EXHIBIT 52

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

IN RE: ROUNDUP PRODUCTS LIABILITY LITIGATION	)	MDL No. 2741
THIS DOCUMENT RELATES TO ALL CASES	)	Case No. 16-md-02741-VC

THURSDAY, SEPTEMBER 21, 2017

CONFIDENTIAL - SUBJECT TO PROTECTIVE ORDER

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VIDEOTAPED DEPOSITION of JENNIFER R. RIDER, ScD, held at the offices of Cetrulo LLP, 2 Seaport Lane, Boston, Massachusetts, commencing at 9:01, on the above date, before Maureen O'Connor Pollard, Registered Merit Reporter, Realtime Systems Administrator, Certified Shorthand Reporter.

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INDEX

EXHIBITS

P R O C E E D I N G S

THE VIDEOGRAPHER: We are now on the record. My name is Chris Coughlin. I'm a videographer for Golkow Technologies. Today's date is September 21, 2017, and the time is 9:01 a.m.

This video deposition is being held in Boston, Massachusetts, In Re: Roundup Products Liability Litigation, MDL No. 2741, Case Number 16-md-02741-VC, for the United States District Court, Northern District of California.

The deponent is Dr. Jennifer Rider.

Will counsel please identify yourselves and state whom you represent.

MR. MILLER: Good morning, this is Michael Miller and Nancy Miller on behalf of plaintiffs.

MR. COPLE: Good morning. This is William Cople and Grant Hollingsworth, both of Hollingsworth LLP, for Monsanto.

THE VIDEOGRAPHER: The court reporter is Maureen --

MR. TRAVERSE: Jeff Traverse from the Miller Firm on the phone.

MR. COPLE: Anyone else?

THE VIDEOGRAPHER: The court reporter is Maureen O'Connor, and she will now swear in the witness.

JENNIFER R. RIDER, ScD,
having been first duly identified and sworn, was examined and testified as follows:

EXAMINATION

BY MR. MILLER:

Q. Good morning.

A. Good morning.

MR. COPLE: Excuse me for a moment, Mike. I just have a brief comment for the record.

On behalf of Monsanto, we are producing Dr. Rider as a general causation expert pursuant to Pretrial Order No. 7 of the deposition protocol. Monsanto provisionally designates as confidential in its entirety the transcript, videography, and exhibits used in this deposition.

BY MR. MILLER:

Q. How are you doing today?

A. Good. Thank you.

Q. Excellent.

What's your name?

A. Jennifer Rider.

Q. And Dr. Rider would be appropriate?

A. Sure.

Q. Okay. And, Dr. Rider, have you been deposed before?

A. Never.

Q. Okay. I'm going to ask some questions. I'm sure these lawyers have had an opportunity to explain that concept to you.

A. Yes.

Q. So if at any time you do not understand my questions, will you let me know?

A. Absolutely.

Q. Okay. So if you answer, I'll assume you answered truthfully, fully, and as fair as you would in front of a jury. Okay?

A. Okay.

Q. Great.

I see your CV, and we'll talk about it a little bit, but it kind of speaks for itself. I just want you to know up front, no matter what anybody said, I'm going to bend over backwards to be courteous and to be intellectually honest

Page 10

in my questions, and I know you'll do the same and try to be intellectually honest in your answers, and we'll extend each other that courtesy. Okay?

A. Sounds good.

Q. Great.

And you have the same sort of knack I do, I like to nod at people, but she can't type that down. You have to verbalize an answer.

A. Okay.

Q. Okay. Good. All right. As I understand, and I got your report that was sent on this case, and I assume that you prepared this?

A. I did.

Q. Okay. And I just want to ask you -- I'm not going to go through it page-by-page, line-by-line or anything, but I did want to ask you about this. The scope of the report, and I'm going to quote this and see if we can kind of do this shorthand, but "Hollingsworth LLP" -- of course, that's the law firm that represents Monsanto. You understand that?

A. I do.

Q. Okay.

Page 11

-- "has requested that I evaluate from my perspective as an expert in the field of cancer epidemiology whether there is a body of evidence using population-based research and epidemiologic methods that could demonstrate that glyphosate is a causal factor in the development of non-Hodgkin's lymphoma." That's what they asked you to do?

A. That is correct.

Q. Yes, ma'am.

And we're going to go into more detail over the next seven hours what your opinions are, but generally speaking, your opinion is that there is not such a body of evidence; is that fair?

A. I reached the conclusion, as I stated in my report, that there is not sufficient evidence to determine that glyphosate is a causal factor in any child development.

Q. Yes, ma'am. So let me ask you this.

Is there a body of evidence that shows that men who have high ejaculation rates have a lower risk of prostate cancer?

MR. COPLE: Objection. Foundation, vague.

Page 12

BY MR. MILLER:

Q. You can answer.

A. Okay. So I believe you're referring to one of my recent publications.

Q. I am, ma'am.

A. "Ejaculation Frequency and Prostate Cancer."

Q. Yes, ma'am.

A. And could you just restate the actual question?

Q. Sure. I just want to know, it's the same question, that is there a body of evidence using population-based research and epidemiologic methods that demonstrate a negative causation between high ejaculators and prostate cancer?

A. So that paper reflects one study on that topic, and, you know, while I think it's a strong study, I would not determine from that single study that ejaculation frequency is a causal factor in prostate cancer.

Q. But you would agree from that one study you saw strong evidence of a negative causation between high ejaculators and prostate cancer; true?

Page 13

MR. COPLE: Objection to form.

A. We found a strong inverse association between frequency of ejaculation and subsequent development of prostate cancer.

BY MR. MILLER:

Q. And you characterized that as strong evidence in your report?

A. Sir, I don't know what you're referring to. Where do I characterize it as strong?

Q. That's fair. I'll show it to you.

MR. MILLER: Let's mark this as Exhibit 1.

(Whereupon, Rider Exhibit 23-1, Rider, et al article, Ejaculation Frequency and Risk of Prostate Cancer, was marked for identification.)

BY MR. MILLER:

Q. And this is 23-1. And here's a copy (handing).

Would you identify what that is, ma'am?

A. This is an article for which I was the first author on Ejaculation Frequency and Risk of Prostate Cancer in the health professionals

follow-up study cohort.
Q. Also authored by Lorelei Mucci?
A. That's correct.
Q. I didn't mean to interrupt you. I'm sorry.
A. Yes. Dr. Mucci was also a co-author. Correct.
Q. I wanted to make sure I was pronouncing that right.
Let's go, if we can, to the Conclusion. And you say in that first sentence that the study "provides the strongest evidence to date of a beneficial role of ejaculation in the prevention of PCa." Right?
A. That is what it says, yes.
Q. So in -- so you and I agree that one study can provide strong evidence of an association between an event and exposure and a cause; right?
MR. COPLE: Objection to form. Vague.
A. It really depends on the quality of the study.
BY MR. MILLER:
Q. I understand that. But one study, if it's of good quality, can; right?

A. As I said before, even though I think that the study we conducted here was a very strong study, I would not make the leap that our findings are indicative of causation. I do believe it provides strong evidence of the association.
Q. Sure. It would be irresponsible for any epidemiologist to make the leap for causation without using the Bradford-Hill criteria; right?
MR. COPLE: Objection, vague. Objection to form.
A. I think the Bradford-Hill criteria provide one means by which to synthesize evidence, but it certainly isn't the be-all and end-all of determining causation, no.
BY MR. MILLER:
Q. Well, I guess in science is anything the be-all and end-all of anything really, I mean, honestly?
MR. COPLE: Objection. Argumentative.
BY MR. MILLER:
Q. I'm just asking.
MR. COPLE: Same objection.
A. Sorry, I don't understand your

question.
BY MR. MILLER:
Q. Well, I think you said that the Bradford-Hill criteria was not the be-all end-all of causation, and I guess my question is, what is the be-all end-all -- I mean, in science is anything the be-all end-all?
MR. COPLE: Objection. Vague.
A. So I can speak for epidemiologic research, and there, before one would even go down the road of evaluating the Bradford-Hill criteria, you would first want to be certain that all of the studies that had been conducted and that you were attempting to synthesize had a reasonable degree of internal validity. So in many cases we wouldn't even get to the point where the Bradford-Hill criteria were useful.
BY MR. MILLER:
Q. And in this case you decided to not implement the Bradford-Hill criteria because you felt there were internal problems with these studies; fair?
MR. COPLE: Objection to form.
A. Particularly in the case control studies, I thought that the limitations of those

studies were sufficient enough where, you know, trying to synthesize them with the Bradford-Hill criteria was not a useful exercise.
BY MR. MILLER:
Q. Yes, ma'am.
So let's go back to your study of ejaculation frequency that showed strong evidence of association. It -- your findings did not have statistical significance; right?
A. That's incorrect.
Q. Explain to me, you're the epidemiologist, why is that incorrect?
A. If you look at -- there are a number of statistically significant results in this paper. Perhaps the main finding we could look at, let's say, in Table 2.
Q. Give me one second. I'm at Figure 1. Okay. I'm at Table 2. Yes, ma'am.
A. Okay. So we can look really at any of the results in this table. We can look, say, at the p for -- trend for men, frequency of ejaculation during ages 20 to 29 years or 40 to 49 years or in the year before the questionnaire, and both the age-adjusted hazard ratios and the multivariate adjusted hazard

ratios are statistically significant.
Q. You're one of the few people that actually talk faster than me. So you're going to have to slow down a little bit or she's going to get exhausted.
A. Sorry.
Q. So you pointed out, and probably very correctly, that in Table 2 there are some statistically significant findings.
A. That is correct.
Q. Yes, ma'am.
And what do we mean by "statistically significant findings"? How would you explain that to a jury?
MR. COPLE: Objection. Vague.
A. So I can tell you what we meant by them in this particular paper. So let's take the example of the multivariate adjusted hazard ratio for frequency at ages 40 to 49. Here the test that we're performing is looking at a trend across those categories of ejaculation, and we find that compared to men with a frequency of 4 to 7 ejaculations per month, men in the -- as the categories of ejaculation increase, the hazard ratio for prostate cancer decreases in a

monotonic way, so that we get a p-value of less than .0001, and that is consistent with saying that, you know, the probability of observing that result under the null hypothesis would be -- that result or a result more extreme would be less than .0001.
Q. Which makes it a statistically significant finding?
A. That is correct.
Q. Which means it's unlikely to be by chance?
A. The purpose of hypothesis testing and of estimating p-values is to be able to evaluate the role of chance.
Q. And by having the statistically significant result, we reduce the possibility of chance low enough to where we call it statistically significant?
A. So, again, you know, I think, as I said, the p-value is one way in which we evaluate the role of chance in our findings. But, you know, I think it's important to point out that, you know, the confidence intervals here are also giving us really important information about the precision of those

results, information that isn't necessarily captured all the time in the p-value.
Q. Are there other causes for reduced risk of prostate cancer --
MR. COPLE: Objection.
BY MR. MILLER:
Q. -- other than high ejaculation?
MR. COPLE: Objection to form. Vague.
A. So, I mean, part of the reason why these results are interesting is we actually know very little about risk factors. For prostate cancer, I think most experts would agree that the established risk factors for prostate cancer are race, age, family history, and there have been a number of genetic determinants of prostate cancer. But yes, we -- it's a disease for which we know relatively little about the risk factors.
BY MR. MILLER:
Q. How would you account for those risk factors -- how did you account for those risk factors when you did your ejaculation frequency study?
A. So because this is a very large study, so, you know, close to 32,000 men answered the

questions on ejaculation frequency, and we had nearly 4,000 prostate cancer cases that were included, we were able to control for a number of different variables in our multivariable analysis.
So you can see in the footnote of Table 2 all of the variables that were controlled for in that analysis. Those were selected because they have either been associated with prostate cancer in other studies, or were specifically associated with prostate cancer in this particular cohort.
Q. And this article that we are discussing, it was published in a peer-reviewed journal?
A. That is correct, European Urology.
Q. And what do we mean when we say "peer-reviewed journal"?
A. Well, I think what you mean is a journal that subscribes to a peer review process by which the -- a publication that's being -- a manuscript that's being considered for publication would be sent out to one or more scientists, peer reviewers, to evaluate that publication so that the journal can decide

whether to accept, reject, or invite the authors to respond to comments.

Q. Would it be fair to say that scientists look more seriously on peer-reviewed journals than non-peer-reviewed journals?

MR. COPLE: Objection. Vague.

A. I couldn't -- I couldn't speak for scientists, generally, and certainly not people outside of my own field.

BY MR. MILLER:

Q. All right. Well, let's narrow it.

Do you, Dr. Rider, do you put more weight or importance in peer-reviewed journals over a non-peer-reviewed journal?

A. I think, you know, most of my -- all of my original scientific articles have been published in journals that have some form of peer review. I think those journals are more commonplace in my field.

Q. Are you a peer reviewer?

A. I am.

Q. And when you peer review, you look at it and scrutinize it to make sure the article is worthy of being published; fair?

A. I don't really see that as my role. I

think that I review the paper to, you know, certainly determine whether I agree with the methods that were used in the paper. But most of the time the comments that I provide are a peer -- as a peer reviewer deal with sort of the clarity of the data presentation or the author's interpretations of the findings based on sort of the quality of the study.

Q. And as a peer reviewer, oftentimes you'll -- so to be clear, the authors that want to get the article published, they don't know who the peer reviewers are? That's a blind process; is that fair?

MR. COPLE: Objection to form. Vague.

A. It really depends on journal to journal. So more and more journals are actually having an open peer review process where you do sign your name as a reviewer.

BY MR. MILLER:

Q. Was this article on ejaculation frequency, was that under an open review process or a blind review process?

A. I can -- I review articles frequently for this journal. So I know that for this one it is a blind review process.

Q. And how many people would review a typical article before it would be put in the European Association of Urology?

A. In the European Urology journal, it varies. So from my experience in being a peer reviewer, sometimes I am one of two peer reviewers reviewing an article. Other times I have had papers that have been reviewed by six reviewers. It varies from situation to situation.

Q. Yes, ma'am.

The more important the article, perhaps the more reviewers?

MR. COPLE: Objection, vague. Objection to form.

A. Yeah, I'm -- I am unaware that that's how it happens. I think it has a lot to do with how many reviewers agree to review the article.

BY MR. MILLER:

Q. Fair enough.

And the reviewers are contacted and selected by the editors of the article?

A. So, again, I can speak to the process for this particular journal. There is an associate editor who is assigned an article to

be sent out for peer review. The associate editor would then contact potential peer reviewers and invite them to review the manuscript.

Q. And it's your understanding, certainly with this journal, that the reviewers then can make comments, and they can either recommend the journal publish the article or not; is that fair?

MR. COPLE: Objection to form.

A. So, again, for this particular journal, and it does vary from journal to journal, but this particular journal does allow the reviewers to weigh in on whether or not the article should be accepted, rejected, whether there should be a major revision or a minor revision. But it is up to the associate editor to ultimately make that decision. The AE doesn't need to take into account the reviewer's recommendation.

BY MR. MILLER:

Q. Yes, ma'am.

And so articles can be revised on the recommendation of reviewers and editors. That happens; right?

MR. COPLE: Objection. Vague.
A. It is common for an article that's been reviewed to go back to the authors for revisions, yeah, that is common.
BY MR. MILLER:
Q. And with most journals, the lead author is the first author that is mentioned on the article; is that true?
MR. COPLE: Objection. Vague, lacks foundation.
A. So in this case I was the first article because I drafted the manuscript, but I think the order of authors and how that's decided probably varies a lot from group to group, and certainly across disciplines.
BY MR. MILLER:
Q. Would it be fair to say on this article you would be the lead author?
A. I am the first author on this publication. I don't really know what you mean by "the lead author."
Q. You don't use the phrase "lead author"?
A. Well, I don't -- to me, someone is a first author or a co-author or a last author.

Those are the sort of positions of authorship that I would use.
Q. Okay. Was this article rejected or requested to be revised?
A. It went through a couple of rounds of revisions, yes.
Q. And when you put the phrase in your conclusion that this study was strong evidence, we looked at earlier, it's the first sentence of your conclusion, did anyone object to you calling this strong evidence?
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. Any of the reviewers?
A. So --
MR. COPLE: Objection. Vague.
A. -- to be clear, what it says in the conclusions is "provides the strongest evidence to date." And I really don't recall whether anyone commented on that, but I don't think so.
BY MR. MILLER:
Q. Did any of your co-authors object to you using that sentence, "strong evidence to date," when you did the draft manuscript?
A. I don't recall anyone having an

objection to that, no.
Q. What's a forest plot?
A. So when I think of a forest plot, I think of a plot that is used to visually depict the results of different studies, the point estimates, along with their confidence intervals.
Q. Do you use forest plots in the practice of epidemiology?
A. I have never used a forest plot in my own work, no.
Q. And speaking of your own work, it's fair to say it's primarily cancer, and it's primarily the cancer in the context of urology; is that fair?
A. I would describe myself as a cancer epidemiologist. Most of my own research has been in the area of prostate cancer.
Q. Would it be fair to say you've done any or one article on non-Hodgkin's lymphoma cancer?
A. I have one published study on Hodgkin's lymphoma that's listed on my CV. I have no publications related to non-Hodgkin's lymphoma. But, again, that reflects my own sort

of research interest and not, you know, what I feel qualified to evaluate as a cancer epidemiologist.
Q. Are you currently working on any non-Hodgkin's lymphoma research?
MR. COPLE: Objection. Vague.
A. No, I'm not.
BY MR. MILLER:
Q. Okay. Now, you and I were discussing Bradford-Hill earlier, and I think you said something generally to the effect -- I'm not trying to quote you -- it's not the end-all be-all.
But here's my question now. It is an accepted methodology in epidemiology to determine causality; true?
MR. COPLE: Objection to form. Lacks foundation.
A. So it's interesting, actually, what I teach my students is that there's actually only one Bradford-Hill criterion that's actually required for causality. That would be temporality. So certainly temporality is a very important criterion and one that I would require be satisfied before I, you know, made the claim

that an exposure was a causal factor in the disease. But in terms of all of the other factors, they are -- they're not required for causality.

BY MR. MILLER:

Q. Yes, ma'am.

And so you do teach epidemiology to medical students?

A. Primarily to students who -- graduate students in public health in epidemiology.

Q. Which is the track to become an epidemiologist?

A. Many students are getting their master's in public health. They can go on to do a variety of things in the public health field, not just epidemiology.

Q. And you teach them in that class about the Bradford-Hill criteria?

A. I have mentioned the Bradford-Hill criteria both in methods courses of epidemiology, and also in my work in teaching cancer epidemiology.

Q. Yes.

Do you have the students use a textbook in that class?

A. For which class?

Q. For either -- or any of these classes that you're referring to.

A. The last time I taught an epi methods class there was, I believe, a recommended but not required textbook by Kenneth Rothman.

Q. And what year was that? Was that this last semester or --

A. The -- it would have been last fall. So a year ago now was the last time I taught that course.

Q. What is your definition of causation?

MR. COPLE: Objection, vague. Also objection to the extent it calls for a legal opinion.

A. So as an epidemiologist, I think it's most convenient to think of causality in terms of the counterfactual. So you have a person who is exposed to something. If you were to keep everything the same about that person's experience except for remove exposure, would the person have the same -- would the same outcome occur.

So, you know, we talk about this in classes as, you know, putting people in time

machines. If we could put someone in a time machine, keep everything the same except remove exposure, would that person still have the same outcome.

BY MR. MILLER:

Q. If I was in one of your classes and I said, "Dr. Rider, can there be more than one cause of a condition," what would the answer be?

MR. COPLE: Objection. Vague, incomplete hypothetical.

A. So in terms of cancer epidemiology, I think we have established that many cancers have many different causes.

BY MR. MILLER:

Q. And although you don't hold yourself out as an expert in non-Hodgkin's lymphoma personally, there's no reason to believe that doesn't apply to that type of cancer as well; true?

MR. COPLE: Objection to the form of the question.

A. So I'm a cancer epidemiologist and --

BY MR. MILLER:

Q. Yes, ma'am, I'm not challenging that.

A. Yes. And I would say that, you know,

we know very little about -- we have very few established risk factors for NHL. And so, you know, it would certainly be possible that the unknown causes, which I think, you know, are -- have estimated to be somewhere in the area of 50 percent of NHL is -- you know, has an unknown cause, that there could be several different exposures that are related to the development of those cancers.

Q. Dr. Rider, does smoking cause lung cancer?

MR. COPLE: Objection. Vague.

A. I believe we have established, yes, that smoking is a causal factor in lung cancer development.

BY MR. MILLER:

Q. And we use epidemiology in part to do that?

A. I think the epidemiology studies were critical in determining that smoking was a causal factor in lung cancer.

Q. And fair to say we use the Bradford-Hill criteria in that regard as well?

MR. COPLE: Objection. Lacks foundation, vague.

Page 34

A. I have no idea how the Bradford-Hill criteria factored into determining causation in smoking and lung cancer, but that is a disease for which, when we did the epidemiologic studies, we were seeing adjusted relative risks, you know, on the order of 20. So very, very strong associations between the exposure and the outcome.
BY MR. MILLER:
Q. You certainly don't think that one has to have odds ratios of 20 in order to find causality, do you?
MR. COPLE: Objection to the form of the question. Vague.
A. So I think that when we're talking about risk factors that have only, you know, very modest associations with the outcome, it becomes much harder to ensure that the association that we're seeing is actually a causal association.
So going back to the lung cancer example, when you see a relative risk on the order of 20, it's very difficult to come up with a potential confounding factor that could explain all of that association that we see,

Page 35

because that factor would have to be incredibly tightly related to the exposure and also a very, very strong risk factor for the outcome. But when you're looking at a relative risk of, you know, 1.2, even a relatively weak confounder could be responsible for that entire association we see.
So, no, while theoretically it's possible to find causes of the outcome that are small, it's very difficult to do that in an epidemiologic study.
BY MR. MILLER:
Q. Sure.
But when there are associations of 20 percent, public policy decisions are often made on those associations, aren't they?
MR. COPLE: Objection. Lacks foundation, vague.
A. Yeah, I have no idea. I would need a specific example.
BY MR. MILLER:
Q. Well, let's use yours. Exhibit 1, your ejaculation frequency, what's the percentage of reduced risk of prostate cancer from your study?

Page 36

A. So we found about a 20 percent decrease in risk comparing the highest category of ejaculation frequency to four to seven times per month.
Q. Yes, ma'am.
And you felt that was important enough to be put in the medical literature; true?
MR. COPLE: Objection. Vague.
A. I certainly felt that it was important to publish the study, because it tells us something potentially about the etiology of prostate cancer. But nowhere in this article will you find me suggesting that we should make public health recommendations based on the results.
BY MR. MILLER:
Q. And the publisher of the articles felt it was important enough to publish it; true?
MR. COPLE: Objection. Lacks foundation.
A. I think science advances because articles are published, the scientific community gets an opportunity to discuss those results to formulate additional studies that can follow up on those results. But, you know, the reason for

Page 37

publishing an article is not because you've established causation.
BY MR. MILLER:
Q. Nor did I suggest that.
You did say in your article that you've established strong evidence of a --
A. Sorry.
Q. Strong evidence to date of a beneficial role of ejaculation to prevent prostate cancer; right?
MR. COPLE: Objection. Asked and answered.
A. It says in the conclusions that this study "provides the strongest evidence to date of a beneficial role of ejaculation in prevention of prostate cancer."
BY MR. MILLER:
Q. Sure.
And you know that articles like this are read by urologists who actually see and treat patients in an office setting; true?
A. Yes, I imagine the primary audience for this particular journal is -- are urologists.
Q. Sure.

So it would -- you would not be surprised to learn that urologists are making decisions with real patients based upon these kinds of articles that they read from experts in the field; right?

MR. COPLE: Objection, vague. Object to the form of the question.

BY MR. MILLER:

Q. You can answer.

A. I think that urologists are interested in research surrounding prostate cancer, even when the point of that research isn't to make public health or clinical recommendations. So, you know, nowhere in this article did we instruct the clinical community to advise their patients to change their behavior based on our results.

Q. What is the level of certainty that an expert needs before they can say there is causation?

MR. COPLE: Objection. Vague.

A. It varies very much from situation to situation.

BY MR. MILLER:

Q. How many epidemiological studies were

available to scientists before they concluded smoking causes lung cancer?

MR. COPLE: Objection. Lacks foundation.

A. I don't recall. It's been a long time since I've reviewed all of the specific studies.

BY MR. MILLER:

Q. Sure.

Does smoking cause oral cancers?

MR. COPLE: Objection. Vague.

A. So smoking is a risk factor for oropharyngeal cancers, say.

BY MR. MILLER:

Q. When we say "risk factor for oropharyngeal cancer," if a student were to raise their hand and say, Dr. Rider, my uncle smokes tobacco, is he at increased risk of oropharyngeal cancer, what would the answer be?

MR. COPLE: Objection. Vague, incomplete hypothetical.

BY MR. MILLER:

Q. You can answer.

A. So I would say that smoking is one established risk factor for oropharyngeal cancer.

Q. As we sit here today, we can both agree, I think, that there have been people out there who have gotten oropharyngeal cancer as a result of smoking; true?

MR. COPLE: Objection. Lacks foundation, vague, form of the question.

A. Again, I would say that oropharyngeal cancer, one risk factor for that cancer is smoking. But we can never know on an individual level, of course, what caused someone's cancer.

BY MR. MILLER:

Q. So we never know what causes someone's cancer?

A. Not an individual, I'm afraid, no, because we don't have the time machine.

Q. Very good. All right.

Is Roundup a risk factor for non-Hodgkin's lymphoma?

MR. COPLE: Objection. Vague.

A. In my review of the epidemiologic literature, I would say there is no evidence that Roundup is a risk factor for NHL.

BY MR. MILLER:

Q. And in your review of the literature, did you review the IARC report on the issue?

A. I did read through the IARC report, yes.

Q. You said you read through it. Did you read the whole thing?

A. I definitely skimmed over the entire thing, but the IARC report wasn't critical to me coming to my own independent expert opinion because I thought it was important to go back to the primary studies.

MR. MILLER: Take a break and walk my knee like we talked about. I appreciate your indulgence.

THE VIDEOGRAPHER: Going off the record. The time is 9:37.

(Whereupon, a recess was taken.)

THE VIDEOGRAPHER: Back on the record. The time is 9:41.

MR. COPLE: Confirm who is on the line again, Mike. We're on the record.

MR. MILLER: We're back on the record, and it's just Mr. Traverse on the phone, right? All right. Hearing no one argue with me, I assume it's just Mr. Traverse on the phone.

MR. COPLE: Mr. Traverse, are you still with us now?

