Care of Burns in Scotland (COBIS)
ANNUAL REPORT 2016/17

Lead Clinician: John Kinsella

Programme Manager: Alison Gilhooly

Care of Burns in Scotland (COBIS): 2016-17 Annual report

Contents

Executive summary

This reporting period culminated in a period of planned change for the Care of Burns in Scotland (COBIS) network. The network had invested significant resource into supporting the review of burn services, providing data and people resource to the review. The recommendations from the review will have a significant impact on the network in terms of supporting development of a hub and spoke service model.

Professor John Kinsella has been the Lead Clinician for COBIS for over six years, and announced his intention to stand down at the end of March 2017. Following an open recruitment process, Mr Stuart Watson, Consultant Plastic Surgeon in NHS Greater Glasgow & Clyde was appointed as Prof Kinsella's successor.

COBIS has continued to develop and improve access to best practice guidelines and protocols for burn care in Scotland, with changes to the network website, and the publication of updated guidelines. The communications sub group has also been developing posters to raise awareness of the network website and guidelines.

Introduction

The NMCN for Care of Burns in Scotland (COBIS) was launched in April 2007. It aims to fulfil the core principles for networks outlined in policy documents including 'Better Health, Better Care' and CEL 29 (2012) 'Managed Clinical Networks: Supporting and Delivering the Healthcare Quality Strategy'. The steering group has representatives from each profession involved in burn care , across Scotland and patients. The mission of the NMCN is to ensure that patients who suffer serious burn injury in Scotland:

- Are treated at an appropriate centre
- Are transported safely and expeditiously to that centre
- Receive a high standard of care irrespective of where they live

Since designation in 2007 the network has developed care protocols for both paediatric and adult burns patients, established a skin bank for Scotland and worked with the National Disaster Planning Group to ensure that burns care requirements are included in any plans.

Having gathered data on patient numbers over five years, the network proposed a review of burn services in Scotland in 2015. This was approved and the network management team and Lead Clinician have spent much of 2016 supporting the review. The final report was submitted to the National Planning Forum (NPF) in March 2017, and was welcomed. The National Specialist and Screening Directorate (NSD) will now work with the network and regional services to implement the recommendations. Outputs from staff and patient surveys carried out during the review will help to inform the network workplan for 2017-18.

Aim/ Purpose/ Mission Statement of network

The purpose of the network is to enhance the delivery of care to patients (adults and children) who have suffered a severe burn injury. The network aims to:

- Optimise the level of support for patients – adults and children – as well as their families and carers
- Support the establishment and maintenance of a skin bank (both autologous and allogenic) to ensure there is safe and satisfactory supply of skin allografts that have been stored and processed in accordance with all the appropriate regulations
- Initiate and maintain training and educational events to meet the skill requirements of those involved in the treatment and care of burned patients
- Ensure that there is a comprehensive plan in place in Scotland to deal with large numbers of burn victims, which may arise from an adverse event resulting in multiple casualties
- Establish and maintain a database of complex burn injury in Scotland
- Set up mechanisms to regularly audit outcome of burn treatment against nationally agreed standards of care
- Maintain a website to provide guidance and access to national protocols for those managing burn injuries in Scotland, as well as patients and carers, which will also be accessible to the general public for information purposes.

Report against Workplan

Review of Burn Services

During 2016 a review of burn services was carried out by NSD on behalf of the NPF. This was managed by the network management team, with a significant amount of input from members of the network. Members of the network demonstrated great passion for burn care and service improvement throughout. The network will lead the implementation of certain recommendations arising from the review.

The review found that while there were no issues with the clinical effectiveness of the current service, with reducing patient numbers there was a need to revise the current delivery model. The full report can be seen on request from the network management team.

Patient and staff surveys provided some excellent feedback on how the service and network are operating, and have helped to inform plans for 2017-18.

Psychosocial Care Training

A programme of training in psychosocial care was delivered between 2013 and 2015, ensuring that staff across the services are trained to support people who experience psychosocial issues associated with facial burn injury. Dr Rebecca Crawford had led the project to deliver the initial training around Scotland. Following staff changes, she agreed to lead revised arrangements for delivery of training. Two training sessions per year will be held in central Scotland, with staff from across burn services in Scotland invited to attend.

Update of Burn Care Guidelines

Burn care guidelines published by COBIS have all been reviewed and published to the network website in 2016-17.

The network website continued to be developed to show clear referral pathways, and improve access to information for patients and clinicians.

Data Reporting

The network has continued to improve data collection across most sites, and the national burns prevalence, reported by Public Health and Intelligence (PHI), is consistent for most reporting boards (see table 1)

