

## Antivaccine movement: anti-skepticism, radical skepticism, or denialism?

MARCO MACHADO

Fundação Universitária de Itaperuna (FUNITA) – Itaperuna, RJ, Brazil  
marco@funita.com.br

ORCID: <https://orcid.org/0000-0001-6364-6798>

### Abstract:

*The antivaccine movement is a growing phenomenon that has gained traction in recent years, fueled by misinformation, distrust of authority, and social media. While some proponents of the movement argue that they are simply being skeptical of vaccines, others are accused of engaging in denialism, rejecting the overwhelming scientific evidence supporting vaccination. This essay explores the different perspectives on the antivaccine movement, examining the distinctions between healthy skepticism, radical skepticism, and denialism. It delves into the historical and cultural factors that have contributed to the growth of the antivaccine movement, as well as the potential consequences of vaccine hesitancy and refusal. Finally, the essay considers the ethical implications of the antivaccine movement, including issues of individual autonomy, public health, and social responsibility. Ultimately, this essay argues that while skepticism is a valuable and necessary component of scientific inquiry, denialism undermines the scientific enterprise and poses a significant threat to public health.*

**Keywords:** skepticism; denialism; vaccine; public health; philosophy

### 1 INTRODUCTION:

*“I don't think we did go blind, I think we are blind, Blind but seeing, Blind people who can see, but do not see.” – José Saramago, Blindness*

In recent years, the antivaccine movement has gained considerable attention and has become a topic of much debate and controversy (Larson & Omer, 2019). The movement consists of individuals and groups who are opposed to vaccines, often based on the belief that they are unsafe or ineffective (Betsch et al., 2018; Dubé et al., 2014). Despite overwhelming scientific evidence demonstrating the safety and efficacy of vaccines, the movement continues to gain support, and their efforts have led to decreased vaccination rates in some communities (Kata, 2012).

This essay aims to explore the underlying philosophical positions that may inform the antivaccine movement. Specifically, we will examine whether the antivaccine movement is characterized by anti-skepticism, radical skepticism, or denialism. The central research question guiding this essay is: what philosophical positions underlie the antivaccine movement, and how do these positions contribute to its opposition to vaccines?

Through this essay, we hope to shed light on the philosophical positions that may underlie the antivaccine movement and contribute to a better understanding of this complex and contentious issue (Lewandowsky et al., 2021).

## 2 SKEPTICISM AND ITS ROLE IN SCIENCE

*2.1 Definition of skepticism:* Skepticism is a philosophical position that emphasizes the importance of doubt, critical inquiry, and questioning of claims and beliefs. Skepticism has a long history in Western philosophy, dating back to ancient Greece, where philosophers such as Pyrrho and Sextus Empiricus developed skeptical approaches to knowledge (Skepticism, n.d.).

### *2.2 Historical development of skepticism*

Skepticism has evolved, with different philosophers and movements emphasizing different aspects of skepticism. In the modern era, the scientific revolution of the 17th century brought about a new form of skepticism known as scientific skepticism, which is concerned with evaluating scientific claims and evidence (Klein, 2015).

### *2.3 The Role of Skepticism in Science*

Skepticism plays a critical role in science, where claims and hypotheses are subjected to rigorous testing and evaluation. Scientific skepticism involves evaluating evidence and arguments systematically and objectively, with a willingness to revise or abandon hypotheses that do not hold up to scrutiny. The scientific method is grounded in skepticism, with scientists using empirical evidence to support or refute hypotheses, and peer review serving as a mechanism for evaluating the validity and reliability of scientific research (Kuhn, 1970; Popper, 1959; National Academy of Sciences, 2017; Giere, 2010).

In the next Topic, we will explore different types of skepticism and their relationship to the antivaccine movement. By understanding the role of skepticism in science and philosophy, we can gain a deeper understanding of the issues at play in the debate over vaccines.

## 3 TYPES OF SKEPTICISM

### *3.1 Definition and explanation of different types of skepticism*

There are several types of skepticism, each with its distinct approach and philosophical outlook. Some of the most significant types of skepticism include radical skepticism, scientific skepticism, and philosophical skepticism.

- *Radical skepticism:* Radical skepticism is a form of skepticism that takes doubt and skepticism to an extreme level. Radical skeptics doubt the existence of all knowledge and reject the possibility of knowing anything with certainty. Radical skeptics may argue that even basic perceptual beliefs, such as the belief that objects in the world exist, cannot be known with certainty (Descartes, 1641; Hume, 1748).

- *Scientific skepticism:* Scientific skepticism is a form of skepticism that is concerned with evaluating scientific claims and evidence. Scientific skeptics emphasize the importance of empirical evidence and the scientific method in evaluating claims and hypotheses. Scientific skepticism is focused on evaluating evidence systematically and objectively, with a willingness to revise or abandon hypotheses that do not hold up to scrutiny (Klein, 2015; National Academy of Sciences, 2017).

