Value-Based Pressure Injury Prevention and Treatment: The Importance of Relevant, Reliable, and Contextualised Data

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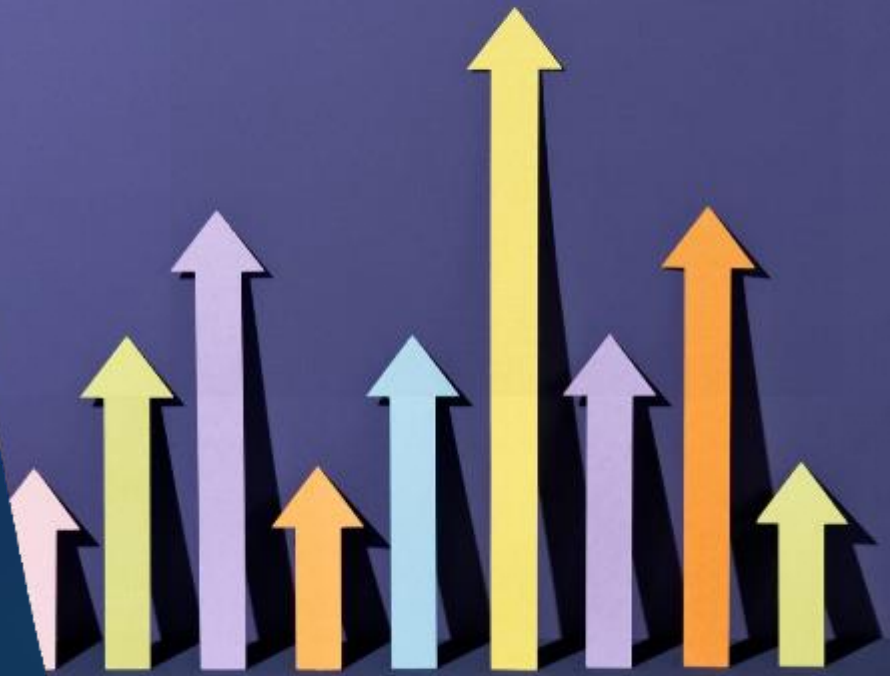

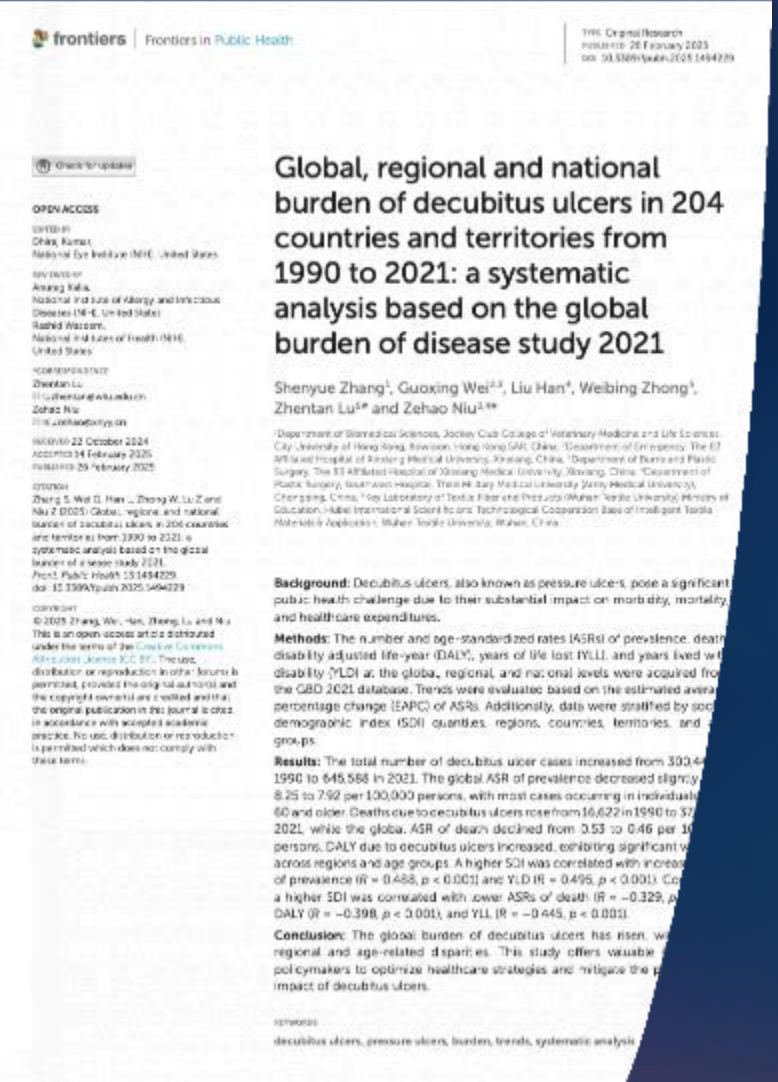

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Global, regional and national burden of decubitus ulcers in 204 countries and territories from 1990 to 2021: a systematic analysis based on the global burden of disease study 2021

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Background: Decubitus ulcers, also known as pressure ulcers, pose a significant public health challenge due to their substantial impact on morbidity, mortality, and healthcare expenditures.

Methods: The number and age-standardized rates (ASRs) of prevalence, death, disability adjusted life-year (DALY), years of life lost (YLL), and years lived with disability (YLD) at the global, regional, and national levels were acquired from the GBD 2021 database. Trends were evaluated based on the estimated average percentage change (EAPC) of ASRs. Additionally, data were stratified by socio-demographic index (SDI) quantiles, regions, countries, territories, and age groups.

Results: The total number of decubitus ulcer cases increased from 303,4... 1990 to 645,568 in 2021. The global ASR of prevalence decreased slightly, ... 8.25 to 7.92 per 100,000 persons, with most cases occurring in individuals ... 60 and older. Deaths due to decubitus ulcers rose from 16,622 in 1990 to 3... 2021, while the global ASR of death declined from 0.53 to 0.46 per 1... persons. DALY due to decubitus ulcers increased, exhibiting significant ... across regions and age groups. A higher SDI was correlated with increas... of prevalence ($R = 0.488$, $p < 0.001$) and YLD ($R = 0.495$, $p < 0.001$). Co... a higher SDI was correlated with lower ASRs of death ($R = -0.329$, p... DALY ($R = -0.398$, $p < 0.001$), and YLL ($R = -0.445$, $p < 0.001$).

Conclusion: The global burden of decubitus ulcers has risen, w... regional and age-related disparities. This study offers valuable ... policymakers to optimize healthcare strategies and mitigate the ... impact of decubitus ulcers.

KEYWORDS

decubitus ulcers, pressure ulcers, burden, trends, systematic analysis

Global Public Health Context

- **Global Public Health Context** *(Zhang et al., 2025)*
  - 1990 → 2021: cases rose from 300k → 646k; deaths from 16k → 37k.
  - Disability burden (DALYs) doubled: 409k → 804k.
  - Prevalence ~ 8 per 100k population, mostly in those 60+ years.
  - Aging populations drive rising absolute burden despite stable/decreasing age-adjusted rates.

