Volume 4

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

Before The Honorable Vince Chhabria, Judge

EDWARD HARDEMAN, Plaintiff, VS. MONSANTO COMPANY, Defendant.	**NO. C 16-00525 VC** **PAGES 779 - 781 FILED UNDER SEAL BY ORDER OF THE COURT AND BOUND SEPARATELY**

San Francisco, California
Tuesday, February 26, 2019

TRANSCRIPT OF PROCEEDINGS

APPEARANCES:

For Plaintiff:

ANDRUS WAGSTAFF PC
7171 W. Alaska Drive
Lakewood, Colorado 80226
BY: AIMEE H. WAGSTAFF, ATTORNEY AT LAW
DAVID J. WOOL, ATTORNEY AT LAW

MOORE LAW GROUP
1473 South 4th Street
Louisville, Kentucky 40208
BY: JENNIFER MOORE, ATTORNEY AT LAW

(APPEARANCES CONTINUED ON FOLLOWING PAGE)

REPORTED BY: Marla F. Knox, RPR, CRR
Jo Ann Bryce, CSR No. 3321, RMR, CRR, FCRR
Official Reporters

APPEARANCES: (CONTINUED)

For Plaintiff:

AUDET & PARTNERS LLP
711 Van Ness Avenue - Suite 500
San Francisco, California 94102
BY: MARK E. BURTON, ATTORNEY AT LAW

For Defendant:

WILKINSON WALSH ESKOVITZ LLP
2001 M Street, NW - 10th Floor
Washington, D.C. 20036
BY: BRIAN L. STEKLOFF, ATTORNEY AT LAW
RAKESH N. KILARU, ATTORNEY AT LAW
TAMARRA MATTHEWS JOHNSON, ATTORNEY AT LAW
JULIE RUBENSTEIN, ATTORNEY AT LAW

I N D E X

Tuesday, February 26, 2019 - Volume 4

E X H I B I T S

Tuesday - February 26, 2019 **8:13 a.m.**

P R O C E E D I N G S

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(Proceedings were heard out of presence of the jury:)

THE COURT: Good morning. First of all, we will have a hearing on the order to show cause re: sanctions today at just after -- we have a criminal matter at 2:45, right? Just after the criminal matter we will have a hearing on the order to show cause whether Ms. Wagstaff should be sanctioned, and I'm ordering Mr. Hardeman to be at that hearing. Mr. Hardeman is ordered to be present at the hearing.

MS. MOORE: Okay, Your Honor. They take the bus from Santa Rosa. It takes them about three hours to get here. We will have someone arrange for that to happen. Thank you.

THE COURT: Okay. Thank you.

Now, I have this letter requesting this curative instruction. I'm not going to give this instruction, but it did provoke some thoughts about how to handle this issue a little bit more.

Is Dr. Ritz in the courtroom? Yes, she is.

I have two thoughts. One is that I thought that generally speaking it is a hard line to draw, but I thought that Dr. Ritz handled it about right during her testimony yesterday. And in case you are wondering what I'm talking about, I'm talking about this -- the *McDuffie/Eriksson* dose response issue.

So I thought that Dr. Ritz handled it about right. It is a challenging issue because you have to be allowed to testify to the numbers that emanate from those studies, but you cannot draw the kind of conclusion about them that Ms. Wagstaff drew in her opening statement or -- even if you believe that you can draw that conclusion, I'm not allowing testimony to that effect.

So -- but it strikes me that the real problem comes in at specific causation. And I'm wondering, you know, based on reading this letter and sort of thinking about it further and seeing how the testimony has come in and seeing how the opening statement came in, I'm wondering if the ruling should simply be that the specific causation experts may not testify about *McDuffie* and *Eriksson*, or at least the dose response -- the dose response data from *McDuffie* and *Eriksson*. Because the -- the general causation experts can testify about it as part of the overall mix of information that would lead them to conclude that glyphosate is capable of causing non-Hodgkin's lymphoma, but the point is that the specific causation experts can't assign sort of quantitative risk to someone like Mr. Hardeman based on those unadjusted numbers.

So it seems to me that the consequence of that -- the most sensible consequence of that is probably to say that the specific causation experts may not testify about the *McDuffie* and *Eriksson* dose response numbers at all. So that's my kind

of tentative inclination. We don't necessarily need to argue about that now because -- when is the first specific causation expert coming?

MS. WAGSTAFF: Not this week, so we can --

THE COURT: Okay. So we can find a time to talk about that, but that is my tentative inclination.

MS. MATTHEWS JOHNSON: Your Honor, just very briefly. I do understand your point; and I was listening very closely to Dr. Ritz, and we thought about looking at the transcript and making the submission we made because we wanted to look at the totality of what she had done in terms of speaking about unadjusted numbers and purported dose response. But I do want to raise for the Court there is an upcoming exhibit that is 914 by the Plaintiffs.

THE COURT: Okay.

MS. MATTHEWS JOHNSON: And it is -- it purports to be a plot summary of NHL risk dose response. And what happens here with *McDuffie* and with *Eriksson*, they are plotting unadjusted odds ratio --

THE COURT: Is this the chart that Ms. Wagstaff just put up? Is that what you are referring to?

MS. MATTHEWS JOHNSON: No, no, it's not.

THE COURT: That's not about dose response.

MS. MATTHEWS JOHNSON: It is different.

MS. WAGSTAFF: Sorry. There is a different one.

I would like an opportunity to explain what we are actually going to do with this because obviously this hasn't even been presented to the witness yet.

THE COURT: Right. Let me just take a look at it for a second.

MS. MATTHEWS JOHNSON: And we have a paper copy.

(Whereupon, a brief pause was had.)

MS. WAGSTAFF: This is Number 914 in your binder.

THE COURT: Right. I have seen this. This was used in the opening statement as well; right?

MS. WAGSTAFF: I don't think this was used in the opening statement.

THE COURT: Okay.

MS. WAGSTAFF: So as you can see from this chart that we have been walking through -- and we have been marking it adjusted and unadjusted -- admittedly, Monsanto reminded me last night at midnight that I forgot to put "unadjusted" by this, and I will clear that up to the jury today. We have been clearly identifying which ones are adjusted and which ones are unadjusted. We fully intend when we get here -- I heeded Your Honor's warning -- and I will have her tell us which ones are adjusted and unadjusted. She is going to explain to the jury the value she places on unadjusted versus adjusted.

What Monsanto is asking you to do is their cross-examination for them. They are asking you to take out a

subset of data instead of allowing them to --

THE COURT: I understand. And my reaction to this is that assuming that Dr. Ritz testifies, you know, about *McDuffie* and *Eriksson* when using this chart in a manner similar to the way she testified yesterday, I think it's appropriate.

MS. WAGSTAFF: Thank you, Your Honor.

THE COURT: Anything else?

MR. STEKLOFF: No, Your Honor.

On the specific causation issue that we just discussed, I think we just need to think through it. I mean, one of the things in your order that you noted was -- I think because of the challenge of this issue is unless we decide to use it for impeachment -- I don't know that we will do that, and I think it differs between the experts -- so I do think potentially, say, with Dr. Nabhan --

THE COURT: Right. If you -- it may be -- obviously it is appropriate for you to decide, Look, these things that they said are just so ridiculous that I want to impeach them. We want to impeach them on it and show the jury that they are willing to say anything, that's fine. But we, nonetheless, should set some ground rules for what comes in affirmatively, assuming you decide not to impeach them with those statements.

MR. STEKLOFF: I fully agree. I'm just flagging -- in my mind it is complicated how to deal with it because of that. As we think through this -- I think you've noted it in your

order -- I want to think about it as well. I think ground rules for their direct --

THE COURT: Yeah, but I assume that if you decide to impeach them on it, if you decide to impeach Dr. Nabhan on it, all bets are off; and you and he can have an argument about the *McDuffie* and *Eriksson* studies until the cows come home.

MR. STEKLOFF: I hope to avoid that, but I understand what you are saying.

THE COURT: Anything else?

MS. MOORE: Your Honor, briefly. We received Your Honor's order regarding Dr. Goldstein, and I just have a couple of minor questions about that.

THE COURT: I didn't bring that up with me.

MS. MOORE: I have an extra copy, Your Honor. Would you like that?

THE COURT: I don't know if I need that. You can tell me if you think I need it.

MS. MOORE: Okay. On page 13, Your Honor, it was sustained as unopposed and --

THE COURT: I assume you just forgot to include a response to that.

MS. MOORE: Yeah, it was on the Excel spreadsheet, Your Honor. And I'm sorry, there are so many different versions going back and forth between the parties, every time we make changes. Anyway --

THE COURT: You want to put that in and you want to put that into --

MS. MOORE: It is just his background, Your Honor.

THE COURT: Right. If I recall correctly, that was his education?

MS. MOORE: It's his training and education.

THE COURT: And his training. You know, I think that probably -- I was sort of inclined when I read it to let it in because, you know, he makes these statements about AHS being strong and the other studies being weak; and I allowed those statements in, if I recall correctly. So I actually think there is probably some relevance to it.

MR. KILARU: That's fine, Your Honor.

THE COURT: So that will be allowed.

MS. MOORE: So that will stay in. The video tech will appreciate that.

And then on page 245, Your Honor, you -- I'm sorry, 245, you sustained the Defendant's objections on that. And that was questions about "Apart from the AHS, there have been other studies conducted on the epidemiological studies on the relationship between Roundup exposure and the onset of NHL; correct?"

And the answer is "Correct."

And then the question is: "Do you agree there are -- these other epidemiological studies that evaluate Roundup

exposure and the onset of NHL shows statistically significant elevated risk of NHL given Roundup exposure?"

And he said "Yes. Some of them did show statistically increased odds ratio."

And then it goes on from there and says --

THE COURT: Gets into his criticism of those studies. I don't think that's admissible. I mean, he is not testifying as an expert.

I mean, the hook for the testimony that I allowed in is the ruling about the Acquavella memo. The principle underlying what I allowed in is the ruling about the Acquavella memo, which does not stand for the proposition that any testimony a Monsanto representative gives about the strength or weaknesses about a particular study are admissible.

MS. MOORE: Okay. I understand, Your Honor. Thank you.

And then there was one other place. This is on page 280, Your Honor. And that may be the same issue. So if you give me just a few seconds, Your Honor. And let me scroll through.

Oh, this is when Dr. Acquavella -- they were talking about the AHS study, and they are talking about the memo, and he was asked a quote from the memo. "This has the potential to be disruptive for the agricultural chemical industry as new leads potentially take on a life of their own. Did I read that correctly?"

"Yes."

And you allowed that in, Your Honor.

And then after that he asked, "What is your understanding of what I just read to you?"

So he goes through -- on 281 and 282 Dr. Goldstein goes through his understanding of what that meant, what that criticism from the Acquavella memo meant; and that was what was -- Defendant's objection was sustained. And so we would ask for reconsideration of that because he was designated as a corporate representative, and their understanding of what that 1997 memo meant is relevant in Phase One.

THE COURT: I remember that portion of the testimony well, and I believe that Monsanto -- all of Monsanto's objections to that are well taken, both 403 and calls for speculation.

MR. KILARU: Your Honor, just one --

THE COURT: Actually, I think it is a close question whether that first passage should come in that I allowed in.

MS. MOORE: Well, I don't want to -- okay. Thank you, Your Honor.

MR. KILARU: Nothing else, Your Honor.

THE COURT: Great. I will be back in two minutes.

MS. MOORE: Okay. Thank you, Your Honor.

THE CLERK: Court is in recess.

(Whereupon, a short break was had.)

(Proceedings were heard in the presence of the jury:)

THE COURT: Good morning, everyone. Some bad news and some good news. The bad news is that we lost Mr. Pungyan already. Just to let you know what happened to him, as he was being selected for the jury, his wife was experiencing a major change in her employment situation. Her hours were dramatically cut back. So during jury selection he thought he would be able to handle cutting back his own hours and serving on the jury, but given what happened with his wife's employment, it just became too great of an economic hardship so I excused him. So that is the bad news.

The good news is that in civil trials, the typical practice is to have eight jurors, and I picked nine for this trial because of how long it lasted and for fear that we might lose somebody. Now, I was not anticipating losing somebody on the first day of trial; but fortunately it doesn't create any significant problem for us because of the fact that we usually go with eight.

With that, we can resume the proceedings.

And, Ms. Wagstaff, you can proceed with Dr. Ritz.

MS. WAGSTAFF: Good morning, ladies and gentlemen of the jury. Hope you had a restful evening.

DR. BEATE RITZ,

called as a witness for the Plaintiff, having been previously duly sworn, testified further as follows:

DIRECT EXAMINATION (resumed)

BY MS. WAGSTAFF

Q. Good morning, Dr. Ritz. Are you ready to proceed?

A. Yes.

Q. Okay. So I just wanted to go back to this chart that we were talking about yesterday, and I realized -- yesterday was a pretty long day and I realized we left one piece of information off of this chart. I don't remember which color I was using.

So I wanted to know when we were talking about the *Eriksson* study, do you remember --

A. Yes.

Q. -- our discussion on that?

Okay. This was a dose response study, and you had mentioned that there was a 2.26 risk increase when we -- when there was ten years between -- after exposure. Remember that?

A. Between exposure and diagnosis, at least ten years, yes.

Q. Okay. And so was that data based on adjusted or unadjusted?

A. It is unadjusted for the pesticides, but it is adjusted for age, sex and province, I believe.

Q. Okay. So I'm going to go ahead and put unadjusted right here, and that will represent that those numbers are unadjusted.

I think I also asked you if Dr. Weisenburger was an author on the North American Pooled Project, and you said that he was.

A. Yes.

Q. And I forgot to write his name, so I will go ahead and write his name on there.

A. Yes.

Q. Okay. So we have two studies left on this chart, and actually we have a little key to what A means for adjusted confounders on it.

So the last two relate to the Agricultural Health Study. Can you tell the ladies and gentlemen of the jury a little bit about what the Agricultural Health Study is?

A. So what we heard about so far is called a case control study. So we are going out and we are assembling cases of NHL from the registry or a hospital, and then we are selecting people from a population -- except for the one study that went to the hospital -- and we are asking them to remember what they did throughout their life; right? And you ask them about their occupation, whether they spray pesticides, what they ate, what they smoked, et cetera. Everything is up to the time when they actually had a diagnosis; right? So everybody who is being asked is already either a case or specifically selected because they weren't a case.

So now, we are completely switching gears. This, by the way, case control studies is what we usually do when we study rare diseases; and we call a rare disease anything that is less than 5 or 10 percent in the population. And clearly NHL is

around 1 percent or less, so it is a rare disease.

Why that is important is because I have to watch a hundred people to even have one person get the disease; right? And you see that they had all cases there in -- in above the hundreds. So they had 400, 500, 900, 1,600 cases in those studies. So that is a lot of people we have to watch.

And that is exactly what the next study did. So these two rows there are actually the same study. It is not two different studies. It is the same study, but the same study at two different time points. And this will become important because we are doing -- we are switching now.

We are switching from having cases and non-cases and asking them about their life's exposures to having all non-cases who have a certain occupation. So everybody in the Ag Health Study -- Agricultural Health Study -- was actually a non-case when they were interviewed. Nobody had NHL. Actually, if they had had NHL, they couldn't be participating in this study.

So we want people disease free at the beginning. And since we are interested in cancer -- and they were not just interested in NHL -- they were actually interested in any cancer: Breast cancer, lymphoma, leukemia, lung cancer, prostate cancer. They were interested in all cancers; right? NHL is just one of them.

And what they did is said, Well, you know, who is the

group of people most exposed to pesticides? If that's what we are interested in, it is farmers. So let's go out there and assemble a large group of farmers. And that's what we call a cohort, a cohort of farmers.

And let's do that systematically at one point in time when they are -- and in this case when they are coming to get a pesticide application license. So they were -- that was actually a smart thing to do, by the way, because they knew that they got farmers who wanted to apply pesticides or have somebody on their property apply pesticides; and they needed a license for that; right?

So we have a built-in -- they have to be exposed at least to some pesticides, not a specific one but, you know, any kind of pesticide or else they wouldn't get the license. And they also went to two ag studies -- agricultural -- states -- sorry, states. They went to Iowa and North Carolina. And both of these states have ag extension programs that help farmers in many ways. And one of them they help them is by educating them about pesticides and how to use them correctly and licensing pesticide use.

So these farmers, if they want to buy pesticides, have to come to this licensing agency and take a test. And when they take a test, then they get their license. They can go home and do what they do. But they also instructed -- there is also a training program. It is -- you know, you may all have a

driver's license, so you know you are going to get some training and then you go and take a test; right? It is the same thing here with the pesticides.

So these farmers were trained and then went there and took a test to get their license. And at the time when they took that test, they were approached by research assistants from this agricultural extension program who said, Well, you know, we are really interested in farmers' health, so would you mind being part of the study? And we call it the Agricultural Health Study. And, you know, by being part of it, you will get regular updates on farmer health. And, you know, we just want to help you in any way we can, but we need to study what your health is.

And so -- but that was done when these people were coming to the -- taking a test. And it was -- so they could feel like if I say no, maybe my chances of passing the test are not so great; right? So I wanted to --

MS. MATTHEWS JOHNSON: Objection. Speculation.

THE WITNESS: Well --

THE COURT: Hold on. There was an objection. You have to give me a chance to overrule it before you continue.

Overruled.

THE WITNESS: Sorry.

But, you know, most of them probably said why not? I want to know about health, right, so let's do this.

So what they did is they said, Okay. I will do this. You know, I'm here to take a test so I may as well fill out another questionnaire. And it was a 22-page bubble-in questionnaire. And it says on the front it will take you 25 minutes to fill out. So that's a minute per page, bubbling in. And on that questionnaire -- it was a well-designed questionnaire for pesticides in a way because it had 22 pesticides listed, and then asked, Well, for this pesticide, in what year did you use it or better, in what decade? How many years did you use it? And also how many days per year on average did you use it?

This is easy when you -- maybe when you are a farmer. You are coming there and you are remembering what you did the last 12 months; right? Last year, yeah, I used these three pesticides and I went into the field and I did this five times, you know, at the beginning of the season, the end of the season.

But they weren't asked to remember the last 12 months. They said remember anything in your lifetime. Go back and give me this answer, you know, how much did you apply, how many years did you apply on average, on average, and in what decade.

And yes, the other studies had a similar way of asking people but the other studies sent them questionnaires to the homes and then called them up and encouraged them to ask their spouse or their helpers or look at records. It was a process; right?

Here, you have 25 minutes or some might have taken longer, but you have really a restrictive time period because nobody really expected to be thrown a 22-page questionnaire that you have to bubble in; right? And some people who were younger might remember much better and also don't have as much experience with pesticides, so it goes fast. But somebody who comes there at age 55 and has farmed for 30 years might have a hard time remembering everything; right? But they did anyhow. They wanted to be good citizens. They did it.

And they actually got within a period of 1993 to 1997 -- that's how long it took them -- to get everybody to participate. So a four, five year period. They got 54,000 people to bubble this in. And then in addition they gave them a questionnaire to take home and fill out more information, mostly about health. And they also gave them a questionnaire for the spouses, and then half of the spouses actually sent that questionnaire back.

But the people we are talking about today are the farmers who came for the tests and who filled this out and bubbled it in. So that's okay; right? You bubble it in. But you had no chance to go back to your records, to talk to anyone about your experience of doing this; and you did that and you thought you were done; right? That was all they asked you to do. They didn't ask you to come back next year and do the same thing. You thought you were done.

MS. WAGSTAFF: Thank you. I have a little housekeeping item. I'm trying to make it so the jury can see and counsel can see. I feel like it was in the way.

Can the jury all see this?

MS. MATTHEWS JOHNSON: Yes.

THE COURT: Counsel, you are welcome to be up at one of these podiums.

MS. MATTHEWS JOHNSON: Thank you.

THE COURT: You can go wherever you want in the courtroom.

MS. MATTHEWS JOHNSON: Thank you very much, Your Honor.

MS. WAGSTAFF: Also, if we can please publish 904 which, I believe, is this chart.

Thank you.

THE WITNESS: So I'm actually not done yet.

So what I just told you is all about how they assessed exposure, and so now what we have is a baseline. We call this baseline.

An enrollment when someone comes to the pesticide licensing exam, they are filling out 22 pages about their lifetime pesticide exposure. Some of the people who come are 55 and may be farming five more years or ten more years and then retire. Other people came at 35 and may be farming another 20, 40 years; right? But what you get is what they

tell you at enrollment about the pesticide exposure.

So nobody has the disease because that's actually a rule in this study. Nobody can have the disease when you ask them at baseline.

What you are now doing is you are waiting until they -- these 54,000 people, until somebody among them comes down with the disease, and then you count them as a case. Can you see what happens between the baseline and when they -- when they are diagnosed? Time passes.

In that time what changes? Well, eventually they become sick. But if they keep farming, every year they are using pesticides. Do you know about this? No, you don't; right? So you have no idea what happens after this baseline in terms of what their farming practices are and what pesticides they are using and, you know, whether they change or not.

Q. Thank you, Dr. Ritz.

If you can turn to Exhibit No. 907 in your book, please, and explain to us what this is.

A. Yes.

Q. If it would be helpful in showing the jury this to explain your testimony, and please tell us where you pulled this from.

A. Right. So I like maps. I told you yesterday. So this is a map of the U.S. Do we see it?

Q. Would it be helpful to show this jury the picture -- no, wait -- from yesterday we have to --

A. Yeah.

MS. WAGSTAFF: Permission to publish, Your Honor.

MS. MATTHEWS JOHNSON: No objection.

THE COURT: Go ahead.

THE WITNESS: So we see the U.S. Can you-all see Iowa? It is kind of in the middle there.

MS. WAGSTAFF: Geography test.

THE WITNESS: Right. There it is.

That's Iowa and then North Carolina. It is on the coast and -- yeah, there it is. So that's North Carolina; right? So we have two states where this happens, where the study happens.

And you can see what is on this map is pesticide exposure mapped by the Environmental Protection Agency, according to records that they had for that year of pesticide use; and that year is 1993.

And it is 1993 for the reason because that's when they started interviewing these farmers, and they started interviewing them in Iowa and North Carolina. So try to keep in mind the pattern you see. So there is a little bit of white, but it goes all the way to deep orange in North Carolina but clearly not everybody in North Carolina is using glyphosate. It seems to be just that, you know, that sprinkle in the middle that is using glyphosate.

And then when you go to Iowa, a lot more glyphosate use already; but you still have that light yellow square on the top

where nobody is using glyphosate, or very little.

MS. WAGSTAFF: If you could, please, turn to Exhibit 906. And permission to publish?

MS. MATTHEWS JOHNSON: No objection.

THE COURT: Go ahead.

THE WITNESS: So now we have the same map and the same colors; and we are, again, looking at an EPA map for glyphosate use with the data that EPA collected, and we are in 2013. So you can see in North Carolina when we only had a little bit of people orange, we now have dark brown blotches; and we have them along that coastline and also in the middle.

And then when you go to Iowa, it's all brown. It looks like nobody is not using glyphosate anymore; right? So just about every -- everywhere you have glyphosate use.

And so this is a change between 1993 and 2013. That is a 20-year period. Why am I showing you this 20-year period? Because that is the period this study, the Agricultural Health Study, will cover. Okay?

And the change from 1993 to 2013, the change in use which is an increase in use -- a really -- I mean, a multifold increase in use -- it happened because of the difference in how glyphosate was marketed and used since 1996.

BY MS. WAGSTAFF

Q. All right. Now I would like to take what you just testified to and apply it to your opinion in this case. If you

could, please, turn to tab 911. And I would like to ask you a few preliminary questions about that tab.

Did you assist in creating this document?

A. Yes, I did.

Q. And will this document help you explain your testimony to the jury?

A. Yes.

MS. WAGSTAFF: Permission to publish.

MS. MATTHEWS JOHNSON: No objection.

MS. WAGSTAFF: I actually have a blowup of this. I'm going to set this on top of here.

BY MS. WAGSTAFF

Q. All right. So using the testimony that you just gave about the increase in glyphosate between -- the increase in Roundup between 1993 and 2013, please explain why you created this demonstrative and how this demonstrative relates to your opinion?

A. So I told you that, you know, interviewing or getting bubbled-in questionnaires from 54,000 agricultural farmers took them five years; right? In those five years, it was just one time that they approached the person and they filled out one questionnaire; but since they needed so many people, they had to wait five years for 54,000 to be completed. That's the number they wanted, over 50,000.

So Farmer Ted may have come to get his license in 1994 and

was asked what is your lifetime glyphosate exposure and would have more or less accurately reported what he has been doing so far, when he farmed, when he actually applied glyphosate on his fields or, you know, as weed control. And that would be the exposure you assign to him.

So if he said, Well, I used very little or nothing, then in 1994 he would go into the category of no exposure, low exposure; right?

So in 1996, however, may decide that now these genetically modified crops come on the market. I have been told it is much easier farming. I can make a better profit, whatever his motives are, I don't know. But he decides I'm going to do what my neighbors are doing, and I'm now going to farm in the same way. I start using glyphosate, and glyphosate-resistant crops; right? So that's Farmer Ted. Starting in 1996, now uses glyphosate in a very large amount because that's what you have to do when you are changing the farming practices; right? You use a lot of it.

And then between 1996 and 2006, let's say, he is using for ten years, every year glyphosate. You interviewed him in 1994. All you know is he is not a user; right? If he comes down with NHL in 2006, you may call him not exposed.

Q. Okay. And I want to make sure that you explain what this means in red and why you wrote that it was a major change in glyphosate use and its effect on the entire study versus

glyphosate?

A. So this makes a difference because we have changes in pesticide use. And, you know, they come and go. And some are more popular one year than another year, but rarely do you see something that has happened to glyphosate.

In fact, what happened to glyphosate is pretty unique because of these glyphosate-resistant crops.

MS. MATTHEWS JOHNSON: Objection, Your Honor.

THE COURT: Overruled.

THE WITNESS: So what we have here is a situation where actually the purpose of use changed between 1993, '94, '95 and starting in 1996 because the farming practice changed. It was a radical change in farming practice.

Unfortunately for my colleagues from the AHS, who have really done a great job with many, many pesticides, this happened in the middle of their enrollment period; right? So that the people they already interviewed prior to 1996 told them about their exposure prior to that change. And then if Ted had been interviewed in 1996 or '97, would have told them a very different story; right? But you locked Ted into what he told you in 1994.

Q. Okay. And so you testified earlier that the AHS study -- I think you said 50 pesticides --

A. Yes.

Q. -- is that right?

And so this problem that you were just talking about, is that for all 50 or is that just for glyphosate?

A. No. This is not a problem with the other pesticides.

Q. Okay. And so can you explain why you have an iPhone on your chart?

A. Yeah, I thought, you know, if we need any more visuals, think about when the iPhone was introduced in 2007. And let's imagine we are doing a study on the health effects of iPhone use. And if you enroll people between, let's say, 2005 and 2010; and then everybody started using an iPhone in 2007, we would have the same problem. We would call everybody interviewed in 2005 and '06 a non-user because that's what they told you because, you know, it wasn't -- there were phones, so we asked them about phone use; right? So they would say, yeah, I use a phone and maybe even a hand-held phone; but they wouldn't ever tell you an iPhone because it didn't exist yet. But starting in 1997 they would be able to tell you, yeah, I changed to iPhone; right?

If you think it is something specific about the iPhone, you have a problem. If you think it is any pesticide or any phone, you don't have a problem because they would have reported phone use; right? But if you think it is really the iPhone and not the other phones -- because the iPhone has a special frequency or it does something else, right -- you have that hypothesis, it should be the iPhone, then you are in

trouble with the study that is done that way where you have people before iPhones even came on the market and could be used and people who were coming into the study afterwards. It is the same story.

Q. Okay. So you testified earlier about the issues related to actually the questionnaire and the -- what did you call it? How would you phrase that problem? I think you said "baseline."

A. Yeah, we call it the baseline questionnaire.

Q. Okay. And that -- I just want to make sure I understand your testimony. Was that criticism to all pesticides in the AHS?

A. Well, to all pesticides you can have the criticism -- I mean, you can say the AHS gave them 25 minutes bubbling in 20 different types of pesticides that you are bubbling in, and then a questionnaire you take home and, you know, fill out for more pesticides and send in. By the way, a large number -- I think 13,000 people never sent the take-home back. They didn't want to do it, okay.

But actually, that is -- you are under stress. You want to fill this out. You don't remember. You say, ah, what the whatever. I'm just bubbling it in so they let me go.

So there is some random error, and that random error can occur for every pesticide. That, we cannot help; right? But what is happening with locking you in in 1994 in an exposure

category, that is very specific to glyphosate.

Q. Okay. And so did the initial questionnaire, did it ask you if you wore any sort of personal protective equipment?

A. Yes.

Q. Can you explain to the jury --

A. Right. So my colleagues were really smart. They not only asked what did you use, how many days did you use it, did you -- in what decade did you use it; but they also then at the end of 22 -- 22 pesticides, they filled it out. And then they have a question that says When you use pesticides, all pesticides, not just the specific one, what do you do? Do you cover yourself? Do you drive a tractor with an enclosed cab? Do you wash your hands? They ask all these questions about how you protect yourself.

And they also asked another question: When you apply pesticides, what are the methods you are using? Tractor? Backpack sprayer? All the ways that farmers do it, and you can bubble in yes, yes, yes to every one.

