Using Big Data to Drive Patient Safety

Edward Morris MD FRCOG FHEA
Consultant Gynaecologist, Norwich, UK
Vice President, Clinical Quality, RCOG

Cape Town - March 2017
Using Big Data to Drive Patient Safety

Disclosures

None Relevant
Using Big Data to Drive Patient Safety

“Don’t let yourself be. Find something new to try, something to change. Count how often it succeeds and how often it doesn’t. Write about it. Ask a patient or a colleague what they think about it. See if you can keep the conversation going.”

Atul Gawande, 2005
Quote Translator...

1. Inaction is not an option
2. Find a relevant problem/issue
3. Measure how often it happens
4. Publish your findings
5. Have a chat with someone or change something
6. Don’t stop!
Sounds Familiar?

Identify a problem

Agree criteria
Set Standards

Audit

Identify areas to improve

Effect change

Re-Audit

Closing the Audit ‘Loop’
Effecting Change
Quality

“...the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge.”

Quality Improvement

“...better patient experience and outcomes achieved through changing provider behaviour and organisation through using a systematic change method and strategies.”

The Key to Change

Data

Became the National Confidential Enquiry into Patient Outcome and Death in 2003

Contract managed by NICE then the NPSA and now HQIP under the Clinical Outcome Review Programme

By 2020 each Trust, local maternity system and network should have:

1. significant capability (and capacity) for improvement
2. detailed knowledge of local cultural issues
3. developed a locally sensitive improvement plan
4. made significant improvement to local service quality and safety
5. data to share with their board, staff and commissioners that reflect these improvements

...to create conditions for a safety culture
and a national maternal and neonatal learning system
How do stillbirths rates in the UK compare to other high income countries?
How do rates of stillbirth vary in England?

2014 data (crude):
Weighted mean: 4.35
Range: 1.24 to 7.24

2014 data (adjusted):
Weighted mean: 4.17
Range: 3.16 to 5.39
What is the aim of the collaborative?

“To improve the safety and outcomes of maternal and neonatal care by reducing unwarranted variation and provide a high quality healthcare experience for all women, babies and families across maternity care settings in England”

Scope

• All maternity services in England
• All care settings
• All components of the pathway (conception to puerperium)
Data Source

Introducing the new National Maternity and Perinatal Audit (NMPA)
Lindsay Stewart Centre for Audit & Clinical Informatics

O&G project-based programmes:

• National clinical audit
• Quality improvement
• Clinical indicators
• Analysis of hospital data
• Collaborative/partnerships
• Research
What data do we use?

- Most of our work uses **routinely collected** data. We have access to anonymised patient-level data on all English NHS hospital admissions since 1997.
- For Each Baby Counts, we collect data **directly** from hospitals through our network of Lead Reporters.
- For other projects, the data is collected from **Maternity Information System (MIS)**.
Maternity indicators

https://indicators.rcog.org.uk/
The importance of risk adjustment

- Women living in a socially deprived area
- Women in an ethnic minority group
- Women aged 15-19
- Women aged over 40

© Royal College of Obstetricians and Gynaecologists
Impact of risk-adjustment: Example - Elective Caesarean Section (multiparous women)

Before

Before

Mean: 12%
Range: 1-20%
10th percentile: 9%
90th percentile: 16%
Impact of risk-adjustment: Example - Elective Caesarean Section (multiparous women)

**After**

- Mean: 12%
- Range: 1-16%
- 10th percentile: 9%
- 90th percentile: 14%
Why is having this type of data important?

1. For the NHS
   - Providers
   - Managers
   - Commissioners

2. For the RCOG

3. For the public
Each Baby Counts is the RCOG’s national quality improvement programme with the aim:

“To reduce the number of babies who die or are left severely disabled as a result of incidents occurring during term labour by 50% by 2020”
Eligible babies

- Term (≥37 completed weeks of gestation)
- Intrapartum Stillbirth
- Early neonatal death
- Severe brain injury diagnosed in the first seven days of life
Out of almost 800,000 births in the UK:

- As of May 2016, **921 babies born in 2015 who met the eligibility criteria** for Each Baby Counts had been reported.

- This equates to just **over 1 in 1000 (0.12%)** of all births in 2015.
Each Baby Counts: key messages 2015

Ensure that the care of every baby eligible for Each Baby Counts gets a comprehensive and robust review by a multidisciplinary team that has time set aside for doing this work.

Recognise the additional perspective an external panel member will bring to local reviews.

Make parents aware that a local review is taking place and invite them to participate in accordance with their wishes.

Focus on finding systemic rather than individual-level actions and recommendations to improve future care.

Engage with the new standardised perinatal mortality review tool once it is available.

© Royal College of Obstetricians and Gynaecologists
Each Baby Counts Reports in 2017

- The next Each Baby Counts report will be published on 21 June 2017 on the themes that emerge and the lessons that can be learned from the care of babies born in 2015 in June 2017.

