



# CASE STUDY DESIGNS

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# Questions

- What is case study research?
- How do you design case study research?
- How do you analyse case study research?
- Examples

# What is case study research?

## 1. Empirical enquiry

- Investigates contemporary phenomenon in depth in real-life context
- Boundaries between phenomenon and context unclear

## 2. Features

- Many more variables of interest than data points
- Relies on multiple data sources and triangulation
- Benefits from prior theory to guide data collection and analysis

Yin RK. Case study research. Sage, London 2009

# What case study designs are not

1. Case studies as exemplars
2. Self-controlled case series designs

# Case studies vs other designs

Method	Research question type	Control of events?	Contemporary events?
Case study	How, why, what (where, who when)	N	Y
Experiment	What, (why)	Y	Y
Observational case-control, cohort	What	N	N/Y
Survey	What, where, when, who, (how, why)	N	Y
Qualitative interview, ethnography	How, why	N	N
History	How, why	N	N
Documentary	What, where, when, who, how, why	N	Y/N

Adapted from Yin RK. Case study research. Sage, London 2009

# Types of case study design

1. Aim: descriptive vs exploratory vs explanatory or a combination of these
2. Number: single (typical, critical/revelatory) vs multiple (separate vs embedded)
3. Methods: quantitative, qualitative, multiple, mixed

# Designing case study research

1. Research questions: how, why, who, what, where (when)
2. Propositions
3. Unit(s) of analysis
4. Logic and theory linking data to propositions
5. Criteria for interpreting findings

Yin RK. Case study research. Sage, London 2009

# Types of questions

- How do GP in ED services provide safe patient care? [multiple case]
- Why and how does volunteering on a heritage at risk site contribute to wellbeing? [multiple-case]
- Why and how do ambulance services achieve improvements in performance when taking part in a Quality Improvement Collaborative? [embedded single case, multiple units of analysis]

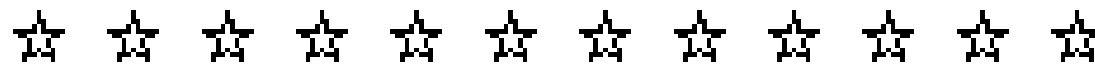


# Unit of analysis: the 'case'

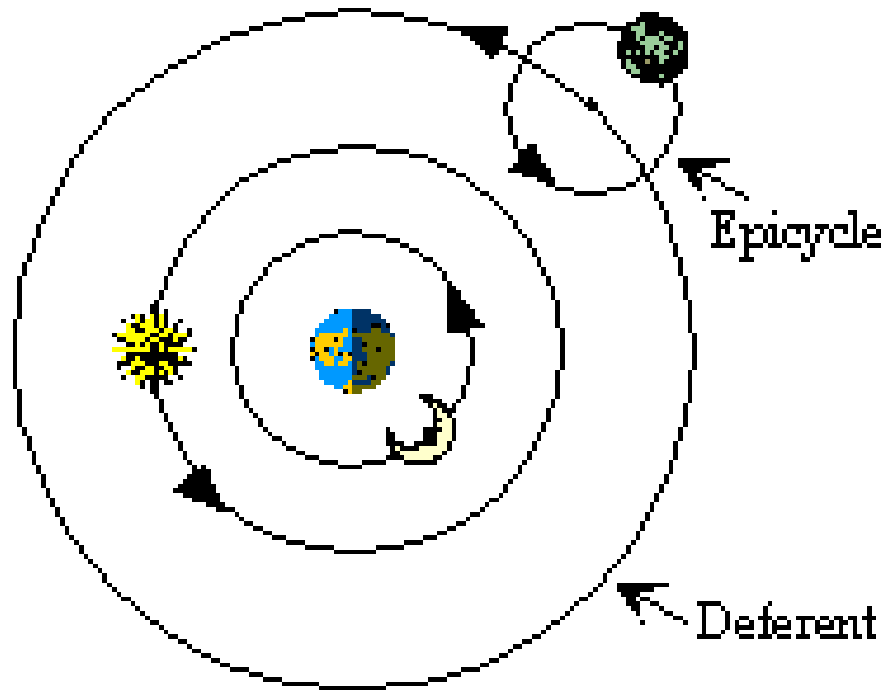
*Can be revisited during the study!*

1. Individuals: patient, staff
2. Groups: partnership, relationship
3. Organisational units: site, organisation, community, country
4. Programmes: project
5. Decisions

# Theory



Background Stars

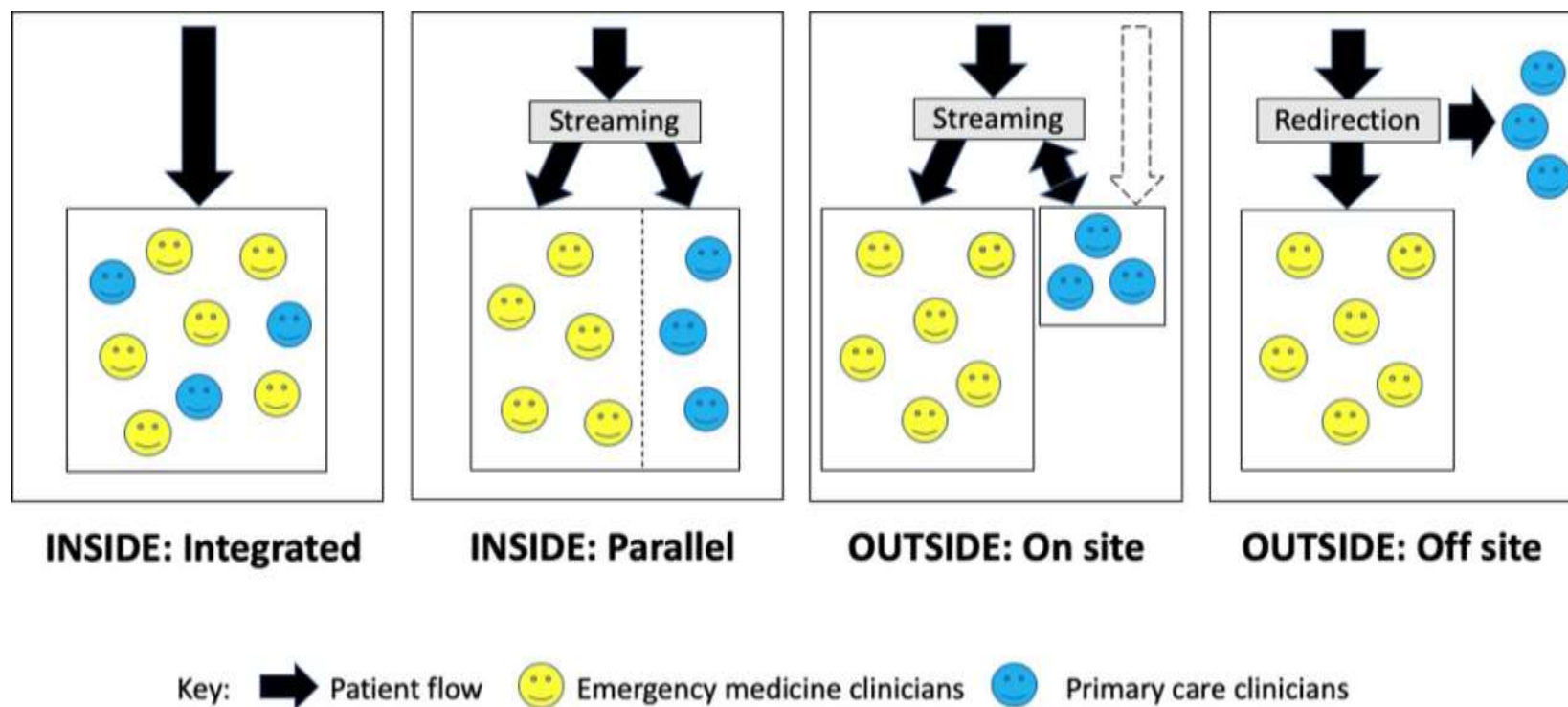


# Quality

Test	Approach	Phase
External validity	Theory informed	Design
	Replication logic	
Construct validity	Multiple sources Chain of evidence Key informant confirmation	Data collection
Reliability	Protocol, instruments Database	Data collection
Internal validity (for explanatory studies)	Logic model Pattern matching Explanation building	Analysis

Yin RK. Case study research. Sage, London 2009

# The form of primary care service models in or alongside emergency departments



Cooper A, Edwards M, Brandling J, Carson-Stevens A, Cooke M, Davies F, Hughes T Morton K, Siriwardena AN Voss S, Bengner J, Edwards A. A taxonomy of the form and function of primary care services in or alongside emergency departments: concepts paper. EMJ 2019; 36: 625-630.



