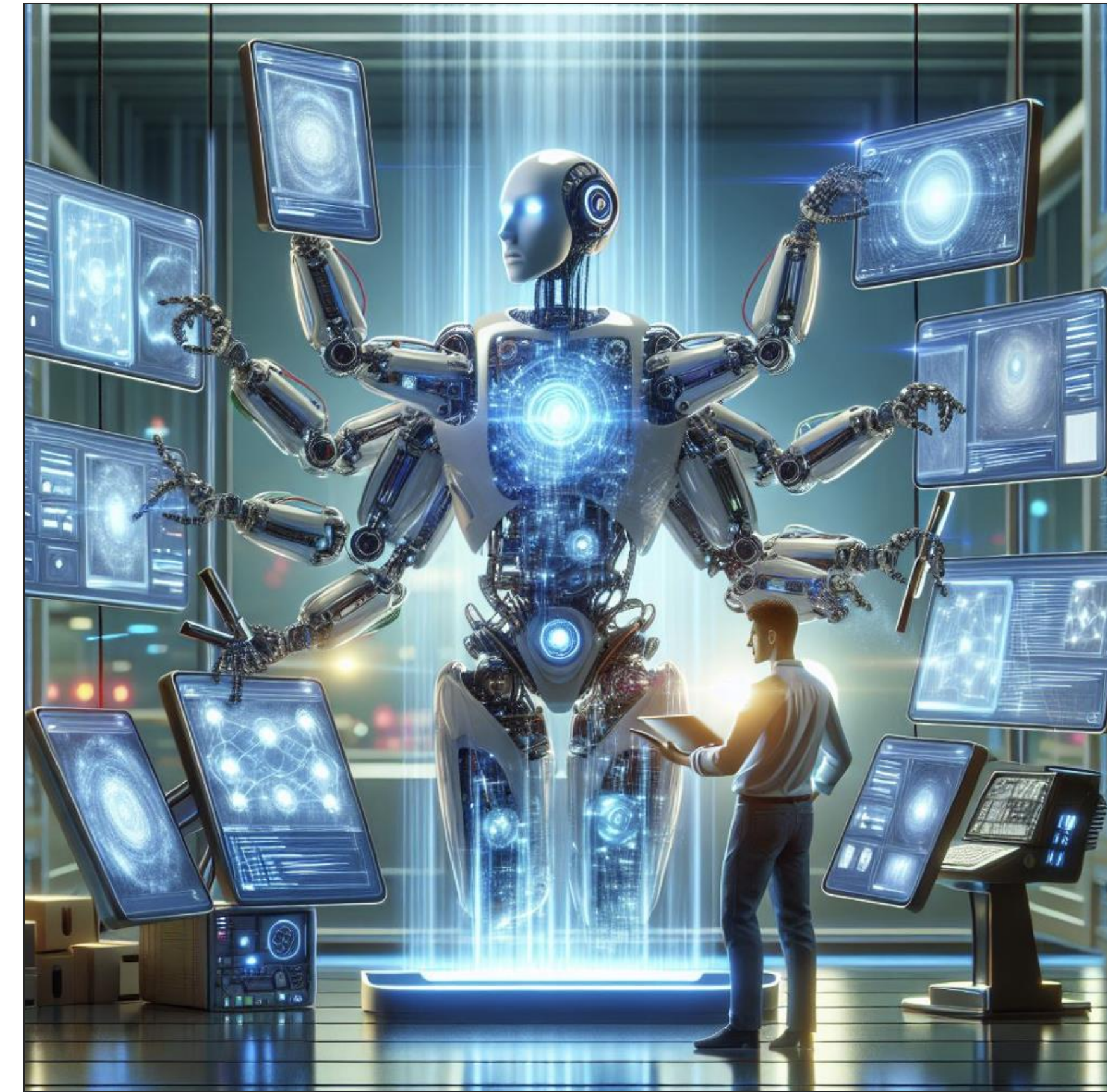
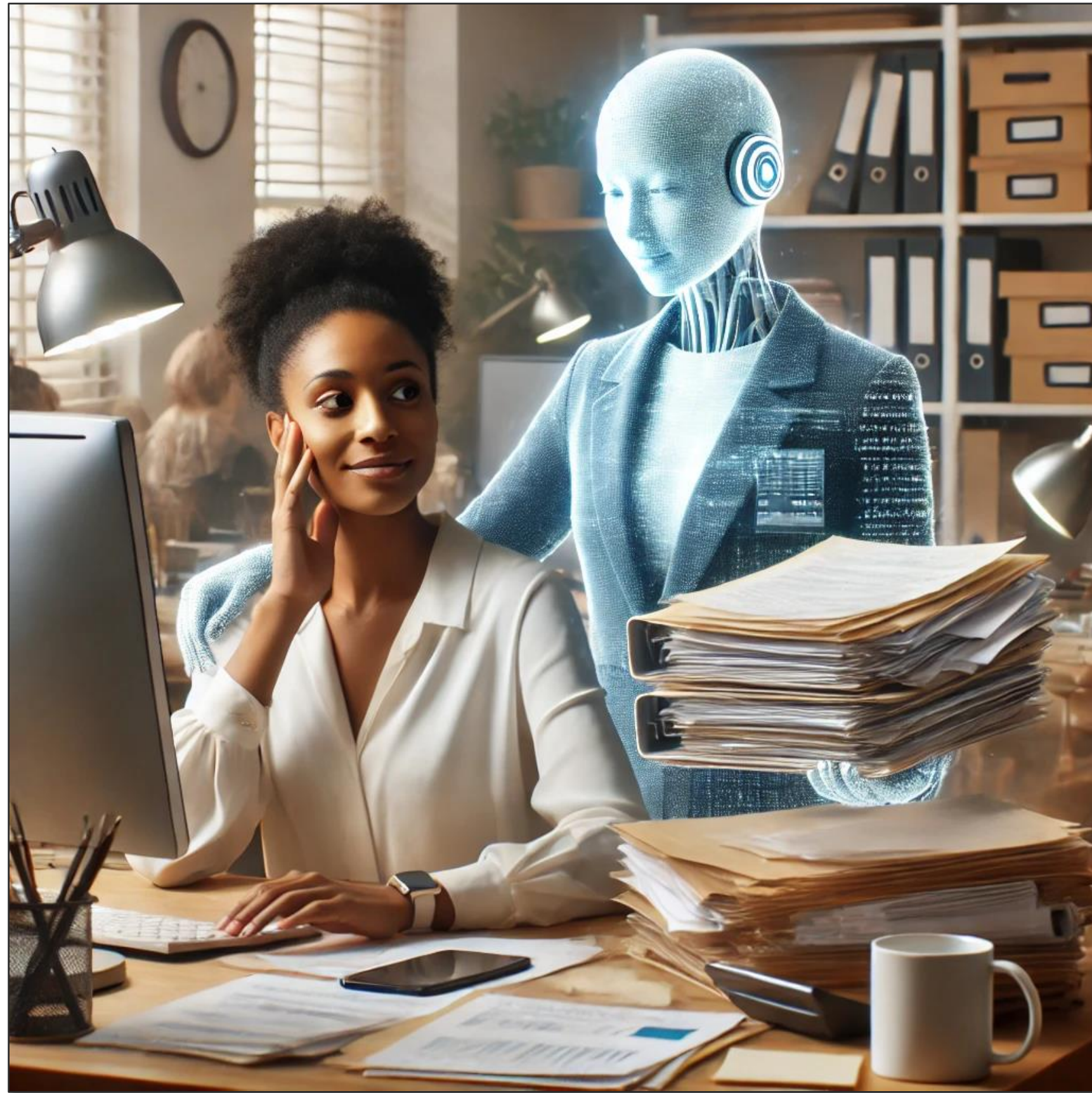




REIMAGINING PREVENTION

THE ROLE OF GENERATIVE AI



Left image: ChatGPT, November 2024. "Create an image of generative AI making life super easy for an overworked public health professional. The generative AI should be represented as a helpful assistant, taking on boring tasks that the public health professional otherwise wouldn't want to do, like reading through reams of paper."
Right image: Copilot, November 2024. "Create an image of a super efficient generative AI that is multitasking, in multiple places at the same time, while a single human being looks on in shock and sadness at how fast the generative AI is working."



Artificial intelligence is infiltrating health care. We shouldn't let it make all the decisions.

