

Scientific Denialism during the Covid-19 Pandemic: Science, Policy and Ethics

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Abstract

This review seeks to evaluate certain aspects of “*healthcare governance*” during the Covid 19 pandemic, in particular the damage caused by policies based on unscientific views. Indeed, in addition to a health crisis, the pandemic coincided with a crisis of *global governance* that undermined scientific medicine, health systems and the communication of scientific data. This was partly driven by scientific denialism, exhibited most prominently by then-US president Donald Trump, with disastrous results in terms of health policy. Here we examine articles appearing in *Science*, *N Engl J Med*, *Sci Am* and *Front Public Health* that adopt a political stance against such denialism, breaking with their traditional neutrality. The analysis addresses the effects of the pandemic on health systems and the general population, as well as on the ways in which science is produced and applied, together with its contradictions. It looks at how political and economic considerations resulted in inconsistent and contradictory models of scientific development that were to have disastrous effects on citizens’ health. In response to scientific denialism and the damage it can cause, we commend the OECD report entitled *PISA 2018 Assessment and Analytical Framework*, which highlights the role of education in the development of scientific literacy in the younger generations. We also consider the work of the *American Association for the Advancement of Science* (AAAS), which recognises and celebrates the value of science in ensuring accessibility to knowledge and scientific endeavour in society. Our analysis suggests that scientific knowledge should be a fundamental tenet, equal to that of individual freedom, of political governance. In this way, health policies can respond more adequately to global threats.

Keywords

Healthcare Governance, Scientific Denialism, Scientific Ethics, Liberalism, The American Association for the Advancement of Science (AAAS), PISA 2018

1. Introduction: The Covid-19 Pandemic and Scientific Denialism

COVID-19 will be remembered for many things, but the pandemic it gave rise to will be remembered because it changed the dynamics of scientific practice and communication and health policy. The pandemic provided a stimulus for new skills and scientific discoveries and science-driven cultural developments, but it was also characterised by the failure of the health response as a result of the incompetence of certain political decision-makers, itself partly driven by scientific denialism. Scientific denialism is defined as “*the employment of rhetorical arguments to give the appearance of legitimate debate where there is none, an approach that has the ultimate goal of rejecting a proposition on which a scientific consensus exists*” (Diethelm & McKee, 2009, citing Hoofnagle & Hoofnagle, 2007).

From late 2019, when severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), responsible for the disease (COVID-19) first appeared in Wuhan, China (Carvalho et al., 2021), until December 2020, when the *Pfizer/BioNTech vaccine* was approved by the *Food and Drug Administration* (FDA) of the United States, the only measures available to governments for limiting the spread of the virus were diagnostic tests, tracing, isolation, obligatory masks and social distancing, as recommended by the *World Health Organisation* (WHO). In hindsight, the responses to the COVID-19 pandemic of liberal-democratic governments, which mainly required good organisation and communication with the citizens, often arrived too late to prevent the spread of the virus and above all they seemed disorderly and not wholly effective. Each government implemented its own health strategy with little international coordination, which in some cases led to difficult situations, as in Sweden, where the government did not introduce lockdowns. Retrospective analyses (Wang et al., 2022) put the number of deaths from Covid-19 in 2020-21 at 18.2 million.

The broad differences in risk assessment and control strategies implemented by the various governments cannot be attributed to a lack of scientific information, which, on the contrary, was readily available to all governments throughout the crisis. Information on the growth of the epidemic and on potential control methods was shared in real time by the main international scientific periodicals and by the WHO, which provided training and technical assistance via its Open WHO platform. It also sent experts via its *Global Outbreak Alert and Response Network* (GOARN) and the *Public Health Emergency Operations Centre Network* (EOC-NET) (Kuznetsova, 2020).