# Heritage at Risk and Wellbeing

## Motivation, barriers and facilitators

- Barriers
- Facilitators
- Motivation

## Identity, belonging and contributing

- Appreciation & attachment to place and community
- Connection with history, heritage and site
- Dislikes & alienation about place and community
- Enjoyment & satisfaction
- Volunteering as self expression (range & variety)

## Retrospect & prospect

- Achievement & legacy
- Restored heritage is changing perceptions
- Volunteering into the future
- Volunteers' personal reflections

## Community engagement, connectedness and inclusivity

- Approaches to engaging communities
- Community ownership and legacy
- Developing or expanding tourism
- Dissemination, recruitment and spreading the word
- Diversity and inclusion
- Lack of public awareness
- Promoting site and heritage to local community

## Physical, psychological and social benefits

- Promotes physical activity
- Promotes psychological benefits
- Promotes social benefits
- Risks, negatives & adverse outcomes

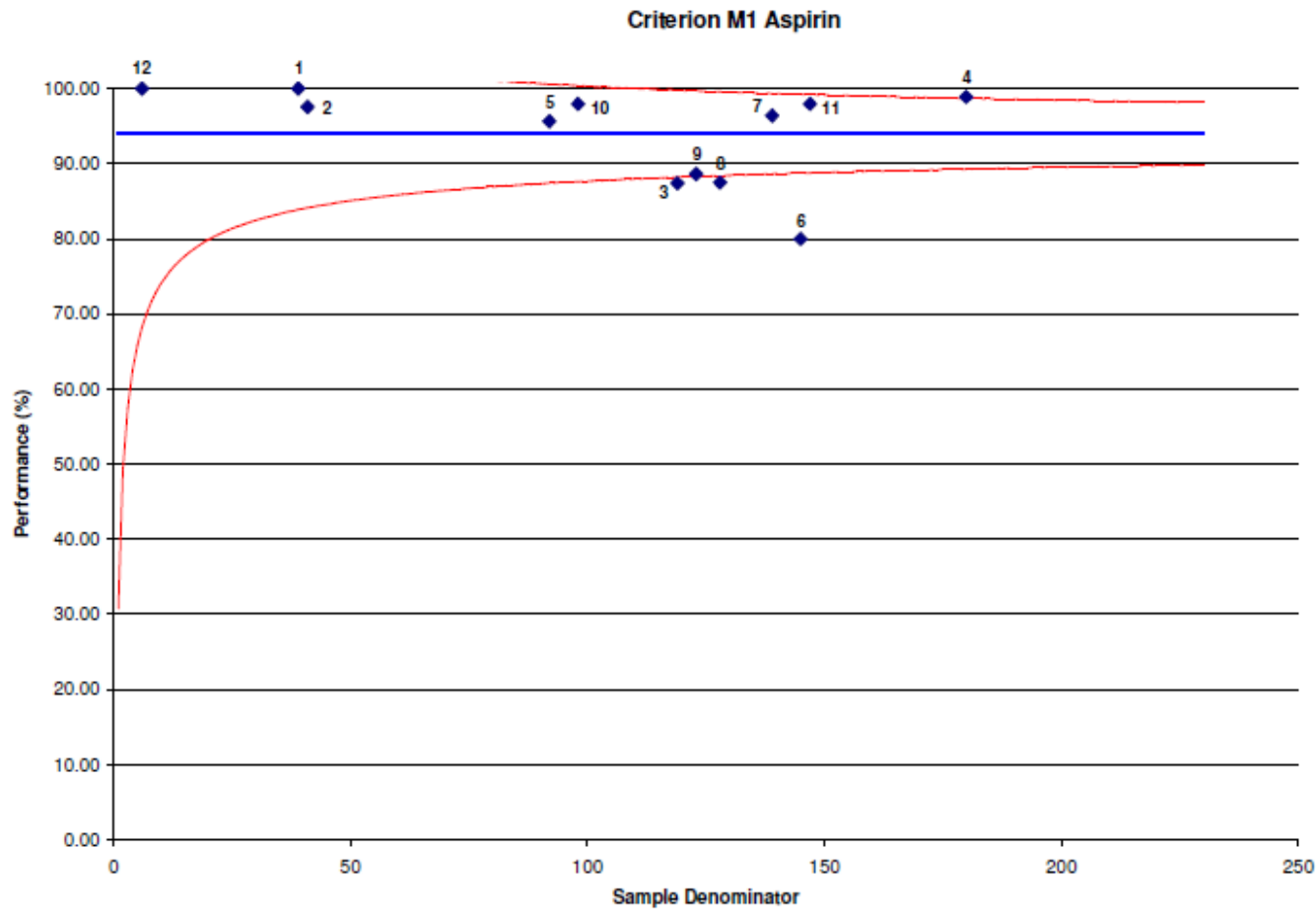
## Learning and diversifying experience

- Experiencing different activities
- Gaining new skills, knowledge, experiences, and qualifications
- Learning about history and site
- Undertaking different heritage roles

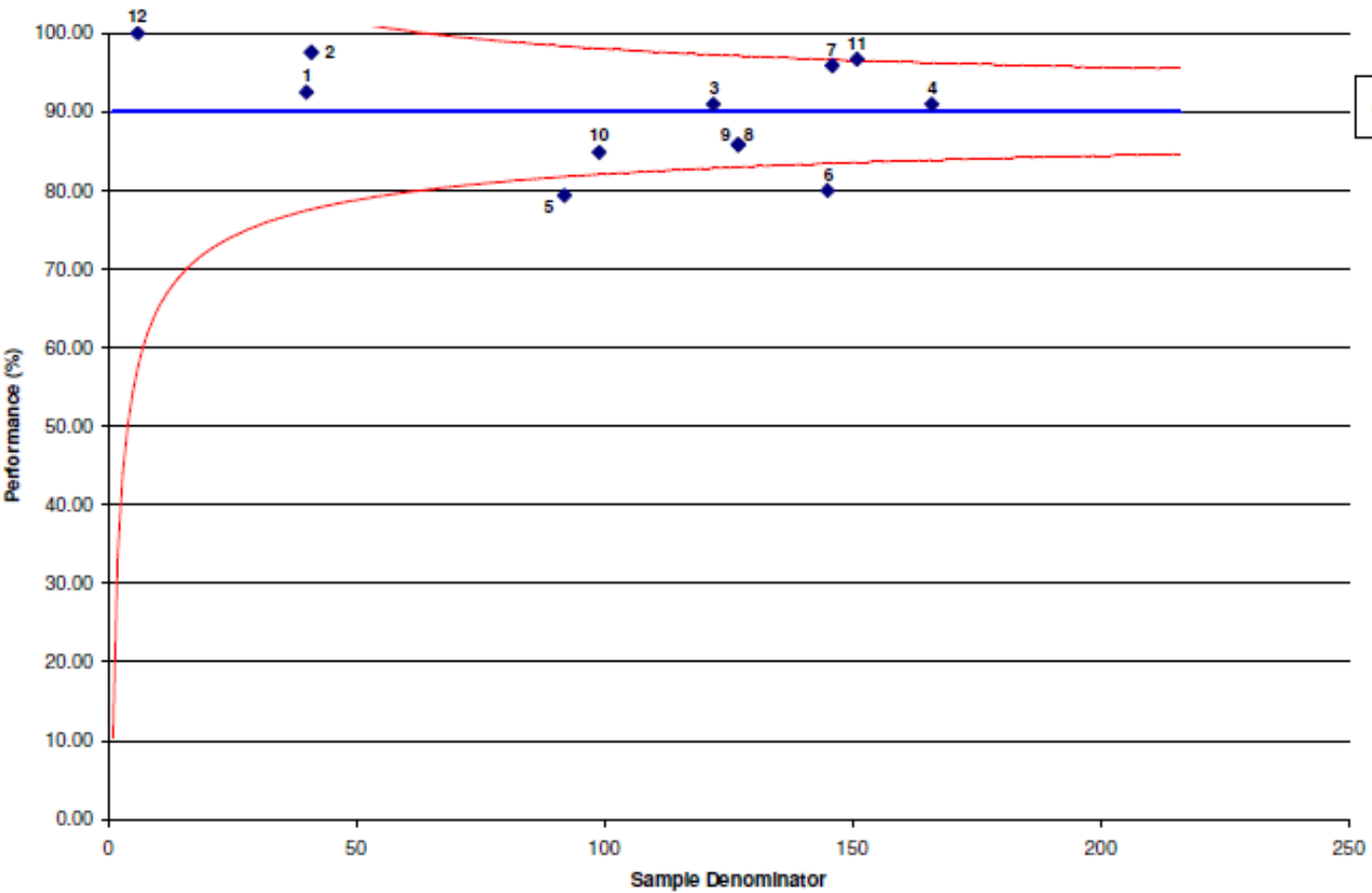
Lewis C, Hughes H, Siriwardena AN, Pattinson J, Laparidou D, et al. Heritage at risk and Wellbeing.funded by Historic England.

# Baseline

STEMI (Data collection period: November 2009)



