Chartered Institute of Ergonomics & Human Factors

PREVIEW

Making human factors and ergonomics work in health and social care CHAPTER 2

A practical introduction to healthcare ergonomics based on the CIEHF professional competencies intended for those responsible for implementing human factors and ergonomics programmes and interventions to improve patient safety, system performance and wellbeing of patients, service users and staff.

Authors: Mark Sujan, Laura Pickup, Helen Vosper and Ken Catchpole

HUMAN FACTORS EVERYWHERE
MUSC Medical University of South Carolina
1495 UNIVERSITY OF ABERDEEN
THEEMIS

Authors

Mark Sujan is a Chartered Ergonomist (C.ErgHF) and Managing Director of Human Factors Everywhere. The company provides ergonomics input to applied research projects and offers consultancy and training in ergonomics across a range of safety-critical industries. Mark is also a Trustee of the Chartered Institute of Ergonomics and Human Factors and leads the Institute's special interest group on digital health and artificial intelligence.

Laura Pickup is a Chartered Ergonomist (C.ErgHF) and a Fellow of the Chartered Institute of Ergonomics and Human Factors. She originally worked as a chartered physiotherapist in the UK healthcare service. Since 2000, she has worked as an independent consultant, researcher and educator of human factors for healthcare and transport industries. She currently has a national role in the field of healthcare investigations.

Helen Vosper is a Principal Fellow of the Higher Education Academy and a Chartered Ergonomist (C.ErgHF). She is also a scientific adviser in human factors and ergonomics to NHS Education for Scotland. Helen's key roles and responsibilities concern human factors educational development to support patient safety. She is also an active researcher in the healthcare human factors domain.

Ken Catchpole is the SmartState Endowed Chair in Clinical Practice and Human Factors at the Medical University of South Carolina. He is a clinically embedded research practitioner who has been applying human factors principles to improve safety and performance in acute care since 2003. He has authored more than 100 peer-reviewed journal articles related to patient safety and human factors, while working alongside clinicians at the front line to understand everyday challenges and address a broad range of reliability, safety and performance concerns from a human-centred perspective. Ken is a Chartered Ergonomist (C.ErgHF).

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Chapter 2 - The organisation

Understanding and shaping the role of your organisation in defining the work context

This book has chosen the Systems Engineering Initiative for Patient Safety (SEIPS) as its systems framework. This is described in detail in Chapter One, but we can summarise it as having two fundamental elements. The first is that outcomes (including safety) are delivered as a result of processes. Secondly, the specific nature of these processes arises from the work context in which they are delivered. The work context is described in SEIPS as the "work system" elements and the "interactions" between them. The organisation is just one element, but its contribution to context is particularly strong, because of its influence on the other elements. For example, the organisation will make procurement decisions that affect the tools and technologies available to staff, while staffing will be influenced by workforce planning at an organisational level. Estates and infrastructure planning (and procurement) will directly influence the physical environment in which care is delivered, while organisational attitudes to risk and safety permeate every other aspect of the work system.

Safety interventions that do not consider the organisational contribution to context are much less likely to be successful, and also limit the potential for wider learning. A good example of this is provided by Dixon-Woods and Martin in their reflection of the impact of Quality Improvement interventions, specifically in relation to the implementation of sepsis bundles (Dixon-Woods and Martin, 2016). These bundles require organisations to deliver on six clinical activities within the first hour after sepsis is suspected (Box 1).

1. Deliver high-flow oxygen
2. Take blood cultures
3. Administer empiric intravenous antibiotics
4. Measure serum lactate and send full blood count
5. Start intravenous fluid resuscitation
6. Commence accurate urine output measurement

Box 1: Elements of the sepsis bundle

On the surface, these make sense and appear straightforward, but in reality they may be anything but, depending on the organisational context. You can see that the need for laboratory testing and antibiotic supply means that your local care delivery system (the ward environment) needs to interact with other systems, such as pharmacy and clinical biochemistry. Access to these (and the effectiveness of your engagement with them) is likely to be affected by factors beyond your immediate control. Within organisations that have delivered successfully on sepsis bundles, it is likely that there are a whole host of 'facilitating conditions', which may well not be present in a different organisation. Reports of interventions that do not acknowledge such contextual factors are not helpful for other organisations. Why don't we routinely report on such factors? Facilitating factors are often invisible – if we approach a well-designed door, the information that tells us how to use it is built in, and we will pass through the door without even really being aware of how we opened and closed it (Norman, 2013). The same is true for organisational facilitators, and if we don't know how to actively identify them, then they often remain hidden.

A second issue is that many of these organisational factors are considerably less tangible than the design features of a door. They emerge from the values, attitudes and deep-seated practices across all levels of the organisation. They are part of what is often described as culture. This is one of the more challenging areas when you are new to human factors. Even experienced specialists struggle with defining and understanding culture: Catchpole (2014) observes that "the idea of culture is perhaps similar to the idea of 'intelligence' – everyone thinks they know what it is, but conceptual clarity is more elusive", while Reason (1997) is perhaps somewhat more blunt in saying that it has "the definitional precision of a cloud".

The aim of this chapter is to help you consider aspects of organisational culture and development that are likely to impact on safety, as well as introduce tools that may be useful for you in assessing safety culture within your own organisation. Given that organisational factors strongly shape context, they are often considered 'performance influencing factors', and examples include staffing, workload and fatigue management.

Finally, another reason that the organisation is so important is the fractal nature of safety. In Chapter 1, we touched on the importance of having organisational processes that reflect a systems approach if we are to avoid 'bad apple thinking', and so it is with all other aspects of safety. It's true that individuals need knowledge, skills and competencies to ensure their own safe and effective practice, but this needs to be supported by a strategic approach to safety at the organisational level. This is perhaps one of the major weaknesses in the healthcare sector: other high

risk industries have to ‘declare’ this organisational approach to safety and risk management through something called the ‘safety management system’ (SMS). This is a possible direction of travel for healthcare and so this chapter will cover the basic principles. This is likely to be of interest to anyone with a safety role at the organisational level, or those seeking to understand the relationship between their own personal safety management and the organisational picture.

