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1 What understanding is there about sepsis incidence, how sepsis is presenting to services, and outcomes from sepsis

Sepsis is a potentially life-threatening condition triggered by acute infection or injury. In the United Kingdom (UK), there are around 150,000 cases of sepsis each year, and results in around 44,000 deaths annually. In Wales, this equates to approximately 2,200 people dying from the condition, representing approximately 13% of all hospital deaths.

Sepsis presents to healthcare services in many different ways, and at times can be difficult to recognise. Common signs and symptoms in adults include:

- Slurred speech and/ or confusion
- Shivering or muscle pain
- Poor urine output
- Severe breathlessness
- Discolouration of skin
- Feeling very unwell.

At any one time in a hospital, about 5% of all in-patients are suffering from sepsis, or severe sepsis. About 30% of those diagnosed with sepsis will die within 90 days of presentation, 30% will recover fully, and 40% will suffer permanent life-changing effects[1,2]. However, even those who recover fully, on-going psychological consequences as a result of the condition may be present. Sepsis, therefore, carries a terrible cost, not only in terms of mortality but also in the consequences that survivors may have to carry with them for the rest of their lives.

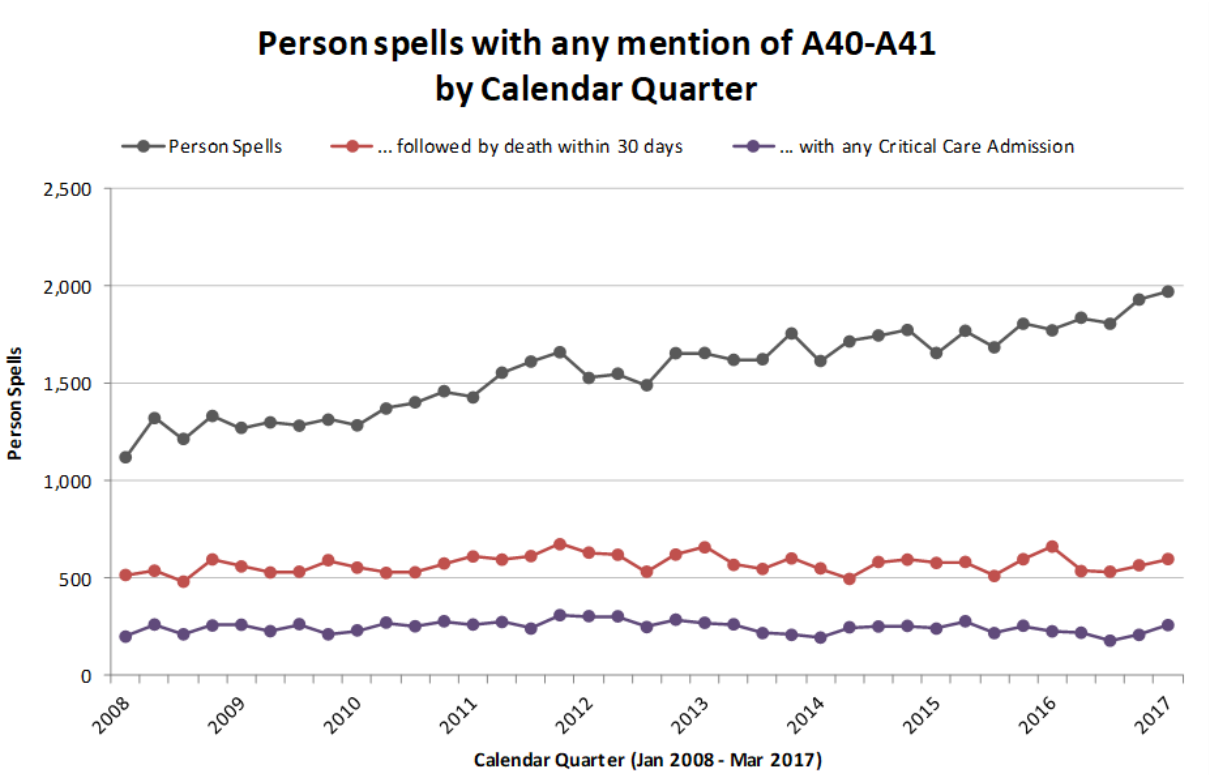
Not all deaths from sepsis are avoidable. However, there is still likely to be a sizeable proportion that are. Early recognition of the signs of sepsis is essential in achieving positive outcomes, and tools such as the National Early Warning Scoring System (NEWS) are pivotal.

