NIHR CLAHRC
Yorkshire and Humber

The University Of Sheffield.

LIVERPOOL JOHN MOORES UNIVERSITY

St Luke's Hospice EnComPaSS Project: Evaluation Case Study

Dr Steven Ariss

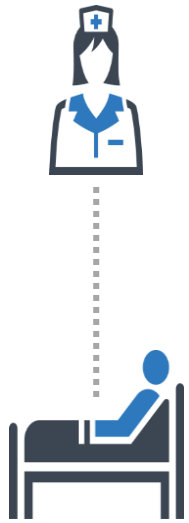
Prof. Sue Mawson

Prof. Debbie Fitzsimmons

The E-Shift Intervention

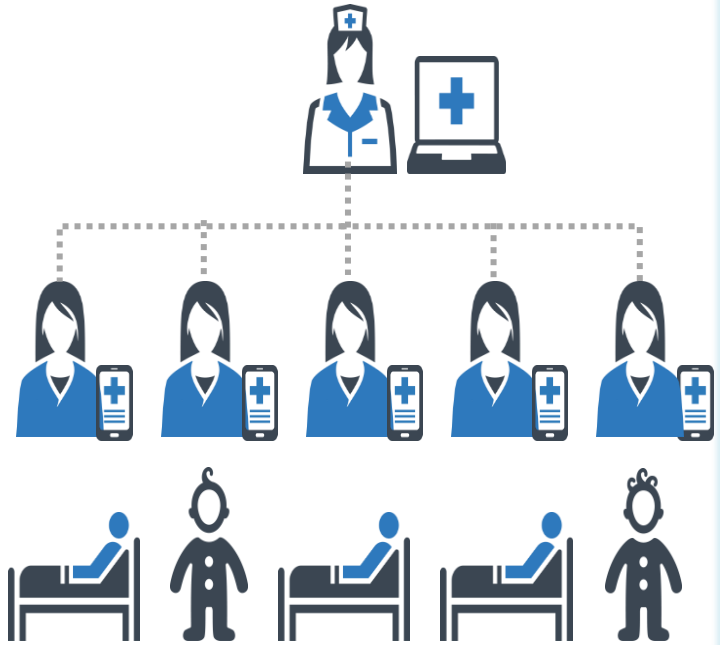
Sensory Technologies

Traditional model



- **Inefficient, Costly, Cannot be scaled**

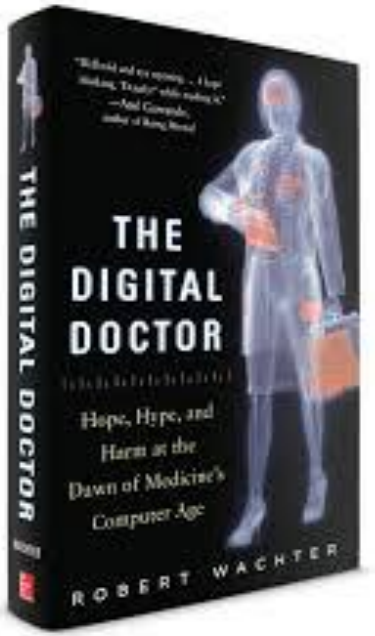
eShift model



- **Efficient, Cost-effective, Scalable**

“it’s fundamentally not a technology project; it’s fundamentally a culture change and a business transformation project.”

Robert Wachter, University of California, USA



Evaluation Design

- Complex intervention
  - Non-linear
  - Emergent
  - Dynamical
  - Adaptive
  - Uncertain
  - Co-evolutionary

- Economic outcomes
- Organisational development
- Changes to patient experiences

Evaluation Design: Theory led approach

Context	Mechanisms	Outcomes
• Tech Functionality • Organisation	• Behaviour Changes • New Ways of Working	• Admission Patterns • Discharge Patterns • Efficiency

1. Initial Theory Development: What? (CMOCs)
2. Selection of Measures & Monitoring Processes: When & How?
   - Longitudinal
   - Pre-Post
   - Qualitative & Quantitative
3. Theory Monitoring, Testing & Refinement: Why?
4. Sense Checking & Validation
5. Describing Outcomes Within a Rational Framework of Changing Contexts and Organisational and Behaviour Change

