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DoD News Briefing

Dr. Joel Michalek, Air Force Health Study Principal Investigator
Wednesday, March 29, 2000 1:30 p.m.

ADM. QUIGLEY: Good afternoon, ladies and gentlemen.

We have with us this afternoon Dr. Joel Michalek. He is an Air Force surgeon and is the principal investigator for the Air Force health study on Operation Ranch Hand, and normally works out of Brooks Air Force Base in Texas. He'll be briefing the findings of the latest phase of this study.

Then when complete, we'll have executive summaries -- paper -- for you back on the table. And the entire study, much more lengthy, will be online, and we'll give you that URL.

Dr. Michalek? All yours.

Q: For the record: Once again we've gone through this issue of we have a complicated subject; we don't have the report before the briefing. It just seems a crazy way to do things. Just for the record.

ADM. QUIGLEY: Noted. We'll see what we can do.

Q: Why can't we have it now so we can look at it?

ADM. QUIGLEY: Because this seemed like a logical way to do it.

Q: Well, I mean, we could follow along while he points to certain thoughts. I mean, that's --

ADM. QUIGLEY: Well, he doesn't have briefing charts to go to page 7 of the study and follow it here as we go to paragraph 4. I mean, that just seems to be a cumbersome way to do it. Rather to have the subject-matter expert walk you through the findings in a relatively brief way, hitting what the professional thinks is the high points of the findings, and then allow you the opportunity to read the thing in depth when you've kind of had the issue framed more broadly by the leader of the effort.

Q: But the point is that we --

ADM. QUIGLEY: If you-all are unhappy with that process, I mean, let me take that. I mean --

Q: The point is we won't be able to question on it, not having seen it.

Q: Yeah. The problem is then we read the report, then we have a dozen more questions, we're back in our offices. Who do we call then?

Q: You get to tell us what you think is important rather than us getting a chance to read the report and -- (inaudible).

Q: And ask.

ADM. QUIGLEY: Yeah. You end up at the same point, Otto, at the end of the day, but it's a different order of doing things. Honestly, if you would prefer to have it the other way, I don't see why that would be a big deal.

Q: It would be real helpful.

ADM. QUIGLEY: We could give it out at such and such a time in the morning of the day, embargo it until the completion time of the brief if that would allow you to have a better, a more comprehensive understanding and ask more intelligent questions.

Q: Which is the way you normally do it because you know that that is the way that we prefer it so we can be not ignorant when we're briefed by a subject matter expert.

ADM. QUIGLEY: All right. We won't be able to do that today, but we'll take a whack at that the next go-round on one of these efforts. Okay?

DR. MICHALEK: Thank you, sir. First of all, I need to tell you, sir, I'm not a surgeon, I'm a statistician. I'm sorry I didn't tell you that earlier.

Q: You're not a medical doctor?

DR. MICHALEK: No. I'm a Ph.D. statistician.

Q: And you're not in the military, are you?

DR. MICHALEK: I am a civilian. Federal civil servant, GS-15, with the United States Air Force, working at Air Force Research Lab, Brooks Air Force Base.

Well, I have some things to tell you. Good afternoon. My name is Dr. Joel Michalek. I am principal investigator of the Air Force health study on Agent Orange, also known as the "Ranch Hand" study.

I appreciate you coming here today, and I'll gladly take your questions after I -- following my prepared statement.

I am always pleased to have an opportunity to tell people about the study. Before I address the report, I want to emphasize that our first concern is for the veterans. I've been with the study since 1978, and I can tell you first-hand that we have spent countless hours with over 2,000 Vietnam veterans in physical examinations in San Diego and Houston. We developed close relations with them, and are dedicated to leaving no stone unturned to find a relation between Agent Orange exposure and adverse health effects.

To provide some background, the Air Force began planning the study in 1978 to address concerns of veterans and the public regarding the consequences of exposure to Agent Orange and its dioxin contaminant. In 1982, we held our first physical examination to evaluate the health and reproductive experiences of veterans of Operation Ranch Hand, the unit responsible for the aerial spraying of herbicides in Vietnam from 1962 to 1971.

