Introduction to Research
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Lecture – 24
Ethical Practices in Research

Hi, welcome viewers. This is a lecture on Ethical Practices in Research. I will try to reflect upon some of the important ethical issues involved in conducting research. So, we will begin with a very brief explanation of what happens in the research process, just to see how ethics becomes important there. Then, afterwards, we will try to see the historical evolution of research ethics or rather ethical issues in research, how this has become an important issue in today's world. Then, finally, we will see the some of the issues as such. That is the way which this lecture is planned.

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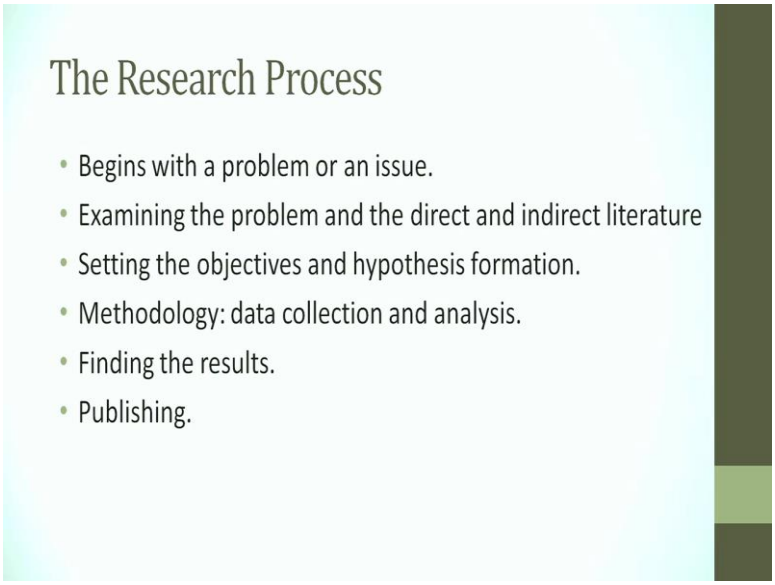

So, first, let us see the research process. This is not a very scientifically classified account of what happens when we do research; it is just a commonsensical account of it - the research process. We begin with a problem or an issue, normally. This need not be the case always, but usually this is a case that a researcher starts with a problem. And quite often we can see that here itself ethics becomes important. Many of these issues which a researcher tries to understand would be resolving an issue in the society, which would

drastically improve, sometimes, the lives of people in the society. So, in that way there itself, we find a role of ethics. Then we will start with examining the problem, and the direct and indirect literature related to the problem, which we normally describe as literature review or you conduct a review of the already existing research in this domain to understand your problem from a right prospective, and also to situate in the correct angle.

Then, we will go to the setting the objectives and hypothesis formation, where exactly some of the problem and its outcome are narrated. Finally, again, you also discuss about the methodology, where how data is collected in various disciplines, this process varies from discipline to discipline. And then, also how an analysis is done and then finding the result; what kind of results, what kind of findings are you planning to come out of with, and then, publishing them in a research journal; and this is very crucial part of it - publishing.

So, it begins with identification of the problem and sort of ends with publishing; one stage of research is over. The other stage is now when you apply this research in actual situation - may be in the industry or in somewhere else. I am not discussing those aspects here, but we could see that all the steps - the six steps described here or narrated here - we can see that ethics plays a very important role, starting from identifying the problem till publishing. For instance, in publishing, there are several issues like authorship - issues related to authorship, whom should be given credit when a paper is being published in a scientific journal or a technical journal, again plagiarism, issues related to publishing; all these are very important ethical issues. So, we will very briefly try to analyze some of these problems today.

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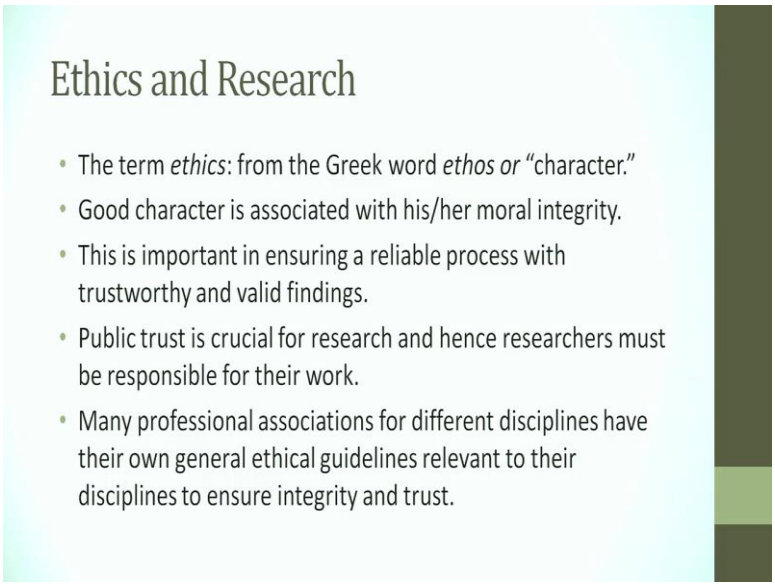

So, ethics and research - the term… Before we really get into the lecture, get into the problems, let us see - what is ethics? So, ethics - the term ethics - is derived from the Greek word ethos which means character. So, here itself we could see that good character is associated with some sort of a moral integrity of a person, and when you try to apply this into the research domain, we could see that the moral integrity of the researcher is extremely important. So, in that sense, we can connect these two terms. Again, this is important in ensuring a reliable process with trustworthy and valid findings - these two things are very important. The valid findings of a research which sort of concludes such activity at certain stages is very important, and this is because research depends a lot on public trust; it is crucial for research; and hence, researchers must be responsible for their work. They have to convince the public, they are indebted to the public. See, many professional associations in engineering or in medicine or various other domains, they have come up with their own ethical course and their own general ethical guidelines which are relevant to their disciplines to ensure integrity and trust - this public trust.

