AN URGE TO ACT

THE HEALTH, SOCIO-ECONOMIC AND ENVIRONMENTAL COSTS OF CONTINENCE PROBLEMS IN THE EU

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ABBREVIATIONS

Urinary incontinence	**UI**
Stress urinary incontinence	**SUI**
Urgency urinary incontinence	**UUI**
Mixed urinary incontinence	**MUI**
Overactive bladder syndrome	**OAB**
Lower urinary tract symptoms	**LUTS**
United States of America	**US**
United Kingdom	**UK**
European Union	**EU**
European Association of Urology	**EAU**
Quality-adjusted life years	**QALY**
Pelvic floor muscle training	**PFMT**
Disability weights	**DW**

TABLES AND FIGURES

1. EXECUTIVE SUMMARY

Some 55–60 million Europeans suffer from problems with continence health (the ability to control the bladder and bowel). However, the health, economic and environmental burden attributed to urinary incontinence (UI) is largely unknown. This report presents an economic analysis that aims to show the burden of UI in the European Union countries (EU) in terms of the prevalence, healthcare costs and the environmental impact. Using a bottom-up approach with a societal perspective, we estimated healthcare resource use, presenteeism, absenteeism, caregiver costs and waste disposal costs associated with UI in 2023 to 2030. This analysis seeks to inform upcoming priorities and work programmes of the European Commission and EU Member States.

Across all EU countries, the economic burden of UI was €69.1 billion in 2023 (lower estimate €26.1 billion, upper estimate €133.4 billion). This equates to roughly half the economic burden of diabetes, which reportedly cost the EU about €149 billion in 2019 and two thirds of the economic burden of cancer, which cost the EU about €100 billion in 2020. The economic burden for females was four times higher than males, and the economic burden increases by 16% when accounting for the informal support provided by caregivers—who are often family members. Without better awareness, prevention, treatment and resource-wise use of continence technologies when UI cannot be cured, the economic burden will most likely increase. The economic analysis presented in this report estimates the economic burden of UI could increase by 25% if no action is taken, to €86.7 billion in 2030 (€32.8 billion–€167.2 billion) without caregiver costs and €100.2 billion (€40.8 billion–€188.6 billion) with caregiver costs. This would raise per-person costs (including caregiver costs) from €1,700 in 2023 to €2,129 in 2030. The total economic burden of UI accumulated across 2024–30 could reach €637.9 billion in 2030 (€259.6 billion–€1,201.4 billion) if no action is taken.

Disposing of incontinence pad waste is associated with significant carbon emissions. According to our analysis, the economic cost of either recycling or incinerating incontinence pad waste in all study countries (EU and non-EU European) is similar, at €83.4 billion for recycling and €83.3 billion for incineration in 2023. However, shifting to 100% recycling of incontinence waste could reduce the overall carbon footprint of continence health in Europe by 157.2 million kg CO_2e in 2023 and an accumulated reduction of 1.1 billion kg CO_2e across 2024–2030.

In order to improve future economic estimates of continence problems, this report recommends better surveillance and monitoring of epidemiological data representing the burden of UI in Europe. This should include clear guidelines on how to categorise UI by type, severity, sex and gender, and should be regularly updated and age standardised, to enable comparison across and within countries. It should also be made publicly available and accessible to improve and facilitate research capabilities. Special attention should be given to Eastern Europe, which was the region where most prevalence data was missing.

2. ABOUT THIS REPORT

This report was commissioned by the European Association of Urology and conducted by Triangulate Health Ltd. The economic burden analysis presented was an independent assessment conducted by Triangulate Health Ltd. To facilitate an understanding of the UI clinical treatment pathway and to supplement epidemiological data gaps, interviews and questionnaires were conducted with Urologists. A questionnaire asking for information about the clinical treatment pathway and the prevalence of UI was sent to all European Urological Societies, of which 13 responded.

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3. AIMS AND OBJECTIVES

We undertook this research to showcase the economic burden of incontinence in the EU and with a view to informing the priorities and work programme of the European Commission and EU Member States. The research is comprised of two parts. First, we conducted a literature review of previous economic studies assessing the economic burden of UI on health systems and individuals, including extracting data on the unit costs of incontinence treatment and prevalence of UI to support the development of an economic burden model. We then designed and analysed the results of a modelling approach to determine the economic burden of UI in the EU. We set out with four objectives:

1. Review and summarise the existing scientific literature on the economic burden of UI in the EU.
2. Estimate the economic burden of incontinence on individuals, carers, health systems, long-term care and society.
3. Describe and estimate the environmental impact of UI waste disposal.
4. Estimate and illustrate the potential impact of Europe-level actions to improve awareness of the current and avoidable economic burden of UI.

4. INTRODUCTION

BACKGROUND

UI and general continence health are important components of health and wellbeing at any stage of life, although often misunderstood as being concerns solely related to old age (1). Continence health incorporates both UI and faecal incontinence, although UI is the sole focus of this report. Among the general population, the prevalence of being incontinent at least once in the past 12 months with any type of UI ranges from 25% to 45% (2,3). The most common types of UI include stress urinary incontinence (SUI), which often affects women during pregnancy, postpartum, perimenopause and menopause and men following prostate surgery, urgency urinary incontinence (UUI), which is more common in older adults, overflow urinary incontinence, which is prevalent in older men due to prostate obstruction, and functional incontinence, which occurs when physical or cognitive impairments or lack of toileting assistance prevent reaching the bathroom in time. It is also possible to have a variety of types and causes, referred to clinically as mixed incontinence (MUI). UI has various other physical and psychological side effects, including skin problems, increased risk of falls, depression and anxiety (4), stigma, and a negative impact on quality of life (5).

The management of UI typically follows a stepwise approach that often starts with behavioural interventions such as altering fluid intake, pelvic muscle exercises, using incontinence pads and other continence management products. Following this—if there is no improvement—pharmacological treatments such as anticholinergic or B3 agonist therapy are offered, which help to manage involuntary bladder muscle movements and thus prevent incontinence events. As a last resort before surgery, electrical stimulation or botulinum toxin therapy can be prescribed to block abnormal bladder contractions (6). Typically, care involves the use of incontinence pads and pharmacological therapies such as anticholinergics (6). Despite a clearly defined treatment pathway, a large proportion of people with UI do not seek or receive treatment. For example, one study reports that less than a third of women with moderate to severe UI receive health or social services support for the condition in the UK (1).

UI can cause a decrease in independence in everyday activities and productivity for both the individual and carers of older patients (1), and as such is also associated with a significant economic burden. An early continence assessment by a qualified health professional allows for a patient-centred and cost-effective care pathway to be followed. However, UI associated healthcare resources, are often paid for out of pocket by individuals or family members. This is partly due to limits of individual countries' healthcare insurance, as well as stigma preventing individuals from seeking help (1). In the US, the economic burden of UI in 2020 amounted to an estimated USD$82.6 billion (about € 88.4 billion, 2023) (7). Neurogenic bladder complications were estimated to cost USD$0.15 billion (about €0.13 billion in 2023) per year, and men with prostate cancer were associated with an annual economic burden of USD$4 billion (about € 4.9 billion, 2023) (8). In the UK, the cost of clinically significant urinary storage symptoms cost an estimated GBP£743 million in 2000 prices (about €1.2 billion, 2023)(9).

UI is also preventable and treatable to a certain extent (10), thus, it is unacceptable that patients go without care and support for this condition. Furthermore, catching and controlling symptoms early can both reduce the healthcare burden and associated costs, thus minimising the economic burden and pressure on healthcare systems.

5. METHODS

LITERATURE REVIEW

A pragmatic literature search was conducted in PubMed, Cochrane and Scopus. A search of grey literature was also conducted using the Tufts CEA Registry and Google, to uncover unpublished research not typically found through a database search. The search strategy focused on key terms related to the main objective of this study. Appendix 1 summarises the search terms used and the number of studies found per search. Table 1 shows the inclusion and exclusion criteria (all economic evaluation studies, cost-effectiveness studies, cost utility, cost benefit and cost consequence studies in English in the last ten years were included). Studies were inputted into a Microsoft Excel database and reviewed by a single researcher using the predetermined inclusion and exclusion criteria. We also included reference mining of key studies.