The problem is none of that is linked to any of the pesticides. So somebody who said ten pesticides is what I used in the last 30 years, you wouldn't know what he reports about protective equipment use and how he applies what pesticide that was. Remember, they are coming to a pesticide licensing exam, so they probably think I need to report that I'm really careful, right, because if I don't know that I have to protect

myself, they may know; and, you know, they may not give me my license. So they may be a little more cautious in how they report. They say, yeah, I use all this protective equipment.

But nothing tells you in 1980 he actually did, and maybe he changed to using because he was educated by the Farming Bureau that he should use protective equipment, as we hoped they were; and he changed three years before he came to this questionnaire. They changed. Yes, now I'm really protecting myself.

And when he asked so on average when you are applying, are you using protective equipment? They say yes, yes, yes. Even so in the '80s maybe they didn't because nobody warned them and so what.

So you don't know whether they really used what they said they used while they were applying glyphosate, and you don't really know what pesticide they were referring to or when they actually used these equipments.

Q. And so your criticisms about not knowing that information, how does that affect the data collected on the AHS?

A. So we had -- before was the other examples. We always went through -- oh, never-ever use; right? Am I a glyphosate user? Yes, no.

And then we had oh, how many years did you use or how many days per year did you use? What these colleagues did was a strategy where they thought I can't even capture whether

somebody is exposed; better by asking them what protective equipment they used and how they applied. And then they came up with a very fancy method of saying, Okay. Your exposure intensity, how much you were exposed depends on what you are reporting as protective equipment and how you applied. But they applied these data -- these pieces of information to every pesticide they report, without knowing that for -- truthfully, for the one pesticide they did this and for the other pesticide they did that. They just applied it across the way because that's the only information they had. That's the best they could do; right?

So somebody may have applied glyphosate, not worn protective equipment. Applied it in a manner that exposed them maximally, but he also applied another pesticide that the farmer considered much more toxic because he had -- there are actually some that give you pretty acute symptoms, so, you know, that you should handle them carefully.

So in that case they are actually putting on a Tyvek suit and goggles and they are using a tractor. And when they are reporting, they say, Yes, I used a Tyvek suit and a tractor, you know, but that is for the other pesticide they use; right?

But that information then subtracts from glyphosate use. So instead of saying this person was X number of years glyphosate exposed, it's intensity weighted, meaning we are subtracting 50 percent or 90 percent of exposure from that

person because they protected themselves when they really didn't.

So what is all what I'm telling you called? It is called exposure misclassification. And the best way to understand that is to think you have a white can of paint and a red can of paint; and every time that you get something wrong, you are mixing these paints. So you are taking a cup and, you know, when you are getting it wrong, you are taking a cup of the red paint and you are putting it in the white. And guess what happens? You stir and it's a little pink. And then you take from the white can and put it in the red, and the red becomes a little lighter. If you do this often enough, we get pink in both cans. Meaning, we cannot distinguish the red from the white anymore or the exposed from the unexposed; right?

And the more we have that situation happening, the less we can really say that that exposure caused anything.

Q. All right. Thank you.

So do you have any other criticisms of the AHS with respect to glyphosate?

A. Did you want to go into the second study or just the *De Roos*?

Q. Well, first, let's talk about the AHS -- let's continue on with the AHS. So let me rephrase my question.

Did the AHS -- you have testified that they did their initial enrollment between '93 and '97?

A. Right.

Q. Did they do a follow-up at all?

A. Yes, they did. So they actually realized by 19 -- mid-1995 that things were actually changing on farms and that if they wanted to keep watching these people, they also needed to get additional information on changes. So they got the National Cancer Institute and the National Institute of Environmental Health to agree to do a second phase.

So in that second phase that started in 1999 -- so between 1993 and 1999 all they did was that enrollment; right? And then they had two years in between where they didn't do anything with these farmers. Then in 1999 they went back and tried to find these farmers again and to interview them again.

So somebody who was interviewed in 1999 -- or who bubbled in this questionnaire in 1993 would be tried to be recontacted in 1999. Of course, they couldn't find all of them right away.

Also at this time they said, Well, maybe it is better if we do phone interviews. So they set up a whole phone bank of interviewers, but it was standard asked interviews. It should take half an hour; right? Same kind of principle, but now we are phone interviewing.

So they are trying to catch these people between 1999; and it took them, again, five years, in 2004 calling them back and the farmer may say, Oh, it is not a good day. Call me another time; right? So they call them back, and they call them back

until they finally say, Okay. I will answer your questions. And then they asked them -- because they knew they were annoying to these farmers maybe -- and they wanted them to come back and tell them more information -- they said, Well, let's just not make it difficult for them because then they wouldn't want to be on the phone. Let's make it easy. So let's not ask what have you been doing between 1993 -- if that's the time when you bubbled in your questionnaire -- and now where I have you on the phone in 2000 or 2001 -- but let's just ask the question the last year you have been farming; and if you are a farmer, that's the last 12 months -- what have you been doing?

So of the pesticide information that they collected, the second time refers to the last year they were farming. So they could have said just the last 12 months, but because some of the farmers were old and they have retired they said, Oh, nothing, so they asked last year of farming. So we don't know if they retired. It might have been 1997, the last year. If it was 1996 they retired, it was that that they reported on. But if they were active farming, it would have been just the last 12 months. So we get all these different years they are reporting. And then they are using that information to fill in the whole period between the baseline and when they reported again.

Can you see how that also allows for a lot of mistakes? Not only that, they actually were only able -- this is very

normal, and I'm not faulting them for this at all -- this is what happens. When you enroll people and you give them this bubbling questionnaire and all they expect to do is bubble this in and that's it, and then you try to reach them again and they are really busy, they don't want to really respond; right? So especially if they are really busy on their farm. I mean, to be on the phone for an hour might not be the fun way to spend your time or they couldn't care less or in the first place they only bubbled in because they wanted to get their license and get out of it. They are not interested in research. They really want nothing to do with this; right?

38 percent of the people did not respond the second time. That's -- you know, that's a lot. 38 percent. So they got 62-point-something percent back on the phone reporting about the one year, the last year they farmed, and 38 percent nothing. So all they have on those people is the time of enrollment in terms of deciding whether they are glyphosate users and how much they used for the rest of the 20 years that we are now looking forward.

Q. Okay. And so for the 37, 38 percent that disappeared from the second follow-up, what did the investigators do with that?

A. So they clearly saw a problem there, and there are different ways of handling this. You can drop these people out of your study, but that would have reduced the study to 30,000 individuals from 40 -- 54 -- about 30,000 individuals. And

they said, Well, that's a lot of people to kind of drop out of your study when you invested already time and energy in them. So can we do something better than just, you know, dropping them out because they don't tell us what happened in the meantime with their exposures.

And they said, Yeah, there is a statistical method where we can actually guess what their exposure was; and so that statistical method is based on the people who come back. So you have the 30-some-thousand who answered the phone call and gave you additional information on what they did in that one year of farming, and then you use that information and what you know about the people who came back to guess what happened to the ones who didn't come back.

Can you see how -- what the guesswork that would be?

MS. MATTHEWS JOHNSON: I'm going to object to the question.

THE WITNESS: And how you --

THE COURT: I'm sorry. What?

MS. MATTHEWS JOHNSON: Objection to the answer being questions.

THE COURT: Yeah. I mean, that is something I noticed before, Dr. Ritz. You shouldn't be asking jury questions and asking them if they understand, that kind of interaction with the jurors. It is appropriate in the classroom but not in the courtroom.

THE WITNESS: I get it. Thank you.

All right. So I try not to. Try my best.

So, basically, what you are doing is you are using all the information you have, and that's the best you can do because all the people who didn't come back, you have no information; right?

So you are setting up guesswork, but it is informed guesswork because you have some information on 30,000 people. And, you know, maybe Farmer Joe represents Farmer Ted, but maybe not. And you have to think about the ways that Farmer Joe who came back to answer the second round might be different from Farmer Ted who couldn't care less and didn't want to be bothered.

Farmer Ted, who didn't come back, may have been too busy. Farmer Ted may have been sick. Farmer Ted may have given up farming. Lots of different things that could have happened; right?

But you are now using those who came back, saying they are a good group for me to guess what happened to the people who never came back and tell me what pesticides they used, in the meantime how much they used and how many days they used. Okay? And that's what they did for 38 percent of people, almost 20,000 people, who never responded a second time to fill in exposure.

\\\

BY MS. WAGSTAFF

Q. And have you ever taught to your students at UCLA your criticisms of the AHS?

A. Yes, I did.

Q. Okay. And do you remember --

MS. WAGSTAFF: Ms. Melen, I would like to go on the ELMO.

Counsel, this was not marked as an exhibit. This is what you handed me yesterday.

MS. MATTHEWS JOHNSON: Oh, no, it is.

MS. WAGSTAFF: It is? Okay. This is not in your book.

Permission to publish?

MS. MATTHEWS JOHNSON: Yes, yes. Correct, no objection to publishing.

THE COURT: Go ahead.

MS. MATTHEWS JOHNSON: Let me identify --

MS. WAGSTAFF: This is not the exhibit right here.

MS. MATTHEWS JOHNSON: For the record it is TX1467.

MS. WAGSTAFF: Okay. I will write that down later.

BY MS. WAGSTAFF

Q. All right. So, Dr. Ritz, you said you have taught your students about -- reflected your criticisms of the AHS study at UCLA. Can you tell the ladies and gentlemen of the jury what I have placed on the ELMO.

A. So this is a printout of my slide deck that I use in the classroom. And you can see that it says "Introduction to cohort studies," which is the Ag Health Study. It is a cohort study. And you can see this was my method class, and I taught it in fall of 2012.

Q. Okay. So I was given some advice from my tech guy. So I just wanted to -- that means that you taught this -- this is a PowerPoint from 2012?

A. Correct.

Q. And do you recall when you were retained to be an expert in this case, roughly?

A. In the fall of 2016.

Q. Okay. So you were teaching your AHS criticisms to your students at least four years prior to ever --

A. Yes.

Q. -- being contacted by Mr. Hardeman or his attorneys?

A. Yes. Ever knowing I should be interested in this.

Q. All right. So, in fact, if we go through this for completeness of record, you actually have here a slide called "Disadvantages of Cohort Method"; correct?

A. Correct.

Q. And have any of your views changed since you taught this to your students in 2012?

A. Actually, I teach exactly the same slides.

Q. Oh, you do?

A. Yes. And I did a few weeks ago.

Q. Okay. A few weeks ago you used these slides or a similar version of these slides to teach to the UCLA students?

A. Yes.

MS. WAGSTAFF: Okay. We can turn off the ELMO, Ms. Melen.

BY MS. WAGSTAFF

Q. If you can turn to -- I believe it's Exhibit No. 910.

MS. WAGSTAFF: And, Counsel, we had redacted some information. So, Mr. Wolf, if you can pull up 910, we agreed to redact some -- yep, I believe that's correct.

BY MS. WAGSTAFF

Q. Before you publish, can you tell us what 910 is?

A. Yeah. It is a slide in which -- that is titled "Exposure misclassification has been recognized a persistent problem throughout the course of the Agricultural Health Study in various peer-reviewed publication," meaning that the problem I just described to you has been described before in -- in journals that had articles that people actually peer-reviewed in the way that I explained yesterday and it wasn't my articles. It was other people's.

Q. Okay. And did you create this document?

A. Yes.

Q. Okay. And would this document help -- would showing this document help you give your opinions to the ladies and

gentlemen of the jury?

A. Yes.

MS. WAGSTAFF: Permission to publish?

MS. MATTHEWS JOHNSON: No objection.

THE COURT: One second. I want to have a very quick sidebar. Don't need the court reporter.

(Sidebar conference heard but not reported.)

THE COURT: You can publish it.

BY MS. WAGSTAFF

Q. Okay. So, Dr. Ritz, there are one, two, three, four, five paragraphs. Is each paragraph a conclusion from a peer-reviewed publication?

A. Yes.

Q. Okay. And did you create this --

A. Actually, the first one is, I think, a report.

Q. Okay.

A. But the others -- well, it's in -- I'm not sure how they peer review, but it might be a report that was published in that journal or an excerpt.

Q. Okay. Just to explain to the ladies and gentlemen of the jury what this document is, let's just look at the first paragraph. It says "Gray, et al. The Federal Government's Agricultural Health Study: A Critical Review With Suggested Improvements."

Is that a medical journal or a review article with Gray,

et al. being the authors?

A. Yes.

Q. Okay. And it was -- it looks like if you keep going, this was from 2000; correct?

A. Yes, yes.

Q. And then just to orient the jury a little, if you look at the next one, Acquavella would be the author with the title being "Exposure Misclassification in Studies of Agricultural Pesticides Insights from Biomonitoring," and that was done in 2006; right?

A. Yes.

Q. And just continuing on, the next one is a third study. And these were all peer reviewed using the process that you discussed to the ladies and gentlemen of the jury yesterday; right?

A. Yeah. And by the way, that journal, Epidemiology, that is the official journal of the International Society for Environmental Epidemiology. It is very highly regarded.

And the next journal, Environmental Health Perspectives, is a journal that is actually curated by the National Institute of Environmental Health Sciences. Again, one of the most highly respected journals in our field.

Q. Okay. So that third one the author was -- how do you pronounce that author's name?

A. Weichenthal.

Q. And that was -- the title of that article is "A Review of Pesticide Exposure and Cancer Incidence in the Agricultural Health Study Cohort," and that was from 2010, correct?

A. Yes.

Q. Okay. And then the fourth one is by Dr. Blair and colleagues. And that one is titled "Impact of Pesticide Exposure Misclassification on Estimates of Relative Risk" -- I think that is a typo -- "Risks in the Agricultural Health Study."

Did I read that correctly?

A. Correct.

Q. And that was an article that was published in 2011; is that right?

A. Yes.

Q. And then the final article that you cite to is Sheppard et al., which is Sheppard and colleagues. And this one says that the title is "Re:" which is regarding; right?

A. Uh-huh.

Q. "Re: Glyphosate Use and Cancer Incidence in The Agricultural Health Study," and that's from 2019; right?

A. Right.

Q. That's from the JNCI, Journal of National Cancer Institute; right?

A. Correct.

Q. And is that the same journal that actually ended up

publishing the Andreotti?

A. Yes.

Q. Okay. So these are five different peer-reviewed articles that have come out between 2000 and 2019, so in the last couple of months, that relate to criticisms of the Agricultural Health Study?

A. Yes. And actually not just any criticism, but the ones I just described to the jury.

Q. Okay. I would -- did you review all of these articles?

A. Yes.

Q. Did you rely on these articles in forming your opinion that you are offering to the ladies and gentlemen of the jury?

A. Yes.

Q. Okay. I would like you to just spend a few minutes on each article and explain to the ladies and gentlemen of the jury, let's start with the first one by Gray. And you can -- I didn't read the conclusions. So if you could tell the jury what the conclusion of the authors were in each study, please.

A. So what I told you about the two cans of paint and taking a cup of red and putting it in white and white putting it in red, that's in our technical terms called non-differential exposure misclassification. So we are mixing the colors a little bit; right? We are saying that somebody has exposure when they don't and somebody else who had exposure -- didn't have exposure, had exposure that they don't. You know, we are

mixing the two cans.

That's called non-differential exposure misclassification, and they say that that will produce bias towards the null, and I think I introduced that concept to you yesterday. Bias is systematic error. So that -- and towards the null means we draw that estimate to. So we are reducing anything we can see to not being able to see it, and you might have an intuition why that is. It is the same as with the paint. In the end the paint will be pink, and we cannot draw any more conclusion because the exposed and the unexposed are so mixed.

Q. Okay. And was this -- was this Gray article related to Harvard University?

A. Oh, yes. The authors Gray, et al. and colleagues are actually from a risk assessment program at Harvard; and they were charged to evaluate the Agricultural Health Study in terms of its -- its design and conduct of the study. And that was a -- a report that was, as far as I remember, initiated by an organization called Crop Life International. And that is an organization of pesticide manufacturers. But this is a Harvard -- respected Harvard group that wrote this report about the Agricultural Health Study having this problem.

Q. Excellent. Let's talk about the next one, Dr. Acquavella's paper from 2006.

A. Right.

Q. Before we start, do you know who Dr. Acquavella is?

A. Yes, I actually met him personally.

Q. Okay. Can you tell the ladies and gentlemen of the jury who Dr. Acquavella was in 2006?

A. In 2006 I think he was still working for Monsanto as their main epidemiologist. He is now not anymore. And he -- I met him because I was actually on an external advisory panel for the Agricultural Health Study in that period. So I met him because he was the representative from Monsanto being sent to these board meetings where the Agricultural Health Study colleagues were presenting what they were doing to external experts, and I was one of them.

Q. Okay. So can you please tell the jury what Dr. Acquavella said about the Agricultural Health Study in 2006?

A. So what he said --

THE COURT: You are talking about in this study?

MS. WAGSTAFF: In this study, yes. Thank you, Your Honor, in this study.

THE WITNESS: There is no evidence that retrospective questionnaire information can be used to differentiate gradients of pesticide exposure. So he says we really cannot say how much exposure there is when we ask people to remember. And that was the problem from the baseline questionnaire; right, all the stuff they had to remember throughout their lifetime. And then he says, given the uncertainty of questionnaire responses about yearly frequency of use and years

of use, our results suggest that dose response analysis based on cumulative days of use would have substantial exposure misclassification. So he pretty much says what I just told you.

BY MS. WAGSTAFF

Q. Okay. Excellent. So Let's move to the third paper. And can you tell me what those authors said in 2010 about the Agricultural Health Study?

A. Yes. So this was, again, a broader view from the outside -- Weichenthal is actually in Canada, from what I remember, and he looked at all of the results and all of the data coming out of the Agricultural Health Study. It was not just on non-Hodgkin's lymphoma. It was a lot of other cancers too they reported on and other diseases. And overall his conclusion after taking a broad look at this study, he says, "Exposure misclassification" -- so, again, putting white in red and red in white -- "undoubtedly has an impact on the Agricultural Health Study findings reported to date."

Q. Let's move to what Dr. Blair said in his study in 2011.

A. So Dr. Blair is actually one of the premier scientists of the Agricultural Health Study. So he designed the study. He conducted the study. He won a big award from my own society for lifetime achievement. He is one of the heroes in the field.

And what he said is "Second, except in situations where

exposure estimation is quite accurate and the true relative risk is three or more," so meaning you have really good instruments to measure exposure, "and your size of the effect is threefold or more." So the exposure causes three times more NHL, for example. The misclassification -- pesticide misclassification made a diminished risk estimates so -- such that -- to such an extent that no association is obvious, which indicates false negative findings might be common.

And that is the -- the scourge of my discipline. Not that we go out there and cry wolf. The scourge of my discipline is we cannot show anything because we are not doing a good enough job for exposure classification. We are mixing white and red, so everybody is considered something else from what he really was. And then we are saying, there is no difference in risk. There is no difference in non-Hodgkin's lymphoma in the red can and white can. We mix them all; right?

Q. You mentioned yesterday when you are talking about *De Roos* and her hierarchical regression how now that IARC has classified glyphosate as a Category 2A, how that would change. Do you remember that testimony?

A. Yes.

Q. Dr. Blair, do you know if he participated in the IARC panel that classified glyphosate as a probable carcinogen?

A. He was there --

MS. MATTHEWS JOHNSON: Objection, Your Honor.

THE COURT: Sustained.

THE WITNESS: I can answer?

THE COURT: No.

BY MS. WAGSTAFF

Q. Do you know if --

MS. WAGSTAFF: Can I have a sidebar real quick?

THE COURT: Sure.

(The following proceedings were heard at the sidebar:)

[redacted]

[redacted]

BY MS. WAGSTAFF

Q. As I was going onto the next one, if we can talk about the final journal article, which is the Sheppard, et al. that came out in 2019 -- so that is a fairly recent article -- if you can please tell the ladies and gentlemen of the jury what Sheppard and colleagues said about the Agricultural Health Study.

A. So the first four articles pretty much -- better than the first two pretty much dealt just with what happened at baseline at enrollment. And then starting with Dr. Blair, actually they started also to look at what happened when we lost people from the second follow-up, meaning they didn't come -- almost 20,000 people who never responded again -- and will that cause a bias; right? Will that even mix our exposure estimates more?

And then Sheppard takes that even a step further. She is a statistician also in my society, very well respected. And she and her colleagues took on this issue again, and write very clearly about what happens when you are then using the -- these guesstimation/estimation procedures where you are just guessing what the exposure was for those who didn't come back and what kind of influence that would have had on the results -- on the latest results, because there are actually two different

papers.

One that deals with early -- with the early phase of the Agricultural Health Study -- the first like five to ten years of follow-up -- and then the second Sheppard deals with the next paper, the Andreotti paper, that actually had a follow-up between 1993 and 2013 for cancer.

MS. WAGSTAFF: Okay. Before we actually get to the studies themselves, Your Honor, I would like to move Trial Exhibit 1467 into evidence, which was for slides from UCLA that the doctor gave me yesterday.

MS. MATTHEWS JOHNSON: No objection.

THE COURT: Admitted.

(Trial Exhibit 1467 received in evidence)

BY MS. WAGSTAFF

Q. Okay. So you didn't hear opening statements yesterday?

A. No.

Q. However, in opening statement Monsanto told the jury that there were hundreds of -- I believe it was hundreds of articles -- a lot of articles published about the Agricultural Health Study. Would you agree with that?

A. Yes.

Q. And so your criticism of the Agricultural Health Study, other than the baseline exposure, does not relate to the other pesticides; correct?

A. Not in the same way, no.

Q. Okay. So the two articles that relate really to glyphosate within the Agricultural Health Study are *De Roos* 2005 and Andreotti 2018; is that right?

A. Right. So the Agricultural Health Study has now published hundreds of articles about pesticides and cancer, but these two papers are really the only ones that deal with glyphosate.

Q. Okay. Let's talk about these two papers then.

MS. WAGSTAFF: So if you can pull up, Mr. Wolf, 528, which is *De Roos* 2005.

BY MS. WAGSTAFF

Q. One quick question. I don't want anyone to be confused. Is this *De Roos* the same *De Roos* that is up here?

A. Yes, that's the same person.

Q. And did she ever retract the findings in her 2003 study?

A. Not that I would know.

Q. Okay. So let's talk about the findings in 2005.

THE COURT: Did you want *De Roos* published to the jury?

MS. WAGSTAFF: Yes, please.

THE COURT: Go ahead, Kristen.

BY MS. WAGSTAFF

Q. So if you can please tell the ladies and gentlemen of the jury a little bit about the background of how the Agricultural Health Study turned into *De Roos* 2005?

A. So we -- as scientists we cannot just collect data, and

you know, watch what is happening. We actually have to publish it. And Anneclaire De Roos was at the National Cancer Institute for quite a time while the Ag Health Study was ongoing and while they were collecting the data, and she got very much involved, I think, in part of that. And then the beauty of being involved in that way is you have access to the data as a scientist. And even so, she -- by the time she published this she was actually at the University of Washington as a professor. She -- she could analyze these data from the Ag Health Study. She had permission to do that. So that's what she did. She analyzed these data and then published on this.

MS. WAGSTAFF: If you can pull up Table 2, please.

BY MS. WAGSTAFF

Q. Can you tell us what information, relative to glyphosate and NHL, is displayed in Table 2?

A. Yeah. So here we have --

Q. Before we stop, when did the data collection for *De Roos* end?

A. In 2001.

Q. So even though this says 2005, the --

A. The cancer -- so we have enrollment 1993 to 1997, and then anybody enrolled is followed every year through the cancer registry. So we are not having to go back to the person. We are actually just watching whether they show up in the cancer

registry; right?

That's how they found the cases. They never recontact these people. They are just pulling them out of a cancer registry. It is called passive follow-up. That's actually an advantage of cohort studies. They can just use these registries, if they exist. In Iowa and North Carolina they had these registries and they found these people.

Q. What if somebody moves?

A. Then they find them through the National Death Index, if that is a cancer you die of; but it may take a few years before you die of it. So you find that person later. And they said they also followed them through tax records to know where they were, but then the question is did they move to a state that has a cancer registry or not. If not, you are waiting for the death certificate.

Q. So it is possible that Farmer Ted who enrolled in 1993 started using glyphosate at a much higher rate in 1999; moved to one of the states that doesn't have a cancer registry, but didn't die. And what is that effect?

A. And we wouldn't know.

Q. Okay. So what -- you just testified that they stopped collecting data in 2001. What happened between 2001 and 2005?

A. So they stopped collecting cancer data because it takes the registry to be complete a few years.

Q. Let's -- why don't you explain really quick what a cancer

registry is.

A. So a cancer registry is actually paid partially by the National Cancer Institute -- that is federal money -- and partially by State money. And what they do is they have people in -- yeah, offices in universities or in public health departments that are called registrars, and they have a law that any pathologist -- so a person in a hospital who looks at tumor slides or tumor samples -- has to report to that registry when they see a cancer. So that is a law.

And so all -- all cancers, more or less, get to a pathologist, and then the pathologist has to put this data into the registry. You can see that big hospitals who have electronic records and where the pathologist is queued into a computer system, that may go fast. But small hospitals, it may take a while before you get that data. And then the registrars have to actually go back and look at records and make sure it is the right classification. So there is a lot of back-and-forth, and that takes a few years before this data in the cancer registry are certified to be complete and certified to be accurate.

Q. Okay. And you were just talking about electronic tracking -- using electronic data to sort of link back up --

A. Right.

Q. Back in 1993 and all -- you know, was the electronic systems different to track cancers than it is today?

A. Well, computers were much slower but they did exist. But not -- but, I mean, UCLA just got an electronic medical records system two years ago. It is like outrageous. So before that, you had to do it with paper.

Q. So. In Table 2, please tell us what this data shows.

A. So we have all sorts of cancer slides. So Anneclaire De Roos wasn't just interested in NHL. That was just one among all cancers. You can read down the list of cancer slides, and you will find NHL -- yeah, down there. And you can see how many she found. She found 92 NHL cases.

So in about five to ten years of follow-up of 54,000 people, all we are finding is 92 NHL cases. That is what you would expect because it is a rare disease; and that's why you need 54,000 people, because if you had 5,000, you would have found five cases, right -- nine cases, sorry.

So you want enough cases to make your study powerful. 92 cases is not a powerful study.

Q. Okay. So what was the data? If you want to give me the risk ratio and the confidence interval, just to be consistent with what we were doing yesterday.

A. Right. So you see two effect estimates for never-ever use. We are not talking about how many days, how many years did you use. Did you ever touch a bottle of glyphosate? And interestingly, you can see that 77 percent said yes. So these farmers -- you know, except for 23 percent -- all have touched

glyphosate in the past. That's what they report in the beginning.

And you see that the effect estimate just adjusted for age, so they are only taking age into account. And most of these are -- almost all of these people are actually male, so we don't care about sex at this point. And she may have only looked at males actually. And you see a 1.2 with a confidence interval of .7 to 1.8. It is suggestive of a 20 percent risk increase, but clearly it is not statistically significant. It is including that 1, that pesky 1.

But then when you are going over and you are adjusting for other pesticides, you see how the estimate drops to 1.1. It is a 10 percent increase. The confidence interval is almost the same or it is actually the same.

Q. Okay. So I'm going to write the adjusted --

A. Estimate, 1.1.

Q. 1.1?

A. Uh-huh.

Q. Is it just 1.10?

A. Yes.

Q. And what is the confidence intervals on that?

A. .7 to 1.9. Actually we don't know whether it is zero. I imagine it is zero because she only gives one digit behind.

Q. .7 to 1.9?

A. .7 to 1.9.

Q. Okay. That's for never-ever use?

A. For never-ever.

Q. Okay. So let's turn to Table 3. Can you please tell the ladies and gentlemen of the jury what information you were able to gather from Table 3?

A. So now she goes beyond never-ever. She says, well, we have how many days people used it, and that's only using the baseline report, what they bubbled in when they came to the exam. That's where we get all of this information from. Nothing else, okay?

So what they bubbled in in terms of how many days they used and cumulative exposure days is over your lifetime how many days. That's all. And you can walk down the cancer slides again, and you find NHL at the bottom.

So now you see what she does here is she actually compares moderate and high day users to low or no users -- actually to low users. She excludes the 23 percent of people in this table who have reported I never touched a bottle of glyphosate. Okay. They are not in here.

In order to now make a comparison, you have to define what am I comparing people to. So she says, the people who tell me I used a little bit, that's my comparison group. Okay? And that's the zero to 20-day users, and then it goes moderate and high.

You want me to read this to you?

Q. Yes, please. Well, first, you were just describing the difference between cumulative exposure days.

A. Right. And then the next -- you want me to say what the next is?

Q. I want you to explain to the jury what that is, please.

A. Yes. So the next one is intensity-weighted exposure days. So now we not only have exposure days. That is easy; right? Just count the days over the lifetime; number of days.

Now, they did what I explained to you before, I think, which is they say how did you use the pesticide. Did you spray it with a backpack? Did you spray it by hand? Did you apply it by tractor? And, remember, they never asked that for glyphosate. That was a question that was asked for all pesticides that you ever used.

And then they also used -- did you use personal protective equipment while you were applying? So did you use Tyvek suits? Did you use goggles? Did you use chemically resistant gloves? All these questions.

And if they said yes, then they took points off. If they said -- points off being exposed. They called them less exposed.

So they reduce all of the information about days by the amount of protection. It seems to make logical sense -- right? -- if you get the protection right. Because, again, they were only reporting about any pesticide, "For any

pesticide applied in my life, yes, I'm using gloves; yes, I'm using goggles." Not for glyphosate.