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Then we try to understand what ethics has to do with research, the ethical dimensions of research. We can see that on most occasions that there are guiding principles - general guiding principles - in research and ethics have ((a very)) role to play in the context. As I already mentioned, right from the beginning, the selection of a research problem itself ethics plays a very important role. And again, there are so many important ethical issues that affect the conduct of research, the very conduct of research and also researchers, how researchers are related to each other. Particularly, in today's world, where there is a lot of collaborative work taking place people have to engage in very important professional relationships, there is a lot of, you know, questions of sharing certain resources, laboratories, and finally, also publishing the kind of findings they have come out of a research work. In all these context, the entire conduct of business need to be regulated by very strong ethical guidelines.

And how to treat the participants in research - these questions are important. There are a set of questions which deal with how to treat the participants in research. Particularly when human beings are involved and also when animals are involved in many domains we know in science, in many domains human beings and animals are involved in research; particularly animals. And when it comes to medicine and biotechnology, human beings are also involved in research; and even in social sciences human beings -the participation of human beings - are unavoidable in today's world. So, in that case there are very important issues - ethical issues - that have to be taken into account. And again,

the need to be truthful and transparent; one has to be truthful - these are basic, very elementary, ethical values.

And again, another very important domain is risk management, because every research involves, particularly if it is scientific research, many research activities involve the question of risk and we cannot avoid that. Our aim should not be avoiding all the risk that are involved in, but rather how to properly take care of, how to properly manage risk. Be aware of the fact that the risk involved, there are risk involved in the research process, and we should also be prepared to tackle them, to manage them, to properly intervene and interfere at the right time, so that we can minimize risk. So, these are some of the important issues.

Then again, willingness to share the benefits; that is very important. Every research will have social a benefit, a personal benefit. And how far researchers are willing to share this. This might come in terms of publications, sometimes in terms of patents or creation of intellectual property and many aspects of findings of research. So, whether researchers are ready to share this with others - those who are stake holders, the fellow researchers, other stake holders, participants in research, subjects in research, even people who help them in conducting those research, this has to be shared. But it need not be shared in the same way. For example, with participants in research or rather with collaborators in research, there is a kind of intellectual sharing. When you publish an article, in a scientific journal, you need to consider many serious authorship issues here. But when it comes to subjects of research, the sharing might be having certain very important financial implications and other implication. So, all these things have to be taken into account and properly taken care of when you do research.

And what is more important is - very simple - act with responsibility. And this term – responsibility, has a very wide meaning in the context of ethical research. And in one sense we can say that ethics is all about responsibility. So, one has to be responsible and show this responsibility in various ways when research is conducted.

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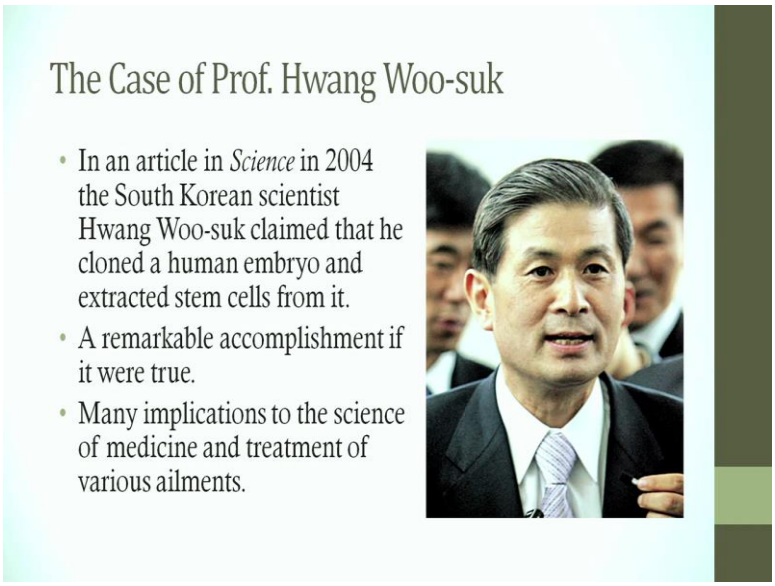

See, I will just, very briefly, explain the case of Professor Hwang Woo-suk, who is being celebrated as the most important Korean scientist, who shot into fame due to certain inventions he made or rather he claimed that he had made. In an article in science, in 2004, the South Korean scientist Hwang Woo-suk claimed that he cloned a human embryo and extracted stem cells from it. It was regarded as remarkable accomplishment, if it were true at that time. And many implications to the science of medicine and treatment of various ailments, this discovery or that or rather this invention would have helped a lot of people all over the world who are suffering from various diseases and ailments.

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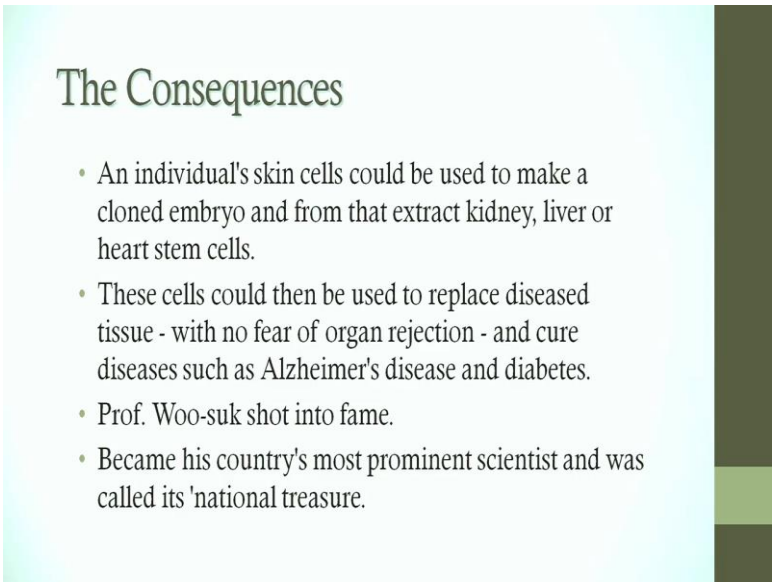

The consequences are very briefly: an individual's skin cells could be used to make a cloned embryo and from that extract kidney, liver or heart stem cells. So, this definitely you can see, quite obviously, will have a lot of implications, positive implications, in the domain of medicine. And these cells could then be used to replace diseased tissue with no fear of organ rejection, because it is extracted from one's own body and cure diseases such as Alzheimer's disease and diabetes. Prof. Woo-suk shot into fame; no, no surprise, and he became his country's - that is South Korea's - most prominent scientist and was called its national treasure at that point of time. He has been celebrated.