Table 1. Literature review inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Studies published beginning 1st of May 2013 to present (May 2023)	Full texts that could not be accessed or were not full texts (i.e. abstracts, protocols)
Studies in the English language	Case studies
Studies whose population focuses on or includes adults	Models not evaluating cost-effectiveness (e.g. regression/ epidemiological models)
Economic burden studies rather than cost-effectiveness (unless cost-effectiveness studies included a 'baseline' scenario determined useful for extracting unit costs).	Studies that discuss the intervention with no mention of health-related quality of life or economic burden.

Studies were collected and sorted using the Covidence software. This software was used to support the title and abstract screening and full text screening. From this, studies were then stored in Mendeley for referencing. We extracted data relating to study type, interventions used (if applicable), comparator (if applicable), outcomes, effect sizes (if applicable), costs, prevalence data and populations studied (e.g primary care patients), including the setting (country and location e.g community, hospital).

ECONOMIC BURDEN MODELLING

Approach

A mathematical model using a bottom-up approach with a societal perspective was developed to estimate the health, societal, environmental and economic burden of UI in 2023 to 2030 for 27 EU and five non-EU countries. The main resources used and associated costs were healthcare costs (incontinence pads, general practitioner and specialist visits, diagnostics, pharmacological treatment, surgery, and physiotherapy), productivity losses (presenteeism, absenteeism and caregiver costs) and waste disposal costs. Costs were expressed in 2023 Euros.

To collect data on costs and resource use, we used sources from published literature validated by urologists, urology researchers and national urological societies. Where data were missing, we asked urologists to estimate clinical data. We estimated missing prevalence data based on neighbouring country averages or published evidence. In the absence of country specific costs, we adjusted available data to country-specific values using GDP per capita as a proxy for relative price levels.

Model outputs are expressed—for European and non-EU European countries, with and without caregiver costs—as the economic burden for men and women combined and separately, per patient economic burden, and economic burden as a percentage of GDP in 2023. We also report the increase in total economic burden expected in 2030 and the accumulated economic burden between 2024—2030. We reported base-case and lower-upper range values, to consider the uncertainty in the key-model inputs.

PROPORTION OF EUROPEANS WITH UI

To support our model, we obtained prevalence estimates from a variety of sources. For most European countries, we extracted data from the 7th International Consultation on Incontinence (2), which summarises prevalence estimates based on population-based studies with a response rate of more than 60%. The most reported type of UI for which prevalence data was available in this document was 'any' UI. As such, we used this definition to support our calculations. Where data were missing, we used alternative published literature sources, prioritising population-based surveys and questionnaires. We also received data from 13 National Urological Societies. Taken together, this resulted in prevalence estimates for 20 EU countries and five

non-EU European countries. For the remaining seven EU member states, we had no data and therefore estimated prevalence based on an average prevalence across neighbouring countries. Overall, we established prevalence estimates for 32 countries. For some countries, we retrieved more than one prevalence estimate, which enabled us to report a prevalence range (lower and upper).

We noted a large variation in how epidemiological data on UI are recorded and described in the literature. These variations depend on methodological differences between studies, such as how the authors define incontinence (age groups, type of UI and severity), underreporting and poor data collection, cultural differences, and the way that UI is perceived, with few studies reporting age-standardised rates (11). Due to the inclusivity of 'any' UI, we also found large variations in the prevalence ranges reported across countries to support the calculations, but there were also some consistencies. Prevalence in women was generally higher than in men, with prevalence increasing for both sexes as a person ages. Women with UI were generally younger than men, with prevalence estimates on average reported at age 25 years old and above; estimates for males were more commonly for 40 years old and above.

Because of the wide variation in UI prevalence found in the literature, we used three different prevalence estimates for males and females: a base case, a lower limit and an upper limit. For females, the base case was capped at 27% to avoid overestimating the costs. This specific value (27%) was taken from a scientific article that estimated the prevalence of UI among 13,340 adult females (aged 20+) in Norway (12). We kept the higher prevalence estimate for the upper range. In cases where we do not have lower and higher limit values, we estimate them by applying -/+ 25% (relative terms) of the base-case value. We did not cap the base-case value for males as these were generally lower than 27%; only in one country was it higher than 25% (Lithuania, 31%). In addition, we obtained percentage values of patients with severe disease based on Alayne et al., (13) which were 4.5% for males and 15.7% for females. See Appendix 2 for more details on the prevalence estimates used.

Figures 1 and 2 describe the base case, upper- and lower-limit prevalence of UI in females and males by country. In females, because we capped the base case at 27%, many countries appear to have similar prevalence. However, the upper prevalence estimate was highest in Sweden (67%) and the Netherlands (59%), and the lower prevalence estimate was highest in Luxembourg (23%) and Turkey (21%). In males, the base case prevalence was highest in Lithuania (31%) and Finland (23%), the upper prevalence estimate was highest in Finland (40%) and Lithuania (39%), and the lower prevalence estimate was highest in Lithuania (27%) and three other countries (Estonia, Finland and Latvia; 17% each). On average—using the base case prevalence values—the prevalence estimates were 22% and 10.5% in females and males respectively.

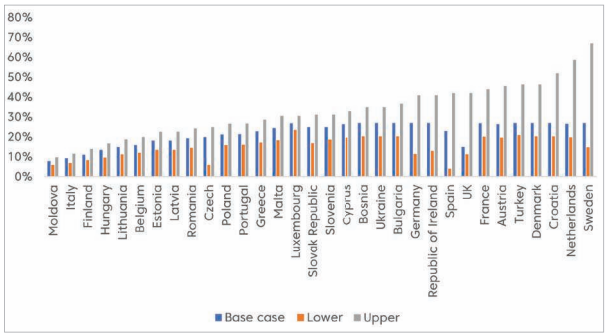

Figure 1: Prevalence of 'any' urinary incontinence in females

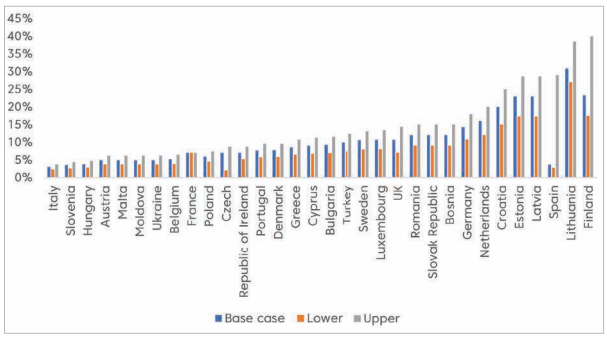

Figure 2: Prevalence of 'any' urinary incontinence in males

HEALTHCARE USE INPUTS

Healthcare use estimates were extracted from the published literature and validated by three urologists (Table 2). Where data were missing from the literature, we relied on the clinical opinion of urologists. We only accounted for resource use that would be reimbursed or covered by public health insurance, not resource use sourced privately. We also made the following assumptions regarding healthcare use:

- Diagnostics—we assumed that all patients who are referred to a specialist will receive a diagnostic test. For less severe cases we assumed that this was an ultrasound. For severe cases referred to surgery, we assumed that the diagnostics used would be urodynamics.
- Surgery—we established the most common surgery types for females and males from a combination of the published literature and the validation of three urologists (14,15). We then asked the urologists to tell us what proportion of patients with UI will receive any surgery and surgery by type. We applied these proportions to the total cohort of patients with UI by sex.

- Nursing-home admission—we assumed only patients with severe UI would be referred to a nursing home. The nursing home costs used only include the cost of initial admission to a nursing home and not year-on-year costs.
- Contacts with healthcare professionals—we assumed that all patients with UI would receive the same number of contacts with healthcare professionals. This includes general practitioner appointments, urologist appointments and physiotherapy appointments. This is because we estimated healthcare use for 'any UI' due to limited prevalence data on one specific UI type for all countries. As 'any UI' includes a mixture of severity and types it was not possible to aggregate prevalence into severity levels. Instead, where possible, we used an upper and lower range of healthcare contacts, with the exception of physiotherapy. For pelvic floor muscle training (PFMT), we assumed all patients assigned to the physiotherapy cohort received one basic PFMT three-month training programme (as stipulated in Imamura et al 2010) (16). This is delivered with up to two sessions or contacts with a healthcare professional per month. Following this, patients are expected to complete physiotherapy exercises at home.
- Incontinence pads—data for use of incontinence pads varied significantly (14–94% of patients require incontinence pads). As we did not stratify the model by severity of UI (as data were

Table 2. All healthcare use model inputs.

