

# **Exhibit 3**

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UNITED STATES DISTRICT COURT  
NORTHERN DISTRICT OF CALIFORNIA

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 IN RE: ROUNDUP PRODUCTS ) MDL No. 2741  
 LIABILITY LITIGATION ) Case No. 16-md-02741-VC  
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 )  
 This document relates to: )  
 )  
 ALL ACTIONS )  
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VIDEOTAPED DEPOSITION OF  
ALFRED NEUGUT, M.D., Ph.D.  
New York, New York  
August 7, 2017

Reported by: BONNIE PRUSZYNSKI, RMR, RPR, CLR  
JOB NO. 127893

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8 August 7, 2017  
9 9:01 A.M.  
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13 DEPOSITION OF ALFRED NEUGUT,  
14 M.D., Ph.D., held at the offices of Weitz &  
15 Luxenberg, P.C., 700 Broadway, New York, New York,  
16 before Bonnie Pruszynski, a Registered Professional  
17 Reporter, Registered Merit Reporter, Certified  
18 Livenote Reporter, and Notary Public of the State  
19 of New York.  
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1 APPEARANCES:  
2  
3 THE MILLER FIRM  
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16 1350 I Street, N.W.  
17 Washington, D.C. 20005  
18 BY: ERIC LASKER, ESQ.  
19 GRANT HOLLINGSWORTH, ESQ.  
20  
21 Also Present: Lem Lattimer, CLVS  
22  
23  
24  
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Page 7	<p>1 Exhibit 14-19 Non-Hodgkin's Lymphoma 235 2 Among Asthmatics exposed to 3 Pesticides 4 Exhibit 14-20 An Evaluation of 244 5 Glyphosate Use and the Risk of 6 Non-Hodgkin Lymphoma Major 7 Histological Sub-Types in the 8 North American Pooled Project 9 Exhibit 14-21 Exponent, May 24, 2017 295 10 Meta-Analysis of Glyphosate 11 Use and Risk of Non-Hodgkin 12 Lymphoma 13 Exhibit 14-22 Section of Occupational 308 14 Medicine, Meeting January 14, 15 1965, The Environment and 16 Disease: association or 17 Causation?, 18 Exhibit 14-23 NIH Public Access, Impact 335 19 of Pesticide Exposure 20 Misclassification on estimates 21 of Relative Risks in the 22 Agricultural Health Study 23 Exhibit 14-24 An Updated Algorithm for 355 24 Estimation of Pesticide 25 Exposure Intensity in the Agricultural Health Study</p>	Page 9	<p>1 ALFRED NEUGUT, M.D., Ph.D., 2 called as a witness, having been first 3 duly sworn, was examined and testified 4 as follows: 5 EXAMINATION 6 BY MR. LASKER: 7 Q. Good morning, Dr. Neugut. Let's 8 just jump right in. I know you have been 9 through this process before, so I assume you 10 understand the deposition process and what we 11 will be doing for the next seven or eight 12 hours today. Correct? You are familiar with 13 that process? 14 A. Yes. 15 MR. LASKER: Let's mark as the 16 first exhibit the deposition notice and 17 document request. This will be 18 Exhibit 14-1. 19 A. Could I ask that you speak a little 20 louder? It's actually -- 21 Q. Yeah, I will speak louder. Thank 22 you. And anytime, obviously -- anytime, if 23 you don't hear me, definitely let me know. 24 We want to make sure you understand the 25 questions that I am asking.</p>

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1 (Exhibit 14-1, Deposition Notice  
 2 and Document Request marked for  
 3 identification, as of this date.)  
 4 Q. For the record, Exhibit 14-1 is a  
 5 deposition notice for your deposition here  
 6 today. And there is a list at the end,  
 7 request for production of certain types of  
 8 documents.  
 9 We have been provided by your  
 10 counsel with a copy of your CV and a copy of  
 11 some billing records. But if you can review  
 12 the request for production and confirm that  
 13 you do not have any other documents that  
 14 would be responsive to these requests.  
 15 A. No. Everything that I had I sent  
 16 to Mr. Travers to forward to you.  
 17 Q. And that would be your billing  
 18 records and your CV; correct?  
 19 A. I sent him a copy of a lecture that  
 20 I gave to the Court on Science Day a few  
 21 months ago, so that also, I think.  
 22 Q. Anything else?  
 23 A. Off the top of my head, I'm not  
 24 recalling anything else that was responsive  
 25 to this.

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1 Q. Okay.  
 2 MR. LASKER: I am not sure if we  
 3 received those slides from you, although  
 4 I believe we have them.  
 5 MR. TRAVERS: Yeah. I sent Heather  
 6 an e-mail asking if she needed us to  
 7 resend them.  
 8 Q. Dr. Neugut, just so I can be clear  
 9 starting off, am I correct in my  
 10 understanding that prior to being retained by  
 11 plaintiffs' counsel for purposes of this  
 12 litigation, you had not conducted any review  
 13 of the epidemiological literature with regard  
 14 to glyphosate and cancer?  
 15 A. I don't believe so, not  
 16 specifically, no.  
 17 Q. So, you had not looked at the  
 18 literature of NHL and glyphosate or cancer  
 19 and glyphosate?  
 20 A. No.  
 21 Q. So, it would be fair to say then  
 22 that you had not formed any opinion with  
 23 respect to any potential association between  
 24 glyphosate and NHL or cancer; correct?  
 25 A. I didn't know anything about it.

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1 Q. Let's mark as Exhibit 14-2 a  
 2 declaration that you had submitted early on  
 3 in this litigation.  
 4 (Exhibit 14-2, Declaration of  
 5 Alfred Neugut marked for identification,  
 6 as of this date.)  
 7 Q. Dr. Neugut, first of all, can you  
 8 confirm that this is your signature on this  
 9 document?  
 10 A. Yes.  
 11 Q. And this is dated April 28, is that  
 12 2015 or 2016?  
 13 A. It looks like 2016.  
 14 Q. '16.  
 15 And this is a declaration that you  
 16 submitted setting forth your opinions as of  
 17 April 28, 2016, with respect to glyphosate  
 18 and cancer; correct?  
 19 A. Yes.  
 20 Q. I'm going to mark as Exhibit 14-3  
 21 one of the invoices that you provided for  
 22 your time as of February 17, 2017.  
 23 (Exhibit 14-3, February 17, 2017  
 24 Invoice, Neugut to Miller Firm marked for  
 25 identification, as of this date.)

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1 Q. Dr. Neugut, can you identify  
 2 Exhibit 14-3 as an invoice that you submitted  
 3 with your time for services rendered in this  
 4 litigation as of February 17, 2017?  
 5 A. Yes.  
 6 Q. As of February 17, 2017, you had  
 7 spent ten hours of work in reviewing  
 8 documents and literature and having various  
 9 meetings with and preparing some documents  
 10 with plaintiffs' counsel; correct?  
 11 A. I don't recall. It is my first  
 12 bill.  
 13 Q. As of this bill, if this bill is  
 14 accurate, as of February 2017, you had spent  
 15 ten hours of work on this litigation;  
 16 correct?  
 17 A. As I say, I would have to see all  
 18 my bills to know how they are laid out. I  
 19 don't have them in my head in terms of the  
 20 history of this litigation and my billing,  
 21 but if this is the first bill, then this  
 22 would sort of compile, although I might have  
 23 put time in previously unbilled prior to  
 24 taking the case.  
 25 Q. Do you have any reason to believe,

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1 first of all, that your invoice for -- that  
 2 you have submitted to plaintiffs' counsel for  
 3 your time as of February 2017 would be  
 4 inaccurate?  
 5 MR. TRAVERS: Objection, asked and  
 6 answered.  
 7 A. Not inaccurate in the sense of what  
 8 I billed for my time working on the case on  
 9 behalf of plaintiffs. But as I say, I  
 10 wouldn't have taken the case without  
 11 previously reviewing -- if I were asked to  
 12 take the case, I would have spent some time  
 13 on my own reviewing the literature, which I  
 14 would not have billed for. So, I might  
 15 have -- I'm sure that I put some time into  
 16 reviewing the literature on glyphosate and  
 17 lymphoma before agreeing to act as a witness.  
 18 Q. Do you recall, sitting here today,  
 19 how much time you spent reviewing literature  
 20 before you agreed to work with plaintiffs'  
 21 counsel in this case?  
 22 A. I wouldn't have kept a record of  
 23 that, and this is a while ago, but it would  
 24 have been certainly on the order of a couple  
 25 or a few hours.

Page 15

1 Q. Do you recall how much time you had  
 2 spent reviewing the literature as of the date  
 3 of your April 2016 declaration, which would  
 4 be approximately ten months, nine to ten  
 5 months before your first bill here?  
 6 A. No.  
 7 Q. Would it have been more than five  
 8 hours?  
 9 A. It would have been -- again, I'm  
 10 reconstructing, going back to that time, but  
 11 my -- my assumption is that at the time, I  
 12 would not have taken -- my taking the case  
 13 was heavily based on the IARC review, and if  
 14 I had, I had read the IARC review, then -- I  
 15 don't know if I am a fast or a slow reader,  
 16 but it would have taken me a few hours to  
 17 read, and I would have based my opinion  
 18 heavily on that document, and I am assuming  
 19 that would have been a few hours.  
 20 But I don't know if I particularly  
 21 billed -- if my ten hours subsequently  
 22 included that review, those hours, or if that  
 23 was, as I say, part of my initial review  
 24 prior to even taking the case, for which I  
 25 didn't necessarily bill plaintiffs.

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1 Q. Okay. I think I understand then.  
 2 So, as of the time of this April 2016  
 3 declaration, you had reviewed the IARC  
 4 monograph; correct?  
 5 A. I wouldn't have taken the case, I  
 6 think, absent that.  
 7 Q. And it was subsequent to this  
 8 declaration that you then started reviewing  
 9 the underlying epidemiological literature in  
 10 preparing the report.  
 11 A. I don't know the timing of that.  
 12 That would have been probably more in line  
 13 with -- well, what report are we talking  
 14 about now?  
 15 Q. Your expert report in the MDL that  
 16 you submitted.  
 17 A. That would be more in conjunction  
 18 with the timing for that, yes.  
 19 Q. Okay. So, the actual review of the  
 20 underlying studies, epidemiological studies,  
 21 would have taken place after your April 2016  
 22 declaration.  
 23 A. Yes.  
 24 Q. You state -- well, let me ask it  
 25 this way: Is it your opinion, Dr. Neugut,

Page 17

1 that the IARC monograph classifying  
 2 glyphosate as a probable carcinogen in and of  
 3 itself provides a reliable scientific basis  
 4 for you to opine that glyphosate causes NHL  
 5 in humans?  
 6 A. I think that the IARC reviews are  
 7 the most authoritative reviews in the field,  
 8 and I think as a starting point, yes, it's a  
 9 fair starting point, and unless there is a  
 10 strong reason to disbelieve them for some  
 11 reason, the answer is yes.  
 12 Q. Just to be clear, in your  
 13 April 2016 declaration, at paragraph 16, you  
 14 state in the second paragraph that IARC's  
 15 assessment -- or second sentence of  
 16 paragraph 16 --  
 17 MR. TRAVERS: Do you mean  
 18 paragraph --  
 19 MR. LASKER: Let me start that  
 20 again. I had the wrong number here.  
 21 Q. In your April 2016 declaration,  
 22 paragraph six, the second sentence, you state  
 23 quote, "IARC's assessment on glyphosate  
 24 provides a reliable scientific basis for an  
 25 opinion that glyphosate does cause

Page 18

1 non-Hodgkin's lymphoma in humans; correct?  
 2 A. And we're talking about paragraph  
 3 six?  
 4 Q. Yes.  
 5 A. Yes.  
 6 Q. And to be clear, in reaching your  
 7 opinion that is expressed in your expert  
 8 declaration in April 2016 that glyphosate  
 9 causes non-Hodgkin's lymphoma in humans, you  
 10 relied solely on the IARC monograph; correct?  
 11 A. I would not say solely, but I would  
 12 say heavily.  
 13 Q. You had not reviewed any of the  
 14 underlying literature at that time, though?  
 15 A. I cannot recall. My guess is, I  
 16 may have looked up one or two of the papers,  
 17 but heavily -- but predominantly, it was the  
 18 monograph itself.  
 19 Q. Now, as a basis for your reliance  
 20 on the IARC monograph, you also state in  
 21 paragraph two of your April 2016 declaration,  
 22 the last sentence, that you would -- and I am  
 23 quoting from your declaration, "equate the  
 24 term 'probable' as used in the IARC monograph  
 25 as corresponding to my understanding of the

Page 19

1 legal term 'within a reasonable degree of  
 2 medical certainty'; correct?  
 3 A. Yes, that's-- there I -- yes,  
 4 that's what I wrote. Um-hum.  
 5 Q. Now, IARC in its preamble states  
 6 that the term "probable" has no quantitative  
 7 significance.  
 8 MR. TRAVERS: Objection.  
 9 Q. Correct?  
 10 MR. TRAVERS: Calls for a legal  
 11 conclusion.  
 12 A. I don't know.  
 13 Q. Have you ever reviewed the preamble  
 14 to the IARC monographs?  
 15 A. Yes, but I don't recall offhand  
 16 that sentence, but --  
 17 Q. Okay.  
 18 MR. LASKER: Let's mark that as  
 19 Exhibit 14-4.  
 20 (Exhibit 14-4, World Health  
 21 Organization IARC Monographs on the  
 22 Evaluation of Carcinogenic Risks to  
 23 Humans, Lyon, France, 2006 marked for  
 24 identification, as of this date.)  
 25 Q. And Dr. Neugut, if I could direct

Page 20

1 you -- and for the record, this is,  
 2 Exhibit 14-4 is the preamble to the IARC  
 3 monographs dated 2006, that had been marked  
 4 previously in this litigation, both by  
 5 plaintiffs' counsel and by Monsanto in  
 6 various depositions.  
 7 If I could direct you to page 22 of  
 8 the preamble. And at this place in the  
 9 preamble, IARC is setting forth its various  
 10 classification schemes for -- for substances  
 11 that they analyze; correct?  
 12 A. Yes.  
 13 Q. And for group two -- we are going  
 14 to go through this. Group one would be if an  
 15 agent is carcinogenic to humans according to  
 16 IARC; correct?  
 17 A. Yes.  
 18 Q. And for IARC, that category is used  
 19 when there is sufficient evidence of  
 20 carcinogenicity in humans; correct?  
 21 A. Yes.  
 22 Q. So, group two is a category for  
 23 substances that IARC defines as being either  
 24 probably carcinogenic or possibly  
 25 carcinogenic to humans; correct?

Page 21

1 A. Yes.  
 2 Q. And in its preamble, IARC states,  
 3 and it's at lines 29 and 30 on page 22, that  
 4 the terms "probably carcinogenic" and  
 5 "possibly carcinogenic" have no quantitative  
 6 significance; correct?  
 7 A. Correct.  
 8 Q. And IARC also states in its  
 9 monograph that IARC may ident- -- let me  
 10 start that again.  
 11 IARC also states in its monograph  
 12 that IARC may identify cancer hazards even  
 13 when risks are very low with known patterns  
 14 of use or exposure; correct?  
 15 A. I don't know where you are reading.  
 16 Q. Do you know that? You have  
 17 reviewed the monograph, haven't you? You  
 18 said that you have.  
 19 A. Yes.  
 20 Q. And does that sound familiar to  
 21 you?  
 22 A. Yes.  
 23 Q. And just so we are clear, on page  
 24 two of the monograph, lines 22 through 24, in  
 25 the preamble, IARC states exactly that, makes

Page 22

1 exactly that point; correct?  
 2 A. Yes.  
 3 Q. You also state in your April 2016  
 4 report, and this is in paragraph six, the  
 5 first sentence, "In reviewing Monograph 112,  
 6 it is my opinion that IARC continued its  
 7 tradition of rigorous transparent analysis  
 8 and used a sound methodological approach when  
 9 reviewing the evidence on glyphosate."  
 10 Correct?  
 11 A. Yes.  
 12 Q. What investigation did you conduct  
 13 prior to signing this declaration to confirm  
 14 for yourself that the Working Group 112 in  
 15 its analysis of glyphosate had followed a  
 16 rigorous transparent analysis and followed a  
 17 sound methodological approach?  
 18 A. Because I read through the report  
 19 carefully.  
 20 Q. Did you do anything other than  
 21 reading the report in reaching this opinion?  
 22 A. No.  
 23 Q. What is your understanding of the  
 24 amount of time that the working group spent  
 25 in conducting its analysis of glyphosate

Page 23

1 prior to issuing its classification?  
 2 MR. TRAVERS: Objection, calls for  
 3 speculation.  
 4 THE WITNESS: Am I supposed to  
 5 answer?  
 6 Q. Yes.  
 7 MR. TRAVERS: If you can.  
 8 Q. Unless he tells you not to answer,  
 9 you should answer the question.  
 10 A. Well, the meetings run about a week  
 11 or more, but I mean, the preparation for the  
 12 meetings run weeks.  
 13 Q. And so, it's your understanding  
 14 that the -- how much time then would you  
 15 understand the working group spent in  
 16 analyzing and evaluating glyphosate to reach  
 17 its classification?  
 18 A. Weeks.  
 19 MR. TRAVERS: Objection, calls for  
 20 speculation.  
 21 Q. Now, you know an individual named  
 22 Dr. Aaron Blair?  
 23 A. I don't think -- I cannot -- I  
 24 probably have met him at least once, like  
 25 years ago, but I don't know him. We don't

Page 24

1 play stickball together. But I mean, I  
 2 certainly know him by reputation.  
 3 Q. Okay. Dr. Blair has -- what is  
 4 your understanding of Dr. Blair's reputation?  
 5 A. It's outstanding.  
 6 Q. And Dr. Blair was the chairperson  
 7 of Working Group 112 that conducted this  
 8 analysis and evaluation of glyphosate;  
 9 correct?  
 10 A. Yes.  
 11 Q. And Dr. Blair was deposed in this  
 12 litigation about the IARC working group's  
 13 analysis; correct?  
 14 A. Yes.  
 15 Q. And you have read that deposition;  
 16 correct?  
 17 A. Yes.  
 18 Q. Dr. Blair testified specifically  
 19 with respect to the Working Group 112 and  
 20 glyphosate, that the working group only spent  
 21 one or two days total in analyzing whether  
 22 glyphosate can cause cancer; correct?  
 23 MR. TRAVERS: Objection, misstates  
 24 his testimony.  
 25 A. I don't recall offhand, but I do

Page 25

1 recall that it was only a couple of -- they  
 2 were evaluating several carcinogens at the  
 3 same time, so it was a limited amount of time  
 4 on glyphosate specifically.  
 5 MR. LASKER: Just so we are clear,  
 6 because of the objection, let's mark as  
 7 Exhibit 14-4 -- I'm sorry, 14-5. I  
 8 didn't mean to mess that up. I don't  
 9 think we have to mark the declaration.  
 10 Let's just use this as an exhibit.  
 11 MR. TRAVERS: Yeah. Do you have a  
 12 copy?  
 13 MR. LASKER: Yes. We are not going  
 14 to mark this as an exhibit. We will just  
 15 use this for the witness' reference.  
 16 Q. So, if I could ask you to turn to  
 17 pages 115, or page 115, and this in the  
 18 manuscript version, so there is four pages  
 19 per page, but page 115, line 12 to line 16,  
 20 there was a question of Dr. Blair:  
 21 "So, you would have maybe a day or  
 22 two of analysis and evaluation that went  
 23 into the IARC working group  
 24 classification of glyphosate; correct?"  
 25 "Answer: Roughly correct."



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1 Do you see that?

2 A. Yes.

3 MR. TRAVERS: Objection. This

4 takes it out of context.

5 Q. You have no reason to doubt

6 Dr. Blair's testimony?

7 A. No.

8 Q. And to provide context, if I could

9 ask you to look to page 114, lines 13 through

10 21, here Dr. Blair is being asked about that

11 time period prior to the working group

12 meeting; correct?

13 A. So, it's -- it will take me a

14 minute to orient, if I can have that.

15 Q. That's fine.

16 A. Okay. Your question?

17 Q. And Dr. Blair on page 114 states

18 that while there was some assembling of data

19 tables prior to the working group meeting

20 during that one-week period, the evaluation

21 processes didn't start until the actual

22 working group meeting; correct?

23 A. Yes.

24 Q. And in fact, Dr. Blair resists the

25 suggestion that any analysis was done prior

Page 27

1 to that one-week meeting, doesn't he?

2 A. I wouldn't know.

3 Q. Well, he states at line eight, in

4 describing what happened beforehand, "Some of

5 the time it's just putting things in a table.

6 That's hardly an analysis, it's an assembly

7 of the data." Correct?

8 MR. TRAVERS: Objection. I think

9 your previous question misstates his

10 testimony.

11 Q. That's what Dr. Blair testifies;

12 correct?

13 A. That's what he says.

14 Q. And do you consider a one- to

15 two-day review of all of the scientific

16 evidence regarding glyphosate and cancer, and

17 that would be not only the epidemiology but

18 the animal studies and the genotox, to be a

19 rigorous analysis?

20 MR. TRAVERS: Objection, misstates

21 his testimony.

22 A. I would have no way of knowing.

23 Q. Now, the IARC working group also

24 did not consider all of the glyphosate animal

25 carcinogenicity data during that one-week

Page 28

1 session because it did not have sufficient

2 time; correct?

3 MR. TRAVERS: Objection, misstates

4 the evidence.

5 A. I don't know.

6 Q. Do you know Dr. Charles Jameson?

7 A. No.

8 Q. Dr. Jameson chaired the animal

9 cancer bioassay subcommittee on glyphosate

10 for the IARC working group. Were you aware

11 of that?

12 A. No.

13 Q. Do you know that Dr. Jameson was

14 deposited in this litigation about his

15 subgroup's work in analyzing the animal data

16 for the IARC monograph?

17 A. Do I know that he was deposited?

18 Q. Yes.

19 A. I don't think I have a specific

20 knowledge of that, no.

21 Q. Let me show you Dr. Jameson's

22 deposition testimony. We will be going back

23 to Dr. Blair's deposition testimony at some

24 point. You can put that to the side for the

25 moment.

Page 29

1 MR. TRAVERS: I'm just going to

2 object, because Dr. Neugut didn't review

3 or rely upon this deposition, so --

4 MR. LASKER: I understand that, but

5 Dr. --

6 MR. TRAVERS: He's not going to

7 have sufficient time to fully analyze

8 Dr. Jameson's testimony to accurately

9 answer questions.

10 MR. LASKER: That -- I understand

11 that, but Dr. Neugut is the one who

12 offered an expert opinion that the IARC

13 working group had put in a -- what was

14 his words? -- rigorous analysis of the

15 glyphosate data, and to that extent, his

16 lack of knowledge of that process is

17 relevant.

18 Q. Dr. Neugut, if I could direct you

19 to Dr. Jameson's testimony on page 191,

20 lines 12 to 24. And -- whoops, I'm sorry.

21 Lines 12 to 24 on page 191,

22 Dr. Jameson is referring to the fact that

23 some data tables were provided to him at some

24 point at the meeting; correct? And just to

25 be -- just to put this in context for you, on

1 line 190 -- on page 190, line nine, these  
2 were data tables with respect to underlying  
3 study data for tumor counts of 14 cancer  
4 bioassays on glyphosate.

5 And then we continue on to  
6 page 191, where he is asked whether he had  
7 access to those materials during the IARC  
8 working group meeting.

9 Do you see that?

10 A. Yes.

11 Q. And on -- further down, starting at  
12 line 25 on page 191, and then continuing on  
13 to 192, line six, question:

14 "You did not then proceed to  
15 actually review and look at the data that  
16 was provided in those supplemental  
17 tables; correct?"

18 And there is an objection, and then  
19 the answer:

20 "There was -- the amount of data in  
21 the tables was overwhelming, and it would  
22 not have been possible to review those,  
23 that data during the meeting."

24 Correct?

25 A. Yes.

1 Q. Do you believe that having  
2 insufficient time to consider all of the data  
3 on the animal cancer bioassays for glyphosate  
4 reflects a rigorous evaluation process?

5 MR. TRAVERS: Objection, misstates  
6 the testimony.

7 A. I would have no way of being able  
8 to characterize what he was able or not able  
9 to evaluate at the meeting. I mean, I think  
10 the data that was described in the monograph  
11 was consistent with, with the report of  
12 carcinogenicity that came out of the report.

13 Q. But just to be clear, in offering  
14 your opinion in April 2016 that glyphosate  
15 can cause NHL, in which you relied upon the  
16 rigorous process that the working group  
17 engaged in, you were not aware of the fact  
18 that there was animal data tables that the  
19 IARC working group did not review because  
20 they didn't have time; correct?

21 MR. TRAVERS: Objection, misstates  
22 the testimony, and it's inconsistent with  
23 IARC monographs.

24 A. Certainly, I'm not aware of whether  
25 they had or did not have data that wasn't

1 available, and relied on what they did report  
2 in their monograph and what they voted on as  
3 part of their process, as part of their  
4 normal process.

5 Q. Now, Dr. Jameson, you talked about  
6 the animal studies that IARC did discuss, and  
7 there were four animal studies that are  
8 discussed in the monograph as providing the  
9 data upon which the working group relied in  
10 reaching its conclusion or its classification  
11 that glyphosate was a probable carcinogen;  
12 correct?

13 MR. TRAVERS: Wait. Objection.  
14 Wait. You say "Dr. Jameson, you talked  
15 about." Do you mean, "Dr. Neugut, you  
16 talked about the animal studies"?

17 MR. LASKER: I'm sorry. I will  
18 start that again. Thank you.

19 Q. Dr. Neugut, you had previously in  
20 one of your previous answers -- you can keep  
21 that.

22 In one of your previous answers,  
23 you said you relied upon what IARC described  
24 in its monograph, what the working group  
25 described in its monograph with respect to

1 the animal studies; correct?

2 A. Yes.

3 Q. And the monograph relies upon four  
4 animal studies as providing the data that  
5 they used in reaching their classification;  
6 correct?

7 A. Yes.

8 Q. Now, Dr. Jameson testified that the  
9 IARC working group did not actually have the  
10 study documents for those four animal  
11 studies.

12 MR. TRAVERS: Objection.

13 Q. Are you aware of that?

14 A. No.

15 MR. TRAVERS: Misstates his  
16 testimony.

17 Q. Okay. Let's have you look to  
18 Dr. Jameson's deposition at page 279, lines  
19 six to 16. And here Dr. Jameson testifies  
20 that IARC relied on summaries of the studies  
21 provided by either EPA or JMPR as opposed to  
22 the actual studies themselves; correct?

23 A. I don't have the ability to absorb  
24 this at this point, but it looks like that.

25 Q. And Dr. Jameson also acknowledges,

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1 continuing on, on page 279, lines 17 through  
 2 24, that the scientists who prepared those  
 3 summaries at EPA or at the JMPR, which is  
 4 part of the World Health Organization, they  
 5 were the ones who had actually looked at the  
 6 underlying study documents; correct?  
 7 A. I don't know where you are  
 8 referencing.  
 9 Q. Lines -- page 279, line 17 through  
 10 24.  
 11 A. Yes.  
 12 Q. And those EPA and World Health  
 13 Organization scientists, in the very same  
 14 summaries upon which IARC relied, concluded  
 15 that the four studies at issue did not  
 16 provide evidence that glyphosate causes  
 17 cancer; correct?  
 18 MR. TRAVERS: Objection, misstates  
 19 the evidence.  
 20 Q. And if you want, I can direct you  
 21 to page 284, lines eight through 17, and why  
 22 don't we read that -- I will read that into  
 23 the record. Question to Dr. Jameson:  
 24 "And with respect to all four of  
 25 these studies, the findings that IARC

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1 cited to as evidence in support of a  
 2 sufficient evidence of carcinogenicity in  
 3 animals, in all of those studies, the  
 4 EPA or the JMPR had concluded that those  
 5 findings were not related to glyphosate;  
 6 correct?"  
 7 There is an objection.  
 8 "Answer: That's what their  
 9 document indicated."  
 10 Correct.  
 11 MR. TRAVERS: I'm going to object.  
 12 We don't know which EPA document this is  
 13 talking about. There are several EPA  
 14 documents.  
 15 MR. LASKER: Okay. We are going to  
 16 just note for the record the speaking  
 17 objections and the sort of misinformed  
 18 objections --  
 19 MR. TRAVERS: It's not misinformed.  
 20 It's just unclear what document.  
 21 MR. LASKER: It may be unclear to  
 22 you. It's very clear that there was some  
 23 testimony. If you are going to continue  
 24 to make those sort of objections to every  
 25 question, we will have to seek relief

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1 from that.  
 2 MR. TRAVERS: I mean, he just says  
 3 that -- he references a document. We  
 4 were just -- we don't know what document  
 5 it is.  
 6 MR. LASKER: Well, maybe you should  
 7 review the deposition testimony of  
 8 Dr. Jameson, but the testimony is very  
 9 clear.  
 10 MR. TRAVERS: Well --  
 11 MR. LASKER: Let me ask --  
 12 MR. TRAVERS: Can you offer the  
 13 document so the witness knows which one  
 14 it refers to?  
 15 BY MR. LASKER:  
 16 Q. If you're -- if -- Dr. Neugut,  
 17 starting on 283, line 14, directly before the  
 18 testimony I just read, Dr. Jameson is  
 19 confirming that this is, the discussion is  
 20 with respect to the four animal data -- four  
 21 animal studies that IARC relied upon in its  
 22 monograph; correct?  
 23 A. By now I have forgotten the  
 24 question. I'm sorry. So --  
 25 Q. From page 283, line 14, through

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1 284, line 17.  
 2 A. Um-hum.  
 3 Q. Dr. Jameson states that IARC's  
 4 conclusion was based upon a summary or review  
 5 document prepared, one by EPA and the other  
 6 by JMPR, and that is the question starting  
 7 line 283 on line 21, answering on 284, line  
 8 seven; correct?  
 9 A. Yes.  
 10 MR. TRAVERS: I have got the same  
 11 objection.  
 12 Q. And from line eight -- page 284,  
 13 line eight to line 17, Dr. Jameson confirms  
 14 that in that review document that IARC relied  
 15 upon for those four studies, the EPA or the  
 16 JMPR concluded that the findings were not  
 17 related to glyphosate; correct?  
 18 MR. TRAVERS: I have got the same  
 19 objection.  
 20 A. Correct.  
 21 Q. Dr. Neugut, is it your opinion that  
 22 for a scientist, relying upon a summary  
 23 document rather than the underlying study  
 24 itself reflects a rigorous review process?  
 25 A. I don't know what Dr. Jameson

1 relied upon, so I don't know, but I would say  
2 it's better of course to rely on the original  
3 data.

4 Q. Do you agree, sitting here today,  
5 with the IARC working group's assessment of  
6 the epidemiological literature regarding  
7 formulated glyphosate products and  
8 non-Hodgkin's lymphoma?

9 A. Specifically with regard only to  
10 the epidemiologic data?

11 Q. Yes.

12 A. Yes.

13 Q. The IARC working group on the  
14 monograph concluded that the epidemiological  
15 evidence associating glyphosate with  
16 non-Hodgkin's lymphoma was limited; correct?

17 A. Was limited, it's probably even a  
18 little stronger than that, but it's on --  
19 let's say it's on the stronger side of  
20 limited, but I think limited is fair.

21 Q. As defined by IARC again in that  
22 preamble, the term "limited" means, quote, a  
23 positive association has been observed  
24 between exposure here to glyphosate and  
25 non-Hodgkin's lymphoma, for which a causal

1 account biology, et cetera, yes.

2 Q. You agree that the epidemiology  
3 alone is not sufficient to show a causal  
4 relationship between glyphosate and  
5 non-Hodgkin's lymphoma; is that correct?

6 A. For -- for the purposes for which  
7 they were evaluating it, I would say that's  
8 correct.

9 Q. The IARC working group also  
10 concluded that there was not even limited  
11 epidemiological evidence to associate  
12 glyphosate with any other type of cancer;  
13 correct?

14 A. That adds to the causal  
15 relationship.

16 Q. I'm not sure I understood your  
17 answer. Maybe my question wasn't clear.

18 The IARC working group in  
19 considering cancers other than non-Hodgkin's  
20 lymphoma concluded that there was not even  
21 limited evidence --

22 A. Correct.

23 Q. -- to support an association;  
24 correct?

25 A. Yes.

1 interpretation is credible, but chance, bias  
2 or confounding could not be ruled out with  
3 reasonable confidence; correct?

4 A. Purely on the basis of the  
5 epidemiologic studies, without taking into  
6 account, say, biology, toxicology, et cetera,  
7 et cetera.

8 Q. You agree with that assessment;  
9 correct?

10 A. Yes.

11 Q. Now, the IARC working group had the  
12 option and chose not to -- well, strike that.

13 The IARC working group concluded  
14 that the epidemiological evidence did not  
15 reach the level of being sufficient to  
16 establish a causal relationship between  
17 glyphosate and NHL; correct?

18 A. I'm sorry.

19 Q. The IARC working group determined  
20 that the epidemiological evidence did not  
21 reach the level where they could find it was  
22 sufficient to show a causal relationship  
23 between glyphosate and non-Hodgkin's --

24 A. Purely on the basis of the  
25 epidemiologic studies, without taking into

1 Q. And you agree with that; correct?

2 A. Yes.

3 Q. So, let's break down the three  
4 qualifiers in the IARC -- in the definition  
5 of "limited" that we have spoken about with  
6 respect to the epidemiology.

7 So, when you talk about the fact  
8 that chance could not be ruled out, with  
9 respect to any epidemiological association  
10 between glyphosate and non-Hodgkin's  
11 lymphoma, that is addressing an issue that  
12 epidemiologists deal with, with tests for  
13 things like statistical significance;  
14 correct?

15 A. Part of it is statistical  
16 significance, yes.

17 Q. And the way that epidemiologists  
18 try to rule out chance is, they look to see  
19 whether the -- either the odds ratios or the  
20 relative risks are above 1.0 and are  
21 statistically significant; correct?

22 A. Yes.

23 Q. You would agree that for an  
24 epidemiological study to be considered a  
25 positive study with respect to a potential

1 exposure and an outcome, that study must  
2 report an odds ratio or relative risk that is  
3 above 1.0 and is statistically significant;  
4 correct?

5 A. Statistical significance nowadays  
6 is not really as much of a requirement as it  
7 might have been in the past, so I would not  
8 agree that it's totally mandated.

9 Q. Okay. Let me ask you, if I  
10 could -- and let's mark -- we will mark this,  
11 a deposition transcript, but this is  
12 deposition testimony that you gave in the  
13 Actos litigation in January of 2013. Just to  
14 set the -- to establish the precedent, you  
15 served as an expert for the Miller firm, the  
16 same plaintiffs' counsel here today, in  
17 connection with the Actos litigation;  
18 correct?

19 A. Yes.

20 Q. And you were deposed a number of  
21 times in that litigation, just like you are  
22 being deposed here today; correct?

23 A. Yes.

24 Q. So, I'm going to ask you about some  
25 of your testimony in that litigation at

1 Q. So, when a study does not show a  
2 positive or a negative finding, it is  
3 considered a null study that has no finding;  
4 correct?

5 A. Or it's in a direction and not  
6 quite statistically significant.

7 Q. Let me ask you again. We will be  
8 switching from various testimony you have  
9 offered in the past, but let's take the  
10 October 22, 2014 testimony. And I'm sorry, I  
11 will be referring back and forth to some of  
12 these, so we will just have to work our way  
13 through that.

14 Here you go.

15 This is again testimony that you  
16 provided in that other Actos litigation, on  
17 October 22, 2014, and if I could turn you to  
18 page, or refer you to page 117 -- I'm sorry,  
19 page 113, lines 15 to 21, and just to give  
20 you a reference point, this is a fairly long  
21 answer that you are providing that starts on  
22 page 111, but it continues to be your  
23 testimony through to page 113.

24 And there you state that, on line  
25 17 through 19, "When a study does not show a

1 various points today.

2 But if we could start just on your  
3 January 7, 2013 deposition testimony, and in  
4 particular, on page one -- I'm sorry, 233 of  
5 your testimony. And in particular, line nine  
6 through line 13. I think I asked this  
7 question the exact same way here today, but  
8 the question was asked of you, "When you say  
9 a positive study, are you saying a study that  
10 has an odds ratio relative risk of greater  
11 than one and is statistically significant?"  
12 And your answer is "yes"; correct?

13 A. Yes.

14 Q. And that is your -- you agree with  
15 that testimony; correct?

16 A. Yes.

17 Q. Now, when a study does not show a  
18 positive finding, it is considered -- well,  
19 strike that.

20 There is also the possibility of a  
21 negative study in which you have an odds  
22 ratio or relative risk below 1.0 that is  
23 not -- that is also statistically  
24 significant; correct?

