

# ETHICAL DILEMMA

(FROM DAVID RESNIK: THE ETHICS OF SCIENCE)

## 12. Nazi data

Raymond Martin is studying the effects of heat exhaustion on human beings. His research is funded by the NIH and has been approved by his university's IRB. He has been using volunteers who have been fully informed of the dangers of this research. He has been carefully monitoring their responses and has been very cautious. He believes that his research can have valuable consequences for society, since it may lead to better ways to treat heat stroke and heat prostration. But Martin recognizes that there are limits to his research: he cannot, for ethical and legal reasons, cause significant harm to his subjects or bring them to the point of death.

A colleague informs Martin that the Nazis did experiments on heat prostration that went much further than his experiments will go. Martin would like to gain access to this data, to assess its reliability, and possibly to use it in his own work. He realizes that this research was obtained under heinous conditions and that it is tainted by the Nazi legacy, but he believes that it could still be quite useful. He applies for a supplemental grant from the NIH to study the Nazi data. Should Martin be allowed to gain access to this data? Should the NIH fund his attempt to evaluate the Nazi data? If he does obtain the Nazi data and it turns out to be valid, should he be allowed to publish it in a paper on heat exhaustion?

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## 16. Unethical teamwork?

Shirley Steadman and Agnes Horowitz are good friends and share the same apartment. They collaborate on many assignments. They are both writing a paper on teaching evolution in schools for their introductory biology class. They do most of their research together and their papers have virtually identical outlines and bibliographies. Although the wording in their papers is different, their ideas are very similar. They do not cite each other or mention their collaboration when they turn in their papers. Have Steadman and Horowitz committed plagiarism? Have they acted unethically? How should their professor respond to this situation if he notices that the papers are very similar?

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## 20. The first author

Arendorf, Dun-Ow, Hanscum, Hernstein, Mirabella, Robertson, Ramos, and Williams are meteorologists at eight different universities in the western United States. They have each made a major contribution to a study on the relation between thunderstorm size and tornado activity. The study has been accepted in a prestigious scientific journal and will probably be cited many times in the literature. Since many people will cite their study as "first author et al," the first author of the study will receive

significantly more recognition than the other authors. Three of the authors, Ramos, Williams and Hanscum, have indicated that they do not care whether they are listed first, but the other writers all have a desire to be the first author. Mirabella and Robertson did most of the writing for the paper; Arendorf and Dun-Ow did most of the grant writing; and Hernstein organized the whole project. All authors collected and analyzed data. Who should be listed first? How should the authors make this decision?

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## 21. Press conference

Anthony Lopez and Adrian White have just completed some experiments demonstrating that a commonly used food additive causes severe birth defects in laboratory rats. They plan to submit the paper to a journal before making a public announcement about the food additive, but they feel compelled to hold a press conference first in order to inform the public and prevent any further birth defects from the food additive. What should they do?

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## 27. Affirmative action

High Plains University has told its Department of Physics that they must hire a woman this year. The department has no women on its faculty. After advertising their position and encouraging some well-qualified women to apply, the department is ready to make its hiring decision. It has received 115 applications, only three of which are from women. After interviewing two women and two men, the department determines that while the two women are competent, they are clearly less qualified than the men they interviewed. Should the department try to hire one of the two women or try to hire the most qualified person they can get?

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## 32. An irresponsible mentor?

Carol Levingston is writing a master's thesis on the effects of ultraviolet radiation on plant growth. George Nijhoff is her thesis advisor and mentor. Three other professors are on her MS committee. During her oral defense, two members of the committee claim that the thesis is poorly organized and poorly written, and the third member says that it fails to mention several recent and important studies in the section that reviews the literature. The committee votes to deny Levingston an MS in botany and recommends that she rework the thesis so she can complete it at the end of the next semester. The following day Levingston discusses this episode with the chairperson of the Botany Department. She complains that Nijhoff did not supervise her work adequately, that he did not offer any substantial comments on earlier drafts of the thesis, and that he did not tell her about the recent studies that she failed to include. Was Nijhoff an irresponsible mentor? How should chairperson respond to this situation?