Trends, risk factors and policy implications

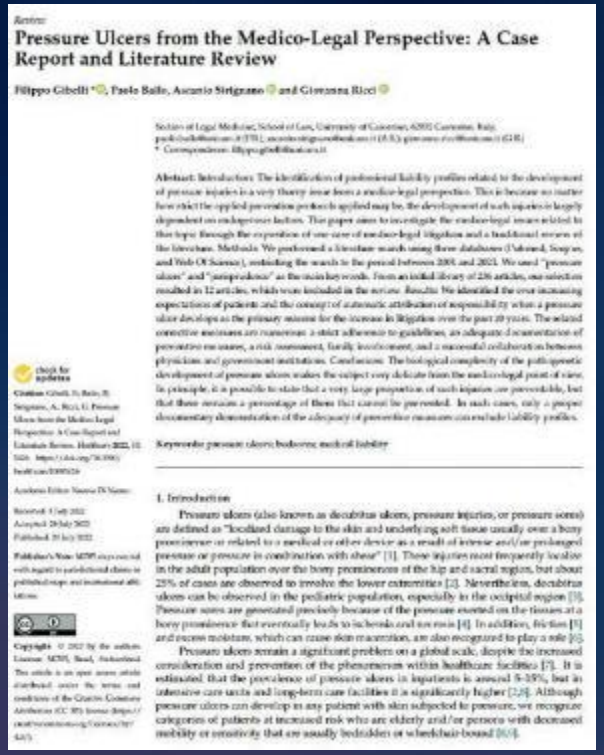
- **Trends (1990–2021)**
  - Global prevalence rate stable (−0.02% change), but absolute numbers increased.
- **Disparities**
  - High-SDI regions (e.g., Western Europe, North America):
    - Higher reported prevalence (better detection, older populations).
    - Lower mortality and DALYs (better prevention and treatment).
  - Low-SDI regions: fewer reported cases but higher death & disability rates.

Why talk about health economics?

High proportion of healthcare spending

- In the UK, treating pressure ulcers costs between £1.4 billion and £2.1 billion annually, equating to 4 % of NHS expenditure.
- In Spain, annual cost estimated at around €461 million, about 5 % of the healthcare budget.
- Across OECD countries, direct costs from unsafe care (which includes pressure ulcers) are estimated at 2 – 4 % of total health expenditure.

Hidden costs



Review

Pressure Ulcers from the Medico-Legal Perspective: A Case Report and Literature Review

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Abstract: Introduction: The identification of professional liability profiles related to the development of pressure injuries is a very thorny issue from a medico-legal perspective. This is because no matter how strict the applied prevention protocols applied may be, the development of such injuries is largely dependent on multifactorial factors. This paper aims to investigate the medico-legal issues related to this topic through the exposition of one case of medico-legal litigation and a traditional review of the literature. Methods: We performed a literature search using three databases (Pubmed, Scopus, and Web Of Science), extending the search to the period between 2000 and 2021. We used "pressure ulcers" and "jurisprudence" as the main key words. From an initial library of 236 articles, our selection resulted in 12 articles, which were included in the review. Results: We identified the ever increasing expectations of patients and the concept of automatic attribution of responsibility when a pressure ulcer develops as the primary reasons for the increase in litigation over the past 20 years. The related corrective measures are numerous: a strict adherence to guidelines, an adequate documentation of preventive measures, a risk assessment, family involvement, and a successful collaboration between physicians and government institutions. Conclusions: The biological complexity of the pathogenetic development of pressure ulcers makes the subject very delicate from the medico-legal point of view. In principle, it is possible to state that a very large proportion of such injuries are preventable, but that there remains a percentage of them that cannot be prevented. In such cases, only a proper documentary demonstration of the adequacy of preventive measures can preclude liability profiles.

Keywords: pressure ulcers; bedsores; medical liability

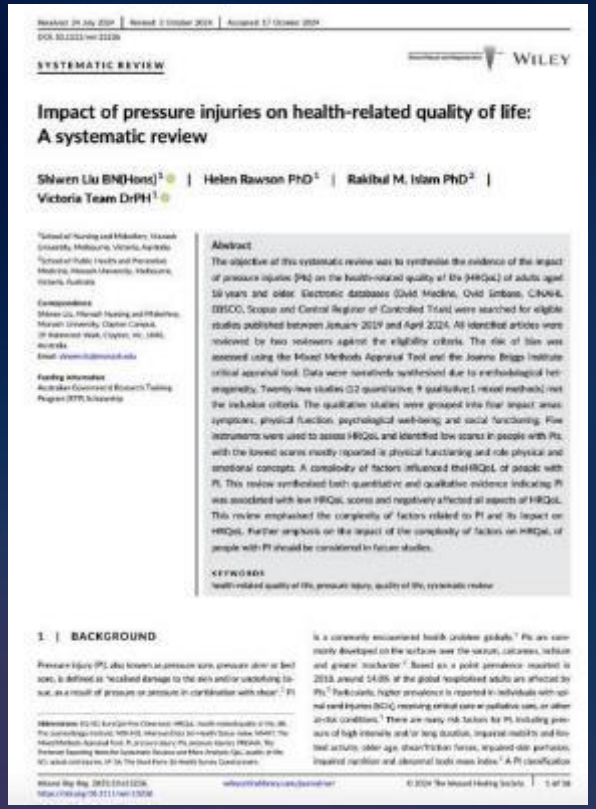
1. Introduction

Pressure ulcers (also known as decubitus ulcers, pressure injuries, or pressure sores) are defined as "localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device as a result of intense and/or prolonged pressure or pressure in combination with shear" [1]. These injuries most frequently localize in the adult population over the bony prominences of the hip and sacral region, but about 25% of cases are observed to involve the lower extremities [2]. Nevertheless, decubitus ulcers can be observed in the pediatric population, especially in the occipital region [3]. Pressure sores are generated precisely because of the pressure exerted on the tissues at a bony prominence that eventually leads to ischemia and necrosis [4]. In addition, friction [5] and excess moisture, which can cause skin maceration, are also recognized to play a role [6].

Pressure ulcers remain a significant problem on a global scale, despite the increased consideration and prevention of the phenomenon within healthcare facilities [7]. It is estimated that the prevalence of pressure ulcers in inpatients is around 5–10%, but in intensive care units and long-term care facilities it is significantly higher [2,8]. Although pressure ulcers can develop in any patient with skin subjected to pressure, we recognize categories of patients at increased risk who are elderly and/or persons with decreased mobility or sensitivity that are usually bedridden or wheelchair-bound [8,9].

- Out-of-court settlements: typically £20–30k, but can reach £1–3M in severe cases.
- NHS spending since 2013: £168M on pressure ulcer litigation (≈£66k/claim).
- Total claims (incl. damages & legal costs): approx. £322M (NHS Resolution).

