National Healthcare Quality Reporting System

First Annual Report

5 March 2015

Ministerial Foreword

I welcome the publication of the first NHQRS annual report. I have set improving patient outcomes and patient safety as one of my priorities for 2015 and beyond. I am a strong believer in transparency and open data. As they say, if you don't measure it, you cannot improve it and without regular measurement and reporting you cannot know if your policies and reforms are actually making a positive difference.

Some people in the health sector will be uneasy with the new approach. They will be concerned that statistics will not be contextualised and may even be sensationalised causing unnecessary concern and worry for patients and their families. I understand this concern but I do not agree. We need to trust people with the truth and the facts.

It's important, however, that the information in this report is used responsibly. Variations in patient outcomes from country to country, county to county and hospital to hospital do not necessarily suggest different standards or quality of care. Sometimes the variance is not statistically significant (i.e. it is within the margin of error). Sometimes it is down to the way data is collected. And of course, countries and counties vary in terms of population health, socioeconomic profile and transience of population. A hospital might have a higher mortality rate than another not because the care is inferior but rather because it is a specialist centre and therefore takes the sickest patients. Rather, I see variance as an amber flag, a cue telling us to look deeper and seek a further explanation for any variance in patient outcomes so that we can address it if we can.

Unfortunately there are no standardised patient experience surveys across the health sector. I have asked the HSE and the Department of Health to address this gap, so that we can include patient experience as a measure in next year's report.

All in all, this report demonstrates that patient outcomes are improving on a number of fronts. Vaccine uptake is increasing and MRSA and C. Difficile infection rates are going down. People who have been admitted to hospital with a heart attack are much more like to survive now than a few years ago and cancer survival rates are catching up with Western norms.

But there is clearly also much room for improvement. Cancer survival rates are below the OECD countries average though it is too soon for these statistics to show the impact of recent developments in services such as the extension of screening and development of designated cancer centres. Rates of hospitalisation for COPD are higher than in other countries in the OECD and there is a lot of variation from county to county. The same applies to Caesarean Section rates with some variation from hospital to hospital.

I look forward to next year's annual report which I hope will show some improvement and will include new data on patients' views on their own experience of the health service.

Leo Varadkar T.D.
Minister for Health

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Glossary

OECD: Organisation for Economic Co-operation and Development. A group of 34 countries that compares how each one is performing in areas such as health, employment and education.

ICD-10-AM: International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification. A system that allows all medical conditions and procedures to be converted into codes for analysis.

HIPE: Hospital In-Patient Enquiry database. A system that collects clinical and administrative information on patients each time they are admitted to a public hospital in Ireland.

Principal Diagnosis: The diagnosis established after study to be chiefly responsible for occasioning the episode of admitted patient care.

95% Confidence Interval: When a result has a high and low range attached, this range is called a confidence interval. There is a 95 per cent chance that the real result lies within this high and low range.

Statistically significant: A result is said to be statistically significant when the chance of it being true is equal to or greater than 95 per cent.

Age-sex standardised death rate (ASDR): This allows the death rate in one hospital or country to be compared against the death rate in another hospital or country. It takes into account the differences in age and sex between the different hospitals or countries.

Comorbidities: When there are two or more diseases existing at the same time in the body.

Introduction

This is the first annual report of the National Healthcare Quality Reporting System (NHQRS). The establishment of the NHQRS was announced in February 2014 by the Minister for Health as part of his commitment to the public reporting of quality indicators that reflect on the quality and safety of health care in Ireland.

Public reporting about the quality of health care helps to drive improvements in the quality of the care provided to patients. The NHQRS will report on health care quality using performance measures or indicators and report them at national, regional, and hospital level to allow for national and international comparison. Each year the Health Service Executive (HSE) publishes its service plan which includes a number of measures related to quality of care. However this information is primarily for performance management and, while published on the HSE website, is not presented in a format that is readily accessible to the public. The NHQRS annual report aims to provide information on the quality and safety of health care services that can be easily understood and used by patients, members of the public, policy makers and service providers to assist them in making informed decisions about their own health care and about health care services in Ireland.

In early 2015, the Minister for Health announced his priorities for the health system which included a focus on improving patient outcomes. The information selected for inclusion in the NHQRS is aligned with and supports decision making for these priority areas.

The report is presented in two sections:

- **Section 1:** sets out the background to quality reporting and the aims, objectives and governance structures of the NHQRS. It also sets out the framework, with the agreed quality domains, for national quality reporting. The indicators selected for the Annual Report 2014 are also described.
- **Section 2:** presents the indicator analysis for this annual report with each indicator presented under the relevant domain.

For each indicator the report sets out the rationale, and the findings. The presentation level can be at national level, regional/county level or hospital level depending on what is the most appropriate and informative level to present the data. Accompanying each indicator is text

which provides commentary on the findings, for example, if there are any variations at international, national, county or hospital level.

Who can use this report

This report has been designed so that the information presented is as accessible as possible to all audiences. There are a number of specifically intended audiences for this report however, the most important being patients, their families and the general public. Therefore, the information is presented so that patients and the public can access information about their own county, their local health services, and the hospitals they attend. The report sets out the information in user-friendly language. However it is recognised that the language reflects the health care services being reviewed and therefore, it is not always possible to use language that is free from technical terms.

The people providing the services are another important audience. Therefore, as well as at national level the information is presented at regional, local health area, hospital group and hospital level so they, the service providers, can see how their organisation or service is performing and allowing comparison to other similar services.

By presenting performance measures at national level and comparing with international measures, policy makers and service providers can compare the performance of Irish health services with health services in other countries. This information can be used to plan, monitor and drive service improvement at all levels, including national level. Importantly, this information can also be used to support evidence-based policy making.

How to use this report

The performance indicators selected for this first annual report reflect on the quality and performance of services across the health system but it is important that what they tell us is not over interpreted.

The indicators in this report are high level indicators that highlight the general direction and trend in relation to how services are performing over time. This is done by both comparing the service to itself and also comparing to other services both in Ireland and internationally. The indicators draw attention to issues that need further exploration and analysis. These

indicators are not intended to be direct measures of the quality of the services. Their value is that they provide an alert that further exploration and analysis is needed to determine if, and why, differences in the indicators exist and the causes of these differences. These indicators work rather like smoke alarms – the alarm attracts people's attention but to find out if there is an actual fire, what caused it and how to prevent it happening again, then further exploration is required.

Differences can be due to many reasons. For example, issues like the quality of the data collected, differences due to patients attending one service being more unwell with more complex needs than those attending other services, or differences related to the quality of the service provided. Indicators can also help to identify good practice from which other services can learn. If an analysis highlights variation in outcomes across health care services, for example, between counties or services then this needs to be further explored and addressed. This is so patients receive the same type and quality of care regardless of where they are in the country or which service they attend.

It is also important to remember that one indicator alone should not be used to measure whether an organisation or service is safe and providing quality care. A single measure or indicator cannot capture all aspects of the health care provided and the quality of that care. Therefore, indicators should not be used in isolation but rather used with other indicators to assess the quality of care being provided by a service or organisation. For this report a relatively small number of indicators were available and therefore, selected. However, it is important to note that in future annual reports, more quality indicators of different types will be included to provide a more comprehensive view of the quality of services being delivered.

This report provides the basis for a very important public discussion about the quality of health services in Ireland. The appropriate response to any reported differences in indicators is for the service providers to further explore and to explain the positive and negative findings. This may require more in depth analysis and evaluation to examine the differences and the underlying reasons for them.

One of the challenges in developing quality measures for the Irish health system has been that it is difficult to track a patient's journey through the health system as there is no unique patient identifier. However, this is being addressed through the Health Identifiers Act 2014,

which provides the legal basis for the development and introduction of unique patient identifiers in Ireland. Therefore, in the future it will be possible to track a patient's journey between services, for example, between hospital services and community services. This will make it possible to track a patient's health status as they move from one service to another.

To allow for international comparisons the findings for all of the indicators are presented at national level and compared, where relevant and available, with international findings. For many of the indicators this means comparison with other countries in the Organisation for Economic Cooperation and Development (OECD). However, it is important to note that there may be variation between countries in their coding practices, in the definitions used, and in the disease classification systems used. For example, Ireland uses the disease classification system ICD-10-AM whereas many other countries use ICD-9 based classifications. Therefore, these differences in coding practices among countries and differences in disease classification systems may affect data comparability between these countries. It is also important to note that, in using definitions that allow for international comparison, it is often necessary to use less detailed information than is available in Ireland. This results in some measures in this report being different to those used by the HSE.

Section 1:
National Healthcare Quality Reporting System

Chapter 1: Why a National Healthcare Quality Reporting System

1.1 Background

It is internationally accepted that for health services to provide high quality safe care they need to measure and monitor the quality of that care. They need to learn from good quality care and improve the quality if it falls below the expectations of patients, the public, policy makers, and the service providers themselves.

To drive improvements in the quality and safety of health care many countries have put in place systems for measuring, monitoring and publicly reporting on the performance of their health services. It is recognised that in health care, as in other arenas, it is difficult to improve what cannot, or is not, measured (1). The importance of measuring and comparing performance in delivering quality health care outcomes between countries has also been recognised and facilitated by the establishment of international quality reporting systems, for example the OECD Health Care Quality Indicators.

Such systems in other countries allow for the measuring, monitoring and public reporting on the quality of health care at regional, national and international level. They empower patients and service users to make informed decisions about their health care, help health care providers to improve their performance through benchmarking with other services, and they facilitate system-wide quality improvement in health care by informing national policies.

In Ireland large amounts of health data are collected through several information systems such as the Hospital Inpatient Enquiry System (HIPE), the National Cancer Registry of Ireland, and the Computerised Infectious Disease Reporting (CIDR). These information sources are used in various ways to measure, monitor and report on a number of health care related activities and outcomes. Indicators derived from these different information systems are used by the HSE through the service plan to monitor their performance on the quality of clinical care. However, these indicators have not previously been collated in a single report to

provide an overall picture of the quality of health care in Ireland with the key aim of informing patients and their families.

The Department of Health carried out an assessment of the feasibility of one of the largest health care information resources in Ireland, Hospital Inpatient Enquiry (HIPE), as a source for deriving quality indicators. This led to the publication of "Health Care Quality Indicators in the Irish Health System: Examining the Potential of Hospital Discharge Data using the Hospital Inpatient Enquiry System" in February 2014 (2). The report found that HIPE was a feasible source to derive quality indicators and it could be used in the future to monitor the quality of health care in Ireland.

At the time of publication of the above named report, the Minister for Health announced the establishment of the National Healthcare Quality Reporting System (NHQRS) for Ireland.

The Minister for Health, with the establishment of the NHQRS, committed to public reporting of information on the quality and safety of health care in Ireland. This is based on a commitment to openness, transparency, improving accountability within the health system and on an understanding that such public reporting of information on performance will help drive improvements in the quality of the care being delivered in the Irish health services.

This reporting system will publicly report indicators that reflect on the quality and safety of health care across the Irish health system and, wherever possible, will be aligned with evidence-based international practice and linked to international norms, e.g. OECD Health Care Quality Indicators.

1.2 Monitoring and reporting the quality of health care

Monitoring the quality of health care includes measuring the performance of a service against a standard or expected level of performance.

It is accepted that performance measurement contributes to improving the quality of health care. This happens in a number of ways:

- Firstly, it drives improvement by providing patients and service users with information about the quality of health care and the performance of services in

providing this care. Patients, service users, their families and members of the public can then make informed choices about their health care both at an individual level but also at population level. Engaging patients in this way drives improvement in outcomes for patients.

- Secondly, performance measurement supports improvement through comparing the performance of individuals, teams or organisations. This comparison can result in a desire to improve or maintain performance relative to others, thus improving quality and safety of services provided.
- Finally, it is recognised from research that professionals have an intrinsic desire to improve their performance when they are made aware, through performance measurement, that there is potential for improvement.

Therefore, the use of performance measures supports the improvement in the quality of health care including improving patient outcomes. One of the ways to measure performance is through the use of key performance indicators (KPIs). KPIs are specific and measurable elements of health care that can be used to assess quality of care (3). They are measures of performance, based on standards determined through evidence-based academic literature or through the consensus of experts when evidence is unavailable (3). They usually have specific targets and in this report agreed international or national targets associated with the selected indicators will be stated.

For the NHQRS it is important that the selected indicators measure performance in all the different sectors of health care such as services for preventative care, primary care, community care, and acute care.

It is accepted that performance indicators are alerts or flags to identify variations in performance that may require further exploration to determine the reason behind the variation. Indicators can also help to identify good practice from which learning can be used throughout the system. However, it must be noted that the international literature on performance indicators warns against using only one measure as an overall indicator of an organisation's performance and safety. For example, there are significant limitations in interpreting in-hospital mortality rates and hospital performance (4). Indicators should be assessed within the context in which care is delivered and should not be reviewed in isolation. Therefore, it is important that a range of indicators are used that reflect different aspects of a service's performance.

A reporting framework for the NHQRS has been developed that sets out in domains the high level patient focused outcomes that a high quality health care service should achieve. The selected indicators in these domains measure an aspect of care that contributes to the achievement of the domain.

Chapter 2: Governance of the National Healthcare Quality Reporting System

The development of the NHQRS and its governance structure was led by the Chief Medical Officer's (CMO) Office in the Department for Health.

2.1 Aim and Objectives of the National Healthcare Quality Reporting System

The overall aim of the National Healthcare Quality Reporting System (NHQRS) is to facilitate improvements in outcomes for patients by ensuring the provision of information on the quality of health care to support health care decision making by patients, policy makers and service providers.

This will be done through:

- providing and reporting information that is orientated towards outcomes that matter to patients,
- measuring and reporting on public health services performance,
- enabling informed accountability,
- supporting the dissemination of learning throughout the health system.

Objectives

The main objective of the reporting system is to provide publicly available information. This information can be used to compare performance at a national, regional and hospital level, as well as at international level, and can be used to hold the health system to account.

The reporting system will focus on outcomes for patients and service users and reflect the care they receive in the different sectors of the health system, including preventative care, primary and community care, and secondary and tertiary care provided in hospitals. It is intended that the outcomes will also be aligned with the life-course so that the measures reflect the quality of care provided from pre-natal through to end of life.

The objectives include the publication of an annual report. It is envisaged that the NHQRS and the selected indicators reported each year will evolve over time. The indicators selected for the first report were indicators that: were feasible, in that they were available and collected within the health system; there were agreed definitions for; reflect on different areas/domains of the health system and that were considered important to the people using

the system, the public, and the service providers. However, there are currently gaps in the availability of indicators. For example, there are no patient experience measures in this first report.

2.2 Governance Structures

A National Healthcare Quality Reporting System Governance Committee was established to provide oversight and advice on the strategic direction of the NHQRS, agree the selected indicators, including definitions and metadata for inclusion in the NHQRS, and prepare and present an annual report to the Minister for Health. The committee members also provide leadership in relation to the NHQRS within their own organisations.

The membership of this governance committee includes representation of patients, clinicians, the Acute Hospitals Division, Health and Wellbeing Division, the Quality Improvement Division and the Clinical Care and Strategy Programme of the HSE; the Acute Hospitals Unit and the Information Unit, Department of Health; the State Claims Agency; the Health Information and Quality Authority (HIQA); the Mental Health Commission and the acute Voluntary Hospitals (see Appendix 1).

The committee agreed the Framework for the National Healthcare Quality Reporting System (NHQRS) and the selected indicators presented in this first annual report.

Chapter 3: Framework for National Healthcare Quality Reporting

In developing the NHQRS it was important to describe the high level patient focused outcomes that a high quality health care service should deliver. These outcomes are described as quality domains. These domains and dimensions of quality are informed by international evidence of what quality health care looks like as well as the description given in the National Standards for Safer Better Healthcare (5). The domains and quality dimensions are also informed by outcomes used in reporting systems in other jurisdictions including the NHS Outcomes Framework (6), the Agency for Healthcare Research and Quality (AHRQ) (7), the Swedish Regional Comparisons (8), and the OECD framework for health system performance assessment (9). Internationally quality dimensions are used to describe high quality care. Examples of the commonly used quality dimensions are effective care, person-centred care and/or safe care. Indicators under the Framework's domains will also reflect these quality dimensions. For example indicators under domain 5 will also reflect the quality dimension of safe care and indicators in the first three domains of the Framework will mainly reflect the quality dimension of effective care.

Framework for National Healthcare Quality Reporting System
Domain 1: Helping people to stay healthy and well
Domain 2: Supporting people with long term conditions
Domain 3: Helping people when they are being treated and cared for in our health services
Domain 4: Supporting people to have positive experiences of health care
Domain 5: Treating and caring for people in a safe environment

Chapter 4: Indicators selected for the Annual Report 2014

4.1 Selection process for indicators

A process was undertaken to select the indicators for the first annual report. The selection process took into account that this is the first annual report and that the NHQRS will evolve over time as more high quality information is collected, and as it becomes more embedded in the health system. It was agreed by the governance committee that the criteria for the selection of the cohort of indicators for the first annual report were:

- availability of data in the Irish health system,
- alignment to international indicators to allow for international comparison,
- face validity of each indicator, i.e. sound clinical or scientific rationale for its use and measurement of an important aspect of quality that may be within the control of the provider or health care system
- a focus on patient outcomes, patient safety and patient care
- importance to patients
- contribution to service improvement and cost efficiencies
- alignment with the domains of the NHQRS framework

The indicators selected took cognisance of the important factors for key performance indicators as outlined in the Health Information and Quality Authority's (HIQA), *Guidelines on Developing of Key Performance Indicators and Minimum Data Sets to Monitor Healthcare Quality (3).*

These selected and reported indicators can inform and support the health care decisions of individual patients and also the decisions of service providers in designing, planning and delivering health care.

Patient experience is internationally recognised as an important measure of the quality of health services. Research has associated positive patient experience with improved outcomes for patients (10). Internationally, there are many methods of measuring patient experience and in Ireland, there have been a number of patient experience surveys carried out with the most recent national survey carried out in 2010 (www.isqsh.ie accessed 20 January 2015). A number of ad hoc surveys have been carried out in some hospitals at a local level. However, a

standardised approach is not being used at present in all services provided by the HSE and so comparison and validation of these surveys is challenging. Therefore, an indicator under the domain "Supporting people to have positive experiences of health care" is not included in the annual report 2014.

In measuring the quality of care across health services, it is important that any measures cover not just acute care, but the other aspects of care, including staying healthy, getting better, and living with illness or disability and that the care and services provided to patients is person centred and delivered in a safe environment. However, for the first annual report it was agreed that the main focus would be on monitoring and reporting performance measures in the Acute Hospital sector.

In this first report adverse events have not been included in the selected indicators under domain 5 "Treating and caring for people in a safe environment". This is because the data and information relating to these events has not been yet fully developed and agreed at a national level.

4.2 Domains and selected indicators

Table 1: Indicators in the Annual Report 2014

Domain	Indicator
1. Helping people to stay healthy and well	**Immunisation rates** Immunisation rate for MMR at 24 months of age Immunisation rate for Men C at 24 months of age Immunisation against influenza for persons aged 65 years and older with medical cards **Cancer screening rates** Percentage uptake of breast screening Percentage uptake of cervical screening
2. Supporting people with long term conditions	**Ambulatory care sensitive conditions** Chronic obstructive pulmonary disease (COPD) hospitalisation rates Asthma hospitalisation rates Diabetes hospitalisation rates
3. Helping people when they are being treated and cared for in our health services	**Cancer survival rates** Five year relative survival rate for breast cancer Five year relative survival rate for cervical cancer Five year relative survival rate for colorectal cancer **Acute hospital care** In-hospital mortality within 30 days of admission for acute myocardial infarction (AMI / heart attack) In-hospital mortality within 30 days of admission for haemorrhagic stroke In-hospital mortality within 30 days of admission for ischaemic stroke In-hospital waiting time for hip fracture surgery Caesarean section rates
4. Supporting people to have positive experiences of health care	**Indicators to be developed for reporting in Annual Report 2015**
5. Treating and caring for people in a safe environment	**Health care associated infection rates** Methicillin Resistant Staphylococcal Aureus (MRSA) rates Clostridium Difficile (*C. difficile*) rates

Each domain is populated with a number of indicators. The exception is Domain 4: 'Supporting people to have positive experiences of health care'. For this domain there is currently no standardised methodology being used to collect data in the health system and therefore, this indicator is not included in the report. However, this is a recognised gap and is an issue that will be further explored by the NHQRS Governance Group with the intention of

reporting an appropriate indicator in the next annual report. The rationale for the selected indicators and indicator groups in each domain is set out below.

4.3 Rationale for selected indicators

The indicators included in this report are ones that meet the selection criteria set out in section 4.1.

This section sets out why the selected indicators are important and which domains they sit under.

Domain 1: Helping people to stay healthy and well

- ***Immunisation rates***
- ***Cancer screening rates***

Immunisation Rates

Immunisation (getting a vaccine and becoming immune) is a simple and safe way of protecting people against harmful diseases such as diphtheria, whooping cough, polio, measles, mumps and rubella. These diseases can cause serious illness and complications such as long term disability and death. Getting immunised also protects other individuals in the community from these diseases who are either too young or too sick to receive the vaccines. Therefore, many countries including Ireland have introduced immunisation programmes for their populations.

This report focuses on two of the childhood vaccines, MMR (measles, mumps and rubella) and Men C (meningococcal C). Both of these vaccines have had issues in relation to their uptake. The MMR vaccine uptake has varied over the years and this may have contributed to a number of outbreaks of measles, mumps and rubella over time and there was a sharp drop in uptake for Men C.

Influenza vaccine is recommended for anyone aged 6 months or older in specific at-risk groups including adults over the age of 65 years. This is because people with chronic

medical conditions or aged over 65 years are more likely to become seriously ill with influenza which can also lead to increased hospital admissions.

MMR, Men C and Influenza vaccine uptake rates provide information on the performance of immunisation programmes in Ireland.

Cancer Screening Rates

Screening for cancer helps prevent significant illness and death by detecting cancer at an earlier and therefore, more treatable stage. In Ireland there are screening programmes for breast, cervical and colorectal cancers. Many countries monitor cancer screening uptake rates as they are an important measure of the performance and quality of preventative services and early detection. Public reporting of the rates also increases awareness and knowledge of these cancers in the population.

In this report the cancer screening rates for breast and cervical cancers are included. The colorectal cancer screening programme commenced in 2012 but, as it was a phased programme, its screening rates are not included.

Breast cancer is the most common form of cancer in women, with the exception of non-melanoma skin cancer (www.ncri.ie. accessed 23rd January 2015). One in nine women will develop breast cancer at some point in their life. BreastCheck is the national breast cancer screening programme which offers women aged 50 to 64 years a free mammogram every two years. The uptake target is 70% of the eligible population. Again, excluding non-melanoma skin cancer, cervical cancer is the 8th most common cancer (www.ncri.ie. accessed 23rd January 2015), diagnosed among women in Ireland and its incidence has increased between 2001 and 2011. The main cause of cervical cancer is sexual exposure to the human papilloma virus (HPV). CervicalCheck is the national cervical screening programme in Ireland and provides free smear tests to women aged 25-60 years. The target for coverage is 80% of the eligible population.

The screening rates for both the breast and cervical cancer programmes are presented in this report and are a reflection of the quality of preventative services available in Ireland.

Domain 2: Supporting People with Long Term Conditions

- *Ambulatory care sensitive conditions*

Ambulatory care sensitive conditions

Ambulatory care sensitive conditions are those where good quality primary care can help prevent the need for hospital admission or for which early intervention can prevent complications or more severe disease. Data which shows the number of hospitalisations for different chronic conditions can give an insight into the performance and quality of services for these conditions in primary care. Avoiding hospital admissions is of benefit to the patient and the health service.

Asthma, chronic obstructive pulmonary disease (COPD), and diabetes are three relatively common conditions in Ireland and hospital admissions due to these conditions are presented in this report. The treatment guidelines for these conditions are well established and suggest that most of it can be delivered at primary care level in the community.

It is important to remember that the number of hospital admissions for ambulatory care sensitive conditions is also dependent on prevalence of the medical condition in the area, environmental conditions, and primary care access to diagnostic tests such as X-rays.

While the need to go to hospital for these conditions will never be eliminated, differences between Ireland and other countries, and between counties in Ireland, indicate that there may be potential to improve the consistency of the care provided to these patients specifically in primary care. Indicators measuring hospital admissions for specific conditions are alerts rather than definitive measures of the quality of primary care services and only highlight the need for further analysis.

Domain 3: Helping people when they are being treated and cared for in our health services

- *Cancer Survival Rates*
- *In-hospital Mortality Rates*
- *In-hospital Waiting Time for Hip Fracture Surgery*
- *Caesarean Section Rates*

Cancer Survival Rates

Cancer survival is one of the key measures of the effectiveness of cancer care, taking into account both early detection of the disease and the effectiveness of treatment. A recent OECD report on cancer care showed that organised screening programmes for specific cancers, shorter waiting times, and the provision of evidence-based treatment were associated with improved survival (11).

Cancer survival rates are reported by the OECD. In this first annual report, survival rates for breast, cervical, and colorectal cancers are compared between Ireland and other OECD countries and also between regions of Ireland.

In-hospital Mortality Rates

International experts consider in-hospital mortality rates to be useful high level indicators of the quality of hospital care when used in association with other measures of quality of care (12). Therefore, in this report in-hospital mortality indicators for acute myocardial infarction (AMI), haemorrhagic stroke, and ischaemic stroke are included. They are calculated using the OECD specifications to allow for comparison between countries. However, it must be noted that there are limitations associated with these three mortality indicators and this is discussed in the relevant section.

In-hospital Waiting Time for Hip Fracture Surgery

The Irish population is growing older. This results in more people having weaker bones (osteoporosis) and an increasing number of hip fractures. Generally, a short time between admission to hospital and performance of hip fracture surgery results in better outcomes for patients such as reduced length of stay in hospital. There can be many reasons for delays in performing hip fracture surgery, for example, the patient being too sick for surgery, but it can

also be due to avoidable administrative reasons. Therefore, an indicator on time to hip fracture surgery is used internationally as a measure of quality and is included in this report.

Caesarean Section Rates

The proportion of live births delivered by caesarean section has increased across the OECD with the average rate going up from 20% in 2000 to 27% in 2011. Some of the reasons proposed for this include, but are not limited to, increasing litigation, increases in first births among older women, and the rise in multiple births resulting from assisted reproduction. Most experts agree that high caesarean section rates are associated with increased maternal deaths, maternal and infant morbidity, and increased complications for subsequent pregnancies (13, 14). High caesarean section rates also have a greater financial cost for health services and there is some discussion about whether they are medically required. Most professional associations of obstetricians and gynaecologists encourage the promotion of normal childbirth without interventions such as caesarean sections (15). Internationally, the rate of caesarean sections is considered an important measure of the quality of maternity services and is therefore, publicly reported. Caesarean section rates for relevant hospitals in Ireland are included in this report.

Domain 4: Supporting people to have a positive experience of health care

There are no indicators in this domain for the first annual report, but it is intended that appropriate indicators will be developed for inclusion in future annual reports.

Domain 5: Treating and caring for people in a safe environment

- ***Health Care Associated Infections***

Health Care Associated Infections

Health care associated infections (HCAIs) are infections people catch while they are receiving treatment for another condition in a health care setting. This is most frequently while in hospital, but can also happen in the community. Most common health care associated infections only cause a minor illness. However, some health care associated infections can cause serious illnesses, such as blood infections. About one third of health care associated infections can be prevented by good hand-hygiene and appropriate care when dealing with patients. The reduction in the number of patients who acquire HCAIs is recognised as a measure of the quality and safety of care provided and therefore rates of HCAIs are included in this report.

Chapter 5: Future Developments of the National Healthcare Quality Reporting System

This is the first NHQRS annual report. Since the announcement of the NHQRS in February 2014, a governance structure and the framework with domains and selection criteria for selecting indicators for the first NHQRS annual report has been developed and agreed.

This annual report sets out the first cohort of indicators selected for public reporting under the NHQRS framework. In selecting these domains and indicators gaps have been identified – specifically in relation to national indicators with a standardised approach for measuring patient experience. As patient experience indicators are important measures of the quality of the health care delivered by a health system, the intention is that over the next year these indicators, reflecting different services, for example, palliative care and end of life services, will be developed so that they can be included in the NHQRS Annual Report 2015.

The presentation of some of the other indicators will be further explored and developed in the coming years. In the future, data may be presented in different ways to inform planning and policy development. For example, reporting cancer screening rates at a regional level, and reporting caesarean section rates for different groups of patients, such as first time mothers. Indicators in other domains will be continuously reviewed and developed so that future reports will more comprehensively reflect the performance of health services in delivering high quality safe health care.

The gaps identified in this report in the data and information required for a complete picture of the quality of Irish health services, highlight the need for a focus on developing and improving good quality health information resources in Ireland.

Section 2:
Indicator Analysis

Overview of Analysis

Each of the indicators presented in this report are set out to provide certain information. Each indicator is presented as a national trend, usually as a ten year trend where possible so that the national picture is clear. Each indicator is also compared, where information is available, with other countries so that Ireland's performance can be compared internationally.

The indicators are then, again where data is available, presented at regional and local and, in some cases, hospital level, to give a clear picture of regional and local variations.

It must be noted that for some of the indicators, age and sex were taken into account in the analysis so that they can be compared with the national average. As part of the age-sex standardisation adjustment, 95% confidence limits were calculated. If these resulting confidence intervals are outside the expected range they are statistically significant. This requires further exploration to determine the reason behind this variation. The fact that a rate is statistically significant does not mean that there is a difference in quality of care, either good or bad, but just suggests that this is different than the expected, and that the reasons must be looked into.

The source of data and information for each of the indicators has been referred to under each indicator. The analysis presented in this report was carried out by the Information Unit of the Department of Health, but also by various agencies, including the National Cancer Registry of Ireland, the Health Protection Surveillance Centre and the National Cancer Screening Service, depending on the indicator selected.

Domain 1: Helping people to stay healthy and well

- *Immunisation rates*
- *Cancer screening rates*

Immunisation rates

Immunisation rates for MMR vaccine at 24 months

Description

Percentage of children who have received the MMR (measles, mumps and rubella) vaccine at 24 months of age.

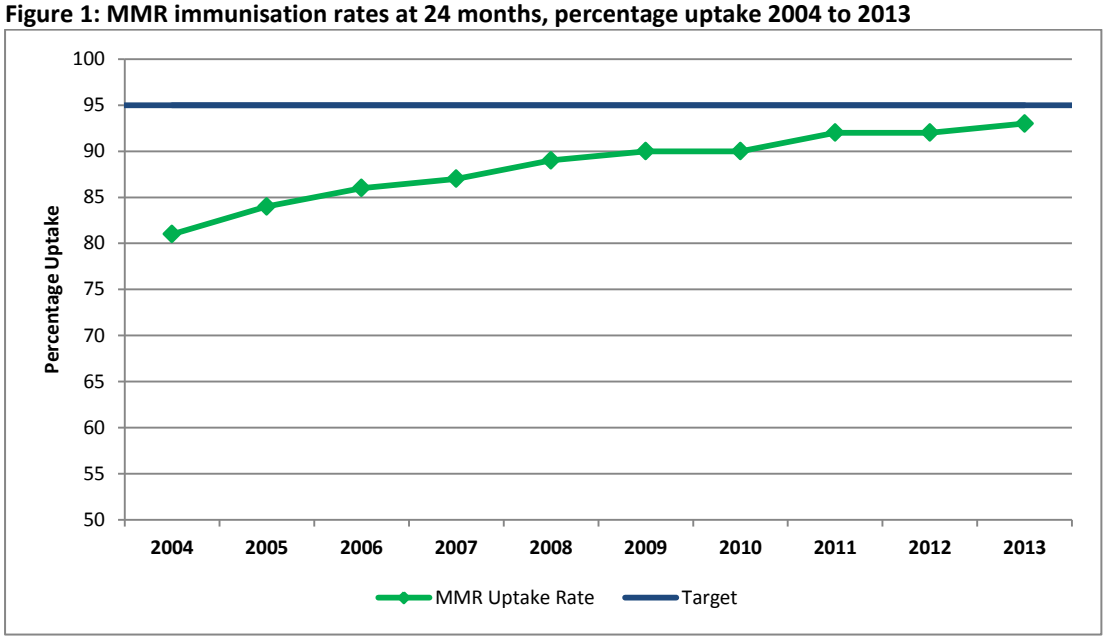
Rationale for selection of indicator

Measles, mumps and rubella were once high infectious common viral childhood diseases, which can cause serious complications and even death. In Ireland, two doses of MMR vaccine are given, the first dose at 12 months and the second dose at 4-5 years of age (16). However, there have been a number of outbreaks of measles and mumps in the last few years in Ireland and it is suggested that this may be due to decreases in vaccination rates following media scares about the safety of the MMR vaccine. These safety concerns have since been refuted, but there may still be population groups that are not reaching the vaccination rate required for community protection. Therefore, the national vaccination rate for MMR over the last ten years and the regional vaccination rates are presented in this report. In Ireland, the national target for uptake is 95% which is in line with international targets.

