# A brief history of pressure ulcer measurement in England: the last 20 years

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Pressure ulcers (PU) have long been recognised as a challenge to healthcare, are a cause of significant pain and distress for patients and are costly for healthcare providers in term of finances and use of human resource (Guest et al, 2020).

This paper, the first in a series of three, describes the predominant methods that have been used to capture the prevalence of PUs in England over the last 20 years. The second paper will describe the proposed system for national PU measurement in England and the third paper will outline proposals for implementing this system to drive quality improvement.

## BACKGROUND

Measurement of the occurrence of PUs (also known as pressure sores, decubitus ulcers, pressure injury and bed sores) has been a part of nursing activity for many years. The first paper on the epidemiology of what were then called pressure sores was published by Petersen and Bittmann in 1971. These initial audits aimed to identify the size of the problem to focus efforts on reducing occurrence through implementing the seminal work of clinicians such as Norton et al (1962). Since then, there have been many publications on this topic, seeking to identify the number of PUs occurring in specific organisations (Barbenel et al, 1977; Stevenson et al, 2013) as well as studies on specific populations such as intensive care (Chaboyer et al, 2018; Jacq et al, 2021), palliative care (Ferris et al, 2019), paediatrics (Delmore et al, 2020; Marafu et al, 2021), spinal injuries (Chen et al, 2020). There have also been larger scale studies across countries (Barrois et al, 2008, Gunninberg et al, 2013), or continents (O'Dea, 1995; Vanderwee et al, 2007; Moore et al, 2019). Recently, because of the COVID-19 pandemic, studies have been published reporting the pressure damage in health professionals related to personal protective equipment (Abiakam et al, 2020; Jiang et al, 2020).

### Measuring pressure ulcers: prevalence and incidence

During this time, the most reported forms of measurement have been prevalence and incidence. Prevalence is the proportion of a population who have a specific characteristic in a given time period. Therefore, the prevalence of PUs is the proportion of a defined patient population with pressure damage during a specified time period. Incidence is the number of specified new events, during a specified period in a specified population. Therefore, the incidence of pressure damage is the number of people in a defined patient population who develop a new PU during a specified time period.

Prevalence of pressure damage is a good indicator of the overall burden and clinical workload related to pressure damage but does not identify when and where the PU occurred, how long it had been present, probability of healing or the cost of care (International Guidelines, 2009). As incidence only identifies new occurrences within the specified time frame, it provides a measure of the quality of care and can be used to help identify possible patterns relating to interventions such as quality improvement initiatives such as the introduction of new equipment or education (International Guidelines, 2009).

Although there are many publications reporting the results of audits and similar studies, unfortunately, these use a range of reporting approaches and definitions. (*Box 1*; Fletcher, 2001). This lack of a consistent, systematic,

**Box 1. Examples of inconsistencies**

- Data may be collected by reviewing patients notes, asking ward staff if damage is present or by inspecting patients' skin for evidence of pressure ulcers.
- Some audits include category 1 pressure ulcers, others do not.
- Inclusion/exclusion of 'avoidable' pressure ulcers.
- Inclusion/exclusion of device related pressure ulcers.

and valid approach to data collection makes meaningful comparison problematic, either within or between organisations.

## Policy approaches to measuring pressure ulcers

In the 1980s and 1990s, organisations began to appoint specialist tissue viability nurses and measurement of PU prevalence became increasingly common. Some organisations undertook extensive audits, repeated annually, 6-monthly or even quarterly (Hibbs, 1988). These audits tended to focus on negative outcomes (e.g., number of PUs, severity, size, location, and origin), but rarely captured information about clinical care or concordance with key measures within preventative care protocols (Phillips and Clark, 2010). It was rare for audits to capture healing data or for audit data to be linked with robust quality improvement programmes so repeat prevalence audits identified the same challenges year on year.

In 1993 the Department of Health (DH) identified PUs as a Key Quality Indicator (DH, 1993). As more and more organisations began to collect PU data, there was national recognition that support was required to standardise and improve data collection practice.

In 1996, the European Pressure Ulcer Advisory Panel (EPUAP) was founded with the aim of reducing the burden of pressure ulcers across Europe (https://www.epuap.org/organisation/) through education, research and by developing a minimum data set for PU prevalence monitoring (Vanderwee et al, 2007).