Description	Male	Female	Source
Proportion of patients with OAB who were working	61%	61%	(17)
Proportion of patients with UI requiring medications	6–14%	6–14%	(18)
Proportion of patients with UI receiving absorbents	14–48%	14–48%	(17)
Proportion of patients with UI receiving any surgery	4–5%	10%	(23)
Proportion of women receiving retro-MUS	NA	60%	(24), clinical opinion
Proportion of women receiving transob-MUS	NA	30.8%	(24), clinical opinion
Proportion of women receiving trad-sling	NA	9.2%	Clinical opinion
Proportion of men receiving endoscopic injectable agent	68%	NA	(25), clinical opinion
Proportion of men receiving at least one sling	20%	NA	(25), clinical opinion
Proportion of men receiving at least one artificial sphincter	20%	NA	(25), clinical opinion
Proportion of patients with UI receiving Physio	30–40%	75%	Clinical opinion
Proportion of patients with UI visiting GP	89%	89%	(26)
Proportion of patients with UI visiting specialist	42–73%	42–73%	(18)
Proportion of patients with UI having diagnostic procedures	42–73%	42–73%	(17), Clinical opinion
Proportion of patients with UI requiring nursing home admission	10%	6%	(27)
Sick leave days due to UI (working-age adults)	2.3–5	2.3–5	(17,21,22)
Presenteeism	2 hours per week	2 hours per week	(17)
Caregivers time off work	2 hours per day, 7 days a week	2 hours per day, 7 days a week	Clinical opinion
Average number of GP visits for a patient with UI per year	2–4	2–4	Clinical opinion
Average number of specialist/outpatient visits per year	3	3	Clinical opinion
% cure following medications	20–50%	20–50%	Clinical opinion
% cure following surgery	65–80%	80%	Clinical opinion

Table 3. Environmental impact model inputs.

Description	Male	Female	Unit	Source
Carbon footprint incineration	377.0	377.0	Kg CO2 emissions per 1000kg pads	(32)
Carbon footprint recycle	-104.0	-104.0	Kg CO2 emissions per 1000kg pads	(32)
Proportion of municipal waste attributed to incontinence waste	4.8%	4.8%	%	(29)
Kg of municipal waste produced per capita	302–834 (530)	302–834 (530)	Kg	(30)

not available for all countries), we decided it would be an over estimation to assume that up to 94% of patients receive incontinence pads, with some patients only having mild UI. To remain conservative, we used the average of all the incontinence pad use estimates reported in the literature as the base-case and upper-limit value (17–19). For the lower limit value, we used 14%.

- Medications—data for medication use was extracted from the literature (17,18,20) and validated with three urologists. Similar to pad use, we found a range of estimates for medication use (6–22%), and as we did not stratify the model by severity of UI, to remain conservative we used the average of medication use estimates as the base-case and upper-limit value (14%). For the lower limit value, we used 6%.

INDIRECT HEALTHCARE USE INPUTS

Sick leave days from work (absenteeism), presenteeism (for the working-age population) and caregiver costs were included. Those costs were only applied to the fraction of patients who were assumed to have continued working (61% according to Irwin et al (17)). We found data reporting the average number of sick leave days for working age adults with UI from Klienman et al and Wu et al (21,22), which was validated by three urologists. We found average presenteeism from Irwin et al (17), and the number of days spent caring for a relative with UI was estimated by one urologist. We only applied caregiver costs to patients with severe UI who were not assumed to require nursing-home admission (Table 2).

ENVIRONMENTAL IMPACT INPUTS

Billions of incontinence pads are disposed of each year; an estimated 39.0 billion units were sold globally in 2021 (28). As populations age, numbers are only set to increase. Current waste disposal options for incontinence pads are mainly incineration or landfill. Pad recycling is available but due to the specialist infrastructure and costs required, incineration and landfill prevail. All three waste disposal options have varying carbon emissions (29). There are currently legal restrictions on landfill in the EU, thus we only estimated the environmental impact in terms of cost and carbon footprint of recycling and incineration. To do this, we first determined the amount of total country waste attributable to incontinence produce. We found a study stating that 4.8% of total municipal waste is comprised of 'adult nappies' (29) and multiplied this by the total amount of waste produced per country in kilograms (kg) (30). This provided us with an estimate of the total incontinence waste per country in kg. We conducted an interview with an incontinence waste disposal plant in the Netherlands, Arn BV, that is piloting the recycling of incontinence pads and diapers (31). This helped understand the cost associated with incinerating and recycling incontinence waste, as well as the carbon footprint for each waste disposal method (Table 3). We multiplied the cost per kg of incontinence material with the cost for incineration or recycling per kg. The environmental costs and carbon outputs were calculated using the estimated use in kg of incontinence pads in every country and the CO2 and economic cost caused if incinerated or recycled.

COST INPUTS

We extracted healthcare costs from a variety of sources described in Table 4. All costs were converted to 2023 Euros using specific country GDP deflator values reported by the World Bank as annual inflation rates. We were not able to extract healthcare costs for all 31 countries, so we used a base cost which was adjusted for country specific values using GDP per capita as a proxy for relative price levels.

PROJECTIONS TO 2030

The prevalence of UI is expected to increase with an aging population (3). Based on the disease and economic burden values obtained for 2023, we projected the health, environmental and economic burden to 2030. To do this, we considered the annual population growth reported by the United Nations (39) for the EU and the EU GDP deflator value (average of the last five GDP annual deflator values reported by the World Bank) as the annual inflation rate (40).

DISABILITY-ADJUSTED LIFE YEARS (DALYS)

According to the Global Burden of Disease, the disability weights (DWs) for UI and SUI are 0.139 and 0.02, respectively (41). From these values, and assuming no premature deaths due to UI, we estimate the annual DALYs for each country. Conservatively, we impute the DW of 0.139 for severe cases only, while for non-severe cases we apply the value of 0.02.

Table 4. Cost model inputs per person per year, 2023

Description	Lower estimate	Upper estimate	Source
Surgery costs women			
Retro MUS	€879.2	€8,070.3	(33)
Transob-MUS	€639.3	€5,868.7	(33)
Trad-sling	€879.2	€8,070.3	(33)
Weighted average surgery women*	€799.2	€7,336.4	(33)
Surgery costs men			
Male sling	€2,474.3	€22,713.2	(34,35)
Male artificial urinary sphincter	€3,711.5	€34,069.8	(34,35)
Male endoscopic injectable agent	€777.4	€7,136.1	(34,35)
Weighted average surgery men*	€2,312.1	€21,224.6	(34,35)
Other direct healthcare costs			
Average medication cost	€317.67	€2,916.07	(18)
Average absorbency pads	€282.97	€2,597.54	(18)
Average nursing home admission	€1,820.47	€16,711.22	(17)
Basic PFMT	€97.07	€891.03	(16)
Diagnostics	€68.92	€632.69	(36,37)
Primary healthcare physician consultation	€24.33	€142.15	(38)
Urologist healthcare consultation	€24.48	€161.53	(38)
Environmental impact costs			
Cost recycle	€45.51	€417.77	(32)
Cost incineration	€28.29	€259.69	(32)

**A weighted average using proportions of surgery type for men and women described in Table 2. Costs include pre-surgery consultation.*

6. FINDINGS

LITERATURE REVIEW FINDINGS

Study Characteristics

Our literature review retrieved 43 studies for inclusion. Only three of these were economic burden studies (6,22,42). Most studies were clinical studies with economic aspects (n=9 studies) (43–51) or cost-effectiveness studies (n=8 studies) (37,52–58). While useful for extracting cost data, the latter two study designs do not aim to understand the total economic burden of UI, rather they evaluate the costs and cost-effectiveness of specific UI interventions. Nine studies (37,47,49,53,54,57,59–61) focused solely on the female population with a variety of incontinence types including SUI, urgency urinary incontinence (UUI), and mixed urinary incontinence (MUI). Only two references were male-focused (52,62).

A majority of the studies (n=17) were based on analyses from the US (7,8,10,22,44–46,50,52,58–60,63–67). A total of 21 studies (1,2,6,37,43,47,49,53–57,62,68–75) looked at analyses conducted in Europe, although the majority were published by UK researchers. The remaining studies were from other countries outside of the EU and US (Canada, Australia, New Zealand, South Korea and Brazil) (42,48,51,61,76). Studies from the EU more commonly took a regional approach, with only five country-specific studies, including the Netherlands (n=3) (49,53,70) and Sweden (n=2) (54,55). Table 4 summarises the studies included by country.

