Improving Oversight : Using Data Analytics to improve patient safety in Mental Health and Learning Disability Settings

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Ludlow Street Healthcare

- Established in 2005 with services in South Wales and the South West of England
- Providing care for males and females over the age of 16 who all have complex needs (Mental Health, Learning Disability, Challenging Behaviour)
- c. 1000 staff
- Person centred – values based - up and down org. structure.
- **Hospitals (3)** provide assessment, treatment and rehabilitation
- **Specialist Autism College** provides residential and day placement education and care
- **Community Homes (14)** – 'specialist clinical focus'

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Workshop Outline

- Values Base of Data in Healthcare.
- Current Regulatory and Statutory Issues in the data oversight of Restrictive Intervention Use.
- Development of a system to oversee RI use in a multi site organisation
- Potential future directions Re : potential for use of predictive analytics in mental health care.

A Long History…….

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A Long History…….

Is Healthcare Scared of the Tin Man?

- Tene, Omer and Polonetsky, Jules, Judged by the Tin Man: Individual Rights in the Age of Big Data (August 15, 2013). 11 Journal of Telecommunications and High Technology Law 351 (2013). Available at SSRN:http://ssrn.com/abstract=2311040

> The focus on the machine is a distraction from the debate surrounding data-driven ethical dilemmas, such as privacy, fairness and discrimination. The machine may exacerbate, enable, or simply draw attention to the ethical challenges, but it is humans who must be held accountable.

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Introduction

- Huge cultural shift needed in MH services – support from NHS, DoH.
- 2010 on – scandal (Winterbourne), perception of inadequate focus on human rights for detained patients.
- Balance between risk management and rights assessed as skewed away from patient.
- Recovery movement
- CQC – Safe, Effective, Responsive, Caring, Well Led services.
- You need data to make decisions.

Positive and Proactive Care

Positive and Proactive Care: reducing the need for restrictive interventions

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Leadership, assurance and accountability

- A board level, or equivalent, lead must be identified for increasing the use of recovery-based approaches including, where appropriate, positive behavioural support planning, and reducing restrictive interventions. [Paras 29-31, 109]
- Boards must maintain and be accountable for overarching restrictive intervention reduction programmes. [Para 109]
- Executive boards (or equivalent) must approve the increased behavioural support planning and restrictive intervention reduction to be taught to their staff. [Paras 108, 119, 124, 125]
- Governance structures and transparent polices around the use of restrictive interventions must be established by provider organisations. [Paras 105-109]
- Providers must have clear local policy requirements and ensure these are available and accessible to users of services and carers. [Paras 114-118]
- Providers must report on the use of restrictive interventions to service commissioners, who will monitor and act in the event of concerns. [Paras 109, 128]
- Boards must receive and develop actions plans in response to an annual audit of behaviour support plans. [Paras 58, 109]
- Post-incident reviews and debriefs must be planned so that lessons are learned when incidents occur where restrictive interventions have had to be used. [Paras 46-53]

Transparency

- Providers must ensure that internal audit programmes include reviews of the quality, design and application of behaviour support plans, or their equivalents. [Paras 58, 109]
- Accurate internal data must be gathered, aggregated and published by providers including progress against restrictive intervention reduction programmes and details of training and development in annual quality accounts or equivalent. [Paras 111, 118]
- Service commissioners must be informed by providers about restrictive interventions used for those for whom they have responsibility. [Paras 109-128]
- Accurate internal data must be gathered, aggregated and reported by providers through mandatory reporting mechanisms where these apply, e.g. National Reporting and Learning Service (NRLS) and National Mental Health Minimum Data Set (NMHMDS). [Paras 110-112]

Monitoring and oversight

- Care Quality Commission's (CQC) monitoring and inspection against compliance with the regulation on use of restraint and its ratings of providers will be informed by this guidance. [Paras 8-10, 105, 106, 112]
- CQC will review organisational progress against restrictive intervention reduction programmes. [Para 108]
- CQC will scrutinise the quality of behaviour support plans which include the use of restrictive interventions. [Para 106]

Human Rights in Healthcare

Positive Care... Be PANEL Aware

What is PANEL?

PANEL is a Human Rights based approach to caring for people. Human rights are basic rights and freedoms that belong to every person in the world. As an organisation we are committed to upholding these values and rights.

What are the PANEL Principles?

P PARTICIPATION

Involve the people you look after in their care. They are partners. At all times start off with involving the service user in decisions. If they don't understand, then change how you communicate to support their understanding.

A ACCOUNTABILITY

Be aware of the processes and guidelines that you work under in your unit. Makes sure you always know who's in charge and who is responsible. Make sure you know about the processes that you have to follow when you're faced with a decision. As always, if in doubt, ask.

N NON DISCRIMINATORY

Treat everyone as equal, regardless of their race, age, culture, class, beliefs, disability or sexuality. We expect others to treat us in this way, so we have to deliver this to people in our care.

E EMPOWERMENT

Our service users have often had a lot of their power taken away from them. Wherever you can, support them to make decisions that increase their confidence to make their own decisions and to advocate for their rights.

L LEGALITY

All our work is controlled by laws designed to look after people when they're under the care of others – the Mental Health Act, the Mental Capacity Act and the Human Rights Act. Be aware of what you are and aren't able to do under these laws, and if you're not sure, ask the person in charge. Don't just assume you can do something to someone because they are a service user.

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Sector Challenges

- Cultural
- Clinical
- Operational
- Regulatory / Statutory
- DATA!
  - Unclear stop/risk signals
  - Integration with governance tools (eg Risk Registers)
  - Seen as *“Managers business”*
  - Staff *: ‘High Level’ or ‘Governance’ = ‘Not About Me’*

Regulatory / Statutory

- Document supports CQC
- Requirement of board level governance:
  - Restrictive Practice Reduction
  - A board Level lead for RI Reduction and Recovery Principles
  - Process for restrictive practice review
  - Recovery principles effectively statutory

Department of Health

Mental Health Act 1983: Code of Practice

www.lshea

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Data Management in MH / LD

- Triple Purpose

1. Requirement for incident data for regulation / commissioning (Corporate)
2. Requirement for incident data for CTP (Clinical Outcomes / Effectiveness / EBP)
3. Requirement for incident data to monitor quality and patient safety (Governance)

What We Did….

