

Peer Review

Review of: "Adverse Environmental and Public Health Effects of Artificial Intelligence: A Comprehensive Review"

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Overall assessment

This manuscript addresses an important and timely topic. However, in its current form it **falls short of the standards expected of a rigorous review article**. The paper repeatedly **overstates causal claims, selectively cites literature, mixes speculative assertions with empirical evidence, and blurs advocacy with scholarship**. Many quantitative figures are presented **without sufficient methodological context**, and the review **lacks balance**, systematically excluding counterevidence or uncertainty. Substantial revision is required before this work can be considered scientifically robust.

Major concerns

1. Lack of methodological rigor for a "comprehensive review"

Problem:

Although the paper claims to be a "comprehensive review" (title; Methods section), it explicitly states that it does not follow PRISMA or any structured review framework (Section 2). The inclusion/exclusion criteria are vague, subjective, and inconsistently applied.

Specific issues:

No flow diagram or count of screened vs. included studies is provided.

No quality assessment of included studies (e.g., risk of bias, study design hierarchy).

Heavy reliance on **preprints, opinion pieces, SSRN papers, and narrative reviews**, which are treated equivalently to peer-reviewed empirical studies.

Google Scholar is used without justification, despite its known reproducibility problems.

Why this matters:

Without transparent selection and appraisal, the review is **not reproducible** and is vulnerable to **confirmation bias**.

Required revision:

Either:

Reframe the manuscript explicitly as a **narrative or perspective review**, or

Introduce a **structured methodology**, including study counts, selection logic, and quality appraisal.

2. Systematic overstatement of causality (environment → health; AI → outcomes)

Problem:

Throughout Sections 3–5, the manuscript repeatedly **implies or asserts causal relationships** where the cited literature only supports association, modeling, or plausibility.

Examples:

Claims that AI “contributes to >9 million premature deaths annually” (Table 1; Section 3.4) are **factually incorrect**. This figure refers to *total global air pollution*, not the marginal contribution of AI-related emissions.

Statements linking AI-generated misinformation directly to measles outbreaks (Section 4.2) are **speculative**; the authors themselves later concede causality is unproven, contradicting earlier wording.

Occupational displacement is presented as a demonstrated health outcome of AI deployment, yet most cited sources are **economic theory papers or reviews**, not epidemiological studies.

Why this matters:

These overstatements **inflate perceived harms** and undermine scientific credibility.

Required revision:

Replace causal language (“leads to,” “causes,” “results in”) with **accurate qualifiers**.

Clearly distinguish **modeled impacts, associations, and empirically demonstrated outcomes**.

Explicitly acknowledge uncertainty where evidence is indirect.

3. Selective and unbalanced literature coverage

Problem:

The review is **one-sided**. Nearly all cited work highlights harms, while literature showing:

efficiency gains,

decarbonization via AI optimization,

reductions in healthcare errors,

or mitigation through model/hardware improvements

is largely ignored or dismissed as “techno-optimistic” without systematic evaluation.

Examples:

AI’s role in grid optimization, energy efficiency, and climate modeling is mentioned only rhetorically, not reviewed.

No serious engagement with peer-reviewed work showing declining energy intensity per computation.

Corporate emissions data (Google, Microsoft) are cited without normalization per unit of compute or revenue, making the argument misleading.

Why this matters:

A review must **evaluate evidence, not advocate a position**.

Required revision:

Include and critically assess **countervailing evidence**, even if the authors ultimately disagree with it.

4. Quantitative claims lack context, normalization, and uncertainty

Problem:

Many numerical estimates are presented as standalone facts, without:

confidence intervals,

scenario assumptions,

denominators (per user, per query, per GDP),

or comparison to alternative technologies.

Examples:

“A single AI query uses 4–10× the energy of a web search” (Section 3.1) is cited without specifying:

model type,
query length,
hardware,
or year of measurement.

“700,000 liters of water for GPT-3 training” is repeated multiple times but not contextualized against:

lifetime inference water use,
total data center water consumption,
or regional baselines.

Why this matters:

The presentation **encourages misinterpretation and sensationalism.**

Required revision:

Add ranges, assumptions, and uncertainty.
Normalize impacts where possible.
Clearly indicate when numbers are **upper-bound estimates.**

5. Conceptual overreach in environmental justice framing

Problem:

While environmental justice is an important lens, the manuscript **extends it beyond available evidence.**

Examples:

Claims that AI infrastructure is systematically placed in “historically redlined Black neighborhoods” rely on **secondary commentary**, not spatial epidemiology.

The term “toxic colonialism” is used rhetorically without analytical precision.

Assertions that marginalized communities receive “no commensurate benefits” ignore employment, tax base, and infrastructure heterogeneity.

Why this matters:

Strong moral language without proportional evidence weakens the argument.

Required revision:

Clearly distinguish **documented cases** from **theoretical or normative claims.**

Avoid absolute language (“systematically,” “always,” “without benefit”).

6. Conflicts of interest and self-citation concerns

Problem:

The author cites **multiple recent papers authored by himself** (e.g., rare earth toxicity, chelation therapy) that are **peripheral to AI impacts** and not widely established in this context.

Why this matters:

This raises concerns about **scope creep** and potential **self-citation bias**, particularly where speculative biomedical mechanisms are discussed.

Required revision:

Justify inclusion of these references or remove them.

Ensure that speculative toxicological discussions are clearly labeled as such.

7. Regulatory discussion lacks accuracy and nuance

Problem:

The description of the EU AI Act (Section 6) overstates its environmental provisions and understates ongoing implementation uncertainty.

Examples:

Environmental reporting requirements are presented as more concrete than they currently are.

U.S. regulatory landscape is simplified and omits recent executive actions and agency guidance.

Required revision:

Update regulatory analysis with precise legal language.

Avoid implying enforcement mechanisms that do not yet exist.

Minor issues (but numerous)

Repetition of identical claims across Abstract, Introduction, Tables, and Conclusions.

Several grammatical errors and awkward phrasing (e.g., duplicated numbering, inconsistent hyphenation).

Table 1 and Table 2 mix **heterogeneous evidence types** without clear labeling.

Figure 1 is conceptually useful but **overloaded with claims not empirically supported**.

Conclusion and recommendation

Recommendation: Major revision

The manuscript addresses a critical topic, but its current form is **more advocacy essay than scientific review**. To be publishable, the authors must:

Substantially tighten methodology

Correct causal overstatements

Balance the literature review

Contextualize quantitative claims

Separate evidence from normative argument

Without these changes, the paper risks **misinforming rather than informing** policy and public health discourse.

Declarations

Potential competing interests: No potential competing interests to declare.