

January 2018

What can we learn about safety?

Guidance document to support use and understanding of the
Safer Intelligence dashboard

Version 2. Review by September 2018

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Introduction to Safer Intelligence

Safer Intelligence is an enabling driver of the Safer Salford programme. The first phase of this programme aims to “collaboratively test and produce a roadmap, enabling Salford to become the safest health and social care system, by April 2018”.

The Safer Intelligence work-stream seeks to address a gap in Salford by bringing together data from across the health and care system to create a system-wide measurement tool, based on the latest thinking in safety. This gap was identified by a scoping project to understand how data is currently used by primary, secondary (including mental health) and social care providers and commissioners. The measurement tool has been developed to enable improvement in how information is used to learn about safety for residents in Salford.

Design principles

In 2013 Professor Charles Vincent *et al*, proposed the Measurement and Monitoring of Safety Framework (“the MMS framework”¹) as a way to think differently about safety in healthcare, taking learning from high risk industries. The MMS framework highlights five dimensions which should be included in any safety monitoring approach to give a comprehensive and rounded picture of safety², which seeks to address the imbalance between leading and lagging indicators.

The following design principles for the dashboard are agreed:

- measures will include a combination of past harm, current climate and predictive tools, following the principles of the MMS framework
- a strategic dashboard will be used to establish an overall picture of how the system is performing
- measures will enable identification of areas for improvement, including measures which identify ‘best in class’ performers to support learning
- the target audience will be senior leadership within a new integrated care system
- presentation will be simple, visually appealing and interactive to help a broader audience make sense of complex data
- data collection and display will link to existing IT systems, adding value and narrative to complement existing measures, avoiding duplication

¹ Also known as the “Vincent Framework”

² Visit <http://safersalford.org/framework/> or <http://www.health.org.uk/node/534> for more information about the MMS Framework

What can we learn about safety

Using the Safer Intelligence dashboard

The dashboard is specifically presented to support learning and stimulate further discussion and investigation. A deliberately small number of measures are included to provide a strategic oversight of how components of the health and care system are interacting to deliver for patients, rather than telling the whole story.

The dashboard is at its most successful when users are moved away from looking at data for assurance toward inquiry, prompting searching questions such as “what can we learn about safety?” and “are we getting safer?” The need to look elsewhere for answers can be frustrating – particularly in an environment of limited time for looking at data – however a core principle of the MMS framework reflects the need for reflection and learning, which can only come through interrogation and deeper understanding of information presented.

Definition of safety

There is no single definition of safety across health and social care; even within individual settings and conditions, understanding of safety varies considerably. From the early stages of development it was clear that it would not be possible to definitively categorise “safety” in Salford, indeed the MMS Framework advocates that we shouldn’t seek to do so.

The dashboard uses a small number of measures to provide an *indication* of safety, and should be viewed in that light. Indicators selected are chosen on the basis that the management and impact of harm can be mapped through the Salford health economy, and they provide a narrative for how the system is interacting and working together to reduce harm.

Introducing the measures

- **Falls** – Salford has the second highest directly standardised rate of falls admissions in England; a rate substantially higher than the England and North West averages, and the highest in Greater Manchester³. Falls can happen anywhere, but most occur at home. Whilst falls can result from a variety of different causes, many are predictable and preventable. Displaying data will support system-wide improvements, with a real opportunity to benefit patient outcomes.
- **Medicines** – actions and management of medication takes place in all health and care settings, therefore this is readily recognised as a system-wide concern. It is evident that there is a considerable amount of existing data that is being collected regularly across Salford. However this is not necessarily fully interrogated (e.g. to show change over time), nor systematically brought together and shared across all relevant professionals, groups and organisations.

The selected indicators above should not be viewed as the only measures of safety, nor the only ones of importance; there are a number of other common harms which could equally be the focus of

³ Public Health England. Public Health Outcomes Framework 2015, Cited 12/11/2015, Available from [http://www.phoutcomes.info/.](http://www.phoutcomes.info/)

this dashboard. We recommend that a prioritisation exercise take place before further indicators are added, to make sure investment in measurement is targeted towards generating greatest learning.