# Criterion M2 GTN

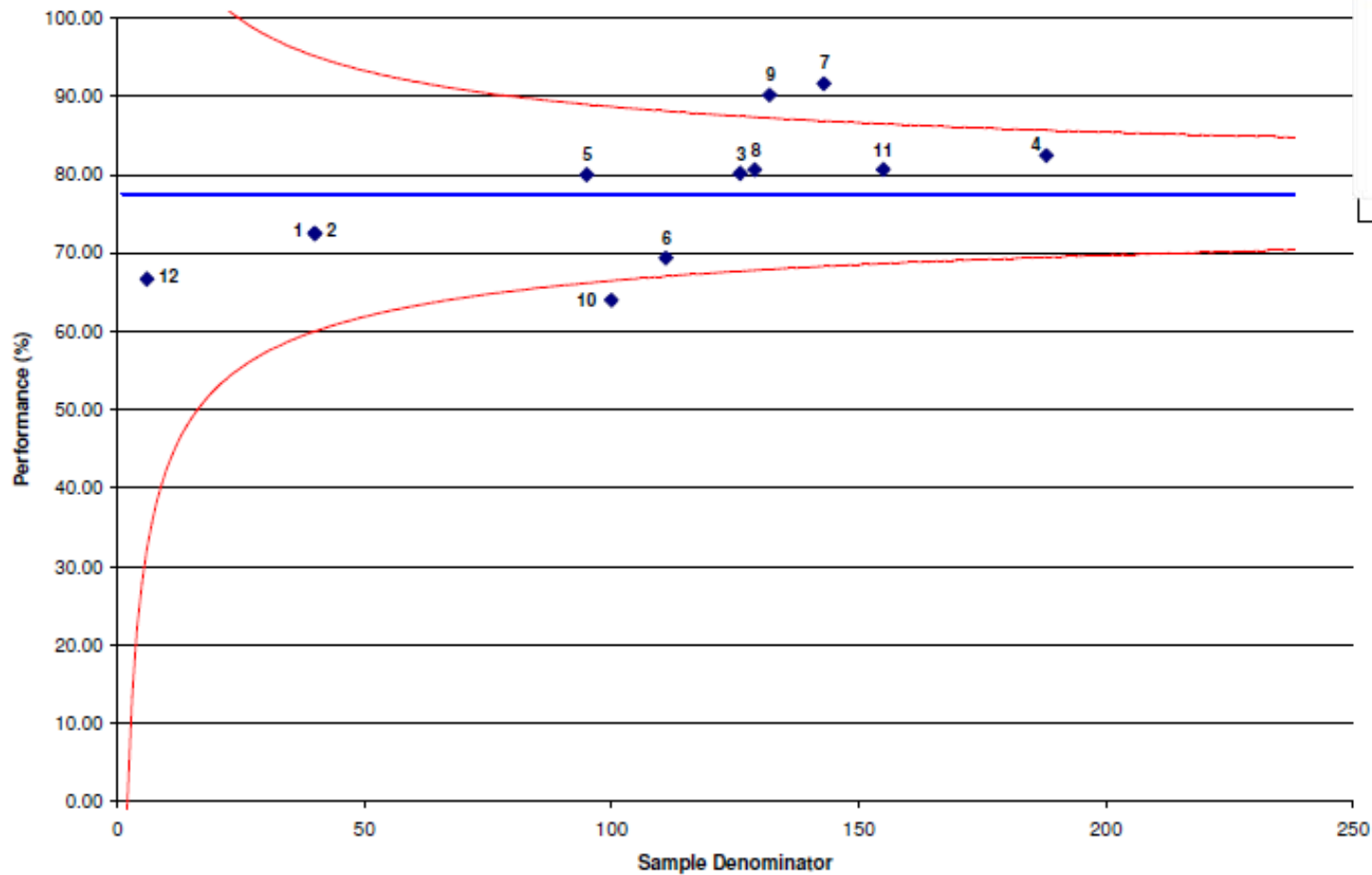


Mean  
90.0%

- Identifiers
- Mean
- UCL
- LCL

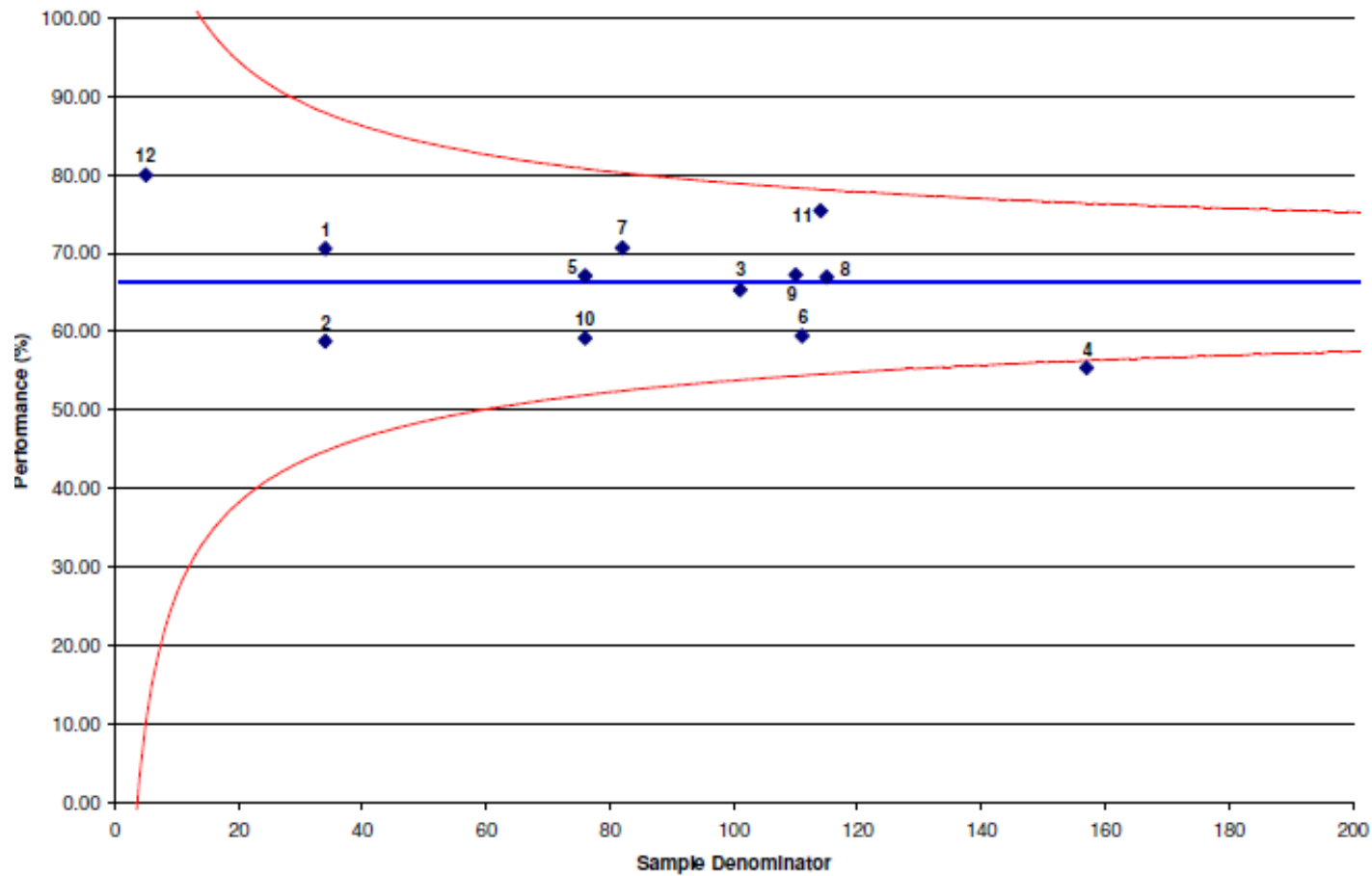


Criterion M3 Two Pain Scores recorded





### Criterion M5 Analgesia Given (Morphine and/or Entonox)



Mean  
66.4%

Identifiers  
Mean  
UCL  
LCL

# Care bundle

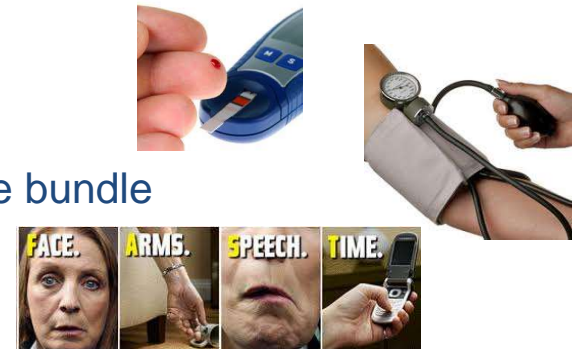
*“A care bundle is a structured way of improving the processes of care and patient outcomes: a small, straightforward set of evidence-based practices — generally three to five — that, when performed collectively and reliably, have been proven to improve patient outcomes”.*