Of the three economic burden studies (6,22,42), one looked at the economic burden of UI in Australia (42), another looked at the economic burden of UUI among employees in the US (22), and a final study explored the economic burden of treating UI and Overactive Bladder Syndrome (OAB) with botulinum toxin therapy and best supportive care in the EU (6).

Table 5. Global distribution of literature addressing costs of UI included in the literature review supporting the economic burden model.

Country	Number of studies	References
EU	5	(2,6,62,68,69)
EU and US	1	(71)
The Netherlands	3	(49,53,70)
Sweden	2	(54,55)
UK	8	(1,37,43,47,56,57,72,73)
Global (including EU)	2	(74,75)
US	17	(7,8,10,22,44–46,50,52,58–60,63–67)
Canada	1	(76)
Australia	1	(42)
New Zealand	1	(61)
South Korea	1	(48)
Brazil	1	(51)

ECONOMIC BURDEN FINDINGS

In this section we report the results of our economic burden model. We do this in the following ways. First, we take the total economic burden across all EU member states, plus the additional costs accrued from adding five non-EU European countries (Bosnia & Herzegovina, Moldova, Turkey, United Kingdom and Ukraine). We report total economic burden by sex, per patient and as a proportion of country GDP, and the extent to which the burden could increase by 2030 should no action occur. The proportion of the economic burden attributable to direct and indirect costs is also illustrated, as well as the percentage distribution across all cost categories included in our analysis. We report the total DALYs accrued across EU member states due to UI, by country and by sex. Finally, we present the results of our environmental burden analyses, indicating the total costs required to recycle UI waste versus recycling, and the associated carbon footprints.

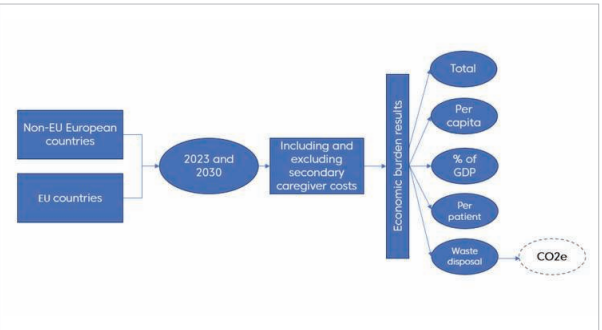

Figure 3. Model framework describing data inputs and outputs

Note: *Rectangles represent the input variables and ovals represent the outputs presented. Dashed lines represent variables for which costs are not presented.*

ECONOMIC BURDEN OF UI BY COUNTRY

Across all EU countries, the economic burden of UI was €69.2 billion (€26.1 billion–€133.2 billion). Including the five additional non-EU European countries, the economic burden of UI increased to €83.3 billion (€32.5 billion–€169.3 billion), which was also associated with 2,432,818 DALY's (1,594,792–3,932,829). Figures 4–6 describe the economic burden of UI split by males and females for EU countries (results for non-EU countries available in Appendix 2). The economic burden across EU countries was higher in females than males (€55.7 billion, compared to €13.5 billion for males), a trend that did not change when adding an additional five additional non-EU European countries.

ECONOMIC BURDEN OF UI AS PERCENTAGE OF GDP AND PER PATIENT

Figures 7–9 show the total economic burden of UI adjusted by country GDP and patient population size for all countries included in our analyses (EU and non-EU). The economic burden as a percentage of GDP is the highest in Ukraine (0.72%), and lowest in Italy (0.19%). Per patient economic burden is the highest in Luxembourg (€4,629) and lowest in Ukraine (€220). Four of the non-EU countries included—Moldova, Ukraine, Turkey and Bosnia & Herzegovina—have the lowest economic burden per patient.

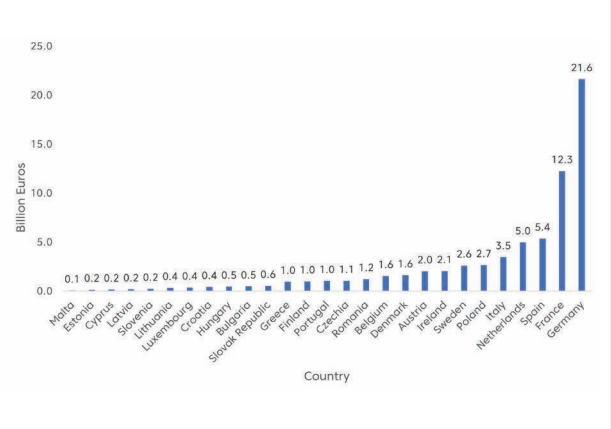

Figure 4. Economic burden of UI males and females combined in 27 EU-member states in 2023, billion Euros.

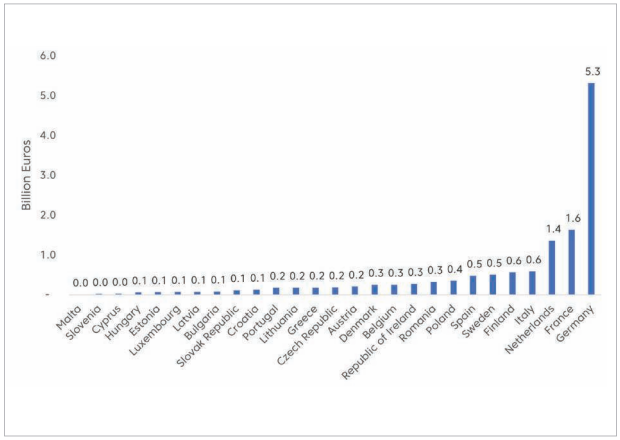

Figure 5. Economic burden of UI males in 27 EU-member states in 2023, billion Euros.

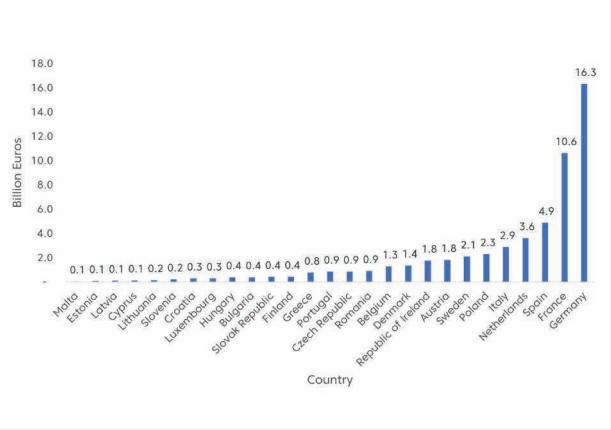

Figure 6. Economic burden of UI females in 27 EU-member states in 2023, billion Euros

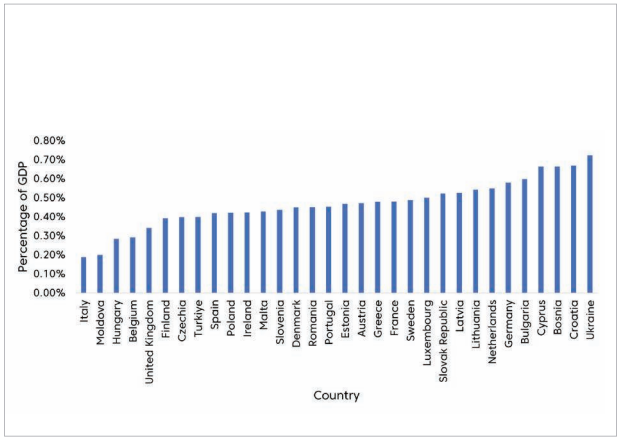

Figure 7. Economic burden of UI expressed as percentage of total GDP in 2023 (EU and non-EU European countries).

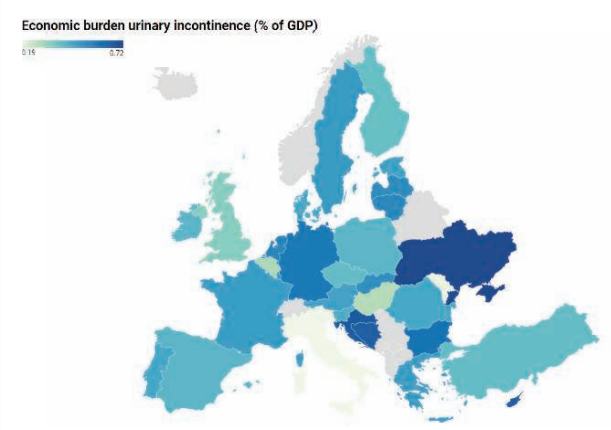

Figure 8. Economic burden of UI expressed as percentage of total GDP in 2023 geographically (EU and non-EU European countries).