- **Resilient operations** – in this measure, we seek to surface health economy wide data to understand how flow and staffing impact safety outcomes. Although individual organisations have mechanisms to provide and review this data to a high degree of sensitivity⁴, this isn't used at a system-wide level to understand the interrelationships between sectors, nor viewed directly alongside safety measures.
- **Behaviours** – the MMS Framework highlights many examples of specific behaviours, which make an organisation safe, such as patient safety champions, leadership walk rounds, safety huddles and safety culture. It is notoriously difficult to measure and monitor prevalence of specific behaviours, to do so would result in an over-reliance and repetition of complex staff surveys or filling out forms that would be seen as tick box exercises across Salford. Measures in this dashboard are solely leading indicators and form part of our learning as to how to build a safe health and care system.

Mapping the dashboard to the MMS Framework domains

The below matrix demonstrates how the 5 domains of the MMS Framework have been incorporated across the measures, demonstrating how the dashboard re-addresses the balance in the use of leading and lagging indicators. The matrix shows the interrelationship between measures and how indicators should be used alongside one another to present a complete picture of safety in Salford.

	Past 'harm'	Reliability	Sensitivity to operations	Anticipation and preparedness	Learning and integration
Falls	Y	Y		Y	Y
Medicines	Y	Y		Y	Y
Resilient operations	Y		Y	Y	Y
Behaviours			Y	Y	Y

Caveats

The sample size for all data presented in this dashboard is all Salford *residents*. This sample is used to ensure consistency with other data presented and used in health and social care settings across Salford (in particular within the integrated care organisation).

Two important caveats must be taken into account when reviewing the Falls and Medicines indicators:

- Data displayed geographically will not capture data from patients who are *resident* within Salford, but admitted to secondary care *outside* Salford, e.g. Bolton
- Data displayed by GP practice will not include patients *registered* with the practice, but resident *outside* of Salford

⁴ For example TrendCare and CUR which is used to provide real-time data in Salford Royal

Falls

1. Admissions to SRFT as a result of harm from fall

This chart provides historical data since January 2015 for the *rate per 100,000 population*. Using rules for interpreting SPC charts (see Appendices - Reading SPC charts on page 16), the upper and lower control limits portray the common cause variation observed within the system, by extending these lines into the future, we can have an idea of the falls rate we can expect to see, if we make no further changes to the system.

Caveats

- This only includes the most severe harm from falls (i.e. those requiring an admission to secondary care), therefore we recommend further investigation at a local level to understand more about the frequency of falls with and without harm
- The data does not include falls taking place when already in SRFT
- Admissions to SRFT are used as a proxy for all admissions due to falls. Residents living on the outskirts of the city could be admitted to neighbouring hospitals for which data is not included in this dashboard.
- The limits on the chart are dynamic only when all Salford data is included. When one or more specific area(s) are selected the limits of the charts are based on data of the first 12 months and won't rebase if special cause is visible.
- Patients need to have been discharged and their admission needs to have been coded before the patient's data will be included on this dashboard. This can result in a 2-3 month delay before all data is available. The last 2-3 data points will change upwards if the data wasn't complete before.

Further information / sources to investigate

NHS 'Classic' Safety Thermometer is collected at SRFT and in some care homes, providing data over time on rates of falls and falls with harm.

Can admissions data for Salford residents be sought from neighbouring hospitals to give a more complete picture?

The safeguarding team at SRFT collects information on falls for all residents that are safeguarded.

ONS captures mortality figures from which falls can be extracted.

2. Where falls are occurring

This map shows the rate of falls by neighbourhood (minus residents living within a care home), the more red a neighbourhood, the higher the rate of admissions. This information can provide helpful signals as to where resources to prevent falls could be targeted when viewed alongside "sensitivity to operations" measures.

