

# Global Leaders in Predictive Analytics



we predict

- Turning big and small data into actionable insights for some of the world's largest companies
- Deliver solutions on a Software as a Service platform for an annual fee
- As a Service – customer driven change and improvement requests can be incorporated
- Solutions and requirements evolve
- No customer hardware or software requirement
- Speed of implementation
- Scalable business model
- Initial focus on manufacturing and in particular automotive

# We Predict Service

Sound, complex statistical analysis

Domain expertise input

Automated & visualisations

Computer Science  
+ Statistics =  
Data Science

- data cleansing
- data quality
- research
- analysis

Statistics

Epidemiology

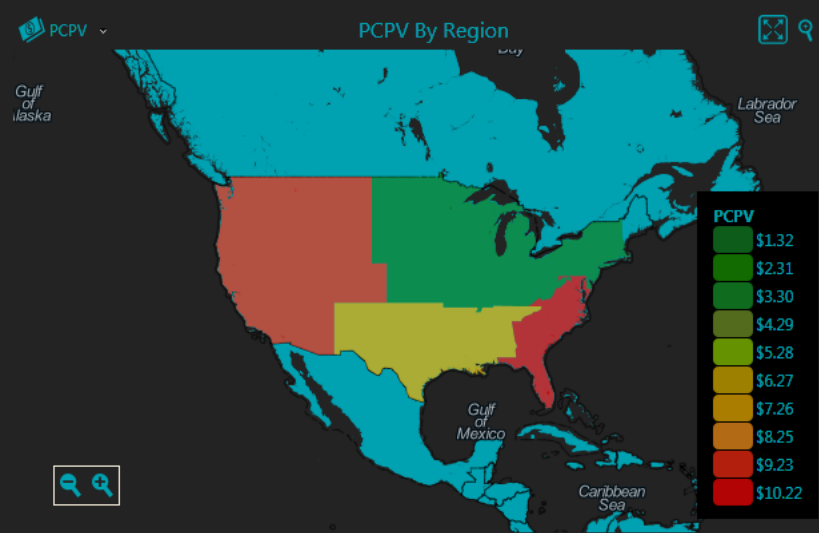
Comp Sci

Domain  
Expertise

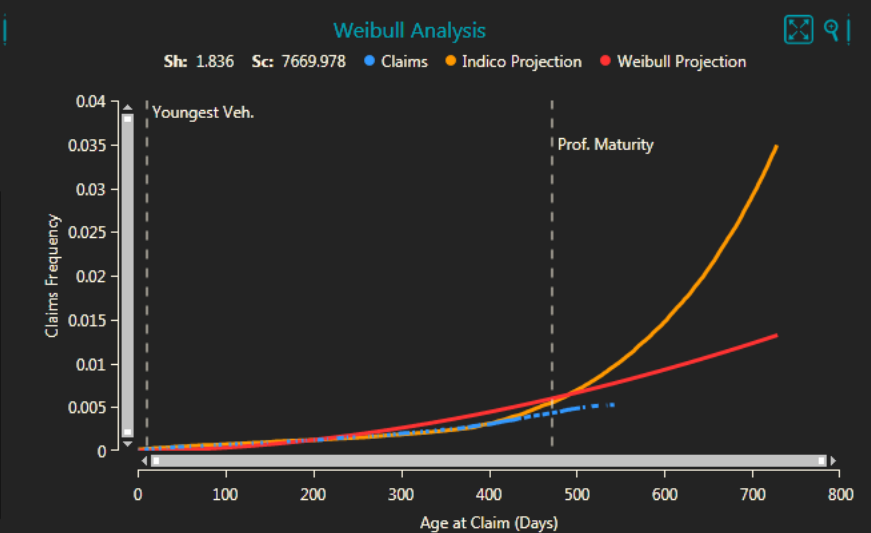
Visualisation



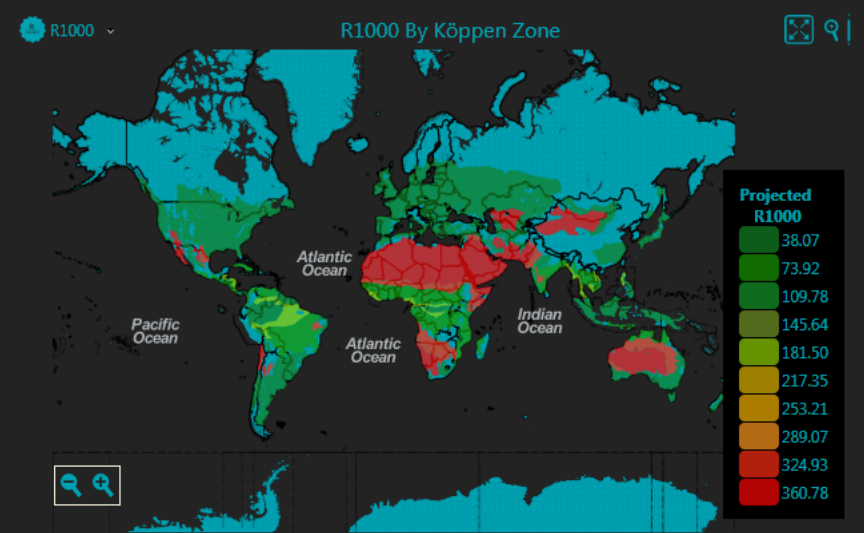
Region Map Region Chart Profile Weibull Analysis Part Code List Köppen Map Köppen Chart



