

## EVERYDAY ETHICS

## First, Do No Harm: Ethical Considerations Surrounding the Environmental Impact of Our Digital Content

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### ABSTRACT

There is a direct correlation between digital content and greenhouse gas emissions. We have an ethical obligation to mitigate our climate impacts when we can to prevent harm.

Anthropogenic climate change is expected to have significant impacts on the health and wellbeing of all humans,<sup>1</sup> resulting in more intense heatwaves, higher risks of flooding and damaging storms, and a changing pattern of emerging infectious diseases.<sup>2</sup> According to the International Panel on Climate Change (IPCC), human-induced warming of the climate system is widespread.<sup>3</sup> However, the impacts will be unevenly felt with more dramatic consequences experienced by women, those experiencing poverty, and Black, Indigenous, and people of color.<sup>4-8</sup>

Although vulnerable or marginalized populations are the first to experience the most severe consequences of climate change, none of us are immune to the long-term impacts. The 2022 IPCC Summary for Policymakers notes that “near-term actions that limit global warming to close to 1.5°C would substantially reduce projected losses and damages related to climate change in human systems and ecosystems.”<sup>9</sup> With that in mind, we all have an ethical obligation to mitigate our climate impacts when we can.

What does this have to do with medical writing? There is a direct correlation between the content that we create and the generation of greenhouse gas emissions. “Digital is physical,” says Gerry McGovern in his book, *World Wide Waste*.<sup>10</sup> Digital communication—which are the majority of our communication efforts—is/has a huge climate impact. Every bit and byte that we create is nothing more than energy. Energy is quantifiable. And for the foreseeable future, the use of energy emits greenhouse gases, with direct impacts on the health of vulnerable populations. Therefore, we have an ethical responsibility to consider those impacts as we consider our content strategy, content design, and content governance.

### UNDERSTANDING CLIMATE FOOTPRINT

In recent decades, we have been taught to focus on our personal climate footprint; we must make changes to our personal lives to influence the course of climate change. Although there are certainly many options for change on a personal level—household solar arrays, electric vehicles, vegan lifestyles, and abandoning air travel, to name a few—no individual lifestyles changes have as much impact as those we make at work.

A 2017 report published by CDP, the not-for-profit organization that runs the global disclosure system, states 100 companies are responsible for more than half of all greenhouse gas emissions since the start of the industrial revolution 250 years ago. These organizations are responsible for 71% of all emissions since 1998.<sup>11</sup> If most emissions are driven by corporations, then it makes sense that we have the most opportunity for leveraging our impact at work.

### THE CARBON COST OF DATA

There is a direct correlation between energy and data. According to a report published by the nonprofit research organization the American Council for an Energy-Efficient Economy, each gigabyte (GB) of data requires 5.12 kWh of energy.<sup>12</sup> This is a very abstract number; plugging this information into the Greenhouse Gas Equivalencies calculator from the US Environmental Protection Agency (EPA) shows that every GB of data generates approximately 5 pounds of greenhouse gas emissions.<sup>13</sup>

Note that the EPA calculator is regularly updated to reflect the current emissions per kWh in the United States. Although the world is moving away from reliance on fossil fuels, progress is slow. According to the latest data from the US Energy Information Administration, in 2021, the United States generated approximately 20% of its energy from renewable sources.<sup>14</sup> Even if we increase our domestic renewable energy production by 10% annually, we’ll still be relying on fossil fuels for about half of our energy in the United States in 2030.

### Emissions Example 1: Websites

Inbound marketing company Hubspot reports that the average home page weight was close to 2 MB in 2020.<sup>15</sup> The ninetieth percentile of webpages weigh more than 7 MB per page.<sup>16</sup> In the process of research for this paper, I took a random sampling of hospitals, corporations, insurance companies, and health-focused nonprofits—literally the first 8 that came to mind—and ran them through the Pingdom calculator that measures page weight, load times, and performance.<sup>17</sup> All of the home page weights were significantly greater than the 2.0 MB average reported by Hubspot.

Anyone who uses the internet knows that the standard for modern webpages involves large hero images, videos, or carousels that largely fill the screen. As Tom Greenwood notes in his book, *Sustainable Web Design*, roughly half of the weight of a modern webpage is imagery.<sup>18</sup> Worse, that imagery tends to be stock art that slows download times and adds carbon emissions, without adding value to the user's experience.

This practice goes against the concept of plain language, as advocated by Balmford.<sup>19,20</sup> He asserts that “plain language” is not wholly accurate. It's not simply about the choice of words and sentences, but rather the whole document, including language, structure, and design. As communicators, it is our responsibility to consider the best methods for the effective and clear presentation of information. Informative images, charts, graphs, and even videos can have a role in effective communication and should be considered on a case-by-case basis.