*The Institute of Healthcare Improvement*



AMI care bundle

Stroke care bundle

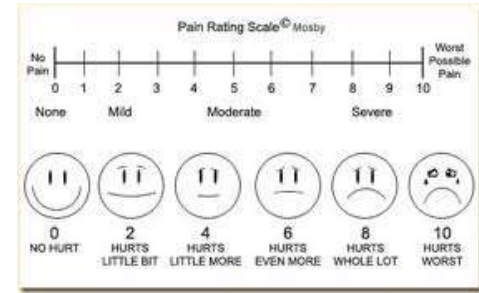


# AMI bundle

M1



M2



M3



&/or = M5



Care bundle = M1+M2+M3+M5

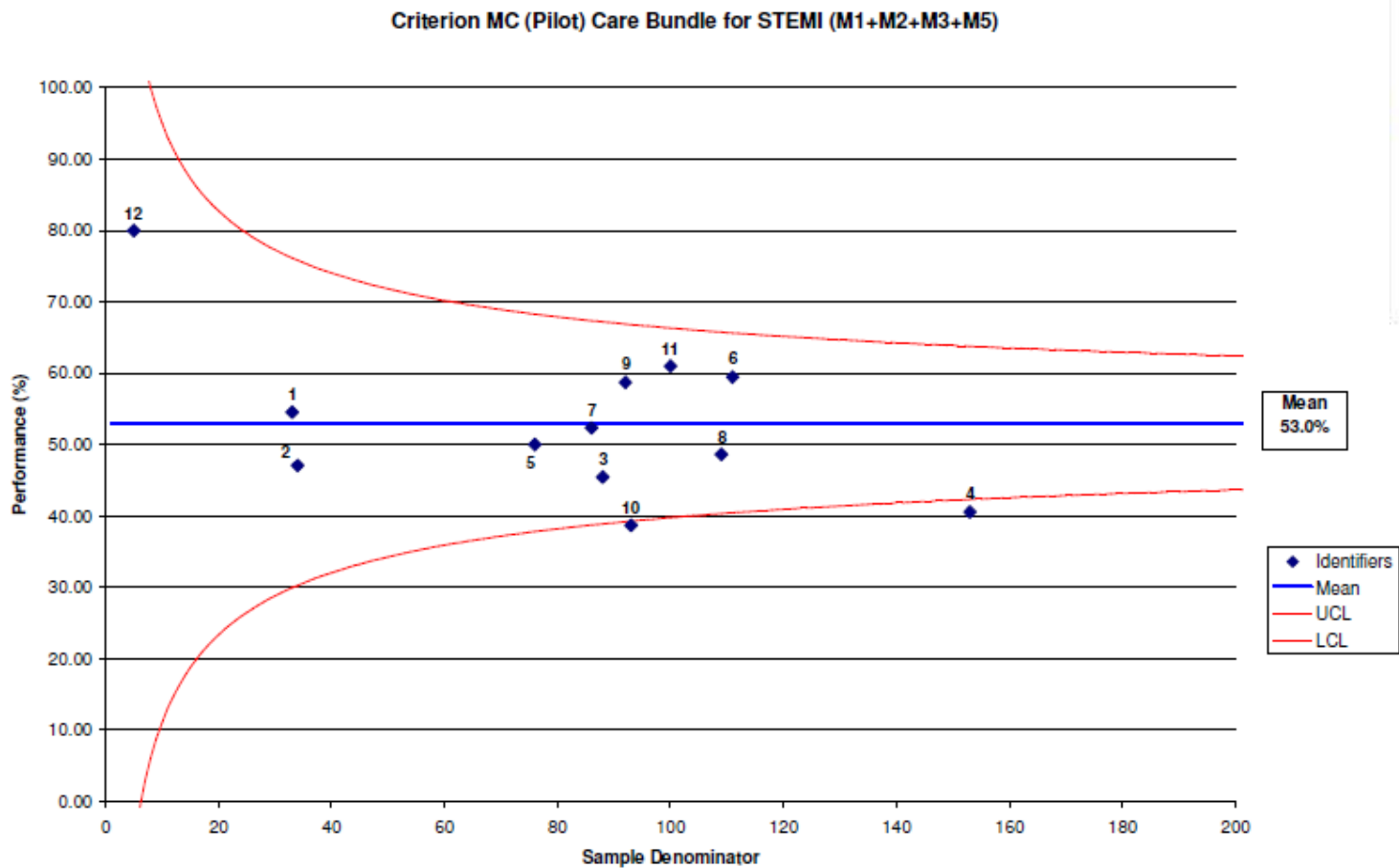
# Stroke bundle

S1



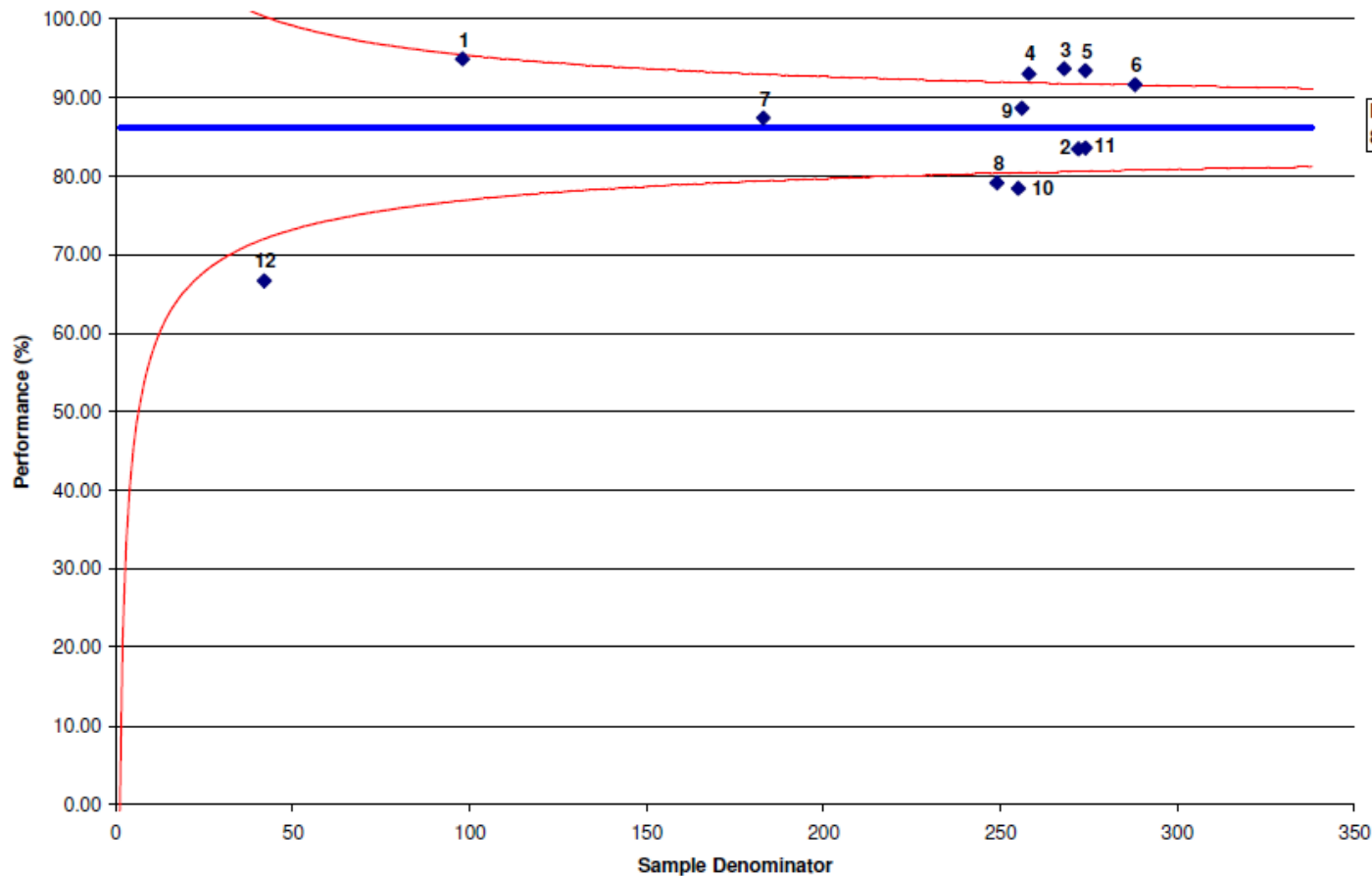
Care bundle = S1+S2+S3

# Care bundle for AMI M1+M2+M3+M5

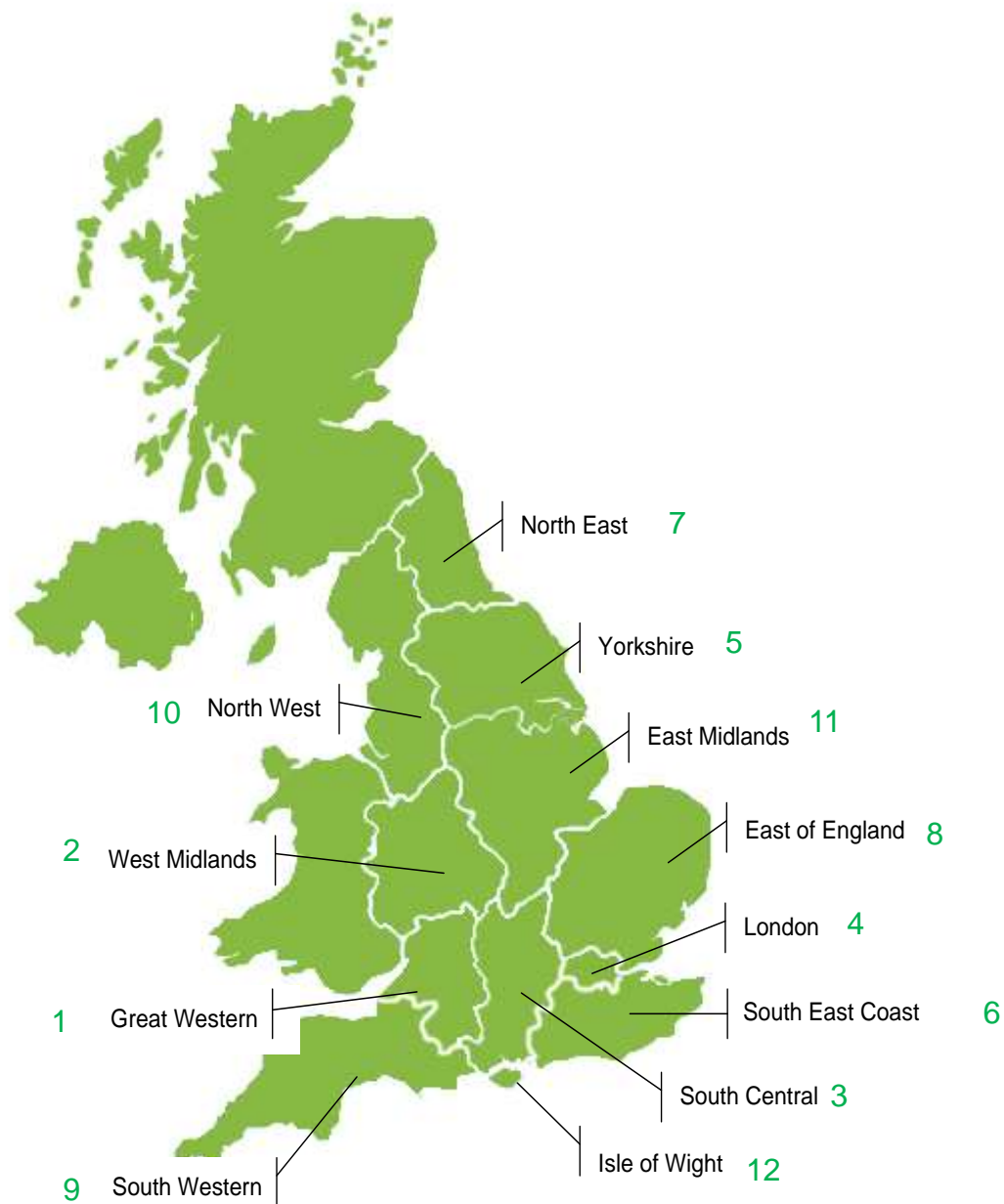


# Care bundle for stroke S1+S2+S3

SC [pilot] Care bundle for stroke (S1+S2+S3)