Commentary

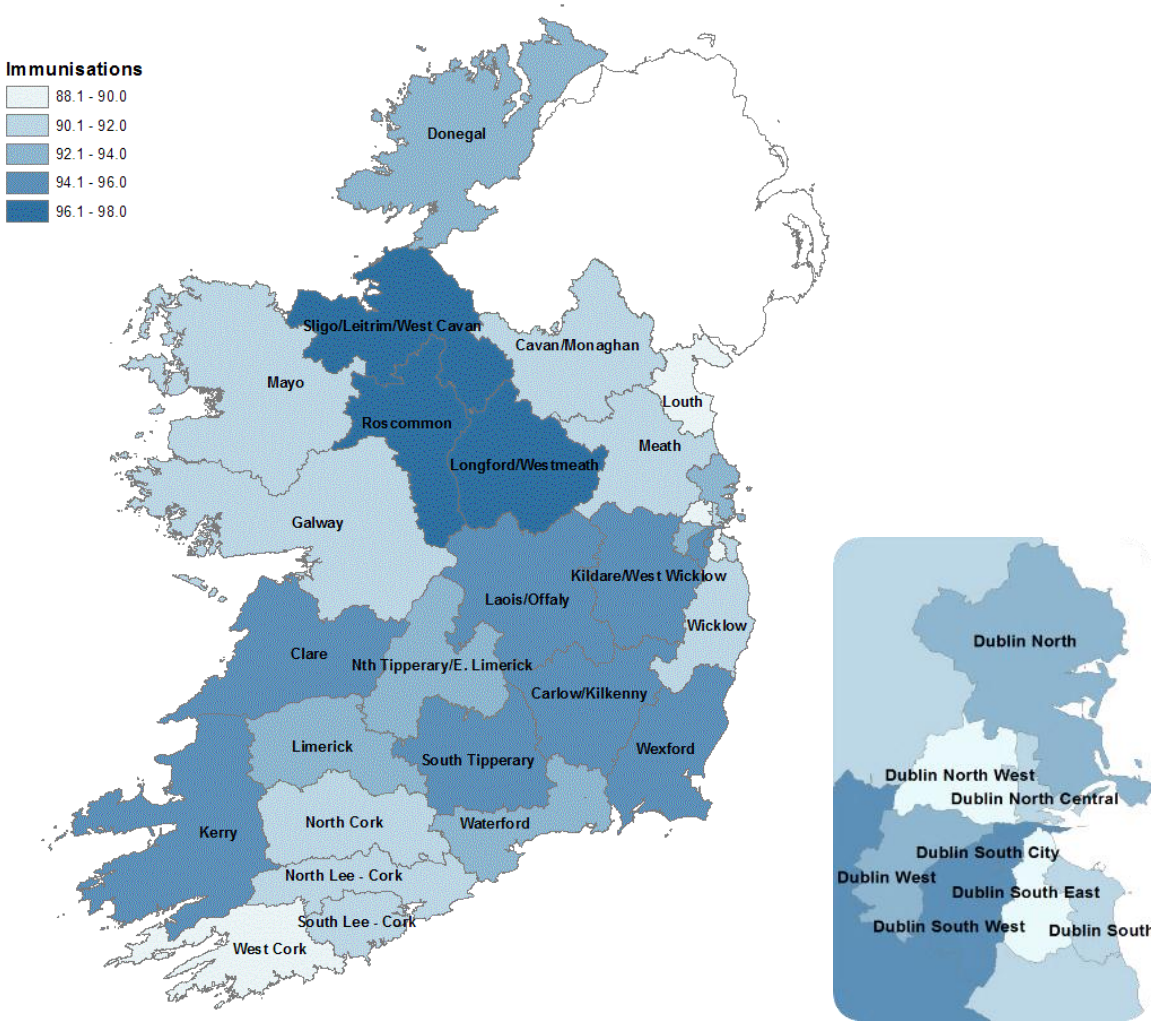
- Figure 1 shows the national immunisation uptake rates of MMR for children at 24 months of age from 2004 to 2013. Although the national target of 95% has not been achieved, the national immunisation rate has been increasing over the 10 year period with a rate of 93% in 2013.
- Figure 2 shows the immunisation rate for MMR at 24 months by local health office in 2013. The map shows that all counties had uptake rates greater than 88%. Roscommon local health office had the highest uptake in 2013, with 97.6% of children receiving the vaccine. The map shows different levels of MMR vaccine uptake across the country. The reasons why some areas have lower uptake than others needs further exploration.

Figure 1: MMR immunisation rates at 24 months, percentage uptake 2004 to 2013



Source: Health Protection Surveillance Centre (HPSC)

Figure 2: Immunisation rate for MMR for children at 24 months by Local Health Office, 2013



Source: Health Protection Surveillance Centre (HPSC)

Immunisation rate for Meningococcal C vaccine for children at 24 months

Description

Percentage of children who have received 3rd dose of Men C (Meningococcal C) vaccine by 24 months of age.

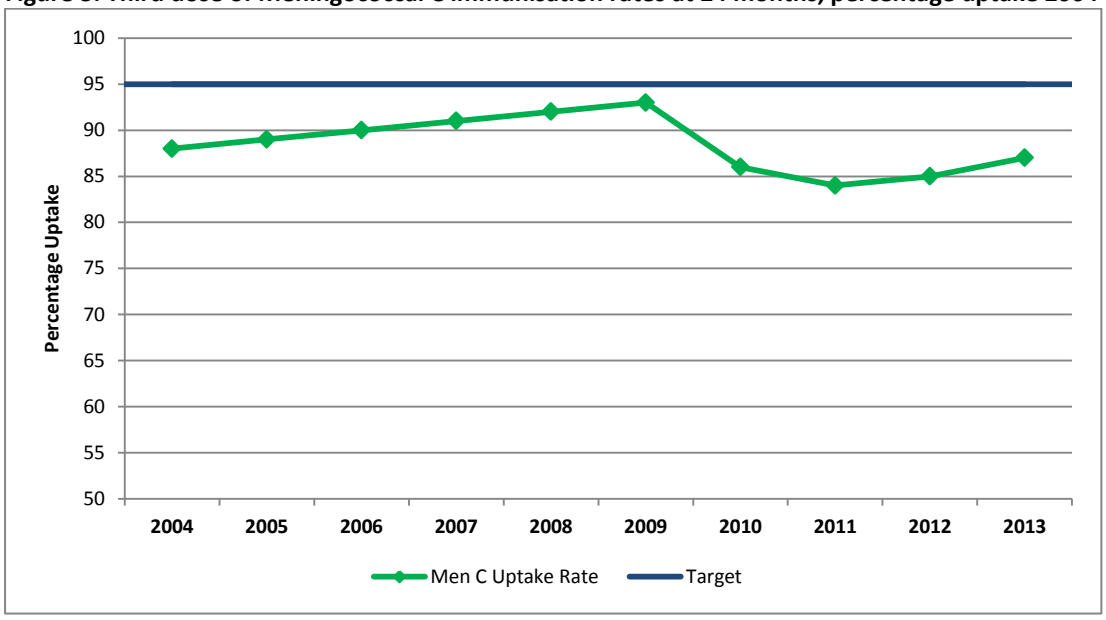
Rationale for selection of indicator

Meningococcal C is an infectious bacteria that can causes meningitis or septicaemia (blood infection), or both. The disease can cause death or serious disability such as deafness, brain damage, or loss of limbs. The meningococcal group C vaccine (Men C) was introduced in Ireland in October 2000. The current vaccine schedule in Ireland is three doses of Men C vaccine at 4 months, 6 months and 13 months of age. (17). In Ireland the national target for uptake is 95%, which is in line with international targets.

Commentary

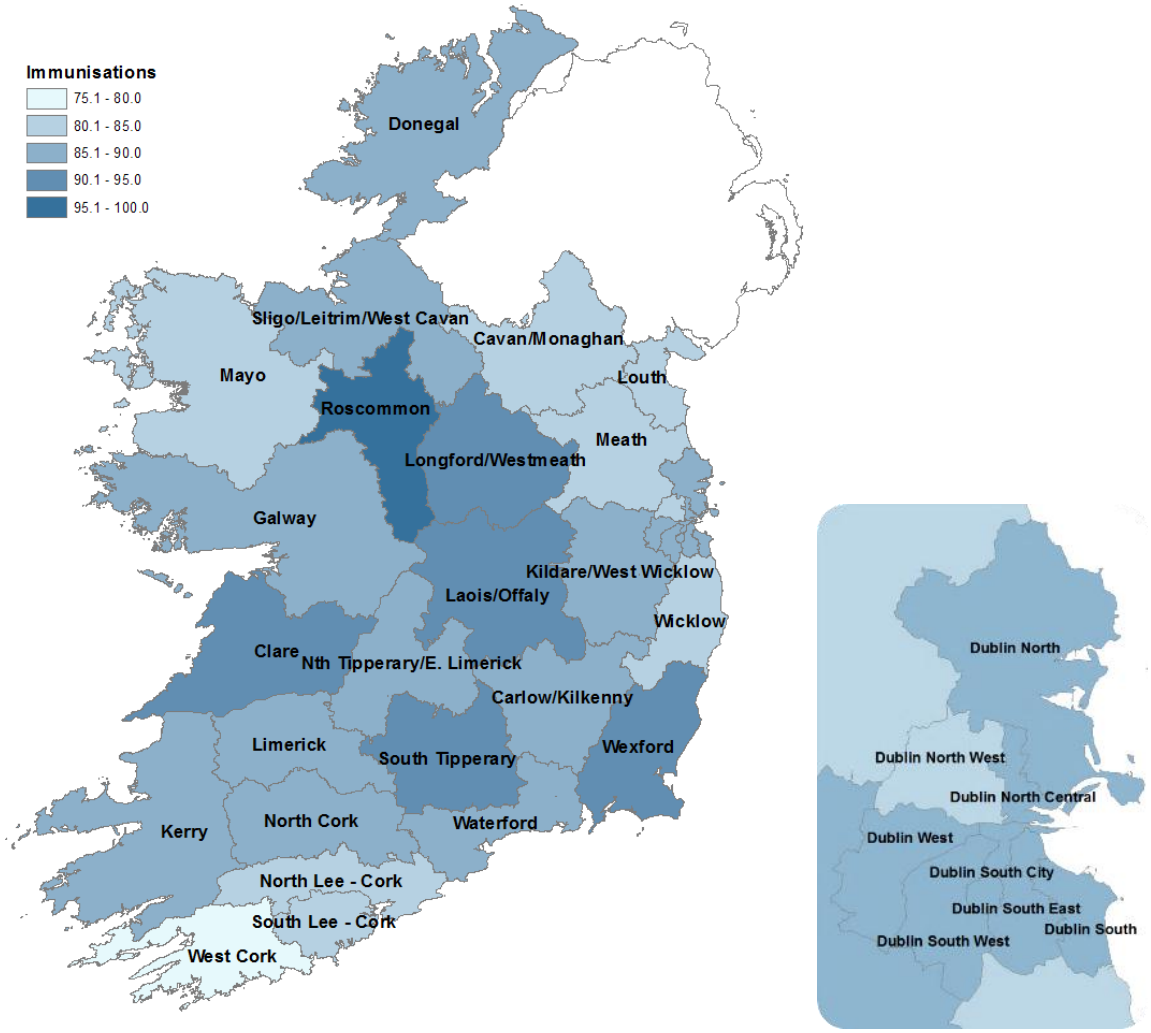
- Figure 3 shows the third dose of Men C vaccine uptake rates of children of 24 months of age at national level for 2004 to 2013. This shows the uptake rates steadily increasing to a peak of 93% in 2009 after which there was a break in the trend. However, the uptake level has increased again in the last few years with 87% of children receiving the vaccine in 2013.
- In September 2008, the childhood immunisation schedule was changed resulting in a change of timing for giving the Men C vaccination. This meant an additional visit to the GP at 13 months of age. In 2010, there was a large decline in reported uptake of the third dose of Men C. This affected children on the new schedule. Research showed that most parents did not know their children were incompletely vaccinated and were unaware of the need for a 13th month visit to the GP. In response to the decrease in uptake, this information was communicated to GPs and updated information materials were developed for parents (18) and subsequently immunisation rates increased again.
- Figure 4 shows the uptake rate for Men C vaccine at 24 months by local health office in 2013. Roscommon had the highest uptake and West Cork had the lowest uptake rate in 2013. The reasons for variation across the country in third dose Men C vaccine uptake needs to be further explored.

Figure 3: Third dose of Meningococcal C immunisation rates at 24 months, percentage uptake 2004 to 2013



Source: Health Protection Surveillance Centre (HPSC)

Figure 4: Immunisation rate for Men C for children at 24 months by Local Health Office, 2013



Source: Health Protection Surveillance Centre (HPSC)

Immunisation against influenza for persons aged 65 and older with medical or GP only cards

Description

Percentage of people over the age of 65 years with a medical card or GP visit card, who have been vaccinated against influenza.

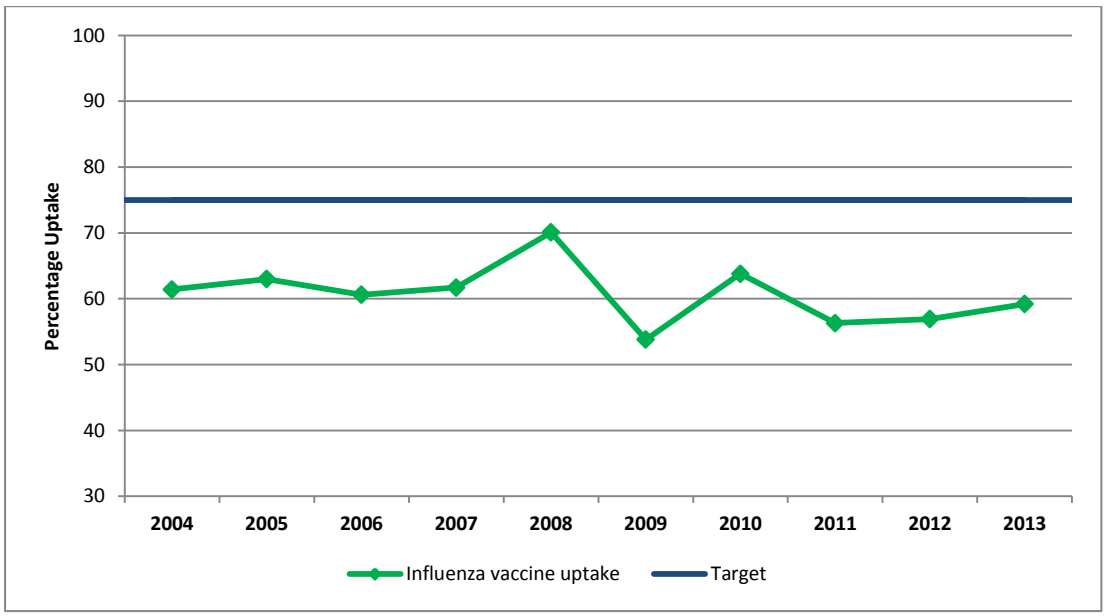
Rationale for selection of indicator

Influenza is a common infectious disease that affects between 5% and 15% of the population each year (19). Most people with the illness recover quickly, but elderly people and those with chronic medical conditions are at higher risk of complications and even death. Influenza can also have a major impact on health services particularly during the winter season. Vaccines provide a safe way of preventing influenza and have been shown to reduce the risk of death by up to 55% among healthy older adults as well as reduce the risk of hospitalisation by between 32% and 49% among older adults (20, 21). In 2003, countries participating in the World Health Assembly, including Ireland, committed to the goal of attaining vaccination coverage of the elderly population of at least 50% by 2006 and 75% by 2010 (22). In Ireland the target for influenza vaccination in the population group aged 65 years and older is 75%.

Commentary

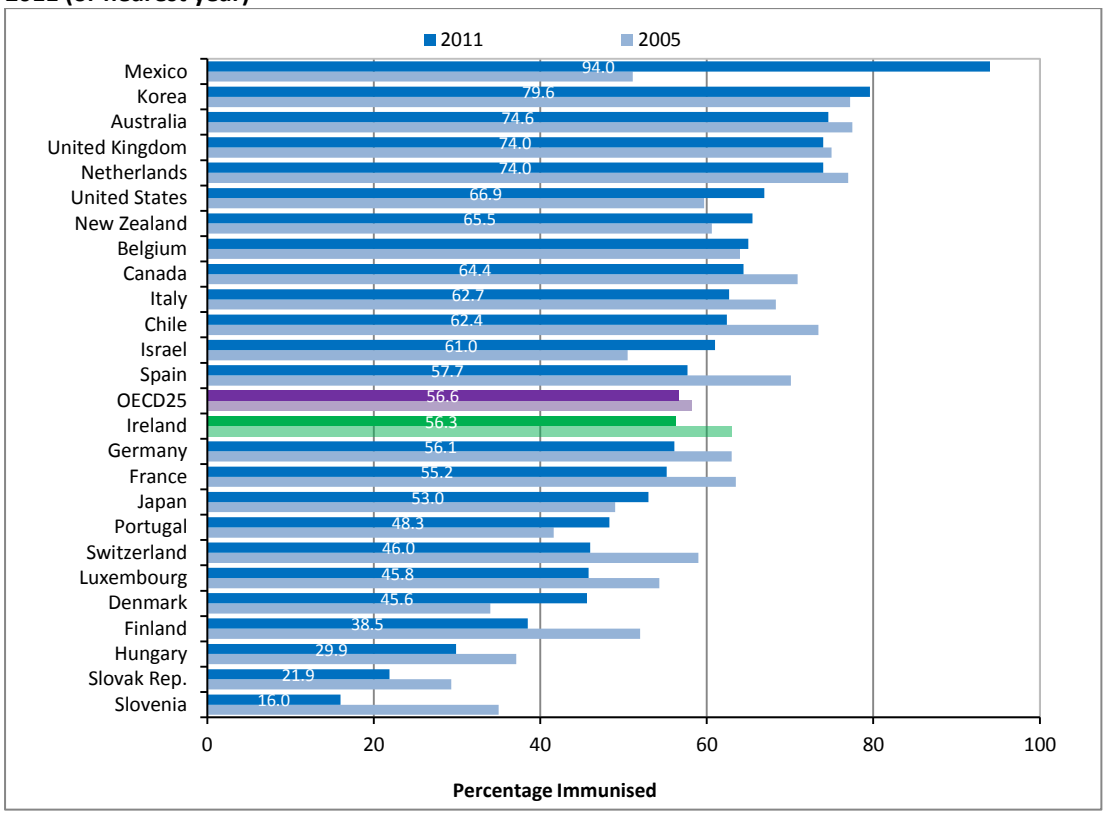
- Figure 5 shows the national trend over the last ten years since 2004. This data shows that although the target of 75% has not been reached, there was a peak in 2008 at 70% followed by a reduction. Since 2011 rates have increased. (Data for 2013 are provisional and data for 2014 were not available at time of publication).
- Figure 6 shows Irelands uptake is below the average for OECD countries.

Figure 5: Immunisation against influenza in medical card and GP visit card holders aged 65 and over, Ireland, 2004-2013



Source: Health Protection Surveillance Centre (HPSC)
Notes: Data for 2013 are provisional.
Data for 2013 refers to the 2013/2014 influenza season, 2012 refer to the 2012/2013 influenza season etc.

Figure 6: Immunisation against influenza, population aged 65 and over for selected OECD countries, 2005 & 2011 (or nearest year)



Source: OECD Health Statistics
Note on international comparability: The main limitation in terms of data comparability arises from the use of different data sources, whether survey or programme, which are susceptible to different types of errors and biases. For example, data from population surveys may reflect some variation due to recall errors and irregularity of administration.

Cancer Screening Rates

Screening rate for breast cancer

Description
Percentage uptake of breast screening in Ireland by eligible* women in the population between 2004 - 2013

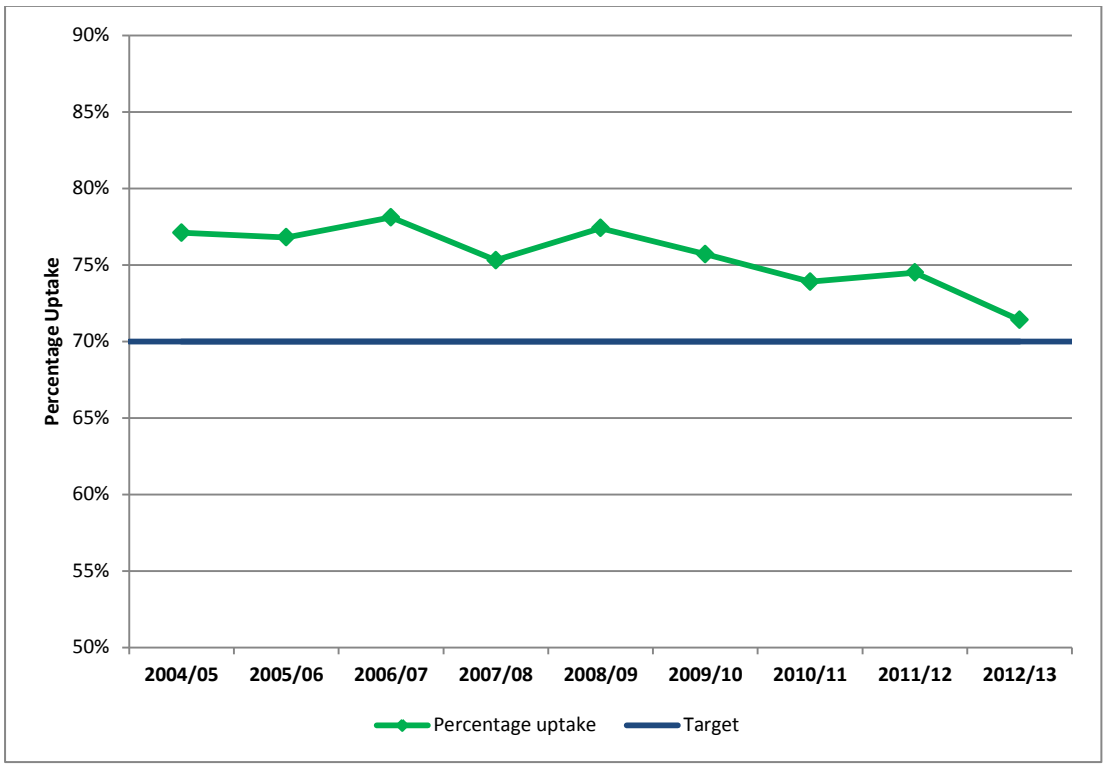
Rationale for selection of indicator
Breast cancer is the most common form of cancer in women. One in nine women will develop breast cancer at some point in their life and one in thirty will die from the disease.

In Ireland "BreastCheck" invites women between the ages of 50 and 65 years (age range extending to 69 years in 2015) for a mammogram every two years. The target uptake rate in Ireland is 70%.

Commentary

- The uptake of breast screening by those eligible has remained above the target of 70%. However, there has been a decline over the last number of years (Figure 7). The reason for this downward trend needs to be further explored.
- Figure 8 shows that Ireland's rate of uptake for breast screening is higher than the OECD20 average. However, it should be noted that there may be differences in scheduling and eligibility for breast screening programmes in different countries and this needs to be taken into account in comparing uptake levels for screening programmes.

Figure 7: Percentage uptake of breast screening of the eligible* population, Ireland, 2004-2013

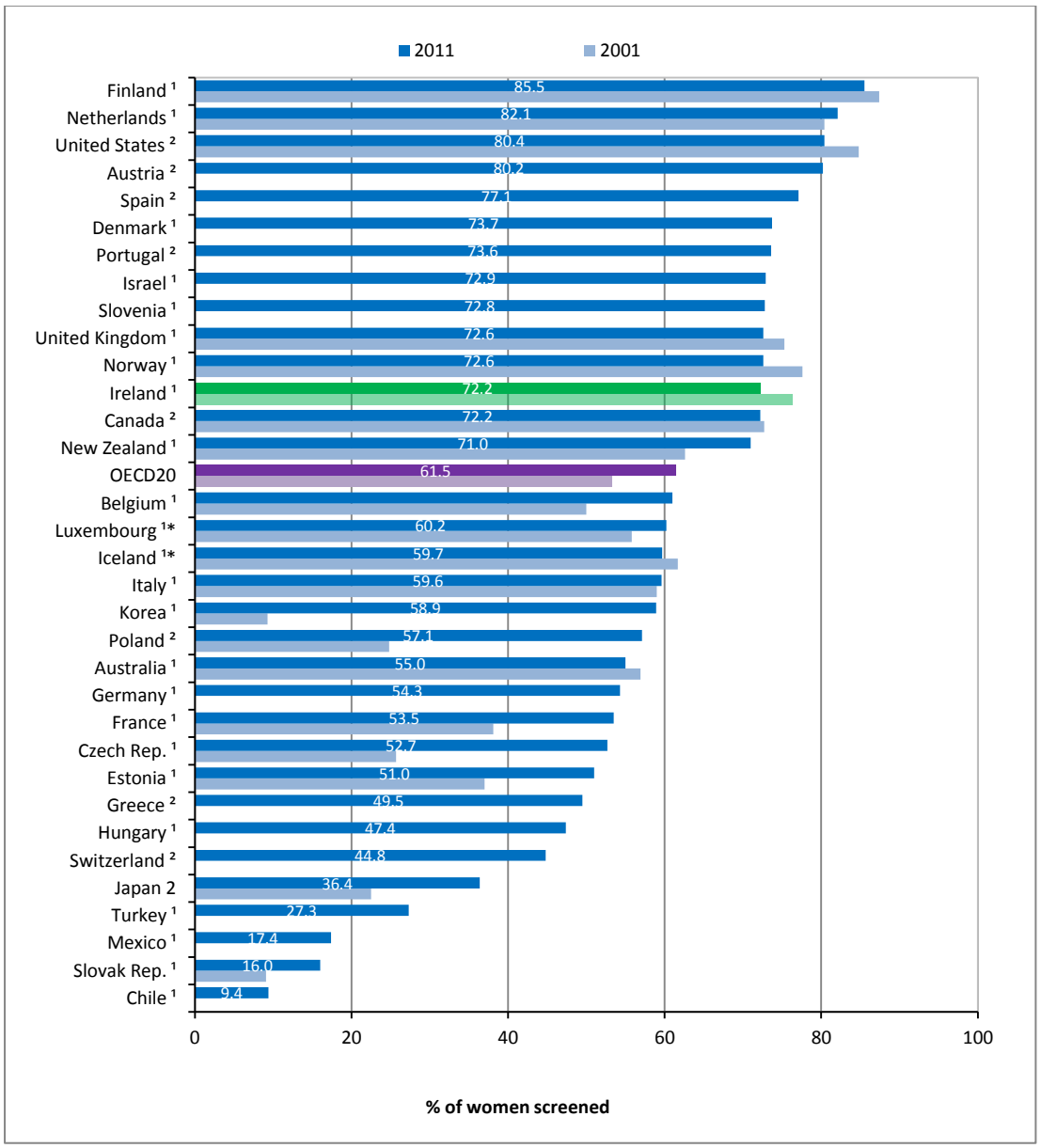


Source: National Screening Service

Notes:

* The eligible population refers to the known target population (women of screening age that are known to the programme) less those women excluded or suspended by the programme based on certain eligibility criteria. See Appendix 3 for further details.

Figure 8: Breast screening in women aged 50 – 69 in OECD countries, 2001 & 2011 (or nearest year)



Source: OECD Health Statistics

1. Programme, 2. Survey, * Three-year average

Note on international comparability: Screening rates reflect the proportion of women who are eligible for a screening test and actually receive the test. Some countries ascertain screening based on surveys and other based on encounter data, which may influence the results. Survey-based results may be affected by recall bias. Programme data are often calculated for monitoring national screening programmes, and differences in target population and screening frequency may also lead to variations in screening coverage across countries.

Screening rate for cervical cancer

Description

The proportion of the eligible population in Ireland who had a satisfactory smear test within a five year time period.

Rationale for selection of indicator

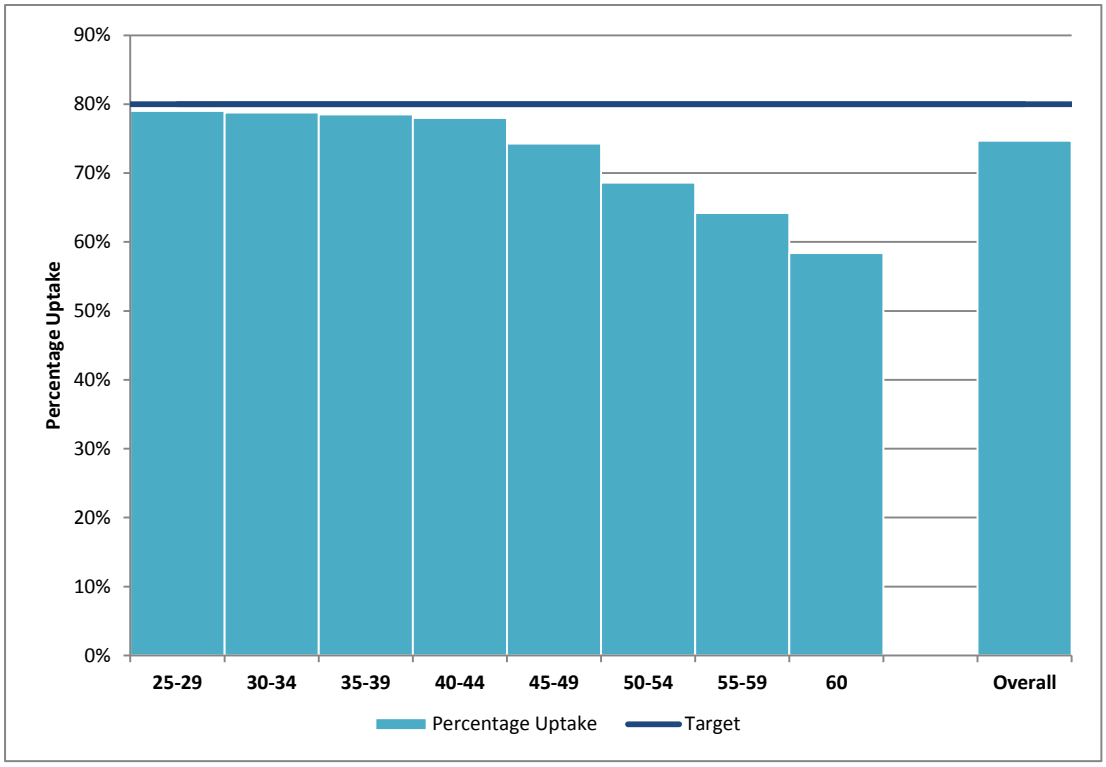
Cervical cancer is highly preventable if pre-cancerous changes are detected and treated before progression occurs.

In Ireland all women aged 25-60 years are able to avail of CervicalCheck. The programme operates both an invitation entry system whereby eligible women received an invitation letter and "direct entry" whereby a woman can be screened by a smear taker (GP). CervicalCheck aims to reach a target five year coverage of 80%. In the first five years of the programme between 1st September 2008 and 31st August 2013, 331 790 women attended screening.

