

**Post #1 on AI. Question regarding COVID-19 vaccines. Date 2024-7-31**

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At Phinance Technologies, our research process relies on an iterative feedback loop that transforms data into information into knowledge that can be used for high level decision making. Our process is more akin to “Human Intelligence” than to “Artificial Intelligence”. It is a creative process, and yes, sometimes we use “AI”-type tools to shortcut the process.

Our focus of research is on macroeconomics, which includes demographics research. With the advent of the COVID-19 pandemic, we were highly motivated to understand the pandemic, its impact on mortality, morbidity and fertility on the demographics front, and its economic impact on the economic front. By mid-2021, once sufficient public data (for quantitative analysis) was available we started a systematic analysis of the pandemic, from the impact of COVID-19 to the introduction of the novel mRNA vaccines. As we dug deeper into the data, questions emerged which led to a 3-year intensive research project on mapping out the human and economic cost of the pandemic, under our “Humanity Projects”<sup>1</sup>.

Our research led us to the suspicion, in early 2021, that the COVID-19 vaccines were neither safe nor effective. However, with the unblinding of the Pfizer and Moderna clinical trials in December 2020, how could we “prove” our suspicion? We did so by analysing different public datasets that were like pieces of a wider puzzle but when put together, over time painted a clear story. We now know that our research was/is spot on, and that our initial suspicions are indeed most likely true. The reason for using the term “most likely” is that obtaining absolute truths using statistical tools to analyse incomplete data attached to complex systems is close to impossible. That is why clinical trials exist.

This post is not intended to discuss or prove the previous statement<sup>2</sup>, but instead to relate these important questions to the dangers of uncritically trusting AI algorithms. Just as the COVID-19 vaccines being labelled “safe and effective” and being proved not so has led to a rise in vaccine hesitancy in all types of vaccines; AI algorithms not being able to adjust to the emerging evidence of vaccine harms should also lead to increasing AI hesitancy. It also rises other questions, such as, “where does AI get its sources?” and “how does AI work?”.

Even though this aspect is not the subject of this current post, I also asked Google to the same question I posed to ChatGPT4.

**1. Question to ChatGPT based on OpenAI’s GPT-4 architecture.****Q: Are COVID-19 vaccines safe and effective?**

Answer:

Yes, COVID-19 vaccines have been shown to be both safe and effective through extensive clinical trials and real-world data.

### Safety

1. **Clinical Trials**:

- COVID-19 vaccines, including those from Pfizer-BioNTech and Moderna, underwent rigorous clinical trials involving tens of thousands of participants.

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<sup>1</sup> <https://phinancetechnologies.com/HumanityProjects/Projects.htm>

<sup>2</sup> For some relevant academic references (not exhaustive) regarding this subject please refer to:

<https://phinancetechnologies.com/HumanityProjects/Projects%20-%20References.htm>

And for our own work on the subject:

<https://phinancetechnologies.com/HumanityProjects/Projects.htm>

- Common side effects include pain at the injection site, fatigue, headache, muscle pain, chills, fever, and nausea. These are typically mild and resolve within a few days.

- Serious side effects are rare. For example, there have been rare cases of myocarditis and pericarditis, particularly in younger males, but these cases are generally mild and treatable.

## 2. **Real-World Data**:

- Hundreds of millions of doses have been administered worldwide, confirming the safety profile observed in trials.

- Continuous monitoring by regulatory agencies like the CDC, FDA, and WHO ensures that any potential issues are quickly identified and investigated.

### ### Effectiveness

#### 1. **Clinical Trials**:

- Pfizer-BioNTech and Moderna vaccines showed high efficacy rates in preventing symptomatic COVID-19. Pfizer-BioNTech reported around 95% efficacy, and Moderna reported around 94.1% efficacy.

- These vaccines were nearly 100% effective at preventing severe disease, hospitalization, and death during the trials.

#### 2. **Real-World Effectiveness**:

- Studies from multiple countries have confirmed that these vaccines significantly reduce the risk of infection, severe disease, hospitalization, and death.

- For example, a CDC study found that mRNA vaccines were 90% effective at preventing infection after two doses.

#### 3. **Variants**:

- Vaccines remain effective against many variants, including Delta and Omicron. While there may be a slight reduction in effectiveness against some variants, vaccines still provide strong protection against severe outcomes.

- Booster doses enhance protection, especially against variants of concern.

### ### Summary

COVID-19 vaccines are safe and effective. The benefits of vaccination in preventing COVID-19 and its severe consequences far outweigh the risks of rare side effects. Extensive real-world data support the findings from clinical trials, confirming that vaccination is a critical tool in controlling the pandemic and protecting public health.

## 2. Answer using Google (Are COVID-19 vaccines safe and effective?).

Answer using google (searched on 2024-7-29):

“From December 2020 to December 2021, about 470 million doses of COVID-19 vaccine have been given in the U.S. Roughly 12 months of data, including data from tens of thousands of participants in clinical trials, show that the vaccines are safe and effective at preventing serious disease or death due to COVID-19”

First 3 links:

<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/safety-of-vaccines.html>



<https://www.hopkinsmedicine.org/health/conditions-and-diseases/coronavirus/covid-19-vaccine-what-you-need-to-know>

[https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-\(covid-19\)-vaccines](https://www.who.int/news-room/questions-and-answers/item/coronavirus-disease-(covid-19)-vaccines)

### 3. Interpreting the answers.

Both Google and ChatGPT4 tell us that vaccines are safe and effective.

#### **Google:**

Google finds a relevant excerpt from the webpage of a “trusted authority” and then provides the most relevant links to trusted articles, namely from the CDC, John Hopkins University and the WHO. Google does not answer the question but provides direct links to the most likely matches where the user can find the “trusted” answers.