- *Philosophical skepticism:* Philosophical skepticism is a broad term that encompasses a range of skeptical positions within philosophy. Philosophical skeptics may be concerned with the limits of knowledge, the reliability of sense perception, or the nature of reality. Philosophical skepticism is often characterized by a critical and questioning approach to claims and beliefs (Popkin, 1960).

## 4 ORIGINS AND CHARACTERISTICS OF THE ANTIVACCINE MOVEMENT

### 4.1 *Historical Overview of the antivaccine movement*

The antivaccine movement has its roots in the early history of vaccination, with opposition to vaccines dating back to the smallpox vaccine in the 19th century. (Levine, 2017) In recent years, the movement has gained new momentum, fueled by a variety of factors, including misinformation, distrust of authority, and a cultural backlash against vaccines. (Dubé et al., 2013)

### 4.2 *Key Characteristics of the antivaccine movement*

The antivaccine movement is characterized by a rejection of scientific evidence and expertise, a mistrust of government and medical authorities, and a reliance on anecdotal evidence and personal beliefs. Antivaccine activists often promote conspiracy theories and argue that vaccines are harmful or unnecessary. (Kata, 2012)

### 4.3 *The relationship between the antivaccine movement and skepticism*

The antivaccine movement has been described as both anti-skeptical and skeptical in nature. On the one hand, the movement is characterized by a rejection of scientific evidence and expertise, which can be seen as a failure to engage in critical inquiry and skepticism when evaluating claims about vaccines. (Dubé et al., 2013)

On the other hand, the movement may also be seen as a form of philosophical skepticism, as it involves questioning the reliability and trustworthiness of scientific claims and evidence. Some antivaccine activists argue that the scientific method itself is flawed and that alternative forms of evidence, such as personal anecdotes or intuitive beliefs, should be given equal weight in evaluating claims about vaccines. (Hotez, 2017)

### 4.4 *The increase of the antivaccine movement*

The antivaccine movement has had a significant increase in public health, with outbreaks of preventable diseases such as measles and pertussis occurring in areas with low vaccination rates. The movement has also contributed to a broader erosion of trust in scientific expertise and evidence-based medicine. (Dubé et al., 2013)

## 5 ANTI-SKEPTICISM AND THE ANTIVACCINE MOVEMENT

### 5.1 *The role of anti-skepticism in the antivaccine movement*

The antivaccine movement can be understood as a form of anti-skepticism, in which individuals reject scientific evidence and expertise in favor of anecdotal evidence, personal beliefs, and conspiracy theories. This rejection of skepticism can be seen as a failure to engage in critical inquiry and to question claims and evidence (Kata, 2010).

### 5.2 *The dangers of anti-skepticism*

Anti-skepticism can be a dangerous force in society, as it allows misinformation and pseudoscience to gain a foothold and potentially harm individuals and communities. In the context of vaccines, anti-skepticism can lead to decreased vaccination rates, which in turn can lead to outbreaks of preventable diseases (Offit, 2018).

### 5.3 *Addressing anti-skepticism*

Addressing anti-skepticism may require a combination of different strategies, including improving scientific education and communication, engaging with communities and cultural groups, and working to build trust in scientific expertise and evidence-based

medicine. One potential approach is to promote critical thinking and scientific literacy, both in schools and in the wider community. This may involve teaching individuals how to critically evaluate claims and evidence, and how to distinguish between credible scientific information and pseudoscience (National Academies of Sciences, Engineering, and Medicine, 2017).

Another approach is to engage with the underlying societal factors that contribute to anti-skepticism, such as political beliefs and cultural attitudes. This may involve working to build trust and relationships with communities that are skeptical of scientific expertise and developing targeted interventions that address specific concerns and beliefs (Dubé et al., 2015).

#### *5.4 The importance of a skeptical approach to vaccines*

Finally, it is important to emphasize the role of skepticism in evaluating claims and evidence about vaccines. While skepticism can sometimes be misused to reject credible scientific evidence, it is a necessary tool for evaluating claims and ensuring that decisions about vaccines are based on accurate and reliable information.

By promoting a healthy skepticism about vaccines, and by encouraging individuals to engage in critical inquiry and evaluation of claims, we can work to counteract the dangerous influence of anti-skepticism in the antivaccine movement.

## **6 RADICAL SKEPTICISM AND THE ANTIVACCINE MOVEMENT**

### *6.1 Definition of radical skepticism*

Radical skepticism is a philosophical position that emphasizes the limitations of human knowledge and the need for rigorous epistemological standards. Radical skeptics argue that knowledge claims should be subject to constant questioning and skepticism and that no belief can be accepted as certain or beyond doubt (Goldacre, 2021).