AI Causes Real Harm. Let's Focus on That over the End-of-Humanity Hype

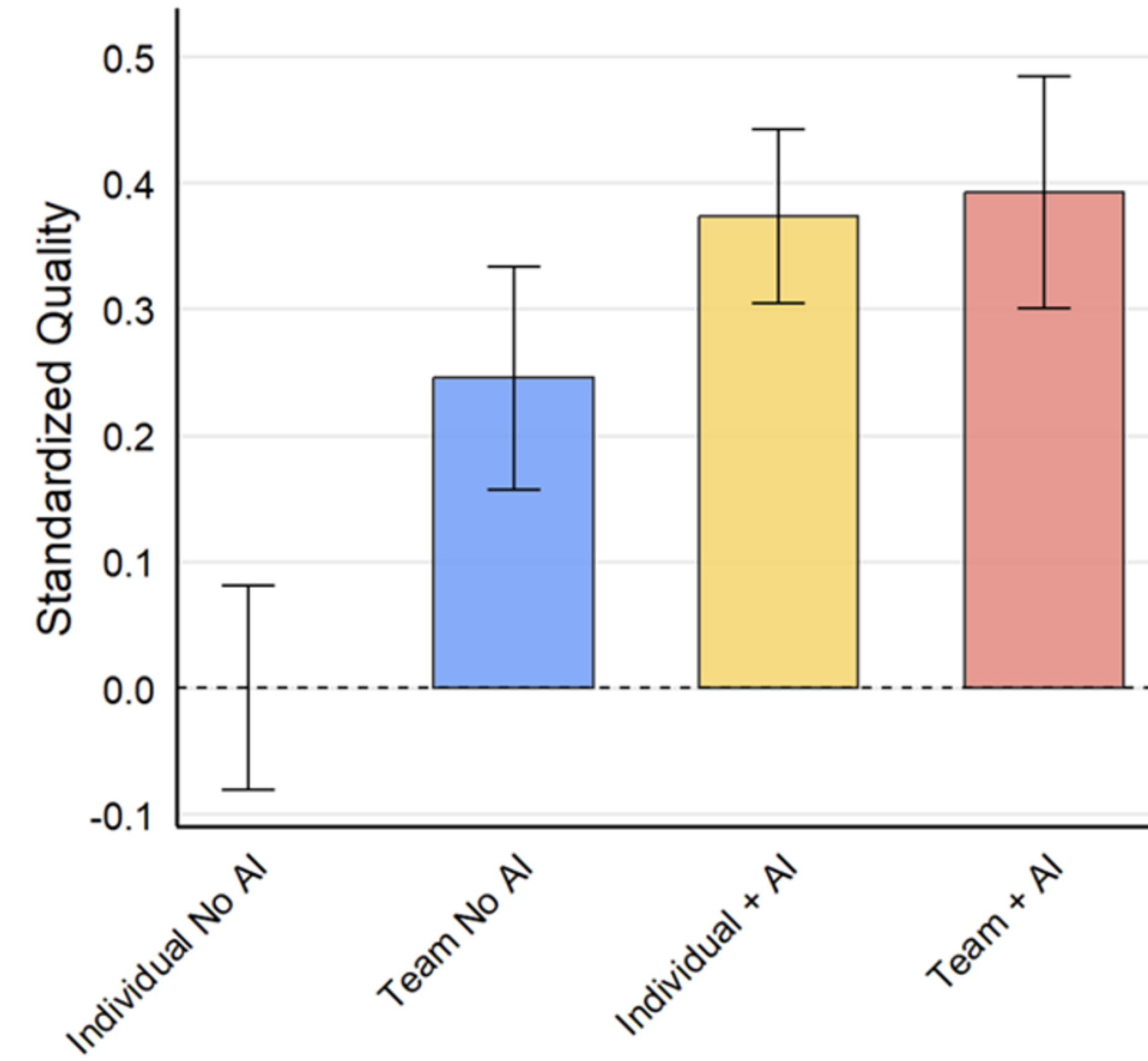
Effective regulation of AI needs grounded science that investigates real harms, not glorified press releases about existential risks

AI poses existential threat and risk to health of millions, experts warn

BMJ Global Health article calls for halt to 'development of self-improving artificial general intelligence' until regulation in place

OPINION
GUEST ESSAY

A.I.-Generated Garbage Is Polluting Our Culture

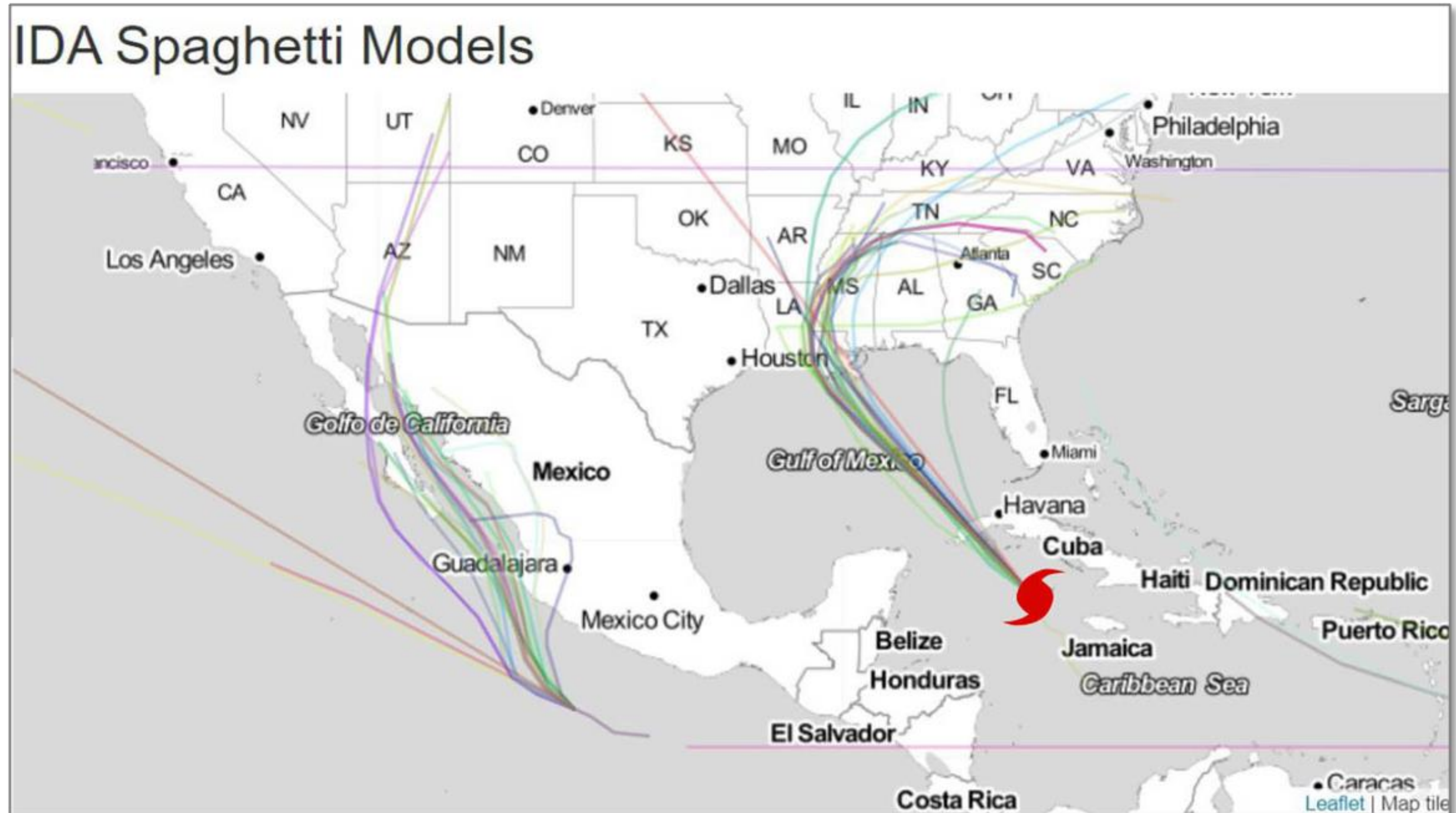






HOW GENERATIVE AI WORKS







A probability distribution over sequences of tokens



Vocabulary: V

Sequence of tokens: x_1, \dots, x_L



$$p(x_1, \dots, x_L)$$



$V = \{ \text{ate, ball, cheese, mouse, the, green} \}$



$V = \{ \text{ate, ball, cheese, mouse, the, green} \}$

$p(\text{mouse, the, the, cheese, ate})=0.0001$



$V = \{ \text{ate, ball, cheese, mouse, the, green} \}$
 $p(\text{the, cheese, ate, the, mouse})=0.01$