Page 42

MR. TRAVERSE: Yes. I'll be on the whole time.
BY MR. MILLER:
Q. Dr. Rider, let's get back to work.
Do any other pesticides cause non-Hodgkin's lymphoma?
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. Or herbicides?
MR. COPLE: Objection. Vague.
A. I have not reviewed all of the evidence for all other pesticides.
BY MR. MILLER:
Q. So it's fair to say, as we sit here today, you do not hold an opinion to a reasonable degree of scientific certainty that other herbicides or pesticides, other than glyphosate, cause non-Hodgkin's lymphoma; true?
MR. COPLE: Objection. Argumentative.
A. My role was to evaluate all of the epidemiologic studies on glyphosate and NHL, so that's what I have reviewed.
BY MR. MILLER:
Q. Yes, ma'am.
Is there a difference between a human

Page 43

health risk and a human health hazard?
MR. COPLE: Objection. Vague.
A. Yeah, I really have no idea what you mean by that.
BY MR. MILLER:
Q. Me either. Okay.
(Whereupon, Rider Exhibit 23-2, Non-Hodgkin Lymphoma and Occupational Exposure to Agricultural Pesticide Chemical Groups and Active Ingredients: A Systematic Review and Meta-Analysis, was marked for identification.)
BY MR. MILLER:
Q. I show you what we've marked as Exhibit 23-2, and ask if you can identify this for me, ma'am.
A. I actually can't identify this. It just says that it's supplementary information, but there are no authors listed. I'm not exactly sure what this is.
BY MR. MILLER:
Q. Okay. We'll set that aside for now.
Have you reviewed the Chang meta-analysis?

Page 44

A. I did read it, yes, but I did not rely on any other meta-analysis in coming up with my own expert opinion.
Q. So you did not rely upon the Chang meta-analysis; is that right? I just want to make sure.
A. That is correct. I thought it was important to evaluate all of the primary studies, so that's how I approached my own review of the literature.
Q. Do you know Dr. Chang?
A. We both are graduates of the Harvard School of Public Health. We may or may not have overlapped for a year. So I certainly know of her, but we don't know each other well.
Q. Are you Facebook friends?
A. No, we are not Facebook friends.
Q. That's the rage these days, isn't it?
What I have, and I'll mark it as 23-3, this is the forest plots from Dr. Chang's meta-analysis, see if you've seen this before.
(Whereupon, Rider Exhibit 23-3, Forest plots from Dr. Chang's meta-analysis, was marked for identification.)
MR. COPLE: Is there a question

Page 45

pending?
MR. MILLER: Yes.
BY MR. MILLER:
Q. Have you seen this before?
A. So I mean, this is --
MR. COPLE: I'm going to object right now. We don't know which document this came from.
BY MR. MILLER:
Q. You can answer.
A. Yeah, I am afraid I agree. I mean, this is just the forest plot from some meta-analysis, but the rest of the paper is missing, so it's hard for me to confirm whether or not it's from that paper.
Q. Sure. And I agree with you the rest of the paper is missing. Let's mark the rest of the paper. We'll mark it as 23-4.
Before I do, I want to go back to an answer you just gave. Did you say you performed your own meta-analysis?
A. I did not say I performed a meta-analysis. I believe I said that I did my own review of the primary studies.
Q. Okay. But it's fair to say that you

Page 46

did not do a meta-analysis?
A. I did not complete a meta-analysis as part of my review, no.
Q. Did you start one?
A. I actually think that meta-analyses have limited value when the studies that you would include in them have problems with their internal validity, because those problems would then carry through to the results of the meta-analysis, so I think it's much more useful to individually analyze the individual studies.
Q. I remember that from your report. But did you start a meta-analysis?
MR. COPLE: Objection. Asked and answered.
A. I did not start a meta-analysis because I didn't think it would be valuable in synthesizing this particular literature.
BY MR. MILLER:
Q. Did you do a pooled analysis?
A. So I did not do a pooled analysis, because, again, what I felt was important were the independent -- were the primary studies in evaluating all of the strengths and limitations of those individual studies.

Page 47

Q. I'm going to find that page so we can tie them up, and then we'll sort of move on here, I hope.
While we're waiting for that, fair to say you put the most emphasis in your expert review on the Agricultural Health Study?
MR. COPLE: Objection to the form of the question.
A. I felt that the Agricultural Health Study offered the strongest level of evidence for a variety of reasons that I outline in my report.
BY MR. MILLER:
Q. Yes, ma'am.
And not just the published Agricultural Health Study, but the unpublished one; right?
A. Well, I had come to my opinion regarding the epidemiologic literature before I had the opportunity to see the draft manuscripts that you're referring to. So while that draft manuscript didn't change my -- alter my expert opinion, I did think it provided confirmatory evidence and addressed some of the issues that were in the published 2005 version.

Page 48

Q. What were the issues in the published 2005 version?
A. That the updated analysis addressed?
Q. Yes.
A. So I mean, for one, the number of cases of NHL that had developed by the publication -- by the time the publication of the -- or the time of the drafting of the 2013 manuscript had tripled, so the first thing would just be an increase in case numbers.
Q. Anything else?
A. For me, I think that that was -- that the additional case numbers and the longer follow-up time would have been the two issues.
Q. We'll go back to that later, but thank you.
Okay. Let's look, if we could, then, we have now got 23-3, which is the forest plot and your concern that you didn't -- you weren't sure where it came from, so we marked 23-4, which is the full Chang article.
If you'd be kind enough to turn to Page 404 in that article, I believe you'll see that --
MR. COPLE: Do you have a copy for us?

Page 49

MR. MILLER: Sure (handing).
(Whereupon, Rider Exhibit 23-4, Chang and Delzell article, Systematic review and meta-analysis of glyphosate exposure and risk of lymphohematopoietic cancers, was marked for identification.)
MR. HOLLINGSWORTH: Does the witness have one?
THE WITNESS: I don't have one.
BY MR. MILLER:
Q. I apologize. I kept the original. My fault. I'll even turn it over to the right page, but it's on Page 404 there.
So can we agree now that 23-3 is a blow-up of what is found at Page 404?
A. Yes.
Q. Okay. And what that is is a forest plot, we can agree; right?
A. Yes, it is a forest plot.
Q. So where we have a long vertical line down the middle, it has 1.0; right?
A. Mm-hmm.
Q. 1.0 means no effect; right?
A. That is correct. When you're dealing

Page 50

with relative risk measures, that would be no association.
Q. And so everything to the left of 1.0 in that vertical line would be a study that indicated a protective effect; right?
A. So relative risks of less .1 indicate that the exposure -- that the outcome is less common among those who are exposed.
Q. Yes, ma'am.
And a result to the right of 1.0 means it's more common in those that are exposed; right?
A. That is correct.
Q. Sure.
And so in this forest plot, it talks about the De Roos 2003 study. You read that one, right, ma'am?
A. I did.
Q. And the De Roos 2005 study which, I believe, is the AHS study; right?
A. That is correct.
Q. And you read that?
A. Mm-hmm.
Q. And you read the Eriksson study 2008?
A. I did.

Page 51

Q. And you read the Hardell study 2002?
A. Mm-hmm.
Q. And the McDuffie, right?
A. Mm-hmm.
Q. And Orsi?
A. Correct.
Q. And the meta-analysis RR, that's from Dr. Chang's study here that we're looking at; right?
A. That is correct.
Q. And all of them come in on the right side of 1; right?
A. Again, so the reason why I felt that it was important to evaluate these studies individually, and not just to look at the results of the meta-analysis, is that an association above 1 means absolutely nothing if you haven't evaluated that study's internal validity.
Q. If it's a bad study, then you can't rely on it?
A. Exactly.
Q. Sure.
And you understand that Dr. Chang, and this is Exhibit 23-4, she found an increased

Page 52

risk of 30 percent between glyphosate Roundup and non-Hodgkin's lymphoma; right?
MR. COPLE: Objection. Lacks foundation.
A. I think what you're referring to is the results of the meta-analysis. But again, to me, that result has very little meaning because you need to take into account the quality of the individual studies that are included in that meta-analysis.
BY MR. MILLER:
Q. And I understand that that's your opinion. But she -- that's what she found. Whether it's valid or whether you should rely on it or not we can debate, but she did find a 30 percent increased risk; right?
MR. COPLE: Objection. Asked and answered.
A. She found a meta-analysis relative risk of 1.3. But, again, there are problems with combining studies that lack internal validity.
BY MR. MILLER:
Q. And do you know who Exponent is?
A. I have become familiar with who

Page 53

Exponent is. I know that Dr. Chang works for Exponent.
Q. Do you know whether Exponent does studies for corporations?
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. That's what their job is?
MR. COPLE: Objection. Vague.
A. I really know nothing about the mission of the company.
BY MR. MILLER:
Q. If you could turn with me, please, to Page 424.
A. Okay.
Q. Do you see the Acknowledgments section there, ma'am?
A. I do.
Q. And it's important for authors of peer-reviewed journals to have a disclosure statement as well; right?
MR. COPLE: Objection. Vague.
A. I think the purpose of the disclosure statement is so that any sort of perceived conflicts can be evaluated by people who read the paper.

Page 54

BY MR. MILLER:
Q. Fair enough.
Let's look at the acknowledgements. "The authors" -- which include Dr. Chang -- "wish to thank John Acquavella and Thomas Sorahan for their thoughtful comments on earlier drafts of this manuscript."
Do you know who John Acquavella is?
A. I'm familiar with him only because I read a couple of his papers.
Q. Are you aware that he was a full-time employee epidemiologist for Monsanto?
MR. COPLE: Objection. Lacks foundation.
A. My only awareness of Dr. Acquavella is in that he was an author of a couple of the papers that I read. I know nothing else about him.
BY MR. MILLER:
Q. I see.
So, then, the answer to my question would be you did not know that he was a full-time employee for Monsanto at one time?
MR. COPLE: Objection. Lacks foundation, asked and answered.

Page 55

A. I know nothing about his employment relationship, no.
BY MR. MILLER:
Q. And you know that Thomas Sorahan was an epidemiologist who did contract work for Monsanto?
MR. COPLE: Objection. Lacks foundation.
A. Again, Dr. Sorahan, I'm familiar with him only because, again, he authored some of the papers that I read. I know nothing about his specific relationship with any company.
BY MR. MILLER:
Q. So this -- may we call it the Chang meta-analysis for shorthand?
A. Sure.
Q. So the Chang meta-analysis was published in a peer-reviewed journal; is that fair?
A. I could only assume that this journal is peer-reviewed. I've never published in this journal.
Q. I see.
And if you could look at Page 424 again, her work finding a 30 percent increased

Page 56

risk between glyphosate and non-Hodgkin's lymphoma, who was it funded by, ma'am?
MR. COPLE: Objection. Lacks foundation.
A. So first of all, I don't -- I don't think that the meta-analysis of 1.3 really tells us anything about the association between glyphosate and NHL. But I can read the funding statement in this paper.
BY MR. MILLER:
Q. Yes, if you would, please.
A. Okay. "This work was supported by Monsanto Company, the original producer and marketer of glyphosate formulations."
Q. Do you know who Donna Farmer is?
MR. COPLE: Objection. Lacks foundation.
A. I am not familiar with that name, no.
BY MR. MILLER:
Q. The people that comment and edit a particular paper, should their names be revealed in the paper?
MR. COPLE: Objection. Vague.
A. I would say it really depends on specific context, the type of contribution

Page 57

someone is making. I couldn't generally say.
BY MR. MILLER:
Q. Did anyone who is not disclosed in your paper on ejaculation make comments about it --
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. -- and edit it? I'm sorry.
MR. COPLE: Objection. Vague.
A. I really don't recall, but, you know, it's possible that people could have provided editorial comments who weren't included on the manuscript. But I -- but I don't exactly remember all of the people who viewed that manuscript.
BY MR. MILLER:
Q. So you're not aware whether one of the lead toxicologists at Monsanto reviewed the Chang paper before it was published?
MR. COPLE: Objection. Argumentative, lacks foundation, vague.
BY MR. MILLER:
Q. If you know. If you don't know --
A. I have no awareness of that.
Q. So while you don't agree with me on

Page 58

the significance of the forest plot, and I understand that, you would agree that it's been put together accurately as to what these studies represent? I mean what they found, whether they're valid or not, that's -- they're put in their correct place on the forest plot?

MR. COPLE: Objection. Lacks foundation, vague.

A. I would argue that a study that lacks internal validity should never be included on any forest plot.

BY MR. MILLER:

Q. I understand that.

But the numbers from the study were accurately placed on the forest plot, that's all I'm trying to get agreement on.

MR. COPLE: Objection.

BY MR. MILLER:

Q. Very little --

MR. COPLE: Objection. Objection. Asked and answered.

A. The numbers are meaningless. So it's very easy to find an association between one thing and another thing. But if what you're interested in is in causality, you have to

Page 59

consider the internal validity of those studies.

BY MR. MILLER:

Q. And I understand they're meaningless to you. They weren't meaningless to the World Health Organization, but on -- that's not my question. I'm trying to get away from that debate now.

MR. COPLE: Objection. Counsel is testifying. Argumentative.

BY MR. MILLER:

Q. Here is what I'm trying to ask. And we can do this by taking each study out and we can draw it on the forest plot, or we can sort of agree that Dr. Chang, who is being funded by Monsanto, put these blots down on the forest plot accurately.

MR. COPLE: Objection.

BY MR. MILLER:

Q. That's all I'm asking.

MR. COPLE: Objection. Argumentative, asked and answered.

BY MR. MILLER:

Q. Or do you think Dr. Chang messed it up?

MR. COPLE: Objection. Argumentative,

Page 60

asked and answered.

BY MR. MILLER:

Q. You can answer.

A. I can't speak to Dr. Chang's, you know, motivations for doing the meta-analysis. It's just my view that a meta-analysis is inappropriate in this case because so many of those studies included -- lack internal validity. And so I can't tell you that this is accurate because, in my view, it's not telling us anything.

Q. I understand.

As you sit here today, do you have an opinion as to whether Dr. Chang put any of the black boxes on 23-3 down inaccurately; that is to say, she simply did not follow fundamental rules of epidemiology as to where to place the black boxes? That's all.

MR. COPLE: Objection. Asked and answered.

A. Honestly we can -- in order to tell you whether or not the black boxes were placed in the correct place, I would need to go back to all of these individual studies and look at the point estimates that were selected.

Page 61

BY MR. MILLER:

Q. Okay. Here we go. In science, if someone does a study and shows an association, like you did with the high ejaculation and prostate cancer, if that association is a real association, one would expect to be able to do another study on high ejaculation and get the same results; true?

MR. COPLE: Objection. Incomplete hypothetical, vague.

A. So one of the things that you said was "a real association," and I don't quite know what you mean by that.

BY MR. MILLER:

Q. You've never used the phrase "a real association"?

A. No, I wouldn't use that, because associations can be associations, you can see one variable that's related to another variable. Oftentimes in epidemiology that's not what we're interested in. We're interested in causal associations.

Q. As a scientist, is it more important to you if you're able to repeat the association that you find in one study in the next study?

MR. COPLE: Objection. Vague, incomplete hypothetical.
A. It's very possible to replicate a study and get wrong answers twice. So, no, I don't think replication is that valuable unless you're confident in the results of the study in terms of that study's internal validity.
BY MR. MILLER:
Q. And if it replicates three times, does that have any value?
MR. COPLE: Objection. Asked and answered.
A. Again, you can replicate a study and get the wrong answer repeatedly. So, you know -- and there isn't a limit to the number of times that that can happen.
BY MR. MILLER:
Q. Is multiple myeloma a form of non-Hodgkin's lymphoma?
A. The definition has relatively recently changed. So that's reflected in some of the epidemiologic papers. So in the more current definition, multiple myeloma was included, yes.
Q. Have you spoken to anyone at Exponent since you've been retained by Monsanto?

A. No, I have not.
Q. Did you e-mail anyone at Exponent, or did they look at any drafts of your report?
A. I've had no contact with anyone at Exponent.
Q. All right. So keep 23-3 in front of you, and let's go to some studies and look at them.
MR. COPLE: Before we jump into the studies, we've been going about an hour. How long do you plan to go before allowing Dr. Rider to take a break?
BY MR. MILLER:
Q. Any time you want to take a break, Doctor, it's fine with me.
A. Yeah, I could take a brief break.
Q. Sure.
A. Thank you.
THE VIDEOGRAPHER: Going off the record. The time is 10:06.
(Whereupon, a recess was taken.)
THE VIDEOGRAPHER: Back on the record. The time is 10:16.
MR. COPLE: Can we be sure that no one has joined?

MR. MILLER: Jeffrey Traverse, are you still there?
MR. TRAVERSE: Yeah, I'm here.
MR. MILLER: Anyone else on the phone? Hearing no one, we'll begin.
(Whereupon, Rider Exhibit 23-5, McDuffie, et al article, Non-Hodgkin's Lymphoma and Specific Pesticide Exposures in Men, was marked for identification.)
BY MR. MILLER:
Q. Doctor, I just handed you 23-5, an exhibit. Can we call that the McDuff article?
A. McDuffie, sure.
Q. Dr. McDuffie.
Do you know Dr. McDuffie?
A. I do not.
Q. Cancer Epidemiology, Biomarkers & Prevention, a peer-reviewed journal?
A. Yes, it is.
Q. And so as we discussed before, the peer reviewer or reviewers would have analyzed this data and either accepted it, rejected it, or asked it to be revised?
MR. COPLE: Objection. Lacks

foundation.
A. So again, I know from my own experience in both publishing and peer reviewing for this journal that at least one peer reviewer would be invited to comment on the article. I don't recall whether this journal allows the reviewers to give recommendations specifically on whether to accept or reject it.
Q. Okay. But at some point we can agree, because it's published, that the editors of this journal decided it was worthy of being published?
A. Yes, we can agree.
Q. And it's published by, I want to count -- one, two, three, four, five, six, seven, eight -- nine different scientists?
MR. COPLE: Objection. Vague.
A. I see nine different people listed in the author list. That's all I can say.
BY MR. MILLER:
Q. You're uncomfortable calling them scientists?
MR. COPLE: Objection. Argumentative.
A. I don't know anything about any of these people, so right now I can only tell that

they're authors on this paper.
BY MR. MILLER:
Q. Well, it does tell you something about them in the paragraph right below; right?
MR. COPLE: Objection. Argumentative.
A. In the affiliations we can certainly see what department they're -- or company they are affiliated with, yes.
BY MR. MILLER:
Q. Dr. McDuffie is with the Centre for Agricultural Medicine, right?
A. At the University of Saskatchewan, yes.
Q. And Dr. Pahwa is at the National Cancer Institute of Canada, Epidemiology, University of Toronto; right?
A. Actually I don't think so. I think that's the person with the initials JRM.
Q. JRM.
A. McLaughlin.
Q. I see. Thank you. Yes, ma'am. Yes. Other scientists here who are authors are at the Centre for Health Evaluation & Outcome Sciences at St. Paul Hospital in Vancouver, British Columbia?

A. That is another affiliation for one of the authors, yes.
Q. And one of the authors is at the Alberta Cancer Board, the division of epidemiology, right?
A. That is correct.
Q. One of the authors is at the department of pathology at the University of Saskatchewan; right?
A. Correct.
Q. So is it fair to call these people scientists?
MR. COPLE: Objection. Vague.
A. Again, they all have, at least the ones that you have referenced here, have either academic or some kind of government affiliation. But, again, I don't know any of these people or their background or training.
BY MR. MILLER:
Q. It's fair to say that, of course, you have never studied non-Hodgkin's lymphoma and its relationship to glyphosate, true, prior to being asked to be an expert in this case; right?
MR. COPLE: Objection. Vague.
A. I've never done my own research on

glyphosate and NHL. And before being retained by Hollingsworth, I had not done a full review of that literature.
BY MR. MILLER:
Q. And when you were retained by Hollingsworth, you understood they were retained by Monsanto; right?
A. I knew who the defendant was, yes.
Q. Okay. If you'd please turn with me to Page 1161 of this peer-reviewed journal, Table 8.
A. Okay.
Q. "Phosphonic acid: glyphosate." Do you see where I am in the table regarding individual compounds?
A. I do.
Q. And it shows for exposed greater than two days per year. Am I reading that correctly?
A. Right. There is unexposed, greater than zero to less than or equal to two days, and then greater than two day categories, yes.
Q. And for greater than two days, it shows an odds ratio of what, Doctor?
A. The odds ratio that's listed in this table is 2.12. But again, that number, you

know, isn't controlling for other chemicals.
And you'll also notice that almost every other -- in fact, every other pesticide or herbicide that they investigated also has an odds ratio above 1.
Q. The odds ratio of 2.12 for greater than two days' use of glyphosate, is that a statistically significant finding?
A. So meaning that the confidence intervals don't overlap 1, yes. But there's really no point in evaluating statistical significance if you don't have confidence in the internal validity of the findings.
Q. Well, these people apparently did have internal validity in the findings because they published this; right?
MR. COPLE: Objection. Argumentative.
A. No. I think we can find a number of examples where there are limitations in the methodologic design or the statistical analysis of a study, and those papers get published, and that's why it's so important to interpret all these estimates in light of the limitations of those studies. It's why putting the numbers, just easily putting them into a meta-analysis

Page 70

doesn't really give us very valuable information about whether an exposure causes disease.
BY MR. MILLER:
Q. Were there limitations in your high ejaculation study?
A. Yes, there were definitely limitations in the ejaculation frequency study, and we disclosed many of those limitations in the Discussion section.
Q. Yet, in spite of those limitations, it provided strong evidence; right?
MR. COPLE: Objection. Argumentative.
A. As I said before, that is not how it was characterized. We said the strongest evidence to date in -- was what that study provided. And even in light of some of the limitations, those findings were still compelling.
BY MR. MILLER:
Q. In the McDuffie study on Page 1161, under the table, if you'd look on the right side of the typed information, they explain to us, "We have included many people in many occupations as well as home and garden users."
Do you see that sentence there?

Page 71

A. I do.
Q. "These are groups for whom we did not find extensive validation studies. Their inclusion may have biased our dose-response findings towards the null."
What does "biased our dose-response findings towards the null" mean, ma'am?
A. So, I mean, generally I think anything -- anytime something is biased towards the null, it would mean that the true association is stronger than the association that you observe.
Q. Would you turn to Page 1162, please?
A. Okay.
Q. If you would look, please, printed underneath the table, first sentence, first paragraph, I want to read it to you and ask you a question. "Our results support previous findings of an association between non-Hodgkin's lymphoma and specific pesticide exposures."
That was their conclusion; true?
A. That's what it says here in this last paragraph.
Q. And you'll see under "Acknowledgements" they had an advisory

Page 72

committee for the project.
Do you see that, ma'am?
A. Yes, I do.
Q. What's an advisory committee for a project? What's it mean to a layperson, I guess I'm trying to ask.
A. Honestly, I'm not really sure. I've not been involved in an advisory committee, so it seems like it would vary from situation to situation.
Q. If you turn with me, please, to Page 1160.
A. Okay.
Q. And I'm looking at the printed portion under the graph, to the left, first full paragraph, last sentence. And you can read it to yourself. But these authors, at least in their opinion, felt they found a dose-response relationship with glyphosate and non-Hodgkin's lymphoma; true?
MR. COPLE: Objection. The document speaks for itself.
A. I would need to, you know, reread the authors' Results section to tell you what they think that they found from the results.

Page 73

BY MR. MILLER:
Q. Let me read that sentence and ask you, "The exceptions were 2,4-D for which there was no dose-response relationship, and glyphosate, which was not significant for exposure but for which we demonstrated a dose-response relationship."
Did I read that correctly?
A. Yes, you did.
Q. And what is a "dose-response relationship"? What does that concept mean in epidemiology?
A. Sure. So the idea is that -- and, of course, dose-response is one of the Bradford-Hill criteria.
Q. Yes, ma'am.
A. But the idea is that you would be more likely to see a risk of your outcome among people who use -- or who have more of a particular exposure compared to people who have lower levels of exposure. So if you sort of look at risk in categories of increasing exposure, you would see an increasing risk of the outcome.
Q. Yes, ma'am.

And let's go, if we can, to our Exhibit 23-3, the forest plot that Dr. Chang has in her article. And when you look at McDuffie and the relative risk of 1.2, .833 to 1.74 for the confidence interval, does that accurately reflect what we see here in the McDuffie article?

A. That is the odds ratio that's taken from Table 2. It is the odds ratio that's been adjusted for only the variables that showed a statistically significant association with the outcome, so things like measles, mumps, allergy, family history, but not adjusted for any other pesticides.

Q. All right. Let's look at -- I know you disagree with it, but when you read this article, it shows a positive association, whether you agree with -- and I know you agree that it's -- that you think it's a poor quality study, it doesn't show us anything, but at least from the view of these authors, it's a positive association study; right?

MR. COPLE: Objection. Vague, asked and answered.

A. Again, positive association, if what

you mean by that is just that they found an odds ratio above 1, that is certainly reflected in their results. But as I stated before, that tells us absolutely nothing about whether the exposure is causally related to the outcome, which is, I think, what we're interested in.

BY MR. MILLER:

Q. At the end of the day, that is what we're interested in.

So would it be fair to say from a lay perspective you simply disagree with these authors?

A. I think that from, you know, taking into account the quality of the study design, and the limitations in the statistical analysis, one could conclude that the association that they observe is not reflective of a causal association.

Q. Let's look at 23-6. This is a Hardell article.

You reviewed that, haven't you, ma'am?

A. Yes, I have.

Q. Here's a copy for you (handing).

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(Whereupon, Rider Exhibit 23-6, Hardell, et al article, Exposure to Pesticides as Risk Factor for Non-Hodgkin's Lymphoma and Hairy Cell Leukemia, was marked for identification.)

BY MR. MILLER:

Q. And this is the article by Dr. Hardell, Eriksson, and Nordstrom?

A. That's correct.

Q. And it's on the issue of exposure to pesticides as a risk factor for non-Hodgkin's lymphoma; right?

A. Yes, it is. That is stated in the title, yes.

Q. It's a Pooled Analysis of Two Swedish Case-control Studies; right?

A. That is correct.

Q. And how would you explain to a layperson what a pooled analysis is?

A. So a pooled analysis is when you take the original data from more than one study, two or more studies, and you re-analyze that data, pooling the exposure and the outcome information that you have from those two studies.

Q. A recognized and valid concept within epidemiology; fair?

A. So it is a way that can be useful for looking at outcomes that are rare. That's one strength of this method. So it's a way to increase your number of outcomes.

Q. Yes, ma'am.

Have you ever performed and published a pooled analysis?

A. I don't believe so, no.

Q. Have you ever performed and published a meta-analysis?

A. I am a co-author on one meta-analysis, yes.

Q. And what is the name of that?

A. I would have to look at my CV to give you the exact title.

Q. Is it regards in some fashion prostate cancer?

A. Yes, it does relate to prostate cancer as the outcome.

Q. Okay. Let's go back to the Hardell study. This is in the journal Leukemia & Lymphoma. Is that a peer-reviewed journal?