So if they used another toxic pesticide for which they used goggles, even if they used glyphosate 100 days a year, you would knock off 90 days because they used goggles. All right? Whether that's right, I don't know.

Q. Okay. So you have some information on cumulative exposure days, and then you have some information on intensity-weighted exposure days --

A. Right.

Q. -- which includes the personal protective problem that you just described. Which data is more informative to you?

A. Well, generally we would like the intensity-weighted cumulative days because we are not sure whether, you know, a little bit over a long period gives you cancer or a high exposure where, you know, you might not be able to recover from or high exposure that actually damages more.

Q. Okay. And this is the first time in all of the studies that we've seen a risk estimate below 1.

A. That's correct.

Q. So can you tell the ladies and gentlemen of the jury what a risk estimate below 1 actually means?

A. So you see that the moderate users here in the intensity-weighted day category have a .6. So that is a 40 percent reduction in risk of getting NHL, of getting the

lymphoma, when you're using more. When you're using more, you're protected; 40 percent less people get NHL when they're using glyphosate.

Q. Okay. So this data suggests to you that glyphosate -- that Roundup --

MS. MATTHEWS JOHNSON: Objection. Leading.

MS. WAGSTAFF: Okay.

THE COURT: Sustained.

BY MS. WAGSTAFF:

Q. Would this be consistent with a protective finding?

A. We call this protective. I usually train my students to say, well, it's a negative association. Whether that protects you is a qualifying statement I wouldn't want to make because if we say it's protective, as suggested by this data, then we should all put a spoonful of glyphosate into our cereal every morning to protect us and we don't want to do that.

Q. Okay. And when you have data that --

MS. MATTHEWS JOHNSON: Objection. Your Honor, we have haven't heard the confidence interval.

MS. WAGSTAFF: I haven't written anything on the board yet.

THE COURT: Okay. The objection is overruled.

BY MS. WAGSTAFF:

Q. When you see data like this that has a risk ratio below 1, what is -- based on your experience and training, what does

that suggest to you about the findings in this study?

A. Well, this is a surprise; right? It would surprise you too to think that, oh, well, when you find no effect, okay, maybe, you know, we made so many mistakes that my two cans are now pink and I can't distinguish them anymore.

But to actually see something going to the other side where the red can now looks white and the white can looks red, then I'm wondering "Did I actually mess up the cans in the beginning, or what else did I do wrong here?"

There's really something -- that's a qualitative change in a direction I don't expect; right? When I expect something to possibly be toxic and I don't find it, I can blame my study for not being good enough; but when I find something this surprising, then I scratch my head and say, "Well, maybe I should go back to the drawing board and see what else went wrong because this is an unexpected finding that I need to pay attention to."

Q. Okay. And so let's actually put some data on this chart, as counsel suggested.

Which one would you -- is more informative to you, the cumulative days of exposure or the intensity-weighted exposure days?

A. The intensity is definitely more informative -- or meant to be more informative.

Q. Okay. And the cumulative exposure days, does that relate

to dose-response?

A. That's what they're trying in both.

Q. Okay.

A. They're trying to relate to dose-response with just counting the days or then also weighting the days by what they know about protective equipment use.

Q. Okay. Well, then, let's put all of the data on here just to be complete. So let's put down the data for the cumulative exposure days, which you just told me is dose-related days. If you could just tell me that data.

A. Right. And that's .7 --

Q. Uh-huh.

A. -- with a confidence interval of point -- of 0.4 to 1.4.

Q. Okay. And is that adjusted or not adjusted for other pesticides?

A. That's adjusted.

Q. Okay.

A. Let's see, make sure.

Q. And the numbers right below it?

A. (Witness examines document.)

Q. It's hard to see. It should be blown up on your screen, if that helps.

A. Yeah. So the next number is .9.

Q. Okay.

A. And the confidence interval is .5 to 1.6.

Q. Okay. And is that adjusted as well?

A. Yes.

Q. And are these the two numbers that relate to dose?

A. To cumulative exposure days.

Q. Okay.

A. So, yes. So that's the median and high exposure.

Q. Okay. So would you consider that to be a dose-response analysis or --

A. Yes.

Q. Okay. And then how about the intensity-weighted data?

A. So there we go to .6 in the medium dose --

Q. Okay.

A. -- whereas 0.3 to 1.1 as the confidence interval.

Q. All right. And is that adjusted?

A. Yes.

Q. Okay.

A. And then we see .8 for the high-exposed, whereas a 0.5 to 1.4 confidence interval also adjusted.

Q. Also adjusted?

A. Yes.

Q. Okay. So do I have the relevant data? Have I marked that correctly?

A. Yes.

Q. And are any of this data statistically significant?

A. No.

Q. And this is also -- is this also a dose?

A. Yes, that's also a dose-response, the .6 to .8, an attempt at estimating dose-response.

Q. Okay. And just sort of to be clear, these under 1 risk estimates you testified sort of a suggest a protective effect?

MS. MATTHEWS JOHNSON: Objection. Leading.

THE WITNESS: The negative association --

THE COURT: Hold on a second.

Sustained.

BY MS. WAGSTAFF:

Q. What does a risk estimate under 1 suggest?

A. I usually say it's a negative association, meaning it goes in a direction of protection; meaning that there are less people who get NHL who were exposed to glyphosate than there are people who got NHL who, according to their data, should be called unexposed. So we have the opposite of what we would expect. We have less NHL among the glyphosate exposed and more NHL in those that we're calling unexposed.

Q. Okay. And anything else you'd like to say about De Roos 2005?

A. No.

Q. So let's talk about our final study that came out last year; right?

A. Uh-huh.

THE COURT: Well, before we do that, I think now is

probably a good time for our morning break.

THE WITNESS: Thank you.

THE COURT: So why don't we break for ten minutes. We'll resume at five after, and that clock has been fixed.

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. Hold on a second.

So just real quick, we had a sidebar off the record in which I expressed concern about using anything from FJC publications. So I just want to make clear for the record, are we all in agreement that neither side can use any FJC material in this case?

MS. WAGSTAFF: That's correct, Your Honor, and we had discussed that before you brought it to our attention and we had agreed upon that.

MR. STEKLOFF: Yes, Your Honor.

THE COURT: Okay. The fact that Blair was the IARC guy, we can talk about that later. You can make an argument for why that should come in during Phase I, but for now that remains off limits.

And then has there -- have you-all filed a stipulation regarding expert compensation that you want me to read?

MS. MOORE: Your Honor, we went back and forth. We'll talk about that on the break and make sure it's final.

THE COURT: Okay. No rush I would think.

MS. MOORE: Okay.

THE COURT: Okay. I'll be back.

MS. MOORE: Thank you, Your Honor.

MS. MATTHEWS JOHNSON: Thank you.

THE CLERK: Court is in recess.

(Recess taken at 9:56 a.m.)

(Proceedings resumed at 10:06 a.m.)

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. You can bring in the jury.

(Proceedings were heard in the presence of the jury:)

THE COURT: Okay. Thank you.

You can resume.

BY MS. WAGSTAFF:

Q. Okay. One last question about the De Roos 2005 journal that came out of the AHS. What was the control group in this paper?

A. So in the 1.1 estimate where we see a 10 percent increase in risk suggested but the confidence interval doesn't help us out, that's ever/never. Right? So we're comparing anyone to people who did not at all use.

Then when we go to what we call the dose-response, we are throwing out all the people who said "No, never," and we're only comparing users.

So we are comparing the 77 percent of people who said,"Yes, I use glyphosate," and then we're using what they said about how many years they used it, how frequently they

used it, and whether they used protective equipment or not to put them into a low use, moderate use, high use category, and that's how we get these negative estimates.

Q. Okay. In your opinion, is that a flaw of the study?

A. It is certainly something that you have to think about when you do this analysis, how you interpret it; and given that we have these unexpected results, we probably need to think about what it means and what those flaws are, and we should think about that very hard.

Q. Okay. So now let's get to the final paper that we're going to talk about.

Mr. Wolf, if you could please publish 550.

This is the Andreotti 2018 paper. If you could please tell the ladies and gentlemen of the jury what this paper is about.

A. So this paper comes out 13 years later, and it comes out that much later because we have now kept doing this follow-up with cancer registries and death certificates over many more years.

In the De Roos paper we stopped looking at cancer registries in 2001. Here in Andreotti we are now looking up to 2012 I think in North Carolina and Iowa 2013. So 2012-'13 is when the last time data was pulled from a cancer registry to tell us whether somebody has NHL.

And so we are now including in our analysis the number of

people who were diagnosed between -- anytime between 1993, if they already enrolled, and 2013. So that's an about a 20-year period; right? However, we are using for exposure what we got at the beginning, at the very beginning, the enrollment.

And then for those who bothered to come back between 1999 and 2004 and answered "What did you use for one year when you were farming, the last year you were farming," we're using that data but we also have all these guesses on what these other people did.

And, again, we have no information on what happened to anyone who answered the second questionnaire between, let's say, 1999 and 2012 either; right? So they could have stopped farming. They could have changed pesticide use. Again, we wouldn't know. Whatever they said at the second interview is now what we are using to project forward what the exposures were; right?

That's really the problem with cohort studies because unless we go back and ask every year that somebody was in the study "What have you been using," we have to make assumptions. We have to guess that we know what they said in the beginning is kind of stable throughout the time until they come down with the NHL.

Q. Okay. And you've identified to the ladies and gentlemen of the jury three big exposure misclassification criticisms of yours. I think --

A. Right.

Q. -- you identified the initial --

A. So we have the initial one where people make just random error by not remembering correctly. But the bigger problem really is the change in exposure in the middle of the assessment of people at baseline; that you have some people locked in in 1993 who would have responded differently had they answered in 1996 or '7; right?

So -- and we don't know this. So we have already a mixing of exposure in the baseline. And then we are losing 38 percent of the people in the second follow-up where we are asking them again to improve on exposure assessment, and we now have to make a lot of guesses on what these people's true exposures were, and we base it only on the information of the people we get assuming that they're no different from the people who we didn't get. Right?

And also for the ones that we get, we don't have really what happened between the first time they answered and when they were on the phone again. We only have that for one year and we assume that that one year gives us the right estimate for the whole time period in between.

And then we keep following them to 2000 -- so the last time they made that phone call in the second round was in 2004, but we keep moving on to 2013 to count cancers; right? So in all those years exposures may have changed again, but we don't

know.

Q. Okay. So you identified the initial baseline?

A. Right.

Q. You identified the change in glyphosate use?

A. Yes, in the middle of the baseline. So that people would have answered differently if they had been interviewed at the beginning or the end of the baseline.

(Pause in proceedings.)

BY MS. WAGSTAFF:

Q. Change in glyphosate use.

Then you mentioned how when they got ahold of people in the second call, they only asked about one previous year?

A. Right.

Q. How would you describe that? How should I write that down?

A. Well, just write only one year of use reported at second questionnaire.

Q. That's, like, a paragraph.

A. Or second questionnaire. Second questionnaire.

Q. Okay. Only one use in --

A. Only one year of use in second.

Q. Okay. This might take me awhile.

(Pause in proceedings.)

BY MS. WAGSTAFF:

Q. How about if I write only one year lookback at second?

A. Between baseline and the second they only looked back to one year and assumed that that year is representative of all the years between baseline and follow-up.

Q. Okay. And then the fourth one you discussed sort of the guesswork or --

A. Yes. The guesswork for the 38 percent who never responded a second time we're using the data from the ones who responded to then guess what the exposure of those who didn't respond was.

Q. Okay. So for these four exposure problems --

A. And there's a fifth when you're moving forward, which is, you know, you don't know anything about exposure after 19 -- after 2004. Actually, for the ones who answered the second time in 1999, you don't know anything about their exposure after 1999. So possibly 14 years.

Q. Okay. So no information --

A. After second phase.

Q. Which you said --

A. No pesticide information after the second phase.

Q. All right.

A. Actually, they had a third phase, but I think only 38 percent answered so they're not even using it.

Q. Okay. And this second phase -- I think you just said it, but I want to make sure I capture your testimony -- was between 1999 and 2004?

A. Yes.

Q. Okay. So it would be fair for me just to write 1999 --

A. Uh-huh.

Q. Okay. So we have two AHS studies that we talked about.

A. Yes.

Q. Does this exposure problem relate to De Roos 2005?

A. Yes.

Q. Does it relate to Andreotti 2018?

A. Yes.

Q. Okay. Let me make sure I spell this correctly.

(Pause in proceedings.)

BY MS. WAGSTAFF:

Q. The change in glyphosate use, does that relate to both De Roos --

A. Yes.

Q. -- 2005 and Andreotti 2018?

A. Yes.

Q. The only one year lookback at second follow-up, does that relate to De Roos?

A. Only Andreotti. The next three are only Andreotti.

Q. Okay. So I'm just going to write "Andreotti '18" for the next three.

A. Uh-huh. Actually, the last one also relates to De Roos because she doesn't use the second follow-up. So anything that happens between the enrollment and 2001 she doesn't know

either.

Q. So five is Andreotti.

A. And De Roos, but that's not 19 --

Q. But De Roos doesn't know since 1997?

A. 1993 through 2001. That's the interval where cancers were assessed, and she only has one baseline, which is, you know, whatever the baseline year is.

Q. So when you add these exposure problems on top of each other, what happens to the results?

A. That's compounding exposure misclassification over and over and over again, and you don't -- it's really, like, oh, I can improve my -- you know, my distinction between the two pots by just mixing more, and in the end you got pink and both cans are pink and you can't distinguish.

And none of that can happen in a case control study because everything has already happened by the time you interview a case; right? They will report their lifetime exposure up to the point when they were diagnosed. None of that happens in these other studies.

Q. Let's discuss the Andreotti results. We've got the paper up.

If you could turn, Mr. Wolf, please, to the second page of Table 2, which is 513.

There's a section on non-Hodgkin's lymphoma. If you could focus on just that section for a minute.

A. Yeah.

Q. Do you see where I am, Dr. Ritz?

A. Uh-huh.

Q. Explain what Q1, Q2, Q3, and Q4 mean, please.

A. So we don't see the header, but the header of this Table 2 is actually saying "Intensity-weighted Lifetime Days of Glyphosate Use in the Agricultural Health Study." So we have, again, this dose measure that they construct using the number of days of use times the intensity, which they get from "Do you use personal protective equipment and how do you apply?" So it's the same measure.

But then they are splitting this up in five groups: The people who have never used glyphosate so -- but that's, you know, baseline or follow-up. It cannot actually change. You can't get additional people who never used. Actually, at this time point they had less people saying never. I think they only had, like, 15 percent left who said never.

And then they have split up the ones who said ever into four groups, and they call them quartiles. So that is just, you know, cutting it up in different groups in terms of how many days and what the weighting did.

Q. Okay. And can you tell us what information I should put on this chart?

A. Yes.

Q. Since I created this chart, an exhibit sticker has been

placed so I don't have as much room.

A. So basically you get relative risk estimates of .83, .83, .88, and .87.

Q. These are for Quartile 1 through Quartile 4?

A. Yes.

Q. And these are for non-Hodgkin's lymphoma. And this is you said an intensity-weighted lifetime?

A. Yes.

Q. So is that a dose-response?

A. Yes.

Q. So let me write that down here. We'll do .8 --

A. I mean, it's not showing a dose-response. It's showing no dose-response --

Q. Correct.

A. -- but it is a dose-response analysis.

Q. I just want to write those down again. You said .83 in Quartile 1, and I need the confidence intervals, please.

A. 0.59 to 1.18.

Q. 1.18?

A. Uh-huh.

Q. And are the numbers in the Andreotti paper that we're discussing right now, are they adjusted for other pesticides?

A. Yes.

Q. So I'm going to put adjust -- an "A" next to them.

A. For five other pesticides actually.

Q. For just five?

A. Yes.

Q. Okay. What's the number for Quartile 2?

A. .83.

Q. And what's the confidence interval?

A. 0.61 to 1.12.

Q. Adjusted?

A. Yes.

Q. And then Quartile 3?

A. .88.

Q. And the confidence value?

A. 0.65 to 1.19.

Q. And the final quartile?

A. .87 and 0.64 to 1.2.

Q. And that's also adjusted. I'm going to put the "A" below it because I'm running into tape.

A. Yes.

Q. And you said that this is considered a dose-response?

A. Analysis.

Q. A dose analysis.

And, again, we're seeing numbers on the relative risk below 1?

A. Yes.

Q. Can you tell the jury, please, what that means in your opinion?

A. So for each quartile we see between a 13 percent and a 17 percent decrease in risk, meaning that we're seeing less cases than we would expect if you were unexposed.

So it means the ones who are exposed show less lymphoma at every level of dose than the people who had no glyphosate exposure at all according to the baseline and their follow-up.

Q. So let's turn to Table 3. Table 3, which is on the following page, and right above it just caught my eye.

This was published in the -- what journal was this published in, this article?

A. The *Journal of the National Cancer Institute*.

Q. Okay. And the criticism letter from Dr. Sheppard from 2019 was published in what journal?

A. In the same journal.

Q. Okay. So what does -- this table purports to report cancer incidence in relation to lagged intensity-weighted lifetime days. Can you explain to the jury what a lagged intensity means?

A. So we're back to what I tried to explain with Eriksson. Eriksson, remember, they excluded all exposures 10 years prior to diagnosis. Here we are actually going even further. We're going 20 years out, and we say anything -- so if somebody was diagnosed with non-Hodgkin's in 2006, we would not count any exposure that happens in 1986.

All right. If you reported "I used glyphosate in 1987

onward and you used it every single day," we would call that person unexposed; and only if he used glyphosate prior to 1987, so anytime between '74 and '86, that's the exposure category we use. That's where he goes.

Q. So can you please pull up the non-Hodgkin's lymphoma results, Mr. Wolf? It's the third category down.

And they appear to use the same quartile system?

A. Yes.

Q. And are those quartiles the same quartiles categories that were used in the data we just looked at?

A. Yes.

Q. So there's two sets. There's a 5-year lag and a 20-year lag. Are both of those adjusted?

A. Yes.

Q. Which information is more informative to you, the 5-year lag or the 20-year lag?

A. I would say the 20-year lag.

Q. So let's look at the 20-year lag.

Can you tell me the information that they reported from the 20-year lag for the four quartiles?

A. Yes. So they have a 1.22 with a confidence interval of 0.91 to 1.64. And the second quarter is 1.15 with a confidence interval of .86 to 1.55. Then we have 0.98 with a confidence interval of .71 to 1.36. And the last quartile is 1.12 with a confidence interval of 0.83 to 1.51.

Q. So, again, we have one number where the relative risk is below 1?

A. Yes.

Q. And I just want to make sure I'm complete on this board. You mentioned this was also considered a dose --

A. Yes, a dose analysis, and it was adjusted.

Q. And it was adjusted. Okay. Let me put my...

Are any of the AHS numbers for both studies that we've just read statistically significant?

A. No.

Q. When you consider the AHS data with respect to these two studies, what does this information tell you about this study?

A. Well, De Roos we already said we have to think very hard what makes these estimates flip to the wrong side from what we would expect. If this is a toxin, is glyphosate really protective here or not? From Andreotti we would ask the same question for the first, the zero lag analysis, meaning we are counting all exposures; right?

Interestingly, why we want to look at the 20-year and I find the 20-year lag really interesting because it removes some of the problem -- some of the problem -- that happened when glyphosate increased dramatically between 1993 -- remember the maps I showed you? -- 1993 to 2013. That's exactly the period we're talking about, and it flipped from light yellow-white to dark; right?

And that's what was the time period that the study is struggling with to put people in the right bin: Unexposed, medium exposed, low exposed, high exposed. Right? They're trying to sort people in these bins, and they keep resorting them but maybe not in the right way because not everybody gave them the information at the same time or -- and 40 percent -- almost 40 percent didn't even come back and gave them any information. So they keep moving these models around over time.

However, if you're now taking out 20 years of exposure and you say no matter what, if somebody who reported in 1993 or in 1999 reported correctly what they used prior to the 1990s pretty much, we're safe. We are actually probably getting the right answer except for random error where they couldn't remember.

But none of that big change between 1993 and 2013 happened yet so whatever they reported baseline is pretty accurate until 1993, and that's what that 20-year lag period only looks at.

However, they still have a weird pattern here. The estimates don't all flip to the right side and now show an increase because we're still making a mistake probably by excluding all the exposures that came in that period because we're calling them irrelevant. Right? So that is still happening, but at least we are now flipping to the side we would expect.

Q. So on this board we've taken care to mark when data is unadjusted --

A. Yes.

Q. -- or adjusted.

A. Uh-huh.

Q. And I think you testified that the unadjusted data still adjusts for other things, like age --

A. Sex, et cetera.

Q. -- sex or some other lifestyle?

A. Family history, yeah.

Q. This is for pesticide use?

A. Yes. The unadjusted only refers to unadjusted to other pesticides they may have used.

Q. So can you tell the ladies and gentlemen of the jury the value in looking at unadjusted data?

A. Right. So when we are determining what we need to adjust for, the question we have to ask: Is that factor a risk factor for the outcome? Is it a risk factor for NHL? Is it a risk factor for lymphoma?

That -- and then the next question: Does it relate to exposure? Do you have more exposure because you are getting older? Do you have more exposure because you are a man and you are the one spraying in the fields?

If that answer is yes too, then we need to adjust for that factor. Okay?

However, if it's only "I get older" or "I drive a tractor and whenever I drive my tractor, I spray pesticides," but driving a tractor doesn't give you NHL -- right? -- then I should not adjust for driving a tractor because a tractor -- driving a tractor doesn't give you NHL.

The first question you have to ask is: Is that factor giving you NHL? If the answer is no, it's not a confounder we should be adjusting for. It's not a factor, a risk factor, we should consider that would influence what the pesticide does to the person.

Q. And in your experience as an environmental epidemiologist, do you consider unadjusted data?

A. Absolutely. Unadjusted for other pesticides.

Q. Unadjusted for other pesticides.

A. Yes.

Q. Yes. Thank you for that clarification.

And you testified yesterday that you were president of the International Society of Environmental Epidemiology.

A. Right.

Q. And does that society consider unadjusted -- data that's unadjusted for other pesticides?

A. We do that all the time.

Q. That's a piece of the puzzle?

A. Yes.

Q. Okay.

A. And the real reason for that is that you can make a mistake in both ways. What people will tell you, the bigger mistake is not to adjust. So in order to be safe, just put everything in you can think of whether it's a risk factor for the outcome or not. That's the wrong approach.

If you do that, you increase bias. You're actually tearing at your estimate and you are tearing it to one side or another, and you're making it just as wrong as if you forget to adjust or you can't adjust because you haven't measured something. Okay?

It goes both ways. The wrong factor in the model gives you the wrong results. That's why we're always looking at unadjusted and adjusted, and we are thinking about whether the factor is actually a risk factor for the outcome. If it's not qualifying as a risk factor for the outcome, it's not a factor you put in the model.

Q. So if you could turn -- well, before I move off of this, considering all of the data --

A. Yeah.

Q. -- that we've discussed over the last few hours with the jury, including the Agricultural Health Study data and all of the data above that we discussed yesterday, are there any general conclusions that you draw looking at all of that data in total about the risk of exposure to glyphosate and non-Hodgkin's lymphoma?

A. Yeah. So this is a lot of data, a lot of numbers.

Q. Actually, let me change that just because I want to make sure that my wording is actually really correct and I want to make sure that I'm asking the right question.

First of all, when we were talking about the Agricultural Health Study, I was discussing it in terms of glyphosate.

A. Yes.

Q. And that's because that's what was asked on the questionnaire?

A. No. Actually, the questionnaire has glyphosate and then it has in brackets Roundup and other names because we are talking farmers, you know. They are actually applying formulations. They're not applying a chemical. They are applying what they get at the store or from their distributor. It's the real-life, real-world exposure. It's not like in animal studies where we have a choice. Humans use what they are sold. So it's a formulation.

Q. Okay. And glyphosate-based herbicides is sometimes referred to as GBH?

A. Correct.

Q. And Roundup -- is Roundup a glyphosate-based herbicide?

A. Yes.

Q. Okay. So let me reask the question now. Considering all of this data that we've looked at yesterday and the Agricultural Health Study data from today, are there any

conclusions you can draw about the exposure to Roundup and the increased risk for NHL?

A. Well, this is what I -- this is all the data, all the ugly data, that I had to consider to make up my conclusion that it truly is a cause of NHL and, you know, I've explained that over the last two days.

But what is important is I looked at unadjusted and adjusted estimates, and they're telling me the same story. The De Roos is fully adjusted for 48-some pesticides and it -- that analysis is even statistically significant after all those adjustments.

We also see patterns that I would like to see, which are that people with occasional use are not as heavily at risk as people who have heavy use, or maybe they're not even at risk at all; right? Really the most of the risk is among the people who have very high exposures.

There still is that difference that we have to grapple with between all of the case control studies in Canada, in the U.S., and in Sweden, and the one big Agricultural Health Study that had a completely different design and did a completely different thing -- right? -- and showed different results.

Q. So hopefully the ladies and gentlemen of the jury will remember when you taught them -- before you come down, could you please look at Exhibits 914 and 915?

A. Yes.

Q. And did you help in making those two exhibits?

A. (Witness examines document.) Okay. Yes.

Q. And would those exhibits be helpful in explaining your opinions to the jury?

A. Yes.

MS. WAGSTAFF: Permission to publish?

THE COURT: Any further objection?

MS. MATTHEWS JOHNSON: No further objection, that's right, Your Honor.

THE COURT: Okay. You can publish.

THE WITNESS: Do you want me to come down?

MS. WAGSTAFF: So -- yes. Please come down.

THE WITNESS: Is it okay?

THE COURT: Of course.

BY MS. WAGSTAFF:

Q. Dr. Ritz, please explain to the ladies and gentlemen of the jury -- do you have a color that you prefer?

A. I have one here.

Q. Okay.

-- so what this is and the significance and meaning of this.

A. Right. So you've been staring at this ugly chart with all the numbers and it's really confusing; right? To me too.

So -- and I showed you before we can actually graphically display data, and it has the same meaning; right? The number,

the first number we show you on this chart is the big dot; right? That's our central estimate or bullet point estimate or twofold, or whatever, increase in risk.

And then we have these whiskers --

Q. Let me just get this -- let me get set up.

A. Sorry.

Q. I'm going to box you.

A. And then we have these whiskers; right? And I showed you in this chart that these whiskers go all the way out to the right and the left and they may or may not cross that line.

THE COURT: Can I make a suggestion? Why don't you move that chart to somewhere a little bit behind where Ms. Wagstaff is standing? That way the court reporter will be better able to hear you --

THE WITNESS: Yes.

THE COURT: -- and I will be better able to see.

And obviously, Ms. Johnson, you need to move.

(Pause in proceedings.)

BY MS. WAGSTAFF:

Q. You got a pen?

A. Uh-huh.

So I told you before that, you know, if we only have one study and we get this, we would say, "Eh, don't know. Maybe twofold risk."

Then when we put this in context of prior knowledge or

other studies that we can find in the literature and we plot them and they show 2 and some fold, 3 and some fold, some show only 1.1, but generally you get just a whole pattern; right? Most of these studies show there's an increase in risk.

Even so, these whiskers are wide, they're shorter, this one is short, this has a lot of information in the study, but some of them cross the 1, some don't. We're not just going and counting the studies that don't cross the 1. We actually, in our summary of data, we use all of the information we have. We're not exclusive; right? We're inclusive.

And within all of this, we can now put our own study in the context of what we have learned from other studies and overall we can say we now feel comfortable to say that my study is probably confirming what other studies have shown as well.

Okay. So this is what we tried to do with all the data on the ugly chart; but just to visualize what is happening here, we have --

Q. Can you also mark if they're adjusted or just put a "U" or an "A" similar to what --

A. So this is unadjusted and this is unadjusted for other pesticides. It's still adjusted for other risk factors, including sometimes family history, sex, race -- well, they're the same race in Eriksson -- and age.

So -- but these whisker plots show you that in McDuffie they attempted to get at the regular users versus the

occasional users of glyphosate. And the only place where we actually see an effect where the dot is on the right side and the whiskers exclude the 1 is when we go to greater than two days per year. That's what the McDuffie study, the Canadian study, taught us.

The Swedish study in 2008, that's the latest Swedish study that was actually properly big. The first two Swedish studies we didn't even put here because they only had four and eight cases that were exposed. Remember that? This one had a lot more cases so we just go with this one.

And what does this teach us? This teaches us that when we're splitting now by days of use in less than 10 days and greater than 10 days, we are starting to see a dose-response creeping up. And definitely it is, again, the group that has the longer use where the estimate is on the -- further on the right above 2 and the whiskers are wide but they're still excluding the null here; right? So all the action is when you use for more than 10 days.

And then what does this study also tell us is less than 10 years and greater than 10 years, that is excluding -- it says less than 10 years but what it really means is I am not counting the last 10 years in which you were exposed. I'm only counting -- so that's this one (indicating), it's clearly close to 1 -- I'm counting all the exposures that -- exposures that this -- these people had 10 years and more prior to coming down

with NHL. Right?

So that's the timing. And when I get that timing right more than 10 years back, in this case then, again, my estimate is above 2 and that whisker is actually excluding the null, the 1; right? Statistically significant, statistically significant, statistically significant but unadjusted. Unadjusted for other pesticides.

I'm saying here there are no other pesticides that could have caused this instead of glyphosate. That's the assumption I'm making if I believe this data.

If you believe that there's one other pesticide that every time this person uses glyphosate they also use or sequentially use, so everybody who is called pesticide exposed here also always uses something else and only that other product gives them cancer, then this is rubbish. If you think that's not the case, there's not another agent really that is causing all this NHL and that is causing these patterns, unadjusted is perfectly fine.

