

# Lessons from an HIV denialist in the hills of Thailand

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I spent a month volunteering with Dr. Mark,\* a physician in the hill tribe villages of northern Thailand, in the summer of 2010. He was born in Myanmar, graduated from medical school in India and founded a small grassroots organization dedicated to the health of hill tribe villagers. He spent the last five years moving from village to village along the mountainous Thai-Burmese border, working on sanitation projects and seeing patients in makeshift clinics. He is hard working, humble and is known for his fluency in eight languages, including all six of the local hill tribe dialects. During my month with Dr. Mark and his organization, I helped build toilets, collect water supplies and run medical clinics.

Through this experience and my discussions about HIV/AIDS with Dr. Mark, I was exposed to the concept of HIV denialism: what it is, how it is perpetuated and what possibly led Dr. Mark to believe in it. I also reflected on the importance of fundamental science, research methods and epidemiology in the training of physicians, and how such topics affect their ability to engage with medical developments.

Our first conversation about HIV happened one night after dinner, after a long afternoon of shoveling cement. The topic came up during a discussion of the effects of prostitution in the hill tribe populations:

"HIV does not exist," Dr. Mark confidently declared. His words rang in my ears, and I was not sure what to say next. Questions and disbelief ran through my mind. On one hand, I was curious to know what he thought of AIDS, and what HIV-positive tests meant to him. At the same time, I was trying to understand how his HIV/AIDS denialism impacted the communities he was treating. His patient populations inhabit areas that are visibly affected by prostitution and drug abuse, in a country with the highest HIV prevalence rate in Asia.<sup>1</sup>

Throughout our discussions, Dr. Mark held tightly to his beliefs. He believed that HIV has not been successfully isolated by any laboratory, that HIV tests are erratic and that AIDS is caused by malnutrition, drug use and antiretroviral drug treatment. He cited his personal clinical experience, referring to cases of un-medicated HIV-positive patients who fared better than medicated patients and cases of patients whose HIV testing status changed from year-to-year. He also alluded to the apparent research fraud in the seminal 1984 Science papers of Robert Gallo, co-discoverer of HIV. Dr. Mark remarked that there existed handwritten proof by Dr. Gallo that the evidence had been falsified. He also pointed out that HIV did not fit into Koch's four postulates of infectious agents, a set of criteria that supposedly determine causation between an infectious agent and a disease. Moreover, Dr. Mark declared that he is so confident that HIV does not exist, that he is willing to self-inject with blood from an HIV-positive patient. I was astonished. I didn't think practicing physicians could subscribe to such outmoded beliefs.

Beyond my initial disbelief, my next reaction was to look into his ideas with the intention of providing evidence to the contrary. Denialism, a word first used in the context of Holocaust denialism, can be defined as the "rejection of scientific consensus, often in favor of a radical and controversial point of view."<sup>2,3</sup> It is important to distinguish between denialism and skepticism; while skepticism is an essential component of scientific thoroughness, denialism involves maintaining hypotheses that have been disproven by the scientific

community. Further, denialist movements often go beyond science, becoming "a social movement in which large numbers of people come together and propound their views with missionary zeal."<sup>3</sup>

HIV/AIDS denialism itself exists in a spectrum, ranging from the rejection of the fact that HIV is a virus, to the denial of the causative relationship between HIV and AIDS. I read arguments from Dr. Peter Duesberg, a prominent cancer researcher, member of the National Academy of Sciences and a key voice in denying that HIV causes AIDS. I also read claims from groups like RethinkingAIDS, an international group of over 2,500 scientists, doctors and journalists "reevaluating the HIV/AIDS hypothesis."<sup>4-6</sup> In fact, AIDS denialists (including Dr. Duesberg) had influenced the South African president Thabo Mbeki to deny thousands of South Africans access to available anti-retroviral medications in 2000, citing that azidothymidine (AZT), the first antiretroviral treatment for HIV, was poison and instead encouraged treatment via garlic and lemon skin.<sup>7</sup> These policies are estimated to have caused over 330,000 preventable deaths.<sup>7</sup> Despite the ignored dangers of HIV abroad, I was surprised to learn that denialist thoughts are still present in the United States; a 2004 multi-city survey of 696 men who have sex with men (MSM) showed that 45% of MSM agreed "somewhat" or "strongly" with the statement that "HIV does not cause AIDS."<sup>8</sup>

