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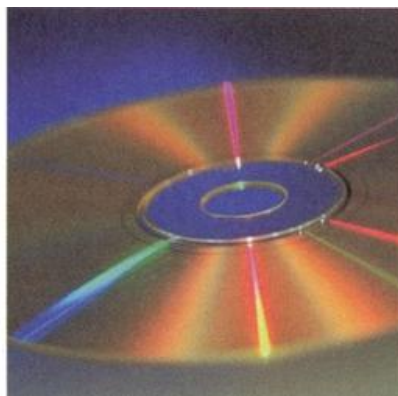
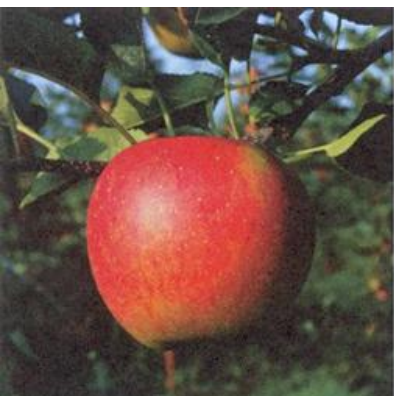
A rapid evaluation of SHREWD: the Single Health Resilience Early Warning Database

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**A rapid evaluation of SHREWD:
the Single Health Resilience Early Warning Database**

January 2013

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Executive summary

This rapid evaluation took place in November and December 2012 and involved interviews and observations in Kent and Medway, across a range of organisations and categories of staff involved in developing and implementing SHREWD.

SHREWD was developed in Medway and then rolled out to Kent, so informants to the evaluation had differing experience with SHREWD ranging from almost no exposure, to being involved for three years since its inception.

We found that SHREWD had met many of its key objectives since it was easy to use, it required little training, and it presented key information in a simple and clear manner. Negative user experiences were more likely to be voiced in the roll-out areas, where SHREWD had not yet been fully integrated into existing ways of working, and was sometimes felt to be partially duplicating other information systems.

A number of aspects seem important to successful implementation and use of SHREWD. These include having central direction, assured funding and having responsive IT support. Spending time discussing what information is to be displayed and establishing the correct trigger values for red/amber/green/black rating is essential, and a substantial amount of time has to be allowed for this part of the process. Having accurate and timely data is also fundamental as SHREWD becomes less useful when data are out of date.

SHREWD is not yet being used to capacity and can deliver further benefits, for example when uploading of data has been fully automated, and as data builds up over time it can be used for more strategic purposes such as reflection and audit, and for prediction and planning.

This study has raised a number of questions relating both to operational and evaluative aspects of SHREWD. Operationally it is not yet clear how well SHREWD will fit into the new NHS architecture, who will be the lead organisation responsible for implementing and maintaining SHREWD, and how SHREWD's licensing, development and associated costs will be met.

In summary this evaluation found that two years after its implementation, SHREWD had achieved many of its key objectives and there are indications of an improvement in the quality and efficiency of managing winter pressures in the site where it was developed. It was thought that there were further gains to be achieved over time. Further more detailed evaluative research is necessary to understand the impact of SHREWD on planning and managing winter pressures, and in particular, its impact on productivity and efficiency. Further research should also explore the processes of implementation to investigate why implementation in Kent was slower than anticipated, and how implementation in other areas might be improved.

Background

In November 2012, the Centre for Health Services Studies at the University of Kent was commissioned by NHS Kent and Medway to conduct a rapid (23 day) appraisal of the SHREWD system and the way it was currently operating across Kent and Medway. SHREWD - Single Health Resilience Early Warning Database - is an “online, real-time early warning and decision support tool”, developed by Transforming Systems (a human systems focused software development company) in collaboration with NHS Kent and Medway, partners within the Medway health system, and the University of Greenwich, with financial support from the South East Coast Strategic Health Authority. It is a system designed to be accessed and updated by partners within a local health system in order to share ‘system critical’ information.

The need for an information sharing database like SHREWD

Year-round capacity planning and accompanying escalation plans are recognised as essential for all health care organisations. Timely and fit for purpose information is crucial to the management of capacity and patient throughput at a time of excess demand on NHS emergency and acute care services (NHS South of England Escalation framework August 2012). If an organisation sees pressure building, all actions must be taken to reduce that pressure, and all system partners must be fully involved in supporting the organisation to prevent them escalating to Black status¹. In addition to locally defined actions, there are a number of mandatory actions that must be implemented across the whole system prior to the declaration of Black status by an organisation. These actions require all partners within the health system to be fully informed and up-to-date with the situation in not just their own organisation, but within other organisations across the health system.

There is no single system for sharing information between agencies planning for and responding to season pressure events or major incidents. A review of the 2009 pandemic flu response and winter plans in Medway found that organisations were often planning and working in ‘silos’, using a range of different information and documentation which was not shared effectively or consistently at times of system pressures. Commissioners were often working without a clear picture of the operational status of providers across the health system as this could take 24 hours or more to collate. In addition, there were often several different plans related to different types of system pressures such as winter plans, flu plans, or major incidents, which meant reduced efficiencies and missed opportunities for common lessons to be learned.

¹ According to the NHS escalation framework, an organisation’s ability to manage demand is rated according to an incremental 4-point scale, colour-coded from green (capacity is sufficient to meet demand; targets are being met), through amber and red, to black. A black status indicates a failure to manage current demand, and that help is being sought beyond the locality boundaries. For organisations at amber or red, there are a number of action points that must be taken to ensure the continuous operational delivery of healthcare services. SHREWD utilises this escalation scale (sometimes referred to as RAG rating), with each organisation identifying their own specific ‘trigger points’ between each of the points on the scale.