25 A. Yes.

1 positive finding, it is actually null. It  
2 has no finding." Correct?

3 MR. TRAVERS: Sorry, which page is  
4 this on again?

5 MR. LASKER: On page 113, from  
6 lines 17 through 19.

7 Q. Dr. Neugut, you testified that  
8 "when a study does not show a positive  
9 finding, it is actually null. It has no  
10 finding." Correct?

11 A. Yes.

12 Q. And you agree with that; correct?

13 A. Yes.

14 Q. And you would not label an exposure  
15 as being associated with an outcome unless  
16 there is a finding of an increased risk that  
17 is statistically significant; correct?

18 A. That's correct.

19 Q. Epidemiologists determine whether a  
20 finding is statistically significant -- they  
21 can do that in different ways. One is based  
22 upon a 95 percent confidence interval; is  
23 that correct?

24 A. Yes.

25 Q. And a finding would be then

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1 statistically significant in the positive  
 2 direction if the lower bound for the  
 3 95 percent confidence interval is greater  
 4 than 1.0; correct?  
 5 A. Yes.  
 6 Q. Epidemiologists can also measure  
 7 statistical significance with something  
 8 called a P value; correct?  
 9 A. Yes.  
 10 Q. And a study is statistically  
 11 significant if a P value is less than 0.05;  
 12 correct?  
 13 A. Yes.  
 14 Q. The size of a study can also impact  
 15 the ability, or can impact the ability of a  
 16 study to find a statistically significant  
 17 result; correct?  
 18 A. Yes.  
 19 Q. So, this is measured by what  
 20 epidemiologists refer to as power, the power  
 21 of a study; correct?  
 22 A. Yes.  
 23 Q. A study that has more power will be  
 24 better able to identify statistically  
 25 significant associations if they exist;

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1 correct?  
 2 A. Yes.  
 3 Q. Epidemiologists generally give less  
 4 weight to studies that have lower power;  
 5 correct?  
 6 A. I'm sorry, that didn't --  
 7 Q. Say it again? I will do it again.  
 8 A. Yeah.  
 9 Q. Epidemiologists, in evaluating a  
 10 study, would give it less weight if it has  
 11 low power; correct?  
 12 A. Because you don't have the ability  
 13 to assess significance.  
 14 Q. So yes --  
 15 A. Yes.  
 16 Q. -- low power means --  
 17 A. Um-hum.  
 18 Q. One way to measure, sort of a  
 19 shorthand way of measuring the power of a  
 20 study is to look at the width of the  
 21 confidence intervals; correct?  
 22 A. Yes.  
 23 Q. So, the narrower the confidence  
 24 interval, the greater the power of the study;  
 25 correct?

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1 A. Yes, but that's-- okay. Yes, that  
 2 is -- that's sort of an a posteriori way of  
 3 looking at it, but yes.  
 4 Q. You would agree that it's not  
 5 proper epidemiological methodology to measure  
 6 power based on the total number of  
 7 individuals who are in the study; correct?  
 8 A. Can you rephrase that or give me  
 9 a better -- tell me what you mean exactly.  
 10 Q. For example, if you have a  
 11 case-control study, and in that case-control  
 12 study there is a certain number of  
 13 individuals whose data is reviewed who had  
 14 the outcome of -- had the, let's say,  
 15 non-Hodgkin's lymphoma. So, you have a  
 16 case-control study, and there is a certain  
 17 number of people who have non-Hodgkin's  
 18 lymphoma in the study.  
 19 With respect to any one exposure  
 20 measure --  
 21 A. Yes.  
 22 Q. -- it would not be appropriate to  
 23 determine the power of the study based upon  
 24 the number of individuals who were in the  
 25 study; correct?

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1 A. The power of the study is going to  
 2 be determined by both -- by -- really by the  
 3 number of endpoints, by the number of people  
 4 with the disease, but also by the number of  
 5 people who are likely to be exposed.  
 6 Q. Right.  
 7 So, with respect to a study, if you  
 8 had 10,000 people in a study but only three  
 9 of them were exposed to the substance at  
 10 issue, the fact that there is 10,000 people  
 11 in the study wouldn't make it a powerful  
 12 study; correct?  
 13 A. That's correct.  
 14 Q. And it wouldn't be reasonable to  
 15 call a case-control study a big study and say  
 16 that it has more weight just because there is  
 17 a large number of individuals who start out  
 18 as potential cases in the study; correct?  
 19 MR. TRAVERS: Objection, calls for  
 20 speculation.  
 21 A. So, you would have to look at each  
 22 study and kind of assess it on a -- on its  
 23 own merits with regard to those parameters.  
 24 Q. Okay. But as a general matter, you  
 25 would want to look at the number of

1 individuals who are -- have the outcome and  
2 have the exposure you are looking at to  
3 determine power; correct?

4 A. Yes.

5 Q. It would not be a reasonable  
6 methodology just to look at the number of  
7 individuals in a case-control study that had  
8 the outcome of interest; correct?

9 MR. TRAVERS: Objection, asked and  
10 answered.

11 A. Yes.

12 Q. Let me show you a table listing  
13 some of the glyphosate epidemiological  
14 studies.

15 (Exhibit 14-5, Table of Studies  
16 marked for identification, as of this  
17 date.)

18 MR. TRAVERS: Who prepared this  
19 table?

20 MR. LASKER: We will address that  
21 shortly, but I have some questions first.

22 MR. TRAVERS: Can we --

23 Q. Dr. Neugut --

24 MR. TRAVERS: I object.

25 MR. LASKER: You can object. Your

1 Q. And the table indicates that this  
2 study included 1,869 individuals with  
3 non-Hodgkin's lymphoma; correct?

4 MR. TRAVERS: Same objection as to  
5 the source of this table.

6 A. Yes.

7 Q. Now, it would not be fair, though,  
8 to suggest from this table presentation that  
9 Cocco is the most powerful study looking at  
10 glyphosate and non-Hodgkin's lymphoma;  
11 correct?

12 MR. TRAVERS: Same objection to the  
13 source of the table.

14 A. Again, you would need to know the  
15 likelihood of exposure.

16 Q. Well, you know, in fact, that Cocco  
17 was the least powerful of all of the studies  
18 looking at glyphosate and non-Hodgkin's  
19 lymphoma; correct?

20 A. I don't have a good memory, and I  
21 don't know -- I can't relate to each paper  
22 without seeing it.

23 Q. Okay. Let's mark your expert  
24 report, because this is in your expert  
25 report.

1 objection is noted.

2 MR. TRAVERS: I think it's  
3 important to know who prepared the table  
4 before answering questions about it.

5 MR. LASKER: That's fine.

6 Q. Dr. Neugut, there is a table, and  
7 these are a listing of some of the studies, I  
8 take it you are familiar with as well, with  
9 respect to glyphosate and non-Hodgkin's  
10 lymphoma; correct?

11 A. Yes.

12 Q. And this has a listing of various  
13 studies with the number of cases in the study  
14 identified; correct?

15 MR. TRAVERS: I'm going to still  
16 object. We don't know where this table  
17 comes from or the accuracy of the  
18 members.

19 Q. Dr. Neugut?

20 A. Yes.

21 Q. Now, the table lists at the very  
22 top, the study that is listed at the very top  
23 of this table is the Cocco 2013 study;  
24 correct?

25 A. Yes.

1 MR. LASKER: And we can make this,  
2 I'm sorry, 14-6.

3 (Exhibit 14-6, Expert Report of  
4 Albert Neugut, M.D., Ph.D. marked for  
5 identification, as of this date.)

6 Q. And you discuss the Cocco paper, I  
7 believe it is on pages 16 and 17 of your  
8 report.

9 A. Um-hum, yes.

10 Q. And you can refresh your  
11 recollection, but specifically on page 17,  
12 you talk about the -- the numbers of exposed  
13 cases and controls and the power of the  
14 study; correct?

15 A. Yes.

16 Q. And does this refresh your  
17 recollection that this study that is listed  
18 in the table 14-5 as the largest of the  
19 studies in fact was the least powerful of all  
20 the epidemiological studies looking at  
21 glyphosate in non-Hodgkin's lymphoma?

22 A. It didn't have much exposure,  
23 correct.

24 Q. The table listing of Exhibit 14-5,  
25 which is based upon a total number of study

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1 subjects, by itself does not provide any  
 2 meaningful information regarding the relative  
 3 power of these glyphosate studies, does it?  
 4 MR. TRAVERS: Objection, form.  
 5 A. Well, you can judge the power by  
 6 the width of the 95 percent confidence  
 7 interval.  
 8 Q. I understand. But if you could  
 9 look to 14-5 in specific, the prior exhibit  
 10 that we had.  
 11 A. 14-5?  
 12 Q. The table, I'm sorry. Not your  
 13 report, the prior exhibit, which has this  
 14 table listed.  
 15 So, this table 14-5 does not  
 16 provide any meaningful information with  
 17 respect to the relative power of the  
 18 glyphosate epidemiological studies regarding  
 19 non-Hodgkin's lymphoma; correct?  
 20 MR. TRAVERS: Objection to form.  
 21 A. I suppose not. It doesn't say  
 22 anything about it.  
 23 Q. And you would not consider this to  
 24 be a methodologically sound approach for an  
 25 epidemiologist to take in analyzing the

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1 relative power of these studies; correct?  
 2 A. I guess a priori it might have been  
 3 a good try, but if in fact the exposures are  
 4 rare, then it's -- you don't get a lot of  
 5 power from -- even from a large study.  
 6 Q. So, for an epidemiologist who had  
 7 actually looked at the underlying studies and  
 8 understood the actual data, this would not be  
 9 a methodologically sound way to present the  
 10 data on these tables -- on these studies;  
 11 correct?  
 12 MR. TRAVERS: Objection to form.  
 13 A. The question doesn't make sense to  
 14 me, but -- so I can't answer the question.  
 15 Q. Okay. Let me restate the question  
 16 then.  
 17 An expert who had reviewed the --  
 18 an expert epidemiologist who reviewed the  
 19 underlying glyphosate literature would not  
 20 present data in this fashion to compare the  
 21 relative power of these studies; correct?  
 22 MR. TRAVERS: Objection, calls for  
 23 speculation.  
 24 A. I mean, it would be a -- it might  
 25 be one way to start, but it wouldn't

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1 necessarily be totally informative.  
 2 Q. This table does not provide you  
 3 with any information as it's presented on the  
 4 relative power of these studies at all;  
 5 correct?  
 6 A. It's not complete.  
 7 Q. And an epidemiologist who presented  
 8 this table as an illustration of the relative  
 9 power of these studies would not be following  
 10 a reliable epidemiological methodology;  
 11 correct?  
 12 MR. TRAVERS: Objection, calls for  
 13 speculation, and takes the document out  
 14 of context.  
 15 A. I'm -- I don't know what an  
 16 epidemiologist would do. I wouldn't be able  
 17 to assess power directly from this. Power is  
 18 based on a number of factors that go beyond  
 19 the sample size.  
 20 Q. Okay. You said you wouldn't know  
 21 what an epidemiologist would -- you know, you  
 22 are an epidemiologist; correct? You have  
 23 been trained in epidemiology?  
 24 A. So, sample -- so power is not based  
 25 solely on the sample size.

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1 Q. So, this table does not follow  
 2 standard epidemiological methodology of  
 3 looking at questions like power; correct?  
 4 MR. TRAVERS: Objection, it takes  
 5 it out of context.  
 6 A. It's not complete, I would say.  
 7 Q. You would not present the data in  
 8 this way yourself; correct?  
 9 A. It depends on what I wanted to show  
 10 to someone.  
 11 Q. If you wanted to talk about the  
 12 relative power of a study, you would not  
 13 present the data this way; correct?  
 14 A. It would be a beginning of showing  
 15 it, but it wouldn't be a totality.  
 16 Q. But you would present other data if  
 17 you were trying to present the power of  
 18 studies; correct?  
 19 A. That's correct.  
 20 MR. TRAVERS: It's been about an  
 21 hour, if you want to take a break.  
 22 MR. LASKER: Let's just put this  
 23 into context.  
 24 Q. Dr. Neugut, you are aware that  
 25 plaintiffs retained another epidemiology



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1 expert in this litigation; correct?  
 2 A. You mean someone against me?  
 3 Q. No. Someone on the same side,  
 4 plaintiffs' counsel.  
 5 A. Oh, plaintiffs.  
 6 Q. Yes.  
 7 A. I'm sorry. Yes.  
 8 Q. Dr. Ritz?  
 9 A. Yes.  
 10 Q. And I have shown --  
 11 MR. LASKER: Let's mark this as  
 12 14-6? 7, sorry.  
 13 (Exhibit 14-7, Expert Report of Dr.  
 14 Beate Ritz, M.D., Ph.D. marked for  
 15 identification, as of this date.)  
 16 Q. So, just to confirm, now, this is  
 17 Dr. Ritz's expert report that she submitted  
 18 in this litigation, and just to confirm, if  
 19 you could turn to page 15.  
 20 A. Fifteen?  
 21 Q. Of Dr. Ritz's expert report. And  
 22 on the top of page 15, Dr. Ritz states, "In  
 23 reviewing the literature, the sample sizes,  
 24 and especially the number of cases, should be  
 25 noted because of their bearing on statistical

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1 significance and the width of confidence  
 2 intervals." Correct?  
 3 A. Yes.  
 4 Q. And she states, "Because many of  
 5 the smaller studies had suggestive findings  
 6 but wide confidence intervals, it is  
 7 particularly important to instead consider  
 8 pools and meta-analysis that summarize across  
 9 these smaller studies and not only provide a  
 10 much larger sample size but may allow us to  
 11 assess NHL subtypes with sufficient  
 12 precision." Correct?  
 13 A. Yes.  
 14 Q. And then it states, "Here I show  
 15 the sample sizes of each human study of  
 16 glyphosate in non-Hodgkin's lymphoma";  
 17 correct?  
 18 A. Yes.  
 19 Q. And the table that Dr. Ritz then  
 20 presents in her expert report is the exact  
 21 same table that has been marked as  
 22 Exhibit 14-5; correct?  
 23 A. Yes.  
 24 MR. LASKER: We can take a break.  
 25 THE VIDEOGRAPHER: The time is

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1 10:06 a.m. We are off the record.  
 2 (Recess taken.)  
 3 THE VIDEOGRAPHER: The time is  
 4 10:15 a.m. We are on the record.  
 5 BY MR. LASKER:  
 6 Q. So, Dr. Neugut, let's go back to  
 7 the limited epidemiological evidence --  
 8 THE VIDEOGRAPHER: Sir, is your  
 9 mike on?  
 10 MR. LASKER: Oh, I'm sorry. Let's  
 11 not go back. Go back in a second. Thank  
 12 you.  
 13 Q. We were discussing -- I'm sorry.  
 14 MR. LASKER: Is this good?  
 15 Q. Dr. Neugut, we were discussing the  
 16 limited epidemiological evidence with respect  
 17 to glyphosate and non-Hodgkin's lymphoma, and  
 18 one of the other factors that you mentioned  
 19 is that bias and confounding could not be  
 20 excluded as an explanation for the findings  
 21 in those studies; correct?  
 22 A. I don't believe I mentioned that,  
 23 but --  
 24 Q. That is the definition of  
 25 "limited"; correct? That bias and

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1 confounding could not be ruled out as an  
 2 explanation for the findings; correct?  
 3 A. So, again, we are now going along  
 4 with the IARC definition of -- you know, with  
 5 the IARC definition of "limited," yes.  
 6 Q. And we talked about your -- your  
 7 testimony regarding the limited definition  
 8 of --  
 9 A. Um-hum.  
 10 Q. -- the glyphosate epidemiology;  
 11 correct?  
 12 A. Purely on the basis of the  
 13 epidemiologic data.  
 14 Q. Right.  
 15 A. Correct, um-hum.  
 16 Q. So, looking just at the  
 17 epidemiological data, bias and confounding  
 18 cannot be excluded as an explanation for the  
 19 findings in those studies; correct?  
 20 A. Yes.  
 21 Q. And these are additional and  
 22 separate concerns that are not addressed by  
 23 measures of statistical significance;  
 24 correct?  
 25 A. I -- I would say that they are all

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1 intertwined and bound together. It's hard  
 2 to --  
 3 Q. Okay.  
 4 A. To say -- it's hard to separate one  
 5 from the other.  
 6 Q. Okay. Let me restate --  
 7 A. This is all a -- I think in  
 8 epidemiologic thinking, you can't so easily  
 9 take one thread and separate it from the  
 10 other threads.  
 11 Q. Let me restate the question.  
 12 A calculation of statistical  
 13 significance does not answer the question  
 14 about whether the underlying study has issues  
 15 with bias or confounding; correct?  
 16 A. Correct.  
 17 Q. And a finding of a statistically  
 18 significant association by itself does not  
 19 mean that there is a cause and effect between  
 20 an exposure and the outcome of interest;  
 21 correct?  
 22 A. Correct.  
 23 Q. And that's because although a  
 24 statistical -- a statistically significant  
 25 association may exist, there is always the

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1 concern that the finding may reflect bias in  
 2 the way that the study was conducted or the  
 3 presence of confounding factors; correct?  
 4 A. If we are talking about a single  
 5 study, yes, um-hum.  
 6 Q. Confounding factors are factors  
 7 that are associated with both exposure and  
 8 the outcome, and therefore could lead to a  
 9 reported association that is not truly a  
 10 relationship between the two, exposure and  
 11 outcome; right?  
 12 A. Yes.  
 13 Q. When an epidemiological study is  
 14 conducted, it's therefore mandatory that the  
 15 study collect information on potential  
 16 confounders, so that the analysis can be  
 17 controlled to measure the -- to properly  
 18 measure the effect of the exposure of  
 19 interest; correct?  
 20 A. "Mandatory" is a strong word.  
 21 "Desirable" I think would be a better word.  
 22 Q. Okay. Let's mark -- this may be  
 23 taking you back a ways, a little ways.  
 24 MR. LASKER: Let's mark this as  
 25 14-8.

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1 (Exhibit 14-8, ASCO-SEP Medical  
 2 Oncology Self-Evaluation Program, Third  
 3 Edition Excerpt marked for  
 4 identification, as of this date.)  
 5 A. That's going back to -- to --  
 6 Q. Not too far. I think this is 2014  
 7 or so.  
 8 A. You could be reading the -- I'm up  
 9 to the sixth edition now. You guys are out  
 10 of date.  
 11 Q. It's hard to get these.  
 12 But in any event, just for the  
 13 record, chapter -- this is a book produced by  
 14 ASCO-SEP Medical Oncology Self-Evaluation  
 15 Program. And this is, as you note, the third  
 16 edition, and I have copied here chapter one,  
 17 which is the chapter that you prepared on  
 18 epidemiology and prevention; correct?  
 19 A. Yes.  
 20 Q. And in this chapter, you discuss a  
 21 number of issues, including how to properly  
 22 evaluate epidemiological data; correct?  
 23 A. Yes.  
 24 Q. And on page five, you were  
 25 discussing the issue of confounding in

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1 connection with smoking and asbestos and lung  
 2 cancer, I believe. In the middle of that  
 3 first column, the first full paragraph that  
 4 starts, "In analytical epidemiology,  
 5 observational studies are carried out."  
 6 Do you see that?  
 7 A. Yes.  
 8 Q. And at the end of that paragraph,  
 9 you state, last sentence, "It is mandatory in  
 10 a study that looks at this exposure and  
 11 outcome to collect smoking information so  
 12 that it can be statistically controlled and  
 13 the individual effects of asbestos exposure  
 14 can be appropriately measured." Correct?  
 15 A. Yes.  
 16 Q. And so, there are circumstances in  
 17 which you agree that it is mandatory to  
 18 collect data on potential confounders;  
 19 correct?  
 20 A. I think that that is true. So,  
 21 again, are you asking me a question?  
 22 Q. I just did. I think that was a  
 23 question, and you are answering, yeah.  
 24 A. So again, I mean, I think the  
 25 answer is contextual. You know, let's say

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1 that the -- how mandatory it is, is a  
 2 contextual issue, and I would say if we are  
 3 talking about asbestos, smoking and lung  
 4 cancer, then where you have a risk factor  
 5 which has a relative risk of ten, then yes,  
 6 doing an asbestos study with lung cancer and  
 7 not taking into account cigarette smoking is  
 8 a very -- would be -- would be difficult --  
 9 or would be mandatory there or -- but that  
 10 doesn't mean that in every instance, you can  
 11 take into account every confounding factor.  
 12 That would be almost impossible in real life.  
 13 And so, that's why I say it's  
 14 desirable in many instances to take into  
 15 account confounders, and it's done to varying  
 16 degrees under different circumstances. But  
 17 sure, one wants to take into account  
 18 confounders to the degree that it's possible.  
 19 Q. Do you agree -- and we can go back  
 20 to his deposition testimony if you want, but  
 21 do you agree with Dr. Blair that there is  
 22 evidence of an increased risk of  
 23 non-Hodgkin's lymphoma in farmers that  
 24 existed prior to the introduction of  
 25 glyphosate?

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1 A. Yes.  
 2 Q. So, there is something going on  
 3 with farmers and their exposures that is  
 4 leading to an increased risk of non-Hodgkin's  
 5 lymphoma that we know for a fact is not  
 6 glyphosate; correct?  
 7 A. Yes.  
 8 Q. So, farming, to the extent that  
 9 glyphosate exposure is associated with  
 10 farming, which is a fair assumption; correct?  
 11 Farmers use glyphosate; correct?  
 12 A. Yes.  
 13 Q. So, farming or at last some other  
 14 farming exposures would be confounders of any  
 15 epidemiological analysis of glyphosate in  
 16 non-Hodgkin's lymphoma; correct?  
 17 A. Yes.  
 18 Q. For -- strike that.  
 19 So, you agree that it would be  
 20 mandatory or at least extremely desirable in  
 21 trying to reach an epidemiological finding  
 22 with respect to glyphosate and non-Hodgkin's  
 23 lymphoma to control for these potentially  
 24 confounding other farming exposures; correct?  
 25 MR. TRAVERS: Objection, misstates

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1 his prior testimony.  
 2 A. Well, to some degree by -- if it's  
 3 possible, yes.  
 4 Q. So, for example, any  
 5 epidemiological analysis that is trying to  
 6 properly measure a potential association  
 7 between glyphosate and non-Hodgkin's lymphoma  
 8 should be adjusted to control for potential  
 9 confounding effects of exposures to other  
 10 pesticides; correct?  
 11 MR. TRAVERS: Objection, calls for  
 12 speculation.  
 13 A. Well, other pesticides that are  
 14 known to cause lymphoma.  
 15 Q. And you, in fact, make that point a  
 16 number of places in your expert report, that  
 17 an epidemiological analysis of glyphosate and  
 18 non-Hodgkin's lymphoma should control for  
 19 exposures to these other pesticides; correct?  
 20 A. To the degree that it's possible,  
 21 yes.  
 22 Q. Now, there are standard  
 23 epidemiological methods that are used to try  
 24 and adjust for confounding; correct?  
 25 A. Yes.

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1 Q. So, there is -- one method is to do  
 2 some statistical analyses or regression  
 3 analyses to be able to adjust for exposures  
 4 to other risk factors; correct?  
 5 MR. TRAVERS: Objection, compound  
 6 question.  
 7 A. Yes.  
 8 Q. Another method is to conduct a  
 9 stratified analysis; right?  
 10 A. Define that.  
 11 Q. Okay. So, in a stratified  
 12 analysis, you compare -- you look at the odds  
 13 ratios of individuals with exposure to the  
 14 substance you are looking at, but not a  
 15 confounding exposure, and you also have a  
 16 measure that has it where they are exposed to  
 17 that substance and the other factor. You  
 18 have one that doesn't have the confounding  
 19 and the other that does. Correct?  
 20 A. That could be done.  
 21 Q. So, the -- we talked about  
 22 statistical significance. We talked about  
 23 confounding. The third issue that is raised  
 24 with respect to limited epidemiological  
 25 evidence is bias; correct?

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1 A. I don't know.  
 2 Q. Okay. Let me go back. The  
 3 definition of "limited" that we have talked  
 4 about for the epidemiological evidence in  
 5 this case, for glyphosate and non-Hodgkin's  
 6 lymphoma, cannot exclude the possibility of  
 7 bias; correct?  
 8 A. Yes.  
 9 Q. How would you define the concept of  
 10 bias in an epidemiological study?  
 11 A. Every study has bias.  
 12 Q. What is bias, just sort of the lay  
 13 perspective?  
 14 A. Bias is a directional error. There  
 15 are errors in every study. We are human  
 16 beings, so every study, particularly in  
 17 humans, that is conducted, has errors  
 18 inherent in it. Every study, observational  
 19 studies in particular.  
 20 So, the errors can be random or the  
 21 errors can be directional. So, bias are  
 22 directional errors where there is -- where  
 23 the -- because of the nature of the error, it  
 24 gives a tilt to the estimate that you get for  
 25 the odds ratio, for the risk ratio, at the

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1 end. It tends to give it a -- either a  
 2 positive or a negative result because of the  
 3 nature of the responses that the subjects  
 4 give.  
 5 I mean, the truth is error is bad,  
 6 but whether it's directional -- well, you can  
 7 smile, but error -- nondirectional error is  
 8 bad also, but biased error is worse than --  
 9 than non-biased error.  
 10 Q. And biased error is what you  
 11 defined as a directional error.  
 12 A. Right.  
 13 Q. And a directional error means that  
 14 you have a reported odds ratio, a risk ratio  
 15 that is actually not reflective of the true  
 16 association, because it has been artificially  
 17 shifted in a certain direction, either higher  
 18 or lower; correct?  
 19 A. Yes.  
 20 Q. Now, in your expert report, you  
 21 discuss two study designs for observational  
 22 epidemiology, cohort and case-control  
 23 studies, that can be subject to different  
 24 types of biases; correct?  
 25 A. Yes.

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1 Q. Given the choice between these two  
 2 study designs, most people prefer cohort  
 3 studies, because the individuals in the study  
 4 are unbiased at the beginning of the study  
 5 when you get your data; correct?  
 6 MR. TRAVERS: Objection, calls for  
 7 speculation.  
 8 A. I would say that in general, one  
 9 prefers cohort studies to case-control  
 10 studies, for the reason you give, but the  
 11 reality is that the truth is, it's the  
 12 quality with which the studies are conducted  
 13 that in the end determine which one is really  
 14 the better one.  
 15 Q. But just to confirm, as a general  
 16 matter, most people prefer a cohort study,  
 17 given the choice between the two, because  
 18 people are unbiased at the beginning of the  
 19 study when you get your data; correct?  
 20 MR. TRAVERS: Objection, asked and  
 21 answered, calls for speculation.  
 22 A. I would say that -- let's say that  
 23 cohort studies are preferred. I'm not sure I  
 24 would agree with -- precisely with the reason  
 25 that you are giving, but the answer is that

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1 the cohort studies are generally preferred.  
 2 Q. Okay. Let's go back to your  
 3 January 7, 2013 deposition. That should  
 4 still be in front of you. It's going to be  
 5 one of these transcripts. I think it's the  
 6 top one there. Yeah.  
 7 A. Did I misquote myself?  
 8 Q. You disagreed with yourself a  
 9 little bit, but --  
 10 MR. TRAVERS: Objection, move to  
 11 strike.  
 12 Q. Let's look at page 174 in your  
 13 deposition.  
 14 A. Is it -- is this the document?  
 15 Q. The January 7 one, yeah. It should  
 16 have January.  
 17 Page 174, lines seven through ten,  
 18 and I believe I quoted you correctly. "Most  
 19 people prefer a cohort study, given the  
 20 choice between the two, mainly because the  
 21 people are unbiased at the beginning of the  
 22 study when you get your data." Correct?  
 23 MR. TRAVERS: Objection. You  
 24 didn't read the full answer.  
 25 A. So, yes. No, I'm not disagreeing

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1 with what I said four years ago, but if you  
 2 are asking me as I sit here now why people  
 3 prefer a cohort to a case-control study,  
 4 there are other reasons.  
 5 Q. What other reasons are there that  
 6 people prefer a cohort study to a  
 7 case-control study?  
 8 A. I think it's a more naturalistic --  
 9 it's more naturalistic.  
 10 Q. That is because you are actually  
 11 following people over time to see outcomes?  
 12 A. Just it's prospective. I think  
 13 it's prospective as opposed to retrospective.  
 14 Q. And given the choice between the  
 15 two study designs, a prospective study design  
 16 is --  
 17 A. It's more natural. It's the  
 18 natural order of life.  
 19 Q. And as an epidemiologist, that is  
 20 preferable in the study design?  
 21 A. Again, we are talking sort of do  
 22 you prefer apples or do you prefer pears, but  
 23 again, whether you like apples or pears, the  
 24 truth is, when you look at the fruit, the one  
 25 that has the bruises on it is the one you are

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1 not going to eat. So, the quality of how you  
 2 carry out the study is ultimately -- a bad  
 3 cohort study is not as good as a good  
 4 case-control study, and vice-versa, you know.  
 5 Q. We are going to look at the quality  
 6 of the studies.  
 7 A. No, I understand, I'm sure we are.  
 8 But I'm saying that --  
 9 Q. I want to make sure I got your full  
 10 answer, though, because you had stated that  
 11 there is testimony about cohort studies, the  
 12 individuals are unbiased at the beginning of  
 13 the study.  
 14 A. Um-hum.  
 15 Q. That was one. And two, you  
 16 mentioned that cohort studies are more  
 17 naturalistic than case-control studies. Are  
 18 there --  
 19 A. Again, this brings up the issue of  
 20 temporality, but again, temporality is not  
 21 usually a major issue.  
 22 Q. Okay. So, with temporality, if I  
 23 understand correctly, a cohort study allows  
 24 you to make sure you have temporality, and a  
 25 case-control study, you can't be as certain.

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1 Is that correct?  
 2 A. Temporality is very rarely -- I  
 3 would have to say uncommonly a major -- a  
 4 major concern.  
 5 Q. Let's -- we will circle back to  
 6 that. Let me just continue from your report.  
 7 In your report you mentioned that  
 8 the main difficulty with cohort design is  
 9 that they are expensive and time-consuming,  
 10 particularly with outcomes like cancer;  
 11 correct?  
 12 A. Yes.  
 13 Q. But as compared to a cohort study,  
 14 a case-control study is more susceptible to  
 15 bias; correct?  
 16 A. They are both susceptible to bias,  
 17 just different biases.  
 18 Q. Let's look at your expert report.  
 19 A. I will say they are both  
 20 susceptible to error, just different error.  
 21 Q. Your expert report, which I think  
 22 was 14-6. It should be still in front of  
 23 you, Dr. Neugut.  
 24 MR. LASKER: If you can give him  
 25 his expert report.

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1 Q. It's 14-6. They should be in  
 2 order.  
 3 No, you can keep it. I have my own  
 4 copy.  
 5 A. Sorry.  
 6 Q. And just on page eight of your  
 7 expert report -- well, pages seven through  
 8 nine, you are comparing the cohort study  
 9 design to the case-control study design;  
 10 correct?  
 11 A. Yes.  
 12 Q. And at the bottom of page eight,  
 13 with respect to case-control studies, you  
 14 state that a disadvantage of case-control  
 15 studies, as compared to cohort studies, is  
 16 that they have an increased susceptibility to  
 17 bias; correct?  
 18 A. Yes.  
 19 Q. For example, one disadvantage of a  
 20 case-control study that you don't have with  
 21 cohort studies generally is the possibility  
 22 of recall bias; correct?  
 23 A. Have less concern for recall bias,  
 24 yes.  
 25 Q. So, recall bias occurs when cases,

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1 for example, of NHL, people with NHL, are  
 2 more likely to recall prior exposures than  
 3 healthy controls that don't have the disease;  
 4 correct?  
 5 A. Yes.  
 6 Q. Recall bias is not an issue in  
 7 cohort studies because the study population  
 8 is followed prospectively and the  
 9 investigators gather the exposure information  
 10 prior to any cancer diagnosis. I'll do it  
 11 again.  
 12 Recall bias is not an issue in  
 13 cohort studies because the study population  
 14 is followed prospectively and the  
 15 investigators gather exposure information  
 16 prior to any cancer diagnosis; correct?  
 17 A. Recall bias is much less or not an  
 18 issue, yes.  
 19 Q. It's not an issue at all; correct?  
 20 A. Not in the way it is in a  
 21 case-control study, that's correct.  
 22 Q. Case-control studies are also more  
 23 prone to selection bias than cohort studies;  
 24 correct?  
 25 A. Yes.

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1 Q. Selection bias can occur when a  
 2 selection of individuals into a study is  
 3 based both on the disease status and their  
 4 exposure status; correct?  
 5 A. I'm sorry, say that again.  
 6 Q. Selection bias can occur when  
 7 selection of individuals into a study is  
 8 related both to their disease status and to  
 9 their exposure status.  
 10 A. It's possible.  
 11 Q. And with a case-control study, you  
 12 are specifically selecting subjects based  
 13 upon their disease status. That's how you  
 14 choose the cases; correct?  
 15 A. Yes.  
 16 Q. So, that takes you halfway to where  
 17 you could have a selection bias problem;  
 18 right? You have one of the --  
 19 A. You have to talk louder.  
 20 Q. That would take you halfway to  
 21 where you could have a selection bias  
 22 problem. You are already selecting based  
 23 upon disease, so if there is anything in the  
 24 methodology that creates selection based upon  
 25 exposure, you have a selection bias issue;

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1 correct?  
 2 MR. TRAVERS: Objection, compound  
 3 question.  
 4 A. I don't understand the point.  
 5 Q. Okay. If there is, in a  
 6 case-control study, some difference in the  
 7 selection of cases or controls that impact  
 8 the likelihood of exposure, that can  
 9 introduce a bias into the study; correct?  
 10 MR. TRAVERS: Objection, calls for  
 11 speculation.  
 12 A. Again, I'm not following the  
 13 question easily.  
 14 Q. In a case-control study --  
 15 A. Um-hum.  
 16 Q. -- if there is some difference in  
 17 the selection method or the selection of  
 18 cases and controls that is associated with  
 19 the exposure of interest, that would create a  
 20 selection bias; correct?  
 21 MR. TRAVERS: Objection, calls for  
 22 speculation.  
 23 A. That would be -- that would be  
 24 extraordinarily uncommon, if I'm  
 25 understanding correctly what you are asking,

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1 and I don't think it would be applicable in  
 2 this particular -- I don't think it would be  
 3 applicable in -- at least in the context of  
 4 what we are talking about.  
 5 Q. Okay. But if there was some  
 6 difference in the selection of cases or  
 7 controls in a cohort study that was  
 8 associated with the likelihood of exposure,  
 9 that would create a selection bias; correct?  
 10 MR. TRAVERS: Objection, asked and  
 11 answered.  
 12 A. Yes, it could, but as I say, I  
 13 don't think it would be relevant in the  
 14 context. There might be exposures and  
 15 outcomes where that might play a role in a  
 16 case-control study -- we're talking now of  
 17 case-control studies or --  
 18 Q. Um-hum.  
 19 A. But I don't think that would be  
 20 applicable here.  
 21 Q. If there was a difference in the  
 22 response rate for inclusion in the study  
 23 between cases and controls, in other words,  
 24 cases participate in a study at a higher  
 25 likelihood than controls, that can raise a

1 concern about selection bias; correct?

2 MR. TRAVERS: Objection, calls for  
3 speculation.

4 A. Yes, but then you might not know  
5 which way the -- again, the direction of the  
6 arrow could go either way.

7 Q. A cohort study -- strike that.

8 In your expert report, you talk  
9 about two types of biases with -- that can  
10 occur in a cohort study, and the first is  
11 loss to follow-up; correct?

12 A. Yes.

13 Q. And one method -- and loss to  
14 follow-up is, you are following them  
15 prospectively and you want to know what  
16 happens to them prospectively, and if ten  
17 years from now you lose track of that person,  
18 you can't track what happened to them, you  
19 have a loss to follow-up; correct?

20 A. Yes.

21 Q. So, one method that epidemiologists  
22 can use to reduce the problem of loss to  
23 follow-up, is if they have another source of  
24 information for outcomes, like a hospital  
25 database or a Medicare database, to be able

1 to the study. I just want to -- just for  
2 clarity, I just want to make sure  
3 which --

4 MR. LASKER: There is an overall  
5 study, and there is lots and lots of  
6 publications --

7 MR. TRAVERS: Okay.

8 MR. LASKER: -- which by design is  
9 a study design.

10 A. I'm referring to the --

11 Q. De Roos 2005?

12 A. Yes.

13 Q. Okay. You also state that cohort  
14 studies may be subject to detection observer  
15 bias.

16 A. I'm sorry?

17 Q. In your expert report, you say that  
18 cohort studies may be subject to detection  
19 observer bias. What is that?