I then looked for evidence against denialist claims; I read a multi-part *Science* feature published in 1994 replying to Dr. Duesberg, including evidence that HIV does indeed cause AIDS in the hemophilia population, and that AZT does not create an immune deficiency characteristic of AIDS (9-12). I found evidence that HIV does in fact meet Koch's postulates, though other common infectious diseases such as cholera and leprosy do not.<sup>10,13,14</sup> In reference to Dr. Mark's claims that Dr. Gallo had falsified evidence, I found that the National Institutes of Health had performed an investigation in 1993 and found insufficient evidence to support claims of scientific misconduct.<sup>15</sup> I followed the discussion between denialists and researchers as more evidence supporting HIV/AIDS accumulated over the next fifteen years, learning that the scientific community began to separate from Dr. Duesberg after he repeatedly disregarded evidence and published controversial work without peer review.<sup>16,17</sup>

Given this consensus among the scientific community, how are denialist ideas propagated so effectively? It has been proposed that denialist groups employ a variety of rhetoric mechanisms, including the use of unqualified experts, the misrepresentation of the opposing parties' views, the selective citation of evidence and the depiction of researchers as conspirators.<sup>3</sup> In my readings of denialist claims, I saw evidence of these techniques; for instance, denialists overplay the scientific misconduct accusations against Dr. Gallo as research fraud, and use them to undermine the entire HIV/AIDS model.<sup>18</sup>

After reading about Dr. Mark's claims, I printed out the most relevant articles and went back to the hills, armed with information. That week, we started working with several villagers on the construction of a water pipeline. I put my concerns about HIV aside as we worked on getting water to flow two kilometers without breaking the fragile PVC pipes. While asking Dr. Mark for insight into this problem, our conversation meandered into the realm of physics, including the gravity of falling objects. He confidently explained that a rock falls faster than a feather simply because the rock is heavier, a statement that is incorrect – it is air resistance that accounts for the

difference in speeds.

At that point, I realized how important fundamental science education is in the training of physicians. Pre-medical undergraduates suffering through five-hour-long titrations in their chemistry labs are often frustrated by the lack of evident connection to the actual treatment of patients. Doctors in all stages of training remember their first semesters of medical school spent memorizing (and often, quickly forgetting) metabolic pathways. It is true that the average physician will not need to recall the specifics of viral genetics, but they also cannot expect to understand the latest advances in medicine without knowing about the ones previous. While the physics of gravity may not be directly necessary to understand HIV, Dr. Mark's misunderstanding arguably signifies a gap in his knowledge of basic science.

Interestingly, Dr. Mark mentioned to me that fourth-year medical students from western countries who came to volunteer had little hands-on skills; for instance, we often could not give injections without help. Dr. Mark, on the other hand, had begun seeing patients and helping in the clinic from the first week of medical school. In addition, while his medical school education was largely similar to that received in a four-year American medical school, it began directly after high school, bypassing undergraduate-level biology, chemistry, physics and mathematics – classes that are generally required for medical school admission in the US. Instead, Dr. Mark received his fundamental science and math education in high school. He also mentioned that his medical school, a government-run school in western India, did not emphasize the fundamental sciences, and graduated clinic-ready doctors in five years, with the last year being a full-time internship in the school hospital.

The example of Dr. Mark, albeit extreme, points out the importance of understanding basic science and research methods to practicing medicine. While a knowledge of disease and treatment may be adequate to treat patients at a given time, when a controversial new topic arrives (be it HIV and antiretroviral drugs, alternative medicine, a new diabetes medication, or electronic cigarettes), medical knowledge itself is no longer adequate; medical professionals need a knowledge of biology, study design, epidemiology and statistics in order to fully inform and treat patients. While I cannot speak fully to Dr. Mark's capabilities, his education did not emphasize these topics, and such training could have helped him understand the disagreement around HIV/AIDS rather than fixating on one side.