The data used in this map could be interrogated further alongside other data to understand a relationship between two factors, such as location and indices of deprivation.

Caveats

- Data displayed geographically will not capture data from patients who are *resident* within Salford, but admitted to secondary care *outside* Salford, e.g. Bolton
- The data does not include falls taking place when already in SRFT

Further information / sources to investigate

NHS 'Classic' Safety Thermometer is collected at SRFT and in some care homes, providing data over time on rates of falls and falls with harm in these settings.

At a local level, further investigation could be taken into understanding the specific location of falls – in the home or in the street, where in the home, etc.

3. Number of referrals to Falls Service

This chart provides historical data since January 2015 for the number of referrals made to the community rehab service. This service estimates that upwards of 80% of referrals are falls related. These falls related referrals are dealt by the multidisciplinary Falls Team. These data can help answer a number of questions relating to our theory of change:

Are falls risks assessments taking place?

Will health and care professionals refer patients at risk of a fall to a dedicated pathway?

Will use of a specialist falls pathway / service reduce the number of falls with severe harm (when viewed alongside the admissions measure)?

We can use this data to understand whether we are improving over time by applying the rules for interpreting SPC charts.

Caveats

- The number of referrals made to a service may be impacted by other factors, such as awareness of the service
- The total number of referrals also includes referrals for other community rehab services, any change in those numbers will have an impact on this data.
- The limits on the chart are dynamic only when all Salford data is included. When one or more specific area(s) are selected the limits of the charts are based on data of the first 12 months and won't rebase if special cause is visible.

Further information / sources to investigate

Compliance data looking at % of and time to complete follow up actions after a referral has been made. Further analysis could identify the demographics of patients being recorded and their health care needs.

Linking the number of referrals to the falls service with where do falls happen, helps to see if the intervention efforts are paying off and if the residents who ended up in hospital because of a fall did have a proper intervention

NICE guidance, Falls in Older People (QS86)⁵ recommends as process measures the “proportion of older people asked about falls during routine assessments and reviews with primary care services/community health services/presenting at hospital.” This data is not currently captured in Salford,

One of the main preventative programmes for falls in Salford is Postural Stability and Step up training. Data are available from Salford Active Leisure showing who has signed up for/received Postural Stability and Step up classes.

4. Who is most at risk?

This chart provides an analysis of the proportion of residents in each neighbourhood who fall into high risk groups. In Salford, being over 80 years of age and having a diagnosis of dementia are considered to be two of the main risk factors for falls⁶. By identifying the proportion of residents in each neighbourhood who carry both risks, we can predict that we would expect to see a higher number of falls in these areas. This information can provide helpful signals as to where resources to prevent falls could be targeted when viewed alongside “resilient operations” measures.

Caveats

- Using the number of people diagnosed with dementia as a source for this measure would be problematic because it is acknowledged that dementia is underdiagnosed⁷. The number of people on the dementia register has therefore been selected as proxy for this

Further information / sources to investigate

Other factors which could be viewed to identify “at risk” population include alcohol-related conditions and setting (i.e. people living alone).

Could these data be used together to target at-risk groups?

⁵ <https://www.nice.org.uk/guidance/qs86>

⁶ Salford Falls Prevention Review, 2016, Strategic Director of Public Health, Salford City Council

⁷ Public Health England and NHS England. NHS Atlas of Variation 2015, Available from http://www.rightcare.nhs.uk/atlas/2015_IAb/atlas.html.

Medicines

1. Admissions to SRFT as a result of adverse medicines event

This chart provides historical data since 2015 for the *rate per 100,000 population*. Using rules for interpreting SPC charts, the upper and lower control limits portray the common cause variation observed within the system, by extending these lines into the future, we can have an idea of the admissions rate we can expect to see as a result of medication error, if we make no further changes to the system.