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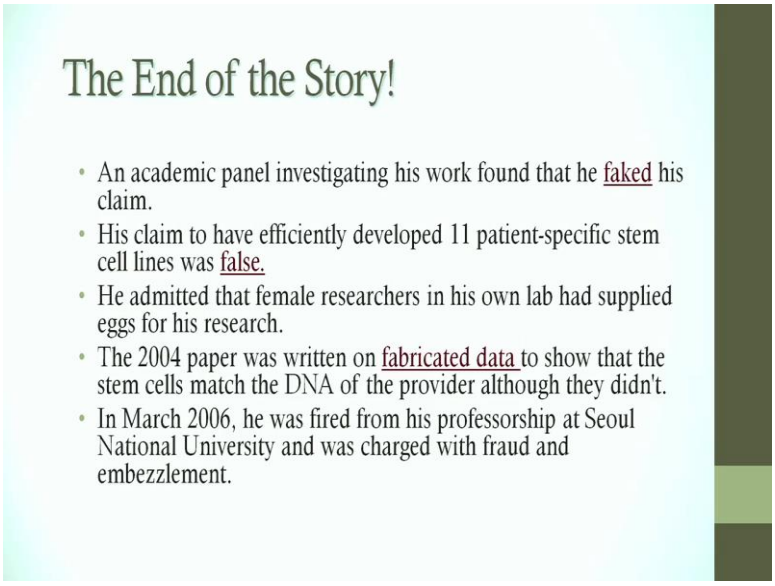

But the end of the story is really sad. An academic panel investigating his work found that he faked his claim. I am just reading it. His claim to have efficiently developed eleven patient-specific stem cell lines was false. He admitted that female researchers in his own lab had supplied eggs for his research, which is actually a very important unethical practice, he should not have done that. Then again, the 2004 paper was written on fabricated data to show that the stem cells match the DNA of the provider although they did not. And again, what is the consequence? What had happened finally? In March 2006, he was fired from his professorship at Seoul National University and was charged with fraud and embezzlement. So, this is the sad end of the story.

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So, let see some of the ethical issues particularly pertaining to this case which we have discussed, and also some of the associated issues which we can consider in this context. One is the unethical and coercive behavior of the scientist and also his team members. Then, fabrication of data is one of the most prominent ethical violations which this particular case is involved in. Dishonesty, no doubt in that; lack of trust because he has violated all basic principles of trust, and the public trust is completely lost in this particular case; a lack of integrity; cheating. So, all these are some of the specific issues pertaining to this particular case, which we have discussed.

But there are certain associated issues which we can find, which would be relevant, when we discuss research ethics, something which has to do with plagiarism or plagiarizing. A

plagiarism is a situation where you take someone else's work and present it as your work either through writing or presenting it as in publishing in journals. When you publish a research article, you publish it as your original work, but you are lifting it or you are taking it from someone else's work without properly acknowledging.

Again, making unfounded charges about another researcher. This often happens in research laboratories, and also collaborative research, and also in certain other context research takes place.

Breach of confidentiality. In many domains of research this happens, because particularly, for instance, in certain domains like medicine, a medical research or even in social sciences this can happen, because confidentiality of participants or subjects are very important; privacy of participants have to be maintained. And, they have trusted the researcher, and revealed a lot of information about them, and researcher now has a lot of information about the subject, and this is happening because the subjects trust the researchers. So, in hope that or rather they believe that researcher will maintain confidentiality, but breach of confidentiality in that sense is a very severe unethical practice.

Discrimination. This again is a very common thing that happens in many context. Discrimination on the basis of gender, caste particularly in the Indian context, race, nationality, and the language you speak, and several other factors which decide our personality or our character.

Negligence. This is what I have already mentioned. A researcher should show responsibility. Responsibility is one of the important things and researcher should conduct his research with responsibility, so that avoid all kinds of possibility of negligence, because sometimes negligence can lead to harm. Truthful and responsible data management.

Research involving human and animal participants; so, this is another very important domain, very sensitive domain; when animals and human beings are involved one has to be extremely careful. First of all, try to avoid all situations of harm wherever it is possible to avoid, and where it is not possible to avoid harm, as I mentioned earlier, one has to be prepared for managing it properly. All care has to be taken, because life is

precious, and it is important, and researcher should respect life, should show at most respect to human and animal life.

And then, in the context of social research there are several other issues, which we may not be discussing, in detail, in this lecture.

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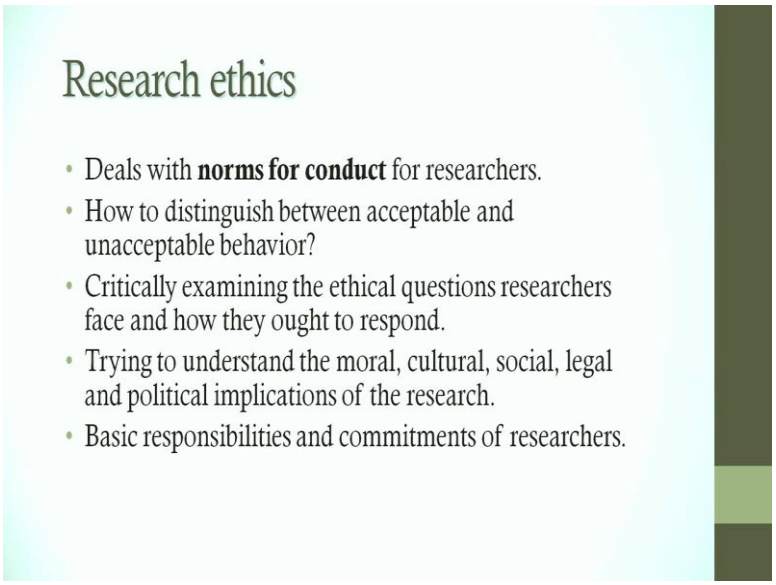

Now, again, when you try to specially understand the domain of research ethics, we can see that it deals with norms of conduct, norms of conduct for researchers. How to distinguish between acceptable and unacceptable behavior? For example, plagiarism is unacceptable; there is a reason for that; or discrimination is unacceptable; there are reasons for why they are unacceptable, because they are all impediments in way of truth, finding truth in research. Again, critically examining the ethical questions researchers face and how they ought to respond.

