

# Developing Effective Health Intelligence to Improve Quality

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Department of Health (England)**

# Aims

- **To understand** the context and fundamentals of health data & intelligence
- **To explain** the unique assets of Scotland's data intelligence
- **To discuss** the importance of data intelligence in your professional roles

**Better data, better lives, better healthcare system**

# Context

## Healthcare Challenges





**Chronic Diseases**

**+**

**Elderly Population**

**+**

**New Technologies/drugs**

**+**

**Waste & Variation**

# NHS Quality / Outcomes

**Suffering no harm**

**Safety**



**Effectiveness**

**Receiving evidence-based treatment**

**Positive patient/carer experience**

**Experience**

**Fundamentals:**  
**Health Data & Intelligence**

# Health Intelligence

- integrated approach of utilising data, people and tools (**inputs**) for converting health data into actionable information, evidence and knowledge (**outputs**)
- **Communicating** outputs to all those who need them
- **Monitoring** the impact of outputs on health services

# Datasets

## **Primary:** routinely collected health data

- GPs & Hospitals, Disease Registries, National & Local Audits Outputs, Mortality/morbidity

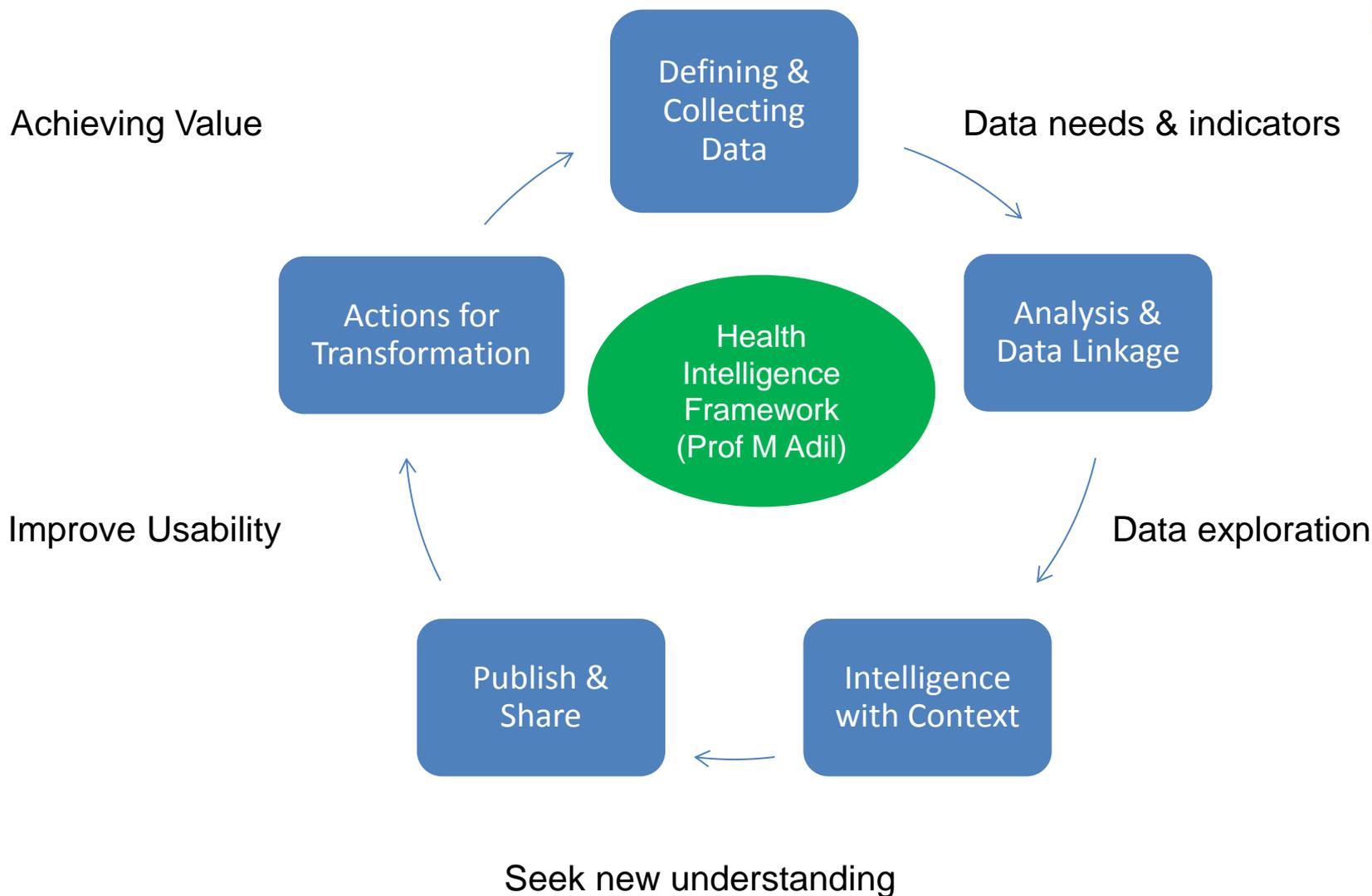
## **Secondary:** adhoc and other health related data/information collected by other government departments

- Population projections & Census, National surveys, Transport

## **Tertiary:**

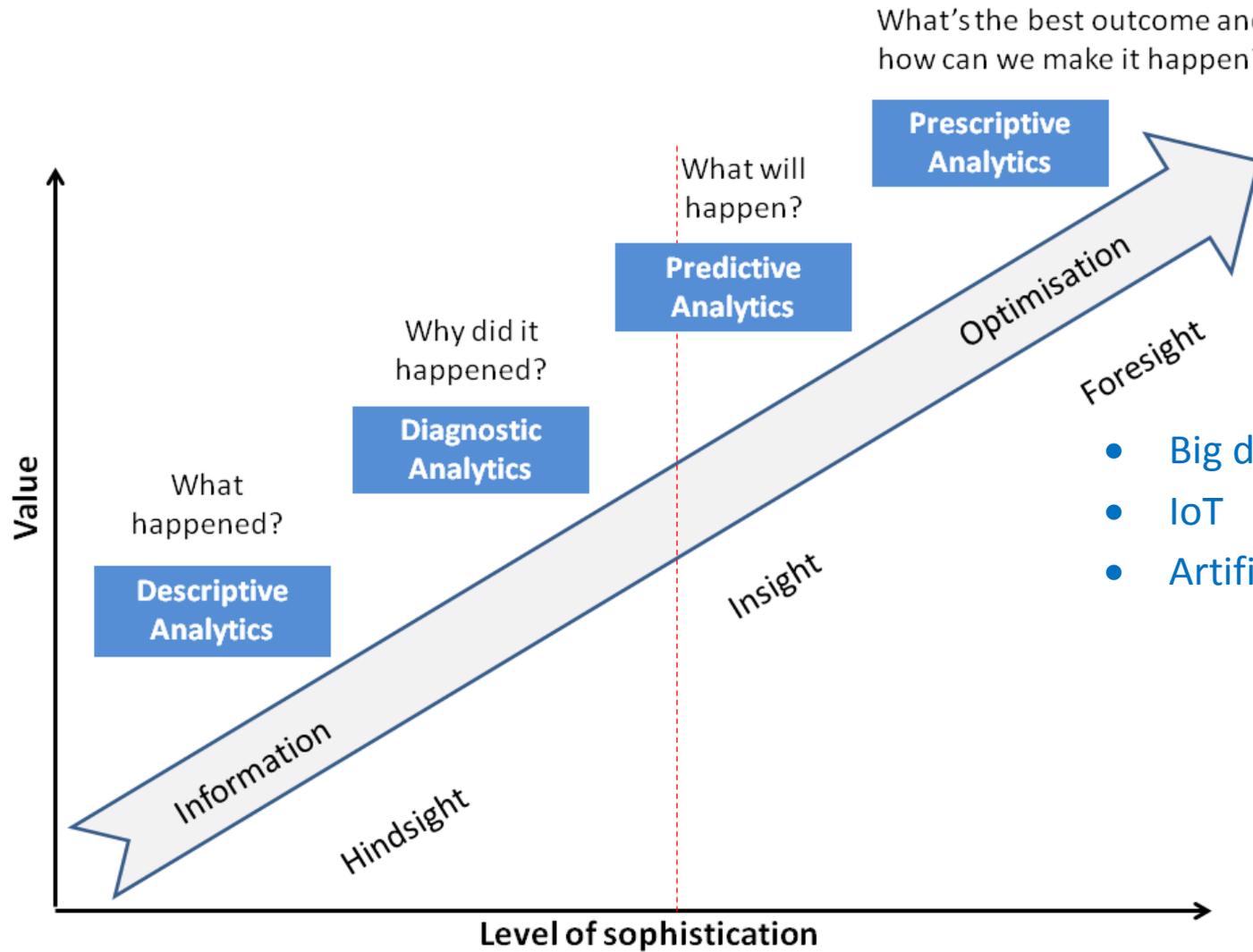
- WHO/World Bank (international disease rates)
- Research papers and unstructured data

# Data to Health Intelligence



# Achieving Value

1. Quality Improvement
2. Performance Management
3. Benchmarking (local, national, international)
4. Policy and planning
5. Innovation & Research