A. I couldn't be certain. I've never

published in this journal.
Q. Dr. Hardell, the papers tells us, is an oncologist?
A. Well, I think it just tells us that he's affiliated with the department of oncology.
Q. And if you'd look at the Abstract section of the first page.
A. Okay.
Q. He tells us, "Among herbicides, significant associations were found for glyphosate."
And what's the odds ratio, ma'am?
A. The odds ratio that they list in the abstract is 3.04. He also lists associations with another chemical where they also found a statistically significant association.
Q. And is the odds ratio of 3.04 statistically significant in his findings?
A. Again, just in looking at the abstract, the confidence interval that they list here does not include the value of 1. It goes from 1.08.
But, again, I don't think it's useful to look at the statistical significance before you're comfortable with the study being free

from systematic bias, because you can have a very statistically significant finding that doesn't reflect the truth.
Q. Now, like the McDuffie article before this, at no time prior to you being retained as an expert in this case did you ever write any criticisms of either of these studies; that is true?
A. That is correct.
Q. And at times epidemiologists will write letters to the editor if they want to debate a study, right? That process occurs?
A. I think the process of writing letters to journal in response to article is sort of how some of the scientific debate happens. In a way it's an extension of the peer review process. Once a paper is out there in the literature, it gives the opportunity for scientists to talk about it.
Q. And that was my point. You were not part of that scientific process or debate prior to being retained as an expert in this case?
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. On this issue or this paper.

MR. COPLE: Objection.
BY MR. MILLER:
Q. Let's narrow it down.
MR. COPLE: Objection. Vague, argumentative.
A. I have not written commentaries on glyphosate and NHL prior to being retained in this case, that is correct.
BY MR. MILLER:
Q. Have you since -- since you've been retained, have you written to the authors of either the McDuffie paper or the Hardell paper or the journals that published them to voice your criticisms about these papers?
MR. COPLE: Objection. Vague.
A. No, I have not.
BY MR. MILLER:
Q. The authors conclude -- and if you'll please turn with me on Page 1047. I'm on the bottom left side of the paper, and let me know when you're there, and I'll wait until you're there.
A. Okay.
Q. I'm reading a sentence, about the fourth up from the bottom, "In this study,

exposure to glyphosate was a risk factor for non-Hodgkin's lymphoma."
A. Sorry, I'm struggling to find where you are.
Q. Sure. Down here at the bottom (indicating).
A. Okay. Great.
Q. The gly- -- okay. I'm going to quote it again. "Glyphosate is the herbicide now most" -- well, strike that.
"In this study, exposure to glyphosate was a risk factor for non-Hodgkin's lymphoma."
You disagree with the finding of these authors in that regard?
A. So, again, the way the authors use the term "risk factor," you know, they could just be indicating by that that what they observed was a statistical association between the exposure and the outcome. They certainly don't say here that they think that glyphosate is causally related to NHL.
Q. Well, nobody says causally related in articles in epidemiology, they talk about associations and risk factors usually; true?
MR. COPLE: Objection. Lacks

foundation, vague, argumentative.
BY MR. MILLER:
Q. You can answer.
A. Why we do the work that we do is we're interested in determining what factors are causally associated in, in this case, cancer development.
Q. How many articles have you published in a peer-reviewed journal?
A. I would have to look at my CV to give you an exact count, but --
Q. An estimate.
A. -- in terms of original published article, it's in the 70s, I believe.
Q. In how many of that 70 do you determine cause?
A. I can say with confidence I have never said in one of my discussions that I have established causality.
Q. And that's because, generally speaking, that's not what we do in these articles, we talk about association, and then as a public policy matter causality will be determined or not determined later; isn't that fair?

MR. COPLE: Objection. Argumentative, vague.
A. I think that it is important to consider sort of the body of evidence. So it would be unusual -- I can't think of a case where causality would be established in a single study.
BY MR. MILLER:
Q. Sure.
Going back to this study and these authors, do you agree with these authors that glyphosate is a risk factor for non-Hodgkin's lymphoma, or not?
MR. COPLE: Objection. Asked and answered.
A. In the way that I use risk factors, no, I do not agree with the authors.
BY MR. MILLER:
Q. Yes, ma'am.
Going to Exhibit 23-3, Dr. Chang's forest plot for these authors, Dr. Hardell, they show a relative risk of 1.85 and a confidence interval from .55 to 6.2. Is that accurately reflected in Dr. Chang's forest plot now that you have the Hardell article with you there?

MR. COPLE: Objection. Asked and answered.
A. So I believe that the point estimate and confidence interval in the Chang meta-analysis comes from Table 7 of the Hardell study. So, yes, that is the point estimate and confidence interval that they used. But, again, it -- that point estimate doesn't reflect -- as actually the authors Chang and Delzell in the introduction of this paper point out, the meta-analysis does not take into account some of the severe limitations in the quality of these studies.
BY MR. MILLER:
Q. How would you define to a layperson what a risk factor is?
A. So a risk factor for disease is a factor that would increase the probability of you having that disease, controlling for other factors.
Q. Let's look to a new article here. We're making progress. Let's look at Dr. De Roos's 2003 article. This will be 23-7.

(Whereupon, Rider Exhibit 23-7, De Roos, et al article, Integrative assessment of multiple pesticides as risk factors for non-Hodgkin's lymphoma among men, was marked for identification.)
BY MR. MILLER:
Q. You reviewed this article before?
A. This is -- yes, I have reviewed this article before, yes.
Q. And it's written by -- one, two, three, four, five, six -- seven, may I call them scientists?
A. I would just call them authors.
Q. Authors.
Okay. Do you know any of them?
A. I do not know any of the authors, no.
Q. Is this a peer-reviewed journal?
A. The -- this is the Journal of Occupational and Environmental Medicine. Again, I've never published in this journal, so I can't be certain.
Q. We can agree that this is an "assessment of multiple pesticides as risk factors of non-Hodgkin's lymphoma among men"?

Page 86

A. That's what's stated in the title, yes.
Q. And if you'd please turn with me to Table 3.
A. Okay.
Q. And in this article in Table 3, what these authors are looking at is the "Effect estimates for use of specific pesticides and non-Hodgkin's lymphoma incidence, adjusting for use of other pesticides"; right?
A. So I believe the -- they present results here that are both unadjusted and adjusted for other pesticides, yes.
Q. And they adjust under two methodologies, logistic regression and hierarchal regression; right?
A. Logistic regression is not controlling for other pesticides.
Q. The logistic regression odds ratio for glyphosate in Table 3 indicates an odds ratio of 2.1?
A. Here it is. The unadjusted logistic regression analysis, yes, finds an odds ratio of 2.1.
Q. Statistically significant?

Page 87

A. Again, if you want to look at that, that's fine, but it doesn't tell you anything if you don't have confidence in that point estimate because of issues of internal validity.
Q. I understand you don't agree with it. But is it statistically significant per these authors?
A. Well, I --
MR. COPLE: Objection. Asked and answered.
A. Actually I don't agree with it because, again, statistical significance doesn't mean anything if you put tight confidence limits around an estimate that's incorrect.
BY MR. MILLER:
Q. And adjusted for hierarchal regression, the odds ratio is 1.6; right?
A. The odds ratio is reduced to 1.6 after their approach for controlling for other pesticides, which was hierarchal logistic regression, yes.
Q. And that's a 60 percent increase; right? That's what 1.6 means?
A. If you had confidence in the result that you were getting because you felt like the

Page 88

study had good internal validity, in that case you would interpret an odds ratio of 1.6 as having 60 percent increase in the odds of that outcome.
Q. As an author, as a scientist, you wouldn't publish a data that you didn't have confidence in; right?
MR. COPLE: Objection. Vague, argumentative.
A. I agree that I would -- as an epidemiologist, part of my process is to try and determine all of the explanations for my findings, other than the fact that there's a causal association between the exposure and the outcome.
BY MR. MILLER:
Q. And one of your criticisms about this study is you think that there's confounding with other pesticide use; right? That's one of your criticisms?
A. I think that the results here, I'm seeing the odds ratio decrease from 2.1 to 1.6, is consistent with there being confounding from other pesticides, yes.
Q. Let's go to Page 7 of 9.

Page 89

A. Okay.
Q. And if you look at, please -- and I'm on the left side about halfway down.
A. Okay.
Q. I'll read you what the authors say in that regard. "Adjustment for multiple pesticides suggested that there were few instances of substantial confounding of pesticide effects by other pesticides."
Do you see that?
A. I do see that sentence, yes.
Q. So fair to say that the authors disagree with you that there was substantial confounding by other pesticides; true?
A. So, again, I can't really tell you what the authors mean without having the larger context of this discussion, which I don't completely recall. But what they're saying is that there were few instances of substantial confounding of pesticide effects by other pesticides. We don't know what chemicals they're referring to, or certainly what they define as substantial.
Q. Do you think this article has a problem with systematic recall bias?

A. I would have to just take a moment again to refresh myself --
Q. Sure. Go ahead.
A. -- with the methods.
(Witness reviewing document.)
A. So I think that, you know, whenever we're conducting a retrospective case control study, you know, we have to keep in mind that the cases who are sort of potentially searching for a cause of their cancer might provide a different quality of exposure reporting than the people without cancer, the controls. So I think that, you know, in any retrospective case control study we'd be concerned about that, even -- you know, especially since we're looking for exposures, you know, a relatively long time ago.
And then on top of that there is a potential issue with proxy respondents, so that the quality of information that you might get would vary between the cases who reported their exposure directly and the cases for whom next of kin was used to gather that exposure information.
Q. The authors considered recall bias and

selection bias and concluded they did not have a problem with it in this article; true?
A. I would have to reread their discussion.
Q. If you'd look at Page 8, and halfway down on the left, I'll read you a sentence. It says -- let me know when you have it. Okay?
A. Okay.
Q. "Second, the fact that there were few associations suggests that the positive results we observed are not likely to be due to a systematic recall bias for pesticide exposures, or selection bias for the subgroup included in the analyses of multiple pesticides."
So they considered it and felt it wasn't a problem; true?
A. I agree that the authors came to the conclusion that those weren't major issues, but I would sort of -- I would disagree with --
Q. I understand.
A. -- the impact that that could have on the findings.
Q. And just a follow-up question.
Like the last article, you did not submit any letters to the editor criticizing

this study; right?
A. I have not submitted letters to the editor, no.
Q. And if you go back to Dr. Chang's forest plot, you'll see that De Roos '03 is on the plot. And is it accurately represented?
MR. COPLE: Objection. Asked and answered.
A. So the point estimate and confidence interval in the Chang and Delzell systematic review and meta-analysis comes from the hierarchal logistic regression results for glyphosate in the Hardell paper.
BY MR. MILLER:
Q. Okay. Let's move on to --
A. Sorry, the De Roos paper. I apologize.
Q. Yes. Under De Roos '03?
A. Exactly.
Q. Yes, thank you. All right. We'll move on.
Let's talk about Eriksson '08.

(Whereupon, Rider Exhibit 23-8, Eriksson, et al article, Pesticide exposure as risk factor for non-Hodgkin lymphoma including histopathological subgroup analysis, was marked for identification.)
BY MR. MILLER:
Q. You've reviewed this paper?
A. I have, yes.
Q. And we can agree the International Journal of Cancer is a peer-reviewed journal?
A. It is, yes.
Q. Have you published in that journal?
A. I have, yes.
Q. Respected journal?
A. Yes.
Q. Have you been a peer reviewer for that journal?
A. Yes, I have.
Q. How many peer reviewers do they generally have review a paper?
A. Honestly, I couldn't recall. It's been awhile.
Q. And so there's -- one, two, three -- four authors to this paper that's in the

Page 94

peer-reviewed journal, International Journal of Cancer; true?
A. There are four authors listed, yes.
Q. And this is a paper on the issue of pesticide exposure as a risk factor for non-Hodgkin's lymphoma; true?
A. Correct.
Q. And generally -- we'll get to some quotes in a minute. But generally speaking, they found some positive associations for glyphosate and non-Hodgkin's lymphoma; true?
MR. COPLE: Objection. Lacks foundation.
BY MR. MILLER:
Q. And I know you don't agree with them that these findings are significant, but that's what they found?
MR. COPLE: Objection. Lacks foundation, vague.
A. The associations that they found, yes, were above 1. But, again, I think that those results can be explained by systematic bias.
BY MR. MILLER:
Q. Yes, ma'am.
Let's read a couple of quotes and see

Page 95

if this is what the authors say. The Eriksson paper, and I'm looking at the abstract section, they say, "Exposure to glyphosate gave an odds ratio 2.02." Statistically significant; true?
A. That is what it says, that the glyphosate gave OR 2.02, and then they list a confidence interval that does not include the value of 1.
Q. Yes.
And for greater than ten-year latency period, the odds ratio was 2.26, and statistically significant; right?
A. Again, 2.26, and then they list a confidence interval that does not include the value of 1, that is correct. But, again, those results, especially for the ten-year latency period, aren't controlling for other chemicals.
Q. And have you done any calculations to see what the odds ratio would be if they control for the other pesticides?
A. It's not possible to do that with the information that's provided in the paper. And, also, controlling for other pesticides requires that you are collecting the information on those pesticides, and at a quality that's sufficient

Page 96

to control for them.
Q. And I repeat this question. You did not write any letter to the editor to criticize the Eriksson paper; right?
A. I have never written a letter, no, to criticize the Eriksson paper.
Q. Before I forget, have you and Dr. Mucci e-mailed each other about your respective work here as expert witnesses for Monsanto?
A. No, we have not.
Q. Have you spoken to each other about it?
A. We have not -- we are both aware that we are being retained by Hollingsworth as expert witnesses, but we have not spoken about the case, no.
Q. Who did they retain first, you or Dr. Mucci?
A. I have no idea.
Q. Did you first get contacted by Dr. Mucci about this, or by the lawyers of Monsanto?
A. It was attorneys at Hollingsworth LLP that contacted me.

Page 97

Q. Did any other epidemiologists tell you that they were going to be calling?
A. No. It was the attorneys at Hollingsworth that contacted me.
Q. These authors thought about the issue of misclassification; right?
MR. COPLE: Objection. Vague.
A. Can you tell me what you mean by that? What type of misclassification?
BY MR. MILLER:
Q. Let's hit it at 30,000 feet. What is misclassification in the context of epidemiology?
A. Well, there's both exposure and disease misclassification, so those are sort of two separate misclassification issues. And then within both exposure and disease misclassification you can have differential and non-differential misclassification. I can explain what that means, if you'd like.
Q. Yes, in a bit we will, but I think I'm fairly familiar with it.
But here they talked about exposure misclassification. The authors discussed that and decided that if there was any, it would only

Page 98

weaken their results; right?
MR. COPLE: Objection. Lacks foundation.
A. I would need to reread the paper to determine what the authors -- how they interpreted that. I don't recall.
BY MR. MILLER:
Q. Yes, ma'am.
Let's turn to Page 1660, in their Discussion section there on the right side.
A. Okay.
Q. Yes. I'm reading about the third paragraph down, halfway through the paragraph, "Exposure to pesticides may be difficult to assess, and some misclassification regarding quantity of exposure has probably occurred, but such misclassification would most probably be nondependent of case/control status, and therefore only weaken any true risk."
That's true, isn't it?
A. I would disagree with that statement. In a case control study where you're evaluating exposure after disease has occurred, it's a very strong assumption to assume that the level of misclassification you have in the cases would be

Page 99

equivalent to that that's in the controls.
Q. What evidence do you have that they're not correct on that?
A. So I mean, first of all, all of my training as an epidemiologist where we're cautioned to be concerned about the quality of exposure reporting in retrospective case controlled studies. It's sort of a fundamental concept in case control design. But, you know, when it's one of those issues that, you know, just because you can't, you know, show that it's happening, you still need to interpret your findings in consideration of the impact that it would have on those results. And -- yeah.
Q. If you'd please turn to Page 1659.
A. Okay.
Q. On Table 2 in this peer-reviewed article by Dr. Eriksson and three other scientists from International Journal of Cancer, they have a table about exposure to various herbicides; true?
A. Yes, they do.
Q. And one of those herbicides is glyphosate; right?
A. Yes, it is listed in the table.

Page 100

Q. And in that table they say if you've been exposed to greater than ten days of glyphosate, your odds ratio is 2.36; right?
A. So this is an analysis where they attempted to take into account the duration of exposure using this relatively low category of ten total days. And, again, this analysis is unadjusted for other pesticides. And there they find an odds ratio of 2.36, yes.
Q. 2.36 means it would be over a doubling of the risk; right?
A. Only if you, again, believe in the internal validity of this study, and that that result isn't confounded by the use of other pesticides or other risk factors for NHL.
Q. I understand the caution.
But just to assume hypothetically in any study, if it was about smoking or lung cancer, an odds ratio of 2.36 means we have a doubling of the risk; right?
MR. COPLE: Objection. Asked and answered, incomplete hypothetical.
A. Again, it's easy to find an association between variables, so an odds ratio of 2.36 is consistent with that outcome being

Page 101

twice as common among -- that exposure being twice as common among people with the outcome, but it doesn't tell you what the causal relationship is.
BY MR. MILLER:
Q. Dr. Rider, can you point to me a study done on the issue of glyphosate and non-Hodgkin's lymphoma where the results indicated people who were exposed to glyphosate had less non-Hodgkin's lymphoma than people who were?
A. Well, I think, no, I can't point to a study where I could confidently tell you that glyphosate exposure was a protective factor for non-Hodgkin's lymphoma, if that's what you're saying. If you're asking me if there are studies where we've observed relative risk estimates that are below 1, I can certainly point you to those examples.
Q. Please do.
A. So, for instance, if we look at the dose-response analyses in the Agricultural Health Study.
Q. Any others besides the Agricultural Health Study? Because we're going to look at

Page 102

that, as you might imagine, in more detail later.
A. That is the first one that comes to mind.
Q. Do any others come to mind?
A. I would have to review the results of the pooling project data, but there could be an example in there as well.
Q. That's the NAPP study?
A. Correct.
Q. Any others?
A. That's all I can think of off the top of my head. But, again, it would be helpful to either look at my report or to see the original studies to say for certain.
Q. Let's go back to this peer-reviewed article by Eriksson and his three colleagues, and we're still on Page 1659.
These scientists also indicate on Table 3 an odds ratio for B cell lymphoma; right? Do you see that, ma'am?
A. I do, yes.
Q. And, of course, B cell lymphoma is a form of non-Hodgkin's lymphoma; right?
A. That is correct, yes.

Page 103

Q. And they show an odds ratio for glyphosate for B cell lymphoma of what, ma'am?
A. The odds ratio listed there is 1.87.
Q. And that is statistically significant?
A. Again, I don't really think it's meaningful to talk about that, because I don't have confidence in the point estimate. So, again, as I said before, you can have a very precise confidence interval around an estimate that's inaccurate and not reflective of the truth.
Q. Yes. And I understand that is your strongly held belief. But it is statistically significant?
MR. COPLE: Objection. Asked and answered.
A. Again, if you're asking me does that confidence interval include the value of 1, actually it does. It's not statistically significant. It goes from .998 to 3.51.
BY MR. MILLER:
Q. So the p-value would be what in that instance?
A. I can't do that math in my head. I can't tell you what the exact p-value would be.

Page 104

Q. These authors did a univariate analysis as well as a multivariate analysis; right?
A. I don't know that I'd describe it as univariate. I believe they adjusted for the matching factors in the study, which is appropriate, but they did do sort of a minimally adjusted analysis and then an analysis adjusted for additional variables, yes.
Q. And there was still an increased risk under the multivariate analysis; true?
A. What results are you referring to?
Q. Yes, ma'am. 1661, Table 7.
A. Okay. I see it there. So the results of the multivariate analysis, they found an odds ratio of 1.51, and that was substantially reduced from the odds ratio that was not controlling for other factors.
Q. For the univariate risk they saw a doubling of the risk, and for the multivariate risk they saw a 50 percent increased risk; right?
A. Again, I think that's not an accurate way to portray the findings because it makes it sound like you're making a causal interpretation

Page 105

of the findings, which I don't think is appropriate.
Q. Setting aside, I'm not trying to make a causal association on one study, but that -- the numbers mean 50 percent more likely or 100 percent more likely, and I'm -- whether they're valid or not, but isn't that what odds ratios mean?
MR. COPLE: Objection. Asked and answered.
A. If you had confidence in the methods of the study and the internal validities of the study and you found an odds ratio of 1.5, only in that case would you say there was a 50 percent increase in the odds of the outcome.
BY MR. MILLER:
Q. Yes. Okay. All right. So last question on this peer-reviewed study, and that is, could you please take Dr. Chang's 23-3 chart and look to see if Eriksson is accurately portrayed there by Dr. Chang?
MR. COPLE: Objection. Asked and answered.
A. So the Eriksson results that are included in the Chang and Delzell systematic

Page 106

review and meta-analysis come from this Table 7, the multivariate findings.
MR. MILLER: All right. I've been advised we have to take a break to change tapes.
A. Okay.
THE VIDEOGRAPHER: Going off the record. The time is 11:08.
(Whereupon, a recess was taken.)
THE VIDEOGRAPHER: Back on the record. The time is 1:24.
BY MR. MILLER:
Q. All right, Doctor, back to work.
Before we move -- we were going through the studies, the case control studies, I want to go back to a De Roos '03. And we talked about the logistic regression and the hierarchal -- how do you say that?
A. Hierarchical.
Q. Hierarchical. I'll forget that.
But I thought you mentioned logistic regression was not -- had not been adjusted?
A. That's right. The authors don't indicate that the logistic regression analysis has been adjusted for other pesticides.
Q. Let's go back and look at Table 3.

Page 107

Mr. Traverse wanted me to point this out. If you'll look and see where it says "Logistic regression." Do you see on Table 3?
A. I do.
Q. And then the asterisk underneath Table 3 it says, "Each estimate is adjusted for use of all other pesticides listed in Table 3."
Do you see that?
A. I do see that. But when you read the methods, it appears as though it is the hierarchical logistic regression that is adjusted for other pesticides, while the logistic regression is not.
Q. So you agree that at least in this table where it says, "Effect estimates for use of specific pesticides and non-Hodgkin's lymphoma incidence, adjusting for use of other pesticides," asterisk, and then it goes to the asterisk, it says, "Each estimate is adjusted for use of other pesticides."
MR. COPLE: Objection. Objection, asked and answered.
A. So I agree with you that there is an asterisk in the title of the table that is referred to as a footnote at the bottom of that

Page 108

table, but the asterisk doesn't tell us which analysis they're referring to when they say, "Each estimate is adjusted for use of other pesticides."
And then when you go to the Methods section, they do not discuss controlling for other pesticides in their logistic regression analysis.
BY MR. MILLER:
Q. Do they say in the Methods section we did not control for other pesticides?
A. I would need to go back to the Methods to tell you exactly what they say.
(Witness reviewing document.)
A. So if you look in the middle of the Statistical analyses paragraph on Page 2 of 9.
Q. Where are you now?
A. In about the middle of the Statistical analyses paragraph on Page 2 of 9 --
Q. Yes.
A. -- they talk about how, "We employed two approaches to our analyses: standard logistic regression (maximum likelihood estimation) and hierarchical regression, calculating odds ratios to estimate the relative

Page 109

risk associated with each pesticide. All models included variables for age and indicator variables for the study site. Other factors known or suspected to be associated with NHL, including first degree relative with hematopoietic cancer, education, and smoking, were evaluated and found not to be important confounders of the associations between NHL and pesticides. The standard logistic regression models did not assume any prior distribution of pesticides effects, in contrast to the hierarchical regression modeling."
So there in that paragraph they do not talk about how the logistic regression models included other pesticides as potential confounders, but then they go through a whole column of methods describing their approach, hierarchical regression that controls for other pesticides.
Q. Have we already asked, do you agree that Eriksson on the Chang chart is correctly portrayed? And I'm sorry to bounce around on you, but I'm trying to move back now.
A. Sorry. So now we're going back to --
Q. Back to the Eriksson.

Page 110

A. -- Eriksson?
Q. Yes, ma'am. And asking if -- I think I've already asked. If I have, I apologize. I want to make sure that the Chang chart forest plot Eriksson is accurately represented on that?
A. So we did go over that the odds ratio that's presented here in the Chang and Delzell systematic review and meta-analysis does come from Table 7 of the Eriksson paper. But as I said before, I'm just including that point estimate and confidence interval there is really meaningless unless you consider all of the threats to internal validity, as well as the fact that, you know, these authors found associations with every chemical that they evaluated when they looked at NHL, which is consistent with some form of systematic bias.
And, also, you know, if we wanted to look at my report, I outline several other issues also with the Eriksson study.
(Whereupon, Rider Exhibit 23-9, Cocco, et al article, Lymphoma risk and occupational exposure to pesticides, was marked for identification.)
BY MR. MILLER:

Page 111

Q. 23-9, the Cocco study, you reviewed that before?
A. I did read the Cocco study, yes.
Q. The Cocco study, there's -- one, two, three, four, five, six, seven, eight --
MR. COPLE: Do we have a copy?
MR. MILLER: Of course (handing).
BY MR. MILLER:
Q. -- 18 authors?
A. I would need to count them. One, two, three, four, five, six, seven, eight, nine, ten -- yes, there are 18 authors on this publication, correct.
Q. And the name of this publication is the Occupational Environmental Medicine?
A. Oh, I'm sorry, the name of the journal?
Q. Yes.
A. Occupational and Environmental Medicine, yes, that's correct.
Q. A peer-reviewed journal?
A. I have not published in this journal, so I'm not certain.
Q. Do you know any of these authors?
A. I do know two of these authors.

Page 112

Q. And who are they?
A. Paul Brennan and Paolo Boffetta.
Q. Are they well-respected in their field?
A. Yes. I believe they are well-respected epidemiologists, yes.
Q. Paolo Boffetta used to be the head of IARC?
MR. COPLE: Objection. Lacks foundation.
A. I know that Dr. Boffetta had some role at IARC, but honestly I don't know what that role was.
BY MR. MILLER:
Q. Do you know where he is now?
A. No, I do not know where he's currently affiliated.
Q. Let's go, please, to Page 4, and please go to Table 4 on Page 4. Let me know when you're there.
A. Okay. Yep, I'm there.
Q. This is "Risk of B cell lymphoma and occupational exposure to selected active ingredients of pesticides"; right?
A. That is correct.

Page 113

Q. And they list one of those pesticides as glyphosate; right?
A. That is correct.
Q. And the odds ratio they list is 4 point -- I'm sorry, 3.1?
A. That is true. But what's more striking to me in this table is that the analysis is based on four exposed cases and two exposed controls only.
Q. You'll agree that non-Hodgkin's lymphoma is a rare cancer?
MR. COPLE: Objection. Lacks foundation.
A. In terms of cancers in the US, yes, there are many more common cancers.
BY MR. MILLER:
Q. Let's go to the next page. I'm going -- I'm just going to back up and not even ask a question.
Is 2,4-D a herbicide? Is that your understanding?
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. That's a broad question.
MR. COPLE: Objection. Vague.