Trying to understand the moral, cultural, social, legal, and political implications of research. Here is again we could see responsibility coming in; one has be careful about the cultural factors, because when a research is conducted in a one particular culture, the implications of that research, the way in which it is understood, all will be different when it is the same research is conducted in some certain other culture. And this is very important in today's world, because we are living in a globalized world, and a research which takes place in one of the distant corners of this globe will have implications to all human beings in this world. Say, for example, a research in the pharmaceutical industry,

the medicine which is going to be invented or designed will have implications on the health of all human beings in the globe, so, in that sense, but certain experiments cannot be conducted in certain areas, and one has to be sensitive towards the cultural aspects then social and legal; certain countries… Law will be different in different countries. So, certain experiments or research cannot be conducted in certain countries, but while in certain other countries the law might be different.

Then, political implications of research. So, all these things a researcher might be aware of and should be sensitive to.

Basic responsibilities and commitments to researchers. This involves one's commitment to other researchers, one's students, one's professors, one's fellow researchers, to the society, to the scholarly community, etcetera.

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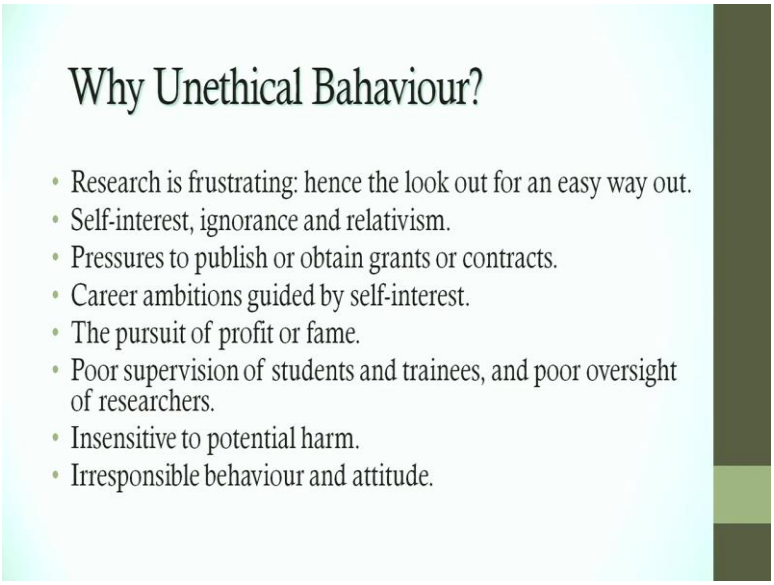

And, when we examine why unethical behavior happens, we could see that there are several reasons for this. Particularly, in today's world, there is the chances of, you know, research world encountering unethical practices are more compared to some 50 years ago. The reason is that research is frustrating; hence, researchers might look out for an easy way out. So, there are many such attempts might be severely unethical.

Self-interest, ignorance, and relativism. People do not know that certain practices are unacceptable and unethical. People may not be knowing; they do not have the awareness.

Again, relativism. They think that it is ok and which may not be ok in certain other places or certain other individuals. So, when they collaborate, this might create a problem. So, the ethical practices, when particularly in collaborative research, it is important that all the collaborators agree upon certain practices, before they really get into the process.

Pressures to publish or obtain grants or contracts; this is another thing. Today's world there is a lot pressure to publish; publish or perish has become the mantra in many places. Many research organizations and universities appoint people with the expectation that they come up with wonderful results in research. They are ready to fund the researchers with money, but they also expect results, and if this does not happen that will affect the job security of the researchers. So, naturally, there is a lot of pressure to publish and also to obtain grants and contracts. So, in this context, out of frustrations, researchers might give up for self-interest and look for easy ways out, which might result in unethical behavior. So, one has to be very careful in dealing with that.

Again, career ambitions guided by self-interest. The pursuit of profit or fame. Then, poor supervision of students and trainees and poor oversight of researchers. This is again, very important, because as professors or as senior scholars, researchers might have certain responsibilities towards the scholarly community, and one of such responsibilities is towards one's students. And it is very important that people should guide their students properly, their trainees also properly.

And then, again, insensitivity to potential harm. People have to be extremely careful about this, because certain actions or certain consequences of research might end up in harming human beings or otherwise even nature, animals. So, one has to be very careful try to avoid it.

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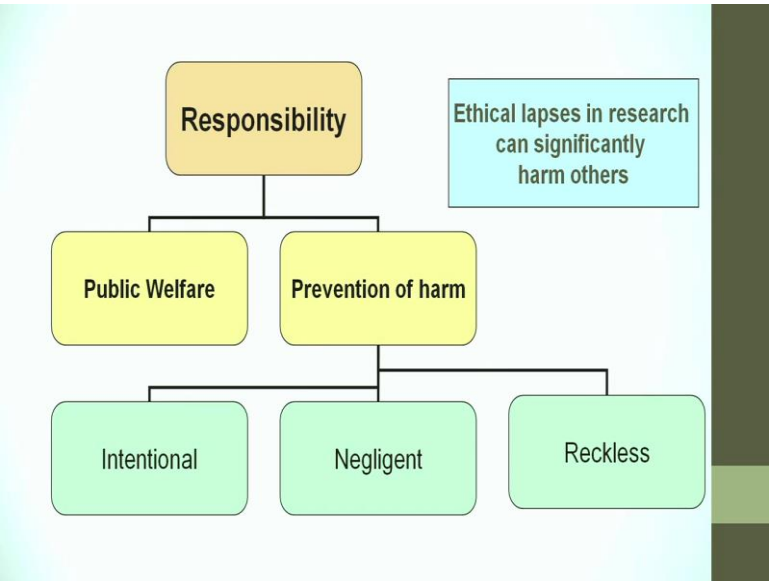

Irresponsible behavior and attitude. So, as I mentioned, responsibilities so key term in research, and because ethical lapses in research can significantly harm other people. So, when we talk about responsibility, every researcher has a responsibility to negatively to prevent harm; I would start with that, I say negatively, because researchers, research work or the findings of research or the products and consequences of research, might harm people or even the process itself might be harmful. So, it is very important that researchers are aware of it, and there are different types of harm: intentional, negligent, and reckless, you should avoid all the three types of harm and try to prevent it.

