based care, with the lower requirement of hospital beds also requiring a 48% increase in the primary care workforce, 13,000 additional residential care beds and a 120% increase in homecare.
[21] This data includes private hospital beds. For Ireland, the sources of information are the Health Service Executive and the Department of Health's Survey of Private Hospitals. This data is aggregated by the OECD to enable international comparison (OECD 2021).

Figure 16: Acute care beds per 1000 inhabitants Ireland vs OECD (by country)

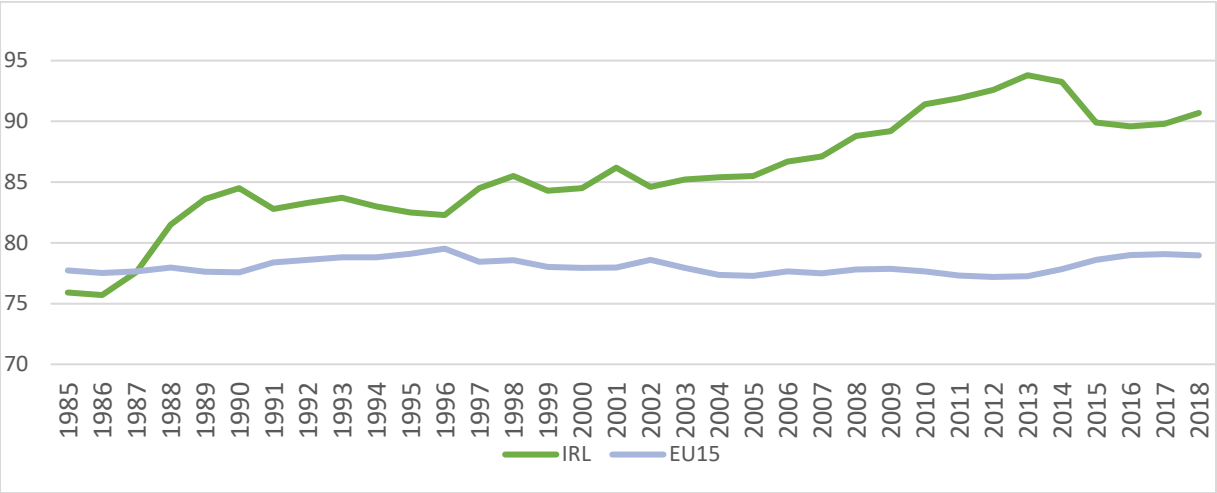


Source: OECD Data (2019), Acute Beds per 1,000

3.3 International Hospital Occupancy

In terms of occupancy, Ireland's hospitals have consistently overshot the identified clinically safe occupancy level of 85% (Madsen, Ladelund and Linneberg 2014). Ireland also has worse performance than EU comparators on acute care occupancy, both historically and at present. From 1987 onwards, Ireland's acute care occupancy has been consistently higher than the EU, with an average occupancy in Ireland of 85% between 1987 and 2014, versus 77% over the same period in the EU. This relationship has also worsened in recent years, with Ireland's acute care occupancy at 91% in 2018, versus 79% in the EU.

