

Environmental Impact of a Respiratory Outpatient Appointment

St Joseph's Healthcare
Hamilton



AstraZeneca 



**Sustainable
Healthcare
Coalition**

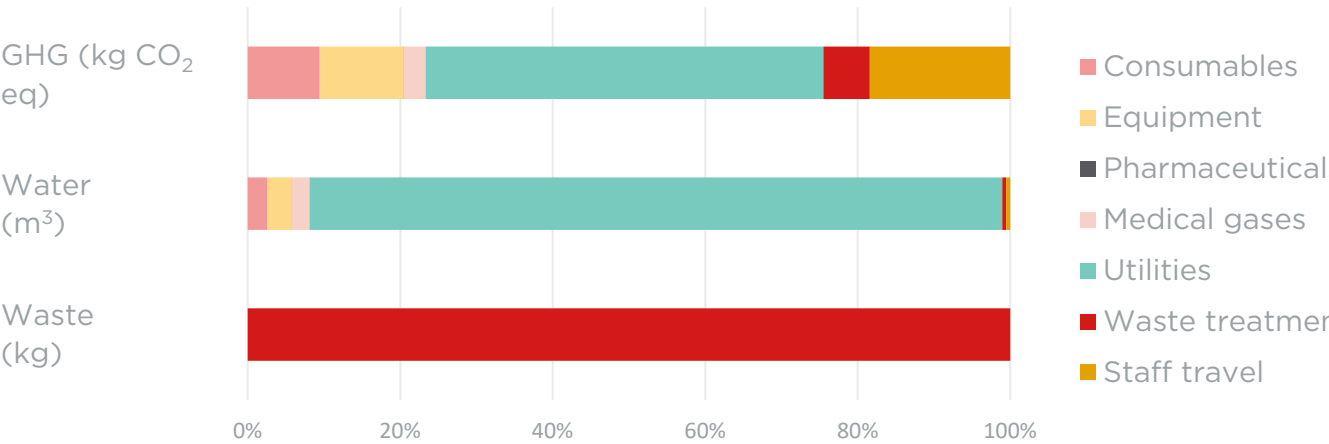
August 2026

Title	Respiratory outpatient centre 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	Marnie Buchanan (mbuchana@stjoes.ca)
Conformance with Care Pathways: Appraising Sustainability Method¹	Adheres to the method
Care pathway description	Average appointment at respiratory outpatient centre
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 a respiratory outpatient appointment. The study found a greenhouse gas (GHG) emission impact of 31.0 kg CO₂ eq, water use of 269 m³ and waste of 2.7 kg per appointment at the respiratory outpatient centre.



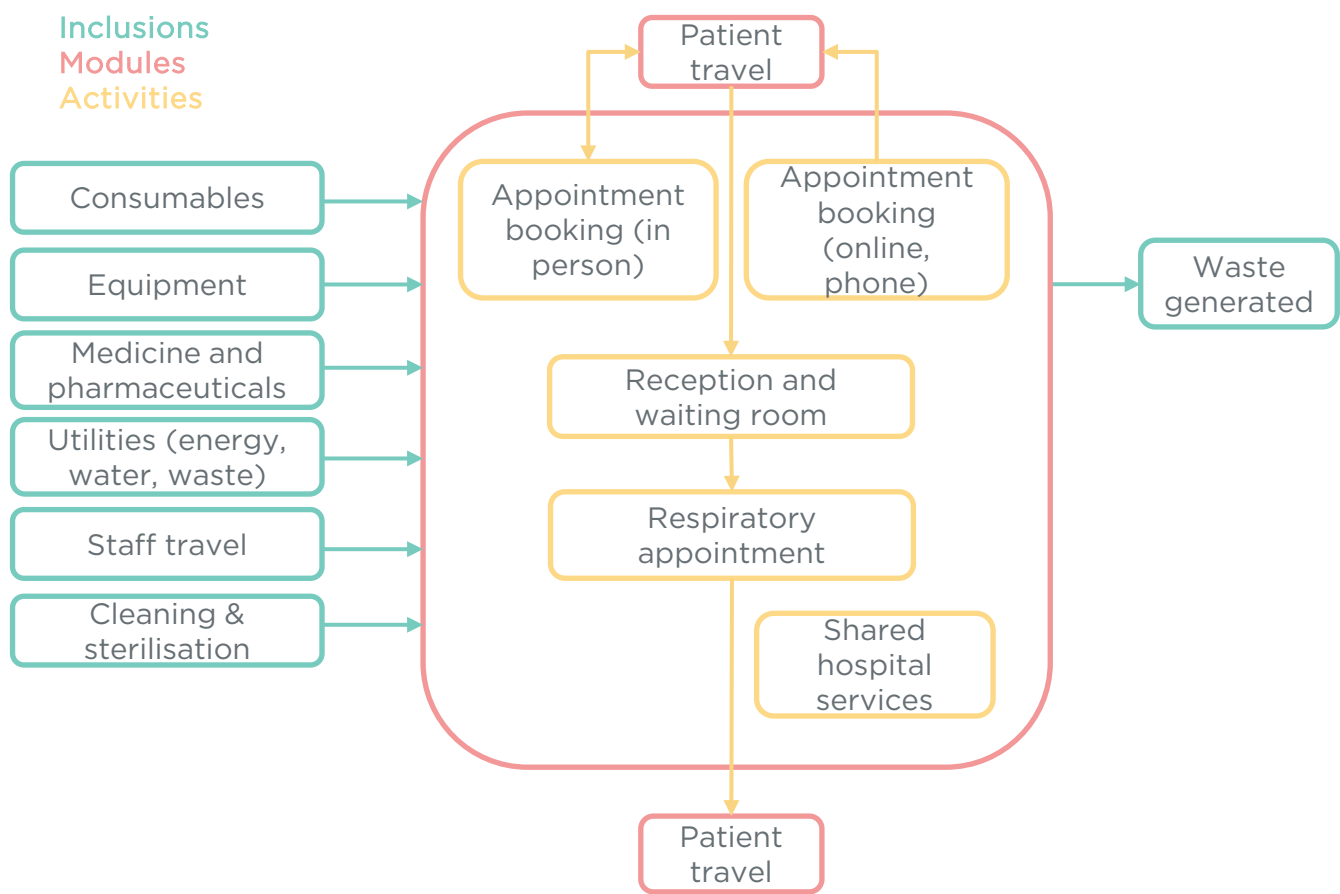
¹ Sustainable Healthcare Coalition (2026). Sustainable Care Pathways Method. Available at: <https://shcoalition.org/sustainable-care-pathways-guidance>.