20 A. I knew you were going to ask me  
21 that.

22 Q. If you don't know, that's fine.  
23 This is mentioned in your expert report on  
24 page eight; right?

25 A. That -- it's basically the -- it's

1 to track the outcome of those individuals  
2 prospectively; correct?

3 A. In a large cohort study, you hope  
4 you have such a database, but that is often  
5 difficult with free living individuals.

6 Q. But when you do have such a  
7 database, and in particular the AHS study had  
8 that, that addresses this concern of loss to  
9 follow-up; correct?

10 A. As long as the people stay in the  
11 area where the registry is.

12 Q. And with respect to the  
13 Agricultural Health Study, that was the case,  
14 in fact; they were able to continue to track  
15 those individuals through the database?

16 A. Yes.

17 Q. You also state --

18 MR. TRAVERS: I just want to --  
19 just an objection. When you say "AHS,"  
20 are you referring to De Roos 2005 or --

21 MR. LASKER: The Agricultural  
22 Health study. That would be De Roos 2005  
23 as well, yes. The study is the study.

24 MR. TRAVERS: Well, it's two  
25 different -- there are different phases

1 the complement to what you -- we talked about  
2 earlier with regard to the case-control  
3 study, which is that the knowledge of the --  
4 of the exposure affects the -- affects the  
5 diagnosis subsequently. So, it's sort of the  
6 prospective equivalent of what you were  
7 calling earlier -- what we were calling  
8 earlier selection or diagnostic bias, that  
9 knowing, for example, that someone was  
10 exposed to -- to an exposure, might influence  
11 how they are diagnosed subsequently.

12 Q. That issue, detection observer  
13 bias, is not a concern in the Agricultural  
14 Health Study; correct?

15 A. So, I was listing, you know,  
16 potential biases. To what degree it plays a  
17 role in this particular -- this was a  
18 theoretical, if you will, or general  
19 discussion of cohort versus case-control  
20 studies, and I wasn't specifically speaking  
21 with regard to the Agricultural Health Study.  
22 It was a general discussion of cohort versus  
23 case-control studies.

24 Q. Yeah, I understand that.

25 A. Right. So --

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1 Q. I'm just trying to clarify that  
 2 that issue, detection --  
 3 A. Right. So --  
 4 Q. Sorry. Detection observer bias is  
 5 not a concern with the Agricultural Health  
 6 Study; correct?  
 7 A. I would probably not rate it as a  
 8 major bias in the analysis of the outcomes.  
 9 Q. It's not any bias. I mean, there  
 10 is no issue of people being diagnosed with  
 11 non-Hodgkin's lymphoma based upon their  
 12 exposure; correct?  
 13 MR. TRAVERS: Objection to form.  
 14 A. I would doubt it.  
 15 Q. Now, in its conclusion that the  
 16 epidemiological literature for glyphosate and  
 17 non-Hodgkin's lymphoma is limited, IARC also  
 18 considered an IARC meta-analysis of the  
 19 epidemiological studies; correct?  
 20 A. Yes.  
 21 Q. Now, you have never conducted or  
 22 published a meta-analysis yourself; correct?  
 23 MR. TRAVERS: Objection, compound  
 24 question.  
 25 A. Personally, I have not. I think

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1 one of our fellows has done one now that is  
 2 sort of winding its way through the  
 3 literature, but for all intents and purposes,  
 4 the answer is no.  
 5 Q. You do agree, though, that  
 6 meta-analyses usually do not substantially  
 7 alter one's understanding of the underlying  
 8 studies; correct?  
 9 MR. TRAVERS: Objection, calls for  
 10 speculation.  
 11 A. I don't know what that means.  
 12 Q. Okay. Let's mark as 14-9 an  
 13 article that you have published that I think  
 14 states exactly that. Let's see if I am  
 15 right.  
 16 (Exhibit 14-9, Etiology article,  
 17 Meta-analysis: Use of combined oral  
 18 contraceptive in the past ten years is  
 19 associated with an increased risk for  
 20 breast cancer, 1996 Nov-Dec marked for  
 21 identification, as of this date.)  
 22 Q. And Dr. Neugut, I'm handing you  
 23 a -- I think it was maybe a letter or an  
 24 editorial, I'm not sure how you describe  
 25 this -- that you prepared for the American

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1 College of Physicians entitled  
 2 "Meta-Analysis: Use of combined oral  
 3 contraceptives in the past 10 years is  
 4 associated with an increased risk for breast  
 5 cancer."  
 6 MR. TRAVERS: I just have one  
 7 question. Is this just the abstract or  
 8 is there a full study?  
 9 MR. LASKER: This is the full  
 10 document. It's a commentary.  
 11 MR. TRAVERS: Okay.  
 12 Q. And on page three of your  
 13 commentary, or three of four, the first --  
 14 the second paragraph, I'm sorry, you state:  
 15 "As is usual for meta-analysis -- for  
 16 meta-analyses, the overall results do not  
 17 substantially alter one's understanding of  
 18 the previous studies."  
 19 And by "previous," you mean the  
 20 underlying studies, I take it; correct?  
 21 A. Yes.  
 22 Q. And you agree with that; correct?  
 23 A. Yes.  
 24 Q. And in particular, when  
 25 observational studies report small relative

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1 risks, less than 2.0, it's your view that  
 2 meta-analyses are probably as good as can be  
 3 done and suggest that there is not a greater  
 4 concern, or greater cause for concern;  
 5 correct?  
 6 MR. TRAVERS: Objection, misstates  
 7 his commentary.  
 8 A. Yes.  
 9 Q. Just to be clear, my question was,  
 10 correct, you do believe that when  
 11 observational studies report small relative  
 12 risks, meta-analyses are probably as good as  
 13 can be done and suggest that there is not a  
 14 greater cause for concern; correct?  
 15 A. Yes.  
 16 Q. You have also cautioned, and  
 17 cautioned in this commentary, about reaching  
 18 causation opinions based upon statistically  
 19 significant findings below 2.0 in  
 20 meta-analyses; correct?  
 21 A. Yes.  
 22 Q. And in your opinion, we should  
 23 refer to such findings -- or strike that.  
 24 We should not refer to such  
 25 findings as small but statistically



1 significant, but instead should state that  
2 such findings are statistically significant  
3 but small; correct?

4 A. I would point out that this was  
5 written 20 years ago.

6 Q. That's why I am asking you today.

7 A. And this is --

8 Q. You agree --

9 A. And this is an old -- you know, I  
10 had hair then.

11 Q. That's good to know.

12 A. So --

13 Q. I'm asking if you agree with that  
14 statement today.

15 A. I think -- so, I agree that with  
16 smaller risk ratios, one has to exhibit more  
17 caution, but I think that the field has moved  
18 in that direction. And by "the field," I am  
19 referring to epidemiology in general. And  
20 that back in the 1990s, that there was more  
21 caution with going below risk ratios of two,  
22 and even legally, the Daubert -- if we are  
23 talking about a Daubert hearing, the legal  
24 field would have been more cautious below a  
25 risk ratio of two.

1 But now, risk ratios of 1.3 and 1.4  
2 are taken seriously. Many risk factors that  
3 we take very seriously in public health are  
4 really at that level of 1.3 and 1.4, and even  
5 1.2, and we consider them significant  
6 carcinogens and act on them in the public  
7 health sphere.

8 So, I would say that -- that while  
9 it is true that it's more difficult, it makes  
10 it more difficult methodologically to  
11 establish a risk in that range, and that's  
12 why we are for the most part sitting here  
13 talking about this risk ratio, but that  
14 doesn't mean it's unimportant. I would  
15 disagree with my statement to the degree that  
16 it's -- when I say statistically significant  
17 but small, "small" doesn't mean unimportant.  
18 "Small" means small and difficult to  
19 establish with -- to the degree that we would  
20 like to be comfortable and confident that  
21 it's a true causal association.

22 It makes it more difficult  
23 methodologically for us an epidemiologists  
24 and scientists to be -- to establish it as a  
25 probable carcinogen or a true or an absolute

1 carcinogen, which is why -- why we are -- why  
2 we are sitting here.

3 Q. Just so I understand your prior  
4 testimony, one of the factors that you  
5 mentioned in your consideration of these  
6 types of findings in meta-analysis is your  
7 understanding of the changes in the Daubert  
8 standard with respect to what courts are  
9 looking for?

10 A. No, I'm not making a legal -- I was  
11 not trying to make a legal conclusion for you  
12 guys. That's your job. I'm simply saying, I  
13 recognize that -- I'm simply saying that even  
14 in the legal field, the standard of what is  
15 big and small, if I am understanding the  
16 legal ramifications, has changed also in the  
17 last 20 years.

18 Q. There are certain guidelines that  
19 have been set forth on how to conduct  
20 meta-analyses; correct?

21 A. Yes.

22 Q. And you cite to such guidelines in  
23 your expert report; correct?

24 MR. TRAVERS: What page is that?

25 MR. LASKER: Page nine.

1 A. Yes.

2 Q. And in particular, you cite to an  
3 article, and this is the third full paragraph  
4 in the meta-analysis, in discussing how to  
5 perform a meta-analysis, you cite to a --  
6 guidelines prepared by Walker, Hernandez and  
7 Kattan in 2008; correct?

8 A. 2008?

9 Q. Yes.

10 A. Um-hum.

11 Q. Is that correct?

12 A. Yes.

13 Q. This is an article that you rely  
14 upon as authoritative in providing guidelines  
15 on proper approaches for meta-analyses;  
16 correct?

17 A. Yes. Again, I don't do them  
18 personally, but as a reference.

19 MR. LASKER: Let's mark this paper  
20 as 14-10.

21 (Exhibit 14-10, Cleveland Clinic  
22 Journal of Medicine, June 2008,  
23 Meta-analysis: Its strengths and  
24 limitations marked for identification, as  
25 of this date.)

1 Q. Dr. Neugut, this is the guideline  
2 article that you cite in your expert report  
3 for meta-analyses; correct?

4 A. Yes.

5 Q. So, as one of the key points at the  
6 beginning on this first page of the Walker  
7 guidelines, one of the key points that is  
8 stated right under the abstract, is that  
9 there are many caveats in performing a valid  
10 meta-analysis, and in some cases a  
11 meta-analysis is not appropriate and the  
12 results can be misleading. Correct?

13 A. Yes.

14 Q. And you agree with that; correct?

15 A. I suppose, yes.

16 Q. And on page 436, there is a section  
17 on randomized control trials versus  
18 observational trials.

19 A. I'm sorry, page?

20 Q. 436. Do you see that?

21 A. Yes.

22 Q. And the Walker guidelines state  
23 that some researchers believe that  
24 meta-analysis -- meta-analyses should be  
25 conducted only on randomized control trials;

1 correct?

2 A. Yes.

3 Q. And that is because -- let's take a  
4 step back and define, a randomized control  
5 style -- a randomized control trial is a  
6 different type of epidemiological study  
7 where, for instance, in drug studies, where  
8 they will have a placebo group and a control  
9 group, and the investigators will provide the  
10 medication to the subjects and actually have  
11 a controlled study going forward; correct?

12 MR. TRAVERS: I object to the  
13 testimony of counsel.

14 A. A randomized control trial is a  
15 cohort study where the -- where the  
16 investigators provide the exposure to the  
17 subjects.

18 Q. Okay. So, let me make sure I  
19 understand your testimony then. Is it your  
20 testimony that a randomized control trial is  
21 a -- is a type of cohort study?

22 A. Yes. I mean it's a specialized  
23 form. It falls under -- there are only two  
24 kinds of studies in epidemiology, cohort  
25 studies and case-control studies. A

1 randomized trial is a specialized -- falls  
2 under the rubric of cohort studies. I  
3 mean --

4 Q. Okay. Fair enough.

5 A. But, I mean, it's an easy -- it's  
6 an easier form of study to analyze, because  
7 you have -- you are giving the exposure to  
8 the individual or not giving the exposure to  
9 the individual, rather than having it be  
10 decided upon by subject choice or by, you  
11 know, random -- by -- not random, but by --  
12 well, by subject decision.

13 Q. The concern that the Walker  
14 guidelines are noting here with meta-analyses  
15 outside of randomized control trials is that  
16 observational trials are more prone to  
17 confounding and bias errors than randomized  
18 control trials; correct?

19 A. I think they are saying that to  
20 meta-analyze observational studies, there is  
21 going to be heterogeneity between the  
22 studies, so it makes it a little more  
23 difficult or makes it more difficult to  
24 combine them in a way where you can be  
25 confident that the result that you get is not

1 due to some -- something other than purely  
2 the exposure and outcome relationship.

3 Q. And there -- the meta-analysis  
4 methodology does not allow for the  
5 investigators to address problems of  
6 confounding or bias in the underlying  
7 studies; correct?

8 A. In the usual meta-analysis, the  
9 answer is, for the most part, no. For the  
10 most part, no. Again, I'm not an expert in  
11 meta -- I mean, I can read them, I can  
12 analyze them, but for the most part, the  
13 answer is no.

14 Q. Okay. Just to be clear for my  
15 question, so the answer is no, in a  
16 meta-analysis, you cannot fix problems of  
17 bias or confounding in the underlying  
18 studies.

19 MR. TRAVERS: Objection, misstates.

20 A. I don't want to misstate it. I  
21 mean, the truth is that generally speaking,  
22 if you put together several studies, the  
23 biases are going to dilute out presumably  
24 over the -- over the several studies, and  
25 it's probably not going to be as big a

1 problem as -- you know, as people think or as  
2 one might presume.

3 You can't -- bias is omnipresent.

4 So, if you are going to start just throwing  
5 around the word "bias," and say, "Bias, bias,  
6 bias, the study sucks," then you can throw  
7 out 90 percent of the epidemiology studies,  
8 and then we know nothing about anything.

9 But you have to look at studies and  
10 use judgment and common sense, and assess how  
11 big the bias is, how important is the bias,  
12 how well does the study address the bias, and  
13 then put them together, and that's part of  
14 the methodology of putting -- of doing a  
15 meta-analysis, is to qualitatively assess  
16 them as well.

17 Q. Okay. So, just so the record is  
18 clear, if an underlying study has an issue  
19 with recall bias --

20 A. Every study has an issue with  
21 recall bias.

22 Q. I understand. Let me ask the  
23 question.

24 If an underlying study has a  
25 problem with recall bias, the meta-analysis

1 problem with confounding in any of the  
2 underlying studies; correct?

3 A. Not if the study itself did not  
4 address it, no.

5 Q. Now, another concern raised about  
6 meta-analysis in these Walker guidelines, and  
7 you mention it as well in your expert report,  
8 is the issue of publication bias; correct?

9 A. Yes.

10 Q. And publication bias occurs where  
11 investigators will not submit findings where  
12 there is no showing of a statistically  
13 significant result because those data are,  
14 for whatever reason, perceived as being less  
15 interesting; correct?

16 MR. TRAVERS: Objection, misstates  
17 the evidence.

18 A. That is a little simplistic. I  
19 would say publication bias is more  
20 complicated than that.

21 Q. But the concern about publication  
22 bias is that statistically significant  
23 associations are published and findings that  
24 are null are not published. That would be a  
25 publication bias; correct?

1 methodology will not change that; correct?

2 MR. TRAVERS: Objection, asked and  
3 answered.

4 A. Not necessarily, no, but then  
5 again, you have to ask yourself how big is  
6 the recall bias. You have to ask yourself  
7 why is it only in non-Hodgkin's lymphoma.  
8 You have to ask yourself why -- you know,  
9 how -- it's not enough to say recall bias,  
10 the study can't be looked at.

11 Q. I'm not -- that wasn't my question.  
12 Mine is a methodological question, and we  
13 will be discussing individual studies. But  
14 methodologically, a meta-analysis does not  
15 provide any -- does not fix an underlying  
16 recall bias in one of the underlying studies;  
17 correct?

18 MR. TRAVERS: Objection, asked and  
19 answered.

20 A. No, it does not.

21 Q. And the meta-analysis would not fix  
22 an underlying selection bias in any of the  
23 studies, underlying studies; correct?

24 A. No, it would not.

25 Q. And a meta-analysis would not fix a

1 MR. TRAVERS: Objection, asked and  
2 answered.

3 A. So, the entire epidemiology  
4 methodologic system is set up to be  
5 conservative, so that null findings are the  
6 norm. We don't want to find positive  
7 findings. The system is set up not to find  
8 positive findings. It's biased, for lack of  
9 a better word, to avoid finding positive  
10 findings. Sort of like the legal system, you  
11 don't want to find someone guilty, you want  
12 everyone to be innocent unless they are  
13 really guilty.

14 So, on some level that's how  
15 epidemiology is constructed. So, when you  
16 have a positive finding, it's taken more  
17 seriously than when you have a null finding.  
18 So, on a certain level, publication follows  
19 that -- that track or that scenario, so that  
20 when you do have a positive finding, an  
21 editor, a publisher, a reviewer takes a  
22 positive finding as something that is more  
23 significant than several negative findings or  
24 null findings. I don't mean negative, that  
25 may have been null.

1 And so, so it's more important to  
2 report positive findings. So yes, there is  
3 some bias towards publishing positive  
4 findings, but that is how the system -- that  
5 is not necessarily a, let's say a, a  
6 criticism. That is not necessarily a, a bad  
7 thing in the literature. That may be the way  
8 it should be, that -- I mean, it wasn't  
9 intended that everything should come out  
10 50/50, you know, that 50 percent of the  
11 studies should be null and 50 percent of the  
12 studies should be positive.

13 But then again, some of the  
14 publication bias is also that some studies  
15 never reach -- there's publication bias in  
16 other ways, that some studies, if you started  
17 off and you wanted to recruit 200 patients  
18 into your sample, and you ended up running  
19 out of money after 100 people, so you never  
20 finished your study, so those studies don't  
21 get published either, because you only  
22 reached 100, and so a half study -- half  
23 studies don't get published either. So, that  
24 is part of publication bias also.

25 What happened to all those, you

1 know, incomplete -- there are incomplete  
2 studies that are part of publication bias,  
3 too. There are all sorts of -- if you want  
4 to call them biases that -- you know.

5 Q. Well, just to be clear, because  
6 "publication bias" is the term in your expert  
7 report, and it's also in the Walker  
8 guidelines that you cite to, just so I am  
9 understanding the term correctly, publication  
10 bias refers to the situation where positive  
11 findings are published but null findings in  
12 another study may not be published; correct?

13 A. Publication bias refers to where  
14 anything isn't published that could have  
15 been, should have been, might have been  
16 published. Could be positive findings. As I  
17 say, if you didn't finish a positive study  
18 and it never got published, or you dropped  
19 dead before your successor could -- and so no  
20 one ever picked up the study to submit it to  
21 a journal, that is also publication bias. It  
22 goes both ways.

23 I suspect, as you say, more null  
24 findings are not published than positive  
25 findings, but it's also true that there

1 are -- I'm sure there are positive findings.  
2 I have many papers that are sitting in my  
3 computer on my hard drive that I thought were  
4 the greatest studies ever done, and that have  
5 been rejected by ten or 12 journals and that  
6 are not published, and they are sitting there  
7 gathering dust in my computer that, you know,  
8 I think the world is waiting to see, and no  
9 journal will publish them, and who knows?  
10 You know, so, there is that bias, too.

11 Q. Okay. But specifically with  
12 respect to this, the guidelines for  
13 meta-analysis, the concern that you raise and  
14 that Dr. Walker raises in his guidelines is  
15 that positive findings may be published and  
16 null findings may not be published; correct?

17 MR. TRAVERS: Objection, misstates.

18 A. That tends to be the way it goes.  
19 Yes.

20 Q. And the meta-analysis guidelines  
21 you cite in your expert report state that,  
22 quote, to ameliorate the effects of  
23 publication bias on the results of  
24 meta-analysis --

25 A. I'm sorry. Are you quoting me now

1 or you're quoting this?

2 Q. I'm quoting your guidelines, and if  
3 you want, it's on page 432.

4 MR. TRAVERS: Objection. They are  
5 not his guidelines.

6 A. You are quoting this.

7 Q. Okay. The Walker guidelines cited  
8 in your expert report. The meta-analysis  
9 guidelines you cite in your expert report  
10 state on page 432, and it's in the second  
11 column, the third full paragraph, "to  
12 ameliorate the effect of publication bias on  
13 the results of meta-analysis, a serious  
14 effort should be made to identify unpublished  
15 studies." Right?

16 A. Yes.

17 Q. And the same guidelines that you  
18 cite in your expert report, on page 433,  
19 state, in the border, "Exclusion of  
20 non-published studies increases selection  
21 bias." Correct?

22 A. Yes.

23 Q. How can the exclusion of  
24 non-published studies from meta-analysis  
25 increase selection bias?

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1 A. I'm sorry, say it again.  
 2 Q. How can the exclusion of  
 3 non-published studies from a meta-analysis  
 4 increase selection bias?  
 5 A. I suppose if you haven't included  
 6 every study, then you are -- you have to be  
 7 concerned that you are biasing the results  
 8 upward.  
 9 Q. And these recommendations in the  
 10 Walker guidelines that you cite in your  
 11 expert report, they are consistent with lots  
 12 of other meta-analyses guidelines on how to  
 13 treat unpublished studies, aren't they?  
 14 A. I don't know.  
 15 Q. So, you have also written about the  
 16 use of time trends for the incidence of  
 17 specific cancers to provide some clues as to  
 18 potential causes of cancer; correct?  
 19 A. I have?  
 20 Q. Yes.  
 21 A. I guess.  
 22 Q. Well, let's go back to your chapter  
 23 on epidemiology and prevention in the  
 24 ASCO-SEP, and I didn't write the number on  
 25 this one. Which is this? 14-8.

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1 A. That is the ASCO-SEP?  
 2 Q. Yes.  
 3 MR. TRAVERS: And this is a 1996  
 4 article?  
 5 MR. LASKER: No. This is 2014,  
 6 maybe. I don't know when this -- the  
 7 copyright is 2013.  
 8 Q. That's it. And on pages, I think  
 9 two and three, you are discussing some sort  
 10 of time trends that you -- to compare against  
 11 exposures to sort of get some clues as to  
 12 causation; correct?  
 13 A. Yes, um-hum.  
 14 Q. So, for example, you show how time  
 15 trends in lung cancer incidence can be traced  
 16 to increases and decreases in smoking;  
 17 correct?  
 18 A. Yes.  
 19 Q. And when you do a time trend  
 20 analysis for cancer, you need to account for  
 21 latency; correct?  
 22 A. Oh, it depends, but depending on  
 23 the context, yes.  
 24 Q. And generally, just so the record  
 25 is clear, the issue for latency is that for

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1 cancer, there is usually a period of years  
 2 after an exposure before cancer would be  
 3 developed and diagnosable; correct?  
 4 A. Depends on what the exposure and  
 5 the outcome is.  
 6 Q. But the concept of latency is that  
 7 there is some time period that elapses from  
 8 exposure until a cancer; correct?  
 9 A. Yes.  
 10 Q. And you would then be looking --  
 11 for time trend, you would be looking for  
 12 impacts on the cancer rate some years after  
 13 changes in the exposure incidence; correct?  
 14 A. Again, it would depend on the  
 15 specific context that we are talking about.  
 16 It varies from -- every exposure and every  
 17 outcome has its own unique idiosyncratic  
 18 relationship.  
 19 Q. Plaintiffs' expert Dr. Weisenburger  
 20 has, and he's an expert in this litigation  
 21 for plaintiffs, has opined that the latency  
 22 created for non-Hodgkin's lymphoma caused by  
 23 pesticide exposure would be on the order of  
 24 ten years or more. Does that sound right to  
 25 you?

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1 MR. TRAVERS: Objection. Do you  
 2 have his report, if you are going to ask  
 3 about it?  
 4 Q. First off, while we are getting the  
 5 report, out, let me ask you, does ten years  
 6 sound like a reasonable estimate of the  
 7 latency for non-Hodgkin's lymphoma following  
 8 pesticide exposure?  
 9 A. I wouldn't have any basis on which  
 10 to make a judgment.  
 11 Q. You have not looked at that  
 12 question?  
 13 A. No.  
 14 Q. You do agree that the issue of  
 15 latency is a significant factor in analyzing  
 16 epidemiological findings; correct? For  
 17 cancer.  
 18 A. Say the question again.  
 19 Q. You do agree that this concept of  
 20 latency is an important issue to be aware of  
 21 in reviewing findings from epidemiological  
 22 studies of an exposure and an cancer outcome.  
 23 A. I think if one has a specific  
 24 epidemiologic association and mechanism, then  
 25 the answer is yes.

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1 Q. And Dr. Weisenburger's report --  
 2 MR. LASKER: Let's mark as -- what  
 3 did I say it was? 14-11.  
 4 (Exhibit 14-11, Expert Report of  
 5 Dr. Dennis Weisenburger, M.D. marked for  
 6 identification, as of this date.)  
 7 Q. It's Dr. Weisenburger's report, and  
 8 we are marking pages one through six, because  
 9 that's the section in which he discusses the  
 10 issue of latency.  
 11 MR. TRAVERS: I will object, that  
 12 it's not the full report.  
 13 MR. LASKER: That's fine.  
 14 Q. And on page five of his expert  
 15 report, Dr. Weisenburger is talking about the  
 16 issue of latency; correct?  
 17 A. I'm on page five. Can you point  
 18 out --  
 19 Q. The whole paragraph on page five.  
 20 A. The one that begins, "Only one  
 21 large cohort study?"  
 22 Q. That's it.  
 23 A. Can I have a moment to look at it?  
 24 Q. You can.  
 25 A. Okay. What is the question?

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1 Q. So, Dr. Weisenburger in this  
 2 paragraph is talking about the issue of  
 3 latency for pesticide exposure and  
 4 non-Hodgkin's lymphoma; correct?  
 5 A. Yes.  
 6 Q. And Dr. Weisenburger talks about  
 7 6.7 years as perhaps being too short of a  
 8 time period to account for latency between  
 9 pesticide exposure and non-Hodgkin's  
 10 lymphoma; correct?  
 11 A. In terms of latency?  
 12 Q. Yes.  
 13 A. Yes.  
 14 Q. And he talks about various studies  
 15 and suggests a cutoff of ten years as being  
 16 the, you know, reasonable estimate of the  
 17 latency period for exposure to pesticide and  
 18 non-Hodgkin's lymphoma; correct?  
 19 A. Yes.  
 20 MR. TRAVERS: Objection, misstates  
 21 his opinion.  
 22 Q. And do you have any reason to  
 23 disagree with Dr. Weisenburger's analysis of  
 24 this issue of latency?  
 25 A. Do I have any reason to --

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1 Q. Disagree with Dr. Weisenburger's  
 2 analysis of latency.  
 3 MR. TRAVERS: Objection, calls for  
 4 speculation.  
 5 A. I have no basis on which to agree  
 6 or disagree. It would depend on what --  
 7 whether one thinks that glyphosate is a tumor  
 8 initiator or a tumor promoter. You know,  
 9 latency periods can be as short as one or two  
 10 years, depending on the exposure and the  
 11 outcome.  
 12 And I am not sure, even as I sit  
 13 here, what the actual mechanism is by  
 14 which -- that is not my expertise per se,  
 15 what the precise mechanism is by which  
 16 glyphosate causes non-Hodgkin's lymphoma  
 17 biologically, so I would have difficulty  
 18 characterizing the latency period, but I have  
 19 no reason to doubt his expertise.  
 20 Q. So, just to be clear, you do not  
 21 have an expert opinion on the latency period  
 22 for glyphosate exposure and non-Hodgkin's  
 23 lymphoma?  
 24 A. Correct.  
 25 Q. And you do not have an expert

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1 opinion that glyphosate is a tumor promoter;  
 2 correct?  
 3 A. As opposed to an initiator?  
 4 Q. Yes.  
 5 A. Well, it wasn't shown to be a  
 6 mutagen, so I guess once it's not a mutagen  
 7 or -- I don't know -- as I said, I don't know  
 8 specifically its exact mechanism of how it's  
 9 causing -- how it is precisely causing  
 10 cancer.  
 11 Q. So for a -- if we are doing a time  
 12 trend analysis of non-Hodgkin's lymphoma, if  
 13 Dr. Weisenburger is correct with a ten-year  
 14 latency period, we would want to look and see  
 15 how incidence of non-Hodgkin's lymphoma  
 16 changed ten years after exposures to  
 17 glyphosate? Is that a correct understanding  
 18 of how the time trend analysis would work?  
 19 MR. TRAVERS: Objection, compound  
 20 and misstates Dr. Weisenburger's  
 21 testimony.  
 22 A. Are you talking now on a population  
 23 scale?  
 24 Q. Yes. Like the way you presented in  
 25 your chapter.

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1 A. So, when I talk about it in my  
 2 chapter, we are talking about lifestyle  
 3 factors that are prevalent across an entire  
 4 population, like cigarette smoking or  
 5 postmenopausal women taking hormonal -- you  
 6 know, menopausal hormones, which is a very  
 7 widespread phenomenon.  
 8 If you are talking about exposures  
 9 where only a small fraction of the population  
 10 is actually exposed, and where the relative  
 11 risk is 1.2 or 1.3 or 1.4 -- let's say 1.3 or  
 12 1.4, then to see that impact on the -- you  
 13 know, on the population prevalence of  
 14 non-Hodgkin's lymphoma would require quite  
 15 a -- that would be rather -- rather profound.  
 16 I don't know if you would see it on a  
 17 population scale.  
 18 Q. So, is it your understanding that  
 19 exposures to glyphosate in the population are  
 20 rare?  
 21 A. No. It's fairly common, but in  
 22 a -- in a selective portion of the  
 23 population.  
 24 Q. And those would be sort of  
 25 agricultural populations?

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1 A. Agricultural, gardeners, you know,  
 2 my wife, I don't know, but she's got tomato  
 3 plants now, but -- so, it may be profound. I  
 4 don't know. It's not my -- again, I am not  
 5 going to put myself up as an expert in that  
 6 regard, in how much the attributable risk is  
 7 going to be across the population.  
 8 I'm simply saying that if you want  
 9 to see a population effect, it has to be a  
 10 fairly prevalent -- it's not just -- it's  
 11 both the risk and the prevalence of exposure  
 12 that is significant in order to see a -- to  
 13 see a population-based time trend change, you  
 14 know.  
 15 Q. Fair enough.  
 16 A. In addition to the latency. You  
 17 know, I mean then first latency will play a  
 18 role and you might have to wait -- again, if  
 19 he says ten years, you might have to wait ten  
 20 years to first see it show up.  
 21 Q. Dr. Neugut, in your report, you --  
 22 your expert report, you note that  
 23 epidemiological studies use a multistep  
 24 process to establish causal inferences;  
 25 correct?

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1 A. Yeah.  
 2 MR. TRAVERS: What page?  
 3 Q. Well, if you need to refer to your  
 4 expert report for this, it's at page six.  
 5 But first, principles of causal  
 6 inference are used to construct theories  
 7 which help us formulate testable hypotheses;  
 8 correct?  
 9 A. Yes.  
 10 Q. Epidemiologists then design studies  
 11 to test those causal hypotheses; correct?  
 12 A. Yes.  
 13 Q. And that is the definition of a  
 14 scientific method; right? The formulation of  
 15 hypotheses and the testing of those  
 16 hypotheses to determine whether they can be  
 17 validated; correct?  
 18 A. Yes.  
 19 Q. And you also agree that a  
 20 hypothesis generally cannot be validated  
 21 based upon the results of any one  
 22 epidemiological study; correct?  
 23 MR. TRAVERS: Objection, calls for  
 24 speculation.  
 25 A. Any one single -- well, I'm sorry,

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1 say that question again.  
 2 Q. You would agree that a hypothesis  
 3 generally cannot be validated based upon the  
 4 results of any one epidemiologic study.  
 5 MR. TRAVERS: Same objection.  
 6 A. You mean could there be one single  
 7 epidemiologic study which is so terrific or  
 8 so profoundly good that I could reach a  
 9 conclusion based solely on that? The answer  
 10 is, there probably could be.  
 11 Q. But as a general matter?  
 12 A. But -- and there have been, so the  
 13 answer is, I don't agree with that statement,  
 14 but I think with -- with risk ratios like  
 15 this, and prevalences like this, this isn't  
 16 one of the contexts where that is probably  
 17 going to be true.  
 18 Q. Okay. So, in the context  
 19 particularly that we are dealing with here, a  
 20 scientist following the scientific method  
 21 would be formulating hypotheses, testing  
 22 those hypotheses to see if they could be  
 23 validated, and then testing those hypotheses  
 24 again to determine whether those findings are  
 25 replicated; correct?

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1 A. Yes.

2 Q. Epidemiologist studies also --

3 strike that.

4 Epidemiological studies sometimes

5 will report out results that are not linked

6 to any preset hypothesis; correct?

7 A. So, could you just define that a

8 little better for me?

9 Q. So you -- epidemiological studies,

10 they can have a hypothesis that they are

11 designed to test.

12 A. Right.

13 Q. But they can also report out other

14 results that are not part of the original

15 hypothesis, but they have the data; correct?

16 A. Yes.

17 Q. And those types of studies are

18 often studies that report out a large number

19 of different potential associations relating

20 to different exposures; correct?

21 MR. TRAVERS: Objection, calls for

22 speculation.

23 A. Yes.

24 Q. Those are often referred to as

25 exploratory studies; correct?

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1 A. Sometimes, yes.

2 Q. And in those studies, the results

3 can generate future hypotheses that then must

4 be tested through studies that are designed

5 to test those hypotheses; correct?

6 MR. TRAVERS: Objection, calls for

7 speculation.

8 A. So, again, how much weight you put

9 on them really is again a contextual

10 question, but in general, I would probably

11 agree with what you are saying.

12 MR. LASKER: And just in --

13 objection, calls for speculation, with an

14 expert witness I have never heard before.

15 All of his testimony is his opinion, none

16 of it is speculation, so I'm going to

17 object to your objection.

18 MR. TRAVERS: Well, you are asking

19 for speculation.

20 MR. LASKER: I'm asking for his

21 opinions.

22 Q. So, just so I understand, when an

23 epidemiologist reviews the findings of an

24 epidemiological study, one question that must

25 be considered is whether the study was

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1 designed -- let me state that again.

2 When an epidemiologist is analyzing

3 the finding of an epidemiological study, one

4 question that must be considered is whether

5 that study was designed to test the

6 hypothesis that is the subject of that

7 epidemiologist's inquiry; correct?

8 MR. TRAVERS: Objections, calls for

9 speculation.

10 A. Whether it was the primary

11 hypothesis?

12 Q. Correct.

13 A. Yes.

14 Q. Okay. Let's talk about the -- some

15 of the specific epidemiological studies you

16 mentioned in your expert report. And let's

17 start with the De Roos study, 2005 De Roos

18 study. There is two of them.

19 MR. LASKER: We will mark that as

20 Exhibit 14-12.

21 (Exhibit 14-12, Environmental

22 Health Perspectives, January 2005, Cancer

23 Incidence among Glyphosate-Exposed

24 Pesticide Applicators in the Agricultural

25 Health Study marked for identification,

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1 as of this date.)

2 Q. And Dr. Neugut, we have already had

3 some brief mention of this study. The

4 De Roos 2005 is part of a larger initiative

5 called the Agricultural Health Study;

6 correct?

7 A. Yes.

8 Q. And the Agricultural Health Study

9 is funded by the National Cancer Institute

10 and the National Institute of Environmental

11 Health Sciences in collaboration with EPA and

12 the National Institution of Occupational

13 Safety and Health; correct?

14 A. Yes.

15 Q. The AHS study is not funded by

16 private companies; correct?