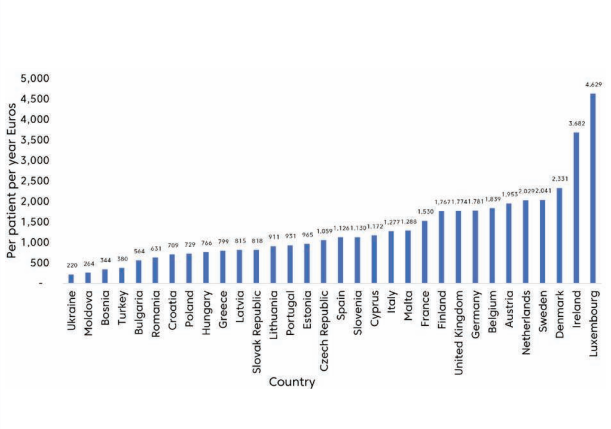

Figure 9. Economic burden of UI per patient per year in 2023 Euros (EU and non-EU countries).

PROPORTION OF TOTAL ECONOMIC BURDEN ATTRIBUTED TO UI INTERVENTIONS

Figure 10 describes the proportion of the economic burden of UI, attributed to each UI cost included in our analysis for one country (Germany) in males and females. For males, productivity losses (absenteeism, presenteeism and caregiver costs) account for the largest share of the total costs (40%), followed by the cost of incontinence pads (28%). Medications, primary healthcare visits and physiotherapy costs account for between 7–9% each, leaving specialist health visits, diagnostics, nursing home admission and surgery costs accounting for between 1–3% each of healthcare costs. The distribution of costs changes for females. The total costs attributed to physiotherapy increases from 7% in males to 12% in females, and the total costs attributable to caregivers' trebles from 5% in males to 15% in females. The proportion of costs across all other interventions reduced by 1–6% in females compared to males. The distribution of UI costs in all countries was relatively similar to Germany.

PROJECTING THE ECONOMIC BURDEN OF UI FROM 2023 TO 2030

The economic burden of UI in EU countries will increase from €69.2 billion in 2023 (€26.1 billion–€133.4 billion) to €86.7 billion in 2030 (€32.8 billion–€167.2 billion) as a consequence of the annual inflation rate and population aging. Including the five additional non-EU countries, the economic burden of UI will increase from €83.3 billion in 2023 (€32.5 billion–€169.3 billion) to €104.6 billion in 2030 (€40.8 billion–€212.1 billion). On average, this is a 25.5% increase in costs from 2023 to 2030.

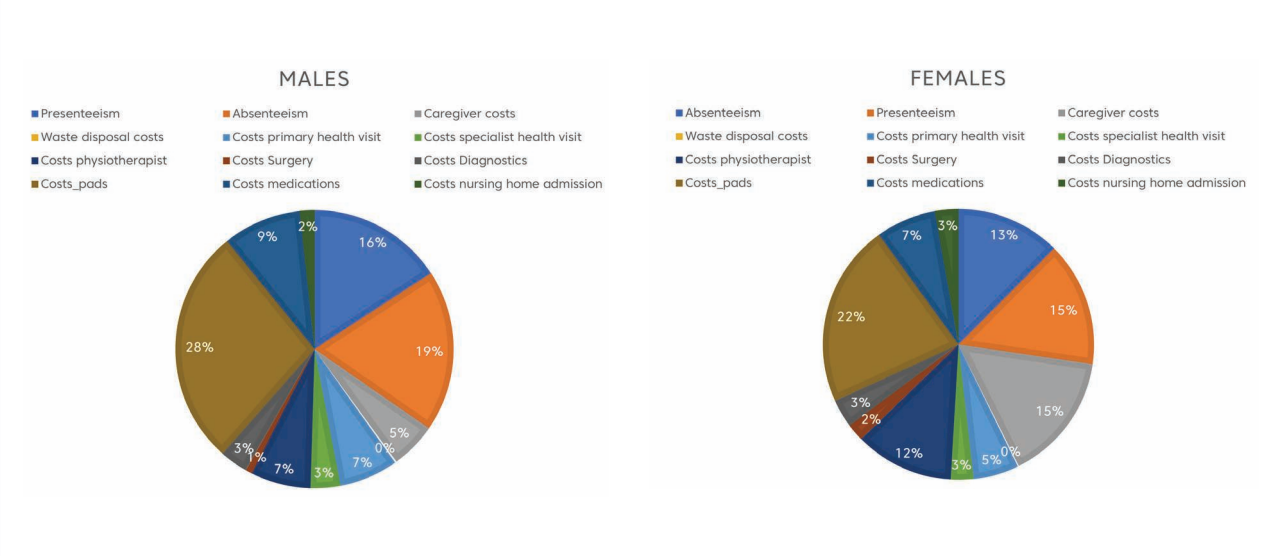

Figure 10. Proportion of total economic burden attributable to all costs categories included in one country (Germany), males and females in 2023.

We estimate the accumulated, year-on-year economic burden of UI from 2024 to 2030 at €552.2 billion (€208.7 billion–€1,064.5 billion) for EU countries and €665.6 billion (€259.8 billion–€1,350.8 billion) including the five additional non-EU European countries (excluding caregiver costs). Finally, the projected DALYs will accumulate from 2,432,818 (1,594,792–3,932,829) in 2023 to an aggregated total of 17,130,967 by 2030 (11,239,939–27,680,298).

CAREGIVER COSTS

Adding caregiver costs increases the economic burden of UI in EU countries from €69.2 billion (€26.1 billion–€133.4 billion) to €80.0 billion (€32.5 billion–€150.6 billion) in 2023 and €100.2 billion (€40.8 billion–€188.6 billion) in 2030. When including the five non-EU European countries the economic burden of UI including caregiver costs was €96.2 billion (€40.4 billion–€191.2 billion) in 2023 and €120.5 billion (€50.7–€239.2) in 2030. Including caregiver costs increased the economic burden by 16% on average. The accumulated year-on-year economic burden from 2024 to 2030 would increase to €637.9 (€259.6 billion–€1,201.4 billion) when including caregiver costs for EU countries. Figure 11 shows the total economic burden in all study countries including caregiver costs, and Figure 12 shows the distribution of direct and indirect costs and how these change when caregiver costs are included in the economic burden. The proportion of the economic burden attributed to indirect costs—including those accrued from individuals and carers taking time out of work—increases from 33% to 42% and direct costs decrease from 67% to 58%.

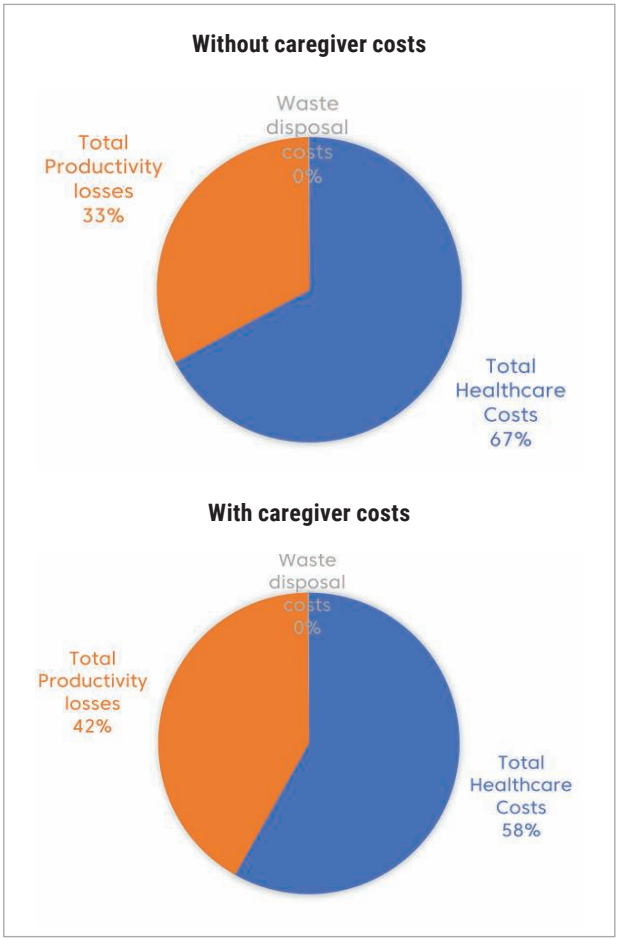

Figure 12. Proportion of total economic burden attributable to productivity losses, total healthcare costs and waste disposal costs in EU and non-EU European countries, with and without caregiver costs in 2023.