The second one is the positive aspect of responsibility where researchers should understand that their entire work and career is based upon public trust. So, they have a responsibility towards public; they are indebted to the public and public welfare is very important. They should know that public supports or rather the trust is built upon the expectation that research work might end up or result in some sort of development or progress in the society, it might benefit the society. So, with that expectation researchers are supported by the society. So, researchers should keep this in mind that they have a positive ethical, moral responsibility towards public; that their work should benefit the public in a significant manner.

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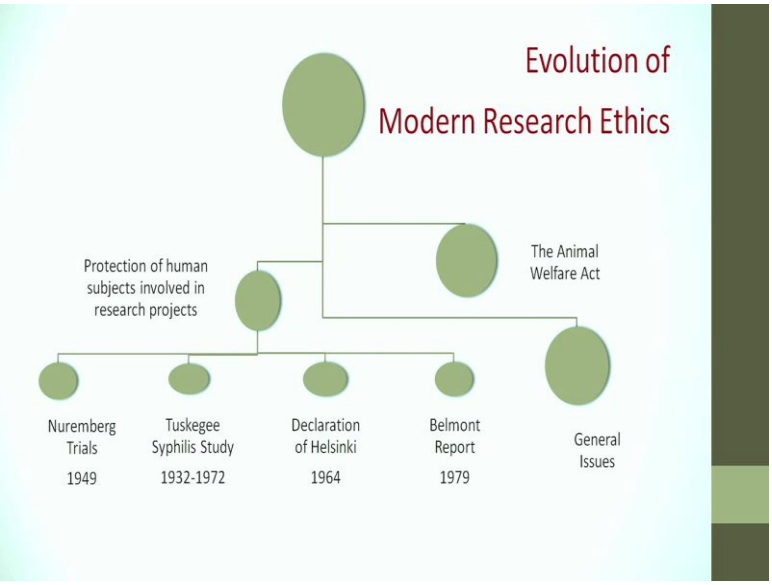

And now let us very briefly try to understand, the evolution of modern research ethics, because research itself is a comparatively modern phenomenon. Earlier also people used to conduct research, but the way they use to conduct it was very different. Now around eighteenth century onwards the way in which research as we understand today came into existence. Prior that also research was there, but they used to perform it in a very different environment with different priorities. Most of the researchers of earlier days were very spirited people, and they really enjoyed what they were doing, and they were not constrained by several factors which a modern day, contemporary day researcher, are constrained by.

So, if you try to understand the evolution of modern research ethics, we could see that the protection of human subjects involved in research projects was one of the primary concerns of research ethics in the modern day. Primarily after the Second World War this has become a major issue; and all over the world this is being discussed. Immediately after the Second World War, with the victory of the allied forces, lot of atrocities and cruelties, the Nazis - the Nazi Germans - have done to the Jews were exposed. Jews and the gypsies, and old people, the sick people - all of them suffered immensely under the rule of the Nazis. So, in this context, lot of discussions happened all over the world.

So, there are certain milestones we could find in the development of modern day research. I will very briefly explain them.

The first one is the Nuremberg trials which took place somewhere around 1949, which has ultimately some with certain codes. Then, the Tuskegee Syphilis Study which lasted for nearly about forty years in the US, and which also exposed some grossly unethical practices that took place in the state of the Alabama. Then, the declaration of Helsinki which has come up with some of the very important guidelines of how research needs to be performed. Following that in 1979 the Belmont report. So, these are some of the historical milestones; and then, later on, we could see that all these important events have taken place in the domain of or rather they are more directly related to medicine or health where human beings are particularly involved in.

As I mentioned, the explicit concern was protection of human subjects involved in research projects. And then, again, we could see that in this context the animal welfare act in the US, which has come up with some of the or rather expressed some of the concerns when we conduct research on animals or when animals are involved as subjects. Proper care has to be taken and the researchers have responsibility to value the life of animals as well; we cannot just ignore them. So, those things are articulated in the animal welfare act, and many countries in the world today have laws or legal suggestion, how animals have to be respected. And particularly, in research institutions and organizations we have ethics bodies today or ethics committees or institutional review boards; all of them will take care of or will look into that kind of research that is happening in within the institute, within the organization, and try to suggest ethical guidelines to be followed when researchers conduct their research. And then, of course, some general issues, some of them which we have already seen.

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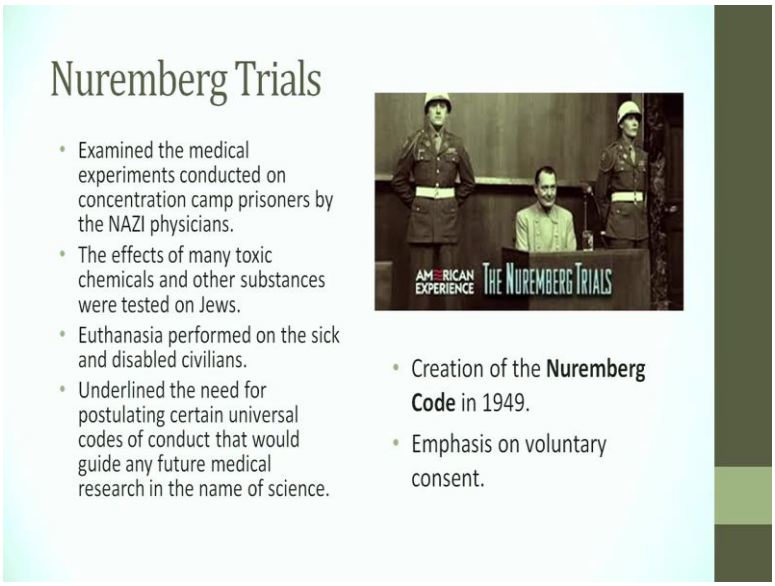