17 A. Not to my knowledge.

18 Q. Monsanto does not fund the

19 Agricultural Health Study; correct?

20 A. I don't think so.

21 MR. TRAVERS: Objection, which -- I

22 think we have to be specific, because

23 there is one AHS study funded by

24 Monsanto.

25 MR. LASKER: That's not correct.



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1 MR. TRAVERS: It's from the AHS  
 2 cohort.  
 3 Q. Dr. Neugut, specifically, De Roos  
 4 2005 was not funded by Monsanto; correct?  
 5 A. I would have no idea, but not to my  
 6 knowledge.  
 7 Q. The Agricultural Health Study, and  
 8 specifically De Roos -- well, the  
 9 Agricultural Health Study is the only  
 10 prospective cohort study that has looked for  
 11 a possible association between glyphosate and  
 12 cancer; correct?  
 13 A. The only cohort study, yes.  
 14 Q. Yes.  
 15 The Agricultural Health Study was  
 16 initiated to address some of the limitations  
 17 of case-control studies that had looked at  
 18 potential associations between farming  
 19 exposure and cancer; correct?  
 20 MR. TRAVERS: Objection, calls for  
 21 speculation.  
 22 A. I don't know, but I assume.  
 23 Q. Okay. Can you pull out Dr. Blair's  
 24 deposition testimony again. It should still  
 25 be in front of you. I think it's probably

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1 over there.  
 2 Dr. Blair is one of the initiators,  
 3 one of the original investigators for the  
 4 Agricultural Health Study; correct?  
 5 A. He's a coworker.  
 6 Q. And if I can refer you to  
 7 Dr. Blair's deposition testimony at page 94,  
 8 specifically, line -- page 94, lines six to  
 9 16, Dr. Blair testifies that the Agricultural  
 10 Health Study was initiated to address some of  
 11 the limitations of case-control studies that  
 12 had looked at potential associations between  
 13 farming exposures and cancers; correct?  
 14 A. And his answer was, "It was  
 15 initiated and formed to provide a different  
 16 design to look at the same issue."  
 17 Q. And then the next question:  
 18 "It was initiated at least in part  
 19 to address some of the limitations of  
 20 case controlled studies; correct?  
 21 "Answer: Yes."  
 22 A. Yes.  
 23 Q. You have no reason to doubt that,  
 24 do you?  
 25 A. No.

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1 Q. The AHS study was initiated to  
 2 avoid the problem of recall bias in  
 3 case-control studies; correct?  
 4 A. Yes.  
 5 Q. The Agricultural Health Study also  
 6 was designed to avoid misclassification bias;  
 7 correct?  
 8 A. Misclassification bias of what  
 9 type?  
 10 Q. Misclassification of exposures.  
 11 A. How did it do that?  
 12 Q. By going to farmers that had better  
 13 recall and also periodic follow-up.  
 14 MR. TRAVERS: Objection, move to  
 15 strike.  
 16 A. So, you are saying it did not have  
 17 misclassification bias? Misclassification  
 18 error?  
 19 Q. I direct you to Dr. Blair's  
 20 deposition testimony at page 96, line two  
 21 through seven.  
 22 A. To try and deal with issues of  
 23 misclassification.  
 24 Q. Yes.  
 25 "The Agricultural Health Study was

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1 also designed to try and deal with issues  
 2 of misclassification of exposures by  
 3 going to farmers, who you testified  
 4 earlier had better recall, and also  
 5 periodic follow-up; correct?  
 6 Answer by Dr. Blair: "Yes."  
 7 A. I emphasize the word "tried."  
 8 Q. You have no reason to believe  
 9 that that was part of the effort in the  
 10 design of the Agricultural Health Study;  
 11 correct?  
 12 A. That was part of the --  
 13 Q. Effort in the design of the  
 14 Agricultural Health Study.  
 15 A. Effort?  
 16 Q. You have no reason to doubt  
 17 Dr. Blair's testimony that --  
 18 A. That was part of the effort?  
 19 Q. Yes.  
 20 A. Okay. Fair enough.  
 21 Q. Now, the Agricultural Health Study,  
 22 I think as you note in your report, includes  
 23 some 57,311 private and commercial  
 24 applicators who are licensed to apply  
 25 restricted-use pesticide at the time of

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1 enrollment into the study; correct?  
 2 A. Yes.  
 3 Q. And Dr. Neugut, I think it's going  
 4 to be easier for the videographer if you  
 5 could remove your hand --  
 6 A. I apologize.  
 7 Q. No problem. I think the court  
 8 reporter is getting it, but --  
 9 MR. TRAVERS: We have been going  
 10 over an hour.  
 11 MR. LASKER: Do you want to take a  
 12 break?  
 13 MR. TRAVERS: Yeah, before you get  
 14 into it.  
 15 MR. LASKER: That's fine.  
 16 THE VIDEOGRAPHER: The time is  
 17 11:35 a.m. We are off the record.  
 18 (Recess taken.)  
 19 THE VIDEOGRAPHER: The time is  
 20 11:41 a.m. We are on the record.  
 21 THE WITNESS: Thank you.  
 22 BY MR. LASKER:  
 23 Q. Dr. Neugut, before the break, we  
 24 were talking about the Agricultural Health  
 25 Study. The Agricultural Health Study focused

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1 on private and commercial applicators of  
 2 pesticide because they were likely to have  
 3 the highest levels of exposures to  
 4 pesticides; correct?  
 5 A. Yes.  
 6 Q. The hypothesis being tested in  
 7 De Roos 2005 was whether glyphosate exposure  
 8 was associated with cancer or cancer  
 9 subtypes; correct?  
 10 A. Oh. Yes.  
 11 Q. And we will -- I'm going to turn to  
 12 some of the comments you have in your expert  
 13 report in a minute, but you would agree, I  
 14 take it, that De Roos 2005 does not provide  
 15 evidence that would validate the hypothesis  
 16 that glyphosate exposure causes non-Hodgkin's  
 17 lymphoma; correct?  
 18 A. Yes.  
 19 Q. And De Roos 2005 did not find an  
 20 association between glyphosate exposure and  
 21 non-Hodgkin's lymphoma either in its analysis  
 22 adjusted solely for age or in its analysis  
 23 controlling for other pesticides or other  
 24 potential confounders; correct?  
 25 A. Correct.

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1 Q. De Roos 2005 also does not find any  
 2 increased association with non-Hodgkin's  
 3 lymphoma with higher exposure levels to  
 4 glyphosate either measured by duration or  
 5 measured by duration and intensity of  
 6 exposure; correct?  
 7 A. Correct.  
 8 Q. The days of exposure to  
 9 glyphosate-based herbicides in the exposed  
 10 members in the Agricultural Health Study  
 11 cohort in De Roos 2005 was significantly  
 12 higher than any reported days of exposure in  
 13 the glyphosate case-control studies; correct?  
 14 A. In the glyphosate --  
 15 Q. Case-control studies.  
 16 A. Yes.  
 17 Q. The lowest exposure group in  
 18 De Roos 2005 had between one and 20 total  
 19 days of glyphosate exposure; correct?  
 20 A. Yes.  
 21 Q. The lowest exposure group in  
 22 De Roos 2005 includes individuals who would  
 23 be categorized in the highest exposure groups  
 24 in both McDuffie and the Eriksson 2008  
 25 studies; correct?

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1 A. Yes.  
 2 Q. The highest exposure group in the  
 3 Eriksson study was ten days or more; correct?  
 4 MR. TRAVERS: Objection. If we are  
 5 going to ask about specific studies, I  
 6 think we need the --  
 7 A. I don't recall offhand.  
 8 MR. LASKER: Okay. Well, if you  
 9 want to refer to the study, we can do  
 10 that.  
 11 Mark this as 14-13.  
 12 (Exhibit 14-13, Pesticide exposure  
 13 as risk factor for non-Hodgkin lymphoma  
 14 including histopathological subgroup  
 15 analysis marked for identification, as of  
 16 this date.)  
 17 Q. So, this is the Eriksson study  
 18 and -- a 2008 study, and at page 1659 in that  
 19 study --  
 20 MR. TRAVERS: Sorry, do you have a  
 21 copy?  
 22 MR. LASKER: I'm sorry, I didn't  
 23 include you?  
 24 MR. TRAVERS: Or did you?  
 25 MR. LASKER: Is that what's in your

1 hand?  
 2 MR. TRAVERS: No. This is De Roos.  
 3 MR. LASKER: I'm sorry.  
 4 Q. So table two of Eriksson shows that  
 5 their breakout for the low exposure group and  
 6 the high exposure group is ten days; correct?  
 7 A. Yes.  
 8 Q. So, the lowest exposure group in --  
 9 or the highest exposure group in the Eriksson  
 10 study included -- would be within the lowest  
 11 exposure group in De Roos 2005; correct?  
 12 A. Well, maybe yes or maybe no. It  
 13 could have been --  
 14 Q. Partially.  
 15 A. Overlapped it.  
 16 Q. The highest exposure group in the  
 17 McDuffie study, and if you need to, I will  
 18 show you that study, was greater than two  
 19 days per year; correct?  
 20 A. Yes.  
 21 MR. TRAVERS: I'm going to object.  
 22 If we are going to ask about the specific  
 23 figures in a study, I think we need to --  
 24 Q. If at any time, you need to refer  
 25 to a study, let me know.

1 Q. And compared to the lowest dose  
 2 group, the risk of non-Hodgkin's lymphoma in  
 3 this highest dose group, up to as much as  
 4 seven years of daily glyphosate exposure, was  
 5 also reduced; correct?  
 6 A. Yes.  
 7 Q. De Roos 2005 also analyzed  
 8 dose-response for glyphosate based upon the  
 9 intensity of glyphosate exposure; correct?  
 10 A. Yes.  
 11 Q. And De Roos 2005 calculated  
 12 intensity of exposure based upon factors like  
 13 how glyphosate was used and whether the  
 14 applicator used protective gear; correct?  
 15 A. Yes.  
 16 Q. None of the case-control studies in  
 17 the glyphosate literature included any  
 18 measure of the intensity of exposure to  
 19 glyphosate.  
 20 MR. TRAVERS: Objection, misstates  
 21 evidence.  
 22 A. None of the --  
 23 Q. None of the case-control studies in  
 24 the glyphosate epidemiological literature  
 25 include any measure of the intensity of

1 A. That one I remember.  
 2 Q. Okay. So, the middle exposure  
 3 group and the dose response analysis in  
 4 De Roos 2005, and this is the De Roos 2005  
 5 paper at 52, table three, that middle  
 6 exposure group had between 21 and 56 days of  
 7 exposure; correct?  
 8 A. Yes.  
 9 Q. And compared to this lowest dose  
 10 group, individuals with this higher duration  
 11 of glyphosate exposure had a  
 12 non-statistically significant 30 percent  
 13 lower risk of non-Hodgkin's lymphoma;  
 14 correct?  
 15 A. Yes.  
 16 Q. The highest exposure group in  
 17 De Roos 2005, in the dose-response analysis,  
 18 had between 57 and 2,678 days of glyphosate  
 19 exposure; correct?  
 20 A. Yes.  
 21 Q. So, there was at least one  
 22 individual in the De Roos 2005 study that had  
 23 the equivalent of more than seven years'  
 24 worth of daily glyphosate exposure; correct?  
 25 A. Yes.

1 exposure to glyphosate; correct?  
 2 MR. TRAVERS: Same objection.  
 3 A. I don't believe they do.  
 4 Q. De Roos 2005 also reported that  
 5 there were lower risks of non-Hodgkin's  
 6 lymphoma with increased duration and  
 7 intensity of glyphosate exposure; correct?  
 8 A. Yes.  
 9 Q. There is no data anywhere in the  
 10 epidemiologic literature reporting a higher  
 11 risk of non-Hodgkin's lymphoma with greater  
 12 intensity exposures to glyphosate; correct?  
 13 MR. TRAVERS: Objection, misstates  
 14 evidence.  
 15 A. I'm sorry.  
 16 Q. There is no data anywhere in the  
 17 epidemiologic literature reporting a higher  
 18 risk of non-Hodgkin's lymphoma with greater  
 19 intensity exposure to glyphosate; correct?  
 20 A. Not to my knowledge.  
 21 Q. So, there is no such data; correct?  
 22 MR. TRAVERS: Objection, asked and  
 23 answered.  
 24 A. Again, to my knowledge, no.  
 25 Q. Now, in your expert report, you

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1 identify four criticisms of De Roos 2005;  
 2 correct? And we can go -- it's on your  
 3 report at pages 12 to 13.  
 4 A. Yeah, I mean --  
 5 Q. If you want to pull your report  
 6 out, we can walk through this. And in your  
 7 report on page 12, you identify four  
 8 limitations in the De Roos 2005 paper;  
 9 correct?  
 10 A. Yes.  
 11 Q. I would like to talk with you a bit  
 12 about those criticisms.  
 13 First, I believe I am correct that  
 14 three of these criticisms relate in some way  
 15 to the length of follow-up in the study, and  
 16 when exposures to glyphosate would have  
 17 occurred in comparison to the development of  
 18 non-Hodgkin's lymphoma. Correct? Criticisms  
 19 one, two, and four?  
 20 A. Yes, but -- well, four is more  
 21 complicated, but the one and two, you are  
 22 correct.  
 23 Q. Okay. Well, we will get to four in  
 24 a minute, and we will also get to one and two  
 25 in a minute.

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1 Let's start with number three. I  
 2 want to understand that one first. I'm  
 3 putting those into one category and three in  
 4 the other.  
 5 A. Okay.  
 6 Q. So, with respect to your third  
 7 criticism, and this is set forth on page 13,  
 8 in this criticism you are, if I understand  
 9 correctly, raising the concern that there may  
 10 be an elevated risk of non-Hodgkin's lymphoma  
 11 in the control group due to exposure to  
 12 another pesticide; correct?  
 13 A. As you stated earlier, farmers are  
 14 at elevated risk -- forget about why, whether  
 15 it's because of other pesticides, herbicides,  
 16 et cetera, farmers are at elevated risk of  
 17 lymphoma. I mean, I think it's a good study  
 18 design to use farmers as the overall sample  
 19 population, mainly because it's a population  
 20 in which you are going to get a large number  
 21 of people exposed. That's why it's a good  
 22 sample, you know, sample universe, but then  
 23 when you are looking for a risk ratio, you  
 24 are already starting off with a higher risk  
 25 in the unexposed group.

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1 Q. Well, correct, but there is no  
 2 differential with farmers. There is farmers  
 3 in the numerator and there's farmers in the  
 4 denominator; correct?  
 5 MR. TRAVERS: Objection. I think  
 6 that misstates the study design.  
 7 A. Yes, but it's harder to see a -- to  
 8 see an elevation when you are starting off  
 9 with a higher -- from a higher platform, or  
 10 it may be -- it may be harder to see an  
 11 elevation when you are starting off from a  
 12 higher platform.  
 13 Q. Well, I'm a little bit confused  
 14 about that. If you were, for example, to do  
 15 a study of -- an epidemiological study of  
 16 asbestos and smoking, to be able to do that  
 17 study, you might want to start off with a  
 18 full cohort of smokers and then look at  
 19 asbestos in the differential; right?  
 20 A. You are right.  
 21 Q. Having smokers be your entire  
 22 population doesn't undercut the study. It  
 23 actually allows you to look at the exposure  
 24 you are interested in; right?  
 25 A. It --

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1 Q. Dr. Neugut, is that correct?  
 2 A. I'm thinking.  
 3 Q. Okay. No, continue. I'm sorry. I  
 4 didn't know if your mind was turning to  
 5 something else.  
 6 A. So, even in the context of  
 7 multicausal phenomena, which is essentially  
 8 what we are in a sense talking about, it is  
 9 still a little harder to see elevated risk  
 10 ratios in that. While yes, you can still  
 11 account for an elevated risk in the context  
 12 of other causes, like other herbicides or  
 13 other risk factors that farmers may have for  
 14 lymphoma, but it's still harder to see it on  
 15 top of that elevated risk than if you were in  
 16 a population where there was no elevated risk  
 17 of non-Hodgkin's lymphoma.  
 18 Q. Well, all populations have  
 19 different risk factors that could impact an  
 20 outcome. What you are trying to do in an  
 21 epidemiological study is -- and specifically  
 22 with glyphosate, is to tease out the  
 23 glyphosate impact; correct?  
 24 A. Correct.  
 25 Q. And in that context, you don't want

<p style="text-align: right;">Page 138</p> <p>1 to have different -- you know, where you have 2 more farmers in the numerator and less 3 farmers in the denominator. 4 A. No, that is true, but it's a 5 tradeoff of sorts. You know, you also 6 have -- you're comparing high exposed to low 7 exposed, which is different than comparing 8 high exposed to unexposed. 9 Q. Yes, I understand. That is a 10 different issue, but not the issue we are 11 talking about on page 13 of your report. 12 Correct? 13 A. No. 14 Q. Okay. So, specifically on page 13 15 of your report, this third criticism, though, 16 the concern you are mentioning is that the 17 control group, the individuals not exposed to 18 glyphosate, would have had exposures to other 19 pesticides, and specifically you mentioned 20 2,4-D; correct? 21 A. Um-hum, yes. 22 Q. And the point you are making there 23 is that 2,4-D might be associated with 24 non-Hodgkin's lymphoma. 25 A. Yes.</p>	<p style="text-align: right;">Page 140</p> <p>1 correct? 2 A. Well, more if they are 3 misclassified between the two of them, but 4 yes. 5 Q. And your concern here is that 6 because there are 2,4-D exposure -- 7 53 percent of the control group has exposure 8 to 2,4-D, that can result in De Roos 9 reporting an underestimation of the true NHL 10 risk with respect to glyphosate; correct? 11 That's what you state in your report. 12 A. Yes. 13 Q. Now, you were able to determine 14 that 53.3 percent data point for the use of 15 2,4-D in controls from De Roos 2005; correct? 16 That's data you got from the De Roos study? 17 A. I believe so. 18 Q. Let's pull out the De Roos study 19 again. That is page -- Exhibit 14-12, and 20 it's on page 50, table one, I believe. And 21 the data point for never exposed to 22 glyphosate and exposure to 2,4-D is in that 23 first column of table one, towards the 24 bottom; correct? 25 A. Yes.</p>
<p style="text-align: right;">Page 139</p> <p>1 Q. And therefore, the cases, the 2 denominators that are in the -- in the risk 3 ratio, would have a higher incidence of 4 non-Hodgkin's lymphoma that is not 5 attributable to glyphosate; correct? 6 A. Yes. 7 Q. And the reason that would occur is, 8 as you hypothesize in your expert report, if 9 individuals -- individuals who use glyphosate 10 are less likely to use 2,4-D; correct? 11 A. Okay. Yes. 12 Q. And that is because you would have 13 fewer 2,4-D exposure, less 2,4-D exposure in 14 the glyphosate-exposed individuals that could 15 push their risk up; correct? As compared to 16 the cases. Strike that. 17 A. I don't know. 18 Q. I will restate that. 19 The concern that you are raising in 20 your report is that if there are -- if there 21 is a difference in the incidence of exposure 22 to 2,4-D between the glyphosate exposed and 23 the glyphosate non-exposed, that would 24 potentially bias your outcome for the 25 glyphosate -- reported glyphosate risk ratio;</p>	<p style="text-align: right;">Page 141</p> <p>1 Q. And there it reports that 2 individuals never exposed to glyphosate, 3 53.3 percent of them were exposed to 2,4-D; 4 correct? 5 A. Yes. 6 Q. Now, directly to the right of that, 7 the second column reports the prevalence of 8 exposure to 2,4-D among individuals with the 9 lowest exposure level of glyphosate; correct? 10 A. Yes. 11 Q. And they actually had a higher 12 exposure rate to 2,4-D than those who were 13 never exposed; correct? 14 A. Yes. 15 Q. And in the highest exposure group 16 for glyphosate, the third column, those 17 individuals had an even higher exposure rate 18 to 2,4-D; correct? 85 percent? 19 A. Um-hum, yes. 20 Q. So, based upon the analysis in your 21 expert report, if 2,4-D was associated with 22 an increased risk in non-Hodgkin's lymphoma, 23 then that means that the effect reported by 24 De Roos for glyphosate would actually be an 25 overestimation of the NHL risk, not an</p>

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1 underestimation; correct?  
 2 A. If 2,4-D is associated with  
 3 non-Hodgkin's lymphoma, correct.  
 4 Q. So, your expert report analysis  
 5 here, your criticism number three was  
 6 incorrect; right?  
 7 A. It's probably not a problem.  
 8 Q. If I could ask you to turn back to  
 9 table one for De Roos 2005. There is also  
 10 data on -- one, two, three, four, five, six,  
 11 seven, eight -- I think nine other  
 12 pesticides; correct?  
 13 A. Yes.  
 14 Q. And in every instance, with each  
 15 one of these pesticides, individuals who have  
 16 exposure to glyphosate also have higher  
 17 exposures to those other pesticides; correct?  
 18 A. Yes.  
 19 Q. And in every instance, individuals  
 20 with the highest level of exposure to  
 21 glyphosate have the highest level of exposure  
 22 to each of those other pesticides; correct?  
 23 A. Yes.  
 24 Q. And based upon your -- the analysis  
 25 you presented in your expert report, that

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1 would also create a bias that could  
 2 artificially suggest a dose-response analysis  
 3 with glyphosate exposure; correct?  
 4 A. Yes.  
 5 Q. So, the results in the study, to be  
 6 clear, because exposure to glyphosate is  
 7 associated with higher exposures to other  
 8 pesticides, if you were to look simply at  
 9 exposure to glyphosate and not adjust for  
 10 exposures to other pesticides, you could find  
 11 an apparent dose-response that in fact was  
 12 due to confounding; correct?  
 13 A. If they were associated with NHL,  
 14 yes.  
 15 Q. Now, I want to move to some of your  
 16 other criticisms of the AHS study. On  
 17 page 12 of your report, you talk about the  
 18 follow-up period for the De Roos study, a  
 19 median follow-up period of 6.7 years;  
 20 correct?  
 21 A. Yes.  
 22 Q. And just so I am clear, you weren't  
 23 stating here that De Roos 2005 only  
 24 considered exposures that took place a median  
 25 of 6.7 years prior to NHL diagnosis, are you?

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1 A. No.  
 2 Q. The follow-up time is just the  
 3 number of years after AHS had gathered  
 4 information on prior exposures; correct?  
 5 A. Had gathered --  
 6 Q. Information on prior exposures.  
 7 A. Yes.  
 8 Q. At the time of -- that the AHS  
 9 gathered information on prior exposures, the  
 10 cohort on average had 15 years of prior  
 11 exposure; correct?  
 12 A. I don't know, but I -- I believe  
 13 they certainly had exposure prior to the time  
 14 of entry.  
 15 Q. You read Dr. -- again, Dr. Blair's  
 16 deposition.  
 17 A. Yes.  
 18 Q. Do you recall him testifying about  
 19 this?  
 20 A. Yes.  
 21 Q. And Dr. Blair testified that at the  
 22 time AHS gathered information at the  
 23 inception, the cohort on average had 15 years  
 24 of prior exposure; correct?  
 25 A. I don't recall that it was on

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1 average. I know some had that much exposure.  
 2 I don't know the distribution.  
 3 Q. Okay. Why don't we look at  
 4 Dr. Blair's deposition testimony again. And  
 5 this is at pages 96 -- page 96, lines 11 to  
 6 15. If you can read that and see if that  
 7 refreshes your recollection.  
 8 A. I'm sorry, the page?  
 9 Q. Ninety-six. And lines 11 through  
 10 15.  
 11 Does that refresh your recollection  
 12 that at the time that the AHS started  
 13 gathering information --  
 14 A. Yes.  
 15 Q. -- there is an average of 15 years  
 16 of prior exposure; correct?  
 17 A. Yes.  
 18 Q. And at the time that the  
 19 Agricultural Health Study gathered  
 20 information on the cohort's prior exposures,  
 21 which was over the mid 1990s, glyphosate had  
 22 been on the market for about 20 years or  
 23 more; correct?  
 24 A. Yes.  
 25 Q. So, the AHS study allows for a

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1 sufficient latency period between exposure to  
 2 glyphosate and potential NHL; correct?  
 3 A. Yes.  
 4 Q. And the potential latency period in  
 5 the De Roos 2005 study is up to 27 years;  
 6 correct?  
 7 A. Yes, I think -- yeah, I don't think  
 8 latency period is a major problem.  
 9 Q. Now, your concern, if I understand  
 10 correctly, regarding the follow-up period in  
 11 the AHS study is that longer follow-up would  
 12 have resulted in more cases of non-Hodgkin's  
 13 lymphoma; correct?  
 14 A. Yes.  
 15 Q. And that relates back to this issue  
 16 about power; correct? More cases of NHL  
 17 would give the study more power.  
 18 A. Yes.  
 19 Q. And that's also your point with  
 20 respect to the age of the cohort. If the  
 21 cohort was older, then would have more cases  
 22 of NHL; correct?  
 23 A. Yes.  
 24 Q. Now, also, just to be clear, when  
 25 you state in your expert report the age of

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1 the cohort, that is data that is based upon  
 2 the age at enrollment; correct?  
 3 A. At study entry, yes.  
 4 Q. So, the age of the cohort at the  
 5 time of the actual De Roos analysis would be  
 6 a median of 6.7 years older; correct?  
 7 A. Sure.  
 8 Q. So, the population at the time of  
 9 the 2005 De Roos paper, for purposes of the  
 10 analysis, would have been within that 50- to  
 11 55-year age range that you state in your  
 12 report is where you see that exponential  
 13 increase in cancer incidence; correct?  
 14 A. Well, "exponential" is a strong  
 15 word, but let's say where you see an  
 16 increase.  
 17 Q. Okay. I thought "exponential" was  
 18 your word.  
 19 A. Oh.  
 20 Q. On page 12, you state in your  
 21 report, "Ages" -- it's sort of towards the  
 22 bottom on page 12. "Ages of 50 to 55 years,  
 23 when we see an exponential increase in cancer  
 24 incidence," about five or six lines from the  
 25 bottom.

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1 A. Then I guess it's a good word.  
 2 Q. So, the age of the cohort at the  
 3 time of De Roos 2005 is right in that spot  
 4 where we are seeing that exponential  
 5 increase.  
 6 A. But it's just starting at -- it's  
 7 still a young group.  
 8 Q. But again, the issue is, you want  
 9 to get enough cases of NHL; correct?  
 10 A. And there are too few to really  
 11 have enough power.  
 12 Q. So, now the -- now, the NHL -- I'm  
 13 sorry. The De Roos study 2005 has 92 cases  
 14 of non-Hodgkin's lymphoma; correct?  
 15 A. Yes.  
 16 Q. And the De Roos study in fact is  
 17 one of the most powerful epidemiologic  
 18 studies of glyphosate and non-Hodgkin's  
 19 lymphoma, isn't it?  
 20 A. I don't know offhand, but does it  
 21 have the tightest confidence limits?  
 22 Q. Well, let's look at your expert  
 23 report. You have that information there,  
 24 don't you?  
 25 Have you -- let me ask this

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1 question. Have you looked to determine the  
 2 relative power of the De Roos 2005 study as  
 3 compared to the case-control studies for  
 4 glyphosate in non-Hodgkin's lymphoma?  
 5 A. I haven't done power analyses on  
 6 them, but in the -- you know, the --  
 7 Q. Can you state, sitting here today,  
 8 whether there is any case-control study that  
 9 is more powerful in answering the question  
 10 whether glyphosate is associated with  
 11 non-Hodgkin's lymphoma?  
 12 A. We don't talk about statistical  
 13 power after a study is completed  
 14 a posteriori. If you have a positive  
 15 finding, then that is a more powerful study.  
 16 Q. Well, let me take a step back.  
 17 First of all, it's your criticism  
 18 here that the Agricultural Health Study does  
 19 not have sufficient power because of the  
 20 years of the follow-up and the age of the  
 21 cohort; correct? That is your criticism.  
 22 MR. TRAVERS: In.  
 23 A. And that in part because the --  
 24 yes.  
 25 Q. And in offering that criticism, you

<p style="text-align: right;">Page 150</p> <p>1 do not know whether in fact the Agricultural 2 Health Study, De Roos 2005, is the most 3 powerful of all the epidemiologic studies to 4 answer the question of whether glyphosate 5 causes non-Hodgkin's lymphoma. 6 A. I did not do a power analysis. 7 Q. Let's look at -- you mentioned that 8 one way you can determine the power of a 9 study is by looking at the confidence 10 intervals and the range of the confidence 11 intervals. We talked about that earlier; 12 right? 13 A. Yes. 14 Q. And in your expert report, you 15 actually provide information on that on 16 page 43, particularly where there is these 17 forest plots of the different studies; 18 correct? 19 A. Yes. 20 Q. And those forest plots, both the 21 forest plot from Schinasi and Leon and the 22 forest plot in Chang and Delzell, would allow 23 you to look and see the relative weight of 24 these different epidemiological studies and 25 the different power -- relative power;</p>	<p style="text-align: right;">Page 152</p> <p>1 identification, as of this date.) 2 Q. And in particular, if you can look 3 at table three on page 1159 of McDuffie. I'm 4 sorry, table three. No, it's table two. 5 Sorry, table two. 6 And they have the odds ratio for 7 glyphosate of 1.2, which is the odds ratio 8 you report on in your expert report and on 9 page 43; correct? About midway through the 10 table, the farthest to the right column. 11 A. Okay. 12 Q. And you can see that odds ratio 13 adjusted footnote B; correct? 14 A. Yes. 15 Q. And the footnote on the bottom 16 explains what the odds ratio is adjusted for; 17 correct? 18 A. Yes. 19 Q. It's not adjusted for exposure to 20 other pesticides; correct? 21 A. Yes. 22 Q. So, of the odds ratios adjusted for 23 other pesticide exposure, De Roos 2005 is the 24 most powerful study that exists for 25 glyphosate and non-Hodgkin's lymphoma;</p>
<p style="text-align: right;">Page 151</p> <p>1 correct? 2 A. Yes. 3 Q. And of the case-control studies, 4 the only case-control study that has -- is 5 reported in these forest plots as having 6 higher power than De Roos 2005 is the 7 McDuffie study; correct? 8 A. Is what? 9 Q. Is McDuffie. 10 A. I'm sorry, is? 11 Q. McDuffie. 12 A. You are talking about in Chang and 13 Delzell? 14 Q. Either one. 15 A. Yes. 16 Q. And the McDuffie study, the risk 17 ratio there is not adjusted for other 18 pesticides; correct? 19 A. I don't know offhand. 20 Q. Okay. Should we go to McDuffie and 21 check that out? 22 MR. LASKER: And this is 14-14. 23 (Exhibit 14-14, Cancer 24 Epidemiology, Biomarkers &amp; Prevention by 25 McDuffie, et al marked for</p>	<p style="text-align: right;">Page 153</p> <p>1 correct? 2 A. I may or -- I don't know. Perhaps. 3 Q. Not perhaps. You have the numbers 4 right here. De Roos 2005 is the most 5 powerful study with respect to non-Hodgkin's 6 lymphoma and glyphosate adjusted for exposure 7 to other pesticides; correct? 8 MR. TRAVERS: Objection, asked and 9 answered. 10 A. Okay. That may be. 11 Q. It is; correct? 12 MR. TRAVERS: Objection to the 13 testimony of counsel. 14 A. Again, it's a little hard for me to 15 be definitive as I sit here now and trying to 16 make a decision in 30 seconds, in a minute, 17 but okay, I will agree. But -- 18 Q. This is not something that you 19 considered in preparing your expert report 20 and your criticism of the Agricultural Health 21 Study. 22 A. That doesn't mean -- whether it has 23 the most or the least, it doesn't have 24 adequate power. 25 Q. And so then I take it your</p>



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1 testimony would be that none of the  
 2 case-control studies have adequate power.  
 3 MR. TRAVERS: Objection.  
 4 Q. Correct?  
 5 MR. TRAVERS: Misstates the  
 6 testimony.  
 7 A. Having power, having a positive  
 8 finding is -- a posteriori is really enough.  
 9 If you have a positive finding, the question  
 10 of whether you had statistic power up front  
 11 is really -- sort of begs the question.  
 12 Q. So, is it your testimony then that  
 13 an epidemiologist would only consider the  
 14 power of a study if the finding of a study is  
 15 null?  
 16 A. I would say that in designing a  
 17 study, you would be concerned about the  
 18 statistical power in designing the study, but  
 19 once you have a positive finding, the  
 20 question of how much power you had up front  
 21 is much less of a concern.  
 22 Q. So, if a study has --  
 23 A. Statistical power is -- statistical  
 24 power is a concern in the context of the null  
 25 find.

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1 Q. So, if you have a study with very  
 2 low power, very wide confidence intervals,  
 3 but it's a positive finding, it's your  
 4 testimony that you would not be concerned  
 5 about the power of the study in weighing the  
 6 importance of that study?  
 7 A. I'm sorry, can you repeat the  
 8 question?  
 9 Q. Sure.  
 10 If you have a study that reports a  
 11 positive finding with very, very wide  
 12 confidence intervals, a very low power study,  
 13 is it your testimony as an epidemiologist  
 14 that you are no longer concerned about the  
 15 power of that study?  
 16 A. Of course you are. Then you don't  
 17 have a positive finding.  
 18 Q. No, no, let me strike that. Let me  
 19 repeat it to make sure I am clear.  
 20 If you have a study that reports a  
 21 statistically significant result with very  
 22 wide confidence intervals, so it's a study  
 23 with very low power but a statistically  
 24 significant result, is it your testimony that  
 25 as an epidemiologist, you are no longer

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1 concerned with the power of that study?  
 2 MR. TRAVERS: Objection, asked and  
 3 answered.  
 4 A. So, of course, if you are talking  
 5 about a sample size where you get down to the  
 6 level of six cases versus one, then you can  
 7 consider it, and an epidemiologist would use  
 8 his logic and his common sense, his or her  
 9 logic or common sense to evaluate the study  
 10 and all of that.  
 11 But the answer is, if you have a  
 12 positive finding and it's statistically  
 13 significant, then the consideration of  
 14 statistical power in the context of a  
 15 positive finding is less of a concern than it  
 16 is in the context of a null finding.  
 17 And the issue of statistical power  
 18 is an issue in the design of a study up front  
 19 and whether you should be doing the study in  
 20 the first place or whether you have enough  
 21 power to do the study and whether it's going  
 22 to give you the ability to define an outcome  
 23 with enough confidence that you are going to  
 24 get an answer.  
 25 If you end up with a null finding

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1 and wide confidence limits, then you haven't  
 2 answered the question that you started out  
 3 with, which is basically what happened at  
 4 least in the first report, in this report  
 5 from 2005 with glyphosate.  
 6 Q. Dr. Neugut, there is no  
 7 epidemiological study anywhere in the  
 8 literature which reports in its most fully  
 9 adjusted model a statistically significant  
 10 increased risk of non-Hodgkin's lymphoma with  
 11 glyphosate, is there?  
 12 MR. TRAVERS: Objection, misstates  
 13 the evidence.  
 14 A. I'm unaware when you go up to the  
 15 higher levels, maybe not with the ever/never  
 16 analyses, but I think in some of the  
 17 dose-responses, there are. What about De  
 18 Roos 2003?  
 19 Q. De Roos 2003 did not have a  
 20 dose-response -- the fully adjusted model,  
 21 which is set forth on page 43 of your report,  
 22 is not statistically significant.  
 23 MR. TRAVERS: Move to strike  
 24 testimony of counsel.  
 25 Q. That's correct; right?

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1 A. Yes.

2 Q. So, again, and you're talking about

3 dose-response analyses, the only

4 dose-response analysis anywhere in the

5 epidemiological literature for glyphosate and

6 non-Hodgkin's lymphoma adjusted for other

7 exposures is De Roos 2005; right?

8 A. Yes.

9 MR. TRAVERS: Objection, misstates

10 the evidence.

11 Q. So it is correct to state --

12 A. I'm sorry. Say the last point

13 again before I say yes to that one.

14 Q. The only dose-response analysis

15 adjusted for exposures to other pesticides

16 anywhere in the literature --

17 A. Um-hum.

18 Q. -- in the epidemiological

19 literature, is De Roos 2005; correct?

20 MR. TRAVERS: Objection, misstates

21 evidence.

22 A. I don't know, but it sounds right.

23 Q. There is no odds ratio anywhere in

24 the epidemiological literature that reports

25 for glyphosate and non-Hodgkin's lymphoma an

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1 adjusted odds ratio positive association

2 statistically significant; correct?

3 MR. TRAVERS: Objection, misstates

4 the evidence.

5 A. Not that -- correct, for the

6 herbicides, for the -- um-hum.

7 Q. So, going back now to the issue of

8 power, to the extent that you have a

9 criticism of power with respect to the

10 Agricultural Health Study, that same

11 criticism in your mind applies to all of the

12 case-control studies for glyphosate and

13 non-Hodgkin's lymphoma; correct?

14 A. All of them have difficulties with

15 power, yes. Non-Hodgkin's lymphoma is a rare

16 outcome, and glyphosate is -- in many of them

17 is an uncommon exposure, too.

18 Q. So, let's look now at the -- I

19 think it's your -- I think it's your final

20 criticism, maybe your second. Go back to

21 page 12 of your expert report.

22 So, your second criticism is

23 talking about the inability to determine

24 disease latency for NHL in the AHS cohort;

25 correct?

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1 A. Yes.