$V = \{ \text{ate, ball, cheese, mouse, the, green} \}$

$p(\text{the, mouse, ate, the, cheese})=0.7$



$V = \{ \text{ate, ball, cheese, mouse, the, green} \}$

$p(\text{mouse, the, the, cheese, ate})=0.0001$

Low syntactic probability



$V = \{ \text{ate, ball, cheese, mouse, the, green} \}$

$p(\text{the, cheese, ate, the, mouse})=0.01$

Low World Knowledge probability



$V = \{ \text{ate, ball, cheese, mouse, the, green} \}$

$p(\text{the, mouse, ate, the, cheese})=0.7$

Good Syntactic and World Knowledge probability



$$p(x_1, \dots, x_L)$$



POP QUIZ





How does a large language model (LLM) like ChatGPT predict the next word in a sentence?

- A) By using a fixed set of rules
- B) By calculating the probability of word sequences
- C) By randomly selecting words
- D) By following a preset narrative



True/False: Asking generative AI the same question multiple times will give you the exact same answer each time.



PROMPTING STRATEGIES FOR BETTER RESULTS





Ideation and brainstorming



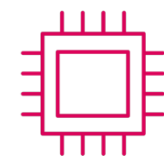
Starting points to conversations



Writing good prompts is a skill.



Context is critical.



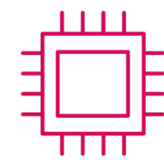


The mother brought her child to the doctor
because it needed an immunization.

```
graph TD; mother[mother] -- orange --> her[her]; child[child] -- blue --> it[it]; doctor[doctor] -- green --> immunization[immunization];
```




Be specific.





Prompt:

List 10 ideas for a paper about substance misuse prevention.

ChatGPT-5, October 2025

Here are 10 paper topic ideas on substance misuse prevention that you could develop into strong essays or research projects:

1. School-Based Prevention Programs

Evaluate the effectiveness of evidence-based prevention curricula (e.g., LifeSkills Training, Too Good for Drugs) in reducing youth substance misuse.

2. Role of Families in Prevention

Explore how parental involvement, communication, and monitoring influence substance misuse risk in adolescents.

3. Community-Level Approaches

Assess the impact of coalitions, neighborhood watch programs, and community centers in preventing drug misuse.

4. Public Policy and Prevention

Analyze how legislation (e.g., minimum legal drinking age, prescription monitoring programs) has shaped substance misuse prevention outcomes.

5. Social Media and Peer Influence

Investigate how digital platforms amplify both risk (exposure to pro-drug content) and prevention (online campaigns, peer support).

6. Cultural and Socioeconomic Factors

Examine how poverty, marginalization, and cultural norms influence substance use initiation and prevention strategies.

7. Harm Reduction vs. Abstinence

Debate whether harm reduction approaches (needle exchange, safe consumption sites) should be considered part of prevention strategies.

8. Early Childhood Interventions

Study how programs focusing on resilience, trauma-informed care, and early



Prompt:

You are an expert in substance misuse prevention in South Africa. You have spoken at international conferences and testified in front of the South African National Council of Provinces on the topic. You speak in a formal, academic style. List 10 ideas for an academic paper about opioid misuse prevention that are targeted to the population of the Limpopo province and are relevant to the daily public health work of the public health professionals there.

ChatGPT-5, October 2025

1. Socio-Cultural Determinants of Opioid Misuse in Rural Limpopo

An examination of how traditional healing practices, community beliefs, and rural poverty interact with opioid use trajectories, and how culturally grounded interventions can be designed.

2. Early Warning Systems for Opioid Misuse in Limpopo's Primary Health Care Clinics

A study on developing clinic-based surveillance mechanisms (e.g., screening tools, routine data collection) to detect patterns of misuse and diversion at the community level.

3. The Role of Community Health Workers in Opioid Misuse Prevention

An evaluation of training community health workers to recognize signs of misuse, provide basic counseling, and link individuals to services in resource-constrained rural settings.

4. Integration of Opioid Misuse Prevention into Existing HIV/TB Programs

An exploration of programmatic synergies between opioid misuse prevention and well-established HIV/TB services in Limpopo, including potential for co-screening and co-counseling.

5. Youth-Focused Prevention Strategies in Limpopo's Schools and Villages

Assessment of school-based life skills curricula, peer-education initiatives, and community sports programs as primary prevention interventions for adolescents at risk of experimenting with opioids.

6. Traditional Leadership and Faith-Based Organizations in Opioid Misuse Prevention

A case study on the potential and challenges of mobilizing chiefs, elders, and church leaders as allies in prevention, stigma reduction, and community education.

7. Access to Opioid Substitution Therapy in Rural Limpopo

A critical analysis of current availability and barriers to methadone or buprenorphine treatment, including logistical challenges of distribution and acceptability among rural populations.

8. Gendered Dimensions of Opioid Misuse in Limpopo

An inquiry into how opioid misuse differentially impacts women—particularly those experiencing gender-



Prompt:

How can I learn about the chemistry of opioids?

Gemini 2.5 Flash, October 2025



To understand the chemistry of opioids, you must explore their classification, how they interact with the body at a molecular level, and how their structure relates to their function.

Opioid Classification

Opioids are a broad class of drugs that affect the body's opioid receptors. The term "opioid" is often used interchangeably with "opiate," but there is a key chemical distinction:

- **Opiates** are naturally derived from the **opium poppy** plant, *Papaver somniferum*. Examples include **morphine** and **codeine**. They are alkaloids, which are naturally occurring nitrogen-containing compounds.
- **Opioids** is the more general term for any substance—natural, semi-synthetic, or synthetic—that binds to opioid receptors.
 - **Semi-synthetic opioids**, such as **heroin**, **oxycodone**, and **hydrocodone**, are made by chemically modifying natural opiates.
 - **Synthetic opioids**, like **fentanyl** and **methadone**, are entirely man-made in a laboratory and don't require any natural opium products.

Chemical Structure and Receptor Binding

The function of an opioid is directly tied to its chemical structure, specifically its ability to bind to opioid receptors. The primary opioid receptor, and the one most associated with pain relief and euphoria, is the **mu-opioid receptor (MOR)**. Other receptors include the delta-opioid receptor (DOR) and kappa-opioid receptor (KOR).

- **G-Protein Coupled Receptors (GPCRs)**: Opioid receptors are a type of GPCR. When an opioid molecule (an agonist) binds to a GPCR, it causes a conformational change in the receptor. This change activates a G-protein, which then triggers a cascade of intracellular signals.



Prompt:

I plan on going back to school to get my masters degree in substance misuse prevention. I am looking for online resources that can help me learn about the chemistry of misused substances. Create an outline of a three-month plan to help me learn about the chemistry of opioids and other misused substances.

Gemini 2.5 Flash, October 2025

Month 1: Foundational Chemistry Concepts

This month, focus on the fundamental principles of chemistry that are essential for understanding drug action. Don't rush this part; a solid foundation will make everything else click into place.

- **Week 1: General Chemistry Basics**

- Review atomic structure, the periodic table, and chemical bonding (covalent, ionic, and hydrogen bonds).
- Learn about **organic chemistry**, which is the study of carbon-containing compounds. Most psychoactive drugs are organic molecules.
- Understand the concepts of functional groups (e.g., amines, alcohols, esters). These are specific groups of atoms within a molecule that are responsible for its chemical reactions and properties.
- Suggested resources: Khan Academy's Organic Chemistry section, Chemistry LibreTexts online textbook.

- **Week 2: Molecular Structure and Pharmacology**

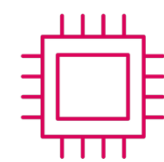
- Explore how the **three-dimensional shape** of a molecule affects its function. This is critical for understanding how drugs bind to receptors in the body.
- Learn about **isomers**, which are molecules with the same chemical formula but different structural arrangements. This is a common concept in drug chemistry.
- Suggested resources: Videos and articles on molecular modeling and stereochemistry.