The *Improvement Cymru* (formerly 1000 Lives) Acute Deterioration team in Public Health Wales have worked since 2011 to support improvement in the early recognition and effective management of sepsis across the NHS in Wales. These efforts have mainly focussed on acute hospitals because this is where most cases have presented and been recorded. In responding to 'A Healthier Wales' and understanding that early recognition is vital to a positive outcome, the team have

recently broadened their scope to include primary and community care and are providing training and support to community nursing teams.

1.2 Improved National Outcomes

In October 2015, the Deputy Health Minister, Vaughan Gething, announced a significant reduction in mortality associated with two sepsis codes that had appeared to coincide with the changes made in healthcare systems occurring because of the 1000 Lives Rapid Response for Acute Illness Learning Set (RRAILS) programme. Whilst causation is impossible to attribute it does seem probable that these outcome improvements are associated with this initiative (see chart below)



2 Public and professional awareness of sepsis

2.1 Public Awareness Campaign

The issue of public awareness campaigns is challenging. Assessing the impact of any public awareness campaign is difficult. Campaigns appear to be most effective when targeting 'at risk' groups. This makes it difficult for addressing sepsis campaigns as it is not possible to identify 'at risk' groups [3].

Despite considerable work in England and Scotland, it is questionable whether the public awareness campaigns that have been run have produced any lasting evidence of raised knowledge of sepsis within the broader population.

It is also extremely difficult to maintain the delicate balance between 'spreading the message' to the public and possibly increasing demand on General Practice and Emergency Departments with those concerned. Consequently, in Wales, we have

not undertaken any specific work with the public although have worked closely with the UK Sepsis Trust in the past.

Tracey Cooper, Chief Executive of Public health Wales, has also addressed this question in her evidence given to the Health and Social Care Committee in July 2019. An excerpt of the transcript can be seen in appendix 1.

Instead, we have focussed on raising professional awareness as part of the campaign that we have been effectively running as part of our support for 10 years.

2.2 Raising professional's awareness

The main vehicle for the continued improvement of recognition and treatment of sepsis in Wales for professionals has been is through participation by multidisciplinary professionals from all Health Boards and Trusts in the Improvement Cymru Acute Deterioration Programme. This has been overseen by a Rapid Response to Acute Illness Learning Set (RRAILS) Steering Group. In the coming months this will evolve to support a broader safety programme.

The awareness campaign for professionals has focussed on ensuring that:

- training on the recognition, escalation and response to sepsis has been integrated since 2013 into Life Support courses that are delivered as part of mandatory training by the resuscitation training departments within each HB
- the exact numbers of staff trained at any one time will be known by each HB
- There is a focus on doctors, nurses and support workers repeating this training on an annual or bi-annual basis.

To support this training, as 1000 Lives, Improvement Cymru previously developed a suite of e-learning modules (RRAILS online) that can be accessed through the ESR and Learning@Wales. Each module takes approximately 15 minutes to complete and there would certainly be scope to make some of the modules mandatory for some professional groups. It would also be relatively easy to use this platform for the hosting of more modules on, for example, sepsis in primary care settings.

It is important to remember that Sepsis, although a major cause of harm, is not the only cause and so the training that has been developed focusses upon identifying the deteriorating patient quickly and escalating to a professional to make an appropriate diagnosis swiftly. It is this focus which we believe has resulted in the favourable sepsis outcomes that we have seen in Wales.

The Improvement Cymru Acute Deterioration programme aims to reduce avoidable harm and death from causes of acute deterioration (sepsis and acute kidney injury) in the Welsh population. The programme to date has supported acute hospitals, primary and community care settings across every health board area in Wales; offering healthcare staff standardised quality improvement tools and resources to help identify and treat their patients. The current focus is mainly on:

- Improving patient outcomes and reducing variation in practice across secondary care by conducting peer reviews to identify and share areas of good practice and areas for improvement.
- Standardising the care of acutely deteriorating patients across the whole pathway of care by introducing the National Early Warning Score (NEWS) into community settings.
- Supporting development of a systematic method of review, communication of deterioration and rapid treatment in paediatric settings.
- Supporting developmental work with post-hospital Sepsis support groups.
- Developing and maintaining a Sepsis Registry.