Consideration of the organisational context should be the starting point for any activity, but this approach might be of particular use for:

- Incident/disciplinary investigation
- Designing new procedures
- Procurement
- Initiating a new service
- Reviewing/cessation of a service.

Chapter objectives and learning outcomes

- ✔ To describe, in simple terms, the concept of organisational culture, and specifically how safety culture relates to this
- ✔ To recognise features of good safety culture
- ✔ To define key concepts of proactive risk management
- ✔ To briefly introduce the idea of safety management systems and safety cases
- ✔ To introduce methods for assessing safety culture (and consider their strengths and weaknesses)
- ✔ Using a worked example, to introduce a tool for helping you to understand and strengthen safety culture in your own organisation.

Organisational culture

In the large complex organisations that deliver health and social care, organisational culture is not uniform and is made up of many interwoven subcultures (Mannion and Smith, 2018). Often these are forged along the lines of occupational subgroups as illustrated by the Morecambe Bay investigation (Box 2), or in terms of organisational outcomes, such as safety. These subcultures are impossible to separate – and will share many of the same elements. However, for this chapter we will use the term ‘culture’ to refer to safety culture in particular.

Safety culture

The birth of the term ‘safety culture’ is associated with the investigation into the Chernobyl disaster, although coining the term probably reflected a growing awareness that safety ‘belongs to the system’ and that major adverse events have both a history and a context that is organisational in nature. If this seems complicated and bit vague, then you would be right – it is! – and there are no easy answers to measuring, assessing and improving culture. Over the past century, we have seen a shift in safety thinking (Dekker, 2019), moving from behaviourist scientific management approaches that sought to improve safety and performance by standardising processes and removing variation, to a systems approach (Figure 1). The latter recognises that safety is an emergent organisational outcome that depends on so much more than individual attitudes and behaviours, but instead on the shared thinking, as well as the administrative structures and allocated resources, that embed ideas about what it means to be safe and how an organisation can have confidence that it is operating safely.

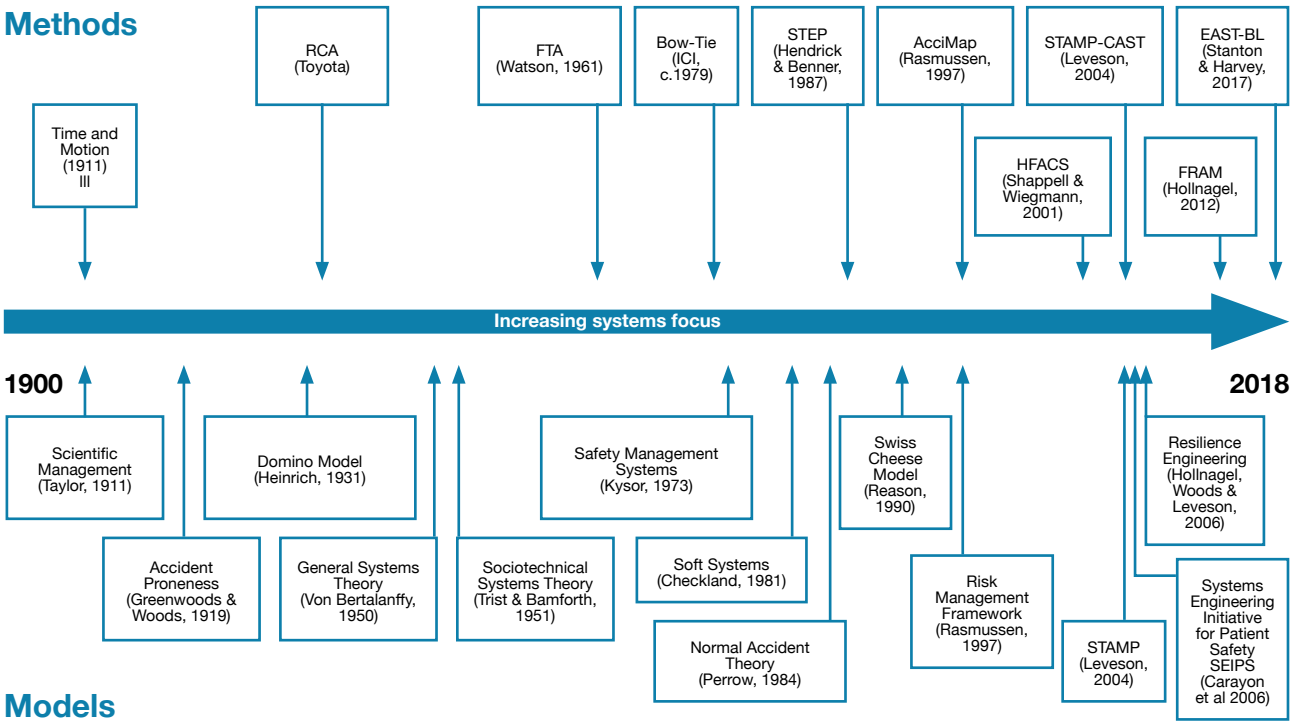


Figure 1: Timeline showing a move from behaviouristic safety and performance management to a systems approach.

Adapted from Stanton, N.A., Salmon, P.M., Walker, G.H. and Stanton, M., 2019. Models and methods for collision analysis: A comparison study based on the Uber collision with a pedestrian. *Safety Science, 120*, pp.117-128.

Defining what we mean by safety culture is one of the first challenges: this has been the subject of numerous debates, articles and books over the years but it is beyond the scope of this chapter. However, if the concept of culture is to be useful, it is important to have some understanding of it, and how it relates to the specific work setting under consideration. In the introduction we discussed the concept of emergence – culture is in many ways an emergent outcome of the system that describes the organisation as a whole. Specifically, it emerges from the beliefs, goals and activities of the people within the organisation across all levels of the organisation. From a practical perspective, Phipps and Ashcroft, (2014) offer a useful insight that "at the heart of safety culture is a reciprocal relationship between the effort organisational members put into safety practice and the contentment with what is achieved through these efforts". Strong safety cultures will, therefore, have structures that support double-loop learning: safety goals will be actively set, and performance against these goals assessed regularly. The 'double loop' aspect comes from a continual process of assessment of the goals themselves – are they the right goals for this organisation at the current time?