We can achieve our content goals with smaller page weights.

At Company A, they had an image-intensive home page. At 4.9 MB, it was heavier than the average weight reported by Hubspot, within the upper half of the sampled page

weights (Figure 1). The page was loaded with stock art of health care providers in scrubs and masks; none of these images showed products or services in action, leaving the reader with no visual clues beyond the knowledge that the product was something medically focused.

Eliminating unnecessary stock images and replacing others with more informative product-oriented photos cut the page weight by half. The result was a page that still met the visual criteria expected from a professional website, but was more informative, downloaded faster, and reduced the carbon emissions by half.

The net result was a savings of nearly 17 tons of avoided emissions, or the equivalent of removing more than 3 passenger cars from the road for a year (Figure 2).

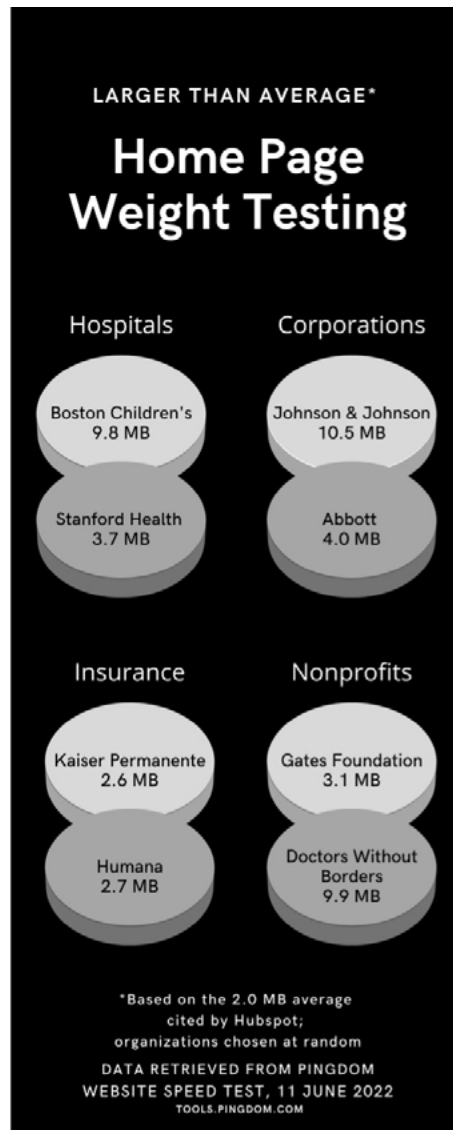


Figure 1. Sample page weights for health care organizations and health-focused nonprofits.

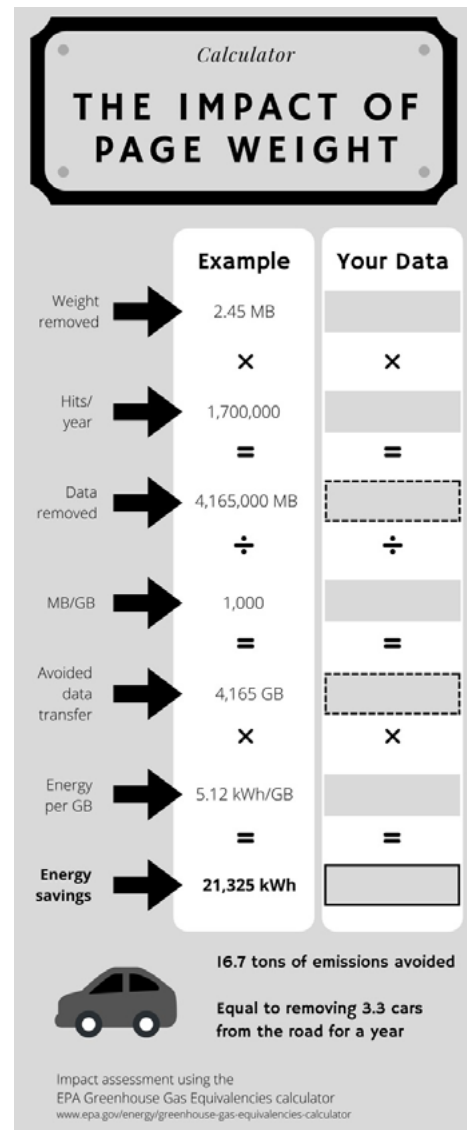


Figure 2. Reducing page weight also reduces greenhouse gas emissions.

## Emissions Example 2: Comparing the Impacts of Video and Audio

Just like text, there are times video and audio are indispensable tools for walking customers through setup or use of a product, or for presenting educational information. There are also times in which video is an unnecessary, heavy-weight, flashy video for video's sake—something that could have been explained just as clearly in text or imagery.