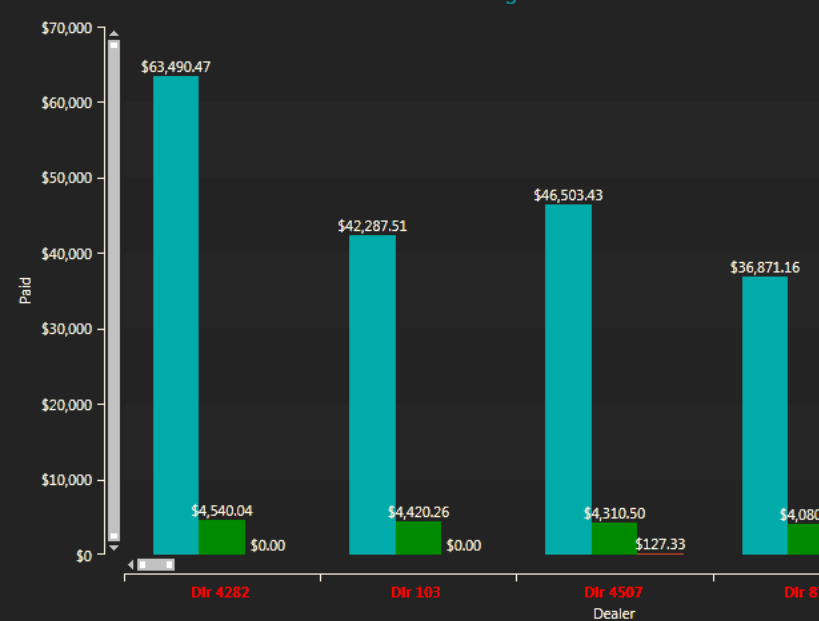
### Weibull Analysis



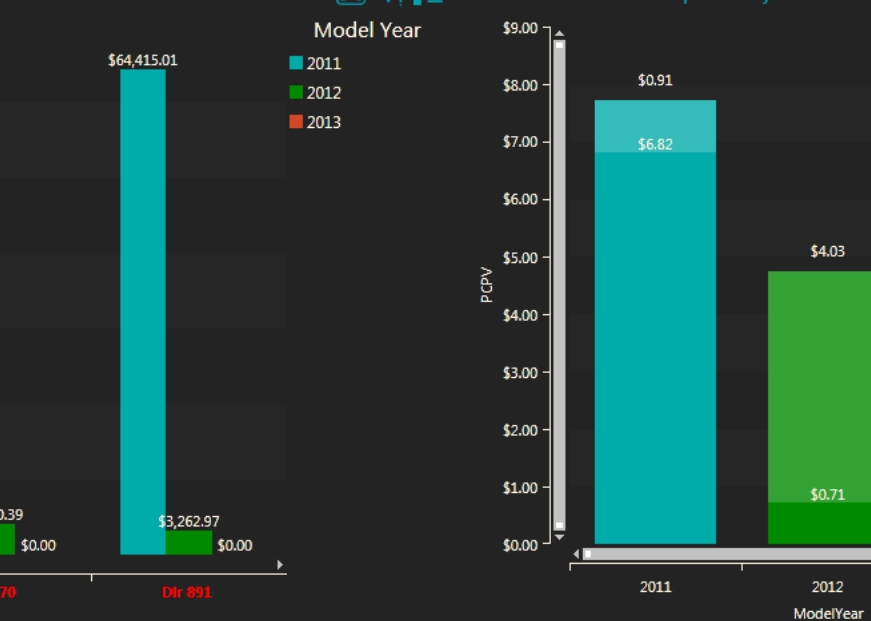
### R1000 By Köppen Zone



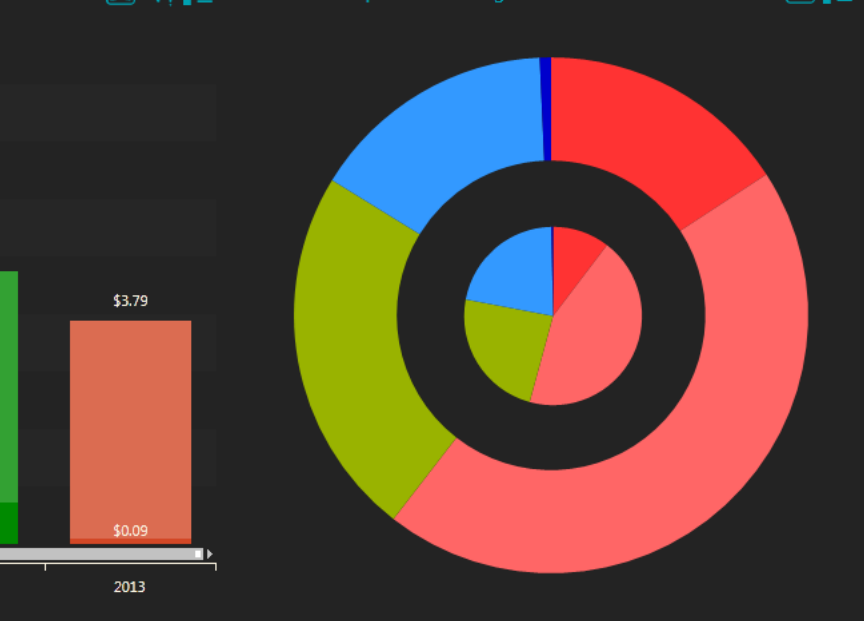
### Highest Cost Dealers



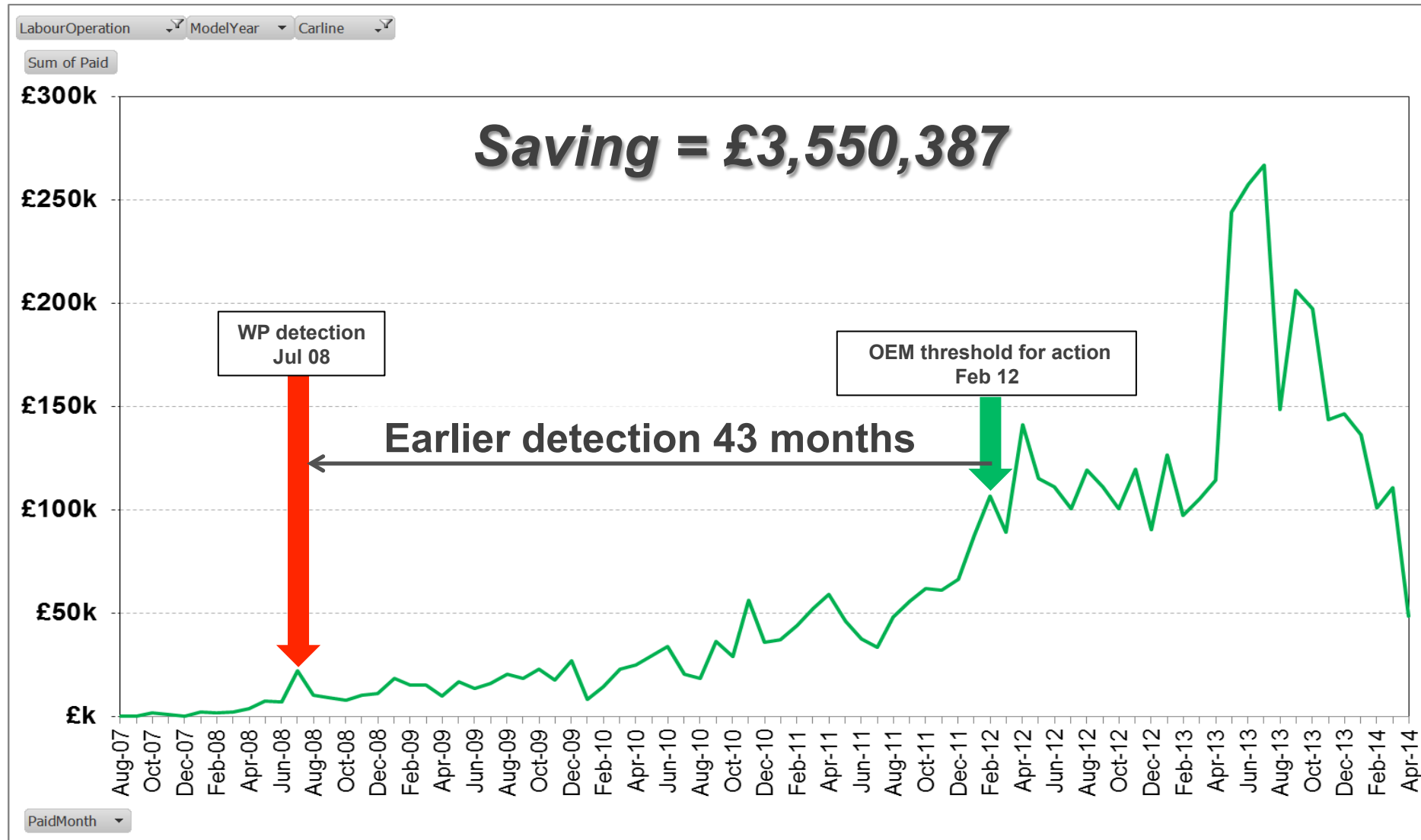
### PCPV Development By Model Year



### Temperature Categories On Claim Dates



# Example - Fuel Injection Kit





**CHRYSLER**



**HONDA**

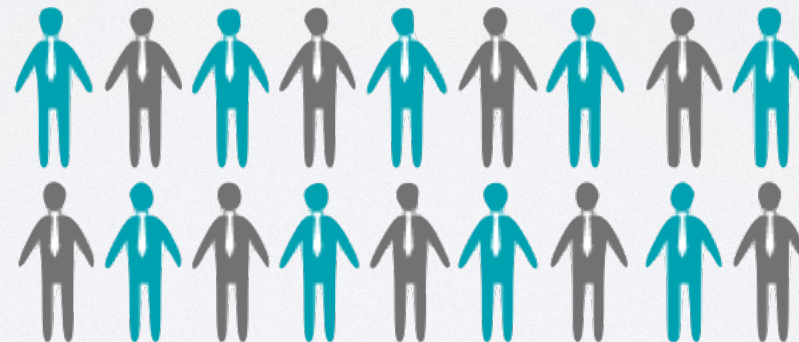


**HYUNDAI**

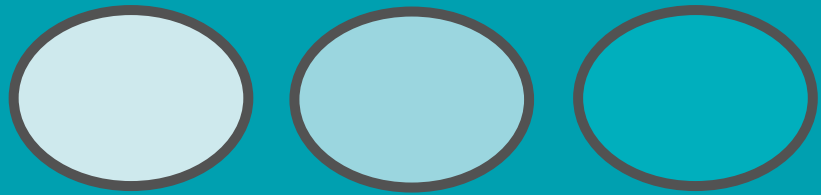
**KOSTAL**

DEEP  
ANALYTICAL  
TALENT:  
WHERE ARE  
THEY NOW?

McKinsey Global  
Institute (MGI) Projects  
that by **2018 the US** alone  
may face a **140,000**  
**person shortfall** between  
supply and demand of  
deep analytical talent.







**We Predict and Health**

**we predict**

# How can we improve the health of our population through the better use of data?



An Innovate UK Challenge: ABMU/We Predict/SAIL collaboration



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Craig Barker – Senior Information Analyst



Swansea University  
Prifysgol Abertawe

Luke Player - Project Manager

we predict

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Dr Kelly Nock PhD – Data Scientist

Chris Davies – Software Engineer

Mike Nicholas – Visualisation Specialist

Wayne James – Project Manager



(Click on a Polygon to change the selected Health Board)

### Changelog

**Version 6.1:** 2nd June 2015

Added Unscheduled Care reporting tracks covering A&E and Inpatients.

**Version 6.0:** 16th March 2015

Initial system build with two reporting tracks: Population Overview, Diabetes & Obesity.