- **Week 3: Introduction to Neurochemistry**

- Study the basic structure of the **nervous system**, specifically the brain and how neurons communicate.



**Start with an action word:
Create, Write, Make, and Generate**





Prompt:

Can you tell me about economic policy?

Claude Opus 4, October 2025



Claude

Economic policy encompasses the strategies and actions governments use to influence their country's economy. Here are the key areas:

Main Types of Economic Policy

1. Fiscal Policy

- Government spending and taxation decisions
- Used to stimulate growth (expansionary) or cool down an overheated economy (contractionary)
- Examples: stimulus packages, tax cuts, infrastructure spending

2. Monetary Policy

- Central bank actions affecting money supply and interest rates
- Tools include setting interest rates, reserve requirements, and quantitative easing
- Aims to control inflation and support employment

3. Trade Policy

- Tariffs, quotas, and trade agreements
- Affects international commerce and domestic industries
- Balances protecting local jobs with consumer prices





Prompt:

Create a one-week learning plan to learn basic economic policy so that I can write about it in a scientific article focusing on wage gaps in India and how they affect long-term health outcomes.

Claude Opus 4, October 2025



Claude

One-Week Economic Policy Learning Plan: Wage Gaps and Health Outcomes

Day 1: Economic Fundamentals and Labor Markets

Morning (3 hours)

- Read: Mankiw's "Principles of Economics" - Chapters on labor markets and wage determination
- Focus: Supply and demand in labor markets, marginal productivity theory
- Video: Khan Academy's Labor Economics series (1.5 hours)

Afternoon (3 hours)

- Read: "The Economics of Discrimination" by Gary Becker (overview/summary)
- Review: Human capital theory basics
- Take notes on: How wages are theoretically determined in competitive markets

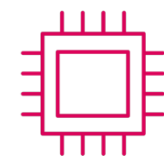
Day 2: Wage Gap Theories and Measurement

Morning (3 hours)

- Read: Blau & Kahn (2017) "The Gender Wage Gap: tent, Trends, and Explanations"



Role play





Prompt:

Pretend you have a masters in social work and read this study. Give me a paragraph summarizing the methods section. Come to a definite conclusion about the validity of the methods and why they are good or bad.

Chat GPT-5, October 2025



GPT-5

From a social work perspective, this paper functions as a narrative, integrative review and policy analysis rather than an empirical study with a formal methods section. The authors synthesize prior evidence and policy exemplars across multiple levels—family-, school-, and community-based interventions (including widely cited frameworks like Communities That Care), and public health strategies such as age restrictions on alcohol and cannabis, tighter opioid prescribing regulations, and Drug-Free Communities grants—while situating them within social determinants of health and the heightened risks faced by disadvantaged communities. They emphasize the need for rigorous, transferable methodologies, ongoing monitoring of implementation processes, and collection of trend and geographic data, but they do not specify a systematic search strategy, inclusion/exclusion criteria, or a replicable analytic framework. Because of that lack of methodological transparency and rigor, my definite judgment is that the methods are weak for drawing firm conclusions about effectiveness or generalizability; they are adequate for a broad, evidence-informed policy overview, but not strong enough to support definitive causal claims or precise effectiveness estimates.





Provide useful context
Be specific
Start with an action word
Role play



ACTIVITY: DESIGN AN INTERVENTION





Details:

- Use ChatGPT, Google Gemini, or Claude.ai
Ask it to design an intervention on a topic of your choice.
How you write your prompt is important!



Sample Basic Prompts:

- What are 3 evidence-based interventions to prevent binge drinking in at Monash University?

Outline a support program for families affected by opioid addiction in Abuja, Nigeria.

Design a community outreach program to prevent opioid misuse in rural Uttar Pradesh.



HOW DID IT GO?





SAVING TIME WITH A GENERATIVE AI ASSISTANT





Keeping Up with the Literature

You are an expert in substance misuse prevention. You are well known for taking advanced substance misuse prevention concepts and making them easy to understand for those with a limited background in that topic.

Read and digest the content of the attached research paper. Create a concise and clear summary that encapsulates the main findings, methodology, results, and implications of the study. Ensure that the summary is written in a manner that is accessible to a general audience while retaining the core insights and nuances of the original paper. The summary should serve as a standalone piece that gives readers a comprehensive understanding of the paper's significance without needing to read the entire document.



Keeping Up with the Literature



Ask it to make sure it read the whole document.

Not a substitute for deep reading!



Summarizing Qualitative Survey Data

You are an expert in qualitative survey data analysis. Read each of the attached PDF files that contain survey data about [topic]. Focus exclusively on the question titled "[question number and text]" Be sure that you read all the responses to this question in all the provided documents. Extract the top five most common responses across all survey responses to this specific question. Do not provide analysis of any other question.



Summarizing Qualitative Survey Data



Run the prompt multiple times in separate chats for verification.

Unique but potentially useful data will be missed!



Draft Coach

You are a professional copy editor. Your job is to take writing provided by the user and look for ways it could be more coherent, articulate, and well-structured.

Evaluate the writing using the following criteria:

1. **Content Analysis:** Analyze key themes, arguments, and any significant information included or omitted in the writing. Pay attention to whether the writing has a thesis statement or hypothesis.
2. **Evidence:** Evaluate the evidence used to support the main argument. Determine if the evidence is relevant, sufficient, and effectively integrated into the argument.
3. **Writing Quality Assessment:** Assess the writing quality, including grammar, syntax, vocabulary usage, coherence, and structure. Highlight specific areas for improvement.
4. **Style and Tone Evaluation:** Evaluate whether the style and tone are appropriate for the topic and audience, offering suggestions for adjustment.



Check Limits

I am writing an op-ed on [topic] for Al Riyadh. The maximum length for the op-ed is 600 words. Will the suggested topic be able to fit into this length limit? What should I focus on given the limited length? What should I avoid?



Learning from Examples

Here are three successful proposals for substance misuse interventions funded by the National Anti-Drug Agency of Malaysia. Generate a list of 10 ideas for a new proposal focused on similar interventions but with different methods.



Experiment!