Hidden costs



SYSTEMATIC REVIEW

WILEY

Impact of pressure injuries on health-related quality of life: A systematic review

Shiwen Liu BN(Hons)[1] | Helen Rawson PhD[1] | Rakibul M. Islam PhD[2] | Victoria Team DrPH[1]

Abstract

The objective of this systematic review was to synthesise the evidence of the impact of pressure injuries (PIs) on the health-related quality of life (HRQoL) of adults aged 18 years and older. Electronic databases (Ovid Medline, Ovid Embase, CINAHL, EBSCO, Scopus and Central Register of Controlled Trials) were searched for eligible studies published between January 2019 and April 2024. All identified articles were reviewed by two reviewers against the eligibility criteria. The risk of bias was assessed using the Mixed Methods Appraisal Tool and the Joanna Briggs Institute critical appraisal tool. Data were narratively synthesised due to methodological heterogeneity. Twenty-five studies (12 quantitative, 9 qualitative, 1 mixed methods) met the inclusion criteria. The qualitative studies were grouped into four impact areas: symptoms, physical function, psychological well-being and social functioning. Five instruments were used to assess HRQoL and identified low scores in people with PIs, with the lowest scores mostly reported in physical functioning and role physical and emotional concepts. A complexity of factors influenced the HRQoL of people with PI. This review synthesised both quantitative and qualitative evidence indicating PI was associated with low HRQoL scores and negatively affected all aspects of HRQoL. This review emphasised the complexity of factors related to PI and its impact on HRQoL. Further emphasis on the impact of the complexity of factors on HRQoL of people with PI should be considered in future studies.

KEYWORDS

health-related quality of life, pressure injury, quality of life, systematic review

1 | BACKGROUND

- Reputational damage from litigation and media exposure
- Extended hospital stays reduce bed availability and efficiency
- Patient/family burden: pain, anxiety, social isolation

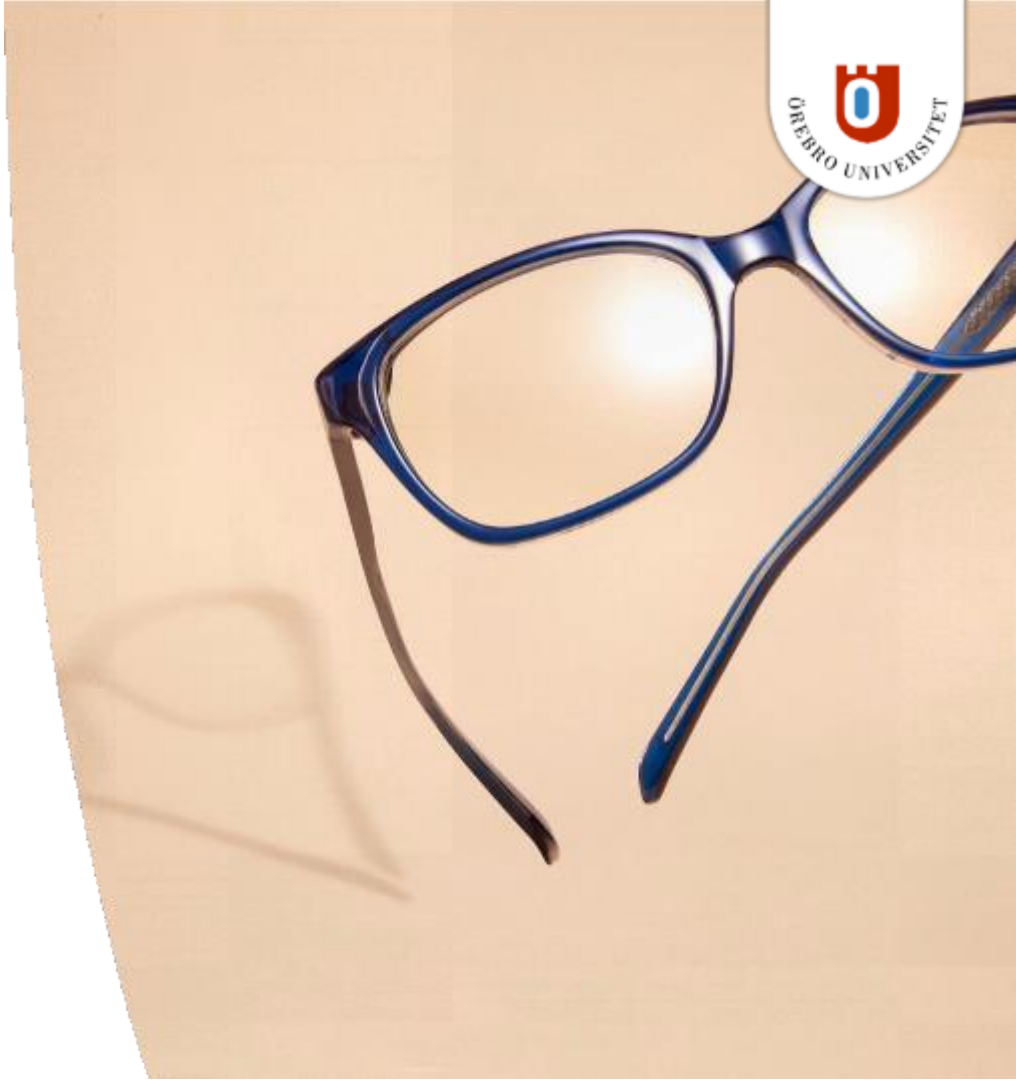
Quality of life: the reality behind the economics

A 2025 systematic review included 22 studies (12 quantitative, 9 qualitative, 1 mixed-methods).

- Pressure injuries were associated with poorer HRQoL across four major domains:
  - Symptoms: particularly pain and discomfort
  - Physical functio: mobility, activity and independence
  - Psychological wellbeing: anxiety, frustration, loss of dignity
  - Social functioning : isolation and restricted participation
- If quality of life is absent from the economic model, an important part of the benefit of prevention and effective treatment disappears.

Liu S, Rawson H, Islam RM, Team V. Impact of pressure injuries on health-related quality of life: A systematic review. Wound Repair Regen. 2025 Jan-Feb;33(1):e13236.

Two takeaways so far …



Pressure ulcers cause avoidable harm with high human and financial costs - prevention is both a moral and economic imperative

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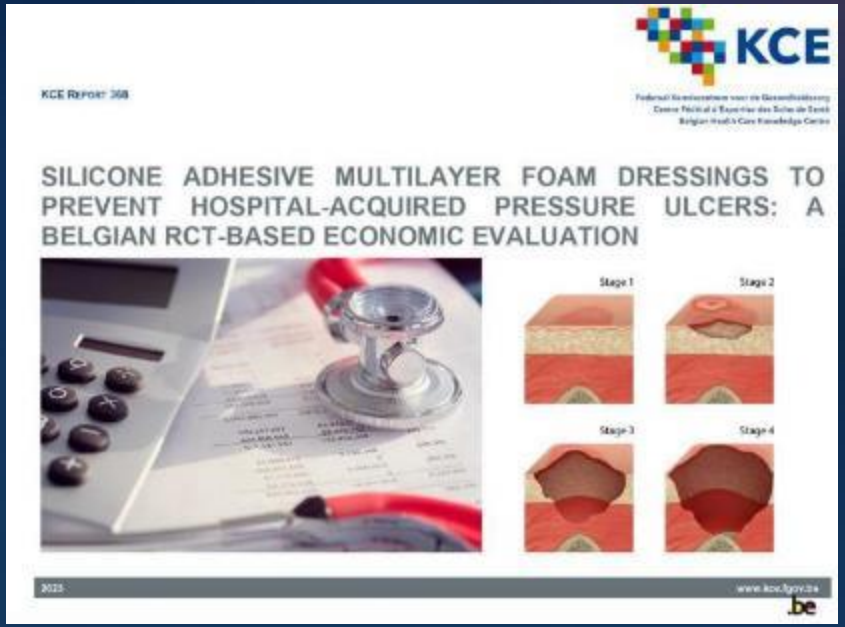
Economic data on pressure ulcers is inconsistent and incomplete, underestimating true costs, especially indirect ones, making prevention benefits harder to prove.