In 2010 the Department of Health classified PUs as an avoidable harm (DH, 2010a) and tasked organisations with reducing their frequency as part of the Quality Innovation, Productivity and Prevention (QIPP) programme (DOH, 2010b). The responsibility for PU prevention was placed squarely on the shoulders of nurses and midwives when PU prevention was included in the High Impact Actions for Nursing and Midwifery (DH, 2010c).

The QUIPP Programme covered four high-cost, high volume harms (venous thromboembolism (VTE), PUs, urinary tract infection in patients with urinary catheters and falls) selected because they account for a large proportion of all avoidable injury to patients and share many underlying factors relating to fundamental patient care (e.g., mobility, medication management, nutrition, hydration). This QUIPP programme led to the development of a measurement tool – the NHS Safety Thermometer and to the development of the Commissioning for Quality and Innovation (CQUIN) payment framework (DH, 2010d) which enabled commissioners to reward excellence in care delivery.

The NHS Safety Thermometer aimed to collect accurate nationally comparable data with low burden to staff that could be used to support quality improvement work (Power et al, 2016). The Safety Thermometer was a voluntary system, but financial incentives meant that most NHS organisations participated. Data collection was undertaken locally on one specific day of each month by front line nursing teams, for all NHS funded patients. Anonymised data was then uploaded to the national database, providing a point prevalence of existing PUs, presented as the percentage of all in-patients with a PU on the survey date. The data were presented as overall totals, by type of organisation (Hospital, community, nursing home) and for each individual organisation. At best the Safety Thermometer information represented the prevalence of patients in the organisation with PUs on that given day. The methodological limitations meant it was not possible to capture incidence data.

Alongside Safety Thermometer reporting, organisations were encouraged to also report pressure ulcers via Incident Reporting Systems (IRS) (such as Datix and Ulysses). The aim was to support the National Reporting and Learning System (NRLS) and NHS England's web based serious incident management system, the Strategic Executive Information System (StEIS) for the reporting of serious incidents (SIs).

## Stop the Pressure Programme

To support the introduction of the Safety Thermometer in 2011 the Stop the Pressure programme was launched as a short-term regional initiative in the East of England (and later the Midlands and East Strategic Health Authority) with a clear ambition to eliminate all avoidable category II, III and IV PUs by December

2012. The Stop the Pressure Programme (StPP) focussed on quality improvement using the Safety Thermometer data to give a base line prevalence figure for PU numbers. Organisations were invited to participate in quality improvement collaboratives and resources were developed to encourage standardisation of approaches. This approach led to a significant reduction in the prevalence of PUs from 5.59% in July 2012 to 4.4% in 2015 and 2016 (Power et al, 2016).

The StPP workstream ceased in April 2012 with the reorganisation of the NHS and dissolution of the regional Strategic Health Authorities but recommenced in September 2016 as a national NHS Improvement and later NHS England and NHS Improvement England programme (National Stop the Pressure Programme; NStPP).

One of the initial objectives of the NStPP was to agree, implement and evaluate revised national definitions for PUs in order to achieve consistent reporting and reduce uncertainty and variation. A consensus methodology was used to reach agreement on key areas of measurement and reporting. The Revised Framework for Definition and Measurement (revised from the definitions in Safety Thermometer) was published in July 2018 (NHS Improvement, 2018).

## Issues with measurement of pressure ulcers

However, these initiatives brought problems as well as benefits. Critics argued that there was considerable pressure to achieve poorly devised targets and that the approach to measurement was not evidence-based and subject to significant variation in interpretation and implementation (Dealey et al, 2012). A retrospective evaluation of the impact of the Safety Thermometer (Power et al, 2016) showed that around a third (32.6%) of survey respondents questioned the reliability of the data collected, believing it was "vulnerable to 'gaming' by organisations trying to look good," and that the data were not comparable across organisations.

In 2015 a large-scale study funded by the Tissue Viability Society (TVS) surveyed the existing data capture systems (Safety Thermometer, Incident Reporting Systems, StEIS) across 24 NHS organisations and identified variation and inaccuracies in reporting mechanisms. They concluded that differences in reporting precluded trust to trust comparisons of PU prevalence (Smith et al, 2016) and made recommendations for improvement (Coleman et al, 2016). They concluded that the systems used to monitor PU patient harm lack standardisation, are characterised by high levels of under-reporting and, despite their limitations, have been unfairly used to compare and sometimes financially penalise trusts.

In April 2020, following a public consultation as part of proposed changes to the NHS Standard Contract, all data collection for the 'classic' Safety Thermometer and the 'next generation' Safety Thermometers was stopped in favour of using alternative data sources to inform quality improvement.