Data collection

- Meetings/informal discussions
- Interviews
- Acute care data
- Hospice data
- Observations:
  - Patient Visits
  - Paperwork
  - Computer use
  - Board rounds
  - Multi disciplinary team (MDT) meetings

Benefit Assumptions:

More appropriate hospital admissions

Improved monitoring of vital signs, regular assessment of family ability to cope, improved care planning and more efficient working practices

= more appropriate admissions

Benefit Assumptions:

Reduced travel costs and more visits per day

- Mobile access to patient records and streamlined administration practices reducing reliance on returning to the office
- Less need to attend office before first visit
- Reducing the distance travelled will release cash by reducing expenses currently spent per mile of travel
- Increased efficiency = more visits per day

Enablers:

- Visit scheduling processes implemented
- Changes to working practices to facilitate remote working

HSJ, 21 Oct, 2010

Benefit Assumptions:

Streamlined Multi-Disciplinary Team (MDT) Meetings

Efficiency gain: More efficient practices owing to improved record keeping and data flows, reduced need to discuss all of the information currently required = Reduced length/frequency of MDT meetings

Enablers:

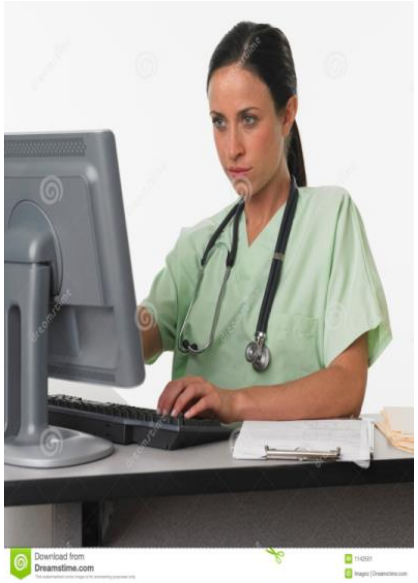
- Conversion of paper records to electronic records
- Review and reorganisation of MDT meetings in light of new data available and new processes of working

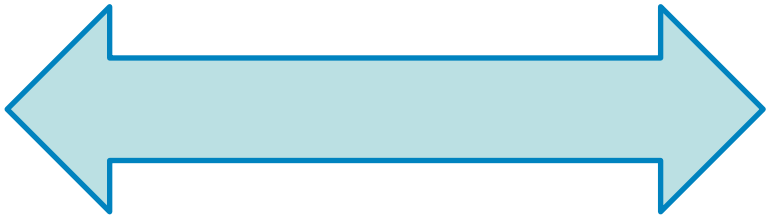
Photograph: iStock

Benefit Assumptions:

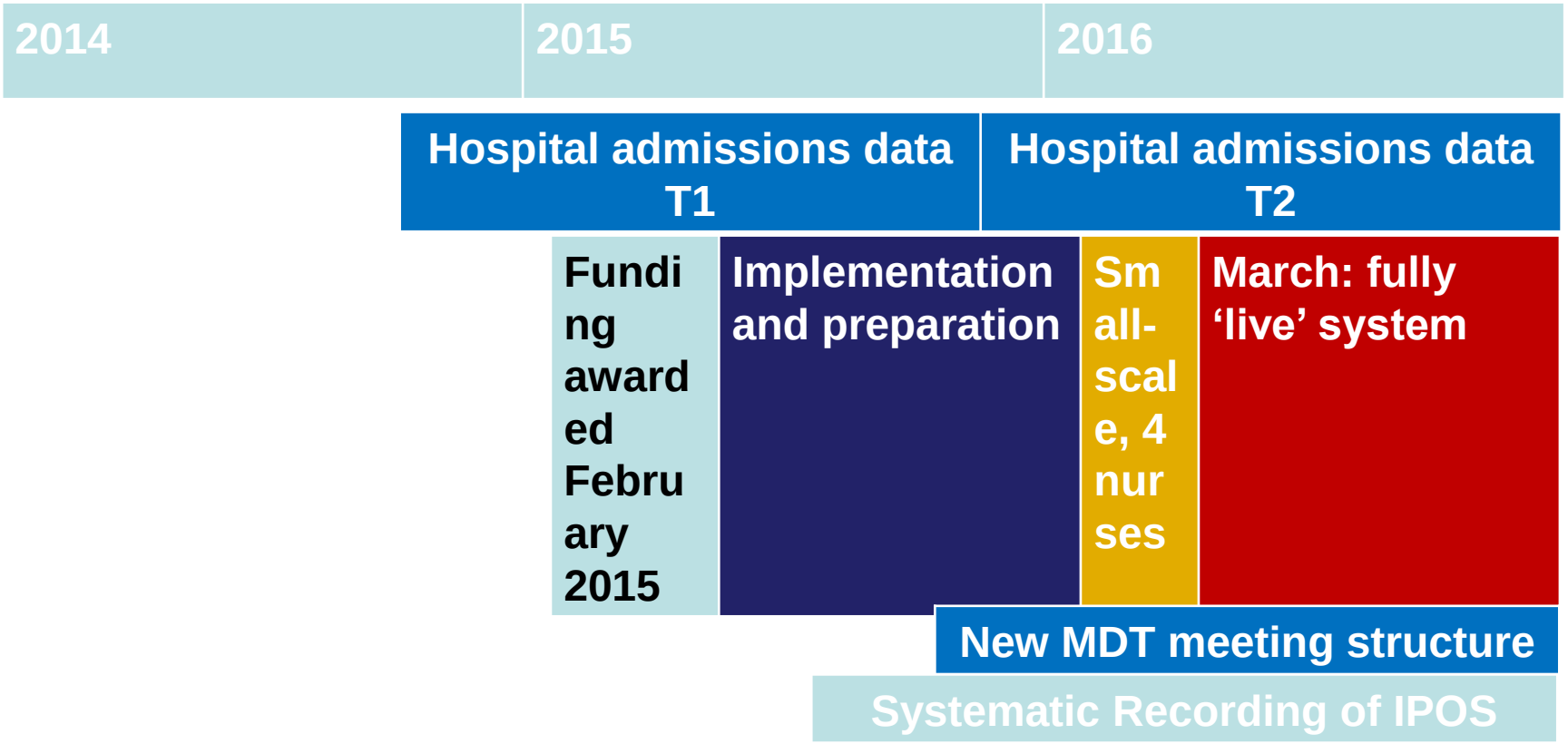
Remote support of lower band staff

The capability for remote supervision and delegation of tasks will reduce the number of senior nurse and medical face-to-face patient contacts required = increase in the senior clinician to patient ratio





Implementation and data collection



T1 = 1st October 2014– 30th September 2015
T2 = 1st October 2015– 30th September 2016

Pre-Post Findings

	Hospital admissions data T1	Hospital admissions data T2	Difference
Hospice Patients	1521	1501	20 ⇩
Patients admitted to Hospital	1238	1156	82 ⇩
Total admissions	5771	4548	1223 ⇩
Admissions per patient	4.66	3.93	0.73 ⇩
Length of Stay per admission	6.23 days	5.99 days	0.23 days ⇩
Total hospital time	35902.46 days	27008.60 days	8,893.86 days ⇩
Total time per acute patient	29.00 days	23.36 days	5.64 days ⇩

Translating findings to savings

- Proportional time saving for 1,156 patients= 6,519.84 days
- Assuming admissions accepted by the hospice community service remain static, and all acute admissions are to bed-based services, at a cost of specialist palliative care of £371/bed day (PSSRU, Unit Costs of Health and Social Care 2015), this represents a potential saving of £2,418,860.64 per year.
- Representative implementation costs are difficult to calculate:
  - Pilot project
  - Software development
  - Sensory technologies investment in UK demonstration site
  - Concurrent staffing and organisational developments
- However, hospice costs were covered by a £250,000 Nursing Technology Fund award (1 year return ratio 1:9.7)

How does this fit with the theory?