Prevention vs treatment: a clinical trial example

- Belgian KCE RCT & economic evaluation (2023)
- Design: 1,633 at-risk hospitalized patients, 8 hospitals.
- Intervention: Silicone adhesive multilayer foam dressings (sacrum, heels, trochanter) + standard care vs standard care alone.
- Clinical outcomes:
  - New pressure ulcers (Cat. II+): 4.0% (dressing) vs 6.3% (standard care) → 36% risk reduction (RR 0.64, p=0.04).
  - Strongest effect at sacrum (risk reduced by 41%).
  - No significant effect on heels; very few trochanter ulcers.



The policy dilemma

- Limited budgets force tough choices.
- New technology often looks more attractive.
- Prevention programmes are less visible but highly impactful
- Without strong health-economic evidence, prevention often loses out to flashier investments.

The health- economics reality

Table 27 – Overview of costs and consequences sacrum PU prevention with silicone adhesive multilayer foam dressings

Variable	Value	More information in part
Cost prevention: - Dressings (average use: 3) - Time (3 times 2 minutes)	€30 (~€27**) €4.52	6.2.2.1
ARR PU (NNT)	2% (50)	6.2.1.1
Total investment cost per PU avoided: €1726* (~€1576)**		
Distribution PUs	Cat. II: 65.4% Cat. III/IV: 34.6%	6.2.1.1
QoL	Potentially smaller improvement in QoL in patients with PUs	5.3.1
Cost PU treatment under assumption of no increase in LoS for PU cat. II.	€212	6.2.2.2
Cost PU treatment under assumption of an increase in LoS of 5 days for PU cat. III/IV.	€4313***	6.2.2.2
Total savings under the applied assumptions: €1631****		

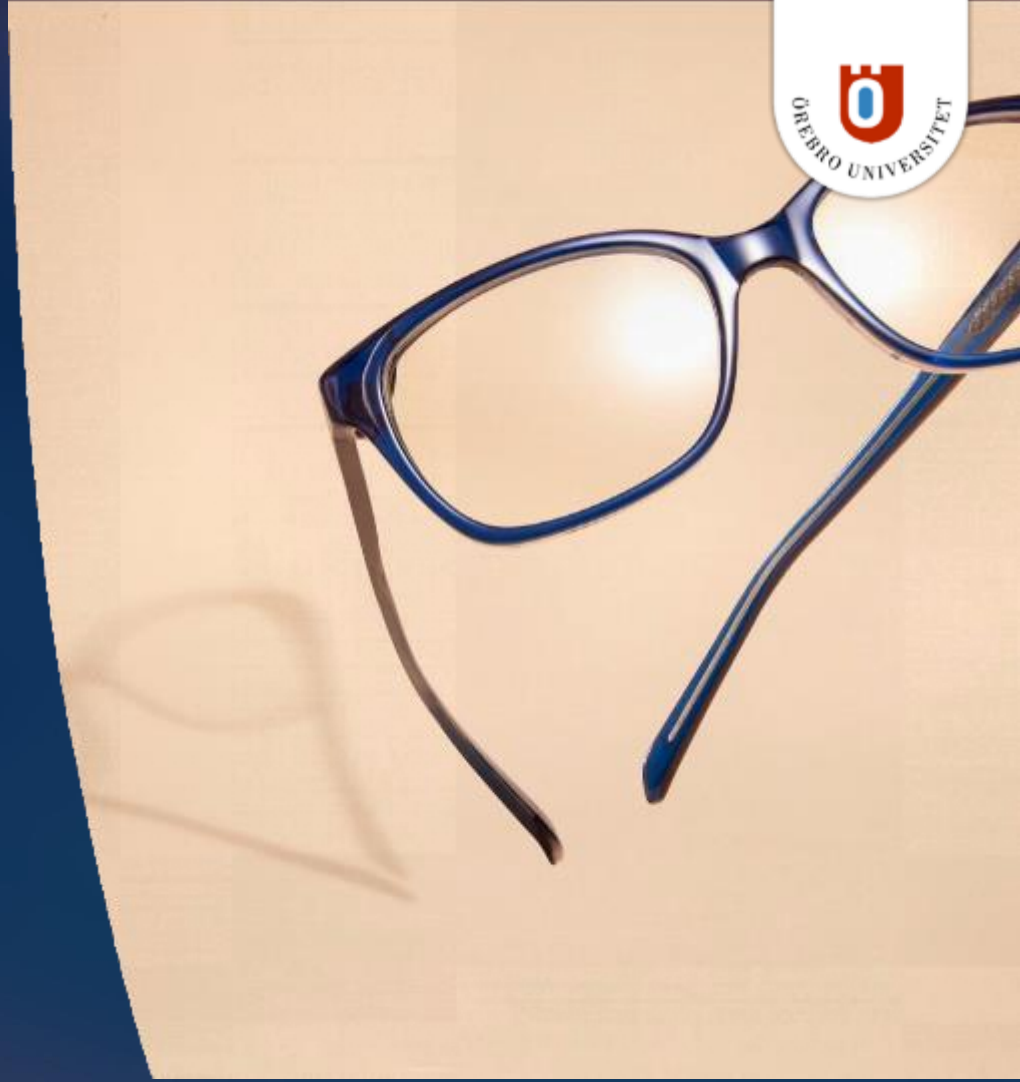
ARR: absolute risk reduction; Cat.: category; NNT: number needed to treat; PU: pressure ulcer; QoL: quality of life.
** (€30 + €4.52) x 50 (NNT) = €1726.*
*** This is the result if a cost of about €9 per dressing is applied.*
**** (€3907 + €4719)/2 = €4313.*
***** (65.4% x €212) + (34.6% x €4313) = €1631.*

- Costs: Dressings add upfront costs (~13 dressings/patient, avg. use per trial), but prevention may avoid expensive Cat. III–IV ulcers. Break-even possible if severe ulcers are prevented.
- Claim
  - Prevention is cost-saving and ethically imperative: Investing in prophylactic measures (e.g., silicone multilayer foam dressings on sacrum) can reduce ulcer incidence, avoid high treatment and litigation costs, protect hospital reputation, and lessen patient/family suffering.