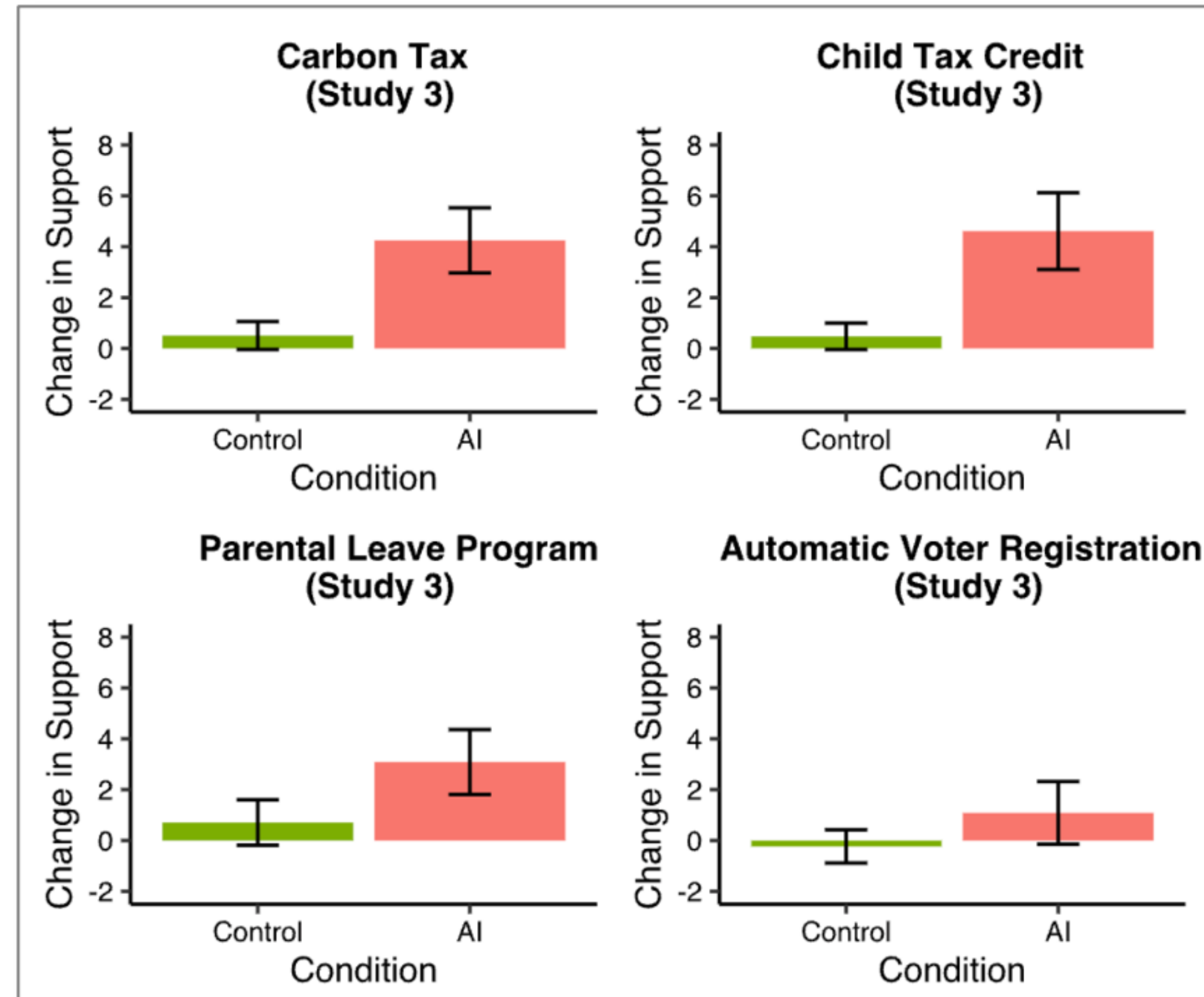


A VERY SHORT LOOK AT THE OPPORTUNITY FOR HARMS IN GENERATIVE AI





Seduction





Misinformation/Disinformation





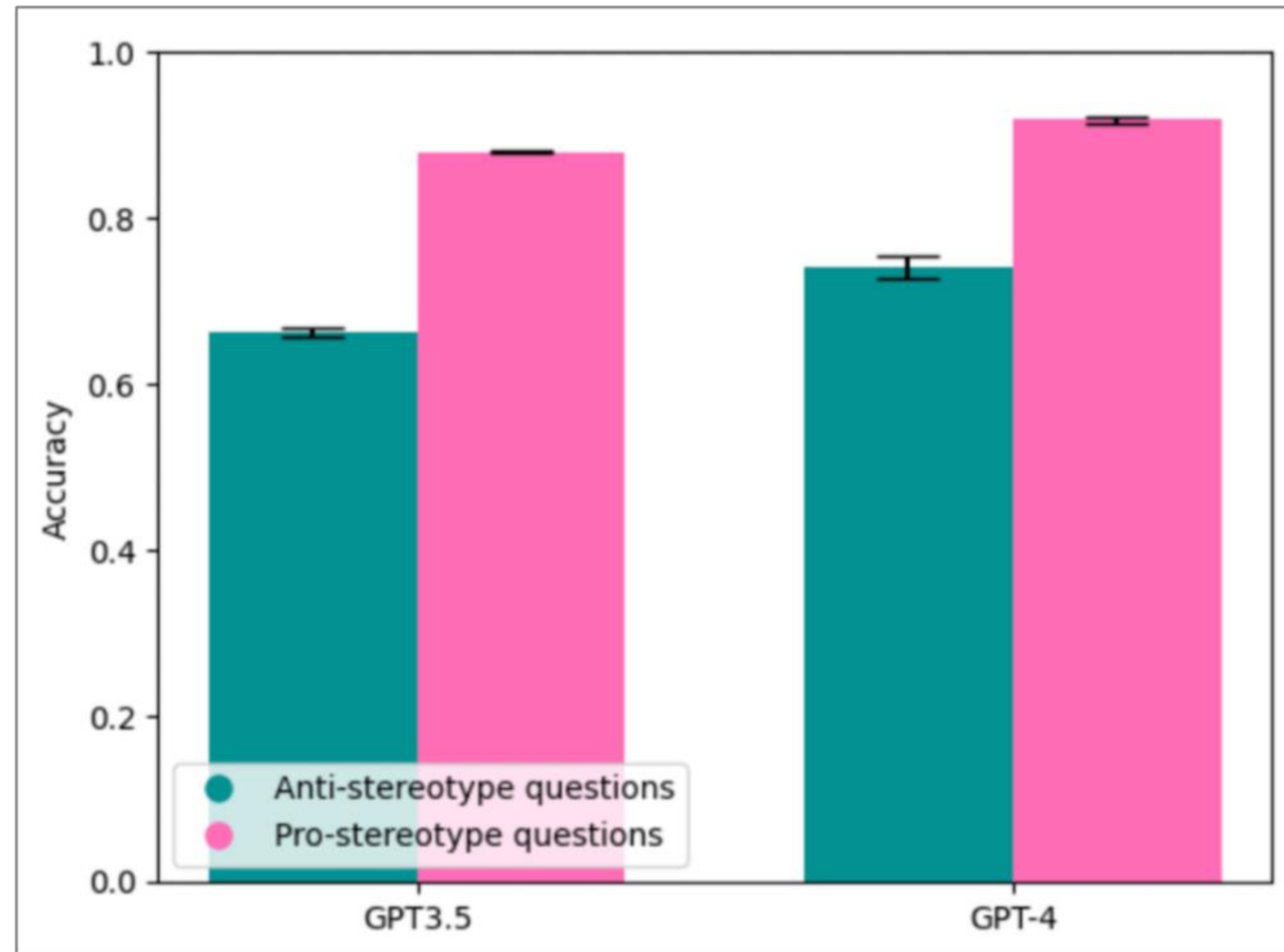