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## 33. An AZT Trial

Four physicians from the US are conducting a clinical trial in country Z on the effectiveness of AZT, a drug used to treat HIV and AIDS. Patients are randomly assigned to one of two groups, a group that receives AZT and another that receives a placebo. The clinical trial would be unethical and possibly illegal in the US and other industrialized nations because AZT is a standard treatment for HIV/AIDS in those countries. However, Country Z is very poor, and most HIV/AIDS patients in this nation do not have access to AZT. The physicians maintain that their trial is ethical and humane because it is providing the possibility of treatment to patients who would not receive any treatment at all. Is this trial ethical? Is it possible for a clinical trial to be unethical in one country but ethical in another? Are the researchers exploiting their patients?

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## 36. Research on prisoners

Sam Adams and Wu-lee Wong are conducting cancer research in country X. So far they have only conducted statistical analyses of cancer rates in various populations. They have found that cancer rates are associated with various lifestyles and diets. While conducting their research, they have continually consulted with local authorities. Today, the authorities offer them the opportunity to conduct some experiments on a human population. The experiments are being proposed by some scientists at University Y and would be performed on prisoners serving long sentences. These experiments would offer researchers the opportunity to observe the long-term effects of various diets on cancer and could significantly impact human knowledge of cancer and its prevention. However, Adams and Wong have some strong moral reservations about these experiments, given the country's record on human rights. They believe that the prison system is a highly coercive environment and that their subjects will have no choice but to participate in the experiments. However, their colleagues from this country have no such reservations about doing this research and see it as one way that the prisoners can repay their debt to society. Should Adams and Wong help conduct these experiments?



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## 42. The politics of disease

Several studies on the politics of health care funding indicate that 70 percent of the NIH's funds over the past thirty years have supported research on white, male populations. In order to correct for racial and sexual inequities in the study of disease and increase medical knowledge about human health, NIH has decided to target research on specific populations, such as women and various racial and ethnic groups. In the future, the NIH will set aside up to 30 percent of its funds to sponsor research on diseases that primarily affect these populations. Is this a fair policy? Could it create any ethical problems?

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## 45. Environmental activism

The town of Butterfield, NM, is holding a hearing on banning the use of pesticides that control mosquitoes on the grounds that the pesticides are threatening a local toad species, which is on the verge of extinction. Many scientists at a local university, ECO U, have offered their expert testimony and opinions. Each side in this debate has been allowed to call in its own witnesses. Roger Rubble, a professor at ECO University, has taken an active role in the movement to ban this pesticide: he has written newspaper columns, appeared on television, circulated flyers, and gone door-to-door talking to people. Many of Rubble's colleagues and members of the local community are worried that he is overstepping his bounds as a scientist and is now no more than a policy advocate. How can (or should) Rubble participate in this public policy debate?

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## 47. Co-opted research

Wayne Tillman and several colleagues conduct research on artificial intelligence at MIT and have recently developed a device that can recognize a variety of targets and return gunfire. They have applied for a patent for this device and hope that it will one day be useful in police operations that use special weapons and tactics. However, after applying for this patent, they are visited by officials from the CIA and NSA who inform them that their device poses a threat to national security. The officials ask them to continue their research in a different context: the research would be funded by the DOD and would become highly classified. Lacy Jones, one of Dr. Tillman's colleagues, tells the group that the CIA and NSA would probably lose a legal battle over the control of this research and that the research team need not work for the military in order to continue its work. Even so, many members of the team feel threatened by the CIA and NSA and they would rather simply work for the military than fight its attempt to control their research. What should Tillman and his colleagues do?

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## 50. Sex determination

Two geneticists, Elizabeth Xanatos and Michael Fullwinder have developed two drugs that regulate the sex of offspring. One drug kills sperm that carry an X chromosome; another drug kills sperm that carry a Y chromosome. (In mammals, males carry an X and a Y chromosome; females carry two X chromosomes.) In animal studies on several different mammalian species, the drug has been 95 percent effective at determining the sex of offspring. Xanatos and Fullwinder have applied for patents on these drugs for agricultural uses. They are also planning to begin clinical trials on human subjects. Should these drugs be developed for human use? Should research on human applications of these drugs be banned?