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Evaluation of a system for real time surveillance of suicide in England

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Crisis: The Journal of Crisis Intervention and Suicide Prevention

IN PRESS VERSION

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CITATION:

Doyle, M., Ainsworth, P., Boul, S. and Lee, D. (In press). Evaluation of a system for real time surveillance of suicide in England. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*

ABSTRACT

Background

Access to timely data on suicide is crucial to support suicide prevention. A real-time suicide surveillance (RTSS) system enables public health teams and allied agencies to review information following suicides promptly and take action quickly.

Aims

The aim of this paper is to report on an evaluation of a RTSS system in South Yorkshire, England.

Method

The system was reviewed and outcome data analysed for 2019 and 2020 based on recorded suspected suicides, a stakeholder focus group, evaluation of postvention bereavement service outcomes and lessons learned.

Results

The benefits of RTSS included rapid response to emerging trends, identifying clusters, effective bereavement support, information to inform measures to mitigate risk and supporting evaluation of interventions. The challenges faced included limited resources, data quality, consistency across places and linkages with coronial processes.

Limitations

This was an evaluation of one RTSS system based on routinely collected data covering one area, South Yorkshire, so some data limitations and direct comparison with other services or against a control group was not possible.

Conclusion

The RTSS system has led to better support for suicidal people and a responsive, timely and effective service for those bereaved by suicide, all of which are likely to lead to enhanced well-being and community resilience.

INTRODUCTION

Death by suicide accounts for 700,000 deaths globally each year (World Health Organisation, 2021a). Suicide prevention is a public health priority in many jurisdictions and the first step towards an effective public health approach is an accurate, timely and reliable surveillance system (Ahmedani and Vannoy, 2014). Some well-known surveillance systems have been identified internationally (Sutherland et al., 2018; Leske et al., 2020; Bran et al., 2021) and although most countries will have a system for recording suicides, many will face the challenge of delays in acquiring suicide figures from their systems (Appleby, et al., 2021). In England, a coroners conclusion of suicide at inquest takes on average about six months while some can take over a year (Office for National Statistics (ONS), 2019) and the delay for those bereaved by suicide to receive emotional and psychological support can be up to 4.5 years (McGeechan, et al., 2017). This delay presents a barrier to providing a timely response to emerging suicide trends and delays access to support for those bereaved by suicide. Due to the time taken to complete, coronial registration processes are often unsuitable for immediate monitoring of suicide (Appleby, et al., 2021), and the lengthy processes can result in data that are insufficient to guide timely suicide prevention actions (Pirkis, et al., 2021).

In England and Wales, the National Health Service (NHS) Long Term Plan commits that all regional public health systems will have a suicide prevention programme in place by 2024 to include real-time surveillance systems and services to provide timely and appropriate support to families bereaved by suicide. Public Health England (PHE: 2020) note that real-time suicide surveillance (RTSS), enables public health teams and local suicide prevention groups to identify if interventions are required after a suspected suicide, usually well in advance of the coroners' conclusion. In the UK there are generally two models of RTSS; one led by coroners, and one led by the police/first responders at the scene of a death. Police-led systems can assist in data recording and timely decision making, and this has led to a reduction in those bereaved by suicide dying by suicide (Thorne and O'Reilly, 2021). Recent research in the North-East of England compared the police and coroner-led models and found that the coroner model was more accurate at identifying suspected suicides, whereas reports of suspected suicide were filed much quicker with the police-led model enabling a timelier response (McGeechan et al., 2017).

A review of RTSS police-led systems in three countries (Ecuador, Japan and Poland), found a number of advantages, including, more rapid response to emerging suicide trends, identifying clusters and locations of concern, provision of up-to-date information to share

with the public, information to inform measures to mitigate risk; especially in response to new risk factors, and supports evaluation of systems and research (Baran et al., 2021). In 2019, a systematic-review of RTSS internationally found that only two published studies were identified relating specifically to RTSS systems (Newbury-Birch et al., 2019). However, in their review of 56 local authorities in England, they found 15 areas reported currently using an RTSS system and 39 were intending to use the system in the future. Recent growth in systems is welcomed but systemic and data quality issues remain. Some solutions recommended include a national digital solution, agreement of a national minimum dataset, adequate sustained resourcing and nationally agreed standards (Coles, 2021).

Despite inevitable variance across jurisdictions, an international consensus on the potential benefits of RTSS is gradually emerging (Baran et al., 2021). To support this and in order to improve timely suicide prevention, more service evaluations are required, as to date supporting literature evaluating contemporary RTSS systems remains limited.