Commentary

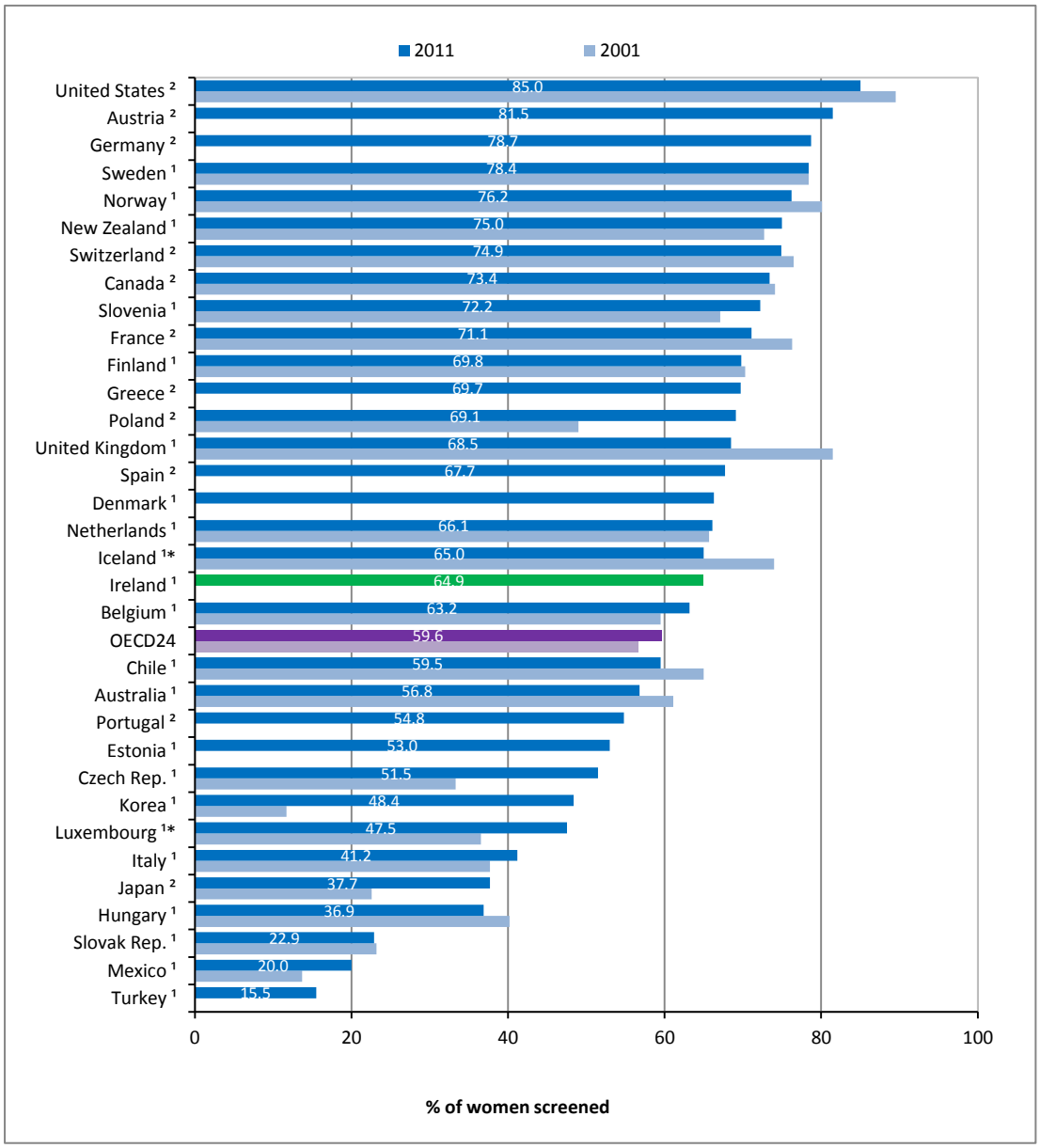
- The coverage of CervicalCheck in the first five years was 75% (2008-2013). Coverage by age group is shown in Figure 9 which shows higher coverage in the younger compared to the older age groups.
- Figure 10 shows that Ireland's rate of uptake for cervical screening is higher than the OECD24 average. However, it should be noted that there may be differences in scheduling and eligibility for cervical screening programmes in different countries and this needs to be taken into account in comparing uptake levels for screening programmes.

Figure 9: The coverage in the first five years of the cervical screening programme in Ireland by age group, 01/09/2008-31/08/2013



Source: National Screening Service

Figure 10: Cervical screening in women aged 20 – 69 in OECD countries, 2001 & 2011 (or nearest year)



Source: OECD Health Statistics

1. Programme, 2. Survey, * Three-year average

Note on international comparability: Screening rates reflect the proportion of women who are eligible for a screening test and actually receive the test. Some countries ascertain screening based on surveys and other based on encounter data, which may influence the results. Survey-based results may be affected by recall bias. Programme data are often calculated for monitoring national screening programmes, and differences in target population and screening frequency may also lead to variations in screening coverage across countries.

Domain 2: Supporting People with Long Term Conditions

Ambulatory Care Sensitive Conditions

- ***COPD hospitalisation rates***
- ***Asthma hospitalisation rates***
- ***Diabetes hospitalisation rates***

COPD Hospitalisation Rates

Description
The age and sex standardised rate of hospitalisations of people aged 15 years and older with a principal diagnosis of COPD per 100,000 population.

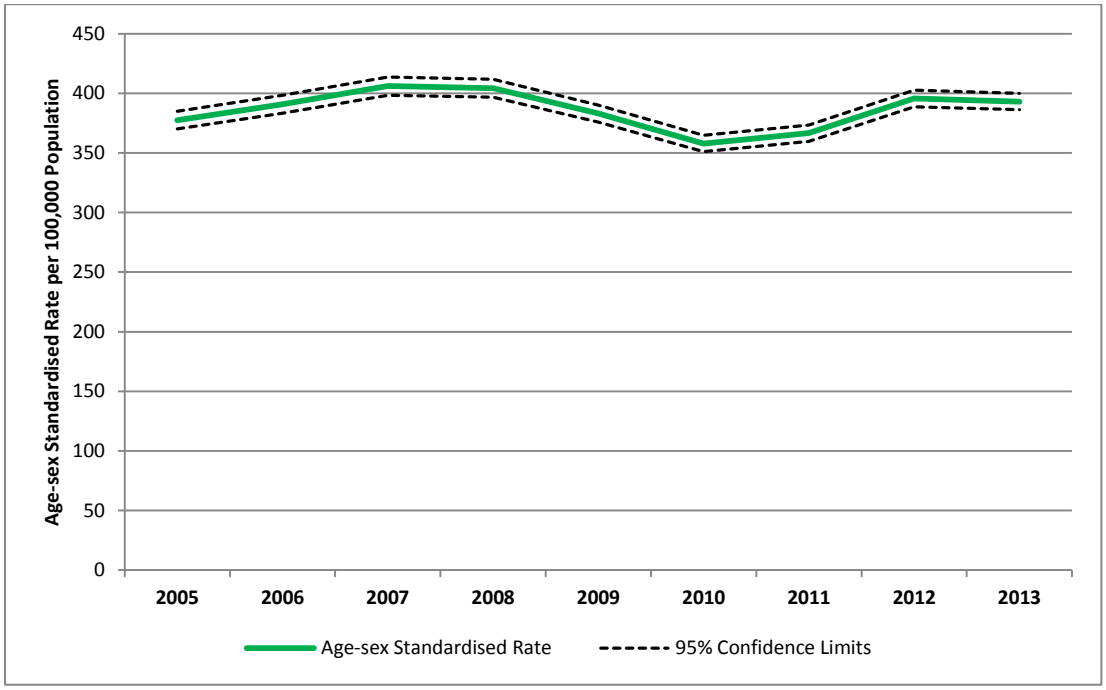
Rationale for selection of indicator
Chronic obstructive pulmonary disease (COPD) is a common progressive lung disease that almost exclusively affects current or prior smokers. Symptoms of COPD can usually be managed by the patient with their GP and the primary care team, only requiring hospitalisation if they have very severe symptoms. It is important to note that not all hospitalisations are avoidable and they may be clinically appropriate.

Commentary:

- The national age-sex standardised hospitalisation rate for COPD has increased slightly between 2005 and 2013, with 378 hospitalisations per 100,000 population in 2005 compared to 393 per 100,000 population in 2013 (Figure 11). Most countries in the OECD have reported a reduction in hospitalisation rates for COPD over recent years which the OECD proposes may represent an improvement in access to, and the quality of primary care (23).
- In 2011 (the latest year for which OECD data are currently available), the age-sex standardised hospitalisation rate for Ireland based on the OECD age-sex standardisation was 365.0 per 100,000 population, which was higher than the OECD average of 197.3 hospitalisations per 100,000 population (Figure 12), and was the second highest rate among selected OECD countries. Other countries that use ICD-10-AM coding were also above the OECD average and there has been some discussion about the impact of different classification systems on the data and therefore, on the comparability of data between countries.

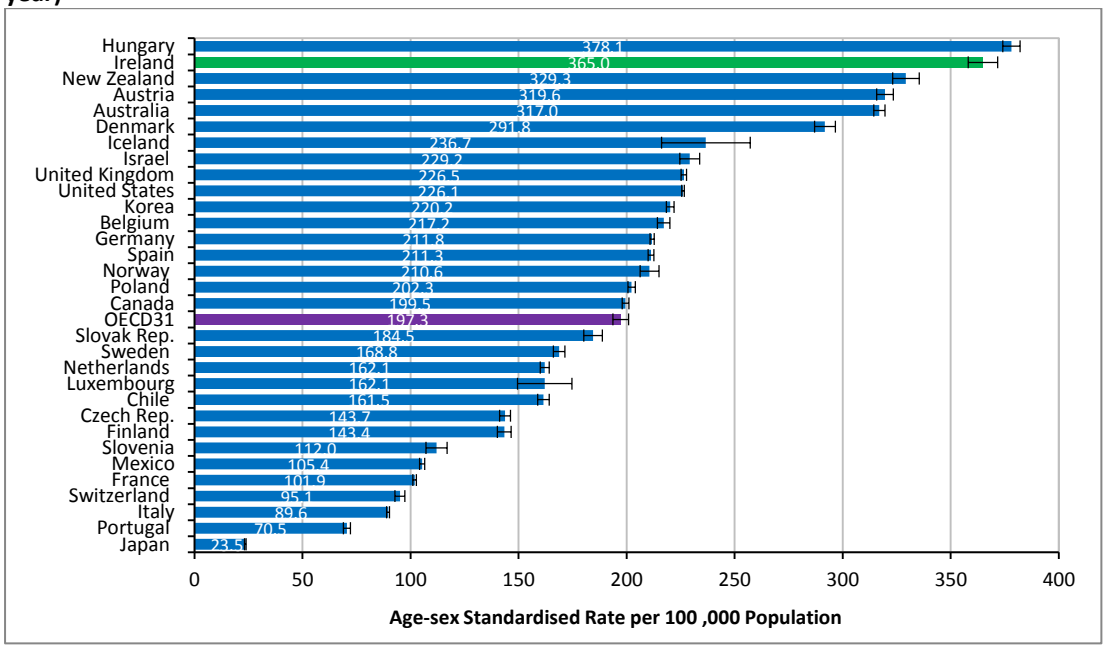
- In Ireland during the three year period from 2011-2013, the hospitalisation rate by county of residence ranged from 219.6 in Kerry, to 657.7 hospitalisations per 100,000 population in Offaly, a three-fold variation. (Figure 13, Table 2). The reasons behind this three-fold variation need to be further explored and explained. There can be a number of different reasons behind these variations and it cannot be concluded that higher or lower rates are a reflection on the quality of care provided in primary and community care. The reasons include, but are not limited to issues related to the quality of the data, differences in the prevalence of chronic conditions in the population, availability of services at primary and community care level, access to specific treatments, and the availability of hospital beds.

Figure 11: COPD hospitalisation rates per 100,000 population, 2005 – 2013



Source: Hospital Inpatient Enquiry (HIPE)

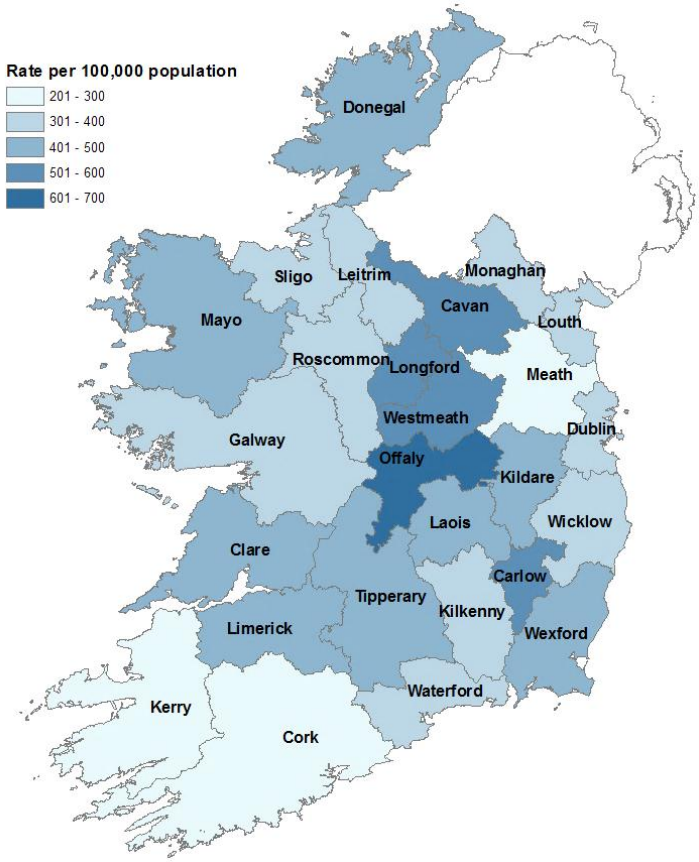
Figure 12: COPD hospitalisation rates per 100,000 population for selected OECD countries, 2011 (or nearest year)



Source: OECD Health Statistics

Note on international comparability: Differences in coding practices among countries and the definition of an admission may affect the comparability of data. Differences in disease classification systems, for example between ICD-9-CM and ICD-10-AM, may also affect data comparability.

Figure 13: COPD hospitalisation rates per 100,000 population by county of residence, 2011 – 2013



Source: Hospital Inpatient Enquiry (HIPE)

Notes: Data refer to the average annual age-sex standardised hospitalisation rate per 100,000 population from 2011-2013. See Table 2 for 95% confidence limits.

Table 2: COPD hospitalisation rates per 100,000 population by county of residence, 2011 - 2013

County of Residence	Number of Hospitalisations	Age-sex Standardised Hospitalisations Rate	Lower 95% Confidence Limit for Rate	Upper 95% Confidence Limit for Rate
Carlow	539	500.8	458.7	543.0
Cavan	782	512.7	476.8	548.5
Clare	1,147	467.5	440.5	494.5
Cork	2,991	276.5	266.6	286.4
Donegal	1,719	470.3	448.2	492.5
Dublin	9,221	378.2	370.5	385.9
Galway	1,833	370.3	353.4	387.2
Kerry	772	219.6	204.1	235.1
Kildare	1,263	415.7	392.2	439.2
Kilkenny	680	334.3	309.2	359.4
Laois	699	487.0	451.1	523.0
Leitrim	274	330.8	291.6	369.9
Limerick	1,691	420.9	400.8	440.9
Longford	416	509.1	460.6	557.7
Louth	885	390.4	364.7	416.1
Mayo	1,422	431.1	408.8	453.4
Meath	879	298.3	278.3	318.4
Monaghan	494	388.2	354.2	422.2
Offaly	1,015	657.7	617.5	697.9
Roscommon	597	365.1	335.8	394.3
Sligo	600	389.4	358.5	420.3
Tipperary	1,702	464.8	442.8	486.7
Waterford	768	308.5	286.7	330.3
Westmeath	943	557.6	522.3	592.9
Wexford	1,456	473.9	449.5	498.3
Wicklow	804	311.7	289.9	333.4
National Total	**35,592**	**385.3**	**381.3**	**389.3**

Source: Hospital Inpatient Enquiry (HIPE)

Notes:
Data refer to the average annual age-sex standardised hospitalisations rate per 100,000 population from 2011-2013.
See Appendix 3 for detailed indicator definitions and methodology.

Asthma Hospitalisation Rates

Description

The age and sex standardised rate of hospitalisations of people aged 15 years and older with a principal diagnosis of asthma per 100,000 population.

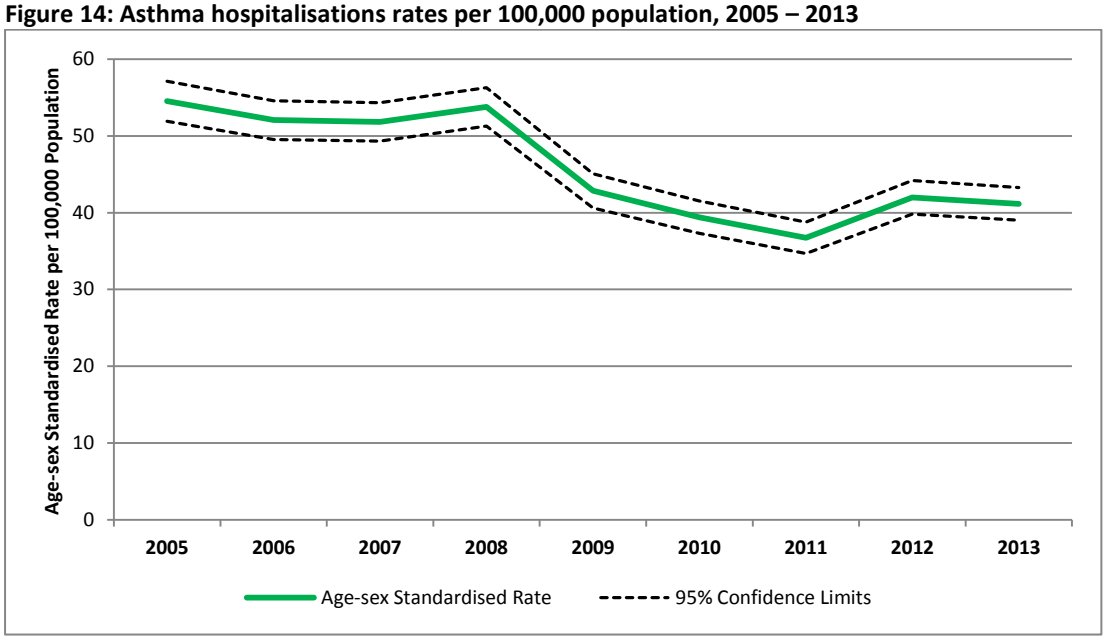
Rationale for selection of indicator

Asthma is a common condition which causes difficulty breathing. For most people with asthma it is possible to improve their health and quality of life so that they have few or no symptoms (asthma control). Hospitalisation with an acute exacerbation (attack) of asthma is a sign of uncontrolled asthma, and so, in many cases, may be preventable. One of the aims of good asthma healthcare is to reduce the need for hospitalisation with better preventive healthcare. It is important to note that not all hospitalisations are avoidable and they may be clinically appropriate.

Commentary

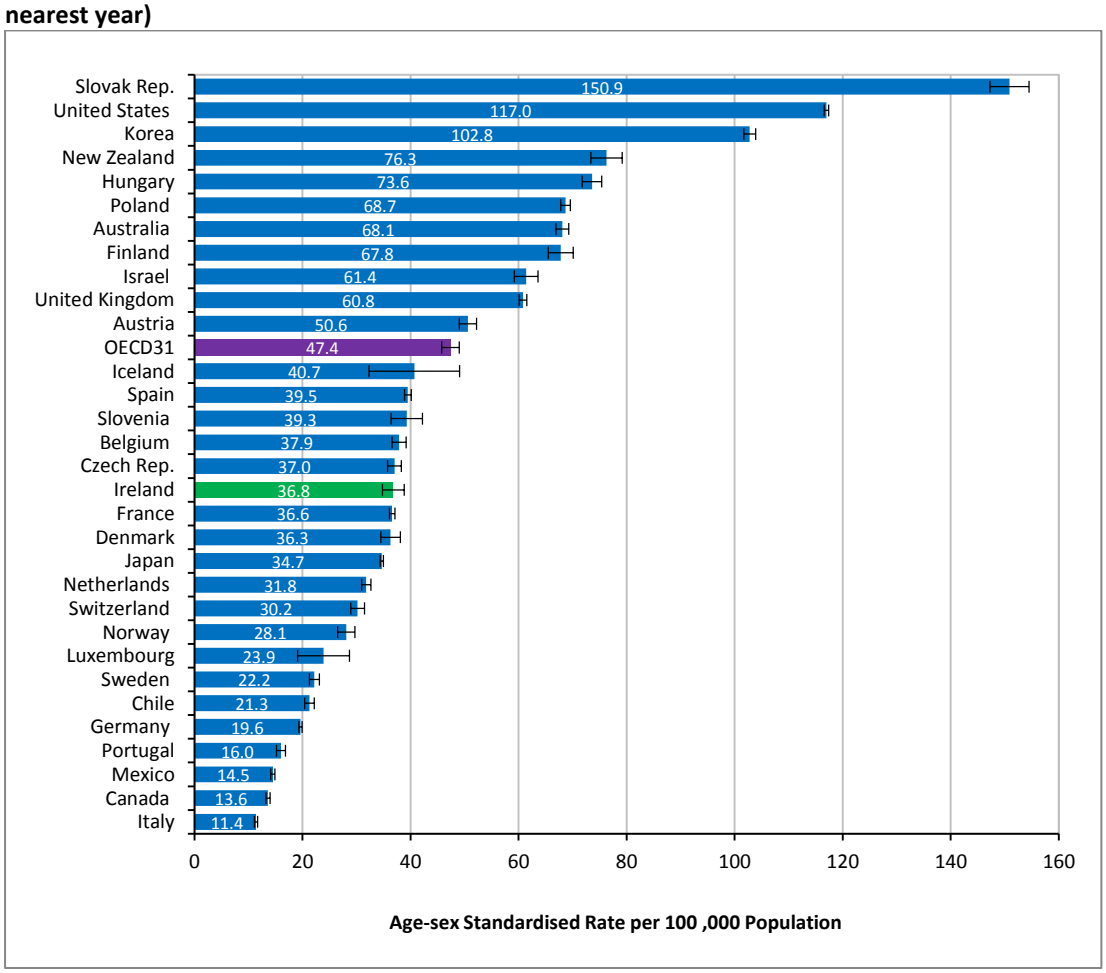
- The national trend in relation to hospitalisations for asthma over the last several years until 2013 has been decreasing (Figure 14). The age-sex standardised rate of hospitalisations for asthma has decreased from 55 per 100,000 population in 2005 to 41 per 100,000 population in 2013, a reduction of 25%.
- In 2011 (the latest year for which OECD data are currently available), the age-sex standardised hospitalisation rate for Ireland was 36.8 hospitalisations per 100,000 population which was below the OECD average of 47.4 hospitalisations per 100,000 population (Figure 15).
- During the three year period from 2011-2013, the rate by county of residence ranged from 21.2 in Monaghan to 78.6 hospitalisations per 100,000 population in Longford, an almost four-fold variation (Figure 16, Table 3). The reasons behind this variation need to be further explored and explained. There can be a number of different reasons behind these variations and it cannot be concluded that higher or lower rates are a reflection on the quality of care provided in primary and community care. The reasons include, but are not limited to, issues related to the quality of the data, differences in the prevalence of chronic conditions in the population, availability of services at primary and community care level, access to specific treatments and the availability of hospital beds.

Figure 14: Asthma hospitalisations rates per 100,000 population, 2005 – 2013



Source: Hospital Inpatient Enquiry (HIPE)

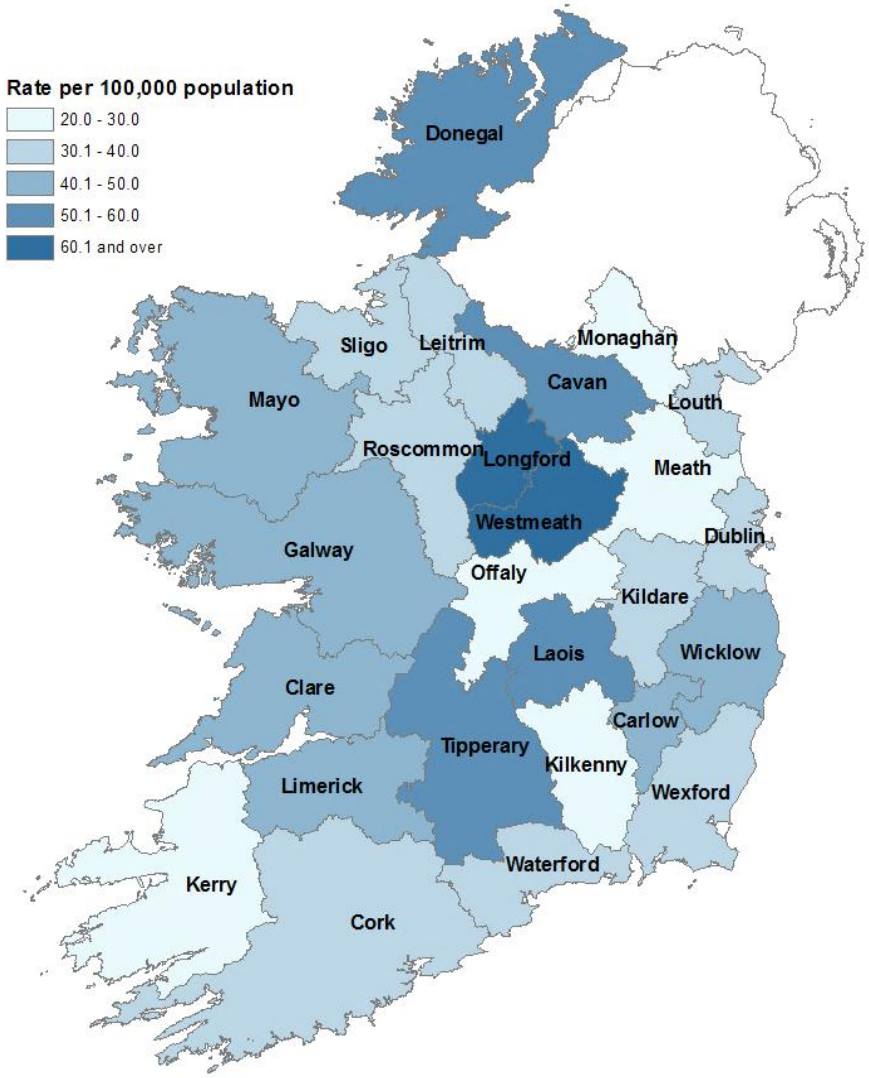
Figure 15: Asthma hospitalisation rates per 100,000 population for selected OECD countries, 2011 (or nearest year)



Source: OECD Health Statistics

Note on international comparability: Differences in coding practices among countries and the definition of an admission may affect the comparability of data. Differences in disease classification systems, for example between ICD-9-CM and ICD-10-AM, may also affect data comparability.

Figure 16: Asthma hospitalisations rates per 100,000 population by county of residence, 2011 – 2013



Source: Hospital Inpatient Enquiry (HIPE)

Notes:
Data refer to the average annual age-sex standardised admission rate per 100,000 population from 2011-2013. See Table 3 for 95% confidence limits.

Table 3: Asthma hospitalisation rates per 100,000 population by county of residence, 2011 – 2013

County of Residence	Number of Hospitalisations	Age-sex Standardised Hospitalisation Rate	Lower 95% Confidence Limit for Rate	Upper 95% Confidence Limit for Rate
Carlow	52	43.8	31.8	55.8
Cavan	91	56.0	44.4	67.6
Clare	132	48.6	40.2	57.0
Cork	359	30.1	27.0	33.2
Donegal	200	55.5	47.8	63.2
Dublin	1,130	39.0	36.7	41.4
Galway	238	43.0	37.5	48.5
Kerry	97	28.4	22.7	34.1
Kildare	155	34.2	28.6	39.9
Kilkenny	65	29.2	22.1	36.4
Laois	93	51.1	40.5	61.6
Leitrim	27	38.6	23.7	53.4
Limerick	221	50.0	43.4	56.7
Longford	72	78.6	60.3	96.8
Louth	95	35.6	28.4	42.8
Mayo	131	42.7	35.4	50.1
Meath	115	29.4	23.8	35.0
Monaghan	29	21.2	13.4	28.9
Offaly	52	27.7	20.2	35.3
Roscommon	50	33.9	24.4	43.4
Sligo	60	38.3	28.6	48.0
Tipperary	201	55.2	47.5	62.8
Waterford	103	38.2	30.8	45.6
Westmeath	135	69.9	58.0	81.8
Wexford	132	39.8	32.9	46.6
Wicklow	133	43.5	36.0	51.0
National Total	**4,168**	**39.9**	**38.7**	**41.2**

Source: Hospital Inpatient Enquiry (HIPE)

Notes:
Data refer to the average annual age-sex standardised hospitalisation rate per 100,000 population from 2011-2013.
See Appendix 3 for detailed indicator definitions and methodology.

Diabetes Hospitalisation Rates

Description
The age and sex standardised rate of hospitalisations of people aged 15 years and older with a principal diagnosis of diabetes per 100,000 population.

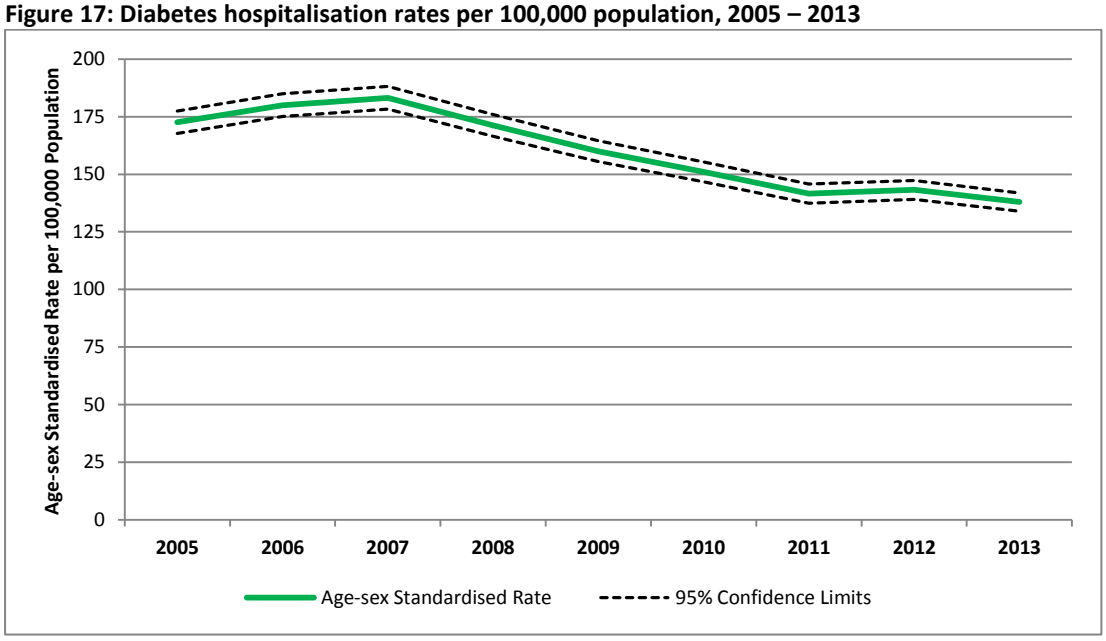
Rationale for selection of indicator
Diabetes is a condition where the body cannot regulate excessive glucose levels in the blood. This can lead to many complications over the longer term such as kidney failure or loss of sight; in the shorter term, loss of consciousness or coma can occur.

Patients with diabetes may be hospitalised for diabetic complications such as unstable diabetes, hypoglycaemia, hyperglycaemia or diabetic coma. It is important to note that not all hospitalisations are avoidable and they may be clinically appropriate.