And when we talk about, very briefly about, Nuremberg, when we talk about Nuremberg trials, which I have already indicated, these trails have examined the medical experiments conducted on concentration camp prisoners by the Nazi physicians. The effects of many toxic chemicals and other substances were tested on the bodies of Jews and gypsies. And euthanasia was performed on the sick and disabled civilians without their consent and permission. This, underlined the need for postulating, these trials actually underlined need for postulating certain universal codes of conduct that would guide any further medical research in the name of science. So, scientific research cannot be blindly carried out by scientist, just because the consequences are going to be good for humanity, just because the end is good, you cannot conduct it in any manner you want. The means also are very important; the ends and means are intimately interconnected; one has be careful about that. So, the creation of Nuremberg code took place in 1949, where there is an explicit emphasis on voluntary consent. People have to be consented, people have to be taken… the subject's permission or consent has become so central for research involving human subjects thereafter.

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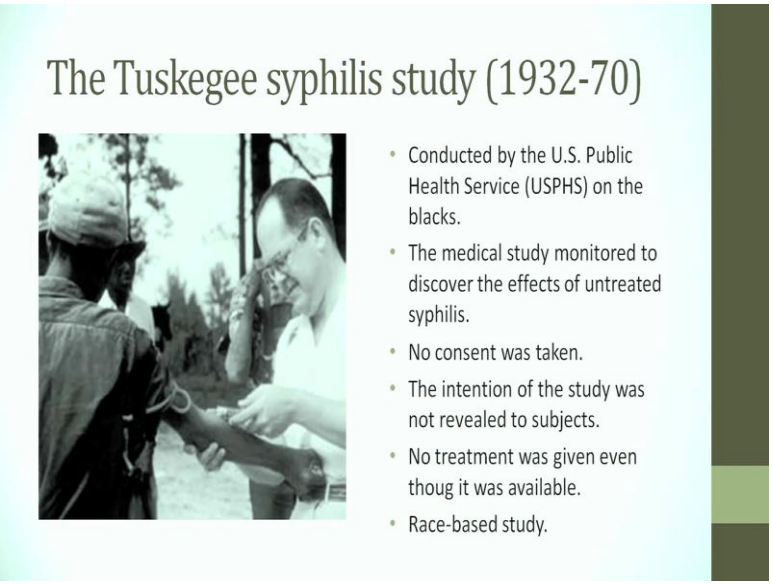

The Tuskegee syphilis study, another unfortunate incident that had happened in the United States; one will be surprised to know this. It has happened for forty years from 1932 to 1972, when it was exposed by the media to the public. And it was conducted by the US public health service on the blacks. So, only blacks were selected as subject for this study, which also highlights how racially motivated this scientific study was. And the medical study monitored to discover the effects of untreated syphilis. So, people with syphilis and without syphilis, they were all monitored by the physicians. And the people who had syphilis were not treated even though medicines became available slightly later, they were never given, they were never administered this medicine because a purpose of the study was to see the effects of untreated syphilis.

And no consent was taken, because many of these participants did not know for what this study was conducted. And they were never been told. They were only told that they were treated for bad blood. No other information was given and no consent was obtained. The intention of the study was not revealed to the subject at all. And no treatment was given even though it was available and in that process many people lost their life; many people were injured, and finally, there was a public outcry against this when it appeared in the newspapers, and the study was stopped. The research study was stopped by the US public health services. So, it was obvious that it was a race based study. So, sometime back I mentioned about discrimination. Here there is a gross violation of the principle; it was based on discrimination; no whites were studied as subjects in this research work.

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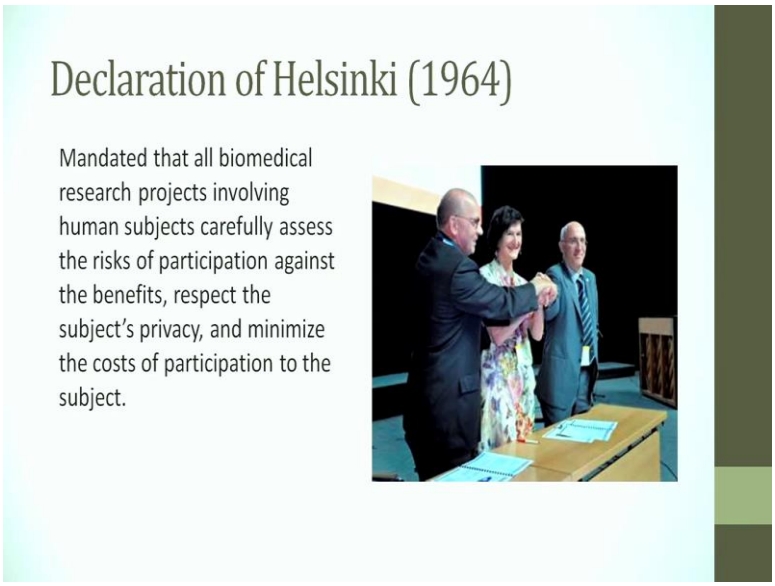

Again, the declaration of Helsinki in 1964 mandated that all biomedical research projects, involving human subjects, carefully assess the risk of participation against the benefit. So, there should be a risk-benefit analysis done, and if the benefits are more the study can be conducted. Respect the subject's privacy. So, this is what I mentioned about - confidentiality. Every individual human being who participates in this subject, in the study, in the research study as subject, has to be respected as a human person; his or her privacy should be maintained. So, all information about him or her should be maintained confidentially, and minimize the cost of participation to the subject. So, risk management - proper risk management has to be taken into account.

