Environmental Impact of an Emergency Department Visit

St Joseph's Healthcare Hamilton

AstraZeneca

Sustainable Healthcare Coalition

August 2026

Title	Emergency department visit at St. Joseph's Healthcare Hamilton
Organisation and role	AstraZeneca UK Limited initiated and funded this work, but it was not involved in collecting and analysing the hospital data. AstraZeneca UK Limited saw only the final output.
Company website	www.astrazeneca.com/
Contact details	Ekaterina Maslova (ekaterina.maslova@astrazeneca.com)
Completion date	June 2026
Assurance	Internal assurance
Supporting information	Operational data from St. Joseph's Healthcare Hamilton, Canada
Data gathering and analysis contact	Michael Collins, Partner, ERM (michael.collins@erm.com)
Hospital contact	Andrea McKnight for acute emergency (amcknight@stjoes.ca) Heather Radman for psychiatry emergency (hradman@stjoes.ca)
Conformance with Care Pathways: Appraising Sustainability Method[1]	Adheres to the method
Care pathway description	Emergency department visit
Environmental issues appraised	Global warming potential (IPCC AR6, CO_2 eq, 100-year), water use, waste

This resource is supplementary material for the study 'Appraisal of Environmental Impact of St. Joseph's Healthcare Hamilton.'[2] Refer to that document for a description of the assessment procedures.

Findings

This study appraised the environmental impact of emergency department (ED) visits: an acute ED visit, a psychiatric ED visit and an average ED visit. An acute ED visit has a greenhouse gas (GHG) emission impact of 20.9 kg CO_2 eq, water use of 141 m^3 and waste of 0.7 kg per patient visit. A psychiatric ED visit has a GHG impact of 42.9 kg CO_2 eq, water use of 287 m^3 and waste of 2.8 kg per patient visit. An average ED visit has a GHG impact of 22.1 kg CO_2 eq, water use of 150 m^3 and waste of 0.8 kg per patient visit.

The climate change impact of an **acute ED visit** was dominated by consumables (27%), followed by staff travel (21%) and utilities (20%). Consumables emissions were driven primarily by infection-prevention and wound-care items, including dressings and micropore tapes, cleaning wipes, and waste management consumables, such as bin bags. Utilities impacts were dominated by the hospital's use of natural gas, while staff travel impacts were largely attributable to internal combustion engine-powered car travel.

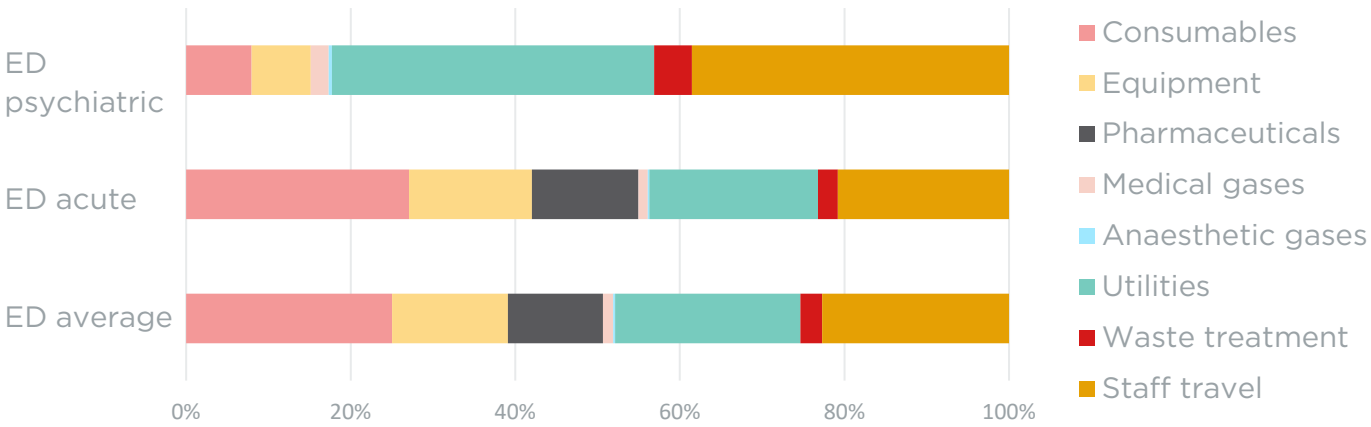
[1] Sustainable Healthcare Coalition (2026). Sustainable Care Pathways Method. Available at: https://shcoalition.org/sustainable-care-pathways-guidance.
[2] ERM (2026) Appraisal of Environmental Impact of St. Joseph's Healthcare Hamilton. Available at: https://shcoalition.org/wp-content/uploads/2026/09/Hospital_StJosephs.pdf

The climate change impact of a **psychiatric ED visit** was driven by utilities (39%) and staff travel (39%), followed by smaller contributions from consumables (9%) and equipment (7%). As aforementioned, utilities impacts were dominated natural gas usage, while staff travel impacts were associated with internal combustion engine-powered car travel. Consumables impacts arose from the production of high-volume, routine clinical items, including patient care disposables (e.g. emesis and foot basins, slipper socks), waste management items (e.g. bin bags), wound-care materials (e.g. dressings and micropore tapes), and hygiene and sanitation products (e.g. toilet tissue and facial tissue). Equipment impacts were driven mainly by the production of patient furniture, particularly high-back task chairs, with smaller contributions made by mobile monitor stands, shower chairs and vital sign monitoring equipment.