A small amount of theory is useful in considering the challenges to exploring and changing culture. The references provide links to further reading (Waterson, 2014, Dekker, 2012, Guldenmund, 2000), but it is fair to say that most of the models in the literature reflect the concept of culture having multiple layers, often described as an 'onion'. The core of this onion is deeply hidden, and this presents challenges, both in terms of understanding and describing it but also in terms of changing it. However, the core strongly influences the outer layers, which are easier to observe. While the relationship between the layers is not straightforward to understand, the literature also contains well-made arguments that indicate starting with the outer layers – usually considered to be the "observable practices" of the organisation (Figure 2) – is the only way to bring about change within a reasonable timeframe.

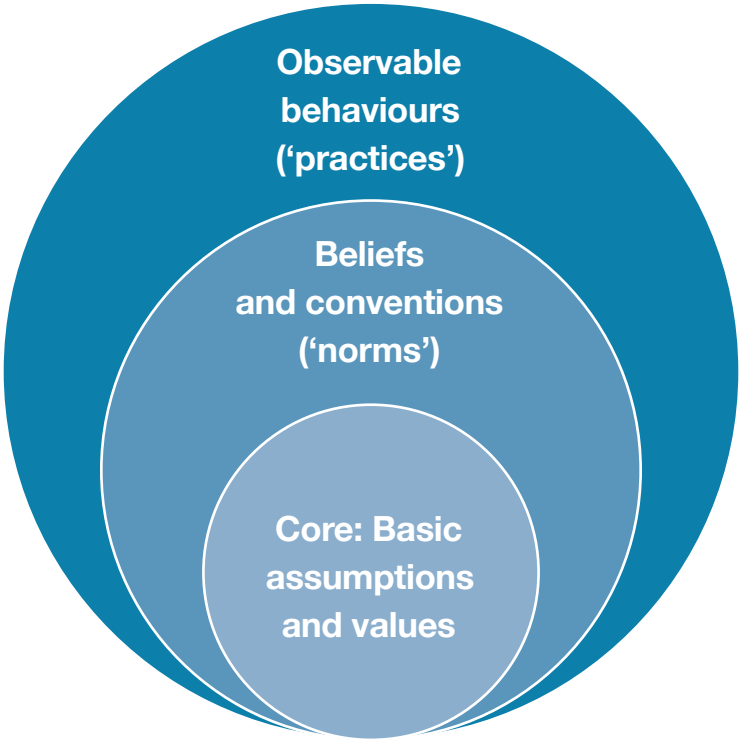


Figure 2: Summary of the core principle of current culture models. The deepest layer is fundamental, even pre-conscious, and members of the group may not even be able to articulate these assumptions and values and may not even recognise why they are so important to them. 'Norms' are the agreed expectations that guide the behaviour of the group, while 'practices' are the observable behaviours and accessible artefacts, such as policies and procedures. Exploring and influencing the outer layer will ultimately influence the core.

Another aspect of theory that might be useful in thinking about 'practical culture' is recognising that culture development is an evolutionary survival mechanism – for groups of people to have a shared understanding (albeit completely implicit) means that any individual knows how people in this group are expected to behave. They, therefore, know how they should behave – it is part of an adaptation to environmental change. Understanding the history of your organisation and the pressures that have shaped it can give you an insight into culture. It follows from the notion that 'culture reflects history', that culture is also a form of organisational memory, indicating that culture is 'learned'. This is important to be aware of – new people coming into the organisation will not have been directly affected by previous change, but they will learn their responses based on what they observe in the workplace, which might not necessarily be appropriate or desirable. A final point worth considering is that culture within an organisation is not likely to be homogeneous. Culture belongs to groups, and organisations are made up of individuals who are part of other groups, and each of these groups will have its own

values, norms and practices. Culture clashes may contribute to adverse events as illustrated by the poor relationships between midwives and obstetricians described in Box 2.

Box 2: Example – cultural layers exposed during the Morecambe Bay investigation into maternity services

Morecambe Bay was an investigation into the management, delivery and outcomes of care provided by the maternity and neonatal services at the University Hospitals of Morecambe Bay NHS Foundation Trust from June 2004 to June 2013. The investigation was led by Dr Bill Kirkup CBE (Kirkup, 2015). In terms of outcomes, there were 20 instances of what were considered "significant or major failures of care" at Furness General Hospital, and these were associated with three maternal deaths and the death of 16 babies. It was considered that different clinical care could have prevented 12 of these deaths (one mother and 11 babies). The investigation considered culture to be a significant factor, and although this was complex and difficult to unpick, there were some specific aspects that are useful in illustrating the layers described in Figure 2. The investigation began with **tangible artefacts** including incident investigation reports. These revealed poor practice: for example, almost all investigations were carried out by the same senior midwife, and they were almost invariably uni-disciplinary in nature; there was evidence of blame-shifting behaviour that aimed to protect the midwifery team, and there was little evidence of dissemination of these findings to support organisational learning. Risk assessment practices also appeared inadequate in identifying babies and mothers at higher risk. Further investigation uncovered an **apparent norm** within the midwifery team that could be described as 'keep obstetricians away' – obstetricians were often not informed that a mother was delivering, and they were not contacted even when it became apparent that complications were unfolding. This may seem difficult to understand, but at the heart of this behaviour was a deep belief that birth had become over-medicalised and this impacted negatively on both mothers and babies. Many people would empathise with this perspective, but it appears that the relevant **shared value** of the midwifery team had become 'normal birth at all cost'. This is a problem, because while birth is undoubtedly a normal physiological process, it is also inherently risky with a relatively high frequency of life-threatening complications, and medical intervention does save lives.

What does a positive safety culture look like?