- Big data
- IoT
- Artificial Intelligence

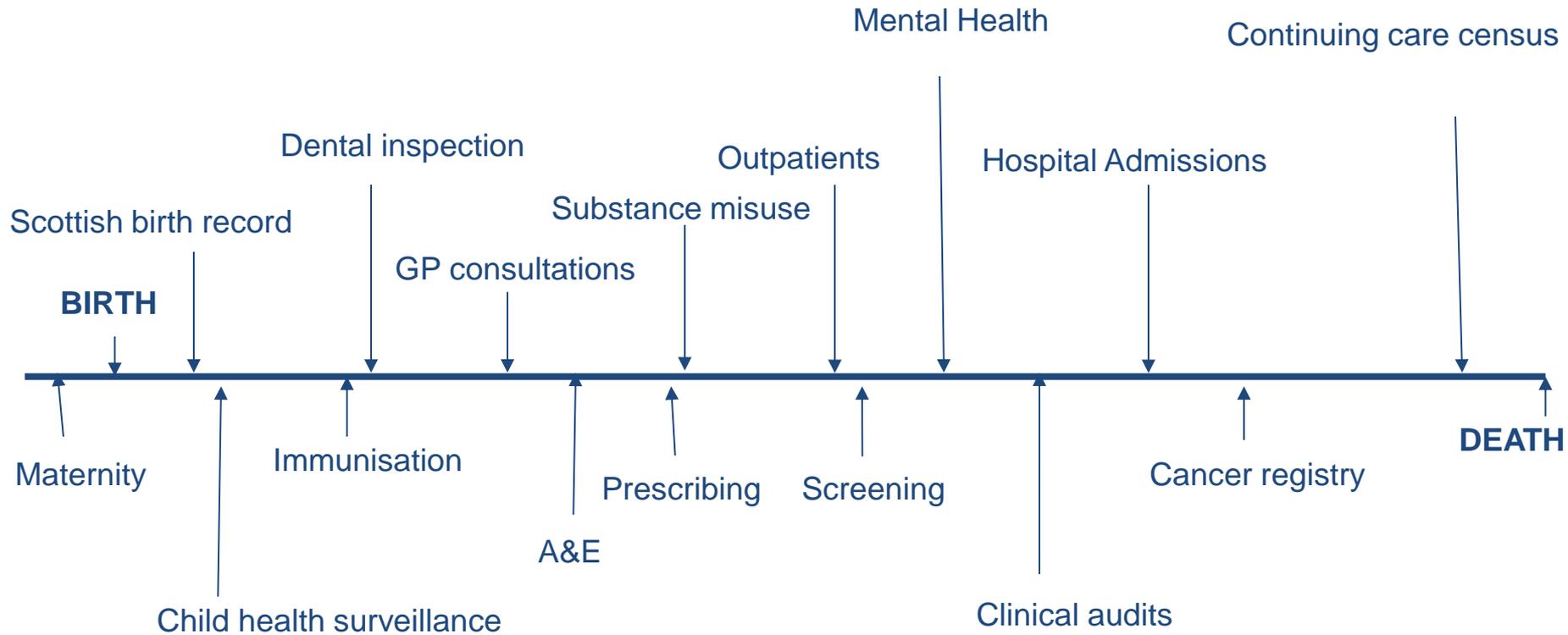
## Scotland's Health Data Assets





- **£13.0 B**
- **Population 5.3 M**
- **14 Territorial Boards (no purchaser-provider split)**
- **31 Health & Social Care Partnerships**
- **38 Hospitals, 1020 General Practices**

# Data from cradle to grave



Scotland has some of the best health service data in the world



# The data landscape

Every week in Scotland data are collected on around :

- 1,000 Births**
- 15,000 Out of Hours attendances**
- 20,000 Screened for cancer**
- 30,000 Hospital discharges**
- 30,000 A&E attendances**
- 40,000 NHS eye exams & tests**
- 90,000 NHS dental treatments**
- 200,000 Outpatient clinic attendances**
- 500,000 GP practice consultations**
- 2,000,000 Drugs dispensed**

# ISD Scotland

<http://www.isdscotland.org/>

**ISD Scotland** better information, better decisions, better health

**Information Services Division**  
ISD Scotland is part of NHS National Services Scotland

You are: [Home](#)

|                        |                              |   |
|------------------------|------------------------------|---|
| <a href="#">Topics</a> | <a href="#">Publications</a> | <a href="#">Products &amp; Services</a> |
|------------------------|------------------------------|---|

**About ISD**

Scotland has some of the best health service data in the world. Few other countries have information which combines high quality data, consistency, national coverage and the ability to link data to allow patient based analysis and follow up. The Information Services Division (ISD) is a division of National Services Scotland, part of NHS Scotland. ISD provides health information, health intelligence, statistical services and advice that support the NHS in progressing quality improvement in health and care and facilitates robust planning and decision making.

[More about ISD](#)

**What's New in ISD?**

**NHS Performs - Latest update**

NHS Performs has been updated to include information on:

- Emergency Department activity for the week ending 14 May 2017
- Numbers of hospital wards closed with confirmed or presumed Norovirus infections on 15 May 2017
- Hospital Standardised Mortality Ratios for October - December 2016



- Producer of Scotland's official health statistics
- Responsible for over 200 national datasets
- 600 staff with over 50 clinicians