The bigger picture

- A PI pevented reduces:
  - Staff burnout (less repetitive wound care)
  - Material waste and carbon emissions.
  - Overall financial strain on health systems.
- Sustainability = economic + environmental + workforce well-being.

Two more takeaways …



OECD notes that promising digital prevention tools lack solid evidence on costs, benefits, and ROI, particularly in patient safety.

Policy inertia and short-term thinking drive underinvestment in prevention, despite it being 3-4 times more cost-effective than treatment.

Current evidence: a patchwork

Many studies - but methodologically diverse and hard to compare.

Systematic review found large variations in cost estimates:

- Treatment cost per patient per day ranges from €1.71 to €470.49, depending on the setting.
- Prevention costs ranged from €2.65 to €87.57.

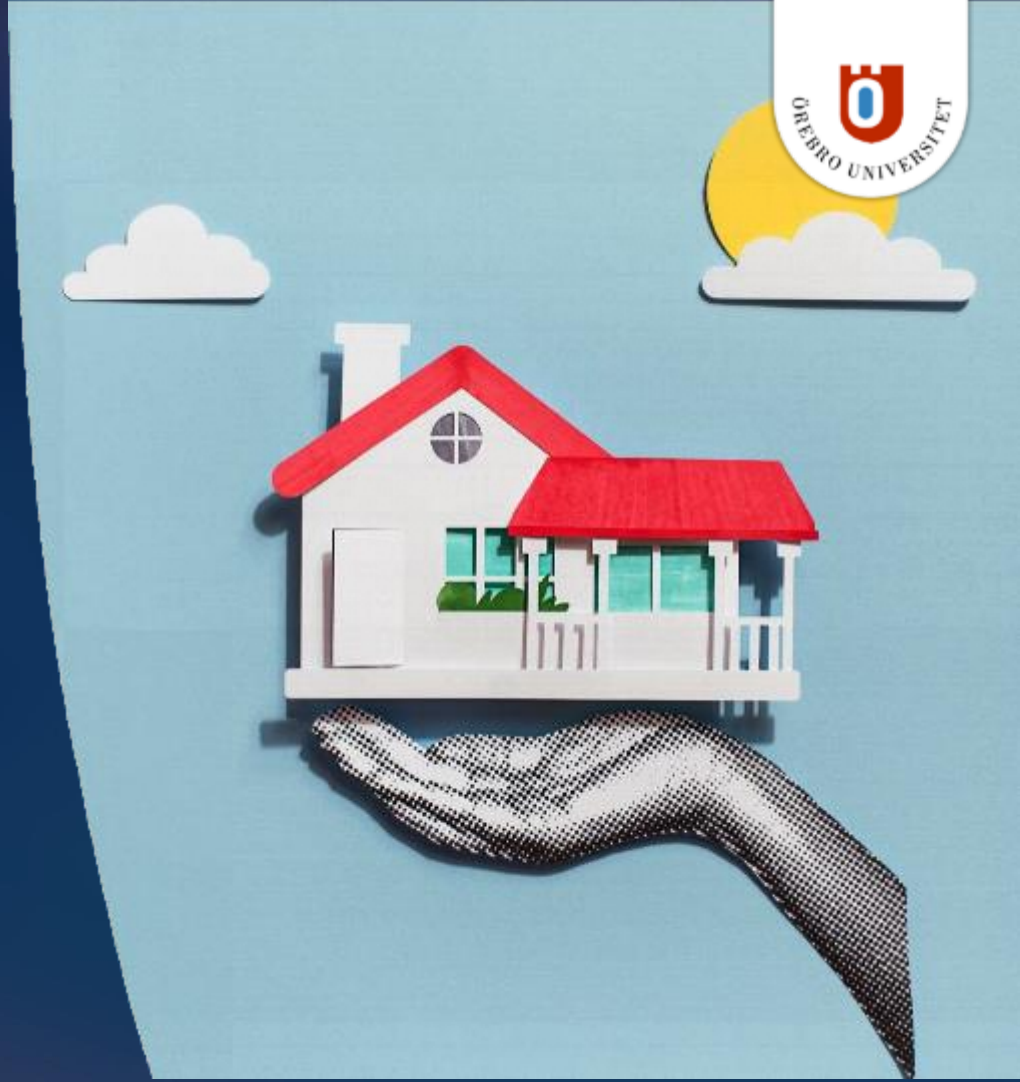
Current evidence: a patchwork

UK study variations:

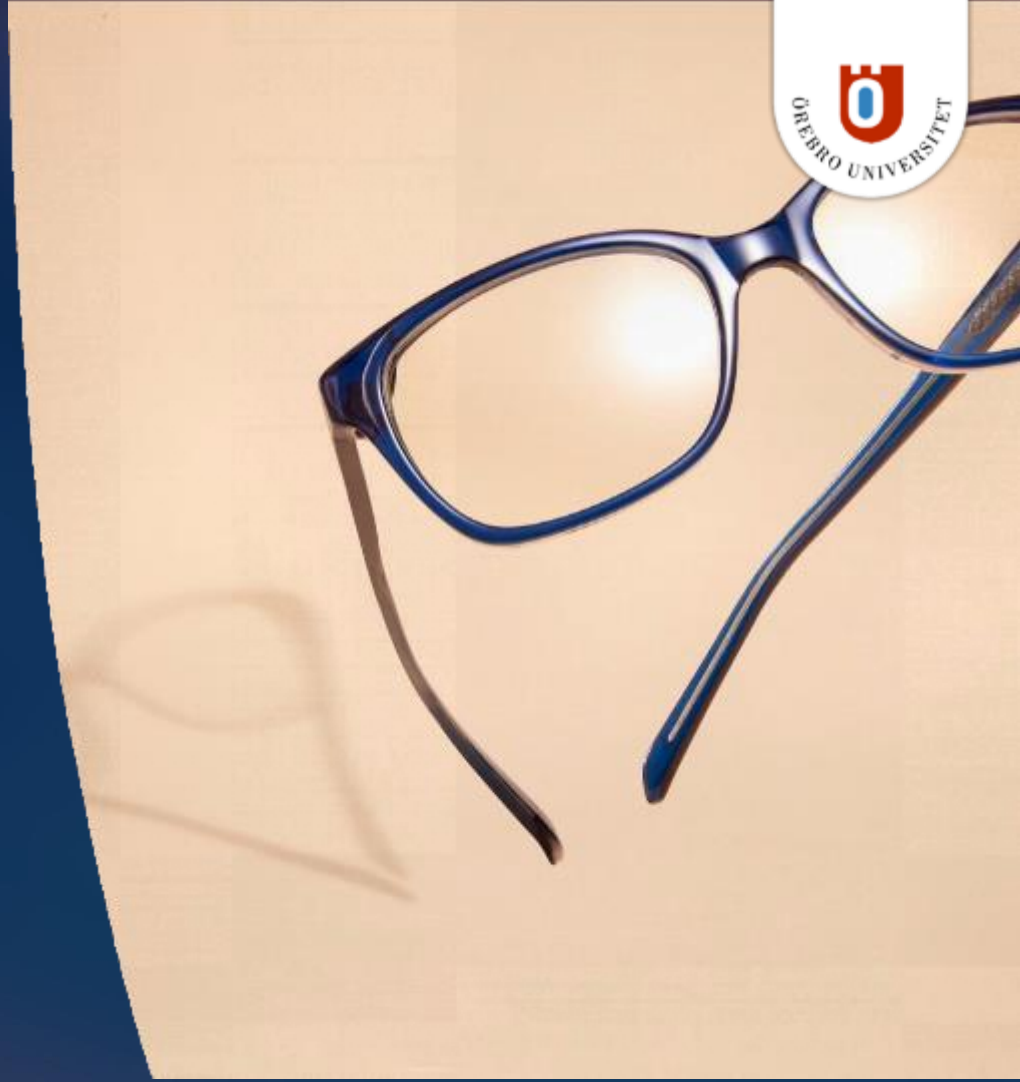
- One UK estimate: £1,214 (Grade 1) to £14,108 (Grade 4) per ulcer
- Another estimate cited total NHS annual cost at £1.4–£2.1 billion (~4% of budget)
- Wide-ranging figures reflect conflicting inclusion of cost components, e.g., productivity vs. direct care costs.

