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Investigating the origin of AIDS: some ethical dimensions

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The theory that AIDS originated from contaminated polio vaccines raises a number of challenging issues with ethical dimensions. The *Journal of Medical Ethics* dealt with a submission about the theory a decade ago; subsequent developments have raised further issues. Four areas of contention are addressed: whether the theory should be investigated, whether anyone should be blamed, whether defamation actions are appropriate and whether the scientific community has a responsibility to examine unorthodox theories.

A decade ago, the *Journal of Medical Ethics* rejected a submission about the origin of AIDS on the grounds that, at 19,000 words in length, it was too long. The paper, by independent scholar Louis Pascal, argued that AIDS may have arisen from inadvertently contaminated polio vaccines used in Africa in the late 1950s. Subsequently, I arranged for publication of Pascal's piece as a working paper at my university.[1] Not long after, the editor of the *JME* wrote a forthright editorial explaining the journal's decision not to publish.[2]

When Pascal first raised his concerns in the late 1980s, linking polio vaccines to the origin of AIDS was totally off the scientific agenda. Today it is taken far more seriously, for example having stimulated considerable scientific research. Hence it is appropriate now to reconsider some of the issues raised by Pascal and to examine ones that have arisen in the years since. In this paper, four main questions are addressed. Should the polio-vaccine theory be pursued? Should anyone be blamed for the origin of AIDS? Should defamation actions be used when they inhibit discussion of scientific ideas? What is the responsibility of the scientific community to pursue unorthodox theories? But before delving into these issues, it will be useful to outline the polio-vaccine theory and the scientific community's response to it.

Scientists widely agree that HIV, the human immunodeficiency virus responsible for AIDS, arose from simian immunodeficiency viruses (SIVs) that were transferred from monkeys or chimpanzees in Africa to humans. The question is how. The conventional theory has been that monkey blood got into humans through a hunter butchering a monkey, through humans eating undercooked monkey meat, through a monkey bite or some other such means. This is called the 'cut-hunter' or 'natural transfer' theory.

Pascal proposed that the transfer of SIVs to humans could have occurred by accident through polio vaccines given to hundreds of thousands of people in central Africa in the years 1957-1960, in the world's first mass polio vaccination campaign, run by polio pioneer Hilary Koprowski. These polio vaccines - made from a modified, less virulent strain of live polio virus - were cultured on monkey kidneys, giving rise to the possibility of contamination with SIVs. Monkeys can carry SIVs without symptoms. No screening for SIVs could have been carried out since they were not discovered until 1985.

The most striking evidence for the theory is the coincidence in space and time between Koprowski's African polio vaccination campaigns and early evidence for AIDS. Most of the earliest HIV-positive blood samples and AIDS cases are in the very regions where polio vaccinations were carried out. The earliest known HIV-positive blood sample is from Kinshasa - a vaccination site - in 1959. In addition, there is a precedent: monkey virus SV-40 is known to have contaminated polio vaccines given to millions of people.[3]

Pascal submitted papers about this theory to several scientific journals in the late 1980s, without success. After advice from the editor of *JME* about the suitable style and length, Pascal submitted a new paper addressing both scientific and ethical dimensions, but at 19,000 words it was far longer than the stipulated length. The *JME*'s editorial outlined the theory and, without endorsing it, stated that Pascal's thesis 'is an important and thoroughly argued one and ought to be taken seriously by workers in the AIDS field.'[4] The editorial also gave details on how to obtain the paper, leading to dozens of requests for copies in the following years.