Context and background

South Yorkshire and Bassetlaw Integrated Care System (SYB ICS) was identified nationally in 2017 as a region that had higher than the national average rates of death by suicide. The three-year aggregate rate for suicides 2017-2019 was 12.1 per 100,000 population compared to 10 in England as a whole (ONS, 2019). The SYB ICS Suicide Prevention Work Programme was first established in 2018 and is a collaboration of over 25 health, social care, 'blue light' emergency services (police, fire, ambulance) and voluntary organisations SYB, all committed to reducing suicide rates through shared leadership, innovation and collaboration. Previously, suicides were monitored and analysed through the audit of coroner's records. Although these audits contain valuable information on trends, patterns and risk factors, a major limitation is the timeliness of the findings. The need to provide timely postvention (post-suicide) support to anyone exposed to, affected by or bereaved from suspected suicide is a key priority. Timely postvention support for the bereaved can minimise the emotional impact, promote recovery and reduce further suicides (Lascelles et al., 2016).

In August 2018, the SYB Suicide Prevention Steering Group agreed to take forward implementation of an RTSS system and bereavement support offer. The main aim was to implement an RTSS system, which would allow review and response to suspected suicides within a maximum of 72 hours of notification being received. The five service objectives are:

1. A reduction in suicide rates among people bereaved by suicide

2. Increased service uptake
3. A consistent offer of high-quality postvention support available in all local places
4. An increase for individual well-being and community resilience
5. A reduction in the distress of people bereaved by suicide

The RTSS system is led by South Yorkshire Police for Barnsley, Doncaster, Rotherham and Sheffield, and by Public Health, alongside Nottinghamshire Police, for Bassetlaw. An electronic recording and monitoring system called QES was commissioned to ensure that each area can produce timely and meaningful data and reporting. The RTSS system and referrals process for SYB is a police-led system and is illustrated below (Figure 1).

Figure 1 about here

A Suicide Liaison Officer¹ completes their part of the process and each local authority within SYB then continue with the following steps:

1. Utilise the QES system to send confidential enquiry forms to partner organisations after each suicide;
2. Partner organisations record incident immediately on QES and return the confidential enquiry forms within 2 weeks for analysis by the Public Health Lead for suicide prevention, and
3. Public Health Lead then convenes a suspected suicide learning panel where the findings are discussed and lessons identified.

If bereaved friends or family have been identified, an offer of support is made as soon as possible, and; an immediate response is provided if there is a need to safeguard children and vulnerable adults.

METHOD

The aim of this paper is to report on the development, implementation and evaluation of the RTSS system in South Yorkshire, England. The objectives of the evaluation were to review and compare the characteristics of the suspected suicides reported, critically appraise

¹ Police officer with dedicated time to monitor and report on suspected suicides and, from the information available, to contact as many people and agencies as possible to effect a timely response.

the performance of the RTSS system, evaluate the impact of the new postvention suicide bereavement service and review lessons learned since inception of the RTSS system. The methods chosen were similar to previous evaluations of suicide surveillance systems and in accordance with recognised public health guidance (Sutherland et al., 2018; Centre for Disease Control and Prevention, 2001). As this was a service evaluation using existing routinely collected anonymous data, ethics committee approval was not required in accordance with Health Research Authority guidance ², although information governance safeguards were followed. The evaluation was conducted using the following methods:

- A review and report of the frequency and characteristics of all suspected suicides between 1st January 2019 and 31st December 2020
- A focus group attended by key stakeholders (public health staff and clinicians) from each geographical area in SYB to critically appraise the RTSS system and obtain feedback on the SYB RTSS system performance attributes. The structure of the focus group and the evaluation lines of enquiry were based on the attributes identified in the *Centre for Disease Control and Prevention Updated Guidelines for Evaluating Public Health Surveillance Systems* (2001) in terms of usefulness, simplicity, sensitivity, timeliness, data quality and acceptability. The focus group was planned, delivered and evaluated in accordance with best practice guidance (Stewart and Shamdasani, 2015) and thematic analysis was consistent with method outlined by Braun & Clarke (2006). Eleven senior staff representing all SYB ICS partners attended the 90 minute group chaired by Professor from local university (MD) who was part of service evaluation team.
- An evaluation of postvention suicide bereavement service, to review how many people were referred and benefitted, and how long it took to access the service. The average improvement on the seven-item *Warwick-Edinburgh Mental Wellbeing Scale* (WEMWBS: NHS Scotland et al., 2006) based on pre and post intervention was highlighted. The WEMWBS has been used previously to evaluate bereavement services (Hodiamont et al., 2019) and was completed electronically at the start of the intervention and then again when intervention complete.
- A review of emerging lessons and responses from learning lessons meetings. Learning lessons meetings were held approximately monthly across the ICS to identify psychosocial and risk information arising from the RTSS system. Membership is wide