Why foundations matter

- Prevention is consistently shown to be cost-effective: prevention bundles save thousands per patient and reduce incidence by >70%.
- Yet prevention remains underfunded because:
- Short-term cost models ignore long-term savings (e.g., avoided complications, reduced hospital stays).
- Indirect benefits (quality of life, productivity gains, caregiver relief) are rarely included in models.



More?



Decision-makers favour visible, high-tech investments over “quiet savings” from prevention

Weak data foundations lead to underinvestment in safety and prevention, despite evidence of high returns (OECD, 2022)

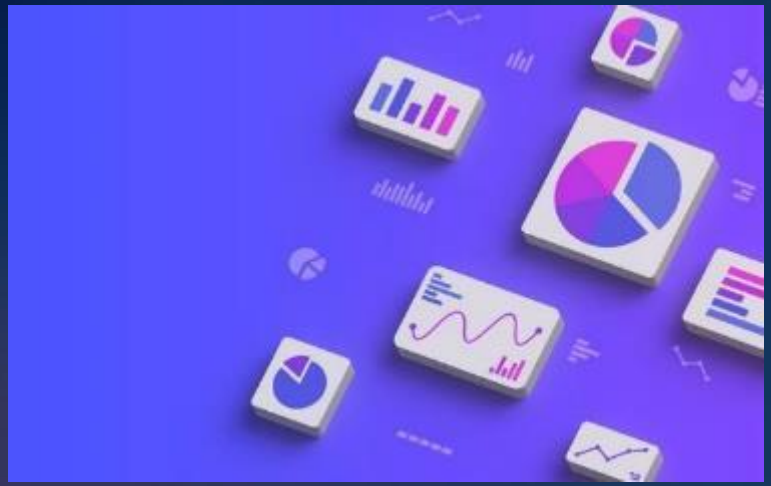
The three building blocks

Relevance: Does the data capture what really matters?

- Many studies only measure “visible” costs = underestimate the true burden.
- Spain: Pressure ulcer care ~€461 million/year, >50% from hospital stay length (not just dressings/materials).
- Canada: Excluding quality-of-life impacts underestimated total burden by ~30%.

The three building blocks

Relevance: Does the data capture what really matters?

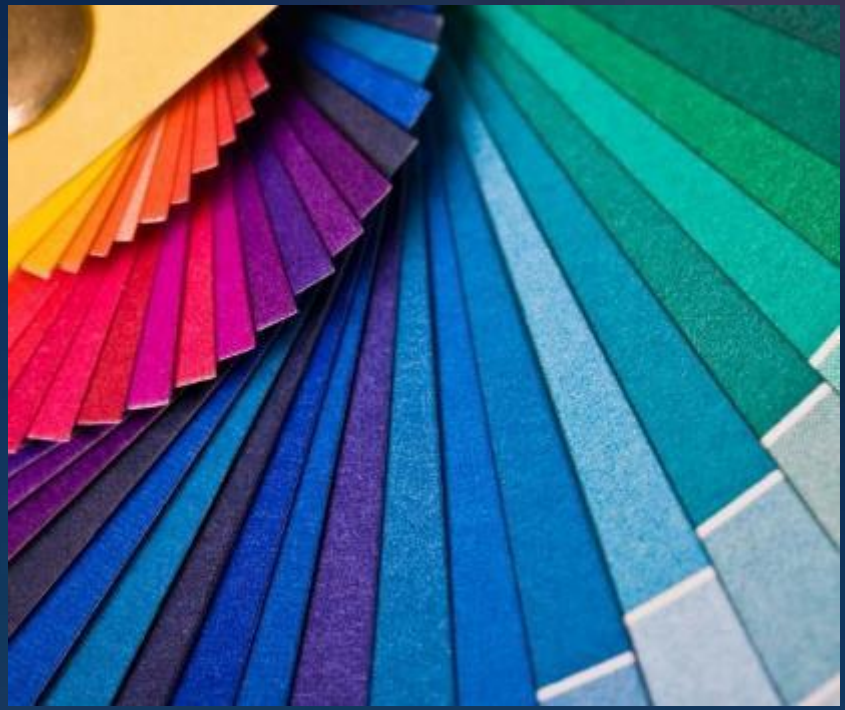


Direct Costs	Indirect Costs
Staff time and nursing workload	Prolonged hospital stays
Support surfaces and equipment	Readmissions
Prophylactic dressings	Reduced patient mobility
Skin care products	Loss of productivity
Monitoring technologies	Long-term disability
Organisational infrastructure	Caregiver burden
Protocol development	Diminished quality of life
Auditing systems	Social isolation / stigma
Nutritional support	Psychological distress
Surgical interventions	Early mortality

The three building blocks

Relevance: Does the data capture what really matters?

- Spain (Soldevilla Agreda, 2007): Main direct prevention costs came from special mattresses, cushions, and nursing time.
- Germany (Rexroth et al., 2015): Preventive dressings and staff time were the largest cost drivers in ICU prevention bundles.
- US (Padula et al., 2019): Workforce costs and capital equipment (beds, mattresses) accounted for the bulk of prevention expenses.