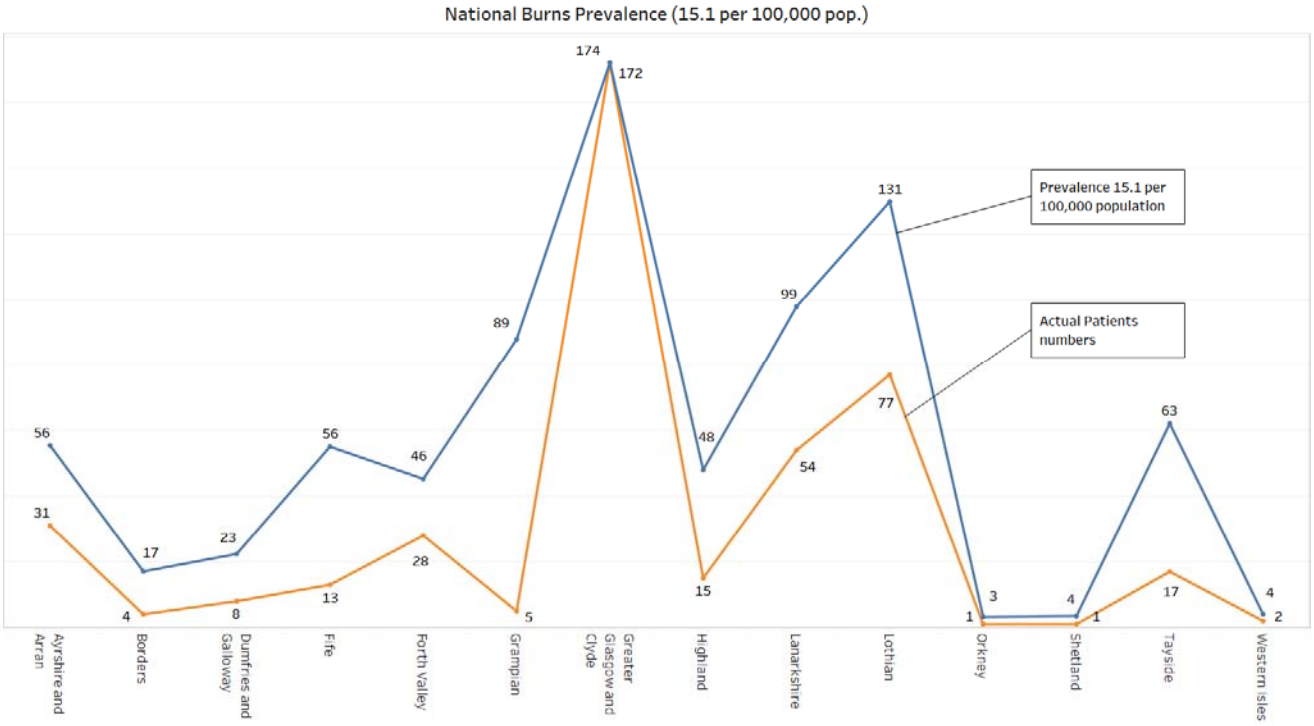

Table 1 – Burn prevalence and COBIS patients recorded.

Where there are discrepancies, this might be where there is no dedicated burn service, and only a proportion of patients are being transferred to a specialist burn care hospital, for example patients with a small burn not requiring surgical intervention in a hospital remote from the four burn service hospitals are likely to be managed conservatively by local clinicians rather than transferred a significant distance for a short hospital stay. There might also be some mis-coding in data reported to PHI. There is a known discrepancy in data from NHS Grampian and NHS Tayside, and this is being investigated by the network management team.

Dr Charlotte Gilhooly, the data lead for the network has been working with colleagues from PHI to review the data available to the network against that held by PHI in relation to death and medical records for those who have been in hospital with a burn injury. This project is ongoing, and is scheduled to report in 2017-18.

428 patients were recorded on the Clinical Audit System for 2016 and data was used to ascertain how these patients were spread across the five deprivation categories (see table 2). It has been reported before that burn injuries affect the most deprived in the population, and this is borne out in the data gathered by COBIS (see figure on page 4). It is anticipated that further analysis of this data will lead to work in injury prevention by the network. A full data report can be found in appendix 3.

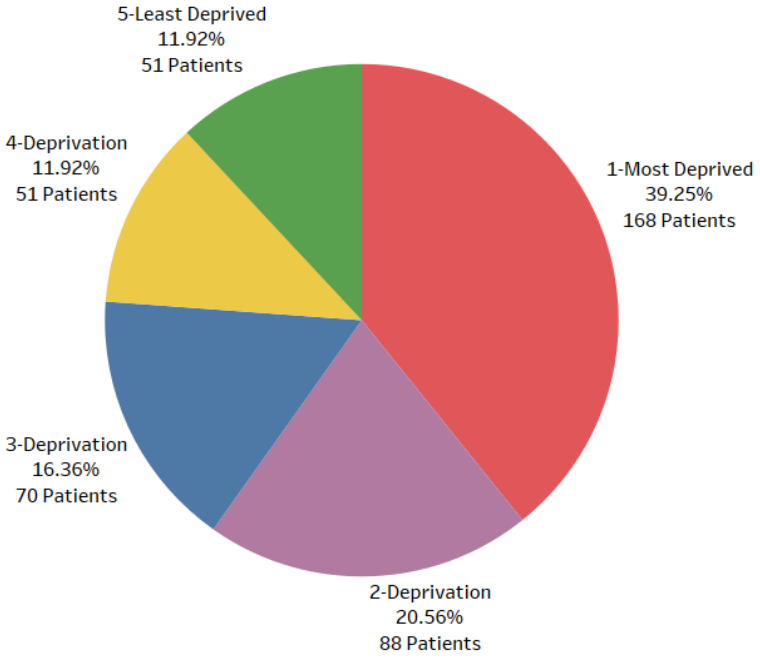

Table2 – patients split by category of deprivation.

Plans for the year ahead

At the COBIS Steering Group in May 2016 Professor John Kinsella announced his intention to stand down at the end of the financial year . Prof Kinsella has provided expertise to the network and, with Dr Charlotte Gilhooly, Network Data Lead, has driven improvement in data collection and led the network to a position where it has informed a recommendation for service change, .

The role of lead clinician was advertised in January 2017, and Mr Stuart Watson successfully interviewed for the post at the end of March 2017. Mr Watson brings experience from the Burns and Plastic Surgery service in NHS Greater Glasgow and Clyde, as well as supporting the development of services in Malawi and Ghana.

The review of burn services recommended that Burn Care Standards for Scotland should be developed to ensure that the future service is able to be appropriately monitored and managed, and this will be a key objective for the network in the coming year.

Through the patient survey carried out for the review of services, it was found that while patients found that they generally had a good experience in treatment, the discharge process for patients was variable. Developing best practice guidance for discharge of patients from burn care will form a priority for the network in 2017-18.

Improvements in engaging with stakeholders continue to be a priority for network members, and stakeholders will be asked how the network website might better meet their needs. There are two areas that have already been recognised, one is to improve referral guidance for hospitals. The second area is to establish an educational strategy and prepare education materials that can be published on the website.

The network was due to be reviewed in 2016-17. This was delayed to allow the completion of the review of burn services. As the review of burn services has made recommendations which include work for the network, it was agreed with NSD, as Commissioners, that a minor review would be undertaken by the network Programme Manager. As part of the review, the network will have the opportunity to consider its objectives for the years ahead, including how to address the strategic and operational priorities identified in the service review.

Network governance

COBIS is part of the National Network Management Service in National Services Division. Through the management structure and terms of reference for the network Steering Group and sub-groups, COBIS meets the core principles of managed clinical networks as set out in CEL (2012) 29. Workplans and reports are published on the network website, and any documents produced by the network are publically available for clinicians and patients to view.