Admissions	2014-15		2015-16		
	Frequency	Percent	Frequency	Percent	Change %
ADM	3442	59.6	2831	62.2	2.6↑
Emergency	2329	40.4	1717	37.8	2.6↓
Total	5771	100.0	4548	100.0	

Findings support the theory that improved care is resulting in reduced and more appropriate hospital admissions

Admissions	2014-15		2015-16		
Hospital	Frequency	Percent	Frequency	Percent	Change%
NGH	4609	79.9	3441	75.7	4.2↓
WPH	720	12.5	738	16.2	3.7↑
RHH	442	7.7	369	8.1	0.4↑
Total	5771	100.0	4548	100.0	

General Hospital with Emergency Department

Cancer Specialist Hospital

How does this fit with the theory?

Theory: Improved community support and case management allows more patients to be discharged to their home after a hospital episode

Discharge Destination	T1%	T2 %	Change
Usual place of residence (e.g. Own home)	49.8	53.0	3.2↑
Admitted to hospital bed/became a lodged patient of the same health care provider	29.5	26.4	3.1↓

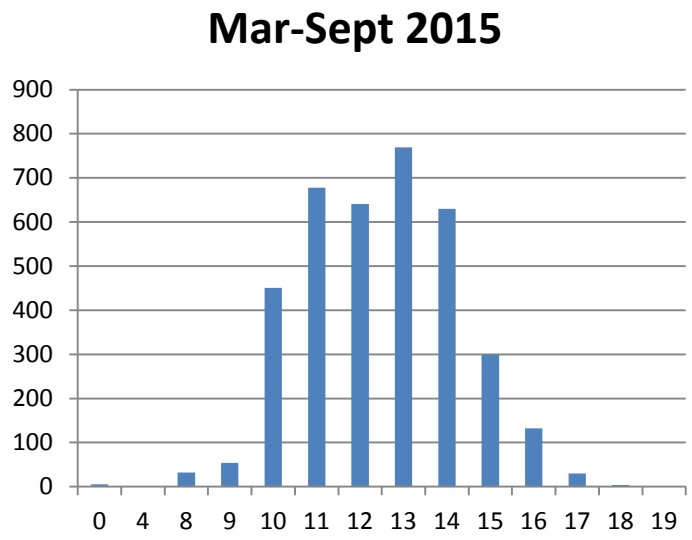
Changes to visit types

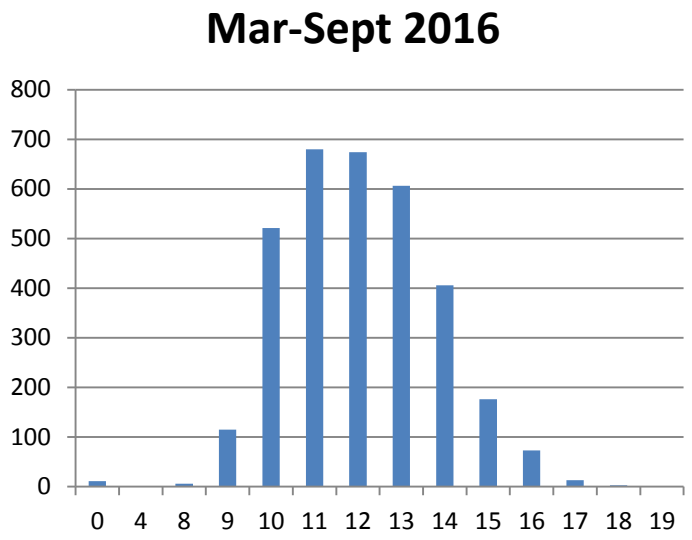
- Remote support of staff will enable lower grade nurses to provide community services.
- Remote support will reduce the need for joint visits and consultant visits.

	Mar-Sep 2015	Mar-Sep 2016	Difference
Band 5 Nurse - Visit	0	286	286
Consultant - Joint visit	65	28	-37
Consultant - Visit	40	20	-20
Nurse - Joint visit	170	51	-119
Nurse - Visit	3361	2730	-631
Specialist Palliative Registrar - Joint visit	84	45	-39
Specialist Palliative Registrar	5	125	120
Grand Total	3725	3285	-440

How does this fit with the theory?