### Population Overview

Abertawe Bro Morgannwg University Health Board

### Unscheduled Care: Inpatient

Abertawe Bro Morgannwg University Health Board

### Unscheduled Care: ED

Abertawe Bro Morgannwg University Health Board

### Diabetes & Obesity

Abertawe Bro Morgannwg University Health Board

### Network Comparison: Unscheduled Care

Abertawe Bro Morgannwg University Health Board

### Network Comparison: Diabetes & Obesity

Abertawe Bro Morgannwg University Health Board

### Type-2 Diabetes: 10 Year Follow-up

Statistics

### Type-2 Diabetes: Extended Cox Model

Statistics

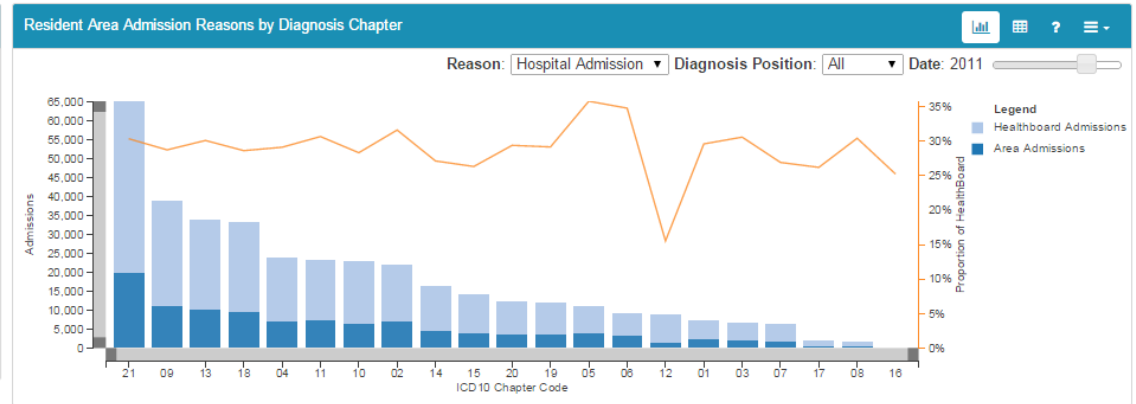
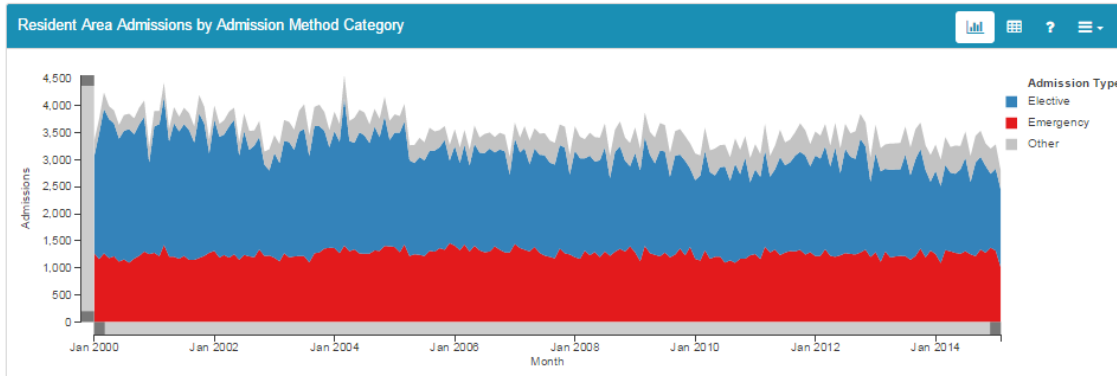
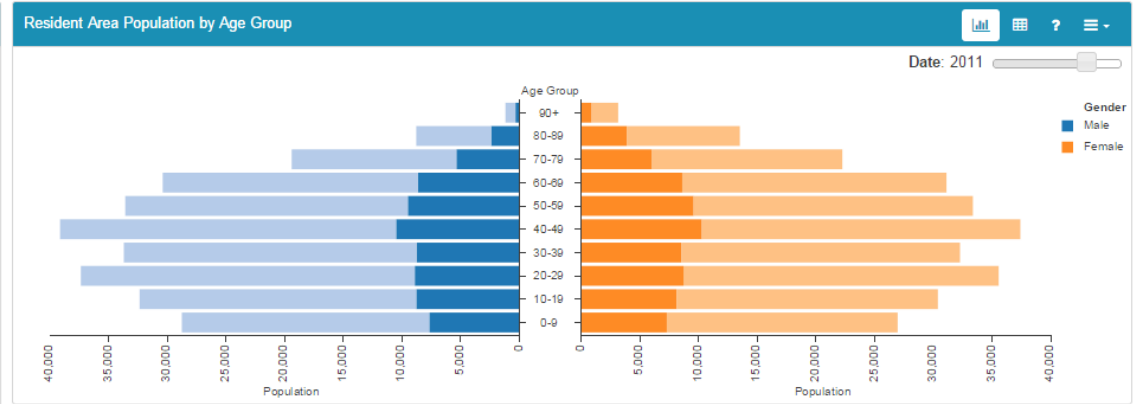
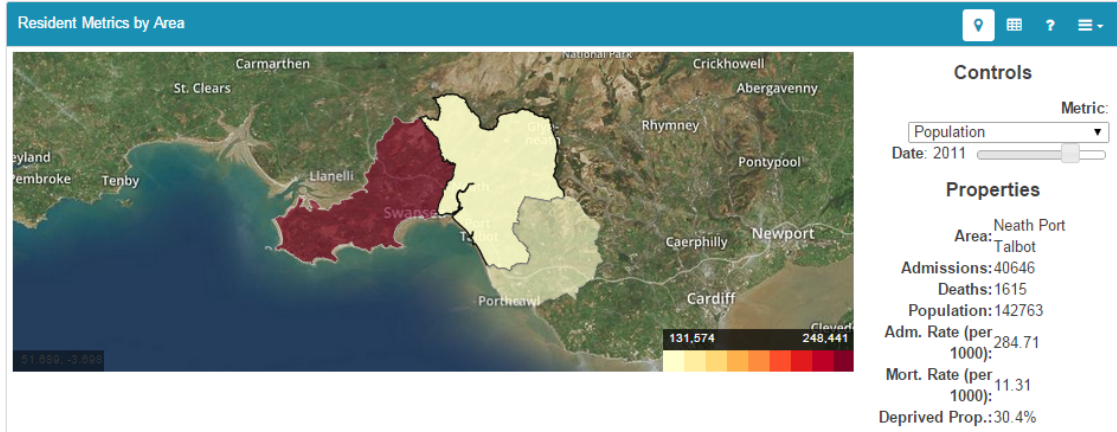
### Data Quality

# Healthboard - Population Overview Healthboard Report

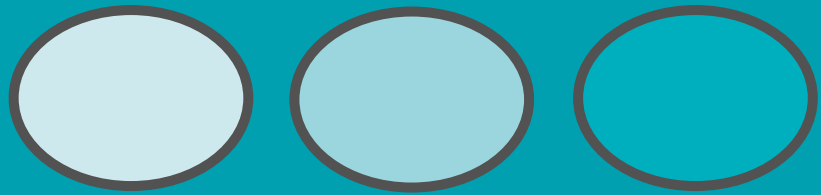
Abertawe Bro Morgannwg University Health Board