Okay. Then we are going to Andreotti. So this is the last paper we talked about, the paper in 2018 from the Agricultural Health Study, completely different study design, and that's the 20-year lag.

And you can see when -- we're excluding all that weird period of glyphosate increase from 1993 to 2013, we're excluding that. 20-year lag means I subtract all the exposures

in the last 20 years before that lymphoma occurred. Okay? All that goes out.

Pretty much it says the only exposures allowed here are between 1974 and about 1990 for most people. That's the exposure rate we're looking at.

And you can now see that actually we are on the right side of the 1 except for this one (indicating), but none of these whiskers excludes the 1 but somehow we are going from being protective to actually seeing an effect.

But we have now a situation where we have to say it is correct to totally ignore all the exposures between 1990 and 2013. That's probably not right. But if we try to include them, then we're doing what I told you was the bucket. We're taking a scoop from one bucket and putting it in the other and the other way around until everything is pink.

What that does is guarantee that we are on 1 because you cannot distinguish pink from pink. You can't distinguish the number of cases in the exposed divided by the number of cases in the unexposed because they're all mixed, and that ratio then becomes 1. So we would get right there (indicating).

Q. So let me just ask a question. This is now a new concept meta, and that stands for meta-analysis. And is that a new paper that we haven't discussed yet?

A. Yes. That's actually a paper that was just came out by --

Q. So could you publish the Zhang paper, which is 1984,

please?

Dr. Ritz, if you could look at this.

A. So this is --

Q. Can you highlight the date that it came out, please, Mr. Wolf?

A. Yes. 5th of February 2019, so really hot off the press, in a journal called *Mutation Research*.

And so what these authors --

Q. Hang on one second.

If you could go to the conclusion, Mr. Wolf, on page 2.

And then, Dr. Ritz, if you could please tell the ladies and gentlemen of the jury about the Zhang paper.

A. So what these people conclude from this data (indicating) -- right? -- big dot with whiskers, whisker above 1 meaning statistically significant, they say (reading):

"Overall, in accordance with evidence from animal and mechanistic studies, our current meta-analysis of human epidemiologic studies suggests a compelling link between exposures to glyphosate-based formulations" -- H? What is H?

Q. Herbicides?

A. (reading)

-- "herbicides and an increased risk for NHL."

Q. And is Roundup a glyphosate-based herbicide?

A. Yes.

Q. Okay. And so if you could explain what a meta-analysis is and what the Zhang scientist did and how it fit on your board?

A. So you can see they give you 2 whisker plots with a dot and whiskers, and what they did is they used exactly the data that we have on that ugly chart but they made a distinction. Instead of what former -- it's a summary of all the data so they are now summarizing across all the studies and give you this overall estimate that's around 1.5. Okay?

So if you summarize across all those studies, what happens? In former meta-analyses what people have done is use the never/ever glyphosate exposed; and then summarized across the estimates, the measures they got just yes-no exposed. What they did is said, "Well, I want to only count the people that I truly believe are exposed." So they go with the highest exposed from every paper and they summarize across those people who were the highest exposed.

And when they do that and leave the Agricultural Health Study, the second one, out but use the first one, the De Roos paper, they get a 1.50. So they use the highest exposure estimate from the intensity-weighted De Roos study, which we know was on the wrong side, and threw that in and averaged it in with all the other data from the other studies and still got an increased risk and one that's statistically significant.

And then they said, well, now let's do that with the latest paper that came out, the Andreotti paper that looked,

you know, all the way to 2013. They had to take the De Roos out because you're not allowed to count studies twice so they are replacing De Roos with Andreotti. And guess what? Not much happens; right?

So the estimate is still about 1.48 and the whiskers shrink a little bit and they're definitely on the other side of the 1, meaning it's statistically significant. So we have a about 50 percent increased risk even if we count the Agricultural Health Study, which showed, if anything, protective effects.

Q. So what does this data that summarizes the dose-response effect tell you about exposure to Roundup causing non-Hodgkin's lymphoma?

A. Well, this is what I based my opinion on, which is that glyphosate-based herbicides in fact are causing non-Hodgkin's.

Q. All right. Let's do one similar. This is still data from that chart, which I think is beautiful.

This actually has printed on there the adjusted numbers.

A. Right.

Q. So you don't need to write anything, but are those correct as near as you can tell?

A. As near as I can tell, yes.

Q. Okay. So could you explain what this is different than the one we just looked at?

MS. MATTHEWS JOHNSON: Objection as to the foundation

of the question that it contains adjusted numbers.

MS. WAGSTAFF: It actually says right here "Adjusted." Instead of us writing it on there "U" or "A" --

MS. MATTHEWS JOHNSON: Okay.

MS. WAGSTAFF: -- it actually is printed on there.

THE WITNESS: Yeah.

So what she's saying is we have -- actually authors do two different analyses; right? For example, Hardell in 2002, he showed us an estimate, this one (indicating), that was pretty big, about three, but he didn't adjust for other pesticides in that model. He just said "It's glyphosate. Let's just look at glyphosate and ignore the other pesticides."

But then he also had one analysis where he actually threw other pesticides in, and you can see that that estimate moves towards the 1, which is actually what I would expect if you throw the wrong pesticide into the model. Meaning pesticides that really correlate with your exposure with glyphosate, just like driving a tractor would be an indicator of spraying glyphosate but driving a tractor is not a risk factor -- right? -- and another pesticide that goes along with glyphosate but is not a true causal effect for the outcome for the lymphoma should not be in the model. Tractor driving should not be in the model because it's not a cause of the disease.

When you do that, we call that splitting the variance so you're actually guaranteed to drive an estimate down to the 1.

Okay? If you do the wrong thing, adjust wrong, this is what happens. You're generating bias, in this case bias towards the null.

Okay. But what you can see whether or not we agree that we should put pesticides in the model, these estimates, these dots -- right? -- they are, except for Orsi, all on the right side.

BY MS. WAGSTAFF:

Q. Orsi was the hospital study; right?

A. Right. That's the hospital study, the French one.

Q. Put an "H" by Orsi or write "hospital" if you will, just so we don't forget.

A. (Witness complying.)

Q. All right.

A. All right. And then down here (indicating) we show you now previous meta-analyses, which are summarizations just like we saw for this February 5th paper, but they were done by different people in 2014, '15, and '15 again. So three different groups have tried to summarize across these data and these are the estimates they present. And these have been criticized because they are in 2014, '15, and '15 so they are not including the Andreotti paper.

And you remember that the Andreotti paper only came out in 2018, and that was the one where everything was on the other side of the 1 -- right? -- was protective.

So you can see that all of these meta-analyses also pointed at an increased risk and all of them are statistically significant because they're not crossing the 1.

So the conclusions from the former meta-analyses without the Agricultural Health Study paper of Andreotti was there is a risk increase across all studies, and the conclusion of the new meta-analysis is exactly the same and they include Andreotti.

Q. Okay. Thank you very much.

And one last concept I would like you to teach the jury, and if you would indulge me. This is exhibit number -- it's the *Bradford Hill* chart, which is Exhibit 905.

MS. WAGSTAFF: Permission to publish.

MS. MATTHEWS JOHNSON: No objection.

THE COURT: Go ahead.

BY MS. WAGSTAFF:

Q. So I'd like you to please use this pen. I think it actually has more ink.

If you could please explain what the *Bradford Hill* is to the ladies and gentlemen of the jury, how it's used in the field of environmental epidemiology, and then give your analysis to the jury, that would be very helpful. Thank you.

A. So it's actually used in all of epidemiology and it's Sir Bradford Hill because he was knighted by the Queen for his accomplishments, and he in the 1960s actually came up with what he called his considerations for causation. So we have seen

all these ugly numbers. We have looked at all these studies. We know more about these studies than we ever wanted to know now, but how do we summarize what we've seen?

And he said these are criteria we should use in order to come up with is there causation or not. And he said we shouldn't just use human studies and we shouldn't use human studies out of context. We also should use experimental studies because we have our colleagues who are testing these products on animals, on mice, on rats, and we should use that data and include it in our overall thinking as a scientist.

We also have people who draw blood from people who were glyphosate exposed or other types of pesticide exposed and then look at what happens to their lymphocytes, to their white blood cells. Right? So we have a lot of different sciences around us that are showing us results.

But let's stick for now with consistency of associations. That is just the human studies. And it says: Is there a consistency in what we see in human studies? Meaning are most of these studies showing you an increase in risk?

Well, I would say, yes, strong consistency except --

Q. Let's see if this one works.

A. It's working.

Q. Okay.

A. -- strong consistency except the Agricultural Health Study; right? That one drops off.

Q. Can you write that a little darker if you can?

A. This one?

Q. Yes.

A. (Witness complying.)

Okay. Then how strong is the association? Meaning, how strong -- how large is that relative risk? Well, you could say maybe moderate because it's only an overall 50 percent increase in risk. It's not twofold. But that's moderate for ever/never. Right? When you're going to the regular users, it's actually strong because it's more than 2 for regular use.

Okay. Biologic plausibility. This is where we have to ask ourself: Could glyphosate-based formulations actually cause cancer and how would they do this? And there are now 10 or some odd principles that the International Agency for Research on Cancer agreed on that show you that something can cause cancer and there are two mechanisms, one is called oxidative stress and the other is called genotoxicity. So one is your cells get bombarded with oxygen that corrodes and pretty much -- yeah, corrodes your proteins and your genetic material. And the other one is called genotoxicity, meaning your genetic material is attacking the cell. And both of them were found for glyphosate-based formulations so there is actually biological plausibility.

Q. And, Dr. Ritz, have you written papers on that concept of oxidative stress?

A. Yes, I have.

Q. And were they published in peer-reviewed journals?

A. Yes, in medical journals.

Q. Okay.

A. And so then gradient. This is the question: Do we see a dose-response? Right? And I have already shown you my arguments why I think that it's actually quite believable that there's a stronger effect, there's a gradient in a sense that you need a lot more exposure in order to be at risk; right? You need exposure above a certain level. So there is a gradient, yes.

Temporality, meaning did the exposure come before the disease occurred? Well, it had to when you already have the disease and you ask them, "Well, what happened before"? And also in the AHS study definitely. So that is given, yes.

Specificity is a difficult one. It means -- a bit more difficult to understand maybe -- it means does one agent always just cause one disease? So does glyphosate only cause one type of cancer and not many? Actually, that seems to be the case in the humans as well.

And then coherence just puts all of the animal world study together with what I have seen in the humans. It goes back to mechanism, goes back to cell data, and then says "Do we coherently see what we see in humans also in experimental animals?" And there are actually at least I think now six

mouse studies that also showed some kind of lymphoma showing up in mice that were dosed with these formulations. So I would say yes.

Q. Thank you.

So going through your *Bradford Hill* considerations, what does that tell you and how does that inform your opinion on whether or not exposure to Roundup causes non-Hodgkin's lymphoma?

A. Well, this is pretty much the exercise I went through in order to come up with my determination that GBHs are actually causing non-Hodgkin's lymphoma in humans.

Q. Okay. And when you made that opinion, did you consider the animal studies?

A. Yes, I did.

Q. And did you consider the cell studies?

A. Yes.

Q. All right. And if you would return to your seat. Thank you very much.

I just have one last question for you. Yesterday during opening statement, Monsanto's counsel put a graph to the jury, and I don't have a copy of it so I'm going to try to draw it. The graph looked something like -- and you'll just have to bear with me -- something like glyphosate use --

MS. MOORE: Aimee, I don't think they all can see you.

MS. WAGSTAFF: I'll turn it.

Q. And this was supposed to be over time.

I'm going to go back here because it's probably more important that the jury sees it.

Can everybody see this? You can see it? Dr. Ritz?

A. Yes.

Q. Everyone on the jury?

Okay. So this was time headed this way (indicating), and the suggestion was that glyphosate use has spiked. And you've testified to that; right?

A. Yes.

Q. And then there was some line drawn to suggest that over that time, NHL had stayed the same, the rate of NHL.

A. Okay.

Q. That was the suggestion made by this chart, some version of that. I'm drawing it off of freehand.

A. Yes.

Q. If that is, in fact, the case, can you explain why that would happen?

A. Yeah. That's what we usually call an ecologic analysis. So you're comparing the rate of increase of one thing with a rate of increase of another thing. Right? In this case while glyphosate use increased, you would expect NHL rates to also increase. It doesn't tell you who's exposed or who's unexposed. It's just a general number in the population of, you know, percentage use or rate of NHL.

It's called an ecologic analysis and we're actually using that in my class in very many funny ways. For example, there's in a medical journal recently an article about the intake of chocolate use and the number of Nobel laureates, and you can, actually across countries, you can see how the number of Nobel laureates goes up with how much chocolate you eat.

And it's true data. So -- but, you know, nobody would think that chocolate-eating gives you the Nobel Prize. Okay.

Q. Would an analysis like this take into account maybe the change in protective equipment used over time?

MS. MATTHEWS JOHNSON: Objection. Objection. Leading.

THE COURT: Sustained.

THE WITNESS: So --

THE COURT: Hold on. I sustained the objection. So you don't answer the question.

THE WITNESS: Oh, yeah.

BY MS. WAGSTAFF:

Q. Assume -- if the rate in which people wore protective equipment changed over time --

MS. MATTHEWS JOHNSON: Objection. Leading.

BY MS. WAGSTAFF:

Q. -- how would that affect this study?

MS. MATTHEWS JOHNSON: Objection. Leading.

THE COURT: Sustained.

BY MS. WAGSTAFF:

Q. Does this study take into account dose-response?

A. No.

MS. MATTHEWS JOHNSON: Objection.

THE WITNESS: The reason is we don't know who was exposed and at what level at the individual level. We're just having a general population estimate of the amount sprayed, but we don't know what people did when they sprayed.

MS. WAGSTAFF: Thank you. I pass the witness.

THE COURT: Okay. Ms. Johnson.

MS. MATTHEWS JOHNSON: May I have one moment, Your Honor?

THE COURT: Sure.

MS. MATTHEWS JOHNSON: I want to make sure I'm doing this correctly.

(Pause in proceedings.)

CROSS-EXAMINATION

BY MS. MATTHEWS JOHNSON:

Q. Good afternoon, Dr. Ritz.

A. Hi.

Q. My name is Tamarra Matthews Johnson. We've never met before; right?

A. No.

Q. All right. I'll be asking you some questions today.

I think you mentioned on direct examination that you're a

medical doctor; correct?

A. Yes.

Q. But not an oncologist; is that right?

A. No.

Q. And you haven't practiced medicine since 1983-ish, over 35 years; is that right?

A. In 1983 I got my degree --

Q. Okay. And have you --

A. -- and practiced until 1989.

Q. Okay. So you haven't practiced since 1989. So I apologize for my math. So roughly 30 years you have not practiced as a physician?

A. If you mean I didn't treat patients, correct. If you mean I didn't see patients, no.

Q. Are you here today to testify about the plaintiff Mr. Hardeman's medical condition?

A. No.

Q. So you have not reviewed his medical records?

A. No.

Q. You do not know of any conditions he may have had over the years?

MS. WAGSTAFF: Objection. Sidebar, Your Honor.

THE COURT: Okay. I don't think this needs to be on the record.

(Sidebar conference heard but not reported.)

BY MS. MATTHEWS JOHNSON:

Q. Thank you, Dr. Ritz.

So you did not examine his medical records or have any idea what medical conditions Mr. Hardeman may have had over these many years?

A. No.

Q. You have said epidemiology is the study of groups; is that fair to say?

A. Yes.

Q. And you teach at UCLA?

A. I still do.

Q. And there's a course that we were looking at, a PowerPoint "Introduction to Cohort Studies, Epi 200A"; is that right?

A. That's the one we already saw.

Q. Yes. Of Fall 2012.

(Pause in proceedings.)

BY MS. MATTHEWS JOHNSON:

Q. All right. So I am going to be enrolling in your class -- I assume maybe I've already taken an entry level course since this says 200A -- fall 2012; is that right?

A. Right.

Q. So that's the time period we're in. It just so happens that in the fall of 2012, you were also on the Advisory Committee for the Agricultural Health Study; is that right?

A. I'm still on the committee, but they didn't meet any more

after 2007.

MS. MATTHEWS JOHNSON: I want to ask to publish this to the jury. I was just reminded. May I?

THE COURT: Any objection?

MS. WAGSTAFF: No objection, Your Honor.

THE COURT: You may publish it.

MS. MATTHEWS JOHNSON: I believe it's in evidence. Thank you.

Q. Okay. So here we are. "Introduction to Cohort Studies." I'm in your class. It's the fall of 2012. I think you've just said that, yes, in fact you were on the Advisory Committee in 2012.

A. Well, by this time the AHS didn't have money.

Q. I'm sorry, Dr. Ritz. I just want to know, were you on the Advisory Committee in 2012?

A. Yes, I was on the Advisory Committee.

Q. You were?

MS. WAGSTAFF: Objection. Can she be allowed to answer the question?

THE COURT: The objection is overruled.

BY MS. MATTHEWS JOHNSON:

Q. Fall of 2012, you are on the Advisory Committee and you're not just on the committee, you're the chair?

A. I was the chair, yes.

Q. You were the chair because you became the chair in 2005?

A. Yes.

Q. Because you joined the committee in 2001?

A. Yes.

Q. Okay. So I'm in your class. It's the fall of 2012. You are on the Advisory Committee for the Agricultural Health Study.

A. Uh-huh.

Q. Okay. And that study is run by the National Institutes of Health?

A. By the National Cancer Institute, the National Institute of Environmental Health, and EPA.

Q. Okay. And so the N -- I'm going to get this wrong -- the NCI and the NIEHS are within the Institutes of Health; is that right?

A. Correct.

Q. Okay. I mix up the letters sometimes. I'm sure you will correct me if I get that wrong.

And so these are government agencies that have been sponsoring the Agricultural Health Study?

A. What do you mean by "sponsoring"?

Q. Sponsoring it.

A. Funding it?

Q. "Funding," is that the right word?

A. Yes.

Q. So when you say "funding it," you mean there's no industry

money --

A. Correct.

Q. -- in that study?

A. Yes.

Q. And so by that, that also includes Monsanto. No Monsanto money in the study?

A. Correct.

Q. Okay. And this study has been running for years and years and years by 2012?

A. Yes.

Q. Okay. So I'm in your class, you're teaching it, and you are also on the Advisory Committee for the Agricultural Health Study.

Now, this is a long deck, and we are not going to do all of these slides in here today; but if I go to the second slide, kind of one of the overview points it looks like you're talking about different kinds of studies. And I think you've said in the past that this is a way to kind of provoke discussion about different types of studies.

A. Correct.

Q. Okay. So we're not going to go slide by slide. So is there a way, if possible -- I don't want to click through too many of these.

But suffice to say, you spent a number of slides, and I'm just going to click through because we're not going to stop on

every one, but talking about cohort studies and a number of different aspects of cohort studies?

A. Yes.

Q. Is that fair to say?

A. That's fair to say.

Q. Okay. And so by the time we get to about Slide 26, we are up to the "Summary of Cohort Studies." So we're going to go to Slide 26 and not do the previous two dozen slides in the interest of time.

So, first, we see here in your PowerPoint that cohort studies are generally the most accepted in the scientific community?

A. Emphasis on "general."

Q. Okay. They include the entire available study population; is that correct? Am I reading that correctly?

A. That's what this says, yes.

Q. Right. We're reading -- what I'm doing here now is just reading your slide deck. I'm sitting as a student in your class so this is what I'm going to see up on the board.

A. Okay.

Q. Is that right?

A. Yes.

Q. Okay. And it's so -- it's most similar to standard experimental strategies, and the goal is to estimate the risk of various or one diseases among the exposed subjects relative

to the background risk experienced by comparable unexposed persons; is that right?

A. Correct.

Q. And at the bottom, I mean, this is kind of the heart of the question -- right? -- what would have happened to this group of exposed subjects if they had not been exposed; is that right?

A. Yes.

Q. Because I think you've talked about it. There are all kinds of things in the mix. There's age that's in the mix; correct?

A. Correct.

Q. There can be health history that's in the mix; is that right?

A. Could be.

Q. Right. I mean, you talked about the Orsi study. That was a hospital-based study, and one of your critiques was that the people in there had other health issues; is that right?

A. No, that wasn't the critique. The critique was that other health issues may be related to the exposure of interest, not that they had health issues. That's perfectly fine.

Q. Okay. But if someone has health issues, that can be in the mix?

A. In what mix?

Q. Of any question if you're saying what would happen if

someone weren't exposed, you're looking at all the other things remaining the same.

A. Only if it relates to the outcome of interest. So all other health outcomes are allowed as long as they don't influence the outcome.

Q. Right. So if it doesn't influence whether someone gets the particular disease, that's one thing; but if it is a factor in whether they can get that disease, that's a whole other situation? Is that right?

A. Well, then we want to measure that factor.

Q. So, next, "Summary: Cohort studies." So this talks about how you select people, how you recruit them into the cohort; is that right?

A. Uh-huh. Yes.

Q. And then you have a slide that says "Advantages of the Cohort Method." So you look at some of the advantages. It can provide a complete description of experience of cohort members; is that correct?

A. Subsequent to exposure.

Q. Subsequent to exposure; is that right?

A. Yeah.

Q. Okay. It can allow the study of multiple potential effects potentially?

A. Yes.

Q. It allows for calculation of the rates of disease?

A. In exposed versus unexposed.

Q. Can it permit flexibility in choosing the variables to be recorded?

A. Right.

Q. And it allows for thorough quality control in measurement of study variables?

A. Not in historical cohort studies.

Q. Okay. And so when you're talking about that, we're talking about whether we're looking back or looking forward and tracking people forward?

A. No. What -- yes, that's generally what you call a historical cohort study, but that also refers to baseline assessment.

Q. When you're asking people to add --

A. Backwards.

Q. -- to look backwards to start; is that right?

A. Right.

Q. Okay. Then you have a slide that talks about the disadvantages of the cohort method; is that right?

A. Yes.

Q. And then we get to slides about the Agricultural Health Study Cohort; is that right?

A. And you don't want to know the disadvantages?

Q. Well, you've got a slide that says "Advantages" and "Disadvantages," don't you, Doctor?

A. Yeah, but you made me read the advantages and not the disadvantages.

Q. Yes.

A. And that's why I put those in there.

Q. Oh, absolutely. And I'm sure you teach those to your students, and Ms. Wagstaff may want to talk to you about those; but what I want to be clear on is on direct examination, you were shown the disadvantages slide and said -- and asked if you taught about that. Just to be clear, there's also an advantages slide --

A. Of course.

Q. -- that appears before the disadvantages slide; is that right?

A. Yes.

Q. So now we're on to the Agricultural Health Study Cohort. So I'm in your class and I'm looking at what you are putting in your slides about AHS.

A. Yes.

Q. So first we learn that it's a collaborative effort to study the effects of pesticide exposures among farmers; is that correct?

A. Yes.

Q. And here we have the National Cancer Society. Is that another way of saying National Cancer Institute? Is that --

A. Oh, that's a typo.

Q. Okay. Fair enough.

Is it NCI or National Cancer Society? Or maybe it's both.

A. No. It's the NCI.

Q. Okay. So it's the National Cancer Institute?

A. Institute.

Q. Okay. And then we have the National Institute of Environmental Health Sciences?

A. Correct.

Q. And the EPA as you said?

A. Uh-huh.

Q. And we've also got the website here aghealth.nci@nih.gov?

A. Yes, for those who want to know more.

Q. That's right. That's right, but not allowed to research here. But in general people who want to know more.

The "AHS Cohort Study: Retro- and Prospective Data Collection," is that the next slide that I see in your class?

A. Yes.

Q. So "Phase I, Initial Cohort Recruitment 1994 to 1997."

A. Right.

Q. And it lists 89,658 folks; is that right?

A. Yeah, because it includes the wives and the commercial applicators.

Q. Right, yes. So there were some commercial applicators on top of the farmers and then they were also tracking sometimes spouses, as well as family members; is that right?

A. Yes.

Q. Okay. And so they were recruited at Iowa and North Carolina; is that right?

A. Yes.

Q. And each applicator was asked to complete a 21-page enrollment questionnaire, and that included all kinds of information about them; right? Pesticides, you talked about 50 pesticides?

A. Yes.

Q. Demographic data, which I'm taking to mean -- let me know if I'm wrong -- things like age, race, sex?

A. Yes.

Q. Lifestyle, smoking, alcohol, vegetable and fruit consumption; is that right?

A. Yes.

Q. A brief medical history, so there was an interest in understanding the medical history of the individuals who were enrolled?

A. Yes.

Q. Family history of cancer, kidney failure, diabetes, and heart disease?

A. Uh-huh.

Q. Is that right?

A. Yes.

Q. And then farm exposures other than pesticides, and it says

not in the commercial pesticide applicator version, and then there were identifiers that were collected as well; is that right?

A. Yes.

Q. And so they completed questionnaires and then they were given a few take-home questionnaires; is that correct?

A. Yes.

Q. So next, next slide, it talks more about the actual questionnaires, work practices, farm exposures, pesticide information, work and physical activity, diet, cooking practices, and then they also did medical history comprehensive; is that right?

A. Yes.

Q. And those were for the take-home questionnaires?

A. Yes.

Q. Okay.

A. But the take-home did not come back from everyone.

Q. Right. And we're going to get there. We're going to get to that part where, you know, it happens sometimes. I think you said every researcher has this issue --

A. Yes.

Q. -- trying to get, you know, as many responses as they can get; is that right?

A. That's correct.

Q. So cancer and noncancer outcomes were linked with things

like cancer registries, vital statistics, and the United States Renal Data System, which is also one of the --

A. Yeah, for renal disease.

Q. And is "renal," just for the record, kidney --

A. Yes.

Q. -- related issues?

A. Yes.

Q. Okay. So then there's also exposure data collection, and it says there's a baseline questionnaire at the licensing exam and then there's a follow-up. And you talked about telephone interviews; right?

A. Correct.

Q. And that's the CATI system?

A. Yes.

Q. So that system is -- you talked about it being assisted but the idea is that live people are on the phone, correct, calling other live people?

A. It's pretty much like what the calls are that you're getting, you know, to buy something.

Q. Well, but they're collecting information, aren't they, Dr. Ritz?

A. Yes, they are collecting information.

Q. Okay. So the idea of having a list is to make sure that everybody is getting asked the same types of questions; right?

A. Correct. It's standardized.

Q. Right. You don't want to get on the phone and just chat about what you want to chat about. You want to make sure everybody is asking the same set of questions.

A. Right.

Q. That's to increase validity?

A. Right.

Q. Okay. So they also ask about food and then something here called cheek cell collection, and I think you talked about this a little bit, about this biometric side of things where --

A. Right.

Q. -- at various points during the study they were trying to collect information from people, like either urine or here cheek cells. So there was actual attempts to -- not just attempts but actual practices of collecting physical data from people as they tried to examine these questions; is that right?

A. Correct.

Q. So then there were follow-ups. There's a Phase II follow-up 1999 to 2003. There's a phase III follow-up from 2004 to 2008. Is that right?

A. Yes.

Q. So I think I forgot to just cover one thing. The cancer registries. I think you've talked about them and I think you've said in the past that it is common across all studies to use cancer registries, right, if you're tracking a cancer event?

A. What studies?

Q. Well, if you're doing -- if you're a researcher and you want to know about the incidence of cancer, do researchers kind of find particular resources reliable for getting that data?

A. Yes. If you have a cancer registry, you are in good shape, but not -- we don't have a national cancer registry.

Q. I understand there might not be a national cancer registry, but there are state cancer registries?

A. Correct.

Q. They were in Iowa and North Carolina?

A. What was that?

Q. Iowa and North Carolina have state --

A. Yes. That's why they did the study there, yes.

Q. So if you look at the cohort studies, you are also going through more information here looking at cancer incidence. There is cross-sectional studies. So you are using questionnaire data, biomarkers. Are you going to tell me what GIS is?

A. Geographic Information System. That is my favorite.

Q. Is it? Okay. Geographic Information System. And there is also this idea of nested case control studies. And --

A. I wish they had done one on glyphosate, and they didn't.

Q. I understand. But they have case control studies that operate within some of these cohort studies?

A. They have one.

Q. Okay.

A. One big one. That's the Parkinson's study.

Q. And you are very familiar with that one?

A. Yes.

Q. Okay. So -- and then they have exposure assessment and validation studies. So there will be other publications that I think we will get a chance to talk about, but all along the way during AHS, there were individuals publishing articles about how the study was run; is that right?

A. About what -- about what they were finding and what they were doing, yes.

Q. And what they were doing. I mean, what you are finding is one thing. But, for instance, if you want to know if your questionnaire was good, there was a period of time, just about a year after initial enrollment, when they went back to 4,000, 4,000 people who had come back in to get their licenses renewed, and they have them fill out another questionnaire, didn't they?

A. Yes, that was in Iowa and only in Iowa, not in North Carolina. And it was only a one-year period difference.

Q. Right. I get that, but is the answer to my question, yes, 4,000 people came back and did another questionnaire a year later?

A. They came back for a licensing exam, and at that time they were asked to fill out the same 20-some odd page questionnaire

again, and they did.

Q. And they did. And the point of that was to test and see, like I said, the first time around where they were in a rush and did they not really want to provide the information, how does it look in comparison to those earlier responses. And then there was an actual article publication about that whole process.