Theory: Reducing the need to return to the office in the afternoon to complete paperwork will result in visits spread more evenly over the course of the day





Assumption is incorrect at present: However, there is a small shift towards earlier visits

Key themes from final qualitative data (n=13)

37 : Incompatibility of systems	9	9	2	20
7 : Changes to administration	4	14	0	18
36 : Difficulties	2	11	0	13
40 : Practical usage	10	1	2	13
16 : Delegation and managing visits	2	0	8	10
6 : Admission avoidance or more appropriate	4	0	5	9
25 : Workforce development	0	2	6	8
41 : Preference for paper	2	6	0	8
11 : MDTs	2	3	2	7
12 : Real-time data collection	5	0	1	6
13 : Travel time & mileage	5	0	0	5
5 : Additional visits or patients	3	0	1	4
19 : Monitoring patient outcomes	1	0	3	4
10 : Increased visits	2	0	1	3
17 : Improved patient care	0	0	3	3
18 : IPOS	3	0	0	3
23 : Standardising procedures	2	1	0	3
35 : Device preferences	3	0	0	3
38 : Issues to watch	2	0	1	3

Oversight & real-time joint decision-making

- I think the erm, the biggest flexibility has come with the delegation role, being able to see where people are and what people are doing

- Actually it's, it's a bit like having a ward out in community now and we are making sure the right person's there at the right time, and that can change during a working shift

Oversight & real-time joint decision-making

- I think it can be misleading because if you tick a 4 it, the delegator will pick up on it, and go ‘oooh’… what are you going to do about that

- It does flag up, high scores and you can sort of say, what are you doing about this, but nine times out of ten, with our team we say I’m already on it
- Yes and that came up yesterday in terms of erm you know instances where the person delegating has noticed things happening
- Absolutely
- And been able to you know intervene or at least erm or even like monitor the process

Oversight & real-time joint decision-making

- …the fact that it comes in live means that …the actual delegator can say …I need more detail, and then they can get the detail then, … and that gives the delegator and clinician the confidence, because it's documented and it's consistently assessed, to actually give an intervention advice or investigation advice or escalation advice, in a way that just couldn't happen if the patient was at home and then you had to come back and wait for a week's MDT…get the notes out and then go through it all again, it literally is converting a two to three week process into a process that takes minutes, and that has to have a profound effect …

More appropriate admissions

- e-shift should probably play a role in more appropriate admissions …like my lady did on Friday, who was a urology patient, or going straight into the McMillan Unit, rather than the front door of the hospital, A&E or medical admissions, I suppose would be possibly due to talking things through with a delegating clinician

- If you are trying to stabilise a patient or trying to gather more information about somebody that is acutely unwell and you can ping that back right to somebody back here who they can then phone the Mac unit or the nurse practitioner at Western Park

- We have more staff on at a weekend, so actually when there are crises and patients in need at a weekend …those patients I presume before could have ended up in A&E…and we are also by doing that if they need admission, getting them to the right place within the acute trust

Travel & coordination

- most people are flexible to be able to say, yes if this is an urgent problem to go back out again but if you can spot them before they are physically back in S11, and they are still in S9, that is only going to be more efficient, so it has happen a couple of times…'Y' did another visit yesterday, just by chance she was on the same street, but she didn't have the notes with her, but she had e-shift so there was enough for her to be going on, on there. So I think that's where, from an efficiency point of view you see some improvements

- If we can see the day that there are patients in that area to be visited and it works for him he can go straight out from home there

- But then can he take his computer, does he take his computer home the day before,

- Yes, or his phone

Travel & coordination

- I think the erm the biggest flexibility has come with the delegation role, being able to see where people are and what people are doing and in the situations like happened yesterday with ‘X’. ‘X’ arrived at a patients home and they weren’t in or couldn’t get hold of them, had already made up a bit of a backup plan hadn’t you?
- Well I had to take something off the next day so I was able to put them in
- So you could just do that, I mean did you take paper notes out anyway?
- No I did it from e-shift

Workforce development

- We couldn’t have had band 5’s on at a weekend…
- Which we have
- Because we have got the delegating clinician

- I think the skill level is higher because they are getting to be more skilled … I think the team are more challenged because through the MDT process, every new patient has been discussed, all the patients in routine are coming back, and being discussed again
- Their plans are being monitored

Workforce development

- The team now operate rapid response Monday to Sunday, previously it was a Monday to Friday service we then introduced Saturday we have now introduced Sunday, and at the weekend we can have up to 4 nursing staff, on duty to support patients across the city. Three years ago we had one…We couldn't have done it without e-shift because we wouldn't have…we wouldn't have had the capacity…the senior support to spread those junior nurses across the system