In some cases, most notably the United States, the reluctance of politicians to coordinate and implement the necessary measures arose from a long-standing ideological aversion to collective action and resistance to the notion of experts dictating policy in the cause of the common good, as opposed to politicians catering for specific constituencies or interests. Many authors have noted the “*strong connection [of scientific denialism] with various forms of right-wing*

politics’ (Hansson, 2017), including the rejection of the scientific consensus on pollution and climate change, which had characterised Trump’s approach even before the start of the Covid-19 pandemic. Indeed, Trump sought to override the health rules of the *Environmental Protection Agency* (EPA or USEPA), putting people at greater risk of cardiac and pulmonary diseases caused by pollution and viral infection. He replaced many scientists on the consultative committees of scientific agencies with representatives from the worlds of industry, business and finance. In his continuous denial of reality, Trump obstructed the United States policies on climate change, falsely arguing that there was no climate crisis and withdrawing from international accords designed to mitigate it.

As noted by the *Science* (Editorial, 2020a), for a long time President Trump also denied the danger of the Covid-19 pandemic, initially prohibiting the use of masks, and promoted hydroxychloroquine as effective for both the treatment and prevention of COVID-19 with no scientific proof. President Trump posted a video on Twitter that promoted a drug whose efficacy against COVID-19 had not been demonstrated (Tanne, 2020). Lastly, President Trump and his administration also publicly attacked the credibility of various federal agencies including the *Food and Drug Administration* (FDA) and the *Centers for Disease Control and Prevention* (CDC). Anthony Fauci, director of the *National Institute of Allergy and Infectious Diseases* (NIAID), and Deborah Birx, coordinator of the coronavirus task force set up by the White House, strongly emphasised the need to wear masks as a preventative measure against infection, but it was not until long after the beginning of the pandemic that the president endorsed their use, reversing his previous position (*Nat Biotechnol.*, Editorial, 2020b). This discrediting of the science and denial of the threat had effects on public health, and Donald Trump showed that he had little interest in science-based policy or in following scientific health norms. Of course, his political decisions arose from the need to ensure rapid economic recovery after the lockdown and to gain electoral support. His policies thus sought to reduce the independence of federal agencies such as the prestigious *Food and Drug Administration* (FDA), his attacks becoming increasingly frequent, affirming the primacy of the economy over public health. Some authors estimate that his denialist policies may have been responsible for 40% of Covid-19-related mortality in the United States in the years 2020-2021 (Woolhandler et al., 2021).

The hesitation (or downright belligerence) of political leaders with respect to the recommendations of scientific medicine was tackled by the editors of the prestigious *New England Journal of Medicine* (Editorial, 2020c) and *Scientific American* (Editorial, 2020d), who broke with their long-standing political neutrality to call for a vote against Donald Trump and his policies, accusing him of undermining public confidence in science and public institutions concerned with health and science. In the broader international context, many scientists accused political leaders of being incapable of controlling the epidemic (regarding the Italian government and the WHO, see the case of Francesco Zambon and

Ranieri Guerra), and they hoped that the democratic process would resolve the problem See

<https://it.euronews.com/2020/12/22/covid-in-italia-rapporto-censurato-dall-oms-tedros-sapeva>).

2. Liberalism and Scientific Competence: A Troubled Relationship?

Global threats require a coordinated international response by the various states, which is possible only if such threats are perceived in the same way by all the parties and if governments have similar priorities. The effectiveness of the response relies on adequate policy information and citizens' full compliance with the health measures imposed, which in turn requires confidence in the government. Our hypothesis is that certain fundamental characteristics of liberalism, such as the neutrality of the state and the primacy of the individual, not to mention *an inherent suspicion of government itself*, complicate global and collective health responses. With its rigorous respect for individual liberties and private interests, western liberalism has not always been a champion of collective action and sacrifice to ensure the common good.

In this rapidly evolving health and political crisis, following the news about discoveries made by the scientific community directly on social media has become more important than ever, but many western political leaders and heads of state have not been paying sufficient attention, inflicting great damage on science. Some, such as Donald Trump, have preferred to act directly and arbitrarily, bringing the flow of scientific and health information under their political control and applying it to society in a strictly personal way. Science however should never be subordinated to political and economic power. It is a democratic process linked to the fundamental values of the individual and a free society (Muraille, 2019).