- Initially – review of all existing paper based reporting forms across all sites.
- Review of purpose of data collection:
  - Functional analysis, plus
  - Frequency and intensity data
- Risk of collecting too much data globally rather than more specific for specific patients (e.g. need detailed Functional Analysis for some patients = clinical task)
- Decision to focus on key patient safety issues
  - Severity and Impact
  - Restrictive Practices
  - Non restrictive effectiveness

Process – Jan 2014 on

- Development of severity / impact scales to operationalise incident data (later superseded by NHS Wales categories)
- Development of electronic body map to ensure no remnant of paper system.
- Building a Restrictive Intervention (RI) database linked to a central governance dashboard.
- Operationalising definitions of RI, and of global Non RIs
- Setting up selective incident notifications for involved clinicians
- Clarifying process of final data sign off (hierarchical)
- Piloting (1 week in each site)
- Development of a staff training booklet

What We Created

- Live incident dashboard with multiple metrics
- Data can be filtered to manage granularity:
  - By Whole organisation
  - By Ward / Unit
  - By Patient
  - By time
  - By location
  - By staff member
  - By severity / Impact
  - By RI use (inc IM PRN)

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How We Use It….

- As the Data Link to our RI Reduction strategy:
- Process:
  - **Local Governance** groups review data monthly by ward / unit in each site.
  - Using a Standardised review of data re: Incidents / RI
    - Type and nature and frequency
    - Trend
    - Restrictive Interventions
    - Reduction Actions

How We Use it….

- **Restrictive intervention reduction plans are** activated on the basis of the data using a format we created.
  - Ward / Unit level
  - Individual Service Users
- The **Corporate governance Group reviews** local governance decisions to activate reviews:
  - Accept decisions or….
  - Mandate a RI reduction plan and review

How We Use it….

- Corporate Governance
  - Now has Live view of whole organisation's RI use
  - Monitors areas of concern
  - Allows data driven decisions re: areas / individuals requiring more clinical input.
  - Live Monitoring of formal Restrictive Intervention reviews – automated notification to RMs and Directors when one is activated.

Advantages…

- Supports understanding of resource allocation
- Can identify ‘hot spots’ across certain sites ref time and location of incidents.
- Can compare multiple sites with similar patient group and triggers questions re comparative data and performance / quality.
- Ensures director overview for multiple sites in a large organisation.

Communication

- ‘Live Data’ system
- Automatic MDT anonymised notification of incident details via automated email.
  - When a safe hold of any kind happens and is placed on the system, every clinician working with that person knows and everyone knows that everyone knows.
- Ensures whole team communication re incidents

Feedback

- Standard formats for feedback to service users (Automated).
- Feedback to all clinical teams for quality and governance purposes.
- Automated notifications to commissioners for notifiable incidents.

Challenges

- Functionality re : data analysis limited to an .xls database underneath MS Sharepoint
- Limit to metrics that can be computed e.g. modal data.
- Some issues with metric based triggers (e.g. no current functionality to notify if use of RIs crosses threshold for review – needs local governance eyeball review)

Challenges - Internal

- A learning process re: what global metrics are most useful given almost infinite granularity.
- Visualisation issues with Excel – can appear messy / hard to pick out key info.
- Size of database
- Cultural – supporting clinicians to use data for decision making as well as clinical judgement / impressionistic views.

Challenges - Internal

- Requires reliable connectivity and adequate IT infrastructure.
- Changes to underlying software can cause resource drain
- Balance between generic and specialist clinical data – agreement on key metrics for CTP / CPA between psychologists!

Challenges - External

- Constantly changing regulatory and reporting landscape.
- Operational definitions of severity – variance across settings
- Current benchmarking re use of RI "Restraints/1000 bed days." – contextual benchmarking needed.
- Balance between use as governance sharing info (regulation) and clinical sharing (commissioning).

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The Future? (What We Want to Do)

- Use of Deep Learning models to autonomously probe and pick up patterns in the data that people can't?
  - We have noticed that as the dataset grows larger, patterns emerge visually (eg pareto type distributions)
  - Wouldn't it be good if:
    - Mental health services could work together to develop a system that will learn what relation variables are associated with a greater risk of particular incidents (in terms of both Order and Association)
    - Mental Health and Learning Disability services could predict likely resource and treatment need for individuals based on comparing individual behavioural data parameters with 'big data' derived prototypes.

The Future? (What We Want to Do)

- Use of predictive analytics to predict times of increased resource need (and intervene proactively)?
  - Wouldn't it be good if we could confidently allocate staffing and predict demand based on a probabilistic variable derived from actual behavioural data? (eg it is likely at a probability of X that a service will experience high demand at X time in X location given historical data)
  - Wouldn't it be good if we could have staff at the ready to provide additional proactive support if a trigger signal (based on past events) is detected in behavioural data?
  - Wouldn't it be good if this was done automatically?

The Future? (What We Want to Do)

- Automatic flagging of the global data conditions that typically precede Serious Incidents to populate a live clinical risk register?

  - Wouldn't it be good if managers and directors were able to see changes in risk imminence in each area they oversee, live, and with the awareness that the assessment is based on actual past events and patterns?

The Future? (What We Want to Do)

- Live access to dashboard by Service Users?
  - Wouldn't it be good if users of our service and their carers and families could gain live access to their own data, to support their own recovery.
  - Wouldn't it be good if we could give people an evidence based overview of their progress through the system, linking changes in outcomes with actual treatment provided?

Conclusion : Clinicians and Technology

- The Mental Health and Learning Disability system is too often not safe enough for people under our care.
- Understanding people and behaviour and organising systems around high risk behaviour is risky and complex – a “Wicked Problem”.
- Mental Health and Learning Disability clinicians are uniquely placed to understand the context in which behavioural data works.
- If patient safety in MH and LD care is achieved by
  - Applying knowledge in context
  - Eliminating process gaps
  - Learning from error
  - Reacting to acute risk signals
- Then without clinician involvement in design of data systems, it will be harder to achieve.