A. Correct.

Q. Now, we are getting more into the breakdown of the cohort. So when we talk about the 50-plus-thousand dollars -- dollar, excuse me -- the 52,000-plus person number, pardon me, that is the private applicators; is that right?

A. Yes. 52,395 are private applicators in Phase One who completed the questionnaire.

Q. And it sounds like sometimes across the case -- I think everybody has been doing it, we sometimes just talk about these folks as "the farmers"?

A. Yes.

Q. Right, because I think you have said farmers are on the front line.

A. Of what?

Q. The front line of these pesticide studies. I think you said in the past that farmers are on the front line.

A. Of application, not -- the people who are actually more exposed are the people producing the pesticides, and those are

the people we should be studying but aren't allowed to.

Q. Okay. Well, what I'm talking about is what we are saying here, the people who are using it. You went off people who are producing it. I'm just talking about people who are using it, using the product. That's where I am.

A. We generally think that farmers have the highest likelihood of being exposed because they do it commercially on their farm, but not every farmer sprays the pesticides. They hire people to do that as well.

Q. I understand, but I want to be clear about this. You have said that farmers are on the front line?

A. Yes.

Q. And that, I think as you noted, they have some of the highest exposures?

A. Some, yes.

Q. I think you have also said they tend to be pretty good at reporting that use?

A. I'm not sure what you mean by "pretty good," but generally something I do every day I'm able to report. If I do it once a year, I might forget. If I have to report 30 years back, I might forget.

Q. Well, there have been some actual articles about that, too, though, haven't there been? Where they have gone and tested and gone back to the distributors of the pesticides, so they have had farmers fill out things saying, Where did you get

your pesticides? Then they go back to the distributor and they check those records, and they have overlaid them and found reliability and what the farmers had reported in the first place; is that right?

A. That is actually the Canadian study who did that, *McDuffie*. And they confirmed that they had a good exposure assessment in that way.

Q. Okay. So then we have health study topics. If I'm sitting in your class -- and what I think is really important is that we start to get the full scope of what AHS has been studying. So it's not exclusively a cancer study, first of all; right?

A. No, it's not.

Q. And it is not exclusively a Roundup or glyphosate or GBS study, is it?

A. No.

Q. Okay. So there is the question of cancer mortality and incidence in applicators and spouses; is that right?

A. Uh-huh.

Q. There is pesticide exposure assessment of the applicator, children and spouses, including the questionnaire; is that right?

A. That is the purpose of the study, yes.

Q. And also field studies, this is an -- and also -- is that right, field studies?

A. They try to assess acute exposures, yes.

Q. And then also looking at any kind of effects of chronic pesticide exposures across 50 pesticides; is that correct?

A. What is the question?

Q. The question is biologic and functional effects of chronic pesticide exposure across 50 pesticides, because I understood there to be 50 pesticides at issue.

A. No. They selected pesticides and honed in on those. For example, fungicides in orchard workers. Those were special sub-studies --

Q. Okay.

A. -- where they watched them over a whole application period.

Q. Okay. Okay. So that is a deep dive on fungicides. So that is --

A. In a small subgroup of people who was in the ag health, like a few hundred.

Q. A fungicide is something that kills fungus?

A. Yes, uh-huh.

Q. That would, like, grow on fruit?

A. Yes.

Q. Okay. I understand.

So when you talk about they also covered injuries, lifestyle and diet; is that right?

A. Yes.

Q. All other kinds of things that might go on. Respiratory, neurologic, autoimmune; is that fair?

A. Yes, but those are all based on self-reported disease, and then they try to go back and find medical records, but it is actually the worst kind of design you have for these studies, unless you see the people and diagnose them correctly. So all of these other outcomes, except for cancer and Parkinson's, where they actually went and saw the patients, are not confirmed diagnoses.

Q. Well, that's fair. You are dealing with what people report to you. It sounds like they went out and tried to confirm it too; is that right?

A. They tried to confirm it, yes.

Q. Okay. And, of course, I think as you noted in your answer, cancer is in a different position because of these very reliable registers; is that right?

A. If you can find a person in the registry, yes.

Q. So I just want to be clear. I mean, now -- I'm still sitting in your class, so this is a long PowerPoint. We are not going to go beyond this point. But I have now gone through all of the slides that I would see as a student in your class on the Agricultural Health Study; is that right?

A. You saw the slides, yes.

Q. I saw the slides. That's what I saw. Because what goes on is other kinds of things, how you can pool cohorts and there

are other topics that are covered in this PowerPoint; is that right?

A. There are other topics, but what you don't have is what I said about the slides.

Q. I understand. We don't know what you said about the slides. I think that is important. What I will say, though, is kind of grade school through high school, all the way really through my whole education, what the teacher puts on the blackboard or puts up on the screen is what they want you to remember. Would you agree with that?

A. No. In grade school I do the opposite. In grade school I put the obvious on the slide, and then I ask questions in the way I was told I shouldn't ask you questions because I like to stimulate discussion and I like to be provocative. So what you see on my slides is just the basics that you can read up anywhere. If you want to get my lecture, you have to come.

Q. So just to be clear, there is nothing on these slides, Doctor, that says anything about this study being useless for glyphosate; is that correct? There's nothing in the slides?

A. Well, we want to go a few slides back and let me tell you what I say?

Q. Well, I just want to be clear. On the slides when you talk about the Agricultural Health Study, you are not saying that it is useless for glyphosate. That is not in the slides. I just want to be clear. It is not in the slides, is it?

A. Well, that would be giving the final answer away. Are you giving exam answers away to your students? I make them think. So what do you think the question, the problem is with this. And then they have to give me the answer. I'm not writing that answer on the slide. I'm not stupid.

Q. So the bottom line is it is not in the slides, is it, Doctor?

A. What is not on the slide?

Q. That glyphosate is useless -- that the AHS is useless for glyphosate.

A. I'm not telling my students anything about glyphosate on these slides. I'm telling them -- this is not about glyphosate. None of these slides is actually about glyphosate. These slides are about how you conduct a cohort study and how you shouldn't conduct it. And when I talk about the cohort study, which is the Ag Health, I tell my students that, yes, this is a cohort study. Yes, they have a lot of agricultural applicators. But guess what? They only ask them at baseline and 38 percent didn't come back. And I actually show the graph with who came back. You add that up but you didn't ask me a question. So I didn't say anything; right?

But on that one graph on that table, you could already see how many people they had lost who didn't come back, and that's what I explained to my students. Be careful because you have only one exposure assessment. At the second time only

62 percent come back. And then you have a long time to wait for the cancers to occur, and you have all of these problems that can occur in the meantime. That's how I teach this and --

Q. I'm so sorry --

A. -- cohort studies --

Q. So just to be clear, let's go down to imputation, Doctor. I think you just said this question about the 63 percent; is that right?

A. Yes.

MS. MATTHEWS JOHNSON: Let's take a look. I think I will need the ELMO now, please.

BY MS. MATTHEWS JOHNSON

Q. Andreotti 2018. This is the second article, the one that was discussed; is that right?

A. Yes.

Q. So this is the article, 2018, the lead author is Gabriella Andreotti; is that correct?

A. Yes.

Q. And one of the things they are talking about --

THE COURT: You want to publish this to the jury?

MS. MATTHEWS JOHNSON: I would, thank you, Your Honor.

THE COURT: Let me also ask you, how long is this line of questioning going to go? I'm deciding when we should break for lunch.

MS. MATTHEWS JOHNSON: This is a perfect time to

break, if that works for the Court.

THE COURT: Okay. Why don't we -- before we get into the Andreotti study, why don't we break for lunch. We will resume at 12:30. And remember all my admonitions about not doing research, talking to anybody or anything like that. Thank you.

(Jury exited.)

MS. MATTHEWS JOHNSON: I just wanted to make sure that the witness has been instructed now that she has been passed, she is not to have any conversations with counsel about her testimony.

THE COURT: Has she been so instructed?

MS. WAGSTAFF: I was just going to ask to instruct her, but also make it clear that we can be with her and talk with her, just not about the substance of her testimony.

THE COURT: That's fine.

MS. MATTHEWS JOHNSON: Thank you.

THE CLERK: The court is in recess.

MR. WISNER: One thing before we break.

THE COURT: Yes, Mr. Wisner.

MR. WISNER: Hi. I have Dr. Portier's first day of depo that we have gone through the objections, and I think I have done it in a way that is easy to use. This is the --

THE COURT: I'm not going to hold my breath.

MS. MOORE: He has been working all morning, Your

Honor.

MR. WISNER: Your Honor, if I can give this to you, the Defendants have a copy of all this.

THE COURT: Okay.

MR. WISNER: And this is for day one. There is only about maybe 15 objections. Of them, six are substantive. So it is actually pretty easy.

THE COURT: You agree this is what I should be reviewing?

MR. STEKLOFF: Yes. I just want to clarify that it is only the direct -- or part of Mr. Wisner's direct. So the cross will be coming later. And I have not been involved in the objections to know whether there is any part of the cross that provides context for this, but we are not objecting --

THE COURT: Yeah, I mean, it seems to me I should probably -- I can start reviewing it, but I can't sort of make a final decision on anything before I look at the cross.

MR. WISNER: Fair enough. I don't think that is going to be a problem if you need to take a look at it. If it is not, we can cut the video tonight, have it ready tonight, and start this process. That's why I rushed here.

THE COURT: Okay. So when are you going to get me the cross?

MR. WISNER: We have a meet-and-confer at 2:00 p.m. We will try to get it done tonight; first thing tomorrow

morning or even late tonight.

THE COURT: Got it. Thank you.

(Luncheon recess was taken at 11:40 a.m.)

AFTERNOON SESSION **12:32 p.m.**

(Proceedings were heard out of presence of the jury:)

THE COURT: So I took one cut through this -- is Mr. Wisner here?

MS. WAGSTAFF: He is upstairs on the 18th floor.

MS. MOORE: We can get him here.

THE COURT: No. It's okay. I took one cut through the Portier testimony, and it seems like it will be pretty easy to deal with.

MS. MOORE: Okay.

THE COURT: I can't remember what he said about when he wanted it back.

MS. WAGSTAFF: So he had a meet-and-confer with Monsanto set for 2:00 for day two, which is the rest of the Phase One testimony; and he said he could give it to you --

MS. MOORE: Well, the plan was we would give you that, but we would love to have the rulings on the direct so we can have our tech person work on the direct, and then we would get you the rulings -- I mean, get you the cross testimony later today after their meet-and-confer at 2:00.

THE COURT: Are you comfortable with -- so I could do that if that would be helpful. But are you comfortable with

cutting it, knowing that the ruling is tentative? Because I -- you know, the tricky thing here, you know, I'm seeing it in a lot of Portier's testimony, direct testimony is, well, in isolation maybe this is okay; but it is starting to move us down the road of having a fight about the EPA or having a fight about the IARC or whatever.

So, you know, I would be reluctant to let it in if letting it in meant that you would even go further down that road on cross; right? So that's the challenge.

MS. MOORE: I understand what you are saying.

THE COURT: So you might -- you know, if I give you my rulings, they would be tentative and you would be cutting the video and you might have to change it. So --

MS. WAGSTAFF: Why don't we ask --

THE COURT: What do you want me to do?

MS. WAGSTAFF: -- the tech guy what is easier for him?

MR. WOOL: I would be happy to take the rulings now. It's easier to cut them back in.

THE COURT: Okay.

MS. MOORE: It's better to have it, Your Honor. We have done that today where we stuck some in and took some out, so that would be great.

THE COURT: I will get that to you shortly after the OSC hearing.

MS. MOORE: Okay. Wonderful. Thank you, Your Honor.

THE COURT: Bring in the jury.

MS. WAGSTAFF: Can I actually put something on the record just before we bring in the jury?

THE CLERK: Hold on one second.

MS. WAGSTAFF: I just wanted to put this sidebar on the record that we --

THE COURT: Let me cut you off. You are going to object that I precluded Dr. Ritz from stating that Blair was the head of the IARC working group?

MS. WAGSTAFF: That's not what I was talking about, but I will object to that as well.

THE COURT: Okay.

MS. WAGSTAFF: The sidebar that we had that wasn't on the record was relating to the questions to Dr. Ritz on specific causation. She was asked if she was here to testify about Plaintiff's mental condition. She answered no.

And she was asked if she reviewed his medical records, if she knew of medical conditions he may have had over the years. She was asked if she had reviewed his medical records again and if she had any idea of what medical conditions he had. And we objected to that. That was off the record on sidebar. And I just wanted to put that on the record.

THE COURT: Sure. And you are, of course, free to deal with that on redirect.

MS. WAGSTAFF: She seems to have moved on. I don't

know if she is --

MS. MATTHEWS JOHNSON: We will not be dealing with that.

THE COURT: All right. Bring them in.

(Proceedings were heard in the presence of the jury:)

THE COURT: Welcome back.

Ms. Johnson, you can resume.

MS. MATTHEWS JOHNSON: Thank you, Your Honor.

BY MS. MATTHEWS JOHNSON

Q. Good afternoon, everyone. Good afternoon, Dr. Ritz.

A. Good afternoon.

Q. When I had left off, I had just asked to publish Exhibit 1032 on the ELMO; and this is the Andreotti 2018 study that you testified about on direct examination; isn't that right?

A. Correct.

Q. One aspect of your testimony related to an issue where there were some 50-plus-thousand people who filled out an initial questionnaire, and you expressed some concern about the fact that there were others who didn't do the second questionnaire and that there was a process that I think was labeled imputation that took place. Do you recall that testimony?

A. Yes.

Q. Now, if we turn here into the actual Andreotti article

itself, we will see on page 4 of 8 that one of the ways these researchers dealt with this issue was to say, Well, okay, let's not deal with imputation at all and let's just look at the 34,698 people who filled out both questionnaires.

And they say here in the article -- please let me know if I'm reading this correctly -- "To evaluate the impact of using imputed exposure data for participants who did not complete the follow-up questionnaire, we limited the analysis to 34,698 participants who completed both questionnaires, reducing the total number of cancer cases to 4,699. Glyphosate use was not associated with NHL."

Did I read that correctly?

A. Correct.

Q. And the 4,699 cancer cases is all cancer cases in that cohort; is that right?

A. Yes. All cancers, not NHL.

Q. Next I would like to publish, if I can, Exhibit 1031. Now, this --

MS. MATTHEWS JOHNSON: May I publish it to the jury?

MS. WAGSTAFF: No objection.

THE COURT: Go ahead.

BY MS. MATTHEWS JOHNSON

Q. So the Andreotti 2018, which is Exhibit 1032, was published in the Journal of the National Cancer Institute; correct?

I'm sorry. I'm going back to the previous one just to cover. It was the journal it was published in; is that right, Doctor?

A. Yes.

Q. And then I think you noted there were some critique of the study, and these authors, Gabriella Andreotti, came out with a response to the critiques. And it is a response to Sheppard and Shaffer. Do you see that, Doctor?

A. Yes, it says response to Sheppard and Shaffer.

Q. Okay. And just starting without -- above the highlighted text, please let me know if I'm reading this correctly: "We thank Dr. Sheppard and Ms. Shaffer for their interest in our report of glyphosate and cancer risk in the Agricultural Health Study and the opportunity to discuss the potential impact of our method of assigning glyphosate exposure for participants who did not complete the follow-up questionnaire. As they correctly state, we did not account for a health outcome when impugning exposure."

But then they go on to say: "Although we agree that this method could theoretically bias the risk estimate towards the null, based on sensitivity analyses that we conducted and reported in the manuscript and describe more fully below, we demonstrate that our imputation likely did not materially impact risk estimates."

Did I read that correctly?

A. Yes.

Q. And then they go on to say: "Overall, we believe that these data demonstrates that not including outcome information in our imputation of glyphosate exposure did not introduce meaningful -- that did not introduce meaningful bias in our cancer risk estimates associated with this pesticide"; is that correct?

A. That's their belief.

Q. Yes. And on direct examination, Ms. Wagstaff did not show you these portions of this article or this response that was made to the two -- Dr. Sheppard and Ms. Shaffer; is that correct?

A. What is the question?

Q. During your direct examination --

A. Yeah.

Q. -- when you were shown Dr. Sheppard and Ms. Shaffer's concerns, and you were shown -- you were not shown these portions of the response by Gabriella Andreotti?

A. I weren't shown but I have seen them.

Q. Right. But not during your testimony here in this courtroom?

A. No.

Q. So, Doctor, would you agree that NHL, like most other cancers, is a disease of aging with dramatically higher incidents as people age?

A. It is not a disease of aging. Cancer is a disease of aging. NHL has some aspects, but it is certainly not the strongest showing aging effect. It does show aging effect, but there are cancers that are much worse.

Q. If you would, please, Doctor, we have provided, I believe, to the Court and to you -- doctor, if you look immediately to your right, you will see a very large binder.

A. Yes.

Q. And it contains both your reports and prior testimony. And I believe you have a report that is dated May 1, 2017.

A. Do you want me to take this?

THE COURT: Yeah. You can grab it and pull out tab 1.

THE CLERK: What exhibit number is this?

MS. MATTHEWS JOHNSON: It is -- well, it is her report. We are not going to -- we are not going to seek to mark it at this point. I'm drawing the Court and the witness' attention to a particular portion. We are not seeking to admit it.

BY MS. MATTHEWS JOHNSON

Q. If you would please go to page 21.

MS. WAGSTAFF: Is it tab 1, Counsel?

MS. MATTHEWS JOHNSON: It is tab 1, I apologize. There is an index at the front. We are talking about your testimony, May 1st, 2017. It is tab 1. We are going to page 21 and the first full sentence at the very top of the page.

Your Honor, I was wondering if I might be able to read that into the record.

THE COURT: Just that one sentence?

MS. MATTHEWS JOHNSON: Yes. Yes, Your Honor.

THE COURT: Any objection?

MS. WAGSTAFF: I think we should read a little bit more than this one sentence. This is a --

THE COURT: What other lines do you believe need to be read for completeness?

MS. WAGSTAFF: Well, I'm not sure. This is a 25-page substantive report that I didn't know one sentence was going to be pulled out of.

THE COURT: You can read the sentence.

BY MS. MATTHEWS JOHNSON

Q. Okay. For the record I'm reading to you the first full sentence on the top of page 21 of the report, of your report. And just for the record you did write this report; right, Doctor?

A. Yes.

Q. And does it say "NHL, like most other cancers, is a disease of aging with dramatically higher incidence as people age"; is that correct?

A. That's correct.

Q. Okay.

THE COURT: And, Ms. Wagstaff, since you seem so

confused about that, I will just remind you the rules, which is that if -- when a witness is being cross-examined, a lawyer can impeach them with prior statements if there is an inconsistency between the prior statement and the testimony that the witness gives on the stand. So that's why we pull out the one sentence that the lawyer is attempting to impeach the witness with.

BY MS. MATTHEWS JOHNSON

Q. And if you would look down, please, Doctor, there is a figure -- figure 1.

A. Yes.

MS. MATTHEWS JOHNSON: Your Honor, we would like to publish just this figure, not the report, but just this figure that reflects the figure -- the citation of figure 1.

MS. WAGSTAFF: No objection.

THE COURT: Go ahead.

BY MS. MATTHEWS JOHNSON

Q. Doctor, we are looking here at Figure 1, also found at page 21 of your report. It says "Age specific incidence of NHL, SEER, 2009 to 2013."

This is a figure from your report?

A. Yes.

Q. Just for the record, SEER is Surveillance Epidemiology and End Results; is that correct?

A. Yes.

Q. And just to be clear, this is publicly available data.

This is not private data that just you have access to; is that right?

A. You can pull it off the internet.

Q. Pull it off the internet, okay.

And it does show an increase in reflection of what you wrote in your paper, increase with age; is that right?

A. Yeah, and a drop in the older age groups.

Q. In the oldest age groups, yes. Do you happen to know what age Mr. Hardeman was when he was diagnosed with NHL?

A. No.

Q. Now, with respect to publicly available data, are there places that you can go to learn about incidence of various types -- of various types of cancer including NHL, like what we see here?

A. The SEER.

Q. And there are also the places you can go and look at the actual numbers of diagnoses of a particular type of cancer over time. Not this particular graphic, but in general there is a place you can go to look for the diagnoses of particular types of cancer over time?

A. I believe that the NCI has a website like that.

Q. Okay. If you would, please, look at Exhibit 1089, and you will probably have to switch books, I'm sorry. They are large. Let me give you a second to do that.

(Whereupon, a brief pause was had.)

THE COURT: What was it again?

MS. MATTHEWS JOHNSON: It is 1089.

THE WITNESS: Yes.

BY MS. MATTHEWS JOHNSON

Q. Okay. Doctor, do you see -- do you have in your book Exhibit 1089? And is that the sort of data that you are saying is publicly available and reflects the incidence of NHL over time?

A. Well, I can only tell you what I see here, and it says NIH, National Cancer Institute, cancer stat facts. And if this is a truthful image of what you find on that website, I have to presume it is from SEER.

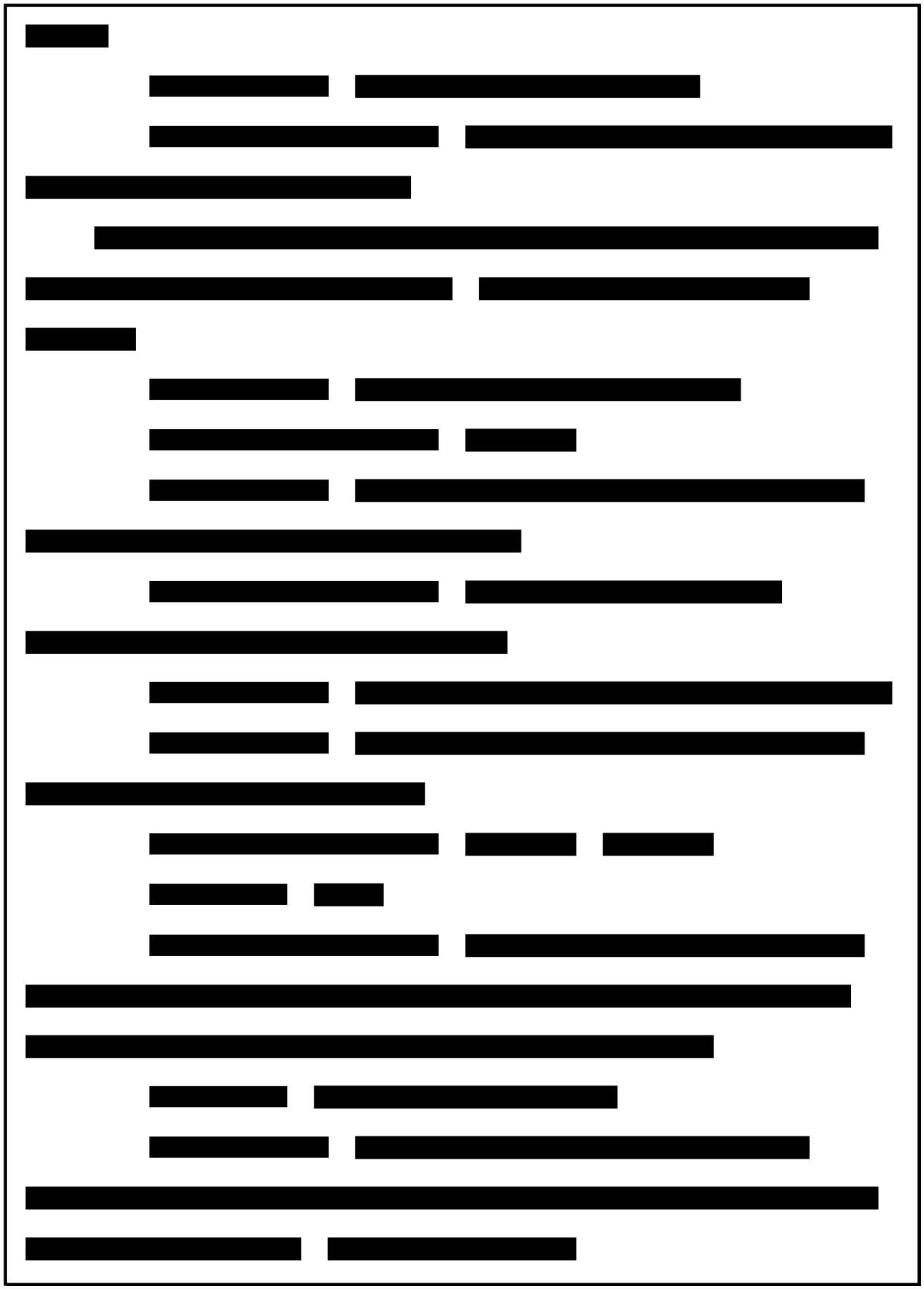
MS. WAGSTAFF: Your Honor, I would like a sidebar on this.

MS. MATTHEWS JOHNSON: Sure.

THE COURT: Okay.

(The following proceedings were heard at the sidebar:)

[redacted]



[redacted]

BY MS. MATTHEWS JOHNSON

Q. Okay. And so now, Doctor, looking -- if you look on the screen you will see specifically what we are publishing. So we are not talking about the other items that might be on that page. So just for clarity, do you see there that graphic reflecting the number per 100,000 persons of diagnoses of NHL from 1992 to 2015?

A. Yes.

Q. So, Doctor, you spoke on direct examination -- and I think you have spoken before -- about the idea of large sample sizes giving greater statistical power. Is that something you have talked about?

A. I talked about sample size. Sample size refers to different things in case control, in cohort studies and large samples in -- large size in a cohort study doesn't mean power.

Q. Okay. So if we can take a look, then, at some case control studies, and we just want to look at some sizes. What I would like to do -- so everyone knows where we are headed -- is to look at first *McDuffie*, which is 1375 is the exhibit.

But just to publish a table from *McDuffie*.

MS. WAGSTAFF: Sure. No objection.

MS. MATTHEWS JOHNSON: And I need slide 8, please.

THE COURT: That's okay.

BY MS. MATTHEWS JOHNSON

Q. So if we look at *McDuffie*, you can see here they provide this information in the tables, don't they, Doctor? They will provide the number of cases of NHL. They will provide the number of controls of NHL. And then they will provide the numbers in each of those categories that were exposed; is that correct?

A. That's correct.

Q. And then if we can do similar for *De Roos*, 2003, which is slide 9, and then again here, case control study. They give you the number of cases, 650; the number of controls, 1,933; and then they give you the amount of exposed cases in each of those categories; is that correct?

A. Yes. It's the same data I put on that chart.

Q. And if we could go to *Hardell* 2002, which is slide 10; and again, they are giving the number of cases, the number of controls. So 515 cases, 1,141 controls. And then in this -- in this particular one, which was *Hardell* 2002, you have eight cases and eight controls; is that right?

A. Correct.

Q. Now, *Hardell* 1999 came just before this, a few years

before, and it had four cases and three controls out of the same size of cases and controls; is that right?

A. No.

Q. Was there an addition of a particular category for hairy cell leukemia in this *Hardell* 2002?

A. In 2002 they added cases and controls.

Q. They added cases and controls?

A. Yes.

Q. And they added hairy cell leukemia to the category?

A. They added cases.

Q. Right. But did they add the diagnosis of hairy cell leukemia?

A. That's what the study said.

Q. Okay. I just want to confirm. They added the diagnosis of hairy cell leukemia for *Hardell* 2002?

A. Plus controls.

Q. Right. But they added it from *Hardell* 1999; is that correct?

A. Yes.

Q. Now, let's take a look at *Eriksson*, slide 11.

So we had 910 cases and 1,016 controls. And then there were 29 exposed cases and 18 exposed controls in that study; is that correct?

A. Yes.

Q. And if we could next go to Orsi. So Orsi, there were 491

cases.

A. No, there weren't.

Q. I'm sorry, 244 cases; is that right, Doctor?

A. Yes.

Q. Thank you.

And 456 controls. And then there were -- and that's total cases, as you said, total controls. I think you said this is those with disease and those without. Within those groups, those exposed to glyphosate case, there were 12 cases exposed and 24 controls that were exposed; is that correct?

A. As you can find on the slide I made, yes.

Q. Now I would like to talk a little bit about the time periods that these studies covered. So we just talked about the size of the studies. Now I would like to talk about the timeframe they cover. Now, I think you have said and testified on direct, and, of course, we have seen elsewhere, that you talk about an increase in glyphosate use; correct? An increase --

A. Absolutely.

Q. -- that took place?

A. Yes.

Q. And I think you have even called it a dramatic increase that occurred in the mid-1990s --

A. Yes.

Q. -- is that correct?

And among the things that you have cited is a particular article that is Exhibit 1051.

So what I would like to do, if we could, Doctor, if you go to Exhibit 1051 and look at page 5 at the bottom, please.

A. Yes.

MS. MATTHEWS JOHNSON: I would like permission to publish the table, Table 1, at the bottom of page 5.

MS. WAGSTAFF: No objection.

THE COURT: Go ahead.

BY MS. MATTHEWS JOHNSON

Q. So, Dr. Ritz, this is a table from an article that you cite in your report related to the increase in glyphosate use; is that correct?

A. Yes.

Q. Okay. And I think you -- you have assessed that there was an increase in what looks to be the mid to late '90s and into the early 2000s; is that fair to say?

A. Yes.

Q. So now I would like to look at these case control studies and sort of what timeframe those are in. So if we can go to, please, slide 15, which is going to be from *McDuffie*.

So for the *McDuffie* study, is it correct that these were diagnoses that occurred between 1991 and 1994?

A. Yes.

Q. If we can go to *De Roos*, which is slide 16, please.

And *De Roos*, if I'm not mistaken, is a few studies that came together; is that right, Doctor? There wasn't just a single study involved with *De Roos*.