The purpose of the study is to determine whether Ranch Hand veterans have experienced adverse health that can be attributed to their exposures. Ranch Hand veterans were exposed to herbicides through the loading, flight operations and maintenance of the aircraft and spray equipment. The study includes a comparison group of other Air Force veterans who flew in service C-130 aircraft in Southeast Asia from 1962 to 1971, the same period during which the Ranch Hand unit was active. These comparison veterans were not involved with spraying herbicides.

The 1,000 ranch hands and 1,300 comparisons participated in the physical examinations in 1982, 1985, 1987, 1992, and 1997. A final physical exam is scheduled for the year 2002. The data gathered during these exams is analyzed, evaluated and published in various reports and articles. Our work is peer-reviewed by leading experts in their fields at the Centers for Disease Control and Prevention, the National Institutes of Health, the National Academy of Sciences, as well as academic experts throughout the country and, indeed, the world. In addition, we work through an advisory committee of leading academic experts that also include members nominated by veterans organizations.

Today we are releasing our latest morbidity report summarizing the results of the 1997 physical examination of 2,300 Air Force veterans. Although previously reported in 1992, this report includes the strongest evidence to date that exposure to Agent Orange is associated with adult onset diabetes.

The 1997 result suggests that as dioxin levels increase, not only are the presence and severity of adult onset diabetes increased, but the time to onset of disease is decreased. A 47 percent increase in diabetes was seen in those veterans with the highest levels of dioxin. This is particularly strong evidence, since dioxin is that component of Agent Orange that has been linked to many health effects in laboratory animals.

Cardiovascular disease findings were mixed. As an overall group, the Ranch Hands have experienced a 26 percent increase in heart disease. But the risk was not increased in the Ranch Hands with high levels, high dioxin levels. Within the Ranch Hand group, the risk of cardiovascular abnormalities such as high

blood pressure and the prevalence of prior heart attack indicated by electrocardiogram did tend to increase with dioxin levels. The mixed results mean that some indicators of disease increased with exposure and others did not.

While the study indicates that adult onset diabetes and cardiovascular disease seem most likely related to herbicide exposure, biological processes relating herbicide exposure with these diseases have not yet been described. And until such processes are found, these statistical findings may not reflect cause and effect.

In recognition of the need for biological studies, the Air Force has funded research at two separate academic institutions to explain any biological relationship between dioxin and diabetes. We have launched a study of glucose, transporters and dioxin body burden in adipose tissue of Ranch Hand veterans and have just begun a study on insulin sensitivity and dioxin body burden. In regard to cardiovascular disease, we are consulting with cardiology experts to determine what new tests to be included in the next physical examination to clarify what we have already found in 1997.

At the end of 15 years' follow-up, we still have found no consistent evidence that the Ranch Hand veterans are experiencing an increased risk of cancer. The Ranch Hands as a group exhibit a 6 percent increase in the risk of cancer. However, differences by military occupation were inconsistent, and therefore not supportive of a relation between herbicide exposure and cancer.

For example, the Ranch Hand enlisted ground crew, the subgroup with the highest dioxin levels, and presumably the greatest herbicide exposure, are experiencing a 22 percent decreased risk of cancer.

Another finding of the study is a loss of sensation in the feet, which increased with dioxin levels.

Finally, several blood tests regarding liver function and lipids were slightly elevated and did tend to increase with dioxin level. However, these tests may be elevated for many reasons, are not a disease by themselves, and cannot be explained entirely by any other finding in the study.

The report recognizes two major limitations of the study.

First, the results should not be generalized to other populations, such as Vietnamese civilians or other DOD veteran populations, who may have been exposed in different ways and at different levels of herbicide. The Air Force cannot determine what effect herbicides or dioxin levels have, other than those found in the Ranch Hand group, or from other sources, such as contaminated food. Groups with higher exposures may well have effects not seen in this study.

Second, the size of the study makes it difficult to detect increases in rare diseases, and small increases in those rare diseases may not be detected. For example, liver cancer is very rare, and even a tenfold increase in disease may not be detected in the study.

In conclusion, diabetes and cardiovascular abnormalities represent the most important dioxin-related health effects seen in the Ranch Hand study. These two areas appear to have the greatest magnitude of effect in terms of quality of life and health care costs, and, from a public health perspective, demand the greatest attention. I can assure you will continue to devote ourselves to that end.

Finally, the National Academy of Sciences will review this report, along with many other studies of herbicide and dioxin exposure, to make a report to the secretary of the Department of Veterans' Affairs, to assist him in decisions related to compensation.