The three building blocks

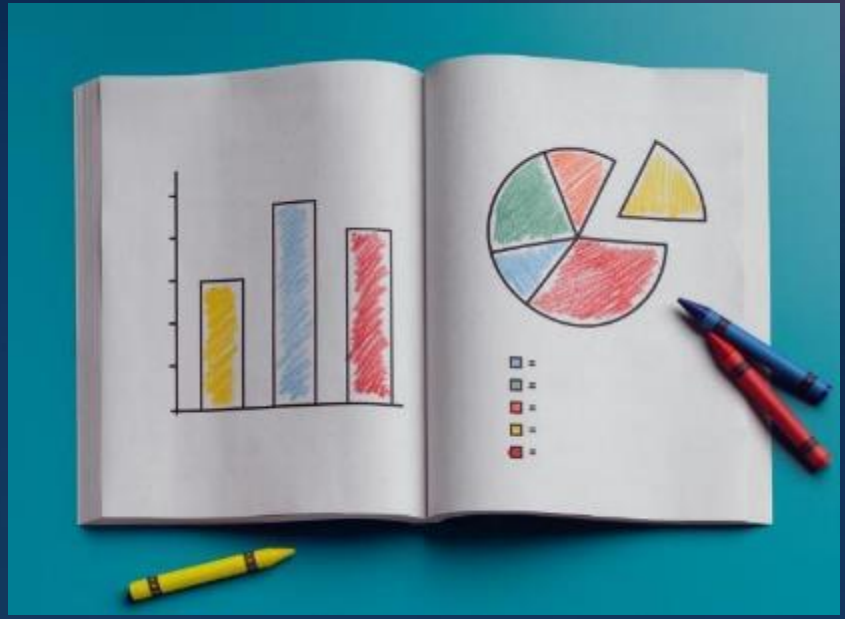
Relevance: Does the data capture what really matters?

- US Medicare data: Surgical closure of stage III/IV pressure ulcers costs $124,000+ per patient on average.
- UK NHS data: Flap surgery alone for a pressure ulcer estimated at £11,000–£15,000, excluding long-term follow-up.
- Recurrence rates post-surgery can be as high as 28–40%, adding repeat costs..

The three building blocks

Reliability: Are the data acurate and comparable?

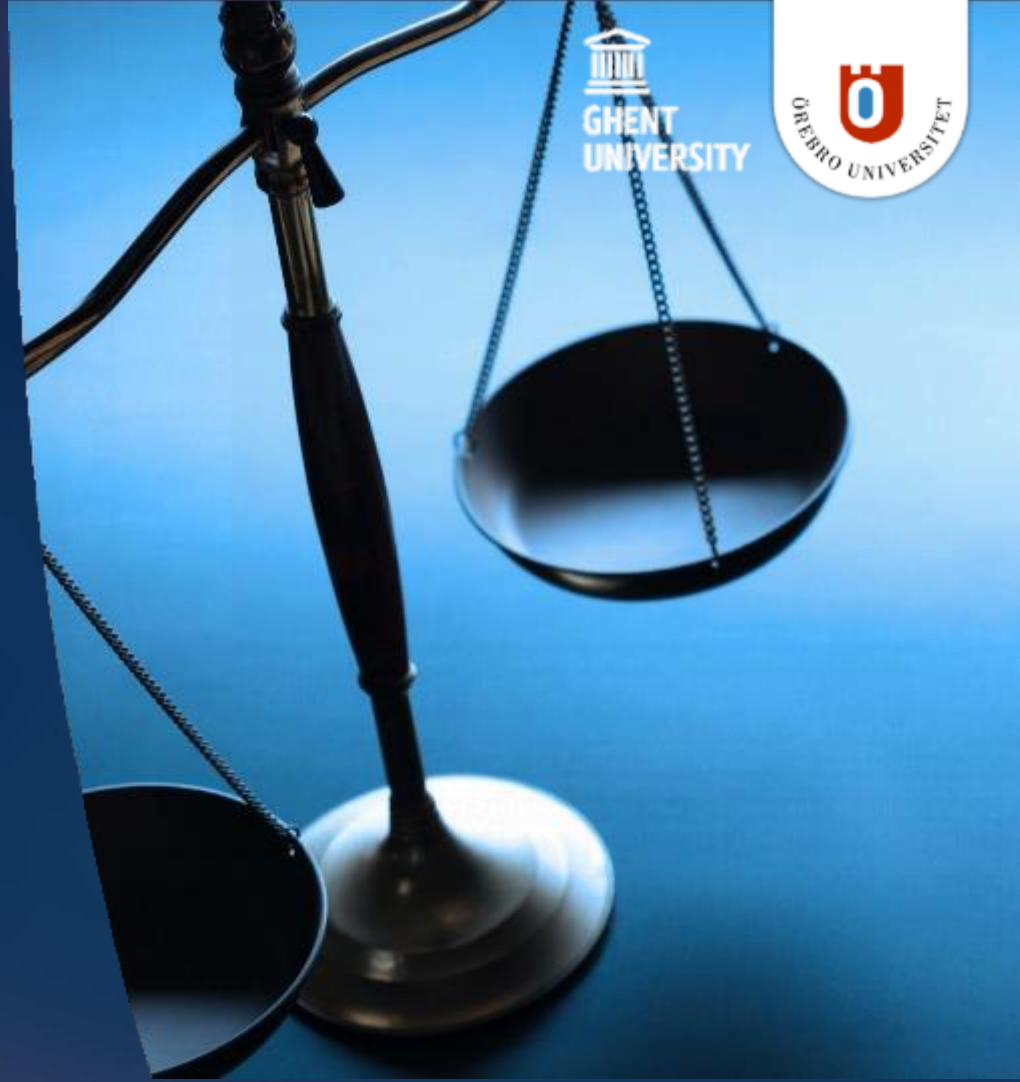
- Study design and definitions vary → inconsistent estimates.
- Netherlands vs. Germany: Prevention costs ranged from €2.65/day to €87/day, same interventions but different costing frameworks.
- Multicentre EU study: Prevalence estimates varied 5 – 25% across sites just from differences in data collection methods.



The three building blocks

Reliability: Are the data acurate and comparable?

- Registries: Large-scale, centralised data improve comparability.
- EHRs (Electronic Health Records): Enable continuous, real-world data collection.
- Standardised definitions: Reduce variation and ensure consistency across studies.



The three building blocks

Context: Do the data apply to the local setting?

- Data often transplanted without adaptation.
- US: Severe pressure ulcer treatment cost >$70,000 per case.
- Eastern Europe (Czech Republic): Median cost €678–€929 per case (different wage structures/system).

The three building blocks

Context: Do the data apply to the local setting?