A. Three studies.

Q. And so what we have got -- just for the record -- in Nebraska, the diagnoses were between 1983 and 1986; is that correct?

A. Yes.

Q. In Minnesota the diagnoses were between 1980 and 1982; is that correct?

A. Yes.

Q. And in Kansas, the diagnoses were between 1979 and 1981; is that correct?

A. Yes.

Q. Next if we can look at *Hardell*.

So for *Hardell* -- and this is -- just to be clear, we are talking about the timeframe between *Hardell* -- we are including *Hardell* 1999 and 2002 for this date range of 1989 to 1990; is that correct?

A. Yes.

Q. Go to slide 18, please.

Now onto *Eriksson* which was published in 2008, but it covered diagnoses that occurred between 1999 to 2002; is that correct?

A. Yes.

Q. And just to be clear, those are diagnoses of cases of NHL?

A. Correct.

Q. If we go to slide 19. If we look at Orsi, which is the 2009 study, which I think you said was in the hospital, or hospital-based, those diagnoses were between 2000 and 2004; is that right?

A. Yes.

Q. So now, Doctor, I would like to talk a little bit -- we have on your -- I think you have marked on your chart very clearly the unadjusted and the adjusted figures; is that right?

A. Yes.

Q. Okay. And we were watching carefully and got all the numbers down, so we are not going to go back through that again. But I do want to ask you this: When you do your own studies, the studies that you have published, when you present your odds ratios, do you not try to adjust as much as you can?

A. As much as I can and as much as I need and as little as I need.

Q. And with respect to *De Roos* -- I would like to go to slide 20, which is from *De Roos* 2003. You covered, I believe, and testified on direct that the Anneclaire -- Anneclaire; is that correct?

A. Anneclaire.

Q. -- Anneclaire De Roos in 2003 is the same as Anneclaire De Roos in 2005; is that right?

A. Same person, not the same study.

Q. Yes, correct.

And in *De Roos* 2003, it seems that she says -- and I want to make sure I have read this correctly -- "Specific chemicals not pesticides, insecticides or herbicides as groups should be examined as potential risk factors for NHL."

She goes on to say: "A chemical-specific approach to evaluating pesticides as risk factors for NHL should facilitate interpretation of epidemiological studies for regulatory purposes."

Did I read that correctly?

A. Yes.

Q. And she then became the lead author in the cohort study for glyphosate that came out of the Agricultural Health Study; is that correct?

A. The first one.

Q. The first one, okay.

I just want to look at NAPP just very briefly, if we can have slide 21. Now, we talked about *De Roos* involving other studies; correct? I think you mentioned that on your direct examination; isn't that right?

A. Yes.

Q. But the North American Pooled Project is also existing studies; isn't that right?

A. As I explained when I was explaining --

Q. Right.

A. -- the studies, yes.

Q. So no new data in the North American Pooled Project; correct?

They are pulling together more data, and that has benefits; but just to be clear, we are still talking about the same timeframes; are we not? Are we still talking about data from 1980 to 1983, from 1976 to 1982, from 1983 to 1986, and from 1991 to 1994?

A. No, not data from this time period. People who were diagnosed during this time period but had exposures prior to it.

Q. Okay. Fair enough.

But just to be clear, the original studies also looked at people diagnosed in that same period; correct?

A. Yes.

Q. Okay. So I understand the exposure has to be earlier than the diagnosis; right?

A. Yes. Absolutely.

Q. Okay. So the diagnoses for all of the years that I just listed and that appear on the screen are, in fact, the same years that are covered in the North American Pooled Project?

A. It is the same studies. The data is pooled. That's what I tried to explain. I'm sorry if that didn't come across.

MS. MATTHEWS JOHNSON: May I publish this exhibit?

THE COURT: You may.

MS. MATTHEWS JOHNSON: Thank you.

BY MS. MATTHEWS JOHNSON

Q. I'm going to try not to do all of that over again. But the upshot is the North American Pooled Project involved studies that occurred before; is that correct?

A. I tried to explain that before, yes. That's what I said. It is a pooled study of the American and Canadian data that was collected prior.

Q. So the Canadian data involves diagnoses of non-Hodgkin's lymphoma that occurred between 1991 and 1994; is that correct?

A. Yes.

Q. And the North American side is *De Roos* 2003, which actually involves three separate studies, *Cantor*, Iowa Minnesota, diagnoses between 1980 and 1983; is that correct?

A. Yes.

Q. The *Hoar* study based out of Kansas between 1976 and 1982; is that correct?

A. It looks like it.

Q. And then the *Zahm* study out of Nebraska, which is from 1983 to 1986; is that right?

A. Yes.

Q. Okay. And if you may know, it is Dr. Weisenburger who is involved with the -- technically the Nebraska study and the North American Pooled Project; is that right?

A. Yes.

Q. But I think, as you have testified on direct very clearly, this is unpublished?

A. The NAPP project is unpublished.

Q. Yes, Doctor.

A. Yes.

Q. There are, in fact, multiple slide decks. There are more -- I don't know, three -- I mean, how many have you seen?

A. I think three.

Q. Three? Three, okay.

And they have kind of been spread out over a couple years. And really I think the ones that you were talking about -- the one you talked about, the data you had was, from June 2015. That itself is nearly four years old?

A. Yes.

Q. That slide deck?

A. Uh-huh.

Q. But it is still not published?

A. It is hard to publish data that has already been published because every journal wants something new.

Q. So on the question of meta-analysis, you have talked about meta-analysis in the past because I think you have explained that they are really a summary of estimates; is that correct?

A. Yes.

Q. And is it true that as a scientist you never rely on any

summaries. You usually go to the original data and look at it, and then actually try to judge each piece of work on its own merit; is that true?

A. What do you mean by "rely"? What am I trying to do here?

Q. Well, I'm in a little bit of a bind because I'm trying to -- we may need to direct you to something. Let me do that. Let me direct you -- rather than say where the source of this -- let me direct you, if I can, to your testimony on January 19th, 2018.

A. Where is that?

Q. Okay. Let me tell you -- it is tab 5, if you go to page 114.

On page 114, I would like to draw your attention to lines 15 through 19, please.

A. Yes.

Q. And I want to give you a chance to read before that -- you know, if you would like.

THE COURT: You said you were going to read this testimony?

MS. MATTHEWS JOHNSON: I was, but --

THE COURT: Any objection?

MS. WAGSTAFF: Any objection to -- what are you -- I was reading the testimony. I'm sorry. What did you do?

MS. MATTHEWS JOHNSON: Well, the last thing that happened on the record was the witness asked me a question

about the word "rely," because she used the word "rely." I was in a bind so I took her to the testimony.

MS. WAGSTAFF: No objection.

THE COURT: Okay.

THE WITNESS: So what you just read to me as my answer was an answer. You want me to say that?

BY MS. MATTHEWS JOHNSON

Q. Yes. Let me just try to make sure we are clear.

Were you asked if you rely on the summary and findings in meta-analysis, and then you gave the answer, just to be clear, is this accurate: "As a scientist I never rely on any summaries. I usually go to the original data and look at it and then actually try to judge each piece of work on its own merit."

Was that your answer?

A. That's an answer to a longer question that asked me whether I rely in -- "upon summary estimates in those meta-analyses as support for your opinion that there is an association between non-Hodgkin's lymphoma and glyphosate-based herbicides?"

Q. Okay. So that is your answer to that question; is that right?

A. Right. I never rely only on a meta-analysis. I would be a bad scientist if I did.

Q. Well, just to be clear, for the record your answer was not

"only." It was "I never rely on any summaries." Is that the word that is there, "any summaries"?

A. I may have said "any," but what this means is as a scientist, I would not do my duty if all I did was look at somebody else's work who pooled or meta-analyzed data that I have no idea where it came from and what it says. What I do when I see a meta-analysis, I go back to the -- and ask about my opinion, and I have been reviewing meta-analysis many times. I actually go to the original articles. I pull out what these articles say, and then I compare it to what these people who do the meta-analyses have been doing to the data.

Q. Thank you.

A. And then I make my own opinion about whether the meta-analysis is appropriate and has done a good job or not. And that's what I write up as a reviewer, and that's what I use as a scientist. That is my job.

Q. Thank you.

So with respect to the Agricultural Health Study, Doctor, you said before that you think it is a beautiful study; is that right?

A. Absolutely. Unfortunately not for glyphosate.

Q. And I think you have also said that you admire your colleagues for doing that study?

A. I have all the respect in the world for my colleagues from the Ag Health Study. They have done an amazing job under lots

of pressure, but what they have done for glyphosate is not what I think is state-of-the-art, sorry.

Q. And the Andreotti study, Andreotti 2018, actually received an award, did it not, for outstanding research paper by a staff scientist or staff clinician; is that right?

A. I wouldn't know.

Q. So you -- I think we have talked a little bit about this before, Doctor. But you, in fact, have served on the external advisory committee to the Agricultural Health Study; isn't that right?

A. Absolutely right.

Q. And I think we have a slide that describes what it does. Let me just --

MS. MATTHEWS JOHNSON: Yes, if I may have slide 25, please. I'm going to -- and what I would like to do is publish from Alavanja 1996, the description.

MS. WAGSTAFF: No objection.

THE COURT: Go ahead.

MS. WAGSTAFF: What tab is the actual article?

MS. MATTHEWS JOHNSON: Exhibit 1021.

MS. WAGSTAFF: No objection.

MS. MATTHEWS JOHNSON: Okay. So --

MS. WAGSTAFF: Although I ask that she be allowed to put the article in front of them.

MS. MATTHEWS JOHNSON: Sure. It is Exhibit 1021. And

it should be right there in one of those gigantic binders.

May we publish?

THE COURT: Yes.

BY MS. MATTHEWS JOHNSON

Q. Okay. Doctor, now Alavanja 1996 is one of those articles that we talked about earlier where there were publications about the study and how the study was going to be designed and proceed; is that correct?

A. Yes, that's actually the baseline description of what the study is doing.

Q. And it is talking about an advisory panel, "composed of epidemiologists, biostatisticians, agricultural exposure experts and farmers that have been assembled to provide advice and oversight to the collaborating agencies during the development and conduct of the project. The advisory panel meets annually to review study protocols, evaluate study progress and comment on analyses and reports."

Did I read that correctly?

A. Yes, you read that.

Q. And the next thing is on the website. I think you mentioned there is an AHS website; is that correct?

A. Yes.

Q. And there is a description of the advisory group?

MS. WAGSTAFF: I have no objection to this being published; however, I would object to the continual reference

to a website.

THE COURT: I'm not sure I understand the objection. You don't object to it being published, but you object to how it is described, how it is referenced?

MS. WAGSTAFF: I would just -- the continual description of the actual website address with descriptions on how to navigate the website I would object to, but I do not object to this being published. So maybe we can just move on from there.

MS. MATTHEWS JOHNSON: What we have up -- if we can switch, I guess, away from it being published so the Court can see. We are talking about slide 26 that should be appearing not for the jury, but just for the Court to see.

THE COURT: That's fine. You can publish that.

BY MS. MATTHEWS JOHNSON

Q. So here from the Agricultural Health Study website, you have a description of the advisory group; is that right?

A. Yes.

Q. And it says: "An independent group of experts advises AHS researchers on study implementation, direction, data analysis and reporting. Members of the AHS advisory group include senior scientists with interest or expertise in agricultural science, epidemiology, molecular biology, occupational health and other related fields. Members also include active farmers from each of the participating states."

Did I read that correctly?

A. Yes.

Q. And now, you served in this capacity from -- you served as a member from 2001 to 2005; is that right?

A. Yes.

Q. And then in 2005 you became the advisory board chair?

A. Yes. And we met exactly once while I was chair.

Q. Okay. Can we go to slide 27, please.

Do you see that there, Doctor?

A. Yes.

MS. MATTHEWS JOHNSON: Okay. May I publish this to the jury?

MS. WAGSTAFF: No objection.

THE COURT: Go ahead.

BY MS. MATTHEWS JOHNSON

Q. Okay. Doctor, so here we have the timeline that shows just marking your service on the advisory board. You became a member in 2001, and then you became chair in 2005; is that correct?

A. I can't remember but it might be correct, yes.

Q. Okay.

A. Let's assume it is correct.

Q. And then you have here -- it is a picture of you. And just to be clear, is this one of those meetings where you said you met? Is this a meeting that you had?

A. I wouldn't be able to say that because I see my friend Jane there, and it looks like we are at the NIEHS, and normally we weren't meeting at the NIEHS. We were meeting at a hotel.

Q. Okay. So let's do a couple things just for the record. On here you have identified -- are you photographed in this picture? First thing first, are you in this picture?

A. I presume this is me and not somebody photoshopped me in there.

Q. Right. And what two -- I guess, in the picture to the right in a pattern black-and-white dress, it seems, you said my friend Jane?

A. Hoppin.

Q. Jane Hoppin. Just for the record, this is Jane Hoppin. And she is -- is she the co-principal investigator for AHS; is that right?

A. No, she hasn't been.

Q. She hasn't been. She has never been?

A. I don't know what she was, but from what her complaints about everything was -- as a friend, was that she never had the role she wished she had. So I don't know her titles in the study, but she was definitely a member of the investigative team from NIEHS, but the chair was actually Dale Sandler.

Q. Okay. So there is a Dale Sandler, who is the principal investigator.

Okay. So let me just go back and unpack this a little

bit. You are saying you can't say for certain that she was the co-principal investigator; is that correct?

A. Correct, because I don't know what that term means.

Q. Okay. But you do know that she was involved in NIEHS?

A. Yes, I do.

Q. Okay. And she also worked in the National Institute of Environmental Health Science epidemiology branch; is that also correct?

A. Yes, that's the institute that helped investigate.

Q. Okay. And just so -- just for completeness, do you happen to know who the woman to the left is? And you may not.

A. No, no.

Q. Okay. You do not know who that is.

Now, do you recall whether there was a meeting attended or where a meeting facilitator, Mr. -- maybe Dr. -- Alavanja was present, the same Alavanja who wrote Alavanja 1996?

A. He was always present.

Q. He was always present.

And do you recall at these meetings you and others being asked, do you endorse our plan? Do you think we are on the right track? Do you think that we are doing the right things?

Do you recall those kinds of questions being asked?

A. He could have asked those, but this was between 2001 and 2000 let's say '07, and the baby had already fallen into the well. They had already done the baseline, and they were almost

done with their second follow-up. That's when I came in, and I came in --

THE COURT: If I can interrupt you for a moment, her question was simply whether you recall being asked those questions. And I'm sure there will be an opportunity for you to elaborate after that, but try to pay attention to the question that is asked of you.

THE WITNESS: Right.

No, I don't -- I don't recall being asked these questions.

BY MS. MATTHEWS JOHNSON

Q. Okay. So you don't recall being asked: Do you think we are on the right track, that we are doing the right things, and do you have suggestions for modifications?

A. I don't recall exactly these questions. But that's, of course, the underlying question in the room when you are on an advisory board; but I can't recall that somebody stated that explicitly.

Q. Okay. And there have been times when you have been asked in years since whether you ever had any discussions with any of the AHS scientists regarding any study data on glyphosate and non-Hodgkin's lymphoma. You have been asked before if you ever had those conversations.

A. What are you asking me?

THE COURT: I want to remind you that the ground rules we set for this is you are not asking questions about prior

statements or testimony.

MS. MATTHEWS JOHNSON: Yes.

THE COURT: You ask them what their testimony is; and then only if you believe that prior testimony is inconsistent with that, will we get into their prior testimony.

MS. MATTHEWS JOHNSON: Yes, Your Honor. I will rephrase.

BY MS. MATTHEWS JOHNSON

Q. Dr. Ritz, have you had any discussions with any of the Agricultural Health Study scientists regarding any study data on glyphosate and non-Hodgkin's lymphoma?

A. In an official capacity?

Q. I'm simply asking yes or no, did you have --

A. Or as a friend?

Q. I'm just asking --

THE COURT: That is a question you can answer.

THE WITNESS: So in an official capacity, no. As a friend, I tried to mention it, yes.

BY MS. MATTHEWS JOHNSON

Q. Have you had conversations with AHS scientists about how to conduct their dose response and analyses of pesticides and non-Hodgkin's lymphoma?

A. No.

Q. Did the advisory committee, of which you were a member and a chair, make recommendations to the AHS scientists on methods

to address exposure misclassification or potential for exposure misclassification that the AHS scientists did not accept?

A. I can't remember that, but I remember a lot of discussions of their exposure validation efforts.

Q. In your role as chair of the external advisory committee to the AHS, have you spoken with anyone at AHS to share the opinion that the imputation method that they were using was inappropriate for glyphosate?

A. The imputation method was published in 2012. We haven't had any meetings in that timeframe.

Q. At this time I would like to draw your attention to some prior testimony, please. So if we can go to your deposition from September 18th, 2017, tab 3. And I just want to start with pages 27, lines 11 through 15 and also 28, lines 7 through 12.

THE COURT: What was the second one?

MS. MATTHEWS JOHNSON: I beg your pardon, Your Honor. It is page 28, lines 7 through 12.

And it is actually -- yeah, line 8 technically is where the question starts.

THE COURT: Any objection to that being read?

MS. WAGSTAFF: No objection.

THE COURT: Go ahead.

BY MS. MATTHEWS JOHNSON

Q. So first I would like to read September 18th, 2017,

page 27, lines 11 through 15: "Have you had any discussions with any of the Agricultural Health Study scientists regarding any study data on glyphosate and non-Hodgkin's lymphoma?"

Did I read that correctly, Doctor?

A. Yes. And the answer is "No."

Q. And the answer you gave to that question was "No"?

A. Yes.

Q. If we can go to page 28, lines 7 through 12.

MS. MATTHEWS JOHNSON: Technically it is line 8 through 12. Yes, Your Honor. Thank you.

BY MS. MATTHEWS JOHNSON

Q. The question: "Have you had conversations with the AHS scientists about how to conduct their dose response analyses of pesticides and non-Hodgkin's lymphoma?"

And your answer was "No."

A. Correct.

Q. And then, I believe, for the record -- I'm not sure if I asked this question -- I believe I did ask: "In your role as the chair to the external advisory committee to the AHS, have you spoken with anyone at the AHS to share the opinion that you have been offering here today that the imputation method that they are using is inappropriate for glyphosate?"

I think I asked that question earlier. Did I not, Doctor?

A. I'm not sure where you are.

Q. Okay. Let's go to page 385, please. I think I already

asked this.

A. Same testimony.

Q. It is the same. Page 385, lines 3 through 14.

THE COURT: Any objection?

MS. WAGSTAFF: Let me just -- one second, Your Honor. No objection.

THE WITNESS: 385? Where are we?

MS. MATTHEWS JOHNSON: Sorry, Doctor. It is page 385, and it is lines 3 through 14.

BY MS. MATTHEWS JOHNSON

Q. I will read the question first, which is lines 3 through 9: "Dr. Ritz, in your role as the chair of the external advisory committee to the AHS, have you spoken with anyone at the AHS to share the opinion that you have been offering here today that the imputation method that they are using is inappropriate for glyphosate?"

And your answer is: "I have not talked to them about glyphosate."

A. Correct.

Q. Is that correct?

A. So that is consistent; right?

Q. So if we can go to the timeline, I'm not sure if it is up. It is not up on my screen.

There we go. I lost mine. That's what's throwing me off.

Okay. Let's remove -- let me be clear. Let's remove

"co-principal investigator," just to be clear because you are not certain of that title; right, Doctor?

A. No.

Q. We can take that down and take that out.

We know she is with AHS, though; right?

A. No, she is not anymore.

Q. She is not anymore, but at the point in time when this picture, as you said -- as you indicated, during that timeframe, she was?

A. She was an investigator.

Q. She was an investigator. So maybe "AHS investigator." I just want to make sure we are being accurate here.

Now, we talked about the fact that you did not bring these things -- well, your testimony speaks for itself -- but do you recall that there were a number of publications over the years that dealt with questions -- issues, questions about the questionnaire about exposure; do you recall that?

A. Oh, yes.

Q. Okay.

A. I read them all, with interest.

Q. Okay. So what I would like to do now, then --

MS. WAGSTAFF: No objection.

BY MS. MATTHEWS JOHNSON

Q. And so, Doctor, just as we wait for that slide to come up, Alavanja 1996 was an article about general methodology and the

goals of the AHS. Do you recall that?

A. Yes.

Q. And I can also direct you to the exhibits. Just for the record, it is Exhibit 1021.

Exhibit 1661.

A. Which one do you want me to open?

Q. The exhibit binder, not your testimony binder, if -- I know they are so big, so --

A. Number, please.

Q. The number is 1661.

A. Yes.

Q. Okay. And so Tarone study 1997 published about the issue of whether the non-responders of the take-home questionnaires were different than those who responded and whether there was an issue with selection bias as a result?

A. This is the take-home of the baseline.

Q. Okay. But, again, this is a publication about the -- about the study and how the study is going to be executed?

A. Yes, you would hope they would publish on that, and they had.

Q. Can we go --

THE COURT: Is now a good time to take an afternoon break? I think the answer is yes.

MS. MATTHEWS JOHNSON: It is perfect. Perfect for me.

THE COURT: Why don't we take a 10-minute break. We

will resume at 1:40. Thank you.

(Proceedings were heard out of presence of the jury:)

THE COURT: See you in ten minutes.

(Recess taken at 1:30 p.m.)

(Proceedings resumed at 1:40 p.m.)

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. You can bring the jury back in.

(Proceedings were heard in the presence of the jury:)

THE COURT: I see we have our afternoon coffee. That's good.

You can resume.

MS. MATTHEWS JOHNSON: Thank you, Your Honor.

Q. Dr. Ritz, just for a moment, we're going to return to Exhibit 1089, and if you can look at Exhibit 1089 just briefly.

A. Are we done with Tarone?

Q. No. We were on that line and we'll go back there in just a moment, but for just a moment we're going to return to the SEER data and it's Exhibit 1089.

A. Okay.

Q. And if you would go to the -- I'm not sure they're paginated but, one, two, three, four -- if you would go to the fifth page, you will see at the top "Data Number Per 100,000 Persons" and it's 1975 to 2015. It's the graphics just at the top.

A. The graph?

MS. MATTHEWS JOHNSON: Your Honor, may I approach the witness just so she can see what we're talking about?

THE COURT: Sure.

MS. MATTHEWS JOHNSON: Thank you.

Q. It's this one (indicating).

A. Which exhibit?

Q. 1089.

A. Is it this one (indicating)?

Q. I think it's at the top. Is that the one you have?

A. This one (indicating)?

Q. Yes. Is that good?

A. Yes.

MS. MATTHEWS JOHNSON: So may we publish the graph that is at the top of the fifth page?

MS. WAGSTAFF: Your Honor, no objection with respect to if the title is removed from the graph.

MS. MATTHEWS JOHNSON: Correct, and it is. And it is.

THE COURT: Okay.

BY MS. MATTHEWS JOHNSON:

Q. All right. I believe everyone can see it now, Doctor.

A. Yes.

Q. And what we were talking about here is SEER data. We've talked about this before, that there is a cancer incidence that is tracked. And what we see with this data is 1975 to 2015; isn't that right?

A. Yes.

Q. All right. Thank you.

Oh, I see. Let's keep that up for just a moment if we can. Sorry.

And just so we can clarify, we don't need to turn to it on the screen, but if you can refer back to what I showed you before, it was also the same data but for a narrower time frame starting in 1992. So if you just compare -- if you go to the first page of that exhibit and the bottom table, that date range was 1992 to 2015.

A. Yes.

Q. And then if you look further in where we are now on the screen, we're looking at 1975 to 2015; is that correct?

A. Correct.

Q. Okay. Thank you very much, Doctor.

So where we were, Doctor, was looking at a timeline and we were looking at a number of publications, and we just stopped with Tarone.

And now I'd like to draw your attention to Exhibit 1156 -- oh, we're going to -- may we keep that up? We're just going to be following along with these titles if it's okay. Thank you very much.

So Exhibit 1156 for you. It's the Dosemeci article.

A. Yes.

Q. And does this involve an algorithm? This is a publication

about an algorithm that's used to estimate exposure; is that correct?

A. Yes.

Q. And, in fact, is the Dosemeci algorithm one that you said that you've used in your research; is that correct?

A. Yes. I really like that algorithm for what I've been doing, uh-huh.

Q. And so -- and then we also see here De Roos 2005, and we've been through that one so we're not going to dig back in there.

But suffice it to say, that De Roos 2005 came up right while you were in the midst of serving on the Advisory Board and you actually became chair that year; is that correct?

A. At the end of that board meeting, yes.

Q. Okay. And if we can look, and you can turn in your book, to Exhibit 1112, which is Coble, and that's a 2011 publication, and that was an effort to actually update the Dosemeci algorithm; isn't that right?

A. Yes, it was.

Q. And so the issue there is trying to figure out what do you put together to really try to get a sense of exposure, and Coble was an updated algorithm; is that right?

A. I believe that's correct.

Q. Okay. And then if we can look at Exhibit 1258, Heltshe.

A. Yes.

Q. And Heltshe was an article that was specifically looking at how the imputation method worked, if it -- and trying to validate that the imputation method had been done correctly, how you dealt with the nonresponders, as you said, to the second questionnaire?

A. Emphasis on "trying," yes.

Q. Now, AHS, across its many decades and publications, there are about more than 250 papers that have been published arising out of that study; is that right?

A. Yes. Yes. Very productive.

Q. And I think we've already heard your testimony concerning the lack of conversations that you've had concerning the concerns about glyphosate that you've articulated here today, and so just the last stamp on our timeline is, I believe you testified to on direct, that in August of 2016 -- did you say the fall or summer of 2016?

A. Yes.

Q. -- you actually became an expert retained by the plaintiffs; is that correct?

A. Yes.

Q. Okay. And I think we can -- if we can mark that on the timeline.

And at that time, shortly after, I think you were actually contacted by some folks at AHS and you told them that you were now serving in this capacity; and just because I want to be

clear, these are not my words, your words, you said they kicked you out?

A. I may have said that, but that's not how it happened. They actually -- it wasn't the board at all. What happened is I was contacted by Laura Beane Freeman to review the Andreotti paper, prereview it, and I said that would be a conflict of interest that I would not want to step into because I've now been retained in this court case.

And as a scientist, I like to not have a conflict of interest so I disclosed that I'm now, you know, an expert for the plaintiff and that, therefore, it would be inappropriate for me to actually look at the Andreotti paper. And she said, "Thank you and that's really great. Thanks for telling me."

Q. Now, on your CV and I believe in the opening you were actually listed as serving on the Advisory Board. So that would be an error in your CV, would it not?

A. Isn't there an end date?

Q. I think you could check it.

A. I think that Advisory Board actually doesn't exist anymore. It hasn't existed in years.

Q. But it shouldn't say "to present"; is that fair to say?

A. That's correct.

Q. Okay. And the opening slide shouldn't say "to present" either?

A. Correct. Actually, the board really hasn't existed in

more than a decade because they ran out of money.

Q. And as you sit here today, you are not able to identify any time in the 2001 to 2017 time frame where you expressed the information that you did today concerning imputation, as you said before, and you said you never talked to them about glyphosate; is that accurate?

A. Glyphosate was never on my radar when I talked --

MS. MATTHEWS JOHNSON: I think that's an answer.

THE COURT: I don't -- I mean, that is amenable to a yes-or-no answer. If it's very important to explain something, you can do it, but --

THE WITNESS: Yeah.

THE COURT: -- usually the way it works is the plaintiff's lawyer has an opportunity to allow you to elaborate on some things when they come back up.

THE WITNESS: Uh-huh. I cannot recall ever talking to them about glyphosate.

MS. MATTHEWS JOHNSON: May I have just one moment, Your Honor?

THE COURT: Sure.

(Pause in proceedings.)

MS. MATTHEWS JOHNSON: Your Honor, I was just reminded -- I'm sorry -- there is a stipulation that we could either read now or at the conclusion of her testimony.

THE COURT: Whatever you prefer. I haven't seen it

yet I don't think, but you can hand it up to me if you want.

MS. WAGSTAFF: Can I see the stipulation?

MR. STEKLOFF: It was filed, Your Honor, but if you want a copy, we'll get you a copy and then we can do it at the end of the testimony if that's easier.

THE COURT: Okay. I can pull it up. I'll pull it up while you-all are wrapping up.

MR. STEKLOFF: Thank you.

MS. MATTHEWS JOHNSON: Dr. Ritz, I have no further questions at this time. Thank you.

THE WITNESS: Thank you.

REDIRECT EXAMINATION

BY MS. WAGSTAFF:

Q. All right. Dr. Ritz, I have a transcript right here of everything that was said so I just want to read back the question and see if you have anything else to say (reading):

> "As you sit here today, you are not able to identify any time in the 2001 to 2007 time frame" -- "2017 time frame where you expressed the information that you did today concerning imputation as you said before, and you said you had never talked to them about glyphosate; is that accurate?"

A. As far as I remember.

Q. Okay. So it seemed like you had more to say, and I just wanted to make sure you had an opportunity to finish what you

needed to say.

A. So what I'm saying is, as we heard from counsel, this is a huge study with a lot of people involved, a lot of scientists involved, and a lot of interests and every scientist has a different interest. Some scientists are interested in a certain disease. Other scientists are interested in getting the exposure assessment as right as they can or go out and actually do substudies.

A lot of what I heard about at these Advisory Board meetings was about substudies that they were now conducting where they enrolled farmers and watched them while they were applying pesticides to learn more about what went on while they were applying pesticides, but that was all done after they had already asked them in the baseline; right? All these people were enrolled. They had their names and addresses.