Conclusion : Mental Health Clinicians and Technology

- Mental Health and Learning Disability clinicians are uniquely placed to understand the context in which behavioural data works.
- If patient safety in MH and LD care is achieved by
  - Applying clinical and historical knowledge about individuals and groups in context.
  - Eliminating process gaps
  - Learning from error
  - Reacting to acute risk signals
- Without clinician involvement in design of data systems, useful systems will be harder to achieve.
- We are responsible for shaping the agenda
- It's not just a software / tech issue.

Finally : The Moral Economy of Tech

“Today we are embarked on a great project to make computers a part of everyday life. As Marc Andreessen memorably frames it, "software is eating the world". And those of us writing the software expect to be greeted as liberators. Our intentions are simple and clear. First we will instrument, then we will analyze, then we will optimize. And you will thank us.

But the real world is a stubborn place. It is complex in ways that resist abstraction and modelling. It notices and reacts to our attempts to affect it. Nor can we hope to examine it objectively from the outside, any more than we can step out of our own skin.

The connected world we're building may resemble a computer system, but really it's just the regular old world from before, with a bunch of microphones and keyboards and flat screens sticking out of it. And it has the same old problems.

Approaching the world as a software problem is a category error that has led us into some terrible habits of mind. “

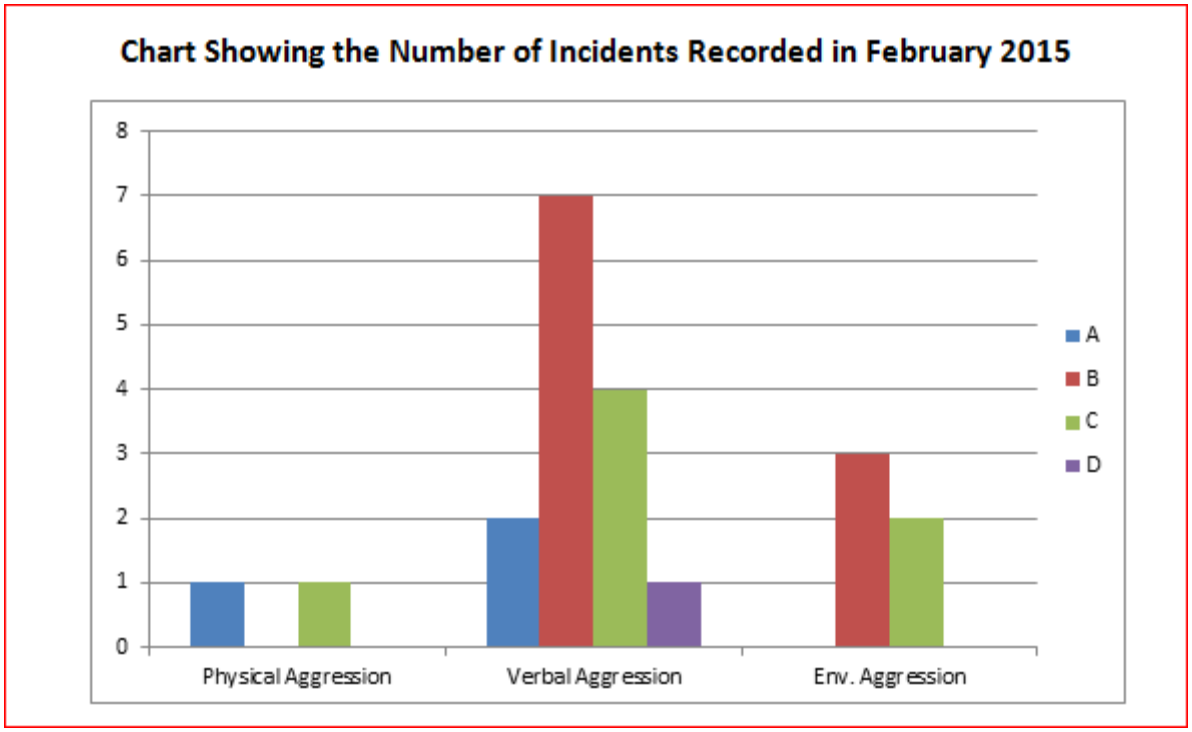
Maciej Cegłowski, June 26, 2016, at the SASE conference in Berkeley, CA.

http://idlewords.com/talks/sase_panel.htm

Where We Are Now

- All sites on system as of January 2016 (18 locations)
- Over 2 Million data points in granular system
- Development of specialist analytics to increase automation and develop as a governance and patient safety tool.

Simple Behavioural Frequency Graph (Individual)



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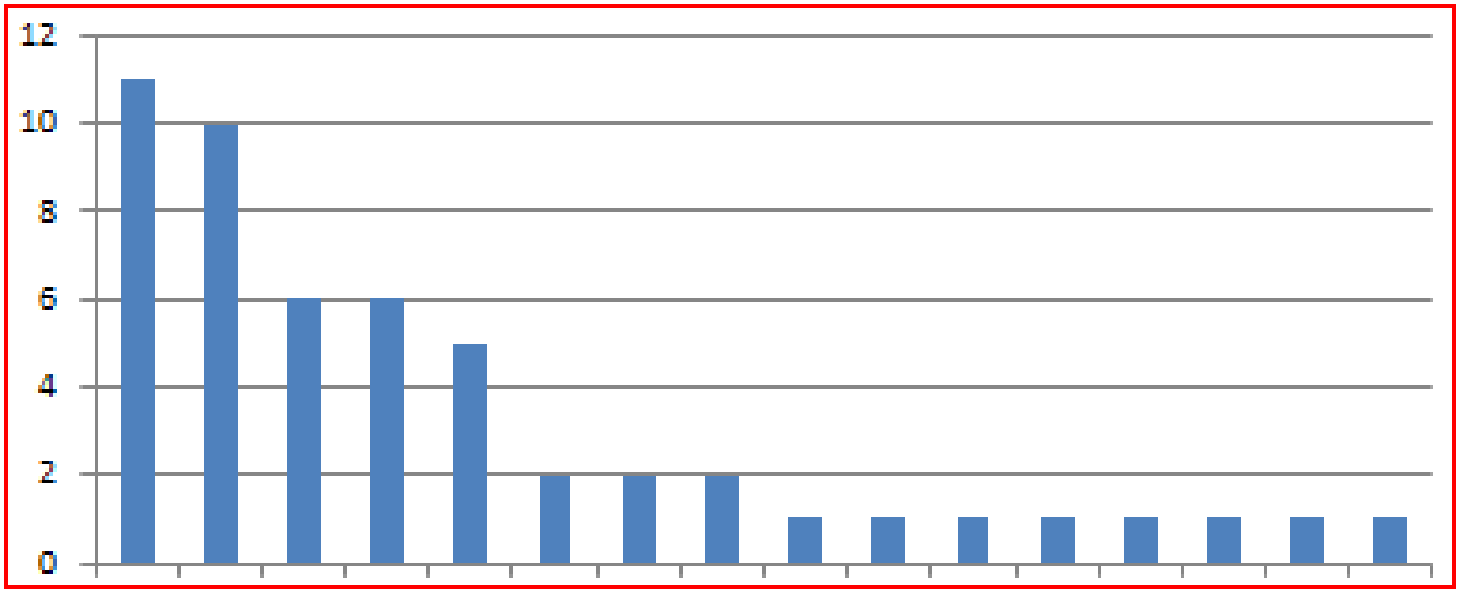
Example PRN Monthly Chart of all PRN used during incident on a Single Ward – by Service User