Commentary

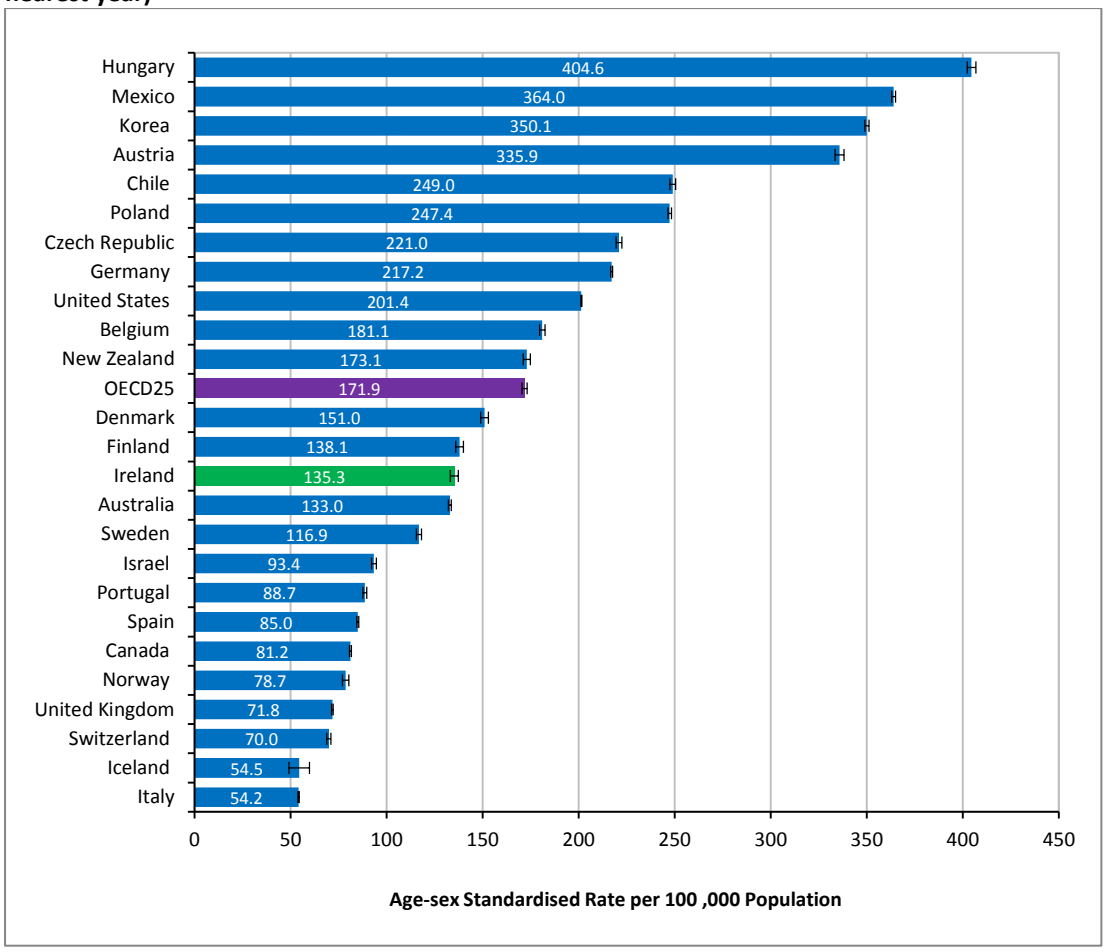
- The national age-sex standardised hospitalisation rate for diabetes has decreased by 20% between 2005 and 2013, with 173 hospitalisations per 100,000 population in 2005 compared to 138 per 100,000 population in 2013 (Figure 17).
- In 2011 (the latest year for which OECD data are currently available), the age-sex standardised hospitalisation rate for Ireland was 135.3 hospitalisations per 100,000 population which was below the OECD average of 171.9 hospitalisations per 100,000 population (Figure 18).
- During the three year period from 2011-2013, the rate of hospitalisations by county of residence ranged from 101.7 in Leitrim, to 199.0 per 100,000 population in Carlow, almost a two-fold variation (Figure 19, Table 4). The reasons behind this variation need to be further explored and explained. There can be a number of different reasons behind these variations and it cannot be concluded that higher or lower rates are a reflection on the quality of care provided in primary and community care. The reasons include, but are not limited to, issues related to the quality of the data, differences in the prevalence of chronic conditions in the population, availability of services at primary and community care level, access to specific treatments and the availability of hospital beds.

Figure 17: Diabetes hospitalisation rates per 100,000 population, 2005 – 2013



Source: Hospital Inpatient Enquiry (HIPE)

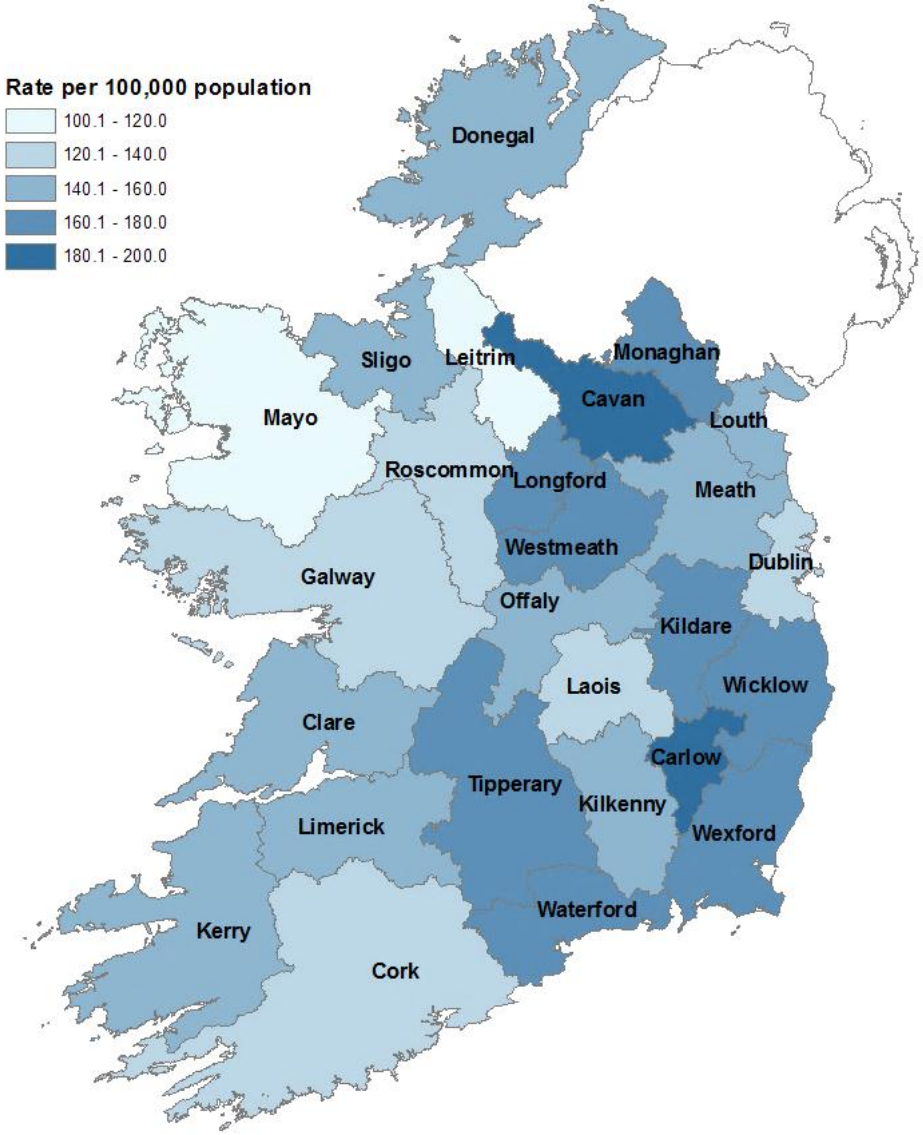
Figure 18: Diabetes hospitalisation rates per 100,000 population for selected OECD countries, 2011 (or nearest year)



Source: OECD Health Statistics

Note on international comparability: Differences in coding practices among countries and the definition of an admission may affect the comparability of data. Differences in disease classification systems, for example between ICD-9-CM and ICD-10-AM, may also affect data comparability.

Figure 19: Diabetes hospitalisation rates per 100,000 population by county of residence, 2011 – 2013



Source: Hospital Inpatient Enquiry (HIPE)

Notes:
Data refer to the average annual age-sex standardised rate of hospitalisations per 100,000 population from 2011-2013.
See Table 4 for 95% confidence limits.

Table 4: Diabetes hospitalisation rates per 100,000 population by county of residence, 2011 - 2013

County of Residence	Number of Hospitalisations	Age-sex Standardised Hospitalisations Rate	Lower 95% Confidence Limit for Rate	Upper 95% Confidence Limit for Rate
Carlow	227	199.0	172.9	225.1
Cavan	316	193.7	172.2	215.2
Clare	383	145.3	130.7	159.9
Cork	1,440	126.3	119.7	132.8
Donegal	532	145.8	133.3	158.2
Dublin	3,182	121.4	117.1	125.6
Galway	705	134.3	124.3	144.3
Kerry	492	140.9	128.4	153.4
Kildare	632	178.1	163.5	192.7
Kilkenny	320	154.3	137.3	171.3
Laois	214	135.4	116.9	153.9
Leitrim	83	101.7	79.5	123.8
Limerick	613	146.4	134.7	158.0
Longford	138	161.7	134.5	188.8
Louth	379	149.9	134.6	165.2
Mayo	379	117.8	105.9	129.8
Meath	515	152.1	138.4	165.8
Monaghan	225	167.6	145.7	189.6
Offaly	257	151.5	132.8	170.1
Roscommon	199	126.9	109.1	144.6
Sligo	237	149.1	130.1	168.1
Tipperary	617	164.6	151.6	177.7
Waterford	455	175.6	159.4	191.8
Westmeath	334	177.0	157.9	196.1
Wexford	535	166.7	152.5	180.9
Wicklow	495	164.8	150.0	179.5
National Total	**13,904**	**140.8**	**138.5**	**143.2**

Source: Hospital Inpatient Enquiry (HIPE)

Notes:
Data refer to the average annual age-sex standardised admission rate per 100,000 population from 2011-2013. See Appendix 3 for detailed indicator definitions and methodology.

Domain 3: Helping people when they are being treated and cared for in our health services

Cancer Survival Rates

- **Breast cancer survival rates**
- **Cervical cancer survival rates**
- **Colorectal cancer survival rates**

Acute Hospital Care

- **In-hospital mortality within 30 days after acute myocardial infarction (AMI)**
- **In-hospital mortality within 30 days after haemorrhagic stroke**
- **In-hospital mortality within 30 days after ischaemic stroke In-hospital waiting time for hip fracture surgery**
- **Caesarean section rate**

Cancer Survival Rates

Breast cancer survival rates

Description

Age-standardised estimates of cumulative 5-year relative survival in Ireland for female breast cancer patients for the period 2005-2010

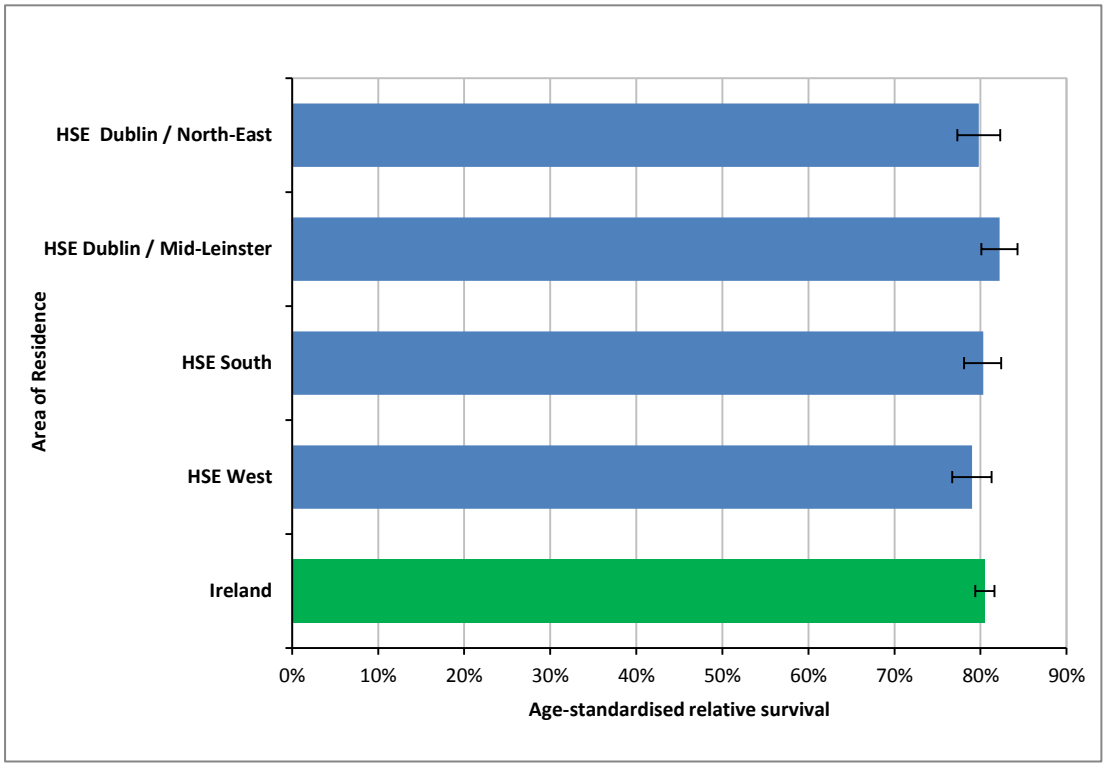
Rationale for selection of indicator

Breast cancer survival reflects advances in treatments, as well as public health interventions to detect the disease early through screening programmes and greater awareness of the disease. The introduction of new evidence based treatment regimens and screening programmes has improved the survival for breast cancer in the last few years, as well as improving quality of life for survivors.

Commentary

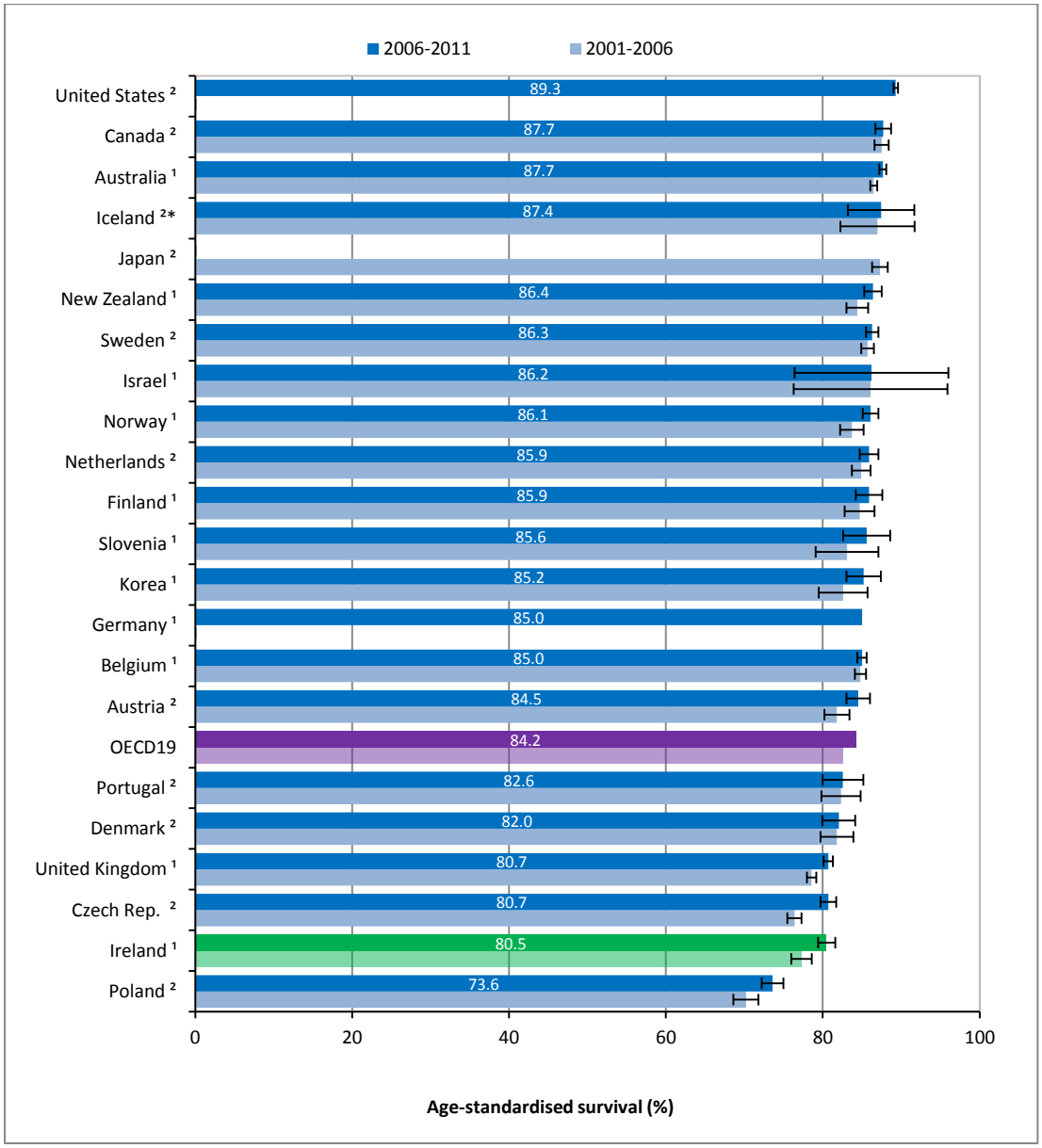
- Figure 20 shows breast cancer 5-year relative survival rates nationally, and for HSE regions for the period 2005-2010. There is no statistically significant difference between the national rate and any of the four regions.
- Figure 21 shows that the survival rate in Ireland is below the OECD average but has improved over time. The findings at national level are compared with other countries in the OECD. It is important to note that there may be variations between countries due to difference in their coding practices, in the definitions and disease classification systems used and therefore, this needs to be taken into account when comparing the countries.

Figure 20: Age-standardised estimates of cumulative 5-year relative survival in Ireland for female breast cancer patients for the period 2005-2010



Source: National Cancer Registry of Ireland

Figure 21: Breast cancer five-year relative survival, 2001-2006 and 2006-2011 (or nearest period), OECD countries



Source: OECD Health Statistics.

Notes: 95% confidence intervals represented by H.

1. Period analysis. 2. Cohort analysis. * Three-period average.

Cervical cancer survival rates

Description

Age-standardised estimates of cumulative 5-year relative survival in Ireland for cervical cancer patients for the period 2005-2010

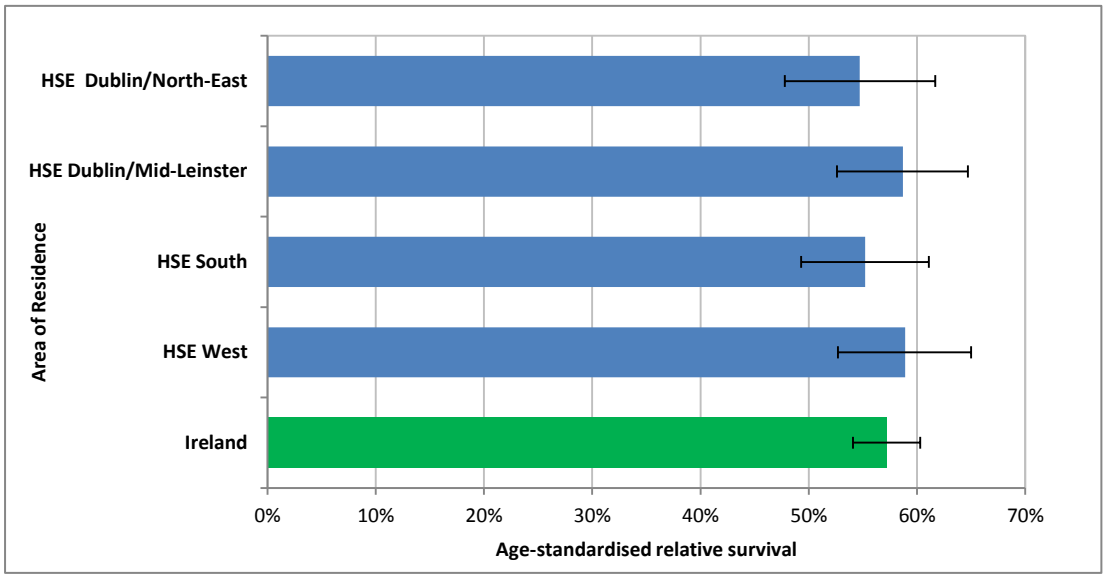
Rationale for selection of indicator

In recent years, five-year relative survival for cervical cancer has improved in many countries. This may be due to many reasons including improved effectiveness of screening and treatment.

Commentary

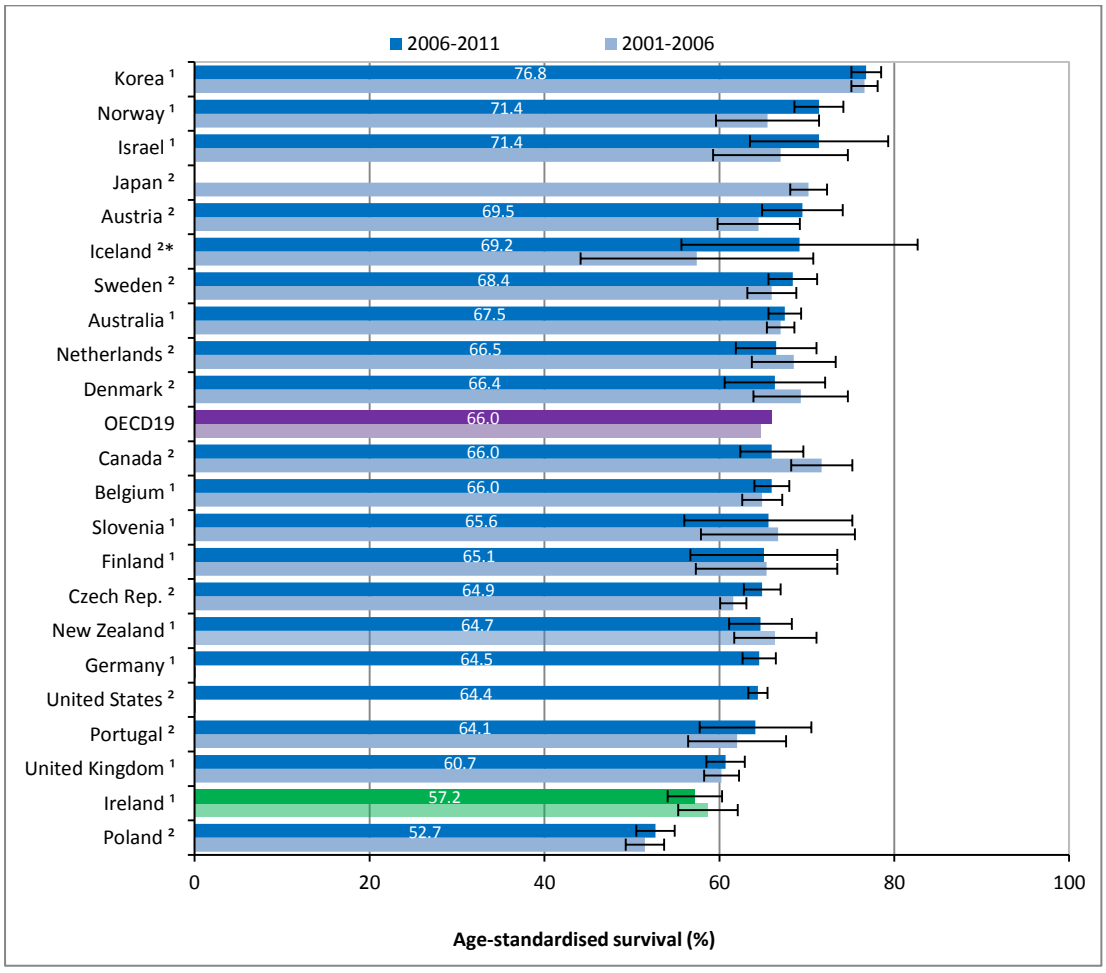
- Figure 22 shows cervical cancer 5-year relative survival rates nationally, and for HSE regions for the period 2005-2010. There is no statistically significant difference between the national rate and any of the 4 regions.
- Figure 23 shows that the survival rate in Ireland is below the OECD average and has decreased over time, although this reduction is not statistically significant. The findings at national level are compared with other countries in the OECD. It is important to note that there may be variations between countries due to difference in their coding practices, in the definitions and disease classification systems used and therefore, this needs to be taken into account when comparing the countries.

Figure 22: Age-standardised estimates of cumulative 5-year relative survival in Ireland for cervical cancer patients for the period 2005-2010



Source: National Cancer Registry of Ireland

Figure 23: Cervical cancer five-year relative survival, 2001-2006 and 2006-2011 (or nearest period), OECD countries



Source: OECD Health Statistics.

Notes: 95% confidence intervals represented by H.

1. Period analysis. 2. Cohort analysis. * Three-period average.

Colorectal Cancer survival rates

Description

Age-standardised estimates of cumulative 5-year relative survival in Ireland for colorectal cancer patients for the period 2005-2010.

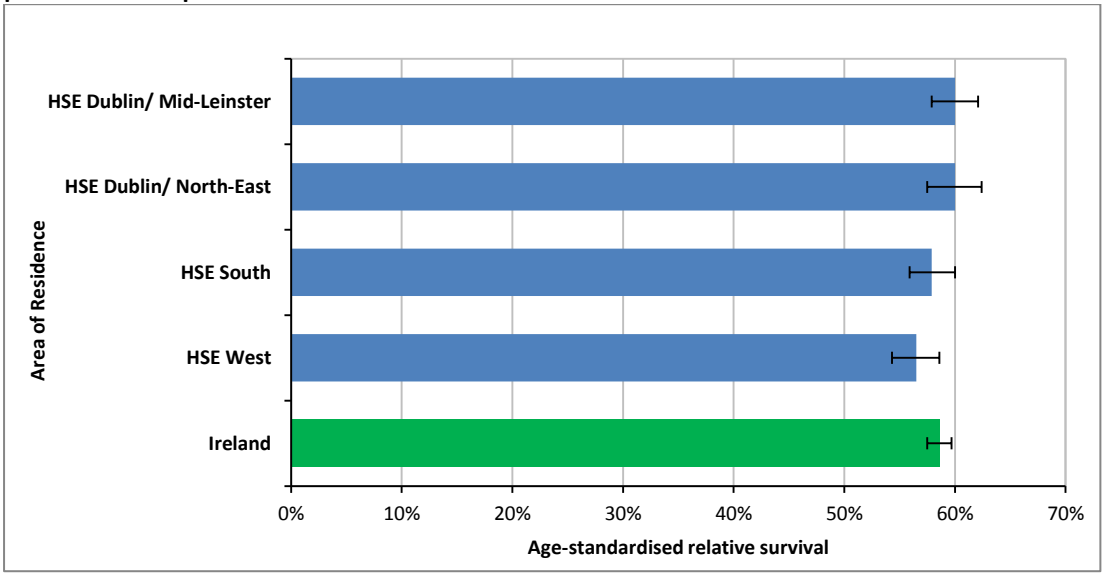
Rationale for selection of indicator

Advances in diagnosis and treatment of colorectal cancer have increased survival over the last decade. There is compelling evidence in support of the clinical benefit of improved surgical techniques, radiation therapy and combined chemotherapy, with most countries in the OECD showing improvement in survival over recent periods.

Commentary

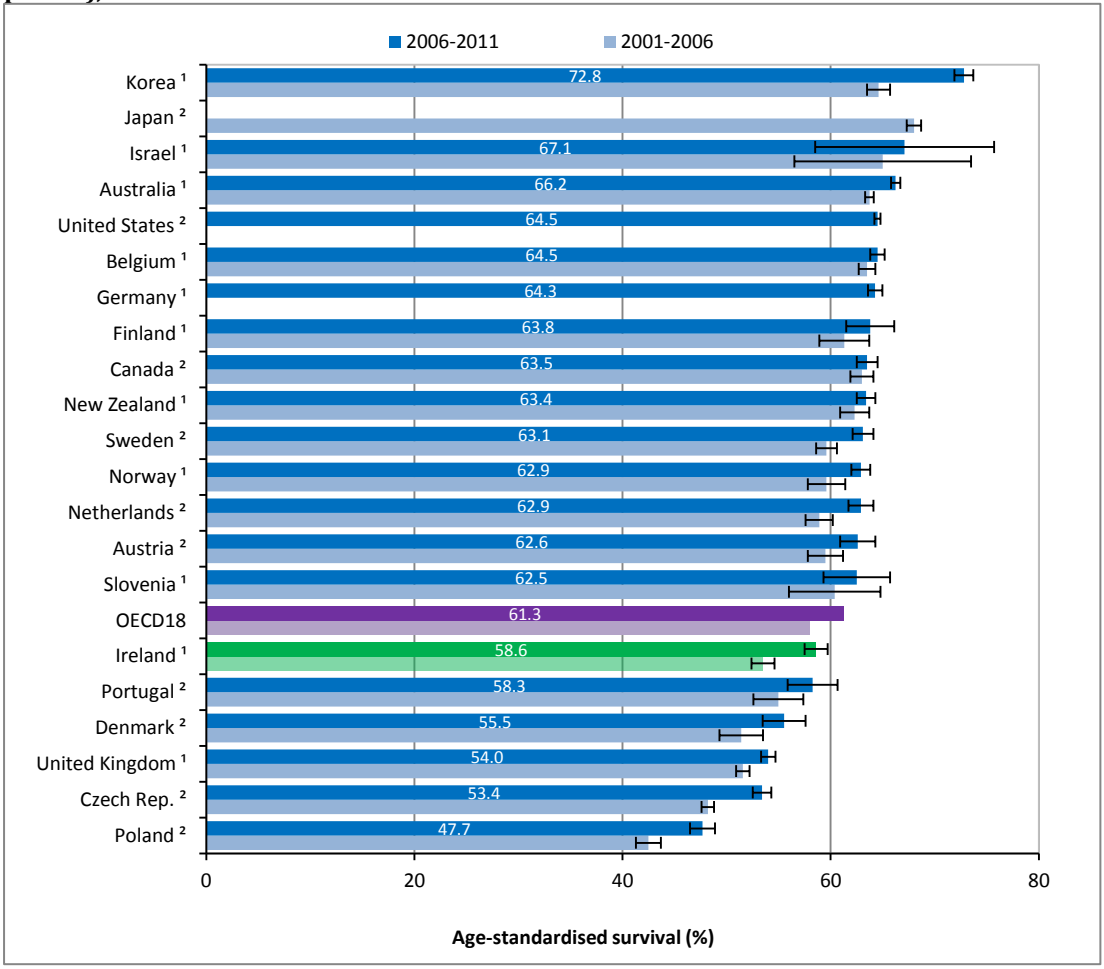
- Figure 24 shows colorectal cancer survival rates nationally and for the HSE regions for the period 2005 to 2010. This shows survival rates are lowest in the West region although this is not a statistically significant difference from the national rate.
- In Figure 25 the survival rates at national level are compared with other countries in the OECD. Ireland is below the OECD five year survival rate although it does increase between the time periods presented. It is important to note that there may be variations between countries due to difference in their coding practices, in the definitions and disease classification systems used and therefore, this needs to be taken into account when comparing the countries.

Figure 24: Age-standardised estimates of cumulative 5-year relative survival in Ireland for colorectal cancer patients for the period 2005-2010



Source: National Cancer Registry of Ireland

Figure 25: Colorectal cancer five-year relative survival, 2001-2006 and 2006-2011 (or nearest period), OECD countries



Source: OECD Health Statistics.

Notes: 95% confidence intervals represented by I-I.

1. Period analysis. 2. Cohort analysis. * Three-period average.

Acute Hospital Care

In-hospital mortality within 30 days after Acute Myocardial Infarction (AMI)

Description

In-hospital mortality within 30 days after AMI is defined as the number of patients aged 45 and over who die in hospital within 30 days of being admitted with a principal diagnosis of an AMI, as a proportion of the total number of patients aged 45 and over admitted to that hospital with a principal diagnosis of an AMI.

Rationale for selection of indicator

A heart attack, or acute myocardial infarction (AMI), is one of the leading causes of death in Ireland. Heart attacks are life-threatening emergencies that happen when the coronary arteries, the blood vessels supplying blood to the heart muscle, are suddenly blocked. Lack of blood damages the heart muscle, weakening its function or stopping it altogether. Evidence links the processes of care for AMI, such as thrombolysis and early treatment with aspirin and beta-blockers, to survival improvements. The use of the 30-day mortality rate after AMI is a recognised outcome measure of acute care quality, and is one of the OECD Health Care Quality Indicators (HCQI).