² Health Research Authority (2017). Defining Research. <http://hra-decisiontools.org.uk/ethics/>

ranging but core membership is usually made up of all stakeholders. Local groups would feed into ICS-wide meetings held quarterly.

RESULTS

Review of frequency and characteristics of all suspected suicides between 1st January 2019 and 31st December 2020

Over the 24-month evaluation period, 2019-2020, there were 356 reported suspected suicides reported via the RTSS system; 172 in 2019 and 184 in 2020. This compares to officially registered number of suicides of 189 in 2019 and 161 in 2020 (ONS, 2021). The number of suspected suicides recorded by the RTSS system in 2020 was higher than suicides reported in ONS data in 2020, although it was lower in 2019. This is possibly due to the RTSS system taking time to get established in 2019 and by 2020 it became more effective at detecting suspected suicides.

Nearly three-quarters (262, 74%) were male and the age of those who died ranged from 16 to 87 years and mean age during evaluation period was 44.4 years (SD 16) and median was 42 years (Table 1). Females were older with a median age of 45.5 years v 41 years for males, and the overall median age increased by four years between 2019 and 2020 (41 to 45 years). The vast majority were white North European ethnicity (293, 82.3%) although this was higher in 2020 compared to 2019 (86.4% v 77.9%). The most frequent method of suicide was hanging/asphyxiation accounting for over two-thirds of deaths overall but more likely in males compared to females (70.3% v 56.4%). This reduced from 71% overall in 2019 to 62% in 2020. Nearly a third of female deaths were due to overdose/poison, 30.9%, compared to 13.8% in males.

Table 1 about here

Stakeholder feedback on key system attributes

The focus group was useful and productive as many positive benefits emerged , including partnership working, information sharing agreements, rapid response to incidents and emerging trends, evidence-based interventions and support for safeguarding of children and vulnerable adults (Table 2). Weaknesses included staffing capacity, variable engagement with the coroner and coronial process, inconsistencies across the ICS between places and

poor data quality and completeness, thereby hampering service evaluation. Despite these weaknesses the overall message was very positive and actions to improve the system suggested and underway, including developing ICS-wide strategy, reviewing capacity and demand, linking with national standards work and better preparation for those first on the scene.

Table 2 about here

Evaluation of postvention suicide bereavement service

Evaluation data were available for calendar year 1st January 2020 to 31st December 2020, across four quarters. During this time there were 109 suspected suicides where a relative or friend of the deceased person was identified and 125 referrals to the service. Nearly all (98%) were contacted within 24 hours and 115 (93%) benefitted from the intervention based on those who were able to access the service (Table 3). An average improvement of five on the WEMWBS was recorded by those receiving postvention care, suggesting an improvement in wellbeing in this time.

Overall average improvement on WEMWBS score was five indicating the service was beneficial for improving wellbeing..

Table 3 here

Emerging lessons and response from learning lessons meetings

During these meetings, a number of common themes were identified, and it was noted that the following groups were prominently represented:

- People who had made a previous suicide attempt prior to death (37% at least one previous attempt in 2020)
- Children bereaved by suicide (33 in 2020)
- People with long term physical health conditions and/or chronic pain
- People currently prescribed medication
- Females, military veterans and students higher than expectations
- Perpetrators of domestic violence (accounted for 23% of suspected suicides in a 2020 audit)

In response, targeted work to improve suicide prevention included:

- *Attempted Suicide Response* services to consolidate recovery and proactive coping to prevent future attempts
- Local Bereavement support services for children
- Crisis care alternatives and community transformation
- *Problem Orientated Policing* (POP Plans) designed for areas of high suicide risk or crisis.
- Identified potential clusters and convened targeted multiagency responses (e.g. veterans, students, ethnic group)
- Suicide contagion planning when there is a death of a young person (under 18)
- Closer working arrangements between police and probation service to support those involved in domestic abuse

DISCUSSION

This paper reports on the evaluation of an RTSS system in England. Evaluations of this type are consistent with recent World Health Organisation recommendations to evaluate suicide surveillance systems (World Health Organisation, 2021b). This service evaluation identified strengths of the system and challenges faced which informed plans for suicide prevention.