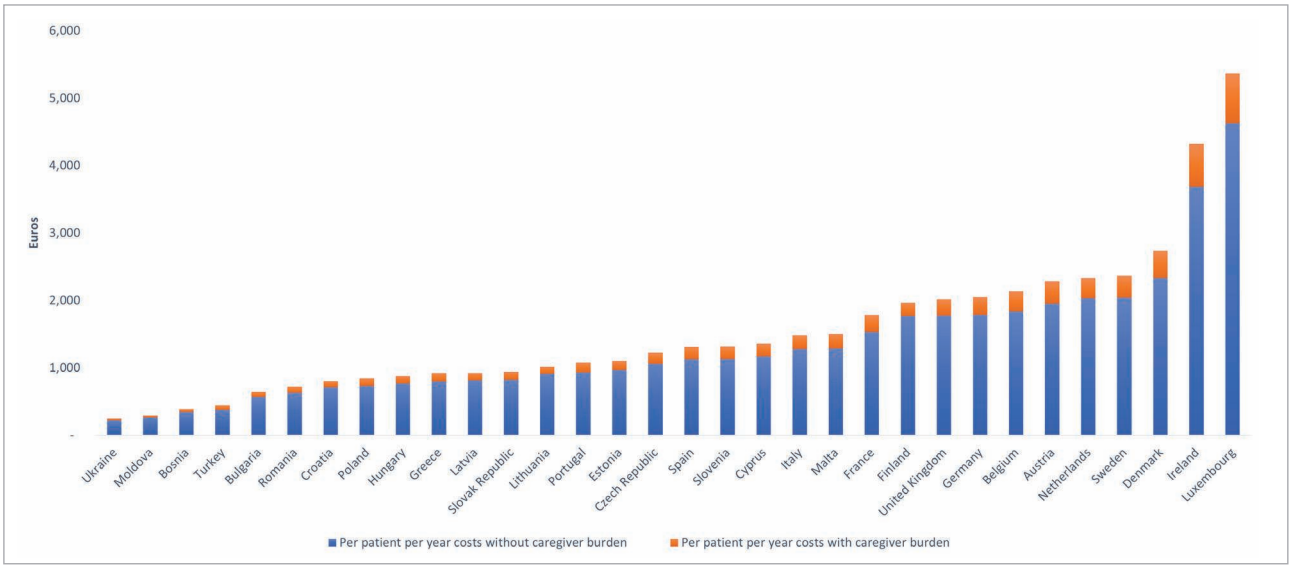

Figure 11. Total economic burden per patient per year with and without caregiver costs in 2023 in Euros (EU and non-EU countries).

PER PATIENT PER YEAR COSTS

Table 6 shows the total per patient, per year costs for EU and non-EU countries, with and without caregiver costs, in 2023 and 2030. Per patient, per year costs in EU member states are estimated at €1,470.6 in 2023, rising to €1,844.2 in 2030 without caregiver costs. Including caregiver costs increases the per patient, per year costs to €1,700.0 in 2023 and €2,129.2 in 2030. When including all study countries, the per patient, per year costs are €1,252 in 2023 and €1,571 in 2030 without caregiver costs, and €1,444.2 in 2023 and €1,810.0 in 2030 with caregiver costs.

ENVIRONMENTAL BURDEN

The economic burden in 2023 when considering recycling versus incinerating incontinence pad waste in all European study countries (EU and non-EU) is €83.4 billion for recycling and €83.3 billion for incinerating. To recycle 100% of incontinence waste would cost an additional €75.0 million in 2023, increasing to an accumulated, year on year cost of €599.3 million in 2030. Shifting to 100% recycling would also reduce the overall carbon footprint of continence health in Europe by 157.2 million kg CO2e in 2023 and 1.1 billion kg CO2e in 2030. Estimated costs and carbon emissions of incontinence waste disposal available in Appendix 4.

Table 6. Total per patient, per year costs for patients in EU countries and non-EU countries, with and without caregiver costs, in 2023 and 2030.

	Year 2023		Year 2030	
	Without caregiver costs	**With caregiver costs**	**Without caregiver costs**	**With caregiver costs**
EU countries	€1,470.6 (€888.7– €1,813.7)	€1,700.0 (€1,106.6– €2,048.2)	€1,844.2 (€1,116.9– €2,273.14)	€2,129.3 (€1,388.1– €2,564.5)
Non-EU countries	€725.2 (€436.8– €1,061.6)	€828.8 (€540.3– €1,197.2)	€912.8 (€548.3– €1,328.0)	€1,041.8 (€677.02– €1,496.3)
All study countries	€1,251.8 (€738.4– €1,576.7)	€1,444.3 (€918.3– €1,789.1)	€1,570.8 (€927.8– €1975.3)	€1,810.0 (€1,151.6– €2,227.9)

Table 7. Incremental costs of recycling versus incinerating UI waste in 2023 and 2024–30 in billion Euros.

	2023	2024 - 2030
Incremental costs if 100% recycled	€0.075 billion (€0.046 billion–€0.13 billion)	€0.60 billion (€0.36 billion–€1billion)
Carbon footprint (tonnes of CO2 emissions) avoided if 100% recycled	157,230.1 (98,084.1–254,253.6)	1,109,804.4 (693,372.7–1,793,735.1)

7. CONTINENCE HEALTH CASE STUDIES

CANCER

Prostate cancer and bladder cancer can both result in UI. This is due to changes in the body and its functions due to the cancer or its treatment (77). Cancer and cancer treatment in general can also aggravate urinary problems. In the first ever prostate cancer quality of life survey, which surveyed around 3,000 men, 67% reported problems with urinary dripping or leakage following prostate surgery (78). Half of the men surveyed reported using incontinence pads following prostate surgery (78). In a cross-sectional analysis of 5,990 men aged 65 years and above, 426 (12%) reported a history of prostate cancer and 60% of those reported UI. Daily incontinence risk increased with time since diagnosis after adjusting for age (79). In the case of bladder cancer, men are at higher risk of developing it, but women often present with more advanced disease and worse outcomes (80). Around 20% of women report UI following surgery for bladder cancer (81).

Recommendations

- Prevention and early detection of cancers, as the more advanced the cancer is at diagnosis the more severe the effects of the treatment will be on UI (82).
- Better multi-disciplinary training between cancer specialists, nurses and urologists, so that UI associated with cancer can be effectively managed (77).

PREGNANCY

The prevalence of UI is generally experienced at a younger age in women than men. This is largely due to women being at risk of developing bladder and bowel symptoms during pregnancy and the postpartum period. Prevalence of UI at around 30 weeks gestation ranges from 31%–42%. Postpartum prevalence ranges from 30% in the first three months to 47% in the first year. Up to 12 years after delivery, two-thirds to three-quarters of women may still experience UI symptoms (83). PFMT can reduce the risk of UI during and after pregnancy—a Cochrane review found that women randomised to a PFMT group were 29% less likely to experience UI than women receiving usual care up to six months after giving birth (84).

Many women with no prior UI before pregnancy do not receive PFMT information and advice (83). In addition, pelvic floor disorders associated with pregnancy and childbirth do not have appropriately adapted assessment questionnaires. There are no tools designed specifically to assess continence health complications related to pregnancy (85). Continence health should be regularly managed by midwives during and after pregnancy to avoid long-term complications (1).

Recommendations

- Appropriate guidance and counselling on UI management provided to women during pregnancy and the first year postpartum.
- Improved awareness of PFMT support and training programmes.
- Design specific UI assessment tools for pregnant and postpartum women.