Caveats

- This only includes the most severe harm as a result of an adverse medicines incident (i.e. those requiring an admission to secondary care), therefore we recommend further investigation at a local level
- Adverse medicines events do not directly correspond to medication *errors*. For example, a patient may be admitted to hospital as a result of a known side-effect of medication, without the presence of any medicine administration error
- Data is reliant upon use of appropriate coding at the admitting unit in secondary care, therefore may be influenced by changes to coding culture
- Admissions to SRFT are used as a proxy for all admissions due to medication errors. Residents living on the outskirts of the city could be admitted to neighbouring hospitals for which data is not included in this dashboard.
- The data does not include any adverse medication events which take place during a stay at SRFT

Further information / sources to investigate

Given the known issues around coding of medication errors, work could be done to triangulate the errors revealed by coding with those reported in systems such as DATIX. What are the most prevalent medication errors and could there be a drive to improve the coding of these?

Can admissions data for Salford residents be sought from neighbouring hospitals to give a more complete picture?

What work is undertaken that impacts severe adverse drug events?

2. Where are admissions coming from?

Patient medication is typically managed by patients at home. It is useful to understand the role of primary care in medicines management, for this reason we look at the rate of admissions by GP practice. This has been reflected in feedback provided during the testing phase of this dashboard.

The purpose of providing this information is to signal the practices who appear (on the basis of serious harm as a result of medication error) to be 'best in class' to being a process of sharing learning and tools to effectively manage medications.

It is possible to isolate individual or a group of practices and identify whether there is an improvement over time in relation to the other measures.

Caveats

- Data displayed by GP practice will not include patients *registered* with the practice, but resident *outside* of Salford. Therefore practices located on the outskirts of the city may show lower rates of admissions which should be treated with caution.

Further information / sources to investigate

The rate is calculated with the use of NHS England's Weighted populations for core CCG allocations for 2016-17 to 2020-21. See <https://www.england.nhs.uk/publication/nhs-england-allocations-2016-17-to-2020-21-overall-weighted-populations-for-core-ccg-allocations/> for more information on the measures and the actual figures.

Are there comorbidities that increase the chance of an adverse medication event (such as mental health conditions)? What can ambulance call-out data tell us about harms from adverse medicines events?

3. Dangerous drug combinations

This measure highlights the number of patients currently prescribed a combination of drugs which could lead to severe harm. The measure presented relates to the number of patients with a history of peptic ulcers prescribed anti-platelets without a co-prescription of gastro protective medicine. This measure has been identified from the SMASH dashboard⁸ as the most prevalent prescribing error in Salford and therefore is presented here as an overall indicator of safe prescribing.

It is possible to isolate individual or a group of practices and identify whether there is an improvement over time in relation to the other measures.

Where viewed in combination with the medicines reconciliation information, and staffing (e.g. capacity of GP and pharmacists) it can tell a story as to the reliability of the medicines prescribing processes in Salford.

Caveats

- A focus on this single prescribing measure may steal focus from other issues, therefore should be viewed purely as an indicator to direct inquiry.

Further information / sources to investigate

Practices may wish to look in more detail at other SMASH measures to understand the prevalence of safe prescribing in their locality.

Other predictive measures for understanding the drivers of harm from adverse medication events include prescribing errors and the use of error warning systems and polypharmacy rates

Adherence to medication prescriptions is notoriously difficult to measure, would provide an insight into patient understanding and behaviours, for example, appropriate use of compliance aids.

⁸ The Salford Medicines Safety Dashboard is a web application that allows primary care professionals to spot instances of unsafe medication prescribing and unsafe medication monitoring in their practice– for more information about the development of this dashboard, visit: <http://www.farrinstitute.org/wp-content/uploads/2016/12/SMASH-Case-Study-25-1.pdf>

4. Proportion of patients with medicines reconciliation completed

Medicines reconciliation was considered by subject matter experts to play the most significant role in the prevention of adverse medication events. SRFT and GMMH monitor compliance with medicines reconciliation on admission against their own standards. By taking this existing data and presenting it alongside the admissions data we look to identify what impact, if any, this activity has on prevalence of serious adverse medication events.