**We create value by transforming data into actionable intelligence**

Health Intelligence  
Our Strength in Scotland



Community Health Index (CHI) Number

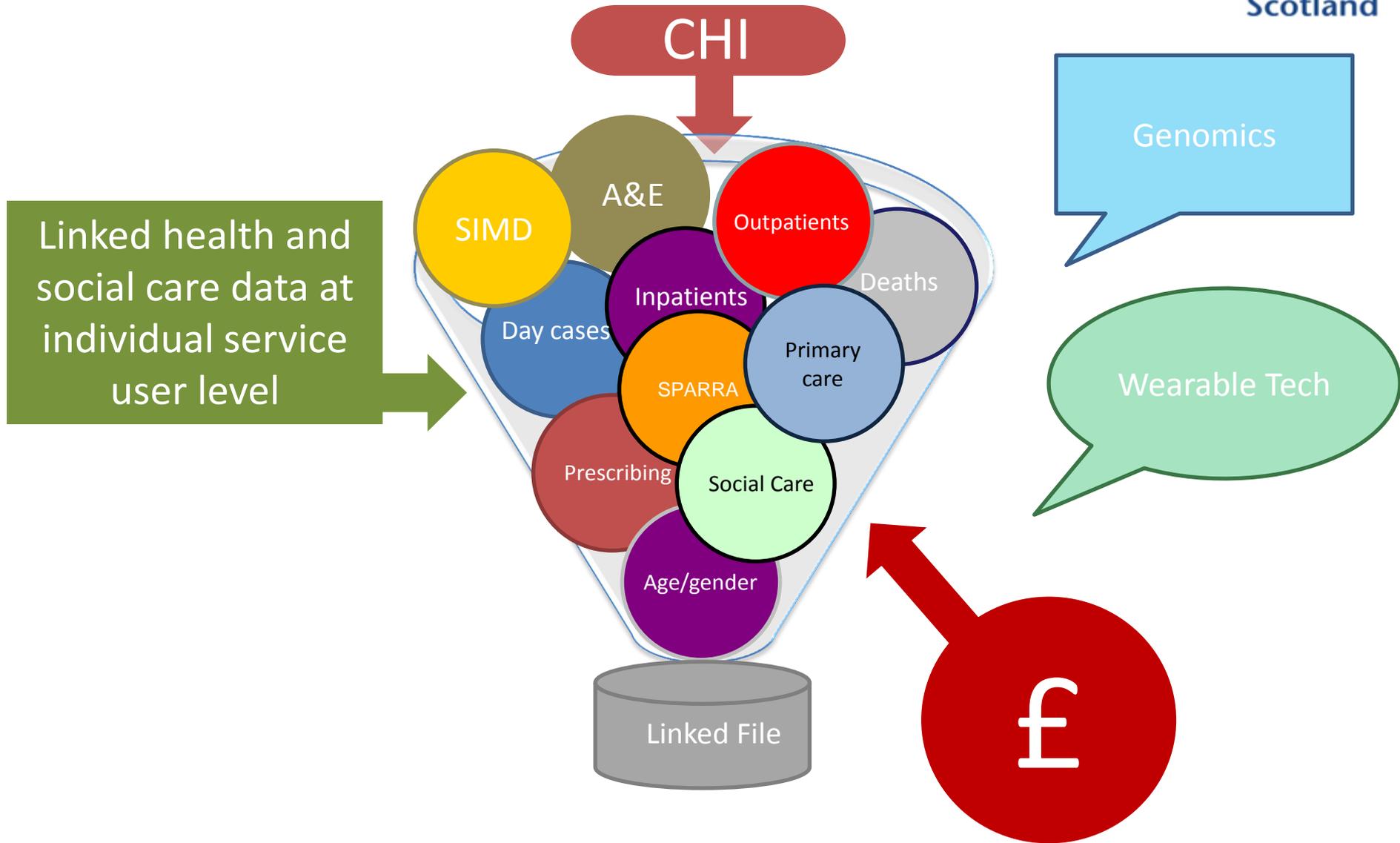
**07 10 64 02 5 0**

**Date of Birth**

**Sex**

**Check**

# Integrated Data



## Examples of Applied Intelligence

**Improving practice, innovation & clinical quality**



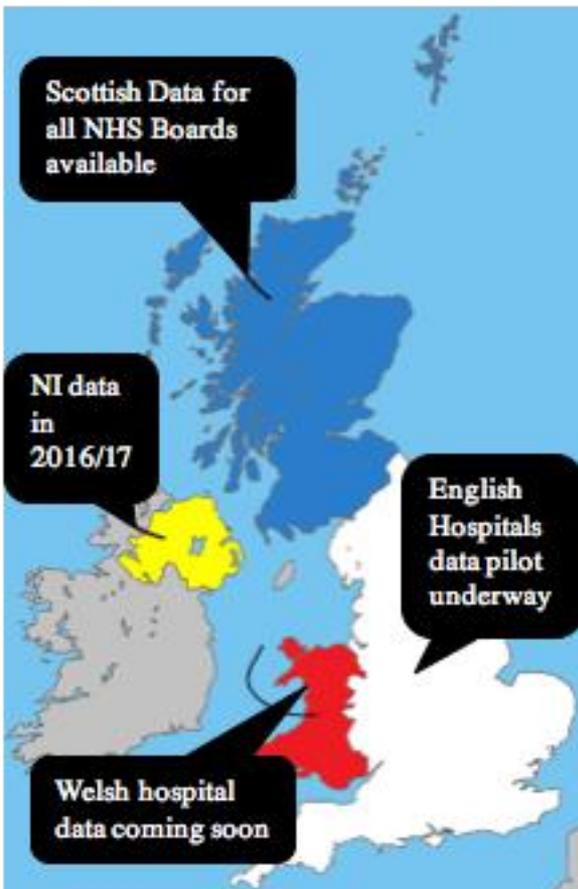
# NSS Discovery



[www.discoverydev.scot.nhs.uk/](http://www.discoverydev.scot.nhs.uk/)

# NSS Discovery - What is it?

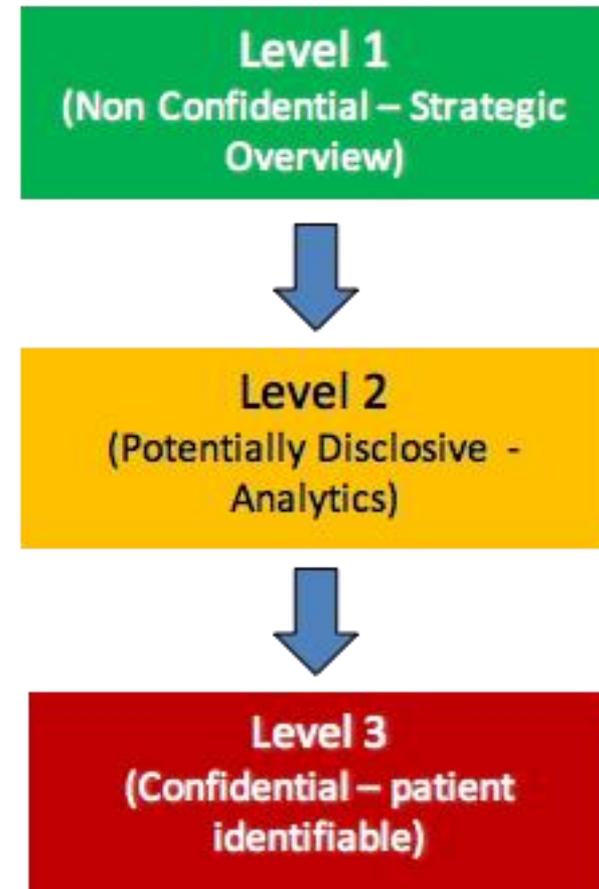
## Scottish and Home Countries Data



## 41 Indicators under 2020 Vision Quality Dimension

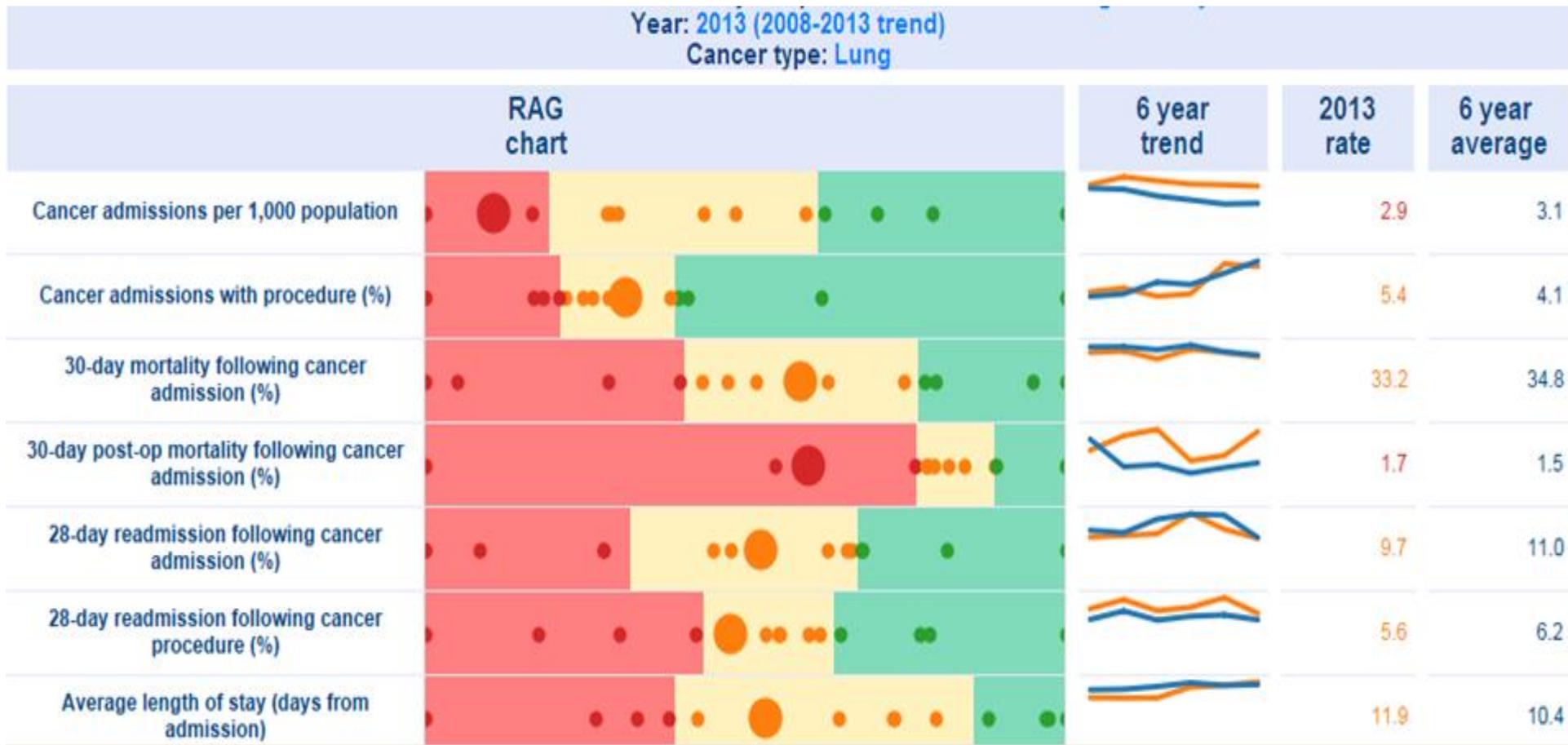


## Three Data and Security Levels



# Clinical Outcome Indicators (Example)

## Lung Cancer – 2013 (Health Board of Residence View)



# Consultant-Level Data

## Trauma & Orthopaedic Surgery

Information | Overview | Procedure Diagnosis Search | Procedures | Diagnosis | HRG

**NSS Discovery Level 2 Consultant Summary**  
**HRG**

Date From: April 2014 | Date To: September 2015

NHS Board: NHS Mountain | Location: Sulliven Hospital | Speciality: Trauma And Ortho... | HRG Chapter: (All) | HRG Sub Chapter: (All) | GMC Code: (All)

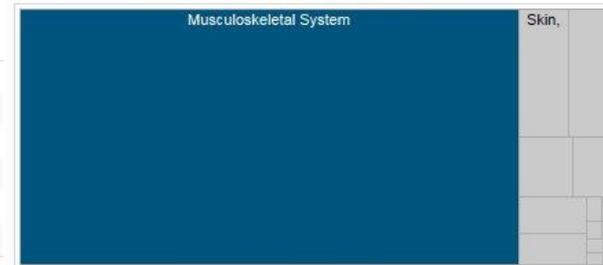
Number |  Days

**Total SMR01 Episode**  
 Speciality: Trauma And Orthopaedic Surgery | HRG Chapter: All | HRG Sub Chapter: All

Summary - [Click a measure to filter charts](#)

|                                     | Selected      | Board          | Scotland       |
|-------------------------------------|---------------|----------------|----------------|
| <a href="#">Elective Inpatient</a>  | 8,346         | 40,683         | 48,771         |
| <a href="#">Elective Day Case</a>   | 8,317         | 33,169         | 38,893         |
| <a href="#">Emergency Inpatient</a> | 11,341        | 45,012         | 52,439         |
| <a href="#">Transfer Inpatient</a>  | 4,202         | 12,779         | 14,682         |
| <a href="#">Transfer Day Case</a>   | 22            | 71             | 90             |
| <b>Total SMR01 Episode</b>          | <b>32,228</b> | <b>131,714</b> | <b>154,875</b> |