Table 1: Frequently used safety culture/climate assessment tools

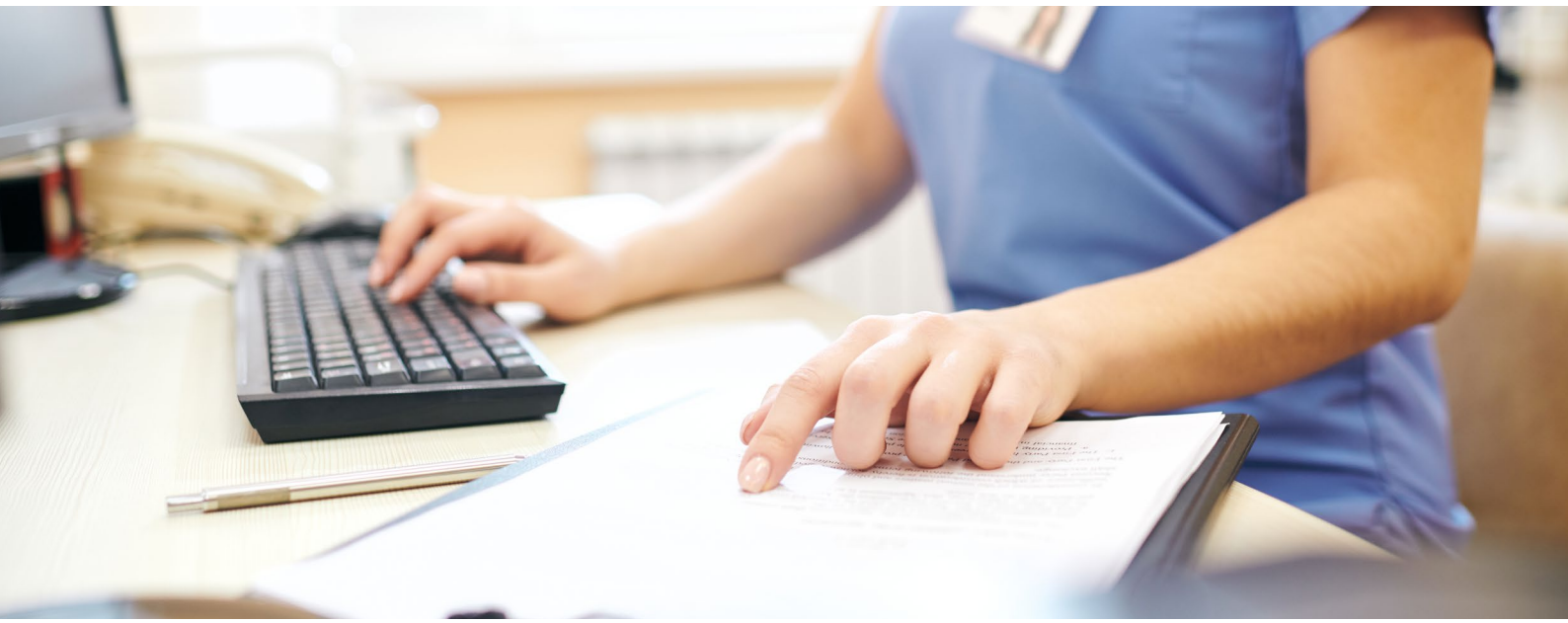
Tool	Type	Dimensions	Notes
Safety Attitudes Questionnaire (Sexton et al., 2006)	Quantitative	Teamwork climate Job satisfaction Perceptions of management Safety climate Working condition Stress recognition	The majority of the questionnaire consists of Likert-scaled responses. However, there is also a free text-response question: “What are your top three recommendations for improving patientsafety in this clinical area?”
Safety, Communication, Operational Reliability, and Engagement (Sexton et al., 2019)	Quantitative	Improvement readiness Local leadership Burnout climate and personal burnout Teamwork climate Safety climate	This tool is a development of the SAQ and has a broader focus. There are additional sections that explore growth opportunities, workload, participation in decision-making, job-related uncertainty and career advancement.
Safety Culture Index (Spurgeon et al., 2019)	Quantitative	Coping with work demands Participation in decision-making Checking and accountability Commitment to learning Purpose and direction Working in collaboration Sharing information Blame-free climate Role clarity Staff motivation Standards monitoring Vision and mission	Dimensions are divided as belonging to the individual, to the team and to the organisation. This division recognises that organisations are hierarchical, and so culture can be assessed at multiple levels. The matrix also recognises four different working contexts: **Task** focus; **people** focus; **controls** focus and **change** focus.

Tool	Type	Dimensions	Notes
Patient Safety Culture in Healthcare Organisations (Singer et al., 2007)	Quantitative	Senior manager engagement Organisational resources Overall emphasis on safety Unit safety norms Unit recognition and support for safety Fear of shame Fear of blame Learning	Dimensions are divided as belonging to organisation, to units within the organisation, and to the individual. Together, they produce the ninth dimension of “provision of safe care”
Hospital Survey on Patient Safety Culture (Sorra and Nieva, 2004)	Quantitative	Teamwork across hospital units Teamwork within units Hospital handoffs and transitions Frequency of event reporting Non-punitive response to error Communication openness Feedback and communication about error Organisational learning and continuous improvement Supervisor/manager expectations and actions promoting patient safety Hospital management support for patient safety Staffing General perceptions of safety	In addition to the Likert-scaled responses, participants are asked to award an overall grade on patient safety for their work area / unit and to indicate the number of reported events in the last year.

Tool	Type	Dimensions	Notes
Safety Climate Survey (Sexton et al., 2000)	Quantitative	Senior managers' engagement Organisational resources for safety Overall emphasis on safety Unit manager support Unit safety norms Unit recognition for support and safety efforts Collective learning Problem responsiveness Fear of blame and punishment Provision of safe care	This is a questionnaire developed for aviation and applied in healthcare.
GP-SafeQuest (de Wet et al., 2010)	Quantitative	Workload Communication Leadership Teamwork Safety systems	As many of the other instruments recognise, the term "organisational culture" subsumes multiple sub-cultures. This tool was devised to support understanding of team culture in primary care settings.
Manchester Patient Safety Assessment Framework (Kirk et al., 2007)	Qualitative	Commitment to overall continuous improvement Priority given to safety System errors and individual responsibility Recording incidents and best practice Evaluating incidents and best practice Learning and effecting change Communication about safety issues Personnel management and safety issues Staff education and training Team working	The tool has been adapted for a number of different care settings. Widely used across England and Wales. Encourages discussion and assessment of safety culture maturity.