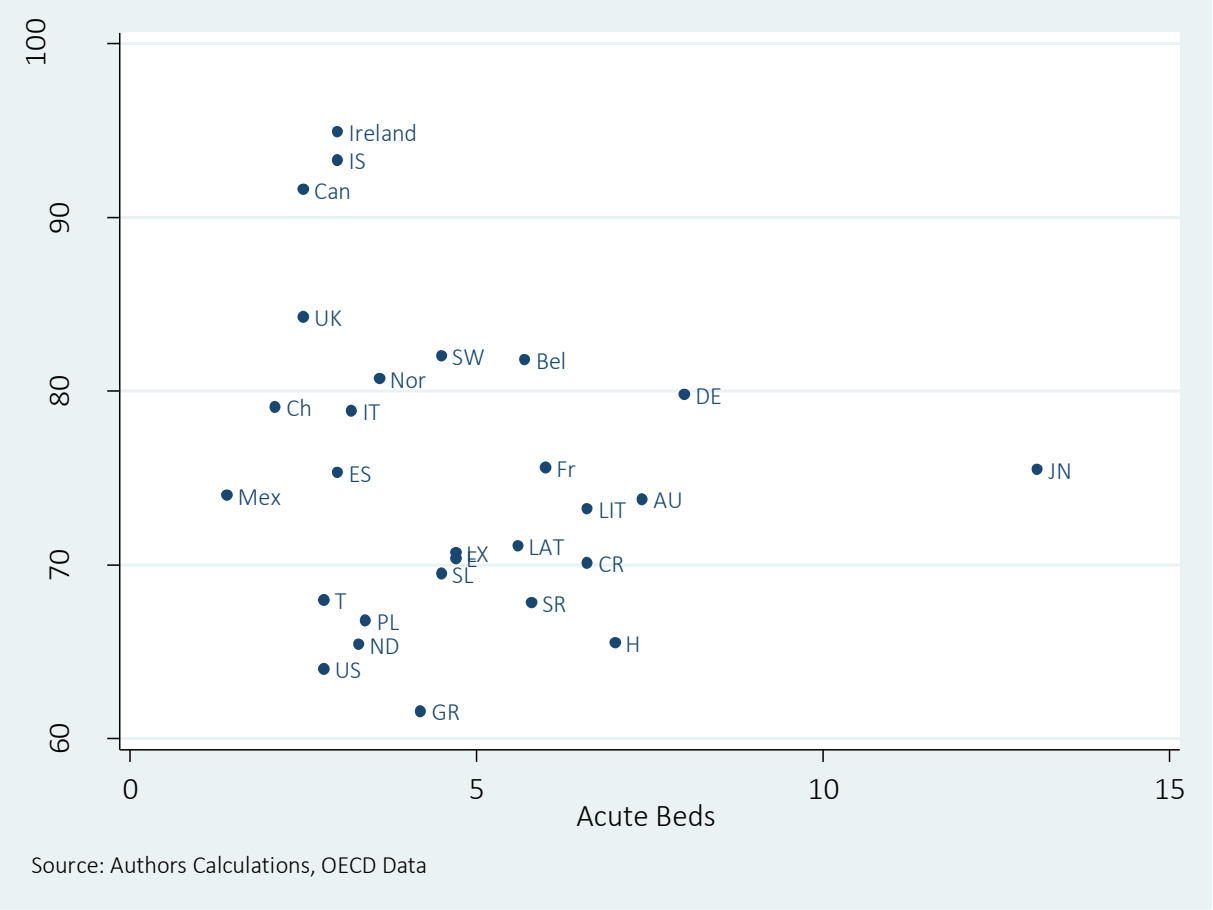
Figure 17: Acute Care Occupancy (%) Ireland vs EU 1985-2018 (%)



Source: OECD Data (2019)

On a per country basis, Ireland is an outlier in the OECD in terms of both acute care beds and occupancy, having one of the lowest levels of acute care beds per capita, and the highest level of occupancy. Figure 17 highlights this relationship across the OECD, demonstrating that while some countries succeed in maintaining low levels of occupancy in spite of low levels of acute beds, Ireland fails to do so. This is likely influenced by the level of non-acute care delivery in Ireland versus other OECD countries, with the limited capacity of the non-acute sector acknowledged as an issue in the context of Irish healthcare delivery (e.g, see Department of Health (2012)).