In response to this assessment, a paper-based system was developed in Medway to assist with information collation and sharing during the pandemic, and to focus discussions during multi-agency teleconference calls. The potential for this system was quickly seen, and it was subsequently developed in 2010, with the assistance of Greenwich University, into the online database being used across Kent and Medway today. The initial focus of the work has been to support winter planning and response to winter pressures.

The function and objectives of SHREWD

SHREWD was initially designed and jointly developed to meet NHS Medway partners' requirements. It was based upon the results of an in-depth requirements analysis (undertaken by the University of Greenwich School of Computing), and detailed work on indicators and trigger points undertaken by the Head of Urgent Care Commissioning. SHREWD was developed, tested and rolled out in Medway, and went live in the summer of 2011. It was then commissioned to be rolled out across NHS Kent & Medway in September 2011, and was re-commissioned in March 2012, to take account of the learning and new requirements of the NHS as it adapts to meet the needs of Clinical Commissioning Groups.

The primary function of SHREWD is to support informed decision making through the identification of what, and where, stress is in the system, such as winter pressures or major incidents through the sharing of real-time information, such as bed capacity and staff availability.

The key objectives of SHREWD are to:

- facilitate a collaborative whole health economy approach to joint working and information sharing;
- provide real time information on a range of indicators agreed by partners;
- provide instant access to the information available at all levels from executive team/strategic to frontline operational in a series of dashboard formats;
- streamline a complex process of daily/regular multi-agency conference calls via the design and development of an E conference call, minutes and actions recording system;
- provide a proactive view of stress within a health economy, individual organisation or area of practice (e.g. out of hours activity, assessment units);
- identify single points of failure and create considerable system resilience for no additional cost;
- develop a system that can be used remotely (24/7) via the use of mobile technology e.g. ipads;
- allow whole system or focused training without the cost or impact on staff time.

At the time of this evaluation, SHREWD has been fully operational for a year and a half in Medway, and for several months across Kent (although Kent partners have been involved in developing and testing the system since September 2011).

Purpose and objectives of the evaluation

The SHREWD system has not been formally evaluated to date. A value for money evaluation would be desirable, and is being considered for funding by the Partnership for Innovation in Health. Prior to that, however, CHSS were asked to conduct an initial rapid evaluation to assess, as far as possible within the timeframe of the study, the extent to which SHREWD is seen as meeting its aim and objectives, and to provide early indicators of the impact on resources within the local health economy.

Based on the perceptions of key system users, this evaluation addresses three main questions:

1. What issues have arisen from the implementation and operation of SHREWD?
2. To what extent and how has SHREWD contributed to improvements in the quality of co-ordination and planning processes?
3. What are the cost/resource implications of implementing/using SHREWD?

More specifically, it will:

- identify key stakeholder views about the system wide impact of SHREWD;
- provide information on the way SHREWD is utilised in NHS organisations;
- identify whether there are benefits in adopting and using SHREWD in data reporting, data management, organisation co-ordination and emergency planning;
- identify impact on resource use;
- assess the system against key objectives (set out in section 1);
- establish criteria for a fuller evaluation of SHREWD's operation.

Methods

This evaluation was conducted by two researchers experienced in health systems research, working with the Director of CHSS, over a period of 23 days in November-December 2012. We collected data using recorded semi-structured qualitative interviews. In addition, we made a number of observations of the SHREWD dashboard, of teleconference calls and minutes using the SHREWD system, and of a SHREWD-based winter planning exercise. For each of these observations, we made notes, and used the findings to supplement and cross-examine the interview data.

In planning interviews, we developed a purposive sampling frame to ensure we collected data from a range of organisations within the health economy, and from a range of people at different levels across the organisations who were involved in: the development of SHREWD; inputting data to SHREWD; using SHREWD for co-ordinating purposes; and using SHREWD for strategic decision making. We refer to three broad levels as being: operational (including those who input data into SHREWD), tactical (including those responsible for winter planning and managing seasonal pressures) and strategic (including those who operate across organisations

and across a larger geographical area). In addition, we made a further distinction between sectors, and categorised people as belonging to: commissioning, acute care, community care, primary care and ambulance services. We hoped to achieve a good spread of interviewees across each of these levels and sectors, and individuals were selected and approached on this basis. However, a number of individuals (particularly within the acute care sector) did not respond. Given the tight time-scale of this project, we were unable to chase further or select alternative interviewees. Additional interviews in each of the sectors, but perhaps particularly in acute care, undoubtedly would have enriched our data and may have led to further conclusions.

Interviewees were asked a set of open-ended questions guided by the three research questions (see Annex A for interview guide). For some interviewees (particularly those at the operational level who only used SHREWD to input data), not all questions on the guide were relevant. A total of 21 interviews were conducted with SHREWD users (see table 1), which ranged in length from 15 minutes to 90 minutes and were either face-to-face, or over the telephone. All interviews (except one) were digitally recorded to aid note taking.

Table 1: Data Sources

	Operational	Tactical	Strategic
Commissioners		4 (covering all areas of Kent and Medway)	4 (covering all areas of Kent and Medway)
Acute care	1 (EK)	1 (EK)	
Community care	2 (Medway and EK)	3 (Medway and WK)	
Primary care	1 (Medway)	1 (Kent and Medway)	1 (EK)
Ambulance services	1	1	1
TOTAL interviews:	21		
OTHER DATA:	Observation of East Kent winter pressures teleconference Observation of Kent and Medway’s winter pressures exercise Interview with Colin Rees, Transforming Systems Information from SHREWD, e.g. Minutes from winter pressures teleconference meetings		

Findings

General experiences of using Shrewd

There was a range of experience of using SHREWD across the research area. There are clear differences between Medway, where the system was first developed over two years ago, and where it has been used routinely for over a year, and the rest of Kent. This section starts by describing implementation and use of SHREWD, followed by interviewees’ comments on the benefits and problems from using it.