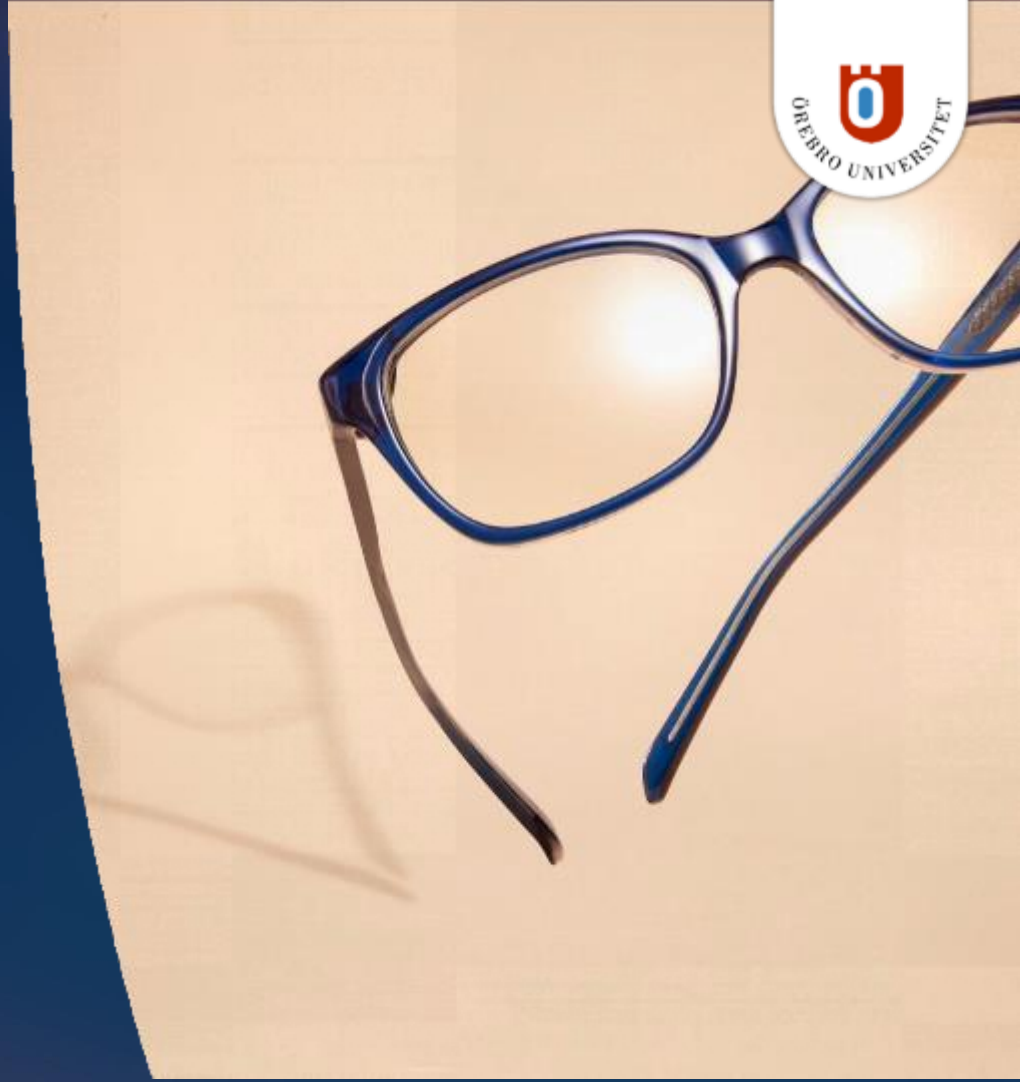
- Time horizons: acute episode vs. long-term view.
- In Spain, 6-month horizon = prevention costly; 2-year horizon = prevention saves millions.

The three building blocks

Context: Do the data apply to the local setting?

- Health systems and wages: In Finland, higher nurse wages raise prevention costs, but outcomes still favour prevention long term.
- Japan: Costs dominated by nursing-home care, unlike Western Europe where hospitals dominate.

Another 3 …



Relevant data = hospital stay + complications + QOL + caregiver time.

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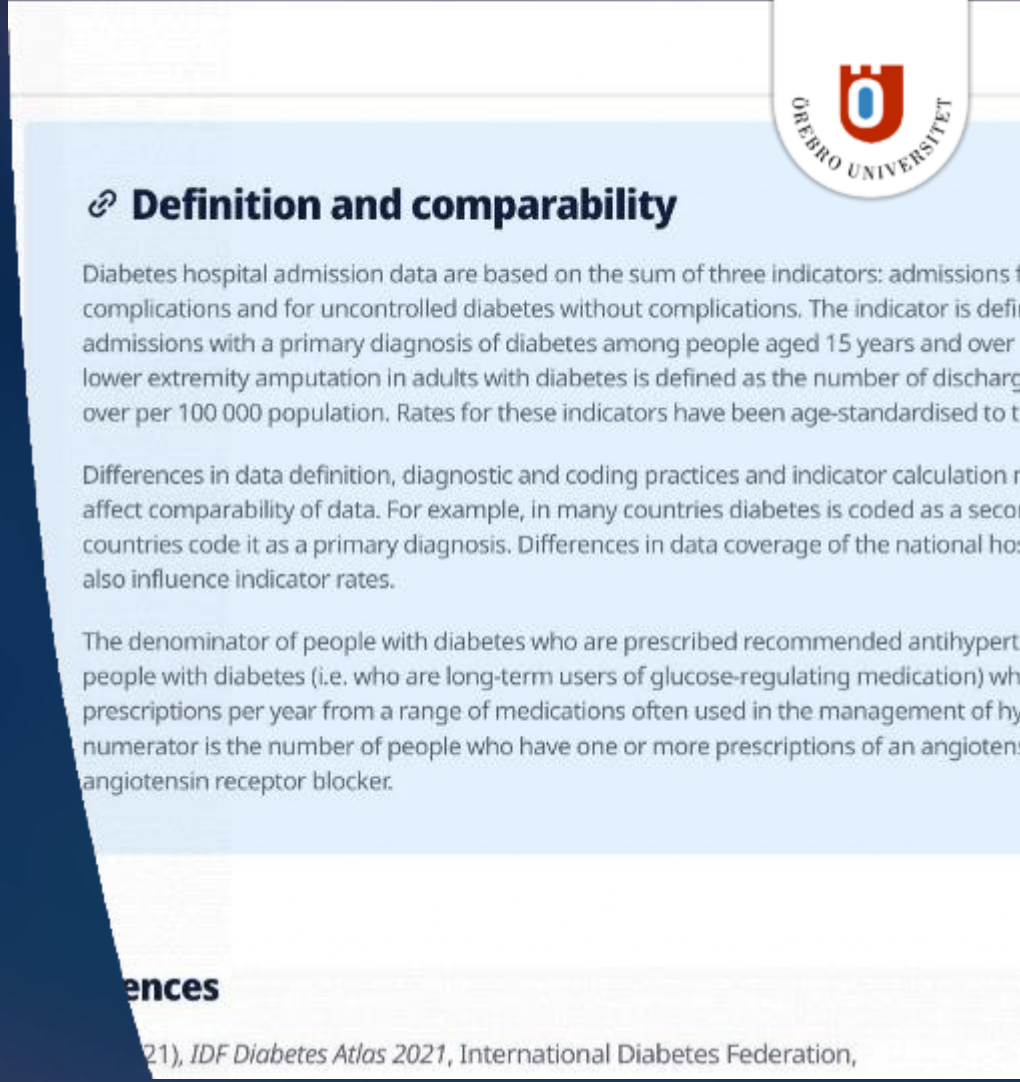
Without reliable, standardized methods, cross-study comparisons are misleading.

Context matters: what is cost-effective in one setting/region/country may not be in another.

From data to decisions

- Strong data → robust models → better policies
- Pressure ulcer prevention still lacks a unified economic evidence base.
- Like OECD work on diabetes, a standardised framework could transform pressure ulcer prevention policy.



Take-Home Messages

- HAPIs are expensive and wasteful.
- Prevention is cost-saving and sustainable.
- Investments in prevention → better care, lower costs, smaller footprint.
- Prevention = value-based healthcare in action.
- Invest early to save later.

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