Prifysgol Cymru
Y Drindod Dewi Sant
University of Wales
Trinity Saint David

Evaluating the Carbon Impact of Electronic Prescription Services (EPS) in Wales

Laurice Keogh (2115745) – BSc Data and Information Systems

1. Introduction

The Electronic Prescription Service (EPS) allows GPs to send prescriptions digitally to pharmacies, reducing the need for paper and patient travel. This project investigates how EPS helps NHS Wales reduce carbon emissions. Through spatial analysis, regression modelling, and Power BI dashboards, it shows EPS has already cut over **57 tonnes of CO_2**, making it a low effort, high impact climate tool.

2. Background

If the global healthcare sector were a country, it would be the **5th largest emitter** [1].

- A4 prescriptions emit 0.0225 kg CO_2 [2]
- Each transport mile emits 0.2733 kg CO_2 [3]

EPS sends scripts digitally from GP to pharmacy, cutting both paper and travel.

3. Aims & Objectives

To quantify CO_2 savings enabled by EPS in Wales.

- Calculate travel distances in ArcGIS Pro
- Model paper-savings regression in Python
- Build Power BI dashboard for trends
- Produce reusable "EPS Framework Document"
- Advise rollout strategies for NHS Wales

4. Methodology

Data: DHCW EPS data, GP/pharmacy locations, DEFRA factors

Travel: ArcGIS Pro → GP to Pharmacy miles

Emissions: Apply 0.2733 kg CO_2/mile factor

Paper: Regression on electronic vs paper prescriptions, 0.0225 kg/sheet factor

Visualisation: Power BI dashboard

Framework: Detailed EPS Framework Document

5. Results

EPS adoption reached 92 % by April 2025 for Cadwgan GP, saving 423 kg CO_2 from paper alone.

Transport savings by pharmacy show high-impact sites (e.g. FWQ9 ≈ 4,000 kg saved).

One prescription saves 0.017147 kg; scaling to 3,343,646 electronic items giving 57,332.68 kg CO_2 saved.

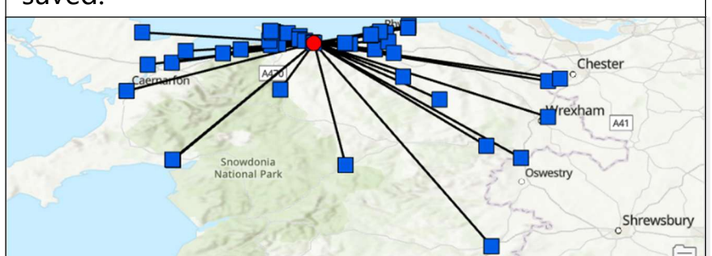


Figure 1: ArcGIS Drive-Length Calculation (Cadwgan GP Practice)

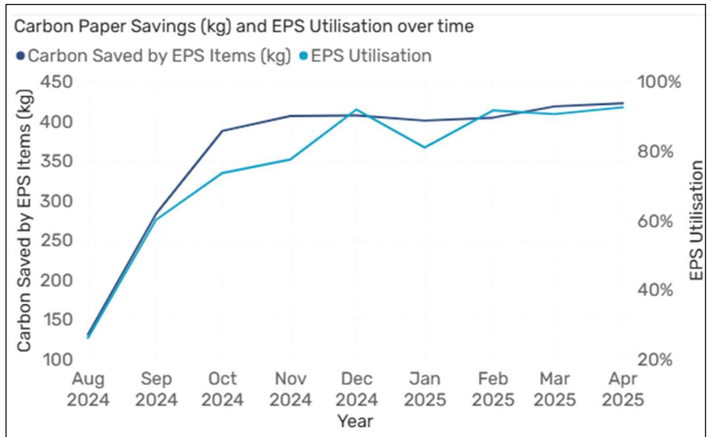


Figure 2: Carbon paper savings (kg) and EPS uptake over time

6. Recommendations

- Mandate EPS for all repeat prescriptions
- Integrate EPS with sustainable logistics (optimised delivery)
- Apply the EPS Framework Document across NHS Wales
- Include EPS metrics in NHS sustainability reporting

7. References

[1] Health Care Without Harm, "Global Health Care Climate Footprint Report," 2020.

[2] DEFRA, "GHG Reporting: Paper Emission Factors," 2023.

[3] DEFRA, "GHG Reporting: Transport Emission Factors," 2023.