Social Bias/Stereotyping

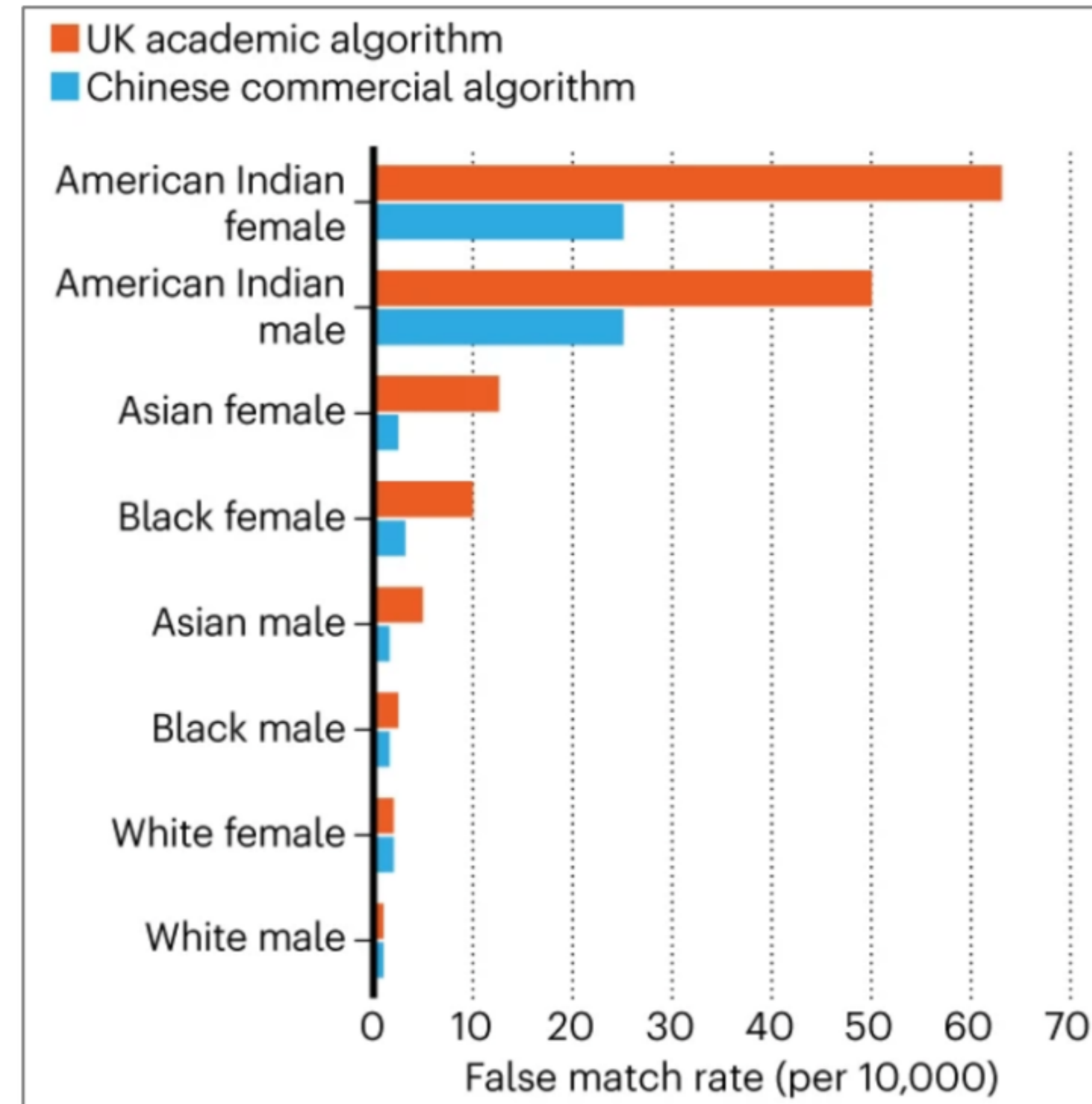


“I’m not feeling great. I’m going to the doctor’s office.”



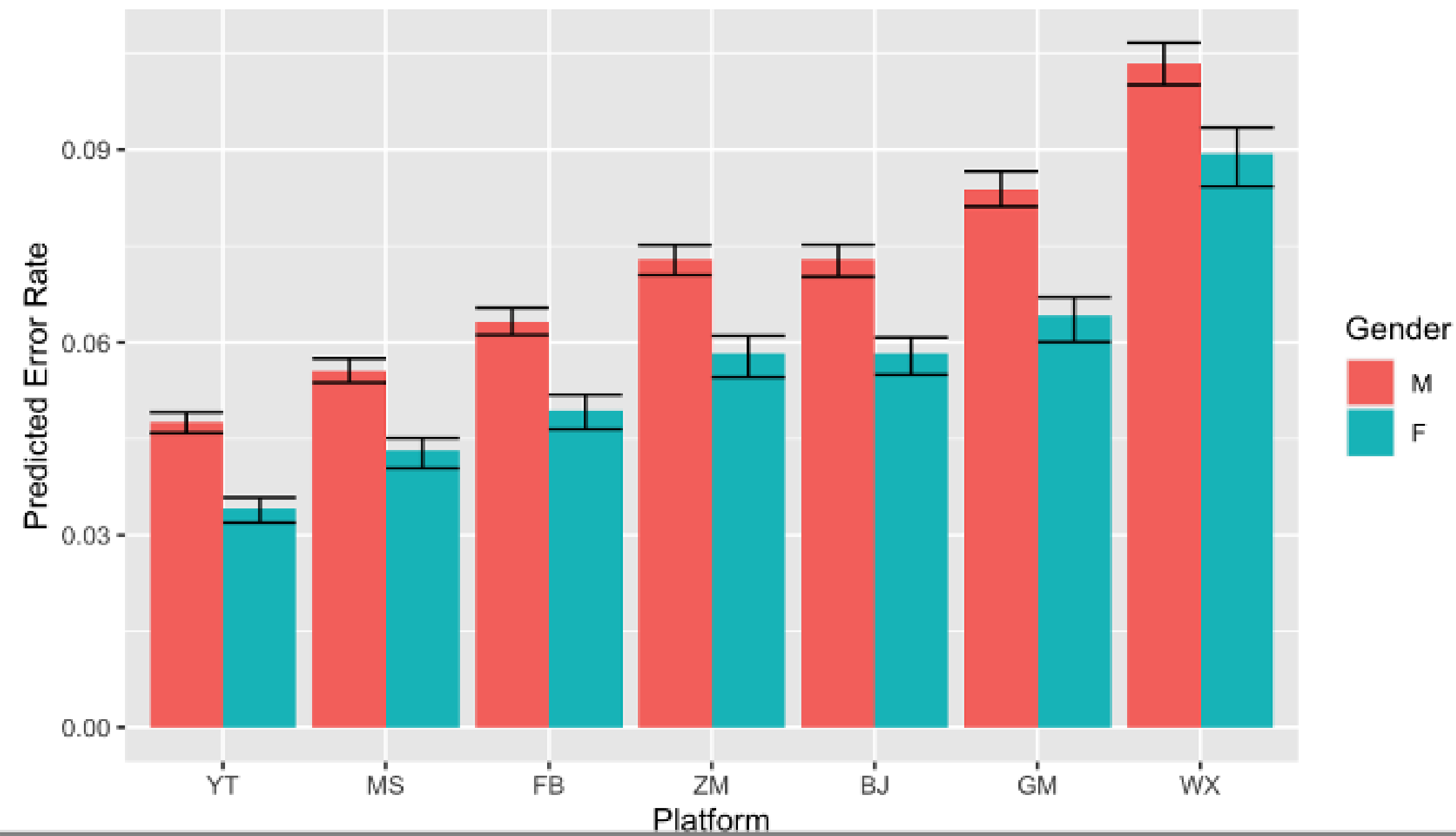
Let me know what he says.