Implementation

SHREWD was developed in Medway, an area with coterminous organisational boundaries, a unitary council and a single acute hospital, to meet their identified needs, and to match their ways of working. The development team at Transforming Systems have worked closely with the users in Medway to continue to refine and improve the system. In Medway, data is routinely uploaded by a number of individuals in each organisation to the SHREWD dashboard. At the time of the evaluation, data input for key indicators for the ambulance trust and the acute trust was also in the process of being automated. The system is fully used in regular teleconferences during winter (twice weekly, or more if necessary) and some staff have continued to use it throughout the year for monitoring. The teleconference calls are chaired by the urgent care commissioner and involve middle to senior managers of the local council (social services), the acute trust, the ambulance trust, the community trust and any relevant neighbouring organisations. At times of pressure a once a week executive level conference also takes place to pick up issues over a wider geographical area.

The economies of North, West and East Kent cover a population that is four times that of Medway, with three acute trusts (and three district general hospitals in East Kent alone) and the need to take into account pressures across boundaries with London, Surrey and Sussex as well as Medway. SHREWD was introduced to the Kent economies as a partly developed system, with some key indicators pre-identified. There were further discussions across Kent to agree indicators and trigger levels, but these areas have had less involvement in the system's development as a whole. The process of implementation in Kent and Medway differed considerably. Whilst there was an expectation that SHREWD would be rolled out across Kent relatively quickly once senior executives had bought into it, actual implementation was much slower. Consequently, there has been less time to gain experience of using SHREWD and there is not the same degree of ownership of the system in Kent compared to Medway. At the time of the evaluation, organisations in all three Kent economies were uploading data manually onto the SHREWD dashboard on a reasonably regular, though not routine basis. As in Medway, the process of automating data input for the acute trusts and ambulance trust was being rolled out during the period of evaluation. Only one of the three Kent economies was making use of the SHREWD teleconferencing facility.

Key benefits of using the system

Interviewees across all levels and sectors identified many benefits of using SHREWD, most of which impact on users at tactical and strategic levels. However, the system is in its infancy in the sense that it has only been in use for a short period of time (particularly within Kent), but also in the sense that it is still evolving (a new version, SHREWD version 2 was rolled out at the start of our evaluation, and another is expected soon). Consequently, SHREWD (or at least the latest version of it) has not yet been used on a regular or routine basis across Kent and Medway. Some of the benefits identified therefore are *potential*, rather than *actual*. It was very clear that interviewees unanimously felt that SHREWD has good *potential* benefit, but many mentioned various caveats to this: for example, *if* data within it is reliable and accurate; *if* data is updated

regularly; *if* people trust the data; *if* people use the system proactively, to foresee and prevent the worsening of system pressures down the line; *if* people use the system for teleconferencing and recording minutes and actions; and so on. Given that these issues cannot yet be taken for granted, most actual benefits were identified as ‘hit and miss’. One commissioner commented:

“If all the information on there is accurate, it’s like a balance sheet. It’ll tell you exactly how the system is at any one given moment. So you see if it’s red, green, black – in a second, you can see how bad your system is. I can’t underestimate how valuable that is. Without SHREWD, we would have that, but we would have it through ringing around individually, and eventually coming to that assessment. So that single point of information is brilliant.” (Tactical level commissioner).

It is important to get a sense of what people at tactical and strategic levels within the Kent and Medway health economy had *without* SHREWD. In most interviews, it was clear that SHREWD had *added* value to some degree. One strategic level interviewee, who had been involved in helping to implement the system, felt that before SHREWD, it was difficult for commissioners to get any idea of how to improve things when pressure was building in the system:

“By the time they got the information, it was out of date, and it needn’t necessarily reflect how it was going to be tomorrow. They got a sense that some provider organisations were having a hard day, but by the time they got any real sense of the issues, it was too late to do anything – they were always 24 hours behind. With SHREWD, the data sharing, and discussion of the issues, is quicker. In Medway, it is clear they have been able to move more into talking about real time, and making a difference.” (Strategic level interviewee).

One of the key benefits of using SHREWD was clearly around having the information on a dashboard that was accessible and easy to interpret. Interviewees appreciated the broad overview of information on their own organisations, and on other organisations within the health economy:

“Having the basic information from all the providers in one place helps to understand what the pressures are in the system.” (Tactical level commissioner).

A strategic level interviewee who appreciated that all data in all areas cannot yet be trusted entirely, commented that even when you don’t simply trust all the data on SHREWD, it is a good prompt for further questions.

Those who don’t need to have this information themselves (such as operational level interviewees who only used SHREWD to input data) saw the benefit of having the information available to others. One operational level interviewee in Medway felt that using the system had reduced the number of phone calls and the sense of panic within her area of the organisation, as there is more understanding around issues such as delayed discharges.

A further benefit related to the way in which the information was presented; the visual representation, with arrows to indicate changes in pressure within indicators, was felt to be useful. The RAG rating (the colour coding of each indicator) also helped to put numbers into context – to understand whether a particular situation was worrying or not. This seemed particularly useful for users in non-acute sector organisations who are less familiar with bed numbers and A&E targets.

Other benefits related to what can be done as a result of having the information presented on SHREWD. There were several examples of how having the information on their own and other organisations had proved useful. SHREWD has, for instance, helped a manager in social services to spot things like problematic sickness affecting their staff; a manager in community health care said it has helped to see potential points of concern and to allocate staff accordingly; and it has helped a manager within the ambulance service to think about things they could do around patient movement to help relieve pressure. Similar discussions were observed during the winter planning exercise and the observed teleconference call where, after viewing the dashboard, participants were making suggestions about how they could help relieve pressure, mitigate escalation, or improve patient flow.

