

## The Carbon Footprint of Digital Communication within the Healthcare Service

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Emails are ubiquitous and unavoidable. Their utility in healthcare is exemplified by the success of Healthmail, which securely sends 40 million emails annually to general practices, public hospitals, private hospitals, and other approved services across Ireland; however, each click requires electricity. Energy use increases with the size of the email and the number of recipients. An average message costs our environment roughly 4 grams of CO<sub>2</sub> equivalents (CO<sub>2</sub>e).<sup>1</sup> Signatures and attachments can increase this above 50g. Multiplied by 80,000 Health Service Executive (HSE) employees, across 250 working days, and ever-increasing email traffic, our annual carbon bill quickly puts us in the red.

Healthcare's worldwide carbon footprint is around two gigatons of CO<sub>2</sub>e, equating to 4.4% of global emissions.<sup>2</sup> By aiming for net zero carbon emissions, healthcare systems can limit climate change directly and mitigate the downstream public health harms caused by environmental crises.<sup>3</sup> If Ireland is to reach net zero by 2050, every sector must be scrutinised and optimised, including the HSE.

The HSE's information technology landscape is complex, making it difficult to establish the full extent of email activity. We collated data from several sources across Ireland to illustrate some examples of the CO<sub>2</sub>e burden of email in Irish healthcare and suggest actions for improvement.

In a single day, the servers supplying one tertiary hospital, two small general hospitals, and the community and primary care services in their area sent 28,800 emails. At an estimated 4g CO<sub>2</sub>e per email, this equates to approximately 29 tonnes CO<sub>2</sub>e per year from sent emails alone — the equivalent of driving over 115,000 kilometres.

Elsewhere, two large teaching hospitals both sent 1.6 million external emails per year, equal to 6.4 tonnes CO<sub>2</sub>e per hospital, not including internal emails. Received emails accounted for 12.8 tonnes CO<sub>2</sub>e at one hospital (3.2 million emails) and 15.6 tonnes (3.9 million emails) at the other.

A private hospital reported 770,000 external emails received annually while a second private clinic received 1.2 million, equivalent to 3 tonnes and 5 tonnes CO<sub>2</sub>e, respectively. One private hospital provided data on sent emails: 600,000 messages or 2.4 tonnes CO<sub>2</sub>e annually. Emails sent from Healthmail result in approximately 80 tonnes CO<sub>2</sub>e per year.

Emails are vital to the timely, effective, and safe functioning of our health services, but these numbers are striking. Individual users can only do so much. The HSE and other employers must lead the way by reviewing email usage and workflows, providing shared drives to store large documents rather than sending attachments, minimising “blast” emails, “thank you” emails or generic emails to large groups of users, and repurpose the heat and energy generated by servers.

To achieve a sustainable, net zero healthcare service, every gram of CO<sub>2</sub>e, every click, and every email matters — but emails are just one example. We must urgently coordinate our efforts to minimise the environmental harms associated with healthcare delivery. Small steps in an organisation the size of the HSE can start to move mountains.

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