- ◆ Identifiers
- Mean
- UCL
- LCL

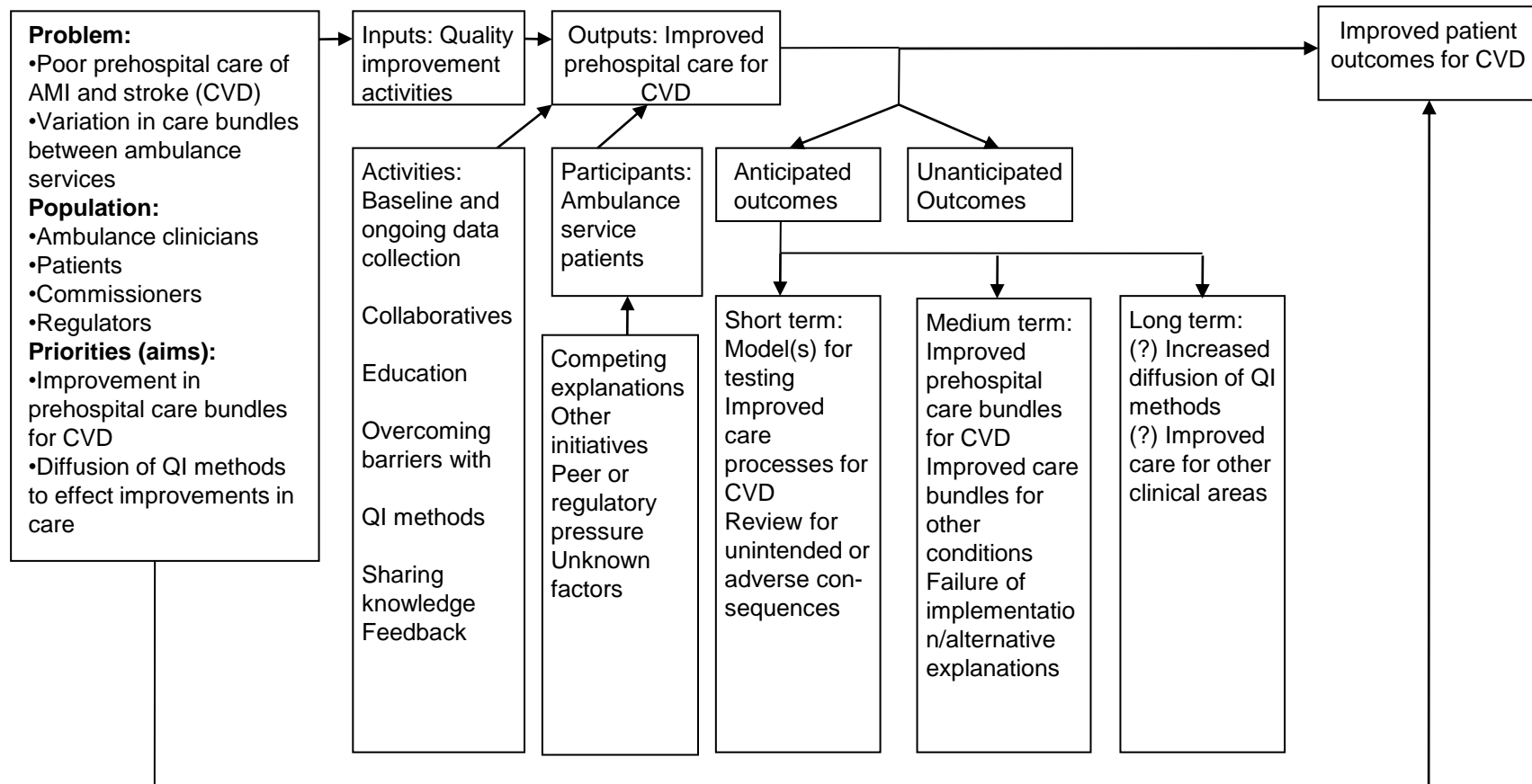


# Aims

- AMI care bundle from 57% to >70%
- Stroke care bundle from 86% to > 90%
- Increase diffusion of QI methods in ambulance services



# Ambulance Services Cardiovascular Quality Initiative



Siriwardena AN, Shaw D, Essam N, Togher F, Davy Z, Spaight A, Dewey M. The effect of the Ambulance Services Cardiovascular Quality Initiative on prehospital care for acute myocardial infarction and stroke in England. Implementation Science 2014; 9:17. doi:10.1186/1748-5908-9-17.

# Quality Improvement team



## From left to right back row:

Phil Bainbridge  
Mark Hall  
Rodger Gregson  
Steve Mortley  
Nick Puckett  
Paul Fell  
Kevin Clarke  
Gary Matthews

QI Fellow  
QI Fellow  
QI Lead  
QI Lead  
QI Lead  
QI Lead  
QI Fellow  
QI Collaborator

Yorkshire Ambulance Service  
East Midlands Ambulance Service  
Yorkshire Ambulance Service  
East of England Ambulance Service  
Isle of Wight Ambulance Service  
North East Ambulance Service  
South Western Ambulance Service  
East Midlands Ambulance Service

## From left to right middle row:

Chloe Small  
Georgina Jones  
Mary Peters  
Anne Spaight  
Michelle Kelly  
Deborah Shaw  
Jeannie Bowler  
Nadya Essam  
Zowie Davy  
Angie Carter

QI Fellow  
QI Fellow  
QI Lead  
Project Co-lead  
QI Fellow  
Data Analyst  
QI Fellow  
Project Manager  
Social Scientist  
QI Fellow

Great Western Ambulance Service  
London Ambulance Service  
North Western Ambulance Service  
East Midlands Ambulance Service  
West Midlands Ambulance Service  
East Midlands Ambulance Service  
North East Ambulance Service  
East Midlands Ambulance Service  
University of Lincoln  
South Central Ambulance Service

# Process mapping





# CPI Checklist

20/09/2011 VS



Great Western Ambulance Service **NHS**  
NHS Trust

Stroke	STEMI	Cardiac Arrest	Hypo-glycaemia	Asthma
BM (rule out hypoglycaemia)	Aspirin 300mg (whoever gave it)	ROSC on arrival at hospital	BM (before treatment)	Respiratory rate
BP	GTN (doses given by crew)		BM (after treatment)	PEFR (before treatment)
FAST	2 Pain Scores		Treatment (oral, i.v., drugs, etc)	SpO <sub>2</sub> (before treatment)
Onset time (first symptoms)	Analgesia (Morphine, Colace, etc)			Beta-2 agonist given
				O <sub>2</sub> therapy

## To make it count.... MAKE IT SEEN!

Always use the dedicated boxes (especially for FAST, ROSC & Pain Scores). Please also record all drugs, even if given prior to your arrival (PTA) or contraindicated (See below)

Time	Name	Code	Dose	Unit	Route	Batch	EXP	PIN
PTA	Salbutamol	SLB	5	mg	Neb	N/K	N/K	GP
PTA	Aspirin	ASP	300	mg	Oral	N/K	N/K	Pt / EOC
18:58		GTN	CONTRA	↓BP				1963
18:59		NOO	REFUSED					1963

CPIs cannot be done when:

- Patient refuses
- Patient unable (e.g. Peak flow, Pain scores)
- Drug is contraindicated

BUT please DOCUMENT reason/exclusion

Yorksire Ambulance Service  
NHS Trust

**STEMI CPI**

Pain score 1  
Aspirin  
SpO<sub>2</sub>  
GTN  
Analgesia/  
Entonox/  
Morphine  
Pain score 2

**NHS**

Yorksire Ambulance Service  
NHS Trust

**STROKE CPI**

Face  
Arms  
Speech  
Time of onset

BM  
BP

**NHS**



## CPI Friday – looking back

Issue 12/2011

### Brief synopsis:

- We've made significant improvements in all areas of stroke and STEMI care since Jan 2010
- Few other trusts rival our figures, month in, month out, and the care that this inherently implies

### Ramblings

For the few CPI Friday hardcore that are out there that have been reading my ridiculous ramblings now for almost a year, I thought it time to reflect on how we've improved.....

### Strokes

Stroke CPI performance has always been high (largely over 85%) but we've not been complacent, we've upped our game so we are now consistently over 95%, often 100%. Yes, of course there are areas we can still improve on, but compare us to most other trusts and we're streets, even villages, ahead!! As the BM kit issue gets sorted (thanks to everyone involved at all levels), our care bundle figure, I know, will hit that 100% line for good.