The SARS-CoV-2 vaccine arrived in record time despite all the technical and biotechnological difficulties. In the meantime, however, many lives could have been saved if the political and social messages on scientific discoveries had been correct in terms of the risks and complications. Moreover, they should have been clearer and should have been issued sooner (Muraille et al., 2022). Everybody agrees that the COVID-19 vaccines were developed so quickly because a series of scientific sectors that had long been starved of funding for basic research were suddenly reactivated as a result of new political priorities. Science that is useful for the improvement of the human condition comes from below, driven by society's social and economic needs, and it must aim upwards in the observance and application of universal ethical and social values (Hassan et al., 2021).

Another aspect that emerges strongly is the difficulty in interpreting scientific data in terms of their broader epistemic complexity and thus their use and abuse regarding the policies adopted to tackle pandemics. Indeed, in the name of "data", personal freedoms are suspended and social and economic relationships

are frozen, while pharmacological and other treatments are administered or withheld (and the amount of public money invested in research is determined) on the basis of patients' chances of survival. For medicine, "*scientific evidence*" is an open and complex epistemic question, whose interpretation is subject to moral, legal and thus political considerations (Pagel & Yates, 2021).

This situation has resulted in social and political conflicts that are slowly leading to the impaired communicability and paralysis of knowledge, with serious repercussions for the democratic system and ethical values (Boschele, 2021).

3. The Social and Ethical Value of Science

In this difficult post-pandemic era, far from diminishing individual freedoms, sound information and scientific knowledge will *increase* them, because they increase concreteness and justness in practical decisions. In other words, good science is able to resolve the problems of society and individuals' daily lives. We argue that the properly directed and democratically controlled use of scientific knowledge increases individual freedom in the sense that by means of scientific knowledge, citizens become harder to manipulate. From a regulatory and legislative point of view, the functioning of science within the organisation of western societies needs to be guided by a "*libertarian*" approach, understood as a *practical democratic method rather than a political ideology*" (Cruft, Liao, & Renzo, 2015). Science needs to be seen as a liberal-democratic ethical value, embracing respect for both the freedom of knowledge and citizens' rights in political and social strategies and decision-making. Scientific knowledge must therefore aim to improve human beings' conditions of life by broadening the range of available human and social choices and enabling new lifestyles by continuously transforming life into a field of new possibilities.

Our objective is to make known and disseminate scientific culture, in the broadest and most effective way possible, and to make good use of reflection and current scientific research in order to share it with citizens, their political representatives and economic exponents. This will foster greater familiarity with scientific data among common citizens, in line with strategies designed to improve the quality of life of the community (Dove, Barlas, Birch et al., 2015). This does not mean that everyone will have to become an expert in scientific disciplines. However, the aim is to ensure that the greatest possible number of people possess the rudiments of knowledge on which to base informed choices and understand that the equilibrium of the biological and climatic ecosystem and the health and survival of the planet and future generations depend on their actions (*Nat. Cell Biol., Editorial*, 2018). Scientific culture is important because it makes citizens aware of themselves, the reality of their bodies and the natural world that surrounds them. At the heart of our scientific interests are climate change and human health, and the relative social and industrial applications (Terry, 2019). The governments of the world need to ensure that this type of scientific competence is thoroughly disseminated among the younger generations. Inter-

esting in this regard is the report entitled “PISA 2018, *Assessment and Analytical Framework*” (OECD), which highlights the need to develop suitable approaches to the teaching of science and technology. Aimed at political decision-makers, it also stresses the need to shape scientific thought in such a way as to create aware citizens who are able to scientifically explain the phenomena they encounter. Science unfolds via assessment and planning of research: it entails describing and evaluating scientific research and proposing ways of tackling problems scientifically; interpreting data and evidence scientifically by analysing and evaluating the results obtained; presenting arguments in a variety of ways; and lastly drawing appropriate scientific conclusions. Science sets us free because the scientific method of observing reality prompts us to look at the world from a critical standpoint, to seek solutions to problems, testing them and analysing what we have done: in other words, to be aware of what is not right and to look beyond our assumptions. See *PISA 2018 Assessment and Analytical Framework* See (<https://read.oecd.org/10.1787/b25efab8-en?format=pdf>) and an analysis of the findings of a previous PISA report by Italian educationalists, *INDAGINE OCSE PISA 2015: I RISULTATI DEGLI STUDENTI ITALIANI IN SCIENZE, MATEMATICA E LETTURA*.