- The report will contain final data for 2015 and provisional data for 2016

- To include more information relating to characteristics of events, in-depth qualitative analysis of 2-3 recurrent contributory factors identified by our reviewers

Find out more: rcog.org.uk/eachbabycounts

@eachbabycounts EachBabyCounts
National Maternity & Perinatal Audit

- A new large scale audit of the NHS maternity services across England, Scotland and Wales

- Using timely, high quality data, the audit aims to evaluate a range of care processes and outcomes in order to identify good practice and areas for improvement in the care of women and babies looked after by NHS maternity services
Partner Organisations

Royal College of Obstetricians & Gynaecologists

THE ROYAL COLLEGE OF MIDWIVES

RCMCH
Royal College of Pediatrics and Child Health

LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE

Data Partners

NHS Digital

ICNARC
Intensive Care National Audit & Research Centre

Public Health England

Glynn Family atanan
Informatics Service

Wales

NHS
Audit Philosophy

- Audit of all mothers and newborns cared for by NHS maternity services across England, Wales and Scotland (in midwife-led and obstetric units, at home and in the community).
- Strong service-user involvement to ensure that the audit’s strategic development remains closely aligned with the perspective of women and their families.
- Audit will use available data sources and record linkage to avoid bespoke data collection, minimising burden on clinical staff.
- The NMPA will not only measure ‘auditable standards’ but rather a wider set of interventions and outcomes; benchmarking against the national average or ‘peer units’ is in itself of value.
Audit elements

1. **Survey** of the **organisation** of maternity care

2. **Continuous** clinical audit of a number of key interventions and outcomes

3. Flexible programme of ‘**sprint audits**’ on specific topics

nmpa@rcog.org.uk  
maternityaudit.org.uk
Electronic Maternity Software

Legend:
- Electronic Maternity Record Software (Supplier)
  - Athena (K2 Medical Systems)
  - HealthSuite (CleverMed)
  - CMIS/Cicora Maternity Information System (H B Clinical)
  - CSC Maternity (CSC)
  - Cambio (Cambio)
  - E3.net (HSS EuroKing)
  - Evolution (CSC/AsSOFT)
  - HICSS (Ascribe)
  - Hyberspace (Epic)
  - K2 (HSS EuroKing)
  - Locally developed/bespoke system
  - Lorenzo (CSC)
  - Meditech (Centennial MIT)
  - Medway (McKesson System C Healthcare)
  - Millennium (Cerner/BT)
  - Myndlin (NIU)
  - None
  - Obba (Aspects)
  - Protos (CSC/AsSOFT)
  - Silverlink (Silverlink)
  - Stork (HP)
  - TreakCare (InterSystems)
  - Unknown
- ICS (CSC/AsSOFT)

NHS Trusts/Health Boards/Maternity Units' Locations and the Electronic Maternity Record Systems Used
Each point represents an NHS trust/health board, except for trusts using more than one system, in which case each maternity unit is represented.
Quality Improvement project to reduce Obstetric Anal Sphincter Injury

Aim:
To reduce the rates of obstetric anal sphincter injury (OASI) in the UK by standardising practice for the prevention of OASI in a way that is acceptable to women and clinicians.

Method:
The use of a care bundle, a skills development module, and campaign materials in 16 maternity units with a comprehensive qualitative and quantitative evaluation.

Funding:
The Health Foundation—Scaling Up Improvement

Taking action on 3-fold increase in Obstetric Anal Sphincter Injury in England between 2000 and 2012.


rcog.org.uk/oasicarebundle
Evaluation of primary outcome – OASI rates

- Analysed retrospectively using anonymised patient-level data from local maternity information systems (MIS).
- Compliance monitored weekly.

Evaluation of implementation outcomes

- Quantitative and qualitative data used to provide information about barriers and enablers with uptake and scaling-up interventions.
- Implementation outcomes will be evaluated to assess acceptability, feasibility, coverage and sustainability of the intervention as well as the implementation strategies.
People

- Anyone can do it
- Best done in teams
- Limited to enthusiasts in the past
- Now the word is spreading....
Partnership between the Health Foundation and NHS Improvement
UK wide & all remits of quality
What is Q?

- A connected community working together to improve health and care quality across the UK

- Supports people in their existing improvement work: making it easier to share ideas, enhance skills and make changes that benefit patients
Who can join Q?

Anticipating 1000s of members from all backgrounds

Applicants need to demonstrate:

• Experience and understanding of improvement
• Thoughtful commitment to Q

q.health.org.uk
Recommended Reading

A practical guide to quality improvement

Susanna Crowe MRCOG, a,* Sanjula Sharma MRCOG b

aConsultant Obstetrician and Gynaecologist, Royal London Hospital, London E1 1BB, UK
bConsultant Obstetrician and Gynaecologist, Newham University Hospital, London E13 8SL, UK
*Correspondence: Susanna Crowe. Email: susanna.crowe@gmh.net
Using Big Data to Drive Patient Safety

“You’re a complicated community.”

Atul Gawande, 21st March 2017
RCOG World Congress, Cape Town
Contributors

Each Baby Counts
Professor Zarko Alfirevic
Professor Alan Cameron
Emily Petch
Hannah Knight
Professor Marian Knight
Dr Edward Prosser-Snelling
Dr Louise Robertson

Gynaecological Indicators
Professor Jan van der Meulen
Dr Rebecca Geary
Dr Ipek Gurol-Urganci

OASI
Miss Ranee Thakar
Alexandra Hellyer
Dr Posy Bidwell
Dr Ipek Gurol-Urganci
Vivienne Novis
Dr Nick Sevdalis
Louise Silverton CBE
Professor Jan van der Meulen

NMPA
Professor Jan van der Meulen
Hannah Knight
Andrea Blotkamp
Dr David Cromwell
Dr Ipek Gurol-Urganci
Dr Tina Harris
Dr Jane Hawdon
Dr Jen Jardine
Dr Lindsey Macdougall
Natalie Moitt
Mr Dharmindra Pasupathy

Clinical Quality
Anita Dougall, Senior Director
Dr Alison Elderfield, Head of Lindsay Stewart Centre
Becky Dumbrill, Administrator, Lindsay Stewart Centre
Louise Thomas, Head of Quality Improvement
Mr Edward Morris, Vice President
Using Big Data to Drive Patient Safety