Figure 18: OECD Acute Care Beds vs Occupancy (2018)

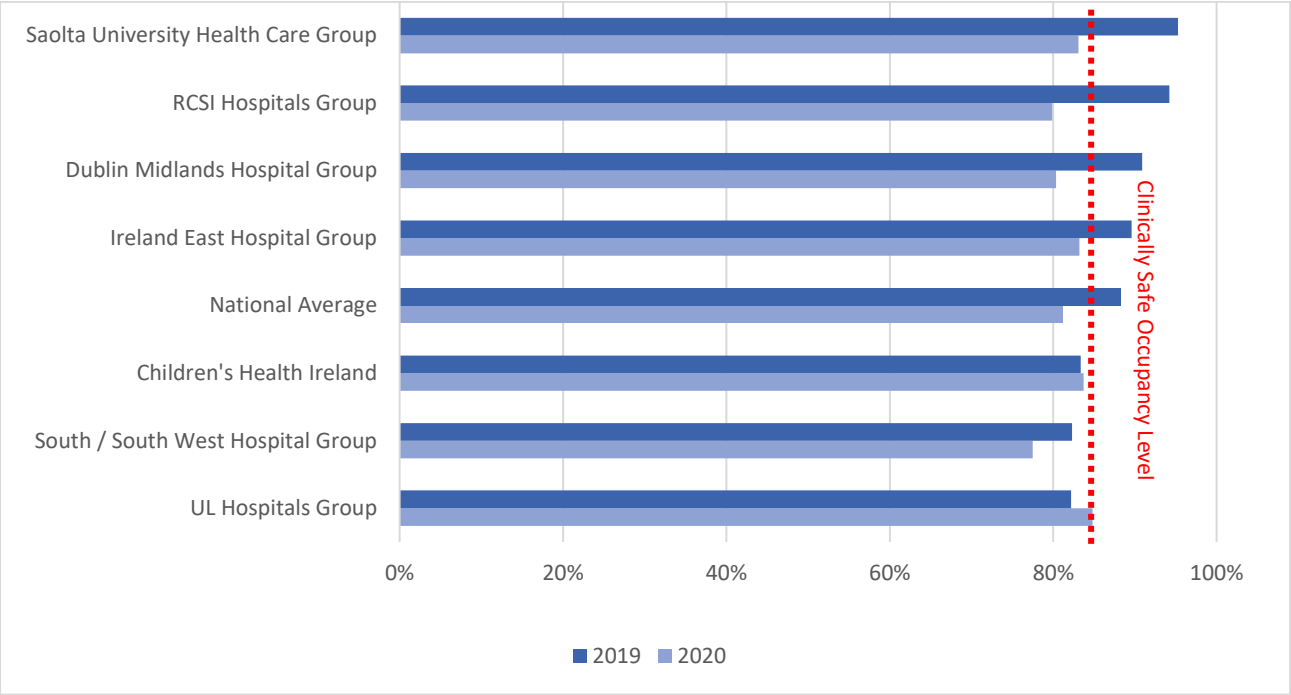


Source: Authors Calculations, OECD Data

Source: WHO

Examining Irish occupancy on a per hospital group basis paints a similar picture. In 2019, average occupancy across all hospital groups was 88%, with occupancy for the Saolta, RCSI and Dublin Midlands hospital groups over 90%. The reduction in services delivered during the COVID crisis and the imposition of public health operating restrictions led to a corresponding reduction in occupancy. From March to May 2020, occupancy averaged just 70%, while overall occupancy for the year was 81.8%.