Having the information collated and presented on the dashboard has also streamlined the conference call process – particularly in Medway, where they are more used to using this function. Several interviewees noted that having the data on the dashboard in advance of the phone call is “undoubtedly helpful”; it is no longer necessary to write down the figures by hand whilst on the phone, and it enables people to focus on the issues, and discuss causes and solutions. One interviewee (from Medway) suggested that a knock-on effect of having conference calls that are shorter, more organised and “less of a pain”, is that that more people are now reliably dialling in to them: “these calls have tended to bring people together, so we build those relationships” (tactical level, primary care).

Having the information available on SHREWD also allows users who log-in to see when there is a problem that might escalate. A tactical level manager in social care commented that he can see from the dashboard when a hospital trust is “stuffed to the gunnels”, and they can actually get on to the actions that need to follow from this. An interviewee from an ambulance trust commented that using SHREWD “gives her a head start” to knowing which hospitals are getting into trouble, so rather than having a phone-call when the issue has arisen, it allows pre-planning of ambulance movements to avoid a problem.

In addition to the presentation of data, some of the other functions within SHREWD were pointed out as being useful – for instance, one interviewee liked the fact that the system will send text messages alerting you of a potential problem (like an organisation escalating to black). Several interviewees (in Medway) valued the fact that when the teleconference function within SHREWD was used, it enabled the minutes from those meetings to go out quickly, containing all the most important information, giving people a record of the organisations’ pressures, and related actions, within hours of the teleconference meeting. The fact that these minutes, with

clearly allocated actions, are all recorded and stored within the system, was also thought to be useful, since it can provide an 'audit trail'.

There were some benefits of using the system that were slightly less tangible, but which would be interesting to explore further. For instance, one interviewee from within a community hospital felt that having her organisation's data visible on the system gave her site "more credibility": if they are 'black', others can see this, and this is accepted. There was also a feeling that use of SHREWD has helped to create an awareness of the whole system, by giving a more rounded picture of what is going on. A tactical level interviewee in primary care felt that this puts the economy at a "better state of readiness", and can also help people to see knock-on effects – for example, if an A&E department is busy, patients are being diverted, and there is an impact on social care in terms of staffing levels and allocation. An interviewee from within the ambulance trust felt that SHREWD gives her an idea of how pressures elsewhere will impact on their service.

There was evidence that individuals who did not necessarily need to look at the data in their own and other organisations and economies often did so anyway – sometimes described as 'being nosey', but also credited for giving them a sense that they are 'not alone' in feeling pressured. The general sense of being one small part of a much wider system might have implications which need to be explored further.

The interrelationships between different organisations, and the way pressure moves through the economy as a whole, were discussed by several interviewees who were interested in potentially seeing whether there are any patterns in the way pressures move – for instance, whether Medway sees pressure rise in a particular area a day or two before West Kent. This sort of analysis would be helpful in predicting and perhaps mitigating against the rising of pressures within organisations or local areas in the future, but would only be possible using the data captured over time within SHREWD.

Problems with or disadvantages of using the system

Interviewees were asked to identify any problems with or disadvantages of using SHREWD. No *actual* (as opposed to potential) disadvantages of using it were identified. However, a number of issues were raised. Many of these were 'teething problems' associated with rolling out a brand new system, and these were felt to be quickly overcome and largely not problematic. These include occasional difficulties logging in, and a few 'niggles' and 'glitches' often attributed to system changes or upgrades.

Most other issues relate not to the system itself, but to the implementation of it. They point to some important areas of consideration for future improvement or further roll out (see section 4.4).

Interviewees at the operational and tactical levels raised a number of issues that can be grouped into four broad areas. The first was concerned with the importance of, and difficulties with, getting the indicators and trigger levels right. It was clear that having the right indicators and

trigger levels within SHREWD was crucial to achieving the benefits of the system, and important in creating 'buy-in' from all partners. The process of identifying and agreeing indicators and triggers is lengthy, but cannot be underestimated. It has been described as an important process in itself, but it is also important to get right.

In Medway, there was general agreement on the indicators and trigger levels, and they appeared to be working well. In other areas, they were not yet right. In one organisation, indicators had become less relevant as the organisation had changed over time. In another, it was felt that more indicators were needed to give a clearer picture. In primary care, one interviewee said that more detailed information is needed, and more primary care indicators would be extremely helpful. For example, he explained that it is not particularly useful just to know the proportion of GP practices currently closed; it is important to know whether they are from one particular area (which would have profound consequences), or are spread across the patch (which would not be so significant). However, this is difficult to achieve because of the number of sites involved, and because of the nature of the independent contractual relationship with GP practices, which means they are limited with regards to what information they can get from all practices.

Getting the trigger points right is also important. Since the RAG system is such a simple and visual one, it can easily give the wrong impression if it is not right. It is clear that at the time of our evaluation, trigger levels were still not right in some organisations. This led to one interviewee (tactical level, acute site) 'switching off' from the system, and repeatedly stating that he did not use the system because he felt that the data was unreliable (although when questioned further, it was clear that it was not the data that he did not trust, it was the RAG status automatically attributed to that data). He was irritated that SHREWD was giving people the wrong indication of what was going on in his organisation.

An interviewee in a non-acute organisation also commented that hospital trusts frequently 'declare black', and that this frequent occurrence can lead to a 'desensitisation' to it. He stated the importance of being able to distinguish between 'real crises' and 'a bit of pressure'. Several interviewees stressed the importance of not only getting the trigger levels right internally, but also of having comparability across organisations – so that red in one organisation meant the same as red in an equivalent organisation. One interviewee felt that the issue with the trigger points was the biggest problem with SHREWD, because it "camouflages everything else".

The second broad area concerns the collection of regular and routine information. Several interviewees remarked that the system is only as good as the information in it. There were some clear problems with data not being entered regularly and reliably, although interviewees frequently stated that the automation process will address this, providing the process is robust. Strong leadership from executive (strategic) level has also improved engagement with the system at tactical and operational levels. Whilst the system is not providing real time information, one interviewee remarked that it is closer to real time than they have ever been.