Page 114

A. I know that 2,4-D was a common chemical that has been evaluated in many of the same studies that has identified -- that have looked at glyphosate.
BY MR. MILLER:
Q. Yes.
And have these studies indicated an association between 2,4-D and an increased risk of non-Hodgkin's lymphoma?
MR. COPLE: Objection. Vague, lacks foundation.
A. Yes, some of the studies have identified an association between 2,4-D and NHL.
BY MR. MILLER:
Q. And if a person is exposed to two substances, both of which increase the risk of a condition, would that make them at an even more increased risk than being exposed to only one of those items?
MR. COPLE: Objection. Vague, incomplete hypothetical.
A. Yeah, it really depends on the -- on the specific relationship between those exposures and between the disease.
BY MR. MILLER:

Page 115

Q. Could not teach that to a class in the abstract without knowing the specific exposures?
A. Not based on the way that you described it, no.
Q. And I know I'm not a real smart guy. What's wrong with the way I described it?
A. Well, I don't know what concept you're trying to get at in your description.
Q. Well, I'm not trying -- just forget about pesticides, forget about herbicides.
A. Okay.
Q. If condition A -- exposure to A can cause an injury, and if separately exposure to B can cause an injury, would I increase my risk of that injury if I was exposed to both A and B?
MR. COPLE: Objection. Vague, incomplete hypothetical.
A. It depends whether there was a synergistic relationship between A and B.
BY MR. MILLER:
Q. And how would you describe to a layperson what a synergistic effect is?
A. So when we're talking about sort of biological synergy, that would mean that the effect of exposure A on the outcome and the

Page 116

combined exposure with exposure B were sort of more than the sum total of the individual exposures.
Q. Does chewing tobacco cause oropharyngeal cancer?
MR. COPLE: Objection. Vague.
A. Actually, I'm not sure.
BY MR. MILLER:
Q. Okay. Does -- we've talked about smoking causes lung cancer. And here's my next question.
Does smoking and moderate drinking increase the risk of cancer --
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. -- over one who smokes and does not drink?
MR. COPLE: Objection. Vague.
A. Sorry, which cancer are we talking about?
BY MR. MILLER:
Q. Any cancer.
MR. COPLE: Objection. Vague.
A. So it depends on the cancer that we are talking about.

Page 117

BY MR. MILLER:
Q. Okay. Any cancer, I mean, just any one.
MR. COPLE: Objection. Asked and answered.
A. I can't tell you the answer to that question if I don't know what specific cancer we're talking about. It would certainly vary according to which cancer we're talking about.
BY MR. MILLER:
Q. Okay. Some cancers it would increase the risk, and some it wouldn't?
MR. COPLE: Objection. Asked and answered.
A. Again, could you rephrase the question that you're asking, please?
BY MR. MILLER:
Q. I'm not trying to hide the ball. I mean, I'm just trying --
A. I just don't understand the question.
Q. Okay. Like smoking and drinking as compared to just smoking, does that increase one's risk of lung cancer?
A. Not that I'm aware of, no.
Q. How about oropharyngeal cancer?

Page 118

MR. COPLE: Objection. Asked and answered.
A. So again, if what you're asking is, is there a biological interaction between smoking and drinking with respect to oropharyngeal cancer, if that's what you're asking, I'm actually not sure. I believe that both of those are independent risk factors for oropharyngeal cancer. I don't know if there's a synergistic relationship. I'm not sure.
BY MR. MILLER:
Q. Going back to the last study we looked at, the Cocco study, the odds ratio 3.1 that we saw in Table 4 --
A. Mm-hmm.
Q. -- do you remember that conversation?
Do you criticize this study or this result?
A. I think that an analysis based on four exposed cases and two exposed controls should be interpreted as exploratory at the very most.
Q. Let's move on to the next study.

Page 119

(Whereupon, Rider Exhibit 23-10, Schinasi and Leon article, Non-Hodgkin Lymphoma and Occupational Exposure to Agricultural Pesticide Chemical Groups and Active Ingredients, was marked for identification.)
BY MR. MILLER:
Q. We're at our first meta-analysis. Can we look at 23-10 together? This is Schinasi. Am I pronouncing that right?
A. I have no idea.
Q. I don't know. Nor do I. You've -- have you reviewed this?
A. I did look at this, yes. But as I said before, none of the analyses really weighed into my own independent expert opinion.
Q. You say you looked at it. Did you read the whole thing?
A. I probably skimmed over the whole thing. I don't think I read the whole thing thoroughly.
Q. And this is published in the International Journal for Environmental Public Health, I don't know what the RES stands for, frankly -- Research and Public Health.

Page 120

A. Yes, that's correct.
Q. Is it a peer-reviewed journal?
A. Again, I haven't published in this journal, so I couldn't be certain.
Q. Oh, I've got to switch with you. I gave you the wrong copy. Sorry. All right. Doctor, that same thing, just not my work copy (handing). Okay?
A. Okay.
Q. Do you know either of the authors?
A. I do not.
Q. And the issue they're studying in this article is Non-Hodgkin's Lymphoma and Occupational Exposure to Agricultural Pesticide Chemical Groups and Active Ingredients; right?
A. That is correct.
Q. And it's a meta-analysis; right?
A. Well, like the Chang and Delzell paper that we've also been referring to, it is a systematic review and meta-analysis, so the combining of the relative risks and the confidence intervals is just one sort of small piece of the paper.
Q. Let's look at this meta-analysis, if we could, please, on Page 4513.

Page 121

A. Okay.
Q. And that is a table on the meta-analytic summary estimates of association between herbicides and insecticides with non-Hodgkin's lymphoma; right?
A. That is correct, yes.
Q. And one of the herbicides that they look at is glyphosate; right?
A. That is listed here in the table, yes.
Q. And they give us a meta-risk ratio estimate, and for glyphosate they give us 1.5 as the risk ratio; right?
A. That is the number that's listed in the table, yes.
Q. And the width of the confidence interval is 1.1 to 2.0; right?
A. That is correct. But as I've said, unless you believe that the -- all of the studies that are included in this meta-analysis have internal validity, there's really no meaning to that point estimate or the confidence interval.
Q. And the papers that these authors say contribute to this meta-analysis are papers 30, 31, 33, 43, and 46 in their footnotes; right?

A. 30 to 33, 43, and 46, that is correct.
Q. So that would be the De Roos paper in '03?
A. Yeah, I'm there.
Q. And it would be the De Roos paper in '05, which is the Agricultural Health Study; right?
A. That is correct.
Q. And it would include Eriksson's study from '08 that we've just discussed; right?
A. Correct.
Q. And they also analyzed the Hardell study from '02?
A. Correct.
Q. And also in the Schinasi meta-analysis. They looked at the McDuff paper that we've talked about; right?
A. McDuffie, yes.
Q. McDuffie.
And finally, they looked at the Orsi paper, right?
A. Yes, that is correct.
Q. And when they looked at all these papers and performed a meta-analysis on them, at least to these authors they felt there was a

50 percent meta-risk ratio; right?
MR. COPLE: Objection. Asked and answered.
A. So as I said, that is the result of their meta-analysis from those papers that you just -- that you just listed. I think it's important to point out that that list does not include some of the more recent and, in my opinion, the strongest evidence that we have to date on glyphosate and NHL, as was included in the subsequent meta-analysis by Chang and Delzell. But even more importantly, that 1.5 doesn't take into account the systematic bias that could have affected the results in all of those individual studies.
And if, you know, we read through the systematic review portion of this article, as well as the Chang and Delzell article, I think you get a much better sense for how there could be alternative reasons for those odds ratios that were above 1, other than that glyphosate is a cause of NHL.
BY MR. MILLER:
Q. You said "could have affected," but you certainly can't say to a reasonable degree

of scientific certainty did affect; right?
MR. COPLE: Objection. Argumentative.
A. Can you tell me, affect what? What do you mean?
BY MR. MILLER:
Q. You said -- I want to go back and look. Give me a second here. You said that this didn't -- I want to go back and get the right language here. One second, excuse me.
"But even more importantly, that 1.5 doesn't take into account the systemic bias that could have affected the results in all of these individual studies." And "could have affected," but you can't say to a reasonable degree of scientific certainty did affect. And that's fair; right?
MR. COPLE: Objection. Argumentative.
A. I think that from what we now know from the Agricultural Health Study and from the NAPP, it seems very clear that these studies did have systematic bias that influenced their results.
BY MR. MILLER:
Q. How does the -- you're referring to the AHS unpublished study, is that --

A. Or even the 2005 study.
Q. And we're going to talk about both of those in more detail. But let's go back to the published meta-analysis by Schinasi and Leon --
A. Okay.
Q. -- still on Table 5.
In addition to showing a 50 percent risk for glyphosate, they also looked at the glyphosate association specifically with B cell lymphoma; right?
A. Yes.
Could you remind me of that page number again?
Q. Yes, ma'am. That's 4513.
A. Thank you.
Okay. Yes, they also present another estimate for the glyphosate association specifically with B cell lymphoma.
Q. And they showed a doubling of the risk, right?
A. I wouldn't characterize it that way. I would say in their meta-analysis, using all of these studies that I've told you I think have some very important limitations, they found meta-analysis RR of 2.0.

Page 126

Q. And they cite as the studies they used in that finding as the Eriksson study, and 63, which is the Cocco study that we just looked at, right?
A. That is correct, yes.
Q. And you disagree that these are accurate findings; right?
A. I do. As we talked about before, the Cocco study was based on only four exposed cases. I definitely don't believe you can make causal inferences based on four people. And the Eriksson study was -- had a number of issues, including the fact that every single chemical that was investigated in the Eriksson study -- I can't tell you how many there are offhand, but if we looked at my report we could tell. Every single chemical they looked at showed an association with NHL. So we could take that to mean that every single one of those chemicals is associated -- is a cause of NHL, or the much more likely explanation is that study suffers from a systematic bias.
Q. Let's look at Table 5. It's not true to say that every chemical was associated with a risk, is it, Doctor?

Page 127

MR. COPLE: Objection. Argumentative.
A. Sorry, Table 5 in this -- in the meta-analysis?
BY MR. MILLER:
Q. Yes.
A. Okay.
Q. Alkalol, whatever that is, was not associated with an increased risk, was it?
A. I was talking about the Eriksson study. So you were asking me about whether I believe those results were true for B cell lymphoma specifically, and I was explaining that --
Q. I see.
A. Yes.
Q. I misunderstood you then.
But you'll agree from Table 5 on this meta-analysis done by Schinasi, they list several chemicals where they don't show an increased risk; true?
A. Again, so I mean, I think, you know, all of these meta-analysis risk ratios are dependent solely on the quality of the studies that went into developing that meta-analysis estimate. So, you know, I haven't reviewed all

Page 128

of the studies for all of these other chemicals, so I can't speak to their quality. I would need to go and look at all those primary studies to tell you.
Q. For Alkalol they do not show an increased risk; true?
MR. COPLE: Objection. Asked and answered.
A. I'm sorry. Alkalol in this Table 5?
BY MR. MILLER:
Q. Yes. It's at the top of Table 5.
MR. COPLE: Same objection.
A. So, you know, I can look at this meta-risk ratio in this table from the meta-analysis component of this systematic review and meta-analysis, and indeed it does show that there is a risk ratio of .9, but that risk ratio means absolutely nothing if we don't interpret it in terms of the context of the quality of those studies that it went into generating that meta-analysis risk ratio estimate.
BY MR. MILLER:
Q. And they showed no increased risk for trifluralin, right?

Page 129

A. Sorry.
Q. It's about a third of the way down, trifluralin.
A. Trifluralin. So I can really give you the same response that I just said a moment ago, that's that while this meta-risk ratio is .9, that estimate means absolutely nothing if we don't have confidence in the results of the independent studies that were used to generate that meta-analysis risk ratio.
Q. Urea herbicides, they show an increased risk on Table 5; right?
MR. COPLE: Objection. Asked and answered.
A. So once again, that meta-risk ratio estimate is 1.0. I would know really nothing about how meaningful that meta-analysis risk estimate is without reviewing all of the individual studies that went into that estimate, because if those studies are biased, then so, too, will be this meta-analysis risk ratio estimate.
Q. Indeed, Table 5 from this peer-reviewed published meta-analysis shows the meta-risk ratio for a whole page load of these

Page 130

items, and the highest risk ratio for any item is glyphosate associated with B cell lymphoma; true?

MR. COPLE: Objection. The document speaks for itself. Asked and answered.

A. So I mean, there are other risk ratio estimates on this page that are equivalent to the one found from glyphosate. But again, none of these mean anything at all. We can combine lots of estimates from lots of different studies that were improperly conducted or had flaws in their analysis and, you know, we can see a risk ratio that's above 1, but that doesn't provide us with any greater assurance as to the association, the causal association between the exposure and the outcome than those poorly conducted individual studies did.

BY MR. MILLER:

Q. And have you written to anyone to tell the journal that this was a poorly conducted study, the Schinasi and Leon? Have you criticized it in writing before being hired as an expert by Monsanto in any way?

MR. COPLE: Objection. Vague.

A. I don't need to contact the journals

Page 131

to be able to offer my opinions and review of the literature.

BY MR. MILLER:

Q. I'm sorry, I interrupted. Go ahead and finish.

A. That's not typically how this works. And while, you know, you have stated again that this is a peer-reviewed publication, I think any scientist would agree that the quality of the peer-reviewed published literature varies substantially. So just because we see something in print doesn't mean that we can just take those results at face value without considering the limitations of the study.

Q. In your high ejaculation low risk of prostate cancer study, someone did write a letter to the editor and criticized that study.

Do you remember that?

A. There was a dialogue, and I responded to that letter that I believe you're referring to. I wouldn't really characterize that as a criticism. I think the authors were sort of seeking clarification. They had one specific hypothesis about how they thought that our results might have come about if ejaculation

Page 132

frequency wasn't a cause of prostate cancer, and in our response to those articles we provided them with evidence that that was actually an implausible hypothesis.

Q. And so that's what I'm asking. As regard that happens in science, people write letters to editors to debate articles, and authors respond; right?

MR. COPLE: Objection. Asked and answered.

A. So it certainly happens, but more often than not it doesn't happen. I think the number of articles that are out there in the peer-reviewed literature for which there's never been a letter written far exceeds the number of articles for which there has been this dialogue through letters. And I think that has nothing to do with the quality of those publications.

BY MR. MILLER:

Q. To be clear, before we leave the Schinasi article, you did not write such a letter criticizing the Schinasi article to the International Journal of Research and Public Health?

MR. COPLE: Objection. Asked and

Page 133

answered four times.

A. Yeah, I don't think it's necessary to write letters for every article that I might have criticisms of, no.

BY MR. MILLER:

Q. All right. Can you think of anyone that wrote a letter criticizing this article by Schinasi and Leon?

MR. COPLE: Objection. Vague.

A. I would have to look in PubMed to tell you whether or not there were -- there were letters written.

BY MR. MILLER:

Q. Since you've been retained as an expert by Monsanto, have you written any letters criticizing this --

MR. COPLE: Objection. Asked and answered.

BY MR. MILLER:

Q. -- article?

A. So I have answered that already. I have not written letters about any of these articles. That has nothing to do with my determination about the quality of those articles, and, yeah, those two things aren't

Page 134

related.
Q. Let's go to the NAPP study. You reviewed that, right, Doctor?
A. The draft manuscript is what you're referring to, or the -- what aspect of the NAPP study?
(Whereupon, Rider Exhibit 23-11, 9/21/15 NAPP manuscript, was marked for identification.)
BY MR. MILLER:
Q. What aspects of it have you reviewed?
MR. COPLE: Objection. Vague.
A. So I have reviewed both a draft manuscript as well as some oral presentations and PowerPoint slides that were presented at conferences.
BY MR. MILLER:
Q. Let's start with the manuscript. Is this 23-11 the manuscript that you reviewed?
MR. COPLE: Do you have a copy?
MR. MILLER: Of course (handing).
A. Yes. So I believe this is the same version that I reviewed, but in my report I primarily relied on the results from the PowerPoint presentations that were presented at

Page 135

various conferences.
BY MR. MILLER:
Q. And this is authored by 12 authors?
MR. COPLE: Objection. The document speaks for itself.
A. Yes, I count 12 authors, correct.
BY MR. MILLER:
Q. Do you know Dr. Aaron Blair?
A. I do not.
Q. Have you read his deposition in this case?
A. I do not believe I've reviewed Dr. Blair's deposition, no.
Q. Let me back up.
Have you reviewed any depositions in this case?
A. I have. I've reviewed Dr. Neugut's deposition, and also Dr. Ritz's deposition.
Q. Do you know Dr. Neugut?
A. I have never met Dr. Neugut, no.
Q. Did you take any notes, any criticisms about Dr. Neugut's testimony?
A. I did --
MR. COPLE: Objection to the extent you're looking for notes by an expert witness.

Page 136

That's covered by the protocol.
A. I did not take any --
MR. COPLE: Don't --
A. -- any notes.
MR. COPLE: Okay.
BY MR. MILLER:
Q. Okay. Is there anything you're going to tell a jury, gee, Dr. Neugut's just scientifically wrong on this, other than we disagree -- we have a reasonable disagreement about conclusions?
MR. COPLE: Objection. Argumentative.
A. There were a number of things that I disagreed with in Dr. Neugut's testimony.
BY MR. MILLER:
Q. And I'm sure you disagree with him using the Bradford-Hill criteria here, or coming to the conclusions on causality that he did, but is there anything that you read that you thought, gee, this guy just doesn't know his epidemiology?
MR. COPLE: Objection. Argumentative, vague.
A. I would need to see Dr. Neugut's deposition to point you to specific examples.

Page 137

But, yes, it was -- there were issues, other than the use of the Bradford-Hill criteria, for which I disagreed with his application of epidemiologic methods, yes.
BY MR. MILLER:
Q. Looking at 23-11, do you know anything about Dr. Blair's credentials or his expertise?
A. No. I had not -- I was not familiar with Dr. Blair until reading in these -- the papers that he had co-authored.
Q. Do you whether he had any relationship with IARC?
A. I know that he was present at the IARC monograph, because that's disclosed in the actual monograph.
Q. Was he the chair of that monograph Volume 112?
MR. COPLE: Objection. Monograph speaks for itself.
A. I would have to look again at the monograph. I don't recall.
BY MR. MILLER:
Q. Let's go to Page 2, and it says "What This Paper Adds."
Do you see that?

Page 138

A. I do.
Q. And let me go back. I think I jumped ahead.
The title of the paper is, and it's on Page 1, "An evaluation of glyphosate use and the risk of non-Hodgkin's lymphoma major histological sub-types in the North American Pooled Project (NAPP)"; right?
A. That is correct.
Q. So looking at that issue, on Page 2 the authors say "What This Paper Adds," "Date of last revision: September 21, 2015."
A. Uh-huh.
Q. Do you know if that was after IARC Volume 112?
A. I actually don't recall the exact date of the IARC meeting, no.
Q. So what this paper adds, sub-bullet three, "Subjects who ever used glyphosate had elevated odds ratios for non-Hodgkin's lymphoma overall and for all subtypes except follicular lymphoma."
Did I read that correctly?
MR. COPLE: Objection. The document speaks for itself.

Page 139

A. Yes, follicular lymphoma, yes.
BY MR. MILLER:
Q. And you disagree with the authors in that conclusion?
A. Well, I think that when we look at the results of the analysis in the NAPP that were adjusted for other chemicals, and also the analysis where they excluded proxy respondents, we see no association between glyphosate and NHL.
Q. These authors write, "Significant or nearly significant risk of non-Hodgkin's lymphoma overall were observed for greater than two days per year (odds ratio 2.42)."
Is that an association that you think was -- that you criticize?
A. I think that the results from the NAPP that are adjusted for other chemicals, so they adjusted for three other chemicals, and then found no association between glyphosate and NHL. I believe those results are much more compelling because their results are consistent with there being confounding by those other pesticides.
Q. Go to, if you would, to Page 12, please.

Page 140

A. Okay.
Q. In the Discussion section, the second paragraph, these authors state, "This report confirms previous analyses indicating increased risk of non-Hodgkin's lymphoma in association with glyphosate exposure."
Do you agree, or not agree?
A. I disagree with that statement.
Q. And below that, the next paragraph, "Our results are also aligned with findings from epidemiological studies of other populations that found an elevated risk of non-Hodgkin's lymphoma for glyphosate exposure and with a greater number of days/years of glyphosate use, as well as a meta-analysis of glyphosate use and non-Hodgkin's lymphoma risk. From our epidemiological perspective, our results were supportive of the IARC evaluation of glyphosate as a probable carcinogen for non-Hodgkin's lymphoma."
Agree or disagree?
A. Well, I would disagree, because these results that they are referring to don't adjust for other pesticides, as I've mentioned. And, you know, you can see clearly in their oral

Page 141

presentations where they adjust for those pesticides that that adjustment has a profound impact on the results and the conclusions that you would draw from those results.
They also, in those same presentations, determine that proxy respondents were extremely influential and drove the odds ratios upward, and when they removed those proxy respondents the association was no longer apparent.
So it's my view that when they're talking about how their results are consistent with previous findings, first of all, I don't think those findings tell us much because of the quality of many of those studies, but also they're choosing the wrong estimates to base that opinion on.
Q. They end their discussion -- well, not quite the end, but go to the bottom of Page 14 of 19.
A. Okay.
Q. They talk about recall bias and state that it is not a major concern in the Canadian studies or in the NAPP as a whole.
Do you see that statement?

Page 142

MR. COPLE: Objection. The document speaks for itself.
A. Could you give me a little more direction on where that statement is?
BY MR. MILLER:
Q. Yes, ma'am. At the bottom of Page 14, "No similar analysis of recall bias has been conducted in the Canadian case-control study, but the similarity of study designs between the US and Canada make it likely that recall bias is not a major concern in the Canadian study and NAPP as a whole."
Do you agree or disagree?
A. Well, I mean, I think that in their own analyses of the NAPP they've demonstrated that recall bias was a problem, because when you don't include the proxy respondents, you get a different result. So I would disagree with that statement.
But I think even if you don't think that recall bias is an issue, there are a number of other issues in these case control studies that went into the pooling project data. I mean, I think I outline them all in my report, and we can go through those.

Page 143

But just, for example, the timing of when the studies were conducted, with respect to when glyphosate went on the market, allowed for only a very, very short latency period, and it's very unlikely that the cancer cases that arose during that study could have been due to exposure by glyphosate.
Q. So you take this study as support for your opinion that there is no association between glyphosate and Roundup; right?
A. I wouldn't say that. You've just been asking me if I agree with the authors' conclusions of the paper, and I, as I said, I disagree with many of their conclusions because I think they're looking at the wrong results.
Q. Okay. And this is a new question. So I want to make sure I understand.
When I think about Dr. Rider's opinions, Dr. Rider does not say the NAPP study supports, or does say the NAPP study supports her opinion there's no association?
A. So I would say that the analyses in the NAPP study, particularly those that were not presented in this -- in the manuscript but are available in those oral presentations, confirm some of my concerns regarding the individual North American case control studies.
Q. Okay. Switching topics.
A. Okay.
Q. Exponent meta-analysis. Do you know what I mean when I say that?
MR. COPLE: Objection. Vague, lacks foundation.
A. You would need to show me what you mean by that.
BY MR. MILLER:
Q. Dr. Chang's meta-analysis, are you familiar when I say that?
A. Well, the one you showed me previously was also Dr. Chang's meta-analysis.
(Whereupon, Rider Exhibit 23-12, 5/24/17 Exponent paper, Meta-Analysis of Glyphosate Use and Risk of Non-Hodgkin Lymphoma, was marked for identification.)
BY MR. MILLER:
Q. Doctor, I'm showing you what we've marked as 23-12.
A. Okay.
Q. Have you seen this document before (handing)?
A. Yes, I have.
Q. And provided to you by the attorneys at Hollingsworth?
A. That is correct.
Q. Did you rely in part on this in formulating your opinions?
A. No, I did not. I reviewed the meta-analysis, but it was not influential in coming up with my own independent expert opinion. I felt like it was important to review the primary studies.
Q. So later when I ask you what information you rely upon in formulating your opinions, this document will not be one of those things?
MR. COPLE: Objection. Argumentative, misstates the witness --
MR. MILLER: I'm just asking.
MR. COPLE: Augmentative, misstates the witness's testimony.
A. So as I said, I have had access to this document. I did review it and read it, but in formulating my own independent expert opinion, meta-analysis -- meta-analyses did not

Page 144

Page 145

Page 146

come into play because of the shortcomings of meta-analyses and observational studies. I relied on only the primary studies in coming up with my expert opinion.
BY MR. MILLER:
Q. I'm going to show you what we marked as Exhibit 23-13, and this is --
(Whereupon, Rider Exhibit 23-13, 1/28/16 retainer letter, was marked for identification.)
MR. COPLE: Before -- excuse me, Mike. Before we get into this, is this a good time for lunch, or do you want to wait?
MR. MILLER: I have a couple more minutes, if you don't mind.
BY MR. MILLER:
Q. Is that okay?
A. Yes.
Q. Okay. Here's 23-13. Identify that for me, please.
A. I believe this is my retainer letter from Hollingsworth.
Q. And I want to read the first sentence. "This letter confirms that Hollingsworth, on behalf of Monsanto, has retained you to provide

Page 147

expert consulting services to HLLP" -- that's the Hollingsworth -- "for the purpose of assisting Hollingsworth in representing Monsanto in connection with potential and/or actual litigation against Monsanto involving injuries allegedly caused by Roundup and/or glyphosate."
Did I read that correctly?
A. Yes.
MR. COPLE: Objection. The document speaks for itself.
BY MR. MILLER:
Q. Were you advised of what assisting Monsanto would involve when you were first contacted?
A. I -- again, I don't recall the specific conversations, but I was going to provide my own expert opinion on the epidemiologic literature on glyphosate and NHL.
Q. You've never been an expert before; right?
A. I've never been an expert in a case before, no.
Q. How did you arrive at your hourly fee of $400 an hour?
A. I asked some colleagues who have been

Page 148

involved in litigation before for some advice on the hourly rate.
Q. And is that money going to you, or to the university where you're employed, or how does it work?
A. I am employed as a consultant. So it is separate from my employment at Boston University.
Q. When you were retained, when did you first learn that IARC had -- well, let's back up.
You know what IARC is; right?
A. I do, yes.
Q. And what do those initials stand for?
A. The International Agency for Research on Cancer.
Q. And you are now, as we sit here, currently affiliated with Harvard?
A. I have an adjunct appointment at the Harvard School of Public Health. My primary appointment is at the Boston University School of Public Health.
Q. So for us, as laypeople, you sort of work at Boston University now, but still have some sort of affiliation that you just described

Page 149

with Harvard. Would that be --
A. That is correct.
Q. Okay. And the reason I bring up Harvard, I think that's where Dr. Mucci is employed; is that right?
A. Dr. Mucci's primary employment is at the Harvard School of Public Health; correct.
Q. Would it be fair to say she's a mentor of yours?
A. She was on my doctoral dissertation committee, yes.
Q. IARC has had numerous members of Harvard participate as members of IARC. Are you aware of that, or no?
MR. COPLE: Objection. Vague, lacks foundation.
A. Yeah, I'm really not aware of who has participated on a panel except -- beyond the one person I know who has participated.
Q. And who is that?
A. Kathryn Wilson.
Q. And how do you know Dr. Wilson?
A. We were both students at Harvard at the same time.
Q. And how did Kathryn Wilson get invited

Page 150

to participate in IARC?
A. Actually I'm not aware of the details of how she was invited.
Q. Have you ever been invited to participate in IARC?
A. I have not been invited to participate on a panel.
Q. When Volume 112, which relates in part to glyphosate, was being voted upon and reported by IARC, were you involved at all in the process?
A. I was not involved on the IARC panel, no.
Q. Were you following the issue at all?
A. I was not aware that those meetings were going on at the time, no.
Q. Okay. As you sit here now, you know that IARC voted that glyphosate was a 2A under IARC classification; right?
MR. COPLE: Objection. Lacks foundation.
A. IARC's conclusion, correct, was 2A, yeah.
BY MR. MILLER:
Q. And what do you understand 2A to mean?