2 Q. And this is that concept that we

3 were talking about earlier, you want to have

4 some period of time that has passed between

5 the exposure and the outcome to account for

6 this latency period for the development of

7 the cancer; correct?

8 A. Yes.

9 Q. Okay. And your criticism here is

10 that there might not be sufficient latency,

11 or there is not -- there is not a way to tell

12 whether there is latency between exposure and

13 diagnosis; correct?

14 A. Yes.

15 Q. Now, the De Roos 2005 study,

16 though, takes exposure data from that period

17 of 1993 to 1997; correct? It considers

18 exposures back in that 1990s time period;

19 correct?

20 A. Yes.

21 Q. And so, there is in effect a lag

22 time in that study, because you are looking

23 at cancers that developed later in time than

24 the exposures, than the latest possible

25 exposure that you are looking at; correct?

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1 A. I don't follow the question.

2 Q. So, at the time of enrollment, we

3 had data for De Roos 2005 of exposures from

4 the mid '90s back; correct?

5 A. Back?

6 Q. Into history. It could be as early

7 as whenever they first were exposed.

8 A. I see.

9 Q. So, your exposure period is mid

10 1970s to the mid 1990s.

11 A. Yeah.

12 Q. Correct?

13 And then you are looking at

14 non-Hodgkin's lymphomas that can develop as

15 late as December 31, 2001; correct?

16 A. Yes.

17 Q. And to deal with the issue of

18 latency, studies often will have this sort of

19 lag period where they are looking for

20 development of cancer at some period of time

21 after the period of exposure; correct?

22 A. Yes.

23 Q. That is what De Roos 2005 in effect

24 did; correct?

25 A. How did they do it?

1 Q. By having exposures that were up to  
2 the mid 1990s and having cancer  
3 development --

4 A. I see.

5 Q. -- at that later date; correct?

6 A. Yes. I don't think the latency  
7 thing is necessarily a problem here.

8 Q. Okay. So, criticism two in your  
9 report is not really as much of an issues as  
10 it might be otherwise.

11 A. So, it will vary from -- depending  
12 on the -- if you say -- if everyone truly had  
13 15 years of exposure on average beforehand,  
14 then latency is probably not going to be a  
15 major problem.

16 Q. Okay. So, again, this is -- for  
17 your criticism two, I just want to make sure  
18 we are clear on your testimony. The second  
19 criticism you have of the AHS De Roos 2005  
20 study in your report at 12, pages 12 to 13,  
21 it's probably not a major concern; is that  
22 fair?

23 A. I won't speak for the Weisenburger,  
24 but again, I will be -- you know, to my  
25 knowledge, I will say I am agnostic on the

1 subject.

2 Q. Okay. Let's talk about your final  
3 criticism then, your fourth criticism of the  
4 AHS study. And this is -- you are dealing  
5 here with non-differential exposure  
6 misclassification, and I think your point,  
7 your point here -- let me make sure I  
8 understand your -- your criticism.

9 You state that intensity of  
10 exposure to glyphosate was collected only for  
11 enrollment from 1993 to 1997; correct?

12 A. Yes.

13 Q. And your concern here is that there  
14 would have been a dramatic increase in the  
15 intensity of exposure potentially after that  
16 time period; correct?

17 A. Well, I really have two concerns,  
18 and I may not have stated it correctly here.  
19 I think we have been talking primarily about  
20 biases, but in a cohort study, you also  
21 have -- in every study, you also have the  
22 problem, as we said earlier, of  
23 non-differential misclassification, and I  
24 think there is probably enough  
25 non-differential misclassification that it

1 would have -- again, in the context of a null  
2 study -- if a null study, again, because  
3 epidemiologic analyses are conservative, they  
4 mitigate against positive findings, so  
5 non-differential misclassification attenuates  
6 risk ratios, so, having a null finding could  
7 easily arise from having significant  
8 misclassification of exposure.

9 Q. I have a few follow-ups on that.  
10 First of all, let me make sure, you said  
11 there are two issues here. One is  
12 non-differential misclassification.

13 A. That's in the first place, from the  
14 time of enrollment.

15 Q. And the second one is intensity of  
16 exposure.

17 A. Well, but --

18 Q. I'm just trying to understand if  
19 those are the two.

20 A. Those two. One is that, in the  
21 first place, when they filled out the  
22 questionnaires at enrollment, that they  
23 incorrectly stated their exposure.

24 Q. Okay. So that let me make sure I  
25 understand this. I just want to break out

1 the two opinions, so I understand them. The  
2 first opinion is that there would have been  
3 more intensity of exposure if they had  
4 subsequent measure --

5 A. More or less, or if they weren't  
6 exposed to glyphosate and confused it with a  
7 different --

8 Q. Well --

9 A. -- herbicide, or vice versa.

10 MR. TRAVERS: You have to let him  
11 finish answering.

12 Q. Okay. I just want to break it out.  
13 You said there is two.

14 A. So one is that -- so, when you fill  
15 out -- when you are asked about were you  
16 exposed to glyphosate, some people are going  
17 to say no when it's a yes; some people are  
18 going to say yes when it's a no. That's not  
19 recall bias, but just fill out the  
20 questionnaire wrong.

21 Q. I understand.

22 A. So, in general on questionnaires  
23 like that, there is a 10, 20 percent kind of  
24 error. If I ask you how much broccoli do you  
25 eat, you know, you are not going to --

<p style="text-align: right;">Page 166</p> <p>1 Q. Well, I eat a lot of broccoli, but 2 I get your point.</p> <p>3 A. So, you are not going to fill it 4 out -- you are not going to be right about -- 5 and that degree of misclassification, when we 6 are talking about a risk ratio of 1.3 or 7 something of that sort, is enough to -- to 8 nullify a -- a risk ratio in the realm of 1.3 9 or 1.4, again. So, when you get -- again, as 10 I said, epidemiologic analysis is 11 conservative. It -- errors generally 12 attenuate -- generally are biased towards 13 giving you a null finding. So that kind of 14 an error or random misclassification -- 15 again, this is not biased error, this is just 16 people are just making innocent errors in 17 filling out a form, that are random -- will 18 bias the error toward -- will bias the 19 estimate towards one.</p> <p>20 Q. So, I understand that point, and I 21 want to ask you questions about that, but I 22 want to make sure I am clear. Is there any 23 other criticism that you were trying to 24 address in this paragraph four?</p> <p>25 A. If you filled out -- if you entered</p>	<p style="text-align: right;">Page 168</p> <p>1 do have the actual intensity data for that 2 cohort. Whether they had other intense 3 exposures in the future after the enrollment 4 period, we do know the intensity of exposure 5 at the time of enrollment; correct?</p> <p>6 A. Yes.</p> <p>7 Q. So, we are able to, and in fact 8 De Roos 2005 does do an assessment of actual 9 intensities of exposure to determine whether 10 more intense exposures give rise to a greater 11 risk of non-Hodgkin's lymphoma; correct?</p> <p>12 A. Yes, but I believe there was 13 some -- as I mentioned here, I believe there 14 was some change in 1996 that actually, there 15 was some secular change that actually caused 16 a change in the overall use of Roundup, in 17 1996, in the middle of this study, that may 18 have made a more dramatic or may have 19 occasioned a more dramatic impact.</p> <p>20 And how much it may or may not have 21 affected risk, I don't know. I'm just 22 raising it as a potential issue.</p> <p>23 Q. Okay. But just so I am clear, 24 the -- first of all, the fact that there was 25 a change in the use pattern in '96, '97 would</p>
<p style="text-align: right;">Page 167</p> <p>1 the study in 1993 or 1994, something like 2 that, that your use of the -- of the 3 herbicide may have changed subsequently, and 4 that may have a change -- that may affect 5 your subsequent risk of developing the 6 disease. I realize that there were -- I 7 think there were subsequent attempts to fill 8 out follow-up questionnaires to kind of 9 re- -- reestimate the -- to requantify the, 10 the -- I don't know, call it the true 11 exposure or the -- certainly if we are 12 talking about the intensity of exposure, we 13 are not talking now about never-ever, but say 14 the quantity, but that wasn't reflected, at 15 least in the De Roos 2005 paper. If there 16 are subsequent analyses, then that may play a 17 role.</p> <p>18 But again, if someone changed their 19 exposure pattern over time, that would be -- 20 that would be something significant and may 21 be important in terms of their risk.</p> <p>22 Q. So let me just -- I'm going to take 23 each one of those in turn.</p> <p>24 First of all, with respect to the 25 intensity of exposure of the 2005 cohort, we</p>	<p style="text-align: right;">Page 169</p> <p>1 not alter the findings in De Roos 2005 with 2 respect to the analysis that they had and the 3 data they had that more intense exposures did 4 not increase the risk of non-Hodgkin's 5 lymphoma; correct?</p> <p>6 MR. TRAVERS: Objection, compound.</p> <p>7 A. I don't know. I mean, it wouldn't 8 have -- I guess it depends on how much change 9 there was in the farmers, in the pesticide 10 applicators' use of the agents, you know, of 11 Roundup, and in the 6.7 years, it depends how 12 many cases you are getting subsequently and 13 what the latency period is.</p> <p>14 It's a complicated issue. We are 15 not talking about a lot of cases here either. 16 You know, change of a few subjects is going 17 to change -- change of a few cases, one way 18 or another, exposure and outcome, is going to 19 change the risk ratio fairly substantially.</p> <p>20 Q. And with respect to this latency 21 issue, the time period you are talking about 22 of -- after 1996, of a potential change in 23 the pattern of use of glyphosate, if 24 Dr. Weisenburger is correct with respect to 25 latency, that would be irrelevant to the</p>

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1 findings for De Roos 2005; correct?  
 2 A. If Dr. Weisenburger is correct, you  
 3 mean with regard to a ten-year latency --  
 4 Q. Yes.  
 5 A. -- then yes, it would be irrelevant  
 6 to what I am saying.  
 7 Q. And we will get to --  
 8 A. It would be irrelevant for the  
 9 De Roos 2005 analysis.  
 10 Q. We have also talked about, there is  
 11 a subsequent analysis, and we will get to  
 12 that in a moment.  
 13 With respect to the first point  
 14 about exposure and misclassification, that's,  
 15 if I understand correctly, an issue that  
 16 arises in every study that obtains exposure  
 17 data through questionnaire; correct? There  
 18 is nothing unusual about --  
 19 A. You mean like recall bias?  
 20 Q. Well, no. Here you are talking  
 21 about exposure misclassification. Maybe I  
 22 misunderstood. You not talking about recall  
 23 bias in --  
 24 A. No. But I'm saying that it arises  
 25 in every cohort study, like recall bias

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1 arises in every case-control study?  
 2 Q. No. As in -- let's start that  
 3 again. I will restate the question.  
 4 The issue that you talked about  
 5 with respect to exposure misclassification  
 6 would be an issue not only with De Roos 2005,  
 7 but every case-control study for glyphosate;  
 8 correct? They are all based on  
 9 questionnaires.  
 10 A. So, I am saying that if you are  
 11 going to start to throw around recall bias  
 12 for every case-control study, then you have  
 13 to throw around non-differential  
 14 misclassification for every cohort study.  
 15 But it's been assessed, and there is a paper  
 16 on it by Blair which assessed it and shows  
 17 that the degree of misclassification would  
 18 have been sufficient -- they estimated it to  
 19 some degree, and it suggests that it would  
 20 have been -- even a reasonable amount,  
 21 reasonable meaning even a, shall we say a --  
 22 what one would expect under normal  
 23 circumstances of everyone doing it correctly,  
 24 and doing even a decent quality, recruitment  
 25 of subjects, and everyone doing their best

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1 filling out the questionnaires, that the  
 2 degree of misclassification was sufficient to  
 3 have attenuated a risk ratio in the -- in the  
 4 realm that we are talking about, to null.  
 5 That's why I was saying earlier,  
 6 when you get null findings, you have to be  
 7 very suspicious, that there -- that they're  
 8 not meaningful in a sense, that they're--  
 9 that they're-- that they arise out of errors  
 10 or out of -- that's why there's publication  
 11 bias and things like that.  
 12 Q. Let me just make sure I understand  
 13 this concept of bias towards the null. Now,  
 14 in the AHS study, when they looked at the  
 15 dose-response analysis, they were finding  
 16 risk ratios below 1.0 for the higher exposure  
 17 groups; correct?  
 18 A. Yes.  
 19 Q. So, a bias towards the null then  
 20 would mean that those risk ratios were  
 21 actually increased as compared to what they  
 22 would have been; correct?  
 23 A. Yes.  
 24 Q. So, the issue of differential  
 25 exposure misclassification for the

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1 Agricultural Health Study would not have  
 2 lowered those odds ratios, it would have  
 3 increased them; correct?  
 4 A. I'm -- I can't follow that logic.  
 5 That is too complicated for me to --  
 6 Q. Okay. Let me step back. Maybe  
 7 it's the way I asked the question. I will  
 8 frame it correctly.  
 9 In the De Roos 2005 paper, if there  
 10 was this non-differential exposure  
 11 misclassification, that would mean that the  
 12 odds ratios reported for that dose-response  
 13 below one were actually lower than the  
 14 reported numbers; correct?  
 15 A. It would not solely be from  
 16 exposure misclassification.  
 17 Q. Right. But any differential --  
 18 non-differential error, including the  
 19 exposure misclassification error you identify  
 20 as your concern for the Agricultural Health  
 21 Study, would have increased those odds ratios  
 22 as reported in the De Roos 2005  
 23 dose-response; correct?  
 24 A. Yes.  
 25 Q. So, that is not a concern, then,

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1 that the De Roos study is missing a positive  
 2 association. It's that the De Roos study  
 3 might be missing a negative association;  
 4 correct?  
 5 A. That's getting too complicated for  
 6 me to -- again, to work out sitting here.  
 7 Q. Okay. But it is correct then,  
 8 though, that in the AHS study, if there was  
 9 non-differential misclassification, including  
 10 non-differential exposure misclassification,  
 11 the risks of glyphosate in association with  
 12 non-Hodgkin's lymphoma would have been  
 13 overestimated; correct?  
 14 MR. TRAVERS: Objection, asked and  
 15 answered.  
 16 A. Would have been overestimated? No,  
 17 it would have been -- it would have been  
 18 attenuated. It would have been --  
 19 Q. Or not?  
 20 A. Why would it have been --  
 21 Q. You're biasing towards the null;  
 22 correct? It's going closer to 1.0; correct?  
 23 A. Yes.  
 24 Q. The reported odds ratios were below  
 25 1.0; correct?

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1 A. Now we are getting into it, but --  
 2 so I -- it's getting too complicated to,  
 3 like, tease out now what that means in real  
 4 terms, so you are going to tell me that  
 5 glyphosate has a protective effect on -- we  
 6 should all be taking glyphosate so we don't  
 7 get lymphoma?  
 8 Q. I'm trying to understand your  
 9 criticism, Dr. Neugut.  
 10 A. It's really -- it's getting too  
 11 complex to -- you know, there are too many  
 12 variables involved in this and too many  
 13 assumptions to really make a -- to, as we sit  
 14 here, make a -- make a meaningful statement  
 15 about what a -- what a 0.9 means as opposed  
 16 to a 1.0, or whether it's just, you know,  
 17 within the bounds of statistical analysis.  
 18 Q. Dr. Neugut, this is your criticism  
 19 number four on page 13 of your expert report.  
 20 And in your expert report, you state that  
 21 because of this non-differential exposure  
 22 misclassification, there could be a bias  
 23 towards the null, and that the reported  
 24 association between glyphosate and NHL would  
 25 be underestimated.

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1 A. Yes.  
 2 Q. That's what you state in your  
 3 report.  
 4 A. Absolutely.  
 5 Q. If there is -- and in fact, we know  
 6 for a fact that there is, that the AHS study  
 7 in its dose-response analysis reports risk  
 8 ratios for the higher exposure groups below  
 9 1.0, a bias towards the null would be pushing  
 10 those numbers up, not down; correct?  
 11 MR. TRAVERS: Objection, asked and  
 12 answered.  
 13 A. The glyphosate analysis, as I  
 14 recall it, is still above 1.0 in the AHS  
 15 study for ever/never, and for most of the  
 16 exposure categories. I don't think it really  
 17 comes out that --  
 18 Q. Let's look back at 2005 De Roos.  
 19 MR. TRAVERS: Eric, just whenever  
 20 you get a break in a subject, we have  
 21 got -- lunch is here.  
 22 MR. LASKER: Yes. Once we get  
 23 through this.  
 24 Q. I just want to make sure we are  
 25 clear, because I thought we had discussed

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1 this previously. The -- on page 52 --  
 2 A. I'm sorry.  
 3 Q. -- of the De Roos study, 2005  
 4 study.  
 5 A. Fifty-two?  
 6 Q. Page 52. The odds ratios for  
 7 glyphosate and non-Hodgkin's lymphoma, for  
 8 the two -- for the increased dose groups, as  
 9 you increase cumulative exposure, and as you  
 10 increase intensity-weighted exposure, those  
 11 odds ratios are below 1.0; correct?  
 12 A. Yes, but --  
 13 Q. If there is non-differential  
 14 misclassification, those numbers have been  
 15 biased upwards toward the null of 1.0;  
 16 correct?  
 17 A. Yes.  
 18 Q. Which means that the true  
 19 relationship between glyphosate and  
 20 non-Hodgkin's lymphoma as you increase dose  
 21 is an even lower odds ratio, a greater  
 22 reduced risk than is reported; correct?  
 23 MR. TRAVERS: Objection, asked and  
 24 answered.  
 25 A. So, I was referring to

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1 misclassification in terms of being exposed  
 2 at all, not talking about the  
 3 misclassification, or classification of how  
 4 much intensity or how long people were  
 5 exposed. I don't know -- I didn't think  
 6 through or analyze the exposure intensity  
 7 part of it, and I don't know how that would  
 8 affect the attenuation here.  
 9 Q. Dr. Neugut, if there was  
 10 non-differential misclassification biasing  
 11 these numbers towards the null, as you  
 12 suggest would occur in your expert report,  
 13 for AHS -- for the De Roos 2005 paper, that  
 14 would have resulted in an overstatement or  
 15 overestimate of the odds ratio that increased  
 16 dose of exposure, not an underestimation;  
 17 correct?  
 18 MR. TRAVERS: Objection, asked and  
 19 answered.  
 20 A. Could you say the question again.  
 21 Q. Sure.  
 22 If your -- again, we are talking  
 23 about your criticism of AHS, the De Roos  
 24 2005, your fourth criticism. If there is  
 25 this non-differential exposure

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1 misclassification, then --  
 2 A. It's not my criticism. It's Aaron  
 3 Blair's. I'm just quoting a paper. But go  
 4 ahead.  
 5 Q. Okay. Well, okay. But is it not  
 6 your opinion in here?  
 7 A. No, no, no. The paper is good.  
 8 Q. Okay. So, your criticism then of  
 9 the AHS paper, of the De Roos 2005, is there  
 10 could be this non-differential exposure  
 11 misclassification, and if that in fact  
 12 occurred, the dose-response analysis that is  
 13 reported in the 2005 De Roos paper is  
 14 actually overestimating the risk of  
 15 glyphosate exposure for non-Hodgkin's  
 16 lymphoma, and not underestimating it;  
 17 correct?  
 18 MR. TRAVERS: Objection,  
 19 mischaracterizes his testimony. It's  
 20 asked and answered.  
 21 A. It's overestimating?  
 22 Q. You state in your expert report  
 23 that if there is a bias towards the null, the  
 24 association of exposure to glyphosate and  
 25 association with non-Hodgkin's lymphoma would

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1 be underestimated, because there is a bias  
 2 towards the null, meaning the numbers have  
 3 been artificially pushed towards one.  
 4 A. I'm looking at table two, not at  
 5 table three.  
 6 Q. I know, but I am asking you about  
 7 table three.  
 8 A. Well, I can't answer with regard to  
 9 the exposure. That's not -- that's a  
 10 different categorization.  
 11 Q. So, sitting here today, if there is  
 12 non-differential exposure misclassification,  
 13 you cannot state what biasing towards the  
 14 null would mean with respect to the numbers  
 15 reported in the 2005 De Roos paper?  
 16 MR. TRAVERS: Objection, asked and  
 17 answered.  
 18 A. That's correct.  
 19 Q. So, with respect to the  
 20 dose-response analysis then in De Roos 2005,  
 21 am I correct in my understanding that you do  
 22 not have a criticism of that finding based  
 23 upon non-differential exposure  
 24 misclassification?  
 25 A. Specifically, no.

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1 MR. LASKER: Why don't we take a  
 2 break here.  
 3 MR. TRAVERS: Okay.  
 4 THE VIDEOGRAPHER: The time is  
 5 12:47 p.m. We are off the record.  
 6 (Luncheon recess taken.)  
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1 AFTERNOON SESSION  
 2 THE VIDEOGRAPHER: The time is  
 3 1:50 p.m. We are on the record.  
 4 BY MR. LASKER:  
 5 Q. Dr. Neugut, good afternoon.  
 6 We talked previously about  
 7 Dr. Blair's deposition that you have read.  
 8 And you are aware from that deposition, I  
 9 take it, that there is a 2013 update of the  
 10 Agricultural Health Study data that contains  
 11 additional data for glyphosate and  
 12 non-Hodgkin's lymphoma; correct?  
 13 A. Yes.  
 14 Q. You have not offered any expert  
 15 opinion regarding that study in your expert  
 16 report; correct?  
 17 A. Yes.  
 18 Q. You are aware, though, that the  
 19 2013 AHS analysis included five years of  
 20 additional exposure data beyond the data in  
 21 De Roos 2005; correct?  
 22 MR. TRAVERS: Objection,  
 23 mischaracterizes the study.  
 24 A. I am aware that it exists. Is that  
 25 what you are asking me?

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1 Q. No. My question is, are you aware  
 2 that the 2013 analysis included five years of  
 3 additional exposure data beyond the data in  
 4 De Roos 2005?  
 5 MR. TRAVERS: Same objection.  
 6 A. What is -- am I aware of it?  
 7 Q. I will ask the question again.  
 8 A. I'm sorry.  
 9 Q. You are aware that the 2013  
 10 analysis of the Agricultural Health Study  
 11 data includes five years of additional  
 12 exposure data beyond the data in De Roos  
 13 2005; correct?  
 14 A. Yes.  
 15 Q. You are also aware that the 2013  
 16 analysis had an additional seven years of  
 17 follow-up for non-Hodgkin's lymphoma;  
 18 correct?  
 19 MR. TRAVERS: Objection,  
 20 mischaracterizes the study.  
 21 A. I don't know the details, but I  
 22 know that it has additional follow-up. I  
 23 don't know -- I couldn't quote you the  
 24 numbers, but --  
 25 Q. Okay. Let's take a look at

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1 Dr. Blair's deposition testimony on this.  
 2 And if you have Dr. Blair's deposition before  
 3 you, pages -- on page 168.  
 4 A. What page?  
 5 Q. 168. And specifically lines six to  
 6 line 16.  
 7 And having reviewed Dr. Blair's  
 8 deposition testimony, does that refresh your  
 9 recollection that the 2013 AHS analysis had  
 10 an additional seven years of follow-up for  
 11 NHL beyond De Roos 2005?  
 12 A. Yes.  
 13 Q. The 2013 analysis of the AHS data  
 14 was three to four times larger than the  
 15 De Roos 2005 study; correct?  
 16 MR. TRAVERS: Objection,  
 17 mischaracterizes the study.  
 18 A. Can -- I don't know. If it's in  
 19 Dr. Blair's testimony, then I read it at some  
 20 point, but --  
 21 Q. Let me refer you to page 171,  
 22 specifically lines 21 through 24. Dr. Blair  
 23 testifies here that the 2013 cohort study,  
 24 with results for glyphosate and non-Hodgkin's  
 25 lymphoma, is more than four times larger than

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1 the De Roos 2005 study; correct?  
 2 A. Yes.  
 3 Q. The answer is yes. You have no  
 4 reason to disagree with Dr. Blair on that;  
 5 correct?  
 6 A. No.  
 7 Q. The 2013 study, with even longer  
 8 follow-up, also analyzes applicators that had  
 9 even higher levels of cumulative exposure to  
 10 glyphosate than in De Roos 2005; correct?  
 11 A. I believe so.  
 12 Q. That goes to one of the issues you  
 13 had talked about in your report, about  
 14 additional years and different uses of  
 15 glyphosate and more intense exposures;  
 16 correct?  
 17 A. I don't recall offhand, but yes,  
 18 I -- I don't recall.  
 19 Q. And according -- Dr. Blair was one  
 20 of the listed investigators that prepared  
 21 that 2013 analysis; correct?  
 22 A. I wouldn't know.  
 23 Q. Dr. Blair testified -- well, let me  
 24 just state -- let me just ask this. The  
 25 ever/never risk ratio for glyphosate and NHL



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1 in this larger 2013 AHS analysis was below  
 2 1.0. It was around 0.9; correct?  
 3 A. I don't know.  
 4 Q. Let's look at Dr. Blair's testimony  
 5 on page 172, line 16 to line 24.  
 6 A. Okay.  
 7 Q. Dr. Blair reports that this 2013  
 8 analysis of the AHS data reported an  
 9 ever/never odds ratio or risk ratio for  
 10 glyphosate and non-Hodgkin's lymphoma of  
 11 approximately 0.9; correct?  
 12 MR. TRAVERS: Objection, that  
 13 misstates his testimony.  
 14 A. "Reports" means what?  
 15 Q. Dr. Blair states --  
 16 MR. LASKER: And if we are going to  
 17 have speaking objections, we can switch  
 18 you and you can be the witness, but  
 19 otherwise, please do not provide speaking  
 20 objections, counsel.  
 21 MR. TRAVERS: Well, you can't  
 22 misrepresent --  
 23 MR. LASKER: Dr. Neugut can respond  
 24 to the questions. You cannot.  
 25 MR. TRAVERS: I'm just giving

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1 reasonable objections. You are  
 2 misstating the testimony.  
 3 MR. LASKER: Well, if you continue,  
 4 we'll have a whole record of this --  
 5 MR. TRAVERS: Okay, it's on the  
 6 record.  
 7 MR. LASKER: And we can bring this  
 8 to the judge if you want, but your  
 9 objections have been ridiculous all day.  
 10 Q. Dr. Neugut, once again, Dr. Blair  
 11 testifies that the ever/never ratio for  
 12 glyphosate and non-Hodgkin's lymphoma in this  
 13 larger 2013 AHS analysis was below 1.0,  
 14 approximately 0.9; correct?  
 15 MR. TRAVERS: Objection, misstates  
 16 his testimony. You can just read the  
 17 transcript.  
 18 A. Yes, but obviously it's unpublished  
 19 and all of that, but -- yes.  
 20 Q. But this 2013 study, just so the  
 21 record is clear, this 2013 AHS study reports  
 22 a risk ratio for glyphosate and non-Hodgkin's  
 23 lymphoma for ever/never use of below 1.0 at  
 24 around 0.9; correct?  
 25 A. Yes.

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1 Q. And Dr. Blair also reports that  
 2 there was in fact, in one of the  
 3 dose-response analyses, a statistically  
 4 significant negative finding for diffuse  
 5 large B-cell lymphoma; correct?  
 6 MR. TRAVERS: What page is that?  
 7 A. I don't recall.  
 8 Q. I will refer you to page 195.  
 9 A. 195?  
 10 Q. Yes. And particularly lines nine  
 11 through 21.  
 12 The 2013 AHS data finds a  
 13 statistically significant negative  
 14 association between increased glyphosate  
 15 exposure and diffuse large B-cell lymphoma;  
 16 correct?  
 17 A. Yes.  
 18 Q. Now, the 2013 AHS analysis that  
 19 Dr. Blair testified to, that was attached as  
 20 an exhibit to Dr. Blair's deposition;  
 21 correct?  
 22 A. I don't know.  
 23 Q. You have reviewed Dr. Blair's  
 24 deposition; correct?  
 25 A. Yes.

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1 Q. Did you, in reading his deposition,  
 2 note that that study was marked as an exhibit  
 3 to the deposition?  
 4 A. I don't notice things like that  
 5 when I read depositions. I don't look at the  
 6 index. I don't look at the supplements.  
 7 Q. Well, in the testimony, as we are  
 8 going into the questions that you are  
 9 reading, it was marked as an exhibit. You  
 10 saw that; correct?  
 11 MR. TRAVERS: Objection, asked and  
 12 answered.  
 13 A. As I said, I don't know that I did.  
 14 Q. Have you ever looked at the 2013  
 15 AHS analysis?  
 16 A. No.  
 17 Q. Now, you have -- well, strike that.  
 18 I take it then you have no opinions  
 19 with regard to the methodology or the  
 20 findings in that 2013 AHS analysis.  
 21 A. No.  
 22 Q. Now, you previously -- well, let me  
 23 make sure the record is clear there.  
 24 Am I correct in my understanding  
 25 then that you don't have any opinions with

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1 regard to the 2013 AHS analysis?  
 2 A. It didn't play a role in my  
 3 opinions.  
 4 Q. Now, you have previously, I think  
 5 we have discussed, been retained as an expert  
 6 witness by the same attorneys who are  
 7 representing the plaintiffs in this case;  
 8 correct? In other litigation?  
 9 A. Only for the Actos, I believe for  
 10 the Actos litigation.  
 11 Q. And in that litigation, like in  
 12 this one, you were retained to provide an  
 13 opinion based upon epidemiologic evidence  
 14 that a substance, there it was a drug, caused  
 15 cancer; correct?  
 16 A. Yes.  
 17 Q. And in that litigation, you relied  
 18 upon a non-published, non-peer-reviewed  
 19 epidemiological study in support of your  
 20 opinion, didn't you?  
 21 A. I don't recall.  
 22 Q. Okay. Let's go back to your  
 23 January 7, 2013 deposition, and it should be  
 24 in front of you. Dr. Neugut, it looks like  
 25 this.

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1 If I could direct you to page 157,  
 2 158, and you can, I think -- it starts on  
 3 page 157, line 20, to 158, line six. You may  
 4 recall this -- well, you will recall this  
 5 better than I would. I wasn't there.  
 6 But does this testimony refresh  
 7 your recollection --  
 8 A. Which line, which page?  
 9 Q. From page 157, line 20, through  
 10 158, line six.  
 11 A. Yes.  
 12 Q. Does that refresh your  
 13 recollection, Dr. Neugut, that in the Actos  
 14 litigation, where you were represented by the  
 15 same plaintiffs' counsel that you are  
 16 represented here today, in offering your  
 17 opinion as to whether exposure can cause  
 18 cancer, you relied upon a non-published,  
 19 non-peer-reviewed study?  
 20 A. I wasn't aware at the time that it  
 21 wasn't published, I think, or I was in error  
 22 at the time, or I had some confusion about  
 23 it, as I say here. This was a series. It  
 24 was in the same context of a cohort study,  
 25 where this was the fourth, if I recall --

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1 again, it's a while ago. But if I recall, it  
 2 was the fourth follow-up from the same study,  
 3 and it was not -- I did not rely upon it in  
 4 actual litigation subsequently in any of the  
 5 testimony that I gave in any of the trials.  
 6 Q. Just to be clear, Dr. Neugut, in  
 7 this deposition testimony we just reviewed,  
 8 you stated that you were going to be relying  
 9 upon the non-published, non-peer-reviewed  
 10 results of a nested case control, and your  
 11 answer was yes; correct?  
 12 A. So I -- yes, it is, but I do not  
 13 recall in what way I did rely on it and how I  
 14 did or did not.  
 15 Q. But just for the record, in other  
 16 litigation in which you were represented by  
 17 this same plaintiffs' counsel who represents  
 18 you here today, in which you were asked to  
 19 assess the epidemiology for exposure causing  
 20 cancer, you relied upon a non-published,  
 21 non-peer-reviewed study, and in this case,  
 22 you chose not even to look at the 2013 AHS  
 23 data; correct?  
 24 A. Yes.  
 25 Q. Let's take a look at some of the

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1 case-control studies for the glyphosate and  
 2 non-Hodgkin's lymphoma. One of those was a  
 3 study by Cantor in 1992; correct?  
 4 A. I'm sorry, I am -- I was -- my mind  
 5 was wandering.  
 6 Q. That's all right. 1992 Cantor  
 7 study.  
 8 A. What about it?  
 9 Q. That was one of the studies you  
 10 looked at in your analysis; correct?  
 11 A. Yes.  
 12 MR. LASKER: And let's mark the  
 13 Cantor study as Exhibit 14-15.  
 14 (Exhibit 14-15, Cancer Bulletin,  
 15 May 1, 1992, Pesticides and Other  
 16 Agricultural Risk Factors for  
 17 Non-Hodgkin's Lymphoma among Men in Iowa  
 18 and Minnesota marked for identification,  
 19 as of this date.)  
 20 Q. And for the record, this is the  
 21 Cantor 1992 study that you discussed in your  
 22 report; correct?  
 23 A. Yes.  
 24 Q. What was the testable hypothesis  
 25 for this study?

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1 A. I'm sorry, ask your question again.  
 2 Q. What was the testable hypothesis in  
 3 the Cantor 1992 study?  
 4 A. What does "testable hypothesis"  
 5 mean?  
 6 Q. Well, I was, I thought, taking that  
 7 from you. You had described your methodology  
 8 for reviewing epidemiological studies, and  
 9 you talked about the fact that you first  
 10 formulated a hypothesis.  
 11 A. You mean the primary hypothesis?  
 12 Q. If that's what you meant. Just to  
 13 make sure we are talking on the same page  
 14 here, in your expert report on -- let's see,  
 15 where was it? Page six. You talk about this  
 16 multistep process to establish causal  
 17 inferences; correct?  
 18 A. Um-hum.  
 19 Q. And so you -- you first formulate a  
 20 testable hypothesis, and then you design  
 21 studies to test the hypothesis; correct?  
 22 A. Yes.  
 23 Q. So, my question for you with  
 24 respect to Cantor 1992 is, what was the  
 25 testable hypothesis of that study?

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1 A. I guess it was being a farmer, or  
 2 being a -- having a farming occupation, or  
 3 however you want to phrase the -- however you  
 4 want to phrase that.  
 5 Q. Okay. Would it be fair to say that  
 6 Cantor 1992 was not designed to test the  
 7 hypothesis whether glyphosate can cause  
 8 non-Hodgkin's lymphoma?  
 9 A. Yes. That was a secondary --  
 10 secondary aim, analysis, however you want to  
 11 phrase it.  
 12 Q. Now, the Cantor study looks at  
 13 individuals who are diagnosed with  
 14 non-Hodgkin's lymphoma between 1980 and 1983;  
 15 correct? And if you look at the methods  
 16 section for case selection on the first page.  
 17 A. Yes. Um-hum, yes.  
 18 Q. So, the cases of NHL in this study  
 19 were diagnosed somewhere between -- well,  
 20 certainly less than ten years after  
 21 glyphosate first became available for use in  
 22 the market; correct?  
 23 A. Something less than that, yes.  
 24 Q. Now, we talked earlier about  
 25 Dr. Ritz, and I believe her expert report is

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1 still in front of you. Can you just pull out  
 2 Dr. Ritz's expert report.  
 3 It's thicker than that, about this  
 4 thick.  
 5 A. Is this it?  
 6 Q. No. Maybe on the bottom.  
 7 A. The very bottom. I'm sorry.  
 8 Q. Always the way.  
 9 So, Dr. Ritz, she is another expert  
 10 witness epidemiologist on behalf of  
 11 plaintiffs in this litigation; correct?  
 12 A. Yes.  
 13 Q. And if you could turn to page 18  
 14 and 19 of her report. Dr. Ritz states that  
 15 "the findings of Cantor are less informative  
 16 because there was not sufficient time to  
 17 account for the latency of non-Hodgkin's  
 18 lymphoma."  
 19 Do you see that?  
 20 A. Yes.  
 21 Q. And she states that "one would like  
 22 to see a medium potential latency period of  
 23 at least ten years for an epidemiologic study  
 24 of glyphosate and non-Hodgkin's lymphoma to  
 25 be informative." Correct?