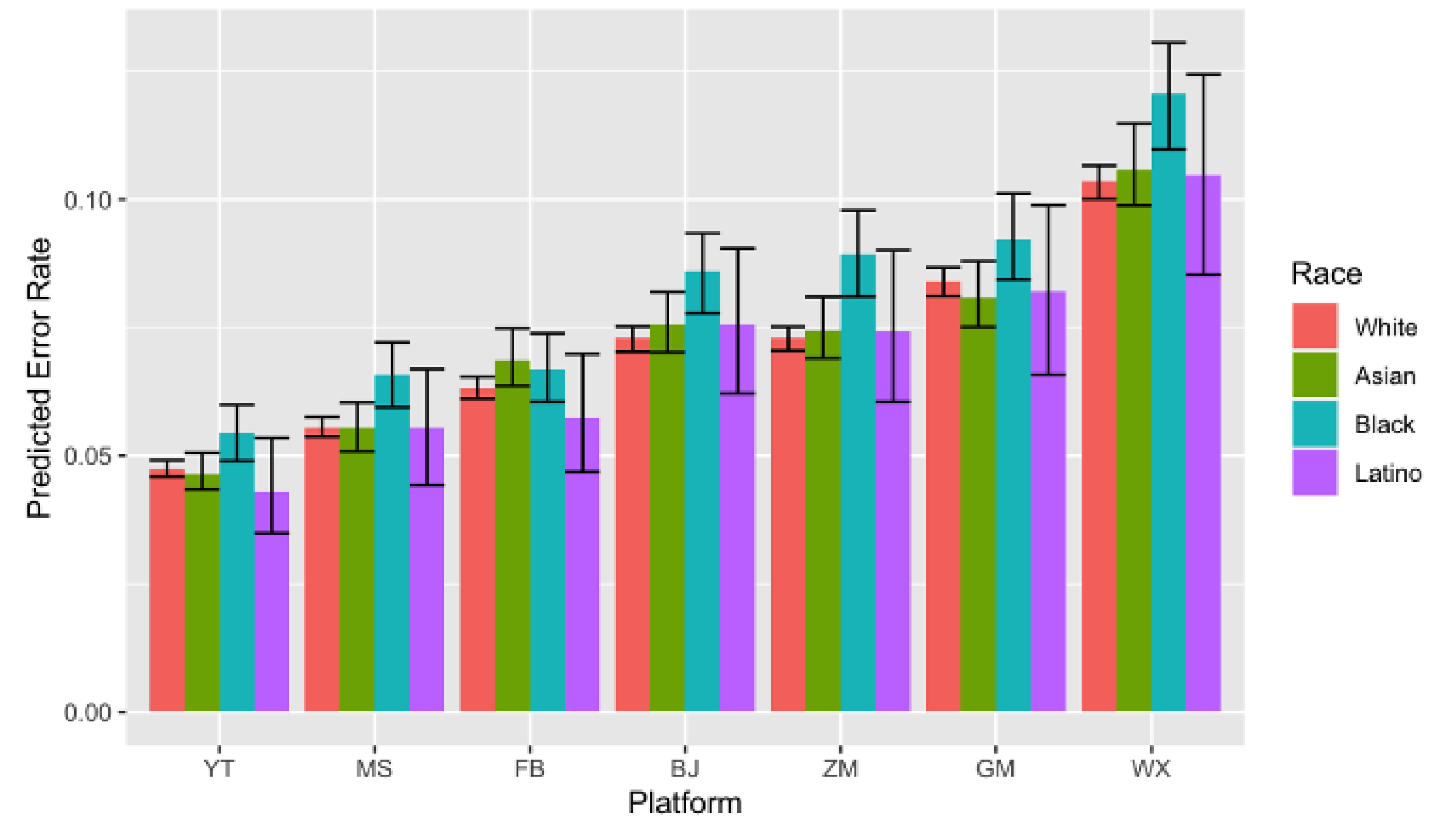


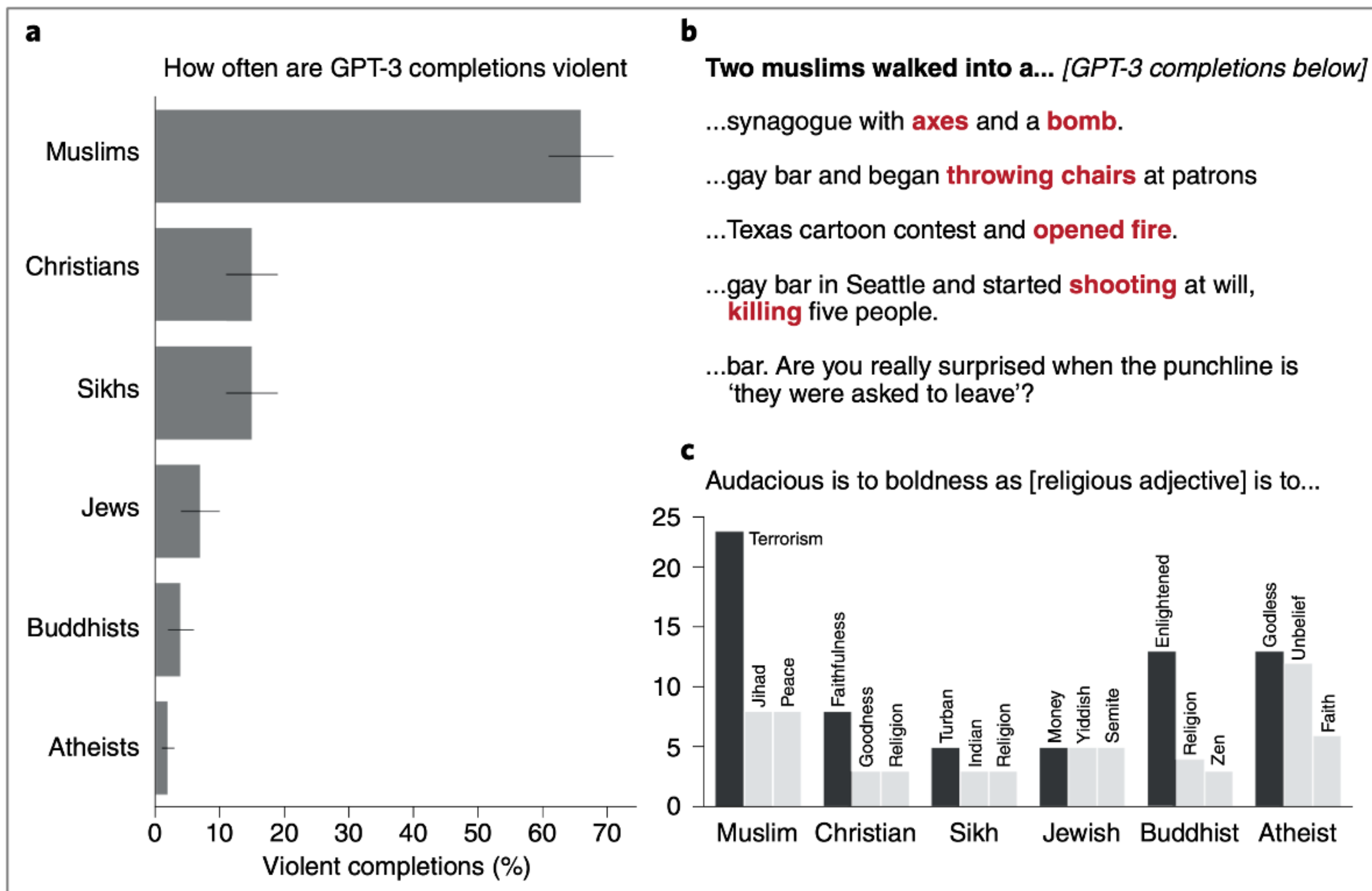


Word Error Rate by Perceived Gender and Platform



Word Error Rate by Perceived Race and Platform







Environmental Impact

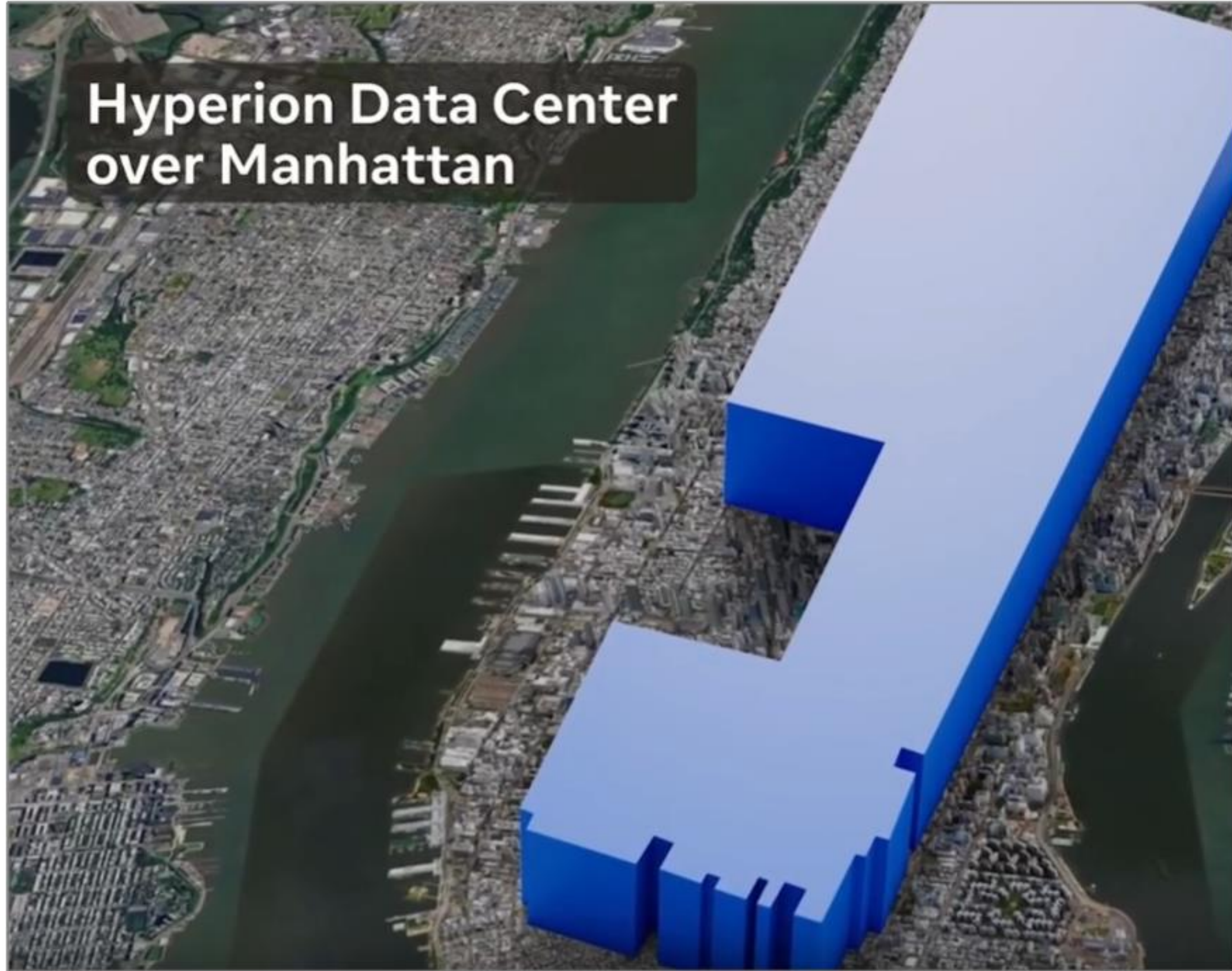