Caveats

- A process mapping exercise undertaken with subject matter experts showed that medicines reconciliations take place at a number of different points as a patient moves from one setting to another. However, the only time these are recorded electronically, consistently across the system is on admission to hospital. Therefore, only these are shown in this data.

Further information / sources to investigate

What do we know about medicines reconciliations that take place when patients move back from secondary to primary care? What would the impact be on readmissions?

NHS 'Medication' Safety Thermometer collected in SRFT, NHS 'Mental Health' Safety Thermometer collected in GMMH providing data over time on a wider suite of medication safety measures.

How are medication reviews linked to preventing adverse medication? Data collection systems currently don't collect this information centrally or at all.

Resilient Operations

1. ED Wait Times (for patients who are admitted to SRFT)

This measure provides valuable insight into two elements of how the health and social care system is operating:

Is SRFT admitting patients from ED in a timely fashion? Are they able to supply what is currently demanded?

Is there capacity within the system to enable patients to be treated in the right place, at the right time? Are there blockages?

When viewed alongside other measures presented on this dashboard, it is possible to build a picture of where potential blockages in the system exist, which are preventing safe transfers of care (e.g. lack of availability of social care means it is not possible to discharge a patient who is medically fit, but has ongoing care needs).

By presenting this data over time, it is possible to identify causes of variation in the data, for example, are there seasonal changes, which we can predict and plan for. This can be viewed in comparison with other measures included on the dashboard to identify relationships.

Caveats

- Data presented does not specifically identify the impact of changing demand for ED services, therefore this measure should be viewed alongside the number of patients attending ED to provide a more complete picture of the supply / demand relationship.

Further information / sources to investigate

Average wait times at ED will provide a fuller picture of demand for this service (the measure presented is only for patients admitted to SRFT, for the purpose of surfacing capacity within SRFT itself).

Time to next available appointment in GP practices will help surface whether delays in primary care are driving patients to ED as first point of call to access health services.

TrendCare will provide greater granularity to understand in real-time capacity in SRFT.

What are access time to home care services and care home services? Are access times compromising the safety of residents?

2. Bed days caused by delayed transfers

Where the ED wait time data can tell us something about flow into the hospital, bed days due to transfers of care are a good measure of flow out of care settings, including hospital. "Delayed transfer of care from acute or non-acute (including community and mental health) care occurs when a patient is ready to depart from such care and is still occupying a bed"⁹. This measure sits in the

⁹ Definition taken from: Monthly Delayed Transfer of care Situation Reports – Definitions and Guidance, version 1.09 October 2015, <https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2015/10/mnth-Sitreps-def-dtoc-v1.09.pdf>

dashboard to prompt questions about what is stopping residents to access the care at the right place.

By viewing the data over time, we can map changes in the data to the accessibility of services that should enable patients to be discharged as soon as they are ready. Again, we can also look for seasonal trends that might help community services to prepare for periods of high demand.

The data source for this information is NHS England, see [here](#) for the specific website. The delayed transfers of care can be from acute or non-acute (including community and mental health) and occur when a patient is ready to depart from such care and is still occupying a bed. Delayed transfers of care can occur for a range of reasons. The NHS England website provides more information on the measure.

Further information / sources to investigate

SRFT's Clinical Utilisation Review Tool allows a granular analysis of sources of delay in real time. This is a potentially valuable tool available to staff within SRFT but are staff outside SRFT informed and empowered to manage delayed transfers of care?

3. Safe staffing

This element of the dashboard is currently in development, pending establishment of Salford-wide measures through the locality workforce transformation group. The purposes of including these measures are to identify and highlight where staffing and resourcing is an issue, and learn about the impact this may have on safety. This dashboard will identify differences between sectors and job roles in availability of safe staffing (e.g. vacancy rates).