MENTAL HEALTH

Continence health is highly stigmatised, which can lead to underreporting of the true prevalence of UI, leaving patients without support or guidance on how to manage the condition effectively. UI can affect the personal and professional lives of both patients and their carers. There is a growing body of evidence supporting a bi-directional relationship between UI and depression and anxiety, both among patients and family members (4,86,87). In a survey of 4,076 men (the LUTS Asia database), male UI was correlated with anxiety and depression, and 28% of men who reported UI did not manage their condition (88). Other studies report that 60% of women with moderate to severe UI experience restrictions to activity levels, and 25-30% of women with UI experience sexual dysfunction (89). Mental health problems can also trigger incontinence (90) due to UI and mental health sharing common biological pathways (91). One study found that women aged 20 and above, with depression or anxiety, were 50% more likely to develop UI (87). Furthermore, incontinence is also linked to neuro-degenerative conditions such as Alzheimer's and Parkinson's disease. Patients with these conditions experience many symptoms including incontinence which can hinder independence and the ability to leave the house. In turn patients and their carers experience loneliness which can also fuel depression and anxiety (85).

Recommendations

- Recognising urological symptoms in mental health strategies at EU level.
- Further research defining the relationship of incontinence with mental health and the underlying pathophysiological pathways.

IRISH INTEGRATED CONTINENCE SERVICES

The Irish government is committed to Sláintecare (92), which is a government action plan setting out the ongoing reform priorities, one of which is healthy communities. Healthy communities aims to deliver increased health and wellbeing services in the community, one of which is an integrated continence service. This service consists of a continence advisor and specialist physiotherapist who are accessible in the community via the general practitioner, community provider or nursing home (93). This service allows for both the assessment and management of incontinence in the community while remaining under the governance of urologists who interact with the service whenever patients require referral for specialist assessment and treatment. Urologists in Ireland are almost exclusively based in large teaching hospitals, where the majority of their time is spent managing complex cancer cases and reconstructive work. An incontinent patient who requires advice, reassurance and prevention traditionally waits a long time to access urological care. The rationale for a community-based continence service, therefore, is to allow for less severe incontinence cases to be managed in a timely and effective way outside of the hospital setting (see Appendix 5 for the Irish UI care pathway).

Recommendations

- Improve the accessibility of continence services in community settings reducing the demand on waiting lists for specialist services.
- Share learnings from the Irish integrated continence service at EU level, to promote the adoption of community continence care more widely.

8. DISCUSSION

Our total economic burden results for EU countries are comparable to the published literature but there are some important differences to note. Our study included additional costs generally omitted from the UI economic burden literature, such as the costs of incontinence pad waste disposal and the cost of caregivers. We found no other studies reporting the total economic burden of UI in all 27 EU member states, making our finding of €69.2 billion (€26.1 billion–€133.4 billion)—increasing to €80.0 billion (€32.5 billion–€150.6 billion) when including caregiver costs—difficult to contextualise.

It was important to firstly confirm that the economic burden of incontinence was lower than that of other costly diseases with high prevalence in Europe such as diabetes and cancer, even when caregiver costs are included. In a 2019 EU parliamentary enquiry (94), the total cost of managing diabetes in 60 million Europeans was quoted at €149 billion. Estimates of the total cost of cancer in Europeans range from €199 billion in 2018 (95) to €100 billion a year in 2022 (96).

Next, we looked for studies that reported economic burden estimates for multiple European countries, yet the ones we found were between 15 and 17 years old (17,18). One systematic review (74) published in 2014 confirmed that all existing multi-country economic burden studies in Europe at that time were published between 1997–2008. We did not find any more recent multi-country economic burden studies after 2014 in our own literature search. Irwin *et al.* and Reeves *et al.* (17,18) shared the most similarities with our study, as they included economic burden estimates for five European countries (Germany, Italy, Spain, Sweden, UK). We inflated the costs from these studies to 2023 market values. Neither of these studies included caregiver costs—which are responsible for approximately 10¬–15% of the total economic burden in the current study—so we excluded these from our totals for comparative purposes. Table 8 describes the comparability of costs across studies.

In general, the total economic burden results in the current study are much higher than those reported in Irwin *et al.* and Reeves *et al.* (17,18), whom report similar total economic burden estimates for individual countries, with the exception of Italy (Table 8). The results for some countries in our study—such as Germany—are much higher than in the literature, a 13–18-fold increase, in some cases. However, there are some important differences in the methods applied. Although Irwin *et al.* and Reeves *et al.* (17,18) both include costs associated with managing common UI comorbidities that are excluded in this study, we include more cost categories and use higher prevalence ranges of UI. Irwin *et al.* (17) estimates the economic burden of OAB with and without UUI. As such, the prevalence estimates are lower than those included in this study, with an average prevalence for males and females of 11.8% and 2.9% for OAB with UUI respectively. In this study, the average prevalence of 'any' UI for males and females in the same five European countries (Germany, Italy, Spain, Sweden and UK) is higher, at 14% (8%–28%), thus more patients are included, meaning more costs.

Irwin *et al.* (17) also excludes presenteeism costs, which were responsible for about 18% of the total costs in our current study. Studies cited within Irwin *et al.* (17) suggest excluding presenteeism might result in underestimating overall costs, as it accounts for a larger proportion of productivity losses than absenteeism in patients with OAB (97,98). Indeed, we found that presenteeism costs are higher than absenteeism costs, at 18% compared to 15%. Reeves *et al.* (18) reports a similar prevalence range to the current study but excludes all indirect costs and nursing-home admission costs.

Nursing-home admission costs for patients with UI are reportedly large. In a study of UI in the US, an annual cost of USD$6 billion was accrued for managing nursing-home admissions for residents with UI (8). Other costs excluded in Irwin *et al.* and Reeves *et al.* (17,18) include physiotherapy, which accounts for about 7% of the total economic burden in males and about 14% in females in this study.

The results are more comparable using per patient, per year costs. On average, this study reports a per patient, per year cost of €1,700.0 (€1,106.6–€2,048) including caregiver costs, and €1,470.6 (€888.7–€1,813.7) excluding caregiver costs. Again, for comparability to the literature we use the totals excluding caregiver costs. Only one of the per patient, per year estimates reported in Irwin *et al.* (17) falls within the range of €1,470.6 (€888.7–€1,813.7) (Table 7). However, the lower estimate in this range—based on the lower prevalence estimate we used to support the economic burden calculations (Figures

1–2)—is more comparable as it does not exceed double the per person estimates reported in Irwin *et al.* (17). In another study reporting medical resource use for women in outpatient settings across three Western European countries, per patient costs ranged between €632.3 and €840.3 in 2023 values (20). These costs are closer to those of this study, considering they exclude indirect costs and nursing-home costs, and do not include the costs accrued for men. In a study conducted in the Netherlands (49), which collected medical, nonmedical costs and productivity losses associated with UI, the per patient per year costs were €2,012 in 2023 values, exceeding the upper range in the current study. Incontinence waste disposal costs were excluded from all the studies we used as a comparison despite only accounting for about 0.2% the economic burden.

A larger body of evidence on the economic burden of incontinence published outside of Europe also serves as a comparator, although it is important to be mindful about differences in health system configuration and payment systems. A study conducted in Australia, for example (42), found the total economic burden of incontinence to be AUD$42.9 billion (AUD$9,014 per patient) in 2010 (42), which equates to about €33.2 billion overall and €6,973 per patient in 2023 values. This is much higher than the current study when comparing per patient estimates, but this study also included the cost of faecal incontinence. Despite this, if we assume half of the economic burden reported in this study is attributable to UI (€3,990 per patient, per year), our findings are still lower. Also worth noting is that Australia has a total population of 25.7 million people, and the current study included prevalent UI cases equivalent to more than double the population of Australia, making our findings appear conservative.

There are further similarities to the published literature when comparing the main cost drivers. When including caregiver

Table 8. Current study results compared to the published literature, reported in 2023 Euros.