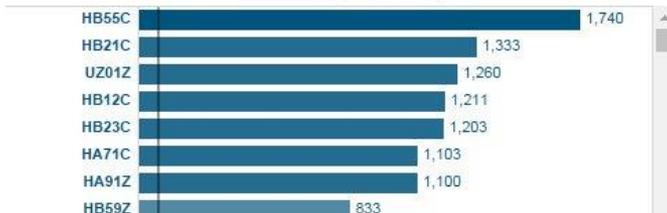
HRG Chapter - [\(Click to filter\)](#)



HRG Trend - All



HRG Code - [\(Click to filter\)](#)



HRG & GMC Code Table

| HRG Code | GMC Code      | Number | % of Total | Mean LOS | Days |
|----------|---------------|--------|------------|----------|------|
| HB55C    | Consultant 11 | 24     | 1.38%      | 0.3      | 7    |
|          | Consultant 12 | 187    | 10.75%     | 0.0      | 9    |
|          | Consultant 13 | 123    | 7.07%      | 0.2      | 20   |
|          | Consultant 14 | 153    | 8.79%      | 0.1      | 13   |
|          | Consultant 15 | 421    | 24.20%     | 0.1      | 63   |
|          | Consultant 16 | 7      | 0.40%      | 0.0      | 0    |
|          | Consultant 17 | 43     | 2.47%      | 0.0      | 2    |
|          | Consultant 18 | 99     | 5.69%      | 0.2      | 15   |
|          | Consultant 19 | 142    | 8.16%      | 0.2      | 34   |
|          | Consultant 20 | 76     | 4.37%      | 0.4      | 28   |
|          | Consultant 21 | 148    | 8.51%      | 0.2      | 27   |
|          | Consultant 22 | 143    | 8.22%      | 0.1      | 16   |
|          | Consultant 23 | 136    | 7.82%      | 0.1      | 12   |

# Procedures of Low Clinical Value

## BQBV- Procedures of Low Clinical Value

Procedure Comparison: January 2016 - December 2016

Time Period

Health Board of Treatment

Benchmark

 Mean  
 UQ

**NHS** - Summary

94.8
1,060 #
£1,878,726

**Opportunities by Procedure** (select procedure to filter trend)

|                                 | Observed Values | Ratio | Potential Admissions Saved | Potential Savings |
|---------------------------------|-----------------|-------|----------------------------|-------------------|
| Cataract Surgery                | 3,337           | 109   | 439                        | £526,978          |
| Minor Skin Lesions              | 1,108           | 164   | 303                        | £348,128          |
| Knees                           | 653             | 114   | 40                         | £288,066          |
| Inguinal, Umbilical and Femoral | 672             | 134   | 127                        | £255,612          |
| Hysterectomy for Menorrhagia    | 291             | 117   | 35                         | £141,208          |
| Knee Washouts                   | 318             | 137   | 43                         | £96,292           |
| Varicose Veins                  | 279             | 136   | 50                         | £74,914           |
| Primary Hip                     | 422             | 109   | 8                          | £55,888           |
| Cochlear Implants               | 10              | 142   | 3                          | £47,746           |
| Jaw Replacement                 | 40              | 137   | 9                          | £39,742           |

**Trend in Potential Savings, NHS Board:** Procedure: All

| Period        | Potential Savings (£) |
|---------------|-----------------------|
| Apr14 - Mar15 | £1,619,455            |
| Apr15 - Mar16 | £1,680,326            |
| Oct15 - Sep16 | £1,988,651            |
| Jan16 - Dec16 | £1,878,726            |

**Opportunities by Procedure**

Opportunity Chart

# 5 biggest Harms (NHS Safety Thermometer)

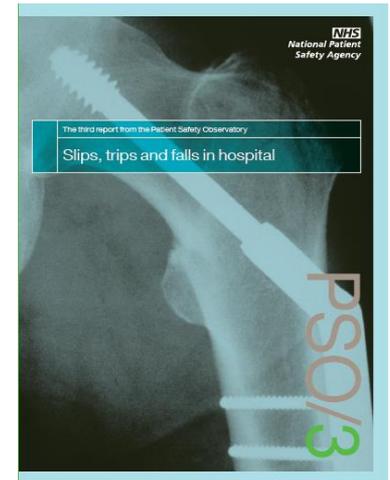
- In-patient falls
- Hospital acquired infection
- Medication errors
- Bed ulcers
- VTE

# Nationally: England & Wales

**284,438 falls**

**1390 fractures  
(840 #NOF)**

**83 deaths**



## NHS In-Patient Fall Rate

Average = 6 /1000 bed days  
Range = 3 -12 /1000 bed days

# Business Case for Quality

Cost of Falls?

£200,000/year

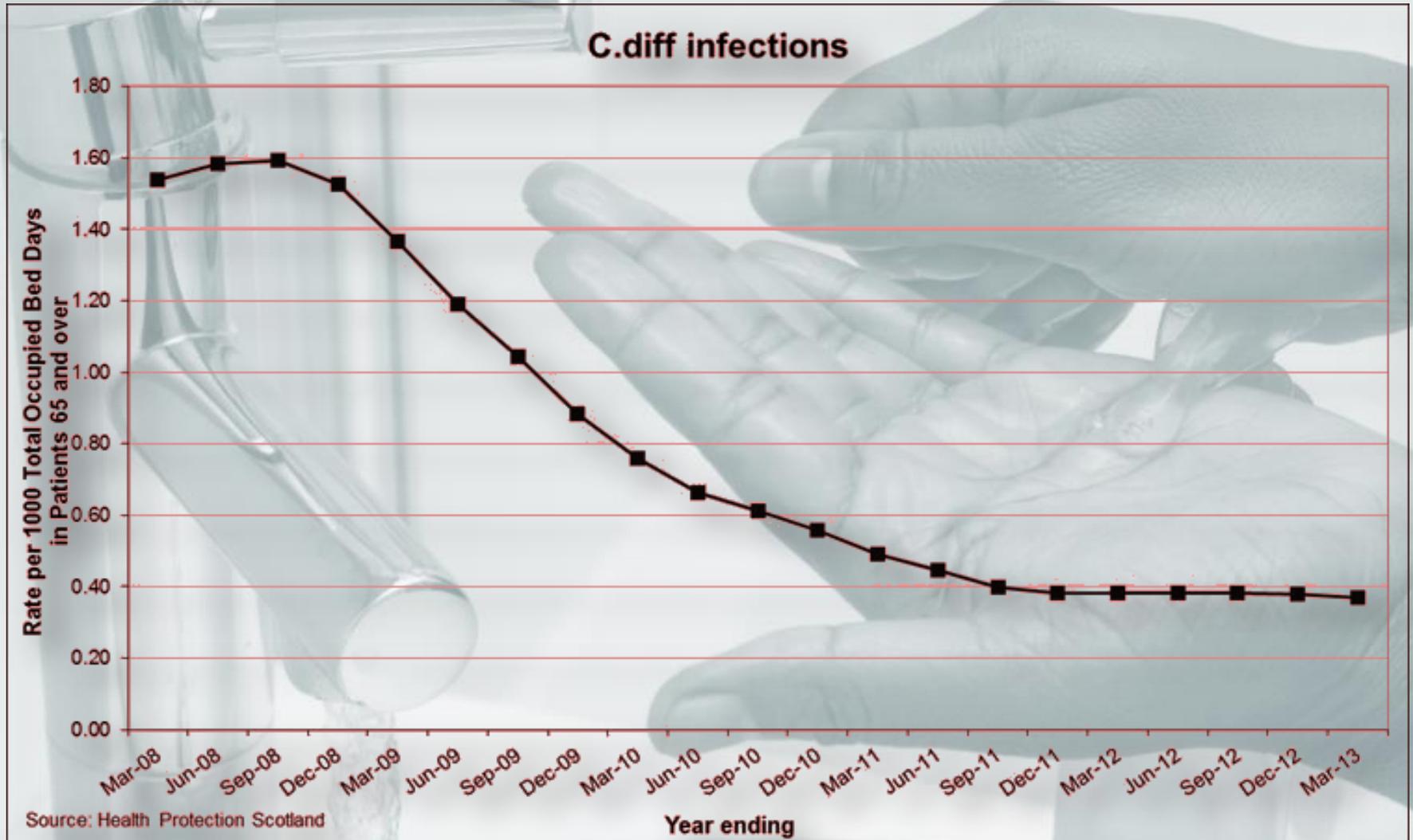
Cost of interventions?