In the USA, science is promoted by the *American Association for the Advancement of Science* (AAAS), which recognises and celebrates the accessibility, diversity, equity and inclusion that science brings to scientific knowledge and scientific endeavour in society. AAAS’s mission is to promote science, engineering and innovation throughout the world for the benefit of all citizens. Promoting science, at the service of society, is the fundamental objective (<https://www.aaas.org/mission>).

Ever since its foundation in 1848, AAAS has held regular meetings, in which a range of themes regarding science and its relationship with politics and society are explored. AAAS champions human rights, of which science constitutes an ethical pillar. Indeed, the human right to science and knowledge is set out in the Universal Declaration of Human Rights (*Article 27*). AAAS seeks to ensure the progress of science and to serve society by means of science policy initiatives, diplomacy and support for scientists’ careers. The United Nations’ Committee on Economic, Social and Cultural Rights has recognised science as an individual right on the same level as economic, social and cultural rights. In 2020 it published *General Comment No. 25* on science and economic, social and cultural rights. These rights are set out in article 15 of the *International Covenant on Economic, Social and Cultural Rights* (ICESCR), which affirms “*the right of everyone... to enjoy the benefits of scientific progress and its applications*”. As we face the impacts of climate change, COVID-19 and the growing political and economic threats against science and scientists, the AAAS maintains a positive outlook and promotes a vision of a world in which “the benefits of scientific progress” can truly be enjoyed by all citizens.

The new *ethical duty* of scientists, i.e., to make clear to policymakers what is

best for the good of society, emerged with great force during the pandemic. Those policymakers in turn have a duty to ensure that adequate science funding is allocated from national budgets and that resources are invested in scientific research for the good of all (Wong, 2020). Today, the main objective of policies to apply the findings of science to society is to improve public health services via the analysis of costs, performance and universal access. This is clearly a technical task that involves analysing the various issues and aspects concerning the implementation of services as part of the public health system. This entails evaluating the problems arising from the integration of the various health systems; analysing the organisational factors that influence health performance; conducting studies of the cost-effectiveness of diagnostic and therapeutic medical systems; and identifying changes to health policy on the basis of scientific research that increase collective well-being.

In addition, it is necessary to raise awareness among scientists of the importance of the ethics of scientific research, which is essential to its quality; to promote ethical conduct in all phases of the research; to adopt suitable tools for the preliminary identification of ethical issues in order to ensure respect for human rights and the biological ecosystem of Planet Earth; to safeguard and promote the autonomy and political and economic independence of scientific research; and to facilitate the dissemination and interpretation of scientific results among the wider public (Gu, Qin, Wang, Zhang, & Guo, 2021).

The presentation and dissemination of scientific findings represent key aspects of democratic societies, and they contribute to the maintenance and development of cultural traditions and awareness among the public. In addition, researchers must contribute to public debate by presenting arguments based on research guided by scientific reasoning. It is time to put an end to situations, as seen during the pandemic, in which scientific research is discussed in public by figures from the fields of medicine or biology who are not associated with the original research and might distort its findings. Researchers have no control over how the results of their research are used by others but in any case, they share responsibility for how they are originally interpreted and thus how they are interpreted in subsequent contexts (cid.ethics@cnr.it).

4. Conclusion

A strategic policy plan for science in the short term should include a judicious approach to the creation of a new democratic scientific culture that honours the ethical principles of diversity, equity, inclusion and freedom in basic research.

Enabling science to proceed autonomously requires full freedom for scientists from political and economic influence, which means that the allocation of resources must be independent of political power. At the same time, it is necessary to improve the mechanisms by which scientific information is disseminated. In addition, the ethical preconditions for giving the best researchers the chance to generate and pursue ideas independently from political and economic power

must be established.

Our objective as doctors and researchers must not be to advance pre-packaged solutions of a political or ideological nature, but rather to indicate the scientific pathways that lead to informed and beneficial political and social decisions, shared by all and beyond reproach from the scientific and social point of view.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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