The RRAILS steering group, supported by Improvement Cymru, has also published guidance on the NHS Wales response to the publication of the RCP paper on NEWS 2, the standard self-assessment for the RRAILS peer review and is in the process of publishing the all Wales guidelines for Acute Kidney Injury. The work of NHS Wales is also shared more broadly via membership of the UK National Outreach Forum (NOrF) Executive Board and the International Society of Rapid Response Systems (ISRRS) third consensus statement working group.

3 Identification and management of sepsis in out-of-hospital settings, including use of relevant screening tools/guidance, and the referral process between primary/secondary care.

There is increasing recognition that early intervention in sepsis is associated with improved outcome. It is, therefore, paramount that there is a focus on the identification and management of sepsis in out-of-hospital settings.

In 2019, Improvement Cymru launched a programme to spread NEWS and sepsis screening in community following the successful work of piloting amongst GPs, Community Nurses and the Wales Ambulance Service. There has been considerable analysis performed into the suitability of NEWS for community usage. This analysis indicates that NEWS works well at identifying sick people but more importantly as a standardised communication tool.

Consequently, some of the tools used in secondary care have been adapted for use in community settings and care homes. All health boards and trusts have been involved in the development of the programme that aims to implement NEWS in all 160 Welsh district nursing teams by September 2020. It is expected that, in addition to providing and extending the use of NEWS as a common language of risk in Welsh Healthcare, this initiative will result in a similar positive effect upon patient outcomes for sepsis as that experienced in Welsh hospitals with the introduction of NEWS in secondary care.

In addition, a first draft of an All Wales out of acute hospital observation chart has been launched. This is compliant with the Royal College of Physicians recommendations and principles of NEWS 2. Following testing during the roll out of NEWS, it is anticipated that this chart will become standard in all non-acute hospital settings, meaning that increasing numbers of people will be identified as sick and given appropriate treatment without need for admission to hospital.

A peer review process requested by Welsh Government as a response to the publication of the PSMO report on 'out of hours' services has recently been completed following visits to 20 acute hospital sites in the seven health boards and Velindre across Wales. The final report is currently being prepared and recommendations will be used to inform future work with Improvement Cymru. The recommendations outlined include:

- Every Health Board should establish an overarching Acute Deterioration Steering Group
- Identify an operational lead for acute deterioration within each organisation, ideally with protected time for the role.
- Establish a 24/7 Rapid Response System (RRS) featuring a Critical Care Outreach
- Ensure whole hospital daily 'huddles' and ward shift handover explicitly feature information on patients at risk of deterioration
- Health Board Acute Deterioration Steering Group should agree, publicise and monitor compliance with Standard Operating Procedures (SOPs) for escalation and treatment of acute deterioration, sepsis and acute kidney injury (AKI)
- Ensure that NEWS is reliably utilised in all adult clinical areas (except maternity) both in and out of hospital.
- Demonstrate compliance with sepsis screening for all patients meeting national criteria (NEWS greater than 3 and a suspicion of infection).
- Implement and measure compliance with an Acute Kidney Injury care bundle to respond to patients identified via the AKI e-alert system
- Establish and regularly review at a hospital and Health Board level, a standard dashboard of acute deterioration metrics
- Embed standardised national training on AD, sepsis and AKI

Recommended Actions to be taken at an all Wales level:

- Create an all Wales Faculty to provide evidence to Welsh Government and to advise on future Acute Deterioration programmes
- Develop and publish a set of standards for recognising, escalating and responding to acute deterioration in secondary care and support Health Boards to self-assess against these to inform the creation of annual action plans.

- Establish a suite of role specific competencies based upon the standards to enable development and evolution of relevant education and training.
- Identify a high level dataset and reporting schedule to enable HBs to demonstrate improvements in processes and outcomes associated with acute deterioration, Rapid Response Systems and CCOTs.

4 Identification and management of sepsis in acute (hospital) settings

The identification and management of sepsis within acute settings continues to be a major focus of attention. There continues to be more that can be done, especially identification and management of patients on general wards rather than ED and critical care. Work to date in Wales, supported by Improvement Cymru/ 1000 Lives includes:

❖ Introduction of the National Early Warning Score (NEWS)

The National Early Warning Score (NEWS) has been introduced in all acute clinical areas, in the Welsh Ambulance Service Trust (WAST) and in many community and primary care settings. Wales was the first country in the UK and Ireland to implement NEWS as standard in 2013. This has had the effect of changing the national culture around acute deterioration and has hugely raised the awareness of sepsis amongst health care professionals.