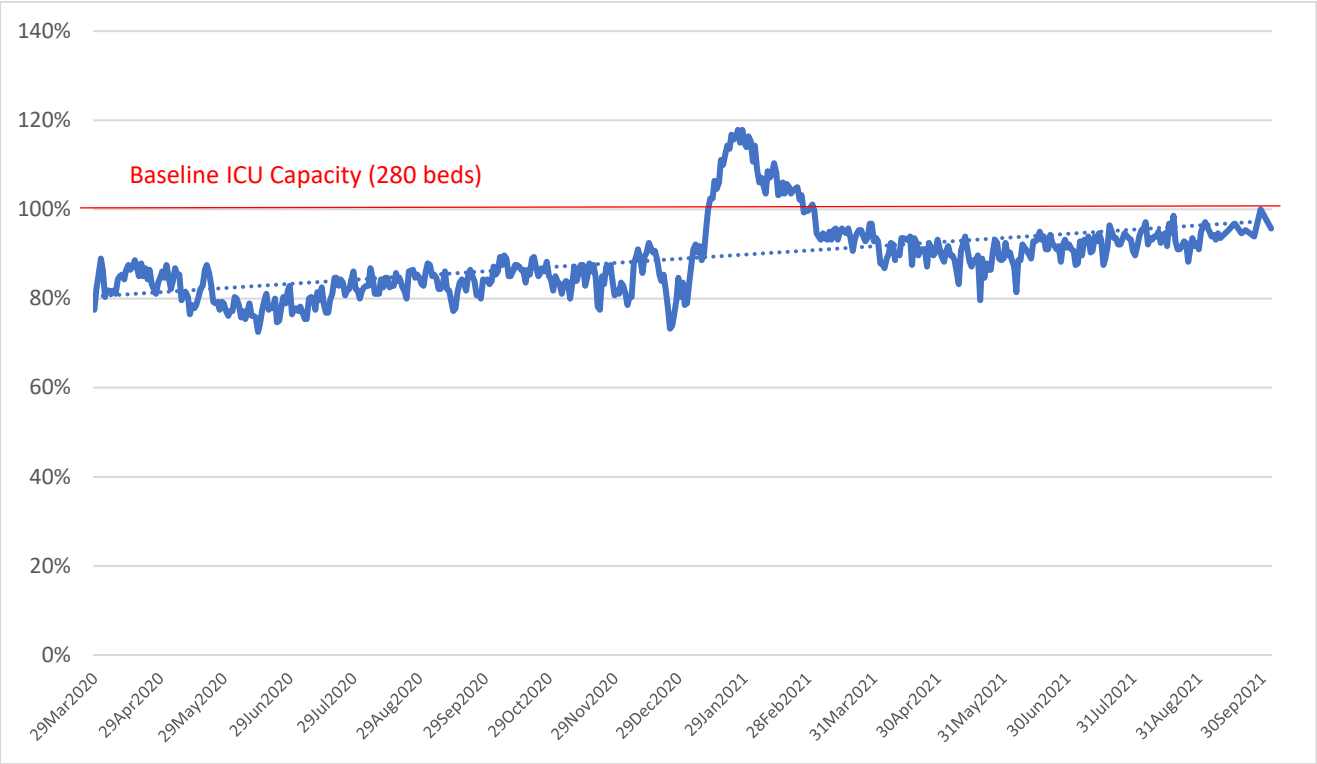
Figure 19: Acute Care Occupancy by Hospital Group 2019 vs 2020



Source: HSE BIU Acute, Red Line is Clinical Safety Threshold from Madsen et al. (2014)

ICU occupancy was also high throughout the COVID pandemic. Baseline ICU capacity as of 1st December 2020 was 280 beds, with a further 70 beds designated as surge capacity used in the event of a sudden increase in ICU demand (HSE 2020). Comparing ICU occupancy throughout the pandemic to baseline ICU capacity highlights the consistent pressures present in this area, with daily ICU occupancy averaging 88% of baseline capacity between April 2020 and September 2021. It can also be observed that baseline ICU capacity was exceeded for an extended period during January and February 2021 as a result of the surge in COVID infections during this time. In general, the high levels of occupancy in Ireland for both acute and ICU beds may threaten the delivery of adequate care in the context of an unforeseen medical emergency, with international literature suggesting hospitals hold a surge capacity of 20% above normal operating capacity (e.g, see (Hick, et al. 2014)).