Healthboard

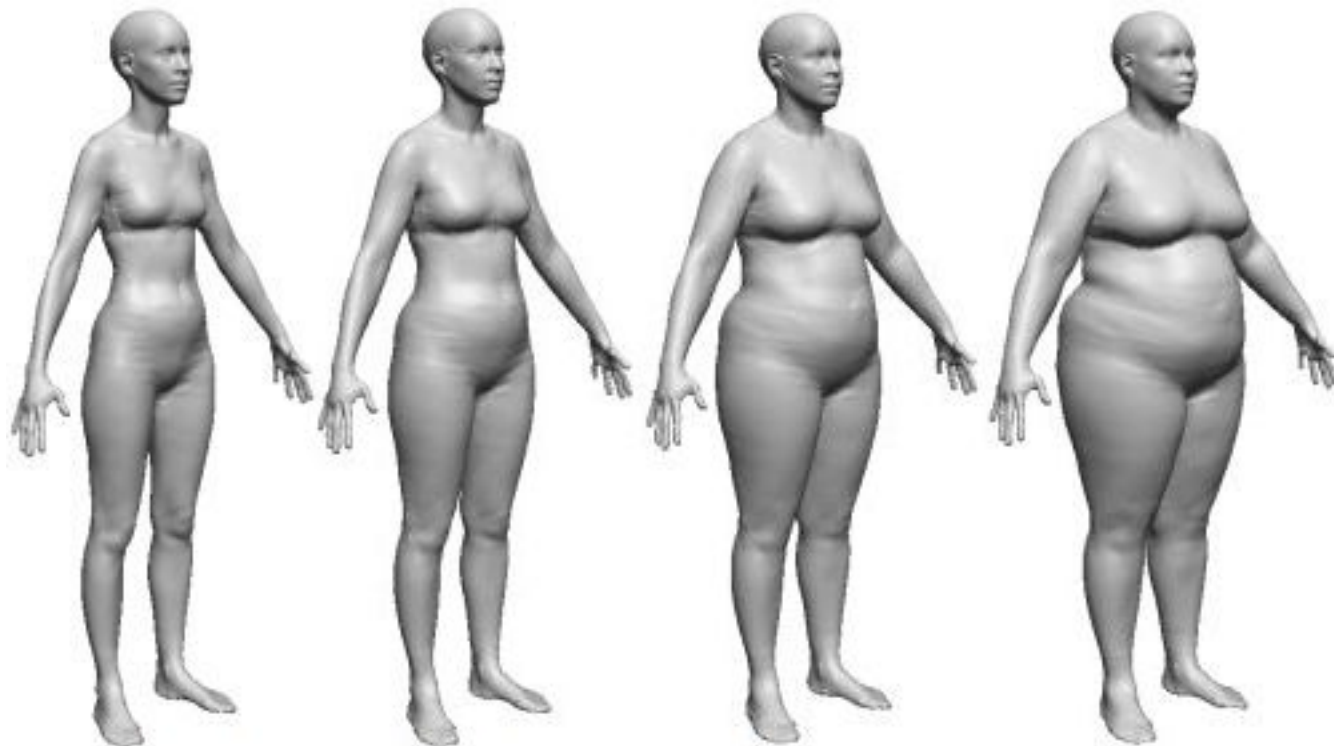
Population: Resident



Neath Port Talbot



**Diabetes**



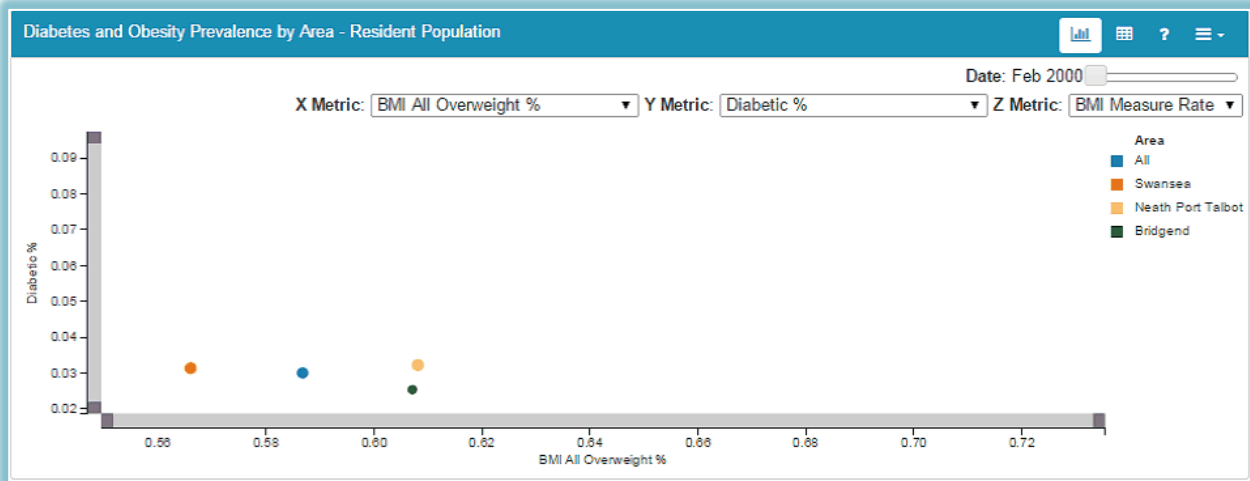
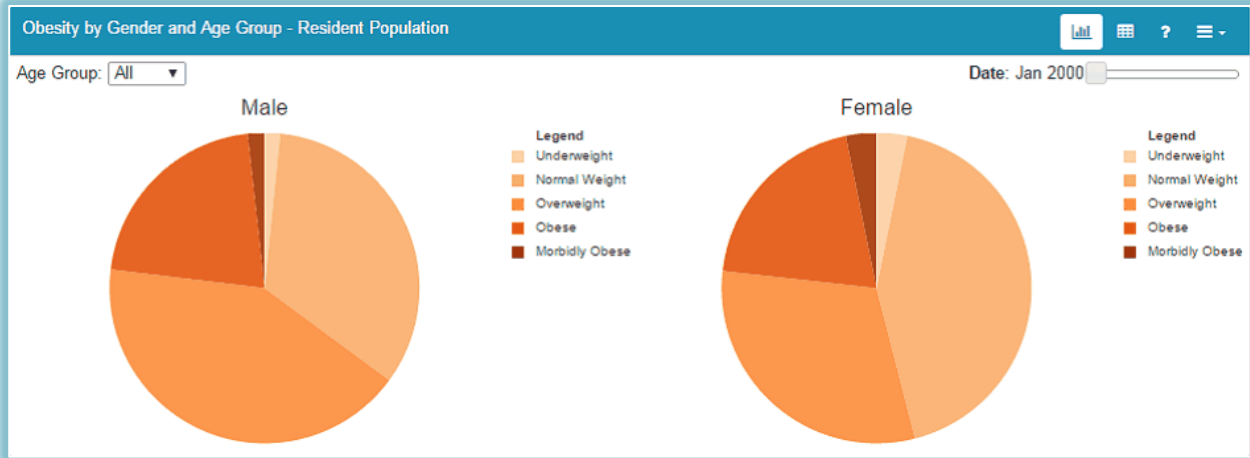
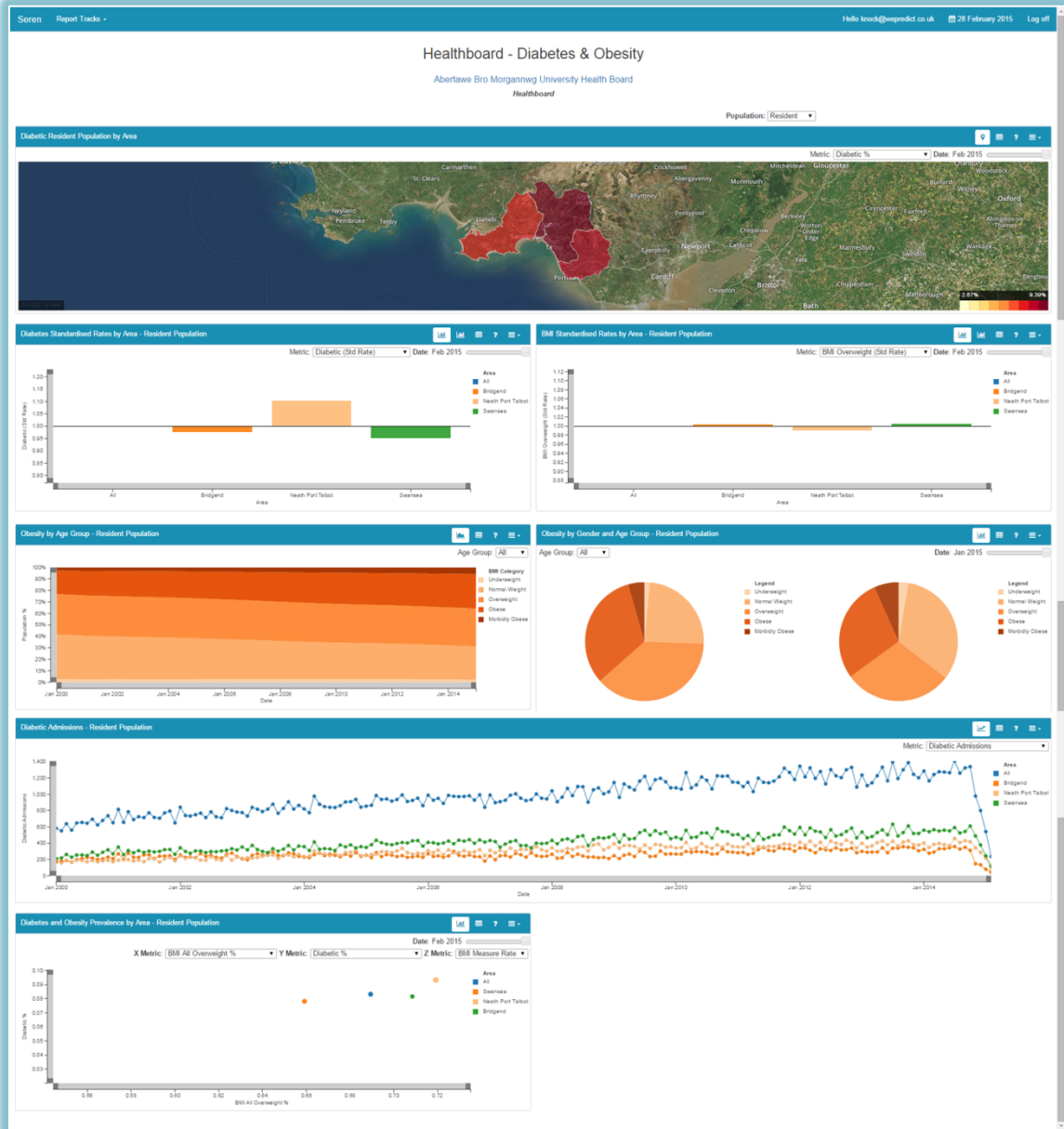
BMI 17.5

BMI 22.0

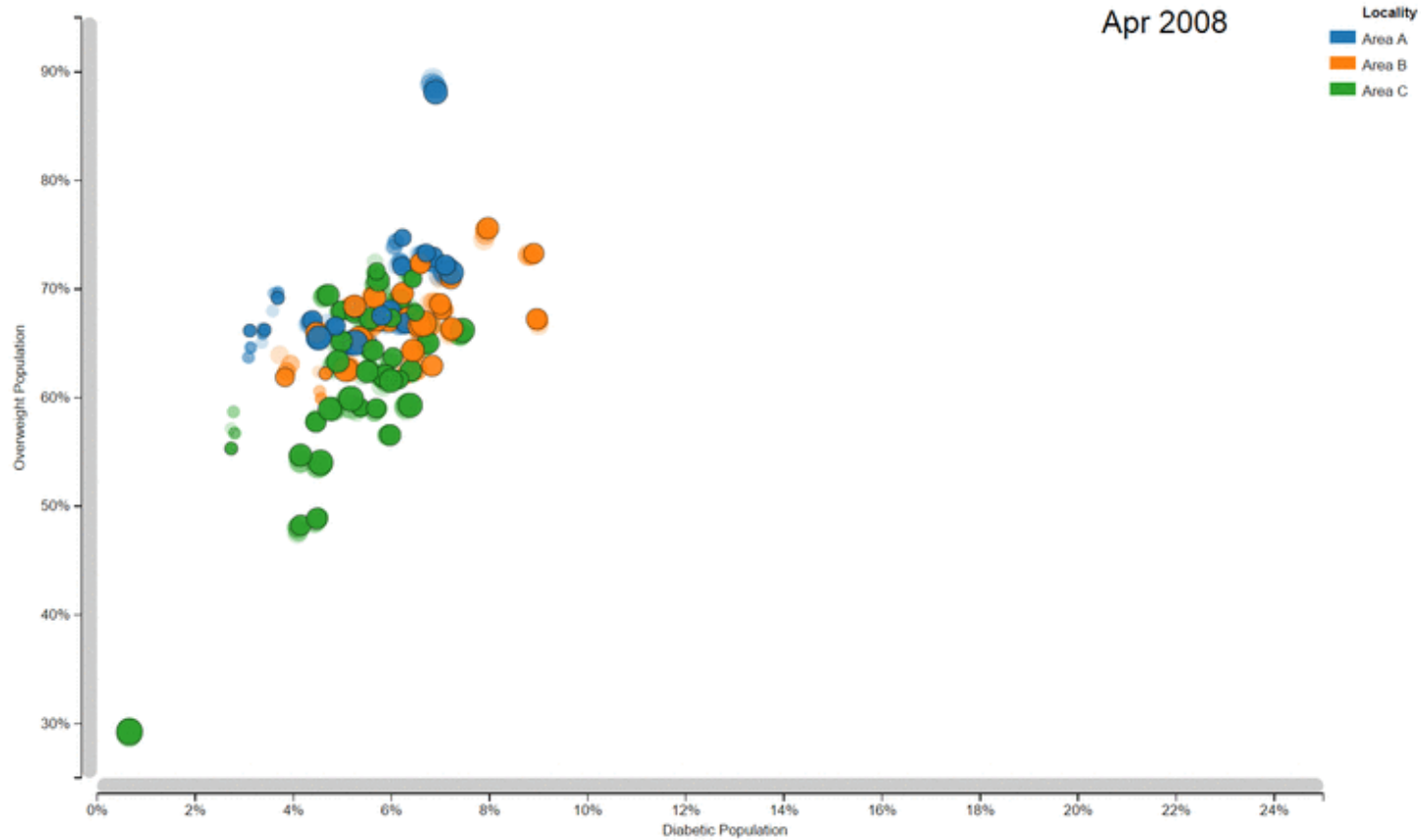
BMI 30

BMI 40

# Diabetes & Obesity



# Type-2 Diabetes & Obesity

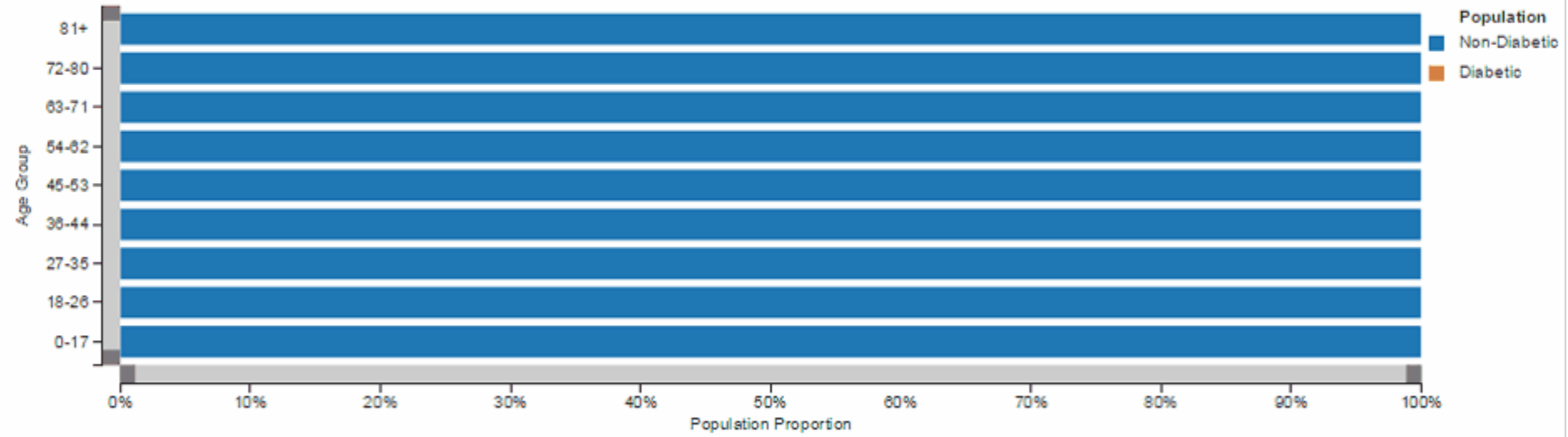




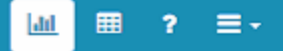
### 10 Year Follow Up - Cumulative Probability/Survival to Type-2 Diabetes - Male