There are also issues with incident reporting of PUs. Since 2010 (DH, 2010c), NHS organisations have been required to incident report Category II and above pressure damage. While this has provided a mechanism for organisations to investigate incidents of pressure damage and harm, it has sometimes led to punitive measures against organisations that report higher numbers of patients with more severe pressure damage. Understandably, many organisations have chosen to deploy senior tissue viability specialist clinicians to verify PU categorisation, but this reduced senior clinician availability for other more clinically and cost-effective tissue viability practice such as clinical leadership for PU prevention strategies or care for other types of wounds. This focus on PU categorisation has deflected attention away from patient safety or quality improvement programmes and might explain why the NHS has not achieved much progress in reducing the prevalence or incidence of PUs.

**Box 2: Statistical Process Control**

Statistical Process Control (SPC) is linked with PDSA (Plan, Do, Study & Act) cycles. SPC charts allow the user to plot data over time determining common and special cause variation. SPC calculates the upper and lower control limits on an SPC chart from the variation within the data. Using some simple 'rules' users can link PDSAs (changes) to improvement. The most commonly used rule to spot improvement is a run of 7 consecutive data points all above or below the average (the chance of this happening by chance is 1 in 128)

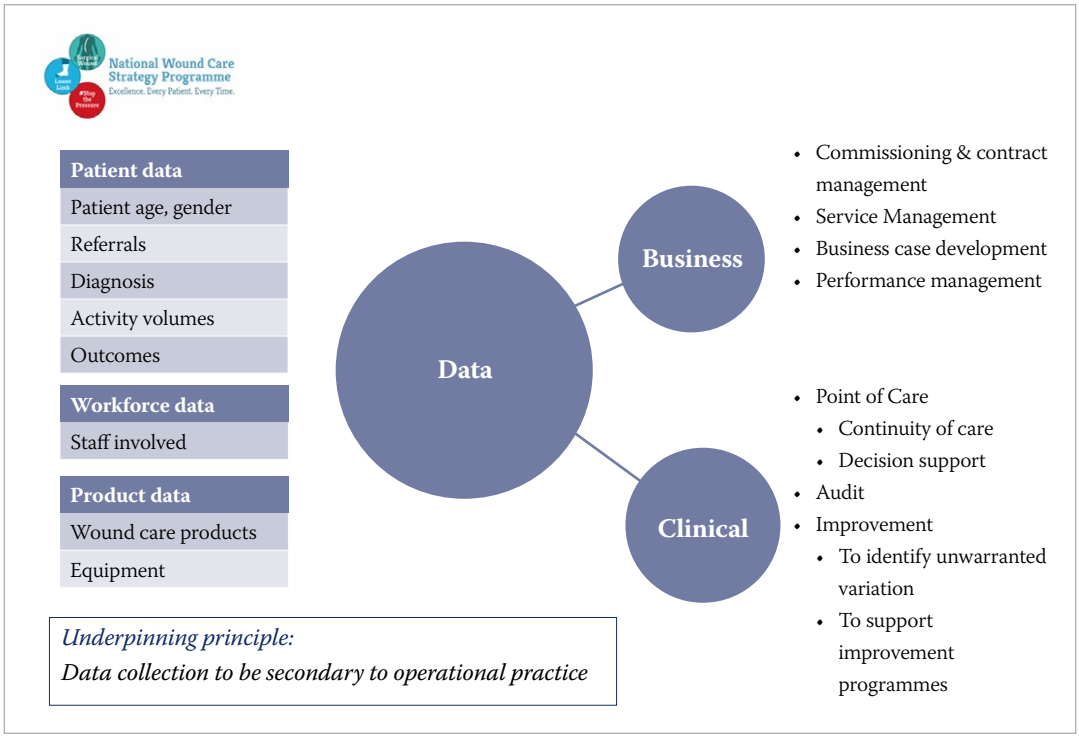


**Figure 1. Identify the purpose of the data**

## From counting to improvement

Over the last 20 years, in England, there has been significant investment in the collection of PU data. This effort has made an important contribution to raising the profile of PU prevention, but data collection has placed a large burden on health professionals. This has led to the unintended consequence of diverting clinical time away from clinical initiatives that would reduce the incidence and prevalence of PUs and improve healing rates for other types of wounds.

To address this, data capture for PUs, and other wound types, must be less time consuming, more accurate, inform quality improvement and not in itself add to the burden of the clinical workforce.