A few months after Pascal's paper was published, it was overshadowed by an independent account of the same theory by journalist Tom Curtis in the mass circulation magazine *Rolling Stone*.[5] Whereas Pascal's submissions had been ignored by the scientific community, ironically publication in *Rolling Stone* made scientists take the theory more seriously, with commentary and letters in leading scientific journals. In subsequent years there were further publications about the theory, including by AIDS activist Blaine Elswood,[6] who had originally encouraged Curtis to investigate the story, and later by journalist Julian Cribb.[7] My own role was to write commentaries on the dynamics of the scientific community as revealed by responses to the theory [8, 9] and later to provide a website with relevant documents.[10]

In the latter part of the 1990s, attention to the theory diminished, although if anything the evidence was stronger than before. This dramatically changed in 1999 with publication of Edward Hooper's epic book *The River*,[11] which provided voluminous new evidence in a powerfully written story. Leading evolutionary biologist William D Hamilton encouraged the Royal Society to hold a meeting to discuss the theory, though tragically he died before it was held. At the meeting, much new scientific work relevant to the origin of AIDS was presented.[12]

Credibility of unorthodox theories

The volume of relevant data and the scientific complexities of the debate are now far greater than when Pascal first presented his ideas. However, the ethical dimensions remain relatively unexamined, though they are just as salient. As a matter of logic, none of the four main questions discussed here depends on the polio-vaccine theory having a certain level of scientific plausibility. Indeed, if the theory were widely accepted as plausible, some of the questions might not even arise! Nevertheless, before addressing the questions, it may be useful to discuss the plausibility of the polio-vaccine theory today and when Pascal wrote his paper.

When discussing a scientific theory that is not accepted by the majority of the scientific community, there is no single standard criterion for assessing its plausibility. Some criteria that may be used are:

(1) endorsement by some reputable scientists; (2) serious consideration in the general science press; (3) subsequent vindication; (4) research undertaken in response to the theory; (5) endorsement by informed nonspecialists. 'Endorsement' here refers to endorsement as a plausible theory or as a theory worth investigating, not necessarily belief that it is correct. If a theory satisfies several of these criteria, or satisfies one or two strongly, it could be said to be more plausible than a theory that satisfies fewer criteria or satisfies them more weakly.

(1) The polio-vaccine theory was endorsed as plausible by several mainstream scientists around the time when Pascal was presenting his ideas.[13, 14] More recently, several scientists contributing to the Royal Society meeting have treated the theory as plausible.[15, 16]

(2) Serious consideration in the science press includes editorials and news items in leading scientific journals as well as popular commentaries by leading scientists. Following the publicity about the polio-vaccine theory in 1992, there were quite a number of such items that treated the polio-vaccine theory seriously. For example, well-known scientist Jared Diamond, in commenting on competing theories of the origin of AIDS, included the polio-vaccine theory as a possibility worthy of serious discussion.[17] After publication of *The River* in 1999, a number of book reviews by scientists in scientific journals took the polio-vaccine theory quite seriously, even when the reviewers did not personally support it.[18, 19]

(3) Subsequent vindication of a theory can retrospectively add weight to the claim that earlier it was worthy of consideration. The polio-vaccine theory has not been vindicated in the sense that it is widely accepted by scientists. However, Pascal's work could be said to be partially vindicated in the sense that a decade later, after much additional research, some scientists believe the theory remains worthy of consideration.

(4) One test of the value of a theory is whether it stimulates research. Of course, a theory need not be correct in order to stimulate research, but this criterion reflects whether a theory is taken seriously. Quite a number of the contributions to the Royal Society meeting report extensive research triggered by the polio-vaccine theory; some of this research has led to insights relevant to the origin of AIDS and some, in addition, has involved discovery of new information and development of new techniques (such as for mathematically analysing the evolution of HIV). Largely this research was stimulated by publication of *The River*, but without earlier work such as Pascal's, Hooper would not have undertaken the massive investigation that culminated in his book.

(5) Finally, a theory may have greater plausibility if it is endorsed, as worthy of attention or investigation, by informed nonspecialists. This criterion is especially important when a theory does not lie within a single discipline, so that it cannot be fully investigated or judged by any single group of specialists, and when there are good reasons to believe that a theory may be opposed for nonscientific reasons, such as a threat to profits or reputations. Thorough investigation of the polio-vaccine theory definitely requires skills from several fields, including epidemiology, phylogenetics, archival research and investigative journalism. Therefore, it could be argued, informed assessment by nonspecialists is relevant, since specialists from any given field have only a partial perspective. Raanon Gillon, editor of *JME* in 1992, could be considered an informed nonspecialist when he stated that the polio-vaccine theory ought to be taken seriously.[4] More recently, many of the reviews of *The River* that were published in newspapers and magazines could be considered to be endorsements by nonspecialists.[20, 21] (Some of these 'nonspecialists' are actually specialists in their own fields, a point reflecting the difficulty of talking about expertise concerning a theory that crosses many disciplinary boundaries.)