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1 A. Yes.  
 2 Q. Do you agree with Dr. Ritz on that?  
 3 A. I stated earlier that I am agnostic  
 4 with regard to the question of latency  
 5 period. We have spoken earlier about  
 6 Weisenburger's opinion. I don't know what  
 7 the latency period is, so I don't know the  
 8 answer.  
 9 Q. Do you agree that this question of  
 10 latency period is important in analyzing what  
 11 one can glean from the Cantor 1992 study with  
 12 respect to glyphosate?  
 13 A. If one knew what the latency  
 14 period -- if one knew what the mechanism is  
 15 of how glyphosate -- if one was -- one knew  
 16 definitively how glyphosate causes lymphoma,  
 17 so that one could definitively establish the  
 18 latency period, then yes, it would be very  
 19 important. But otherwise, it's difficult to  
 20 be able to know how to apply it in this  
 21 instance.  
 22 Q. If Dr. Weisenburger is correct that  
 23 the latency period is ten years for  
 24 glyphosate and non-Hodgkin's lymphoma, do you  
 25 agree with Dr. Ritz that that would mean that

1 the Cantor study is not informative with  
 2 respect to glyphosate and non-Hodgkin's  
 3 lymphoma?  
 4 A. I would say that it would be  
 5 difficult to say how it would have enough  
 6 cases to be able -- how it would be  
 7 informative.  
 8 Q. That's because the individuals in  
 9 the study would have been exposed too close  
 10 in time to their diagnosis for latency to  
 11 have occurred and for the exposure to have  
 12 been related to non-Hodgkin's lymphoma;  
 13 correct?  
 14 A. It wouldn't have been impossible  
 15 for a few of them to have been, but for at  
 16 least for some -- for a large number of them,  
 17 it would have been probably not possible.  
 18 Q. And in your expert report, you  
 19 state that Cantor had again low power because  
 20 there were only 26 cases of NHL with exposure  
 21 to glyphosate; correct?  
 22 A. Yes.  
 23 Q. And this goes back to our earlier  
 24 discussion. The key number for power is the  
 25 number of individuals who were both exposed

1 and had the outcome of interest; correct?  
 2 A. Yes.  
 3 Q. And you believe that a study that  
 4 has only 26 individuals with exposure to  
 5 glyphosate and NHL does not have sufficient  
 6 power to provide reliable information  
 7 regarding any potential causal relationship  
 8 between glyphosate and non-Hodgkin's  
 9 lymphoma; right?  
 10 MR. TRAVERS: Objection, misstates  
 11 his testimony.  
 12 A. I didn't say that.  
 13 Q. Let me make sure I understand your  
 14 testimony then. Okay. So let me -- let me  
 15 rephrase the question.  
 16 Do you believe that a study with  
 17 only 26 individuals with exposure to  
 18 glyphosate and NHL is severely limited in its  
 19 ability to provide information regarding any  
 20 potential causal relationship between  
 21 glyphosate and NHL?  
 22 A. If you have a -- if you have a null  
 23 finding, then you have to -- then I think you  
 24 have to be limited in terms of how you  
 25 interpret a null finding in that context,

1 because you didn't have enough statistical  
 2 power to be able to find the positive  
 3 association.  
 4 Q. With respect to power, is it your  
 5 opinion then that power only matters for a  
 6 finding of a positive association and doesn't  
 7 matter with respect to reaching an opinion  
 8 about a causal relationship?  
 9 MR. TRAVERS: Objection, asked and  
 10 answered.  
 11 A. That question doesn't make sense.  
 12 Q. Okay. Let me restate.  
 13 If a study is insufficiently  
 14 powered, in your opinion does that severely  
 15 limit your ability to reach a causal opinion  
 16 based upon that study?  
 17 A. If a power is insufficiently -- if  
 18 a study is insufficiently powered, then you  
 19 have to interpret a null finding with extreme  
 20 caution or with -- or -- or not be able to  
 21 draw a -- not be able to draw a definitive  
 22 conclusion from it. In other words, if there  
 23 was insufficient power to start with, and you  
 24 have a null finding, then you certainly are  
 25 limited in being able to conclude that there

1 is no positive association.  
 2 Q. Okay. I understand that, but I'm  
 3 asking the other direction as well. Is it  
 4 fair to say that if a power -- if a study is  
 5 insufficiently powered, it is severely  
 6 limited in providing you with the type of  
 7 evidence that you would want to have as an  
 8 epidemiologist to reach a causation opinion?  
 9 MR. TRAVERS: Objection, asked and  
 10 answered.  
 11 A. I'm not sure that isn't saying the  
 12 same thing. How is that question different?  
 13 Q. The answer may be yes, but let me  
 14 just make sure I understand in my own mind.  
 15 A. If I -- if I had an  
 16 insufficiently -- if I had a study that  
 17 a priori was -- had poor -- was small, so it  
 18 didn't have sufficient power in the first  
 19 place that I was happy doing it, but having  
 20 then conducted the study, I had a positive  
 21 association, I would still take the  
 22 positive -- I would still have to take the  
 23 positive association at least -- seriously,  
 24 and take it -- because, as I said in our  
 25 morning discussion, I think positive

<p style="text-align: right;">Page 202</p> <p>1 associations always have to be at least 2 seriously entertained and analyzed, 3 because -- because the system, the structure 4 of epidemiologic and statistical analysis 5 militates against positive findings. 6 Of course, if the numbers are 7 really tiny, then you can take that into 8 consideration and say it's really so small, 9 that even though it's statistically 10 significant, that the numbers are so small, 11 I'm not going to really give it that much 12 credit, or maybe it's a statistical artifact 13 or maybe it's bias. 14 But that's why we are given brains, 15 and we are supposed to use our logic and our 16 judgment and our common sense, and that is 17 what epidemiology is all about. Epidemiology 18 is the ultimate in judgment, causal 19 considerations, the application of logic, 20 common sense, and intelligence to taking data 21 and trying to analyze it, and to be able to 22 interpret what you find, because you will 23 never have pure, unadorned, perfect data 24 to -- well, you will almost never have pure, 25 absolute data that you can interpret without</p>	<p style="text-align: right;">Page 204</p> <p>1 lymphoma discussed in your report had even 2 less power than the Cantor study; correct? 3 A. I would think so, yes. 4 Q. The Hardell study in 2002, that has 5 less power than the Cantor study; correct? 6 A. Yes. 7 Q. The Cocco study, the Cocco, 8 C-O-C-C-O, study we looked at earlier, that 9 has less power than the Cantor study; 10 correct? 11 A. Yes. 12 Q. The Orsi study, that has less power 13 than the Cantor study; correct? 14 A. Yes. 15 Q. And the Eriksson study, that one, 16 let's look at that one, because that is a 17 little bit more involved. I think I marked 18 that Exhibit 14-13, so you should have that 19 in front of you. Exhibit 14-13. 20 A. That's -- oh, I see. That's 21 Eriksson? 22 Q. Yes. 14-13. Eriksson 2008, and 23 the information is -- can be determined from 24 table two for all exposures with glyphosate, 25 table two on page 1659. That study involved</p>
<p style="text-align: right;">Page 203</p> <p>1 having to use your brain to, to analyze. 2 So you have -- as with everything 3 else, you have to apply your, your logic and 4 thinking to what you see, and to come up with 5 the best interpretation you can. Reasonable 6 people may reasonably disagree, as in every 7 other -- as in many other walks of life, but 8 in epidemiology, that is particularly a -- 9 more so than in most other scientific 10 endeavors, that is a particularly crucial 11 part of what we do in our daily endeavors. 12 Q. Dr. Neugut, let me ask the question 13 again, because I still don't understand the 14 answer. 15 Do you believe, if a study has 16 insufficient power, that that is a 17 significant limitation in your ability to use 18 that study to reach a causation opinion? 19 MR. TRAVERS: Objection, asked and 20 answered. 21 A. I think it certainly limits the 22 ability of the study to be able to give you a 23 correct answer. 24 Q. Now, many of the other case-control 25 studies of glyphosate and non-Hodgkin's</p>	<p style="text-align: right;">Page 205</p> <p>1 29 individuals with exposure to glyphosate 2 who had non-Hodgkin's lymphoma; correct? 3 A. Yes. 4 Q. And the Eriksson -- so that's -- I 5 think there is three more cases in Eriksson 6 than there was in Cantor 1992; correct? 7 A. Yes. 8 Q. The Eriksson study had only 9 18 controls, though; correct? 10 A. Yes. Exposed controls, you mean. 11 Or am I mischaracterizing it? 12 Q. You're looking at the study. 13 A. Am I looking at table two? 14 Q. Yes. 18 exposed controls -- 18 15 controls for 29 cases; correct? 16 A. This is the number of exposed cases 17 and number of exposed controls. 18 Q. And in Cantor 1992, they actually 19 had, I believe, 49 controls. Correct? And 20 you can look back to that, if you need to. 21 Do you need to look back at the Cantor study 22 to confirm if they had 49 controls for 23 glyphosate? It's on table six. 24 A. Table six? 25 Okay.</p>

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1 Q. And the power of a case-control  
 2 study is determined both by the number of  
 3 cases and the number of controls; right?  
 4 A. Yes.  
 5 Q. And so from this data, it appears  
 6 that Eriksson also had lower power than  
 7 Cantor with respect to glyphosate and  
 8 non-Hodgkin's lymphoma; correct?  
 9 A. Which one has lower power?  
 10 Q. Eriksson.  
 11 A. A priori, yes.  
 12 Q. Now, to put these numbers into  
 13 context, we have been talking about 26  
 14 exposed cases or 29 exposed cases, the  
 15 updated 2013 Agricultural Health Study  
 16 analysis, depending on which definition of  
 17 non-Hodgkin's lymphoma you used, was studying  
 18 between 250 and 350 individuals with exposure  
 19 to glyphosate and non-Hodgkin's lymphoma;  
 20 correct?  
 21 A. Yes.  
 22 Q. So, that is somewhere between ten  
 23 to maybe 13 times larger than any of these  
 24 case-control studies; correct?  
 25 A. Well, the statistical power doesn't

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1 exactly go by multiplication, but it's  
 2 larger, certainly.  
 3 Q. Mathematically, it's ten to 13  
 4 times larger, the AHS 2013 study, than any of  
 5 these case-control studies --  
 6 A. Yeah.  
 7 Q. -- we talked about.  
 8 A. Um-hum.  
 9 Q. And the earlier De Roos 2005 study,  
 10 the published study that we talked about that  
 11 you have looked at, that had 92 individuals  
 12 with exposure to glyphosate and who had been  
 13 diagnosed with non-Hodgkin's lymphoma;  
 14 correct?  
 15 A. Yes.  
 16 Q. So, again, numerically, much larger  
 17 than these case-control studies; correct?  
 18 A. Yes.  
 19 Q. Now, the other comment you make in  
 20 your expert report about the Cantor study is  
 21 that it is also limited by the lack of  
 22 adjustment for other herbicides used in the  
 23 cohort. And that's page 14 of your expert  
 24 report; correct?  
 25 A. Yes.

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1 Q. And that's your opinion; correct?  
 2 A. It's limited by that, yes.  
 3 Q. And you have -- I think you  
 4 testified earlier that this lack of  
 5 adjustment for other exposures to pesticides  
 6 limits a study's ability to tell us anything  
 7 about the true association between glyphosate  
 8 and non-Hodgkin's lymphoma; correct?  
 9 A. I didn't say "anything about." I  
 10 said it limits our ability to tell us  
 11 precisely what's going on.  
 12 Q. And as you already discussed --  
 13 strike that.  
 14 Well, as you already discussed, the  
 15 McDuffie study does not adjust for exposures  
 16 to other pesticides; correct?  
 17 A. No.  
 18 Q. It's correct that it doesn't;  
 19 right? Let me restate that question, because  
 20 I gave you a double negative.  
 21 The McDuffie study does not adjust  
 22 for exposures to other herbicides or other  
 23 pesticides; correct?  
 24 A. No, it does not.  
 25 Q. And the Lee study, which you also

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1 address in your expert report, it does not  
 2 adjust for exposures to other pesticides;  
 3 correct?  
 4 A. Correct.  
 5 Q. And the Eriksson study, except  
 6 for -- well, the Eriksson study in its  
 7 analysis of latency and its analysis of  
 8 dose-response and its analysis of NHL  
 9 subtypes, it does not adjust for exposures to  
 10 other pesticides; correct?  
 11 A. Correct.  
 12 Q. Now, let me just make sure I  
 13 understand the bases for your testimony that  
 14 the Cantor study -- and first of all, the  
 15 Cantor study reports an odds ratio for  
 16 glyphosate of 1.1 with confidence intervals  
 17 of 0.7 to 1.9; correct?  
 18 I'm not sure you are looking at the  
 19 right study, Dr. Neugut. The Cantor study.  
 20 A. Oh, I'm sorry. Getting out of hand  
 21 here. Cantor study.  
 22 What was the question, please?  
 23 Q. The Cantor study reported an odds  
 24 ratio of 1.1 with confidence intervals of 0.7  
 25 to 1.9.

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1 A. Yes.

2 Q. That is a null finding for

3 glyphosate and non-Hodgkin's lymphoma;

4 correct?

5 A. Not an elevated finding, yes.

6 Q. It's a null finding.

7 A. Essentially.

8 Q. And now you state here that -- in

9 your expert report, that this finding was not

10 adjusted for other pesticide exposures, but

11 Cantor adjusted for other high-risk

12 exposures; correct?

13 And if you could look at the Cantor

14 study at page 2448, at the top of the second

15 column.

16 A. He adjusted for other risk factors,

17 if that's what you are asking.

18 Q. Well, for other exposures that he

19 looked at in the study; correct?

20 A. Yes.

21 Q. And to the extent that any of --

22 and he looked at a number of different

23 pesticides and herbicides and insecticides in

24 this study; correct? You can look to table

25 three and table four and table five and table

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1 six. And table seven, table eight.

2 A. Yes.

3 Q. And by a high-risk exposure,

4 Dr. Cantor means that he adjusted for any

5 exposure with an odds ratio above 1.5 when it

6 was adjusted solely for age and state of

7 residence; correct?

8 A. Yes.

9 Q. So, to the extent that the -- any

10 of these other pesticide exposures met that

11 criteria, Dr. Cantor did control for those

12 pesticide exposures; correct?

13 A. Yes.

14 Q. So, that limitation that you noted

15 in your expert report is actually -- for the

16 Cantor study, is actually incorrect; right?

17 A. What limitation?

18 Q. You state that there was a lack of

19 adjustments for other herbicides used by the

20 cohort, is the word you used in your expert

21 report.

22 A. Did I make an error?

23 Q. That is my question of you. It's

24 on page 14 of your expert report. I think

25 your expert report is up there. And on the

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1 top, page 13 to 14, you are talking about the

2 Cantor 1992 study. At the very top of 14,

3 the last line in your discussion of Cantor,

4 you state that "interpretation of the results

5 is also limited by lack of adjustments for

6 other herbicides used by the cohort."

7 Correct?

8 A. I guess I was referring

9 specifically to the one where he was using

10 the 26 versus -- that that specific analysis,

11 but perhaps in the other analyses --

12 Q. Well, table -- we look at the

13 analysis on table six; correct? In Cantor.

14 A. I may have made an error.

15 Q. Just so we are clear, the criticism

16 in your expert report of the Cantor study,

17 that it was limited by lack of adjustment for

18 other herbicides, that is incorrect.

19 A. I missed that.

20 Q. Let's turn to the McDuffie study.

21 And I think -- have we already marked this?

22 Yeah. This was 14-14, so you have that

23 already in front of you.

24 And Dr. Neugut, the McDuffie study

25 also was not designed to test the hypothesis

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1 that glyphosate might be associated with

2 non-Hodgkin's lymphoma; correct?

3 A. Not specifically.

4 Q. That would be a secondary finding

5 in the study; correct?

6 A. I'm not sure that that is accurate.

7 I mean, it was to look at pesticides and

8 non-Hodgkin's lymphoma. I mean, and if you

9 say that glyphosate was one of them -- I

10 don't think glyphosate was particularly the

11 one that they were targeting, but they were

12 looking at pesticides in general.

13 Q. Well, McDuffie in their study

14 actually specifically discusses -- and I will

15 refer you to page 1161.

16 A. 11 --

17 Q. 1161.

18 A. 61, um-hum.

19 Q. And this is in the second column of

20 the text on that page, the full bottom

21 paragraph on the right side, full complete

22 paragraph that starts, "We reported results,"

23 on the right-hand column.

24 A. Um-hum.

25 Q. And the authors of the McDuffie

<p style="text-align: right;">Page 214</p> <p>1 paper themselves describe their analyses in 2 this study as exploratory; correct? 3 A. And so? 4 Q. I'm just asking if it's correct 5 that this was an exploratory study. We 6 talked about that before. 7 A. That's -- that may or may not be 8 true, but that may -- their aim may have been 9 to do a study to look at exploratory -- to do 10 an exploratory study. 11 Q. Right. No, I'm not -- I just want 12 to make sure I understand. The McDuffie 13 study with respect to glyphosate was an 14 exploratory study. 15 A. That's -- yes. I mean, they may 16 not have had a specific villain in mind when 17 they were looking -- when they were setting 18 up the study, to say this particular agent is 19 what we are primarily focused on. We are 20 looking in general at pesticides and 21 lymphoma, and here is a list, and we will 22 look at all of them and see what pops up 23 associated or not associated with lymphoma. 24 Q. Right. That's what we were talking 25 about earlier this morning, that there are</p>	<p style="text-align: right;">Page 216</p> <p>1 McDuffie adjusted for medical variables, age 2 and study area; correct? 3 A. Family history, but -- is that what 4 you mean by "medical variables"? 5 Q. Yes. Yes. 6 A. Um-hum. 7 Q. And that is set forth on table two 8 in the odds ratio of 1.2 that you mentioned 9 in your expert report for glyphosate; 10 correct? 11 A. Yes. 12 Q. Why would an epidemiologist, in 13 this case Dr. McDuffie, adjust for medical 14 variables like family history of cancer or 15 specific medical conditions? 16 A. Well, family history may or may not 17 be related to risk of lymphoma. I mean, 18 conditions tend to run in families, so, if 19 you had a family history of lymphoma, you may 20 be at increased risk of getting a lymphoma, 21 so that is a fair variable to adjust for. 22 Q. You agree with Dr. McDuffie then 23 that to try and zero in on whether there is a 24 true association for pesticide exposure and 25 non-Hodgkin's lymphoma, you would want to</p>
<p style="text-align: right;">Page 215</p> <p>1 epidemiological studies that are exploratory 2 studies, and then there are -- that are not 3 actually testing hypotheses, but they are 4 generating additional hypotheses. Correct? 5 A. Yes. 6 Q. Now, in the -- in your expert 7 report discussing McDuffie, you state, on 8 page 14, that the McDuffie odds ratio of 1.2 9 was adjusted for high-risk exposures. That 10 is on page 14 of your report. 11 A. Yes. 12 Q. And so, this is the type of 13 adjustment we were just discussing about 14 with -- in the Cantor study; correct? 15 A. Yes. 16 Q. Now, in fact, the McDuffie study 17 did not adjust for high-risk exposures, did 18 it? 19 A. No. 20 Q. So that's another mistake in your 21 report? 22 A. Okay. 23 Q. Yes? 24 A. Yes. 25 Q. In its most adjusted odds ratio,</p>	<p style="text-align: right;">Page 217</p> <p>1 adjust for medical variables like family 2 history and these medical conditions? 3 A. Certain medical conditions that may 4 or may not be related to risk of -- of 5 getting lymphoma, yes. 6 Q. So, just so I am clear then, do you 7 believe that Dr. McDuffie's adjustment of her 8 findings for medical variables like family 9 history of cancer, and the specific 10 conditions she lays out, improves the 11 reliability of the findings in her study? 12 A. At worst, it doesn't hurt it. At 13 best, maybe it improves it. 14 Q. Now, in your report, you point to 15 an analysis of odds ratios for, I think less 16 than or equal to two days per year and 17 greater than two days per year. Do you 18 recall that? 19 A. We are talking now still about 20 McDuffie? 21 Q. Yes. 22 A. Yes, I believe so. 23 Q. And you rely on these findings from 24 McDuffie in your expert report as evidence of 25 a dose-response in support of your Bradford</p>



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1 Hill analysis; correct?  
 2 A. Yes.  
 3 Q. Now, this analysis of less than or  
 4 equal to two days versus greater than two  
 5 days exposure for glyphosate, in McDuffie,  
 6 that was not adjusted for exposures to other  
 7 pesticides; correct?  
 8 A. Correct.  
 9 Q. And as we were talking about this  
 10 morning, in the De Roos 2005 study, if that  
 11 finding in De Roos 2005 is correct that there  
 12 is greater exposures to other pesticides at  
 13 greater levels of glyphosate exposure, then  
 14 the failure to adjust for other pesticide  
 15 exposures could confound and create an  
 16 artificial appearing dose-response that  
 17 doesn't exist; correct?  
 18 A. Could or could not. I don't know.  
 19 Q. So, it's certainly possible that  
 20 confounding could artificially increase the  
 21 reported odds ratios for high exposure to  
 22 glyphosate in the McDuffie study; correct?  
 23 A. I would really not be able to say.  
 24 Q. The -- now, the analysis in  
 25 McDuffie that you cite as evidence for

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1 dose-response was not even adjusted for those  
 2 other medical variables and family history  
 3 that we just discussed; correct?  
 4 A. Yes.  
 5 Q. The analysis in McDuffie for  
 6 dose-response also does not take into account  
 7 duration of exposure; correct?  
 8 A. Correct.  
 9 Q. So, if there was an individual who  
 10 used glyphosate twice a year, let's say, for  
 11 each of ten years, they would be categorized  
 12 in the low exposure group with 20 cumulative  
 13 days of exposure; correct?  
 14 A. I'm sorry, I missed -- I didn't  
 15 follow the last question.  
 16 Q. If there is an individual in  
 17 McDuffie who had used glyphosate every year  
 18 for ten years two times a year, they would be  
 19 in the low exposure group; correct?  
 20 A. Yes.  
 21 Q. And they would have 20 days of  
 22 cumulative exposure; correct?  
 23 A. Yes.  
 24 Q. If there was another individual who  
 25 used glyphosate for only one year but used it

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1 on three different occasions, they would be  
 2 characterized in McDuffie as high exposure;  
 3 correct?  
 4 A. Yes.  
 5 Q. So under McDuffie, you could have  
 6 in your dose-response analysis someone with  
 7 three days of exposure being classified as  
 8 high exposure and someone with 20 days of  
 9 cumulative exposure being classified as low  
 10 exposure; correct?  
 11 A. Yes.  
 12 Q. And in your own epidemiological  
 13 research, when you have looked at pesticides  
 14 and you've looked at dose-response, you have  
 15 actually -- you looked at cumulative  
 16 exposure, not per time period exposure;  
 17 correct?  
 18 A. Have I done pesticide exposure?  
 19 Q. In your -- in your research, in  
 20 your epidemiological research, when you do a  
 21 study like this and you are doing a  
 22 dose-response analysis, you look at  
 23 cumulative exposure; correct?  
 24 A. Sometimes you do, sometimes -- I  
 25 mean, you know, you never know what is the

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1 right -- what is the right way to analyze  
 2 dose and dose-response. Sometimes you do  
 3 cumulative, sometimes you do it other ways.  
 4 MR. LASKER: Let's mark as  
 5 Exhibit 14-16...  
 6 (Exhibit 14-16, American Journal of  
 7 Epidemiology, Reported Residential  
 8 Pesticide use and Breast Cancer Risk on  
 9 Long Island, New York marked for  
 10 identification, as of this date.)  
 11 Q. And Dr. Neugut, Exhibit 14-16 is  
 12 one of the epidemiological studies that you  
 13 conducted; correct?  
 14 A. Jesus Christ. Don't put that in  
 15 the record.  
 16 Q. She can't do that, unfortunately.  
 17 She has to take everything down.  
 18 Dr. Neugut, Exhibit 14-16 is one of  
 19 the studies that you were an investigator on;  
 20 correct?  
 21 A. Yes.  
 22 Q. Looking at pesticide exposure and  
 23 the potential risk of breast cancer; correct?  
 24 A. Yes. Yes.  
 25 Q. And in this study, you conducted a

<p style="text-align: right;">Page 222</p> <p>1 dose-response analysis; correct?  2 A. Yes.  3 Q. And you used cumulative exposure as  4 your measure for dose-response; correct?  5 A. Yes.  6 Q. And we in fact know, going back to  7 the glyphosate findings in McDuffie, that if  8 one were to look at cumulative exposure,  9 there is no increased risks in the high  10 exposure group; correct?  11 MR. TRAVERS: Objection,  12 misclassifies, or mischaracterizes the  13 study.  14 A. I'm sorry, can you repeat the  15 question?  16 Q. We know in fact that for the  17 McDuffie data, because the McDuffie data has  18 now been analyzed further by the North  19 American Pooled Project, that when you look  20 at cumulative exposure, there is no evidence  21 of increased risk of non-Hodgkin's lymphoma  22 with glyphosate; correct?  23 MR. TRAVERS: Objection,  24 mischaracterizes the studies.  25 A. I don't know that study.</p>	<p style="text-align: right;">Page 224</p> <p>1 study; correct?  2 A. Yeah, although I would say that in  3 the studies of that type, it's not as big a  4 differential as it may sound. I mean, you  5 get differentials like that in case-control  6 studies. But yes, it's an issue.  7 Q. And the goal of the case-control  8 study is not to have this sort of a  9 differential in your response rates between  10 cases and controls; correct?  11 A. Correct.  12 Q. Let's talk about the Hardell study.  13 So this is a study -- Exhibit 14-17.  14 (Exhibit 14-17, Exposure to  15 Pesticides as Risk Factor for  16 Non-Hodgkin's Lymphoma and Hair Cell  17 Leukemia: Pooled Analysis of Two Swedish  18 Case-control Studies marked for  19 identification, as of this date.)  20 Q. And Dr. Neugut, this is, I think,  21 one of the studies that we spoke about  22 earlier that had very low power to analyze a  23 question of an association between glyphosate  24 and non-Hodgkin's lymphoma; correct?  25 A. Yes.</p>
<p style="text-align: right;">Page 223</p> <p>1 Q. You don't know the North American  2 Pooled Project study?  3 A. No. I haven't looked at it.  4 Q. Well, we will talk about that in a  5 moment.  6 Now, in your expert report, you  7 also note that McDuffie had a low response  8 rate; correct?  9 A. Yes.  10 Q. And McDuffie had a 67 percent  11 response rate among cases and only a 48  12 percent response rate among controls;  13 correct?  14 A. Yes.  15 Q. And that is -- that differential  16 goes back to one of the potential concerns we  17 discussed this morning about potential  18 selection bias; correct?  19 A. Yes.  20 Q. So that's an issue with the De Roos  21 study as well; correct?  22 A. It's an issue, but I would say --  23 Q. I'm sorry, let me go back.  24 This issue of selection bias is an  25 issue of concern for McDuffie, the McDuffie</p>	<p style="text-align: right;">Page 225</p> <p>1 Q. And that is because there were only  2 eight cases and eight controls, I think, in  3 this study.  4 A. I don't remember the exact number,  5 but it was a very small number.  6 Q. Now, when Hardell -- Hardell has in  7 his analysis, he has a multivariate analysis  8 that he presents in this study; correct?  9 A. Yes.  10 Q. What confounders did Hardell adjust  11 for in his multivariate analysis?  12 A. I think he adjusted for exposure to  13 other herbicides or pesticides.  14 Q. Where do you see that in  15 Dr. Hardell's study?  16 A. "When risk estimates for different  17 pesticides are analyzed" --  18 Q. What page are you on?  19 A. 1045. The first paragraph.  20 Q. In 1045?  21 A. Top paragraph.  22 Q. Okay.  23 A. "When risk estimates for different  24 pesticides were analyzed, only subjects with  25 no pesticide exposure were taken as unexposed</p>

<p style="text-align: right;">Page 226</p> <p>1 whereas subjects exposed to other pesticides 2 were disregarded." 3 I'm assuming that means they were 4 excluded from analysis. 5 Q. They were excluded from the 6 definition of "unexposed." 7 A. I am not exactly sure what he 8 means, but -- 9 Q. What Dr. Hardell is stating here, 10 and this is a methodology that carries 11 through in all the Swedish studies, is that 12 their definition of "unexposed" excluded not 13 only individuals unexposed to glyphosate, but 14 individuals unexposed to any pesticide; 15 correct? 16 A. Correct. That's a different way 17 of -- that's a different way of adjusting for 18 herbicide exposure. 19 Q. Well, if you are taking out 20 information from the controls so that the 21 cases have exposures to glyphosate and 22 exposures to other herbicides, but the 23 controls don't have exposure to any 24 pesticides -- 25 A. No. I would assume then, you have</p>	<p style="text-align: right;">Page 228</p> <p>1 findings from two earlier case control 2 studies, one by Hardell and Eriksson and one 3 by Nordstrom; correct? 4 A. I'm sorry, I was still -- I was 5 still in the middle of this one. 6 Q. No, we're still with Hardell. 7 A. Yeah. 8 Q. The Hardell study, Exhibit 14-17, 9 pools the data from two earlier case-control 10 studies, one by Hardell and Eriksson and one 11 by Nordstrom; correct? 12 A. Yes, um-hum. 13 Q. And you do not discuss those 14 earlier case-control studies in your expert 15 report; correct? 16 A. Right. 17 Q. Is it fair to say once you pool 18 those studies into a larger study, it's the 19 later pooled study that provides all the data 20 relevant to a causation theme? 21 A. Yes. 22 Q. Let's turn to De Roos 2003, which 23 is the De Roos case-control study. And this 24 would be Exhibit 14-18. 25 (Exhibit 14-18, Integrative</p>
<p style="text-align: right;">Page 227</p> <p>1 to take them out of both groups. 2 Q. But it's not -- there is -- is 3 there anywhere where it's stated that they 4 take that out of both groups? 5 A. Kind of ambiguous. 6 Q. If in fact the Swedish case-control 7 studies defined unexposed so that there was 8 no exposure to any pesticide and allowed 9 other exposures, exposures to other 10 pesticides to occur with the glyphosate 11 exposed cases, that would be a methodological 12 flaw in the study; correct? 13 A. Probably, yes. 14 Q. That would make it impossible to 15 actually adjust for the potential impact of 16 other exposures; correct? 17 A. Yes. 18 Q. Now, the Hardell study pools the 19 findings from two other case-control studies, 20 an earlier study by Hardell and a study by -- 21 I don't know if I am getting this correctly. 22 Is it Nordstrom? Is that correct? 23 Dr. Neugut? 24 A. I'm sorry? 25 Q. The Hardell study 2002 pools the</p>	<p style="text-align: right;">Page 229</p> <p>1 assessment of multiple pesticides as risk 2 factors for non-Hodgkin's lymphoma among 3 men, Occup Environ Med 2003 marked for 4 identification, as of this date.) 5 Q. And the De Roos paper pools all of 6 the -- all of the prior North American -- I'm 7 sorry, U.S.-based case-control studies that 8 looked at glyphosate and non-Hodgkin's 9 lymphoma; correct? 10 A. Yes. 11 Q. And this De Roos study has -- 2003 12 case-control study, has the same latency 13 issue or problem that Dr. Ritz identified 14 with respect to the Cantor study; correct? 15 A. You mean that the cases were 16 diagnosed between '83 and '86? 17 Q. Well, if we look at the data from 18 the De Roos study, and it's on page -- table 19 two, page four of nine, and you will have to 20 actually look back to the study population, 21 because there are three different studies 22 that are pooled there. 23 A. Um-hum. 24 Q. But if you look at page one and 25 two, you will see the three different</p>

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1 populations, and when they were diagnosed.  
 2 Correct?  
 3 A. Yes.  
 4 Q. And so for Iowa and Minnesota and  
 5 Kansas, those exposures were between 1979 and  
 6 1983; correct?  
 7 A. Yes.  
 8 Q. And if you look at table two in  
 9 the -- and that is -- just to step back, that  
 10 is the problem that Dr. Ritz was highlighting  
 11 in the Cantor study; correct? Those dates of  
 12 exposure?  
 13 A. I don't recall what she was  
 14 highlighting, but that is an issue, yes.  
 15 Q. And if you look at table two in  
 16 De Roos 2003, the case control study, and you  
 17 look at the data that was included in the  
 18 analysis for the pesticides, roughly  
 19 82.6 percent of the cases would have been  
 20 diagnosed with non-Hodgkin's lymphoma between  
 21 1979 and 1983; correct?  
 22 A. Yes.  
 23 Q. And so, those exposures, those  
 24 cases, again, at the very earliest, the very  
 25 earliest, still could not have been exposed

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1 to glyphosate more than nine years prior to  
 2 their diagnosis; correct?  
 3 A. Yes.  
 4 Q. And so that did not come close to  
 5 the median ten-year latency period that  
 6 Dr. Ritz opined would be necessary to look  
 7 for a potential association between  
 8 glyphosate and non-Hodgkin's lymphoma;  
 9 correct?  
 10 A. Yes.  
 11 MR. TRAVERS: Objection, misstates  
 12 Dr. Ritz's testimony.  
 13 Q. And the remaining 17.4 percent of  
 14 the cases were diagnosed between June 1983  
 15 and June 1986; correct?  
 16 A. Are you talking about the Kansas  
 17 cases or --  
 18 Q. Yes. I'm sorry, the Nebraska  
 19 cases.  
 20 A. The Nebraska cases.  
 21 Q. Let me just confirm, so that the  
 22 record is clear, you can go back and look at  
 23 the study populations. And once you look at  
 24 that, am I correct in my understanding that  
 25 the remaining 17.4 percent of cases were

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1 diagnosed between June 1983 and June 1986?  
 2 A. Yes.  
 3 Q. So, even for these Nebraska cases,  
 4 they would not have had a median ten-year  
 5 latency period to examine with respect to  
 6 glyphosate and non-Hodgkin's lymphoma;  
 7 correct?  
 8 A. They would have had just barely ten  
 9 years.  
 10 Q. That would have been the maximum,  
 11 not the median; correct?  
 12 A. It's hard for me to figure out, but  
 13 if it was starting in '74 -- right? '75,  
 14 '74?  
 15 Q. Let's say -- we can talk about '74  
 16 or '75. I don't think it matters for this  
 17 question.  
 18 A. Um-hum.  
 19 Q. If the question is whether or not  
 20 there would be a median of ten years --  
 21 A. Oh, I see.  
 22 Q. -- of latency, which Dr. Ritz  
 23 identified --  
 24 A. So, I guess it would be about eight  
 25 years, seven or eight years.

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1 Q. Eight years would be maximum.  
 2 A. Okay.  
 3 Q. Correct?  
 4 A. Yes.  
 5 Q. It wouldn't be a ten-year median  
 6 latency, even for that smaller --  
 7 A. Yes.  
 8 Q. -- population; correct?  
 9 A. Yes.  
 10 Q. Now, de Roos 2003 --  
 11 A. And again, I'm not subscribing to  
 12 the ten-year -- I told you, I'm personally  
 13 not --  
 14 Q. You're agnostic.  
 15 A. I'm agnostic on the latency period.  
 16 Q. I understand.  
 17 A. But I respect my colleagues.  
 18 Q. Now, De Roos in the 2003 study  
 19 presents results for a logistic and a  
 20 hierarchal regression analysis; correct?  
 21 A. Yes.  
 22 Q. And those analyses are described on  
 23 page two of the De Roos 2003 study; correct?  
 24 The left-hand column, middle of the page  
 25 talks about statistical analyses?

1 A. Yes.  
 2 Q. And as explained in that  
 3 statistical analysis section, De Roos  
 4 controlled for other pesticide exposures in  
 5 the hierarchal regression analysis; correct?  
 6 A. Yes.  
 7 Q. Did not -- De Roos did not control  
 8 for these other pesticide exposures in the  
 9 logistic regression analysis; correct?  
 10 A. No.  
 11 Q. Again, the answer is unclear from  
 12 my question. Is it correct that Dr. De Roos  
 13 did not control for the other pesticide  
 14 exposures in the logistic analysis?  
 15 A. That's correct.  
 16 Q. Let's move on to the Lee study.  
 17 MR. LASKER: And this will be  
 18 Exhibit 14-19.  
 19 (Exhibit 14-19, Non-Hodgkin's  
 20 Lymphoma Among Asthmatics exposed to  
 21 Pesticides marked for identification, as  
 22 of this date.)  
 23 Q. So, Lee, the Lee study likewise  
 24 uses pooled data from the same case-control  
 25 studies in the United States; correct?