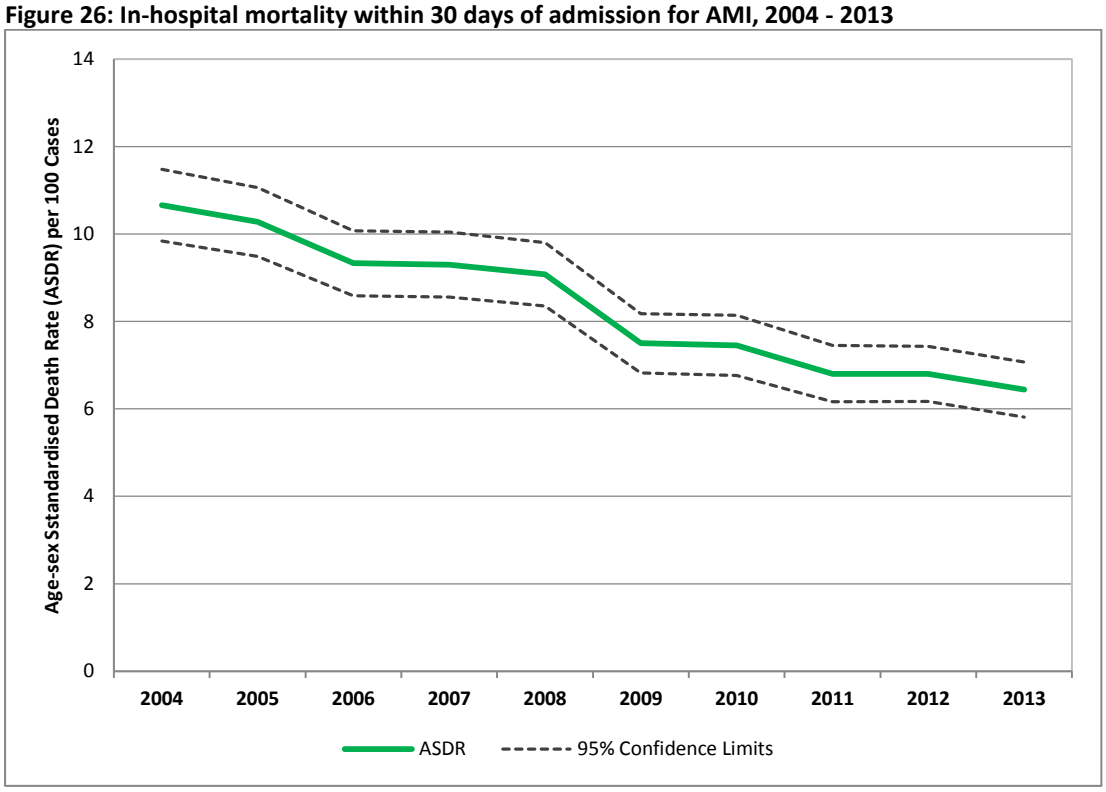
Commentary

- Figure 26 shows the national trend in mortality rates following a heart attack over the last 10 years (2004 to 2013). Between 2004 and 2013, there has been a 40% reduction in in-hospital mortality rates within 30 days of admission for an AMI (from 10.7 deaths per 100 cases in 2004 to 6.4 in 2013).
- The average in-hospital mortality rate in the 30 days following admission to hospital for AMI in Ireland is lower than the OECD average rate, i.e. 6.8 deaths per 100 cases in Ireland, compared to the OECD average of 7.9 deaths per 100 cases (Figure 27).
- Reviewing the three year period from 2011-2013, it was found that in most hospitals the age-sex standardised mortality rates were within or lower than the expected range. However, the age-sex standardised mortality rates for three hospitals were statistically significantly higher than the national rate at the 95% confidence level (Table 5, Figure 28). Note, that for this indicator, the age-sex standardised mortality rates are statistically significantly higher than the national rate if the lower 95% confidence

limit for a hospital is above the upper 95% confidence limit for the national rate (i.e. above 7.05).

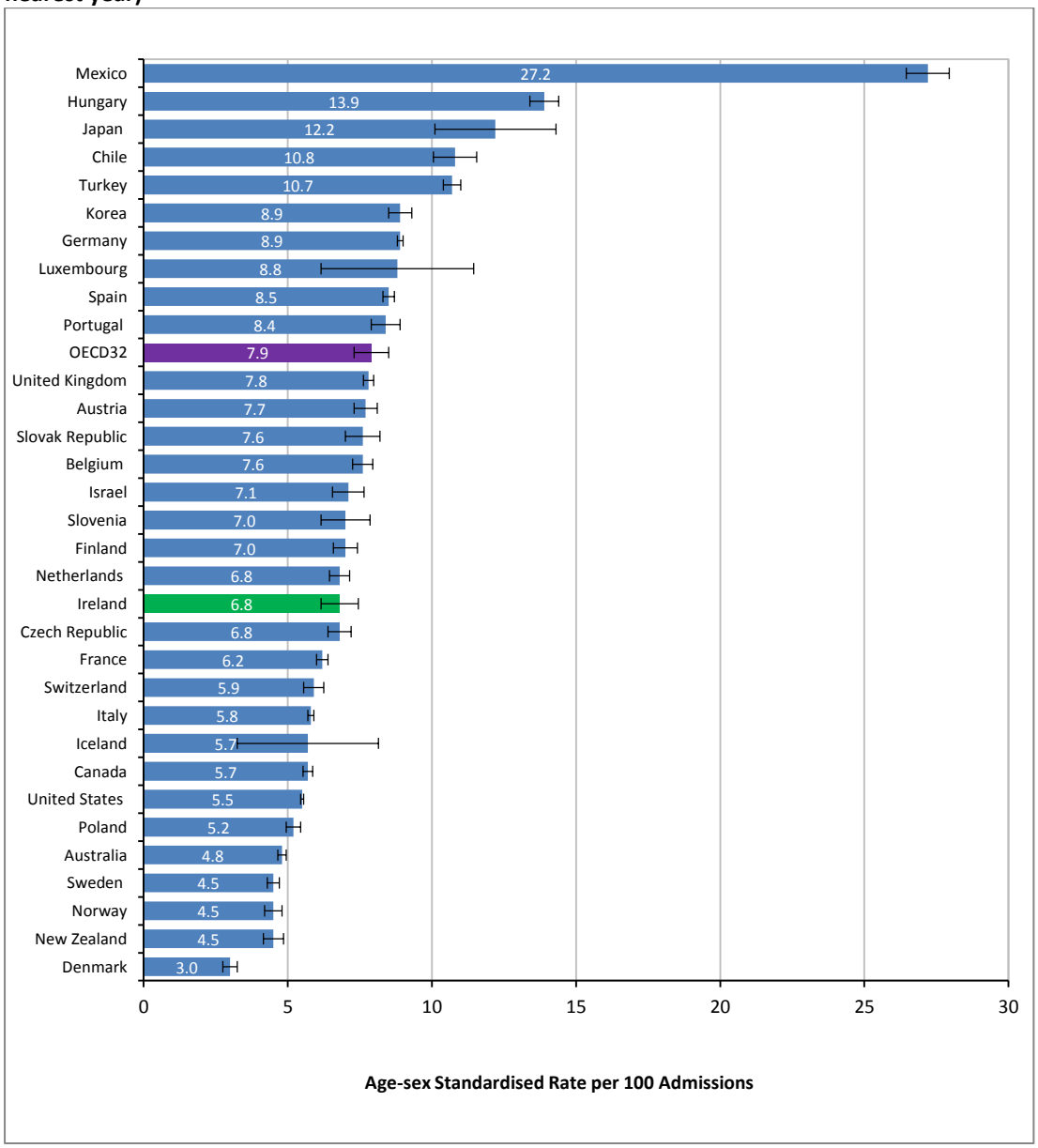
- It is important to note however, that the age-sex standardised rates presented here are high level indicators only. There can be many reasons why the age-sex standardised mortality rates for a hospital would be higher or lower rates than the national average, including
  a. differences in the types of patients attending different hospitals (for example some hospitals may have a higher or lower proportion of patients with other medical conditions attending than others and this may influence outcomes),
  b. inconsistencies in the quality of the data gathered in different hospitals,
  c. differences in access to medical care prior to arrival at the hospital,
  d. transfer patterns of patients between different hospitals,
  e. variations in the quality of care delivered in different hospitals.
- Therefore, it cannot be concluded that a high mortality rate is indicative of poor quality care. Rather it provides an indication that a further evaluation should be carried out to determine the reasons for the identified variation.

Figure 26: In-hospital mortality within 30 days of admission for AMI, 2004 - 2013



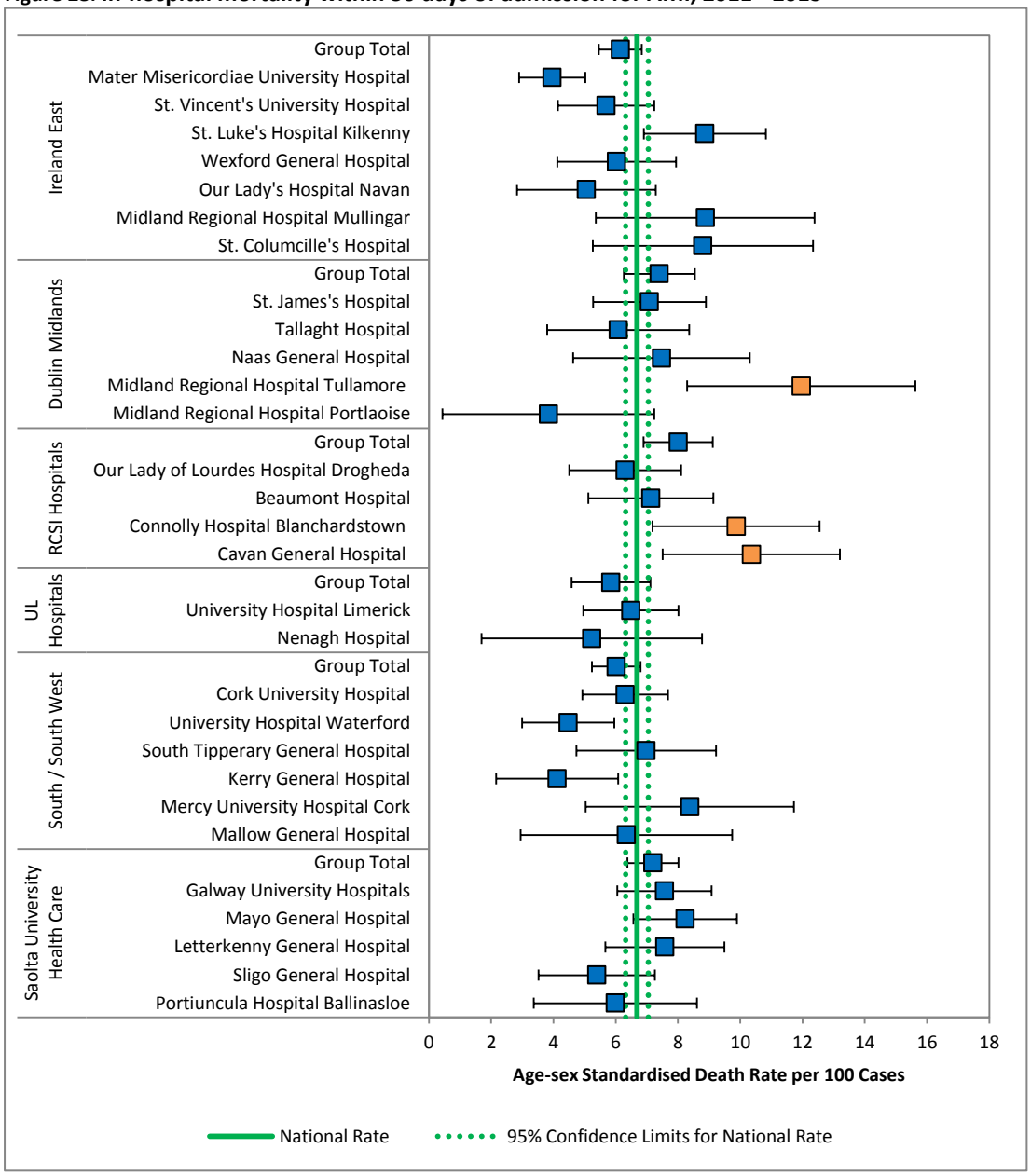
Source: Hospital Inpatient Enquiry (HIPE)

Figure 27: In-hospital mortality within 30 days of admission for AMI for selected OECD countries, 2011 (or nearest year)



Source: OECD Health Statistics.
Note: 95% confidence intervals represented by **H**.

Figure 28: In-hospital mortality within 30 days of admission for AMI, 2011 - 2013



Source: Hospital Inpatient Enquiry (HIPE)

Notes:

Hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals.

The data presented above are age-sex standardised mortality rates per 100 cases. 95% confidence intervals for hospitals and hospital groups are shown by **H**.

Where the 95% confidence interval for a hospital or hospital group overlaps the 95% confidence interval of the national rate (i.e. the dashed green lines), it can be concluded that the rate is not statistically significantly different from the national rate and so is within the expected range.

Where the 95% confidence interval for a hospital or hospital group does not overlap the confidence interval of the national rate, it implies that the mortality rate is statistically significantly different from the national rate and is therefore outside the expected range.

There can be many reasons for variations in mortality rates including differences in patient profiles; data quality issues; and differences in the quality of care.

Age-sex standardised mortality rates that are statistically significantly higher at the 95% confidence level than the national rate are shown in amber. Rates for all other hospitals and hospital groups are below or within the expected range of the national rate.

Table 5: In-hospital mortality within 30 days of admission for AMI, 2011 – 2013

Hospital Group	Number of Cases	Age-sex Standardised Death Rate (ASDR) per 100 Cases	Lower 95% Confidence Limit for ASDR	Upper 95% Confidence Limit for ASDR
Ireland East	**5090**	**6.15**	**5.46**	**6.84**
Mater Misericordiae University Hospital	1933	3.96	2.9	5.02
St. Vincent's University Hospital	871	5.69	4.14	7.24
St. Luke's Hospital Kilkenny	828	8.86	6.9	10.82
Wexford General Hospital	649	6.03	4.12	7.94
Our Lady's Hospital Navan	359	5.06	2.83	7.29
Midland Regional Hospital Mullingar	228	8.88	5.36	12.39
St. Columcille's Hospital	160	8.8	5.26	12.34
St. Michael's Hospital	62	-	-	-
Dublin Midlands	**2347**	**7.4**	**6.26**	**8.54**
St. James's Hospital	840	7.08	5.27	8.9
Tallaght Hospital	712	6.08	3.8	8.36
Naas General Hospital	322	7.47	4.63	10.31
Midland Regional Hospital Tullamore	265	11.96	8.29	15.63
Midland Regional Hospital Portlaoise	208	3.84	0.43	7.24
RCSI Hospitals	**2257**	**8.01**	**6.89**	**9.12**
Our Lady of Lourdes Hospital Drogheda	695	6.3	4.51	8.1
Beaumont Hospital	684	7.13	5.12	9.14
Connolly Hospital Blanchardstown	483	9.87	7.18	12.55
Cavan General Hospital	395	10.36	7.51	13.2
UL Hospitals	**1229**	**5.84**	**4.58**	**7.11**
University Hospital Limerick	990	6.49	4.96	8.02
Nenagh Hospital	119	5.23	1.69	8.77
Ennis Hospital	66	-	-	-
St. Johns Hospital	54	-	-	-
South / South West	**3942**	**6.02**	**5.24**	**6.8**
Cork University Hospital	1586	6.3	4.93	7.68
University Hospital Waterford	964	4.47	2.99	5.95
South Tipperary General Hospital	436	6.98	4.74	9.22
Kerry General Hospital	399	4.12	2.16	6.08
Mercy University Hospital Cork	276	8.38	5.03	11.73
Mallow General Hospital	135	6.34	2.94	9.74
South Infirmary/Victoria University Hospital Cork	77	-	-	-
Bantry General Hospital	69	-	-	-
Saolta University Health Care	**3511**	**7.2**	**6.38**	**8.02**
Galway University Hospitals	1212	7.57	6.05	9.08
Mayo General Hospital	876	8.23	6.57	9.89
Letterkenny General Hospital	643	7.58	5.67	9.49
Sligo General Hospital	488	5.39	3.52	7.26
Portiuncula Hospital Ballinasloe	286	5.99	3.37	8.61
Roscommon County Hospital	6	-	-	-
Total for All Hospitals	**18376**	**6.68**	**6.32**	**7.05**

Source: Hospital Inpatient Enquiry (HIPE)

Notes: Hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals.
See Appendix 3 for detailed indicator definitions and methodology.

In-hospital mortality within 30 days after haemorrhagic stroke

Description

In-hospital mortality within 30 days after haemorrhagic stroke is defined as the number of patients aged 45 and over who die in hospital within 30 days of being admitted to hospital with a principal diagnosis of haemorrhagic stroke, as a proportion of the total number of patients aged 45 and over admitted to that hospital with a principal diagnosis of haemorrhagic stroke.

Rationale for selection of indicator

Stroke is a leading cause of mortality in Ireland. A stroke is the sudden death of brain cells in a localized area due to inadequate blood flow caused by a haemorrhage (bleed) or ischaemia (clot). Many patients who survive a stroke are left with disability. Timely diagnosis and therapy for all stroke victims in dedicated stroke units improves survival and limits disability. Variations in stroke mortality rates reflect many factors including early recognition of symptoms, seeking medical care as quickly as possible, and potential differences in the care provided.

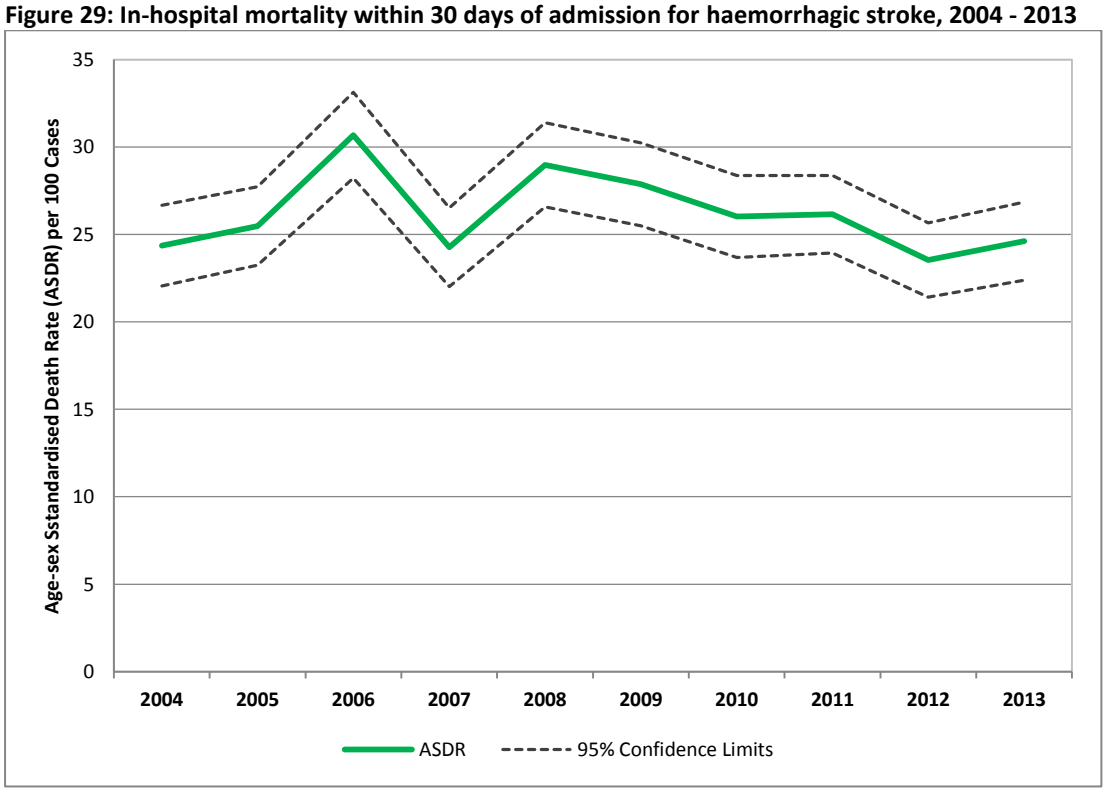
Commentary

- The age-sex standardised in-hospital mortality rate within 30 days of admission for haemorrhagic stroke has remained almost unchanged over the ten year period from 2004 to 2013, with 24.4 deaths per 100 cases in 2004 compared to 24.6 in 2013 (Figure 29).
- In 2011, the average in-hospital mortality rate within 30 days of admission with haemorrhagic stroke in Ireland was above the OECD average rate, i.e. 26.2 deaths per 100 cases for Ireland in that year compared to the OECD average of 22.6 deaths per 100 cases (Figure 30).
- During the three year period from 2011-2013, the age-sex standardised mortality rate for one hospital was statistically significantly higher than the national rate at the 95% confidence level. The rates for all other hospitals were within or lower than the expected range (Table 6, Figure 31). The overall rate for one hospital group (Ireland East) was also statistically significantly higher than the national rate. Note, that for this indicator, the age-sex standardised mortality rates are statistically significantly higher than the national rate if the lower 95% confidence limit for a hospital or a

hospital group is above the upper 95% confidence limit for the national rate (i.e. above 26.0).

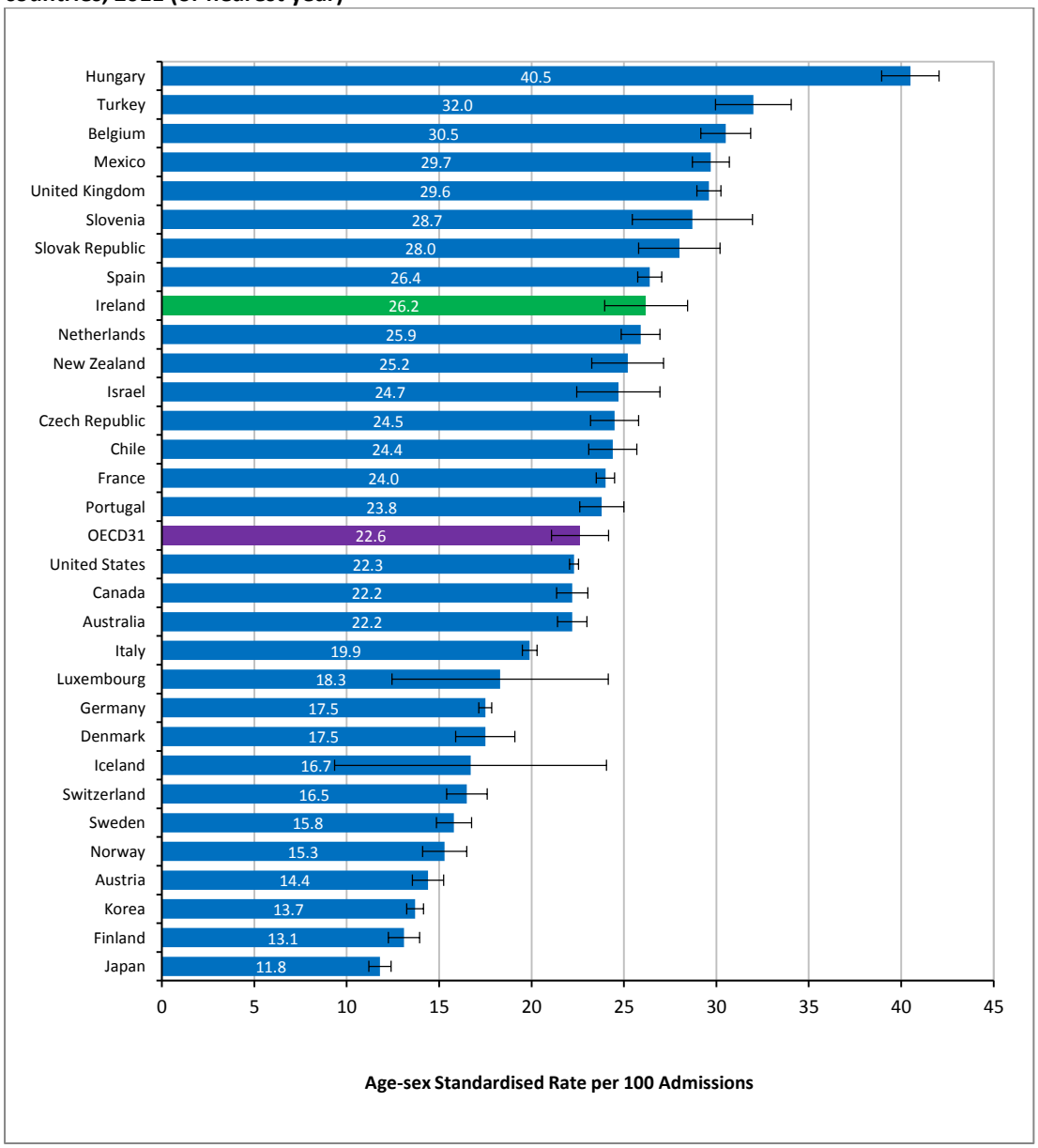
- It is important to note however, that the age-sex standardised rates presented here are high level indicators only. There can be many reasons why a hospital would have higher or lower rates than the national average, including
  a. differences in the types of patients attending different hospitals (for example, some hospitals may have a higher or lower proportion of patients with other medical conditions attending than others, and this may influence outcomes),
  b. inconsistencies in the quality of the data gathered in different hospitals,
  c. differences in access to medical care prior to arrival at the hospital,
  d. transfer patterns of patients between different hospitals,
  e. variations in the quality of care delivered in different hospitals.
- It cannot be concluded that a high mortality rate for a particular hospital is indicative of poor quality care. Rather it provides an indication that a further evaluation should be carried out to determine the reasons for the identified variation in mortality rates.

Figure 29: In-hospital mortality within 30 days of admission for haemorrhagic stroke, 2004 - 2013



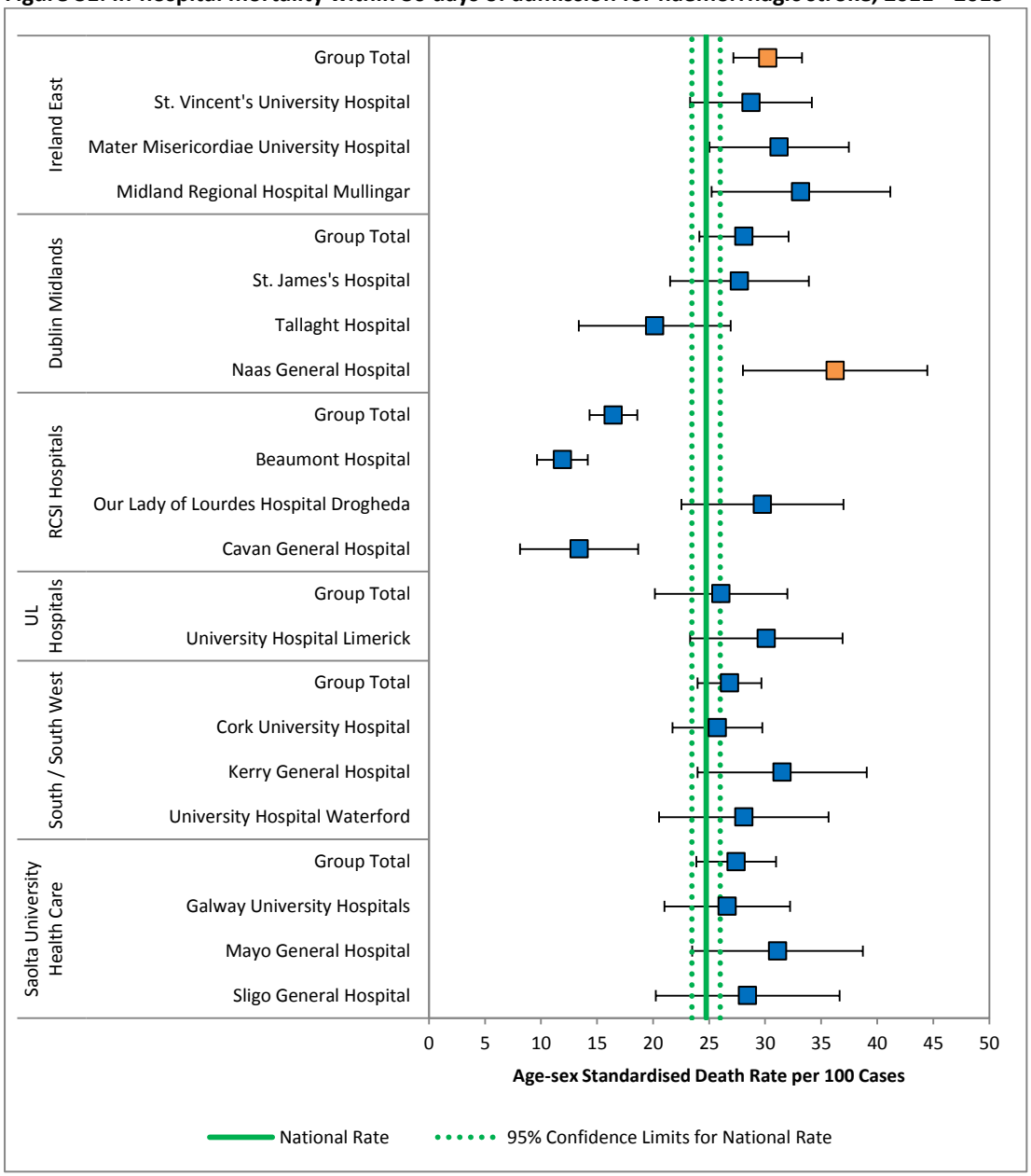
Source: Hospital Inpatient Enquiry (HIPE)

Figure 30: In-hospital mortality within 30 days of admission for haemorrhagic stroke for selected OECD countries, 2011 (or nearest year)



Source: OECD Health Statistics.
Note: 95% confidence intervals represented by H.

Figure 31: In-hospital mortality within 30 days of admission for haemorrhagic stroke, 2011 - 2013



Source: Hospital Inpatient Enquiry (HIPE)

Notes:

Hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals.

The data presented above are age-sex standardised mortality rates per 100 cases. 95% confidence intervals for hospitals and hospital groups are shown by **H**.

Where the 95% confidence interval for a hospital or hospital group overlaps the 95% confidence interval of the national rate (i.e. the dashed green lines), it can be concluded that the rate is not statistically significantly different from the national rate and so is within the expected range.

Where the 95% confidence interval for a hospital or hospital group does not overlap the confidence interval of the national rate, it implies that the mortality rate is statistically significantly different from the national rate and is therefore outside the expected range.

There can be many reasons for variations in mortality rates including differences in patient profiles; data quality issues; and differences in the quality of care.

Age-sex standardised mortality rates that are statistically significantly higher at the 95% confidence level than the national rate are shown in amber. Rates for all other hospitals and hospital groups are below or within the expected range of the national rate.

Table 6: In-hospital mortality within 30 days of admission for haemorrhagic stroke, 2011 – 2013

Hospital Group	Number of Cases	Age-sex Standardised Death Rate (ASDR) per 100 Cases	Lower 95% Confidence Limit for ASDR	Upper 95% Confidence Limit for ASDR
Ireland East	**849**	**30.23**	**27.17**	**33.29**
St. Vincent's University Hospital	255	28.74	23.31	34.17
Mater Misericordiae University Hospital	199	31.25	25.04	37.47
Midland Regional Hospital Mullingar	113	33.18	25.21	41.16
St. Luke's Hospital Kilkenny	85	-	-	-
Wexford General Hospital	84	-	-	-
Our Lady's Hospital Navan	65	-	-	-
St. Columcille's Hospital	42	-	-	-
St. Michael's Hospital	6	-	-	-
Dublin Midlands	**486**	**28.11**	**24.13**	**32.09**
St. James's Hospital	157	27.71	21.51	33.91
Tallaght Hospital	136	20.15	13.36	26.93
Naas General Hospital	111	36.24	28.01	44.47
Midland Regional Hospital Tullamore	41	-	-	-
Midland Regional Hospital Portlaoise	41	-	-	-
RCSI Hospitals	**1309**	**16.45**	**14.32**	**18.59**
Beaumont Hospital	1002	11.91	9.65	14.18
Our Lady of Lourdes Hospital Drogheda	134	29.75	22.53	36.98
Cavan General Hospital	112	13.4	8.13	18.68
Connolly Hospital Blanchardstown	61	-	-	-
UL Hospitals	**217**	**26.07**	**20.17**	**31.98**
University Hospital Limerick	165	30.11	23.31	36.91
Ennis Hospital	20	-	-	-
Nenagh Hospital	20	-	-	-
St. Johns Hospital	12	-	-	-
South / South West	**913**	**26.82**	**23.98**	**29.66**
Cork University Hospital	479	25.74	21.72	29.75
Kerry General Hospital	146	31.53	23.98	39.07
University Hospital Waterford	114	28.1	20.54	35.66
South Tipperary General Hospital	76	-	-	-
Mercy University Hospital Cork	61	-	-	-
Bantry General Hospital	22	-	-	-
South Infirmary/Victoria University Hospital Cork	9	-	-	-
Mallow General Hospital	6	-	-	-
Saolta University Health Care	**593**	**27.42**	**23.85**	**30.98**
Galway University Hospitals	217	26.62	21.02	32.22
Mayo General Hospital	113	31.11	23.49	38.72
Sligo General Hospital	110	28.44	20.24	36.64
Letterkenny General Hospital	97	-	-	-
Portiuncula Hospital Ballinasloe	48	-	-	-
Roscommon County Hospital	8	-	-	-
Total for All Hospitals	**4367**	**24.74**	**23.47**	**26.00**

Source: Hospital Inpatient Enquiry (HIPE)

Notes: Hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals.
See Appendix 3 for detailed indicator definitions and methodology.

In-hospital mortality within 30 days after ischaemic stroke

Description

In-hospital mortality within 30 days after ischaemic stroke is defined as the number of patients aged 45 and over who die in hospital within 30 days of being admitted to hospital with a principal diagnosis of ischaemic stroke, as a proportion of the total number of patients aged 45 and over admitted to that hospital with a principal diagnosis of ischaemic stroke.

Rationale for selection of indicator

As mentioned in the previous rationale for haemorrhagic stroke an ischaemic stroke is caused by death of brain cells in a localized area due to inadequate blood flow caused by ischaemia (blood clot).