Workforce development

- What we never thought would happen was the acceleration of nurse's inductions because of e-shift…with the band 5's is that because they have a delegating clinician supporting them from the minute they set foot in that patients home, their working knowledge escalates at such a rapid pace, because they have got a senior person with them, all the time they are out, …they are out visiting far sooner than they would have been because they would have been working alongside a senior nurse, supernumerary for however long,
- Sometimes as long as three months

MDT Meetings

- It was a Jackanory story, when I first started here, it was nice, cos as somebody new to palliative care, I learned a lot in those MDT's from just hearing about people's experiences and we all sat down here as a group and we all, I listened to everybody's treatment plans and one patient would be discussed at length for a long time, but that is not efficient for us all to be down there, whereas now we come down one at a time and just look at our patients and we can get through it

- I think the fundamental difference is that what e-shift does, is it, it makes every contact that involves more than one professional an MDT

MDT Meetings

- A new patient comes into the service, they are triaged, they are assessed, they come into MDT, we then determine their complexity, that then determines the frequency of their visits, it determines their frequency of their return to MDT, and if there are any changes, they automatically then come back to MDT…
- So new patients, yes they come to MDT but if they are seen on a err Wednesday afternoon, they won't be back in MDT till the following Wednesday so the board rounds allow that next day assurance, but you've also got the delegating clinician, who is overseeing the care anyway
- I: Yes, what was the criteria for patients being reviewed in the MDT's before?
- There wasn't one, so it was by luck

Fundamental Changes to Service Delivery and Organisation

- We would have just had a doctor doing their visit, the nurse doing their visit and then bringing it all back to the MDT, but the very fact that we've had e-shift has changed our view, the fact that we've implemented delegated care, means that we have got a central hub clinician, senior clinician, who is the central point for patient information flow and managing that and giving data back,…it's completely changed the principal of how we function within the team the concept of delegated nursing has, has definitely added value but that would not work without the MDT process, and the erm the outcome measures as the basis for screening and more detailed assessment

Key Changes

- Band 5 Nurses: Scaling up/weekend cover
- Real-time decision making
- Constant monitoring of visits
  - Quality assurance
  - Rapid learning
  - Multi-disciplinary/senior support
  - Enhanced skill levels
- MDT meetings: systematic process (supported by delegation)
- Accessible patient information
- Coordination of visits