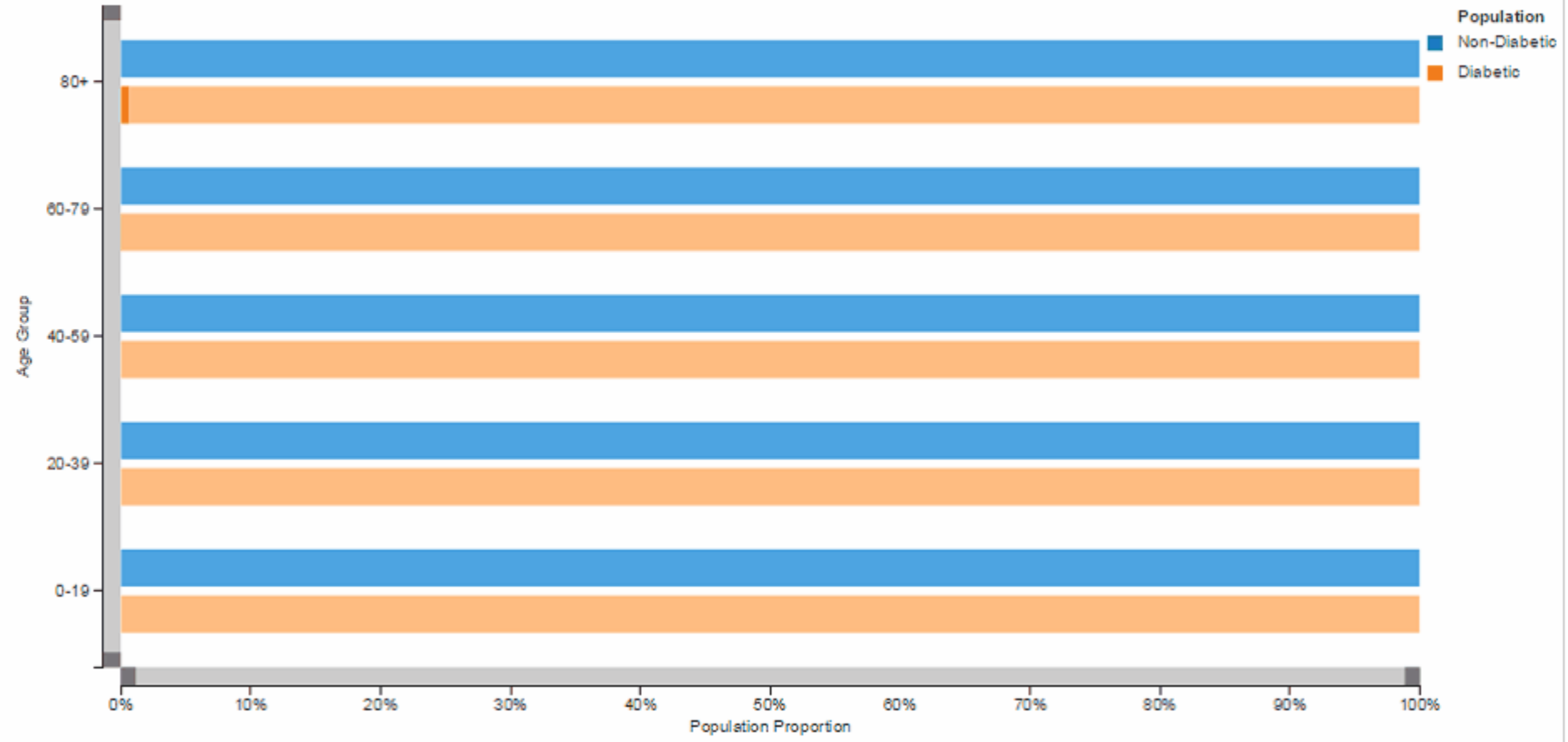
Age Group:  BMI Category:  Stratification:  Time (Years): 0



Case-Control - Cumulative Probability/Survival to Complications - Male



Complication:  Age Group:  BMI Category:  Stratification:  Time (Years): 0








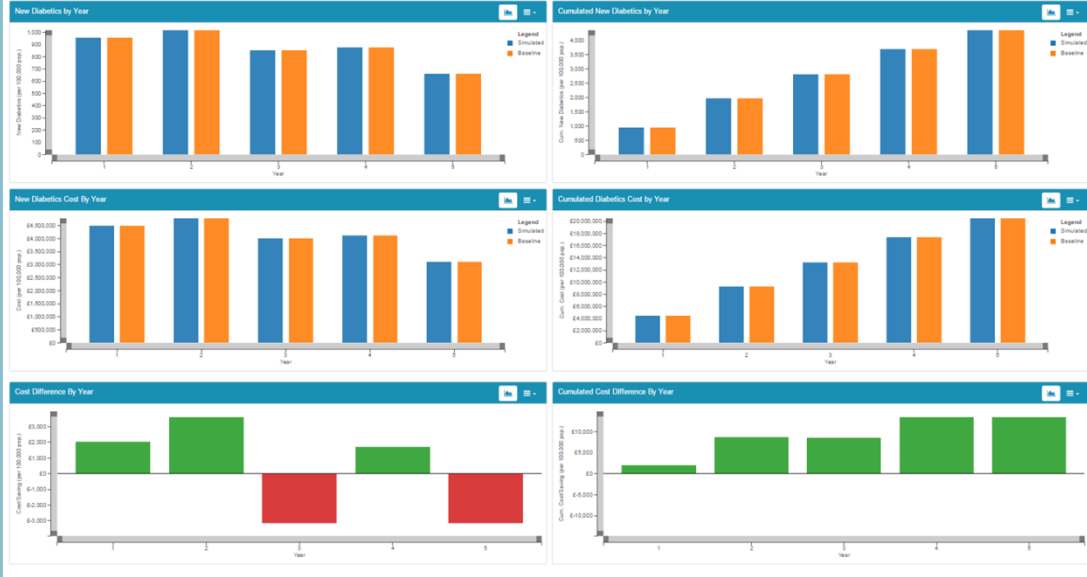
### Type-2 Diabetes: Extended Cox Model

**Information**  
 This dashboard explores the relationship between Obesity and Type-2 Diabetes in the ABMJ population. An Extended Cox Model is generated to quantify the risk associated with Obesity and Type-2 Diabetes. This model is then used as a basis for asking 'what if?' questions about the effectiveness of weight loss interventions for lowering the population risk of Type-2 Diabetes. Forecasts for the expected prevention of Type-2 Diabetes over the next five years and associated costs are presented.

1) Intervention Selection  
 Intervention Target:  Intervention Target Group:  Uptake Rate:  Success Rate:  Intervention Cost (per person):  Diabetic Cost (per person):