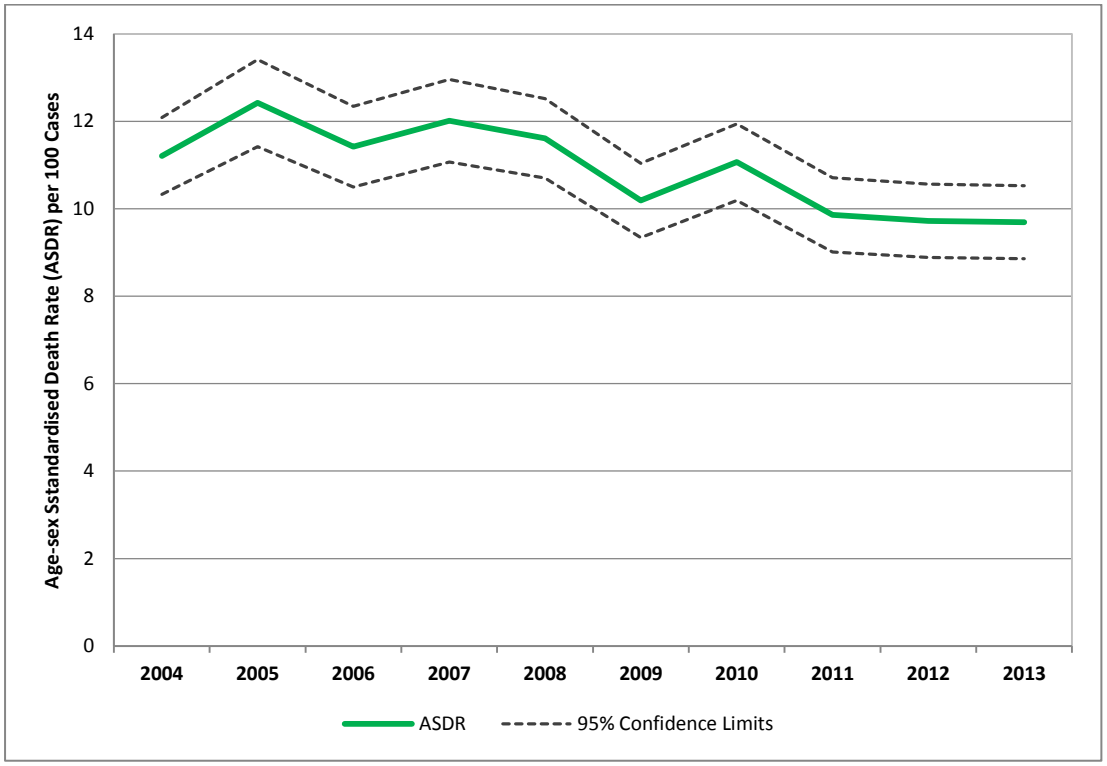
Commentary

- The age-sex standardised in-hospital mortality rate within 30 days of admission for ischaemic stroke has decreased from 11.2 deaths per 100 cases in 2004 to 9.7 in 2013, a reduction of 13.6% (Figure 32).
- In 2011, the average in-hospital mortality rate within 30 days of admission with ischaemic stroke in Ireland was above the OECD average rate, i.e. 9.9 deaths per 100 cases for Ireland in that year compared to the OECD average of 8.5 deaths per 100 cases (Figure 33).
- During the three year period from 2011-2013, the age-sex standardised mortality rates for two hospitals were statistically significantly higher than the national rate at the 95% confidence level. The rates for all other hospitals were within or lower than the expected range (Table 7 and Figure 34). Note that for this indicator the age-sex standardised mortality rates are statistically significantly higher than the national rate if the lower 95% confidence limit for a hospital or a hospital group is above the upper 95% confidence limit for the national rate (i.e. above 10.25).
- It is important to note however that the age-sex standardised rates presented here are high level indicators only. There can be many reasons why a hospital would have higher or lower rates than the national average, including
    a. differences in the types of patients attending different hospitals (for example, some hospitals may have a higher or lower proportion of patients with other medical conditions attending than others and this may influence outcomes),

b. inconsistencies in the quality of the data gathered in different hospitals,
c. differences in access to medical care prior to arrival at the hospital,
d. transfer patterns of patients between different hospitals,
e. variations in the quality of care delivered in different hospitals.

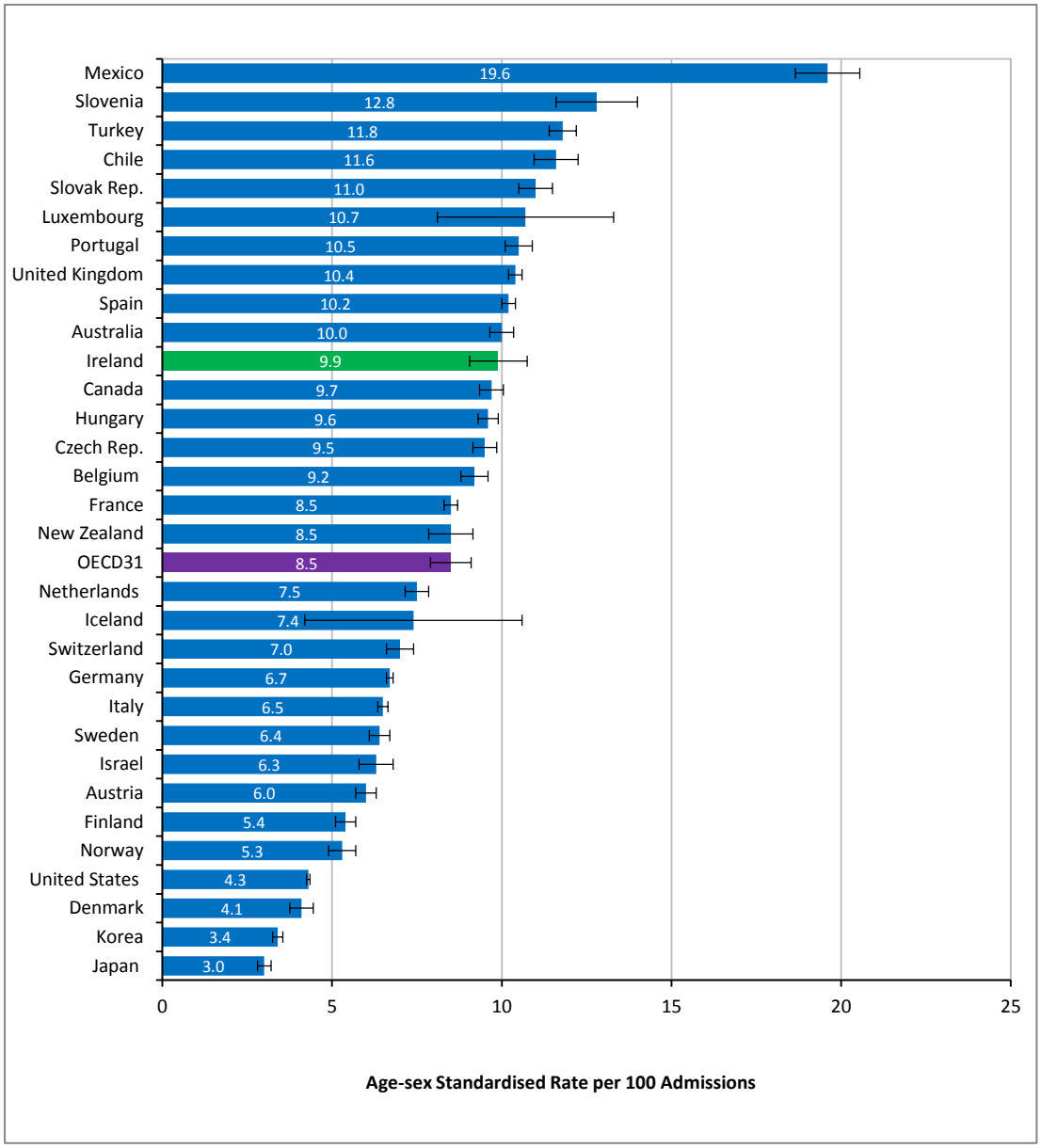
- Therefore, it cannot be concluded that a high mortality rate is indicative of poor quality care. Rather it provides an indication that a further evaluation should be carried out to determine the reasons for the identified variation in mortality rates.

Figure 32: In-hospital mortality within 30 days of admission for ischaemic stroke, 2004 - 2013



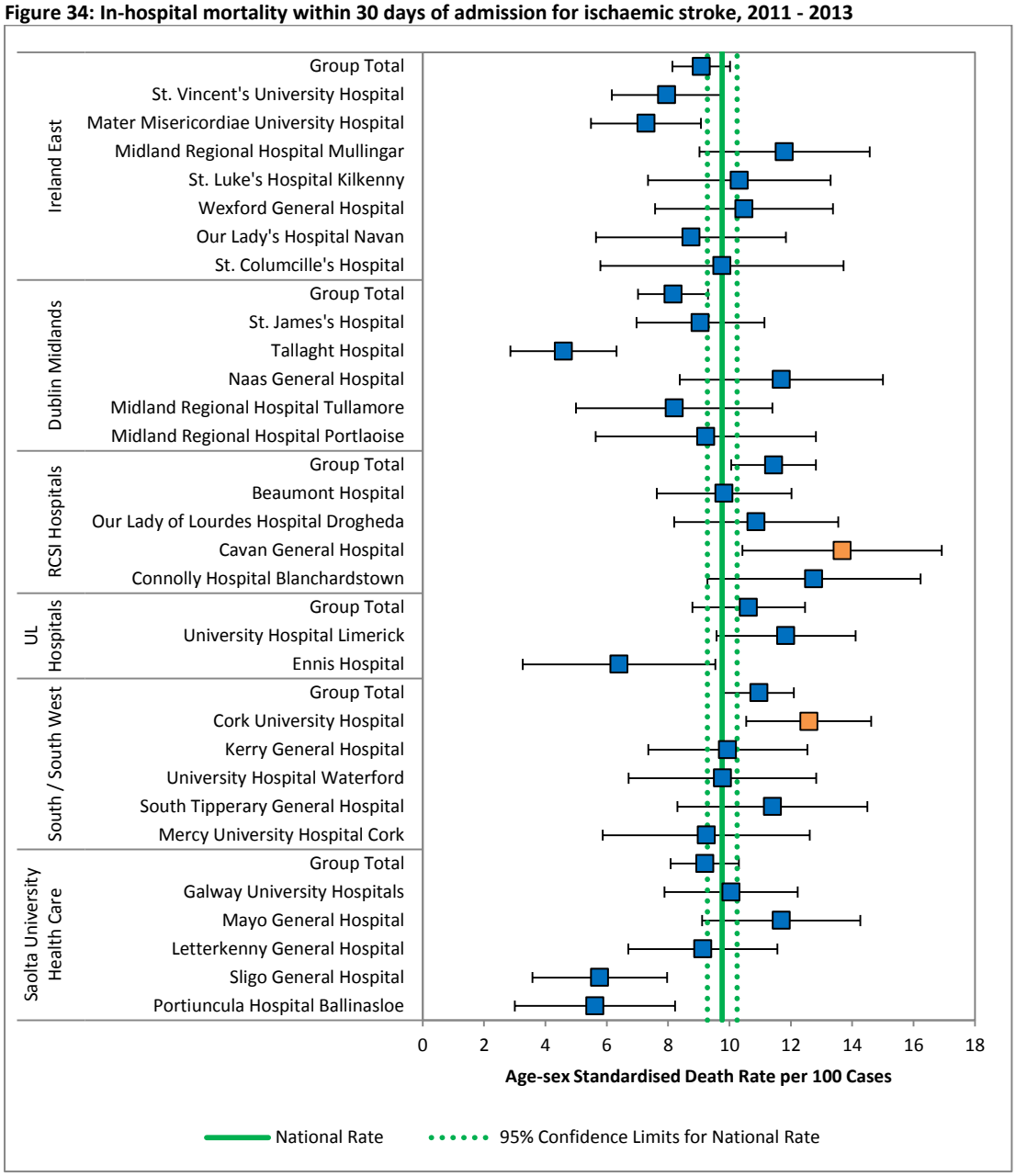
Source: Hospital Inpatient Enquiry (HIPE)

Figure 33: In-hospital mortality within 30 days of admission for ischaemic stroke for selected OECD countries, 2011 (or nearest year)



Source: OECD Health Statistics.
Note: 95% confidence intervals represented by **H**.

Figure 34: In-hospital mortality within 30 days of admission for ischaemic stroke, 2011 - 2013



Source: Hospital Inpatient Enquiry (HIPE)

Notes:

Hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals.

The data presented above are age-sex standardised mortality rates per 100 cases. 95% confidence intervals for hospitals and hospital groups are shown by **H**.

Where the 95% confidence interval for a hospital or hospital group overlaps the 95% confidence interval of the national rate (i.e. the dashed green lines), it can be concluded that the rate is not statistically significantly different from the national rate and so is within the expected range.

Where the 95% confidence interval for a hospital or hospital group does not overlap the confidence interval of the national rate, it implies that the mortality rate is statistically significantly different from the national rate and is therefore outside the expected range.

There can be many reasons for variations in mortality rates including differences in patient profiles; data quality issues; and differences in the quality of care.

Age-sex standardised mortality rates that are statistically significantly higher at the 95% confidence level than the national rate are shown in amber. Rates for all other hospitals and hospital groups are below or within the expected range of the national rate.

Table 7: In-hospital mortality within 30 days of admission for ischaemic stroke, 2011 - 2013

Hospital Group	Number of Cases	Age-sex Standardised Death Rate (ASDR) per 100 Cases	Lower 95% Confidence Limit for ASDR	Upper 95% Confidence Limit for ASDR
Ireland East	**3267**	**9.08**	**8.14**	**10.02**
St. Vincent's University Hospital	783	7.95	6.17	9.72
Mater Misericordiae University Hospital	779	7.28	5.48	9.07
Midland Regional Hospital Mullingar	403	11.79	9.02	14.57
St. Luke's Hospital Kilkenny	385	10.32	7.34	13.30
Wexford General Hospital	380	10.47	7.57	13.37
Our Lady's Hospital Navan	298	8.75	5.65	11.84
St. Columcille's Hospital	194	9.76	5.79	13.72
St. Michael's Hospital	45	-	-	-
Dublin Midlands	**2225**	**8.16**	**7.02**	**9.30**
St. James's Hospital	721	9.05	6.97	11.14
Tallaght Hospital	694	4.59	2.86	6.32
Naas General Hospital	376	11.69	8.38	15.00
Midland Regional Hospital Tullamore	248	8.20	5.00	11.40
Midland Regional Hospital Portlaoise	186	9.23	5.64	12.82
RCSI Hospitals	**1995**	**11.44**	**10.06**	**12.82**
Beaumont Hospital	762	9.82	7.63	12.02
Our Lady of Lourdes Hospital Drogheda	507	10.87	8.20	13.55
Cavan General Hospital	378	13.67	10.42	16.92
Connolly Hospital Blanchardstown	348	12.75	9.28	16.23
UL Hospitals	**994**	**10.62**	**8.79**	**12.46**
University Hospital Limerick	737	11.84	9.58	14.11
Ennis Hospital	156	6.40	3.26	9.54
Nenagh Hospital	63	-	-	-
St. Johns Hospital	38	-	-	-
South / South West	**2645**	**10.96**	**9.81**	**12.10**
Cork University Hospital	977	12.59	10.55	14.62
Kerry General Hospital	457	9.94	7.35	12.54
University Hospital Waterford	388	9.77	6.71	12.83
South Tipperary General Hospital	335	11.40	8.30	14.50
Mercy University Hospital Cork	290	9.25	5.87	12.62
Bantry General Hospital	71	-	-	-
Mallow General Hospital	70	-	-	-
South Infirmary/Victoria University Hospital Cork	57	-	-	-
Saolta University Health Care	**2329**	**9.20**	**8.08**	**10.31**
Galway University Hospitals	680	10.05	7.88	12.22
Mayo General Hospital	523	11.69	9.11	14.27
Letterkenny General Hospital	504	9.13	6.70	11.56
Sligo General Hospital	400	5.77	3.58	7.97
Portiuncula Hospital Ballinasloe	201	5.61	3.00	8.23
Roscommon County Hospital	21	-	-	-
Total for All Hospitals	**13455**	**9.76**	**9.28**	**10.25**

Source: Hospital Inpatient Enquiry (HIPE)

Note: Hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals.

See Appendix 3 for detailed indicator definitions and methodology.

In-hospital waiting time for hip fracture surgery

Description

The in-hospital waiting time for hip fracture surgery indicator is defined as the proportion of patients aged 65 years and older with a hip fracture who have surgery within two days of admission.

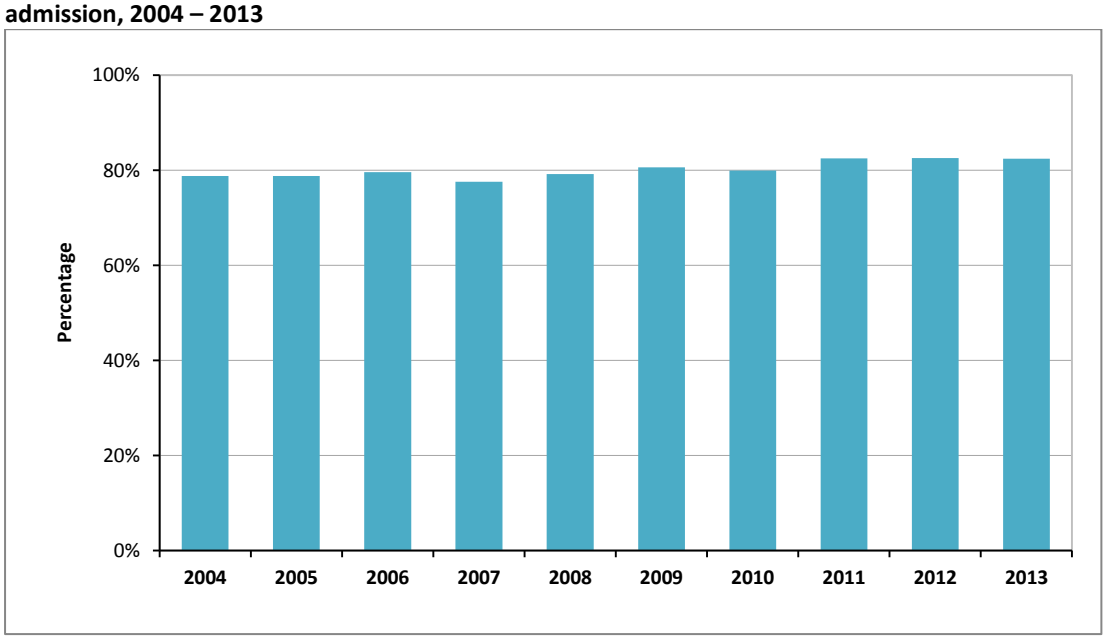
Rationale for selection of indicator

Hip fracture, which is associated with increasing age, can lead to a significant risk of serious illness and sometimes death (24, 25). The standard treatment for hip fracture is surgery. It is known that the outcomes for patients are better if this surgery is timely i.e. that the surgery happens as soon as possible after admission and when the patient is ready and fit for surgery (26). This may mean that the patient needs to be stabilised and therefore, there can be a delay between admission and surgery, whether for medical stabilisation of the patient's co-morbidities, or for administrative/logistical reasons. A delay in surgery can mean that as well as an increased length of hospital stay for the patient, there may also be an associated increased risk of serious illness and death. Based on this evidence the Health Service Executive (HSE) has a target of 95% of emergency hip fracture surgeries to be carried out within 48 hours of admission.

Commentary

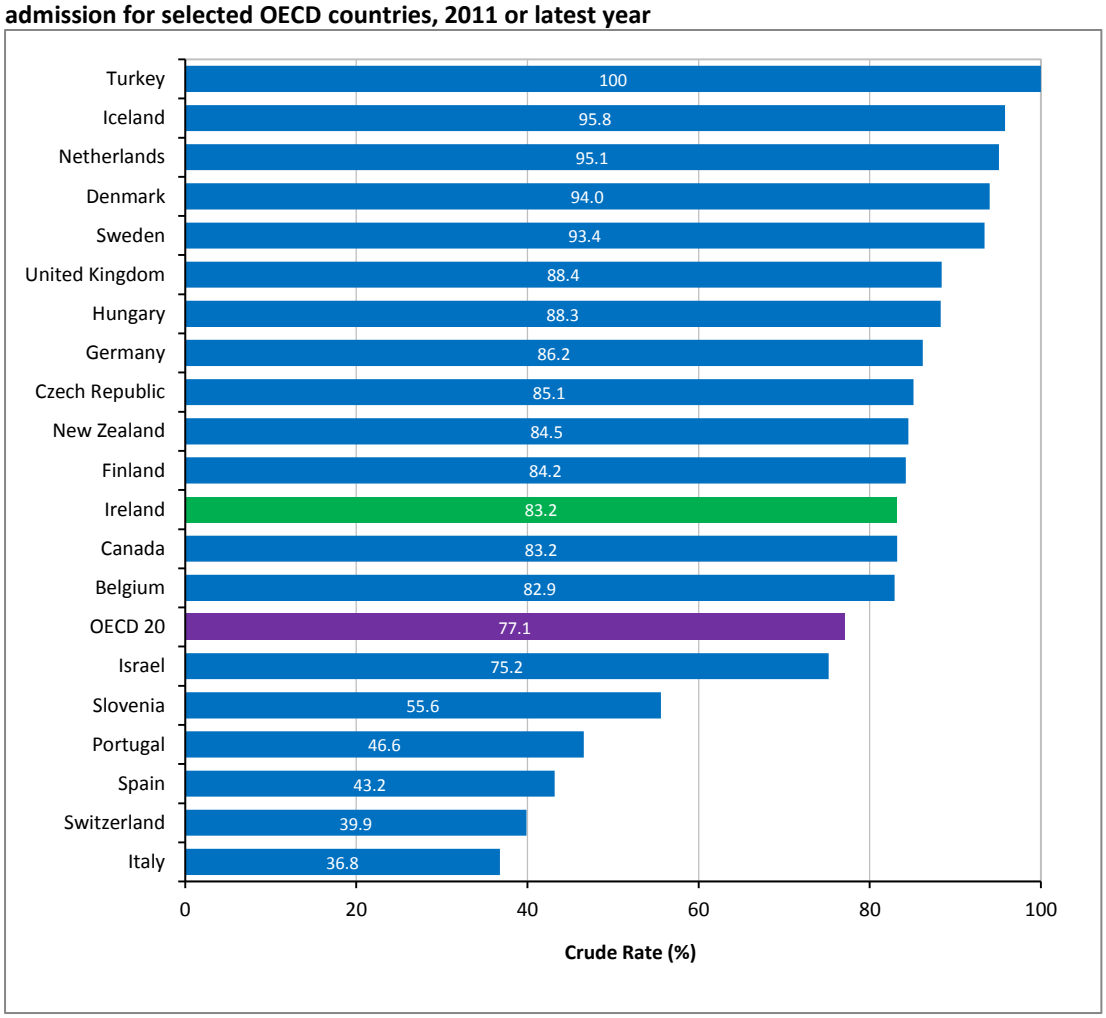
- The proportion of patients with a hip fracture undergoing surgery within two days increased slightly over the ten year period from 2004 to 2013, with 82.4% of cases in 2013 undergoing surgery within two days compared to 78.8% in 2004 (Figure 35).
- In 2011, the average proportion of patients with a hip fracture undergoing surgery within two days in Ireland was 83.2% which was higher than the OECD average of 77.1% (Figure 36).
- During the three year period 2011-2013 there was a variation between hospitals in the proportion of hip fracture cases undergoing surgery within two days with one hospital carrying out 65.9% of surgeries within two days while two hospitals achieved rates of over 95% (Table 8 and Figure 37). This variation needs to be further explored.

Figure 35: In-hospital waiting time for hip fracture surgery - proportion of cases with surgery within 2 days of admission, 2004 – 2013



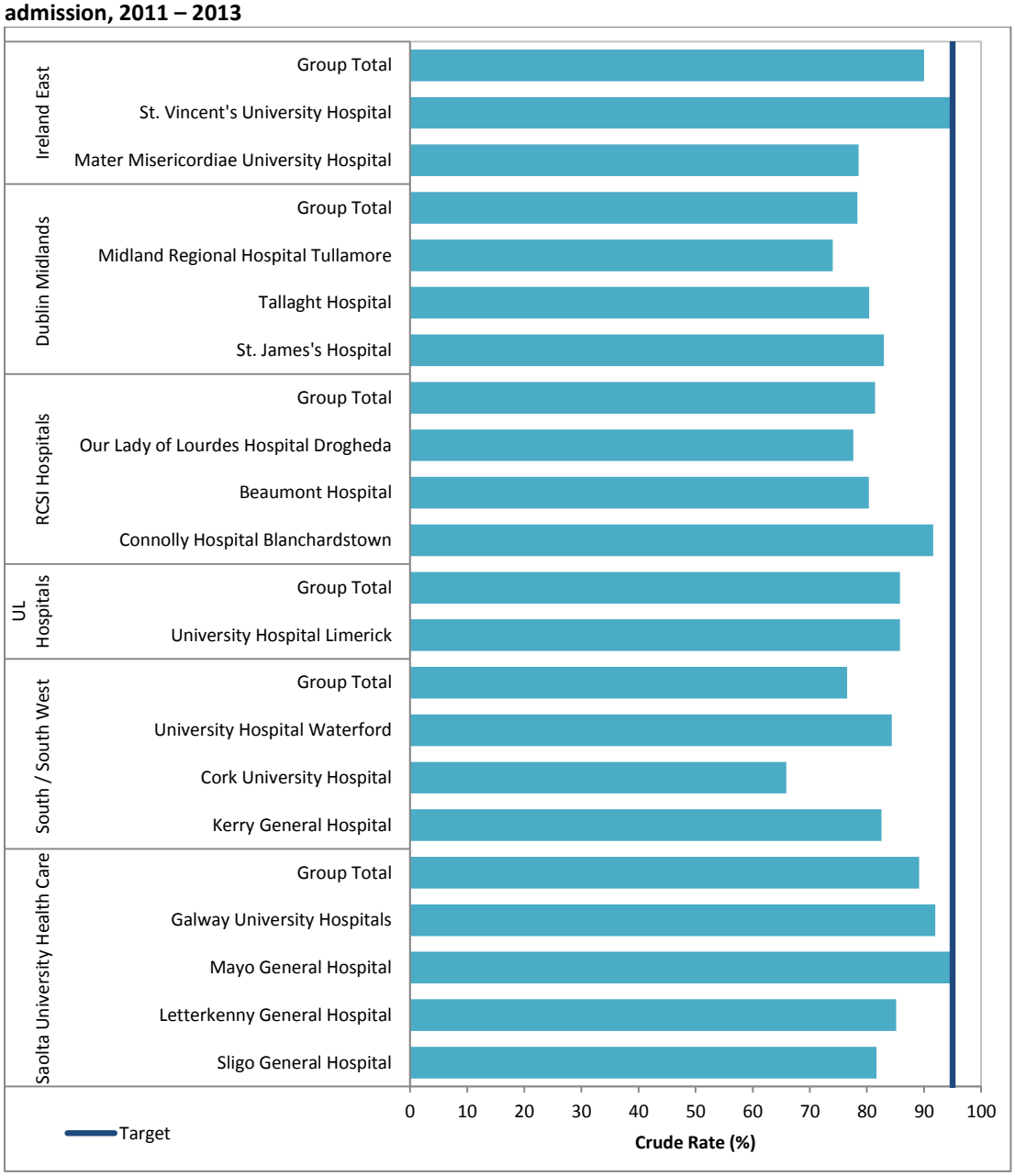
Source: Hospital Inpatient Enquiry (HIPE)

Figure 36: In-hospital waiting time for hip fracture surgery - proportion of cases with surgery within 2 days of admission for selected OECD countries, 2011 or latest year



Source: OECD Health Statistics

Figure 37: In-hospital waiting time for hip fracture surgery - proportion of cases with surgery within 2 days of admission, 2011 – 2013



Source: Hospital Inpatient Enquiry (HIPE)

Table 8: In-hospital waiting time for hip fracture surgery - proportion of cases with surgery within 2 days of admission, 2011 – 2013

Hospital Group	Number of Hip Fracture Admissions	Percentage with Surgery within 2 Days
Ireland East	**1129**	**90.0**
St. Vincent's University Hospital	766	95.4
Mater Misericordiae University Hospital	363	78.5
Dublin Midlands	**1204**	**78.3**
Midland Regional Hospital Tullamore	500	74.0
Tallaght Hospital	428	80.4
St. James's Hospital	276	83.0
RCSI Hospitals	**1341**	**81.4**
Our Lady of Lourdes Hospital Drogheda	643	77.6
Beaumont Hospital	412	80.3
Connolly Hospital Blanchardstown	286	91.6
UL Hospitals	**682**	**85.8**
University Hospital Limerick	682	85.8
South / South West	**2307**	**76.6**
University Hospital Waterford	1036	84.4
Cork University Hospital	944	65.9
Kerry General Hospital	327	82.6
Saolta University Health Care	**1429**	**89.2**
Galway University Hospitals	497	92.0
Mayo General Hospital	330	95.2
Letterkenny General Hospital	329	85.1
Sligo General Hospital	273	81.7
Total for All Hospitals	**8092**	**82.5**

Source: Hospital Inpatient Enquiry (HIPE)
Note: See Appendix 3 for detailed indicator definitions and methodology.

Caesarean Sections

Description

This is defined as the rate of caesarean section deliveries per 100 live births in public hospitals.

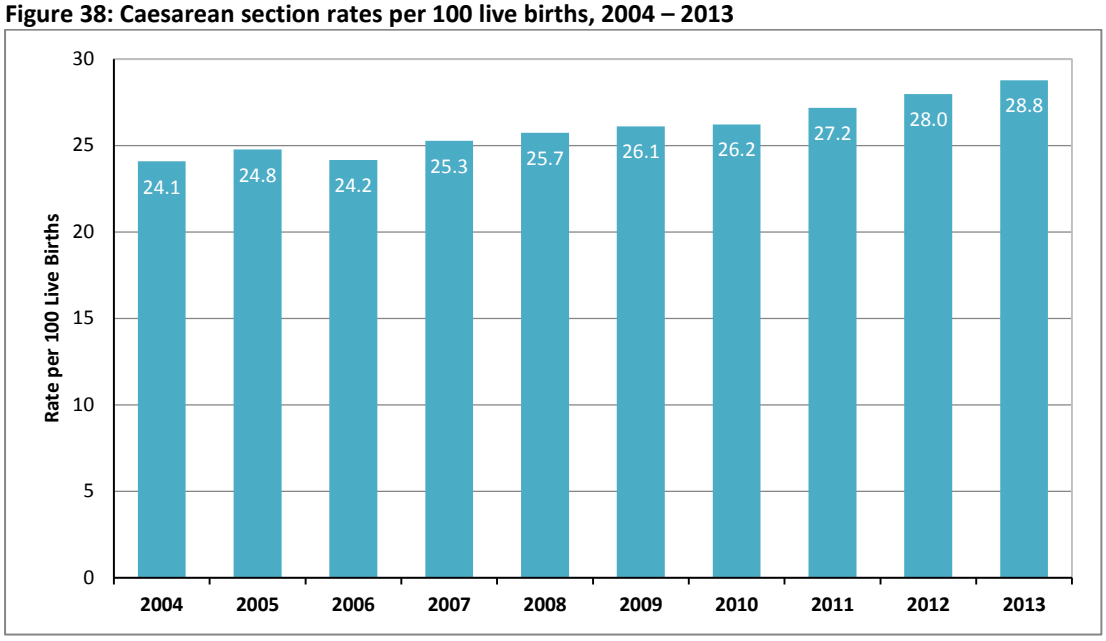
Rationale for selection of indicator

The rates of caesarean sections per number of live births are commonly reported internationally and are also reported by the OECD. To allow for comparison with other OECD countries, rates of caesarean section deliveries per 100 live births in Ireland were calculated. These calculations do not take into account multiple births, history of caesarean section, or other factors which may impact on the likelihood of having a caesarean section. Rates of caesarean delivery as a percentage of all live births have increased in almost all OECD countries in recent decades with the average rate across countries going up from 20% in 2000 to 27% in 2011, although the growth rate in many countries has slowed down since 2005. There are many possible reasons suggested by the OECD for these increases including among others reductions in the risk of caesarean delivery, increasing litigation, increases in first births among older women, and the rise in multiple births resulting from assisted reproduction (27).