Detailed Description of Progress over Reporting Period

2016-17 Workplan

Objective Number	SMART Objective	Linked Dimensions of Quality	Planned start/ end dates	Detailed Plan Available / Owner	Description of progress towards meeting objective as at 31/03/2017	Anticipated Outcome	RAGB status
2015-01	Review of current care protocols to ensure they meet current evidence.	2,3,4,5,6	01/05/2015 – 31/05/2016	John Kinsella	Adult protocols completed for 9th September 2016. Paediatric protocols added as new task.	Patient care protocols will be based on latest evidence, improving patient outcomes for NHS Scotland.	**B**
2016-01	Support a review of burn services in Scotland, providing evidence as required by the Expert Review Group.	1,2,3,4,5,6	01/04/2016 – 31/12/2016	John Kinsella/ Alison Gilhooly	The review of burn services has been completed, and reported to the National Planning Forum in February 2017.	Services will be planned on a sustainable and optimised way for Scotland.	**B**
2016-02	Carry out gap analysis of care protocols and develop network “look” for protocols (i.e. similarities read across between adult/paediatric	2,3,4	01/04/2016 – 31/03/2017	Communications Group/ Alison Gilhooly	All protocols have a cover page where appropriate, and are marked with the date of last review and review due date.	Burn survivors throughout Scotland will be treated according to easily-understood evidence-	**B**

Objective Number	SMART Objective	Linked Dimensions of Quality	Planned start/ end dates	Detailed Plan Available / Owner	Description of progress towards meeting objective as at 31/03/2017	Anticipated Outcome	RAGB status
	protocols)					based care protocols.	
2016-03	Further develop communications strategy in order to map stakeholders, agree and establish methods of communicating with stakeholders	1,2	01/04/2016 – 31/03/2017	Communications Group/ Alison Gilhooly	The Communications Strategy has been completed and approved by the Communications Group, recognising that it is a living document. It will go to the Steering Group in May 2017.	Network will have improved understanding of stakeholders needs and ability to meet these.	**B**
2016-04	Develop plan for ongoing delivery of psychosocial training, as rolled out through Better Together funding	1,3,5	01/04/2016 – 31/03/2017	Rebecca Crawford	A plan has been developed to deliver two half-day training sessions per year for burn care staff around Scotland.	Improved psycho-social care delivered by all staff working in burn care.	**B**
2016-05	Work with eDRIS to review COBIS data against NHS Scotland data to ensure accuracy.	4	01/04/2016 – ~~31/03/2017~~ 30/09/2017	Charlotte Gilhooly	Data was made available in February 2017 from eDRIS, end date extended from 31st March to 30th September 2017	Improved data available for audit and reporting.	**A**
2016-06	Review of current paediatric care protocols to ensure they meet current evidence.	2,3,4,5,6	01/09/2016 – 31/03/2017	Stuart Watson / David McGill	Paediatric protocols to be reviewed in line with work done with adult protocols.	Patient care protocols will be based on latest evidence, improving	**B**

Objective Number	SMART Objective	Linked Dimensions of Quality	Planned start/ end dates	Detailed Plan Available / Owner	Description of progress towards meeting objective as at 31/03/2017	Anticipated Outcome	RAGB status
						patient outcomes for NHS Scotland.	
2016-07	Work with the Information Management Service to develop a plan to improve data management and quality.	4	09/09/2016-31/03/2017	Claire Lawrie/ Charlotte Gilhooly	A plan has been developed with the Information Management Service.	Improved data audit, reporting and management	**B**

2017-18 Workplan

Objective Number	Smart Objective	Linked Dimensions of Quality	Planned start/ end dates	Detailed Plan Available / Owner	Description of progress towards meeting objective as at 31/03/2017	Anticipated Outcome	RAGB status
2016-05	Work with eDRIS to review COBIS data against NHS Scotland data to ensure accuracy.	4	01/04/2016 – ~~31/03/2017~~ 30/09/2017	Charlotte Gilhooly	Data was made available in February 2017 from eDRIS, end date extended from 31st March to 30th September 2017	Improved data available for audit and reporting.	G
2017-01	Develop best practice guidelines for discharge of patients from burn care.	1, 2, 3, 5, 6	01/04/2017 to 31/03/2018	Programme Manager		Patients will be given appropriate information at discharge and followed up appropriately.	G
2017-02	Develop standards against which burn services in Scotland can be monitored.	2, 3, 4	01/04/2017 to 31/03/2018	Lead Clinician (TBC)		Burn care services in Scotland will be able to be monitored against suitable standards.	G
2017-03	Carry out a survey of network stakeholders to establish potential improvements for the network website.	1, 3	01/04/2017 to 30/09/2017	Programme Manager		Network stakeholders will be better engaged with the network, and have a better understanding of how to manage patients with a burn	G

Objective Number	Smart Objective	Linked Dimensions of Quality	Planned start/ end dates	Detailed Plan Available / Owner	Description of progress towards meeting objective as at 31/03/2017	Anticipated Outcome	RAGB status
						injury.	
2017-04	Establish an education strategy and plan for delivering training to the wider burn treatment community in Scotland	1, 2, 3	01/04/2017 to 31/03/2018	Lead Clinician/ Programme Manager		The burn community in Scotland will have access to appropriate training for their role.	G
2017-05	Revise referral guidance to ensure clarity for referring and receiving hospitals.	1, 2, 3, 5, 6	01/04/2017 to 31/03/2018	Programme Manager		There will be greater clarity around what patients should be referred to which hospitals, while allowing for some discretion on the part of clinicians.	G

Workplan Key

Please develop and update the table below to include the network's designation objectives and related agreed annual objectives. When planning for the year ahead, please consider the standard statements in the guidance section to inform the development of annual network objectives.

RAG status key

RAG status	Description
RED (R)	The network is unlikely to achieve the objective/standard within the agreed timescale
AMBER (A)	There is a risk that the network will not achieve the objective/standard within the agreed timescale, however progress has been made
GREEN (G)	The network is on track to achieve the objective/standard within the agreed timescale
BLUE (B)	The network has been successful in achieving the network objective/standard to plan

The Institute of Medicine's six dimensions of quality are central to NHS Scotland's approach to systems-based healthcare quality improvement; therefore objectives should be linked to these dimensions:

1. **Person-centred**: providing care that is responsive to individual personal preferences, needs and values and assuring that patient values guide all clinical decisions;
2. **Safe**: avoiding injuries to patients from healthcare that is intended to help them;
3. **Effective**: providing services based on scientific knowledge;
4. **Efficient**: avoiding waste, including waste of equipment, supplies, ideas, and energy;
5. **Equitable**: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location or socio-economic status; and
6. **Timely**: reducing waits and sometimes harmful delays for both those who receive care and those who give care.