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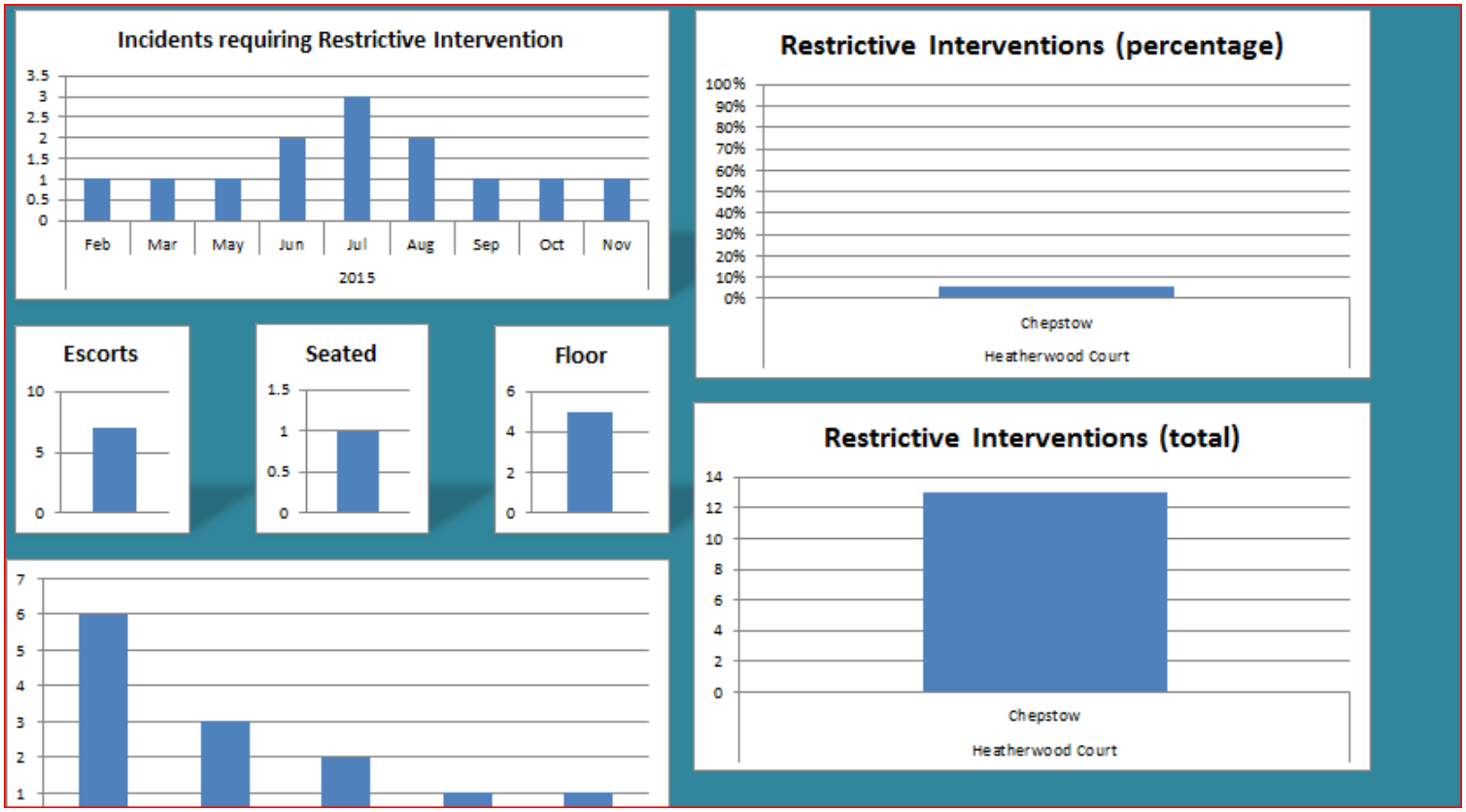
RI Dashboard - Local



We can see summary RI data at any level we want…(Individual, Ward/Area, Hospital/Sub-Unit, Whole Org)