Initial Investigation of Recent Data

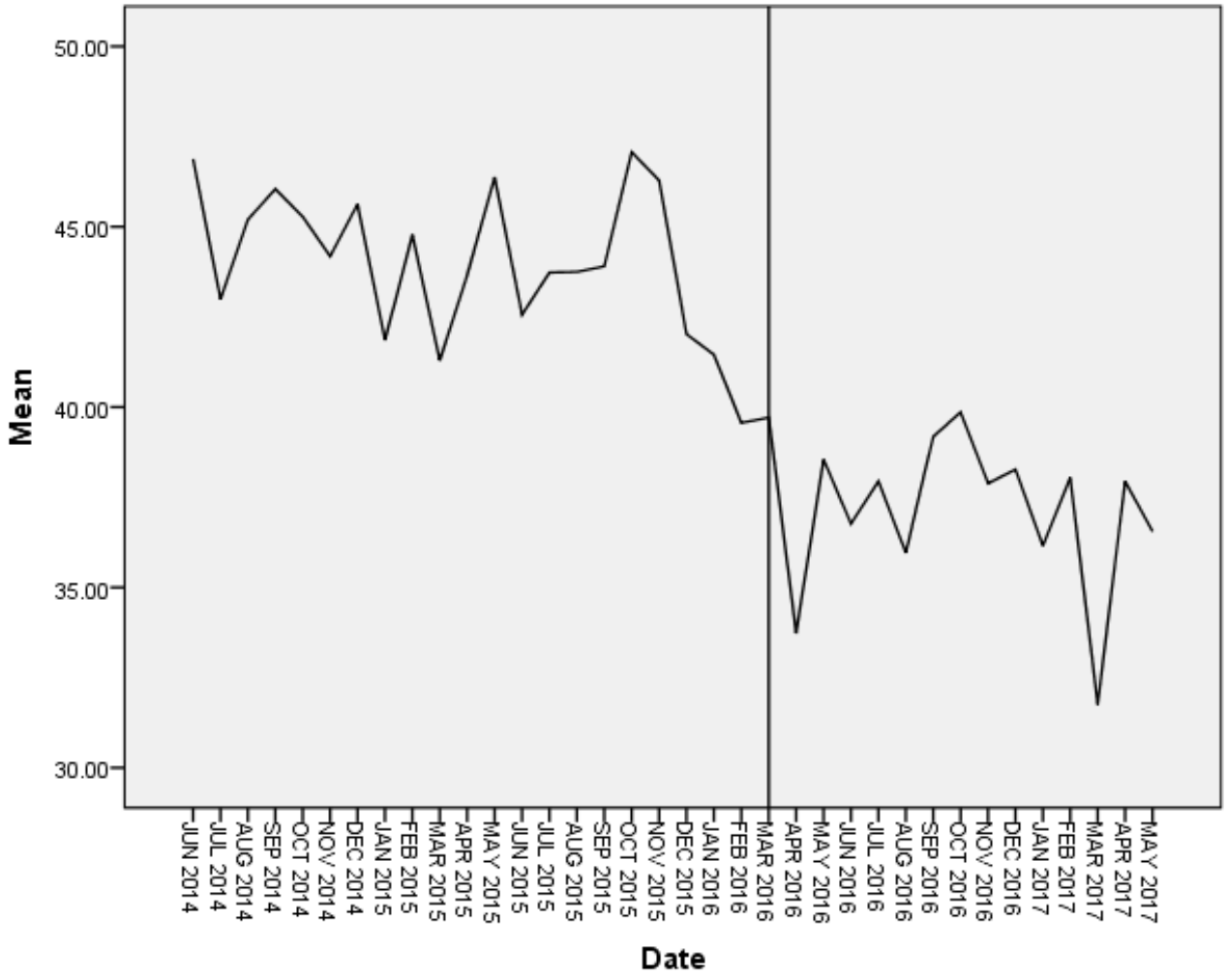
- The following analysis shows the initial visualisation of data that has just been received about contact of hospice patients with acute care services