I'd like to direct you to our website, where we have posted this report and other information about the study. Thank you. I'd be happy to answer any questions you may have.

Q: Doctor, could you tell us, first of all, if cancer hasn't been shown to be linked to it, what are the nine diseases that are now linked to Agent Orange and dioxins?

DR. MICHALEK: Sir, first of all, there are some studies which associate cancers of all kinds with dioxin. And those were found by aggregating the largest chemical-worker studies in the world together into a single study -- and that was published recently -- showing that all cancers combined, in very large studies of industrial workers, are found to be associated with dioxin exposure. That study and all studies of

industrial workers are controversial because industrial chemical workers are exposed to thousands of other chemicals, besides dioxin.

The nine diseases that you just asked for, I do not have memorized. I have some of them, one being -- (inaudible) -- lymphoma, soft-tissue sarcoma, spina bifida in the children of Vietnam veterans, perhaps --

Q: Lung cancer.

DR. MICHALEK: -- lung cancer --

Q: Prostate cancer.

Dr. MICHALEK: -- Prostate cancer, for example. I am sorry; I don't have the list memorized.

Q: But the veterans are being -- correct me if I am wrong -- veterans who do have, for instance, lung cancer and prostate cancer are being compensated currently for such illnesses, are they not?

DR. MICHALEK: Sir, I don't pay much attention to that because my job is to do the Ranch Hand Study. The issues of compensation are handled by the Department of Veterans Affairs.

Q: Do you expect in the years ahead, given how long it takes for cancers to develop -- I would think you would now be reaching the maturation stage, where you would begin to see statistically, an elevated incidence of cancer in this group, whether they were exposed to Agent Orange or not. Are you anticipating the next few years are critical to show you any potential statistical --

DR. MICHALEK: Absolutely because, as the prevalence of disease increase, our power to detect it increases. So the next few years are critical.

We are planning for this study to shut down in the year 2006. And unless we have been directed otherwise, that's going to happen. But in the next several years, the key indicators will be revealed, that you just described; in particular, more detailed analyses of cancer.

And, as an example, we published a paper, in 1999 in the American Journal of Epidemiology, summarizing the cancer data, as I have just described, up to, but not including, the main report, which we are releasing today.

In that article, we showed no relation between cancer of the kidney and bladder. More recently we received a phone call from a nurse in Florida suggesting that we look more carefully at renal cell carcinoma.

We did that and found a trend in renal cell carcinoma against dioxin, and that's being submitted to a journal as we speak.

So that data, although it's been made public -- is published --

Q: (Off mike) -- your group?

DR. MICHALEK: Yes, sir. From our group. So yes, the point being that as

we near the end of the study and the prevalence increases, our ability to detect exposure effects increases, that's why it's so critical that the study be continued through its conclusion in the year 2006.

Yes?

Q: You very carefully selected a control matched in age, matched in their military specialty, but -- so these were people who were operating, working around C-130s in Southeast Asia at this time?

DR. MICHALEK: Yes. They were chosen on purpose, because -- and by the way, the issue of the control group and who should be in the control group and what the numbers should be were all argued out in 1979, 1980, during peer review at protocol.

The issue of who should be in the control group was of central importance. Number one choice at the beginning was that we use Air Force veterans stationed in Europe who flew the same kind of aircraft that the Ranch Handers flew, but that idea was discarded because there weren't enough of them.

Q: But so --

DR. MICHALEK: So we chose these Vietnam veterans who were themselves in Vietnam but had no exposure to herbicides.

Q: That shoots -- I ask because I interviewed a veteran who had brain cancer that he attributed to -- and he had this sort of job in the Marine Corps, and he was exposed to the Agent Orange on the ground as he slept. Now, is this -- were these sort of exposures filtered out of the control group?

DR. MICHALEK: The control group itself has been measured for dioxin as well as the ranch handlers have. They have dioxin levels in background range from zero to 10 parts per trillion. We have been able to characterize their exposure. Many of our controls believe that they were exposed to herbicides in Vietnam, just as many other Vietnam veterans do. All we know about our control group is, number one, they were Vietnam veterans, and number two, they were not Ranch Handlers. And so they are, themselves, an important reference group, because they help us ask the question as to whether the Ranch Hand veterans are any different from any other Vietnam veteran. They will not -- this study will not answer the question as to whether the Ranch Hand veterans are different from veterans who didn't go to Vietnam at all. That study, by the way, was already launched by the CDC in what's called the Vietnam Experience Study. It was patterned after the Ranch Hand study and was stopped in 1989.