1 indication of a true difference; correct?  
 2 A. Yes.  
 3 Q. What sort of analysis would you  
 4 need to see to determine whether there has  
 5 been an actual meaningful difference between  
 6 two different groups in a study?  
 7 A. Well, there is an analysis called  
 8 effect modification, which is some kind of --  
 9 I'm not a statistician, but that analyzes for  
 10 whether the two analyses are statistically  
 11 different from each other. It's basically  
 12 looking at whether subgroups differ from each  
 13 other, and whether the fact that being  
 14 asthmatic would somehow make you more or  
 15 less, or being not asthmatic would somehow  
 16 make you somehow respond differently, let's  
 17 say, to an herbicide than being not --  
 18 than -- whether having asthma somehow plays a  
 19 role in your susceptibility to the exposure  
 20 vis-a-vis the outcome.  
 21 Q. So, if I understand correctly, as  
 22 an epidemiologist, when you see different  
 23 point estimates for different groups that are  
 24 being studied, to determine whether that is a  
 25 meaningful difference, you would like to see

1 A. Yes.  
 2 Q. So, Lee would have the same latency  
 3 issue as Cantor and De Roos 2003; correct?  
 4 A. Yes.  
 5 Q. The odds ratio I think you have  
 6 already noted for Lee for glyphosate was not  
 7 adjusted for exposure to other pesticides;  
 8 correct?  
 9 A. Yes.  
 10 Q. Now, in your report, you discuss  
 11 the fact that there was odds ratios provided  
 12 for glyphosate for non-asthmatics and then  
 13 for asthmatics; correct? Page 15 of your  
 14 expert report.  
 15 A. Yes.  
 16 Q. And there are different point  
 17 estimates of 1.4 and 1.2 that were found in  
 18 that study, but you state that there was no  
 19 evidence or no indication of an effect  
 20 modification in that study; correct?  
 21 A. Yes.  
 22 Q. So, the fact that you have point  
 23 estimates of odds ratios that are different,  
 24 that in and of itself, just a different  
 25 number, doesn't provide you with an

1 some sort of statistical analysis to see if  
 2 they are -- those two groups are  
 3 statistically significantly different;  
 4 correct?  
 5 A. Correct.  
 6 Q. Okay. I would like to refer you  
 7 back again to Dr. Ritz's report, at pages 15  
 8 to 16.  
 9 A. Dr. Ritz's report?  
 10 Q. Yes.  
 11 A. Which page?  
 12 Q. Pages 15 and 16. And at these  
 13 pages in Dr. Ritz's report, she is discussing  
 14 the findings of, as I call it, the North  
 15 American Pooled Project; correct?  
 16 A. You mean on the bottom of 15?  
 17 Q. And over to -- and continuing on to  
 18 page 16.  
 19 A. Okay.  
 20 Q. Now, the North American Pooled  
 21 Project was also discussed in Dr. Blair's  
 22 deposition, which you read; correct?  
 23 A. Yes.  
 24 Q. And the North American Pooled  
 25 Project pooled the data from all of the

<p style="text-align: right;">Page 238</p> <p>1 case-control studies in the United States and 2 Canada; correct? 3 A. I believe so, yes. 4 Q. So, the North American Pooled 5 Project contains all the data that is in 6 De Roos 2003 and then also the data in 7 McDuffie 2000; correct? 8 A. McDuffie -- 9 Q. 2001. 10 A. Yes. 11 Q. So, just like we talked about 12 earlier with Hardell, the NAPP analysis now 13 is a later study that pools all the data from 14 the earlier case-control studies, and that's 15 the study that you can look to for the most 16 up-to-date data from all those studies. 17 Correct? 18 A. I wouldn't know. 19 Q. As a general matter, if it is in -- 20 strike that. 21 If it is correct that the North 22 American Pooled Project has pooled the data 23 from the De Roos 2003 and McDuffie 2001 24 study, then that study would provide the most 25 fulsome information and would be the study</p>	<p style="text-align: right;">Page 240</p> <p>1 Dr. Blair testified, that the North American 2 Pooled Project pooled all the data from 3 McDuffie 2001 and De Roos 2003, then you 4 would no longer look at those earlier 5 studies, you would look at the pooled 6 analysis in the North American Pooled 7 Project, to determine whether that data 8 provides evidence of an association between 9 glyphosate and NHL; correct? 10 A. Since you are telling me this out 11 of a context that I don't know, I -- I -- 12 it's difficult for me to answer the question 13 with any degree of confidence. 14 Q. As a methodological question, 15 though, just so I am clear, when you have a 16 case-control study that pools data from 17 earlier case-control studies, you look at 18 that later pooled analysis; correct? That's 19 what you did in your report; correct? 20 A. That's what I did for those 21 particular studies. Whether I would do it 22 for this other study, I don't know. 23 Q. Do you agree with Dr. Ritz, and 24 maybe you just don't have an opinion, that 25 the findings in the North American Pooled</p>
<p style="text-align: right;">Page 239</p> <p>1 that you would look to for any conclusions 2 from all of those case-control studies; 3 correct? 4 A. Again, I -- since I haven't looked 5 at it and I don't know what it exactly did, I 6 wouldn't know. 7 Q. Okay. Well I'm not talking 8 about -- let me just back up. 9 So, we already talked about the 10 Hardell study and the fact that that pooled 11 two earlier studies, and so in your analysis, 12 you looked at the later pooled analysis from 13 Hardell 2002; correct? 14 A. Yes. 15 Q. And if in fact, and I will ask you 16 to assume, but you have read Dr. Blair's 17 deposition as well, the NAPP pooled the data 18 in De Roos 2003 and McDuffie 2001, then you 19 would look to that NAPP data for the -- to 20 analyze the full set of case-control 21 information from the North American 22 case-control studies; correct? 23 A. I'm sorry, say that last question 24 again. 25 Q. Okay. So, if it is correct, as</p>	<p style="text-align: right;">Page 241</p> <p>1 Project are relevant to the causation 2 analysis for glyphosate and non-Hodgkin's 3 lymphoma? 4 A. I have no way of knowing, since I 5 haven't looked at it, evaluated it or 6 assessed it. Aside from what I read in the 7 transcript from Dr. Blair, I think, I really 8 don't have any knowledge or information about 9 it. 10 Q. You are aware that the findings 11 from the North American Pooled Project have 12 been presented at a number of scientific 13 conferences; correct? 14 A. I know they were presented at the 15 one meeting. I don't know that they keep 16 repeating the same data at different 17 meetings. That is not usually considered 18 kosher. 19 Q. And why is it not considered kosher 20 to keep -- 21 A. To keep presenting the same data 22 over and over again? 23 Q. Yes. 24 A. It's like, you know -- I guess 25 that's like repeat publications, you know. I</p>

<p style="text-align: right;">Page 242</p> <p>1 mean, I'm not criticizing them. I'm simply 2 saying, you know, you don't usually publish 3 the same thing over and over again. Repeat 4 publications. 5 There may be different meetings 6 where, you know, under different 7 circumstances, where, with modifications, you 8 know, and updates, different analyses are 9 included, updated, variations. 10 I'm not criticizing other 11 scientists. I'm simply saying you wouldn't 12 just repeat -- you wouldn't do the same thing 13 several times at different places. That 14 would be -- you know, it would be like -- I 15 don't know what word to use. It would be -- 16 it would be like publishing the same thing 17 two different places. You would get two 18 publications out of one, you know. 19 Q. So, in her expert report, Dr. Ritz 20 only discusses the odds ratios found by the 21 NAPP before it adjusted for the use of other 22 pesticides; correct? 23 A. Shall I read her paragraph? Is 24 that -- 25 Q. You don't know one way or the</p>	<p style="text-align: right;">Page 244</p> <p>1 with respect to this study. Correct? 2 A. A while ago, but yes. 3 Q. And if I could ask you to turn 4 to -- and I will represent to you that this 5 slide deck is for the same conference, the 6 ISEE conference in Brazil, that Dr. Ritz is 7 discussing in her expert report. On page 15, 8 she talks about the presentation of ISEE. 9 Do you see that? 10 A. Yes. 11 Q. So, the -- on the ninth -- 12 unfortunately, they are not numbered. If you 13 could count nine pages into the slide 14 presentation, there is a data table of 15 glyphosate use and NHL risks. 16 Do you see that? 17 A. It's two-sided. 18 Q. It's open, pointing up. Right 19 there? 20 A. This one? 21 Q. Yeah. 22 MR. TRAVERS: Eric, just to 23 clarify, do you recall which exhibit this 24 was from the Blair deposition? 25 MR. LASKER: I do not, I'm sorry.</p>
<p style="text-align: right;">Page 243</p> <p>1 other? 2 A. The question is, what does she say? 3 Q. The question is what she reported, 4 whether she reported adjusted odds ratios or 5 unadjusted odds ratios for other pesticide 6 exposures. 7 MR. ADLER: You mean Dr. Ritz? 8 MR. LASKER: Dr. Ritz. 9 A. So, I can't tell. She doesn't say. 10 She doesn't say what it's adjusted for. 11 Q. Let's -- I'm going to have you take 12 a look at the next exhibit in line, and this 13 was -- 14 MR. LASKER: We will mark this as 15 Exhibit 14-20. 16 (Exhibit 14-20, An Evaluation of 17 Glyphosate Use and the Risk of 18 Non-Hodgkin Lymphoma Major Histological 19 Sub-Types in the North American Pooled 20 Project marked for identification, as of 21 this date.) 22 Q. And Dr. Neugut, this is a slide 23 presentation that was marked as an exhibit in 24 Dr. Blair's deposition, and I believe you 25 read his testimony about the data presented</p>	<p style="text-align: right;">Page 245</p> <p>1 Q. This table presents an ever/never 2 overall odds ratio for glyphosate and NHL; 3 correct? Both for NHL in total and for 4 various subtypes; correct? 5 MR. TRAVERS: I'm just going to 6 object. He hasn't relied on this for his 7 expert opinion and hasn't previously 8 reviewed any of this data. 9 A. What he said. 10 Q. Okay. Just so I am clear, I know 11 you haven't looked at this before, but I'm 12 asking you, the data presented there -- 13 A. Yes. 14 Q. -- is from the North American 15 Pooled Project for glyphosate use and NHL 16 risks overall and for various subtypes; 17 correct? 18 A. Yes. 19 Q. And for the overall odds ratio, 20 they present one odds ratio that is not 21 adjusted for other pesticide exposures; 22 correct? That is ORA. 23 A. Yes. 24 Q. And then another odds ratio, or 25 ORB, that is adjusted for the use of 2,4-D,</p>

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1 dicamba and malathion; correct?  
 2 A. Yes.  
 3 Q. For ever/never use, the odds ratio  
 4 for glyphosate and non-Hodgkin's lymphoma,  
 5 after adjusting for exposure to 2,4-D,  
 6 dicamba and malathion, is 1.13 and it is not  
 7 statistically significant; correct?  
 8 A. Yes.  
 9 Q. So, the NAPP, for its adjusted odds  
 10 ratio, pooling all the case-control data from  
 11 North America, had a null finding for  
 12 ever/never glyphosate use and non-Hodgkin's  
 13 lymphoma; correct?  
 14 A. Had a positive but null finding,  
 15 yes.  
 16 Q. We talked earlier about your  
 17 definition of "positive." Under your  
 18 definition we talked about this morning, the  
 19 North American Pooled Project, pooling all of  
 20 the data from the De Roos 2003 and the  
 21 McDuffie 2001 study, adjusted for use of  
 22 other pesticides, had a null finding for  
 23 glyphosate and non-Hodgkin's lymphoma;  
 24 correct?  
 25 MR. TRAVERS: Objection, misstates

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1 his prior testimony.  
 2 Q. That's correct?  
 3 A. Yes.  
 4 Q. If you could turn to -- and this is  
 5 the slide that is the third slide from the  
 6 end of the entire deck, so go to the end of  
 7 the slide deck and count sort of three from  
 8 the end. You will see another table. It  
 9 says "Proxies versus Self-Respondents." It  
 10 looks, Dr. Neugut, like this. Just go to  
 11 very end of the study, and then count back.  
 12 There you go. Do you see that?  
 13 So, here we see the results of the  
 14 North American Pooled Project for this  
 15 dose-response analysis, and they have  
 16 duration, they have frequency, and they have  
 17 lifetime days; correct?  
 18 A. Yes.  
 19 Q. So, the frequency is the measure  
 20 that McDuffie reported just for Canada, and  
 21 now we have the full pooled dataset.  
 22 McDuffie reported frequency in her study;  
 23 correct?  
 24 A. McDuffie reported --  
 25 Q. Frequency, days per year.

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1 A. Yes.  
 2 Q. We now have, with the North  
 3 American Pooled Project pooling all of that  
 4 data together, we have information on  
 5 cumulative exposures, which multiplies  
 6 frequency by duration; correct?  
 7 A. Yes.  
 8 Q. So, that doesn't have the potential  
 9 misclassification issue for dose-response  
 10 that we talked about in McDuffie; correct?  
 11 A. Correct.  
 12 Q. And when you look at the complete  
 13 pooled data from McDuffie and from De Roos  
 14 2003, for this cumulative exposure  
 15 measurement, glyphosate does not show  
 16 evidence of a dose-response; correct?  
 17 A. Which line are you looking at?  
 18 Q. The bottom line, lifetime days.  
 19 That would be cumulative exposure; correct?  
 20 Duration times frequency.  
 21 A. Yes. It doesn't show, um-hum.  
 22 Q. So, just to be clear, the complete  
 23 data pooled from McDuffie and from De Roos  
 24 2003 for cumulative exposure to glyphosate,  
 25 does not provide evidence of a dose-response;

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1 correct?  
 2 A. I wouldn't go that far. I mean,  
 3 you have the frequency showing -- showing a  
 4 relationship.  
 5 Q. Again, let me -- let me state the  
 6 question again.  
 7 You have -- you have duration, you  
 8 have frequency, and you have lifetime days;  
 9 correct?  
 10 A. Yes.  
 11 Q. And lifetime days, that is a  
 12 cumulative exposure measure of the type that  
 13 you used in that study in Long Island;  
 14 correct?  
 15 A. So, you know, you don't know what  
 16 is the right association or the right -- the  
 17 variable to use in any given analysis. To  
 18 say because you did it in that study in 2006,  
 19 that's what you should be doing in this study  
 20 in 2017, or that they should be doing with a  
 21 different outcome, that's-- that's foolish.  
 22 Q. Let me ask this question, and let's  
 23 see if I can get a clear answer.  
 24 For cumulative exposure --  
 25 A. Hmm?



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1 Q. For cumulative exposure --  
 2 A. Right.  
 3 Q. -- the complete pool of data from  
 4 McDuffie and from De Roos 2003 does not show  
 5 evidence of a dose-response for glyphosate  
 6 and non-Hodgkin's lymphoma; correct?  
 7 A. So, cumulative exposure as measured  
 8 this way, and as they analyzed it here, and  
 9 as I am not seeing in a fully published  
 10 report that is peer reviewed in a journal,  
 11 and as I am not having the ability to analyze  
 12 it carefully, then yes, as you are showing it  
 13 to me in this table, you are correct. But to  
 14 say that this is the be all and end all of  
 15 everything is not -- not fair.  
 16 Q. Just to be clear, the North  
 17 American Pooled Project pooled together all  
 18 the data from McDuffie and from De Roos 2003;  
 19 correct?  
 20 A. I don't know. I told you I haven't  
 21 had a chance to look at it, and you are  
 22 giving it to me now for the first time to  
 23 look at in a slide like this. I didn't even  
 24 get to hear the speaker say it out loud or go  
 25 to Brazil. So, to -- you know.

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1 Q. Dr. Neugut, you did have the  
 2 opportunity to read Dr. Blair's deposition  
 3 testimony when he talked about these  
 4 findings; correct?  
 5 A. But they weren't published, and I  
 6 didn't consider them in my report.  
 7 Q. You had the opportunity to review  
 8 these findings, if you wanted to. They were  
 9 exhibits to Dr. Blair's deposition.  
 10 A. They weren't published.  
 11 Q. You considered unpublished data for  
 12 these plaintiffs' attorneys, as an expert  
 13 witness --  
 14 A. I told you that was under other  
 15 circumstances and a different context. To  
 16 bring it now into this is a different issue.  
 17 Here we are considering a different question  
 18 under different circumstances.  
 19 Q. And you made a decision not to  
 20 consider the data in the North American  
 21 Pooled Project or in the 2013 AHS analysis  
 22 after reading Dr. Blair's deposition, but  
 23 without actually yourself looking at the  
 24 data; correct?  
 25 A. Yes.

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1 Q. So, after reviewing Dr. Blair's  
 2 deposition and his testimony of the findings  
 3 of those -- of the North American Pooled  
 4 Project and the 2013 AHS data --  
 5 A. Wait. I'm sorry. You are  
 6 mischaracterizing my statement. I didn't  
 7 look at the answers and then say I'm not  
 8 going to include it. A priori, I didn't  
 9 include anything that wasn't published.  
 10 The fact that he then happened to  
 11 then -- I happened to then read his  
 12 transcript, and in his transcript there was a  
 13 characterization or description of  
 14 unpublished data didn't then come into --  
 15 didn't then -- I didn't then say, oh, look at  
 16 that, I'm now not going to include that  
 17 because it either bears on or doesn't bear  
 18 on. The decision up front was not to include  
 19 unpublished data, up front.  
 20 Q. Were you aware prior to reading  
 21 Dr. Blair's deposition that there was  
 22 additional data from the Agricultural Health  
 23 Study?  
 24 A. No.  
 25 Q. Were you aware prior to reading

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1 Dr. Blair's deposition that there was  
 2 additional data that had been presented in  
 3 scientific --  
 4 A. No, I wasn't aware of the NAPP  
 5 study.  
 6 Q. -- conferences from the North  
 7 American Pooled Project?  
 8 A. No, I was not, but as I said in my  
 9 report, my takeoff for this entire evaluation  
 10 was from the original IARC study, and I have  
 11 tried to follow the -- take that as my --  
 12 Q. I understand.  
 13 A. My, shall we say takeout point, and  
 14 to follow the guidelines of IARC and to stick  
 15 more or less closely or reasonably to, to  
 16 whatever their characterization has been, and  
 17 I have -- and -- and if things have been  
 18 published subsequent to that, that's been  
 19 fair to include, and I have reviewed whatever  
 20 publications, et cetera, have emanated  
 21 subsequent to that, peer-reviewed, et cetera.  
 22 But I have followed the IARC  
 23 guidelines, and I state that in my -- I  
 24 believe somewhere in my report, or say  
 25 something to that effect, and I have stuck to

1 that, and --  
 2 Q. That wasn't clear to me, so let  
 3 me --  
 4 A. And I have been -- I believe I have  
 5 tried to be consistent with that. If  
 6 subsequently there were other unpublished  
 7 things, and I -- it is stated specifically in  
 8 my report, and I -- I believe, and I have  
 9 tried to adhere to that, and if you want to  
 10 say that in a different litigation, that  
 11 wasn't the rules or that I in one particular  
 12 unpublished thing -- again, as I say, I  
 13 believe that was an error on my part, because  
 14 I misunderstood that particular follow-up  
 15 study, but that's a different issue.  
 16 But -- but in general, I think  
 17 peer-reviewed published things should be, you  
 18 know, the name of the game.  
 19 Q. Let me just make sure I understand  
 20 your testimony then, because I didn't  
 21 appreciate this.  
 22 Am I correct then in my -- let me  
 23 just ask the question. Am I correct then in  
 24 my understanding, Dr. Neugut, that in  
 25 assessing the epidemiological evidence for

1 this case, for glyphosate and non-Hodgkin's  
 2 lymphoma, you followed the methodology that  
 3 is used by IARC?  
 4 A. I don't want to say I got 17 people  
 5 together and put them in a room and, you  
 6 know, talked to them that way.  
 7 Q. Fair enough.  
 8 A. But I tried to adhere -- since I --  
 9 I believe that they are the most  
 10 authoritative and reasonable way to do this,  
 11 they were certainly the takeoff point. They  
 12 were what initially, shall I say, convinced  
 13 me or persuaded me that glyphosate and NHL  
 14 had an association, and I have tried -- at  
 15 least insofar as trying to subsequently form  
 16 opinions in this case, since IARC was the  
 17 original platform from which this all  
 18 emanated, I have tried to adhere to their  
 19 criteria and methodologies for establishing,  
 20 I guess what I would consider to be public  
 21 policy, as well as judgments with regard to  
 22 this issue.  
 23 Q. Okay. So just -- that's fair. So,  
 24 I understand then that for your expert  
 25 opinion in this case, you have, in analyzing

1 the epidemiological literature, sought to  
 2 adhere to the preamble and the guidelines as  
 3 to how that data would be considered by IARC;  
 4 correct?  
 5 A. Yes. I mean, if I may have  
 6 deviated or made a few mistakes along the  
 7 way, a couple of mistakes, you know, in  
 8 interpreting a couple of the papers, that is  
 9 on my head, but -- and if I -- I may make  
 10 errors. I'm human, too. But then, that's on  
 11 me, but -- but I have tried to follow that  
 12 methodology, because I think it is a  
 13 reasonable one, and I think it's a correct  
 14 one for public policy.  
 15 Q. Okay. And for other cases, where  
 16 you were not starting off with an IARC  
 17 monograph, you employed a different  
 18 methodology for reaching a causation opinion  
 19 from epidemiological studies. Is that fair?  
 20 A. Not necessarily. I mean, as I say,  
 21 I am not sure in the Actos case that I didn't  
 22 make an error with regard to the particular  
 23 instance where you pointed it out. I think I  
 24 misread -- I think I may have  
 25 mischaracterized the follow-up data there. I

1 think I thought -- there was a fourth  
 2 follow-up, and I think I thought, given how  
 3 it was presented to me, I thought it was  
 4 actually a publication.  
 5 If you would have seen -- I mean,  
 6 this is a couple of years ago. I believe  
 7 that the way the fourth -- that was the  
 8 fourth follow-up to a large cohort study, and  
 9 I believe the way it was presented to me, it  
 10 looked to me like a publication, and I  
 11 believe at the time I thought it was actually  
 12 a publication.  
 13 But putting that aside, I don't  
 14 know that I was -- that I actually had a  
 15 different attitude at the time, but it may  
 16 well be that under other circumstances, I  
 17 might use a different approach, depending on  
 18 the context or the circumstances and whatever  
 19 it might demand in a certain case.  
 20 Q. And let's just take it outside of  
 21 litigation altogether. When you are doing an  
 22 epidemiological analysis as part of your  
 23 independent scientific research, do you  
 24 follow the IARC methodology then, or do you  
 25 have other methodologies that you use for

1 your independent assessments?

2 A. It depends on the context. Again,  
3 for the purposes of public policy, and where  
4 you are making true public health or issues  
5 that affect standard of care, public people,  
6 public health, et cetera, then I think you  
7 have to adhere strictly to peer -- the IARC  
8 rules and public policy, peer-reviewed  
9 things.

10 If I am sitting around trying to  
11 decide how to do my next study, then I can  
12 have more informality and look at things that  
13 are not necessarily published. When I am  
14 talking to my peers or to my schleppers or  
15 to -- you know, to my students, and we are  
16 looking at someone down the hall has data, so  
17 obviously that is not published, and we are  
18 looking at someone's data from down the hall,  
19 to look at, so then I have -- I am entitled  
20 to do whatever I want to do, but then I am  
21 not also publishing it in the public sphere  
22 necessarily.

23 But occasionally, of course, you do  
24 publish -- even in peer-reviewed  
25 publications, you might publish something and

1 say it's un- --

2 Q. Referring to unpublished data?

3 A. You may refer to unpublished data,  
4 but then you say that it is, but then it  
5 doesn't carry the same weight. It doesn't  
6 carry the same weight, and it's subject to  
7 criticism, and you can never be certain about  
8 it, and it doesn't have the same veracity or  
9 the same, you know, confidence, et cetera.

10 And as I have said, I have had my  
11 own articles. You know, I once thought I had  
12 the solution to colon cancer, you know, which  
13 got turned down by 12 journals in a row, and  
14 before I finally got through my head that it  
15 really was wrong.

16 MR. LASKER: Well, that's -- we are  
17 running out of tape, so why don't we take  
18 a break here, because the tape is going  
19 to run out, and if it's not being taped,  
20 it doesn't actually count.

21 So, let's take a break and we'll  
22 start again.

23 THE VIDEOGRAPHER: The time is  
24 3:36 p.m. We are off the record.

25 (Recess taken.)

1 THE VIDEOGRAPHER: The time is  
2 3:42 p.m. We are on the record.

3 BY MR. LASKER:

4 Q. Dr. Neugut, I just want to follow  
5 up on something you said before we went on  
6 the break. I first want to put my microphone  
7 on, and then I'm going to say it again.

8 Before we took a break, you were  
9 talking about reaching or conducting  
10 assessments for public policy, public health  
11 issues; correct? I think that was one of the  
12 things you mentioned. Where you are trying  
13 to reach an assessment for public health  
14 determination, you would follow the IARC  
15 criteria; correct?

16 A. Yes.

17 Q. And part of this public health  
18 analysis that you are doing is intended to  
19 provide a level of precaution for  
20 populations; correct?

21 A. Yes.

22 Q. And there is something called the  
23 precautionary principle. You are familiar  
24 with that?

25 A. No.

1 Q. Now, you also, though, in other  
2 contexts would do an assessment of a  
3 potential causal inference where you are not  
4 looking at a public health question, but you  
5 are trying to zero in on a scientific  
6 assessment of what the true answer is, as  
7 opposed to what it might be; correct?

8 A. Possibly.

9 Q. When you are conducting an  
10 assessment of the epidemiological literature  
11 for this other purpose, for a scientific  
12 assessment, to dig down and be able to reach  
13 a scientific as opposed to a public health  
14 conclusion, you might have a different  
15 methodology that you would use. Is that fair  
16 to say?

17 A. Possibly.

18 Q. With respect to the -- I just have  
19 one more question on --

20 A. I might add to that, that we are  
21 not in a scientific context here either.  
22 Here we are -- we are in a legal context, and  
23 the rules for the law are different than the  
24 rules for science. And I am not a lawyer.

25 But, for example, you know, when --

1 when IARC says that something is a probable  
 2 carcinogen, that is well beyond what would be  
 3 legalese, in my -- in my unexpert opinion,  
 4 that would be well beyond what would be  
 5 sufficient to define a causal association for  
 6 legal purposes. So, if we are going to start  
 7 fooling around with definitions of different  
 8 causal definitions, based on different  
 9 contexts, then you are going to have to  
 10 change -- you are going to have to define  
 11 what context we are standing in, to be able  
 12 to define what are the rules by which we are  
 13 going to play the game.

14 Q. Okay. And it would be fair then  
 15 for me to understand that you have followed a  
 16 methodology in this case that is not a  
 17 methodology that would be as -- what one  
 18 would do for purposes of science, but is one  
 19 that you -- in your understanding, is  
 20 sufficient for purposes of the legal question  
 21 in this case. Is that fair?

22 A. I would say, if anything, it's  
 23 more -- it's more rigorous than would be  
 24 necessary for legal purposes, because again,  
 25 the IARC rules are -- in my understanding,

1 are beyond -- are more stringent than legal  
 2 rules.

3 Q. And that understanding has --

4 A. That's my understanding, not as a  
 5 lawyer, as a, I don't know, scientist or  
 6 academic.

7 Q. And that understanding has helped  
 8 determine how you approached the question  
 9 of -- in your analysis of the epidemiological  
 10 literature for this case.

11 A. I am approaching it from that  
 12 perspective here. Again, whether that  
 13 applies or does not apply for your purposes  
 14 or for their purposes, or in the context of  
 15 cases when they come up in subsequent  
 16 litigation, is different, and if  
 17 modifications will then be necessary in terms  
 18 of how to use unpublished data or things like  
 19 that, it -- because we'll then be in a  
 20 different context or different framework,  
 21 that may or may not be necessary or  
 22 reasonable.

23 Q. Understood.

24 So, I just want to finish up,  
 25 though, on the NAPP slide deck, which is

1 Exhibit 14-20, because we were looking at the  
 2 third page from the end, this proxies versus  
 3 self-respondents, and there was another  
 4 column here that I want to ask you about,  
 5 because they have the results for proxy and  
 6 self-respondents, and then they have a  
 7 separate column that is self-respondents  
 8 only. Do you see that?

9 A. Yes.

10 Q. And do you agree with Dr. Blair,  
 11 and he testified to this in his deposition,  
 12 we can look at it if you would like, that in  
 13 epidemiological analyses, information  
 14 provided by cases are generally considered  
 15 more reliable than information provided by  
 16 proxies?

17 A. Yes.

18 Q. So, when the NAPP investigators  
 19 focused on the data without proxies and cases  
 20 only, or the pooled data from McDuffie and  
 21 De Roos 2003, they found an ever-never odds  
 22 ratio for glyphosate and non-Hodgkin's  
 23 lymphoma of 0.95; correct?

24 A. Yes.

25 Q. And so, this most reliable odds

1 ratio for ever-never use of glyphosate from  
 2 the U.S. and Canadian case-control studies is  
 3 to the left, if you will, of the null finding  
 4 or below 1.0; correct?

5 MR. TRAVERS: Objection to form.

6 A. Well, you know, you give up  
 7 something when you -- that's true, but you're  
 8 also -- it means you have more empty spaces,  
 9 too. You have more unanswered -- I don't  
 10 know that -- again, as I said before, I don't  
 11 know this data. I'm not looking at tables.  
 12 That means there is going to be more empty  
 13 boxes in your -- there are going to be more  
 14 non-respondents in both the cases -- in the  
 15 cases and the controls, so you have given up  
 16 something as well.

17 Q. Power. You have given up some  
 18 power; correct?

19 A. It goes beyond power. It goes --  
 20 again, we were talking before about random  
 21 classification. You have empty cells.  
 22 It's -- there is -- nothing is free.

23 Q. But as between proxy and  
 24 self-respondent data, and self-respondent  
 25 data alone, you can have, at least with

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1 respect to the information reported, more  
 2 confidence in the data that is reported by  
 3 the respondents; correct?  
 4 A. The validity of the data is better.  
 5 Q. And you are aware that the North  
 6 American Pooled Project has published in the  
 7 peer-reviewed literature its findings for the  
 8 U.S. and Canadian case-control studies for  
 9 glyphosate and multiple myeloma; correct?  
 10 A. I know they published some of their  
 11 results. I don't know offhand specifically  
 12 which. I will take your word for it.  
 13 Q. And you are aware that the  
 14 Agricultural Health Study has also published  
 15 its findings, updated findings, for other  
 16 types of pesticides and non-Hodgkin's  
 17 lymphoma; correct?  
 18 A. Yes.  
 19 Q. And sitting here today, you cannot  
 20 say that any of the methodologies that were  
 21 used in the 2013 AHS data that we discussed,  
 22 or in this North American Pooled Project  
 23 slide deck that we just discussed for  
 24 glyphosate and non-Hodgkin's lymphoma,  
 25 differs from the methodologies that were used

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1 in these peer-reviewed published studies;  
 2 correct?  
 3 A. Correct.  
 4 Q. Let's look at the Eriksson study.  
 5 I know we have looked at it before, but I  
 6 have a few more questions.  
 7 A. Eriksson?  
 8 Q. Eriksson, and I don't know what  
 9 number that is. 14-13.  
 10 Now, this is also, like the  
 11 McDuffie study, an exploratory analysis;  
 12 correct?  
 13 A. Exploratory meaning that they did  
 14 not start off with a particular specific  
 15 pesticide or herbicide in mind to test, if  
 16 that's what you mean.  
 17 Q. Correct.  
 18 A. Is that what you mean?  
 19 Q. Yes.  
 20 A. Yes.  
 21 Q. And in your expert report, you  
 22 state that the odds ratios in this study were  
 23 adjusted to account for possible confounding  
 24 from use of other pesticides; correct? It's  
 25 page 16 of your report, if that helps.

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1 A. Yes.  
 2 Q. Now, in fact, the only adjusted  
 3 odds ratio -- the only odds ratio that is  
 4 reported in Eriksson that was controlled for  
 5 the bounding by other pesticides is in that  
 6 single table seven on page 1661 of the study;  
 7 correct? Where they have the multivariate  
 8 findings.  
 9 A. Yes.  
 10 Q. So, none of the other odds ratios  
 11 reported in Eriksson, other than that  
 12 multivariate odds ratio reported in table  
 13 seven, are adjusted for confounding by other  
 14 pesticides; correct?  
 15 A. That's correct.  
 16 Q. And if I could direct you to page  
 17 1658, in the left-hand column, all the way to  
 18 the bottom, when they are talking about their  
 19 statistical methods. Do you see that?  
 20 A. Yes.  
 21 Q. And the last three lines on that  
 22 column, in the univariate analysis, and that  
 23 is the analysis that they use in presenting  
 24 all the other odds ratios in this report;  
 25 correct?

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1 A. Yes.  
 2 Q. In the univariate analysis,  
 3 different pesticides were analyzed  
 4 separately, and the unexposed category  
 5 consisted of subjects that were unexposed to  
 6 all included pesticides.  
 7 Do you see that?  
 8 A. Yes.  
 9 Q. That was the same issue we saw in  
 10 the Hardell 2002 study; correct?  
 11 A. I don't recall, but okay.  
 12 Q. And that is, as you testified with  
 13 respect to Hardell, a methodological flaw,  
 14 because it prevents any analysis that  
 15 accounts for other pesticide exposures;  
 16 correct?  
 17 A. I'm not following.  
 18 Q. If the unexposed category is  
 19 defined as individuals unexposed to all  
 20 included pesticides, and the exposed category  
 21 for glyphosate can include individuals with  
 22 glyphosate exposures who were also exposed to  
 23 other pesticides, that is a methodological  
 24 flaw in the study; correct?  
 25 A. Why?

1 Q. Because in a case-control study,  
2 you are trying to pull populations of exposed  
3 individuals from the same population. You  
4 want to have the controls be from the same  
5 population as the cases; correct?

6 A. But that's not a flaw in the study.  
7 That is simply the reality of the universe  
8 and of people in the population. I mean,  
9 people are exposed or they are unexposed.

10 Q. Well, I understand that. But if  
11 you are defining "unexposed" to exclude  
12 individuals with exposures to other  
13 pesticides, and you are not doing that for  
14 the cases --

15 A. Then that would mean then that --  
16 so, so that essentially what you are saying  
17 then is, if I may analogize, if you want  
18 to -- let's say we took asbestos and  
19 cigarette smoking and lung cancer --

20 Q. Sure?

21 A. -- as an analogy, and I said I  
22 wanted to know what the effect of asbestos  
23 was on lung cancer, but I wanted to control  
24 for tobacco use, so I could only take  
25 cigarette smokers, I would have to have

1 we say, the methodologically appropriate and  
2 sound way to do it.

3 Q. Okay.

4 A. As opposed to, let's say, taking  
5 people who live on -- in the 10021 area code,  
6 where they are never going to see, you know,  
7 herbicides in any meaningful way, as the  
8 control group for farmers, so to speak. So,  
9 you want to take everybody, let's say, being  
10 a farmer, where everybody has an equal chance  
11 of being exposed to herbicides.

12 Now, it may well turn out that in  
13 one particular farmer or that some group of  
14 farmers isn't going to use herbicides,  
15 because they are organic --

16 Q. Understood, understood.

17 A. -- or something like that. So,  
18 that's fine. They're still -- they're still  
19 fine. They're still in the thing. To say  
20 that therefore, they are screwing up your  
21 study in some methodological way is not fair.  
22 That's -- if that's what you are implying,  
23 then --

24 Q. No. I think you are  
25 misunderstanding me.

1 everybody be a smoker both in the case group  
2 and the control group, because if I had  
3 someone who wasn't exposed to cigarette  
4 smoking, I wouldn't know what to do with  
5 them.

6 Q. No, I think it would be a little  
7 bit --

8 MR. TRAVERS: He is still talking,  
9 I think.

10 A. No, I was finished.

11 Q. It would be a little bit different,  
12 I guess. If you were to do a study of  
13 asbestos and tobacco, smokers, and you had  
14 for your exposed group individuals with  
15 exposure to asbestos who might be exposed to  
16 cigarettes, but for your unexposed group you  
17 excluded anybody who had exposure to  
18 cigarettes, as a definition, that would be a  
19 problem; correct?

20 A. I don't agree. I mean, I think the  
21 best you can do is, you can put the exposures  
22 in everybody's way. You know, you can take a  
23 group where everyone has got an equal chance  
24 of being exposed to all the exposures.  
25 That's the way to do a -- that's the, shall

1 A. Then I am misunderstanding you.

2 Q. Let's go back to this.

3 The statement in the Eriksson study  
4 is that for the unexposed category, for the  
5 unexposed group --

6 A. Unexposed to herbicides.

7 Q. Well, the unexposed for glyphosate  
8 would be unexposed to glyphosate; correct?

9 A. But I think here they are talking  
10 about unexposed to any pesticide.

11 Q. Right.

12 So, each of the different  
13 pesticides was analyzed separately, so you  
14 look at a group that was exposed to that  
15 pesticide, and you are looking at, as your  
16 unexposed group, an individual that is not  
17 exposed to any pesticides. So, there you  
18 have farmers --

19 A. But he is a farmer and he chose not  
20 to be exposed. That was his -- that's life.  
21 That's his lifestyle or whatever choice.