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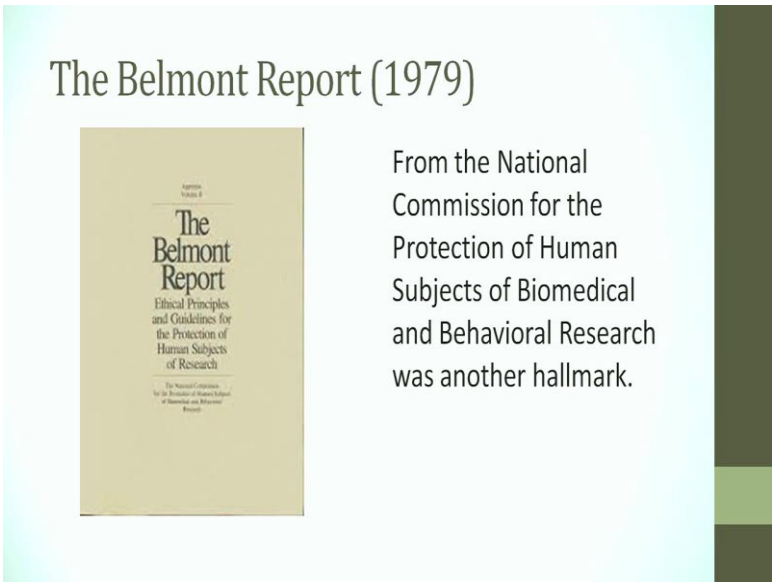

Then Belmont report in 1979. From the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research was another hallmark in this process of evolution of research.

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Again, all these things which we have seen right from Nuremberg trail to Belmont, all of them emphasized the need for voluntary consent from participants. So, people have to be respected, their human rights have to be respected, their permission has to be taken, their consent has to be taken, their information have to be kept confidential - all these things

are highlighted. And recognize the importance of autonomy of individual; each individual is recognized as autonomous entity that we have to respect him and her by virtue of the very fact that he or she is an individual human being.

So, the Animal Welfare Act provides guidelines and regulations for research with animals. Other dimensions were added subsequently. There are many other issues, which got, which actually made the domain of research ethics stronger and stronger. All of them affirm the importance of responsible behavior, and different aspects of responsible behavior from the side of researchers involved.

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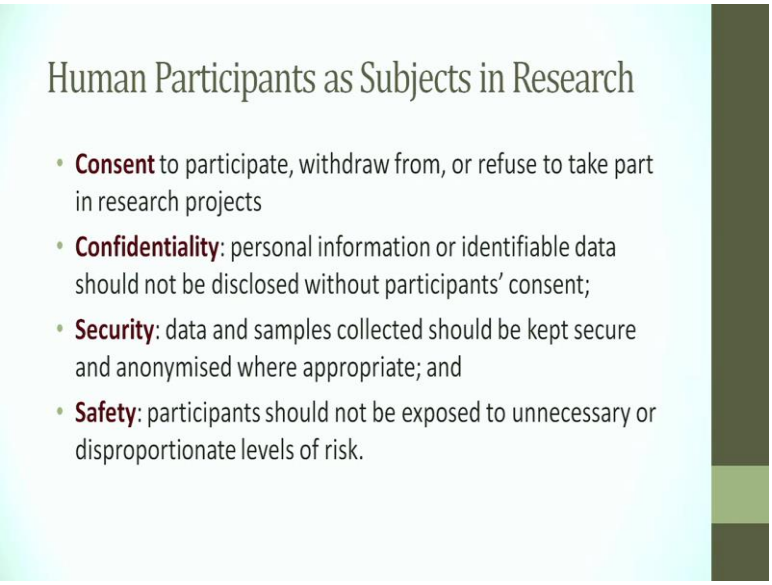

And when you try to address some of the specific concerns like human participants as subjects in research, as I mentioned, some important principles are: consent to participate in the study; for that you know all information about the study, whatever is available should be given to the participants; withdraw from the study at any stage of the study and or refuse to take part in research projects. So, these things have to be respected. Confidentiality, I repeat, personal information or identifiable data should not be disclosed without participant's consent. For example, there are several things when a study is conducted this has to be published in a journal. And several information about the subjects need to be published, but certain information about the subject should be withheld. For example, the name, the place from where the address, and all such details which might help others to identify the identity of the person should not be published by

the researchers. This is very important to maintain confidentiality. Security - data and samples collected should be kept secure and anonymized where appropriate. And safety - participants should not be exposed to unnecessary or disproportionate levels of risk.

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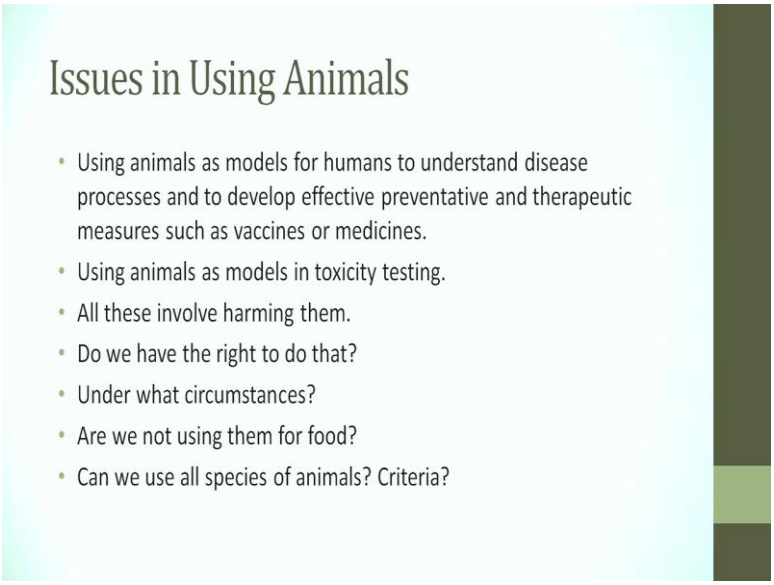