Page 151

A. Again, I think I will get the wording wrong without looking at the IARC monograph, so I'd be happy me to tell you if we looked at that, but...
Q. And we will. You don't remember right now you don't remember right now.
One of Monsanto's goals since IARC has determined that glyphosate is a 2A has been to attempt to invalidate and discredit IARC. Are you aware of that?
MR. COPLE: Objection. Argumentative, lacks foundation, vague.
BY MR. MILLER:
Q. You can answer.
A. I have no awareness of that relationship. My role in this was to evaluate the epidemiologic literature.
Q. So you're not going to in any way criticize IARC as part of your expert process here?
MR. COPLE: Objection. Argumentative.
A. I am critical of IARC's conclusions in reviewing the data on -- the epidemiologic data specifically on glyphosate and NHL, yes.
BY MR. MILLER:

Page 152

Q. It would be fair to say that Dr. Rider disagrees with the conclusion that IARC reached; true?
A. That is correct, I disagree with the conclusions they came to in terms of reviewing the epidemiologic literature on glyphosate and NHL.
Q. Do you know a Tom Smith at Harvard School of Public Health?
A. I do not.
Q. In 2012, are you aware Dr. Smith was a member of an IARC panel?
MR. COPLE: Objection. Lacks foundation.
A. I have no awareness of Dr. Smith, so I wouldn't know anything about that.
BY MR. MILLER:
Q. I show you here -- this is marked as 23-14.
(Whereupon, Rider Exhibit 23-14, IARC Monographs List of Participants, was marked for identification.)
BY MR. MILLER:
Q. And this is a list of participants for Volume 105 IARC monograph. You see Dr. Tom

Page 153

Smith, Harvard School of Public Health as a member? Do you see that?
A. I see that.
MR. COPLE: Objection. The document speaks for itself.
A. I see his name listed, yes.
BY MR. MILLER:
Q. But you don't know him?
A. No, I do not.
MR. COPLE: Objection. Asked and answered.
BY MR. MILLER:
Q. I apologize for asking the same question.
You're aware that Harvard School of Public Health has a website?
MR. COPLE: Objection. Vague, lacks foundation.
A. Yes, I'm aware that they have a website.
BY MR. MILLER:
Q. Are you aware that they published information concerning IARC's findings about glyphosate?
MR. COPLE: Objection. Lacks

Page 154

foundation.
A. I was not aware of that, no.
BY MR. MILLER:
Q. We'll take a look at it. Here's what we've marked as Exhibit 23-15.
(Whereupon, Rider Exhibit 23-15, Document from Harvard T.H. Chan website titled Research Roundup, was marked for identification.)
BY MR. MILLER:
Q. Take a minute to look at that. I have a few questions.
(Witness reviewing document.)
A. Okay.
BY MR. MILLER:
Q. All right. Let's go to the first page.
You're familiar with this website, right?
A. I mean, it looks like this was taken somewhere from the Harvard School of Public Health website, so...
Q. And you've been a member of the Harvard School of Public Health, right?
A. I was a student there and had a

Page 155

post-doc appointment there. And then, as I mentioned, more recently I have an adjunct faculty appointment there.
Q. In March of 2015 were you at Boston, or were you over at Harvard?
A. I moved to Boston University in October of 2015.
Q. Okay. So in March you were still at Harvard?
A. That's correct.
Q. Were you finishing up a fellowship, I guess?
A. No, I was a faculty member.
Q. Yes, ma'am. Let's look at this report.
It says in the bottom half of the page, "In March, 2015, 17 experts from 11 countries assessed the carcinogenicity of five pesticides including glyphosate at the International Agency for Research on Cancer."
Do you see that?
A. I do.
MR. COPLE: Objection. The document speaks for itself.
BY MR. MILLER:

Page 156

Q. The first bullet point states, "In this report, glyphosate was classified as 'probably carcinogenic to humans' (Group 2A)."
Do you see that, ma'am?
MR. COPLE: Same objection.
A. I do see that, yes.
BY MR. MILLER:
Q. And do you disagree that glyphosate is probably carcinogenic to humans for non-Hodgkin's lymphoma?
A. As I said, I disagree with IARC's conclusions of the epidemiologic studies on glyphosate and NHL.
Q. This Harvard publication goes on to say, "Specifically, increased risk of non-Hodgkin's lymphoma was consistent across case-control studies of occupational exposure in the USA, Canada, and Sweden."
That's what you observed in the studies that we've gone over here this morning; right?
MR. COPLE: Objection. The document speaks for itself, misstates the witness's prior testimony.
A. I think I've been -- I've stated

Page 157

repeatedly that I do not see those case control studies as showing evidence of an increased association between glyphosate and NHL because of the limitations of those studies.
BY MR. MILLER:
Q. So you disagree with this statement then?
A. I do.
Q. Okay. And it says at the bottom bullet point, "Evidence suggested the potential mechanisms for cancer were primarily through two pathways: First, the chemicals damaged DNA, which caused mutations or alterations in their gene codes. Second, glyphosate could induce oxidative stress."
And my question is, are you staying out of the toxicology end of this whole thing? Right?
MR. COPLE: Objection. Vague.
A. That's right, I'm not an expert in toxicology.
BY MR. MILLER:
Q. And did not factor any of the non-epi science in your opinions; fair?
A. I did not review all of that

literature, and I focused on the epidemiologic evidence.

Q. Yes. All right. Let's move on.

I saw in your review materials -- correct me if I'm wrong -- but you did see the list of participants in that IARC conclusion of Volume 112?

A. So somewhere, I believe it's in that monograph, there is a list of who participated in the meeting, yes, and I did look at that.

Q. Here's Exhibit 23-16, which I believe is a list of participants for Volume 112.

(Whereupon, Rider Exhibit 23-16, IARC Monographs Volume 112 List of Participants, was marked for identification.)

A. Okay.

BY MR. MILLER:

Q. Do you know any of these folks?

(Witness reviewing document.)

A. I do not. Many of them I have now read some of the publications for which they were authors. But other than that, I do not know any of them.

BY MR. MILLER:

Q. Just because I am a layperson, and as a layperson, you already told us you disagree with these 17 people. Could you tell me if were sitting in a coffee shop, how did they get it wrong and you get it right?

MR. COPLE: Objection. Argumentative.

BY MR. MILLER:

Q. I'm just asking.

MR. COPLE: Argumentative, lacks foundation.

A. So, first of all, I think it's important to point out that they did not have access to some of the more recent data on glyphosate and NHL, so we don't know what conclusion they would have come to had they reviewed that additional data. I mentioned, I think, that strengthens the existing evidence substantially.

However, they did review the Swedish and the North American case control studies as well as the Agricultural Health Study, the only cohort study that's -- that looks at glyphosate and NHL and, in my view, I believe that they overinterpreted the results of the case control studies, not taking into account all of the

systematic bias or the lack of internal validity in those studies, and that they underestimated the results from the case -- the cohort study, I'm sorry, the Agricultural Health Study.

BY MR. MILLER:

Q. And the Agricultural Health Study is a very important piece of what you're formulating your opinions on; is that a fair statement?

A. Yes, it is.

Q. And Aaron Blair who is listed here, he's one of the authors of the Agricultural Health Study, isn't he?

A. That is correct.

Q. And he's also the overall chairman of the IARC group that found glyphosate a probable carcinogen; right?

A. Yes. It appears that way, yes.

Q. So wouldn't it be fair to say that Aaron Blair is in a better position to evaluate the evidence as the author of the AHS study rather than someone who had to be brought in later and hadn't looked at it? Isn't that fair?

MR. COPLE: Objection. Argumentative.

A. I really couldn't speculate as to why the more -- the updated results of the

Agricultural Health Study weren't published or weren't included in their review. I just know that in my review of all of the epidemiology, there is -- I disagree with the conclusion that there is evidence that glyphosate is a probable human carcinogen.

BY MR. MILLER:

Q. Are you aware whether Dr. Blair is one of the authors of the NAPP study that you referred to and relied upon?

A. I don't recall whether he's an author.

Q. Are you aware whether he's one of the authors of the unpublished Agricultural Health Study that you also relied on?

A. He is listed an author at least on the draft that I have access to, yes.

Q. Now, are you aware that even though he is an author on each of those, he has testified under oath that with that new data, he still believes that glyphosate is a probable human carcinogen for non-Hodgkin's lymphoma? Are you aware of that?

MR. COPLE: Objection. Lacks foundation.

A. As I said, I haven't reviewed his

Page 162

testimony, so I can't be sure that's what he believes.
MR. COPLE: Let me interrupt you. How long do you want to go?
MR. MILLER: Yeah, if you want to have lunch now, sure. Sure. Let's take a break.
THE VIDEOGRAPHER: Going off the record. The time is 12:32.
(Whereupon, a luncheon recess was taken.)

Page 163

AFTERNOON SESSION

THE VIDEOGRAPHER: Back on the record. The time is 1:20.
MR. COPLE: Reconfirm who is on the line.
MR. MILLER: Mr. Traverse, are you there?
MR. TRAVERSE: I'm here.
MR. MILLER: Anyone else on the phone? All right. All present and accounted for.
BY MR. MILLER:
Q. Dr. Rider, you had a good lunch?
A. Yes. Thank you.
Q. Before the magic of these machines, I just looked at my last question, I asked you if you were aware of whether Dr. Blair still believes that glyphosate is a probable human carcinogen, and you told me you hadn't reviewed his testimony, so I can't be sure what he believes.
Do you remember that general question?
A. Yes, I do. Yeah, I don't know Dr. Blair, so I couldn't tell you.
Q. Would it be important to you to learn

Page 164

what Dr. Blair, the author of the AHS study, says about these issues?
MR. COPLE: Objection. Vague.
A. So I've reviewed two papers that Dr Blair -- at least two that he's been a co-author on, both from the Agricultural Health Study. And so I don't really see it necessary to have a conversation with him, because I can review the data that's available in those two manuscripts.
BY MR. MILLER:
Q. You and I talked earlier about how it's accepted now that tobacco causes lung cancer.
You generally remember that line of questioning?
A. Yes, I do.
Q. And you would agree with me that a barrier to acceptance of that by the scientific community was the tobacco companies' influence; right?
MR. COPLE: Objection. Argumentative, lacks foundation.
A. Again, I could evaluate the epidemiologic studies on tobacco and lung

Page 165

cancer, but all of the other factors, I'm not an expert on those.
BY MR. MILLER:
Q. Have you ever said that before --
MR. COPLE: Objection.
BY MR. MILLER:
Q. -- that tobacco companies were a barrier to the acceptance of the notion that lung cancer is caused by tobacco?
MR. COPLE: Objection. Vague, lacks foundation.
A. I don't recall, but I couldn't be certain, no.
BY MR. MILLER:
Q. Let's took a look at it. Here's Exhibit 23-17.
(Whereupon, Rider Exhibit 23-17, PowerPoint titled Lung Cancer, Molecular Pathology of Cancer Boot Camp, 1/4/12, was marked for identification.)
BY MR. MILLER:
Q. And is that a PowerPoint prepared by you, ma'am?
A. It is. It's in a short course that I

contributed to at the Dana Farber Cancer Institute.
Q. And this was January 4, 2012, right?
A. That is correct, yes.
Q. Turn with me to page -- and I'm afraid the pages aren't marked, so I can show you the pages that I'm referring to. It's "Barriers to acceptance of smoking-lung cancer relationship."
A. Yes, I found that actually.
Q. "Ecological data - other plausible alternatives" was one issue that you raised; right?
A. Mm-hmm.
Q. "Smoking common in scientific community" was another issue; right?
A. Mm-hmm.
Q. Scientists smoked, and they had trouble trying to believe that they were doing something that was bad for them?
MR. COPLE: Objection. Lacks foundation.
BY MR. MILLER:
Q. That's what you meant, right?
MR. COPLE: Objection. Argumentative.
A. Honestly it's been years, five years

actually since I -- or more since I've looked at this, so it's a little hard to judge out of context. But it is true that I bulleted there "Smoking common in the scientific community."
BY MR. MILLER:
Q. Hopefully less common now?
A. Hopefully, yes.
Q. And you wrote here in January, 2012, that a barrier to acceptance of smoking-lung cancer relationship was the influence of tobacco companies; right?
A. Influence of tobacco companies is one of the bullet points, yes.
Q. And at this boot camp on cancer, you wrote, this is -- so you can find it there.
A. Is that after this?
Q. I think it is. No, it's actually two pages before that, four pages before.
A. Okay.
Q. You point out a 1933 Journal of American Medical Ad that stated, "Just as pure as the water you drink...and practically untouched by human hands," as a cigarette ad. What's the importance of that in your lecture?
A. Honestly I don't remember because, as

I said, it was five -- over five years ago since I've looked at this lecture.
Q. What you did point out, and this would be the next page after the "Barriers to acceptance-smoke and lung cancer relationship," you did an entire page on "A new model of causality," and you typed out the Bradford-Hill guidelines; right, ma'am?
A. So yes, the title of the slide is "A new model of causality," and then I summarize the Bradford-Hill guidelines.
So, but I think, again, out of context, it might be a little difficult to appreciate why I was presenting this. I was talking about how the Bradford-Hill came along when studies of epidemiology started to focus on chronic disease rather than infectious disease, so that was the context. So rather than an infectious disease model of causation, there were now these new guidelines that were presented.
Q. And, yes, when we say "new," the Bradford-Hill criteria came about in the late '50s, early '60s?
A. Honestly I can't recall what the date

was, but I'm not sure.
Q. And you list the guidelines, the various points that are sometimes used in the Bradford-Hill guideline, right?
A. So I believe these are, again, just the bullet points of what is included in the Bradford-Hill criteria.
Q. And then as you and I discussed, the only one that's actually required is the temporal sequencer?
A. Temporality is the only of all of these Bradford-Hill criteria that is required for causation; correct.
Q. Sure. I show you what we're going to mark as Exhibit 23-18.
(Whereupon, Rider Exhibit 23-18, Report from School of Public Health website, Report links welding fumes with risk of cancer, was marked for identification.)
BY MR. MILLER:
Q. Another report pulled down from Harvard Chan School of Public Health.
You're familiar with Harvard School of Public Health; right? We talked about it?

Page 170

A. Yes. I was a student and then a faculty member there, yes.
Q. Sure.
And this report from Harvard tells us, and I quote, "The IARC is a World Health Organization body that has among its activities to produce independent scientific consensus reports on the causes of cancer."
That's true; isn't it?
MR. COPLE: Objection. The document speaks for itself.
A. So you've read a quote from this page of the website that I've never seen before, and it's true that what you said appears on the page, yes.
BY MR. MILLER:
Q. In fact, Harvard School of Public Health works with IARC on various issues concerning cancer; isn't that true?
MR. COPLE: Objection. Lacks foundation, vague.
A. I'm unaware of that.
BY MR. MILLER:
Q. Let's look at this publication from the Harvard Chan School of Public Health. We'll

Page 171

mark it as Exhibit 23-19.
(Whereupon, Rider Exhibit 23-19, Publication titled Global Cervical Cancer: HPV Vaccination and Diagnostics, was marked for identification.)
BY MR. MILLER:
Q. I want to call your attention to, again, the T.H. Chan School of Public Health is at Harvard; right, ma'am?
A. The Harvard T.H. Chan School of Public Health is the new name for the Harvard School of Public Health, yes.
Q. And are you familiar with the Center for Health Decision Science there?
A. I've heard of it, but I've never worked with them, no.
Q. Do you know these -- any of these investigators, Sue Goldie, Jan Kim, and others here?
A. I know a couple of them by name, but I've never worked with them.
Q. And if you'd move down -- halfway down the page, it says "Our partners include," do you see where it says "The International Agency for

Page 172

Research on Cancer"?
A. Mm-hmm.
Q. Were you aware before today that, in fact, Harvard is working in partnership with IARC?
MR. COPLE: Objection. The document speaks for itself.
A. So I've never seen this document, this page from the website before. So in order to sort of learn more about the nature of that relationship, I'd have to really read this.
BY MR. MILLER:
Q. Sure. Take your time.
(Witness reviewing document.)
A. So as I've said, I've never seen this document and wasn't familiar with this work before just now, but it seems like the Harvard School of Public Health is working with IARC, PATH, I'm not sure who that is, and the WHO to pursue a coordinated strategy to make new diagnostics and HPV vaccines accessible, affordable, and sustainable in developing countries.
Q. Sounds like a worthy goal; fair enough?

Page 173

A. Again, I don't know anything about this project.
Q. Sure. Let's go to 23-20.
(Whereupon, Rider Exhibit 23-20, IARC Monograph Volume 114 List of Participants, was marked for identification.)
BY MR. MILLER:
Q. In this case counsel for Monsanto often brings up the red meat conclusions of IARC, and I just want to look at that list of participants from that and go over that with you for a second.
Are you aware that IARC did look at red meat? This is 23-20.
MR. COPLE: Objection. Argumentative.
A. I believe I do recall hearing about this, but I haven't reviewed the monograph, and don't know any of the details.
BY MR. MILLER:
Q. Fair enough. We're not going to get into the details of it.
But one of the members of that monograph team for red meat was Kana Wu from Harvard School of Public Health, and my question

Page 174

to you is, do you know him or her?
A. Kana Wu was at the Harvard School of Public Health when I was there, and we sometimes would attend the same meetings on the health professionals follow-up study cohort, the cohort where my ejaculation frequency results study took place.
Q. Well-respected scientist?
A. Again, I -- other than her attendance at the meeting, I'm not familiar with her work.
Q. Sure.
Do you know a Richard Clapp at Harvard?
A. I do not.
Q. I'm sorry, he's at Boston University. Isn't that where you are now?
A. I am.
Q. He's a professor emeritus. I guess that means he's an old guy like me. Is that what that means?
A. I don't know. I don't know.
Q. I'm going to show you, Doctor, Exhibit 23-21. It's from the Harvard T.H. Chan School of Public Health. I just want to ask you a few questions about it.

Page 175

(Whereupon, Rider Exhibit 23-21, Harvard School of Public Health website page of Richard Clapp, D.Sc, MPH, was marked for identification.)
MR. COPLE: Do you have a copy for me?
MR. MILLER: There you go (handing).
BY MR. MILLER:
Q. Talks about a Richard Clapp, he's a professor emeritus at Boston University School of Public Health. Does that ring a bell about how you might know him, or I guess no?
A. No. I don't believe we've ever met, no.
Q. The reason I bring it up, he co-signed a letter with a physician named Chris Portier concerning that glyphosate and non-Hodgkin's lymphoma issue. Have you seen that letter?
A. No, I have not. I was given a lot of materials to review, but I don't recall that being one of the items I reviewed.
Q. Let me show it to you. 23-22 (handing).

Page 176

(Whereupon, Rider Exhibit 23-22, Portier, et al article titled Differences in the carcinogenic evaluation of glyphosate between the IARC and the EFSA, was marked for identification.)
BY MR. MILLER:
Q. Here's that letter (handing). All right. We can do this quick, I'm not going to -- Richard Clapp is one of the authors. Do you see that?
A. I do.
MR. COPLE: Objection. The document speaks for itself.
BY MR. MILLER:
Q. Was this ever provided to you by Monsanto or their attorneys?
MR. COPLE: Objection. Argumentative.
A. So my only interaction has been with the attorneys at Hollingsworth, and I don't recognize this. I would have to look at the list of materials that I was provided, but I don't recall reviewing this letter.
BY MR. MILLER:
Q. What does it mean to be a professor

Page 177

emeritus? Obviously, you know, I don't even know what that means. That's why I'm asking.
MR. COPLE: Objection. Vague.
A. I actually can't tell you exactly what that means.
BY MR. MILLER:
Q. He, Richard Clapp, is at the same university that you're at now, right?
A. Mm-hmm.
Q. And so he writes with lots of other scientists in this letter, and I'm looking at the top right-hand page. And we've already gone over this point before, but the working group, "The WG concluded that the data for glyphosate met the criteria for classification as a probable human carcinogen."
Do you see where I'm reading?
A. I do.
Q. And you disagree with that; right?
A. I agree with IARC's conclusions based on the epidemiologic data on glyphosate and NHL, yes.
Q. You do agree or don't agree?
A. I disagree with --
Q. Yes.

A. -- IARC's conclusions.
Q. Take -- if we could now go, please, to Page 743 of this letter from Chris Portier, Richard Clapp, and others, and I want to just read one sentence to you, what they write. This is on -- over here on the last column of that.
A. Okay.
Q. They write, "The most appropriate and scientifically based evaluation of the cancers reported in humans and laboratory animals as well as supportive mechanistic data is that glyphosate is a probable human carcinogen."
You disagree with them or --
A. Again, I've never seen this particular letter before, so I couldn't tell you whether I agreed or disagreed with it. But I do disagree with IARC's conclusions based on the population-based studies, the human studies of glyphosate and NHL.
Q. Okay. Let me rephrase my question.
A. Okay.
Q. You disagree with the statement that, "The most appropriate and scientifically based evaluation of the cancers reported in humans and laboratory animals as well as supportive

mechanistic data is that glyphosate is a probable human carcinogen"?
You'd disagree with that statement?
A. I can't tell you whether I agree or disagree, because I've only read this one sentence of this entire several-page commentary. So I can't -- I can't tell you whether I disagree or agree with that statement.
Q. You agree or disagree that glyphosate is a probable human carcinogen?
A. As I mentioned, I disagree with IARC's conclusions based on the epidemiologic literature that glyphosate is a probable human carcinogen.
Q. Take all the time you need to review 23-22. But it's fair to say, then, you disagree with these authors?
MR. COPLE: Objection. Argumentative.
A. I couldn't say that without reading the entire commentary.
BY MR. MILLER:
Q. Sure. Go ahead.
(Witness reviewing document.)
A. So I've only gotten through the first page. I'm a slow reader. I apologize. But

there are a number of things that I could point to that I do disagree with, even in terms of their interpretation of the epidemiologic evidence on glyphosate and NHL.
BY MR. MILLER:
Q. And that -- I understand that to be true, and I'm asking more broadly.
In the summary where they say that the most appropriate scientific valuation is that glyphosate is a probable human carcinogen, I think you disagree with that. But if you agree, that's fine, too. Just let me know.
A. Again, I can't really tell you whether I agree or disagree with that statement without reading the entire commentary.
Q. It's fairly short, so, yeah, go ahead.
MR. MILLER: Somebody else join the call?
(Witness reviewing document.)
A. Okay. So after reading this, it isn't completely clear to me, but I think that what the authors are referring to in that statement is by saying that "the most appropriate and scientifically based evaluation of the cancers reported in humans and laboratory animals as

well as supportive mechanistic data," I believe that they are referring to the IARC review, and I would disagree that the IARC review is the most appropriate and scientifically based evaluation of the cancers, well, at least NHL reported in humans and laboratory animals, as well as supportive mechanistic data.
BY MR. MILLER:
Q. These people who signed this letter, including Dr. Clapp, go on in the next sentence to say, "On the basis of this conclusion and in the absence of evidence to the contrary, it is reasonable to conclude that glyphosate formulations should also be considered likely human carcinogens."
Do you disagree with them on that statement?
A. I do disagree with them on that statement. Again, I think that if you -- if you read this entire commentary, they refer to, you know, the case control studies as high quality. They point to a number of limitations in the cohort study which I think are inaccurate, including a short latency period in the HS which is incorrect. So I do disagree with the

Page 182

conclusions of this particular commentary.
Q. Have -- you gave a list of materials reviewed and considered attached to your report. Do you remember that?
A. Attached to my -- yes, that's correct.
Q. Were all of those provided by the Hollingsworth firm?
A. No, they were not. So many of them were provided by attorneys at Hollingsworth, but I also did my own review of the literature as well.
Q. Are you able to tell me which articles you found and which were provided?
A. I'm not offhand, no.
Q. Okay. Did you read Dr. Portier's report in this case?
A. I do not believe that I reviewed Dr. Portier's report, no.
Q. And you did not -- or did you review Dr. Weisenburger's report in this case?
A. I did not, no. I may have had access to it. I can't recall. But I did not read those.
Q. Okay. Did you read Dr. Nabhan's report in this case?

Page 183

A. No.
Q. Did you read Dr. Neugut's report in this case?
A. Yes, I reviewed both Dr. Neugut's and Dr. Ritz's reports and depositions, yes.
Q. Did you review Dr. Ritz's supplemental report?
A. Her sort of rebuttal report, I think it was?
Q. Yes.
A. Yes, correct.
Q. Anything about that that you disagree with?
MR. COPLE: Objection. Vague.
A. I would have to look at it. I don't remember exactly what she raised in her rebuttal report.
BY MR. MILLER:
Q. Since you became involved as an expert for Monsanto, or for that matter even before then, were you aware of the publications that surrounded IARC after they concluded that glyphosate was a 2A probably carcinogenic?
MR. COPLE: Objection. Vague, lacks foundation.

Page 184

BY MR. MILLER:
Q. You can answer.
A. Yeah, so I'm not exactly clear on your question, but I just want to point out that I was retained by Hollingsworth, not Monsanto. I have not had any communications with Monsanto.
Q. Yeah, I understand that. I appreciate that distinction. But you know they work for Monsanto, the Hollingsworth firm; right?
A. Yes. I am aware of that, yes.
Q. And I -- it was a poorly formed question. I'm just trying to ask this.
There's been some defense of IARC in the face of what IARC perceived as criticism from Monsanto. Have you read anything in that regards?
A. You would need to be a bit more specific. I'm not sure.
Q. Okay. I will.
MR. MILLER: What's our next exhibit number?
MS. MILLER: 23-23.
(Whereupon, Rider Exhibit 23-23, IARC Monograph: 40 Years of Evaluating Carcinogenic Hazards to Humans, was

Page 185

marked for identification.)
BY MR. MILLER:
Q. 23-23. And this is our next exhibit. This is a publication Environmental Health Perspectives, June, 2015, "IARC Monographs: 40 Years of Evaluating Carcinogenic Hazards to Humans"; right?
A. Yes. That is the title. Correct.
Q. And one of the first things I'd like to ask you about, there are -- one, two, three, four -- five authors that are from Harvard in this report or commentary, Dr. Christiani, Dr. Baccarelli, Dr. Laden, Dr. Monson, and Dr. Schernhammer. Do you know any of them?
A. I know a couple of those people just because we were at the same institution, but I don't believe I've ever worked directly with any of them, no.
Q. Okay.
A. Maybe Dr. Schernhammer and I have co-authored a publication, but I can't recall for sure.
Q. Let's look at what these and other physicians had to say about IARC. This is about two, three months after IARC concluded that

Page 186

glyphosate was a probable human carcinogen. Let's go to the Page 2, "Objectives." "The authors of this Commentary are scientists from various disciplines relevant to the identification and hazard evaluation of human carcinogens. We examined criticisms of the IARC classification process to determine the validity of these concerns. Here, we present the results of that examination, review the history of IARC evaluations, and describe how the IARC evaluations are performed."