The third broad area concerns accessing and using the system. Whilst access to the system was felt to be good, it does depend on an internet connection, which isn't always available. In addition, the networks in the NHS are sometimes slow, which can hamper access, and once or twice the system has been 'down'. The majority of interviewees found SHREWD easy to access and use. Only one interviewee found the application to be slightly 'clunky' at times, with a few ongoing 'glitches'.

The final grouping of issues is associated with 'data overload'. Several interviewees referred to other information sharing databases, and their overlaps and potential links with SHREWD. The roll-out of SHREWD across Kent occurred at roughly the same time as the implementation of QlikView in one acute trust. QlikView is being used as an internal application to analyse and report on live data from wards and A&E to help manage resources and demand. Several interviewees also commented on the Ambulance Service's data dashboard which enables them and hospitals to track ambulance activity. Capacity Management System (CMS) and the GP Management Information System were also mentioned as tools that provide information on resources, demand, and patient pathways. The linking of these systems was seen to be important and, whilst it is not usually technically difficult, it was recognised that organisational and professional hurdles often need to be overcome. The issue is complicated further when organisations work across borders, or when organisational boundaries do not match.

Just one potential disadvantage of using the system was raised by one interviewee (strategic level, ambulance), who felt that there was a potential danger in seeking to reduce the amount of discussion that occurs during conference calls. He placed great value in communication, and felt that some understanding or detail might be missed if people become overly reliant on the dashboard.

The impact of SHREWD

Since SHREWD is not yet fully utilised, its impact so far will only be partial. Indeed, within interviews at the strategic level there was a general sense that the potential of SHREWD had not yet been realised, and interviewees tried to explore why that might be. All attributed this to the way the system was being used (or not being used), rather than to the system itself. One interviewee was frustrated by the apparent reluctance from some people to engage with it, despite a general positive response regarding the principle of having near real time data in the system. It was suggested that at the moment, people have mainly been "going along with it"; not really seeing what they're getting out of it, but engaging with it because there is "a three line whip from the PCT". Two interviewees pointed out that it is not until people have used it for a while, and really engaged with it, that they will be able to see what is and isn't working, and will work to improve it and get it right:

"People aren't using it as they should do because they're not used to it, and they're not getting used to it because they're not using it" (strategic level).

One interviewee pointed out that SHREWD is a different way of working for people. To date, it has been reliant on being driven by the commissioner, who hosts the conference call and produces the minutes. It is therefore reliant on a high level of aptitude, and a strong engagement with SHREWD, from the person in that position.

It was felt by several interviewees that the system can only have an impact if everyone believes the data in it, and understands and agrees that the data is reliable. This is not yet the case (at least in Kent), although this might change rapidly as the automation of data input for key indicators is realised. One interviewee (at strategic level) felt that managers in different organisations are suspicious of each other and are reluctant to trust each other's data. This can act as a barrier to accepting SHREWD and what it is trying to achieve. An alternative opinion, however, was that organisations are now "past that", and that SHREWD was consequently believed to give them "one version of the truth".

It is clear that SHREWD is not yet providing real time information, but the information it provides is closer to real time than ever before. This is also changing rapidly as the rollout of automatic updates progresses, and deserves to be re-assessed in a few months' time. The range of indicators within SHREWD are broadly agreed by partners, although some individuals would like to see more indicators or different indicators. It was recognised, however, that there is a balance to be made regarding the level of detail and the usefulness of the dashboard.

SHREWD is clearly accessible to a range of people at all levels, remotely via the use of mobile technology (one interviewee described how she chaired a teleconference call from her parked car mid-way through a journey). However, the information that is accessible varies in usefulness. Repeated observations of the dashboard found that information in some organisations was often not updated for a week or more. There were also indications that some information could be misleading, particularly regarding the RAG status of organisations that had not yet identified the right trigger levels. During the winter planning exercise, it was observed that a few participants had difficulty logging in to the system, and/or had difficulty navigating round the system once logged in (although for some people, it was the first time they had viewed SHREWD).

This evaluation found that the process of multi-agency conference calls had been streamlined considerably in Medway, where the system was most effectively used. In other areas, it was less clear, either because interviewees were not familiar with the process pre-SHREWD, or because they were not using the teleconferencing facility or the dashboard in the way it was intended. In one observed teleconference call, although SHREWD was theoretically being used, participants read out all their data without referring to the information on the dashboard (which in some cases was different). The chair of this call, however, felt that they are only now starting to use the system, and that their use of it is changing weekly as they become more confident of the data, and as they become more comfortable with the system.

At this stage, it is not clear that SHREWD is providing a proactive view of stress within a health economy, individual organisation or area of practice, although there are indications that in Medway it is starting to show potential for this.

In the remainder of this section, we discuss the extent to which SHREWD has contributed to improvements in the quality of co-ordination and planning processes, and made it easier to manage pressures within the system.

More specifically, we consider whether SHREWD has:

- made the sharing of information easier
- improved users' ability to monitor the situation on a day to day basis
- helped users to think more strategically about how to manage system pressures
- helped users to reflect on the way emergencies/system pressures are handled.

Information sharing

There is general agreement that the SHREWD dashboard is a better way of sharing information than exchanging information over a phone call. However, whilst some organisations stand to gain from this access to information, others don't particularly feel any benefit. Whilst it is easier to see the information, this doesn't necessarily have a great impact for all organisations; it doesn't eliminate the need for follow up phone calls to, for instance, confirm that a bed is indeed available, or to organise the transfer of a patient.