And then in the time frame from 1997 onward, they might have gone back to a few of them and asked them specifically "Can we come to your farm and can we measure something?" But that's usually smaller studies of 100 to 200 people out of the 54,000.

And they did that to learn more about how you can protect farmers, and I really admired them for doing that because they came up with a lot of good advice for these farmers of not -- how not to get exposed. Right?

And that's what we were mostly discussing, as well as the

early papers that came out. I can't even recall ever seeing, for example, Anneclaire De Roos' glyphosate paper because that came out in 2005, and I don't think she ever presented that to the board.

At the board we were mostly shown not analysis. They really were more interested in us discussing what else can we do to do -- to do better in terms of not only having this baseline questionnaire and doing all the analysis -- that will happen anyhow; right? -- but what else can we go back to the communities to -- back and help them with.

And all of these smaller substudies, including the Parkinson study, the exposure measurement studies on the farms, the fungicide studies in the orchard applicators, all of that was broadly discussed and where I gave a lot of input. But we rarely -- I can't really remember any time that they really discussed with us actual study results.

Q. All right. Thank you.

So we had talked earlier and you were asked questions about meta-analyses and pooled data --

A. Right.

Q. -- by Ms. Johnson. Do you remember that?

A. Yes.

Q. And so I just want to ask you, did you consider the meta-analyses and the pooled data in your opinion that you're giving the jury today and yesterday?

A. Absolutely, but I would never just, you know -- sorry, that's the -- that's the lazy person's way of doing it is go to a meta-analysis, pull out what somebody else says, and then attach your opinion to it. And that's not science; right? Somebody else did the work for you, gave you a number, and all you do is interpret that number.

That's not me. That's not what I do. I go back and see how the data was generated and then how the data was analyzed in the original studies, and then I look at the meta-analysis and actually look at how they did the meta-analysis and whether they used the appropriate methods and whether I agree with what they did and what the conclusions are.

So it's more of a roundabout way of thinking about the whole -- as I've shown on these exhibits, think about the data in a broader way; right? Think about how the data was generated, who collected it, when did they collect it, what did they collect, and then also how did they put it together, and get a whole picture.

Q. Okay. And that includes the most recent meta-analyses that we discussed this morning by Zhang; is that correct?

A. Yes, that's correct. I read that with great interest.

Q. Okay.

MS. WAGSTAFF: And, Ms. Melen, if we could turn on the Elmo, please.

I'd like to publish the Chang and Delzell meta-analyses

without any objection.

MS. MATTHEWS JOHNSON: We object as beyond the scope of cross.

MS. WAGSTAFF: I can explain why it's not.

THE COURT: Okay. You can kind of lay a foundation for it.

BY MS. WAGSTAFF:

Q. All right. Are you familiar with the Chang and Delzell meta-analysis?

A. Yes, I did read it.

Q. Okay. And Ms. Johnson asked you whether or not the Agricultural Health Study was funded by Monsanto; correct?

A. Correct.

Q. In fact, I think she asked you questions "So there's no Monsanto money in this study"; right?

A. Right.

Q. Something like that.

A. Uh-huh.

Q. If we could -- I didn't have this in my exhibit binder so you'll just have to follow along with me. If we turn -- is this an accurate review and copy of the Chang and Delzell meta-analyses?

A. As far as I can tell, yes.

Q. Okay. And this is from --

MS. MATTHEWS JOHNSON: Objection.

THE COURT: Yeah. I still don't understand why this is relevant.

MS. WAGSTAFF: Okay. So I'd like to go to the conclusion.

THE COURT: Well, I think I would like you to go to sidebar.

MS. WAGSTAFF: Okay. We can go to sidebar.

(The following proceedings were heard at the sidebar:)

[redacted]

(The following proceedings were heard in open court:)

MS. WAGSTAFF: Thank you, Your Honor.

Q. All right. Ms. Johnson asked you about Trial Exhibit 1611. If you could turn to Trial Exhibit 1611. And I believe she displayed for you this page. Do you recall that?

A. No, she didn't show it to me. Oh, the top. She showed the top, yes.

Q. The Advisory Group?

A. Yes.

Q. So I just wanted to flip the page over, which is the next page.

Are you familiar with Matthew Ross?

MS. MATTHEWS JOHNSON: Objection. Outside -- beyond the scope of cross.

THE COURT: Overruled.

THE WITNESS: I'm not sure.

BY MS. WAGSTAFF:

Q. You don't know who Matthew Ross is?

A. No.

Q. You see he's from the --

MS. MATTHEWS JOHNSON: Objection.

MS. WAGSTAFF: Okay. I'll move on.

THE COURT: Move on.

BY MS. WAGSTAFF:

Q. All right. Let's talk about Trial Exhibit 1031. Ms. Johnson asked you questions about Trial Exhibit 1031. Do you recall that? This was the letter --

A. Yes, the letter.

Q. -- response to Sheppard and Shaffer?

A. Yes.

Q. And I underlined the portion she asked you about.

I wanted to just take you to the end of the study to the

references. There's two references and one it says -- you pronounce that Heltshe?

A. Heltshe.

Q. Heltshe, all right.

She briefly touched on Heltshe, but why don't you tell the ladies and gentlemen of the jury what Heltshe is, what it did, and how that affected your opinion if at all.

A. All right. So Heltshe, et al., that's the paper where they actually tried to impute what's called imputation. It's pretty much guessing what the exposure was when you don't know. So that's -- I tried to explain that to you earlier today.

So we have the 63 percent of people who answer the second time and we have 38 percent who didn't come back and didn't answer.

And now we're using the data from the 63 percent who answered and come up with a prediction model for their pesticide exposure as they -- so they're trying to predict from the baseline what these people would answer in 2000, 2001, 2002; but that is trained on the people, that is made with the people who are actually answering. It's not made with the people you have no second information on.

And then you are presuming that that's okay to then use the same prediction model, so like guessing, "You know, I guess that person was exposed. Ah, that one wasn't exposed. Ah, that one must have used 10 days." And all of these guesses

were taken just from the baseline of the 63 percent who came back, and now I'm using that same baseline for the people who didn't come back and now predict what their answer in the 2000s would have been. It's a guessing game.

And there are many, many assumptions -- we call it assumptions -- many things you assume have to be right in order for this to not just be a weird guessing game -- right? -- that doesn't hit the truth. How many times do you hit the truth? And, in essence, we have to believe the assumptions that the people who are playing the guessing game make.

And there's a lot of debate among statisticians and scientists about what assumptions to use. Not about the method. The method is fine; right? It's just, you know, using -- generating these prediction models; right? I mean, gamblers try to predict what the next hit in a roulette -- of the roulette ball might be, and they may think they get really good when they gamble a lot; right? But it's the same thing.

So you have your -- you use your data to generate this prediction model, but you're making lots and lots of assumptions. And actually the discussion that Dr. Sheppard initiated is from the statistical point of view where she says, "Yes, you can use these methods but these methods are known to generate bias. They are known to generate systematic bias, and you did it in a way that probably generated this bias."

Q. And when you formed your opinion that you presented to the

jury, had you considered the Heltshe paper?

A. Yes.

Q. Okay. And has anything you have been asked or heard over the last two days while you've been on the stand changed your opinion?

A. No.

MS. WAGSTAFF: All right. Thank you. No more questions.

THE COURT: Anything further?

MS. MATTHEWS JOHNSON: No, Your Honor.

THE COURT: Okay. Thank you, Dr. Ritz. You can step down.

(Witness excused.)

THE COURT: At the moment I'm going to read a stipulation to you-all.

Are you prepared to play some video deposition for the last 20 minutes or so?

MS. WAGSTAFF: We have a -- I think it's 13 minutes.

MS. MOORE: It's 9 and a half minutes, Your Honor, and it's ready to go.

THE COURT: Okay. Let me first read you a stipulation. You may or may not recall that when I read you the instructions just after you were chosen, I gave you an instruction on what is evidence and I told you that, you know, the testimony of witnesses is evidence, the documents that are

admitted are evidence that you consider, and another type of evidence that you can consider is a factual stipulation. That's a stipulation of fact agreed to by both sides kind of in an effort to make the process more efficient; and instead of having them bicker with witnesses about it, they just reach a factual stipulation, which you are to deem proved.

And the parties have reached a number of them. From time to time I will read you a factual stipulation, and I will read you one right now, and this applies to all the expert testimony in the case.

The parties, Edwin Hardeman and Monsanto Company, by counsel, stipulate that their experts have been paid a significant amount for their time in accordance with normal and customary rates.

So the purpose of that is to avoid them having to ask a bunch of questions of the expert witnesses about their compensation.

So with that, do the plaintiffs want to call their next witness?

MS. MOORE: Yes, Your Honor. Our next witness is Dr. Daniel Goldstein, and this will be played by video deposition. It's a video deposition taken on November 16th, 2017, and November 17th, 2017.

THE COURT: Okay. Go ahead and play it.

\\\

(Video was played but not reported.)

THE COURT: Okay. Is it a good time to wrap up for the day?

MS. MOORE: I think so, Your Honor. We would just move to enter into evidence the exhibits from Dr. Goldstein's deposition.

THE COURT: Any objection?

MR. STEKLOFF: No, Your Honor.

THE COURT: Any further objection?

Okay. It's admitted.

(Trial Exhibit 100 received in evidence)

THE COURT: I should instruct you -- by the way, we probably need an exhibit number for that. Am I right?

MS. MOORE: Yes, and I'll give that to Ms. Melen. Your Honor. It's Exhibit 100.

THE COURT: Exhibit 100.

Let me just mention one thing about that testimony that you just saw. From time to time we will be playing deposition testimony for you rather than having a witness come in here and testify live. That was the first example of that. There will be a number of other occasions where that happens.

What you should know about that is that the witness is put under oath before they begin their testimony, and so they are testifying under oath under penalty of perjury just as they would be if they were in court and you should -- and we've

reviewed the testimony to ensure that it's admissible in accordance with the rules of evidence, and so you should treat the video deposition testimony that is played for you the same way that you would treat live testimony here in court. So just keep that in mind as the trial proceeds.

And with that, we'll call it a day today. Let me just remind you-all once again to avert your eyes if you see any news reports or if you hear any news reports. Don't do any of your own research. Don't talk to anybody about the case. And also avert your ears if you happen to, you know, see or hear somebody related to the case in the building that might be talking about the case. Kind of stay away from those folks and they will try, of course, to stay away from you.

So with that, thank you very much. We'll begin at 8:30 sharp tomorrow. Have a good evening.

(Proceedings were heard out of the presence of the jury:)

THE COURT: Okay. Have a seat.

So we can chat about a couple of things now, and then I have a criminal matter at 2:45; and then right after that criminal matter, we can proceed with the Order to Show Cause hearing.

The couple items that I wanted to mention just while it's on my mind, number one, I want to make clear for the record that, you know, I think there was an allusion to the fact that Mr. Hardeman is almost in remission. At some point -- maybe it

was during Monsanto's opening statement, maybe it was during some of the initial testimony, I can't quite recall; but, in any event, the fact that Mr. Hardeman is almost in remission is not relevant to Phase I and there should be no allusion to that during any of the testimony, including the testimony of Mr. Hardeman. I wanted to make sure that's on the record so we're clear.

I also want to -- sorry?

MS. MOORE: Your Honor, with that in mind, then, we probably will need to do some recuts to the doctors' depositions. We had some objections to that. There were some questions asked about remission to Dr. Ye that Monsanto did, and so we would need to go back and do that --

THE COURT: Yeah.

MS. MOORE: -- which I would like to do, but I just want to make sure that that's --

THE COURT: Yes. And I apologize. I may have allowed those in when I ruled on the depo designations, but it dawned on me when we were having a sidebar on the topic that it really is not relevant to Phase I.

MS. MOORE: That's fine. We can go ahead and fix that. Thank you.

MR. STEKLOFF: I'm sure we can work that out based on Your Honor's ruling. We have no objection to that.

THE COURT: Okay.

And then I want to just remind everybody with respect to expert testimony, we do not begin a question by referencing the expert's prior testimony and saying "You know, you previously said blah, blah, blah, blah, blah," and then start asking them questions about it.

The point is to elicit direct testimony on the stand about what their testimony is today. If it turns out that their testimony today is different from something they said before, you can then impeach them with it, but you should not be starting off questions by saying "You previously said blah, blah, blah." That's not an appropriate way to cross-examine an expert witness in my view.

And then, finally, I want to say to everybody in the courtroom, including in the gallery, everybody needs to remember to be careful when you are in this building talking about this case. The jurors sometimes go down to the cafeteria, the jurors are sometimes riding in the elevator, and you need to make absolutely sure that you are not talking about the case in a way that can be overheard by somebody.

And I'll remind -- I see the courtroom is a little smaller, the crowd is a little smaller today than it was this morning, so I will repeat that instruction in the morning. For any of your friends who are not in the courtroom now but are coming in the courtroom later, please remind them of that as well.

And, let's see... Oh, one last thing. I do think, based on the way the evidence has come in so far -- we had a sidebar earlier that I don't believe was on the record in which I stated that the plaintiffs should not be permitted to elicit from Dr. Ritz the fact that Dr. Blair was the chair of the IARC Working Group for the glyphosate monograph.

I do believe that the way the evidence has come in, I believe it would be appropriate to elicit that bare fact from Dr. Weisenburger, but obviously consistent with my prior rulings, which have been very clear not to go into the process of the IARC Working Group's decision about glyphosate or its general process.

And on that point, let me just say that Dr. Ritz provided some testimony that was strongly supportive of my ruling limiting the amount of evidence that comes in about the EPA and the IARC. She said: It would be lazy to rely simply on somebody else's work. That would be a lazy scientist. That's not proper science. I have to look at the studies myself.

And that is, of course, what we are doing here in this trial, and so I just wanted to emphasize the support that Dr. Ritz provided for my ruling that we're not getting into the details or the analyses or the processes of the EPA or the IARC in this Phase I.

So with that, I'll see you-all -- we can say that the show cause hearing will take place at 3:00 o'clock if that would be

more convenient for you to have something predictable.

Anything else, though, to discuss in the next few minutes?

MR. STEKLOFF: I had two just brief issues, Your Honor.

THE COURT: Okay.

MR. STEKLOFF: The first is, I guess as we think through this issue of the two-day/10-day issue --

THE COURT: Yes.

MR. STEKLOFF: -- I understand the discussion we've had already and --

THE COURT: Can I add one point to that discussion?

MR. STEKLOFF: Yes.

THE COURT: Which is that, you know, I think Dr. Ritz's testimony on this was elucidating for me as well because what it supports is the idea when epidemiologists testify about studies, they say "This study shows X. This study shows Y." Even if they disagree with it, they use those words; right? Dr. Ritz used those words about the AHS a number of times, "This shows, you know, .8. This shows .76."

She doesn't agree with it, but that's the way epidemiologists talk. So I think, to me at least, that supports my idea that when experts are talking about general causation, to speak in those terms and to speak about the numbers is probably okay; but where you have problems, where you run into problems is when the specific causation experts

start speaking in those terms because their testimony is directed specifically to Hardeman and you cannot reach any sort of quantitative conclusion about Hardeman based on the McDuffie and Eriksson dose-response numbers.

So I'm sort of -- I'm happy for you to think about it more and for us to have further discussion about it, but I just wanted to share those thoughts and let you know that that sort of idea is crystallizing in my mind that that is probably the best way to approach it. So that would involve a little bit of a tweaking of my ruling on the issue pretrial.

MR. STEKLOFF: Understood, Your Honor. And what I want to flag is that -- and we've already raised in our letter the way that Dr. Ritz described various odds ratios when she was talking through the chart.

Today I wanted to add sort of an addition because I think, in my view, it was a little bit different even from what Your Honor is describing now, which is that, and I don't have a page number, but at 11:00 o'clock in using the *Bradford Hill* criteria, for the strength of association criteria, she was first describing never/ever users and then she went on to say, and I tried to write it down word for word:

When you're going to regular users -- and so she's talking now about the dose-response users -- it's actually strong because it's more than 2 for regular users.

So I think that differentiated in terms of testimony where

she's trying to rely on the unadjusted doubling of the risk in the dose-response context to describe regular users. And those unadjusted numbers are not, I think, according to Your Honor's ruling, even in general causation a reliable basis.

It's okay to say that there's a dose-response. It's okay that people who use it more in her view, therefore, are more likely to have an association, but it's not okay to single it out about the doubling of the risk. So I want to add that to sort of the record that we've already described.

THE COURT: And if you describe that correctly, I think you have a point; right? And it's not necessarily inconsistent with the point that I was making, which is when they're talking about individual studies, the language that they use is "This study shows... This study shows... This study shows"; right? And then they may go on to say, "And I agree with that," or they may go on to say, "I disagree with that," whatever; right?

So merely saying, "Hey, McDuffie did a dose-response analysis and showed, you know, 2.0," or whatever it was, "for greater than two days," spoken in the general causation context I don't think is a big deal; but it may be that what you're describing, if you are remembering it accurately, is problematic.

And so, you know, we can have a continuing conversation about that and think about -- I think the instruction that you

proposed in your letter is not appropriate, I believe, and it may be that no curative instruction is needed but we just need to sort of zero in a little more specifically on the guidance that we're providing the experts, but that point is perhaps well taken, yeah.

MS. WAGSTAFF: So, Your Honor, if I may, I think the point that you made about these 8 or -- these 2 and 10 days are goalposts a few hearings ago was when Dr. Weisenburger was on the stand, if I remember correctly, during *Daubert*.

And I didn't hear one question on cross about the significance of any of this to Dr. Ritz. I didn't hear one question asked to Dr. Ritz, "Well, how can you say a doubling of the risk over two days didn't -- you know, isn't the above 2 days, 3 days, and 30 days or 3 days and 2 years?" I didn't hear any of that or any of that with respect to Eriksson.

THE COURT: Right, but you would think that from a strategic standpoint, you know, the defense may not want to dive into that. I mean, the whole point is that -- again, they have the right to impeach somebody on sort of the kind of, I think, you know, junk science statements that Nabhan and others were making about Eriksson and McDuffie, but the point from Monsanto is that they're trying not to get into that. They don't want to get into that, and so they want to establish some ground rules for what the experts can and can't say about that. And so the fact that they didn't cross-examine her on it I

think is a reasonable strategic choice to not open the door.

MS. WAGSTAFF: All right. And I would agree with your initial reaction. That is how epidemiologists talk about these studies, and it would be impossible almost to ask them to change all of their lingo to come into court and talk differently. So with that, I will -- nothing more on this.

THE COURT: Okay. Well, who's -- you said you had one other thing?

MR. STEKLOFF: It's really just an open discussion about what is happening tomorrow because --

THE COURT: That's what I was going to ask.

MR. STEKLOFF: -- I think we have now you've seen half of the Portier deposition. And I think the parties are meeting at 2:00 o'clock to try to get you the rest as soon as possible, but that's the only other issue.

MS. MOORE: Your Honor, if you would indulge us for any kind of guidance because I know you have several things to rule on, is that the priority obviously would be Dr. Portier.

And we're hopeful, based on what Mr. Wisner was telling you earlier and you came back after you looked at it, is that we can get the direct ready to play first thing in the morning. And I think there's -- I think that's pretty manageable.

We'll report back to the Court once they finish their meet and confer -- that's where Mr. Wisner is right now -- and turn that cross over to you as well.

I think that that --

THE COURT: Okay. But I just want to make absolutely clear, you can't play the direct until I've ruled on the cross.

MS. MOORE: I understand, Your Honor. I understand, Your Honor.

THE COURT: All right.

MS. MOORE: We have backup plans in place.

And so -- but that's the plan, just so I don't want you to take your time on that.

And then assuming that we can get you --

THE COURT: So you want me to make the first priority Portier's direct?

MS. MOORE: Yes, Your Honor.

THE COURT: Okay.

MS. MOORE: Yes, Your Honor.

THE COURT: And then if it comes in, second priority is Portier's cross?

MS. MOORE: That's correct, Your Honor.

THE COURT: Okay. And what's third priority?

MS. MOORE: The third would be Dr. Reeves, and we have redone that; and I will check to make sure that's all been given to Ms. Melen, but that may --

THE COURT: I think it came in this morning.

MS. MOORE: Okay. So that would be the third priority, Your Honor.

THE COURT: Okay. And then are there any other depo designations outstanding?

MS. MOORE: Yes, Your Honor, there's several.

THE COURT: Do I have Blair?

MS. MOORE: You do have Blair, and I will -- I have --

THE COURT: I don't think I have a hard copy.

MS. MOORE: I have hard copies and I'm going to make sure I hand you the right one, Your Honor, so give me a second. When we come back for the show cause, I'll have that for you.

THE COURT: Yes. Just make sure it's not a mess.

MS. MOORE: I will, Your Honor.

THE COURT: Okay.

MS. MOORE: Okay. I think -- and then the parties are still meeting and conferring on the others so we'll get those to you.

THE COURT: Okay. And then you have -- you still have the treating physicians you need to tweak a little bit based on what I just said.

MS. MOORE: Right. That won't take very much time.

THE COURT: Oh, yes. That reminds me of one other -- the treating physicians, that reminds me of one other thing.

I think as the evidence has come in, there's another thing I should consider about the treating physicians, and that is Dr. Ye's -- is it Dr. Ye, the oncologist?

MS. MOORE: He is, Your Honor.

THE COURT: -- testimony about age being a risk factor. That was something that I excluded, but I think the way the testimony has come in now with Dr. Portier -- I mean, excuse me, Dr. Ritz having clearly identified that as a risk factor, I don't think it's as controversial a concept as I was assuming it was. I don't think there's as much of a difference between a colloquial understanding of age as a risk factor and a scientific one as I thought, and so I think it would be appropriate.

Let me put it this way: Under Rule 403, it would not be -- it's not necessary to exclude Dr. Ye's testimony about age as a risk factor under Rule 403.

MS. MOORE: And, Your Honor, our objection was twofold. One, it was under 403 because we believe that when Dr. Ye is played, that that will be cumulative and a waste of time for the jury; and then the second piece of that was he is a treating physician. He's not being called as an expert witness, and the questioning continued where he was asked "Have you reviewed any of the literature regarding whether glyphosate-based products cause NHL?" And his answer was "No."

THE COURT: Yet he knows that age is a risk factor for NHL, which is relevant. The fact that the oncologist, the treating oncologist, knows that age is a risk factor and doesn't know that something else is a risk factor, it seems to me is relevant --

MS. MOORE: And, Your Honor --

THE COURT: -- and not unduly prejudicial in this context.

MS. MOORE: And, again, I do think it's cumulative, Your Honor, and that would make it prejudicial in this sense.

I would like to go back when I'm looking at the remission parts of the testimony and look at that because I think the way it came in, it was in the context of something else, and we could revisit that, Your Honor, after court tomorrow because we're not going to play that tomorrow.

THE COURT: That's fine, but as of now, my ruling is that --

MS. MOORE: I understand.

THE COURT: -- that passage, which I'm remembering quite well, comes in.

MS. MOORE: Okay.

THE COURT: It was just one passage and it was about half a page or two thirds of a page.

MS. MOORE: That's correct, Your Honor. That's correct. It's just in the context of something up above it so I want to look at that. I don't want to misspeak.

THE COURT: All right. So I'll see you at 3:00 o'clock.

THE CLERK: Court is in recess.

(Recess taken at 2:35 p.m.)

(Proceedings resumed at 3:06 p.m.)

(Proceedings were heard out of presence of the jury:)

THE CLERK: Court is back in session.

THE COURT: Okay. So I sort of made clear, I think, in my written order and in my comments yesterday why I think that Ms. Wagstaff should probably be sanctioned. I have received -- since then I have reviewed the transcript of the opening statement, and I have also received Ms. Wagstaff's response. So the question is why shouldn't you be sanctioned.

MS. MOORE: Your Honor, I would like to address that.

THE COURT: Sure.

MS. MOORE: If I may, Your Honor, I would like to introduce who else is joining us at counsel table this afternoon. Of course Ms. Wagstaff, Ms. Andrus, who is our local counsel here from Oakland, and Ms. Wagstaff's partner came in from Denver to be with us here today, Vance Andrus.

THE COURT: Hello.

MS. MOORE: And, then, of course, Mr. Hardeman did make the trip down, and he is here on time.

THE COURT: Well, did you -- what about that guy from Hastings?

MS. MOORE: From Hastings?

THE COURT: Didn't you guys bring -- didn't you guys hire someone from Hastings when Mr. Wisner was in trouble?

MS. WAGSTAFF: Your Honor, we are going to keep those

incidents separate. I was not involved with the guy from Hastings.

THE COURT: All right.

MS. MOORE: I feel like there is a story there, but I don't really want to get into that.

MS. WAGSTAFF: I have Ms. Moore as my counsel.

MS. MOORE: I know what you are referring to, Your Honor. No, we are not going to go there.

Okay. Your Honor, thank you for indulging us. This is a very serious matter and we take it very seriously. Ms. Wagstaff takes it very seriously. The Ninth Circuit, as the Court knows, is very clear that it is an abuse of discretion to award Rule 11 sanctions for conduct during opening statements.

THE COURT: Okay. So what about under my inherent authority?

MS. MOORE: Under your inherent authority, Your Honor, it is a high threshold, and it should be exercised with restraint and discretion. And in here, our position is that there is absolutely no evidence of bad faith on the part of Ms. Wagstaff.

I have known Ms. Wagstaff personally for over five years.

THE COURT: That is not relevant.

MS. MOORE: Okay.

THE COURT: What is relevant is her conduct, which I

think is objective evidence of bad faith. I mean, I -- quoting documents in opening statement slides that have been excluded by pretrial -- through pretrial rulings.

MS. MOORE: Well, Your Honor, if I can direct the Court's attention to your pretrial order Number 81, which was entered a little over the week ago on February 18th, docket 2775. And as the Court will recall, Monsanto moved in limine -- and this is 11.1, it is on page 3 -- to exclude magic tumor references.

Do you want me to wait, Your Honor?

THE COURT: Let me just go grab my binder with my ruling in it. Sorry. I will be back in 30 seconds.

MS. MOORE: No problem.

(Whereupon, a brief pause was had.)

THE COURT: Sorry about that.

MS. MOORE: No problem, Your Honor.

THE COURT: Go ahead.

MS. MOORE: Under Monsanto's motion in limine 11.1, as the Court will recall, they moved to exclude references to magic tumor; and the Court denied that for both phases of the trial. And the parties -- and you said, Both the parties are on notice that this type of argument or description may not be used during opening statements.

And by saying that, Your Honor, it was our understanding that we cannot use the word "magic" during opening statement,

which Ms. Wagstaff never referred to the Knezevich -- I can never say that right -- & Hogan mouse study as a magic tumor study. So that is --

THE COURT: I think you are responding to something that is -- is not a problem. I mean, there were -- let me -- maybe I should just -- what you are saying is not responsive to the misconduct that Ms. Wagstaff engaged in. So maybe I should just lay it out for you a little more clearly with numerous acts of conduct that Ms. Wagstaff engaged in during her opening statement, and then I will give you a chance to respond.

MS. MOORE: That would be helpful, Your Honor.

THE COURT: Just to make sure that you provide a direct response, because it seems like you are -- what you are providing now is non-responsive.

MS. MOORE: And, Your Honor, that would be helpful because, as you know, this happened yesterday. We had to write a brief by 8:00 p.m. last night. The Ninth Circuit states that clarity and precision are particularly important when limiting what lawyers may argue to the jury.

THE COURT: Yeah. And --

MS. MOORE: It was hard to respond --

THE COURT: And I limited what could be argued to the jury with precision in my pretrial rulings. So I don't think there is any lack of precision or any ambiguity in it at all.

So, number one, Ms. Wagstaff spoke to the jury about what

Phase Two would involve. We -- it was very clear from our discussions pretrial, as well as the instruction we hashed out, that I would give to the jury about phasing, that that would not come in.

Second, Ms. Wagstaff spent a significant amount of time at the beginning of her opening detailing Mr. Hardeman's personal history and the circumstances surrounding when he learned of his cancer, even though that clearly is not relevant to Phase One.

I will add that I -- I jumped in and told Ms. Wagstaff to move on, and she did not move on. She continued to go down that path to the point that I had call a sidebar.

Third, I ruled pretrial in very clear language that the Gingerich memo from 1985 and other similar internal documents are likely to waste time and distract the jury under Rule 403 and would not, at this stage, be admitted, but that I would later evaluate whether they could be introduced. Despite that, she quoted the memo on her opening slide and read the quote from the memo to the jury -- along with, by the way, other similar internal Monsanto documents that fell within the same pretrial ruling.

Fourth, I made a -- I clearly ruled pretrial that the evidence -- that evidence about IARC and its analysis and its process would be strictly limited during Phase One; that the only thing that would come in during Phase One is -- was the

fact of the IARC conclusion and discussion of the independent meta-analysis that IARC made. Yet, Ms. Wagstaff violated this ruling by going into detail about the IARC's analysis and the process by which it reached its conclusion, not to mention the composition of the IARC working group.

And then -- and then I issued a pretrial order clearly limiting evidence about the EPA's analysis of glyphosate, and she violated that by attempting to tell the jury that the EPA is vulnerable to political shifts and had internal disagreements.

All of those -- then there was, of course, you know, the issue about the quantitative conclusions from *Eriksson* and *McDuffie*, which, as I said yesterday, I'm willing for purposes of this discussion to chalk that up to just being a difficult issue. But the other ones that I described -- particularly the last three -- are just such blatant and obvious violations of my pretrial ruling, and they were premeditated because they were in the opening slides.