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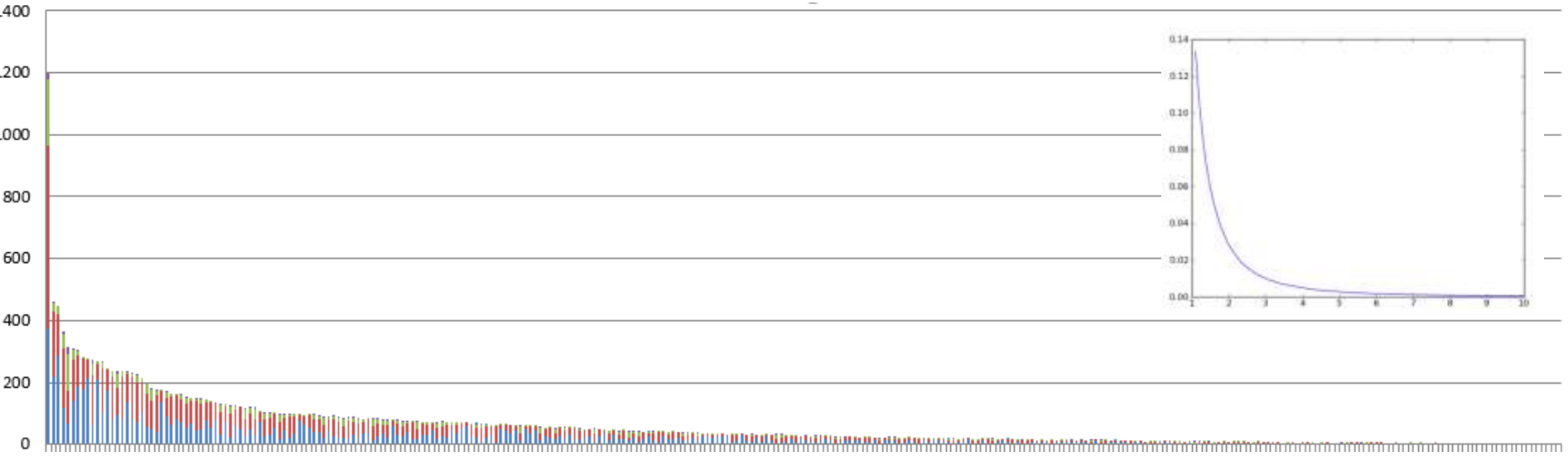
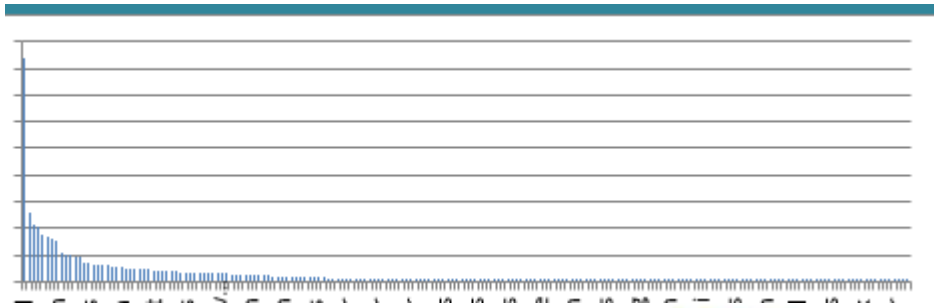
Incidents by SU Graphs:

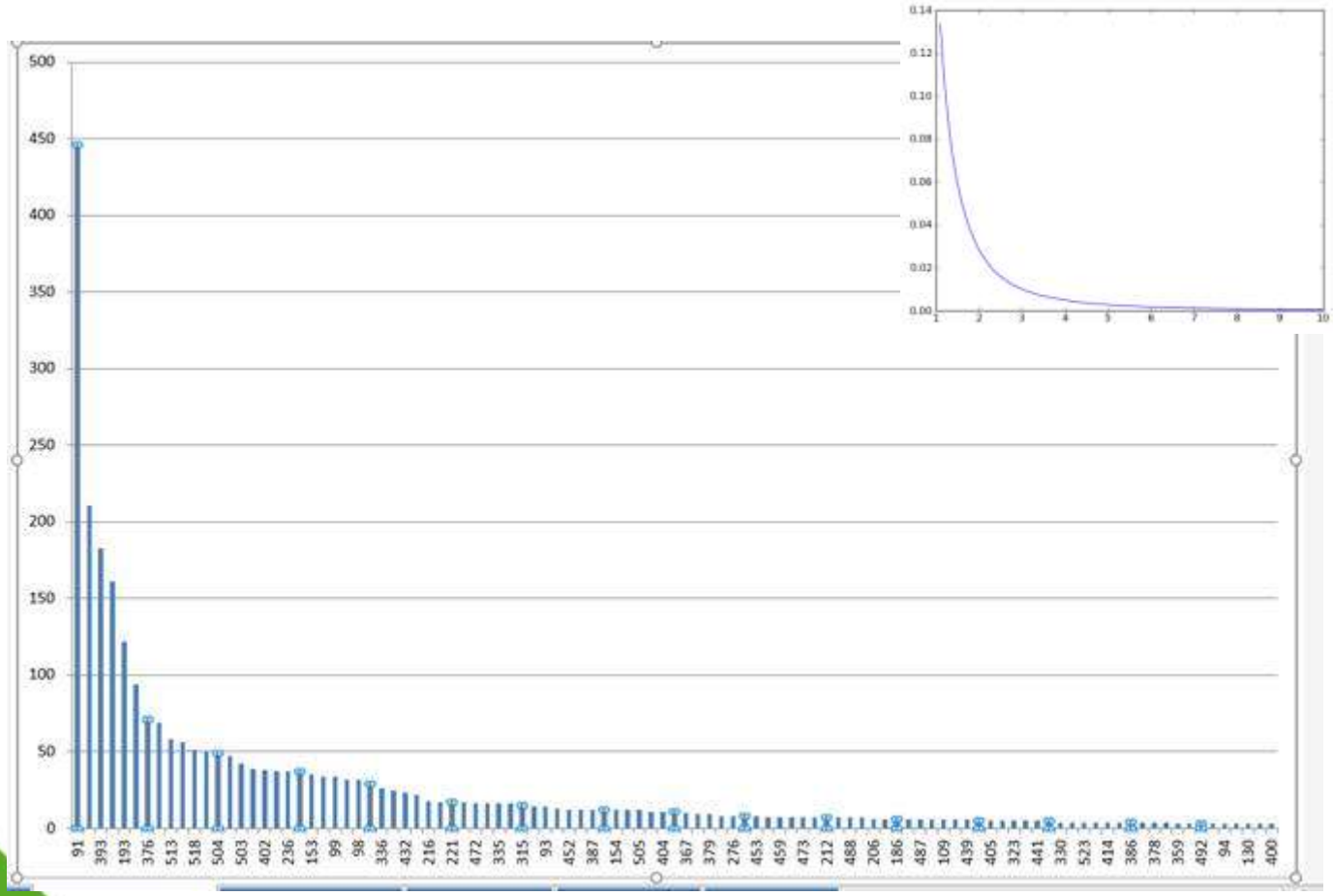
Total incidents (all users) by severity (cumulative, all sites)