One provider felt that the data is more meaningful on the dashboard since they get a sense of what the numbers mean – for instance, whether 3 beds remaining is good or bad. Several interviewees felt that a start had been made, that some small benefits could be seen, but that in some areas, more information, or more useful information, was needed. It was felt by some that the information presented by SHREWD can be a bit superficial, particularly if you don't understand the business of the provider, and what each indicator and trigger actually means. Several interviewees felt that their own business wasn't necessarily completely understood by other people viewing the dashboard. They indicated that unless there is an understanding of implications, having access to the data has limited impact: "why do I want to know if the ambulance trust is red? What does that mean to me?" (tactical level, acute). It was clear that SHREWD cannot replace the 'human component'.

Several interviewees felt that SHREWD provides a consistent and standardised approach to information sharing. This has worked well in some areas, but one interviewee felt that this 'regimental' approach is not as suitable for the needs of other economies.

One interviewee in primary care indicated that data is not only shared amongst those who view the dashboard; he said that when he sees on SHREWD that hospitals are under pressure, he can then inform GP practices, so they are more aware of what is going on, and to remind them to use alternative pathways.

There is a general sense from interviewees at all levels that they are using SHREWD to share information within the health economy, and that SHREWD has made this sharing of information easier.

Monitoring the situation

There is a general consensus that SHREWD is giving a better overview of what is happening, when information is uploaded reliably and frequently. This is achieved without having to ask administrative staff to chase around for the figures, and by having the key information in one location. Great importance is placed, however, on the timeliness of the information. SHREWD appears to allow some people (higher level managers) to monitor the situation better, but those at operational level stressed that the information on the dashboard is only a snapshot of a particular day. This snapshot is not always an indication of how the rest of the day will go. One interviewee felt that the dashboard would need updating every four hours or so to really reflect the current situation. The implementation of automatic data upload is likely to be of significant benefit.

Interviewees felt that it is possible to look at SHREWD to see whether pressure is building, and most explained that they will look at the dashboard most mornings (although most only during winter), to get a brief overview, and to see if there are any pressure points. This has been encouraged by senior level leadership, focusing attention on the use of SHREWD, and getting people into the habit of checking it. It was felt that the simple colour coding system is working to a certain level – if someone is in red, it prompts questions: why are you in red? Do you need any assistance to manage the pressures? And so on.

It was felt that SHREWD helped with monitoring the situation last winter, particularly through the cross-working and teleconferencing. “However, the system is not yet trusted enough and organisations do not want it forced on them” (strategic level interviewee).

Making strategic decisions

The implementation of SHREWD so far has focused on its role in winter planning, rather than during emergency situations. However, its role in preparing for and responding to emergencies has clearly been foreseen by its developers. Several interviewees felt it has the potential to help make decisions, but it would be wholly dependent on having timely and trustworthy information. Several interviewees at operational and tactical levels felt that there would not be time to continuously update SHREWD during an emergency. One raised a question about whether the system had been ‘stress-tested’, to ensure it could cope with this continuous updating by a large number of users at the same time. It was generally felt that the system would need to be used in several exercises before “being used in anger”.

Whilst SHREWD has not yet been used *in* an emergency, several interviewees talked about its role in preventing a pressured situation escalating to an emergency, by improving access to and sharing of information. There was a feeling amongst several interviewees at strategic level that SHREWD has helped people to make decisions when things are coming under pressure.

However, no concrete examples were provided, and these discussions were largely theoretical, rather than based on actual experience.

It was felt by some interviewees that SHREWD helps strategic decision making on a number of levels. One interviewee in primary care felt that using SHREWD has made him more aware that he is working in a system:

“At the end of the day it’s all about patient flows from primary care to secondary care, so it does make you more aware of what is going on, and the difficulties that they are having” (tactical level, primary care).

He felt that this greater awareness of the whole system, and the patient flows, could enable better, more informed decisions to be made. A community trust interviewee felt that SHREWD had stimulated new ways of working more effectively across organisations – she was getting calls from other organisations that wouldn’t have happened if they were not able to view and respond to SHREWD data.

One interviewee in commissioning felt that, as long as the information in the database could be regarded as ‘true’, SHREWD definitely helps them to think more strategically about managing system pressures. He explained the example of delayed transfers of care, and how accurate information in the database would allow them to see how many patients are where, and to see where the blocks are. He explained (hypothetically) that this would enable them to investigate why the blocks are there, so they could then exert the appropriate pressures to help change things. This sort of response could be seen in action during the winter planning exercise, and was also observed to a limited extent during the observed teleconference calls. In Medway, where the minutes and actions function of SHREWD is more consistently used, examples of these decision making processes can also be seen relating to dealing with winter pressures in 2011/12, where increased pressures in one part of the system prompted actions in other parts of the system, either to further examine *why* the pressure was building, or to help alleviate the pressure by altering patient pathways or increasing/moving resources.

It was clear that different organisations would see more or less benefit from using SHREWD. An interviewee in the council, who felt that his organisation was providing information purely to reassure his NHS partners that they are still able to “service the machine”, felt that whilst it is not difficult to manage pressures within their own organisation without having the dashboard and the teleconference, it makes good sense for big organisations like ambulance and acute trusts.

When looking at the health economy as a whole, there was broad agreement that the benefits provided by SHREWD would enable more informed decisions to be made at a strategic level. However, it was felt that the system (or the users of the system) had not achieved this yet. One interviewee felt that this might be because the right people (accountable officers and chief operating officers in CCGs) are not particularly engaged with it. Another felt that this objective

can't be achieved until there is sufficient data and a track record of the system's use, so that it is believed and relied upon.

Two interviewees felt that it was too early to say whether SHREWD has yet been useful in strategic decision making, but felt that real lessons will be learned when they are able to look back over previous years' data, to look at trends and patterns over time. Several interviewees also talked about the added benefit for strategic decision making of having SHREWD data combined with data from the future 111 service:

“One of the things that will do for us is highlight where there are gaps in the system. ...The combination of data might highlight how we might want to redesign pathways”
(strategic level interviewee).