Appendix 1: Network Steering Group membership

Name:	Role/Organisation:
John Kinsella (Chair)	Lead Clinician, NHS Greater Glasgow & Clyde
Alison Gilhooly (Programme Manager)	National Network Management Service, NHS National Services Scotland
Hilal Bahia	Consultant, Plastic & Burns, NHS Lothian
Jacqui Bellew	Ward Manager, NHS Greater Glasgow & Clyde
Liz Blackman	Senior Programme Manager, National Network Management Service, NHS National Services Scotland
Roxanna Bloomfield	Consultant in Anaesthesia and Intensive Care, NHS Grampian
Gillian Calder	Physiotherapist, NHS Greater Glasgow & Clyde
Rebecca Crawford	Clinical Psychologist, NHS Greater Glasgow & Clyde
Alain Curnier	Consultant Plastic Surgeon, NHS Grampian
Julie Freeman	Paediatric Anaesthetist, NHS Lothian
Murray Geddes	Clinical Lead for Critical Care, St John's, NHS Lothian
Charlotte Gilhooly	Consultant in Anaesthesia, NHS Greater Glasgow & Clyde
Roselynn Kennedy	Lead Nurse, Burns & Plastics, NHS Greater Glasgow & Clyde
Susan Lundie	Senior Charge Nurse, NHS Tayside
Alan Masterton	The Scottish Burned Children's Club
Breeda McCahill	Burns Nurse, NHS Greater Glasgow & Clyde
Joanne McPeake	Senior Staff Nurse, Glasgow Royal Infirmary, NHS Greater Glasgow & Clyde
Gavin Moir	IT Programme Support Officer (PSO), National Network Management Service, NHS National Services Scotland
Rob Murray	Changing Faces Representative
Dot Stickings	Staff Nurse, Burns Unit, St John's Livingston, NHS Lothian
Sharon Ramsay	Paediatric Nurse Specialist, NHS Greater Glasgow & Clyde
Thomas Reekie	Research Fellow, Glasgow University
Alison Scott – Telford	Theatre Nurse, NHS Lothian
Christine Smith	Plastic Surgery Nurse, NHS Highland
Ian Taggart	Consultant Plastic Surgeon, NHS Greater Glasgow & Clyde
Alison Walker	Programme Support Officer, National Network Managed Services, NHS National Services Scotland
Stuart Waterston	Consultant Plastic Surgeon, NHS Tayside
Stuart Watson	Consultant, NHS Greater Glasgow & Clyde
Daniel Widdowson	Consultant Plastic Surgeon, NHS Lothian

Appendix 2: Finance

Type of expenditure	**Costs**
eDRIS Data Mapping	£3,290
Meetings (including Education Event)	£975
Promotional cards	£19
Total	**£4,284**

Appendix 3 – Data Reporting

COBIS Report on Data: 2016-2017

Collecting data continues using the Clinical Audit System (CAS) platform provided and administered by NHS National Services Scotland IT Department. This data was used to provide information for the Review of Burns Services in Scotland which completed in 2017 and data was also presented to the National Burns Review last June in England. The most complete dataset collected is that from the year 2014 as COBIS data was supplemented and audited by site visits and extraction of data from ward admission books. This was used for the national service review.

The caveat to this 2014 data is that Aberdeen have subsequently presented conflicting data at the COBIS educational event in November 2016 extracted from their electronic hospital information systems inconsistent with CAS COBIS data. This highlights that data from all centres require additional auditing and verification on a regular basis.

How Complete is the Data entered into the COBIS CAS database?

The completeness and accuracy of the data entered into the database still proves to be inconsistent despite actions taken to improve quality of data input. This is partially due to the complex nature of the generic audit database provided to collect the data. The Information Management Service has been very receptive this year to the issues highlighted to them and there is ongoing work to improve the user interface and to provide additional training to users. To illustrate the problems I have summarised how the data is entered below.

COBIS data collection is set up to have key information input into four tables:

- Demographic Data,
- Encounters – i.e. each admission,
- Core Data Set – Information about the actual Burn size and date,
- Conditions – Information about the type of burn, and about complications and co-morbidities.

In order to be able to analyse the data COBIS need information in all of these parts of the database. When the data is examined it is clear that many patients have data entered on some, but not all of the tables. This makes sensible analysis of the data difficult, and interpretation even more fraught.

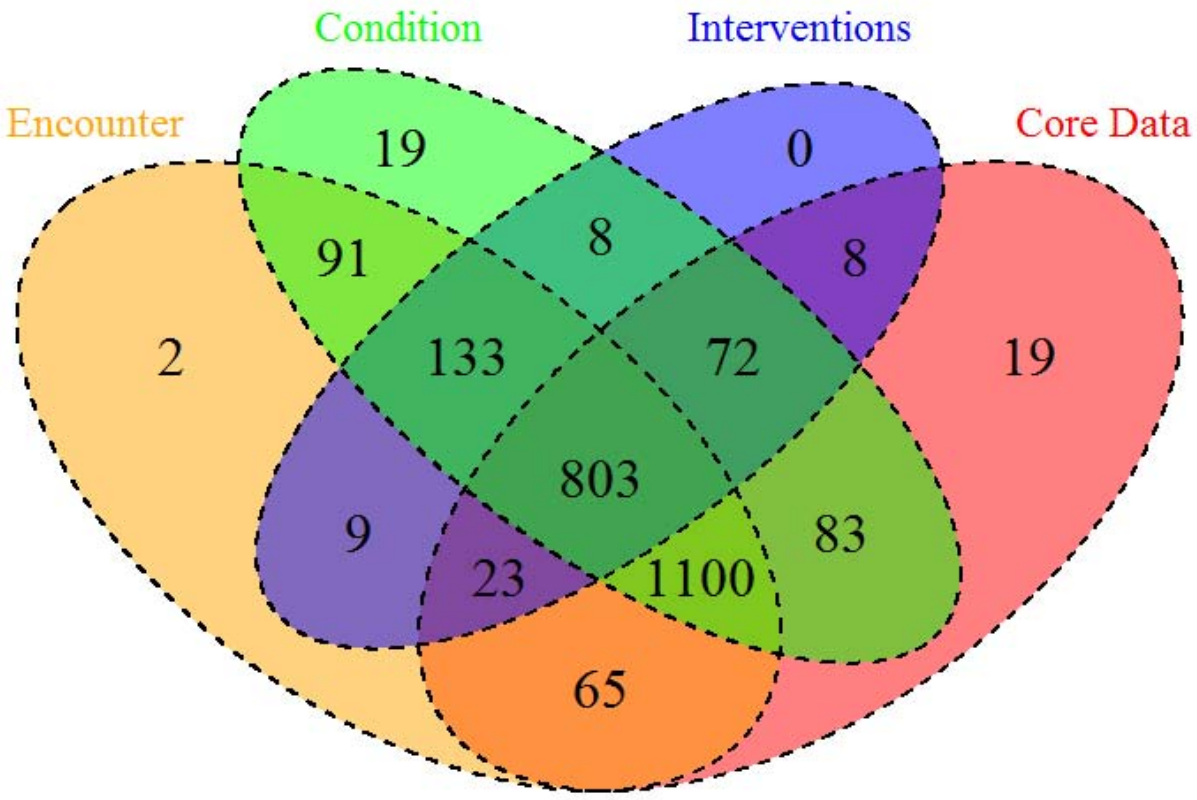

Figure 1: Numbers of Patients in Database with any information entered

Figure 1 shows where data is currently held in the database currently for all years and below is a summary of some of the data as an illustration of the reliability of the database information -

Total number of Patients with ID: 2460

Number of Patients with Core Data available: 2173

Number of Patients with encounter Data available: 2226

Number of Patients with both Encounter and Core Dataset information available: 1991

There are 182 Patients who have core Data Set information with no encounter information. This means that we have no information about the hospital journey for these patients.