Safety culture is often described as multi-dimensional, and there is acceptance that any organisation's culture is unlikely to be equally developed in every dimension. This has led to the development of assessment tools that define dimensions, and require organisations to "score" themselves in respect of these dimensions (Table 1). There is not necessarily any agreed position on what constitutes a positive safety culture, so the dimensions on which each of these tools are based differ. However, there is considerable overlap, and dimensions contained within many tools include:

- Leadership commitment to safety (at all levels of leadership from board level through to managers and supervisors working with frontline staff)
- A shared belief in the importance of safety across all levels of the organisation
- Open communication founded on trust
- Open reporting systems, where staff are comfortable about reporting adverse events without fear of punishment
- Commitment to organisational learning (including learning from near misses and normal work, as well as from adverse events)
- Strong strategic approach to risk and safety management
- Good teamwork and inter-professional team working
- Conditions that support safe working
- Adequate staffing (and other resourcing)
- Understanding the importance of staff wellbeing
- Recognition of stress/burnout
- Understanding fatigue
- Quality of handovers.



Measuring culture

It follows from what has been discussed previously that the safety culture dimensions are likely to describe the more superficial cultural layers. Most of the tools are designed as questionnaires, usually gauging opinion through use of Likert scales. These data are treated numerically, with mean scores being calculated for each of the items in the questionnaire (hence the use of the term “quantitative” in Table 1). The questionnaires are usually restricted to no more than two sides of A4 to avoid making them too onerous. The short timeframe for answering means that results are very much a snapshot of these surface features, and this is what is meant by “safety climate”, although the term is often used interchangeably with culture.

The Manchester Patient Safety Framework (MaPSaF) (Kirk et al., 2007) is different to the others in that it takes a qualitative approach and is designed to support discussions about safety culture among teams, with a view to organisations using the results to position themselves along a maturity axis from pathological to generative as described in Table 2. The greater degree of engagement of this approach is likely to involve a deeper dive into safety culture, and if the results of the discussions are formally captured and analysed, this will give some insight into starting points for improvements. It is worthy of note that the dimensions themselves may need further unpacking if staff are to fully understand them. This is done within all the tools – for the questionnaires, each dimension has several items within it that clarify what is being asked. The MaPSaF handbook contains prompts for each dimension to support further understanding and discussion. However – especially for the questionnaires – individual interpretation may affect the results.

Table 2: Safety culture maturity axis (based on Westrum, 1993)

Maturity state	Characteristics
Pathological	Staff at all levels care less about safety than the need to be seen to comply with regulatory requirements and not to be caught out in terms of infringements. Staff are actively discouraged from highlighting safety issues and reporting incidents. Where reporting happens, it is flawed, limited in scope and there is little or no wider dissemination to support organisational learning.
Reactive	Safety activity is driven almost entirely in response to incidents.
Bureaucratic	The organisation has implemented a structured risk management system, but it tends to be a box-ticking exercise, and the results used as evidence to demonstrate the safety of the system. Rather than engaging the whole workforce, safety efforts are seen as belonging to an individual safety manager or team.
Proactive	The organisation actively seeks out safety information to support the development of its safety management system, and the use of this information is explicit and transparent.
Generative	Safety is embedded across the organisation and everyone understands their role in improvement. Key to improvement is honesty about failure and this is supported by a non-punitive reporting system.

All the tools have limitations: they largely represent 'expert opinion' rather than demonstrating a clear link to an underpinning theory, and elements have been transposed from other sectors without clear evidence to indicate this is justified. The strength of the related psychometric properties (content, criterion and construct validity, as well as reliability) is variable. Choice should depend on your intended purpose and your target population, as well as the reported psychometric properties, but the results can be supported using tools like the Safety Culture Discussion Cards described later in this chapter. The most commonly used tools are listed in Table 1.

Ultimately, any safety culture assessment will only be of value if it can be linked directly to outcomes, and very few studies of safety culture seek to do this. However, in recent years, some studies have indicated a link between a positive safety culture and better patient outcomes. Perhaps even more encouraging are recent observations that *changing* culture can improve outcomes, as shown in the *Leadership Saves Lives* study, where cultural change was associated with significant decreases in risk-standardised mortality in relation to myocardial infarction (Braithwaite et al., 2017, Mannion and Davies, 2018).

Health and Social Care Safety Culture Cards: A route to better understanding safety performance

If you choose a quantitative method for assessing your safety culture, you will be left with a series of scores, which need to be unpacked if they are to be useful for directing improvement. Even the qualitative approach underpinning MaPSaF is limited (as all the tools are) in that it is a snapshot in time. You can augment your safety culture assessment by keeping discussions about safety alive across all levels of your organisation, and a practical way of doing that is through use of the Health and Social Care Safety Culture Cards[1] developed by NHS Education for Scotland, based on cards developed previously by EUROCONTROL (an intergovernmental organisation for air traffic management across Europe). The cards are arranged under eight headings:

- Leadership and management commitment
- Resourcing
- Just culture, reporting and learning
- Risk awareness and management
- Teamwork
- Communication
- Responsibility
- Involvement.

The pack includes guidance and suggestions for how they might be used, but suggested approaches are shown in Table 3.

Table 3: Suggested ways of using the Safety Culture cards... but feel free to improvise!

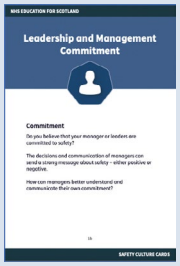
Option for use	Details of approach
Comparing views	Different members of your team can sort cards into two piles: what we do well and what we need to improve (your team may be your organisation unit, professional group, etc). Then compare the piles and discuss: • Where do we agree? • Where do we disagree? • What are the priority issues to address? • What might happen if they are not addressed? • How can this be done? • Who needs to be involved (responsible, consulted, informed)? • When does it need to be done?