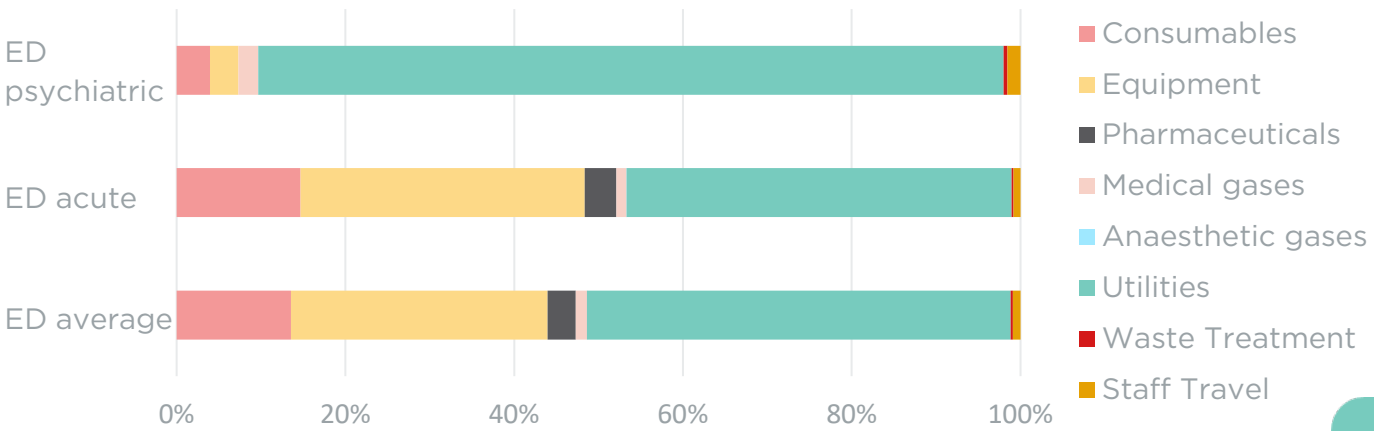
Findings

The climate change impact of an **average ED visit** is driven by consumables (25%), utilities (23%) and staff travel (23%). The average ED visit is the mean of all visits to the ED. In FY25, there was a significantly higher proportion of acute patient visits than psychiatric patient visits, and therefore average visit values are heavily weighted to the acute visit values. Consumables emissions were driven by infection-prevention and wound-care items. Utilities impacts were dominated by the hospital's use of natural gas, while staff travel impacts were mainly associated with internal combustion engine-powered car travel.

GHG per visit (kg CO_2 eq)



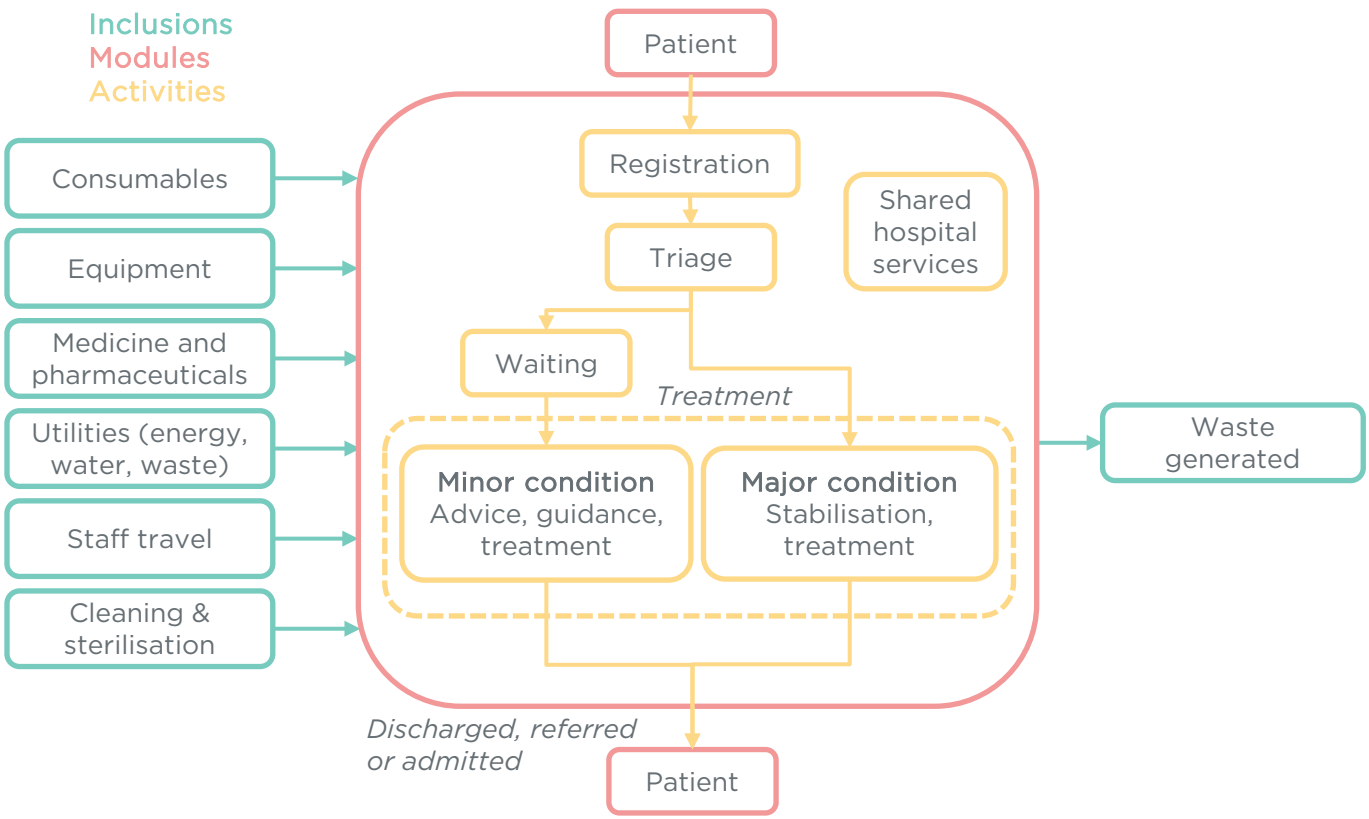
Freshwater use per visit (m^3)