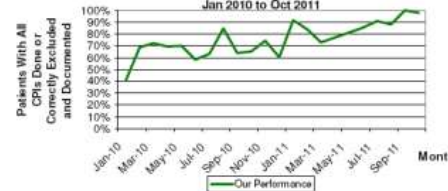
Stroke CPI Performance Improvement  
Jan 2010 - Oct 2011



### STEMIs

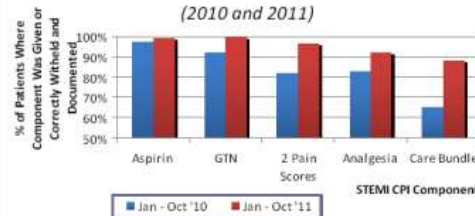
Just look at our performance this year compared to last, and pat yourselves on the back because the improvement is simply fantastic!!!! If ever there were a graph to show significant, steady and consistent improvement, well this really is it, and when I do my ASCQI (Ambulance Services Cardiovascular Quality Initiatives) presentation in March, rest assured that all other trusts will be made fully aware of your commitment to patient care.

STEMI CPI Performance  
Jan 2010 to Oct 2011



If we look at each STEMI CPI, our aspirin and GTN administration have gone from great to superb. Pain scores took a massive leap after the first CPI Friday in January 2011 purely because (like me), few people had fully appreciated the importance of a second score in proving you'd reassessed the patient's pain (or absence of) en route to hospital. Poor Doris didn't want to call you out in the first place, she's hardly going to disturb you mid journey to tell you her pain's getting worse – you need to be proactive, and boy, you certainly have been!!!!

### STEMI Care Comparison (2010 and 2011)



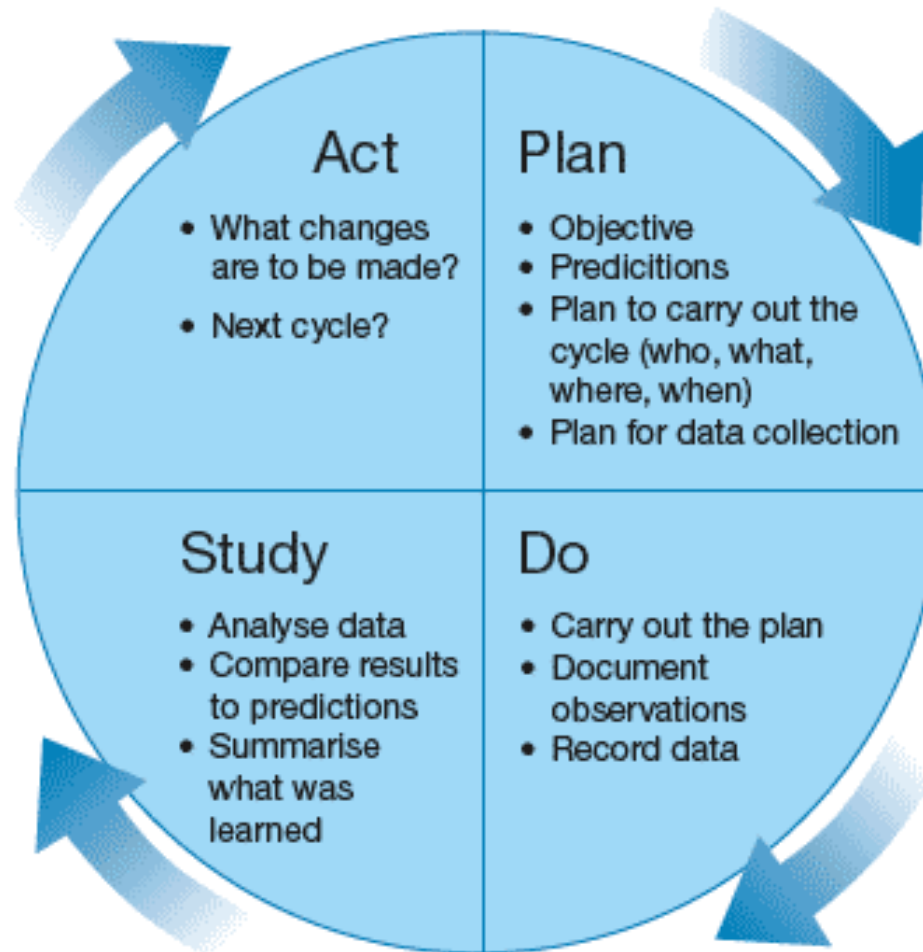
When it comes to analgesia however, there is definitely room for improvement and those of you bonkers enough to keep reading CPI Friday will know that the main points are:

- If the pain's not ZERO, Morphine needs to be given. A "niggle" still needs analgesia. No excuses.
- If Morphine's not possible (failed access, non-para crew, contraindications etc), then give entonox a try. No excuses either!

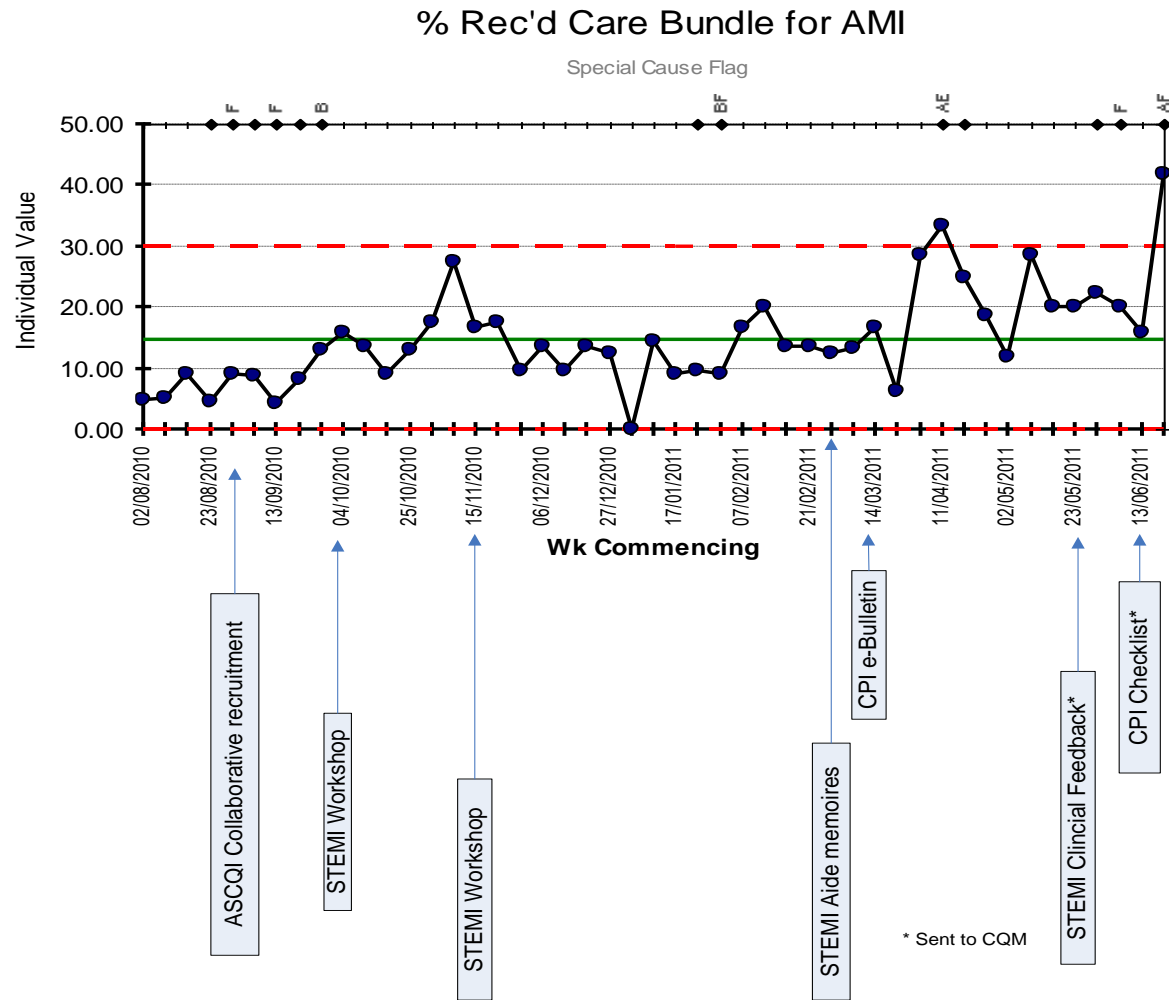
I'm the first to understand that the excitement of getting sucked into the city centre every night shift is about as appealing as Shrek's Princess Fiona after sunset, but (in general) there are no green ogres in our trust when it comes to CPI performance for cardiovascular disease (strokes and STEMIs). In fact, we need others to take a good look at our clinical care and start seeing the wonders that lie within our trust.

So thank you and keep up the professionalism – sector breakdowns in January....you've been warned!!!!