Q: But if you were to examine -- but the blood tests or other work on the control group show a lower -- lower dioxin levels, is that --

DR. MICHALEK: Yes. The controls have dioxin levels like all of us in this room that range really between zero and 10 parts per trillion.

We all have dioxin in our bodies because whenever you touch a piece of Formica or breathe smoke from burning trash or pick up a Styrofoam cup, you're getting a tiny bit of dioxin into your body. It's everywhere; we're constantly picking it up, and we're constantly releasing it. And us in this room have a steady-state condition in our bodies where our uptake is approximately equal to the elimination of dioxin.

So there is a background level in everyone of dioxin who lives in industrialized countries. We recognize that, and that's taken into account in our reports. In fact, in a recent published paper, we have shown that in the comparison group -- forget about the Ranch Handlers -- just in the comparison group, we see trends relating diabetes and dioxin, just as we do in the Ranch Hand group.

Q: Was the relative risk link of the diabetes and cardiovascular disease, was that the same kind of relative risk increase that you saw in the other diseases that are on the list that are currently compensated for?

DR. MICHALEK: We are not able to study most of the other conditions that are on the list because those conditions are very rare, such as soft-tissue sarcoma. We expect to see -- I think we've seen maybe one case of soft-tissue sarcoma in the entire study. The point being, this study is just too small to study the other conditions that are being compensated for. Even spina bifida, which is being compensated for largely because of our data, is a very rare condition. We saw no cases among children born to the comparison group, and only three among children born to Ranch Hand veterans, but we saw a trend, and the trend was enough to convince the National Academy of Scientists to call the data "suggestive," and that led to compensation.

Q: I guess what I'm asking is the trend here with cardiovascular disease and with diabetes enough to -- do you think, in your opinion, considering past experience with other diseases, to get diabetes on the list of compensated diseases?

DR. MICHALEK: I really don't want to answer that, because if I do, that will just destroy my credibility. Yes?

Q: A related question. Are the things that are on the list, are they things where there is a biological process that has been established or are they just things where there is a statistical relationship?

DR. MICHALEK: I don't think a biological process has been established for any of these conditions. I think everything you're seeing on this list is the result of a statistical investigation. I have the list right here in front of me now.

However, the exception may be chloracne; there may be a biological process identified for chloracne. By the way, we have seen no chloracne in the Ranch Hand veterans, and that was published in 1995.

We went back to the medical records collected while the men were in Vietnam, and we studied those looking for any evidence of a condition similar to chloracne, which looks just like acne but which is spread on the face and torso. Found no evidence of chloracne.

Yes?

Q: If the study is so small and you can't make any general comparisons, what's the value of this study?

DR. MICHALEK: It's not really that small. I mean, in terms of rare diseases, it's small, but in terms of common diseases, such as diabetes, it's not small. It's 1,000 exposed and 1,300 controls. We have a lot of statistical power to assess changes in continuously distributed variables such as blood pressure, lipids and liver enzymes; very little ability to study very rare diseases, very good ability to study common diseases, such as diabetes.

Q: You're saying there's no biological link yet between any of these diseases, including your most recent health initiative --

DR. MICHALEK: Diabetes.

Q: -- diabetes. Then you're not prepared to say that Ranch Hand experience relates -- causes these --

DR. MICHALEK: No, I'm not prepared to say that dioxin causes diabetes. I'm only telling you that people who have high dioxin levels are at a greater risk of diabetes. That's an association that I'm reporting to you, not causation.

Q: The limits, the size limits of the study, how does it affect detecting the links with these cancers that have been mentioned? Is it large enough to do that, or --

DR. MICHALEK: It's becoming less and less of an issue because as the men get older, the prevalence is increasing, as was just pointed out. We have good power, we have good ability to study all cancers combined, and pretty fair ability to study subsets of cancer, such as kidney and bladder. And our ability will increase over the next few years as more and more men have cancer.

Q: So the fact that you haven't detected --

DR. MICHALEK: Doesn't mean it's not there.

Q: -- a higher risk of cancer so far does not mean it's not there.

DR. MICHALEK: Exactly.