So, but when you come to animals, research where animals are used as subjects, there again, we have to understand that animal life is also precious. Using animals as models - there are different ways researchers use animals in today's context. People use animals as models for humans to understand disease process, particularly in the domain of biomedical research, in pharmaceutical research, animals are used extensively. And to develop effective, preventative, and therapeutic measures such as vaccines or medicines. Using animals as models in toxicity testing; certain toxic substances, if they are exposed to such substances what are the impact and how they can be cured; all these aspects have to be studied, for that animals are being used. All those involve harming animals because eventually they will get harmed in this process. Do we have the right to do that? That is a very important question, because in the case of human beings at least the consent is being taken. We take the permission of the human being, an adult human being, but in the case of animals this is not the case; we do not take the permission of animals to conduct study upon them. Can we do that? Under what circumstances can we do that? Again, that is another thing. We cannot just abruptly do it; only when it becomes necessary we can do that. Again, are we not using them for food? So, one can definitely come up with such an argument; we are anyway eating them, then what is wrong in using

them for experimental purposes? Even if they are killed or harmed what is wrong in it, because we are using them as food, and to use them as food, we are killing them, but is there any substance in such an argument? Is using animal for food or using an animal for research experimentation are there - are they at the same level? Can we compare them with one another? See these are the some of the issues.

Can we use all species of animals? What is the criteria? See, for instance, for example, some of the animal which are very commonly used are mice, then rats are used very commonly by pharmaceutical research; monkeys are being used, because they are very close to the human species, but can we use chimpanzees which are very close to us. If we cannot use chimpanzees, because some chimpanzees exhibit certain skills, which are evidence which suggest that their brain is quite advanced compared to other animals. So, can we use them? So, these are some of the issues which we have tackle when we discuss ethical issues in research in model animals.

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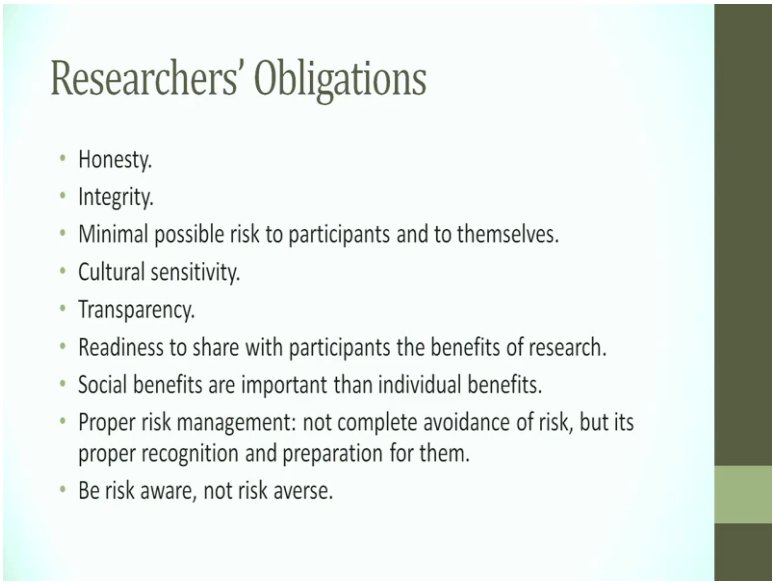

But whatever it is, there are certain obligations which researchers have, which we might underline, before we conclude. One is honesty; honesty of researchers to himself, to the work which he does, to the society, to fellow researchers. Then integrity. Minimal possible risk to participants and to themselves - this I am repeatedly underline this. Cultural sensitivity, I already mentioned this. Transparency for what this research work is being conducted, it has to be published. See, for instance, if a researcher is working in a

university or a research organization, it is very important that before the research work begins, the permission of the authorities - the organization authorities - have to be taken; in the sense that the organization authority would have appointed an institute review broad or an ethics committee, their permission is mandatory. And there the researcher has to be transparent, they should reveal whatever information they have about the research process, wherever they anticipate a risk or a harm that is involved that has to be reported.

Readiness to share with participants the benefits of research. This I have already indicated in the beginning. This benefits of the research can be of different types; on some occasions, credit of the research work needs to be shared with fellow researchers and collaborators. On certain other occasions, we need not do that, because, again, when you publish an article you can keep your colleagues as co-authors. The whole issue of who is the first author, second author, and third author - that is an issue. At the same time, whether a particular researcher who collaborated with your work, can his name be included as an author - that itself involves an ethical issue. Just because somebody helped you at a couple of occasion does not mean that you should use or we can use that person's name, keep that person's name; that person might get a credit, a publication, but that is not the objective of the research. The objective of the research definitely is not for people to get name and fame; it is the social benefit that matters.

So, you have to recognize contributions of people based on the merit. If there is substantial contribution in the development of the ideas involved in the paper, which is published, you should definitely consider giving that person authorship, but if there is no substantial contribution, but only help here and there, then you can just acknowledge that person. So, these are the things which researchers have to keep in mind when they take decisions about it.

Social benefits are important than individual benefit; this is one very important thing we have to keep in mind. We all have responsibilities towards the society, and social benefits are very important, because, as I mentioned and I repeat now, research is based on public trust.

Again, proper risk management which has already been discussed extensively in this lecture. Be aware of the risk, but not one has to be risk aware and not risk averse.

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And other important issues, if you reflect upon some other important issues in research - issues related to society, where social benefit, development and progress of the society is positively some of the outcomes, because a particular research will definitely have some very positive impacts on society. Say, for instance, many research endeavors may not have a very explicit and direct positive impact upon the society; they might definitely have some impact, but certain other forms research will have a very direct positive impact. So, in such cases, what should be the responsibility of the researchers, of the funding agencies, and several other considerations have to be taken into account.

To other researchers, be responsible mentors, I already mentioned this.

Collaborative research where publication and authorship issues are involved.

And respecting intellectual property rights; that is very important, because as a researcher, you should be aware of the fact that you are creating something which is going to contribute to the improvement of the scholarly community. And this can be done only if you respect intellectual property rights of other researchers.

Do not discriminate, be responsible, and take responsibility; one has to be this. Probably I will conclude with this word that what is one of the most important or rather the most important idea in ethics or in research ethics is - be responsible for what you do and take responsibility for what is happening. These are the two terms or rather one single term -

responsibility, which is very important. I will conclude with these remarks.

Thank you.