[1] Freely available at http://www.knowledge.scot.nhs.uk/media/CLT/ResourceUploads/4095107/safetyculture.pdf

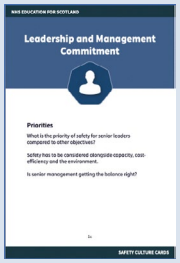
Option for use	Details of approach
Safety moments	In a small group, take just one card – any card. Discuss the card for a set time, e.g. 15-30 minutes. Discuss a different card each time. Alternatively, in a longer session, allow each person to choose one card from a small selection (e.g. from three cards,) and ask them to describe an experience that they have had concerning the issue. What can be learned from their story?
Focus on...	Choose a specific element, such as Resourcing, and discuss each card in depth with your colleagues. You may sort the cards or consider questions such as: • What do we do well? • What and where is our best practice on this issue? • Where have we improved? • Where do we need to improve? • What are we avoiding? • What is stopping us from improving? • How can we improve the situation?
SWOT analysis	Divide the cards into the following piles: • Strengths • Weaknesses • Opportunities • Threats. The cards in each pile will tell you something about how safety culture can be improved, by drawing on current strengths, addressing current weaknesses, anticipating and tackling future threats.
Influences	Organise cards into patterns to show how the issues relate to one another. For instance, some cards may have cause-effect relationships or may influence each other in a more subtle way. Discuss how these relationships work.

In Box 3, we describe the NHS Health Check, a cardiovascular risk management programme, indicating that the outcomes were not strong, with estimates suggesting prevention of relatively few cardiovascular events. Review of the service (generally offered through multiple primary care mechanisms, including via general practice and community pharmacy) suggests that there is significant variation in local implementation, and this may be a factor in limiting effectiveness. An ergonomics study was undertaken to explore community pharmacy delivery of the Health Check, and data were collected using several methods, including direct observation, interviews and focus groups (Vosper et al., 2018). As a final phase of the study, the Safety Culture Discussion Cards were used to explore organisational factors with the different teams, using the Influences approach. Similar themes were repeated across

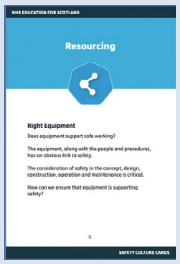
the different groups and Figure 3 shows an example of a related group that was considered particularly important in identifying areas for improving the safety of the Health Check.



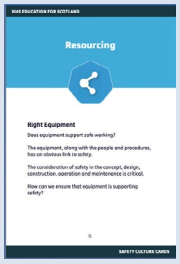
Staff delivering the Health Checks felt that managers didn't really believe in the value of them. This reflected national concerns about the evidence base regarding how individual risk reduction translates into reduced population incidence of cardiovascular events. One participant said that their manager had made the comment, "Well, I'll have retired before the 10 years is up anyway!" Staff felt that these attitudes were reflected in the resourcing that was allocated. While there was some sympathy with this attitude, others pointed out that it would be difficult to build an evidence base if the checks were not carried out to the highest possible standard.



This card brought up several issues which were felt to relate to lack of commitment to the service — for example, in some organisations, it was difficult to ensure that dedicated equipment was available. Often equipment would go missing, only to find it was being used for other activities, sending the message that the Health Check was not important. An important finding arising from this discussion was the limited time allocated for the Check — this turned out to be more than an organisational factor (and may be the driver behind many of the issues): the pharmacist remuneration model still pays pharmacists primarily for dispensing. If the Check took longer than 30 minutes in total, the pharmacy did not make any money.



From the previous card, it seems the risks could be reduced by paying pharmacists properly for providing these services. That is unlikely to happen in the immediate future, so it makes sense to consider other improvements that support safety. The risk engine used for the Health Check requires two blood lipid measurements (total and HDL cholesterol). Some pharmacies used equipment that required two separate blood samples, each of which took a few minutes to complete, increasing the time pressure. There are machines available (and of suitable accuracy) that allow both readings to be taken from a single sample. This provided a good argument to support future procurement decisions.



The time restriction and the need to take two blood samples (alongside everything else) meant that sometimes parts of the Health Check were missed out. Sometimes this included not measuring HDL cholesterol. This is potentially dangerous — the total: HDL cholesterol ratio is one of the most important predictors of risk. Some staff felt unable to speak up about it as it appeared to be accepted practice. Discussions suggested that the cards had helped them with this — they now had a better understanding of what was driving the behaviour and felt happier to talk about it, as recognising the external pressure made the challenge less confrontational, and they also now had a possible solution.

Figure 3: Using the Safety Culture Cards in Influences mode

Despite relative success across the UK in achieving a reduction in morbidity and mortality relating to cardiovascular disease, it is still a major killer, claiming the lives of more than 124,000 people in England during 2017. The NHS Health Check, introduced in 2009, is the largest preventative intervention for cardiovascular disease in the UK, and is based on the theory that identifying high-risk individuals and optimising primary care prevention has a knock-on effect on reducing population risk. There is a quantitative relationship between risk factors and disease incidence. High-quality longitudinal research studies have allowed this relationship to be mathematically modelled, underpinning cardiovascular 'risk engines', which measure individual risk and how it changes following intervention. The NHS Health Check is offered to all people in England between the ages of 40 and 74 years, and involves taking a detailed client history as some simple point-of-care testing, including measurement of blood pressure, body mass index, blood lipid levels (specifically total- and HDL-cholesterol) as well as blood glucose. These data are entered into the risk engine, which returns an estimate of the 10-year risk of a cardiovascular event such as stroke or heart attack. The aim of the service is risk stratification: identifying those with existing disease – or at a high risk of developing it – and referring them for treatment, while those at low-to-moderate risk are encouraged to make diet and lifestyle changes to reduce or maintain their risk status, returning every five years for further assessment.

The outcomes are not strong, given the high programme costs (Kypridemos et al., 2018): only small decreases in modelled risk are achieved, and it has been estimated that this translates into the prevention of one clinical event for every 4,762 attendees. To look at it another way, this means the prevention of 1,400 events across the whole country for each five-year cycle.