❖ Sepsis screening and treatment

A standardised approach to sepsis screening and treatment with the sepsis 6 care bundle has been integrated with the implementation of NEWS and so the escalation process for sepsis in Welsh hospitals has been embedded in the everyday clinical protocols and procedures for many years.

❖ Development of Standardised tools

Working with the Health Foundation and Helen Hamlyn Institute on development of simple tools to make it easy and attractive for clinicians to comply with best practice. These include such developments as the 'Wee Wheel', NEWS Card and Kidney Safe Bracelet. Demand for these has been high in Wales but also in England and worldwide. For example, over 20,000 NEWS cards, which explicitly suggest that sepsis be considered for patients with a high NEWS, are in use across Wales.

❖ Sepsis Metrics Reporting to Welsh Government

NHS Wales, facilitated by the Acute Deterioration Programme, has developed and spread a sepsis screening and escalation tool and has worked to improve systems for delivery of the Sepsis 6 care bundle within a 1-hour window. All Health Boards now report metrics on sepsis screening and treatment to WG on a monthly basis and this data is evaluated as measurement for improvement as part of the RRAILS Steering Group meetings.

❖ Measurement - Suspicion of Sepsis

The Acute Deterioration team of Improvement Cymru/ 1000 Lives have continued to look at routine national data in order to understand the impact we are having on mortality from sepsis and to help identify where to focus our efforts. Unfortunately,

methods that have been used in the past have become unusable due to UK-wide changes in diagnostic coding and we are having to investigate new approaches, working with colleagues from Welsh Government, to analysing this data. 'Suspicion of Sepsis' (SoS; Inada-Kim et al. 2016) is one such approach, looking at emergency admissions with an infection-related diagnosis. NHS England launched a 'SoS dashboard' in September 2019 based on this approach. We have worked to replicate this new approach using Wales's data. Having sought advice from the Public Health Wales Observatory, we are also looking at the demographics and comorbidities of these admissions to check that any positive findings aren't the result of a changing patient-mix.

❖ Significant improvements in recognition and treatment of sepsis at the hospital 'front door'

Following a 1000 Lives Improvement study tour to Dartmouth Hitchcock medical facility in the US, a joint RRAILS/ ABUHB team developed and established the practice of DRIPS (Data, review, improve, plot the dots, share) meetings in two emergency departments and one hospital in 2015. This method has since been spread as part of the Acute Deterioration programme and peer review process to the receiving units in eight hospitals. In every one of these hospitals the number of cases of sepsis identified in emergency departments and medical assessment units has significantly increased and the compliance with delivering sepsis treatment within one hour has increased to between 70-100% on a regular basis. This is a remarkable achievement which may well be an international first in non-electronic health care systems.

❖ Sepsis Box/trolley

Following the sepsis box study at Cwm Taf University Health Board, the concept of giving clinicians 'permission to act' by using a dedicated box or trolley has been adopted by most Welsh hospitals.

❖ NEWS Wales Application (App)

The NEWS Wales App, which enables users to calculate NEWS and suggests the likelihood of sepsis, has been re-developed by the RRAILS steering group and re-released because of popular demand, particularly from paramedics who find it an invaluable tool. It is intended that the app will play a central role in the roll out of NEWS and sepsis screening to community settings this year.

❖ Sepsis Guidance

NHS Wales's ability to standardise best practice at scale has been demonstrated by the publication by Richard Jones, Clinical Lead and Chris Hancock, Programme Lead for the 1000 Lives Acute Deterioration programme, of the guidance letter on the 'recognition and management of the adult with sepsis', as well as guidance on maternal sepsis, identification of sepsis by the Welsh Ambulance Service and with Dr Clare Dieppe, a position statement on acute deterioration in Children.

❖ Paediatric Acute Deterioration Programme

Clare Dieppe, a specialist Emergency Department Paediatric Consultant in Swansea Bay University Health Board has been appointed as Chair of the RRAILS Paediatric sub group and to lead on the paediatric acute deterioration programme in NHS Wales. 1000 Lives Improvement have published a statement outlining the expected scope and direction of paediatric acute deterioration work. With the ongoing work around the Paediatric Early Warning Score Utilization & Mortality Avoidance (PUMA) study yet to conclude, clinicians within the specialty are reluctant to develop a 'score'. They are more comfortable with an approach that improves and standardises the review and communication process.

