

To understand mRNA vaccine hesitancy, stop calling the public anti-science



The COVID-19 pandemic accelerated the development of mRNA vaccines and provided proof of concept for this new approach to protect humans against infectious diseases, as well as other diseases such as cancer. However, the use of mRNA technology depends on the public's attitude toward it. During the COVID-19 pandemic, mRNA technology was a factor in vaccine hesitancy in many countries, as some people feared potential side effects of this new technology¹.

In France, COVID-19 vaccine coverage has reached 93% in the adult population, more than 9 of 10 vaccines administered have been mRNA vaccines, and the public considers mRNA vaccines to be safer and more effective than other available vaccines². However, by the summer of 2022, and again in the summer of 2023, half of those vaccinated reported still having doubts about the vaccine they had received³.

An online survey conducted during the summer of 2023 among a large, representative sample of French adults show that there is uncertainty about mRNA vaccines (Fig. 1), as indicated by many participants expressing no opinion on some questions. Attitudes towards mRNA vaccines were divided, with only two assertions supported by a majority of respondents: "There is still a lot we don't know about the long-term side effects of messenger RNA vaccines" (62% agreed) and "Messenger RNA is a promising technology for tomorrow's medicine" (51% agreed). These opinions underline the ambivalence of the attitudes aroused by this technology, as they express both concern and hope for the future.

More participants agreed than disagreed with the statements "In the event of a new epidemic, messenger RNA vaccines will be very useful" and "It was thanks to messenger RNA vaccines that the COVID-19 epidemic was brought under control". However, 31% of respondents equated mRNA vaccines with gene therapies (46% replied "Don't know"), and 20% believed that mRNA vaccines modify our DNA (42% replied "Don't know").

The 62% of respondents who agreed that "There is still a lot we don't know about the

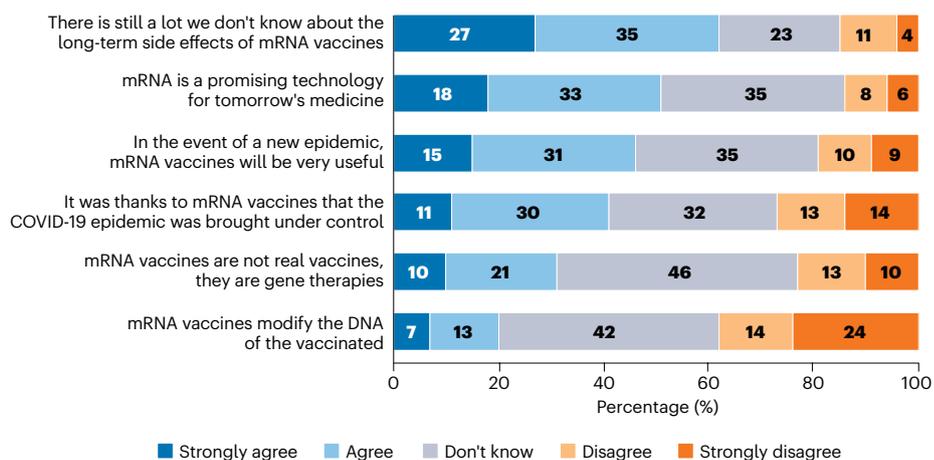


Fig. 1 | Opinions on mRNA vaccines. The ICOVAC1 survey was conducted online between 19 July and 14 August 2023 among a sample of 4,303 participants representative of the French mainland adult population, with a quota method on age, sex, profession, region and size of the area of residence.

long-term side effects of messenger RNA vaccines" should not be considered 'anti-vaxxers' who reject science, even though many are vaccine hesitant: 15% of these respondents had not been vaccinated against COVID-19, 50% had been vaccinated but still had doubts about the vaccine at the time of the survey, and 35% were vaccinated and were at peace with it. Indeed, 78% of these respondents supported vaccination in general, and they did not reject science or medicine: 81% said that they trusted science and 87% trusted doctors (Fig. 2), similar to levels in the rest of the sample. However, this group had lower confidence in the government, official health and environmental agencies, and the pharmaceutical industry. This group, representing almost two-thirds of the French population, trusted science, but not the political, state and economic players who often claimed the authority of science during the pandemic.