4. Provision of social care needs

The average time to perform a contact assessment provides an insight as to whether social care needs are being adequately met within the resources available in the system. This information can also be interpreted as a leading indicator of demand for ED services and delayed discharges, as availability of social care is often cited as a reason for delayed discharge.

A contact assessment is: 'The gathering of social history, social circumstance, health needs and presenting issues with the person requiring assessment (and relevant others where appropriate) and record the outcomes reached in order to identify social care and support needs and an exploration of how those needs may be met'.

The contact assessment is undertaken by a social worker or community assessment officer (CAO) who are trained practitioners. The contact assessment starts at the point of referral once it is clear that a level of assessment is required. It is closed once the assessment and decision making for care and support planning has been completed (if that is required).

There are three different type of assessment teams and performance varies between the teams:

1. Adult Social Care Contact Team (ASCCT)
2. Hospital Team
3. Intermediate Care Team

Caveats

- It can act as a record of action rather than a social care assessment ranging from the provision of sign posting information and advice, monitoring discharges, welfare notices, temporary changes to support plans to name just a few
- An assessment is a process that can take a lengthy period of time depending on the presenting issues and whether a care/support plan is required as part of the contact assessment once needs are confirmed as eligible for funded services. A more comprehensive social care assessment may subsequently be required that we term an 'independence led assessment' (ILA).

Further information / sources to investigate

Salford City Council KPI measures

5. Access time to RAID service (mental health)

The mental health resilient operations measure is access time to the RAID team. The Rapid Assessment, Interface and Discharge (RAID) team assess patients who attend A&E in the acute sector and are triaged as requiring input from mental health. These patients have been identified with suspected mental health needs by A&E staff. The outcome of the assessment could be a range of interventions including mental health inpatient admission, referral to community mental health services or signposting to other agencies for example.

The data consists of all those who have been seen by someone from the RAID team at Salford Royal.

The data has been cleansed to remove any potential data entry errors. Any waiting time of zero, e.g. the referral and seen date and time are equal, and any waiting time larger than 10 days have been removed from the data set.

Caveats

- The data includes people who attended A&E at Salford Royal, therefore could include non-Salford residents. And Salford residents attending an A&E department outside Salford are not included either.
- The data has been cleansed to mitigate data entry errors, however this is not a guarantee that no further data entry errors are present in the data.
- The data only focusses on patients in the highest/acute need of mental health, therefore we recommend further investigation into patients at a lower acuity level (see below for suggestions).

Further information / sources to investigate

Other services that GMMH provides for Salford residents such as IAPT. This is a non-acute, stepped service in which GPs refer into. In Salford, only steps 3 and 4 are provided by GMMH, with steps 1 and 2 covered by other providers. These patients are often known to the mental health service and are generally in a safe place.

Integrated Care Services dashboard includes data on provision of mental health services in Salford.

Triangulate other data sources like DATIX, to see if there are for instance any correlations between number of incidents and residents waiting for care.

Behaviours

1. Measurement and Monitoring Maturity Assessment

This self-reported assessment of measurement maturity reviews existing organisation specific views of the use of safety information. This measure helps answer a question as to how safe we think we are, and raises awareness of areas for improvement within individual organisations. Data presented surfaces variation in terms of where learning can be shared between organisations.

The tool used can be found on the Safer Leadership website:

<http://safersalford.org/programme/safer-leadership/> and [here](#) is also a direct link to the actual link