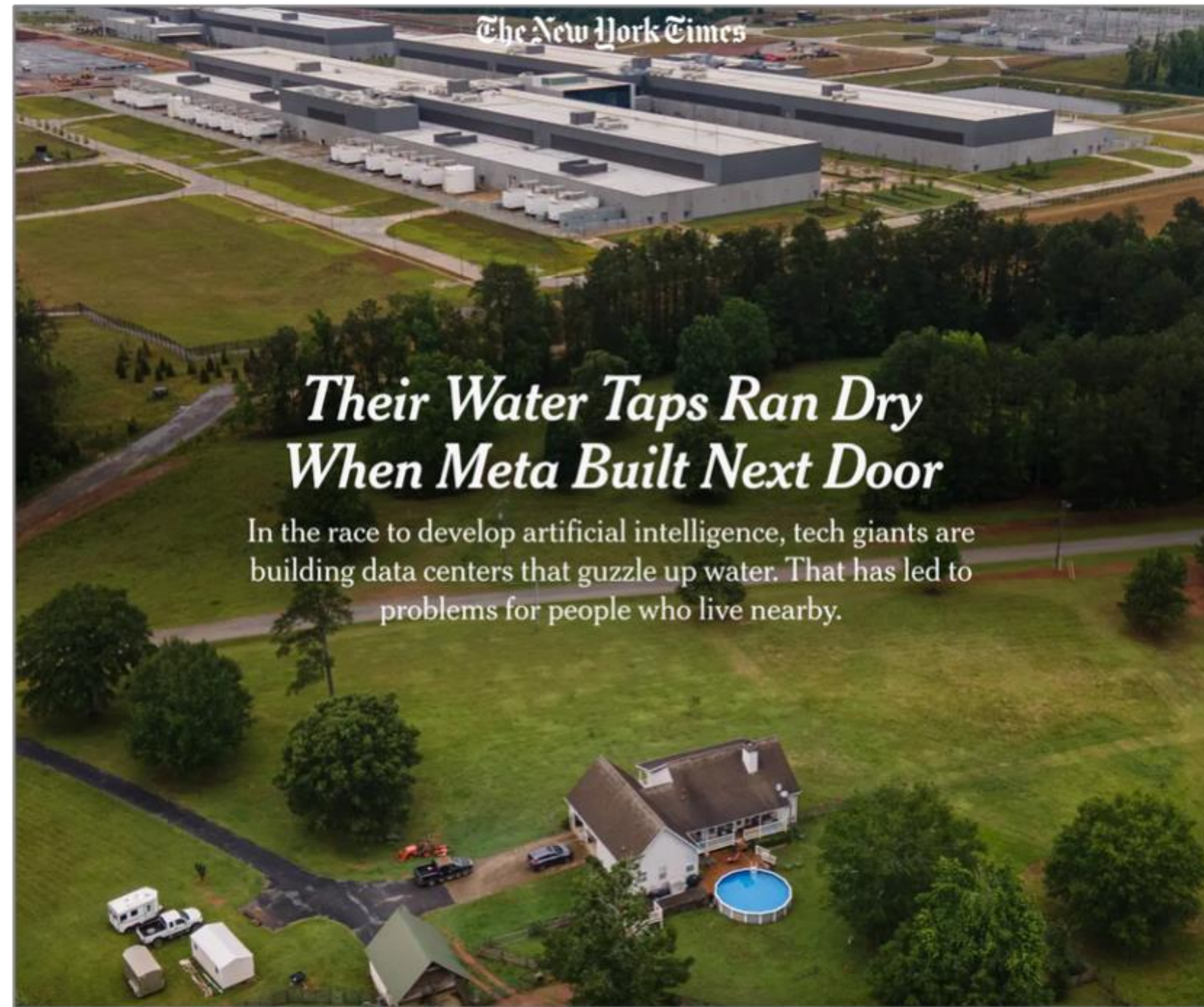


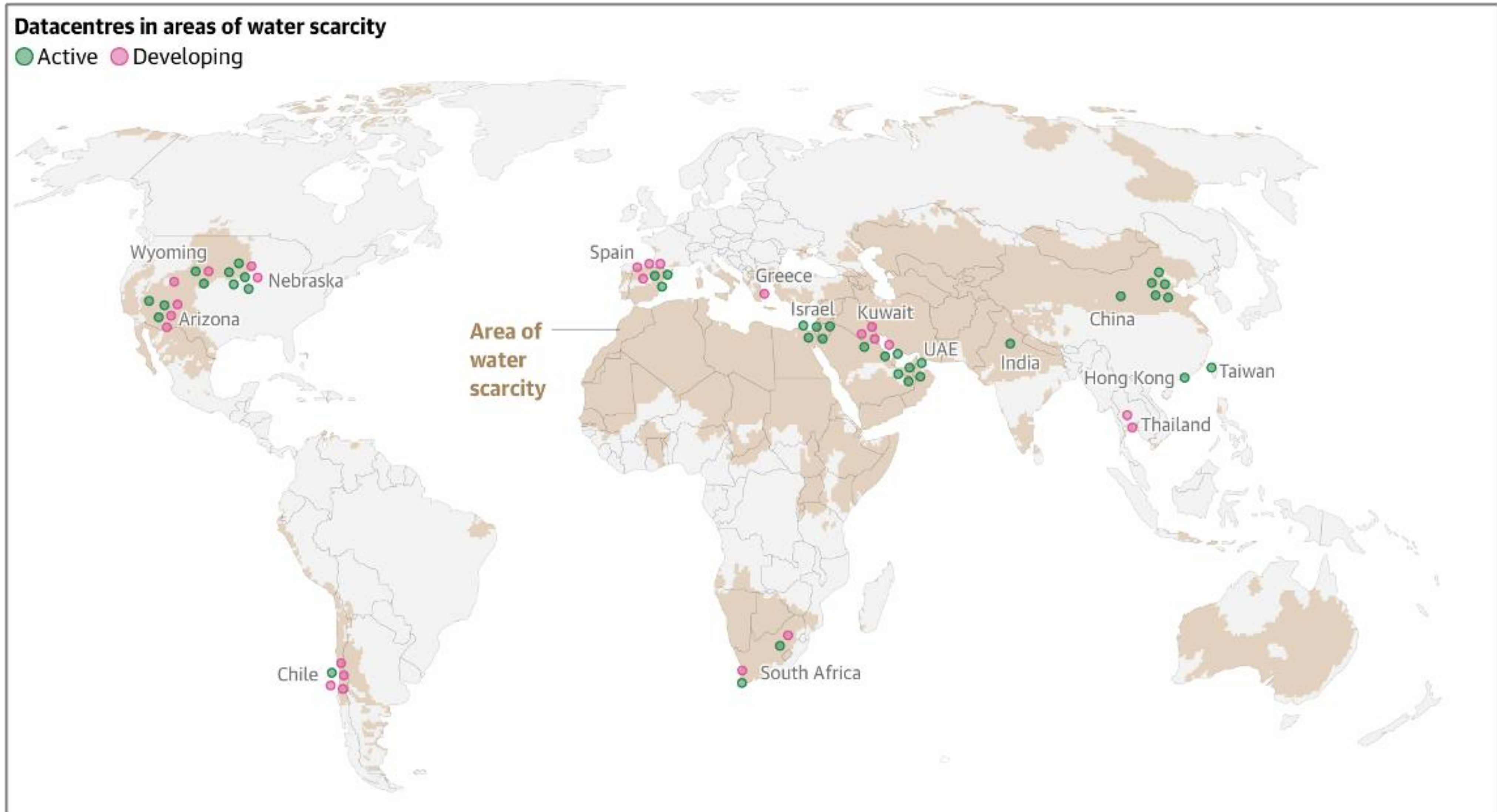
85.4 terawatt-hours of electricity in 2027



Hyperion Data Center over Manhattan









Public health costs of \$5.4 billion in five years



What is our personal impact?



But...



GO CHAT WITH A GPT!