For 2016 there are 439 patients who have either an encounter (407) in 2016, or information in the core data set (392) in 2016 or a condition (370) in 2016. This shows that as a network we are currently inconsistent in where and how we are entering the data.

Analysis of COBIS data

Work has continued on analysis of verified COBIS data and this has been presented at several international and national meetings this year in addition to the COBIS Educational event in November 2016 – namely:

National Burns Review (NBR) (E&W) Mortality Review

June 2016 – Scottish data presented at this meeting.

International Society for Burns Injuries (ISBI) 2016 Miami

Benchmarking Scottish Burns Outcomes: A Comparison of Scoring Tools to Predict Mortality (oral presentation)

This showed that the revised Baux[1] score performed best and is the most suitable to be used in Scottish burns units. Scottish burns outcomes are comparable to other European nations and are lower than in Ghana - a lower income nation.

Society for Critical Care Medicine (SCCM) 2017 Hawaii

Post-discharge Mortality in Scottish Patients with Complex Burn Injury (oral presentation)

Scottish patients admitted to hospital with burns have a high mortality rate following their discharge from hospital for the injury, adjusting for age and sex, compared to the general population. Age is the most important variable to influence mortality after ICU/Burns Unit discharge.

Socio-economic Deprivation and Geographic Remoteness of Complex Burns Patients in Scotland (oral presentation)

Complex burns patients in Scotland, independent of burn size, are more likely to live in an area of high socio-economic deprivation and a large urban area, compared to the general population. Within this patient group, burns patients with the most severe burns are more likely to live in a rural area, compared to those with less severe burns.

Linkage of COBIS data to other national datasets.

Work this year has concentrated on linking the most robust COBIS data to other national data sets in ISD using the electronic Data Research and Innovation Service (eDRIS) to perform further data extraction. Linking data from all of these datasets has been completed for data from 2012-2015. One of the issues identified by previous analysis is that COBIS is not consistent at collecting accurate data on co-morbidities. To improve data quality and reliability on these matters COBIS has identified additional ways of collecting information on co-morbidities by using other national datasets – namely Prescribing Information System (PIS) and General / Acute Inpatient and Day Case national dataset (SMR-01) data. Preliminary work has just been completed to examine the feasibility of this and has shown that PIS may actually be of more use than SMR01 in future comorbidity studies as it can determine comorbidity information for a larger proportion of the population. The diagram below shows how Comorbidity collected from these two datasets compares. Further work will be done to collate this with data on the COBIS data sets and see if these data can be used to improve outcome modelling.

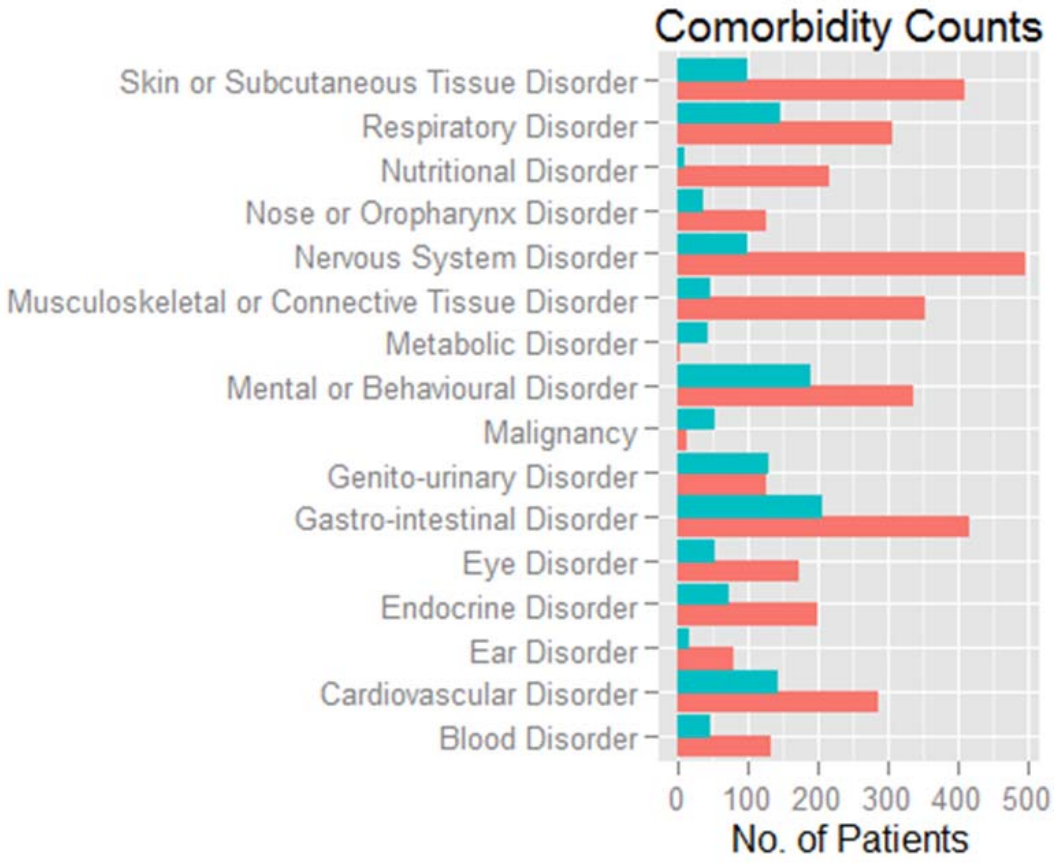

Figure 2: Comparison of National Data on Prescribing Information System (PIS) data and SMR 01

Summary of Activity

Data Entered onto CAS COBIS for 2016

A total of 505 patients were entered into CAS in 2016. Each Centre's data on activity is detailed below. There were 371 Adult burn Admissions of which 27 had a Resuscitation burn of greater or equal to 15%.

134 patients of under 16 were admitted with a burn, of whom 12 had a resuscitation burn of 10% or over.

Airway Burn was recorded as being present in 9 patients, and smoke inhalation recorded as present in 12 patients.

Full Thickness burn was recorded as being present in 7 paediatric patients, 72 patients of working age (16-64) and 17 elderly patients (of age 65 and over).