Reflecting on the way system pressures are handled

There were mixed views about whether SHREWD is yet enabling people to reflect on the way system pressures are handled. However, there was a greater consensus about its potential to do so. It was felt that having everything recorded in one place is a benefit, since it can provide an 'audit trail', rather than forcing a reliance on people's memories. It was also felt that this will become more obvious as they get more data into the system, and when they can look back over previous years to examine what happened during periods of escalating pressure to see if any lessons can be learnt, or to use it to predict pressures they faced before. Observations of the SHREWD database also demonstrate that users in Medway have started to use a 'lessons learnt' section, although it is too early to say whether these lessons are followed up, or lead to improved decision making in the future.

SHREWD's impact on efficiency and productivity

Efficiency and productivity are important as they are goals of the QIPP (Quality, Innovation, Productivity and Prevention (QIPP) programme that aims to meet the efficiency challenge across the health system while maintaining or improving quality. SHREWD can help with the QIPP agenda as it is an innovative tool that has the potential to deliver cost savings by enabling more effective and efficient sharing of information about health services demand and capacity. One of the key objectives of SHREWD was to streamline the complex process of daily/regular multi-agency conference calls and free up time to identify and respond to pressures. SHREWD expects to do this by enabling those on the conference call to access the key data in advance of and during the teleconference meeting, and by providing a tool that supports E conference calls and provides a system for recording minutes and actions. Other key objectives were to create greater system resilience at no additional cost and provide training without cost or impact on staff time.

Interviewees were therefore asked about the cost implications of developing and using SHREWD, which covered system design, on-going maintenance and licence fees. We also asked about the additional time staff had needed to spend to implement and use SHREWD and the resulting savings in time or gains in efficiency they had seen. Collecting and reviewing detailed

cost data was not part of this evaluation, so the findings are based on people's perceptions of costs and time saved.

Costs of developing SHREWD

Few interviewees were able to comment on the cost of developing and maintaining SHREWD. Considerable time had been invested in Medway to develop SHREWD from the early paper-based version, although some of the time-consuming work carried out was felt to have been necessary anyway (such as identification of key indicators and trigger points). Up-front development costs were subsidised by Transforming Systems. Continuing costs were perceived to be small, although the implementation of significant changes to the system (such as the roll-out of automated data input) was recognised to incur up-front costs, mostly in the form of staff time. What is not clear from this evaluation is the extent to which the early development costs (largely in the form of time) can be reduced as the system is rolled out to new areas. The experience of rolling out SHREWD in Kent shows that there is a balance to be made between replicating the whole process undertaken in Medway (which would take considerable time), and adopting the Medway system, making adaptations where necessary (which made developing 'ownership' of the new system difficult, and led to some feelings of resentment that a system developed by someone else was being 'dropped' on them).

Staff time required

Before SHREWD could be used additional staff time had to be spent uploading data, getting relevant staff trained and in agreeing local indicators and triggers. Several people said this was a valuable exercise that had to be done anyway for their winter plans so did not see it in a negative light. Uploading data was not seen as an onerous or significant additional task, and most felt the training was very quick, simple and possibly not even needed. One person commented that spending time on development and implementation took time away from their main job.

Efficiencies and savings in staff time

Some operational level staff said they had had fewer chasing and checking phone-calls to field after they started putting their data on SHREWD. It was also said that in future this group would spend less time uploading data as these processes became automated, and that both these factors would be a benefit at times of extreme pressure. Using SHREWD was therefore expected to save time for the operational staff involved even though amounts were likely to be quite modest.

Tactical level staff said the main saving was in the length of teleconference calls which had roughly halved in Medway (where SHREWD was being used most effectively). Since calls occur twice a week during winter, and might increase to daily calls during times of escalated pressure, this identifies a significant time saving for a number of senior level staff. Having the data visible, and being able to add agreed actions and minutes also saved time for tactical level staff, who reiterated the view that having the data in one place saved them time in ringing around. They

believed the conference calls had become more efficient as everyone started better informed; they were able to understand the pressures other organisations were under and therefore were able to make better decisions. One or two people did not find SHREWD was any better than using paper and pencil or offered any advantage over other IT systems they had in place. However these views were expressed by people who had made limited use or felt that SHREWD had been forced on them, so may have been based on perceptions rather than experience.

Staff at the strategic level felt strongly that when SHREWD was used properly the process of planning and managing winter pressures would be quicker and require less of senior managers' time. However there was the feeling that the extent to which staff time was saved by SHREWD still needed to be demonstrated. One commented that trusts stood to make easy gains by moving patients to less costly community beds. An alternative side of this was mentioned by another interviewee, however, who commented that at a time when block tariffs are being replaced by payment by results tariffs, SHREWD may help non-hospital providers to demonstrate their worth to commissioners.

Lessons learned from implementation and use

It is possible to draw out factors that have emerged that relate to the successful implementation of SHREWD. Sites making most use and getting most benefit had the following characteristics:

- Introduced at a time when it was clearly needed (flu pandemic)
- Getting executive-level buy-in and funding
- Making a detailed assessment of need
- Modelling SHREWD on a system that already is effective
- Having responsive IT support
- Taking up to two years to agree indicators and trigger levels
- Having strong leadership
- Having training for all users that includes the overall purpose of SHREWD as well as how to use it

The following factors may be barriers to successful implementation:

- Competing or overlapping IT and information systems
- A reluctance to change existing ways of managing (pen and paper)
- When SHREWD does not include all the organisations in winter pressures discussions (eg London ambulance)
- When indicators are not seen as satisfactory or trigger levels are not correct
- Not using SHREWD completely or consistently

Conclusion

Limitations

This rapid evaluation took place in November and December 2012, speaking to the developer of SHREWD and interviewing 21 people involved with SHREWD in Kent and Medway across a range of organisations and categories of staff. It is inevitably limited by the small number of informants and where there was under-representation (mainly from acute trusts) if interviews could not be arranged in the available time.