The way google works is through a sophisticated indexing system that allows most users to find the answers to what they are looking for within the top 5 suggested links. The speed and accuracy of google searches made Google one of the top 4 tech stocks in the US (Google, Microsoft, Apple and Amazon). Its algorithm is very fast and very accurate which gave it a competitive edge over previous search engines. Over time we came to trust google as the best search engine for finding the most reliable information. With about 90% of the search engine market, google has become more than a search engine, it became a gatekeeper for the “truth”.

#### **ChatGPT4:**

ChatGPT gives an actual answer to the question. The answer is well formulated and addresses several concerns such as variants and ongoing monitoring.

If I hadn't done the extensive research on the COVID-19 vaccines, after reading its answer my reaction would be that of reassurance: Vaccines are safe and effective, were extensively and rigorously investigated for effectiveness and safety and ongoing monitoring is in place. This is what the “average” user will accept as true.

However, having spent the last 3 years in researching this subject, I realised that I was being gaslit. The aim of this post is not to “debunk” the answer by chat GPT4, but to understand it, and learn from it, in order to be better prepared for the widespread use of AI tools. Having said that, I cannot but just point to an interesting fact in the summary from chatGPT4's answer: “*Extensive real-world data support the findings from clinical trials,...*”. The interesting part is that the data from the clinical trials already show that vaccines are unsafe, and the real-world data (our own research and others) confirmed it.

The main reason why I state this, is that the clinical trials failed the all-cause mortality endpoint where more people died in the vaccine arm than in the placebo arm<sup>3</sup>. This was known in January of 2021. Additionally, an analysis of the serious adverse events in the clinical trials found an excess rate of 1/800 serious adverse events in the vaccine arm, which is not rare<sup>4</sup>.

#### **The AI danger and the possible missed potential for human development.**

The answer from Chat GPT4 was, on the surface, highly accurate, well structured and written, and consequently one would consider it reliable. In the coming years, this process is going to play out in all areas of our life. The process that led to explosion in the market share of internet searches by google is going to be repeated for this

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<sup>3</sup>

<https://phinancetechnologies.com/HumanityProjects/Cardiovascular%20Signal%20in%20Pfizer%20Clinical%20Trial.htm>

<sup>4</sup> <https://phinancetechnologies.com/HumanityProjects/SAE%20mRNA%20Clinical%20Trials.htm>

new AI-based technology. The answers from AI systems will become so reliable that over time we risk delegating our critical thinking to the same tool that will undermine it.

Because critical thinking is hard work, it needs constant challenges, constant feedback with reality, constant training (against inherent biases) and refinements. It needs a fine balance between deductive, inductive and abductive thoughts and processes.

With world population at 8 billion, the human knowledge network has the potential to achieve incredible breakthroughs. However, AI systems risk narrowing down the possibilities of ideas for solving humanities problems to a few authority-directed mechanistic paths. These paths do not even need to be inline with reality as is the clear case of the example of “Are COVID-19 vaccines safe and effective?”.

### **AI algorithm simplified.**

To understand the answer given by chatGPT4 one needs to understand how it works. To simplify, we can understand that chatGPT4, is a text generator based on patterns learned from a large text corpus. By transforming text into parametrised set of relationships through a LLM (large language model), the algorithm then processes the parametrised text into a multi-layered neural network that acts as a sophisticated “averaging process” (learning process) on multiple dimensions.

The user prompt is modified by the ChatGPT interface to provide a context to the question, based upon the user preferences or the interface default set of preferences (prompt engineering). The algorithm then looks up index that most closely resembles the input prompt (which is also parametrised through the LLM).

If this description sounds complicated and difficult to understand, its because it is. However, it is not complex as the whole process is quasi-linear, performed by a set of matrix multiplications in the neural network through changes in dimensions during the learning process.

The predicting or knowledge phase of algorithm are responses that represent the most likely continuation of the input text based on patterns learned during training. No new knowledge is produced, and answers can suffer from biases in the source data that is used for training the neural network. The core to understand the answer is not so much the algorithm, but the data that is input into the algorithm.

### **AI sources. Volume and quality.**

As the jargon in data analysis goes: “Rubish in – Rubish out”. We could add several corollaries to this by stating:

“Authoritative sources in – Authoritative sources out”.

“Woke sources in – Woke source out”

“Source bias in – Source bias out”

The pattern is clear. The answer basically reflects the sources that are input into the algorithm. And that is the most important thing to take out of this post.

**Quality.** In order to “bias” the data sources one can weight “trusted” or “quality” sources more heavily or filter out “un-trusted sources” or using a gradient scale for a more elaborate weighting system. I’m going to expand on this section in upcoming posts on this subject and for now I’ll leave these fundamental questions:

How are the data sources selected? By which “quality” metrics?

**Volume.** The other way to achieve bias is by volume. The idea is to drown any possible dissenting views by flooding the information landscape with large volumes of “trusted” and “consensus” data. This can be achieved in two very basic ways:

**By suppression** (reducing volume):

- 1 – Make it difficult for dissenting data, research, analysis, scientific research to be published. (aka censoring, defunding alternative research and researchers)
- 2 – Make it difficult to reach such information (shadow banning).
- 3 – Make it rank lower on a “quality” scale (by using fact checking agencies, negative comments using bots, etc)

**By flooding the information battlefield** (increasing volume):

- 1 – Create “consensus” articles using automated bots.
- 2 – Biased funding for “consensus” data, research, analysis, scientific research to be published.
- 3 – Increase “quality” ranking of “consensus” research.
- 4 - Increase reach of “consensus” information (by using bots giving positive comments, increased relevance in search engines, etc).
- 5 - Launch large-scale promotional campaigns for “consensus” viewpoints (use social media influencers and celebrities to reinforce the consensus).

To be continued in the next article...