Centre	Adult	Paediatric		not classified	notes
Aberdeen					
Resus Burn	0	0			
Non Resus Burn		2	1		
Total Burns in CAS	3				
Dundee					
Resus Burn	2				
Non Resus Burn		9	4		
Not classified				1	?62 others
Total Burns in CAS	16				
Edinburgh					
Resus Burn	1	1		35	
Non Resus Burn		34	4		
Not classified				6	
Total Burns in CAS	81				
Glasgow					
Resus Burn	20	11			2 adults RSC
Non Resus Burn		153	113		
Total Burns in CAS	297				
Other Hospitals (note these would have been transferred in subsequently to burns centres)					
Resus Burn					
Non resus Burn		6			
Not Classified				1	
Total Burns in CAS	7				

Centre	Adult	Paediatric	not classified	notes
No Centre Identified				
Resus Burn	2			
Non Resus Burn		25	5	
Not Classified				
Total Burns in CAS			32	

Mortality Data

Crude Mortality for Burns patients in CAS is shown in Figure 3. This chart is constructed by using the first date of admission with a burn. There are some patients who have multiple admissions with multiple burns – these are analysed by the date of their first burn. Death in the Burn unit is not shown here, but the time to death after a burn admission is recorded using four categories. The date of death is taken from national data. Mortality has been categorised into death within 30 days of the burn, between 30 and 60 days from the burn, between 60 and 90 days and after 90 days. Many deaths that occur after 90 days will be at a time following discharge from the burn unit.

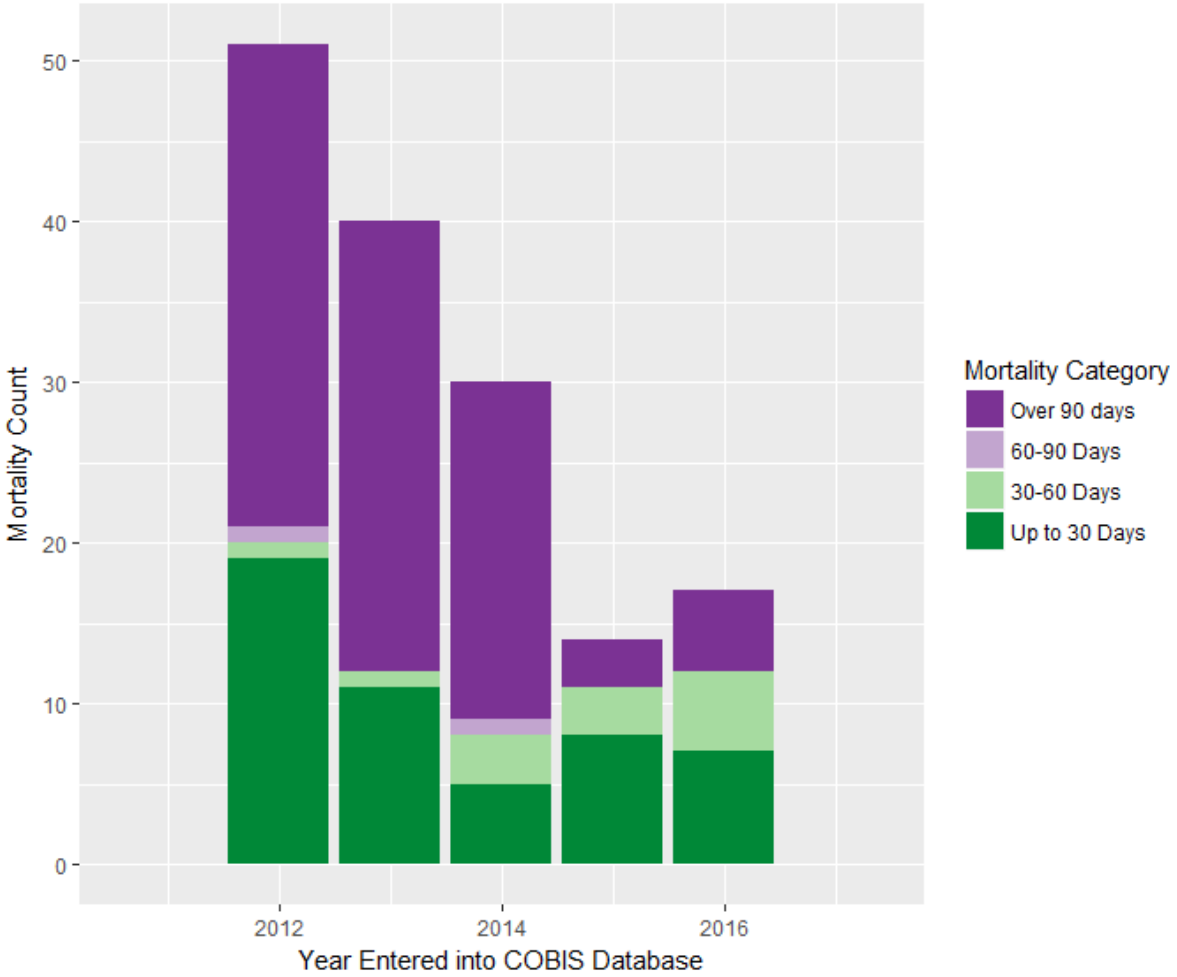

Figure 3: Mortality for All Patients who have been admitted with a burn and entered onto CAS database

Note that as each year passes the mortality from the previous year's cohort is still monitored. This means that the earlier years will have an increasing chance of mortality – illustrated by the number of deaths in the purple over 90 day's category. Figure 4 Survival analysis graph illustrates this. The elderly have the highest mortality, and there has been no long term mortality demonstrated in paediatric patients.