So those are the violations that I'm talking about, and my pretrial ruling on referring to the mouse tumor as the magic mouse tumor has nothing to do with any of those.

So can you explain to me how, despite my pretrial rulings, it was even a close question whether it would be appropriate for Ms. Wagstaff to say any of those things during her opening statement?

MS. MOORE: Thank you for the clarification, Your honor.

Let me start with number one.

THE COURT: Let me just say, you didn't need any clarification. It was obvious. It was obvious and it was obvious yesterday. It was obvious based on my reaction to what Ms. Wagstaff was saying yesterday what the issues were, what the violations were. It is not news to you right now that those were the violations, but go ahead.

MS. MOORE: Okay. I'm going to go through each one.

Phase two, Your Honor, you are referring to a slide where we were -- she had Phase One and Phase Two up. Immediately that was taken down once the Court interjected, and I will note the Defendant did not object on that.

THE COURT: Oh, yeah, thank you for mentioning that the Defendant didn't object. My sense is that you are an experienced trial lawyer.

MS. MOORE: Yes, Your Honor. I have been practicing for over 20 years.

THE COURT: So you know that when the other side is making an opening statement, the last thing you want to do is stand up and interrupt and object. And so you know that one of the things you do when the other side is saying something inappropriate is you look at the judge with an alarmed look on your face and hope that the judge steps in so that you don't

have to be perceived as interrupting opposing counsel's opening statement, and that is precisely what Monsanto's lawyers did over and over again. They were uncomfortable with interrupting you, but it was so obvious that these were blatant violations that I was -- that I was compelled to step in and interrupt.

MS. MOORE: I didn't realize that there were those exchanges, Your Honor.

On Phase Two she immediately took down that slide. None of that slide on Phase Two was read to the jury, Your Honor. None of those bullets points were read.

Number two, I will say --

THE COURT: Hold on a second. Hold on a second.

MS. MOORE: Okay.

Your Honor, if I may just get the transcript and follow along with you?

THE COURT: Of course. So you showed a slide to the jury, and I stepped in and required you to take it down. Mr. Stekloff actually objected to that.

MS. MOORE: Okay. I apologize.

THE COURT: And so you are right, she didn't read it because I, at that point, was on high alert based on the misconduct that Ms. Wagstaff had already engaged in earlier in her opening statement; and I jumped in to prevent her from actually reading the slide to the jury although she showed the slide to the jury.

MS. MOORE: Well, it was immediately taken down per your instruction, Your Honor. She complied with your instruction on that.

THE COURT: Are you -- you think she gets credit --

MS. MOORE: I'm not saying --

THE COURT: -- for my saying take that slide down?

MS. MOORE: -- that, Your Honor. I'm not saying that. I'm just stating the facts.

And I think the conduct you are referring to before Phase Two is when she tried to explain to the jury how Mr. Hardeman found out that he had non-Hodgkin's lymphoma, and I understand what the Court has said about that.

I will just note that this is an unusual trial in the sense that it is phased, and there has been several times by both sides, and this Court, acknowledging, trying to figure out what will come in in Phase One and what will come in in Phase Two. In fact, the Defendant at one point wanted to get all the damages in in Phase One and the Court said no, damages are not coming in. So there are a lot of times --

THE COURT: The difference is that there are many things that you have made clear that you desperately want to be part of Phase One, and I have made very clear that they cannot be part of Phase One, and yet Ms. Wagstaff made them part of Phase One in her opening statement.

MS. MOORE: Well, let me go through --

THE COURT: And that is -- that is relevant to intent. That is relevant to bad faith.

The fact that the Plaintiffs have made so clear that they are so desperate to get this information into Phase One is evidence that it was not just a mistake that they happen to put this information in their opening statements.

MS. MOORE: Your Honor, I did not say we were desperate. What I was trying to explain is that the way the trial is set up is unusual. And I think, Your Honor, that you recognize that after the bifurcation order came out; that this is a unique situation where you limit a trial when we are talking about product case like this to only science in the first phase, and it has created confusion on both sides of the aisle.

THE COURT: You know, and as I said, there are some areas where it may be difficult to draw the line; but these ones don't even come close to the line. I mean, this -- anybody -- you don't have to be in law school to know which side of the line this falls on. You don't have to have graduated from high school to figure out what falls on the wrong side of the line. The only conclusion objectively from the evidence is that this was intentional. It was premeditated.

MS. MOORE: Your Honor, I would disagree with the word "premeditated." I mean, that is making it sound criminal, and

it is not. I mean, there is absolutely no evidence that there was any recklessness on the part -- I'm sorry, that there was any intent on the part of Ms. Wagstaff. And as the Ninth Circuit has clearly stated, recklessness is not bad faith. You may disagree with her style. You may disagree with the way she presented her opening statement to the jury, but recklessness does not equate to bad faith under the Ninth Circuit, Your Honor.

THE COURT: I don't see a shred of evidence that this was merely reckless.

MS. MOORE: Well, let me go through --

THE COURT: All arrows point to this being bad faith, including, by the way, Ms. Wagstaff's reactions to the objections. She was clearly ready for it. She clearly braced herself for the fact that I was going to come down hard on her. And she was -- to her credit perhaps, she was very steely in her response to my coming down hard on her because she knew it was coming and she braced herself for that.

MS. MOORE: Well, I -- Your Honor, I don't think that is not fair; and that is based on assumptions on the Court's part.

THE COURT: That is based on my observations of body language and facial expressions.

MS. WAGSTAFF: Well, actually, Your Honor, I would just like to talk about that for just one moment.

The fact that I can handle you coming down in front of a jury should not be used against me. I have been coming in front of you now for, what, three years. So I'm used to this communication back and forth. And the fact that I was prepared for anything that you had to say to me -- and that you interrupted my opening statement a few times in a row -- should not be used against me. The fact that I have composure when you are attacking me, it should not be used against me.

THE COURT: I was not attacking you. I was enforcing the rules, the pretrial rules.

MS. WAGSTAFF: You just said the fact that I was able to compose myself is evidence of intent, and that is just not fair.

THE COURT: Okay. Anything else?

MS. MOORE: Yes, Your Honor. If I can continue to go on, with regard to point three that you raised, I would draw the Court's attention to motion in limine number 16. Your order, pretrial order 81, this is on page 7.

THE COURT: Wait. Hold on just one second.

MS. MOORE: Okay.

THE COURT: Okay.

MS. MOORE: And as the Court will recall, after we had the bifurcation order, the parties asked for clarification as to how the trial would be -- would be brought before the jury, and especially given that Plaintiff, you know, we represent

Mr. Hardeman, how we are going to present his case to the jury as we have the burden of proof. And so the Court entertained each side presenting evidence to determine whether that will come in in Phase One.

One of the pieces of evidence that we asked to consider whether it would come in in Phase One is the *Knezevich & Hogan* mouse study of 1983. And the Court ordered that evidence during Phase One surrounding the re-review of the 1983 *Knezevich & Hogan* mouse study, including Monsanto's role in pushing for a re-evaluation of the tumor slides based on its concern about the regulatory consequences of that study is granted. And I will continue to read on.

THE COURT: Can you read the next two sentences?

MS. MOORE: Absolutely, Your Honor.

It appears the Plaintiffs will be able to convey this information, and then in parentheses, through evidence, stipulation or some combination of the two, end parentheses, without introducing the February 22nd, 1985 memo from Lyle Gingerich or other similar internal documents which are likely to waste time and distract the jury under Rule 403.

And then you continue by saying, The parties are ordered to confer on this before the start of trial. If the Plaintiffs are unable to convey the relevant information without this document, the Court will re-evaluate whether they might be introduced.

At no point did Ms. Wagstaff violate this rule intentionally. If there was any confusion --

THE COURT: She created a slide, or somebody created a slide, that she presented to the jury quoting from this memo.

MS. MOORE: She was quoting from the deposition of Dr. Reeves, Your Honor. And that was the corporate representative deposition that was taken about a month ago.

THE COURT: But -- but the quote was from the memo.

MS. MOORE: There was examination by Mr. Wisner to Dr. Reeves about that -- and I'm not trying to be cute, Your Honor. I'm saying that that -- she was trying to explain that study. And when you take in conjunction when I started this -- and I understand you didn't want me to talk about this -- when you read Monsanto 11.1, the magic tumor, in conjunction with Plaintiff's motion in limine number 16, it was our understanding, Ms. Wagstaff's understanding, that the mouse study could be discussed during opening statement. This was not in any way intent --

THE COURT: The mouse study could be, yeah. That's not what -- that's not the problem.

MS. MOORE: Well --

THE COURT: I mean, you keep arguing against allegations of misconduct that I'm not making.

MS. MOORE: There was no -- there was no -- do you want to add to that?

MS. WAGSTAFF: Yeah, I would like to add to this since it seems to be my intent right now that we are talking about.

THE COURT: Yes. Although, I do want to say that you didn't create these slides on your own. You didn't prepare this opening statement on your own, and we will get to that in a minute, but go ahead.

MS. WAGSTAFF: As lead trial counsel in this case, I will take all the blame for anything that happens, and my team should actually just be left alone, and it can all fall on me. I'm fine with that.

If you want to go one by one and we can talk about my intent on each one, we certainly can.

THE COURT: Go ahead.

MS. WAGSTAFF: Okay. The first one you identified was the Phase Two slide. It was actually not my understanding, and I did not ever know that I couldn't mention what was going to go on in Phase Two. We have made numerous motions that would merge us presenting part of the evidence to the jury, that is not fair. So I thought -- I will just keep it to me -- I thought that we could explain that there was going to be a Phase Two and what was presented in Phase Two.

THE COURT: We spent a lot of time talking about how the jury would be instructed about the way the trial was going to go. We hashed out an instruction that said we are going to -- the first phase is going to be about causation, and then

we will get to other issues later.

MS. WAGSTAFF: Well, so, if you look at my slide, I just named what those other issues were. It was at most reckless, but it was not intentional. It was not intentional to the point where I should be sanctioned for it. So that's number one.

THE COURT: Well, you are taking them one by one. But we have to consider them all in totality; right?

MS. WAGSTAFF: Well, the trial --

THE COURT: Perhaps that was -- if that were your only transgression, I would say, yeah, that was probably just reckless.

MS. WAGSTAFF: Okay. So the next one, I have never been in a trial before, Your Honor, where I wasn't allowed to introduce the Plaintiff and give some color to who we are actually here for. I didn't know that I was anywhere near the line of upsetting you to the manner that I did, or anywhere near the line of crossing --

THE COURT: Again, it is not about upsetting me. It is about disregarding the rules.

MS. WAGSTAFF: And --

THE COURT: And I told you in the middle of that to move on and you didn't. You continued to --

MS. WAGSTAFF: Well --

THE COURT: -- go on about stuff that is not relevant

to Phase One.

MS. WAGSTAFF: Actually, what I think I did -- and we can look at the transcript. I think what I did was I clearly got to his NHL diagnosis, which is relevant to Phase One. The fact that he has NHL is relevant to Phase One. So we can look at the transcript if you would like.

THE COURT: You have this long speech about needles going -- coming in and out of his neck.

MS. WAGSTAFF: Well, let's look after your objection and see how -- after you -- do you know what page that is on?

THE COURT: Yeah, it is on page 319: "Ms. Wagstaff, can you limit the opening statement to the topic that Phase One is about as we have discussed?"

And by the way, you started to testify during opening statement about a conversation that you had with either Mr. Hardeman or Mrs. Hardeman. I mean --

MS. WAGSTAFF: That is actually not what happened. It was about a conversation I had with Dr. Ritz, and I very clearly moved on. So I think after you --

THE COURT: Told you to move on.

MS. WAGSTAFF: I think I did. I think I went straight to his diagnosis, and then I moved on. And the fact that he was diagnosed with NHL I think is actually relevant to Phase One.

THE COURT: "He goes to the ENT doctor and he starts

getting needles drawn, and then starts getting needles poked in there. Biopsies taken. They want to pull out tissue. They want to figure out what is going on in his neck. Blood is drawn. He has to wait for the results. Finally the results come back and the tissue is dead, so he has to go back in and get drawn again. Get needles poked back into his neck again."

MS. MOORE: Your Honor, that is the testimony that is coming into Phase One from Dr. Turley. And he may not use the word "poked," but all the testimony about biopsies, that has already been admitted -- or not admitted -- but approved by the Court that is going to be played in Phase One. We submitted that that was designated for Dr. Turley.

THE COURT: That he was diagnosed. We did a biopsy and we diagnosed him with NHL.

MS. MOORE: It was two -- it was two biopsies. The testimony that the first biopsy came back that the cell -- the tissue was necrotic. It was dead tissue, so they had to have him come back and do another biopsy that then went to pathology, and then they determined it was NHL. That is all in the Turley designation that was approved to play for the jury.

THE COURT: Okay.

MS. MOORE: And then -- so if I can go back, and then if there is something we need from Ms. Wagstaff, she can interject on that.

The next one was IARC. And we understand from Monsanto's

motion in limine number 1 your order on that. And we did not publish the Monograph, which was the order. However, the Monograph itself will not be admitted as an exhibit. So we did not put that up in the opening statement.

You did -- we thought that under the order, in the second paragraph it says -- we talked about this yesterday -- witnesses who participate in IARC may testify that they are members of IARC and may further explain -- it goes on from there -- the membership supports their credibility but they must limit their scientific testimony to their own scientific conclusions.

THE COURT: How do these slides relate to that? I mean, I don't understand how you can argue that these two slides about IARC fit in with it.

MS. MOORE: Well, the first slide, Your Honor, just simply introduces who IARC is to the jury, which I don't think there is anything wrong with saying what IARC stands for.

THE COURT: What suggested to you that -- that it would be relevant in Phase One that Monsanto sent an observer and participated in the program? What aspect of the pretrial order suggested to you that that would be relevant?

MS. MOORE: Well, there is not anything in the pretrial order that says that that is not.

THE COURT: It explains what the testimony is going to be limited to, the fact that the IARC's conclusion and your

experts establishing that they were stating that they were members of the IARC to bolster their conclusions.

MS. MOORE: The fact that Monsanto also participated and observed the IARC, that to me -- under the reading of the order and -- you know, again, this is not anything intentional. If anything, that would be that we needed to have clarification. Maybe we should have sought clarification. Again, that is not showing an intent.

So on the IARC stuff, again, it was -- there was no violation there from our perspective. It was very limited to introduce IARC.

And then with respect to the EPA, Your Honor, on the EPA we had moved to exclude two specific documents of the EPA, and that was Plaintiff's motion in limine number 5, which was granted in part. And that's where you say -- Your Honor, and this is on page 6 of the MIL order -- it is the second sentence of paragraph 5: "As with the IARC Monograph, the fact of EPA approval is admissible at both phases but the documents themselves are not."

We did not show any EPA documents. We did not show any IARC documents in the opening statement, but we also did not think that --

THE COURT: Wait a minute.

MS. MOORE: Do you want me to continue with the --

THE COURT: Well, I have a question about that.

MS. MOORE: Okay.

THE COURT: Because I'm looking at the --

MS. MOORE: I think it is after the IARC, Your Honor.

THE COURT: What is that?

MS. MOORE: I think it is after the IARC part.

THE COURT: Yeah. I mean, I'm looking at the slide on *Knezevich & Hogan* which quotes the EPA.

MS. MOORE: Yes, Your Honor. And if you will recall, in your order granting us to be able to present evidence of that study, it continued by saying "including Monsanto's role in pushing for re-evaluation." Well, who are they pushing? They were pushing the EPA.

So I don't think that's a violation of that order. We have to be able to say who they were pushing. Otherwise, it is incomplete and causes jury confusion.

I will tell you, Your Honor, all this -- as you may recall, back in late December when we presented a joint case management conference statement to the Court, Plaintiff's position was let's exchange slides from the opening PowerPoint. That's what we wanted to do. Monsanto refused to do that, and the Court agreed with that; and so the parties were not directed to exchange slides.

In fact, I even asked to exchange slides last night and Monsanto refused to give me their slides that they published to the jury yesterday. So they won't give those to us.

So this could have all been avoided with a simple exchange of the PowerPoint ahead of time, as we had offered in December. We did exchange --

THE COURT: But not exchanging is not permission to violate pretrial rulings.

MS. MOORE: I'm not saying that, Your Honor.

We did exchange exhibits, and there was one exhibit that they objected to. We immediately removed that slide. There were exhibits that we objected to that they removed beforehand.

THE COURT: You didn't immediately remove that slide. It was raised pretrial and I said, of course, you can't present that slide.

MS. MOORE: Well --

THE COURT: I mean, raised before -- raised the morning of opening statement. And I said, of course that is not relevant to Phase --

MS. MOORE: Right, and we removed it.

Just like we asked for them to remove certain slides, too, they removed them. And, you know, in fact, one of the slides we had asked -- they had said they were going to show medical records of Mr. Hardeman. And we asked them the night before opening, tell us which records you are going to show to the jury. And they sent us an e-mail. They didn't send us the records. They sent us the e-mail and said which records they were going to show. We asked to confirm they were redacted,

and we were told they were. And as it turns out, they were not redacted, as the Court is aware.

Asking to exchange the PowerPoint shows that we were not trying -- we didn't have any kind of -- an intent to violate any kind of order. We wanted everything to be out in the open. And, unfortunately, that was not what had happened because Monsanto had refused that.

THE COURT: Do you want to try one more time to explain how it is appropriate to include a quote from the 1985 memo --

MS. MOORE: Sure, Your Honor.

THE COURT: -- in the slides in light of the pretrial ruling?

MS. MOORE: I will, Your Honor.

It was not quoted from the memo. It was quoted from Dr. Reeves's deposition. And I will just say, Your Honor, as you have acknowledged, we have been moving at an incredibly fast speed over the last two months, but particularly so in the last week when we had the order -- this is no way to say anything about the Court. I know we are all getting everything to you as quickly as we can. We got the ruling last week, and then we got the summary judgment denial on Sunday.

THE COURT: Yeah, but I'm not talking about the summary judgment denial. I'm talking about the motions in limine that were filed by both sides that we spent hours and

hours arguing about and a ruling in which I issued in plenty of time for you to absorb and incorporate into your opening statement.

MS. MOORE: Right. And that was the order that was issued on February 18th, Your Honor. And we did revise what we were going to be doing here in Phase One based on our understanding on that order. At a minimum, Your Honor, it shows that there may be some recklessness, but there is no evidence at all of an intent on the part of Ms. Wagstaff to violate this Court's order.

And then the last thing you mentioned, EPA analysis and you talked about political shifts, Your Honor. I will tell you where that probably came from. Last week when Dr. Portier was being cross-examined by Monsanto's counsel, they asked a question and they prefaced it with "That was during the Obama Administration EPA, wasn't it?"

So that, I believe, is where that bullet point came from on the slide. It was anticipating that Monsanto was going to make an issue about the political nature of the EPA. And to focus on Obama -- President Obama -- excuse me, Your Honor -- because of where this trial is located --

THE COURT: And maybe that is relevant to Phase Two. That is totally non-responsive to the -- to the -- to the misconduct that occurred here because this is about including that in Phase One, not about including that. It may be

appropriate to talk about the EPA being vulnerable to political shifts in Phase Two. Probably if you spend too much time on it, it would be subject to a 403 ruling, but it may be appropriate. Clearly inappropriate for Phase One, and I don't see how anybody could not have understood that.

MS. MOORE: Well -- and, Your Honor -- and, Your Honor, that was never actually said to the jury. It was on -- I will acknowledge it was on the slide, but it was not said out loud to the jury. So I don't think there is any harm or prejudice there.

THE COURT: Well, that may get to whether there needs to be some sort of curative instruction or whether you opened the door, but it doesn't really get to the question of whether Ms. Wagstaff and possibly her team engaged in bad faith misconduct.

MS. MOORE: And, Your Honor, and then the last thing you raised the *McDuffie* and *Eriksson*. And I think I understood, but I just want to clarify that the sidebar that we had yesterday where you acknowledged it was a difficult line to dance, and then I think you also said today after Dr. Ritz's testimony that you were reconsidering some of that because of her testimony today -- I mean, that is a difficult issue to figure out how do we say it because that's what the studies say. Those are the numbers the epidemiologists use on the more than two days and more than ten days, and then the percentages.

So I --

THE COURT: I agree that that's a difficult issue. I think what Ms. Wagstaff said about them clearly crossed the line. It's a difficult line to draw. What Ms. Wagstaff said clearly crossed the line.

If you put a gun to my head and forced me to bet, I would bet that that's bad faith also, but I'm willing to assume for purposes of this discussion that that was not an act of bad faith because it's kind of a difficult issue.

MS. MOORE: Okay. Thank you, Your Honor.

Again, going back to a phrase Your Honor used on the totality, I've gone through each of these individually. I understand that the Court said on the first one in isolation would not amount to bad faith and that the last one would not amount to bad faith in isolation.

The other ones, whether it's in isolation or totality, considering those, again, each time Ms. Wagstaff complied. She moved on. That some of this was not even read to jury or stated to the jury. There is absolutely no evidence of intent.

And as I stated, Your Honor, the Ninth Circuit is very clear, and this is from the *Keegan Management* case, and the cite is -- oh, let's see -- 78 F.3d 431, is that recklessness is not bad faith.

THE COURT: I understand that.

MS. MOORE: And given that, you know, we would, on

behalf of Mr. Hardeman, who has made the trip down today just to be here for the show cause as the Court ordered him to be, and that given that the *Christian versus Mattel* case says that it's abuse of discretion to award Rule 11 sanctions for conduct during opening statements, we would ask the Court, we would implore the Court not to issue sanctions against Ms. Wagstaff because of what she may have had on a slide or may have said at times during her opening statement.

THE COURT: Okay. Let me ask you a couple additional questions.

MS. MOORE: Sure.

THE COURT: Number one is on the amount of the sanction. Assuming I disagree with you and I conclude that this was bad faith conduct, you know, I'm thinking back to -- there was only one other time that I had to sanction a lawyer during trial for bad faith conduct, and it was a fellow by the name of Gilbert Purcell. I don't know if you know him. He's an asbestos plaintiffs' lawyer, and I sanctioned him $500.

And I'm thinking about his misconduct. I mean, Ms. Wagstaff's misconduct, I think, was far more egregious than Mr. Purcell's. I mean, Mr. Purcell's was one act of misconduct.

What do you think is the appropriate -- assuming I disagree with you, do you have any argument about what is the upper end in terms of the amount of money that I should

sanction her?

MS. MOORE: Well, Your Honor, it's my position she shouldn't be sanctioned at all. Awarding monetary sanctions for something that's said or done during opening statement is, in my view, completely inappropriate, especially given the unique nature of this trial and especially given the commitment that Ms. Wagstaff has to her client and to her entire team. I think it is extremely prejudicial to the plaintiff for that to be imposed upon her, especially given that the defendant also had a slide that was excluded, had references to excluded testimony, and there was not the same level of admonition.

THE COURT: Are you referring to -- well, first of all, I interrupted the defendant's opening statement on my own to put a stop to the use of prior deposition testimony by experts; and, number two, I told them to take the slide down when it included some private medical information about Mr. Hardeman.

Surely you are not suggesting that that was bad faith on the part of the defendant.

MS. MOORE: I don't think either side committed bad faith yesterday, Your Honor. I'm merely pointing out that the defense had slides that the Court had specifically excluded -- had references to evidence the Court specifically excluded in Plaintiffs' *Motions in Limine* Number 6, 11, and 12, and we had asked to see those ahead of time. That was refused by

Monsanto.

We were assured that there would be no references to the excluded materials evidence, and it was still there. We objected and, yes, Your Honor, you told them to take down the slide and it was taken down. I don't think sanctions should be imposed by any means on Mr. Stekloff for that, just like I don't think sanctions should be imposed on Ms. Wagstaff.

I mean, this is -- sometimes you have to make good faith judgment calls on what to do and how to present your case, and lawyers need leeway to be trial lawyers.

And Ms. Wagstaff is, in my view, one of the finest trial lawyers in this country and is well-respected, especially among the women's bar. Women lawyers all over the country respect her.

And --

THE COURT: Are you suggesting I should apply a different standard because she's a member --

MS. MOORE: No, not at all, Your Honor. I'm just saying from my personal experience and what I have observed.

And that -- no, I don't think you should apply a different standard at all. In fact, what I'm asking is to apply the same standard for defense and for the plaintiff, and I was pointing out that there were errors or there were, you know, mistakes or confusion on both sides of the aisle, and that this does not warrant the level of bad faith.

And it absolutely was not intentional or malfeasance on the part of Ms. Wagstaff to defy this Court in any way, shape, or form, and we would ask that sanctions not be awarded, and that our response to the show cause be considered by the Court in its totality and that sanctions not be awarded.

THE COURT: One last question, which is, I mean, obviously Ms. Wagstaff didn't prepare this opening statement on her own. Obviously she practiced it in front of the team. The slides were put together by the team, and so the team of some unknown number of lawyers was complicit in this.

Why -- I appreciate Ms. Wagstaff falling on her sword and saying, "I'm the lead trial lawyer and if anybody should be sanctioned, it should be me, although I don't agree that anybody should be sanctioned," I appreciate that but it's not really responsive because it seems to me that every lawyer on the team is potentially responsible for the deliberate premeditated misconduct that occurred during the opening statement.

MS. MOORE: And, Your Honor, again, I would disagree with your adjectives there. You used "deliberative" and "complicit," and I don't think that's a fair way to describe the way that attorneys prepare their opening statements.

Again, we're trying to find the best way in this unusual circumstance where we can only talk about science in Phase I and still try to represent Mr. Hardeman to the best of our

abilities. Because at the end of the day, Your Honor, that's why we're here. Our job is to represent Mr. Hardeman and we take that very seriously, Your Honor.

THE COURT: Your job is to represent Mr. Hardeman consistent with the Court's rulings --

MS. MOORE: Absolutely, Your Honor.

THE COURT: -- in how the trial is going to go. Your job is not to violate the Court's rulings because you think it's more important for Mr. Hardeman to win.

MS. MOORE: That's not what I said, Your Honor. That's not what I'm implying whatsoever.

And, Your Honor, we take this matter very seriously. I devoted several hours yesterday to this instead of preparing for the trial today.

And I will just say that with respect to the team, we have an amazing team representing Mr. Hardeman and to start the trial off is very prejudicial to this team.

THE COURT: To start the trial off?

MS. MOORE: To start the trial off and award sanctions.

THE COURT: Okay. Does Monsanto want to say anything about this?

MR. STEKLOFF: No, Your Honor.

THE COURT: Okay. Mr. Hardeman, I would like to say something to you.

MR. HARDEMAN: Yes, Your Honor.

THE COURT: Sometimes lawyers forget that their client is in charge. It's their client's case. I have no reason to believe that you are approaching this case in bad faith in any way, but you are in charge of this case and you have hired these lawyers and ultimately you are responsible for what these lawyers do in this courtroom.

And it seems to me that you have a decision to make at this point. Either you can tell your lawyers to continue to conduct themselves the way they conducted themselves yesterday or you can tell them to play it straight. That is a decision for you. You are in charge. Okay?

MR. HARDEMAN: Yes, Your Honor.

THE COURT: And I have the authority to dismiss your case with prejudice if your lawyers continue to engage in misconduct during this trial. So I want you to know that it's not just a question of sanctioning the lawyers. It's not just a question of taking money out of the lawyers' pockets. If the sanctions don't work, if the sanctions don't work, I have the authority to dismiss your case, which means you lose.

MR. HARDEMAN: I understand, Your Honor.

THE COURT: Okay. So it really is up to you how your lawyers conduct themselves for the rest of this trial.

MR. HARDEMAN: I understand, Your Honor. I will talk to them.

THE COURT: Okay. Thank you.

Anything else to discuss before we proceed tomorrow?

MR. STEKLOFF: Your Honor, on a completely unrelated issue, can we approach the sidebar just briefly?

THE COURT: Yes.

(Pages 779 through 781 were placed under seal by Order of the Court and bound separately.)

(The following proceedings were heard in open court:)

THE COURT: So my job is to go back and look at the Portier direct examination, and I'm still waiting for the cross; is that right, Mr. Imbroscio?

MS. MOORE: I think we have an update, Your Honor.

MR. IMBROSCIO: We just spent a couple hours with Mr. Wisner upstairs.

THE COURT: Was it fun?

MR. IMBROSCIO: More than you can imagine, Your Honor. Our staff are working to sort of document what was said and we can try to get something to you as quickly as we humanly can tonight.

THE COURT: Okay.

MR. IMBROSCIO: It will be the entire examination days one and two.

THE COURT: So I'll get to work on the Portier direct. I'll turn to the Portier cross as soon as it comes in. I'll get you the Portier direct as soon as it's done regardless of whether I've received the cross with the understanding that the rulings are tentative.

MS. MOORE: Okay.

THE COURT: And then I'll turn to Reeves after that; right?

MS. MOORE: Yes, Your Honor.

THE COURT: Okay.

MS. MOORE: That sounds good. Thank you, Your Honor.

THE COURT: Okay. Thank you.

(Proceedings adjourned at 3:56 p.m.)

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CERTIFICATE OF REPORTERS

I certify that the foregoing is a correct transcript from the record of proceedings in the above-entitled matter.

DATE: Tuesday, February 26, 2019

Jo Ann Bryce, CSR No. 3321, RMR, CRR, FCRR
U.S. Court Reporter

Marla F. Knox, RPR, CRR
U.S. Court Reporter