2) 2020 Projected Healthboard Impact

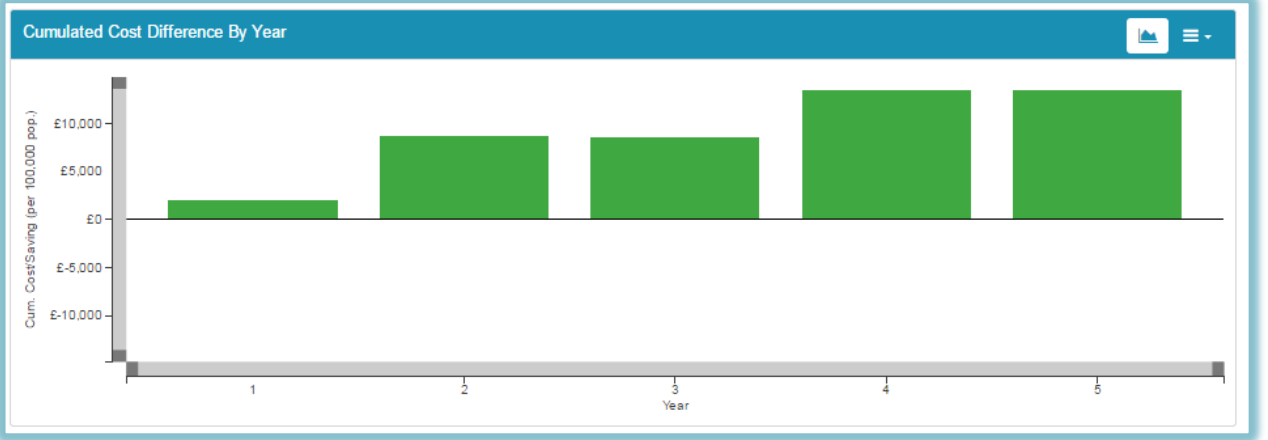
 Diabetics Prevented 19	 Intervened Patients 8,311	 Intervention Cost £ 83,102.52	 Diabetics Cost £ 109,621,316.49	 Projected Diabetic Cost Saving £ 5,615.61
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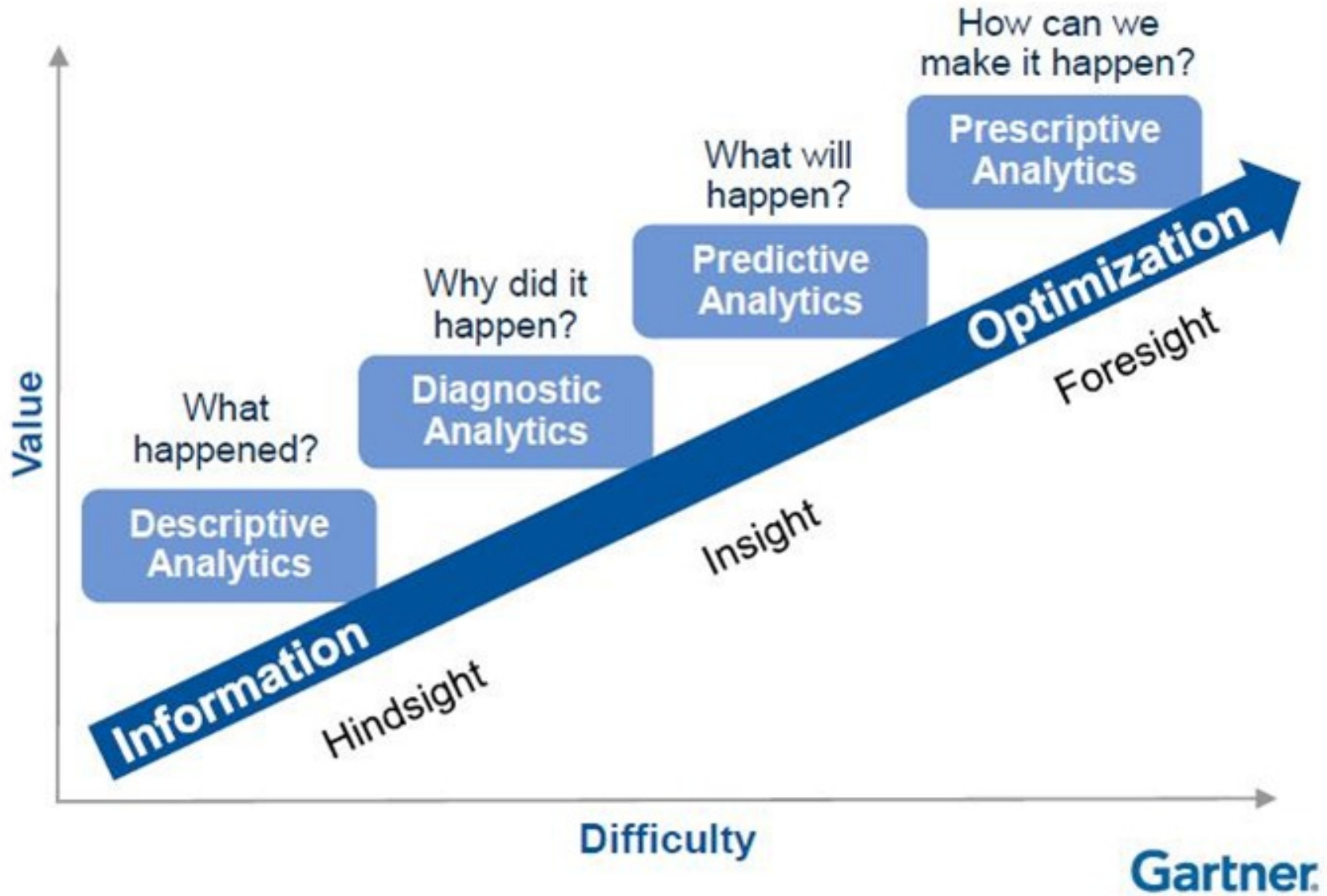


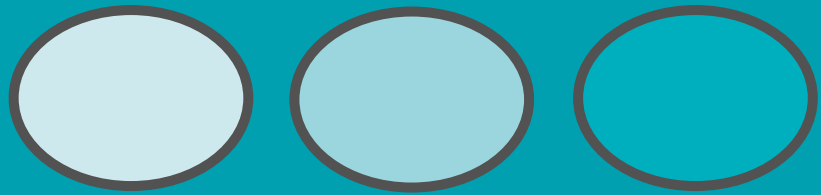
# Type-2 Diabetes

2) 2020 Projected Healthboard Impact

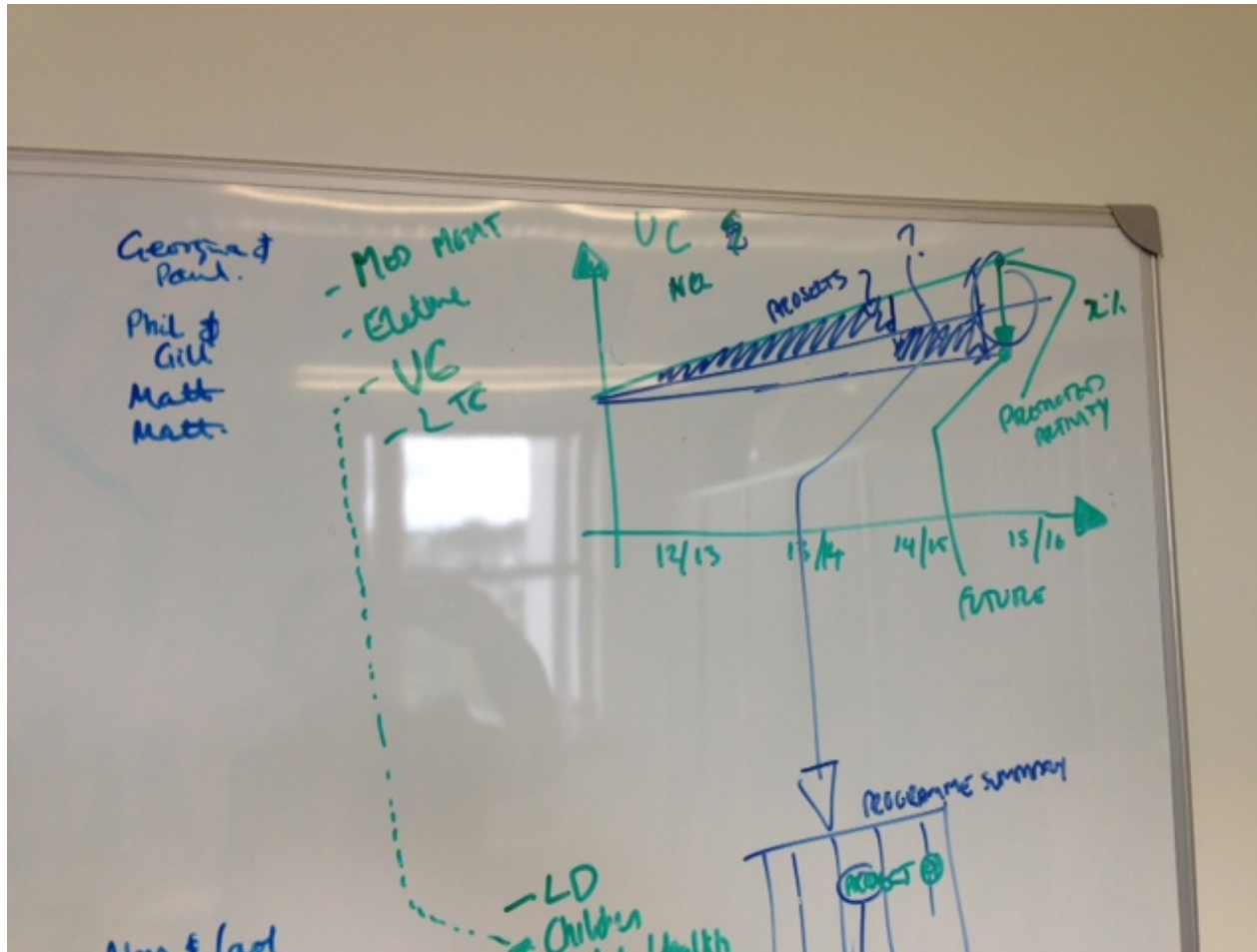
 Diabetics Prevented 25	 Intervened Patients 8,311	 Intervention Cost £ 83,102.52	 Diabetics Cost £ 109,595,458.65	 Projected Diabetic Cost/Saving £ 31,473.45
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## Unscheduled Care



In summary the overall impact of the demand assessments for A&E attendances, bed days, outpatient attendances, elective operating, District Nursing, Health Visiting and therapy services show demand growth. These projected changes in demand are illustrated in Figure 10 below.

Figure 10 : Showing the projected demand for services, against population growth and funding



In order to respond to this growth, provision has been made for funds to be assigned to schemes that manage demand growth within the financial plan. This assignment of funds is not dedicated to the expansion of hospital based care but to the future models of care which: -

- Tackle the widening health inequalities and health needs across our Health Board population, by helping citizens to make healthier lifestyle choices and remain healthy for longer.
- Commit a greater proportion of our resources to delivering care outside hospitals, near or in peoples own homes.
- Strengthen our primary and community teams and integrate them with social care and the third and voluntary sectors to provide proactive, responsive services for citizens, particularly children and the elderly.
- Empower those people with long term conditions to manage their conditions better through education, information and support and to make it easier for them and their primary care teams to access expert advice and review when required.

Section 8 sets out our 3 year financial framework in more detail.