Rates of suicide in South Yorkshire (12.5 per 100,000) are higher than the national average (10.4 per 100,000) and this was confirmed from the number of suspected suicides recorded by the RTSS system. There is a discrepancy between RTSS data and ONS registered suicides as the RTSS records suspected suicides as they arise whereas the ONS provides data on those registered as suicide following inquest, which could be several months or later than date of incident (Appleby et al., 2021). The expectation was that the RTSS system would detect more suspected suicides than the actual suicides reported by the ONS but this was not the case in 2019. This is possibly due to the RTSS system becoming more effective at capturing suspected suicides in 2020 as it became more firmly established. The characteristics of suspected suicides recorded are similar to those reported nationally in terms of gender, age and methods (ONS, 2019).

The benefits of the RTSS system in SYB highlighted by key stakeholders, were similar to those noted in other countries (Baran et al., 2021). Similarly, the challenges faced are consistent with those identified elsewhere, including capacity and resources, data quality,

consistency across places and linkages with coronial processes (Coles, 2021; Sutherland et al., 2018; McGeechan et al., 2017). Future plans identified to develop an ICS strategy that will support RTSS development, reduce variance across places and enhance the sharing of lessons learned and positive practice.

The bereavement by suicide service was accessible, responsive, timely and, based on average improvements on the WEMWBS scores, effective in enhancing mental wellbeing in accordance with indicators of successful postvention services of this type (Public Health England, 2016). However, the full WEMWBS data were not available for more detailed analysis and this is a limitation as pre and post intervention data important to enable more in depth evaluation of the active ingredients of interventions.

Many themes and trends were identified in learning lessons meetings that enabled new, safer and more effective solutions across the ICS, consistent with expectations of suicide surveillance systems (Public Health England, 2020). Highlighted as a concern were the number of children bereaved by suicide and the disproportionate number of domestic abuse perpetrators who die by suicide. Services have already been developed to support bereaved children and the findings on domestic abuse perpetrators are being investigated further to see what additional resources might be required. It is recommended other similar systems need to explore these issues and possible responses.

There are a number of limitations of this evaluation. As this is a single-system evaluation it is limited in terms of generalisable findings and we are unable to compare with other systems or control groups. The evaluation analysed existing data collected routinely to review the system performance and not specifically as part of a research project. Therefore, the findings can only be viewed as practice-based evidence and further, more detailed evaluations of this system and similar systems are required using a robust research methodology to compare RTSS in the UK and beyond. Despite the limitations, the description of the service, context, development and evaluation findings should prove useful for comparison with other services and inform future research, while contributing to consensus building on what a safe and effective RTSS system should look like. It is too early to judge whether the RTSS system in SYB will meet its objective of reducing suicides as it is generally accepted that three-year aggregate data are required to reach any meaningful conclusions. However, based on the findings of the evaluation of the new system, it is reasonable to conclude that the RTSS system has led to higher quality support for suicidal people and a responsive, timely and effective service for those bereaved by suicide, all of which are likely to lead to enhanced well-being and community resilience.