Overall, the psychiatric ED had a 106% higher climate change impact and 103% higher freshwater use per patient visit than the acute ED. These differences were primarily driven by lower patient throughput and higher staffing intensity in the psychiatric ED. Although the psychiatric ED accounted for a smaller proportion of total clinical floor area, it accommodated significantly fewer patient visits in FY25. As a result, allocation-based impacts such as utilities consumption and waste generation were distributed across fewer patient visits, leading to higher impacts per patient encounter. In addition, the psychiatric ED was characterised by substantially higher staffing intensity than the acute ED, further increasing the contribution of staff travel and related impacts on a per-visit basis.

Scope

- This assessment appraises the environmental impact of a visit to the ED at the Charlton Campus Hospital.
- The functional unit of the system studied is a patient ED visit in the financial year (FY) 2025.
- The scope includes patient registration, triage and patient treatment. The scope does not include referral to another service or discharge.
- The hospital ED has an acute and a psychiatric department. The average ED appointment is inclusive of all patient visits across the ED.



Data

Primary data for the ED department were collected for FY25 for consumables, equipment, pharmaceutical products, staffing and patient throughput. Primary data for the hospital were collected for FY25 and allocated to the ED activities on a floor space basis for utilities, waste management, patient nutrition, medical gases and nitrous oxide (an anaesthetic gas). The impacts of shared non-clinical hospital services were allocated

to the ED activities on a floor space basis. The environmental impact of the emergency department for FY25 was modelled and then divided by the total number of FY25 patient visits. Similarly, the environmental impacts of the acute and psychiatric departments for FY25 were modelled and divided by the total number of FY25 patient visits for each department.

Results

Results are presented as the environmental impact per patient visit to the Charlton Campus Hospital emergency department.

Module	ED average kg CO_2 eq	ED acute kg CO_2 eq	ED psychiatric kg CO_2 eq
Consumables	5.53	5.65	3.42
Equipment	3.11	3.11	3.09
Pharmaceuticals	2.55	2.70	0
Medical gases	0.277	0.238	0.936
Anaesthetic gases	0.0487	0.0419	0.165
Utilities	4.97	4.27	16.8
Waste treatment	0.583	0.501	1.97
Staff travel	5.02	4.34	16.5
Total	**22.1**	**20.9**	**42.9**

Module	ED average water use m^3	ED acute water use m^3	ED psychiatric water use m^3
Consumables	20.2	20.8	11.4
Equipment	45.5	47.6	9.71
Pharmaceuticals	5.01	5.31	0
Medical gases	1.99	1.71	6.71
Anaesthetic gases	0.00243	0.00209	0.00823
Utilities	75.1	64.6	254
Waste treatment	0.388	0.333	1.31
Staff travel	1.34	1.16	4.42
Total	**150**	**141**	**287**

Module	ED average waste kg	ED acute waste kg	ED psychiatric waste kg
Waste treatment	0.821	0.706	2.78
Total	**0.821**	**0.706**	**2.78**

Acknowledgements

This document has been developed collaboratively with St. Joseph's Healthcare Hamilton and the Sustainable Healthcare Coalition. The Coalition comprises a range of organisations within the healthcare sector, including pharmaceutical and medical device companies, trade bodies, procurement, government organisations and other stakeholders. The Sustainable Healthcare Coalition operates with the aim of facilitating the journey towards good health and wellbeing on a finite planet, through open-minded collaboration across public and private healthcare.