### Summary of key challenges

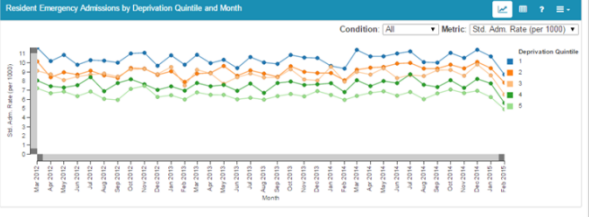
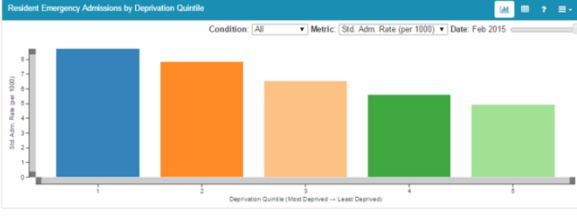
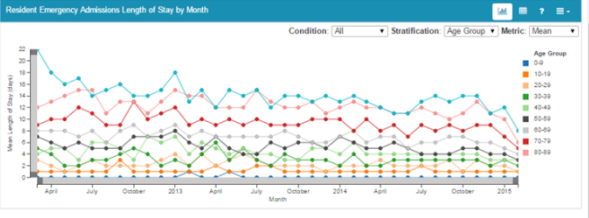
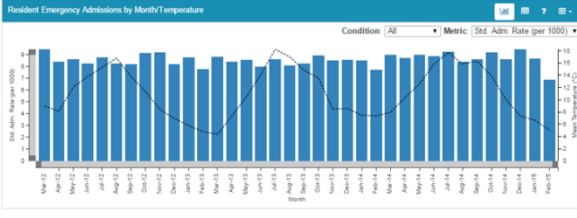
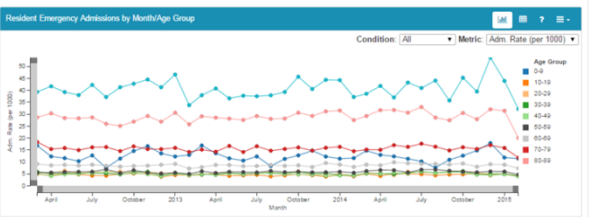
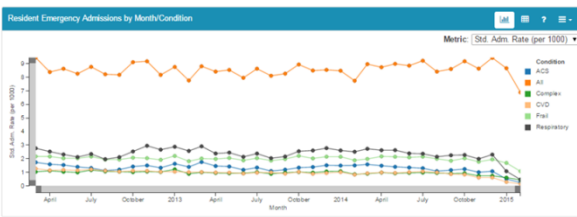
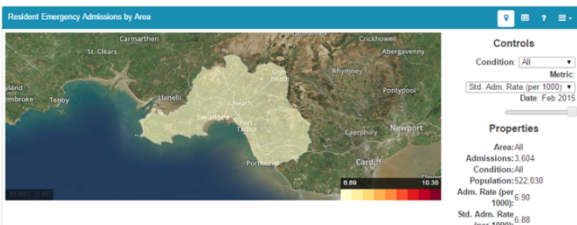
### Healthboard - Unscheduled Care - Overview

Abertawe Bro Morgannwg University Health Board  
Healthboard

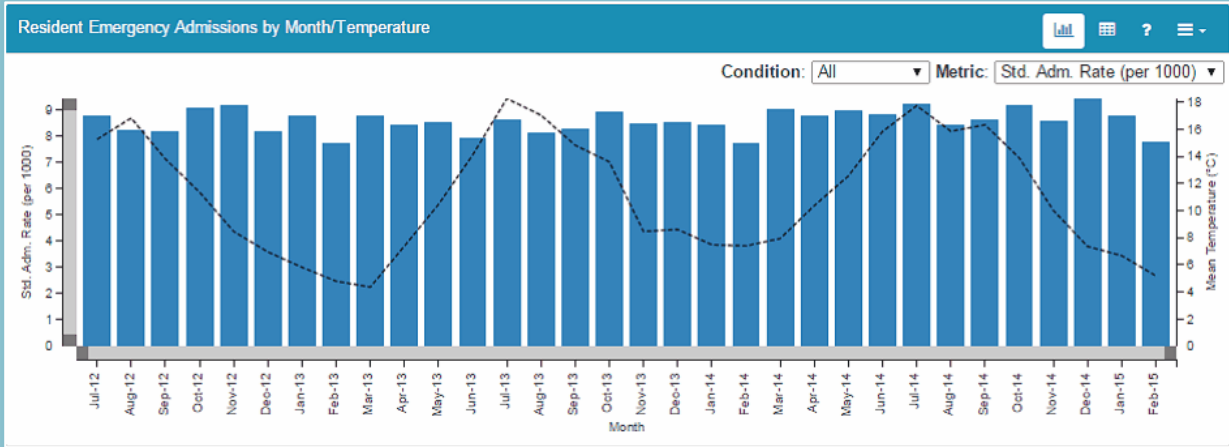
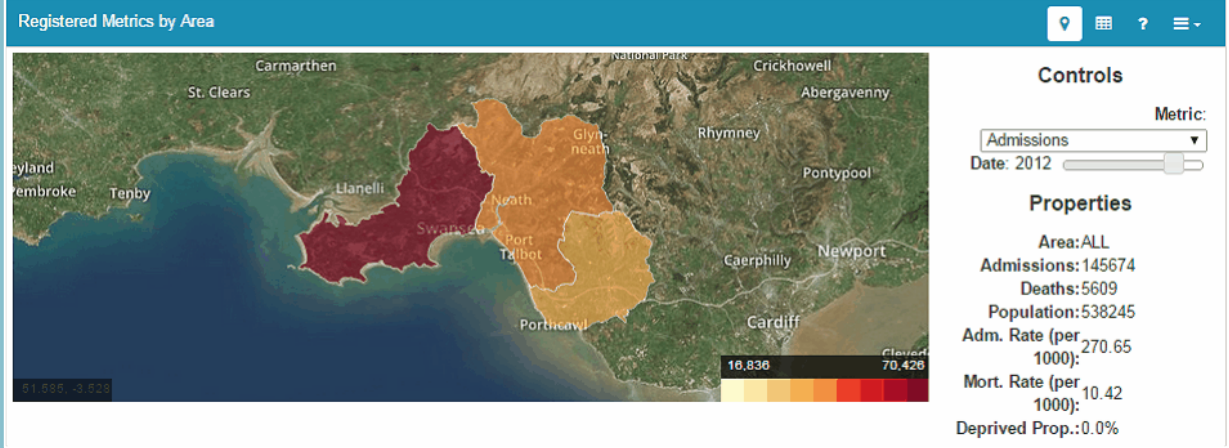
- Inpatient
- Inpatient ACS
- Inpatient Risk Models
- ED

Population: Resident

**Information**  
This dashboard explores Unscheduled Emergency Inpatient Admissions. Users have the ability to select all Emergency Admissions or to filter the admissions by one of five identified conditions - Ambulatory Care Sensitive (ACS), Cardiovascular Disease (CVD), Frail, Complex or Respiratory. Metrics include crude Admissions (Admissions), Admission Rate per 1000 population (Adm. Rate (per 1000)), along with a directly standardised admissions rate per 1000 population using the European Standard Population (Std. Adm. Rate per 1000).