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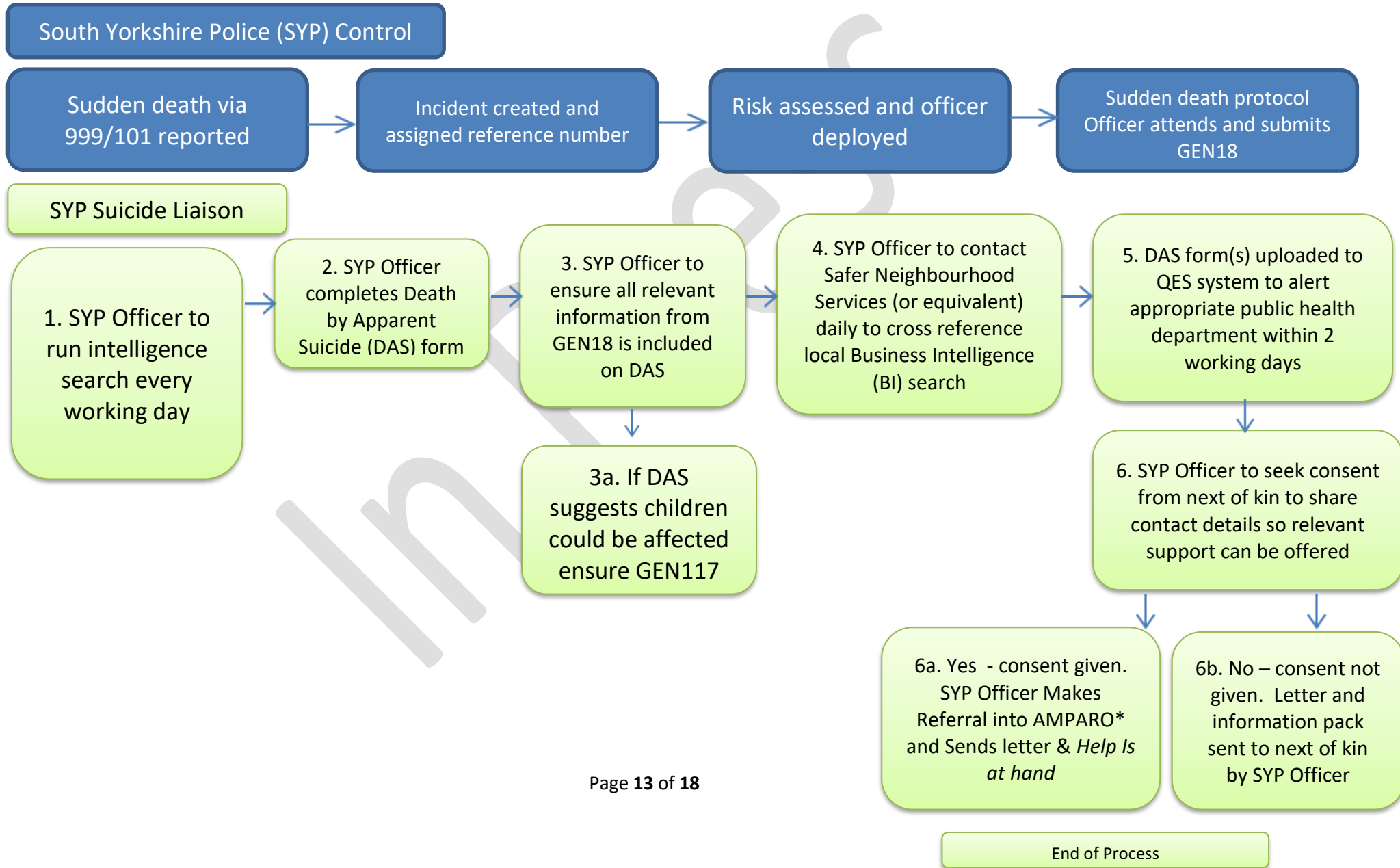
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Figures and Tables

Figure 1 South Yorkshire and Bassetlaw Real Time Surveillance of Suicide Standard Operating Procedure



* AMPARO – This is the organisation that provides postvention service for those bereaved by suicide.

Tables

Table 1 Summary of suspected suicides from 1st January 2019 to 31st December 2020

Variable	Overall	Male	Female	2019	2020
Frequency of suicide (%)	356 (100%)	262 (74%)	94 (26%)	172 (48.3%)	184 (51.7%)
Age in years mean (SD)	44.4 (16)	44 (15.6)	45.5 (16.8)	43.3 (14.6)	45.3 (17)
Age in years median	42	41	45.5	41	45
Age range in years	16-87	16-86	16-87	17-87	16-86
White North European	293 (82.3%)	215 (82.1%)	78 (83%)	134 (77.9%)	159 (86.4%)
Method Hanging/Asphyxiation	237 (66.6%)	184 (70.3%)	53 (56.4%)	122 (71%)	115 (62%)
Method Overdose/poison	65 (18.3%)	36 (13.8%)	29 (30.9%)	31 (18.1%)	34 (18.4%)

Table 2 Strengths weaknesses and areas for development against key system attributes