### *6.2 Discussion of how radical skepticism relates to the antivaccine movement*

The antivaccine movement can be seen as a form of radical skepticism, in which individuals reject scientific evidence and expertise in favor of their own beliefs and anecdotal evidence. This rejection of authority and expertise can be seen as a form of epistemic nihilism, in which all knowledge claims are viewed as equally suspect and subject to doubt (Offit, 2018).

The rejection of scientific evidence and expertise is particularly troubling in the context of vaccines, as it can lead to decreased vaccination rates and the spread of preventable diseases. It also undermines trust in scientific expertise and evidence-based medicine, which can have broader implications for society as a whole (Offit, 2018).

### *6.3 Examination of the antivaccine movement's rejection of all authority and expertise, including scientific expertise*

The rejection of scientific expertise and authority is a common feature of the antivaccine movement. Some individuals may reject scientific evidence because they believe that experts are biased or corrupt, or because they have a general distrust of authority figures" (Offit, 2018).

However, the rejection of scientific expertise is problematic because it fails to distinguish between credible and non-credible sources of information. Scientific expertise is based on rigorous training, peer-review, and empirical evidence, and is a reliable source of knowledge about vaccines and their safety and efficacy" (Offit, 2018).

The antivaccine movement's rejection of scientific expertise can also be seen as a form of epistemic arrogance, in which individuals believe that their own beliefs and experiences are more valid than the collective knowledge of scientific experts (Offit, 2018).

#### *6.4 Implications for addressing radical skepticism in the antivaccine movement*

Addressing radical skepticism in the antivaccine movement may require a nuanced and multifaceted approach. This may involve engaging with individuals in a respectful and empathetic manner, while also emphasizing the importance of scientific evidence and expertise (Offit, 2018).

One approach is to improve vaccine education and communication, by providing clear and accurate information about vaccines and addressing common misconceptions and concerns. This may involve using trusted messengers, such as healthcare professionals or community leaders, to deliver information in a culturally sensitive and effective way (Dubé et al., 2013).

Another approach is to address the underlying social, cultural, and political factors that contribute to radical skepticism and epistemic nihilism. This may involve working to build trust in scientific expertise and evidence-based medicine, while also addressing broader societal issues such as political polarization and distrust of authority figures (Offit, 2018).

Ultimately, addressing radical skepticism in the antivaccine movement requires a concerted effort from individuals, communities, and policymakers. By working together to promote accurate and reliable information about vaccines, and by emphasizing the importance of scientific evidence and critical inquiry, we can help to ensure that vaccines remain a safe and effective tool for protecting public health and preventing the spread of infectious diseases (Dubé et al., 2013).

## **7 DENIALISM AND THE ANTIVACCINE MOVEMENT**

### *7.1 Definition of Denialism*

Denialism is a phenomenon in which individuals or groups reject established facts or evidence in favor of their own beliefs or ideologies. Denialism is characterized by the rejection of scientific evidence, expert opinion, or consensus views in a given field (Broomell & Kane, 2017).

### *7.2 Discussion of how denialism relates to the antivaccine movement*

The antivaccine movement can be seen as a form of denialism, in which individuals reject the overwhelming scientific evidence that vaccines are safe and effective. Some individuals in the movement deny the existence of vaccine-preventable diseases or downplay their severity, while others promote conspiracy theories about vaccines or vaccine safety (Dubé et al., 2014; Larson et al., 2014).

The rejection of scientific evidence and expert opinion by the antivaccine movement can be seen as a form of ideological or motivated reasoning, in which individuals reject evidence that conflicts with their pre-existing beliefs or values (Lewandowsky et al., 2013).

### *7.3 Examination of the harms caused by denialism in the context of vaccines*

The harms caused by denialism in the context of vaccines are significant. Denialism can lead to decreased vaccination rates and the spread of preventable diseases, resulting in illness, disability, and death. It can also undermine public trust in scientific expertise

and evidence-based medicine, leading to a broader mistrust of public health interventions and medical treatments (Hotez, 2017).

The harm caused by denialism is not limited to individuals who reject vaccines themselves but also extends to those who are unable to receive vaccines due to medical reasons, such as allergies or immunocompromised conditions. When vaccination rates fall below a certain threshold, herd immunity is compromised, and the risk of disease outbreaks increases for the entire community (Salmon et al., 2015).

#### *7.4 Implications for addressing denialism in the antivaccine movement*

Addressing denialism in the antivaccine movement requires a multi-faceted approach. One approach is to provide accurate and evidence-based information about vaccines, in a clear and accessible manner. This may involve using trusted messengers, such as healthcare professionals or community leaders, to deliver information in a culturally sensitive and effective way (Dubé et al., 2014).