Q: Can you compare the incidence or the -- how does the result of the Ranch Hand studies or these Ranch Hand veterans compare with the general population?

DR. MICHALEK: Well, that hasn't been our emphasis because we're so concerned with protecting against bias. We do that with a carefully selected control group that's matched to these Ranch Handers on age and military occupation. Comparisons with the U.S. male population haven't been done, but they could be. But they just haven't been done.

Q: Can you answer some of the critics of this program that say you did physicals in '97, it's been two and a half or three years, and you are only now coming out with some results like this?

DR. MICHALEK: Actually, I presented the diabetes results in 1991 at a conference in Stockholm, Sweden. It's published in the proceedings. Shortly afterward we began to write an article; it was published in 1995. We have known about the diabetes result since 1991. We have summarized those results in scientific literature.

We ourselves have been very concerned and critical of our own work, because it was an unexpected finding. The National Academy of Sciences has held workshops on diabetes and dioxin in which I have participated and presented data. Last year we answered a series of in-depth questions from the Institute of Medicine, National Academy of Sciences about our work relating dioxin and diabetes. We responded to those, and soon the National Academy will review the issue and present a decision on dioxin and diabetes. I am not aware of what they're going to say.

Q: So why release the information now? I mean, what's different today about what you knew in '91 and/or '95?

Q: You released it 10 years ago. Why are you doing it (today)?

DR. MICHALEK: The data has actually already been released. It was released in 1991, it was released in 1994, and it's being released again today, the point being that the issue of diabetes and dioxin is very difficult to study. Scientists are very critical of these data, the reason being, number one, this is an unexpected finding; number two, dioxin is related to body fat, and diabetes are related to body fat. So many scientists think, well, because we find a relation between dioxin and diabetes, well, you must not be controlling well enough for body fat. And so the skeptic would say, Oh, there's really nothing to this, you just haven't done a proper statistical control. Well, in the intervening years we've analyzed the data many, many different ways, and we responded to many different questions about the data. And as we do that, the credibility of the result is increased to the point that our advisory committee has written a letter to Secretary Shalala announcing this finding and recommending several million dollars' worth of additional research to relate diabetes and dioxin, and ourselves have launched two independent studies of dioxin and diabetes, one at the University of California Davis, looking at the cellular level relating dioxin and glucose transport in fat cells from fat samples taken from our study studies. Separately, we're sending 30 Ranch Hand veterans and 30 matched controls to the VA Medical Center in Little Rock to undergo insulin sensitivity testing to relate that to their dioxin body burdens.

So as we speak, I am announcing an association which itself is being carefully studied to determine whether this is real or not. In other words, is there really a biological reason why dioxin and diabetes should be related? The answer is, we don't know at this point, but we're trying to find out.

Q: So is this a re- or a new analysis of old data, or is this just a reiteration of previous analyses?

DR. MICHALEK: No, sir. This is another analysis on the same men. Remember, these men have been taking physical exams every five years. It was in 1992 that we saw a result for the first time, because at that time -- actually, earlier than that, 1991 -- we were able for the first time to relate their health to their actual body measurement of dioxin. That's when we saw the diabetes for the first time. They came back for another physical in 1992, and we did more extensive testing on diabetes, thinking that maybe we just hadn't done the right measurements. Well, the finding was maintained. We still saw a dioxin trend in 1992 and we published that.

Then they came back again in '97. We did repeated testing on dioxin and diabetes, and the finding was upheld once again. So you're seeing the repeated measures on the same men. It was saying in-depth measurements of diabetes, following advice from our advisory committee. In other words, as these men come back and as the result is replicated in the same group, the strength of the finding has increased to the point that our committee has recommended to Donna Shalala that additional funding be allocated to the study.

Yes?

Q: And at the same time, as you were saying, you've screened out the associate between body fat and diabetes to make sure that that's not a factor --

DR. MICHALEK: Exactly. We have expertise applied to this study from all over the United States. Statisticians at the Mayo Clinic, at Harvard University, at Hopkins, at the National Academy of Sciences, looking at this data in every way possible to try to address the issue you just described. The point is that the finding has remained, no matter how we choose to adjust the data, for body fat.

Q: Have you increased the percentage of people who appear to be having the onset, or is the percentage roughly the same as it was 10 years ago?