….and cumulative frequency use of RIs across all users in all sites (note outlier and note shape of graphs)



Total Of All RIs Used showing distribution



We can take a data driven approach to supporting people – high use of RI over time occurs in a small number of people – therefore need for clinical responsivity re: resource and intervene (proactively and reactively)

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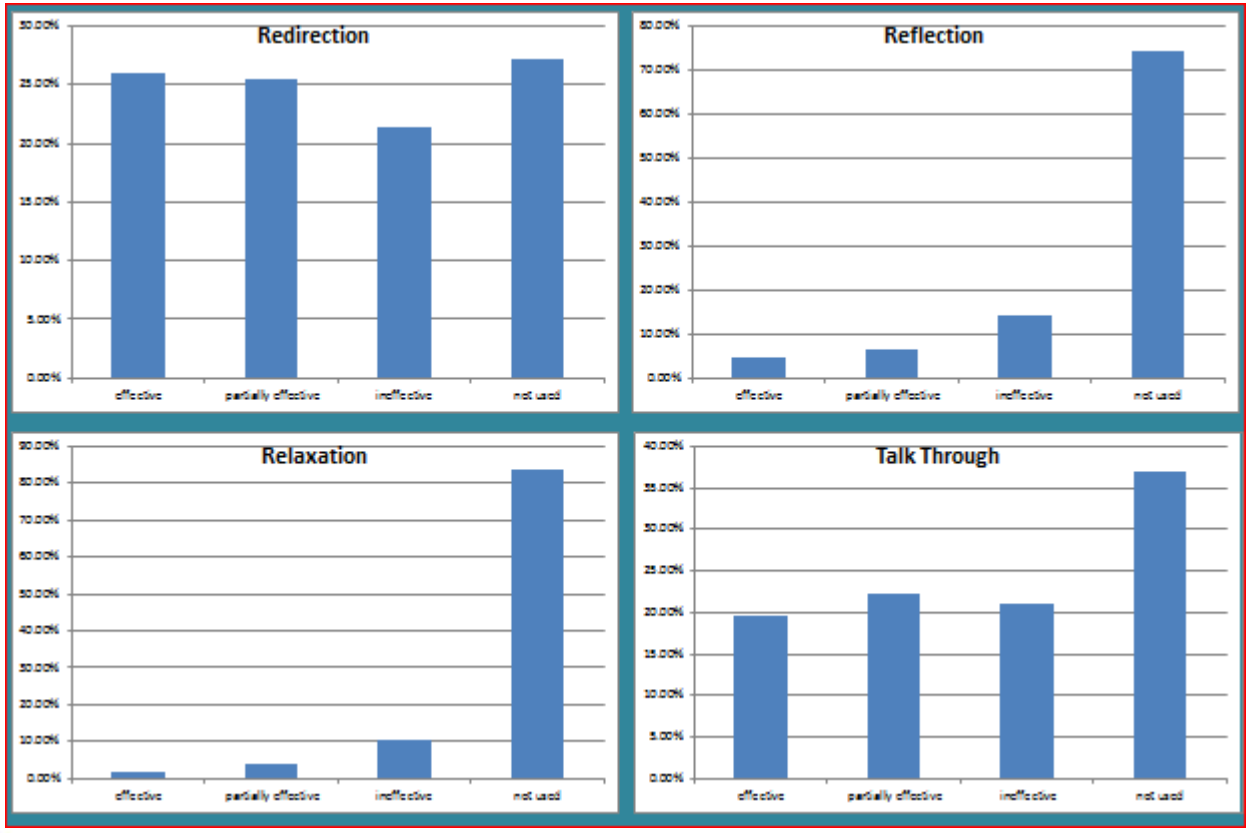
Non RI Dashboard - Local



Tells us information regarding use of and effectiveness of non restrictive responses .

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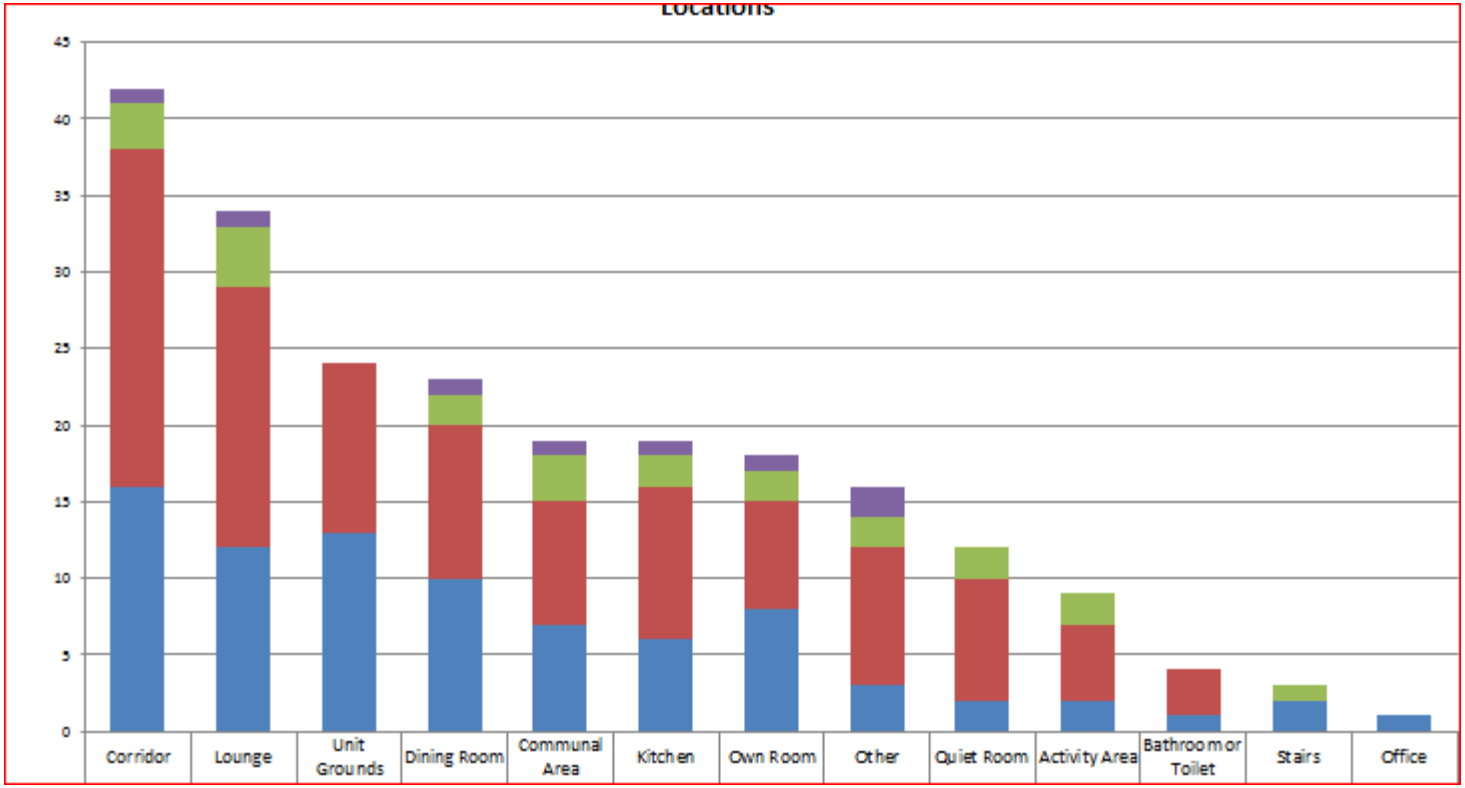
Location Dashboard - Local