Commentary

- Figure 38 shows increasing national rates of caesarean section per 100 live births between the years 2004 and 2013.
- In 2011 the caesarean section rate for Ireland was 27.2 per 100 live births, which was above the OECD rate of 26.9 (Figure 39).
- Table 9 and Figure 40 show variation in the rates of caesarean section per 100 live births in 2013 in maternity hospitals in Ireland. However, it should be noted that this analysis does not take into account a number of factors that are known to impact on caesarean section rates including age of the mother, history of caesarean section, multiple births, or complex presentations and pregnancies. The findings presented in this report are from a high level analysis. Further exploration of the identified variations requires these factors to be taken into account as well as data quality and quality of care issues.

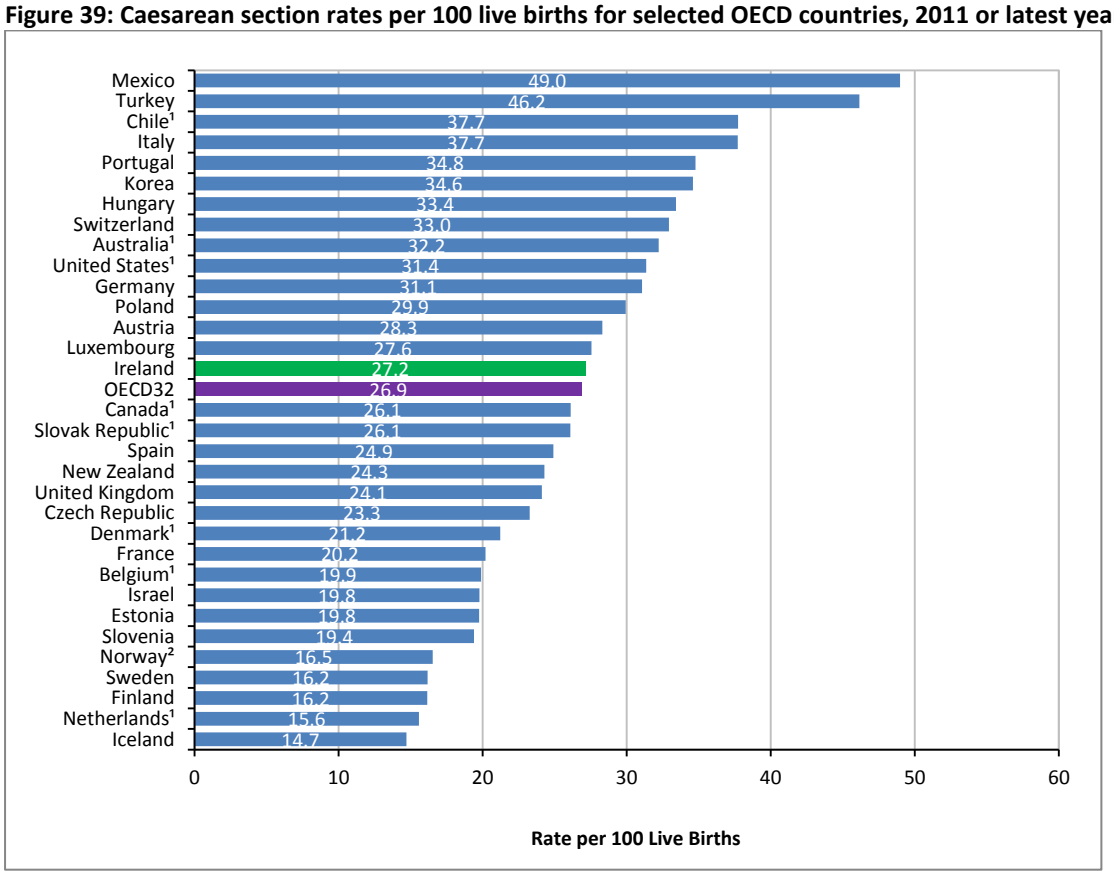
Figure 38: Caesarean section rates per 100 live births, 2004 – 2013



Source: National Perinatal Reporting System

Note: Data refer to the rate of caesarean sections per 100 live births in public hospitals only and were provided by the Healthcare Pricing Office [December 2014]. See Appendix 3 for detailed indicator definitions and methodology.

Figure 39: Caesarean section rates per 100 live births for selected OECD countries, 2011 or latest year

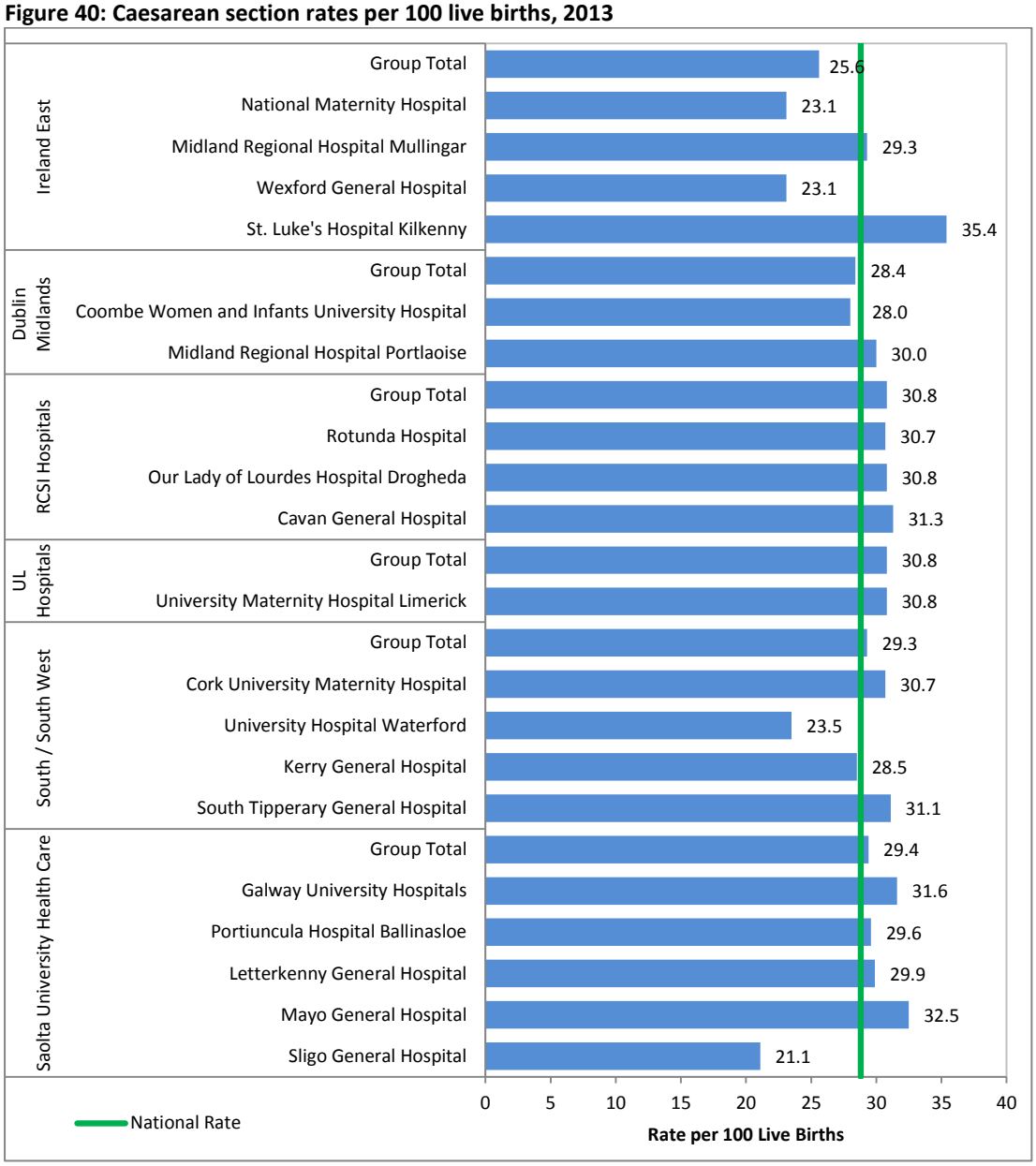


Source: OECD Health Statistics 2013.

Note: Data for Ireland refer to the rate per 100 live births in 2011 (excluding private hospitals) and were sourced from the National Perinatal Reporting System [Healthcare Pricing Office, December 2014].

1. 2010. 2. 2009

Figure 40: Caesarean section rates per 100 live births, 2013



Source: National Perinatal Reporting System

Note: Data refer to the rate of caesarean sections per 100 live births in public hospitals only and were provided by the Healthcare Pricing Office [December 2014]. See Appendix 3 for detailed indicator definitions and methodology.

Table 9: Caesarean section rates per 100 live births by hospital group and hospital, 2013

Hospital Group	Number of Live Births	Rate of Caesarean Sections per 100 Live Births
Ireland East	**14,861**	**25.6**
National Maternity Hospital	8,715	23.1
Midland Regional Hospital Mullingar	2,409	29.3
Wexford County Hospital	1,962	23.1
St. Luke's Hospital Kilkenny	1,775	35.4
Dublin Midlands	**9,912**	**28.4**
Coombe Women & Infants University Hospital	7,955	28.0
Midland Regional Hospital Portlaoise	1,957	30.0
RCSI Hospitals	**14,068**	**30.8**
Rotunda Hospital	8,606	30.7
Our Lady of Lourdes Hospital Drogheda	3,579	30.8
Cavan General Hospital	1,883	31.3
UL Hospitals	**4,525**	**30.8**
University Maternity Hospital Limerick	4,525	30.8
South / South West	**12,936**	**29.3**
Cork University Maternity Hospital	8,133	30.7
University Hospital Waterford	2,147	23.5
Kerry General Hospital	1,471	28.5
South Tipperary General Clonmel	1,185	31.1
Saolta University Health Care	**10,001**	**29.4**
Galway University Hospitals	3,044	31.6
Portiuncula Hospital Ballinasloe	2,006	29.6
Letterkenny General Hospital	1,761	29.9
Mayo General Hospital	1,678	32.5
Sligo General Hospital	1,512	21.1
Total for All Hospitals	**66,303**	**28.8**

Source: National Perinatal Reporting System
Notes: Data refer to the rate of caesarean sections per 100 live births in public hospitals only and were provided by the Healthcare Pricing Office [December 2014].
See Appendix 3 for detailed indicator definitions and methodology.

Domain 5: Treating and caring for people in a safe environment

Health Care Associated Infections

Methicillin-Resistant Staphylococcus Aureus (MRSA) infection rates

Description

Rate of MRSA bloodstream infections in acute hospital per 1,000 bed days used. Under the case definition for the European Antimicrobial Resistance Surveillance Network (EARS-Net), data are collected on the first bloodstream isolate of staphylococcus aureus per patient per quarter.

Rationale for selection of indicator

MRSA stands for methicillin resistant staphylococcus aureus (*S. aureus*). MRSA is a type of *S. aureus* that has become resistant to a number of different antibiotics and is therefore very difficult to treat. Most people who carry MRSA on their bodies or in their noses don't suffer any ill effects. However, MRSA sometimes causes infections and this is more likely to happen to people who are already unwell, particularly those who are in hospital with a serious illness. In a small number of people, MRSA can cause serious infections such as septicaemia and, in some cases, this can lead to serious illness and even death (accessed 08 December 2014. www.hpsc.ie/A-Z).

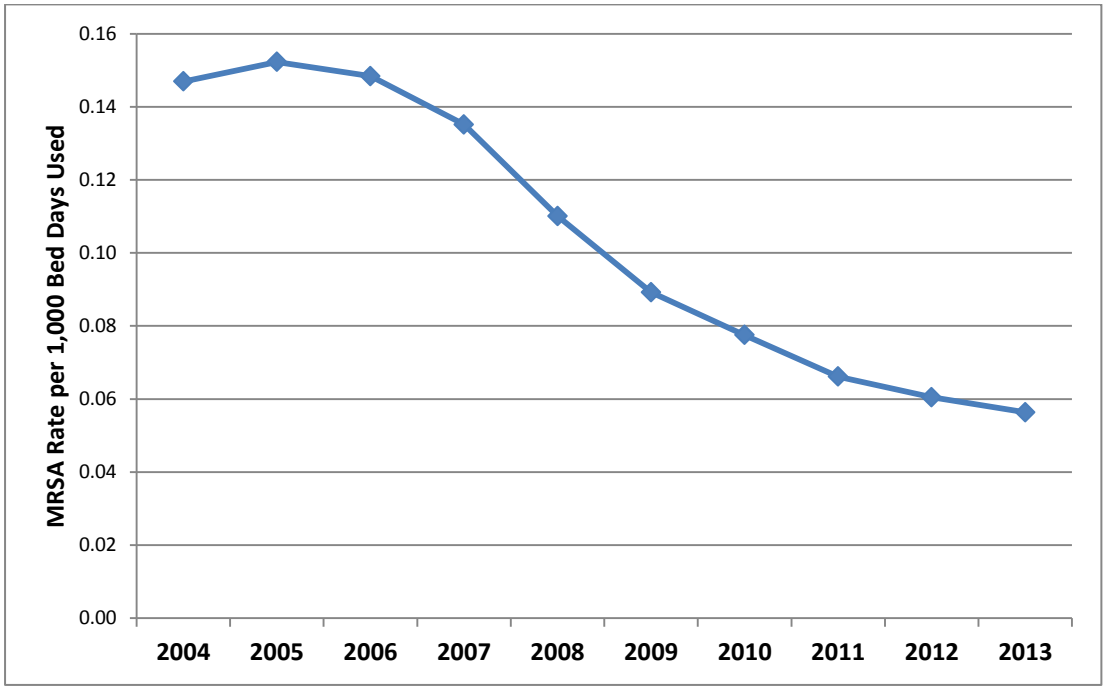
MRSA infection while in hospital can be prevented and therefore, measuring rates of MRSA infection is used as a quality measure in many countries. The European Antimicrobial Resistance Surveillance Network (EARS-Net) collects and reports on the proportion of staph aureus infections that are methicillin resistant for the participating countries. For some countries including Ireland, the trend has been positive as the proportion of staph aureus cases that are methicillin resistant has significantly decreased between 2010 and 2013(28).

Commentary

- Figure 41 shows national MRSA rates per 1,000 bed days used between 2004 and 2013. This rate has been decreasing over the last ten years with a 62% reduction.
- Figure 42 shows Ireland and other European countries who are part of the European Antimicrobial Resistance Surveillance Network (EARS-Net) This international network

publishes national figures on MRSA cases as a proportion of *S. aureus*, that is the proportion of *S. aureus* that are resistant to Methicillin. This figure shows that Ireland is in the middle in relation to other countries for MRSA cases as a proportion of *S. aureus* cases for 2013.

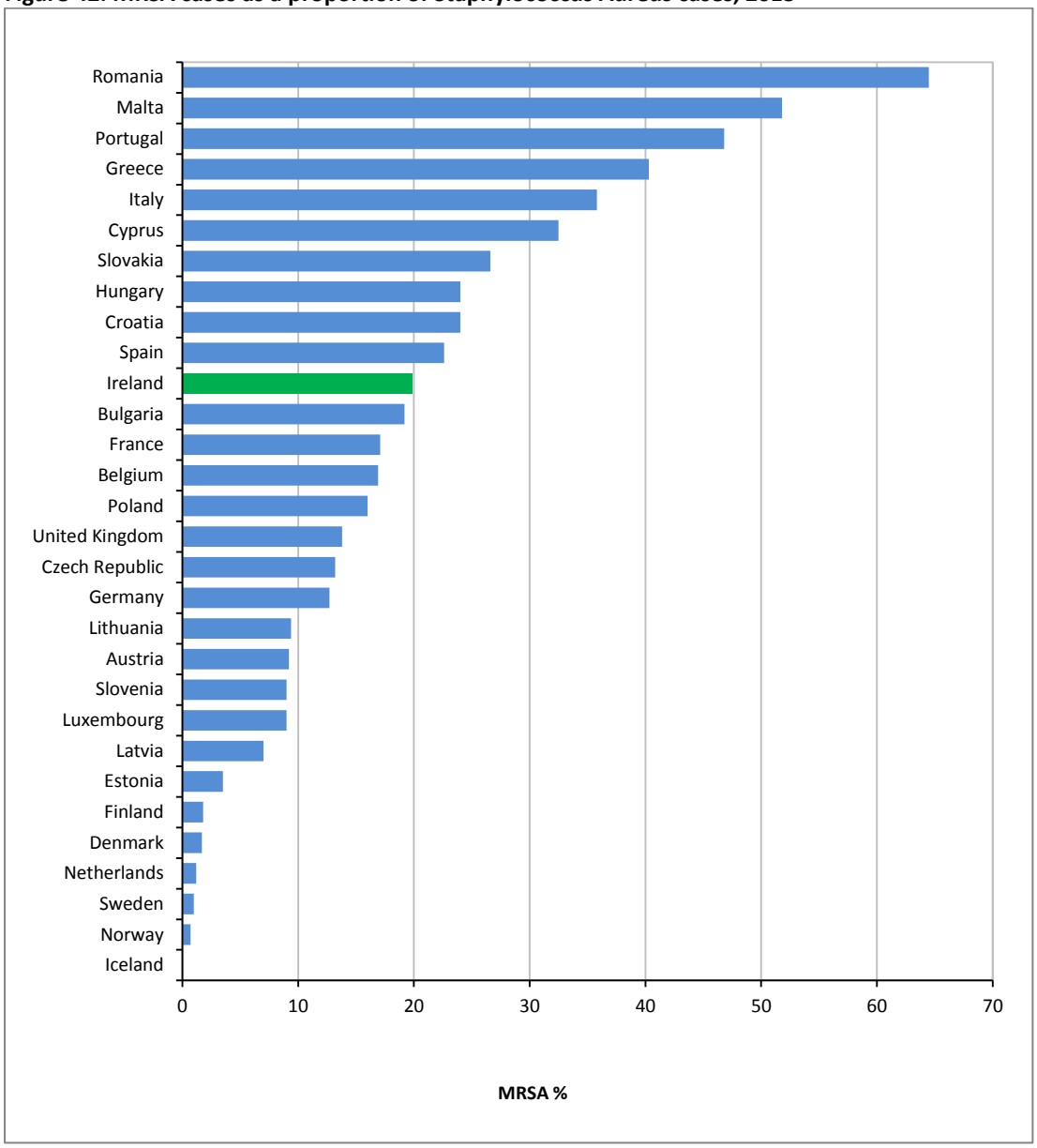
Figure 41: MRSA rate per 1,000 bed days used, 2004 - 2013



Source: Health Protection Surveillance Centre

Note: Rates for 2004 and 2005 were calculated for acute public hospitals only

Figure 42: MRSA cases as a proportion of Staphylococcus Aureus cases, 2013



Source: EARS-Net

Clostridium Difficile (C Difficile) infection rates

Description

Rate of new cases of Clostridium difficile in acute hospitals per 10,000 bed days used

Rationale for selection of indicator

Clostridium difficile (*C. difficile*) is a bacteria that is normally found in the large bowel. A small proportion (less than 1 in 20) of the healthy adult population, carry a small amount of *C. difficile* and don't experience any problem with it. However, sometimes when a person takes an antibiotic, some "good" bacteria die allowing the *C. difficile* bacteria to multiply. This can sometimes lead to an infection in the large bowel.

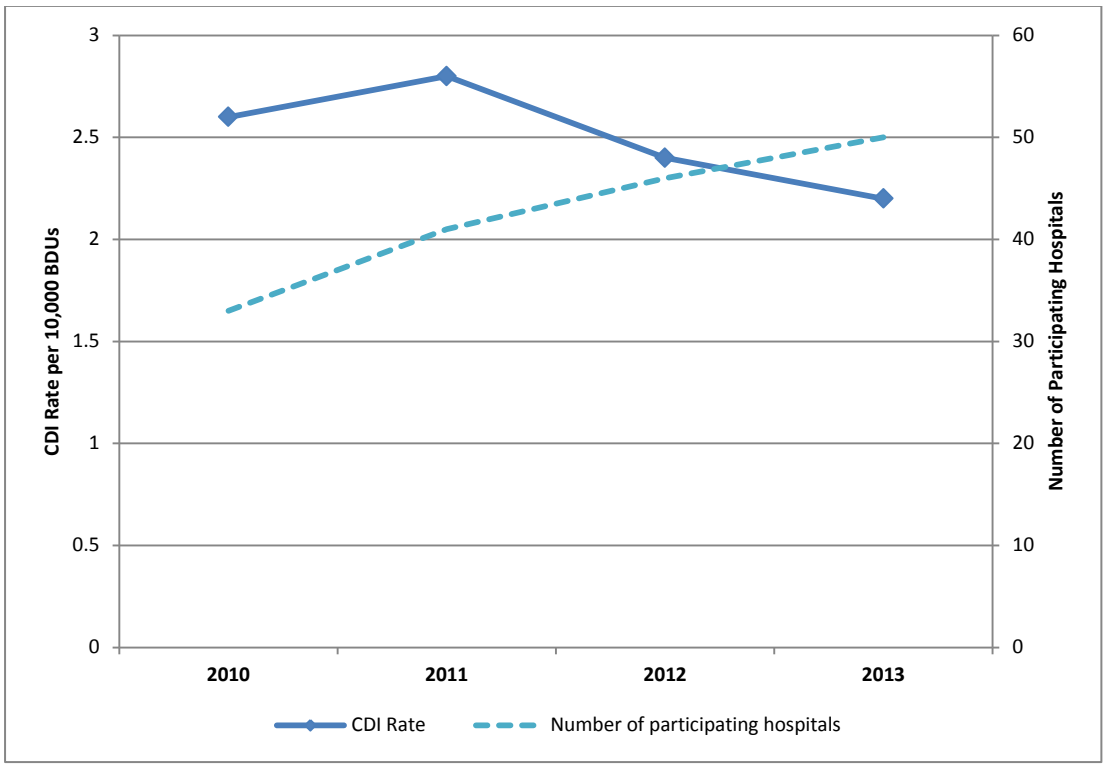
Symptoms of *C. difficile* infection include diarrhoea, stomach cramps, fever, nausea and loss of appetite. Most people get mildly ill and recover fully from it but in certain circumstances, patients can develop serious complication including colitis (inflammation of the bowel) which can be life threatening. Risk factors for developing infection include older persons, antibiotic use, serious illness, immune-compromise (weakened immunity), recent bowel surgery and long term hospitalisation or residence in other health care settings e.g., nursing homes (accessed 08 December 2014. www.hpsc.ie/A-Z).

Control of *C. difficile* comprises of good antibiotic stewardship (only using antibiotics when required and using the right antibiotic for the infection in question) and good infection prevention and control such as patients, their family members and hospital staff regularly washing their hands, and appropriate cleaning and disinfection of equipment. *C difficile* rates in hospitals are recognised and used internationally as a good measure of the quality and safety of a health care service.

Commentary

Figure 43 shows new hospital acquired *C difficile* infection cases per 10,000 bed days used, between 2010 and 2013 at a national level. This rate has been decreasing over this period. Figure 43 also shows the number of hospitals participating in this reporting scheme is increasing.

Figure 43: New hospital acquired Clostridium Difficile Infection cases per 10,000 bed days used, 2010 - 2013



Source: Health Protection Surveillance Centre

Notes: CDI Rate refers to new HCAI Clostridium Difficile Infection cases per 10,000 bed days used

Some hospitals may have participated for part of a year but not the whole year.

Conclusions

Public reporting of patient outcomes enables patients, the public, service providers and policy makers to make more informed health care decisions. It empowers patients, the public and service providers at all levels. Evidence from international research suggests public reporting of patient outcomes is an important means of improving the quality and outcome of health care and is also consistent with the principles of openness and transparency.

This first annual report of the National Healthcare Quality Reporting System (NHQRS) publicly reports measures of health service performance and outcomes of care for Irish health services. It is the first time a report with performance and quality as its sole focus has been produced by the Department of Health. The purpose of the report is to use information that is readily available to inform questions of performance and quality which can then further inform the development of policy, priorities and specific service plans. It allows performance and outcome measures to be compared between regions and health service providers and allows health service performance and patient outcomes to be tracked over time. It also allows the comparison of Ireland's health service performance with that of other countries.

Such comparisons, by their nature, will show variation. However they will not provide the explanation as to why such variation may exist. That is not their purpose. It is important that these measures are understood to be indicators that point to areas that require more detailed analysis and examination. This further examination will inform planning and delivery of services with the aim of improving performance. Demonstrating that there is information available, which establishes that variation does in fact exist, is an essential pre-requisite to the development of a culture of openness, responsiveness and learning that is in turn critical to improving care.

This report highlights areas of the health services that are performing well.

- Immunisation rates have improved in the last few years in spite of the pressures on the health services.
- In-hospital mortality following admission with a heart attack decreased substantially between 2004 and 2013 (40% reduction).

- Survival rates for patients with breast and colorectal cancer are improving and at a rate higher than other European countries in the OECD (27).
- National hospitalisation rates for asthma and diabetes are decreasing and are below the OECD average.
- The national rates of MRSA and C. Difficile infections have improved in recent years.
- The proportion of patients undergoing hip fracture surgery within the recommended time of two days in Ireland is higher than the OECD average.

The report also importantly highlights areas in the health services where there is room for improvement.

- Cancer survival for cervical cancer is not as yet improving.
- There has been a reduction in the uptake for breast cancer screening in recent years.
- Older women have lower uptake rates for cervical cancer screening.
- Rates of hospitalisation for asthma, chronic obstructive pulmonary disease (COPD) and diabetes vary substantially across the country.
- In-hospital mortality for patients admitted with a heart attack or stroke varies between individual hospitals with a small number of hospitals having rates that are statistically significantly higher than the national average.
- The proportion of cases undergoing hip fracture surgery within the recommended two days of admission varies between individual hospitals.
- The rate of caesarean sections varies between individual hospitals.

The performance and quality of a service cannot be measured by one indicator alone. What is required is an analysis of a range of indicators that reflect different aspects of the service. It is possible that some pieces of information highlighted during the development of this report may require a more immediate assessment of quality in a specific service. Any information, therefore, which showed a significant variation in respect of services was fed back to the HSE to enable an appropriate examination and follow-up to take place.

This report is published against a backdrop of information that is already available in the public domain. For example, immunisation uptake rates are reported on a quarterly basis by the HSE-Health Protection Surveillance Centre (HPSC); the National Cancer Registry of Ireland regularly publishes cancer survival rates and the National Screening Service publicly

publishes information on specific cancer screening programmes e.g. Breastcheck annual reports.

The HSE, sponsored by its Quality Improvement Division, is developing quality profiles for all of its services which will include key quality indicators such as patient experience. In the specific area of hospital mortality a Comparative Audit of Hospital Mortality (CAHM) has been developed. This tool will be used by all acute hospitals to audit in-hospital deaths and will also assist hospitals in examining findings from the audits and from other reports such as the NHQRS annual report.The HSE has committed to reporting these in-hospital mortality rates by the end of 2015.

The information in this report will inform strategic decisions being made about the health services. The Minister for Health has set out his priorities for 2015. These include a focus on improved patient outcomes including reduced waiting times for inpatient and outpatient appointments and improving integrated care and the management of chronic diseases. The information in this report is aligned with and supports decision making for these priority areas.

The information on hospitalisation rates for chronic disease such as asthma, COPD and diabetes, particularly the variation across the country, can inform the development and implementation of models of integrated care and the development of GP contracts. Also information in this report relating to cancer can inform decisions about the further development of cancer services including screening services and also feed into the new cancer strategy that is to be developed in the next year.

It is important to note that commitments contained in the HSE National Service Plan 2015 to report measures and indicators (at a more detailed level) are aligned with the information reported in the NHQRS.

The NHQRS reports specific performances measures and patient outcomes in five key domains. Each of these domains is important and it is intended that indicators will be reported for all of them. As this is the first annual report the indicators selected reflect what was available and feasible, while also ensuring their relevance and value. However, the range of

indicators reported through the NHQRS will evolve so that in future reports they will reflect the care provided by all parts of the health services.

At present, there is no indicator that can be reported for Domain Four: *Supporting people to have positive experiences of health care*. This is because currently there are no standardised comparable surveys applied across the health sector. This is recognised as a significant gap and will be addressed by the HSE, the Department of Health and HIQA working together to address this with the intention of reporting relevant indicators in the second annual report of the NHQRS.

This annual report is only the first step in building a national public reporting system that focuses on outcomes that are important to patients, and that are a reflection of the breadth of health services provided in Ireland. Nonetheless, it is an important first step. It enables a more informed public discourse about the quality of care and the performance of Irish health services. Everyone, the public, patient, and providers can participate in this public discourse, which will then have the potential to lead to real improvements in the quality of health services in Ireland.

Appendix 1: Governance Committee members

Deirdre Mulholland (chair) Deputy Chief Medical Officer, Department of Health

Tony Holohan, Chief Medical Officer, Department of Health

Gráinne Cosgrove, Information Unit, Department of Health

Alan Cahill, Information Unit, Department of Health

Jennifer Martin, Quality Improvement Division*, Health Service Executive (up to January 2015)

Michael Carton, Quality Improvement Division*, Health Service Executive (joined January 2015)

Pat Kirwan, State Claims Agency

Brigid Doherty, Patient Focus

Helen Byrne, Acute Hospitals Division, Health Service Executive

Rosemary Smith, Mental Health Commission

Jane Grimson, Health Information and Quality Authority (retired September 2014)

Rachel Flynn, Information Directorate, Health Information and Quality Authority (replacing Jane Grimson September 2014)

Gerard O'Callaghan, Voluntary Hospitals CEO Group

Orlaith O'Reilly, Health and Wellbeing Division, Health Service Executive

Sinead Quill, Acute Hospitals Unit, Department of Health

Paula Monks, Department of Health

* The Quality Improvement Division, HSE was known as the Patient Safety and Quality Directorate, HSE prior to January 2015.