It is worthy of note that there was some scepticism surrounding the inception of the programme – it was felt that the evidence base supporting the population benefits of targeting individual risk was not strong (Martin et al., 2018). Has this misgiving been borne out in practice, or are there other factors at play? It is recognised that there are wide variations in service delivery, which are at least in part due to differences in local implementation. The use of safety culture discussion cards allows the unpacking of barriers and facilitators to cardiovascular risk management.

Box 3: The NHS Health Check

Organisational safety management practices: Risk assessment and safety management systems

Safety management systems (SMS) are a proactive approach for managing safety risk (Li and Guldenmund, 2018). It is beyond the scope of this book to cover the detail, but the features are summarised in Table 4. Some aspects are particularly important and are discussed in greater detail below, along with suggestions for tools that may be useful.

The SMS is part of the fabric of an organisation

The SMS goes beyond compliance with prescriptive regulations – it is the bedrock of the organisational culture and should capture the way people work within that organisation. The documentation should declare the values and philosophies that underpin the work and should include both the organisational aims and the objectives. The latter aspect is particularly important as it captures the practical ways in which safety management may be achieved.

Table 4: Key components of a safety management system

Component	What is involved
Safety policy and objectives	• Articulation of management commitment and responsibility • Lines of accountability • Role descriptions for key personnel • Coordination of emergency response planning • SMS documentation
Safety risk management	• The core of the SMS • Defines the process that identifies hazards and assesses and mitigates risk • Internal safety investigation structure
Safety assurance	• Safety performance monitoring and measurement • Continuous improvement
Safety promotion	• Details of training and education (both initial and ongoing) • Training strategy (and how this is contextualised) • Monitoring of education and training • Safety communication strategy • Incident (and near miss) investigation (and how this is used to support learning).

An effective safety management system requires a systems approach

Safety management systems are often described as 'top-down' approaches. This is in recognition of the fact that they cannot exist at all without the engagement of all accountable managers. Management needs to be seen to commit to (and take responsibility for) the SMS, and this includes ensuring that the necessary human and financial resources are made available. Part of this involves identifying key roles and defining the safety responsibilities and expected behaviours of the personnel in these roles. In other sectors, SMS policy mandates that safety managers should have expertise in human factors and, furthermore, that in large, complex organisations this should be their sole job and not held alongside another role. This is very different from current health and social care norms, where safety management is often the responsibility of clinical staff.

While senior management should take responsibility for development of the safety policy, this cannot be done well unless there is effective engagement with all stakeholders. In large organisations this may not be possible, but there needs to be adequate stakeholder representation. The aim is to build a positive safety culture where all staff understand their role in safety management. This is only possible if those responsible for the SMS understand the reality of the different work environments across the organisation. This is best served by building a shared model of the system that all stakeholders can recognise. Systems frameworks such as SEIPS are useful for building such models.

Safety risk management is the central component of the SMS

The SMS aims to identify hazards and then to make an evidence-based assessment of the likelihood that the harm threatened by a hazard will be realised. 'Risk' is thus associated with uncertainty and, in certain cases, it may be desirable to put numbers on risk (e.g., by using a combination of severity of consequences and likelihood of occurrence), although this is unusual for the highly complex scenarios encountered in health and social care. In this case, risk matrices can be used to support a semi-quantitative assessment of risk. Having assessed the risk, a decision needs to be made about whether the risk is acceptable: if not, action must be taken to reduce the risk to an acceptable level. This should involve appropriate application of the hierarchy of controls, which suggests that it is preferable to eliminate a risk where possible and to consider engineering controls before relying on administrative interventions and training.

Risk management relies on understanding everyday work within the organisation, and methods for gathering these data are described throughout the book. However, one source of data should be the internal investigation process, and its importance

in underpinning understanding of the local context cannot be overemphasised. Even incidents of a seemingly minor nature may provide an early indication of a trend, which may lead to more severe outcomes in future. Making decisions about which incidents have the greatest learning potential (and investigating and analysing them in a way that maximises this learning) requires a high level of expertise. Again, in other sectors, it is recommended that incident investigation (at any level) is only undertaken by trained investigators. Furthermore, in the chapter on Organisational Learning in this book, we describe how effective organisational learning should consider the breadth of events, both successful and unsuccessful, and we frame learning as a social process rather than as something that is owned and done by a specific department, such as a risk management department (Sujan et al., 2017b).

The SMS depends on the determination of 'acceptable risk'

Health and social care organisations are required to hold risk registers, so much of what has been discussed above may seem familiar. However, there are probably two main differences between approaches to risk management in health and social care when compared with other sectors. The first is that other sectors use proactive strategies for identifying hazards, rather than relying on retrospective identification from adverse events. Secondly, in contrast with other sectors, health and social care organisations are not required to demonstrate that risks have been reduced to acceptable levels. In other sectors, this is a requirement, and in the UK this is largely achieved through the building of safety cases. Safety cases may be useful practical tools for helping support risk management, although direct transfer of the practice is hindered by a number of challenges (Sujan et al., 2015, Sujan et al., 2016). In other sectors, regulators set safety goals, but it is up to organisations to demonstrate how they achieve them. This recognises that safety is an emergent outcome of a specific system and therefore control measures need to be appropriate for the specific context. Safety cases allow the organisation to provide a structured argument (supported by relevant local evidence) that risks are being controlled to an acceptable level. Hazards, risks and control measures are identified, as well as the performance indicators and monitoring processes that allow ongoing assessment of safety performance.