Public attitudes to science were a major topic of concern during the pandemic, but vaccine hesitancy should not be interpreted as rejection of science. The scientific literature on public attitudes to sciences and vaccine hesitancy have expanded in the past 10 years, moving away from the idea that the public rejects the cultural authority of science⁴⁻⁶.

When a person's beliefs run counter to the scientific consensus, for example in being opposed to vaccination, it is rarely because they reject the idea that science is the best way to produce knowledge. Instead, they perceive disagreement among the scientific community; misconduct or bad practices among scientists, for instance due to economic or political influences; the persistence of strong uncertainty; or scientific knowledge being used to advance policies that run counter to their interests or values^{4,7}.

The public generally believes in science but at the same time questions the trustworthiness of many people who claim to speak on behalf of science. It is therefore urgent to break away from the science-rejecting public framework. Labeling any belief that runs counter to the scientific consensus as 'anti-science' is inaccurate. Such beliefs are not primarily about science but are more about how people navigate a world in which science is embedded in the economic and political spheres⁴⁻⁶.

The attitudes aroused by mRNA vaccines are marked by uncertainty; the views are nuanced and ambivalent, articulating concerns and hopes, and do not reflect a rejection of science. Instead, they reflect the difficulties of navigating in a world where scientists stand

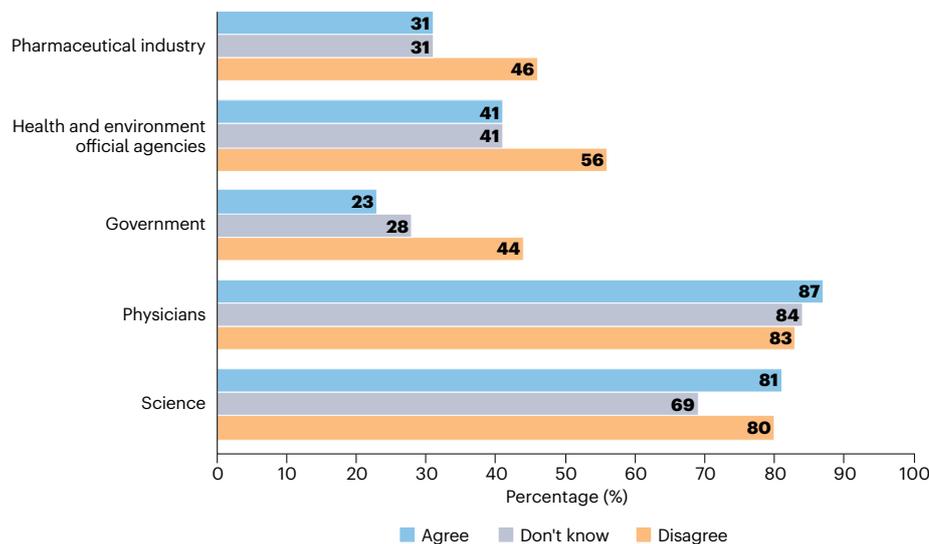


Fig. 2 | Patterns of trust according to participants' opinion on the statement "There is still a lot we don't know about the long-term side effects of mRNA vaccines". Participants in the ICOVAC1 survey were asked if they agreed that each stakeholder was trustworthy; their responses varied according to their agreement with the statement "There is still a lot we don't know about the long-term side effects of mRNA vaccines".

next to elected political leaders when official public health recommendations are being announced.

This is not solely a theoretical issue. For decades, social scientists have underlined the policy implications of frameworks that overestimate the gap between experts and the public and focus on the latter's purported deficit of knowledge and their irrationality. These frameworks favor paternalistic approaches to communication and have dismissed the views of segments of the community^{8–10}. A belief that segments of the public are anti-science can be

used to justify a lack of transparency and a lack of integration of patients in decision-making. Because of this belief, decision-makers tend to focus their interventions on providing more information to the public rather than on the structural limitations of health systems, even though the former approach often has very limited efficacy.

Public health experts and deciders should abandon their tendency to label all forms of doubts about the scientific consensus and beliefs that run counter to it as a rejection of science itself. Otherwise, as Hilgartner,

Hulburt and Jasanoff put it, "like a self-fulfilling prophecy, policy institutions will tend to call forth the kinds of resistant citizens that they imagine they are addressing"⁶.

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