Did I read that correctly?

MR. COPLE: Objection. The document speaks for itself.

A. Yes, I see that there.

BY MR. MILLER:

Q. Did the attorneys from Hollingsworth provide you this document?

A. I don't recall this being one of the materials that I was provided. I was provided with a lot of materials, though, so I could not be sure.

Q. The first sentence in their Discussion is, "We concluded that these recent criticisms are unconvincing."

Page 187

Do you see that?

A. I do.

Q. Okay. They go on to say in the Introduction -- I'm now in the written portion, not the abstract -- "The IARC Monographs on the Evaluation of Carcinogenic Risks to Humans of the International Agency for Research on Cancer are a prominent example of such an expert review process."

My question to you is, do you agree that IARC is a prominent example of an expert review process for causes of carcinogens?

A. I think it's certainly an agency for which many people are aware that they do reviews of potential carcinogens, yes.

Q. Okay. And I apologize for bouncing around, but back to the abstract, it's on Page 2 --

A. I'm sorry.

Q. I'm sorry.

Yeah, the conclusion is, "The IARC Monographs have made, and continue to make, major contributions to the scientific underpinning for social actions to improve the public's health."

Page 188

Do you agree with that?

A. Again, it's a very broad general statement. I don't follow -- actively follow all of the IARC decisions, and so I couldn't really comment on that.

Q. Are you aware that the IARC members don't receive any fee for their work?

MR. COPLE: Objection. Lacks foundation.

A. I'm not aware of how the panels operate, or if there's compensation provided, no.

BY MR. MILLER:

Q. Let's go to Page 512.

A. Okay.

Q. And I'm looking at the top right where it says, "Working Group members do not receive any fee for their work, but they are paid travel expenses, and there is some prestige associated with service on an IARC Monograph."

You have no reason to challenge that statement?

MR. COPLE: Objection. Argumentative.

A. I have no reason to challenge it, no. But, again, this is the first time that I'm ever

Page 189

reviewing this particular document.

BY MR. MILLER:

Q. I understand. Last point and then we'll move on. The last sentence in this article on Page 513.

A. Okay.

Q. And this, again, quote from these scientists on the front page, including five from Harvard, that they say, "However, as a group of international scientists, we have looked carefully at the recent charges of flaws and bias in the hazard evaluations by IARC Working Groups, and have concluded that the recent criticisms are unfair and unconstructive."

Any reason to challenge that statement?

A. Again, I'm only looking at this for the first time, I -- so I would have no reason to challenge it.

Q. Okay. We can move on.

If I wanted to study how quickly someone had to get out of a burning building, a residential building, would I want to study people who are wearing pajamas and T-shirts, or

Page 190

people that are wearing fire-retardant outfits provided by a fire department?
MR. COPLE: Objection. Vague, incomplete hypothetical.
BY MR. MILLER:
Q. Do you see my point?
MR. COPLE: Same objection.
A. I'm not sure that I do see your point, I'm sorry.
BY MR. MILLER:
Q. Well, can you and I agree just as a common sense observation that someone in shorts or pajamas is going to be more susceptible to injury from a fire than someone wearing fire-retardant clothes from the fire department?
MR. COPLE: Objection. Argumentative.
BY MR. MILLER:
Q. Just asking.
A. Again, this is outside of my area of expertise in cancer epidemiology.
Q. So you're unable to answer it, or because it's outside your expertise you won't answer it?
MR. COPLE: Objection. Asked and answered, argumentative.

Page 191

A. Because it's outside of my area of expertise, I'm sort of not comfortable talking about such a hypothetical study.
BY MR. MILLER:
Q. Why?
MR. COPLE: Objection. Asked and answered.
BY MR. MILLER:
Q. Well, you know where I'm going. You know full good and well the Agricultural Health Study was not done of people in the normal setting, was it?
MR. COPLE: Objection. Vague, argumentative, lacks foundation.
A. Can you explain what you mean by "the normal setting"?
BY MR. MILLER:
Q. Well, what, if anything, did someone have to learn in order to be a participant in the Agricultural Health Study?
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. Do you know?
MR. COPLE: Objection. Vague, argumentative.

Page 192

A. Can you ask the question one more time, please?
BY MR. MILLER:
Q. The cases and the controls in the Agricultural Health Study, were they laypeople, home users, gardeners, untrained farmers? What kind of people were they?
MR. COPLE: Objection. Compound questions.
A. So I think you asked about cases and controls, but that's not really how we would talk about a cohort study. But if you're talking about just the people who were enrolled in the Agricultural Health Study, the participants were farmers and oftentimes commercial applicators of pesticides.
BY MR. MILLER:
Q. When you say "oftentimes," are they always that, or no?
A. I would have to go back and look at the methods to be sure, certain.
Q. Would that be important to know what percentage of them were commercial applicators?
A. Well, I think the striking thing about the Agricultural Health Study is that they were

Page 193

able to look at levels of exposure that were many times higher than what had previously been investigated in the case control studies not done among farmers.
Q. Nothing to do with my question, though.
Were they licensed pesticide applicators?
MR. COPLE: Objection. Argumentative.
A. When they were enrolled, it was -- they were being enrolled as part of the licensing process. I mean, that interview, the enrollment happened when they were applying for their license.
BY MR. MILLER:
Q. What does one have to do to become a licensed pesticide applicator?
A. I'm not sure.
Q. How long does it take to become a licensed pesticide applicator?
A. I am not sure of all of the requirements of becoming a licensed pesticide applicator.
Q. Is there an exam for being a licensed pesticide applicator?

Page 194

A. I'm not sure of the requirements for becoming a licensed pesticide applicator.
Q. What is the training involved with explaining to an applicant for the licensed pesticide applicator in terms of what to wear and how to handle herbicides and pesticides?
A. I am not aware. I'm not sure.
Q. Not important?
MR. COPLE: Objection. Argumentative.
A. I think that what is important is that the Agricultural Health Study was able to evaluate levels of exposure that were higher and probably more likely to be associated with an increased risk of cancer if such an increased risk existed.
MR. MILLER: Move to strike as non-responsive.
MR. COPLE: The witness's answer will stand.
MR. MILLER: Let's move on.
BY MR. MILLER:
Q. What percentage of the cohort was licensed pesticide applicators in the HS?
A. Again, I think I mentioned previously, to tell you I would need to look at the actual

Page 195

paper.
Q. Are there any weaknesses in the Agricultural Health Study?
MR. COPLE: Objection. Vague.
A. Certainly I talk about some of those limitations of the study in my report.
BY MR. MILLER:
Q. And what are they?
A. If we could -- if I could see my report, we could go through those.
Q. Feel free (handing).
MR. COPLE: Are you marking it for the deposition?
MR. MILLER: No.
A. Okay. So I reviewed the 2005 study, starting at the bottom of Page 22 of my report.
BY MR. MILLER:
Q. And the question is, what are the weaknesses that you believe exist in the Agricultural Health Study as published in 2005?
MR. COPLE: Objection. Vague.
A. So as I stated in my report, the major limitation of the study relates to how they included in their multivariable analysis a different sample of participants than who was

Page 196

included in the unadjusted results. I referred to it, I call that -- sometimes we refer to that as letting the sample size float. That's how I refer it to in my report.
BY MR. MILLER:
Q. Is that -- are there other criticisms, or is that the only one?
A. I felt like that was the major limitation of the study.
Q. So are there any minor limitations of the study?
MR. COPLE: Objection. Vague.
A. Yeah, I mean, of course, all studies have -- epidemiologic studies have limitations to varying degrees. In this particular study, they, you know, as in the case control studies, they were relying on self-reported exposure information, and so you might expect for some of that exposure to be misclassified, but I think the quality would be stronger than in the case control studies where that would also vary based on whether or not someone had developed the disease.
BY MR. MILLER:
Q. Do -- are licensed pesticide

Page 197

applicators trained to wear a personal protection equipment at a higher rate than people who are not licensed pesticide applicators, or do you know?
MR. COPLE: Objection. Asked and answered.
A. Yeah, I told you previously I don't know about all of the requirements for pesticide licensing.
BY MR. MILLER:
Q. Have you been provided, or in your own research reviewed the Bolognesi study of 2016?
MR. COPLE: Objection. Lacks foundation.
A. I don't recall reviewing that study, no.
BY MR. MILLER:
Q. Let's take a look at it. Doctor, I'm going to hand you what's been marked as 23-24, Bolognesi study of lymphocyte cytokinesis and micronucleus assay for the monitoring of pesticide-exposed populations.

(Whereupon, Rider Exhibit 23-24, Bolognesi and Holland article titled The use of lymphocyte cytokinesis-block micronucleus assay for monitoring pesticide-exposed populations, was marked for identification.)

BY MR. MILLER:

Q. Did you see the study before?

A. I do not recall reviewing the study, no.

Q. The good news is we're not going to go through the whole study. That's number one.

Number two, I'm just going to ask you whether you have an opinion or not on one particular point Dr. Bolognesi makes in his study. And it can be found in the abstract. It's the third to last sentence. He says that there is, "A decreased level of pesticide-induced genotoxicity was associated with the proper use of personal protection."

And my question to you is, do you have an opinion about that issue or not?

MR. COPLE: Objection. Vague.

BY MR. MILLER:

Q. Whether or not -- and just to be precise, whether or not someone who wears proper use of her personal protection has a decreased level of pesticide-induced genotoxicity.

A. I do not have an opinion about that, no.

Q. But if it was true, if that statement was true, then that would mean people who wear the proper use of personal protection would have a lower risk of the problem that would be caused by exposure as to people who don't wear personal protection; right?

MR. COPLE: Objection. Vague, lacks foundation.

A. The only way I would be comfortable in coming to that conclusion would be if there had been a human study that had actually looked at that on the population level.

BY MR. MILLER:

Q. And that would be unethical to do now, wouldn't it?

A. Well, it would certainly be unethical to, you know, randomize people to exposure or not to exposure, but that doesn't mean that it couldn't be studied.

Q. Retrospectively?

A. Or prospectively, for that matter.

Q. But you couldn't randomize people to it?

A. But observational studies, cohort studies are also prospective studies.

Q. Sure, sure.

But we couldn't do a randomized study for that purpose now. We agree on that?

A. I agree, that would not be --

Q. So the Agricultural Health Study is telling us what -- whether there's a risk to licensed pesticide applicators; right? That's what it's telling us?

A. The studied population included people who were applying for their pesticide license, yes.

Q. And, in fact, got their pesticide license; right?

A. Again, I don't recall from the details of the study whether people had to actually get the license to be included. I would have to look at the methods.

Q. All right. We'll mark as 23-25, I believe this is the 2005 Agricultural Health

Study.

(Whereupon, Rider Exhibit 23-25, De Roos, et al article, Cancer Incidence among Glyphosate-Exposed Pesticide Applicators in the Agricultural Health Study, was marked for identification.)

BY MR. MILLER:

Q. This is the Agricultural Health Study that you've been referring to; right?

A. That is correct, yes.

Q. Do you see the Materials and Methods section?

A. I do.

Q. Okay. It says, "The AHS is a prospective cohort study in Iowa and North Carolina, which includes 57,000 private and commercial applicators who were licensed to apply restricted-use pesticides at the time of their enrollment." Right?

A. That is correct, yes.

Q. And wouldn't it be important to know what the education and training is of a licensed restricted-use pesticide applicator in specifically Iowa and North Carolina to reach any conclusions on this study as to how it would

Page 202

or would not apply to people who were not licensed restricted-use pesticide applicators?
MR. COPLE: Objection. Asked and answered, vague.
A. So I believe what you're asking about is the generalizability of the study, so whether or not we can take the results from the Agricultural Health Study and apply them to groups of people who are in some way different, in this case not licensed applicators. And as I talk about in my expert report, you know, the sort of first step in evaluating a study is looking at the internal validity, then you can go ahead and look at the precision of those estimates, and then after -- only after those things have sort of been satisfied do you talk about generalizability.
So I think that the Agricultural Health Study has not demonstrated any association between glyphosate use and NHL. But, you know, so for all intents and purposes we would assume that those results apply to other participants. It's a little bit like, you know, do studies of exercise and cardiovascular disease in men apply to women. Unless we

Page 203

believe that there's some reason where there would be a biological interaction and those results would no longer apply, we assume that the results are generalizable.
BY MR. MILLER:
Q. You assume the results are generalizable to people who don't wear protective clothing when the study is done on people who wear protective clothing. Do I understand that correctly?
A. So, you know, if you're referring to protective clothing as being something that's sort of on the pathway between glyphosate and NHL on the causal pathway, so, you know, if, you know, you use glyphosate, you may or may not wear protective equipment and then that would influence your -- the risk that you have of NHL.
Q. Are you asking me a question now?
A. I'm trying to clarify what the question is. So I think that if you're talking about generalizability, unless we have no reason to believe -- unless we have a reason to believe that the biological relationship between the exposure and the outcome is different in two groups of people, we assume that the results are

Page 204

generalizable. If you're talking about whether, you know, protective equipment could be on the causal pathway between glyphosate exposure and NHL, I would say that, you know, again, in this study we have levels of glyphosate exposure in the highest category, they're -- you know, that are five times what was, at minimum, what was done in previous case control studies. And so if we were going to see an association between glyphosate and NHL, we would likely see that at these higher levels of exposure.
Q. Well, here's my question. Either you are or you aren't saying that results of the AHS study where we have licensed commercial applicators wearing personal protective clothing, and you're saying those results are generalizable to people who aren't wearing personal protective clothing. Is that what I should understand?
MR. COPLE: Objection. Asked and answered.
A. So I mean, in this publication the issue of personal protective equipment isn't directly addressed, so I think that would require some assumptions about these

Page 205

applicators. It also wasn't addressed in many of the case control studies. So we also don't know how often that was used in many of the case control studies that were conducted.
BY MR. MILLER:
Q. Well, how many of the case control studies that we talked about today required participants to be licensed commercial applicators?
A. I am not certain if any of them required participants to be licensed commercial applicators.
Q. So this study, the AHS cohort study, is different from the case control studies in that way, that it requires licensed commercial applicators; right?
A. Yes. And oftentimes cohort studies are conducted in special populations because those populations allow for a better study of an exposure and an outcome.
For instance, in the health professional study that I publish in, you could -- I suppose you could argue that those health professionals are different from the US general population, but the reason that that population

Page 206

was selected was because it was believed that we could get higher quality exposure and outcome data from those participants than for people in the general population.

And unless you believe that there is a biological difference in the relationship between exposure and disease in that population from another population, you can still generalize those results and your study has better internal validity.

Q. And that's why we showed you Exhibit 23-24, the Bolognesi study, because it, in fact, indicates there is a biological difference. Remember it says, "A decreased level of pesticide-induced genotoxicity was associated with the proper use of personal protection." That is a biological difference if, in fact, Dr. Bolognesi is correct?

MR. COPLE: Objection. Argumentative.

A. So, again, I haven't reviewed this paper, and I can't tell you whether that is correct. But I do know that because something is demonstrated in a genotoxicity study does not mean that's what we'd see in a population-based study of humans.

Page 207

BY MR. MILLER:

Q. Going to the AHS study of 2005, you see Dr. Blair is one of the authors; right?

A. Yes.

Q. And to be clear, you have not read his deposition, right?

A. Again, I believe that I had access to Dr. Blair's deposition, but that I have not reviewed it, no.

Q. Would it matter to you if Dr. Alavanja has said that he'd like to say it's positively associated with non-Hodgkin's lymphoma?

MR. COPLE: Objection. Lacks foundation.

A. Again, I don't know Dr. Alavanja, and I couldn't comment on whether that would be important to me.

BY MR. MILLER:

Q. Go, if you would, to the Agricultural Health Study, Page 51.

A. Okay.

Q. And it has a table here for associa- -- or the association of glyphosate exposure ever versus never use with common cancers among AHS applicators.

Page 208

Do you see that table?

A. I do.

Q. Okay. So for these licensed commercial applicators, they show non-Hodgkin's lymphoma, a total of 92 cancers; right?

A. That's correct.

Q. And if they've ever used glyphosate, they have a 20 percent increased risk?

A. They did identify a relative risk of 1.2; correct.

Q. And adjusted for age, demographic, and lifestyle factors and other pesticide use, they had a 10 percent increased risk; right?

A. Well, again, I think that, you know, in this particular study I think the internal validity is sufficient where you would look at that confidence interval, and you would -- you would see that it is -- it does include the null value of 1. So it's consistent with there being no association between glyphosate and NHL.

Q. Let's go to Page 53, if you would, please. The authors point out limitations of their study, and I want to go over some of them. Okay?

A. Okay.

Page 209

Q. "Certain limitations of our data hinder the inferences we can make regarding glyphosate and its association with specific cancer subtypes."

Do you agree with that?

A. Do I agree that certain limitations of the data hinder the inferences they can make?

Q. Yes.

A. Yes, I think that, as I stated, all studies have limitations, and you need to interpret the results in light of those limitations.

Q. And the authors caution that, "The AHS cohort is large, and there are many participants reporting glyphosate use. The small numbers of specific cancers occurring during the follow-up period hindered precise effect estimations."

That's true, isn't it?

A. So, I mean, it's interesting that the authors say that, because while they, I think, are very conservative in saying that their confidence intervals are not precise, they're at least as precise as anything that was in the reported literature up to this point.

Q. These authors say that their study

Page 210

shows an "association between glyphosate and the risk of multiple myeloma"; right?
A. Sorry, I lost you in there.
Q. Second-to-the-last sentence, "a suggested association between glyphosate and the risk of multiple myeloma."
Do you see that?
A. I don't. Sorry.
Q. Yes, ma'am. Right down here, right above (indicating).
A. Okay. Yes, I do see that. Thank you.
Q. And you and I agree multiple myeloma is a form of non-Hodgkin's lymphoma?
A. It was not included in the definition at the time of this publication, but in the subsequent AHS follow-up study, it then was included in that definition.
Q. Do you know whether Monsanto considers applicators in high-volume sprayers or low-volume sprayers to actually experience more exposure?
MR. COPLE: Objection. Lacks foundation, vague.
A. As I've said, I've never had any communications with Monsanto. So I don't -- I

Page 211

don't know what they think about that.
BY MR. MILLER:
Q. Would that be important?
MR. COPLE: Objection. Vague.
A. Could you ask the question again, please?
BY MR. MILLER:
Q. Would it be important to know whether high-volume sprayers actually experience less exposure than low-volume sprayers?
MR. COPLE: Objection. Vague.
BY MR. MILLER:
Q. You can answer.
A. I think that you can measure exposure in a way that gets at the intensity and duration of exposure.
Q. You haven't done that, and this study didn't do that, right?
A. Oh, this study did look at intensity-weighted exposure. That's the second column of their results in Table 3.
Q. Where are you?
A. Table 3 on Page 52.
Q. That's the intensity-weighted exposure days?

Page 212

A. That's correct.
Q. Do you know if IARC has reviewed whether the herbicide 2,4-D is classified as a possible carcinogenic to humans, group 2B?
MR. COPLE: Objection. Asked and answered.
A. I don't -- I don't follow all the IARC decisions, and I haven't read anything about that one, no.
BY MR. MILLER:
Q. Would it be important to you -- you talked about confounding by other herbicides. Would it be important to you whether or not another herbicide was a possible carcinogen or not?
A. So it certainly was important to me in evaluating the results of these studies. And, in fact, when 2,4-D and another chemical was associated with NHL in the pooling project analysis, I felt like those analyses should be adjusted for those chemicals to be interpretable.
Q. And 2,4-D IARC found was not a probable carcinogen. Are you aware of that?
MR. COPLE: Objection. Lacks

Page 213

foundation, asked and answered.
A. As I just said, I have not followed the IARC decisions on other chemicals.
MR. MILLER: Here it is, Exhibit 23-26, IARC monograph evaluating 2,4-D.
(Whereupon, Rider Exhibit 23-26, 6/23/15, WHO Press Release, IARC Monographs evaluate DDT, lindane, and 2,4-D, was marked for identification.)
BY MR. MILLER:
Q. And fourth paragraph down, the herbicide 2,4-D was classified as a possible carcinogenic to humans, which is a lower classification than glyphosate; right?
MR. COPLE: Objection. The document speaks for itself, asked and answered.
A. So this is the first time I'm seeing this document. As I've said, I -- in my own work I rely on sort of the primary studies in order to, you know, synthesize the evidence and come to my own expert opinions on them. So I couldn't really comment on the evidence for 2,4-D.
BY MR. MILLER:
Q. So in your primary studies and your

Page 214

work, did you conclude that 2,4-D was as carcinogenic -- as potentially carcinogenic as glyphosate, or less carcinogenic potentially than glyphosate?

MR. COPLE: Objection. Asked and answered.

A. I -- as I've said, I have not reviewed all of the primary literature for 2,4-D. But I do know that in the analyses where both glyphosate and 2,4-D were considered, 2,4-D appeared to be a confounder of the association between glyphosate and NHL.

BY MR. MILLER:

Q. And how would you define to a layperson what it means to be a confounder in that setting?

A. It's an exposure that's -- or a variable that's associated with your exposure, and also a risk factor for -- an independent risk factor for the disease.

Q. That's fair.

So 2,4-D is an independent risk factor for non-Hodgkin's lymphoma, and then it has to be factored in when you look at these studies?

A. So I would say that if you have a

Page 215

variable that's associated with your exposure, and also a risk factor for the disease, even just within that particular study population, it's -- you need to control for that variable in order to have interpretable findings.

Q. And that's what we're talking about with 2,4-D; right?

MR. COPLE: Objection. Asked and answered.

A. Sorry, what is the question?

BY MR. MILLER:

Q. That's what we're talking about with 2,4-D, that applies to your last answer is all I'm asking; right?

MR. COPLE: Objection. Vague, asked and answered.

A. Sorry, if you would ask me a question, I'll do my best to answer it, but I don't understand what the question is.

BY MR. MILLER:

Q. I did, and I'll ask it again.

"Question: That's fair. So 2,4-D is an independent risk factor for non-Hodgkin's you look at with these studies?

"Answer: So I would say that if you

Page 216

have a variable that's associated with your exposure, and also risk factor for the disease, even just within that particular study population you need a control for that variable in order to have interpretable findings."

And I'm just asking, that applies to 2,4-D and glyphosate, that's what you had to do; right?

A. I'm sorry, that's what I had to do?

Q. Did you -- are you an expert?

MR. COPLE: Objection. Argumentative.

BY MR. MILLER:

Q. Did you look at this as an expert? I'm just trying --

MR. COPLE: Objection. Argumentative.

BY MR. MILLER:

Q. Back up.

I mean, is that what you had to do as expert? Did you look at 2,4-D as a confounder?

MR. COPLE: Objection.

A. As I've said, in the studies where -- in many of the studies, especially many of the case control studies, these other chemicals weren't even evaluated, so you couldn't look at 2,4-D as a potential confounder.

Page 217

But in the studies where data was collected on 2,4-D, there is evidence that it was acting as a confounder, and you can see that in the pooling project analyses that I mentioned in my expert report.

BY MR. MILLER:

Q. So in the AHS study, how did the investigators get the information from the people in the cohort about the issues that were studied? How did that happen?

MR. COPLE: Objection. Vague.

A. So there's a paragraph here in the paper on Page 49 about exposure assessment, and the authors talk about how they used a self-administered enrollment questionnaire to collect comprehensive use data on 22 pesticides and ever/never use information for an additional 28 pesticides.

And then in terms of outcome, there was linkage to cancer registry data.

BY MR. MILLER:

Q. So between 1993 and 1997 they collected questionnaires from people who were commercial applicators who were attempting to get a license to apply restricted-use

pesticides. Right?
A. That is correct.
Q. Okay. And so on that application they would be -- put down either ever or never use for chemicals, including glyphosate; right?
A. No, that's not exactly how it was. They collected much more detailed use on 22 pesticides, and then only ever/never use on an additional 28 pesticides.
Q. Was glyphosate -- was in the more detailed use?
A. That is correct.
Q. But it was a one-time collection in '93, '94, '95, '96 to '97?
A. It was one questionnaire as of this publication.
Q. And then there was a second publication following that we'll talk about in a bit.
A. Okay.
Q. That's AHS, can we call that unpublished?
A. Or the draft manuscript.
Q. Draft manuscript. But -- so this -- the original AHS article was written in 2005;

right?
A. It was published in 2005, yes.
Q. And I guess my point is, so if somebody comes in in '93 and they say I've never used glyphosate, right --
A. Mm-hmm.
Q. -- and then in year '98 they applied glyphosate, which category are they going to be in, the I used glyphosate or I never used glyphosate?
A. Their baseline exposure assessment would be never use.
Q. Okay. And then in 2002 if that person gets non-Hodgkin's lymphoma, they'll be put down as the never use glyphosate; right?
A. That's right. Their baseline exposure would have been never use; correct.
Q. And that's even if they sprayed glyphosate in '98, '99, 2000, 2001, because they hadn't sprayed it by the time they did that questionnaire, and it wouldn't show up?
A. That is correct. It was a baseline exposure measurement.
Q. So that leaves us vulnerable to misclassification bias?

A. Well, certainly if what you're -- you know, misclassification refers to the exposure that you're attempting to measure. In the case of this publication, they were concerned with baseline levels of exposure, again much higher levels of exposure than were investigated previously.
And while it's true that in your example that that NHL that was -- that was diagnosed would be attributed to someone who was unexposed, the latency period for that exposure would have likely been too short to be attributable to glyphosate anyway. So I think that was part of the motivation for characterizing their exposures in the way they did.
Q. Misclassification bias can drive the findings to the null; right? That's fair?
A. That's fair. But it's also important to recognize that when you're looking at exposures in multiple categories, it can also drive them away from the null.
MR. MILLER: Excuse me one second. Take a short break.
THE WITNESS: Okay.

MR. MILLER: I want to get some water and --
THE WITNESS: Great.
THE VIDEOGRAPHER: Going off the record. The time is 2:32.
(Whereupon, a recess was taken.)
THE VIDEOGRAPHER: Back on the record. The time is 2:50.
BY MR. MILLER:
Q. All right, Doctor, back to work.
A. Okay.
MR. COPLE: Let's just check who is on the line.
MR. MILLER: Jeff Traverse, you still there?
MR. TRAVERSE: I'm still here.
MR. MILLER: Okay. Anybody else? Let's go.
A. Okay.
BY MR. MILLER:
Q. We've talked about the Agricultural Health Study, and we talked about who some of the authors are.
Dr. Alavanja, one of the authors, do you remember his name?

A. I do, yes.
Q. Let's look at Exhibit 23-27.
(Whereupon, Rider Exhibit 23-27, Alavanja, et al article, Increased Cancer Burden Among Pesticide Applicators and Others Due to Pesticide Exposure, was marked for identification.)
BY MR. MILLER:
Q. And this is an article he wrote, follow-up article with a Dr. Ross and others.
Were you provided this by the Hollingsworth firm, or have you seen it from another source?
A. I don't recall reviewing this, but it's possible that it was in my list of materials, yes.
Q. Let's just look real quick. And I only bring it up because he's an author of this study that you rely upon to say that there is not causality between Roundup and non-Hodgkin's lymphoma.
And if you would with me, please, go to tab 1, and that is at page -- Table 5. I'm not sure what page that is. Table 5.