Thus, by nearly every one of these criteria, support is given for the plausibility of the polio-vaccine theory. There are many other nonstandard theories of the origin of AIDS, ranging from biological warfare experiments to microbes from space [22]; none of these theories has anything approaching the plausibility of the polio-vaccine theory, according to the five criteria.

With this prelude, it is now time to turn to the four questions concerning the origin of AIDS that have significant ethical dimensions. As noted before, addressing these questions does not require that the polio-vaccine theory has a particular level of plausibility, but nevertheless it may be useful to know that while the theory has been and remains fiercely opposed by some scientists, by the five criteria outlined here it should not be treated as outlandish, but rather as an unorthodox theory that some scientists and informed nonspecialists have considered and still consider worthy of investigation.

Should the origin of AIDS be investigated?

Ever since the polio-vaccine theory was first presented, quite a number of individuals have suggested that the origin of AIDS is not an appropriate topic for investigation. This point of view has not been systematically argued in print, but is commonly made in private conversations and correspondence. There are two main rationales for opposing investigation of the origin of AIDS: (1) that all available resources should be devoted to studying how to reduce the spread of AIDS and to develop treatments for it; (2) current vaccination efforts could be jeopardised if people believed AIDS arose from polio vaccinations.

One reply to the first rationale is that information about the origin of AIDS may lead to insight that could help current efforts against AIDS. For example, studies of chimpanzees may reveal how they can live with SIVs and not suffer the simian version of AIDS. If vaccinations led to AIDS, then some vacinees would have been unaffected, some would have contracted AIDS and some, possibly, developed immunity, especially if molecular immunity is a possibility.[23] Hence, searching for surviving vacinees may reveal some who have immunity to SIV/HIV, providing insight for how this might be promoted.

The value of studying the origins of diseases is widely recognised. A classic example is cholera in London in the middle of the 1800s. Rather than simply treating the victims, John Snow studied patterns of disease and, without knowledge of the causative agent, inferred that a live agent, transmissible human to human, was responsible and that water from the Broad Street pump was one transmission pathway.[24] Therefore it is tempting to suggest that reservations about studying the origin of AIDS are due to something deeper than concern about wasted effort. This brings us to the second rationale: if people believe that vaccinations led to AIDS, then current vaccination efforts may be jeopardised.

Such a public reaction would be unwarranted in that the main risk of new disease from vaccination is to the entire species, not to individuals. If the polio-vaccine origin-of-AIDS theory is correct, possibly a few hundred or thousand individuals were inadvertently infected with SIV/HIV as a result of direct vaccination. All the rest of the tens of millions of HIV infections and AIDS deaths have been through 'conventional' routes such as sexual intercourse. But though a fear of vaccination might be unwarranted, the fear can be quite real.

One way to approach this issue is to argue that a theory should not be investigated if the negative consequences arising from the theory being thought to be correct outweigh the benefits from the knowledge gained. This raises a host of additional issues, such as how the likely consequences are evaluated and compared and who is responsible for making decisions about whether to investigate a theory.

Another approach is to examine the social context in which theories are perceived and, if appropriate, attempt to change it. One element of the context of the origin-of-AIDS issue is the belief that vaccination is an unalloyed good, a belief widely promoted by vaccination promoters. (This in turn is an element in a broader belief that medical intervention is necessarily good.) In this context,

information about negative consequences is especially damaging. A possible response is to promote vaccination with greater openness about hazards, such as the small risk that polio vaccination can lead to polio. If members of the public had a more realistic understanding of risks of vaccination and of medical experimentation, then investigation of theories about the origin of AIDS would not pose such a risk to vaccination programmes, but instead would stand or fall more on the basis of their own merits.

