

The Environmental Impact of Healthcare Data Science

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Abstract

We are striving to learn more about treatments to improve people's lives but what impact is the industry having on planet health? Some categories could be surprising!

A lot of important work is being done, but there are some simple changes that can be made to reduce our carbon footprint individually and collectively. What is realistic for one person might not be for someone else. It's not realistic to walk 20 km to the office and not everyone can afford solar panels, but we could use the train and switch off the radio when leaving the room.

It is important to assess the benefit versus impact of choices we make for ourselves or as part of a company-wide decision. Whether that is travelling to the office, buying new technology, printing the document to review, or even sending a simple 'Thank you' email.

Introduction

This paper will provide a brief insight into carbon footprint in the workplace of healthcare data science. It will give some statistics about environmental impact, followed by highlighting some choices that we make possibly without giving it much thought.

What is Carbon Footprint and how is it measured?

Carbon footprint is the measurement of how much carbon dioxide equivalent (CO₂e) is released into the atmosphere as a result of an individual, company or certain event. (Siegwerk, n.d.) So, how much carbon dioxide (or the equivalent from another gas) is created from what we buy, use and waste?

The average person in the European Union has a carbon footprint of 7.25 tonnes per year. (Statista, 2024)

We want to reduce the amount of greenhouse gases in the environment to reduce the impact of global warming on the planet.

Statistics

If every adult in the UK sent one email fewer per day, it would save 16,433 tonnes of carbon per year. (Molloy, 2020)

62 million tonnes of e-waste (discarded electrical or electronic equipment) was produced in 2022, of which 4.6 million tonnes was small IT equipment like laptops, mobile phones, GPS devices and routers. (Unitar, 2024)

Travelling from London to Paris by plane emits 66kg of CO2e per person, whereas by train this would be 2.4kg of CO2e per person. (EcoRes SCRL, 2023)

In 2020, 43% of the UK’s power came from a mix of renewable sources, wind, solar, bioenergy and hydroelectric. (nationalgrid, 2024)

Green coding

Development of code, running the code in the future and the physical infrastructure (computer and servers) all require energy.

Efficient coding could have a surprising impact. For example, for a dual programmed study with 30 SDTMs, 12 ADaMs and 100 TFLs where each program is run 20 times in a year. If each program is improved to take just 1 second less to run, that would mean a saving of over 1.5 hours of run time!

This is a very conservative example, so think of the possibilities!

Companies can take a more in-depth look into green coding and the data storage to amend their recommended company processes to reduce their carbon footprint.

It is said that time is money, time is efficiency, efficiency is linked to carbon footprint. Take a moment to assess if you could program more efficiently.

The Positive Impact of Each Choice

We need to weigh up the positive and negative impacts of our choices, sometimes the impact mentally or personally could be more important to us at a moment in time. If we are aware of the environmental impact, then hopefully that is considered during the decision-making process.

Table showing the positives of each choice	
Office vs Home	
Meet with people	No travel emissions
Heat one office rather than multiple homes	Save time and money by not commuting
Paper vs Electronic	
Easier to note comments on paper in certain cases (e.g. diagrams)	Saves paper
Can turn off screen while reviewing	Save time copying notes onto email
Buy New vs Fixing	
Newer models of technology could be more power efficient	Less waste going to landfill
Can send old technology to others in need	Lower carbon footprint

Table 1: Positive impact of choices

Conclusion

Most people want to use power and travel in their day-to-day life, but it is important to assess the impacts of choices we make and give an extra thought to the environmental impact of those choices. If we are aware of the impact, we can make more well-rounded decisions.

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