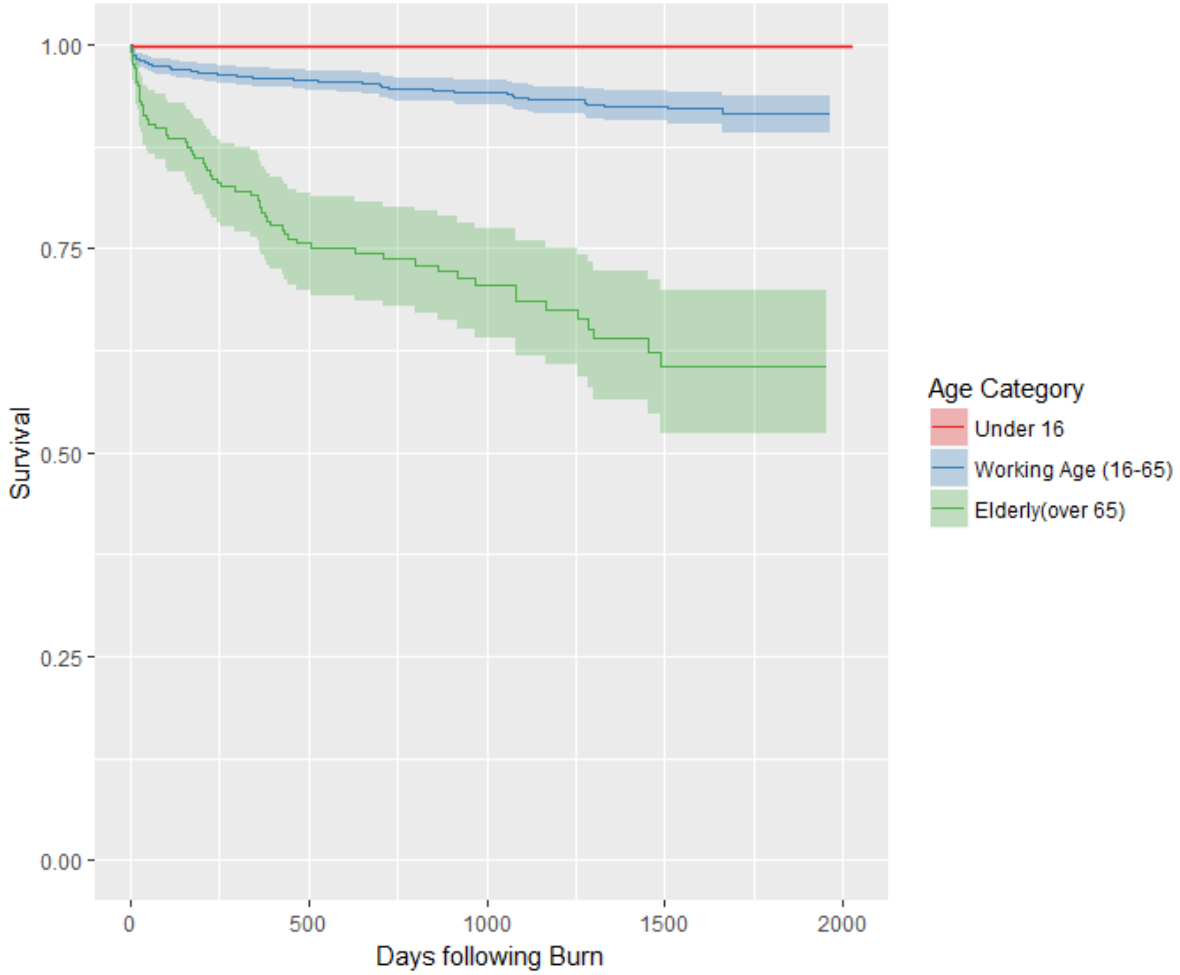

Figure 4: Kaplan Meier Survival Curve Post Burn

Previous work has been done using COBIS data to identify the model that is best used for analysing mortality for Scottish Patients. This has shown that the Revised Beaux Scale[1] is the best model to use to enable mortality predictions and subsequent adjustment for the severity of the cases. This is the first year that case adjusted mortality prediction has been analysed. The Mortality statistic used for this is 90 day mortality because it is the most reliable standardised statistic available at present. Units have been anonymised. SMR outliers may be explained by the lack of data input from some units into the CAS system, with low numbers analysed. All cases have had case severity adjustment applied before analysis.

Figure 5 shows the Standardised Mortality Ratio (SMR) for all the patients currently entered into the COBIS database from 2012 to April 2017. The SMR has been calculated by using the Revised Beaux Score to calculate the expected mortality for each admission. SMR = Observed Mortality Rate/Expected Mortality Rate. The Expected Mortality rate is calculated by taking a mean of the mortality predictions in each unit, and for all the units.

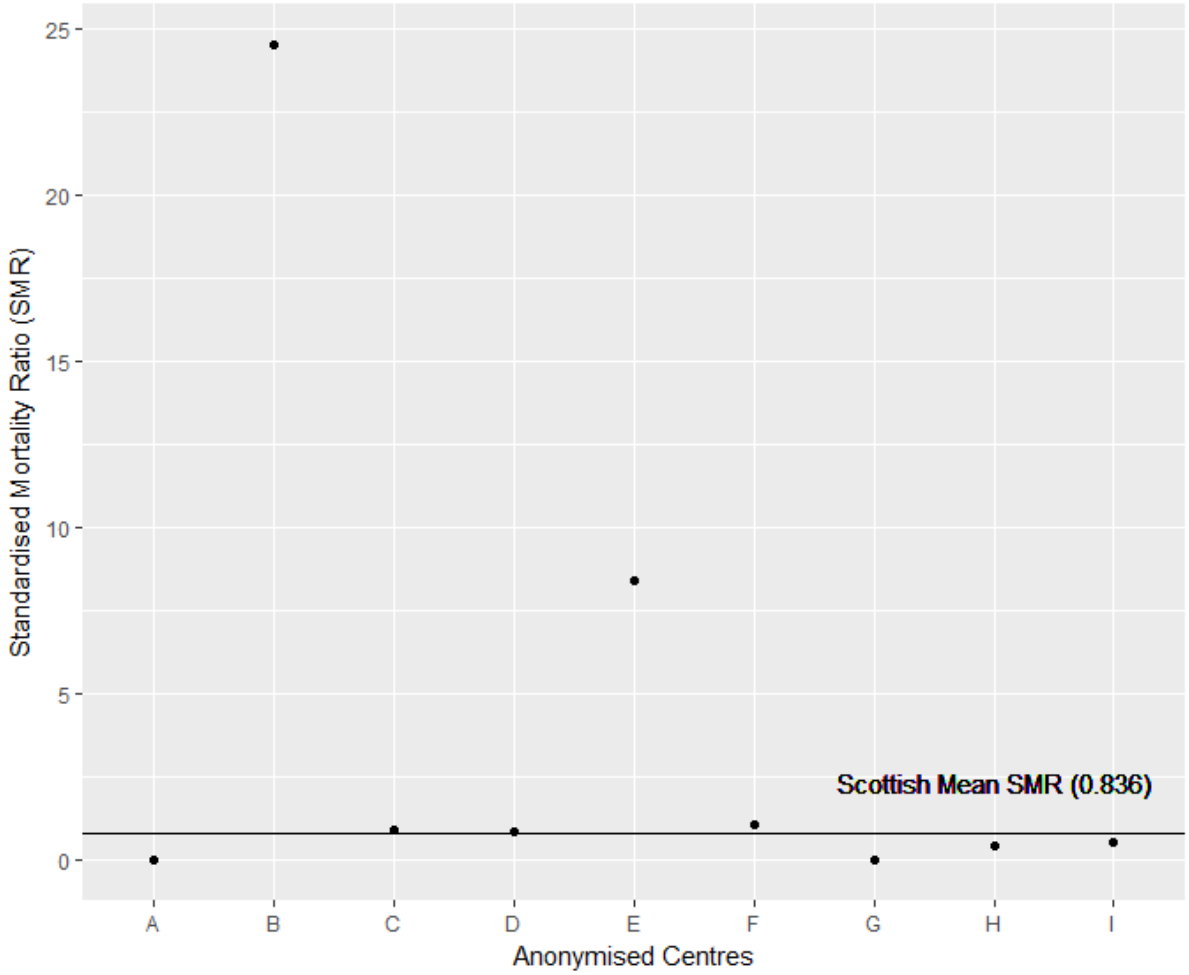

Figure 5: Analysis of all deaths on Patients admitted between 2012-2016 COBIS database