£15K + £5/year

**Financial savings by  
decreasing 50% falls =  
£120K**



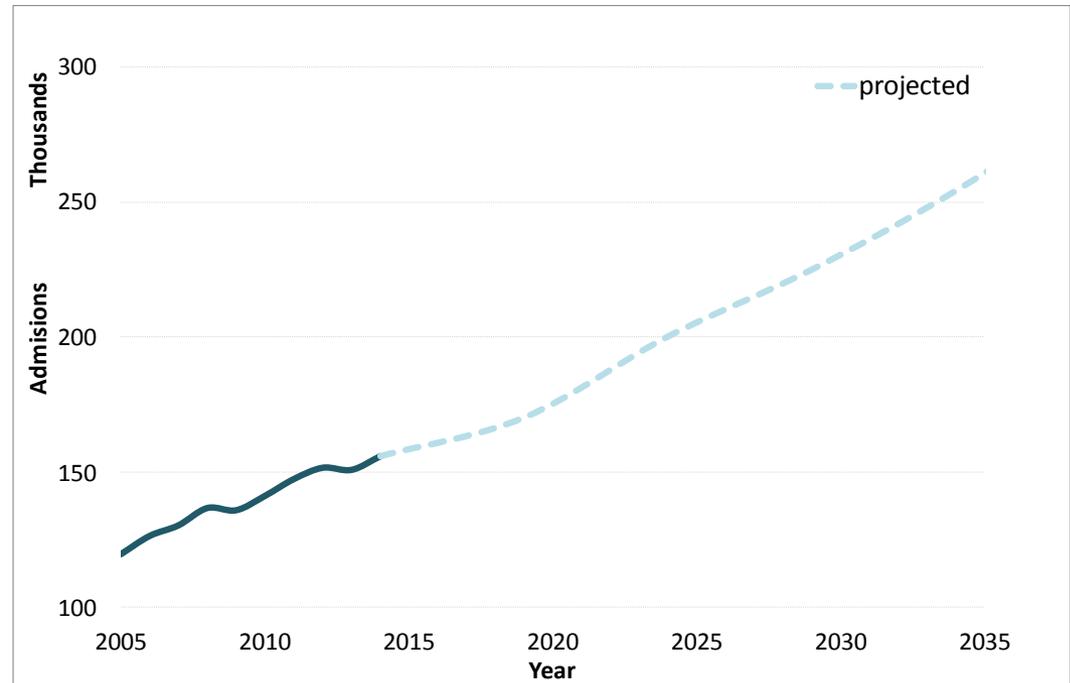
Rate of identifications of CDI across NHSScotland was **0.37 per 1,000 occupied bed days** among patients aged 65 & over (2008 – 2013)

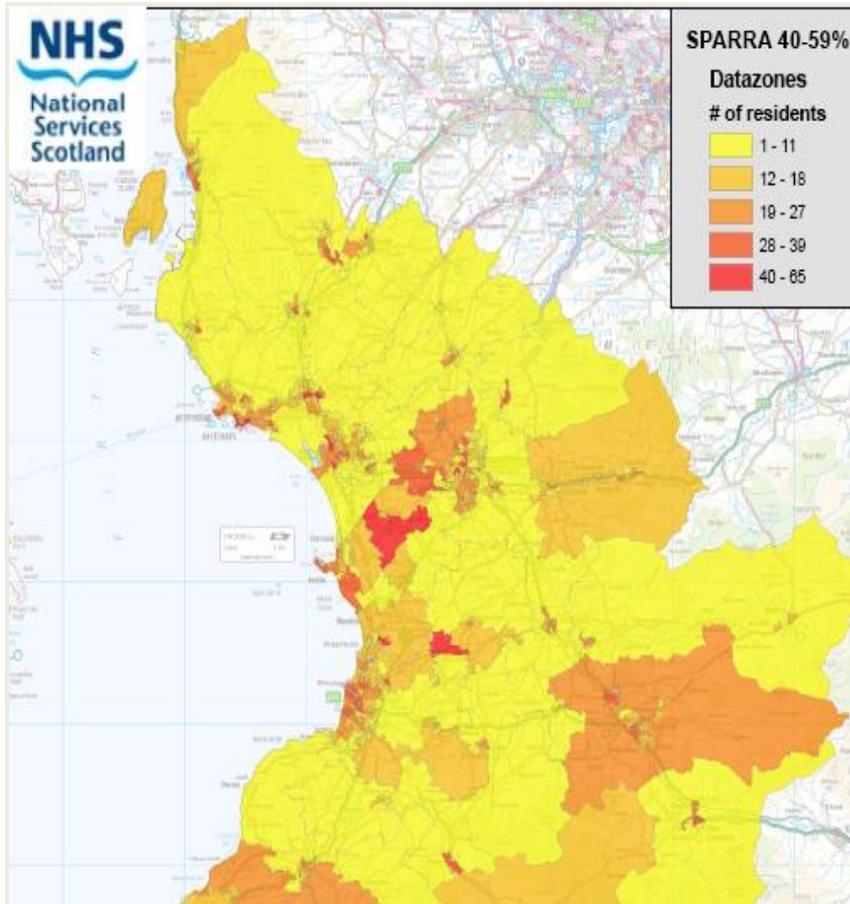


# SPARRA



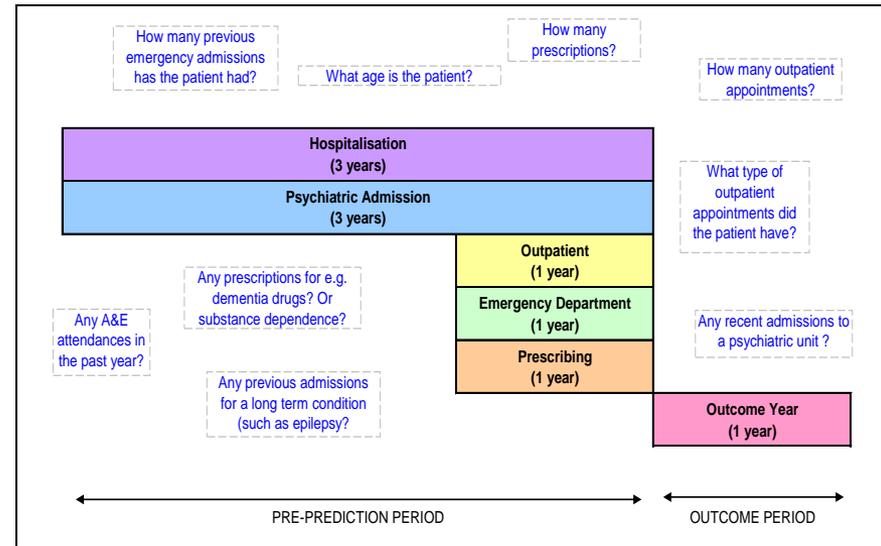
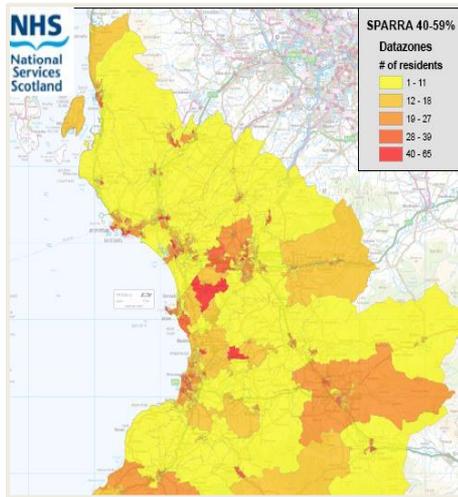
## Scottish Patients at Risk of Readmission & Admission



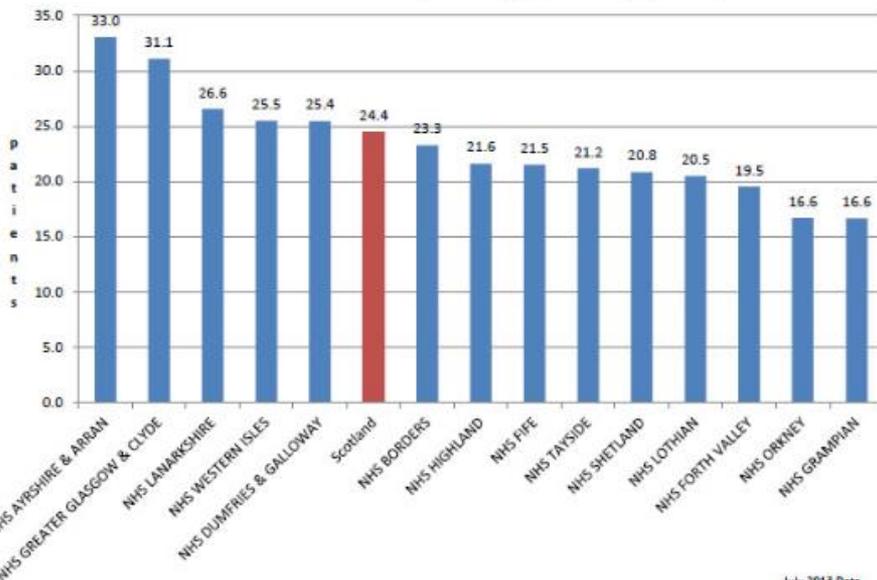


- **How many patients are at risk of having at least 1 emergency admission in the coming year?**
- **Who are they and what are their characteristics (age, LTCs, etc)?**
- **Where are they located - what GP are they registered with?**

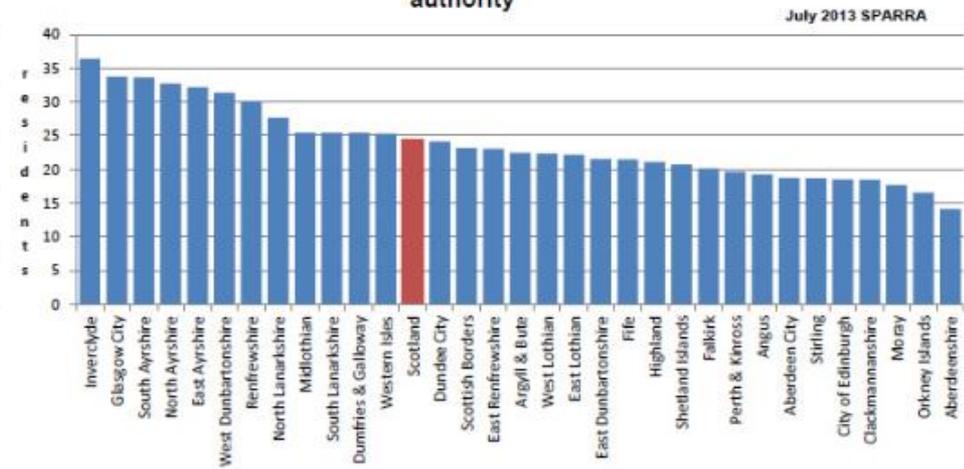
# Scottish Patients At Risk of Readmission and Admission (SPARRA)