Another approach is to address the underlying psychological and social factors that contribute to denialism. This may involve improving critical thinking skills and promoting scientific literacy, while also working to build trust in scientific expertise and evidence-based medicine (Lewandowsky et al., 2013).

It may also be necessary to address the political and ideological factors that contribute to denialism in the antivaccine movement. This may involve engaging with individuals and communities in a respectful and empathetic manner, while also promoting a culture of collaboration and constructive dialogue (Hotez, 2017).

Ultimately, addressing denialism in the antivaccine movement requires a concerted effort from individuals, communities, and policymakers. By working together to promote accurate and reliable information about vaccines, and by emphasizing the importance of scientific evidence and critical inquiry, we can help to ensure that vaccines remain a safe and effective tool for protecting public health and preventing the spread of infectious diseases.

## **8 DISCUSSION: ANTI-SKEPTICISM, RADICAL SKEPTICISM, AND DENIALISM IN THE ANTIVACCINE MOVEMENT**

In this essay, we have explored the various forms of skepticism present in the antivaccine movement. We have discussed anti-skepticism, radical skepticism, and denialism, and how each of these phenomena relates to the movement's rejection of the overwhelming scientific evidence that vaccines are safe and effective.

In Topic 5, we explored the concept of anti-skepticism and how it manifests in the antivaccine movement. We noted that anti-skeptics reject scientific evidence in favor of personal beliefs or ideologies, and often engage in conspiracy theories or the rejection of expert opinion. In the context of vaccines, anti-skepticism can be seen in the rejection of the consensus view that vaccines are safe and effective, and the promotion of alternative treatments or therapies with little or no scientific evidence.

In Topic 6, we examined radical skepticism and how it relates to the antivaccine movement. We defined radical skepticism as the rejection of any sources of authority or expertise, including scientific expertise. We noted that individuals who hold radical skeptical views may be more likely to reject established scientific evidence in favor of their own beliefs or values, and may be more susceptible to conspiracy theories or misinformation. In the context of vaccines, radical skepticism can be seen in the rejection of expert opinion or the promotion of alternative or unproven treatments.

In Topic 7, we explored the concept of denialism and how it manifests in the antivaccine movement. We defined denialism as the rejection of established facts or evidence in favor of personal beliefs or ideologies. We noted that individuals who engage in denialism may reject scientific evidence or consensus views in a given field, and may promote conspiracy theories or misinformation. In the context of vaccines, denialism can be seen in the rejection of the overwhelming scientific evidence that vaccines are safe and effective, and the promotion of misinformation or conspiracy theories about vaccines.

It is clear from our analysis that the antivaccine movement is characterized by a complex interplay of different forms of skepticism, including anti-skepticism, radical skepticism, and denialism. While these forms of skepticism differ in important ways, they all share a fundamental rejection of established scientific evidence and expert opinion.

The harms caused by the antivaccine movement's rejection of scientific evidence are significant, as noted in Topic 7. When vaccination rates fall below a certain threshold, herd immunity is compromised, and the risk of disease outbreaks increases for the entire community. This can lead to illness, disability, and death, and undermines public trust in scientific expertise and evidence-based medicine.

Addressing the various forms of skepticism present in the antivaccine movement requires a multi-faceted approach, as discussed in Topic 7. This may involve providing accurate and evidence-based information about vaccines, engaging with individuals and communities in a respectful and empathetic manner, and promoting critical thinking skills and scientific literacy. It may also involve addressing the political and ideological factors that contribute to denialism in the antivaccine movement and working to build trust in scientific expertise and evidence-based medicine.

In conclusion, the antivaccine movement represents a significant challenge to public health and scientific expertise. The movement's rejection of established scientific evidence and expert opinion is driven by a complex interplay of different forms of skepticism, including anti-skepticism, radical skepticism, and denialism. Addressing these forms of skepticism requires a concerted effort from individuals, communities, and policymakers, to promote accurate and reliable information about vaccines, and to emphasize the importance of scientific evidence and critical inquiry.

### *8.1: Final Thoughts*

According to Aristotle's concept of the golden mean, there is a balance to be found between extremes. In the case of skepticism, the golden mean suggests that healthy skepticism lies in between two extremes: complete acceptance of everything presented without question and complete rejection of everything presented without concrete proof. When applied to the antivaccine movement, healthy skepticism involves a critical evaluation of the available evidence and expert opinions without outright rejection or blind acceptance. However, when skepticism turns into denialism, it can have dangerous and harmful consequences, leading individuals to reject overwhelming scientific evidence and putting their health and the health of their communities at risk. The golden mean encourages us to seek a balance that allows for critical thinking and questioning of information, while also remaining open to new ideas and evidence-based solutions. By following this approach, we can ensure that skepticism is used constructively, promoting progress and innovation, rather than leading to harmful denialism.

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