DR. MICHALEK: Of course, the percentage of the -- the prevalence of diabetes is increasing as the men get older and as they get heavier. One of the primary risk factors for diabetes is body fat. As they age, they get heavier and their risk of diabetes increases.

There are other findings that are related to diabetes and dioxin that are tied into the picture, such as peripheral neuropathy. In the same report that we're releasing today, you will see an association between peripheral neuropathy and dioxin. Now, peripheral neuropathy is one of the sequelae of adult onset diabetes.

Q: That's vision? Is that what that is?

DR. MICHALEK: It's the loss of sensation in the limbs, especially in the feet.

Q: Oh, that's right.

Q: A couple of quick questions. When did the Shalala letter go out?

DR. MICHALEK: It was dated March 7th, from Secretary Shalala's office to Dr. Clint Olden, chief of NIEHS [National Institute of Environmental Health Sciences] in Research Triangle Park.

Q: So she sent the letter?

DR. MICHALEK: It was sent from her office. It didn't have her signature.

Q: And it was sent to the Research Triangle Park to --

DR. MICHALEK: Clint Olden (ph), director of NIEHS, which is a part of NIH.

Q: And, I'm sorry, I was under the impression that you all sent her a letter asking for more money.

DR. MICHALEK: No. The chairman of our advisory committee -- that was Dr. Robert Harrison, University of Rochester, Department of Medicine -- he's the chief of our advisory committee, which is an independently administered advisory group of academic experts, which is actually administered by HHS.

Q: You said a 40 percent -- is that a 47 percent increase in diabetes? What is the actual number of the 1,000?

DR. MICHALEK: I don't know the number offhand. The prevalence of diabetes is relatively high, even in control groups. It's about 17 percent of our controls are diabetic.

Q: In your control group?

DR. MICHALEK: And the individuals with high dioxin levels it's probably over 20 percent diabetic.

Q: What would it be for the general population?

DR. MICHALEK: That's a frustrating issue, because generally people do not have good data on diabetes. Diabetes is not well documented. Studies that purport to show a relation between exposures and diabetes using death certificates for example are not well conducted, because diabetes doesn't show up on death certificates, like heart disease does. Diabetes is difficult to study. It is a condition that is primarily detected through elevated blood sugar, and most people don't have routinely done blood sugar measurements. And so we probably have the best data in the world on diabetes in adult males. So that this study is not only a landmark from the point of view of dioxins; it's probably a landmark from the point of view of diabetes.

Q: How much higher are the levels of dioxins in the Ranch Hand group than the control group?

DR. MICHALEK: The control group dioxin levels range from about zero to 10 parts per trillion. Parts per trillion is 10 to the minus 12. CDC actually measures to 10 to the minus 15, which is parts per quadrillion, and reports to a part per trillion. A part per trillion is approximately equivalent to one second in 32,000 years, or it's equivalent of one dime in a stack of dimes from here to the sun. That's one part per trillion. You and I in this room have between [zero and] 10 parts per trillion. Ranch Hand

veterans have up to 600 parts per trillion today. We think that in Vietnam they had up to 3,000 parts per trillion when you extrapolate that, using our best estimate of the elimination rate.

To give you a benchmark, if you look at the population exposed to dioxin in an industrial accident in Italy in 1974, in Seveso, where civilians were exposed to a factory explosion that occurred at a chemical plant, those exposures range up to 30 to 40 thousand parts per trillion.

Q: Let me double-check something. So that when you talk about the relative risk being 47 percent higher in that ranch hands, your base first is the control group?

DR. MICHALEK: Right. So I see, say, a 50 percent increase. If the percentage in the control group is 10 percent, that means the percentage of the Ranch Hand group is 15 percent, if I am talking about a 50 percent increase.

Q: When you said it was --

DR. MICHALEK: So approximately a 50 percent increase. So if the percentage in the control group is 20 percent, then the percentage in the Ranch Hand group is 30 percent.

Q: You said the percentage in actual numbers was 17 percent?

DR. MICHALEK: Is roughly 17 percent in the control group.

Q: And in the Ranch Hand group it is?

DR. MICHALEK: In that highest exposed category would be, well, 50 percent greater than 17 -- would be about 22 percent, 23 percent, somewhere in there.

Q: And how big is the total Ranch Hand group? I know it's 1,000 in your sample that you studied --

DR. MICHALEK: Well, actually there were 1,261 Ranch Handers that ever existed.