It would be difficult to translate this directly into health and social care, not least because providers are often subject to regulation from more than one body. Furthermore, the operational environment is unusually challenging – managing the complex needs of ageing populations (and delivering the frontline response to public health emergencies such as the pandemic) and all while operating under extreme financial pressures. However, there may be some benefits of even a partial engagement with the principles. Safety cases require the demonstration

of a systematic and proactive approach to risk assessment. Many of the tools described in this resource (such as the Safety Culture Discussion Cards) can be used practically to underpin risk assessment, demonstrating a commitment to this systematic approach. Secondly, safety cases can be very useful as a focus for discussions about safety and risk that might be useful for training and education. As part of this, it also opens the way for a wider discussion about what constitutes "acceptable risk" (Sujan et al., 2017a). This is another challenge for health and social care – acceptable to whom? Even different clinicians are likely to have different views here (for example, doctors compared with relatively risk-averse pharmacists) but what would patients, carers and families consider acceptable risk? These are important conversations in moving beyond the public perception of health and social care as a series of scandals.

Safety management systems work best when there is a commitment to just culture and continuous improvement

In order to improve the effectiveness of learning from incidents, it is important that staff do not get blamed for errors. However, there are situations where individual accountability will still be important. The concept of 'just culture' recognises this, and is built on a shared understanding of, and consensus around, where to draw the boundary between behaviours that are normal and those that are deemed negligent or reckless (Dekker, 2012). It reflects the system's thinking, recognising error is also an emergent property, but includes room for individual accountability. Drawing the line, however, is highly subjective, biased by the role of the decision-maker and hierarchy, and this can be a particular problem for health and social care. Delivering just culture is as complex as the system it serves, and the complexity resides in the flawed assumption that there is one 'true story' in the narrative of an adverse event. Dealing with adverse events requires someone to make a judgement call, and this judgement is simply a social construction, no more than somebody's attribution. The reason that there is not one true story of any event is that all those involved have a different perspective and understanding of the event. Rassmussen (cited in (Dekker, 2012), p.72) formulates this problem succinctly:

"If we find ourselves asking 'how could they have been so negligent, so reckless, so irresponsible?', then this is not because the people in question were behaving bizarrely, it is because we have chosen the wrong frame of reference for understanding their behaviour."

Incident investigation should not be about judgement, but about trying to understand the context, what it was about the environment that made it seem reasonable to those involved to undertake the course of action they selected. If it made sense

to this individual then it is likely to make sense to others working under similar conditions. Human factors and ergonomics approaches seek to uncover this local rationality by trying to understand the conditions.

Performance-influencing factors relating to organisational culture

In Chapter 1, we talked about the importance of avoiding 'bad apple thinking'. One of the reasons we're prone to blame is that human performance (or lack of it!) is easy to observe. Another reason is that we tend to view incidents as 'event sequences'. The human performance aspect will be very apparent in such a sequence but many other factors that influenced that performance will not appear as direct events within that sequence. Consequently, they go unrecorded. Much of what we talked about in Chapter 1 related to systems factors (and the interactions between these) and how these interactions give rise to the systems outcomes. Many of these factors have a strong relationship with outcomes simply because they influence the performance of the people within the work system. Despite the fact that human factors is all about the specific systems under consideration, we do recognise the recurrent nature of many these 'performance-influencing factors' (PIFs). The value of this is that we can gather these PIFs together into taxonomies for specific contexts. By recognising clusters of specific PIF clusters known to be problematic, this supports proactive risk management.

It depends on the specific taxonomy, of course, but PIF groupings often include things like 'individual' (so health, fatigue, skill, currency, etc), 'environmental' (workspace design, temperature, humidity, etc), 'technical' (design, maintenance, availablity, etc of equipment) and 'task' (design, distraction, etc) and 'organisational'. You can see that these fall along the lines of SEIPS categories. Organisational PIFs are often particularly powerful drivers of performance simply because they influence all the other categories of PIFs so strongly. For example, if staff are fatigued, much of this may come from the organisation's approach to recruitment and workload management, or its culture may influence retention etc.

PIFs give insight into how the different elements of the work system might impact on human performance for a given task. There are a number of organisational PIFs that need to be considered and safety culture is one of these. The safety culture maturity axis is simply describing the behaviours that are 'forced' by the nature of the prevailing culture. Other such factors include those which can be grouped under the heading of 'workload management', which includes understanding work pressures and stress, providing clarity about roles and responsibilities (including whether or not authority is given to staff to fully discharge the duties for which they are held accountable). It also includes staffing levels and appropriate complement

(including skills, competencies and experience). Experience (not just within the role, but also within the organisation) is often overlooked – experienced staff cost more and it can seem like a sensible cost-cutting exercise to employ staff on a lower band. How change is managed within the organisation is also likely to be a significant performance influencing factor – a systems approach that engages with all stakeholders is likely to bring staff along with management and increase the likelihood of success.

Measuring and monitoring safety

A final point worth thinking about is that the SMS includes strategies for measuring safety performance. This is one of the most challenging areas for health and social care. We collect a huge amount of data but struggle to use this at all, never mind in meaningful ways. How we might approach this is very much an ongoing discussion, and so beyond the scope of this book. However, one document you might find useful in supporting your own discussions is the Health Foundation's *Framework for measuring and monitoring safety* (Health Foundation, 2016). This framework moves beyond the traditional measurement of past harms and process reliability to include consideration of sensitivity to operations (are we safe now?), anticipation and preparedness (are we going to be safe in the future?) and, crucially, integration and learning. See also the chapter on organisational learning in this book.

Summary

People work for and within organisations, and so the culture of those organisations powerfully influences work performance. The ability of the workforce to deliver successful outcomes depends on the work context, and much of that context is defined by the organisational values and the way in which they are reflected in norms and behaviours. Taking time to explore and understand your own organisation allows a deeper understanding of the barriers to and facilitators of improved performance, safety and wellbeing.

CIEHF Ergonomics/Human Factors Competencies

1. Ergonomics/Human Factors (E/HF) principles

1.1 Understands the role and application of E/HF principles in optimising system performance and wellbeing across all ages and capabilities

2. Ergonomics/Human Factors (E/HF) theory and practice

2.2d Determines the match and the interaction between human characteristics, abilities, capacities and motivations, and the system(s), organisation, planned or existing environment, products used, equipment, work systems, machines and tasks

3. Human capabilities and limitations

3.2d Demonstrates a knowledge of systems theory including socio-technical systems and culture (e.g., organisational and safety culture)

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Chartered Institute
of Ergonomics
& Human Factors