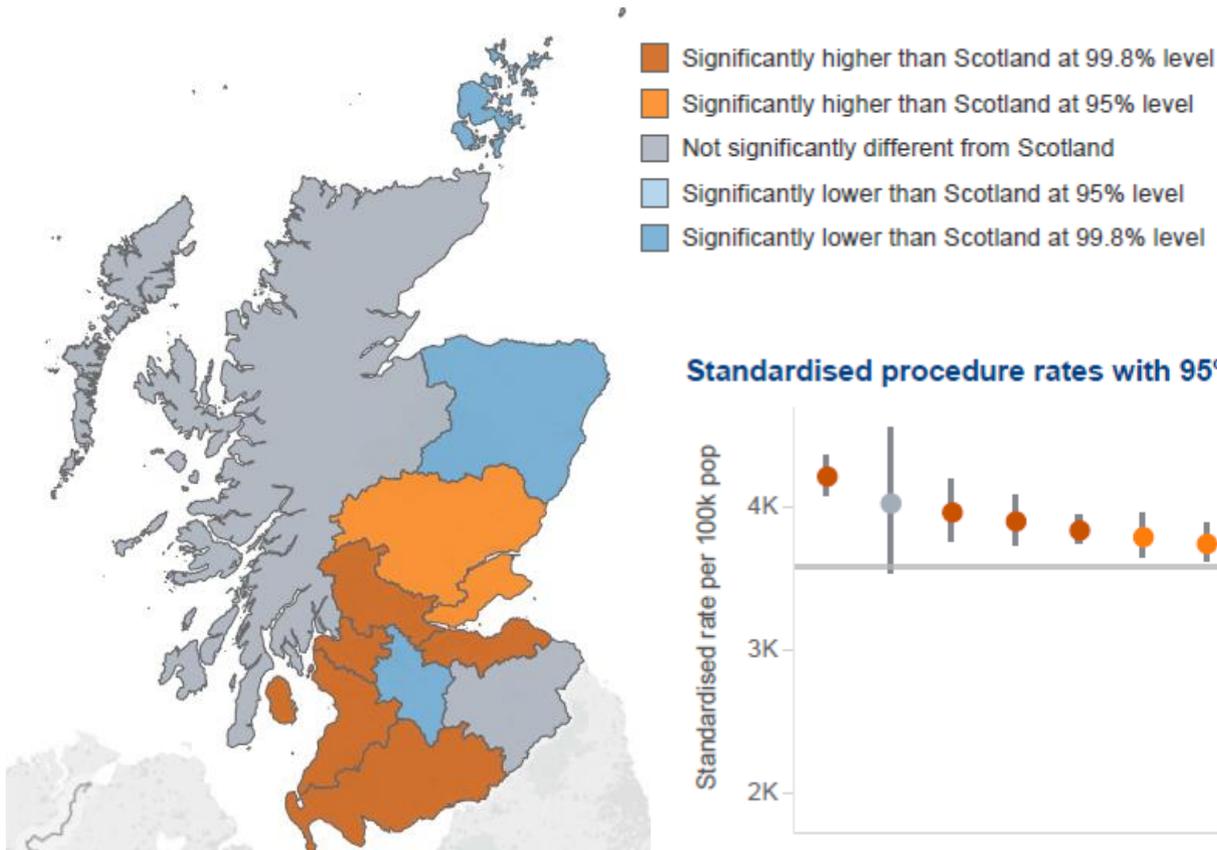
Patients with a Risk Score  $\geq 40\%$  per 1000 population (July 2013)



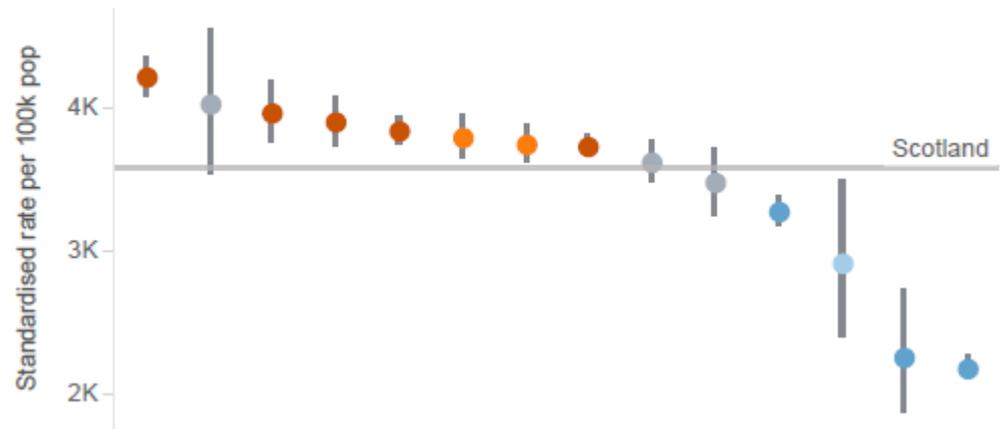
Patients with a Risk Score  $\geq 40\%$  per 1000 population by local authority



# Scottish Atlas of Variation (Example) Cataract (2016/17)



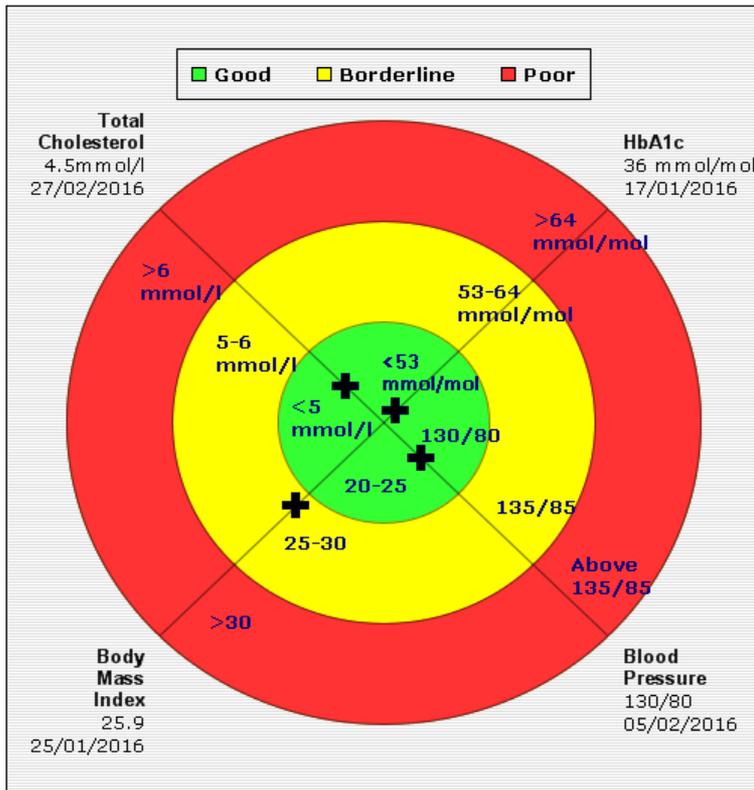
Standardised procedure rates with 95% confidence intervals; 2016/17



[my details](#) | [my lifestyle](#) | [my results](#) | [my eyes](#) | [my feet](#) | [my medication](#) | [my diary](#) | [my letters](#) | [my goals](#) | [my recordings](#) | [my summaries](#)

ARCHIBALD MACKIE

My Target Chart



- 300,000 patients (5.3%)
- 10% of health budget
- Variation in clinical outcomes