Q: (Off mike)?

DR. MICHALEK: Well, 22 were killed in action, 50 died before the first physical, and about 1,000 showing up for physical examinations.

Q: Have you looked at those mortality rates, the 50 that died before the first physical?

DR. MICHALEK: Yes. We do a mortality study every few years. That's published in -- the last one published in American Journal of Epidemiology 1999. And, by the way, you can find all these papers if you go to MEDLINE and just type in my name, and they will all come up.

The overall mortality experienced for the two groups is nearly identical. However, if you look at the subgroup of enlisted veterans, enlisted, non-flying enlisted, that we believe are the most heavily exposed, you will see a 50 percent increase in deaths due to cardiovascular disease. That gives us a signal that perhaps cardiovascular disease is related to dioxin, because we saw those deaths. The caveat on the mortality study is that we don't have access to dioxin levels like we do in the physical exam data. And all of those limitations are described in the main report. The main report, by the way, is about 3,000 pages.

Since the study began, we have published about 20,000 pages of reports. All of them are available through the National Technical Information Service. But very soon all of them will be available on CD-ROM and through our Web page. To get to our Web page -- it has a long complicated address, but I'll tell you the easy way. You go to www.brooks.af.mil. On the opening screen you click on Air Force Research Laboratory, which is where I work. There's many icons on the opening screen. Click on Air Force Research Laboratory. On the next screen, click on Air Force Health Study. And you have to do that in one following stream -- click on Air Force Health Study, and then it will come up.

Q: (Off mike)?

DR. MICHALEK: Yes, the full detailed Web address is there [in the news release]. It's quite long.

<http://www.brooks.af.mil/AFRL/HED/hedb/afhs/afhs.shtml>

Yes?

Dr. Joel Michalek, Air Force Health Study Principal Investigator Wednesday, March 29, 2000

Q: I've got a really dumb question. That is: Did you (inaudible) people who were involved in the airplanes, running the airplanes, flying the airplanes, loading the airplanes and all that stuff? I would think the people who were on the ground in walking through the jungle, places where you would spray, they would probably be a lot more exposed to this. Am I wrong?

DR. MICHALEK: Yes, sir, that is a concern. Actually the CDC in 1986 visited our facilities to copy our protocol and launch a study of Army troops exactly as you described, who had from their measurements high exposure opportunity in Vietnam on the ground. It was called the Vietnam experience study. It was published in 1988 and '89 by the CDC. The study was stopped in 1989-1990 because CDC measured dioxin body burden in those men. They found no increases. They found a distribution in their exposed group that was the same as our control group, and their control group was the same as our controls -- in other words, they are all background levels. That caused the CDC to decide to stop the study. And it was at that point the CDC allocated some of their remaining funds to us so that we could measure dioxin body burdens in the Ranch Hand veterans. And we began to collaborate with CDC in 1985 and '86 to measure dioxin for the first time in serum. And since then CDC has been doing these measurements in the Ranch Hand comparison veterans.

So the study you describe has been done, but it was stopped.

Q: Are you aware of any studies that have been done or are being prepared to look at dioxin levels in Vietnamese civilians? Who -- if American veterans were exposed for 12 months or 13 months -- these people are exposed for decades -- if there was an effect, you would expect it to show up there.

DR. MICHALEK: Exactly. My focus of course is the Ranch Hand study, and now you are talking about policy decisions way above my head. Certainly --

Q: I am just wondering if you are aware of any such studies.

DR. MICHALEK: I am aware of some talk about the possibility of doing studies in Vietnam, and you could probably find out more about that than I can.

Q: Finally, I just want to make this accurate -- dumb question I guess again. The statistical link between diabetes and cardiovascular disease in the Ranch Hand group, is it just as strong a trend as in any of these other diseases? Why can't you answer that?

DR. MICHALEK: Okay, I'm sorry I didn't clarify that. In terms of association, it's probably as strong or stronger than any association that has ever been found between dioxin and any disease. And the reason is that diabetes is so prevalent, so common, and there are so many ways to measure it. Not only do you measure disease onset and the occurrence of disease, you can measure diabetes by means of various kinds of measurements of glucose and sugars in the blood.

Don't have all those degrees of freedom, all those abilities with cancer.

Thank you.

-END-

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