In 2019 the Acute Deterioration programme is supporting the roll out of the Paediatric Observation Priority Score (POPS) within WAST and all NHS Wales Emergency Departments.

5. The physical and mental impact on those who have survived sepsis, and their needs for support

Due to earlier recognition and intervention in sepsis, short term survival has improved recently, resulting in a growing population of sepsis survivors. However, sepsis survivors appear to be at high risk of longer-term complications, worsening of chronic conditions, mental health and cognitive issues, and further hospitalisation [4]. This represents a significant burden to health and social care.

Whilst the physical and mental impact of sepsis survival is recognised, predicting complications in survivors is challenging and more data and research is needed to further understand this. As a consequence, In order to understand long-term outcomes for patients with sepsis and identify those who may need support following sepsis, a sepsis registry has been established in collaboration with the Cardiff and Vale UHB, UK Sepsis Trust, Improvement Cymru, the Healthcare Associated Infection, Antimicrobial Resistance & Prescribing Programme (HARP) and the Critical Care Network. This is the first sepsis registry in the UK to use this methodology.

The registry will be hosted by Public Health Wales as a part of its critical care surveillance programme This is complemented by the establishment of an agreed standard dataset for use by the teams as part of the expansion of Critical Care Outreach. This is ready for activation once the governance issues covering the information held in PHW are resolved.

The plan is to collect data on all acutely unwell patients, particularly those exhibiting an acute deterioration. While not all such patients will have sepsis, a significant proportion of them will. To date, no common dataset exists (e.g. from outreach teams, acute deterioration teams, etc.) on which to begin the development of an all-encompassing Acute Deterioration Registry. We have therefore taken the pragmatic step of beginning a project with a dataset that is common to all acute hospitals with a Critical Care Unit (CCU) in Wales. Currently, all CCUs submit data to the Intensive Care National Audit and Research Centre (ICNARC) using a case management system (WardWatcher) and provide HARP with surveillance data. The Sepsis Registry will utilise Ward Watcher for the required data extraction, identifying patients admitted to critical care units with sepsis and the care received (e.g. organ

support delivered, lengths of stay). This will give a clear picture of what sepsis care looks like for each critical care unit, hospital and Health Board and provide outcome data for the project.

The new data extraction required from Ward Watcher should be complete by June. The data will be analysed prospectively and retrospectively. There is also a future plan to look in more detail at a sample of the patients identified to map their journey to critical care.

References

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Appendix 1

Angela Burns AM 10:27:19

Thank you very much indeed. I wanted to understand how you measure the success of a public health campaign and how you believe we are doing on the sepsis public health campaign.128

Dr Tracey Cooper 10:27:36

If I take the second point first, I'm sure you may be familiar with the fact that we've been doing a huge amount of work around sepsis over the last number of years, particularly through the lens of how we prevent people deteriorating rapidly, and sepsis is part of that. So, we've been doing, if you like, a professional campaign for the last number of years, and I'll come back to the public in a second. Our 1000 Lives Improvement service interacts with the NHS, and we've been putting people through substantial training and it's now part of their mandatory training modules around early deterioration and sepsis specifically.129

Angela Burns AM 10:28:14

Can you just define that for us, though? When you say that you've put 'substantial numbers of people', are we talking hospital staff or are we talking about general practice? 130

Dr Tracey Cooper 10:28:25

It's mainly hospital staff. General practice is a really important one, because we know that a considerable number of people who will progress to sepsis are coming in at quite a late stage from the primary and community area. So, our focus has been, over the last couple of years, more around the secondary care hospital areas, but, in the last 12 months, we've increased our approach around primary and community care, providing more guidance and providing support around sepsis screening.131

Also, through our 1000 Lives team, shortly we'll be embarking on a programme for care homes, as well, because we know, particularly around urinary tract infections, skin infections and infected pressure ulcers—. So, how do we train people up more generally around quality improvement and sepsis being part of that? So, that's a really important area.132

We've also been doing a lot around the alert. A lot of sepsis can be avoided, as you know, and some sepsis can't be avoided. So, what does an alert in a hospital environment look like? What we call the early warning score in any part of an environment in a hospital is what the signs and symptoms are of someone, at the early stages, starting to manifest sepsis and what they do about it. Because, sometimes, people watch and watch and watch, and we compensate and then we deteriorate very quickly. So, we know that, through that

work, we've had a significant reduction in people requiring intensive care and people deteriorating. We're doing another round of outcome measurements around how many lives have been saved as a result of this programme, obviously, because that's going to be absolutely key.133