Knowledge of the origin of AIDS may provide a needed warning about the hazards of certain biological procedures. If people believed that polio vaccines led, or even could have led, to AIDS, this would dramatically increase concern about present-day procedures. Most polio vaccines are today still cultured on monkey kidneys. One of Pascal's original concerns was that polio vaccines might infect the human species with other SIVs, each with the capacity to cause millions of deaths. Although today's vaccines are carefully screened for immunodeficiency viruses, there is always the risk of error. In 1992, the Wistar Institute, where some of Koprowski's polio vaccines had been manufactured, set up a committee to assess the polio-vaccine theory. It found that the theory was extremely unlikely but nevertheless recommended that polio vaccines no longer be produced using monkey kidneys.[25]

As well as vaccinations, other cross-species transfers have the potential to introduce dangerous new diseases. Xenotransplantation, such as transplants of baboon livers to humans, is an avenue for simian viruses to find human hosts, especially since immune-suppressing drugs are required for such transplants. More generally, similar sorts of risks are posed by some types of genetic engineering. Furthermore, just as SIVs were unknown in the 1950s, so prions were unknown until the 1990s and additional disease vectors may be discovered in the future. Recognition of the possibility that AIDS came from polio vaccines could sensitise scientists, regulators and the public to such risks.

Should scientists be blamed?

If AIDS arose from contaminated polio vaccines, who or what is to blame? Alternatively, is it appropriate or useful to allot blame at all?

Blame has multiple dimensions. One is legal liability, something that is settled by courts and legal scholars. Another is educative value. A person blamed for an act may (or may not) learn a lesson, and the process of blaming can serve to warn others. The focus here, though, is on who or what is responsible for the origin of AIDS.

Participants on both sides of the controversy have been unanimous in denying that anyone involved in the African polio vaccination campaigns was responsible for AIDS, because SIVs had not been discovered at the time and thus the potential for disease transmission was not recognised. The contamination, if it occurred, was inadvertent and thus not blameworthy.

More challenging is the issue of what might be called 'structural responsibility,' namely the role of factors such as competition and colonialism. For example, it might be argued that the scientific reputation system, with its rewards for scientists who successfully stake a priority claim, encouraged polio pioneers to take risks. (The pioneers argue that they legitimately took risks for the sake of those who might otherwise be stricken with polio, at the time a widely feared killer disease - rather like AIDS today.) This is to blame the reputation system, not any individual. Similarly, colonialism might be blamed for the ease with which third world people were made available for early mass vaccination campaigns. There has been little attention to this sort of structural responsibility, perhaps in part because the same factors - competition and neocolonialism - continue to play a major role in science today.

In societies characterised by individualism, there is a strong tendency to focus on individual responsibility, leading to what can be called a 'blaming culture,' for example in which patients are prone to sue doctors for any unsuccessful operation. Often there is a tendency to blame the victim, such as when poor people are blamed for their poverty.[26] This tendency is found in psychological studies, where the 'fundamental error of attribution' is to ascribe responsibility for events to individuals rather than structural factors. Blaming individuals has the effect of letting the system off the hook. Pressure for systemic change is thus diverted into a search for scapegoats. The conclusion from this line of argument is that before even thinking of placing responsibility on scientists, the priority should be to learn general lessons for the practice of science.

Should defamation actions be used?

At the end of 1992, Koprowski sued Tom Curtis and *Rolling Stone* for defamation. The case never reached court, being settled by *Rolling Stone*'s payment of $1 to Koprowski and publication of a 'clarification.'[27] Nevertheless, the legal action cost *Rolling Stone* half a million dollars and discouraged Curtis and others from pursuing further investigation of and publication about the polio-vaccine theory. Koprowski also sued Associated Press over a story by a different journalist.