# Transforming Publishing

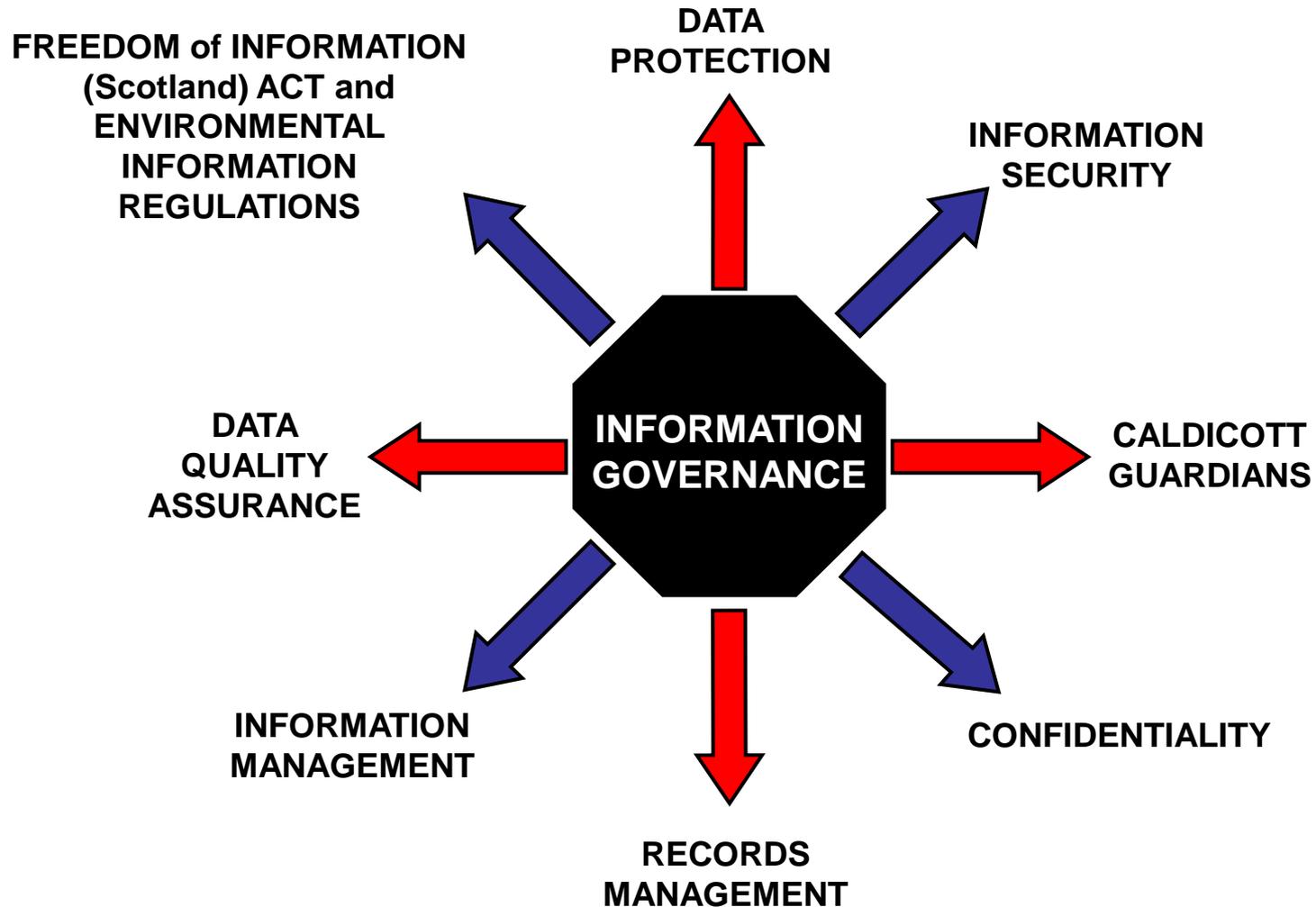
## Monifa - Doctor



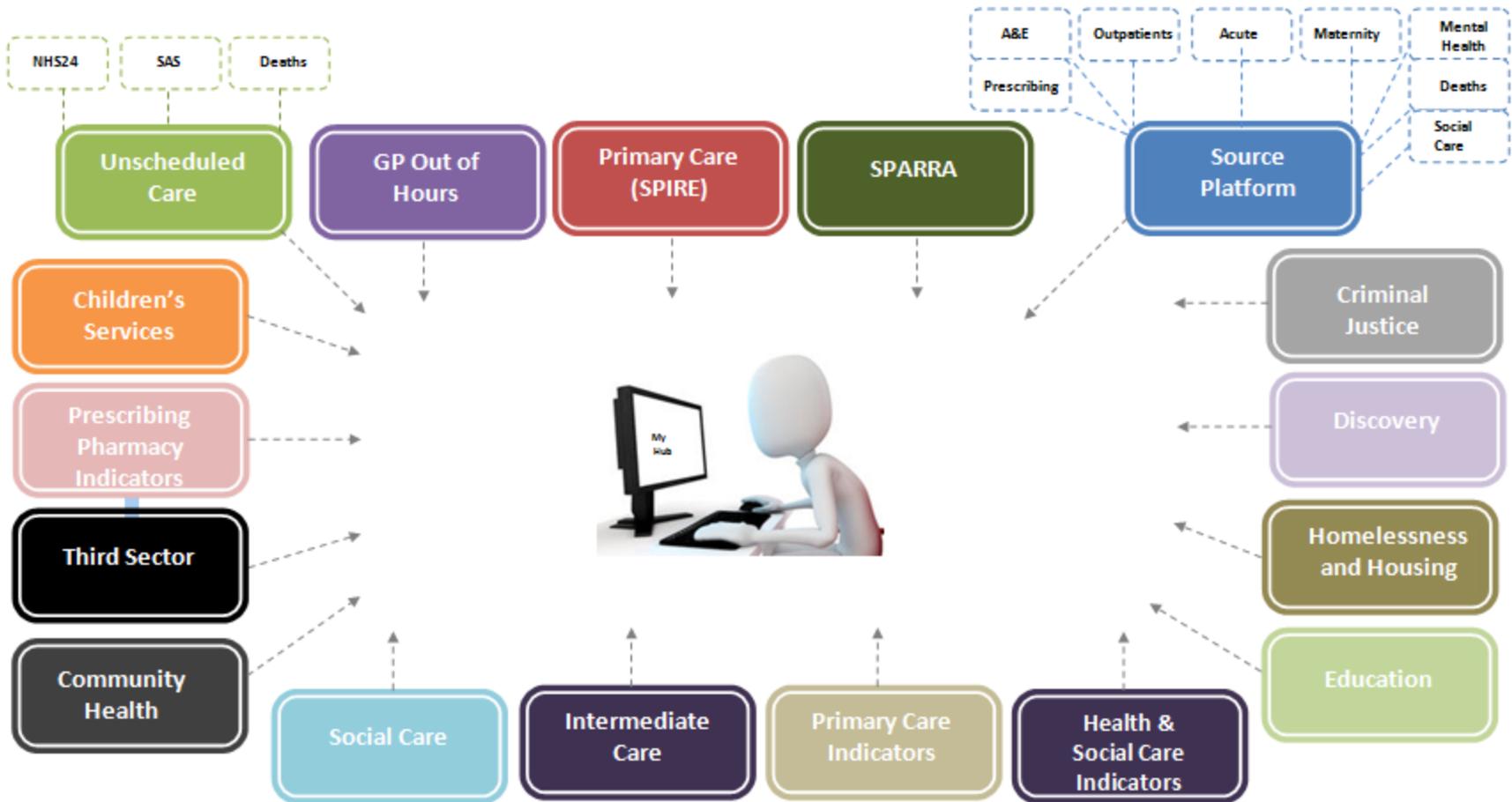
I need thorough **#HSCData** that is relevant to my speciality so that I can improve clinical outcomes for patients.

I'm frustrated as it is not easy from me to get an overview of the data for my specialty.