Thought must also be given to the form in which data is presented as this can have significant impact on the quality of decision making. PU data might be more usefully presented using statistical process control charts (NHS Improvement Making Data Count, 2021) which present data over time rather than the currently popular use of red, amber, green (RAG) tables. *(Box 2)*.

## Next steps

A new national PU data system is now required to support quality improvement for people at risk of pressure damage. This new system should be underpinned by three key principles:

1. Data capture should be secondary to operational practice
2. There should be clarity about the purpose of the data capture. Will it be for business use (commissioning and contracting, service management, performance management) or clinical use (decision support at the point of care, identification of unwarranted variation, improvement; *Figure 1*)
3. Data should be of a level of granularity (detail) relevant to the purpose for which it is required. For example, the data needs of a Clinical Commissioning Group (CCG) or Integrated Care System (ICS) are likely to be different to the data needs of a Tissue Viability Service Clinical Lead. *(Figure 2)*.

Based on these principles, it is proposed that the new system should use data from existing

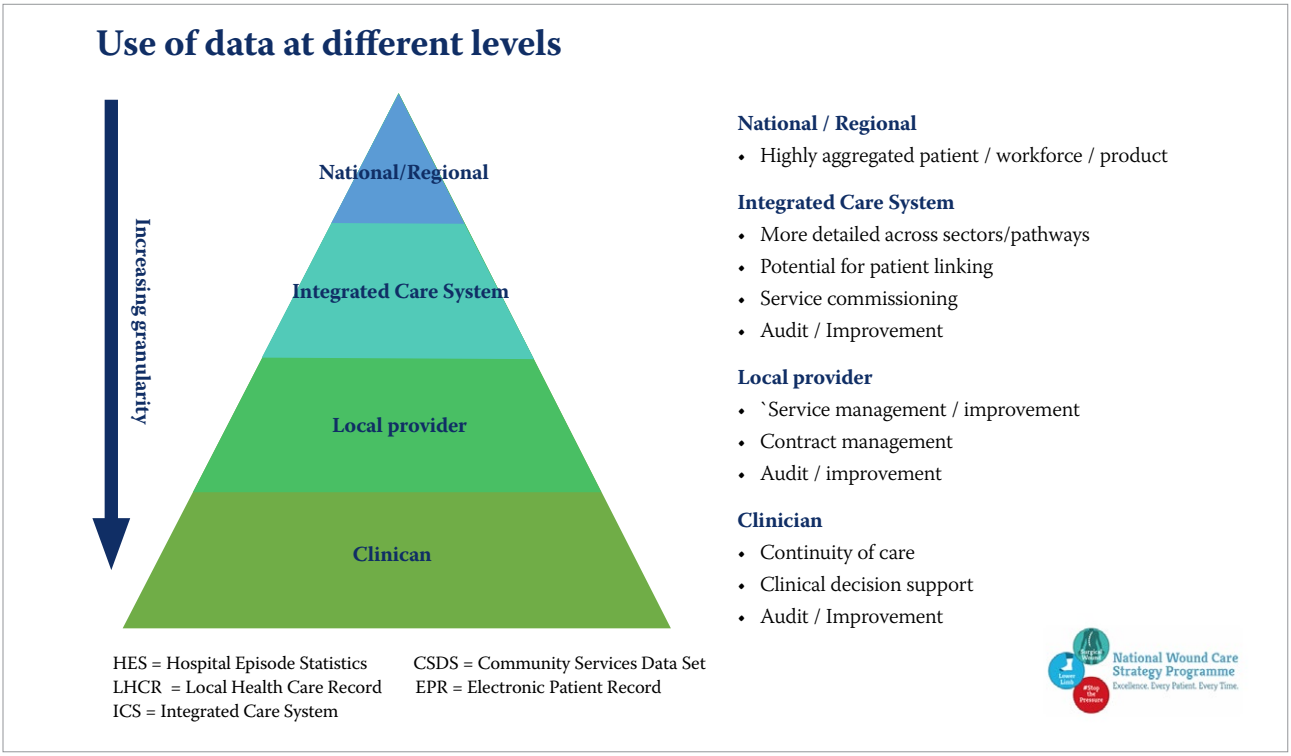


**Figure 2. Use of data at different levels**

data sources that use routinely collected data, thus taking the burden of additional data collection away from clinical staff.

The use of the Hospital Episode Statistics database for PU data capture and reporting will be explored in part two of this three-part series. WUK

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