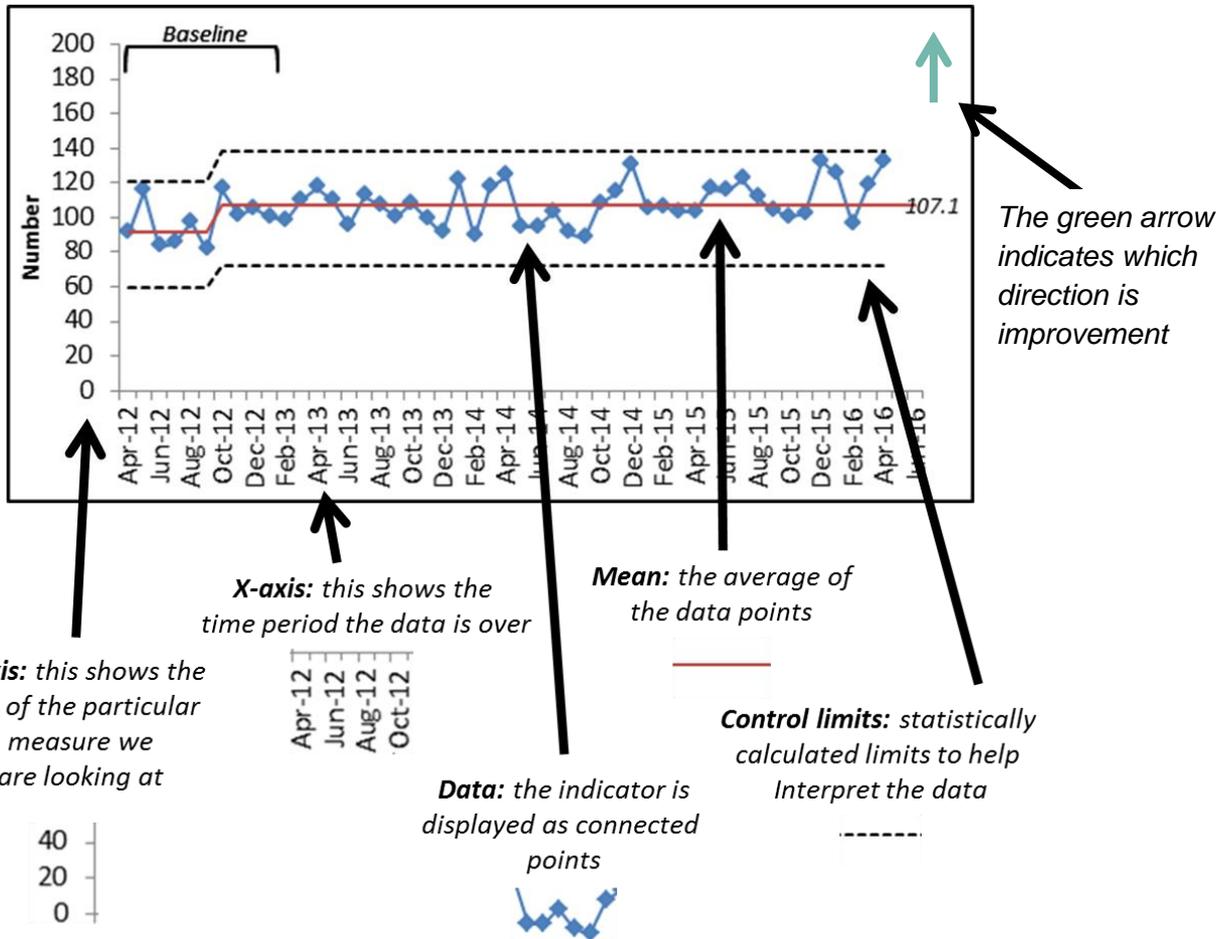
Caveats

- Data is self-reported by those attending assessment sessions, therefore should not be taken as a holistic view of the whole system
- Development of this measure will include consideration of variation within organisations (e.g. executive teams and front-line staff), and potentially different units (e.g. GP practices)