Tells us where things are happening – by severity

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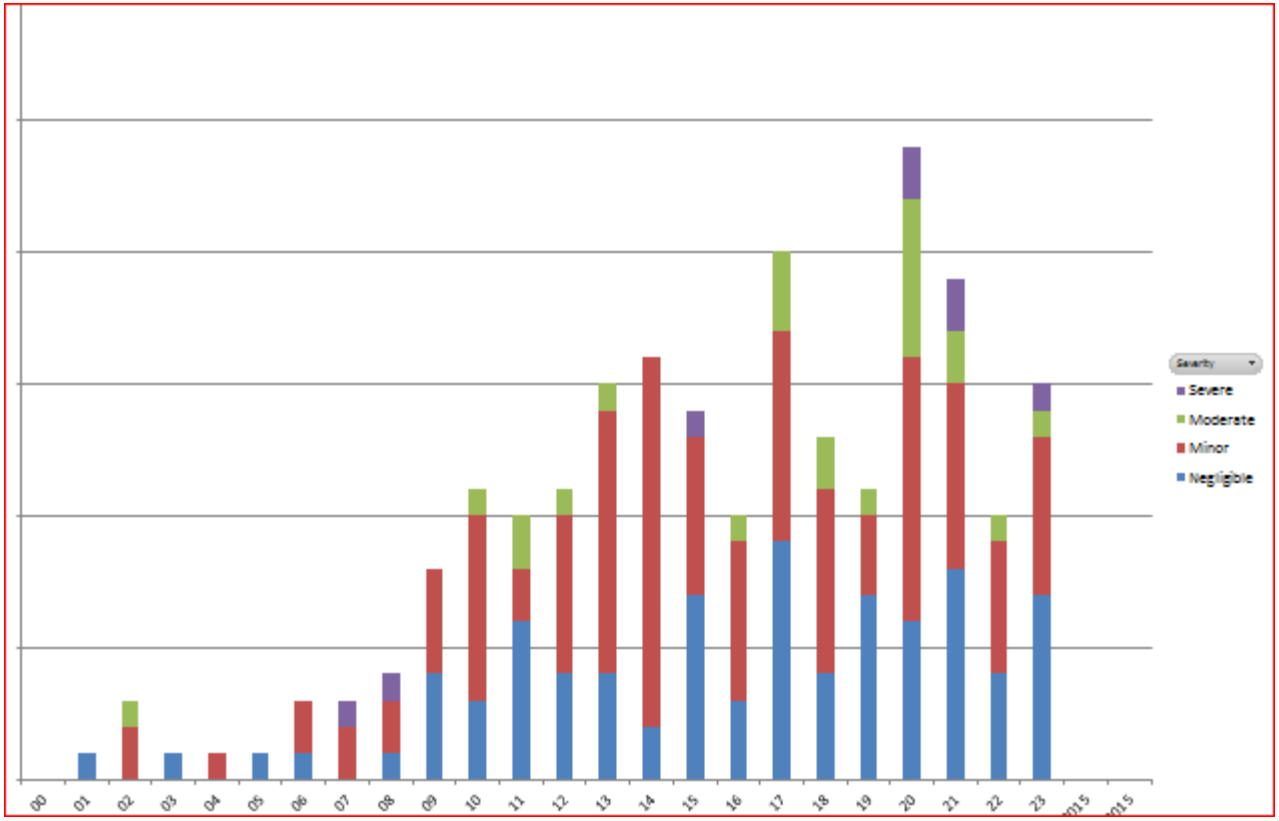
24HR Dashboard by Severity - Local



Live view of temporal pattern of incidents by severity

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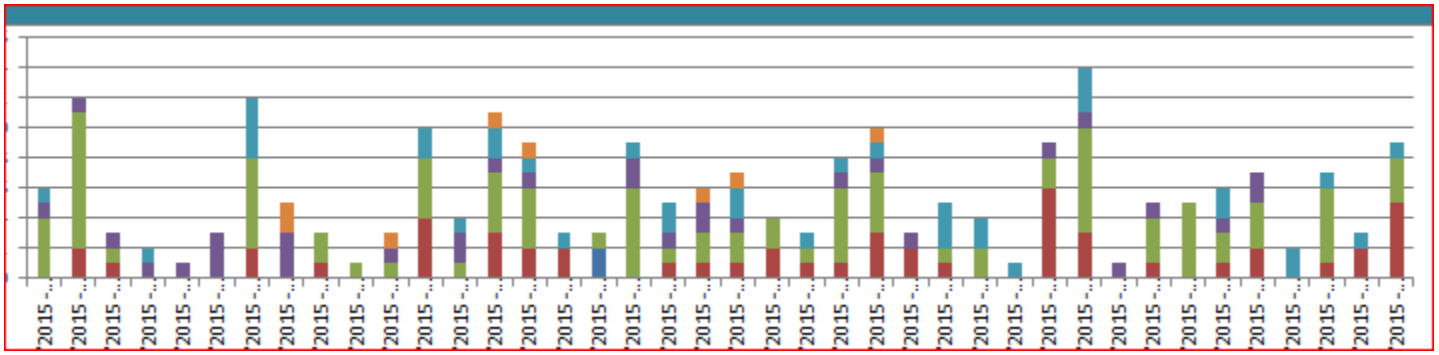
Weekly Dashboard by Type