Currently in the United States, there is a push to shorten medical school to meet increasing healthcare demands. It has been proposed that a three-year curriculum is possible without compromising clinician quality, and the New York University School of Medicine is currently piloting its first class in its new three-year MD program.<sup>19,20</sup> There is also a trend among US medical schools to de-emphasize the basic sciences including biology, due to the growing body of clinical knowledge that must be covered, growing unfamiliarity of biology among faculty and a shift in the model of medical training from academics to apprenticeship.<sup>2</sup> While I do not disagree with these changes, we must proceed warily and ensure that physicians not only understand medicine, but also have adequate training in the topics that will help them make future decisions. For example, although cell biology in and of itself is not relevant to physicians while in the clinic, a basic understanding of how cells reproduce and communicate with each other is completely relevant to appreciating how cancer, viruses and many medications work. Likewise, statistics and research study design are directly applicable to physicians in determining whether a new medication is effective for a specific patient population, beyond the enticing advertisements seen on television. While discussing changes to medical education both in the US and globally, we must ensure familiarity with such topics (currently, both biostatistics and cell biology are topics taught in US medical schools and tested on the US Medical Licensing Exam). For this same reason, medical education must balance between hands-on clinical experience and classroom work, and recognize the importance and limitations of both.

The need for education in research methods and fundamental sci-

ence is even more important in the age of the Internet. Many of Dr. Mark's misconceptions about HIV were likely inspired by online sources, as the ideas that he endorses are found on various denialist websites. These websites can be wildly convincing; in fact, a recent survey of 343 HIV-positive patients revealed that denialist beliefs were more often endorsed in those who more frequently used the Internet (although the study did not determine which internet resources were accessed).<sup>22</sup> For example, one website, "RethinkingAIDS," lists credentialed researchers who deny the "HIV/AIDS hypothesis" and cites quotes from books and documentaries stating that AIDS was born out of political and economic conspiracies.<sup>4</sup> Another website entitled "Virus Myth" brings up the claim that HIV has never been isolated from an infected host and even offers a cash prize to the first researcher who can meet specific criteria for isolation and purification – a convincing claim that requires some research to understand.<sup>5</sup> A literature search in peer-reviewed journals shows that the isolation of HIV from infected patients has been repeatedly demonstrated.<sup>13</sup> However, it is true that HIV isolation has never met the requested criteria; the virology community has deemed these

criteria for isolation as unnecessarily stringent. For instance, they require that only intact viral particles be identified in the culture without contaminants, which is inherently difficult due to the parasitic nature of viruses. Many other viruses have not been identified in this way. Additionally, this is irrelevant as the infec-

tivity of our current HIV isolates frightens researchers out of further investigation.<sup>23,24,25</sup> Taking a step back and looking at the big picture, in the past thirty years, we have not only isolated HIV, but have also identified HIV as the cause of AIDS, developed sensitive and specific tests for HIV and developed effective medications.<sup>26</sup> The point of this exercise is that individual resources can be misleading, and you cannot give them the benefit of the doubt. A basic understanding of biology (in this case, viruses and laboratory techniques) and the ability to perform and understand literature searches is necessary to recognize this.

Tackling denialism requires a complex approach, especially as some degree of skepticism is necessary to good science. Responsibility falls on many parties, including journals and mass media, which through responsible non-partisan journalism can help prevent the spread of unsubstantiated claims. In addition, researchers must consider all evidence, avoid misrepresenting data and take advantage of the peer-review process. Likewise, physicians must have the tools to pick apart controversial topics to help patients make the best clinical decisions; they need to be familiar with enough basic science to understand new medical advances and enough epidemiology and research skills to interpret evidence critically. The stakes are high; other examples of medical controversies causing harm include the belief that autism can be caused by the measles, mumps and rubella (MMR) vaccine, and the belief that second hand smoking does not cause health problems – both of which have been disproved, but have caused significant harm in the interim.<sup>27,28</sup>

Physician education in epidemiology and public health is important in situations like these to dispel misunderstandings. In fact, the survey that determined the high prevalence of denialist thoughts in the US MSM population also found that primary care physicians were cited by these men as their most trusted source of information about HIV/AIDS.<sup>8</sup>

In my last weeks with Dr. Mark, I decided to stop discussing HIV with him as I realized our conversations simply resulted in frustration for both of us. After we completed the water project, I left the village on good terms with him. As I left, I gave him the literature that I had initially printed, along with my contact information and an open invitation to discuss in the future. I am still waiting to hear from him.

I thought ideas like these existed in chain emails, not in the minds of practicing physicians.

References available at  
JGH Online,  
[www.ghjournal.org](http://www.ghjournal.org)