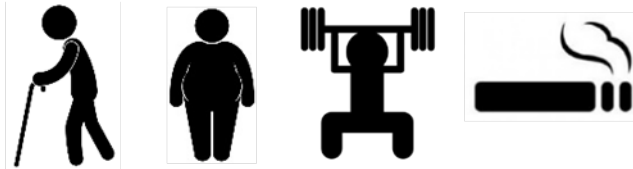
# Unscheduled Care



# Unscheduled Care: Predicting Emergency Admissions



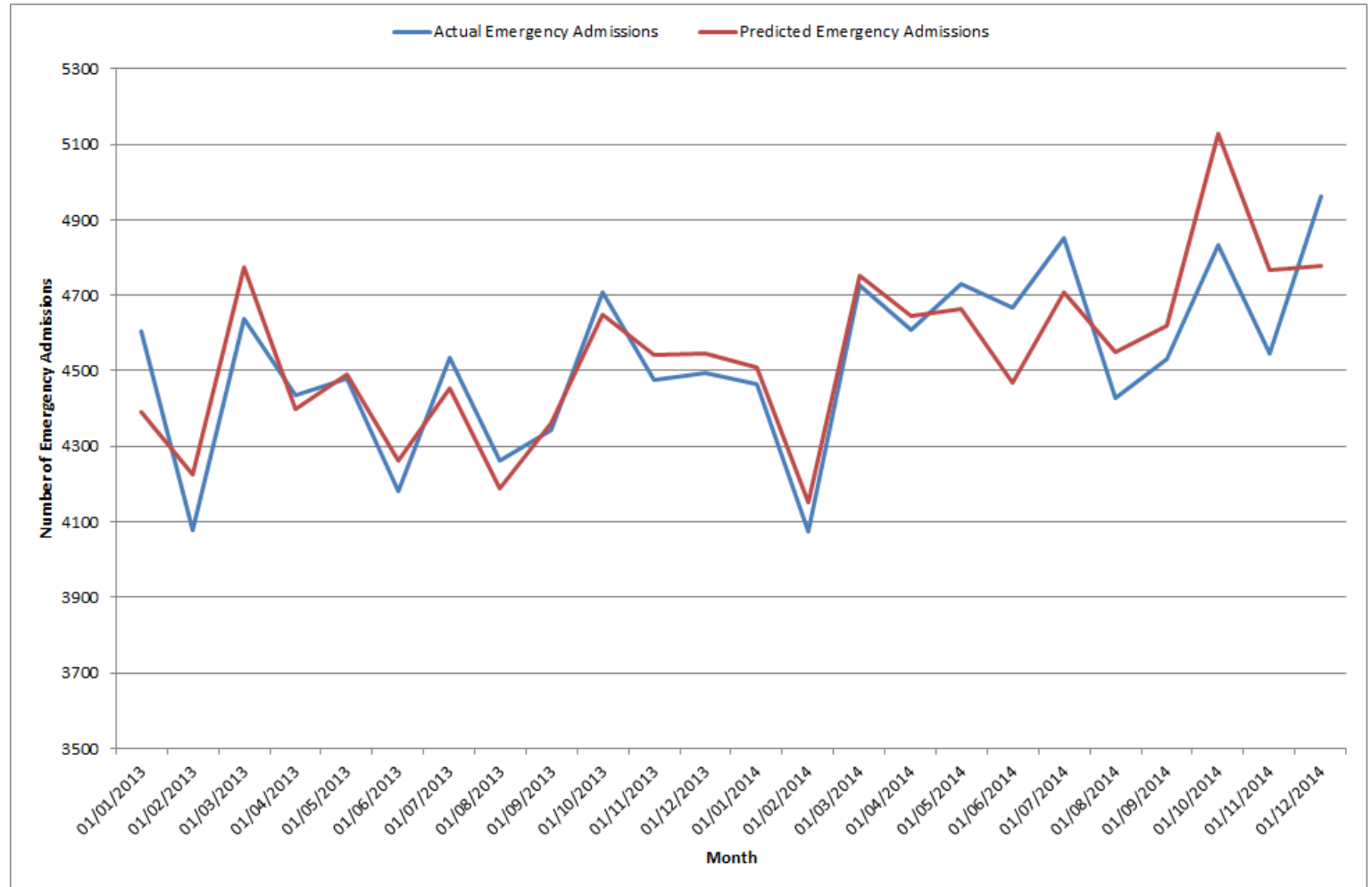
STATUS: # emergencies



WHO: Risk population demographics



PLAN & PREVENT

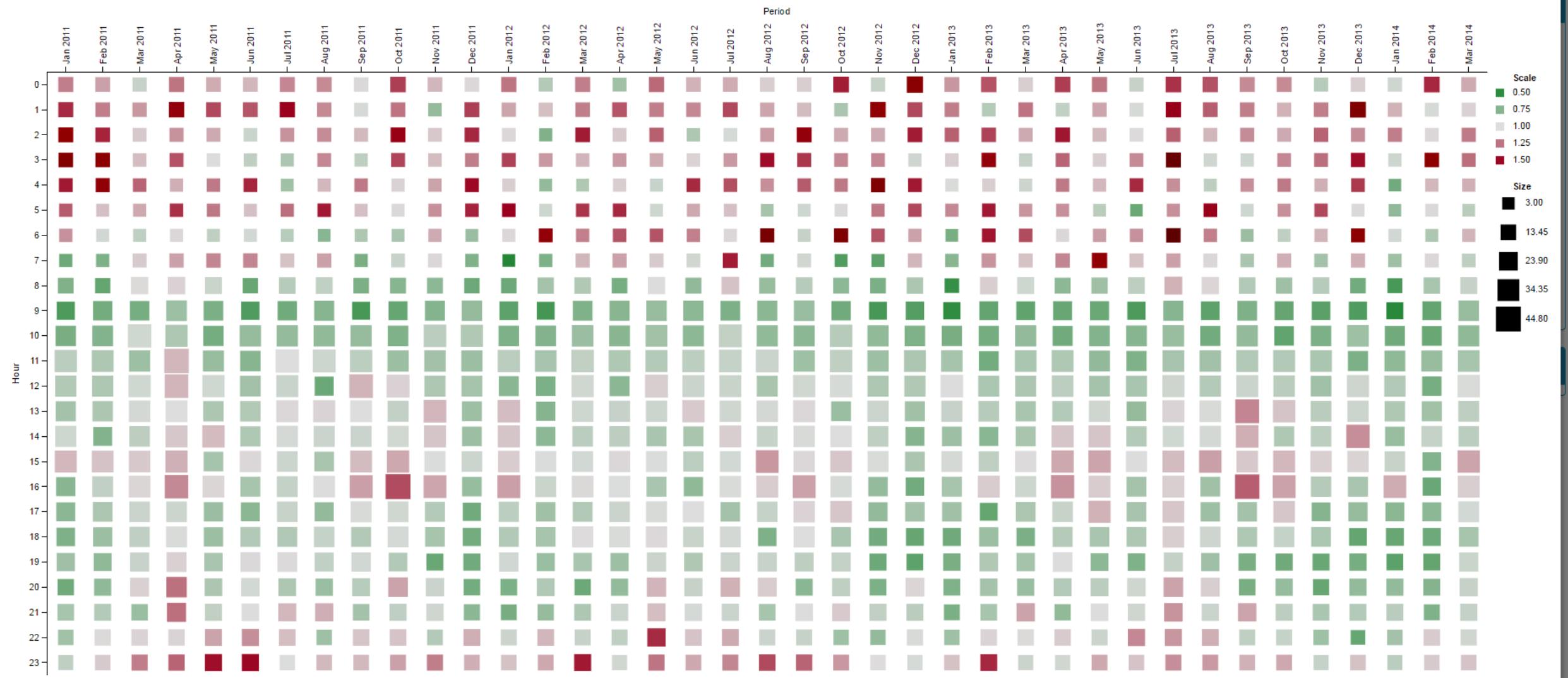




### A&E Attendances by Weekday and Hour - All

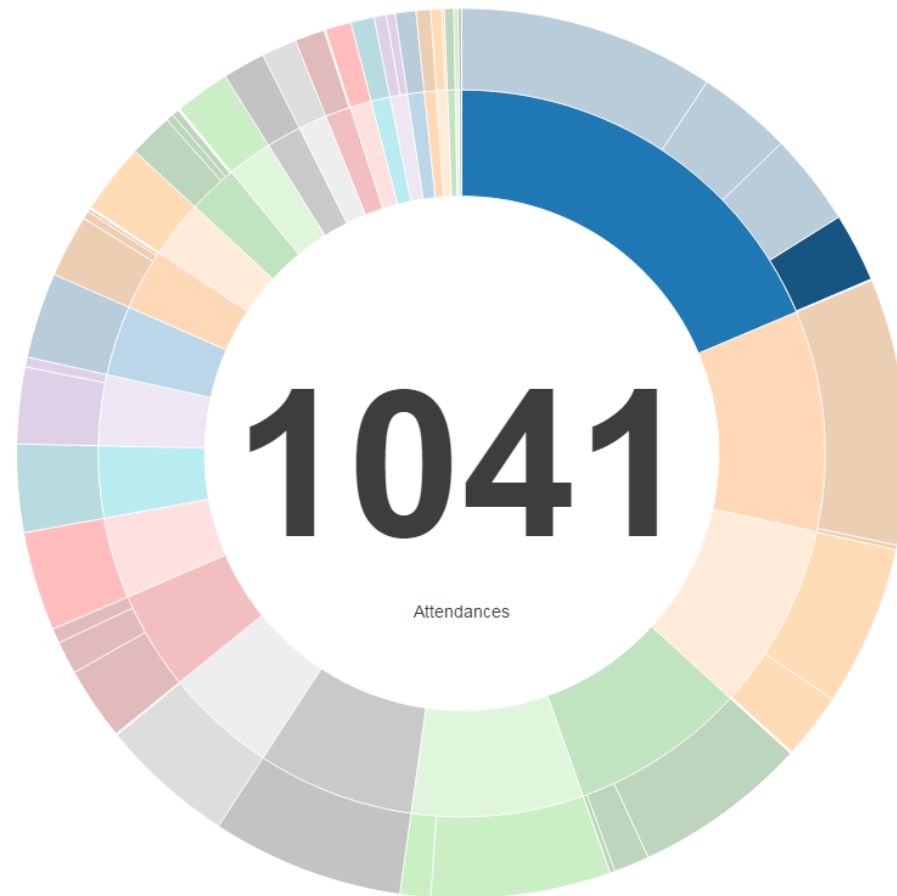
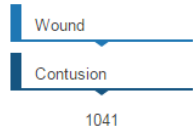


Weekday: **Saturday**



Close

ED Primary Diagnosis Breakdown



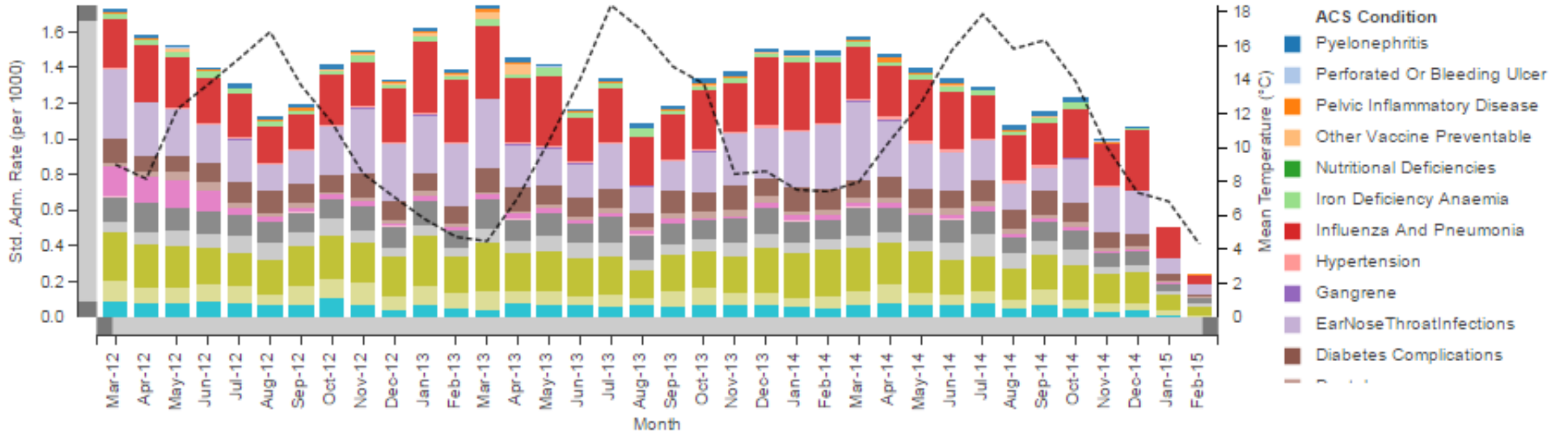
Year: 2013

- Legend
- Wound
  - Head Injury
  - Fracture
  - Neurological Conditions
  - Joint Injury
  - Gastrointestinal Conditions
  - Infectious Disease
  - Cardiovascular Conditions
  - Ophthalmic Conditions
  - Ear, Nose and Throat Conditions
  - Local Infection
  - Urological Conditions
  - Soft Tissue Injury

# Resident ACS Condition Admissions by Month/Temperature/Proportion



Metric: Std. Adm. Rate (per 1000) ▼



we predict

Thank you for Listening