# Improvement methods

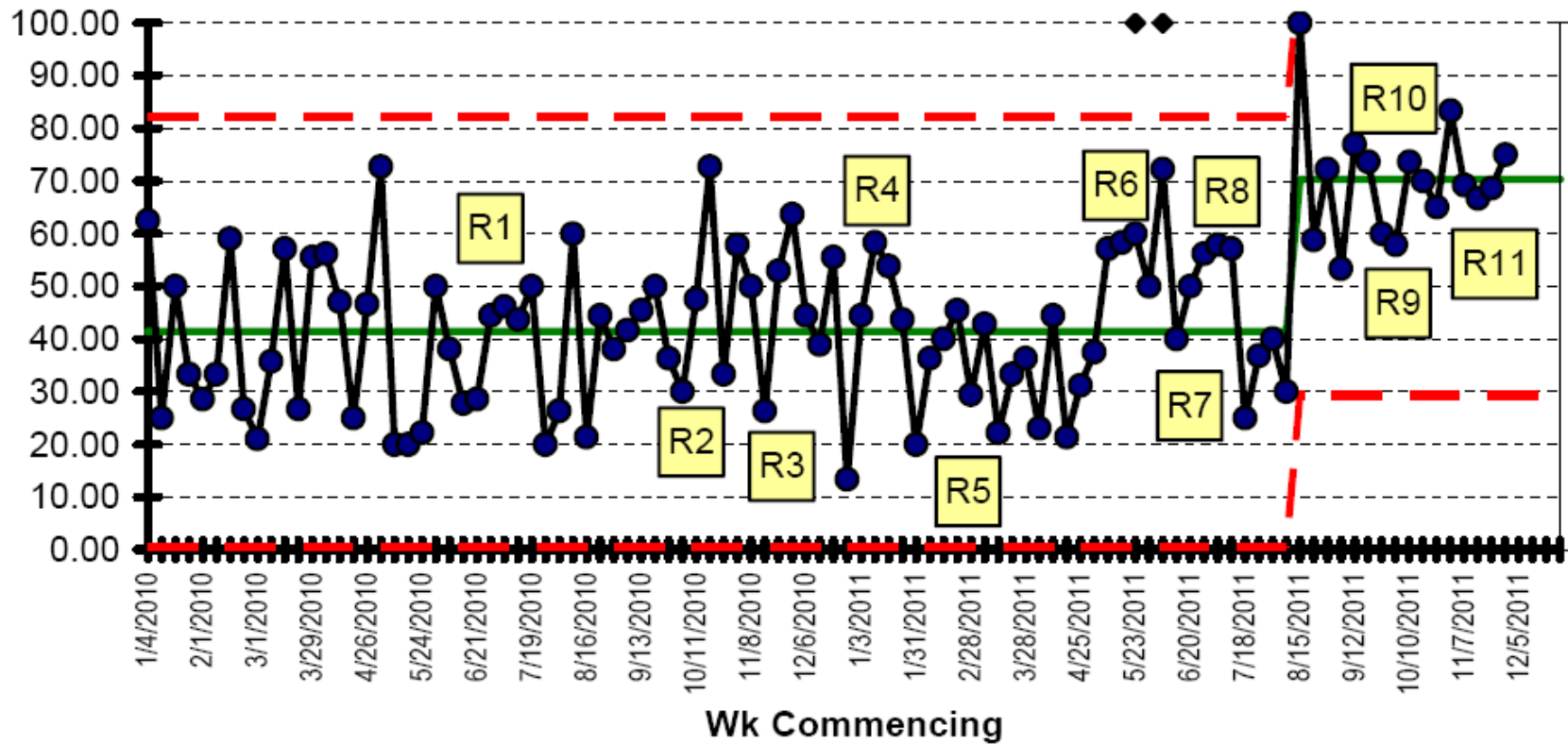


# Small tests of change

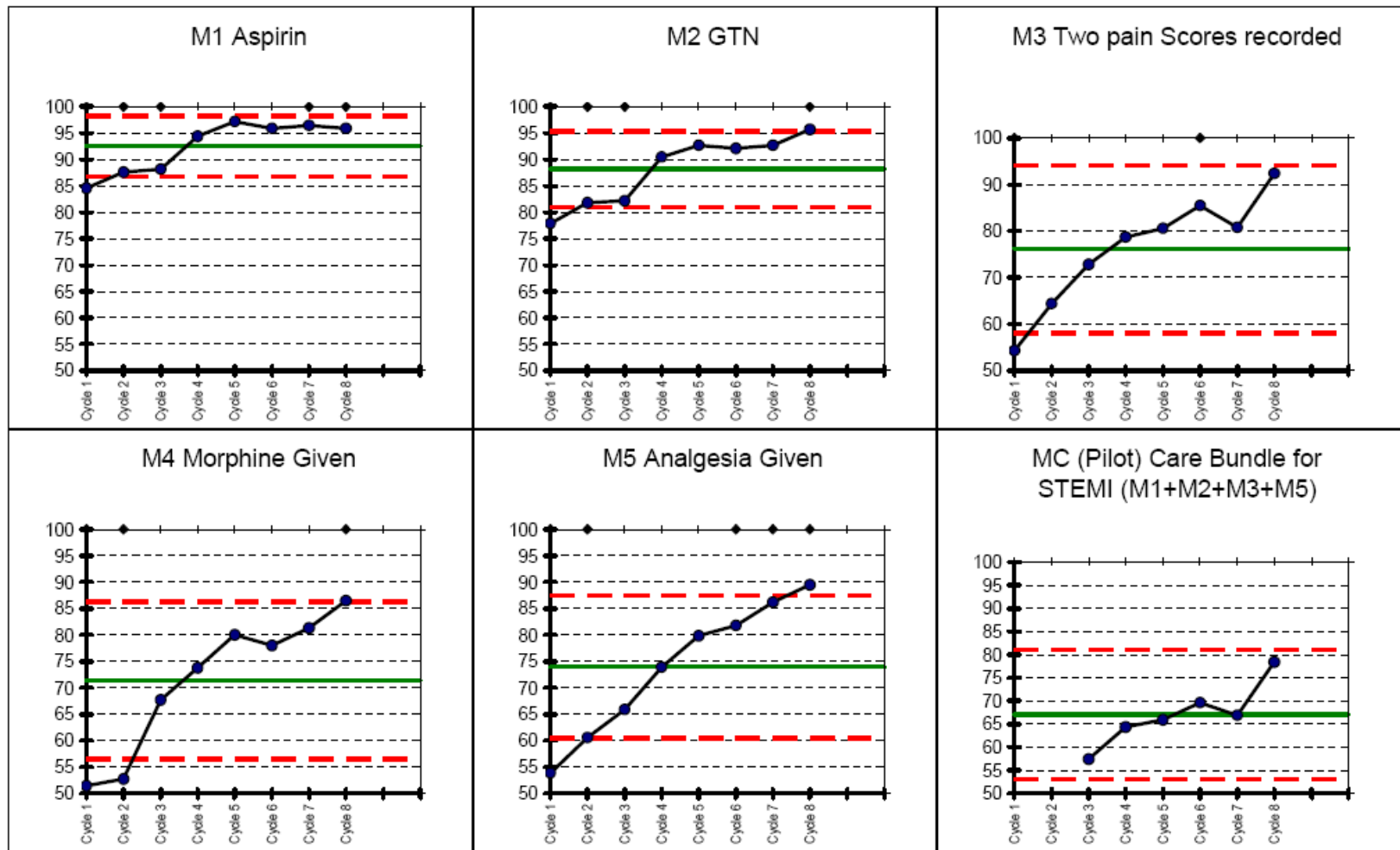




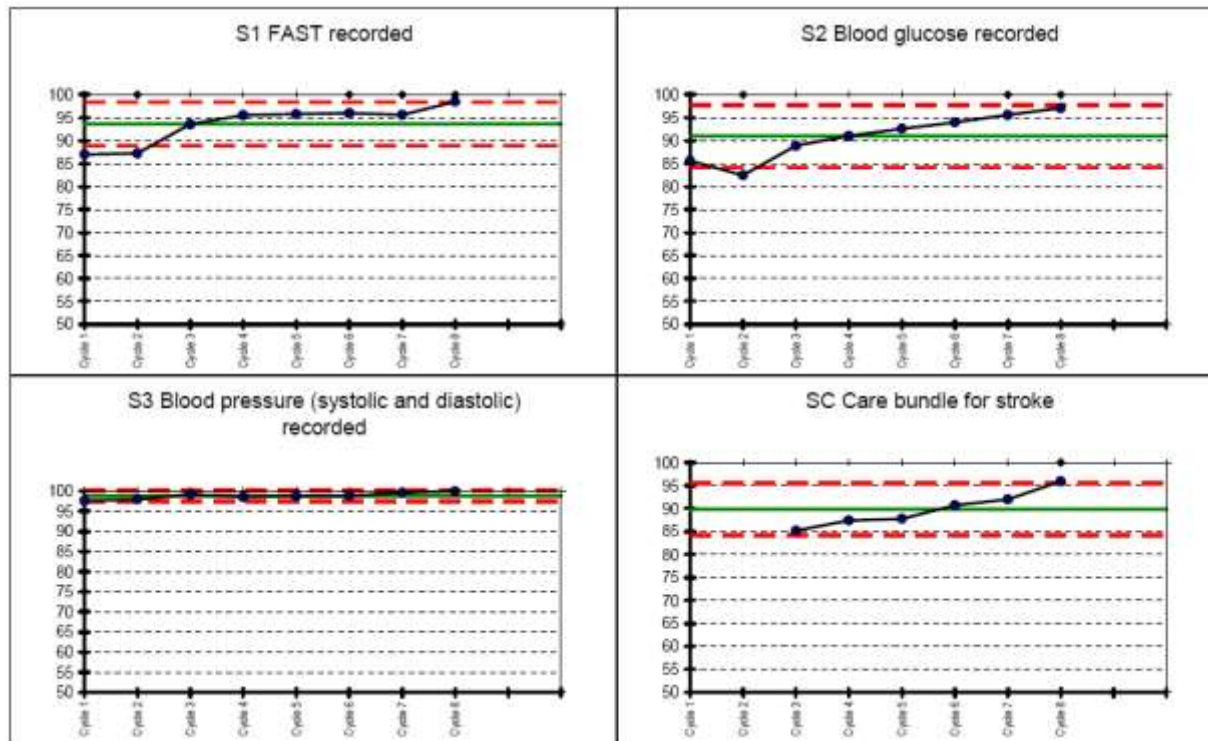
## EMAS % Rec'd Care Bundle for AMI



# Improvements in AMI care



# Improvements in stroke care

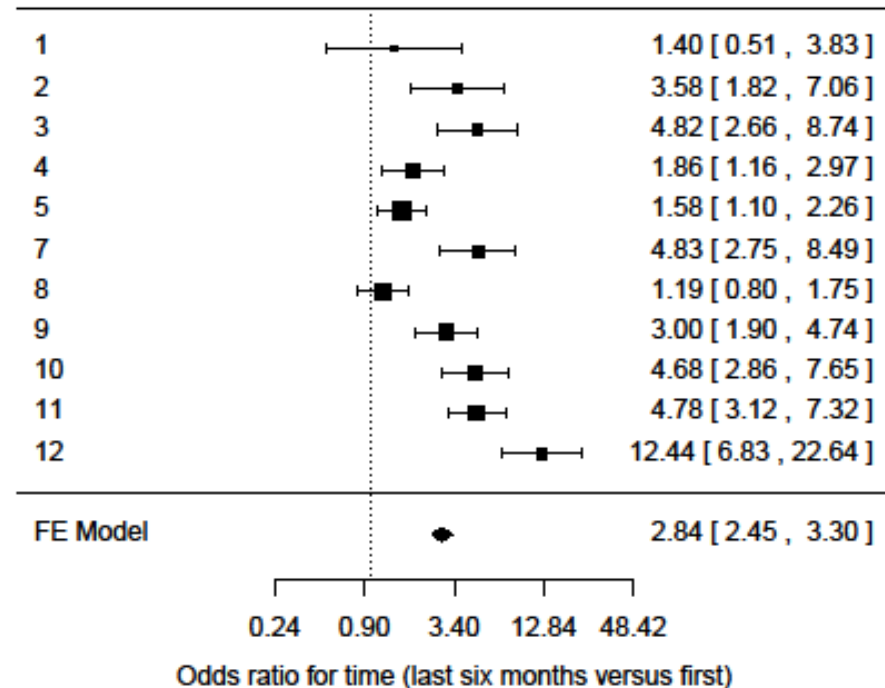
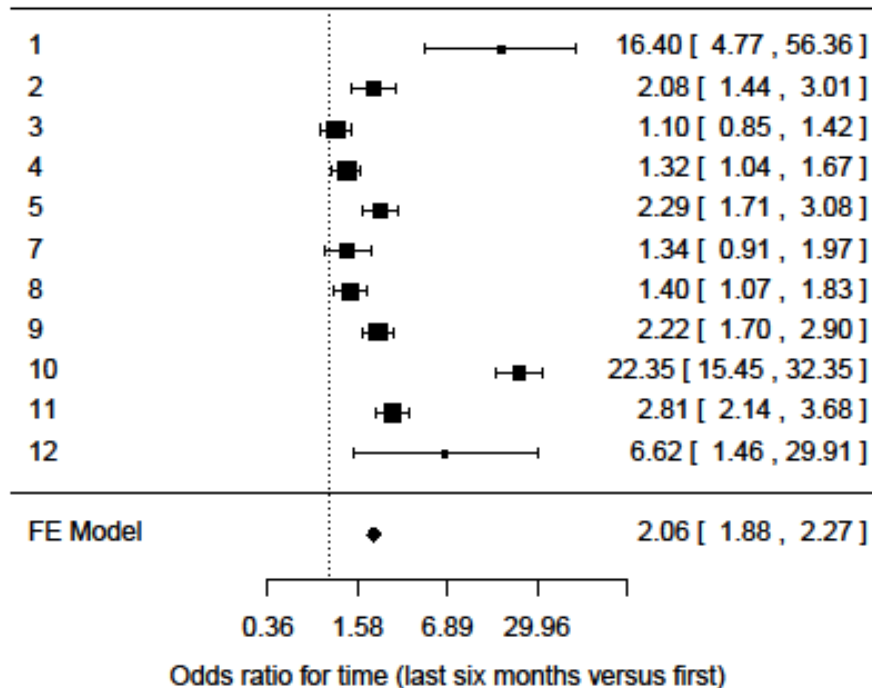


# National improvement

AMI                      57% to 79%

Stroke                      85% to 96%

# AMI vs stroke bundle in each trust

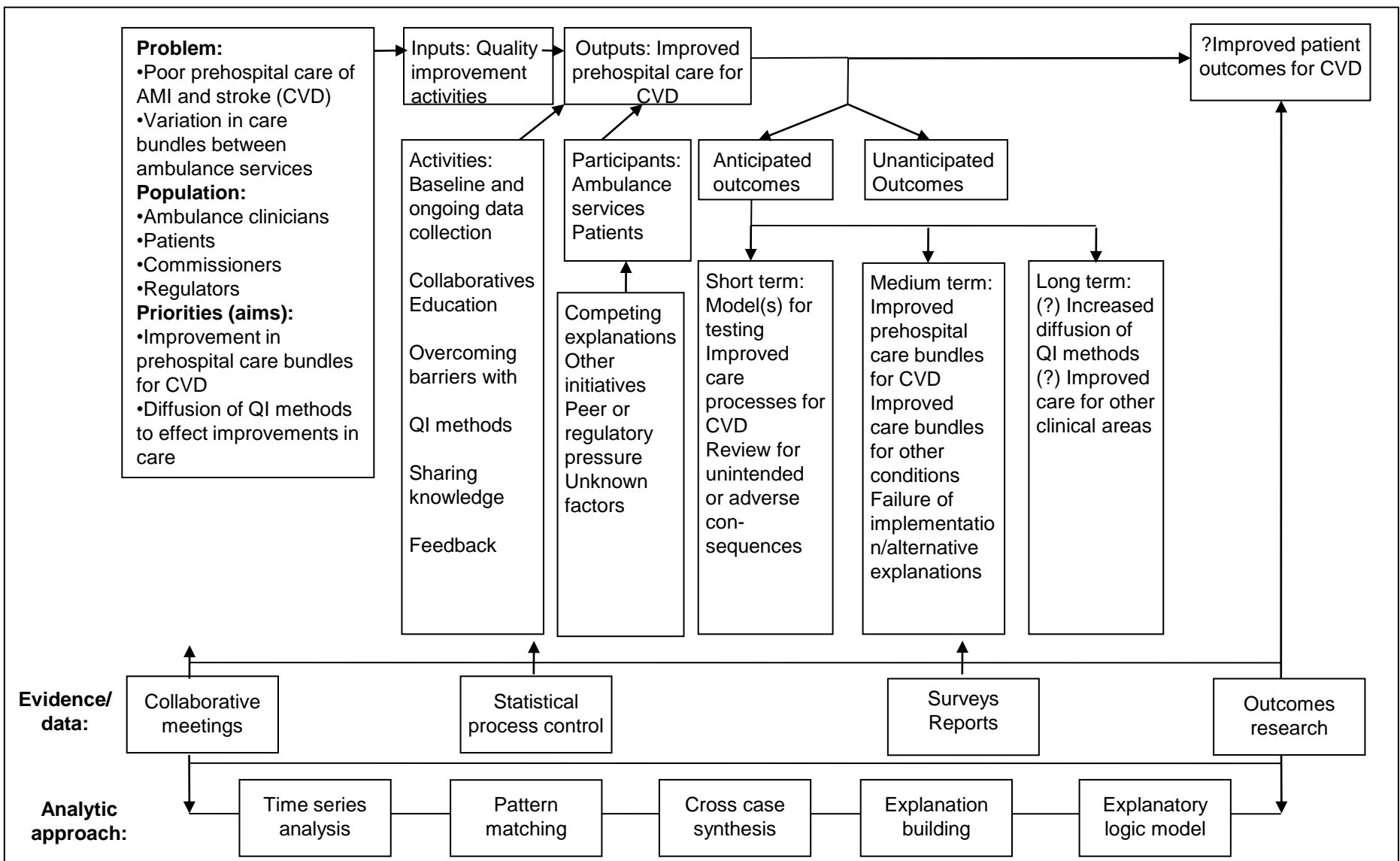


# Pattern matching

- Hypothesis (es) linking outcomes to interventions, e.g. improvement associated with
  - a. checklists
  - b. individual feedback
  - c. group feedback

# Improvement vs interventions

Service	AMI	Stroke	AMI or stroke	AMI and stroke	Checklist	Individual feedback	Group feedback
1	Y	N	Y	N	Y	N	Y
2	Y	Y	Y	Y	N	N	N
3	N	Y	Y	N	N	N	N
4	Y	N	Y	Y	N	N	N
5	Y	Y	Y	Y	Y	N	N
6	-	-	-	N	-	-	-
7	N	Y	Y	N	Y	N	N
8	Y	N	Y	N	Y (late)	N	Y
9	Y	Y	Y	Y	Y	Y	N
10	Y	Y	Y	Y	Y	Y	Y
11	Y	Y	Y	Y	Y	Y	N
12	Y	Y	Y	Y	Y	N	Y



Siriwardena AN, Shaw D, Essam N, Togher F, Davy Z, Spaight A, Dewey M. The effect of the Ambulance Services Cardiovascular Quality Initiative on prehospital care for acute myocardial infarction and stroke in England. Implementation Science 2014; 9:17. doi:10.1186/1748-5908-9-17.



# Questions

- Thank you for listening!
- Any questions?

# Further reading

- Robert K Yin. Case study research design and methods. Sage, London 2009
- Robert E Stake. The art of case study research