# Information Governance (IG)



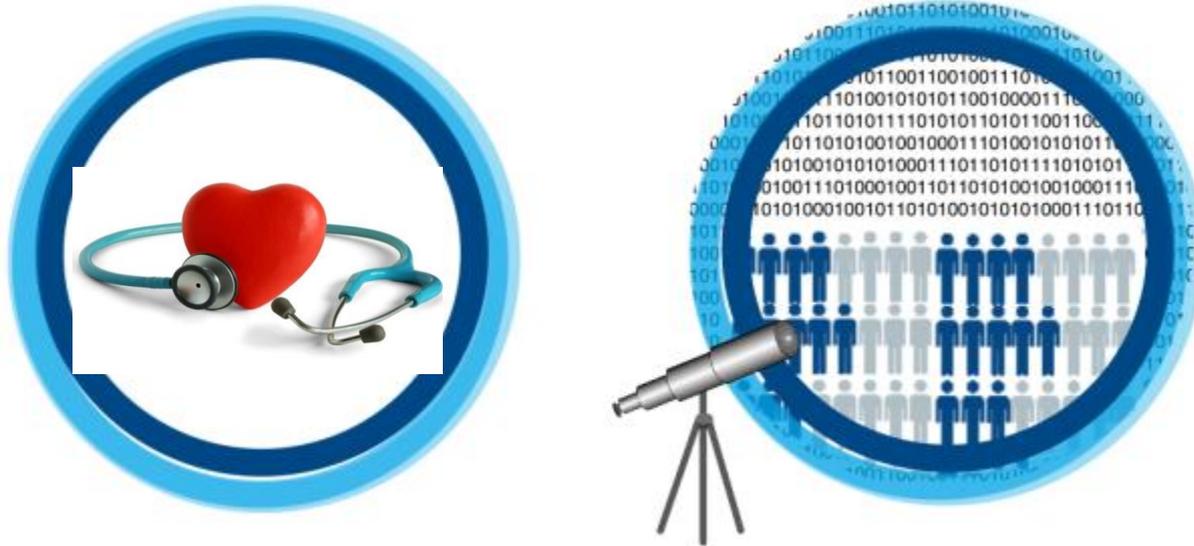
# My Hub



## **Your Leadership Role – Data & Intelligence**

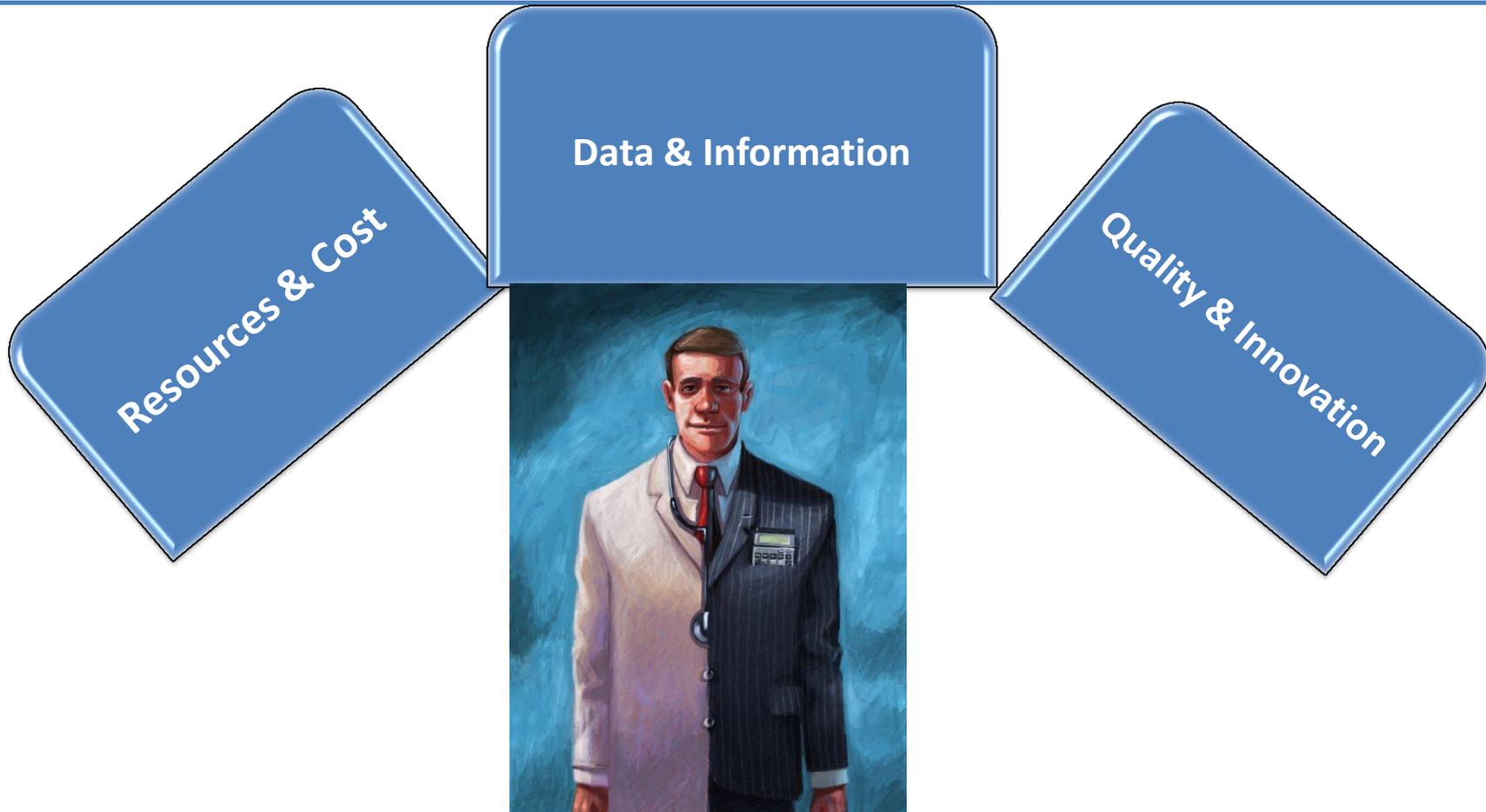
- **Professional**
- **Organisational**
- **National**

# Stethoscope to Datascope

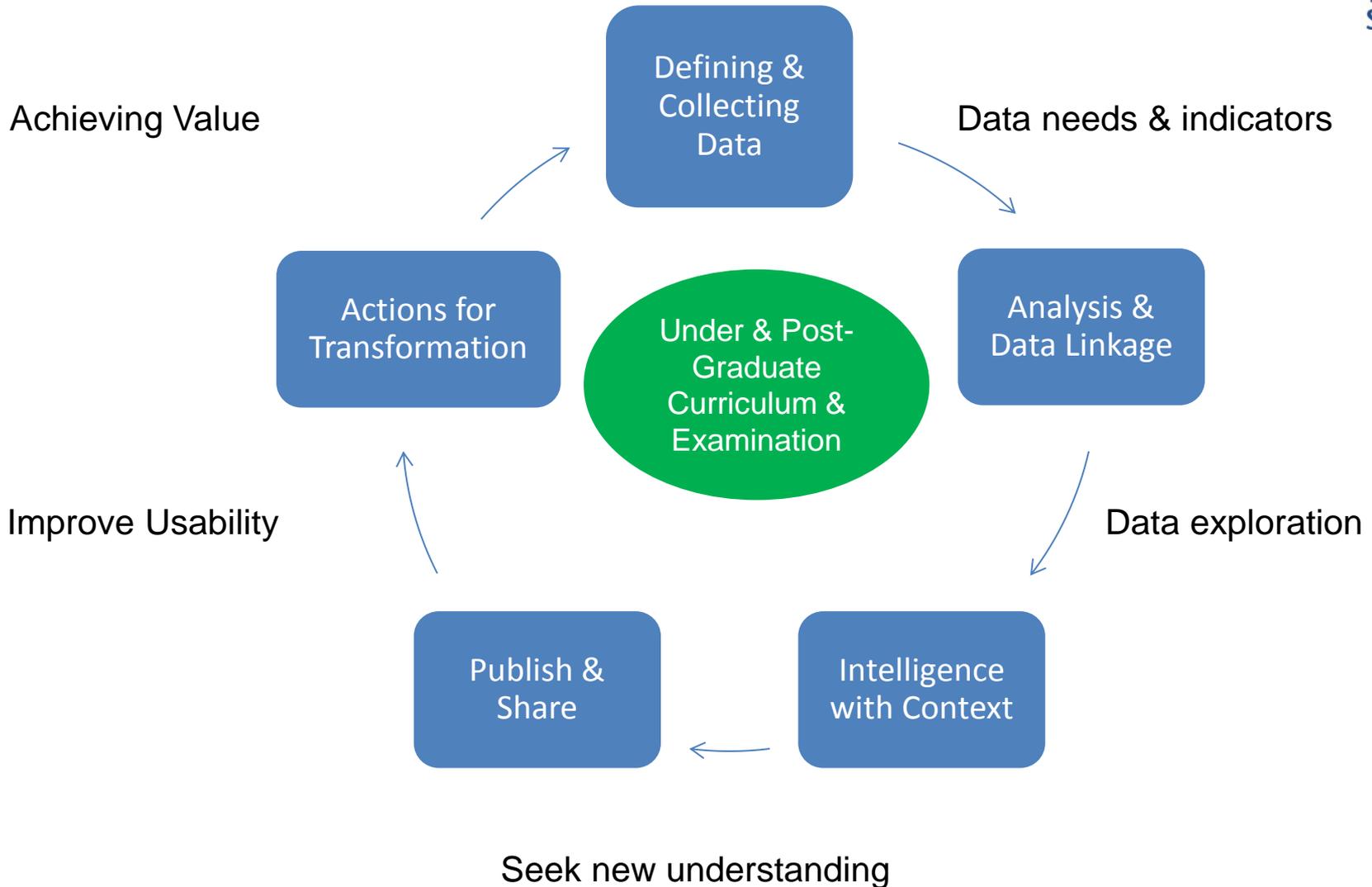


@mahmoodadil

# Future clinical workforce = Change agents & leaders

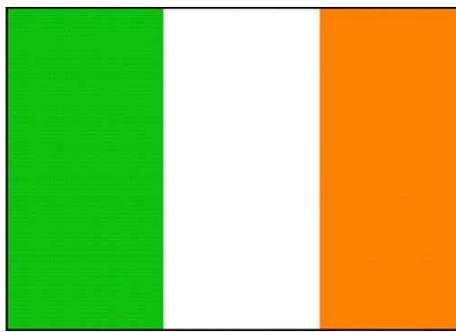


# Education & Training



# Health System Mission





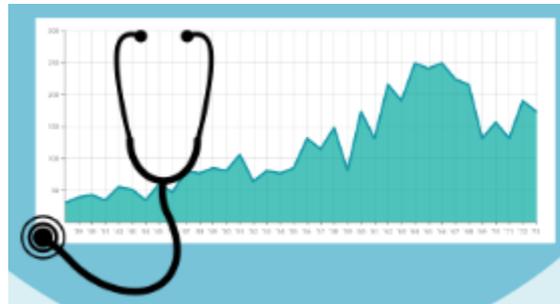
1. Has Ireland got a systematic framework or strategy to produce health intelligence?
2. Who is currently producing health intelligence? Is it reaching to those who need it (right place, right time & right form)?
3. Have we got national and local professional leadership roles on health intelligence?
4. Have we got a common platform among organisations to share data and intelligence?
5. Are we applying the available intelligence?
6. Are we developing clinical workforce to comprehend and utilise health intelligence?



# Prescription for Success

- **Comprehensive data and health intelligence are essential for effective health care system and organisations.**
- **Being a professional leader is about having an insight (with data and intelligence) to make the biggest difference in patient and population health.**
- **Data training in the development of the current and future clinical workforce is key to success.**
- **Better data, better lives, better health system.**

# From Good to Great



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