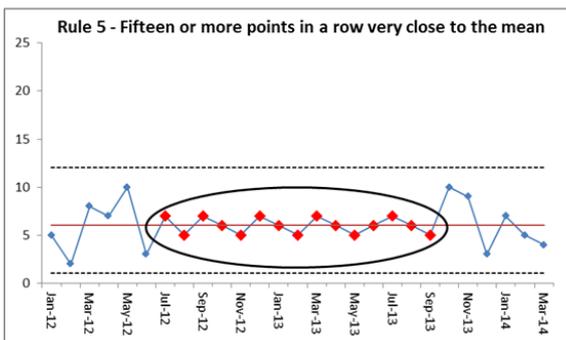
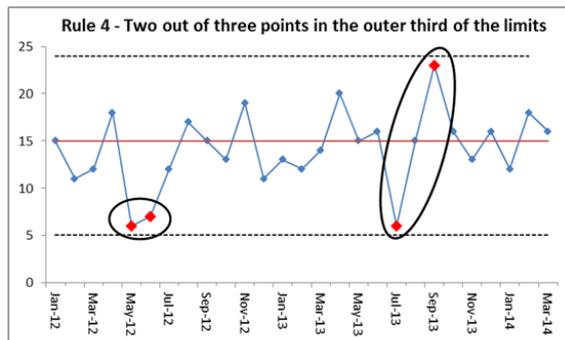
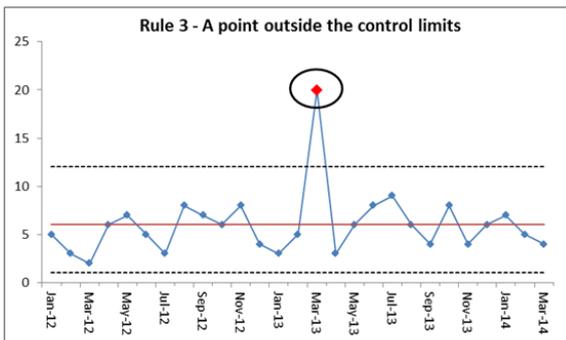
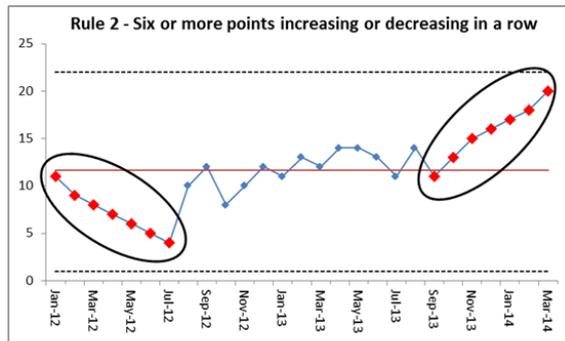
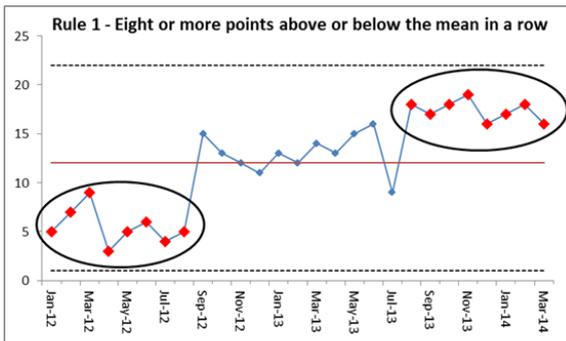
Appendices

Reading SPC charts

The main visualisation method used throughout the dashboard is SPC (statistical process control) charts. This type of chart uses the variation over time from the past to predict the future and spot change.



There are patterns we can look for in the data that indicate statistical change caused by an outside influence on the system, these are shown below:



Patterns like this should be identified and investigated further to understand what external influence could have caused them.

Using Tableau

Tableau is a business intelligence platform that allows creation of online based interactive dashboards. It allows connection of different data sources and encourages exploration and inquiry from the viewer by offering interaction through filtering and highlighting. All data feeding the tableau dashboard is protected and only the non-personal, non-sensitive restricted view is available. More info on tableau can be found here: <https://www.tableau.com/>.

Version control

This document should be reviewed every 6 months.

Discarded measures

The [accompanying spreadsheet](#) lists measures that were considered in the process of developing the Safer Salford dashboard. They are included as resource to help viewers of the dashboard to consider additional data sources to explore.