A. Okay.
Q. And to be fair, let's go to the start of the table, which is, I believe -- yes.
A. Okay. I'm there.
Q. First page of that table, it says what the table is about, and that is about "Epidemiological and Toxicological Evidence of Carcinogenicity for Selected Cancer Sites and Pesticides"; right?
A. Yes.
MR. COPLE: Objection. Document speaks for itself.
BY MR. MILLER:
Q. If we go to the second page of Table 5, it says for the pesticide glyphosate about halfway down.
Do you see that?
A. Yes, I do.
Q. Okay. And this is in 2013, before IARC found glyphosate 2A, so the IARC classification is not evaluated; right? Do you see the columns I'm talking about?
A. Oh, I see, "not evaluated under IARC classification." Yes, I do see that.
Q. And

Exposure Source, it says "Occupational"; right?
A. Yes.
Q. "Epidemiological Evidence," and here the author of the HS study says, "Positively associated with non-Hodgkin's lymphoma."
Do you see that?
A. I see that that's what it says in the table, yes.
Q. You disagree with that, right?
A. Well, again, I have not reviewed this paper prior to now. It's a pretty thick paper. It seems that they're doing their own review of the literature, but I really don't know the basis for that review, so I couldn't tell you whether I agree or disagree.
Q. Putting this paper aside, if someone were to tell you that glyphosate is positively associated with non-Hodgkin's lymphoma, would you agree with him or disagree with them?
A. In the main conclusion of my expert report, I disagree. I believe that there is not sufficient evidence to identify glyphosate as a causal factor in NHL.
Q. We can put that exhibit aside.
Before the break we were talking about

misclassification. Do you remember generally that line of questioning?
A. Yes, I do.
Q. And Dr. Alavanja, one of the authors of the original AHS study, went on in 2014 to write a paper about the AHS study, a second paper about insecticides and fungicides. Have you been provided that paper?
A. The 2014 AHS cohort study, is that the one you're referring to?
Q. Yes.
A. Yes, yes, I do have that paper.
Q. Let's take a look at it.
A. Okay.
Q. And that is 23-28.
(Whereupon, Rider Exhibit 23-28, Alavanja, et al paper, Non-Hodgkin Lymphoma Risk and Insecticide, Fungicide and Fumigant Use in the Agricultural Health Study, was marked for identification.)
BY MR. MILLER:
Q. In that study the AHS authors decided not to include glyphosate; right?
A. Well, I know that the results for

Page 226

glyphosate aren't included in that publication. That's the only information I have.
Q. So for whatever reason, the authors decided to not publish the glyphosate information?
A. The authors decided not to include the glyphosate information and results in this particular publication.
Q. Okay. If you could please turn to Page 15 of that report.
A. Okay.
Q. What these authors caution is, and I want to look at the last sentence before Conclusion, these are the authors of AHS, "Despite the generally high quality of the information on pesticide use provided by AHS participants, misclassification of pesticide exposures can occur and can have sizable impact on estimates of relative risk, which in a prospective cohort design would tend to produce false negative results."
That's true, isn't it?
A. Well, that is what the authors say here.
Q. And to be clear, AHS is a prospective

Page 227

cohort design; right?
A. AHS is a prospective cohort study, yes.
Q. We can move off that exhibit.
Let's look at the draft AHS study which I believe you rely on in part for your opinions; right?
A. I did. I reached my conclusions prior to seeing that publication, but it did sort of confirm and strengthen some of the evidence, I believe.
Q. We'll mark it as 23-29.
(Whereupon, Rider Exhibit 23-29, Draft Lymphoma risk and pesticide use in the Agricultural Health Study, was marked for identification.)
BY MR. MILLER:
Q. Here's a copy (handing). Have you found out why the authors decided not to publish this?
MR. COPLE: Objection. Asked and answered.
A. I have had no communication with any of the authors, so I would have no way of knowing that.

Page 228

BY MR. MILLER:
Q. Have you done a research and decided not to publish it?
A. I think I have definitely been involved in studies where we have not included every result that we found in a manuscript, but I don't think I've been involved in work where I've consciously decided not to publish, no.
Q. What was the loss to follow-up on this study?
A. So could you -- could you clarify a little bit what you meant? Because, for instance, in terms of cancer outcomes, there was virtually no loss to follow-up.
Q. Concerning cancer outcomes, there was virtually no loss to follow-up?
A. Well, they use linkage with registries, so that way they're really able to capture virtually all of the cancers that would occur in the cohort.
Q. And if people don't fill out the second questionnaire -- let's back up.
There was a second questionnaire; right?
A. That's right. A strength of this

Page 229

updated draft is that they incorporate information on exposure after baseline. So in the example that you gave earlier, now that person who was originally classified as unexposed would have an opportunity to provide information, updated information on exposure.
Q. And I guess the good news is 100 percent of these people filled out this questionnaire so we're able to see whether or not they were exposed after the first questionnaire to glyphosate; is that true?
MR. COPLE: Objection. Lacks foundation.
A. It is not true that 100 percent of people responded to the follow-up questionnaire, no.
BY MR. MILLER:
Q. 95 percent?
A. I could tell you if I looked in the paper. It was completed by 36,342 people, which was 63 percent of the original participants.
Q. Okay. I am not real good at math, but if 63 percent completed a questionnaire, 37 percent did not?

A. Yes, that is correct.
Q. So 37 percent of the people could have been exposed to glyphosate at any time after they filled out the first questionnaire, which was sometime between '93 and '97; right?
A. The first questionnaire, the baseline questionnaire, correct, was given between 1993 and 1997.
Q. So 37 percent of the people did not fill out the second questionnaire.
And when was the second questionnaire given out?
A. It says administered about five years after enrollment, so that would have been between 1998 and 2003.
Q. And so in my prior example, someone could have filled out a questionnaire in -- for the first time in '97 even, used Roundup from '98 through 2003, died of non-Hodgkin's lymphoma in, say, 2006, and it will be listed as a non-user or never user of glyphosate; right?
A. I actually don't think that's correct, because in their analysis, even for the participants that didn't respond to the follow-up questionnaire, they used information

on their exposure at baseline in the baseline questionnaire and an approach for handling missing data called multiple imputation to incorporate that exposure, that follow-up exposure information.
Q. They guessed?
MR. COPLE: Objection. Argumentative.
A. Multiple imputation isn't guessing. It's an established epidemiologic method for handling missing data.
BY MR. MILLER:
Q. Tell me how this established epidemiologic method works in lay terms.
A. So the idea is that you use all of the information that you have on these participants. And, of course, in a cohort study like this, you have very rich information on a variety of different covariates and factors about demographics and lifestyle. You use all of that information together with the information that is available on exposure in this case from baseline to come up with a model that predicts whether or not someone is likely -- or how likely someone is to have a particular exposure.
Q. So if I fill out a form in '93 to get

my license, pesticide applicator form, and I say I've never used glyphosate, what rich information is going to tell the epidemiologist whether I used glyphosate in the next ten years?
A. Sure. So fortunately for them, 36,342 people did fill out that questionnaire, and those people answered questions about a variety of different exposures, to glyphosate, to other chemicals. There was information on, you know, age and sex and race and all of these other factors that were encompassed in their questionnaire. And they can use all of that information to create models to predict whether or not someone was exposed or at what level they were exposed.
Q. So we were going to use the information by the 36,000 people that filled out two questionnaires to figure out what the 20,000 people who only figured out -- who only completed one questionnaire, what they would have answered had they filled out the second questionnaire?
A. Yes. That is the basic idea, yes.
Q. Why not just get 100 questionnaires filled out and figure it out from there?

MR. COPLE: Objection.
BY MR. MILLER:
Q. Why bother --
MR. COPLE: Objection --
BY MR. MILLER:
Q. -- with 36,000 questionnaires filled out?
MR. COPLE: Objection. Argumentative.
A. Because the idea is the more data that you have, the better your models will be in terms of predicting exposure status.
BY MR. MILLER:
Q. Because the more loss of follow-up there is, the less accurate the study is. That's true, isn't it?
A. No, I think that's too general. I mean, the accuracy of multiple imputation relies more on our assumptions about what -- this is going to sound very epi speak -- but the mechanisms of missingness.
So in other words, what factors are associated with both not having that exposure information and -- yeah, so that would be the missing mechanism. And so multiple imputation relies on the data being missing at random.

Page 234

In other words, it's okay if the data is missing based on other factors that we measure. For instance, if more older people were non-responders than younger people, that's okay, as long as we've measured information on age.

So it's not just an issue of how many people completed the follow-up questionnaire. It's the mechanism of the missingness that's important.

Q. The mechanism of the missingness --

A. Yes.

Q. -- that's important?

A. Yeah.

Q. Okay. So using the mechanism of the missingness formula, could we have only had 5 percent fill out, or 10 percent, and still have good data?

A. Again, I couldn't tell you that hypothetically. I'm not -- I'm not sure.

Q. But it's the more data you have missing, the less reliable the study is; isn't that a fair statement?

A. I don't think that's true. Again, what I was just saying is it actually depends

Page 235

much more on why the data is missing than how much data is missing.

Q. Well, why is data missing on 20,000 people?

A. It's very common in follow-up questionnaires in cohort studies for not -- for everyone to not answer subsequent questionnaires. You know, people get busy, they have other things going on. But as long as those -- the factors that are associated with why those people didn't fill out the questionnaire are somehow captured in the data that was collected by the cohort, that's not a problem.

Q. So they asked 36,000 people why the other 20,000 weren't responding?

A. No, that's not what I said.

Q. Okay.

A. I said that you -- the reasons for why someone doesn't respond. So, again, in my example from before, if it happens to be that older people don't respond to the questionnaire for whatever reason, that's not a problem, as long as we can take into our imputation modeling the effective age.

Page 236

Q. Turn to Page 8, please.

A. Okay.

Q. The authors right here in the middle of the page on the study that you rely upon, "Not sure what to do but the whole thing just seems messy." How does it strike you to rely upon data not published where the authors think the whole thing is messy?

A. Well, this sentence isn't referring to the whole paper. It's referring to the issue of how they deal with the fact that the definition of NHL has changed in the interim between their 2005 publication and this publication. So they have to make sort of decisions, analytic decisions, and decisions in terms of how they present their data so that the results are both consistent with the current definition, but also can be readily compared to the previous results.

So that comment about it being messy, it's dealing with one very specific issue in this manuscript.

Q. They also don't include multiple myeloma; right?

A. Oh, they do. They look at multiple myeloma both included in the overall definition

Page 237

of NHL consistent with the new definition, but then they also look at it as a separate outcome.

Q. AB, I believe Aaron Blair, it's on Page 8 writes, "I wonder if the decision not to include myeloma might seem inconsistent with our decision to go with a new definition of NHL."

Do you understand what he's referring to there?

A. Yeah, I think -- I think, again, he's talking -- commenting on the analyses where they look specifically at the subtypes of NHL and sort of questioning what category it's best to include multiple myeloma in.

But, again, this really has to do with trying to address a situation that was beyond the investigators' control. It's just the definition changed, and so you have to make sort of editorial decisions and decisions about how to present that data in light of, you know, other things that have changed in the field.

Q. Go to Page 71, if you please, ma'am.

A. Okay.

Q. Do you see the asterisk at the bottom of the page there?

A. Sorry, 71 you said?

Page 238

Q. Yes, ma'am.
A. No, I don't see an asterisk. Sorry.
Q. I'm sorry, a footnote 2. Excuse me. Page 71.
A. My Page 71 doesn't have any footnote.
Q. May I see it?
A. Sure (handing).
Q. Thank you. That could be a problem, couldn't it?
Yes, ma'am, here you go?
A. Okay.
MS. MILLER: That's the problem with using drafts.
BY MR. MILLER:
Q. Well, look at your Page 71. I -- there's something different between that and my work draft. I don't know what.
MR. COPLE: What draft are you referring to?
MR. HOLLINGSWORTH: Was the cover page there?
MR. MILLER: Mine is March -- September 1st, 2017, yeah.
MR. HOLLINGSWORTH: September 1st, 2017.

Page 239

MR. MILLER: September 1 at the bottom right there.
MS. MILLER: And hers is September something else.
A. 9/19.
MR. MILLER: That's a problem. Do you have a clean one that she can work off?
MR. HOLLINGSWORTH: Are you going to mark both of them?
MS. MILLER: I don't have it.
MR. MILLER: I don't have it.
BY MR. MILLER:
Q. I guess -- here's my question, ma'am. It just looks like there's March through -- there's a lot of them. It appears to be March 18th, 2013, then March 21st, 2013, then October 24th, 2016. Then my copy goes as far as September 1, 2017. Apparently you have one that goes even farther than that?
A. The last date is 9/19/2017.
Q. 9/19/2017.
So do you understand this to be various drafts of this document? Is that what we're to understand, or what?
A. Again, I can't be --

Page 240

Q. You just don't know?
A. -- be certain, but in my own working on publications, it's not unusual for the publication to be circulated throughout the co-authors a number of times for comments.
At the same time, it's very clear in reading the publication that, you know, while there's still some comments in the margins and some things in the -- some additional comments in the narrative part of the publication, that this is a publication that if sent out for peer review to me is a publishable paper.
Q. I have a few questions off that.
Number one, you called it a publication, but it's never been published.
A. A manuscript. Excuse me.
Q. A draft manuscript?
A. It is a draft of a manuscript, yes.
Q. It is a fourth or fifth draft of this manuscript apparently; right?
A. It's difficult to tell.
Q. And we don't know if it's been rejected for publication or submitted for publication; it's just too early in the process, isn't it?

Page 241

A. Oh, I don't -- I don't know that it's too early in the process. We're just not aware of the status of the manuscript without talking to the authors, I suppose. But, again, I don't think I need to speak to the authors to know that this manuscript, if cleaned up in terms of the formatting, is certainly publishable.
Q. If the authors felt it was appropriate enough to submit for publication?
A. Well, of course the authors get to decide, you know, when to submit their publication. But I think it's a shame that this has not been submitted for publication and isn't widely available.
Q. Not only do the authors get to decide when to submit, but if to submit, if it's worthy enough in their view to submit for publication?
A. I suppose that, you know, it is -- no one can submit a manuscript on behalf of other authors. That's not the process that we've set up. But as I've said before, it would be a shame if the scientific community was not given access to this manuscript.
Q. Are you aware of the International Community of Medical Journal Editors?

A. I have heard of that, but I really have limited familiarity with them.
Q. Let's take a look at what they have to say on this issue.
MR. COPLE: Before we move on, are you going to mark for the record the copy you were working off?
MR. MILLER: It's got my work notes on it. So the answer is no, I'm not going to mark something with my personal impressions on it.
MR. COPLE: We're going to object to that, subject to discussion later. You were asking a whole series of questions. We can mark it in the record, if need be, about a manuscript that the witness did not have access to.
MR. MILLER: We don't agree on that representation. The record speaks for itself, Counselor.
BY MR. MILLER:
Q. I'm going to show you what's been marked as Exhibit 23-30, International Committee of Journal Editors, "Uniform requirements for manuscripts submitted to biomedical journals.

(Whereupon, Rider Exhibit 23-30, International Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, was marked for identification.)
BY MR. MILLER:
Q. I have a few questions for you.
A. Okay.
Q. If you turn with me, please, to Page 15 of 24.
A. Okay.
Q. Look at the first paragraph. It says, "Moreover, media reports of scientific research before the work has been peer-reviewed and fully vetted may lead to dissemination of inaccurate or premature conclusions."
That's true, isn't it?
A. I have never seen this document before. I don't really even know what it's from.
Q. Well, I'll tell you what it's from. It's from the -- published in the Journal of Pharmacology and Pharmacotherapeutics, it's the International Committee for Medical Journal

Editors. That's what it's from.
Now, do you agree with the statement I read, or no?
A. The statement, "Moreover, media reports of scientific research before the work has been peer-reviewed and fully vetted may lead to dissemination of inaccurate or premature conclusions." As a general statement, I do disagree with that. I think that that's often, and maybe more often, not the case.
And, in fact, just to add to that, I think it's sort of a dated view of how the publication process works now. For instance, if you were to present results at a scientific conference, those results would typically be available publicly on Google or on the website, and that does not then prevent the accurate dissemination of scientific findings in a peer-reviewed journal.
Q. Turn, if you would, please, ma'am, to Page 19.
A. Okay.
Q. This is Roman Number IV, Section A.9, References. And I'm reading the last sentence. "Information from manuscripts submitted but not

accepted should be cited in the text as 'unpublished observations' with written permission from the source."
That's basically what this is; right? This draft that you're looking at is an unpublished observation?
A. It's true that this manuscript has not been published in a journal, and so if I was going to cite it in my own work, I wouldn't really have any other choice but to say that it was an unpublished manuscript. But that doesn't say anything about the quality or its suitability for publication.
Q. You're supposed to obtain written permission from the source before citing unpublished observations; right?
A. I mean, again, this is recommendations from some kind of committee that I have no familiarity with. I'm reading this for the first time. But if it was my own unpublished data, meaning I had presented some data at a conference and now someone wants to cite it, I think it is sort of the -- the polite thing to do in the scientific community would be to ask the author if they're okay with you citing their

work in their paper, given that it's unpublished.
Q. And did you make any effort to ask any of the authors of the unpublished draft of AHS whether you could use their materials here in this exercise?
A. As I mentioned before, I've had no contact with any of the authors.
Q. We're going to switch subjects here.
It would be fair to say you don't consider yourself an expert on non-Hodgkin's lymphoma?
A. No, I don't think that's true. I'm a cancer epidemiologist. And while my own research focus hasn't been NHL, I am -- my training and experience makes me very well-equipped to evaluate the epidemiologic literature on glyphosate and NHL. And, in fact, in terms of peer review, I'm very frequently asked to peer review papers that aren't related to prostate cancer or the exposures that I've studied in the past.
Q. Would it be fair to say as a general observation as a person who has studied cancer that solid tumors take longer to develop than

blood tumors?
MR. COPLE: Objection. Lacks foundation, vague.
A. Again, I wouldn't be willing to make that sort of gross generalization, no.
BY MR. MILLER:
Q. Does that mean you don't know?
MR. COPLE: Objection. Asked and answered.
A. No, it just doesn't -- but I mean, cancer is an extremely heterogeneous disease and, in fact, even within particular cancer types there is a tremendous amount of variability in terms of their natural history. So I wouldn't be willing to say that blood cancers are quicker growing than solid tumors, or vice-versa.
BY MR. MILLER:
Q. You're, of course, not an oncologist; correct?
A. I am not trained as an oncologist, no.
Q. You're not a medical doctor?
A. I have a doctorate in epidemiology, not in medicine.
Q. So you've not done clinical treatment?

A. I do not treat patients, that is correct.
Q. Have you heard of the 9/11 Fund?
MR. COPLE: Objection. Lacks foundation.
A. I don't believe so. I'm not sure.
BY MR. MILLER:
Q. September 11th, 2001, we all know as Americans had that tragedy, and there is a fund set up in New York for injuries which may or may not have been caused by the damage from the World Trade Center. And I'm going to show you a latency document from the 9/11 Fund. Okay?
A. Okay.
(Whereupon, Rider Exhibit 23-31, World Trade Center Health Program, Minimum Latency & Types or Categories of Cancer, was marked for identification.)
BY MR. MILLER:
Q. If you look with me on the Executive Summary, number 3, it lists leukemias, lymphomas, hematopoietic cancers, and it has .4 years for latency for hematopoietic cancers.
Let me back up and ask you first, can

we agree that non-Hodgkin's lymphoma is a hematopoietic cancer?
A. Yes.
Q. And you do not have any expertise to dispute that the minimum latency period for non-Hodgkin's lymphoma is .4 years?
MR. COPLE: Objection. Asked and answered, lacks foundation.
A. I discuss latency periods for cancers in my expert report, and again, this is for every cancer. This is always an estimate. You know, of course, in an individual there is a range, but I have no idea where these authors got the information leading to them to list .4 years as a minimum latency, so I really couldn't comment on that.
BY MR. MILLER:
Q. So it's fair to say you don't have an opinion, to a reasonable degree of medical certainty, about a different minimum latency period?
A. Again, talking about the minimum median latency period, I don't think, you know, we could ever know that on the individual level, so I'm not sure that that's useful.

Page 250

Q. I want to show you a study on hematopoietic cancers from Harvard University, the Residual "Exposure to Pesticide During Childhood and Childhood Cancers: A Meta-Analysis." We'll mark this one as Exhibit 32.

(Whereupon, Rider Exhibit 23-32, Chen, et al article, Residential Exposure to Pesticide During Childhood and Childhood Cancers: A Meta-Analysis, was marked for identification.)

BY MR. MILLER:

Q. Do you know any of these authors?

A. I do not, no.

Q. Department of environmental health, Harvard T Chan School of Public Health, the year is 2015.

You don't know Dr. Lu, I guess?

MR. COPLE: Objection. Asked and answered.

A. No, I don't know any of these authors.

BY MR. MILLER:

Q. Okay. The context of this, the first sentence says, "There is increasing concern about chronic low-level pesticide exposure

Page 251

during childhood and its influence on childhood cancers."

And they report, if you would look, please, at the Data Extraction section, childhood lymphomas, an odds ratio of 1.34. And here's my question.

Have you ever commented on this study and the article that you've read or written? I apologize, bad question, let's try again. That was really a bad question. Made no sense at all to me. Let's start again.

In this article, if we could please go to Page 2, second full sentence, it says, "Children greatly increase their chance of pesticide exposure when they play on pesticide-treated surfaces such as a floor or lawn and then put their hands in their mouths."

My question is, would this add to the body of literature for those of us that believe there's an association between glyphosate and non-Hodgkin's lymphoma, or would the answer be no, it does not?

MR. COPLE: Objection. Vague.

A. So this is a meta-analysis I've never seen before on childhood cancers, which is a

Page 252

topic that I haven't reviewed with respect to glyphosate exposure. I think I've been fairly clear about my feelings about meta-analyses, is that I think it's necessary to go to the primary studies that are included in those meta-analyses, because all of the shortcomings and issues with internal validity in those studies carry forward to a meta-analysis. So I would definitely want to be able to see the primary studies.

And then in terms of that statement, "Children greatly increase their chances of pesticide exposure when they play on pesticide-treated surfaces such as a floor or lawn and then put their hands in their mouths," I would also want to see where the evidence comes from for that particular statement.

Q. Sure.

Children can get leukemia as young as two, sadly, isn't that true?

MR. COPLE: Objection. Vague, lacks foundation.

A. I know that very young children can be affected with leukemia, yes.

BY MR. MILLER:

Page 253

Q. So it certainly would be true if someone got leukemia at the age of two, the latency period for that individual could not have been any more than two years; that's the extent of their life at that point in time?

MR. COPLE: Objection. Lacks foundation.

A. Well, I actually -- I think that's incorrect, because many people investigate in utero exposures with respect to cancer risk. But certainly there is a limit on the latency period.

I also think we know that, in general, the causes of childhood cancers are typically very, very different than the causes of adult cancers.

BY MR. MILLER:

Q. What are the other causes of childhood cancer versus causes of adult cancer?

MR. COPLE: Objection. Vague.

A. So for many cancers we think of the cancers that occur at young age and old age as being sort of etiologically distinct diseases, so diseases for which different risk factors would exist.

Page 254

BY MR. MILLER:
Q. Here's a pesticide exposure in children of non-Hodgkin's lymphoma exposure study from Harvard I'd like to ask you just one or two questions about.
First off, do you know any of these authors?
(Whereupon, Rider Exhibit 23-33, Buckley, et al article, Pesticide Exposures in Children with Non-Hodgkin Lymphoma, was marked for identification.)
BY MR. MILLER:
Q. 23-33, and this is Dr. Buckley and others article.
A. I recognize Dr. Robison's name, but we have never collaborated, I don't know that we've ever met in person. But otherwise, no.
Q. This article written in year 2000, the conclusion says, "The results of the current study provide further evidence linking pesticide exposure to the risk of non-Hodgkin's lymphoma, but the authors were unable to implicate any specific agent."
Do you see that?

Page 255

A. I do.
Q. Okay. So let me back up and ask you, is farming generally considered a risk for non-Hodgkin's lymphoma?
MR. COPLE: Objection. Vague.
A. Well, I think that a number of studies have indicated increased risks of NHL in farmers even prior to the -- to glyphosate being available on the market, yes.
BY MR. MILLER:
Q. So we can comfortably say that farming increases the risk of non-Hodgkin's lymphoma?
A. I believe farming does appear to increase the risk of non-Hodgkin's lymphoma, yes.
Q. And how many studies showed that before glyphosate was on the market?
A. I would have to look at my expert report, but I do cite some of them there.
Q. Statistical significance, you believe, is not necessary to have a valid scientific finding; true?
MR. COPLE: Objection. Vague, lacks foundation, misstates prior testimony.
A. Well, there are two separate issues.

Page 256

The first issue is whether you believe the point estimate that's identified in a study to be reflective of the truth in terms of the true causal association between the exposure and the outcome. And as I've said before, if you don't believe and have faith in that point estimate, there's really no point in determining how precise that estimate is, or how likely it is to be due to chance if it's wrong.
Only after you've established the internal validity of the study would then you go on to say, okay, well, now how likely are the results that I found due to chance, and that's where statistical significance plays a role.
BY MR. MILLER:
Q. I'm going to show you what we've marked as Exhibit 34. And I'm showing my age here, it's a tweet, whatever that means.
(Whereupon, Rider Exhibit 23-34, Copy of Tweet of Jennifer Rider, was marked for identification.)
BY MR. MILLER:
Q. I think that's you in part of that tweet; is that right?
A. Yes, this is from my Twitter page.

Page 257

Q. Okay. I apologize for -- my paralegal was looking at your Twitter page, but I didn't know how to do it, so -- but we only ask about it because you apparently look pretty enthusiastic about -- just correct me if I'm wrong, but apparently the issue in this tweet is that you don't think p-values are that important for scientific conclusions; is that fair?
A. I think p-values, and more specifically hypothesis testing, has a place, but a very small or very statistically significant p-value doesn't tell you anything about the quality of the study or the validity of your point estimate.
Q. On the flip side of that, even if the p-value does not give you a confidence interval of 95 percent, you can still find important scientific information if the study has good internal validity?
A. Yeah. So in this particular example that I'm tweeting about is a little bit different because it's a randomized trial, not an observational study. And, you know, one might argue that hypothesis testing and p-values have a somewhat different role in those

Page 258

randomized trials. But nonetheless, the results of this study found a p-value of .06, and I sort of disagreed with the interpretation of the finding of that study.

Q. You thought that the study should be given significance in that it had important implications, even though it was a .6?

MR. COPLE: Objection. Asked and answered.

BY MR. MILLER:

Q. Is that right? I'm just trying to --

A. Yeah, it was -- again, it wasn't an observational study. It was a randomized controlled trial.

So many of the biases that we worry about that are inherent in observational studies did not apply to this particular study, and so I felt that the study provided some information that could be interpreted, despite the fact that the p-value wasn't statistically significant at the .05 threshold.