Figure 20: Critical Care Occupancy & Baseline Capacity (March 29th 2020 to September 2021)

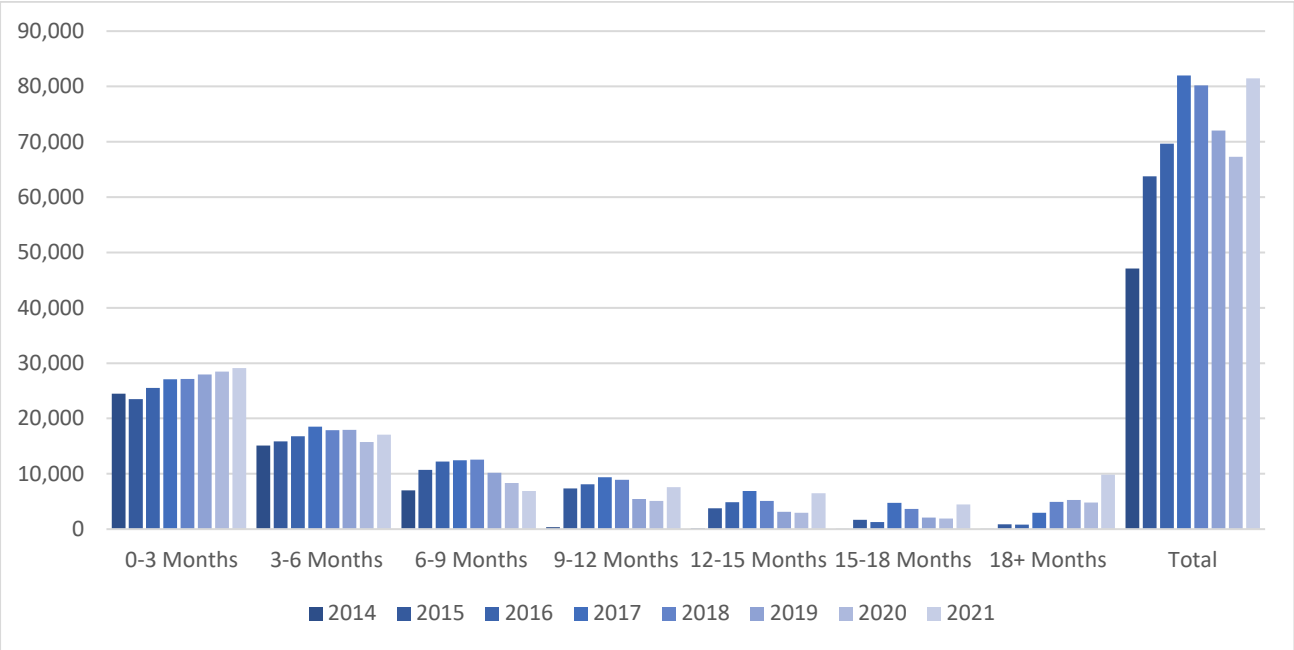


Source: NOCA

3.4 Waiting Lists

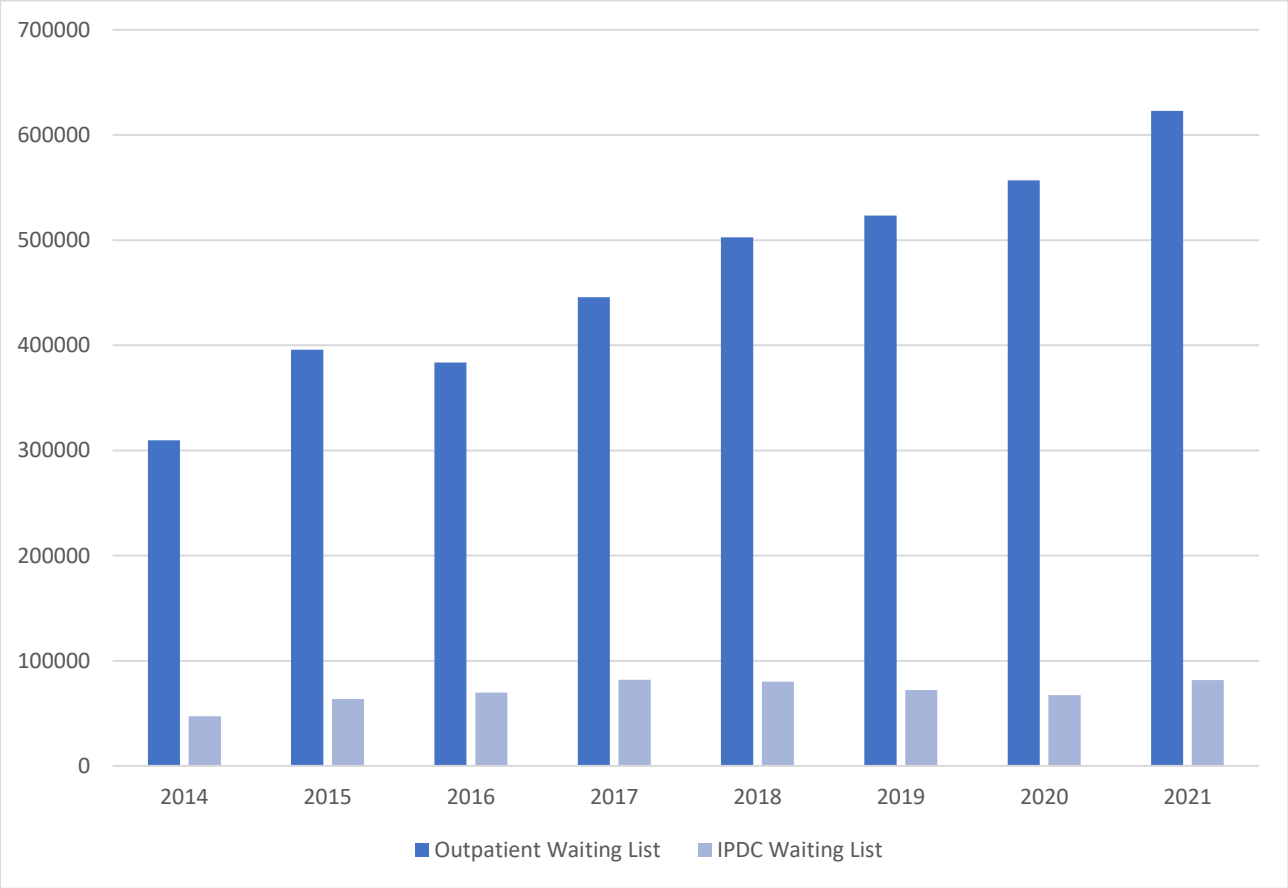
The reduction in occupancy experienced during the pandemic has exacerbated the problem of high levels of unmet healthcare demand in Ireland. Total patients on inpatient and day case waiting lists increased by 21% from Jan 2020 to Jan 2021, from 67,303 to 81,456. Similarly, the number of patients on the outpatient waiting list has also risen, from 556,770 in 2020 to 622,963 in 2021, a 12% increase. Wait times have also worsened during the pandemic. While the numbers of patients waiting for inpatient and day case treatment for 3-6 months has decreased by 10%, those waiting between 15-18 months, and over 18 months has increased by 161% and 119% respectively. These trends are mirrored in the case of the outpatient list, with those waiting over 18 months increasing by 60% between 2020 and 2021. Furthermore, analysis by Brick & Connolly (2021) reveals that Ireland ranks between the 3rd to the 6th longest for wait times for various procedures out of 17 countries considered. From January 2014 to January 2021, total outpatient waiting list numbers have grown from 309,496 to 622,963, a 101% increase. Similarly, the inpatient and day case waiting list has grown from 47,112 to 81,456 over the same period, a 70% increase. While waiting list numbers can be influenced by a variety of factors such as staffing, pathways and productivity, it is likely that the high level of occupancy in Ireland and the associated level of healthcare capital investment are influential in determining waiting list numbers.