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 is primarily driven by utilities (52%), followed by staff travel (18%). The utilities impact is driven by the hospital's use of natural gas. Staff travel impacts are driven primarily by internal combustion engine-powered car travel.

Scope

- This assessment appraises the environmental impact of an appointment at the respiratory outpatient centre at the Charlton Campus Hospital.
- The functional unit of the system studied is a respiratory outpatient appointment in FY25.
- The scope includes appointment booking and the appointment. It does not include any patient prescriptions.
- Two types of respiratory outpatient appointments were studied in greater detail: pre-post bronchodilator (BD) spirometry and a methacholine challenge.



Data

Primary data for the respiratory outpatient centre 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 respiratory outpatient centre activities on a floor space basis for utilities, waste management, patient nutrition and medical gases. The impacts of shared non-clinical hospital services were allocated to the respiratory outpatient centre activities on a floor space basis. The

environmental impact of the respiratory outpatient centre for FY25 was modelled and then divided by the total number of FY25 patient appointments. The pharmaceutical data does not include prescribed medicines for self-administration at home.

Primary data for the pre-post BD spirometry and methacholine challenge appointments were collected for FY25 for the consumables, equipment and pharmaceutical products. The use of shared consumables and equipment across appointment types purchased by the respiratory clinic was unknown. The impacts of utilities, waste treatment and staff travel are assumed to be the same across all clinic appointments.

Results

Results are presented as the environmental impact per respiratory outpatient appointment at the Charlton Campus Hospital.

Module	GHG kg CO ₂ eq	Water m ³		Waste kg
		Direct	Indirect	
Consumables	2.92	-	7.05	-
Equipment	3.41	-	8.26	-
Pharmaceuticals	0.00888	-	0.0310	-
Medical gases	0.900	-	6.45	-
Utilities	16.2	0.344	244	-
Waste treatment	1.89	-	1.26	2.67
Staff travel	5.71	-	1.53	-
Total	31.0	0.344	269	2.67

Respiratory Appointment Findings

The pre-post BD spirometry and methacholine challenge appointments have lower climate change impacts and freshwater use than an average clinic appointment. This is driven by lower consumables and equipment impacts. It should be noted that the consumables and equipment impacts for the pre-post BD spirometry and methacholine challenge appointments include only the specific materials required to deliver the appointment and do not include the materials purchased by the clinic as a whole for shared service delivery.

The impacts of utilities, waste treatment and staff travel are the same across all appointments. The impacts of utilities and waste treatment were provided for the hospital and allocated to the department on a floor space basis; primary data on the department and appointment utilities use and waste generated were not available. Medical gases are not required for the pre-post BD spirometry and methacholine challenge appointments. It should be noted that the studied appointments do not include the medical gas impacts that were allocated to the respiratory outpatient centre on a floor space basis.

The pharmaceuticals climate change impact is notably higher for the methacholine challenge appointment. This is driven by the use of pMDI inhalers within the appointment. For the pre-post BD spirometry, the patient is assumed to use their own inhaler, which is excluded from the study scope.

Module	Average clinic appointment		Pre-post BD spirometry		Methacholine challenge	
	kg CO ₂ eq	m ³	kg CO ₂ eq	m ³	kg CO ₂ eq	m ³
Consumables	2.92	7.05	0.225	0.795	0.626	2.32
Equipment	3.41	8.26	<0.001	<0.001	<0.001	0.00348
Pharmaceuticals	0.01	0.03	-	-	0.521	<0.001
Medical gases	0.90	6.45	-	-	-	-
Utilities	16.16	244.09	16.2	244	16.2	244
Waste treatment	1.89	1.26	1.89	1.26	1.89	1.26
Staff travel	5.71	1.53	5.71	1.53	5.71	1.53
Total	31.0	269	24.0	248	24.9	249

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.