The ways in which video can be used are diverse, which makes comparative weighting difficult. Instead, let's compare audio-only podcasting with video podcasting, YouTube videos, or recorded presentations.

A half-hour video recording, complete with slides and talking head recorded at the YouTube quality of 24 frames per second will end up being about 1.73 GB.<sup>21</sup>

Podcast hosting company Blubrry estimates that the same information presented as a half-hour long, mono-channel, talk-only audio podcast-style recording averages about 23 MB.<sup>22</sup>

When working with audio and video, it's important to decide whether a video is worth 75 times the energy and correlated emissions (Figure 3). Always consider video projects on a case-by-case basis.

## Emissions Example 3: Our Meetings

Particularly since the start of the pandemic era, we've all spent a significant portion of our day on video conferences. But our use of Zoom, Teams, Skype, or related services uses bandwidth and energy, which we now know has a carbon cost.

When everyone joins the meeting with video on, the meeting requires roughly 800-900 MB of bandwidth per person.<sup>23</sup> For one month, I kept track of all of my daily video meetings. On average, every Zoom meeting had 5 participants (some were one-on-one, whereas others were large group calls). When everyone has their video on, that works out to an average of 4 GB of data per call.

That same call—the usual screen sharing, the speaker visible in thumbnail, but other participants in video-off mode—works out to be about 190 MB total on a five-participant call. Leaving everyone's video on for the duration is 20 times more energy and emissions intensive as a video-off meeting (Figure 4).

Many employers believe that video-on is crucial for building relationships while working remotely. A good compromise can be to have video on for the 5 minutes of meet-and-greet at the start of the meeting but turning video off during screen sharing.

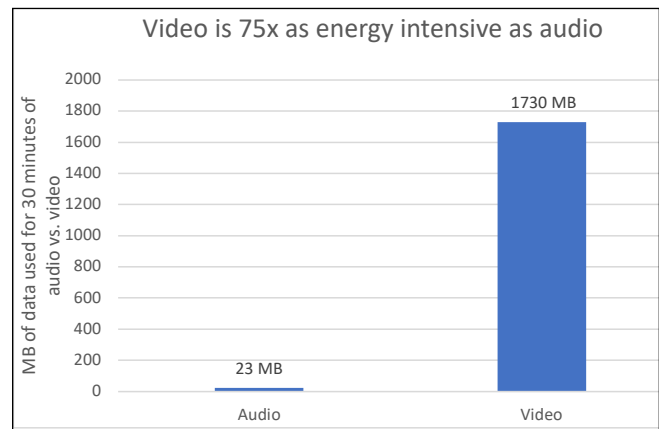


Figure 3. The relative data and energy impact of audio versus video.

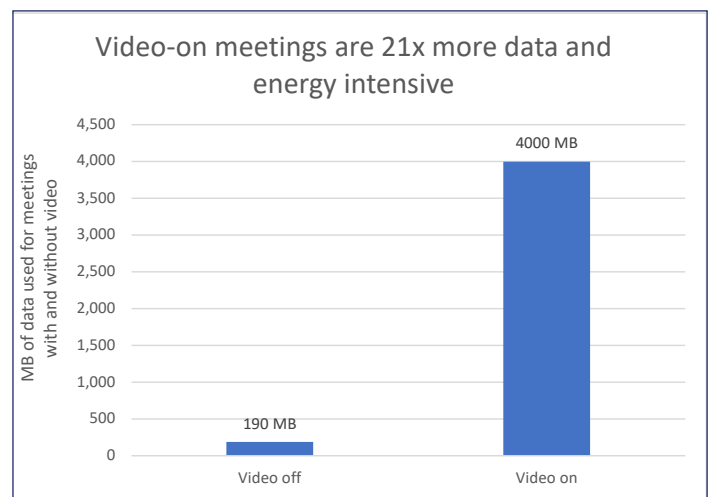


Figure 4. Video-off meetings use less data, less energy, and generate fewer emissions.

## CONCLUSION

We all have an ethical responsibility to reduce carbon emissions to mitigate the impacts of climate change, particularly for those who are the most vulnerable. The content that we create generates measurable greenhouse gas emissions. Knowing that the majority of emissions come from corporations and not individuals, it makes sense that we leverage our influence on our organizations to have the greatest impact on the health and wellbeing of others.

**Author declaration and disclosures:** *The author notes no commercial associations that may pose a conflict of interest in relation to this article.*

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## RESOURCES

### Pingdom website speed test

<https://tools.pingdom.com/>

### Video filesize calculator

<https://toolstud.io/video/filesize.php>

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