Appendix 2: Hospital Groups

No.	Composition
i	**RCSI Hospitals:** Beaumont Hospital; Our Lady of Lourdes Hospital, Drogheda; Connolly Hospital; Cavan General Hospital; Rotunda Hospital; Louth County Hospital; Monaghan Hospital. (Academic Partner: RCSI).
ii	**Dublin Midlands:** St James's Hospital; The Adelaide & Meath Hospital, Dublin, including the National Children's Hospital; Midlands Regional Hospital, Tullamore; Naas General Hospital; Midlands Regional Hospital Portlaoise; the Coombe Women & Infant University Hospital. (Academic Partner: TCD).
iii	**Ireland East:** Mater Misericordiae University Hospital; St Vincent's University Hospital; Midland Regional Hospital Mullingar; St Luke's General Hospital, Kilkenny; Wexford General Hospital; National Maternity Hospital; Our Lady's Hospital, Navan; St Columcille's Hospital; St Michael's Hospital, Dun Laoghaire; Cappagh National Orthopaedic Hospital; Royal Victoria Eye and Ear Hospital. (Academic Partner: UCD).
iv	**South/South West:** Cork University Hospital/CUMH; University Hospital Waterford; Kerry General Hospital; Mercy University Hospital; South Tipperary General Hospital; South Infirmary Victoria University Hospital; Bantry General Hospital; Mallow General Hospital, Lourdes Orthopaedic Hospital, Kilcreene. (Academic Partner: UCC).
v	**Saolta University Health Care:** University Hospital Galway; Merlin Park University Hospital; Sligo Regional Hospital; Letterkenny General Hospital; Mayo General Hospital; Portiuncula Hospital Ballinasloe; Roscommon Hospital. (Academic Partner: NUIG).
vi	**UL Hospitals:** University Hospital Limerick; Ennis Hospital; Nenagh Hospital; St John's Hospital Limerick; University Maternity Hospital Limerick; Croom Orthopaedic Hospital. (Academic Partner: UL).
vii	**Children's Hospital Group:** The acute paediatric services in Dublin; Our Lady's Children's Hospital - Crumlin, Children's University Hospital Temple Street, and the paediatric service in AMNCH – Tallaght. (Academic Partner: All Universities)

Appendix 3: Indicator Definitions and Methodology

Indicator	**Immunisation rates for MMR at 24 months**
Definition	% of children 24 months of age who have received the MMR (measles, mumps and rubella) vaccine
Years Covered	National trend: 2004 – 2013 Local Health Office comparison: 2013
Classification	N/A
Methodology	**Numerator:** Number of children who have received the 1st dose of MMR vaccination by their second birthday. **Denominator:** Number of children who have reached their second birthday.
Notes	The 2005 national MMR figure is incomplete, as Quarter 4 2005 MMR data were not available for the HSE-Eastern area due to technical problems with extraction of MMR data from the HSE-Eastern Area database. The 2006 national MMR figure includes the Quarter 1 2006 HSE-Eastern data, which is an estimate only. This is due to technical problems with extraction of MMR data from the HSE-Eastern Area database. Data for Q3 2008 were not available for 2 regions. The data for 2009 and 2010 are incomplete as data for some regions were incomplete.
Data Source(s)	Health Protection Surveillance Centre

Indicator	**Immunisation rates for Meningitis C at 24 months**
Definition	% of children 24 months of age who have received third dose of the Meningitis C vaccine
Years Covered	National trend: 2004 – 2013 Local Health Office comparison: 2013
Classification	N/A
Methodology	**Numerator:** Number of children who have received 3 doses of the Meningitis C vaccination by their second birthday. **Denominator:** Number of children who have reached their second birthday.
Notes	Data for Q3 2008 were not available for 2 regions. The data for 2009 and 2010 are incomplete as data for some regions were incomplete.
Data Source(s)	Health Protection Surveillance Centre

Indicator	**Immunisation against influenza for persons aged 65 years and over with medical card**
Definition	% of people aged 65 years and over with a medical card or GP Visit Card who have been vaccinated against influenza.
Years Covered	National trend: 2003 – 2013
Classification	N/A
Methodology	**Numerator:** Number of medical card and GP Visit Card holders aged 65 years and over who have received the influenza vaccine from a GP or (from 2012/2013) from a pharmacist. **Denominator:** Number of medical card and GP Visit Card holders aged 65 years and over.
Notes	Data for 2013 are provisional. Influenza vaccine data relate to paid claims for influenza vaccine reimbursement for medical card holders and GP Visit Card holders aged 65 years old and over attending GP clinics and pharmacies for influenza vaccination. Data from pharmacies were only available from the 2012/2013 influenza season when administration of influenza vaccine by pharmacists commenced. Data reported for 2013 (i.e. 2013-2014 season) are provisional. Data for 2008 refer to the 2008/2009 season (September-August), 2009 refer to the 2009/2010 season etc.
Data Source(s)	Health Protection Surveillance Centre

Indicator	**Screening rate for breast cancer**
Definition	Percentage uptake of breast screening by eligible women in the population
Years Covered	National: 2004-2013
Classification	N/A
Methodology	Numerator: the number of eligible women in the population who were invited in the reporting period and have had a satisfactory screening test Denominator: the number of eligible women invited in the reporting period
Notes	The eligible population refers to the known target population (women of screening age that are known to the programme) less those women excluded or suspended by the programme based on certain eligibility criteria. **Excluded** – women in follow up care for breast cancer, not contactable by An Post, women who have a physical/mental incapacity (while BreastCheck attempts to screen all eligible women, certain forms of physical or mental incapacity may preclude screening), terminal illness or other. **Suspended** – women on extended vacation or working abroad, women who had a mammogram within the last year, women who opt to wait until the next round, women who wished to defer appointment, women unwilling to reschedule or other.
Data Source(s)	National Screening Service

Indicator	**Screening rate for cervical cancer**
Definition	The proportion of the eligible population in Ireland who had a satisfactory smear test within a five year time period.
Years Covered	National: (Rolling) 5-year period covering 01/09/2008-31/08/2013
Classification	N/A
Methodology	Numerator: the number of women in the eligible population who have had a satisfactory smear test in the 5-year reporting period Denominator: the number of eligible women in the population at the mid-point of the 5-year reporting period
Notes	This is a rolling parameter which is updated each year to incorporate the previous 5-year period
Data Source(s)	National Screening Service

Indicator	**COPD Hospitalisation Rate**
Definition	The age-sex standardised rate of hospitalisations of people aged 15 years and older with a principal diagnosis of chronic obstructive pulmonary disease (COPD) per 100,000 population.
Years Covered	National trend: 2005 – 2013 OECD comparison: 2011 County of residence: 2011 – 2013 (aggregated)
Classification	ICD-10-AM J41, J42, J43, J44, J47 or J40 with a secondary diagnosis of J41, J43, J44 or J47
Methodology	**Numerator:** Number of hospital discharges with a principal diagnosis of COPD in a specified year, ages 15 and over. **Denominator:** Population aged 15 years and older. **Exclusions:** i. Cases transferred in from another acute hospital ii. Cases in Major Diagnostic Categories 14 (Pregnancy, Childbirth & Puerperium) or 15 (Newborns & Other Neonates) iii. Cases that are discharged on the day of admission **Age-sex standardisation:** Data have been age and sex standardised based on the methodology developed and used by the OECD Health Care Quality Indicators (HCQI) data collection. Age-sex standardised rates facilitate comparison of rates between populations of different age composition (for example hospitals or countries) and also of rates over time. The age-sex standardised rate is the number of cases per 100,000 population that would occur if the county or year had the same age structure as the OECD Standard Population and the local age-sex specific rates applied. Age-sex standardised rates and associated confidence limits are calculated as follows: i. The number of cases in the numerator and the population (i.e. the denominator) are calculated by males and females for each 5 year age-group from 15-19 to 85+ years. ii. Age & sex specific rates are calculated for males and females for each age-group. iii. The age & sex specific rates are multiplied by the number of cases in the OECD standard population (based on the total OECD population in 2010) iv. The age-sex standardised hospitalisation rate (ASR) is then calculated as the sum of the age & sex specific rates multiplied by the standard population, and divided by the total number of cases in the standard population. v. Upper and lower confidence intervals are presented at the 95% confidence level, and are calculated by ASR ± 1.96 * Standard Error of ASR where the standard error is determined from a binomial distribution. Note that the age-sex standardised hospitalisation rates at county of residence level for 2011 to 2013 refer to the average annual rate over the three year period.
Notes	Data are based on discharges from publicly funded acute hospitals; private hospitals are not included. A small number of non-acute hospitals that are not included in the seven hospital groups participate in HIPE for historical reasons; these hospitals have been removed from this analysis. 95% confidence intervals have been produced and these should be considered when

	interpreting the age-standardised rates. Where the lower limit of the 95% confidence interval is above the upper 95% confidence limit of the national rate, it can be said that the rate is statistically significantly higher than the national rate at the 95% confidence level. Similarly, where the upper limit of the 95% confidence interval is below the lower 95% confidence limit of the national rate, it can be said that the rate is statistically significantly lower than the national rate at the 95% confidence level. Note that areas with small numbers of cases tend to have unstable rates and wider confidence intervals. Caution should be exercised in interpreting rates with wide confidence intervals. Since 2005 HIPE data have been coded using the Australian Modification of ICD-10, IC D-10-AM. Prior to 2005 the ICD-9-CM classification was used. The differences between these classifications mean that for certain diagnoses comparison of data from 2004 and earlier years with data from 2005 onwards is difficult. For this reason data from 2004 and earlier years is not included in the calculation of this indicator.
Data Source(s)	**Hospital In-Patient Enquiry (HIPE)** The Healthcare Pricing Office (HPO) manages the HIPE system. For more information on HIPE see http://www.hpo.ie. The data presented for this indicator are based on analysis of HIPE data carried out by the Department of Health using the definitions and methodology developed by the OECD Health Care Quality Indicators (HCQI) project.

Indicator	**Asthma Hospitalisation Rate**
Definition	The age-sex standardised rate of hospitalisations of people aged 15 years and older with a principal diagnosis of asthma per 100,000 population.
Years Covered	National trend: 2005 – 2013 OECD comparison: 2011 County of residence: 2011 – 2013 (aggregated)
Classification	ICD-10-AM J45 or J46
Methodology	**Numerator:** Number of hospital discharges with a principal diagnosis of asthma in a specified year, ages 15 and over. **Denominator:** Population aged 15 years and older. **Exclusions:** iv. Cases transferred in from another acute hospital v. Cases in Major Diagnostic Categories 14 (Pregnancy, Childbirth & Puerperium) or 15 (Newborns & Other Neonates) vi. Cases with any diagnosis code of cystic fibrosis and anomalies of the respiratory system [ICD-10-AM E84, P27, Q25.4, Q31.1 - Q34.9, Q39.0 - Q39.4, Q39.8, Q89.3] vii. Cases that are discharged on the day of admission **Age-sex standardisation:** Data have been age and sex standardised based on the methodology developed and used by the OECD Health Care Quality Indicators (HCQI) data collection. Age-sex standardised rates facilitate comparison of rates between populations of different age composition (for example hospitals or countries) and also of rates over time. The age-sex standardised rate is the number of cases per 100,000 population that would occur if the county or year had the same age structure as the OECD Standard Population and the local age-sex specific rates applied. Age-sex standardised rates and associated confidence limits are calculated as follows: i. The number of cases in the numerator and the population (i.e. the denominator) are calculated by males and females for each 5 year age-group from 15-19 to 85+ years. ii. Age & sex specific rates are calculated for males and females for each age-group. iii. The age & sex specific rates are multiplied by the number of cases in the OECD standard population (based on the total OECD population in 2010) iv. The age-sex standardised hospitalisation rate (ASR) is then calculated as the sum of the age & sex specific rates multiplied by the standard population, and divided by the total number of cases in the standard population. v. Upper and lower confidence intervals are presented at the 95% confidence level, and are calculated by ASR ± 1.96 * Standard Error of ASR where the standard error is determined from a binomial distribution. Note that the age-sex standardised hospitalisation rates at county of residence level for 2011 to 2013 refer to the average annual rate over the three year period.
Notes	Data are based on discharges from publicly funded acute hospitals; private hospitals are not included. A small number of non-acute hospitals that are not included in the seven hospital groups participate in HIPE for historical reasons; these hospitals have been removed from this analysis. 95% confidence intervals have been produced and these should be considered when

	interpreting the age-standardised rates. Where the lower limit of the 95% confidence interval is above the upper 95% confidence limit of the national rate, it can be said that the rate is statistically significantly higher than the national rate at the 95% confidence level. Similarly, where the upper limit of the 95% confidence interval is below the lower 95% confidence limit of the national rate, it can be said that the rate is statistically significantly lower than the national rate at the 95% confidence level. Note that areas with small numbers of cases tend to have unstable rates and wider confidence intervals. Caution should be exercised in interpreting rates with wide confidence intervals. Since 2005 HIPE data have been coded using the Australian Modification of ICD-10, IC D-10-AM. Prior to 2005 the ICD-9-CM classification was used. The differences between these classifications mean that for certain diagnoses comparison of data from 2004 and earlier years with data from 2005 onwards is difficult. For this reason data from 2004 and earlier years is not included in the calculation of this indicator.
Data Source(s)	**Hospital In-Patient Enquiry (HIPE)** The Healthcare Pricing Office (HPO) manages the HIPE system. For more information on HIPE see http://www.hpo.ie. The data presented for this indicator are based on analysis of HIPE data carried out by the Department of Health using the definitions and methodology developed by the OECD Health Care Quality Indicators (HCQI) project.

Indicator	**Diabetes Hospitalisation Rate**
Definition	The age-sex standardised rate of hospitalisations of people aged 15 years and older with a principal diagnosis of diabetes per 100,000 population.
Years Covered	National trend: 2005 – 2013 OECD comparison: 2011 County of residence: 2011 – 2013 (aggregated)
Classification	ICD-10-AM E10 –E14
Methodology	**Numerator:** Number of hospital discharges with a principal diagnosis of diabetes in a specified year, ages 15 and over. **Denominator:** Population aged 15 years and older. **Exclusions:** viii. Cases transferred in from another acute hospital ix. Cases in Major Diagnostic Categories 14 (Pregnancy, Childbirth & Puerperium) or 15 (Newborns & Other Neonates) x. Cases that are discharged on the day of admission **Age-sex standardisation:** Data have been age and sex standardised based on the methodology developed and used by the OECD Health Care Quality Indicators (HCQI) data collection. Age-sex standardised rates facilitate comparison of rates between populations of different age composition (for example hospitals or countries) and also of rates over time. The age-sex standardised rate is the number of cases per 100,000 population that would occur if the county or year had the same age structure as the OECD Standard Population and the local age-sex specific rates applied. Age-sex standardised rates and associated confidence limits are calculated as follows: i. The number of cases in the numerator and the population (i.e. the denominator) are calculated by males and females for each 5 year age-group from 15-19 to 85+ years. ii. Age & sex specific rates are calculated for males and females for each age-group. iii. The age & sex specific rates are multiplied by the number of cases in the OECD standard population (based on the total OECD population in 2010) iv. The age-sex standardised hospitalisation rate (ASR) is then calculated as the sum of the age & sex specific rates multiplied by the standard population, and divided by the total number of cases in the standard population. v. Upper and lower confidence intervals are presented at the 95% confidence level, and are calculated by ASR ± 1.96 * Standard Error of ASR where the standard error is determined from a binomial distribution. Note that the age-sex standardised hospitalisation rates at county of residence level for 2011 to 2013 refer to the average annual rate over the three year period.
Notes	Data are based on discharges from publicly funded acute hospitals; private hospitals are not included. A small number of non-acute hospitals that are not included in the seven hospital groups participate in HIPE for historical reasons; these hospitals have been removed from this analysis. 95% confidence intervals have been produced and these should be considered when interpreting the age-standardised rates. Where the lower limit of the 95% confidence interval is above the upper 95% confidence limit of the national rate, it can be said that the rate is statistically significantly higher than the national rate at the 95% confidence level. Similarly,

	where the upper limit of the 95% confidence interval is below the lower 95% confidence limit of the national rate, it can be said that the rate is statistically significantly lower than the national rate at the 95% confidence level. Note that areas with small numbers of cases tend to have unstable rates and wider confidence intervals. Caution should be exercised in interpreting rates with wide confidence intervals. Since 2005 HIPE data have been coded using the Australian Modification of ICD-10, IC D-10-AM. Prior to 2005 the ICD-9-CM classification was used. The differences between these classifications mean that for certain diagnoses comparison of data from 2004 and earlier years with data from 2005 onwards is difficult. For this reason data from 2004 and earlier years is not included in the calculation of this indicator.
Data Source(s)	**Hospital In-Patient Enquiry (HIPE)** The Healthcare Pricing Office (HPO) manages the HIPE system. For more information on HIPE see http://www.hpo.ie. The data presented for this indicator are based on analysis of HIPE data carried out by the Department of Health using the definitions and methodology developed by the OECD Health Care Quality Indicators (HCQI) project.

Indicator	**Breast cancer survival rates**
Definition	Age-standardised estimates of cumulative 5-year relative survival for Irish female breast cancer patients for the period 2005-2010
Years Covered	National and HSE Region: cohort 2005-2010 OECD: cohorts 2001-2006 and 2006-2011 (or nearest period)
Classification	ICD10 C50, ICD9 174
Methodology	Age-standardized Period estimates of Ederer II relative survival for the follow-up period 2005-2010. Five-year observed survival for women aged 15-99 diagnosed with breast cancer (first primary cancer at the specified site) divided by the expected survival of a comparable group from the general population (expressed in percentage). Survival estimates are standardized to the International Cancer Survival Standard (ICSS) populations by Corazziari I., Quinn M. & Capocaccia R. 2004. Standard cancer patient population for age standardising survival ratios. Eur J Cancer 40: 2307-2316.
Notes	Exclusions: Patients aged <15 or >99 at diagnosis; death-certificate-only (DCO) and autopsy-only cases; second or subsequent malignancies in the same patient (or the less serious of two or more synchronously-diagnosed malignancies); in situ carcinomas, benign tumours and tumours of uncertain behaviour. Cancer registration is a dynamic process and information is continually updated on the NCRI database. As a result, the figures given here may not correspond exactly to those in previous reports or to those previously shown on the NCRI website.
Data Source(s)	National Cancer Registry of Ireland.

Indicator	**Cervical cancer survival rates**
Definition	Age-standardised estimates of cumulative 5-year relative survival for Irish cervical cancer patients for the period 2005-2010
Years Covered	National and HSE Region: cohort 2005-2010 OECD: cohorts 2001-2006 and 2006-2011 (or nearest period)
Classification	ICD10 C53, ICD9 180
Methodology	Age-standardized Period estimates of Ederer II relative survival for the follow-up period 2005-2010. Five-year observed survival for women aged 15-99 diagnosed with cervical cancer (first primary cancer at the specified site) divided by the expected survival of a comparable group from the general population (expressed in percentage). Survival estimates are standardized to the International Cancer Survival Standard (ICSS) populations by Corazziari I., Quinn M. & Capocaccia R. 2004. Standard cancer patient population for age standardising survival ratios. Eur J Cancer 40: 2307-2316.
Notes	Exclusions: Patients aged <15 or >99 at diagnosis; death-certificate-only (DCO) and autopsy-only cases; second or subsequent malignancies in the same patient (or the less serious of two or more synchronously-diagnosed malignancies); in situ carcinomas, benign tumours and tumours of uncertain behaviour. Cancer registration is a dynamic process and information is continually updated on the NCRI database. As a result, the figures given here may not correspond exactly to those in previous reports or to those previously shown on the NCRI website.
Data Source(s)	National Cancer Registry of Ireland.

Indicator	**Colorectal cancer survival rates**
Definition	Age-standardised estimates of cumulative 5-year relative survival for Irish colorectal cancer patients for the period 2005-2010
Years Covered	National and HSE Region: cohort 2005-2010 OECD: cohorts 2001-2006 and 2006-2011 (or nearest period)
Classification	ICD10 C18-21, ICD9 153-154
Methodology	Age-standardized Period estimates of Ederer II relative survival for the follow-up period 2005-2010. Five-year observed survival for the total population aged 15-99 diagnosed with colorectal cancer (first primary cancer at the specified site) divided by the expected survival of a comparable group from the general population (expressed in percentage). Survival estimates are standardized to the International Cancer Survival Standard (ICSS) populations by Corazziari I., Quinn M. & Capocaccia R. 2004. Standard cancer patient population for age standardising survival ratios. Eur J Cancer 40: 2307-2316.
Notes	Exclusions: Patients aged <15 or >99 at diagnosis; death-certificate-only (DCO) and autopsy-only cases; second or subsequent malignancies in the same patient (or the less serious of two or more synchronously-diagnosed malignancies); in situ carcinomas, benign tumours and tumours of uncertain behaviour. Cancer registration is a dynamic process and information is continually updated on the NCRI database. As a result, the figures given here may not correspond exactly to those in previous reports or to those previously shown on the NCRI website.
Data Source(s)	National Cancer Registry of Ireland.

Indicator	**In-hospital Mortality following Acute Myocardial Infarction**
Definition	The age-sex standardised mortality rate within 30 days of admission with a principal diagnosis of Acute Myocardial Infarction (AMI), ages 45 and over.
Years Covered	National trend: 2004 – 2013 OECD comparison: 2011 Hospital & hospital group level: 2011 – 2013 (aggregated)
Classification	ICD-9-CM 410 & ICD-10-AM I21 or I22.
Methodology	**Numerator:** Number of deaths in hospital that occurred within 30 days of hospital admission with a principal diagnosis of acute myocardial infarction in a specified year, ages 45 and over. **Denominator:** Number of hospitalisations of patients aged 45 and over with a principal diagnosis of acute myocardial infarction in the specified year. **Age-sex standardisation:** Data have been age and sex standardised based on the methodology developed and used by the OECD Health Care Quality Indicators (HCQI) data collection. Age-sex standardised rates facilitate comparison of rates between populations of different age composition (for example hospitals or countries) and also of rates over time. The age-sex standardised death rate (ASDR) is the number of deaths per 100 cases that would occur if the hospital, country or year had the same age structure as the OECD Standard Population and the local age-sex specific rates applied. Age-sex standardised deaths rates (ASDRs) and associated confidence limits are calculated as follows: i. The number of deaths and cases are calculated by males and females for each 5 year age-group from 45-49 to 85+ years. ii. Age & sex specific death rates are calculated for males and females for each age-group. iii. The age & sex specific death rates are multiplied by the number of cases in the OECD standard population (based on the total number of AMI hospitalisations in the OECD) iv. The age-sex standardised death rate (ASDR) is then calculated as the sum of the age & sex specific rates multiplied by the standard population, and divided by the total number of cases in the standard population. v. Upper and lower confidence intervals are presented at the 95% confidence level, and are calculated by ASDR ± 1.96 * Standard Error of ASDR where the standard error is determined from a binomial distribution.
Notes	Data are based on discharges from publicly funded acute hospitals; private hospitals are not included. Data have been analysed at hospital and hospital group level (see Appendix for hospital groups). A small number of non-acute hospitals that are not included in the seven hospital groups participate in HIPE for historical reasons; these hospitals have been removed from this analysis. 95% confidence intervals have been produced and these should be considered when interpreting the age-standardised death rates. Where the lower limit of the 95% confidence interval is above the upper 95% confidence limit of the national rate, it can be said that the rate is statistically significantly higher than the national rate at the 95% confidence level. Similarly, where the upper limit of the 95% confidence interval is below the lower 95%

	confidence limit of the national rate, it can be said that the rate is statistically significantly lower than the national rate at the 95% confidence level. Note that hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 denominator cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals. It is important to note that transfer patterns between hospitals have the potential to influence the in-hospital mortality rates. For some conditions there can be significant volumes of patients being transferred out of hospitals and being transferred into other hospitals. The indicators presented in this report are high-level indicators and therefore do not take transfer patterns into account. A more refined analysis of transfer patterns would be required to assess the full effect of transfers on the in-hospital mortality rates.
Data Source(s)	**Hospital In-Patient Enquiry (HIPE)** The Healthcare Pricing Office (HPO) manages the HIPE system. For more information on HIPE see http://www.hpo.ie. The data presented for this indicator are based on analysis of HIPE data carried out by the Department of Health using the definitions and methodology developed by the OECD Health Care Quality Indicators (HCQI) project.

Indicator	**In-hospital Mortality following Haemorrhagic Stroke**
Definition	The age-sex standardised mortality rate within 30 days of admission with a principal diagnosis of haemorrhagic stroke, ages 45 and over.
Years Covered	National trend: 2004 – 2013 OECD comparison: 2011 Hospital & hospital group level: 2011 – 2013 (aggregated)
Classification	ICD-9-CM 430 – 432 & ICD-10-AM I60 - I62.
Methodology	**Numerator:** Number of deaths in hospital that occurred within 30 days of hospital admission with a principal diagnosis of haemorrhagic stroke in a specified year, ages 45 and over. **Denominator:** Number of hospitalisations of patients aged 45 and over with a principal diagnosis of haemorrhagic stroke in the specified year. **Age-sex standardisation:** Data have been age and sex standardised based on the methodology developed and used by the OECD Health Care Quality Indicators (HCQI) data collection. Age-sex standardised rates facilitate comparison of rates between populations of different age composition (for example hospitals or countries) and also of rates over time. The age-sex standardised death rate (ASDR) is the number of deaths per 100 cases that would occur if the hospital, country or year had the same age structure as the OECD Standard Population and the local age-sex specific rates applied. Age-sex standardised deaths rates (ASDRs) and associated confidence limits are calculated as follows: i. The number of deaths and cases are calculated by males and females for each 5 year age-group from 45-49 to 85+ years. ii. Age & sex specific death rates are calculated for males and females for each age-group. iii. The age & sex specific death rates are multiplied by the number of cases in the OECD standard population (based on the total number of haemorrhagic stroke hospitalisations in the OECD) iv. The age-sex standardised death rate (ASDR) is then calculated as the sum of the age & sex specific rates multiplied by the standard population, and divided by the total number of cases in the standard population. v. Upper and lower confidence intervals are presented at the 95% confidence level, and are calculated by ASDR ± 1.96 * Standard Error of ASDR where the standard error is determined from a binomial distribution.
Notes	Data are based on discharges from publicly funded acute hospitals; private hospitals are not included. Data have been analysed at hospital and hospital group level (see Appendix for hospital groups). A small number of non-acute hospitals that are not included in the seven hospital groups participate in HIPE for historical reasons; these hospitals have been removed from this analysis. 95% confidence intervals have been produced and these should be considered when interpreting the age-standardised death rates. Where the lower limit of the 95% confidence interval is above the upper 95% confidence limit of the national rate, it can be said that the rate is statistically significantly higher than the national rate at the 95% confidence level. Similarly, where the upper limit of the 95% confidence interval is below the lower 95%

	confidence limit of the national rate, it can be said that the rate is statistically significantly lower than the national rate at the 95% confidence level. Note that hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 denominator cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals. It is important to note that transfer patterns between hospitals have the potential to influence the in-hospital mortality rates. For some conditions there can be significant volumes of patients being transferred out of hospitals and being transferred into other hospitals. The indicators presented in this report are high-level indicators and therefore do not take transfer patterns into account. A more refined analysis of transfer patterns would be required to assess the full effect of transfers on the in-hospital mortality rates.
Data Source(s)	**Hospital In-Patient Enquiry (HIPE)** The Healthcare Pricing Office (HPO) manages the HIPE system. For more information on HIPE see http://www.hpo.ie. The data presented for this indicator are based on analysis of HIPE data carried out by the Department of Health using the definitions and methodology developed by the OECD Health Care Quality Indicators (HCQI) project.

Indicator	**In-hospital Mortality following Ischaemic Stroke**
Definition	The age-sex standardised mortality rate within 30 days of admission with a principal diagnosis of ischaemic stroke, ages 45 and over.
Years Covered	National trend: 2004 – 2013 OECD comparison: 2011 Hospital & hospital group level: 2011 – 2013 (aggregated)
Classification	ICD-9-CM 433, 434 or 436 & ICD-10-AM I63 - I64.
Methodology	**Numerator:** Number of deaths in hospital that occurred within 30 days of hospital admission with a principal diagnosis of ischaemic stroke in a specified year, ages 45 and over. **Denominator:** Number of hospitalisations of patients aged 45 and over with a principal diagnosis of ischaemic stroke in the specified year. **Age-sex standardisation:** Data have been age and sex standardised based on the methodology developed and used by the OECD Health Care Quality Indicators (HCQI) data collection. Age-sex standardised rates facilitate comparison of rates between populations of different age composition (for example hospitals or countries) and also of rates over time. The age-sex standardised death rate (ASDR) is the number of deaths per 100 cases that would occur if the hospital, country or year had the same age structure as the OECD Standard Population and the local age-sex specific rates applied. Age-sex standardised deaths rates (ASDRs) and associated confidence limits are calculated as follows: i. The number of deaths and cases are calculated by males and females for each 5 year age-group from 45-49 to 85+ years. ii. Age & sex specific death rates are calculated for males and females for each age-group. iii. The age & sex specific death rates are multiplied by the number of cases in the OECD standard population (based on the total number of ischaemic stroke hospitalisations in the OECD) iv. The age-sex standardised death rate (ASDR) is then calculated as the sum of the age & sex specific rates multiplied by the standard population, and divided by the total number of cases in the standard population. v. Upper and lower confidence intervals are presented at the 95% confidence level, and are calculated by ASDR ± 1.96 * Standard Error of ASDR where the standard error is determined from a binomial distribution.
Notes	Data are based on discharges from publicly funded acute hospitals; private hospitals are not included. Data have been analysed at hospital and hospital group level (see Appendix for hospital groups). A small number of non-acute hospitals that are not included in the seven hospital groups participate in HIPE for historical reasons; these hospitals have been removed from this analysis. 95% confidence intervals have been produced and these should be considered when interpreting the age-standardised death rates. Where the lower limit of the 95% confidence interval is above the upper 95% confidence limit of the national rate, it can be said that the rate is statistically significantly higher than the national rate at the 95% confidence level.

	Similarly, where the upper limit of the 95% confidence interval is below the lower 95% confidence limit of the national rate, it can be said that the rate is statistically significantly lower than the national rate at the 95% confidence level. Note that hospitals with small numbers of cases tend to have unstable rates and wider confidence intervals. For this report rates are not displayed for hospitals with less than 100 denominator cases, although the data for these hospitals have been included in the calculation of the national rates. However some hospitals with more than 100 cases may still have unstable rates and caution should be exercised in interpreting rates with wide confidence intervals. It is important to note that transfer patterns between hospitals have the potential to influence the in-hospital mortality rates. For some conditions there can be significant volumes of patients being transferred out of hospitals and being transferred into other hospitals. The indicators presented in this report are high-level indicators and therefore do not take transfer patterns into account. A more refined analysis of transfer patterns would be required to assess the full effect of transfers on the in-hospital mortality rates.
Data Source(s)	**Hospital In-Patient Enquiry (HIPE)** The Healthcare Pricing Office (HPO) manages the HIPE system. For more information on HIPE see http://www.hpo.ie. The data presented for this indicator are based on analysis of HIPE data carried out by the Department of Health using the definitions and methodology developed by the OECD Health Care Quality Indicators (HCQI) project.

Indicator	**In-hospital Waiting Time for Hip Fracture Surgery**
Definition	The proportion of patients aged 65 years and older with a hip fracture who have surgery within two days of admission to hospital.
Years Covered	National trend: 2004 – 2013 OECD comparison: 2011 County of residence: 2011 – 2013 (aggregated)
Classification	Hip fracture diagnostic codes: ICD-9-CM 820 or ICD-10-AM S72.0, S71.1, S72.2 Hip fracture surgery codes: ICD-9-CM 78.05, 78.15, 78.55, 79.05, 79.15, 79.25, 79.35, 79.75, 79.85, 81.21, 81.40, 81.51, 81.52, 81.53 or ICD-10-AM ACHI blocks 1479, 1486, 1487, 1488, 1489, 1491, 1492
Methodology	**Numerator:** Number of hospitalisations with a principal diagnosis of a hip fracture and who had hip fracture surgery on the day of admission, 1 day after admission or 2 days after admission in a specified year, ages 65 and older. **Denominator:** Number of hospitalisations with a principal diagnosis of a hip fracture and who had hip fracture surgery during the admission in a specified year, ages 65 and older. **Exclusions:** Elective admissions and elective re-admissions Data have been calculated according to the methodology used by the OECD Health Care Quality Indicators (HCQI) project. It should be noted that the methodology specified by the OECD for the2012-2013 data collection allowed countries to define the waiting time for hip fracture surgery based on either 48 hours or 2 days. This may reduce the comparability of this indicator among OECD countries. The 2014-2015 HCQI data collection defines this indicator as surgery within 2 calendar days after admission which will improve the comparability of the data.
Notes	Data are based on discharges from publicly funded acute hospitals; private hospitals are not included. A small number of non-acute hospitals that are not included in the seven hospital groups participate in HIPE for historical reasons; these hospitals have been removed from this analysis.
Data Source(s)	**Hospital In-Patient Enquiry (HIPE)** The Healthcare Pricing Office (HPO) manages the HIPE system. For more information on HIPE see http://www.hpo.ie. The data presented for this indicator are based on analysis of HIPE data carried out by the Department of Health using the definitions and methodology developed by the OECD Health Care Quality Indicators (HCQI) project.

Indicator	**Caesarean Section Rate**
Definition	The rate of caesarean section deliveries per 100 live births.
Years Covered	National trend: 2004 – 2013 OECD comparison: 2011 Hospital & hospital group level: 2013
Classification	Not applicable
Methodology	Data are based on the caesarean section rate per 100 live births for total maternities. **Exclusions:** • Data exclude births in Mount Carmel Private Hospital, Bon Secours Private Hospital (2004-2007) and planned domiciliary home births attended by a self-employed community midwife. • In accordance with WHO reporting guidelines, live births with birth weight <500g are excluded.
Notes	Data are based on total maternities where outcome of delivery is live birth(s) and includes total live births, i.e. single and multiple live births. It should be noted that caesarean sections rates vary considerably between single and multiple births. The rates presented in this report differ slightly from those previously published in the National Perinatal Reporting System annual reports. This is due to the exclusion of the private maternity hospitals.
Data Source(s)	**National Perinatal Reporting System (NPRS)** The Healthcare Pricing Office (HPO) manages the NPRS system. The data presented in this report were sourced directly from the Healthcare Pricing Office in December 2014 and were based on the methodology used by the OECD for reporting caesarean section rates. For more information on NPRS see http://www.hpo.ie

Indicator	**Methicillin-Resistant Staphylococcus Aureus (MRSA) Infection Rates**
Definition	The rate of MRSA bloodstream infections in acute hospitals per 1,000 bed days used.
Years Covered	National trend: 2004 – 2013
Classification	Not applicable
Methodology	MRSA rates are calculated based on the number of MRSA cases per 1,000 bed days used.
Notes	Rates for 2004 and 2005 were calculated for acute public hospitals only as there was no denominator data (i.e. bed days used) available for private hospitals.
Data Source(s)	**Health Protection Surveillance Centre**

Indicator	**Clostridium Difficile (C Difficile) Infection Rates**
Definition	The rate of new cases of Clostridium Difficile in acute hospitals per 10,000 bed days used.
Years Covered	National trend: 2010 – 2013
Classification	Not applicable
Methodology	Rates are calculated based on the number of new hospital acquired cases of Clostridium Difficile per 10,000 bed days used.
Notes	Since surveillance began in 2009 there has been a gradual increase in the numbers of hospitals participating in the enhanced surveillance system. The numbers of participating hospitals should be taken into account when interpreting national trends. There is considerable variation in the C. difficile testing methodologies used by participating laboratories. Different methodologies have different levels of sensitivity in detecting C. difficile therefore inter-hospital comparison of CDI rates is not recommended unless data is adjusted for type of testing method used.
Data Source(s)	**Health Protection Surveillance Centre**

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