Figure 21: Inpatient & Day Case Waiting List by Year and Wait Time (January Totals)



Source: NTPF

Figure 22: Outpatient & Inpatient Waiting List Totals by Year (January Totals)

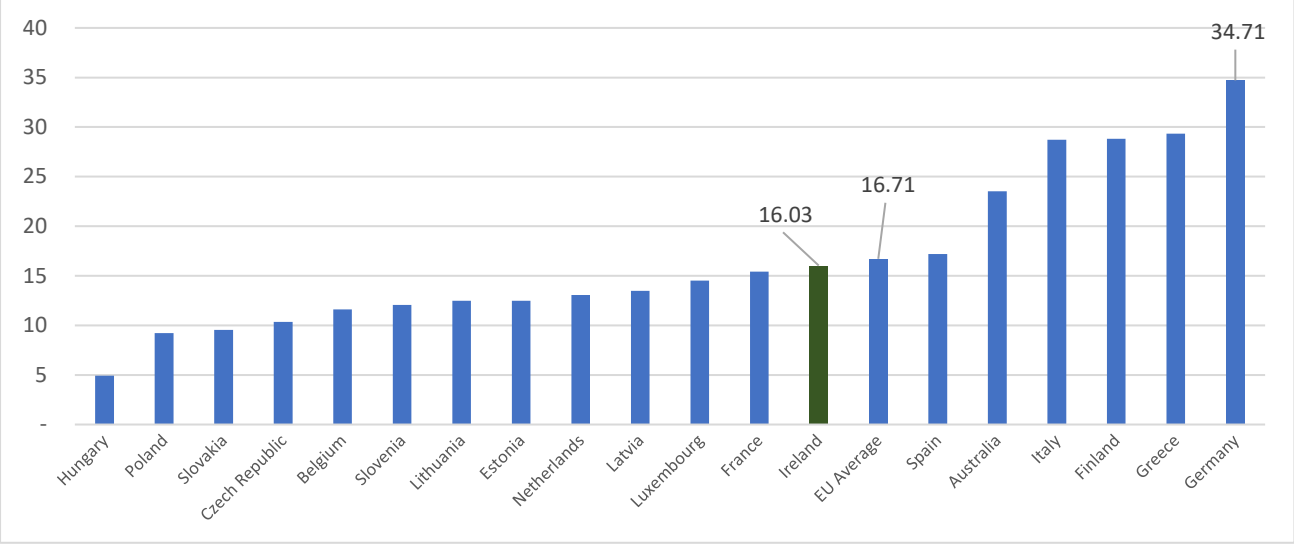


Source: NTPF

3.5 Capital Equipment

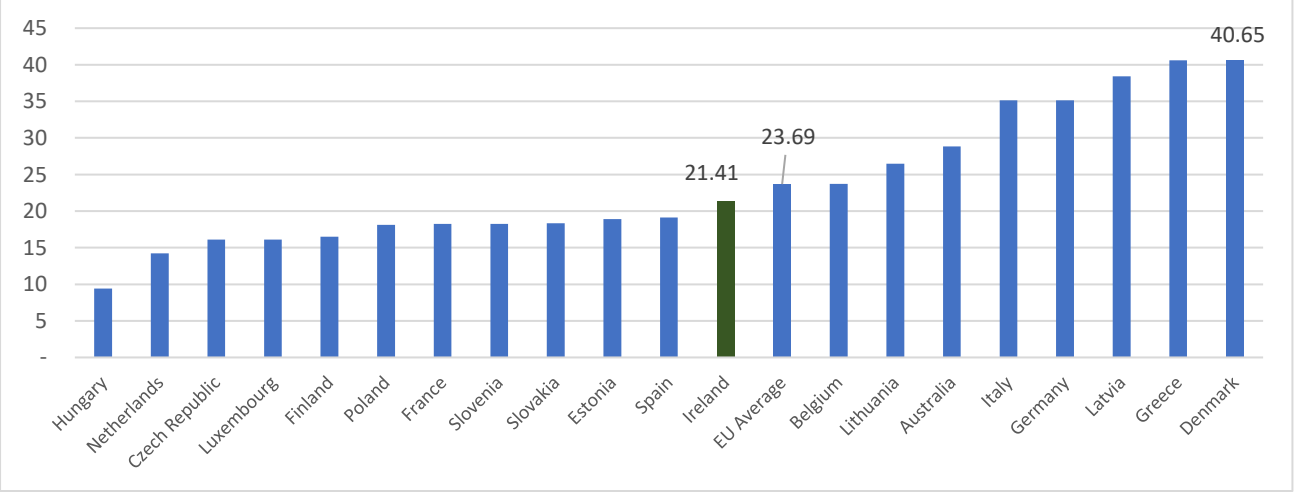
Ireland's performance in relation to capital equipment is more broadly in line with the EU. For both MRI machines and CT scanners per 1m population, Ireland is slightly below the EU average. In comparison to the leaders of these respective metrics however, Ireland is behind. For MRI machines, Ireland has just 16 machines per 1m population, versus the 34 in Germany. Similarly, Ireland has just 21.41 CT scanners per 1m population, versus 40.65 scanners in Denmark.

Figure 23: MRI Machines per 1m pop Ireland vs EU



Source: OECD

3.5.1.1 *Figure 24: CT scanners per 1m pop Ireland vs EU*



Source: OECD

4 Conclusion

This paper has reviewed healthcare capital investment in Ireland including an overview of historic policy in this area, trend analysis compared with other EU and OECD countries, and a review of performance metrics related to Investment in this sector. While healthcare capital investment makes up approximately 10% of the overall health budget, its impact on the capacity to deliver care in a region or service area is far greater, with most health-based interventions requiring infrastructure to be in place so that care can be delivered. In addition, the low level of investment in healthcare historically in Ireland likely continues to impact the modern Irish health system, both in terms of the structure and distribution of investment, and in terms of the capital stock currently held within the sector.

While the research contained in this paper series provides a thorough examination of healthcare capital investment, there nonetheless remains areas worthy of further investigation. Most notably, collation and analysis of Irish healthcare capital stock data, including building age, size, quality, location and care setting would allow for more specific identification of future healthcare investment requirements. Further work could also