Attribute	Focus group line of enquiry	Strengths	Weaknesses	Areas for Development
Usefulness	Are there clear benefits & contribution to detection and prevention of suicides?	<ul style="list-style-type: none"> • Partnership working • Access to clinical supervision • Offer bereavement support • Able to identify specific groups for action • Specific postcode locations fed into local suicide prevention action planning • Addresses cross boundary issues • Influence policy and practice and service provision • Supports effective safeguarding of children and vulnerable adults 	<ul style="list-style-type: none"> • Response to detection and prevention varies by area 	<ul style="list-style-type: none"> • Consider overarching suicide prevention strategy for SYB ICS
Simplicity	Is it easy to use & make sense of output?	<ul style="list-style-type: none"> • Easy to understand and utilise in plans • Information sharing agreement robust • Easy to enter data 	<ul style="list-style-type: none"> • Only one person 	<ul style="list-style-type: none"> • Review capacity and capability of system co-ordination
Sensitivity	Does it pick up all suspected suicides?	<ul style="list-style-type: none"> • Captures the overwhelming majority of cases • ‘Game changer’ in identifying suspected suicides quickly • Able to monitor death warnings to pick up out of area deaths 	<ul style="list-style-type: none"> • Cross referencing with coroner suicides not formalised • If no police involvement then some get missed • Evidence that some do not receive suicide conclusion 	<ul style="list-style-type: none"> • Consistency across all areas • Better preparation of those first on the scene of incident to ensure reliable reporting

Attribute	Focus group line of enquiry	Strengths	Weaknesses	Areas for Development
		<ul style="list-style-type: none"> • Collate successfully with local intelligence 	<ul style="list-style-type: none"> • Limited if suspected suicide in another country 	
Timeliness	Are the findings collated, analysed and disseminated in a timely way?	<ul style="list-style-type: none"> • Death by Apparent Suicide forms are sent out within 24 hours • Data entered usually within 48 hours of report • QES IT system works well 	<ul style="list-style-type: none"> • ICS-wide analysis takes much longer than local area 	<ul style="list-style-type: none"> • Develop reporting standards
Data quality	Are data complete and of a quality that allows timely analyses?	<ul style="list-style-type: none"> • Data sharing agreement in place and supported by all agencies • Already exceeds national expectations • Enables more detailed investigation via partner organisations, e.g. mental health services, schools, social services. 	<ul style="list-style-type: none"> • Minimum data set is limited e.g. ethnicity • Data can sometimes be subjective depending on officer collecting information at the scene • Foreign nationals information not always available 	<ul style="list-style-type: none"> • Review minimum data set • Develop reporting and recording standards
Acceptability	Does the system work for all stakeholders and wider community?	<ul style="list-style-type: none"> • Really good response from all partners on data and alert system • Right balance between who has access to the information • Collaborative commissioning of bereavement support 	<ul style="list-style-type: none"> • Small number of dedicated staff • Difficult for some staff to cope with suicide and sensitive issues • Coroner input and support limited 	<ul style="list-style-type: none"> • Role and function of system co-ordinator needs to be reviewed • Introduce system of supervision • Engage coroners in this evaluation and future plans
Utility	Can system be used to inform suicide prevention plans?	<ul style="list-style-type: none"> • RTS is now the crux to all local plans. • Provides evidence on frequency, locations, 	<ul style="list-style-type: none"> • Variable across different teams • Not clear if involvement, or recent involvement of 	<ul style="list-style-type: none"> • Develop ICS wide strategic approach to enable RTSS to inform planning

Attribute	Focus group line of enquiry	Strengths	Weaknesses	Areas for Development
		<p>emerging risk factors & bereavement</p> <ul style="list-style-type: none"> • Pick up on learning from individual cases to improve care/practice • Target certain groups for support, e.g. children, families, ethnic minorities • Better targeted training • Able to target efforts and resources much more effectively 	<p>mental health or support services at time of report</p>	
Learning	Does the system enable lessons to be learned and acted on?	<ul style="list-style-type: none"> • Changing policy, practice and interventions • Commissioning pilot services in response to lessons learned • Strengthening information sharing agreements • Share relevant information on children who self-harm 	<ul style="list-style-type: none"> • Variable across different areas 	<ul style="list-style-type: none"> • Review terms of reference for learning lessons group and consider more frequent meetings and wider membership

Table 3 Postvention bereavement service activity and evaluation 2020

Quarter in 2020	Suspected suicides where bereaved identified	N of referrals	N (%) contacted within 24 hours *	N of beneficiaries **	% of referrals that are beneficiaries	Average improvement in scale score ***
1- January-March	36	41	38 (93%)	38	93%	4.4
2- April-June	20	22	21 (96%)	21	95%	-
3- July-September	23	27	27 (100%)	26	96%	4.1
4- October- December	30	35	35 (100%)	30	86%	6.5
Overall	109	125	121 (98%)	115	93%	5

* *Consent required and may not be in touch within 24-hours as phone switched off*

** *Received initial brief advice and then community response plan if required*

*** *Warwick-Edinburgh Mental Wellbeing Scale*