SHREWD was developed in Medway and then rolled out to Kent, so informants to the evaluation had differing experience with SHREWD ranging from almost no exposure to being involved for three years since its inception.

Key findings

We found that SHREWD had met many of its key objectives since it was easy to use, it required little training, and it presented key information in a simple and clear manner. Users found it easy to access the dashboard from any location, and because all parties could view the same data it reduced the number of phone calls they made. Using SHREWD during teleconference calls reduced the length of calls, improved the quality of discussion and allowed minutes and actions to be recorded. Seeing the SHREWD dashboards allowed greater understanding of pressures elsewhere in the system and the impact of decisions on other organisations. It was described as being very helpful at times of pressure but had not been used in an emergency.

The cost of development, both in terms of actual expenditure on the system and the development time provided was not quantifiable and particularly in Medway, staff have invested substantial time in supporting development. Savings in staff time have been made as using SHREWD approximately halved the length of teleconference calls, and freed up time to focus on and have more effective discussions on managing pressures. Small gains were also reported at other times as people at all levels could view the dashboard to check the situation and that reduced the number of phone calls to ask for or check the data. Few respondents referred to resource issues and focused more on the use of the system.

Negative user experiences were more likely to be voiced in the roll-out areas, where SHREWD had not yet been fully integrated into existing ways of working, and was sometimes felt to be partially duplicating other information systems. The dashboard was also criticised due to data not being updated regularly, when indicators and trigger levels were not seen as correct, and when it did not cover all the information they would like.

A number of aspects seem important to successful implementation and use of SHREWD. These include having central direction, assured funding and having responsive IT support. Spending time discussing what information is to be displayed and establishing the correct trigger values for red/amber/green/black rating is essential, and a substantial amount of time has to be

allowed for this part of the process. Having accurate and timely data is also fundamental as SHREWD becomes less useful when data are out of date.

SHREWD is not yet being used to capacity and can deliver further benefits, for example when uploading of data has been fully automated (even though manual uploading requires only a small amount of effort), and as data builds up over time it can be used for more strategic purpose such as reflection and audit, and for prediction and planning.

Within this evaluation it was not possible to explore (i) how much it costs to implement SHREWD, and how that balances against gains in efficiency and productivity and improvements in patient care and experience, (ii) where the benefits arising from using SHREWD are most felt, and (iii) which of the identified benefits can be evidenced by real examples, and which are hypothetical.

Further issues and questions

This study has raised a number of questions relating both to operational and evaluative aspects of SHREWD. On the operational front it is not yet clear how well SHREWD will fit into the new NHS architecture, who will be the lead organisation responsible for implementing and maintaining SHREWD, and how SHREWD licensing, development and associated costs will be met.

Questions for further evaluation are:

- In implementing SHREWD, who are the most important actors?
- What factors limit people's engagement with SHREWD?
- Does SHREWD lead to more efficient sharing of information?
- How reliable / accurate is SHREWD data? To what extent is it 'real time'?
- How is the information on SHREWD being used, and by whom? What are the impacts of this?
- To what extent and how have communications between key users of SHREWD changed?
- Does SHREWD enable more informed decisions to be made at times of system pressure?
- What actual benefits are there, and who (which organisations, which levels) is benefiting most/least?
- What are the key aspects of *added* value (entailing some comparison with how things were done before SHREWD)?
- Is SHREWD enabling lessons to be learned over time?
- Is SHREWD being used proactively, to foresee and prevent the worsening of system pressures down the line?

There is a need to carry out more detailed evaluative work, for example a productivity assessment to understand the impact of SHREWD on planning and managing winter pressures. An analysis of benefits and quality improvements seems more valuable than gathering and analysing detailed costs. Further consideration should also be made of the issues around successful implementation, since the evaluation showed clear differences between the site

where SHREWD was developed and other areas when it was rolled out. Other issues around successful implementation include central direction, local buy-in, and time to agree satisfactory indicators and trigger levels. A detailed evaluation is also needed of data quality on SHREWD, covering the frequency, timing and accuracy of data uploaded.

In summary this evaluation found that two years after its implementation, SHREWD had achieved many of its key objectives and there are indications of an improvement in the quality and efficiency of managing winter pressures in the site where it was developed. It was thought that there were further gains to be achieved over time. The evaluation uncovered a range of issues when SHREWD was rolled out to larger and more complex geographical areas. Further evaluative work would be worthwhile to understand the reasons behind these findings more fully.

Appendix: Interview Guide

Research questions

- What issues have arisen from the implementation and operation of SHREWD?
- To what extent and how has SHREWD contributed to improvements in the quality of co-ordination and planning processes?
- What are the cost/resource implications of implementing/using SHREWD?

Interview questions

1. How do you use SHREWD?

- When did you first start using it?
- How was it introduced? (training? Etc)
- How have you found using it?

Have you experienced any benefits of using it?

Have you come across any problems or disadvantages of using it?

Are you aware of how others use the system? (and what impact it has had?)

2. Do you think using SHREWD has made the sharing of information easier? How? (example?)

- What information do you share and with whom?
- Does SHREWD do it all or are there gaps?
- How accessible is SHREWD?
- How easy is it to get into when needed?
- Is the information always there (and is it real time info)?

Has it improved your ability to monitor the situation on a day to day basis?

Has it helped you to make decisions when responding to an emergency?

Has it helped you to think more strategically about how to manage system pressures?

Has it helped you to reflect on the way emergencies / system pressures are handled?

3. Are there any local costs incurred through using SHREWD? (annual fees, IT costs, etc.?)

How has using the system impacted on your role (or that of others you know of)? (time spent doing tasks?)

Are you aware of any ongoing cost or resource issues? (any training, development inputs, software/hardware needs? etc?)

4. What further developments do you think are needed to the system?

Any other comments (3 key benefits and 3 key problems/concerns – if not already covered above)?