be explored in relation to individual hospital level performance, such as using HIPE data on hospital acquired infections and complexity-adjusted length of stay to determine how effective various hospitals in Ireland are. Finally, future research could also focus on the relationship between healthcare capital investment in Ireland and subjective patient and employee experiences, with literature pointing to this relationship in other countries (Rechel, Wright, et al. 2009).

In light of the outsized influence that healthcare capital investment can have on both expenditure and healthcare delivery, the need for a more robust and strategic approach to its allocation is clear. The lack of strategically planned healthcare investment historically in Ireland has likely contributed to ineffective and inefficient care delivery, with Ireland behind EU comparators in terms of metrics such as occupancy, acute care beds and waiting lists. Development and implementation of a strategic investment framework for healthcare would constitute a first step in remedying this issue, allowing for prioritisation of capital investment towards those projects which best meet the objectives of the health system as a whole. While the development of a strategic investment framework for healthcare will be an iterative process involving many different stakeholders, this research series provides a grounding for its authorship.

4.1 Health Capital Investment in Ireland – Further Analysis

The analysis presented in this paper is supplemented by further research focussed on specific issues in healthcare capital investment delivery. The second paper in this series highlights examples of

successful strategic frameworks in other sectors, potential criteria for inclusion in the health framework, and detail of the benefits that the health framework could provide. The second and third papers also outline in more specific detail how current healthcare capital investment allocations and decisions can be improved, adding value to the overriding recommendation for the production of a strategic investment framework for healthcare.

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