Q. Yes. Last question, and we'll walk away from this one.

This is the same Kenneth Rodman here that wrote the textbook that we were talking

Page 259

about earlier; right?

A. That's correct, he's -- yes, he wrote that book.

Q. A 10 percent increased risk you would describe as a modest risk; right?

A. A 10 percent relative risk?

Q. Yes.

A. So, again, it's very difficult to make generalizations like that. It would depend a lot about the specific exposure and the outcome.

Q. Let's take a look at a study that you did with Kathryn Wilson, the same Kathryn Wilson that was on that IARC panel; right?

A. That's correct.

Q. All right. This is a study on "Vasectomy and Risk of Aggressive Prostate Cancer: A 24-year Follow-Up Study."

A. Mm-hmm.

(Whereupon, Rider Exhibit 23-35, Wilson, et al study, Vasectomy and Risk of Aggressive Prostate Cancer: A 24-Year Follow-Up Study, was marked for identification.)

BY MR. MILLER:

Q. And here you and Dr. Wilson are

Page 260

studying this issue, and you found a relative risk of 1.1, a 10 percent increased risk, in prostate cancer if a person had a vasectomy; right?

A. That was the relative risk for overall prostate cancer, that's correct.

Q. Okay. And your conclusion was, "Our data support the hypothesis that vasectomy is associated with a modest increased" risk -- I'm sorry -- "a modest increased incidence of lethal prostate cancer"; right?

A. So there we're referring to the result for lethal cancer, which is in the next sentence of the result, and there that's a relative risk of 1.19.

Q. That's fair. I appreciate that.

So you would describe a 19 percent increased risk as a modest risk?

A. So as -- again, I said it's very context-specific. And for lethal prostate cancer, which is a pretty rare event and one for which we have very few established risk factors, I think that our conclusion that that's a modest increased incidence is accurate, yes.

Q. Sure.

Page 261

And you agree that non-Hodgkin's lymphoma can be fatal?

A. Yes, I agree with that.

MR. COPLE: We've been going for an hour and a half since the lunch break.

MR. MILLER: Another break, sure. Easy to live with. Have a nice break.

THE VIDEOGRAPHER: Going off the record. The time is 3:41.

(Whereupon, a recess was taken.)

THE VIDEOGRAPHER: Back on the record. The time is 4:04.

MR. MILLER: Who is on that speakerphone? No one, apparently. Mr. Traverse, are you still with us?

MR. TRAVERSE: Yeah, I'm here.

MR. MILLER: You're hiding out or something, what's going on there?

Anybody else? Negative. All right.

BY MR. MILLER:

Q. I believe my last question -- you know, we're moving on, making progress. So we were talking about the vasectomy article, and that's marked as what exhibit? I'm sorry, you have it there in front of you.

Page 262

A. 23-35.
Q. Thank you.
All right. So I'll just ask a few more questions on it, and then we'll move on.
And it's important, so I wanted to point out, correct me if I'm wrong, it's on Page 3035, you found this modest association even though it was not statistically significant; right?
MR. COPLE: Objection. Misstates the prior testimony.
A. So the relative risk for lethal disease was 1.19, and the confidence interval was from 1-to-1.43, so it did just barely include the null value, yes.
BY MR. MILLER:
Q. But still holds important information?
A. Again, we are not making any claims in this paper about evidence of causality, but we certainly thought that this information was worth publishing and sharing with the scientific community, yes.
Q. On Page 3036, if you would, please, the first sentence in the typed portion there, it says, "Three previous cohort studies have

Page 263

examined the association of vasectomy with advanced stage disease, with all finding increased but not statistically significant relative risks ranging from 1.4 to 2.1." My only point -- unquote.
My only point for asking about that is they were all important enough to mention here, even though they were not statistically significant. Am I reading that right?
A. I think here we were just trying to provide a summary of the previous research that had been done in the field, so regardless of statistical significance, we felt like we needed to mention the prior studies that had looked at this question.
Q. And just the last page, if we could, 3038. You state, "Thus, these relative risks translate to small increases in absolute risk. The decision to opt for a vasectomy remains a highly personal one in which the potential risks and benefits must be considered." Right?
A. Mm-hmm.
Q. Okay. You found IARC important enough to cite in your own articles; right?
A. I can't recall. I may have, but I'm

Page 264

not sure.
Q. Let's' take a look. We're on 23-26 -- I'm sorry, 23-36.
(Whereupon, Rider Exhibit 23-36, Sigurdardottir, et al manuscript, Sleep Disruption Among Older Men and Risk of Prostate Cancer, was marked for identification.)
BY MR. MILLER:
Q. Here's an article you wrote with Dr. Mucci and others, "Sleep Disruption Among Older Men and Risk of Prostate Cancer," 2013, I believe.
Do you remember this one?
A. I do, yes.
Q. The first point I'd like to ask you about is, you considered a hazard ratio of 2.1 as a strong risk -- or strong association; would that be true? And I'm looking at the Results section in the abstract.
A. I agree that our sort of main finding was that men with sleep disruption, meaning those who had problems falling and staying asleep, had a 1.7 -- a hazard ratio of 1.7 and 2.1 when you consider sort of our version of a

Page 265

dose-response analysis.
Q. And I'm reading down here, quote, in the Results section, "When restricted to advanced prostate cancer, these associations became even stronger [hazard ratio 2.1]."
Do you see that?
A. I do.
Q. So it would be fair to call a hazard ratio of 2.1 a strong association?
A. That's not what it says here. It just says that the hazard ratio of 2.1 and 3.2 were stronger than the ones where we're looking at overall prostate cancer, but I don't think it's making a general statement about what we feel is strong or not strong.
Q. Let's take a look at Page 5. I'm sorry, I'm in the wrong spot. Page 2, I apologize.
In your Introduction, the first thing you point out is that "IARC designated shift work involving circadian disruption as a probable human carcinogen in humans (Group 2A)."
Do you see that?
A. I do.
Q. So certainly in 2013 you thought

Page 266

IARC's conclusions were important enough to be mentioned in your peer-reviewed studies?
A. I think we felt like the fact that IARC had looked at this question, provided some context for as to why we would want to investigate sleep disruption with respect to prostate cancer.
Q. And when you did your paper as to the issues that you looked at, you came to a conclusion consistent with IARC's conclusion?
A. I wouldn't really say that, because I don't think we were looking at this in terms of it being a probable human carcinogen. I think we're evaluating the results more qualitatively, especially given some of the limitations in the study that we're quite up front about acknowledging.
Q. 23-37 is Exhibit B to your report, and it is your list of materials considered. And what I'd ask you to do is to let me know which of these you developed yourself as compared to getting from Hollingsworth firm, okay?
MR. COPLE: Objection. Asked and answered.

Page 267

(Whereupon, Rider Exhibit 23-37, Exhibit B to expert report, Materials Considered List, was marked for identification.)
A. Yeah, I really couldn't do that. I don't recall which ones I found and which ones were given to me.
BY MR. MILLER:
Q. Okay. Can you recall any that you found?
MR. COPLE: Objection. Asked and answered.
A. Again, it was -- my literature search was a very long time ago, and I couldn't say with certainty which of these I found.
BY MR. MILLER:
Q. Can you tell me, we've talked about it, but which of those you've actually read on that list?
A. So you're asking me to go through the entire list and tell you all the ones that I've read?
Q. I know that sounds cumbersome, but it's pretty important.
A. Okay. Again, I'm going based on

Page 268

memory. I started reviewing these papers now a year and a half ago. So I can't tell you for sure, but I can certainly tell you the ones that I know that I read.
I have read both of the papers by Acquavella, number 1 and 2.
I have read the number 5, the Alavanja 2014 study.
I have definitely read at least one of these draft manuscripts by Alavanja. There has been some confusion about that, but one of those drafts I have access to.
I read the American Cancer Society summary of non-Hodgkin's lymphoma.
The Berkson study, number 17.
I have read several of these Blair studies, 21, 22, 23, 24.
I read the Blettner study on meta-analyses and pooled analyses.
I read the study by Bosch, and the Bradford-Hill study, although it's been some time.
The Bravata study.
The Cancer Research UK web publication.

Page 269

The -- I believe I read all three of the Cantor studies.
The Chang and Delzell 2013 meta-analysis.
The 2016 Chang and Delzell systematic review and meta-analysis.
The Cocco paper.
I believe I've read all three of those De Roos papers that have been listed.
The Dreiher paper.
The Dubrow paper.
The Engel paper.
I read at least one of these EPA reports to try and determine the dates that glyphosate was available, but I don't recall which one.
The Eriksson paper.
The expert report of Drs. Neugut and Ritz, as I mentioned.
The Fasal study.
These papers by Gelman about statistical significance.
The Greenland paper.
The Hardell and Eriksson case control study.

Page 270

The Hardell, et al study. I'm sorry, number 90.
The Hernan paper.
The Hohenadel paper.
The Hoppin paper.
The IARC Monograph 112.
The Lash paper.
The Lee paper.
The McDuffie paper.
The National Cancer Institute facts on non-Hodgkin's lymphoma.
The Nordstrom paper.
I believe 129 refers to a presentation at a conference, and I have reviewed. I believe that was the version that I reviewed. There were a few.
The Orsi paper.
The Pahwa publications.
Again, I can't recall which ones I have and have not reviewed, but I have reviewed several presentations and a draft manuscript from the North American Pooling Project.
Just a moment ago we reviewed this Pearce study.
I have read the Charlie Poole paper.

Page 271

The Rinsky paper.
The Samuels paper.
The Schinasi and Leon paper.
The Schumacher paper.
The SEER statistics for non-Hodgkin's lymphoma.
The Sorahan paper.
My own paper on toll-like receptor signaling.
The -- I'm not sure how you pronounce his name, but Szklo and Nieto textbook.
The list of participants at the IARC Monograph 112 meeting.
The Walker paper on meta-analysis.
The World Health Organization definition of epidemiology.
And those are all the ones that I immediately recognize.
Q. Thank you.
Did you ask to review anything that you were not provided?
A. Well, there are materials that I both obtained and cited in my expert report that were not provided to me, yes.
MR. MILLER: I have no further

Page 272

questions. Thank you for your time.
A. Thank you.
MR. COPLE: Are you passing the witness?
MR. MILLER: I would imagine.
MR. COPLE: All right. Let's go off the record. Take a short break.
THE VIDEOGRAPHER: Going off the record. The time is 4:25.
(Whereupon, a recess was taken.)
THE VIDEOGRAPHER: Back on the record. The time is 4:42.
EXAMINATION
BY MR. COPLE:
Q. Good afternoon, Dr. Rider.
A. Hello.
Q. I'm not going to prolong this, but we've got a couple of things that we need to ask you to clear up what we hope is not confusion, but just to clarify.
A. Okay.
Q. You were asked many questions today by plaintiffs' counsel, Mr. Miller, and in many instances Mr. Miller did not give you the opportunity to look at your expert report, but

Page 273

he did hand it to you. It has not been marked as an exhibit, so right now let's mark that as an exhibit to the deposition.
Which one are we up to? 38?
(Whereupon, Rider Exhibit 23-38, Expert Report of Jennifer R. Rider, ScD, 7/31/17, was marked for identification.)
MR. MILLER: Object to the form of the question. Object to the statement.
MR. COPLE: No question, it was just a statement.
MR. MILLER: Object to the statement.
BY MR. COPLE:
Q. And is that your expert report in this case?
A. Yes, it is.
Q. It contains the opinions that you arrived at?
A. Yes, it does.
Q. And have you had occasion to change any of those opinions in the course of questioning today?
A. No, I have not.
Q. And do you hold all the opinions

Page 274

reflected in your report to a reasonable degree of scientific certainty?
A. Yes, I do.
Q. And is that the same about any opinions you had today about the relationship between glyphosate exposure and non-Hodgkin's lymphoma?
MR. MILLER: Object to the form of the question.
A. That is correct.
BY MR. COPLE:
Q. There was also a moment today when you were being asked in reference to unpublished work whether it's necessary to reach out to the authors who are the proponents of the drafters of that work, and you mentioned that there might be a courtesy involved in contacting those authors.
Do you remember that?
A. I do, so I was shown a document where those authors had said that unpublished data should only be cited with permission of the authors.
Q. And that was the courtesy that you were talking about?

Page 275

A. Yeah. I was saying that it would be a courtesy to ask the author's permission before you cited their work in a public forum, so either in a published manuscript or at, say, a conference where those results were going to be presented.
Q. What about the Exhibit 38 which you've identified as your expert report in this case, is there any reason that you would have had to reach out to any of the co-authors of what's been called the 2013 AHS draft manuscript?
A. No. My expert report is not going to be published, and so I did not think it was necessary to reach out for the authors and ask for permission to cite their data.
Q. Okay. You also were asked to go through the list of materials considered, MCL, materials considered list.
A. Mm-hmm.
Q. You had initially testified, as I recall, that you had reviewed it some time ago, and over a period of time, you could not specifically identify all the materials that you did review; is that correct?
MR. MILLER: Object to the form of the

Page 276

question.
A. That is correct. The list of materials is very long, and I received many of those materials now over a year ago.
BY MR. COPLE:
Q. And you went through that list at the request of Mr. Miller, and you identified materials that you specifically recall reviewing; is that correct?
A. That is correct.
Q. Does that mean from your testimony today that anything you did not so identify you did not review?
MR. MILLER: Object to the form of the question.
A. No, it does not.
BY MR. COPLE:
Q. You just don't remember it, sitting here today?
MR. MILLER: If we can, and I understand we all want to go home, but you need to get my objections in before you answer, please. Thank you.
THE WITNESS: Sorry.
MR. MILLER: Thank you very much.

Page 277

MR. COPLE: I don't know if we got my question and answer. Why don't you just read that last one back.
(Whereupon, the reporter read back the pending question.)
A. So that is correct, I don't recall all of the materials that I might have read, sitting here today.
BY MR. COPLE:
Q. And, in fact, there was a supplemental list of materials that you considered in regard to your expert opinion; is that correct?
A. That is correct.
MR. COPLE: Let's mark as Exhibit 39 for this deposition --
(Whereupon, Rider Exhibit 23-39, Supplemental Materials Considered List, was marked for identification.)
BY MR. COPLE:
Q. -- a document, and ask you to identify it for us.
A. This is a Supplemental Materials Considered List.
Q. And does that reflect all the materials that you've now reviewed through today

Page 278

for purposes of preparing and evaluating and reaching your conclusions, your expert conclusions in this case?

MR. MILLER: Object to the form of the question.

A. Yes, it is.

BY MR. COPLE:

Q. Are there additional materials on that list?

A. There are materials on this list, yes, that were not included on the first materials considered list, that's correct.

Q. Now, since the date that that supplemental list was reviewed, have you reviewed any additional materials, for example depositions, since that list?

A. No. Not since this list, no.

Q. You testified earlier you reviewed the depositions of Dr. Neugut and Dr. Ritz?

A. Yeah. They're actually included on this -- oh, I'm sorry, these are the expert reports. I apologize.

I've also reviewed their depositions, which are not listed here.

Q. Those occurred after that supplemental

Page 279

list?

A. Exactly. Exactly.

Q. Before I overlook it, there was an exhibit, and I don't recall the number, frankly, if you can put your hand on it right away we can talk about it, if not I can refresh your memory about it. It was one of the pieces that counsel asked you about that was posted on the website for the Harvard School of Public Health.

A. I think that would have been towards the bottom of the pile. Yes, here it is.

Q. "Nutrition Source. Research Roundup"; is that correct?

A. That is correct.

Q. And who is this written by?

A. According to the last paragraph here, it was written by -- I'm sorry about the pronunciation, Yu-Han Chu, a third year doctoral student who has been researching dietary factors in relation to semen quality and other reproductive outcomes.

Q. And on the first page of that exhibit -- can you tell us what exhibit that is?

A. 23-15.

Q. And on the first page of that exhibit,

Page 280

there are three bullets towards the bottom half of the first page. It all follows the Roman Numeral Guyton.

Now, was this a study that was done of any sort by this doctoral student?

A. No. From what I can gather in my quick read of this, this is just a summary of the Lancet oncology findings, report.

Q. It was not a review by the doctoral student; is that right?

MR. MILLER: Object to the form of the question.

A. It just says here "A summary of the final evaluation was published in Lancet Oncology," and then this doctoral student provides a few bullet points.

BY MR. COPLE:

Q. So it would not even constitute a complete review, in your view?

MR. MILLER: Object to the form of the question.

A. Yeah, I would classify it as a bulleted summary of the report.

BY MR. COPLE:

Q. Okay. Do you have at hand amongst

Page 281

those exhibits De Roos 2005?

A. Here we are.

Q. Okay. You were asked a number of questions about this particular study publication; correct?

A. That is correct.

Q. Now, this was -- as I recall your testimony, and in your expert report, this is the baseline study publication by Dr. De Roos and his co-authors; correct?

A. This is the prospective evaluation, yes, that looked at glyphosate and some -- glyphosate exposure at baseline in the cohort.

Q. And you were asked a number of different questions about personal protective equipment and various other factors for pesticide applicators.

Do you remember that?

A. I do.

Q. Now, in this particular study, at baseline in 2005, did the study co-authors take into account the use of personal protective equipment in terms of the weighted intensity of exposure?

A. Yes. So they looked at exposure both

Page 282

in terms of cumulative exposure days, and then in terms of intensity weighted exposure days. And the intensity weighted exposure days does consider personal protective equipment in their determination of intensity.

Q. Now, if you go to Page 50 on the De Roos document, and you go straight up the middle of the page, you'll see a subheading "Data Analysis."

Do you see that?

A. I do.

Q. And if you go right above that, there's a sentence starting with "Intensity levels."

Do you see that?

A. I do.

Q. Would you read that sentence for the record?

A. Sure. "Intensity levels were estimated using questionnaire data from enrollment and measurement data from the published pesticide exposure literature as follows. Intensity level equals mixing status plus application method plus equipment repair status, all of those things combined, times

Page 283

personal protective equipment use."

Q. What does that mean, Doctor?

A. That means that when they were determining how intense a person's exposure level was, they considered a variety of factors about how specifically that person was exposed, including whether or not that person used personal protective equipment.

Q. So at baseline, the De Roos study report published here with his co-authors took into account personal protective equipment?

A. That is correct.

Q. Now, there were a number of questions that were asked by counsel having to do, as I recall, with the number of follow-up respondents that there were to fill in the blanks since the original baseline collection on the AHS study.

Do you remember being asked that?

A. I do.

Q. And when you were testifying about that, you had mentioned that for those, let's say, 33 percent or so of the respondents that did not respond in one way or another, that an imputation approach was used.

Do you remember that?

Page 284

A. I do, yes. That's correct.

Q. Now, that imputation approach, as I recall, you said is a well established methodology in epidemiology. Is that what you said?

A. Yes.

MR. MILLER: Object to the form of the question.

BY MR. COPLE:

Q. Now, the imputation methodology that you were asked about and you described, has that methodology been validated anywhere?

A. Yes, it's been used in a number of papers within -- published papers within the Agricultural Health Study. But there's one specific published paper, that the purpose of that paper was to describe in more detail the imputation methods that were used, and also to validate the method by using what they call a holdout sample of respondents who they were then able to test their models in.

Q. What is the one particular paper you're talking about?

A. That would be Heltshe, et al.

Q. Did you take Heltshe, et al into

Page 285

consideration in coming up with your expert opinions?

A. Yes, I did.

Q. And is that reflected on your supplemental materials considered list?

A. Yes. It's listed as number 93.

Q. Okay. Also, there was a question about Alavanja and a follow-up paper that he and his colleagues had prepared in 2014, which, as I recall, was published. Do you remember being asked about that?

A. I do, yes.

Q. Has that been marked as an exhibit? Do you have that with you?

A. I can't recall whether that one is here.

Q. Well, let me ask you, and maybe we don't even need to find it.

A. It is.

Q. It has been. What's the number, please?

A. This is 23-28.

Q. And this is the study in the published study manuscript that you had indicated did not include glyphosate, even though that was part of

Page 286

the original De Roos baseline study; correct?
A. That's correct. It's one of the chemicals that was not included in this subsequent published follow-up study.
Q. And as I recall, you also said you don't know why the authors chose to exclude it; right?
A. That is correct.
Q. Okay. Now, with respect to Alavanja, did Alavanja and colleagues, with respect to that 2014 published study, use the same imputation design that you had just referenced from Heltshe?
A. That is correct. It's the same method that is referenced in the draft 2013 manuscript, and the same method that's described in the Heltshe paper.
Q. Let me mark as Exhibit 40 a document, and have you identify it for us.
(Whereupon, Rider Exhibit 23-40, Draft, Lymphoma risk and pesticide use in the Agricultural Health Study, 12/5/16, was marked for identification.)
A. This is the draft manuscript that

Page 287

includes the updated results from the Agricultural Health Study that I used and cited in my own expert report.
BY MR. COPLE:
Q. You earlier today were shown a document marked as an exhibit which also says that it's a draft manuscript from the AHS 2013 follow-up study. Are these documents different from each other?
A. Yeah, it became apparent that there is at least two differences in the -- in these drafts, just from a quick look at them.
Q. And what was the two differences quickly in your quick look?
A. Well, the one that I was shown earlier, Exhibit 29, has a number of dates on the bottom of the title page, whereas the one that I had seen -- the only one that I had seen prior to today has this date of December 5th, 2016. So that's the first difference.
And then, of course, we were alerted to the differences between the manuscripts because there was a footnote on a table that was not in the version that I was looking at.
Q. What's the exact date of the new

Page 288

draft? That's the one that was marked earlier in the deposition.
A. So there are a number of dates here that are sort of crossed out and track changes.
Q. What's the date that was not crossed out?
A. That would be September 19th, 2017.
Q. And you had not previously seen a document purporting to be the draft manuscript of that date; is that correct?
A. That is correct.
Q. And what about the earlier dates that are strucken out in some fashion, had you seen those versions?
A. No, I do not recognize any of those dates to be the date of the version that I've seen.
Q. And you have not been able to have the opportunity to go through page by -- what were the dates of the ones that you had not seen?
A. Sorry, it's a bit difficult to read.
So 9/19/2017 was crossed out once, and then there's 10/24/2016, then 3/21/2013, and then 3-18 -- but I can't see -- oh, 2013. That was the last date.

Page 289

Q. Now, you have not had an opportunity, since you've been in this deposition all day, to carefully go through page by page whether there are differences in writing or data or interpretation or comments or content; is that correct?
A. That is correct.
Q. Okay. With respect to the exhibit that we just marked, which is Exhibit 40, as I recall.
A. Correct.
Q. Exhibit 40 is the draft manuscript version that you were provided; correct?
A. That is correct.
Q. And in that version, I believe you testified that it's ready to be published, as far as you're concerned; is that right?
MR. MILLER: Objection. Form.
A. Yeah, I stated earlier that if I was to receive this manuscript, perhaps without the comments in the margins, but I'd just edit -- visually cleaned-up version of this manuscript, if I was to receive it for peer review, I might have some minor comments, but I would determine it to be publishable.

Page 290

BY MR. COPLE:
Q. Is a study design or an epidemiology study not scientifically valid because it hasn't been published?
A. No, I don't think that whether or not -- you know, there are a number of reasons for why something may not have been published, and so I don't think that having an unpublished draft says anything about the quality of the publication or its suitability for publication.
Q. And you reviewed this publication, correct, this draft of this manuscript; correct?
A. That is correct, I reviewed all of the results, all of the tables. I -- and I reviewed the methods, just as I would do if I was peer reviewing a manuscript.
Q. So, in effect, the manuscript has been peer reviewed by you?
A. That is correct.
Q. Okay. Now, you also said earlier that based on all the evidence that you had seen and reviewed in doing your literature search, considered materials that were provided in coming up with your expert opinions independently in this case, that the draft

Page 291

manuscript that you had worked with and had been provided was the strongest evidence to date.
Do you remember that?
MR. MILLER: Object to form.
BY MR. COPLE:
Q. Do you remember saying that?
A. I have to admit I don't recall saying exactly that, but I certainly said that I thought that it would be a shame if this publication wasn't published and that people weren't aware of this -- these updated results, because it provides such strong evidence on the evidence of glyphosate and NHL.
Q. What does it -- well, what does the evidence tell you based on that draft manuscript?
A. It certainly confirms the previous findings in the AHS that there are -- is no evidence of an association, either ever/never use or, more importantly, in dose-response analyses, between glyphosate and NHL. And in light of -- especially of the IARC decision, I think it's important for the scientific community to have access to these results.
Q. Are you aware of whether IARC itself

Page 292

in that Monograph 112 considered this draft manuscript?
A. It was not one of the materials that they considered in their review, no.
Q. Based on your review of the monograph 112, does that mean that you considered that they did not see this or did not review this as part of their materials?
A. That is correct.
Q. Okay. So your testimony, to a reasonable degree of scientific certainty, is, based upon your literature review and independent evaluation, is that you do not see scientifically reliable evidence showing that glyphosate exposure has a causal association with non-Hodgkin's lymphoma; is that right?
MR. MILLER: Object to the form of the question.
A. That is correct.
MR. COPLE: I have nothing further.
MR. MILLER: I have no further follow-up. I think we are done now.
THE WITNESS: Thank you.
THE VIDEOGRAPHER: This concludes the September 21, 2017 deposition of Dr. Jennifer

Page 293

Rider. Going off the record. The time is 5:03.
(Whereupon, the deposition was concluded.)

COMMONWEALTH OF MASSACHUSETTS)
SUFFOLK, SS.)

I, MAUREEN O'CONNOR POLLARD, RMR, CLR, and Notary Public in and for the Commonwealth of Massachusetts, do certify that on the 21st day of September, 2017, at 9:01 o'clock, the person above-named was duly sworn to testify to the truth of their knowledge, and examined, and such examination reduced to typewriting under my direction, and is a true record of the testimony given by the witness. I further certify that I am neither attorney, related or employed by any of the parties to this action, and that I am not a relative or employee of any attorney employed by the parties hereto, or financially interested in the action.

In witness whereof, I have hereunto set my hand this 21st day of September, 2017.

_____
MAUREEN O'CONNOR POLLARD, NOTARY PUBLIC
Realtime Systems Administrator
CSR #149108

INSTRUCTIONS TO WITNESS

Please read your deposition over carefully and make any necessary corrections. You should state the reason in the appropriate space on the errata sheet for any corrections that are made.

After doing so, please sign the errata sheet and date it. It will be attached to your deposition.

It is imperative that you return the original errata sheet to the deposing attorney within thirty (30) days of receipt of the deposition transcript by you. If you fail to do so, the deposition transcript may be deemed to be accurate and may be used in court.

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ACKNOWLEDGMENT OF DEPONENT

I, _____, do Hereby certify that I have read the foregoing pages, and that the same is a correct transcription of the answers given by me to the questions therein propounded, except for the corrections or changes in form or substance, if any, noted in the attached Errata Sheet.

_____
JENNIFER R. RIDER, ScD DATE

Subscribed and sworn
To before me this
_____ day of _____, 20____.
My commission expires: _____

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Notary Public

LAWYER'S NOTES

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