Country	Current study[a]	Irwin *et al.* (17)[b]	Reeves *et al.* (18)[c]	Current study[a]	Irwin *et al.* (17)[d]	Irwin *et al.* (20)[e]
	Total economic burden (billions)			Per person per year costs		
Germany	21.6 (6.6–38.1)	1.7	1.2	1,780.8 (1,059.3–2,167.8)	607.8	724.6
Italy	3.5 (1.6–5.3)	0.7	2.1	1,277.1 (781.8–1,553.2)	384.5	NA
Spain	5.4 (0.7–16.0)	0.7	1.0	1,125.7 (654.3–1373.1)	327.1	840.3
Sweden	2.6 (0.9–6.9)	0.5	0.4	2,040.7 (1,251.2–2,426.5)	872.4	NA
UK	9.6 (4.1–28.1)	1.8	1.6	1,773.7 (1,060.2–2,229.7)	907.0	632.3

a Caregiver costs not presented.
b Excludes presenteeism, environmental waste disposal costs, caregiver costs and physiotherapy costs, but includes costs associated with treating comorbidities.
c Excludes all indirect costs, environmental waste disposal costs, caregiver costs, physiotherapy costs and nursing-home admission costs, but includes costs associated with treating comorbidities.
d Per person costs exclude presenteeism, environmental waste disposal costs, caregiver costs, physiotherapy costs and care home costs.
e Only includes direct outpatient setting healthcare costs.

costs, 58% of the total costs in this study are attributable to healthcare costs and 42% to productivity losses. Furthermore, within direct costs, incontinence pads were responsible for the highest proportion of costs (22–28%), followed by medication and physiotherapy. This finding is similar to the European published literature, with three studies noting one of the main cost drivers to be incontinence pads (6,49,75) one study reporting physiotherapy treatment (49), and others reporting diagnostic procedures, visits to a healthcare provider (27%) (75) and anticholinergic treatment (6), accruing the largest share. In the UK, the overall spending on incontinence products alone in 2018 was estimated be GBP£80 million annually (99). In the US, in working-age adults, increased medical input (131% more expensive), drug use (52% more expensive), short-term disability (74% more expensive) and absence from work (30% more expensive) reportedly inflate costs (22).

Our estimates for DALYs are also consistent with those reported in the literature. In particular, the analysis conducted for Australia estimated that approximately 100,000 DALYs are attributable to UI in the country (42). We estimated, for example, about 178,377 DALYs (37,972–400,893) for Spain, which has a population approximately 85% larger than that of Australia.

Our environmental impact analysis demonstrates that 157.2 million kg of CO2e in 2023 and 1.1 billion kg of CO2e in 2030 can be avoided if incontinence pad waste is recycled rather than incinerated. Our finding that recycling waste has a lower carbon footprint than incineration is consistent with other healthcare waste disposal evaluations (100). In terms of emissions, a 157,000-tonne CO2e reduction would be seen in Europe in 2023, as would an average reduction of 4,913.5 tonnes CO2e per country. Putting this into context, the UK's NHS creates about 100,000 tonnes of CO2e per year from incinerating or treating all clinical waste (101). We estimate that the UK could eliminate 12,524 tonnes of CO2e emissions by recycling incontinence waste alone rather than relying on incineration. This accounts for 12.5% of the total CO2e produced from incinerating clinical waste in the NHS per year.

LIMITATIONS

Our economic burden calculations only estimate the cost to the healthcare system, and not costs to the individual. The stigma associated with UI may deter people from engaging with the healthcare service, instead buying incontinence pads out-of-pocket. Including out-of-pocket costs would result in a higher economic burden. In the US it is estimated that patients pay 70-80% of incontinence costs out-of-pocket (65). UI-related co-morbidities such as falls or fractures that accrue additional healthcare costs, and the associated hospital admissions were also excluded, and our calculations do not adjust healthcare resource use for each country due to data limitations and study constraints. Although a holistic approach to continence health requires a person-centred combination of prevention, treatment, care and management, it is expected that some European countries may adopt a treat and prevent model, versus a management with incontinence pads model. This would change the proportions of healthcare use across interventions, and, consequently, the results.

In addition, we were not able to extract healthcare costs for all the countries included in the analysis, so we adjusted available data to country-specific values using GDP per capita as a proxy for relative price levels. Although this method is often used to extrapolate unit costs between different countries, it can overestimate or underestimate cost estimates, given that other unmeasured variables could influence the estimations. Other costs associated with UI such as the cost of laundry services from increased washing of bedsheets and clothing and the cost of other continence management technologies such as catheters were also excluded from our study due to lack of data.

There is a general lack of UI prevalence data for most of Eastern Europe, so we estimated this based on the situation in neighbouring countries in order to populate the model. As such, the results for Eastern Europe garner more uncertainty than those for the rest of the study countries. Prevalence data in general that were used to support this study were often collected using different methods, categorisations and from different age groups. This resulted in an inability to stratify the model by age group and type of UI, which is important when trying to apportion healthcare services required by each condition (e.g. SUI, OAB, MUI, UUI). These inconsistencies are reported elsewhere. Milsom & Gyhagen (3) state the prevalence estimates of UI from population studies in various countries range from 5% to 70%, with any UI ranging from 25% to 45% (3). In general, we used studies reporting 'any UI', prevalence to support our model except for in Finnish and Lithuanian females. For these two countries we extracted prevalence from studies using subgroups of UI (SUI (102) and MUI (103), respectively as we were unable to find a suitable alternative. In addition, prevalence data for Croation females was extracted from a study sampling only obese patients which most likely resulted in an overestimate (104). To reflect uncertainty in the analysis we included a prevalence range.

We estimated environmental impact using the cost of waste disposal and associated carbon footprint of incinerating and

recycling incontinence pad waste. However, incontinence pad waste can also be disposed of in landfill or at illegal dumpsites, for which we did not calculate the costs and impact. According to Vaittinen *et al.*, the EU Landfill Directive states landfilled municipal waste has vastly reduced in several EU member states, including Denmark, Germany, Finland, Belgium and Sweden (105,106), which was a driver for not including landfill costs in this study. The data used to calculate the cost of recycling and cost of incineration came from one waste disposal unit in the Netherlands, which was trialling the recycling of incontinence pad waste. As such, the recycling results we present are considered aspirational rather than operational, with some countries not likely to have recycling plants available for incontinence pad recycling. Some costs were excluded from the environmental impact calculations, such as the costs of building and running the waste disposal plant.

9. KEY TAKEAWAYS

- The economic burden of UI in Europe is equivalent to half the direct medical cost of diabetes, and at least two thirds of the economic burden of cancer. For a condition that is not life threatening, these costs are very high, thus more focus should be placed on prevention and treatment, reducing the need for costly interventions such as surgery.

- Absenteeism and presenteeism are responsible for a large share of the economic burden of incontinence. There should be more support available in the workplace for people with incontinence. Human resources departments should be equipped with an understanding of UI as a side effect of pregnancy, cancer and mental health (among others), prompting them to make appropriate adjustments to the workplace such as normalising regular bathroom breaks, creating inclusive washrooms and offering a hybrid approach to working.

- The cost of incontinence pads and physiotherapy are responsible for the largest share of direct costs. Prevention measures should be promoted to reduce the need for incontinence pads. Pelvic floor physiotherapy should be made more accessible through better awareness campaigns to encourage patients to seek help and ensuring it is mentioned in treatment guidelines, so it is offered to patients as a service in a timely way.

- Better surveillance and monitoring of epidemiological data representing the burden of UI in Europe is needed. This should include clear guidelines on how to categorise UI by type and severity and should be regularly updated and age standardised to enable comparison across countries as well as within. Epidemiological data should also be made publicly available and accessible to improve and facilitate research capabilities in urology. Special attention should be given to Eastern Europe.

- UI is expected to increase due to an aging population, resulting in even greater demands on the healthcare service and caregivers. At the same time, UI prevention and symptom management can reduce the need for healthcare resources and should be made accessible for more patients. Integrated continence services such as in the Republic of Ireland should be more widely available.

- UI recommendations should be incorporated into the care pathways of other healthcare disciplines that are associated with UI, such as primary care, cancer, obstetrics and mental health care, to ensure UI is recognised as a co-morbidity and prevented and treated in an appropriate and timely way (Boxes 1—4).

- Prevention of UI is good for the environment. The carbon emissions associated with incontinence pad production and disposal are large but there are ways to reduce associated greenhouse emissions. Adopting recycling of incontinence pad waste versus incinerating, combined with reducing the symptoms of UI, thus reducing the need for incontinence pads are both viable solutions. To make recycling operational, European countries should be supported to create novel waste-management infrastructures nationally and regionally to dispose of incontinence waste.

10. GLOSSARY

Urinary incontinence
Complaint of involuntary loss of urine.

Stress urinary incontinence
Complaint of involuntary loss of urine on effort or physical exertion.

Urgency urinary incontinence
Complaint of involuntary loss of urine associated with urgency.

Mixed urinary incontinence
Complaint of involuntary loss of urine associated with urgency and also with effort or physical exertion or on sneezing or coughing.

Overactive bladder syndrome
A sudden and compelling need or desire to pass urine at any time of the day or night without warning, which is difficult to defer.

Lower urinary tract symptoms
A general term to refer to any combination of urinary symptoms or as a more specific term to refer to those symptoms primarily associated with overactive bladder syndrome.

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