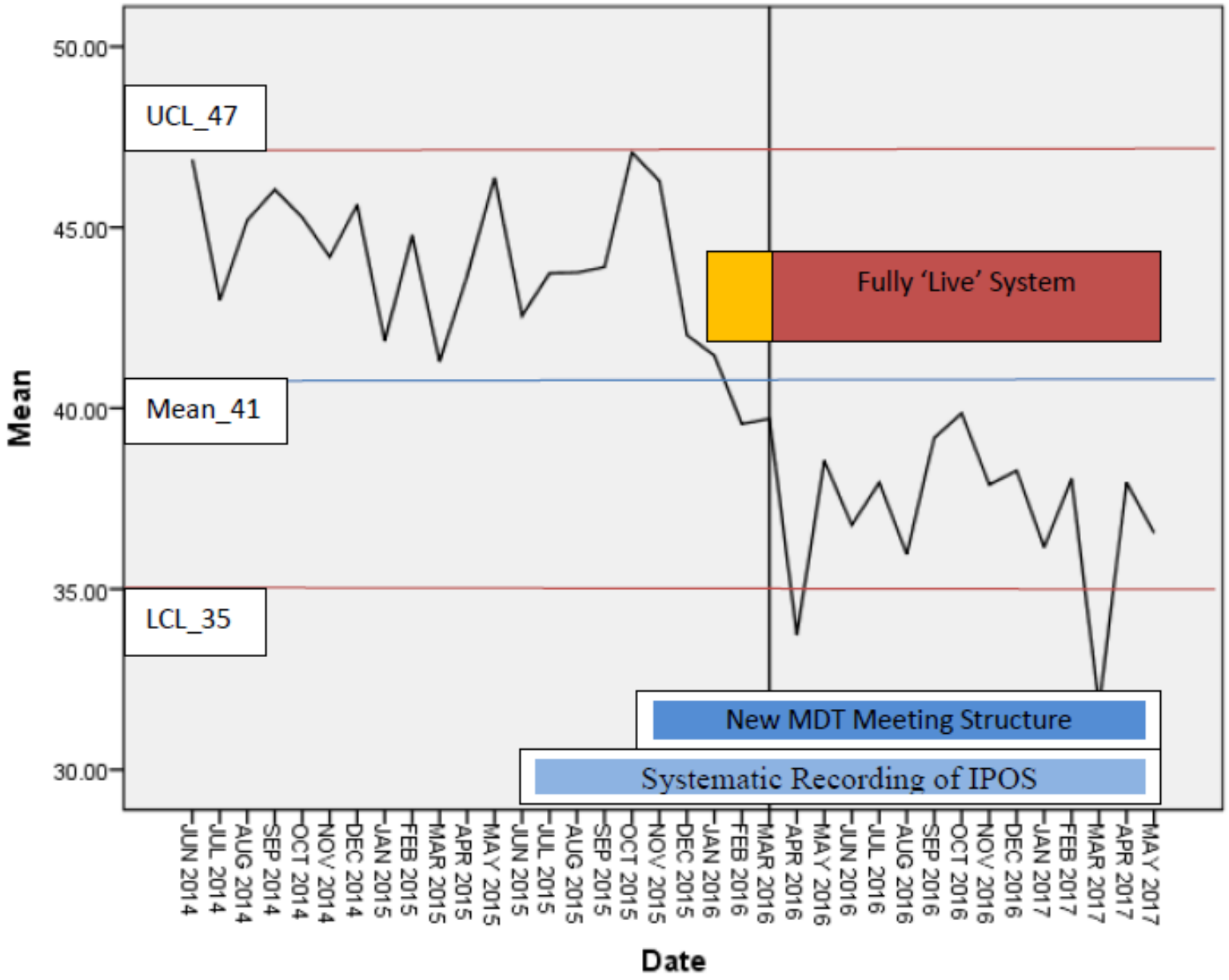
- Further analysis is required, but these findings look promising in terms of demonstrating reduced ED presentations following implementation of the intervention

Mean ED as % of all acute presentations (n=18,871)

T1 = 1st October 2014– 30th September 2015

T2 = 1st October 2015– 30th September 2016




50.00
45.00
40.00
35.00
30.00
Mean
UCL_47
Mean_41
LCL_35
Fully 'Live' System
New MDT Meeting Structure
Systematic Recording of IPOS
JUN 2014
JUL 2014
AUG 2014
SEP 2014
OCT 2014
NOV 2014
DEC 2014
JAN 2015
FEB 2015
MAR 2015
APR 2015
MAY 2015
JUN 2015
JUL 2015
AUG 2015
SEP 2015
OCT 2015
NOV 2015
DEC 2015
JAN 2016
FEB 2016
MAR 2016
APR 2016
MAY 2016
JUN 2016
JUL 2016
AUG 2016
SEP 2016
OCT 2016
NOV 2016
DEC 2016
JAN 2017
FEB 2017
MAR 2017
APR 2017
MAY 2017
Date

CL=(Σ±3)

NIHR CLAHRC
Yorkshire and Humber

The University Of Sheffield.

LIVERPOOL JOHN MOORES UNIVERSITY

Thank you!

Project Team:

Dr Steven Ariss, Evaluation Lead s.ariss@sheffield.ac.uk
Professor Debbie Fitzsimmons, Project Lead D.A.Fitzsimmons@ljmu.ac.uk
Professor Sue Mawson, CLAHRC SY Director s.mawson@sheffield.ac.uk

EnComPaSS Project: http://clahrc-yh.nihr.ac.uk/industry/case-studies/sensory-technologies
NIHR CLAHRC Yorkshire and Humber website: www.clahrc-yh.nihr.ac.uk

This research was funded and supported by the NIHR Collaboration for Leadership in Applied Health Research and Care Yorkshire and Humber (NIHR CLAHRC YH). www.clahrc-yh.nihr.ac.uk. The views and opinions expressed are those of the author(s), and not necessarily those of the NHS, the NIHR or the Department of Health. www.clahrc-yh.nihr.ac.uk

Funded & supported by NIHR