Legally, Koprowski was certainly entitled to sue. However, Michael Curtis, in discussing this and other cases, has strongly argued that defamation actions have a damaging effect on the open discussion that is necessary to seek the truth about scientific matters and that 'complex criticism' should have heightened legal protection.[28] This damaging effect can occur despite the honourable intentions of the suer. Ultimately, changes in law or legal practice are necessary to fully address the chilling of scientific debate by defamation actions, which is only one facet of the greatly increased use in recent decades of legal action to stifle free speech.[29, 30] If such litigiousness had existed in an earlier era, then one might ask, provocatively, what would have been the effect on John Snow's cholera investigations if he had been sued for defamation by the Southwark and Vauxhall Company, supplier for the Broad Street pump?

Should there be a responsibility to investigate unorthodox theories?

One of Pascal's most fervent claims was that the scientific community had an obligation to devote some attention to the polio-vaccine theory. In particular, he felt editors had an obligation to either publish his articles or to provide sound reasons why the theory he was proposing should be rejected. He argued that, if the theory turned out to be correct, the implications were so great that a strong case was needed to justify rejection.

Pascal's assertion can be generalised: a theory deserves serious consideration if the combination of its implications and the chance that it is correct are sufficiently great. Suppose a theory has a one percent chance of being correct but the implications would be a complete revamping of ideas in the field or large social consequences. Then it might be argued that the theory would warrant one percent or more of research effort and journal space. This is analogous to an insurance policy: the chance of disaster is small but the consequences are large, so setting aside a small proportion of money or effort for the unlikely contingency is considered worthwhile.

In practice, few scientists devote time and resources to investigating unorthodox theories. In many cases this is a positive hindrance to one's career.[31] Certainly there is no extra funding for those scientists who are willing to devote a proportion of their energies to exploring or testing nonstandard

ideas. Only a few editors solicit publications about and scrutiny of views that are distant from orthodoxy. (A very few journals, such as *Medical Hypotheses* and *Speculations in Science and Technology*, actively promote this.) Furthermore, some scientists are vociferous in denigrating 'fringe' theories and fields and those who champion them. Far from feeling any obligation to investigate anomalies and challenges to paradigms, even sympathetic scientists seem unable to undertake this for lack of time while many display active hostility. In the case of the origin of AIDS, some opponents of the polio-vaccine theory have argued that, because it is wrong (so they believe), it should not be investigated further.

The orientation of most scientists to current paradigms and research agendas, especially where funding is available, is well documented in the sociology of science. Critics have argued that it can be more productive to be open to challenging views.[32] Certainly there are many cases, such as continental drift, where discredited theories have later been resurrected. The Wistar Committee concluded that the polio-vaccine theory was highly improbable, noting that the 'most telling evidence is the case of the Manchester sailor who appears to have been infected with HIV-1 even before the poliovirus trials were begun in Congo.'[33] However, some years later the evidence for this case was found to be incorrect,[34] revealing yet again the risk of prematurely rejecting a theory.

If science would benefit from more scrutiny of challenging ideas, then an ethical expectation for scientists to devote some fraction of their effort to these ends would help promote this pragmatic end. However, achieving this would require significant changes to the current economic and peer-based reward systems driving research.

An awareness of the routine pressures against unorthodoxy, plus the additional pressures when challengers threaten the funding or status of dominant scientists or the interests of their patrons, should make observers sceptical of claims that challenging views deserve no attention.

Conclusion

On the surface, the origin of AIDS is a scientific issue, but, as shown here, scientific disputation has been permeated by ethical issues. What is most striking is the way that ethical concerns have been used as means for pursuing the debate. Opponents of the polio-vaccine theory have argued that the origin of AIDS does not warrant investigation by referring to ethical concerns, namely maximising efficiency in efforts against AIDS and minimising damage to vaccination campaigns. Allegations have been made about unfair blaming for the origin of AIDS. Defamation actions are founded on claims about damage to reputation. Pascal argued that the scientific community has a responsibility to deal with challenging theories that have significant social consequences.

While ethical dimensions can be examined on their own merits, there is an added dimension to the process when ethical concerns are deployed as means for pursuing a debate. The use of ethical claims as tools for social contention raises second-order ethical dimensions about the use of those claims. The origin-of-AIDS debate is thus a complex combination of scientific knowledge, ethics and the exercise of power.

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