Allows a live view of both frequency and type of incident by week at any level of granularity

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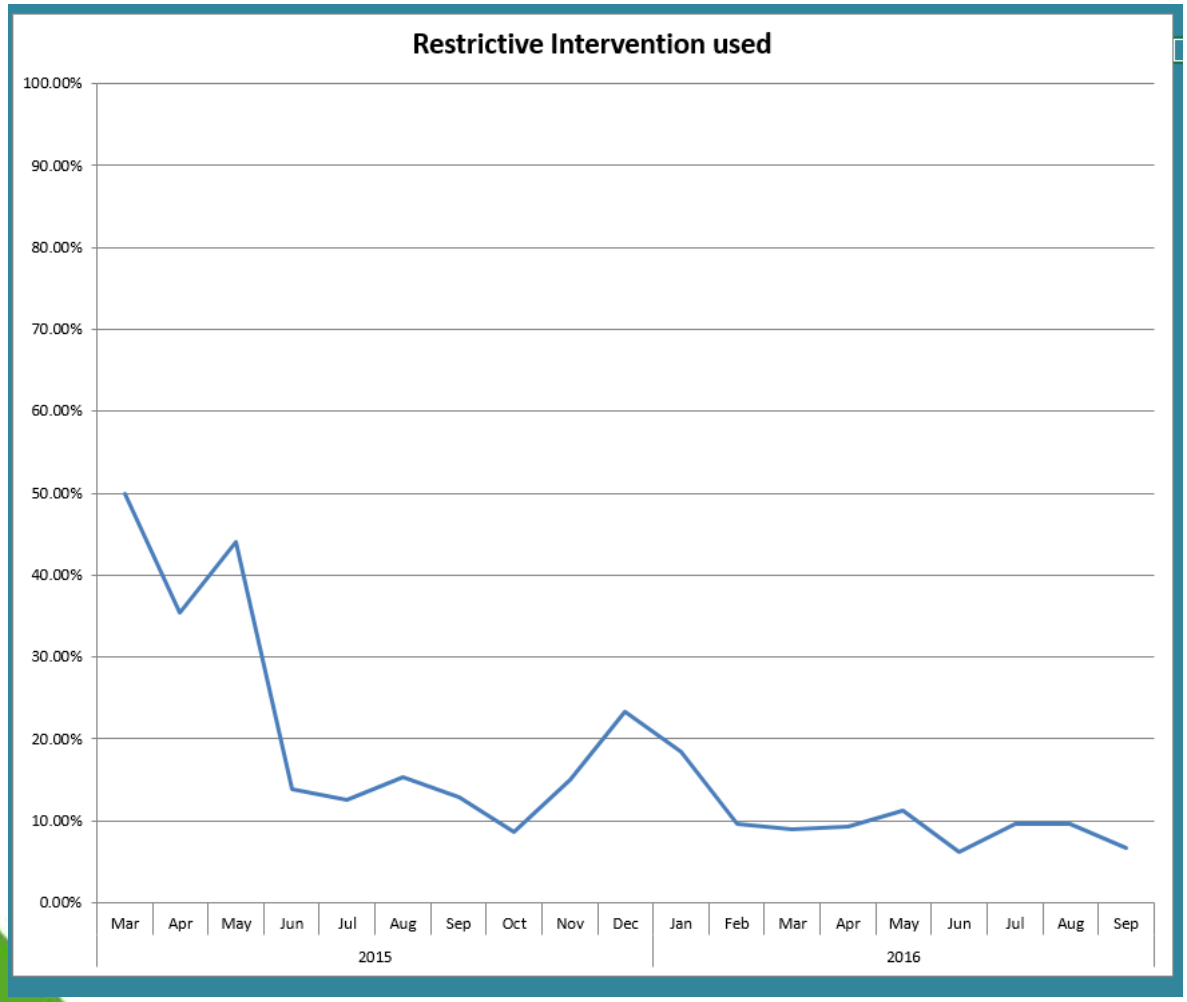
RI Proportional Ratio – Example of Data for a Local System (Multiple Sites)



Allows for granular oversight of percentage response to incidents that would be described as 'restrictive' NB variability in services coming on to system – full integration by Dec 2015

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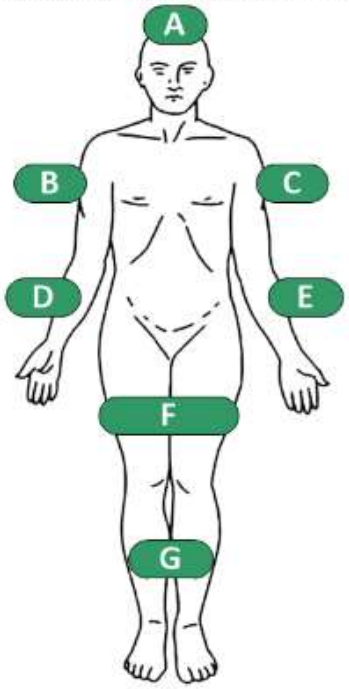
Electronic Body Map, with staffing info

Type of intervention	Escort
Duration of intervention (minutes)	1 - 5m
Individuals involved	Agency ☐ (a) Head ☐ MASON, Andrew (b) Upper right arm ☐ HIDER, Andrew (c) Upper left arm ☐ (d) Lower right arm ☐ (e) Lower left arm ☐ (f) Upper legs ☐ (g) Lower legs



We have easy oversight re: staff involved in RI use

Thanks

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