With the improvements around reducing sepsis, though, we were actually recognised in Wales as one of the global professional campaigns of systematising an approach to sepsis through early warning in a way that other countries haven't. But obviously that needs to translate into reducing it. At the moment we have around about 2,200 deaths per year in Wales, and 13 per cent of those are in hospitals. So, again, going back to how we've systematised this, we've been doing a lot of education and training for people. I accept your point around primary and community care, which is a really important phase for us—the surveillance, detection and alert. So, now health boards are required to alert Welsh Government if there's a person that goes into sepsis, and then demonstrate how they've learned from that, which I think is really key—134

10:30

Angela Burns AM 10:30:58

Can I just ask you—? Because I'm conscious that the Chair will breathe down my neck in a minute. Can I just ask you a couple of questions on that bit of it, before we get to the public health element of it? Do you monitor how many people contract sepsis and survive, but survive poorly—i.e. they have multiple issues, they may have lost a number of limbs, they may have had mental health issues as a result, they may have had brain incapacity as a result? Because you're right; in pure terms, there is a small—and I emphasise the words 'very small'—reduction in the number of sepsis deaths. But what I cannot find out—and I'm the chair of the cross-party group on sepsis, and believe me, I've burrowed through data, but I cannot find out—is how many people are surviving, but you wouldn't necessarily say they had a great quality of life afterwards. Are you able to provide that kind of figure work? Do you measure that anywhere? Because of course that is whether or not we're being successful.135

Dr Tracey Cooper 10:32:01

Absolutely. The short answer is that I'm not aware that we are—. We look at it, as you say, at that point of time, for that episode, that the patient didn't deteriorate, didn't die from sepsis. The extent to which we then do the follow ups—because it may not be just that they're in the hospital stage of subsequent complications; it could be further down the line. I'm not aware that we do, but I'm very happy to go and research it and get back to you.136

Angela Burns AM 10:32:30

I'd be really interested in that. Also, when it comes to the analysis of the data, it would be very helpful to find out where people are being referred from, because we have a clear—. I think the RRAILS programme is

actually very good, and I think it has made substantial changes to the way sepsis is managed within a hospital environment. However, again, what we're unable to really track well is how many people are admitted to hospital having not been handled appropriately in either a care home setting or in a GP setting. I've done quite a bit of research with GPs who—. It's very difficult. You don't know if this person's got flu, or it's going to go into sepsis, or they've got a urinary tract infection and it's going to develop. But again we could have a commonality, particularly in care homes, about who gets looked at in a care home or not looked at in a care home, particularly if it's not a medically based care home, and is left then too long and is suddenly taken in as sepsis. So, I'd like to have a feel for that, and then I'd like to have just a brief word on whether or not you think a public health campaign to explain to people what they need to look at, the signs of sepsis, or just being sepsis aware, or asking, 'Could it be sepsis?'—whether or not you think that would be of benefit.137

Dr Tracey Cooper 10:33:51

We know that 80 per cent of people who attend hospital and become septic originate from primary and community care. So, we have historically been targeted at the hospital, probably because it's actually easier to try and control people. As I was saying earlier, we recognise that, actually, primary and community care is key. My background is as an emergency medical physician, and I was a regulator in a different country, so the quality of care in care homes was fundamental to us, and I would suggest it's about building an understanding quite quickly around deterioration that could be from sepsis. It may be as a result of something else, but actually, it's the fact that sometimes people aren't detected as clinically deteriorating.138

The other challenge is about primary care, and the thresholds for calling a GP into a care home setting. So, part of the conversation we're having even around immunisation and vaccinations and flu, potentially, is whether there are opportunities to train other people up—registered nurses in care homes and others—around those early signs of deterioration. So, we are developing a quality improvement programme—not solely sepsis, but sepsis is part of that—around care homes, for that very reason, because we know it's like a rotating door. I'm very happy to give you more detail or meet with you if that would be helpful to give you some more information on that. 139

