

# ENVIRONMENTAL IMPACT OF DELIVERING OUTPATIENT MEDICATIONS FROM A HOSPITAL PHARMACY TO COMMUNITY PHARMACIES: A SUSTAINABLE DISPENSING MODEL

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## Background and Importance

In recent years, the number of **outpatient medications** dispensed in **hospital pharmacies** has increased considerably. As **tertiary hospitals** serve large areas, many patients must travel long distances to collect their treatments, generating carbon dioxide (CO<sub>2</sub>) emissions, with the consequent environmental impact.

## Aim and Objectives

- To evaluate the potential carbon footprint savings achieved by delivering outpatient medications from a hospital pharmacy to patients' nearest community pharmacies through a cooperative distribution program.

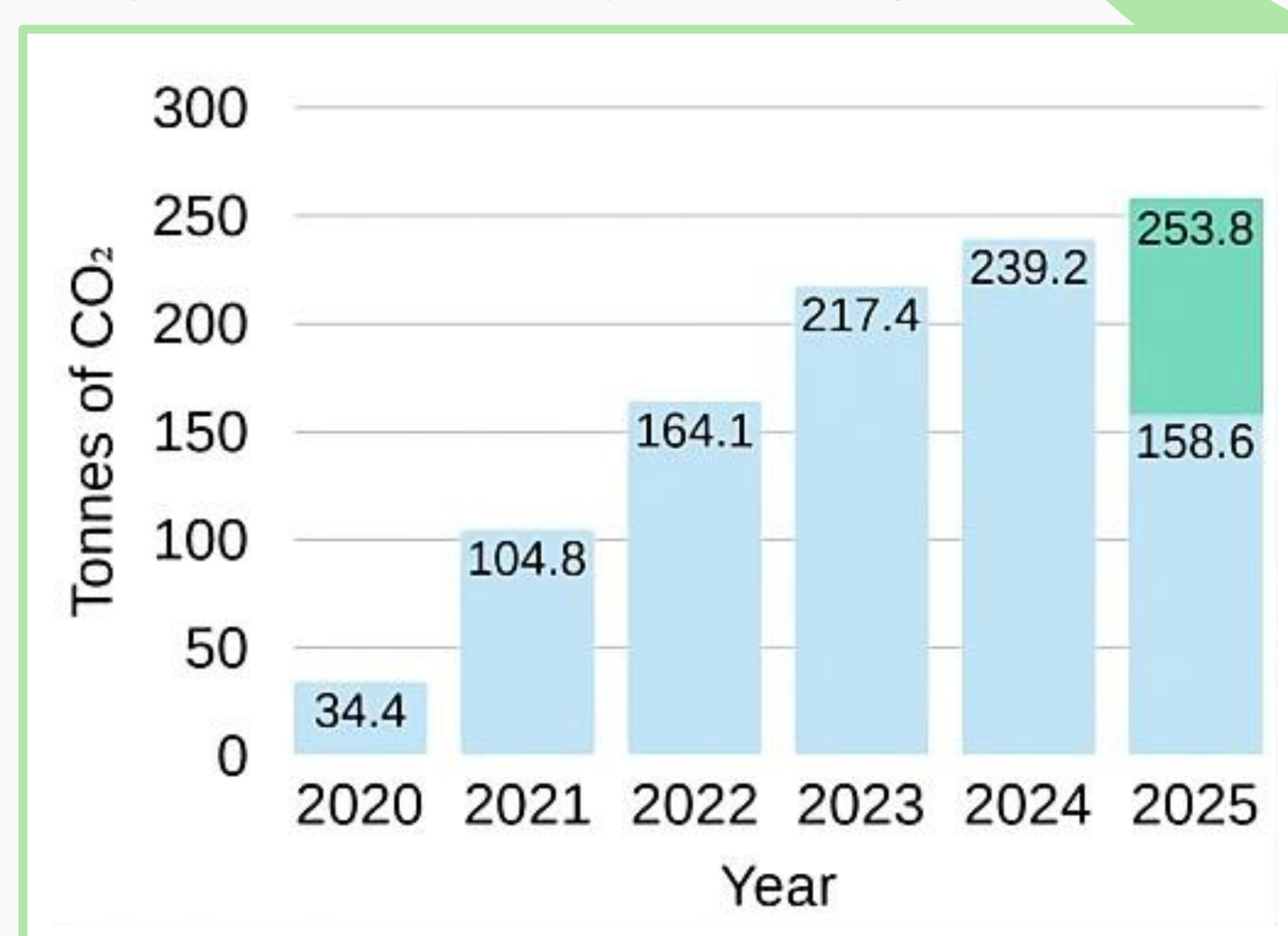
## Materials and Methods

This was a retrospective (2020/3-2025/8) observational study, including outpatient **medication deliveries** from a tertiary hospital **to community pharmacies**. Carbon footprints were assessed using a calculator tool and expressed in tonnes of CO<sub>2</sub> (tCO<sub>2</sub>).

## Results

**26,136 medication deliveries** from the hospital to community pharmacies were included: 976 in 2020, 3,013 in 2021, 4,705 in 2022, 6,219 in 2023, 6,738 in 2024, and 4,485 in the first 7.5 months of 2025. Deliveries resulted in progressively increasing annual **carbon footprint savings** (**Graph 1**). Total savings were **918.5 tCO<sub>2</sub> over 5 years and 5 months**.

Graph 1. Carbon footprint savings.



## Conclusion and Relevance

Delivering outpatient medications from a hospital pharmacy to patients' nearest community pharmacies is associated with substantial carbon footprint savings and supports a more sustainable, environmentally friendly dispensing model.



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