Figure 5 Shows each unit's SMR, and the Scottish Mean for 2016. Units are again anonymised. Of note is that the Scottish mean SMR is low at 0.836. Crude numbers for mortality for patients in each unit is further detailed below, these are not adjusted for severity of injury or co-morbidities and further work on review of these individual patients will be carried out by the network in its annual review of mortality and morbidity.

Deaths that Occurred in patients entered into CAS in 2016 – not necessarily as a result of a burn.

Aberdeen	1
Ninewells	0
St John's	2
GRI	12
RHSC Edinburgh	0
RHC Glasgow	0

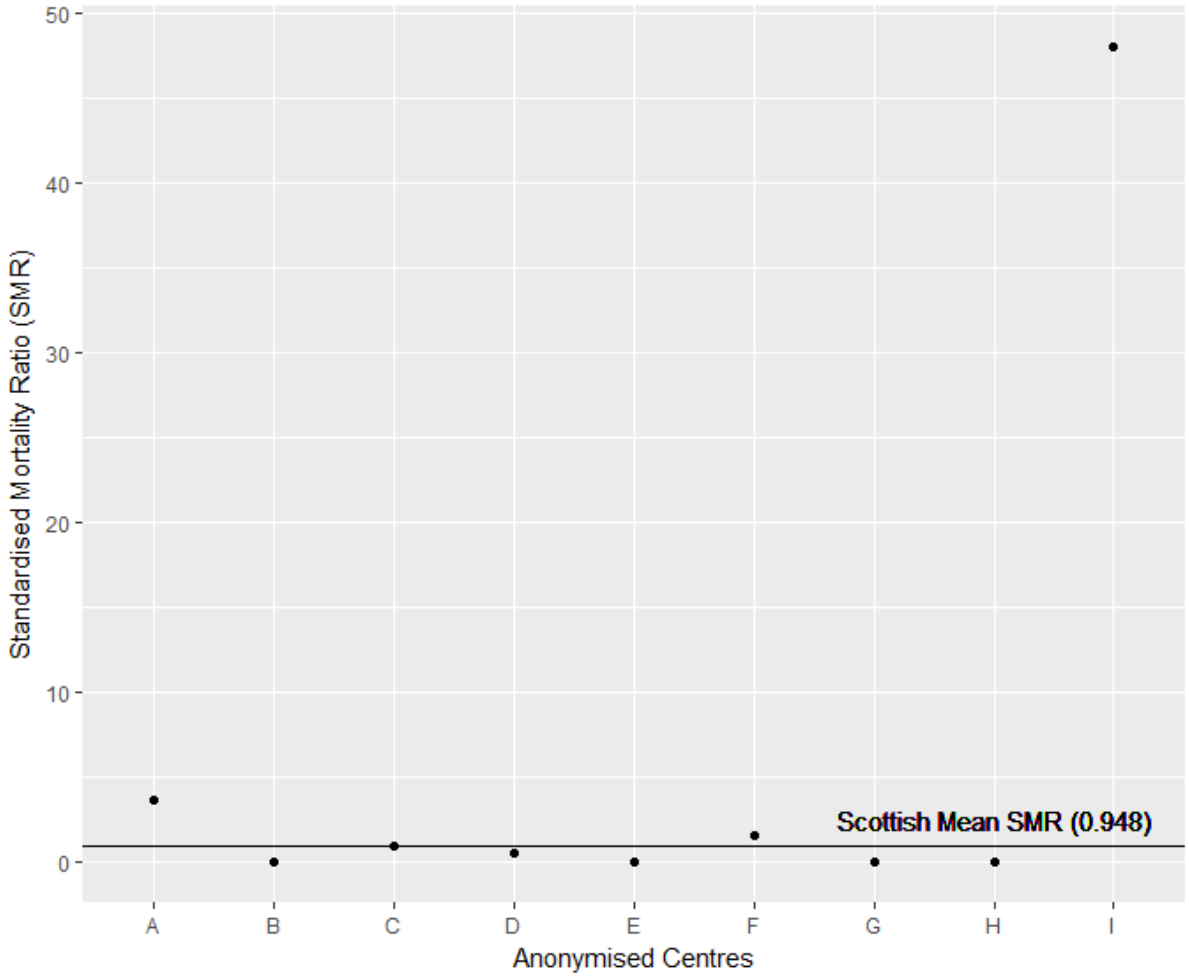

Figure 6: 2016 Data – Note these are different Randomisations of the Units to Fig 5

Conclusion

COBIS continues to collect data on patients admitted to Scottish Burn Units with a burn. The audit data collected by CAS remains the only consistent source of information for the network but is incomplete in that the quality of this data continues to vary from unit to unit. There is evidence that Scotland as a whole has acceptable mortality outcomes but there is variation in individual units in their standardised mortality ratios. As data collection becomes increasingly robust it will be possible to monitor our progress and quality of care. The aims of the audit next year are to improve further the robustness and quality of the data, to further analyse and report on the linked data that COBIS has with other national datasets and to audit co-morbidities in these patients to assess what influence they have on outcomes.

Acknowledgments

Thanks to all of the Units for working so hard to collect and enter the data, to Gavin Moir and Alison Gilhooly for training the unit staff on entering the data and subsequently extracting the data reports from CAS. Thanks also to the Medical Students Victoria Armour, Alistair Carr and Victoria Mitchell who have worked with COBIS data to produce statistical models and Martin Shaw, John Kinsella for all their hard work over many hours helping me make sense of these results.

Reference

1) Osler, T., L.G. Glance, and D.W. Hosmer, *Simplified Estimates of the Probability of Death After Burn Injuries: Extending and Updating the Baux Score.* Journal of Trauma-Injury Infection and Critical Care, 2010. **68**(3): p. 690-697.