In relation to the public health campaign or public campaign around sepsis, it's a really interesting one. We have similar discussions around many campaigns, actually. You may be aware that in 2016 England launched a public sepsis campaign. Scotland did some work as well. What we don't know—we haven't been privy to it; it may be working through—is the evidence that, actually, that made a difference to reducing the incidences of sepsis and the outcome of care as a result of sepsis. We've had discussions on and off, I'd say for about a year or so, with Welsh Government officials about this very issue. We get asked quite a lot about doing public campaigns, understandably, on areas. What I would say is that there are campaigns

around a lot areas that people invest a lot of public money in and, actually, that may not be the way of really getting to the people who can make a decision to control something, to prevent something. 140

10:35

Angela Burns AM 10:36:22

I do totally understand that and, of course, I think one of the dangers with politicians is that we all have a little hobby horse. I'm prepared to admit that mine is sepsis, so I completely get that—you can't rush off and do campaigns around everything. However, sepsis does kill more people per year than the top three cancers. Now, you could ask almost anybody anywhere in Great Britain what cancer is, and they will tell you. You can go almost anywhere in Great Britain and say to people, 'Do you know what sepsis is?' and a huge number will not know what on earth you're talking about. Now, you cannot drive down a road in England—if you pass an ambulance it will have the sepsis warning signs. Every ambulance. I've travelled around and I've taken photos of the things to prove to Wales that there are small things that we could do. To be frank, it's—what do you call it—an orphan event; it's not one of the big ones. We all get cancer and we all understand what it means, but it's killing people. But worse than killing people—and I mean worse than killing people—is that it leaves people devastated afterwards. Very few people walk away from sepsis clean and clear. There are multiple amputations. There is always a side effect. I've yet to meet a sepsis survivor who's had it and has been A-okay afterwards. So, again, on the public health and the benefits in the long term, the pick-up that the state has to do is phenomenal, so I don't quite understand why we wouldn't want to start elevating this up the process, because of those very sort of lifestyle changes that will happen. 141

Dr Tracey Cooper 10:38:15

Yes. I would say it's a priority for us. It's been a continued, very focused piece of work for 1000 Lives, and we've increased progress on that. I'd be delighted to meet and have a conversation about this, because it used to be one of my bugbears in a former world. Yes, it's about what are the messages to which audience. I think one of the challenges is that people may go to their GPs, and at that point it may not be picked up. So, it is about making sure that, actually, we don't just focus on one at the cost of another. It's what the best—we were talking a bit about behaviour change earlier—what's the best message for the public through what medium, what's the best message and guidance, support and direction to professionals through what medium. But I'd love to meet up and have a more detailed discussion about it. 142

Angela Burns AM 10:39:06

Right. You're on. Just one last very small question—and again, other Members here may be more aware of this than I am. I'm chair of the group, but it was only at the last group that I heard of the early warning score. Now, that's supposed to be a public health initiative. So, essentially, we all have a card—I don't know if

everybody else is aware of this—and basically it says what is your normal baseline: what is your normal temperature, what is your normal blood pressure, what's your normal— 143

Dai Lloyd AM 10:39:42

Pulse rate.144

Angela Burns AM 10:39:43

—pulse rate; you know, all of the things, so that if your score—. And it's on a card, so that if you then are unwell there's a baseline that a medical professional will be able to judge you from. I think that's a brilliant idea, and if everyone in Wales had one then you've got something to start measuring people on. But I'd never heard of it. How far out is that? Why isn't that kind of thing being more promoted in public health? Because that would be a good baseline for a gazillion illnesses.145

10:40

Dr Tracey Cooper 10:40:14

Certainly, the national early warning score, we've embedded it in—again, it's more hospital based—for the last number of years. It is absolutely fundamental to start to understand if someone is going to clinically deteriorate in exactly the way that you've just said, particularly if it's a pregnant woman whose physiology is different. We've investigated a sepsis case of someone who sadly died in another country because the clinicians, the people looking after her, didn't understand that her body responds differently in the third trimester than it does when you're wandering around the streets. So, we have a national early warning score that is mainly—and the approach has been—in hospital. It's also about what an obstetric early warning score is and what a paediatric early warning score is. Actually, there's some good stuff that's happened, which again I'm happy to discuss with you. The challenge of having it out and about with you is that your body changes. So, my baseline today could be—. When I'm running, which I really need to do later today, my baseline would be different. The important thing is, while you have observations, if you go to your GP periodically or if you're in a hospital—the only way they can do that is baselining what's normal for you at that point in time and what are the red flags.146