22 Q. Well, no, I understand if they  
23 happen to have somebody who is not exposed.  
24 That is one thing. But here, in order to be  
25 part of the analysis, they define "unexposed"

1 as requiring that there is no exposure to  
 2 other pesticides; correct? That's what  
 3 Eriksson is stating here.  
 4 A. The unexposed were not exposed to  
 5 other pesticides, yes.  
 6 Q. Any pesticides.  
 7 A. Any pesticides, right.  
 8 Q. So, that would be taking a  
 9 non-farmer and putting them in the exposed  
 10 group --  
 11 A. No.  
 12 Q. -- and having a farmer in the  
 13 exposed group.  
 14 A. I don't agree. It would be taking,  
 15 as I said, a farmer who wasn't exposed to  
 16 pesticides. Well, I don't know. What was  
 17 the control group? Maybe I am -- maybe I am  
 18 misunderstanding what the control group is  
 19 here.  
 20 Q. Well, let me --  
 21 A. Oh, I see. These are just general  
 22 population controls. Okay. So, these are  
 23 people who are not exposed to any pesticides,  
 24 yeah.  
 25 Q. If the analysis or case-control

1 A. And no other herbicide.  
 2 Q. Okay. So, if the exposed group is  
 3 glyphosate and no other pesticide --  
 4 A. Correct.  
 5 Q. -- and the unexposed group is no  
 6 pesticide, that's fine.  
 7 A. Correct. That's legal. That's,  
 8 that's -- that is -- wrong word. That's --  
 9 Q. Allowed.  
 10 A. Allowed.  
 11 Q. If the exposed group, though, is  
 12 exposure to glyphosate and other pesticides,  
 13 then it would not be proper to --  
 14 A. Correct.  
 15 Q. -- define "unexposed" as having no  
 16 pesticide exposures.  
 17 A. Absolutely right.  
 18 Q. And if that's what was done in the  
 19 Eriksson study, that would be a flaw.  
 20 A. Right. And, you know, recognizing  
 21 that you're -- what word would I use --  
 22 manipulating or playing with the data to some  
 23 degree or -- and since, as you said at the  
 24 beginning when we picked up this paper, this  
 25 is an exploratory study, the term -- that is

1 study allows for exposure to other pesticides  
 2 when you are measuring, let's say glyphosate,  
 3 as an exposed case, you can have somebody who  
 4 is exposed to glyphosate and also exposed to  
 5 2,4-D and malathion, but for your control --  
 6 for your unexposed, I'm sorry, you are not  
 7 allowing them to be counted if they have  
 8 exposures to any pesticide. Then your  
 9 unexposed population now is not the same  
 10 population as your exposed population;  
 11 correct? You are drawing from different  
 12 populations now.  
 13 A. So, but you are allowed to do that  
 14 as long as you create the same condition for  
 15 both the cases and the controls. So,  
 16 therefore, you could specify that, if you  
 17 also specify that the case group cannot be  
 18 exposed to any other herbicide.  
 19 Q. If you define "unexposed," though,  
 20 as not allowing for exposures to any other  
 21 pesticides at all --  
 22 A. Except for glyphosate.  
 23 Q. No. The unexposed would be none.  
 24 The exposed group would have glyphosate and  
 25 others.

1 precisely what an exploratory study is all  
 2 about. It allows you to explore to see  
 3 what's going on and to do sort of the  
 4 subgroup analyses to see what happens if you  
 5 do this or if you do that, as long as you  
 6 adhere to some reasonable guidelines to make  
 7 everything kind of logical and  
 8 commonsensical, and not be too biased, if you  
 9 will, in terms of how you play the data or  
 10 play the subgroups against each other.  
 11 Q. And so, for all of the analyses  
 12 that are reported in Eriksson, other than  
 13 that one multivariate analysis on table  
 14 seven, they have used this methodological  
 15 design that you need to keep in mind and  
 16 might be okay for an exploratory analysis; is  
 17 that correct?  
 18 A. I think that's fair, yes. Wait.  
 19 Are we still in -- wait. Is this the first  
 20 one?  
 21 Q. Eriksson two thousand and --  
 22 A. Yes.  
 23 Q. -- eight.  
 24 But in analyzing Eriksson 2008, you  
 25 would also want to be aware of the fact that

<p style="text-align: right;">Page 278</p> <p>1 because of the way they defined the unexposed 2 population, that that creates an issue as far 3 as how you can actually analyze the findings 4 in the study; correct? 5 A. You can interpret, I would say. 6 Q. Why don't we just put that aside. 7 Let's start that again, and maybe you can 8 just put your wallet -- 9 A. I'm cool, I'm cool. I'm sorry. 10 Q. So, for Eriksson 2008, because of 11 this fact, that they defined unexposed alone 12 as not having exposure to any other 13 pesticides, that -- that fact has to be taken 14 into account in how you interpret all of the 15 data reported in that study; correct? 16 A. All the data? 17 Q. Other than the multivariate 18 analysis on table seven. 19 A. That is one analysis, and again, as 20 long as they apply the same rules to both the 21 cases and the controls, they can do whatever 22 they like, or that would be a legitimate 23 analysis, and then you -- as I told you 24 earlier, in epidemiology you have the freedom 25 to do whatever you like, as long as it has</p>	<p style="text-align: right;">Page 280</p> <p>1 actually cross-reference. You will see that 2 the univariate odds ratios in table seven, 3 and the univariate is where they do the 4 analysis defining "unexposed" that way -- 5 A. Okay. 6 Q. -- they match up. Correct? 7 A. All right. 8 Q. So, I am correct that for all of 9 the analyses other than the one multivariate 10 analysis on table seven, Eriksson uses this 11 sort of exploratory methodology in which they 12 define "unexposed" as unexposed to all other 13 pesticides; correct? 14 A. Yes, but -- 15 Q. And that's okay for an exploratory 16 analysis. Isn't that your testimony? 17 A. And it may well turn out that that 18 is, as I say -- depending on how you want to 19 think or how you want to analyze it, that may 20 be -- maybe this is the smartest analysis or 21 the best analysis. It depends on how -- how 22 you think through how glyphosate operates or 23 how one -- I mean, if you are concerned about 24 confounding by other herbicide, then perhaps 25 taking all the herbicides out of the picture</p>
<p style="text-align: right;">Page 279</p> <p>1 logic, common sense, and intellectual 2 validity to it. 3 Someone else may think it's silly. 4 They are welcome to think whatever they like. 5 And you can interpret or not, and think it 6 reasonable or not think it reasonable, that 7 you are free -- that you are -- that's 8 your -- that's your freedom, you know, to do. 9 Q. Just so the record is clear, 10 though, in the Eriksson study, the only 11 analysis that does not define "unexposed" as 12 being unexposed to all pesticides is that one 13 data point in table seven for the 14 multivariate analysis. All of the other data 15 presented in that table uses this 16 experimental approach of defining "unexposed" 17 as unexposed to all pesticides; correct? 18 MR. TRAVERS: Objection to form, 19 asked and answered. 20 A. So in table two, when they do the 21 ten days versus greater than ten days, that 22 is excluding anyone with any other herbicide 23 exposure? 24 Q. Yeah. If you look at the 25 univariate analysis on table seven, you can</p>	<p style="text-align: right;">Page 281</p> <p>1 in this way is the smartest. I'm not saying 2 it is or it isn't. I'm saying at least that 3 is one approach to how to analyze the data 4 that addresses that question, and see what 5 the answer is, is one way to address that 6 issue. 7 Q. Just to be clear, we are not taking 8 all the other pesticides out, because the 9 exposed population, exposed to glyphosate, 10 also has exposures to other pesticides; 11 correct? 12 A. If they did that, then I would say 13 it wasn't a legitimate analysis. I mean, as 14 I said, if you are going to take it out of 15 the control -- whatever you do to the 16 case-control group, you have to do to the 17 case group. You have to be consistent 18 between cases and controls. 19 Q. And between exposed and unexposed 20 with respect to other pesticides; correct? 21 A. So again, here, this is a 22 case-control study. 23 Q. Right. 24 A. So, again, whatever you do to the 25 cases, you have to do to the controls.</p>



1 Q. Right.  
 2 A. So, if you are taking all herbicide  
 3 exposures aside from glyphosate out of the  
 4 picture, you have to do it to both groups.  
 5 Q. And with respect to the --  
 6 A. Aside from glyphosate.  
 7 Q. And if you are doing that, by the  
 8 same token, if you are taking all the other  
 9 pesticide exposures out of the unexposed  
 10 group in this study, you would need to take  
 11 all those other pesticide exposures out of  
 12 the exposed group for your analysis; correct?  
 13 A. Yes, but that wouldn't be the way  
 14 you would -- I would say in a case-control  
 15 study, you wouldn't -- that wouldn't be the  
 16 logical way to approach it.  
 17 Q. Right.  
 18 A. I mean, you might get that as the  
 19 out -- that might be the way it would end up,  
 20 but that wouldn't be the way you would  
 21 logically approach it.  
 22 Q. Okay. So, it wouldn't be logical  
 23 to define -- if you are going to have  
 24 exposed -- allow for exposure to other  
 25 pesticides, it wouldn't be logical for your

1 herbicides and insecticides and rodenticides  
 2 and fungicides that are looked at in  
 3 Eriksson 2008 cause non-Hodgkin's lymphoma?  
 4 A. I'm not addressing these other  
 5 agents, so I don't have testimony regarding  
 6 them.  
 7 Q. Is it your opinion, based upon the  
 8 Eriksson study, based upon the findings of  
 9 that study, that all of the -- every one of  
 10 these 20 or so different herbicides,  
 11 insecticides, rodenticides and fungicides  
 12 cause non-Hodgkin's lymphoma?  
 13 A. DDT probably does. So, if we are  
 14 going to add by analogy to the Bradford Hill  
 15 criteria -- I won't do that, but the answer  
 16 is, you know, I don't know, but it's not --  
 17 Q. Let me ask you this, Dr. Neugut,  
 18 When a study uniformly reports odds ratios in  
 19 excess of 1.0, for every exposure that it  
 20 reports out, without controlling for  
 21 confounding, that points to the possibility  
 22 of a systematic bias in the study, doesn't  
 23 it?  
 24 A. Yes.  
 25 Q. And --

1 unexposed to an individual pesticide to  
 2 exclude all other pesticides; correct?  
 3 A. No.  
 4 Q. Okay. So, with respect to the  
 5 Eriksson study, the odds ratios, all the  
 6 other odds ratios that are reported, except  
 7 for this hierarchal odds ratio, are also --  
 8 they are not adjusted for smoking or drinking  
 9 or any other lifestyle factors; correct?  
 10 A. No.  
 11 Q. They are only adjusted for age, sex  
 12 and year of diagnosis; correct?  
 13 A. Age, sex, year of -- yes.  
 14 Q. And virtually every one of the  
 15 approximately 20 different pesticides that  
 16 Eriksson looked at is reported to have  
 17 unadjusted odds ratios above 1.0; right?  
 18 A. So, are we now back in table two or  
 19 table --  
 20 Q. All of the tables.  
 21 A. Huh?  
 22 Q. All of the tables.  
 23 A. Yes.  
 24 Q. Is it your testimony that every one  
 25 of, looks like maybe 20 or more different

1 A. It points to a concern. I mean,  
 2 you know, again, if everything -- if all the  
 3 exposures are related to each other in some  
 4 significant way, or if most of them are, they  
 5 don't all have to be, but if most of them  
 6 are, then it's not totally inconceivable that  
 7 they do elevate some risk.  
 8 But the answer is yes, generally  
 9 speaking, that the -- that's what is referred  
 10 to as specificity in the Bradford Hill  
 11 criteria, and it would -- it should raise a  
 12 concern that it's not purely -- that it's  
 13 not -- that it's not -- well, that it's not a  
 14 causal association, that there is something  
 15 else going on that is methodological or  
 16 statistical rather than causal.  
 17 Q. If there is confounding by other  
 18 pesticide exposures, it's impossible from  
 19 this study results to identify any one of the  
 20 studied pesticides, including glyphosate, as  
 21 having a true association with non-Hodgkin's  
 22 lymphoma; correct?  
 23 A. Say that question again.  
 24 Q. If there is confounding by other  
 25 pesticide exposures, it's impossible from

1 this study to identify any one of  
2 individually studied pesticides, including  
3 glyphosate, as having a true association with  
4 non-Hodgkin's lymphoma; correct?

5 A. I would not worry about confounding  
6 here. That is not -- or at least that would  
7 not be my -- I don't know that that would be  
8 the issue I would be concerned about. I  
9 mean, the --

10 Q. What issue would you be concerned  
11 about?

12 A. We have already said these are  
13 farmers. Farmers have a higher risk of  
14 lymphoma than the general population. The  
15 control group is the general population. So,  
16 you are seeing a slight increase in, if you  
17 want to call it an occupational risk, then --  
18 so, this is -- this is an occupational risk  
19 ratio. You are seeing that farmers have an  
20 elevated risk of lymphoma.

21 Over and above that, the question  
22 is, do herbicides, within the farming group,  
23 or within the farmers, also convey an  
24 additional risk ratio over and above being a  
25 farmer. So, that is a question that the

1 study can address over and above.

2 Q. But this study, because of its  
3 design, can't provide you with that answer;  
4 correct?

5 A. Because?

6 Q. Because everything is above one in  
7 the study, so you can't actually  
8 differentiate any finding with respect to a  
9 specific pesticide; correct?

10 A. Well, you can see if the risk ratio  
11 for specific subgroups are higher than they  
12 are for the over -- for the overall group.  
13 If farmers exposed to glyphosate have a  
14 higher risk than farmers not exposed to  
15 glyphosate, I would worry about glyphosate.  
16 If -- again, we are talking about an  
17 exploratory study. If, if -- if there is a  
18 dose -- if people who have five times the  
19 amount of glyphosate as compared to those who  
20 have one-tenth the amount of glyphosate, have  
21 a higher risk than those --

22 Q. I understand. Sure.

23 A. -- then, as I said before, you have  
24 to apply your thinking and your logic and  
25 your common sense to looking at the data.

1 That's why it's called exploratory or -- and  
2 all of that, to see what makes sense within  
3 the data.

4 Q. But specifically with the Eriksson  
5 2008 study, because of what we are seeing  
6 with elevated odds ratios, and if you look at  
7 table seven, glyphosate is in the middle, I  
8 guess, of the different pesticides, as far as  
9 the reported odds ratios, because of this  
10 systemic bias in the Eriksson study, it's  
11 impossible to reach any conclusion with  
12 respect to glyphosate; correct?

13 MR. TRAVERS: Objection to the  
14 compound question.

15 A. I would say that with this paper in  
16 general, I would be -- I might be concerned  
17 about all of these things, you know.

18 Q. Okay.

19 A. These are pretty high risk -- we  
20 are already getting up into higher risk  
21 ratios than I might expect purely from biases  
22 alone.

23 Q. How about with respect to when you  
24 have every finding above 1.0, so you have  
25 evidence of a systemic bias in the study,

1 it's impossible to reach a conclusion with  
2 respect to any individual exposure reported  
3 out of this study; correct?

4 A. I would say that that would be true  
5 of any -- I would have said that before I did  
6 the study, or it would have been impossible  
7 to reach a conclusion before I did the study  
8 no matter what I found.

9 Q. Because it's an exploratory study?

10 A. Correct.

11 Q. Now, with respect to the analysis  
12 here of latency, there is analysis of  
13 exposures for the categories of one to ten  
14 years, and then there is a category of  
15 greater than ten years; correct? And that is  
16 reported, I believe, on -- where is this  
17 document? Page 1659. 1658 and 1659.

18 A. Yes.

19 Q. But for -- and they report here, or  
20 Eriksson reports here on MCPA, 2,4,5-T,  
21 2,4-D, and glyphosate; correct? In this  
22 analysis.

23 A. The question is what?

24 Q. The Eriksson paper reports results  
25 in this latency analysis for glyphosate, for

<p style="text-align: right;">Page 290</p> <p>1 MCPA, and for 2,4,5-T and 2,4-D; correct?</p> <p>2 A. Yes.</p> <p>3 Q. But for MCPA, 2,4,5-T and 2,4-D,</p> <p>4 there were no exposed cases in that one-</p> <p>5 ten-year latency period; correct? That's on</p> <p>6 the top of page 1659.</p> <p>7 A. Yeah.</p> <p>8 Q. So, we know for these pesticides at</p> <p>9 least that they could not have confounded the</p> <p>10 results for glyphosate within one to ten</p> <p>11 years of diagnosis; correct?</p> <p>12 A. Okay. Yes. Um-hum.</p> <p>13 Q. And the glyphosate odds ratio for</p> <p>14 that one- to ten-year latency period was</p> <p>15 1.11. That's not even remotely close to</p> <p>16 statistical significance. That is a null</p> <p>17 result; correct?</p> <p>18 A. Yes.</p> <p>19 Q. Now, for the latency period of</p> <p>20 greater than ten years, the glyphosate odds</p> <p>21 ratios reported by Eriksson could be</p> <p>22 confounded by exposures to MCPA, 2,4,5-T and</p> <p>23 2,4-D; correct?</p> <p>24 A. Yes.</p> <p>25 Q. And in your expert report, you note</p>	<p style="text-align: right;">Page 292</p> <p>1 A. Correct.</p> <p>2 Q. And if the data from De Roos 2005</p> <p>3 is correct in showing higher exposure levels</p> <p>4 to other pesticides with higher exposure</p> <p>5 level to glyphosate, the finding of increased</p> <p>6 odds ratios at higher exposure levels of</p> <p>7 glyphosate could be an artifact due to</p> <p>8 confounding; correct?</p> <p>9 A. Could be.</p> <p>10 Q. And Eriksson also does not report</p> <p>11 any -- does not conduct any analysis to</p> <p>12 determine whether the findings for glyphosate</p> <p>13 exposure of less than ten days are</p> <p>14 statistically different than the finding for</p> <p>15 glyphosate, the odds ratio of greater than</p> <p>16 ten days; correct?</p> <p>17 A. I mean that's -- the numbers are</p> <p>18 really too small to do anything</p> <p>19 statistically, to address what you just said.</p> <p>20 Q. And going back to what we were</p> <p>21 discussing earlier, with respect to the Lee</p> <p>22 study, which had those two different odds</p> <p>23 ratios or point estimates.</p> <p>24 A. Right.</p> <p>25 Q. There is really no way to tell from</p>
<p style="text-align: right;">Page 291</p> <p>1 in particular that MCPA is commonly used</p> <p>2 together with glyphosate; correct?</p> <p>3 A. Yes.</p> <p>4 Q. Eriksson reported an odds ratio for</p> <p>5 MCPA of 2.81 for that greater than ten-year</p> <p>6 latency period, which is higher than the</p> <p>7 unadjusted odds ratio reported for glyphosate</p> <p>8 for that same greater than ten-year period;</p> <p>9 correct?</p> <p>10 A. Yes.</p> <p>11 Q. And it's impossible to tell from</p> <p>12 Eriksson whether the odds ratio for</p> <p>13 glyphosate, if it had been controlled for the</p> <p>14 use of MCPA, would be elevated at all for</p> <p>15 greater than ten years latency; correct?</p> <p>16 A. Yes.</p> <p>17 Q. Now, in your expert report, you</p> <p>18 also point to the dose-response analysis in</p> <p>19 the Eriksson study for glyphosate; correct?</p> <p>20 A. Yes.</p> <p>21 Q. And this -- again, this</p> <p>22 dose-response analysis reported by Eriksson</p> <p>23 is not controlled or not adjusted for</p> <p>24 potential confounding by exposure to other</p> <p>25 pesticides; correct?</p>	<p style="text-align: right;">Page 293</p> <p>1 the glyphosate -- or from the data in</p> <p>2 Eriksson whether there is any meaningful</p> <p>3 difference between the reported odds ratios</p> <p>4 for less than ten days exposure as opposed to</p> <p>5 greater than ten days exposure of glyphosate;</p> <p>6 correct?</p> <p>7 A. No, but I mean, you can't</p> <p>8 statistically confirm it.</p> <p>9 Q. And just like you said in the Lee</p> <p>10 paper, when you can't statistically</p> <p>11 differentiate the two groups. It's not</p> <p>12 appropriate to say, as an epidemiologist,</p> <p>13 that you have shown that they are actually</p> <p>14 different; correct?</p> <p>15 A. You can't say with definitiveness.</p> <p>16 Q. Let's talk about the meta-analysis,</p> <p>17 and you talk about those on page 17.</p> <p>18 First of all, the -- each of those</p> <p>19 meta-analyses that were presented, and this</p> <p>20 would be both Schinasi and the Chang and</p> <p>21 Delzell 2016 paper, they limited their</p> <p>22 analyses only to the most updated and</p> <p>23 comprehensive analysis of each epidemiology</p> <p>24 study population; correct?</p> <p>25 A. Yes.</p>

1 Q. Now, you are aware, are you not,  
2 that Chang and Delzell have updated their  
3 meta-analysis to include the data from the  
4 2013 Agricultural Health Study and from the  
5 NAPP study; right?

6 A. I'm aware of it, but I haven't seen  
7 the -- I don't believe I have seen it.

8 Q. Were you not provided with the 2017  
9 Chang and Delzell meta-analysis that was  
10 provided to your counsel with Monsanto's  
11 expert reports?

12 A. I didn't read Monsanto's expert  
13 reports.

14 Q. So, you have not looked at the  
15 Chang and Delzell study that is cited in  
16 those reports?

17 A. No.

18 MR. LASKER: Let me mark as the  
19 next exhibit in line, 14-21.

20 (Exhibit 14-21, Exponent, May 24,  
21 2017 Meta-Analysis of Glyphosate Use and  
22 Risk of Non-Hodgkin Lymphoma marked for  
23 identification, as of this date.)

24 Q. And Dr. Neugut, if you look to page  
25 seven of this document, Exhibit 14-21, this

1 that the NAPP data were not included in any  
2 of the meta-analyses. Do you see that?

3 A. Are you in the middle of 16 or --

4 Q. Sort of the top, maybe one-third of  
5 the way down. The bottom of that last  
6 carryover paragraph, the final sentence.

7 A. Up here or down here?

8 Q. Right up here, the top paragraph.

9 At the very end, it says, "The study results  
10 were published in 2014, and as such were not  
11 included in any of the meta-analysis."

12 Correct?

13 A. The study results of the NAPP is  
14 she referring to?

15 Q. Yes. Well, you should confirm that  
16 for yourself, because that's what is  
17 discussed on page 15 and 16, but that is my  
18 understanding. I want to make sure that is  
19 your understanding as well of Dr. Ritz's --

20 A. Okay. Yes, okay.

21 Q. So, Dr. Ritz is pointing to the  
22 fact that, as we have discussed, using the  
23 methodology for meta-analyses that was used  
24 in the studies and was used both by Schinasi  
25 and Chang and Delzell, you would use the most

1 is --

2 A. I'm sorry, where am I looking?

3 Q. Page seven.

4 A. Page seven.

5 Q. This is analysis by Dr. Chang and  
6 Dr. Delzell; correct?

7 A. Yes.

8 Q. And if you look on page four, at  
9 the very top, they state that for purposes of  
10 this analysis, they are using "the same  
11 meta-analysis statistical methods as  
12 described in our publication Chang and  
13 Delzell, 2016." Correct?

14 A. Yes.

15 Q. And that is the meta-analysis that  
16 you cite to in your expert report; correct?

17 A. Yes.

18 Q. Now, plaintiffs' -- Dr. Ritz,  
19 plaintiffs' other epidemiology expert, stated  
20 in her expert report, and we can go back to  
21 her report, Dr. Ritz's report, at page 15 and  
22 16, I believe. She is talking about the NAPP  
23 data again.

24 A. Um-hum.

25 Q. And on the -- on page 16, she notes

1 recent updated complete dataset for the  
2 meta-analysis; correct?

3 A. Yes.

4 Q. And so the NAPP dataset then would  
5 be used as the pooled analysis as compared to  
6 the De Roos 2003 and the McDuffie 2001  
7 studies; correct?

8 A. Yes.

9 Q. And if the NAPP data -- and let me  
10 actually go back to Exhibit 14-21 for you.  
11 That is the 2017 meta-analysis. If you go  
12 back -- if you can go to the pages, page nine  
13 and page ten.

14 A. That is in the Exponent section?

15 Q. Yes. In Chang and Delzell, 2017.

16 Pages nine and ten list all of the  
17 epidemiological studies that we have been  
18 discussing today, with the number one,  
19 Alavanja 2013, being the 2013 AHS data.  
20 Number two is the De Roos 2003, which is the  
21 De Roos case-control study. Are you with me?

22 A. Yeah, I just found it. Alavanja,  
23 De Roos.

24 Q. And then number three is De Roos  
25 2005 AHS study; correct?

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1 A. Yes.  
 2 Q. Number four is Eriksson 2008.  
 3 A. Um-hum.  
 4 Q. Number five is Hardell 2002.  
 5 A. Yes.  
 6 Q. Number six is Hohenadel, and  
 7 Hohenadel did an analysis of -- another  
 8 analysis of McDuffie; correct? The same data  
 9 set. Correct?  
 10 A. Yes.  
 11 Q. McDuffie 2001; correct?  
 12 A. Yes.  
 13 Q. Orsi 2009?  
 14 A. Um-hum.  
 15 Q. And then number nine is Pahwa,  
 16 et al, 2015, and that is the NAPP data;  
 17 correct?  
 18 A. Yes.  
 19 Q. And so they then conduct, using the  
 20 same methodology as they did in the 2016  
 21 meta-analysis that you cite in your report,  
 22 they do meta-analysis looking at these  
 23 different studies and considering different  
 24 studies for -- to determine what the  
 25 meta-relative risk is with those different

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1 studies; correct? And they identify which  
 2 studies they are including in the  
 3 meta-analyses; correct?  
 4 A. Yes.  
 5 Q. So, for their model 26, if you can  
 6 look at that, that's on page 11, using their  
 7 same meta-analysis methodology that they used  
 8 for the 2016 publication, and they are  
 9 looking here now at studies three, four,  
 10 five, eight and nine, so they have used the  
 11 NAPP data in place of De Roos 2003 and  
 12 McDuffie, but then continuing to use the 2005  
 13 Agricultural Health Study data; correct?  
 14 A. Yes.  
 15 Q. So, if you were to use the NAPP and  
 16 substitute that for -- for De Roos 2003 and  
 17 McDuffie per the -- per the normal  
 18 methodology for a meta-analysis, you find  
 19 that there is a meta-relative risk of 1.2  
 20 that is not statistically significant;  
 21 correct?  
 22 A. Yes.  
 23 Q. And if you look at model 21 of  
 24 their meta-analyses, this is the finding if  
 25 you were to use both the 2013 Agricultural

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1 Health Study data and the NAPP data and then  
 2 all of the other studies that you analyzed;  
 3 correct?  
 4 A. I'm not -- are we talking about --  
 5 Q. Model 21.  
 6 A. Back here?  
 7 Q. And you should reference it back,  
 8 so what they have done in this analysis, if I  
 9 understand it correctly, but you should  
 10 correct me if I am wrong, is that they used  
 11 the updated AHS analysis from 2013 in place  
 12 of the 2005 analysis, and they have used the  
 13 pooled analysis for the North American Pooled  
 14 Project in place of the studies that were  
 15 pooled into that study, McDuffie and De Roos;  
 16 correct?  
 17 A. To be honest, I'm -- it's a little  
 18 difficult for me to absorb all of this as I  
 19 sit here.  
 20 Q. The reported finding at least, and  
 21 I understand that you have not had a chance  
 22 to look at this -- well, let me strike that.  
 23 I understand that you haven't  
 24 looked at this, but the analysis, as reported  
 25 by Chang and Delzell, 2017, for a

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1 meta-analysis, when you look at the most  
 2 updated AHS data and the most recent pooled  
 3 data from North America, and in combination  
 4 with the rest of the glyphosate epidemiology,  
 5 your meta-relative risk is 1.0 with a  
 6 confidence interval of 0.86 to 1.2; correct?  
 7 A. Yes.  
 8 Q. And that is a null finding for the  
 9 meta-analysis; correct?  
 10 A. Yes.  
 11 Q. And that finding that Chang and  
 12 Delzell report is consistent with what  
 13 Dr. Blair testified that he would expect a  
 14 meta-analysis to show, using that updated AHS  
 15 data and updated Pooled Project data;  
 16 correct? In his deposition testimony.  
 17 A. Yes.  
 18 Q. So, this 2017 meta-analysis finding  
 19 of Chang and Delzell with the most updated  
 20 epidemiological data does not provide  
 21 evidence of an association between glyphosate  
 22 and non-Hodgkin's lymphoma; correct?  
 23 MR. TRAVERS: Objection to form.  
 24 A. I don't know that it does or it  
 25 doesn't. Again, I am not -- I haven't

1 incorporated it into my opinion and am not --  
2 and you are putting into it data that I am  
3 not including in my opinion, and so, if you  
4 are asking me to form my opinion based on it,  
5 I am not willing to.

6 Q. And that's because you are  
7 following the methodology prescribed by IARC;  
8 correct?

9 A. Plus this is also not peer reviewed  
10 or published or -- and it's including data  
11 that wasn't itself peer reviewed or  
12 published.

13 Q. And we went through this before,  
14 but are you aware of any guidelines -- I know  
15 your -- the meta-analysis guidelines that you  
16 cite to in your report talk about using  
17 unpublished data in the meta-analysis. Are  
18 you aware of any guidelines for meta-analysis  
19 that state you should not consider  
20 unpublished studies in a meta-analysis?

21 A. So, you run the risk of -- what  
22 about the study that they didn't include?

23 Q. Let me -- let me ask the question  
24 again, and let me see if I have an answer.

25 Are you aware of any guidelines for

1 understanding that you have basically taken  
2 this data from the IARC, IARC monograph?

3 A. Primarily. I mean, some of it may  
4 have come also from some of Portier's stuff  
5 or from other sources of a similar ilk.

6 Q. But it would be fair to say that  
7 this type of cited data is outside of your  
8 expertise as an epidemiologist?

9 A. It's not what I deal with on a  
10 daily basis, but I am familiar with this sort  
11 of data, and certainly to the degree of being  
12 able to incorporate it into, say, biological  
13 plausibility arguments, and I have a Ph.D. in  
14 chemical carcinogenesis, so, you know, at  
15 least going back, I have a fairly good  
16 familiarity with this sort of data, at least  
17 fundamental. I don't work in a lab anymore,  
18 and I wouldn't want to, but -- but I  
19 understand it fair enough. But it's not  
20 primarily what I deal with.

21 Q. Okay. And would I be correct in my  
22 understanding that you haven't actually read  
23 any of the toxicity studies or mechanistic  
24 studies for glyphosate?

25 A. I did read a couple of them, just

1 meta-analyses that state that you should not  
2 consider unpublished studies in your  
3 meta-analysis?

4 A. No.

5 Q. Let me turn to pages 17 to 20 of  
6 your expert report.

7 A. I'm sorry, where?

8 Q. Seventeen to 20 of your expert  
9 report. And this is where you are dealing  
10 with toxicity studies and mechanisms, and I  
11 think this may be a quick line of questions,  
12 but I want to make sure.

13 The type of evidence that you are  
14 presenting on pages 17 through 20, this is  
15 dealing with toxicological studies; correct?

16 A. Oh, this isn't --

17 Q. In your report, your own report  
18 again. Sorry.

19 A. I'm sorry. I'm looking at the  
20 Dr. Ritz report.

21 Q. Let's go back again. In your  
22 report, on pages 17 to 20, you are reporting  
23 on certain toxicity studies; correct?

24 A. Yes.

25 Q. And am I correct in my

1 there were one or two that I probably went  
2 back and did read. But I did not -- I did  
3 not certainly do the literature review and  
4 then summarize it here.

5 Q. And you have not, for purposes of  
6 your opinion here, you don't purport to have  
7 done an expert analysis of the toxicity data  
8 or the mechanistic data. You are deferring  
9 to other experts for that; correct?

10 A. That's correct.

11 Q. Let's talk about your Bradford Hill  
12 analysis. And that is -- I believe it starts  
13 on page 20.

14 Now, Bradford Hill, we talk about  
15 Bradford Hill criteria. Bradford Hill is not  
16 a location, it's actually a person; right?

17 A. It's actually what?

18 Q. A person. There is a Sir Bradford  
19 Hill; correct?

20 A. Austin Bradford Hill.

21 Q. Austin Bradford Hill, right.

22 And he came up with these criteria  
23 for causation in a speech or presentation  
24 that he gave in 1965; correct?

25 A. Yes.

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1 Q. And that is the source of the  
 2 Bradford Hill, what we know as the Bradford  
 3 Hill criteria; correct?  
 4 A. Yes.  
 5 Q. And in that seminal article laying  
 6 out his criteria, Sir Bradford Hill stated  
 7 that you should not even consider the  
 8 criteria he specifies for determining whether  
 9 or not there is causation unless you first  
 10 have a statistically significant finding that  
 11 cannot be explained by confounding or bias;  
 12 correct?  
 13 A. It's a long time from 1965 to 2017.  
 14 I mean, so, you know, that's like saying, you  
 15 know, we are still doing what George  
 16 Washington told us to do, and then based on  
 17 that is how we are now interpreting the  
 18 Constitution.  
 19 Q. Okay. There's two -- well, that is  
 20 a separate issue that I am not going to go  
 21 into. But let's just make sure I understand  
 22 the answer to my question.  
 23 A. Yes.  
 24 Q. Because I think you are answering a  
 25 different question.

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1 So, Bradford Hill, when he set  
 2 forth his criteria, it was his statement that  
 3 you should not go move on to consider those  
 4 other criteria unless you first have  
 5 epidemiological findings that are  
 6 statistically significant, positive findings  
 7 that cannot be explained by confounding or  
 8 bias; correct?  
 9 A. I don't recall. I mean, I'm not  
 10 going to tell you I read the paper yesterday.  
 11 Q. You might not be surprised to learn  
 12 that we are going to be looking at the paper  
 13 right now. Expect nothing different.  
 14 A. Here we go down memory lane.  
 15 MR. LASKER: 14-22.  
 16 (Exhibit 14-22, Section of  
 17 Occupational Medicine, Meeting January  
 18 14, 1965, The Environment and Disease:  
 19 association or Causation?, marked for  
 20 identification, as of this date.)  
 21 Q. And this is in fact the president's  
 22 address by Sir Bradford Hill that sets forth  
 23 the Bradford Hill criteria; correct?  
 24 A. Yes.  
 25 Q. And in the second column on the

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1 first page in 295, Sir Bradford Hill, in  
 2 introducing his -- these criteria that we  
 3 will be discussing, states, "As a predicate,  
 4 our observations reveal an association  
 5 between two variables perfectly clearcut and  
 6 beyond what we would care to attribute to the  
 7 play of chance." Correct?  
 8 A. Yes.  
 9 Q. So, for Sir Bradford Hill, for --  
 10 under his analysis, the first threshold  
 11 question is: Do you have a statistically  
 12 significant finding; correct?  
 13 A. Yes.  
 14 Q. And also, that you have a clearcut  
 15 finding that would not be explained by bias  
 16 or confounding; correct?  
 17 A. Yes.  
 18 Q. And then you would move on to the  
 19 criteria that he lays out and you lay out in  
 20 your expert report; correct?  
 21 A. Yes.  
 22 Q. Let's move on then to -- well,  
 23 strike that.  
 24 I'm correct in my understanding  
 25 that you did not apply that predicate

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1 requirement for your decision then to  
 2 consider the Bradford Hill criteria; is that  
 3 fair?  
 4 A. I think Bradford Hill would be  
 5 absolutely appalled that about 90 percent of  
 6 the causal things that are now commonplace in  
 7 modern epidemiology, if he were to apply  
 8 those criteria 50 years after the statement.  
 9 He was working with regard to tobacco and  
 10 lung cancer, where the relative risk is ten  
 11 to 20, and would have been totally -- I  
 12 think, you know, wouldn't have had any  
 13 concept of thinking about risk ratios in even  
 14 the two to three range, much less in the  
 15 under two range, to be able to talk about  
 16 such issues, if he wouldn't be able to read a  
 17 modern epidemiology textbook.  
 18 So, to apply his -- this from 1965  
 19 to now, to make it some kind of criterion for  
 20 how to approach causal thinking, I mean,  
 21 certainly if this were true, we wouldn't have  
 22 to even be sitting here talking, but that's  
 23 out of -- it's so out of date --  
 24 Q. Let me just break this down,  
 25 because you are using the Bradford Hill

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1 criteria in your expert report; correct?  
 2 A. I'm not -- I mean, that's like  
 3 saying I'm using Koch's postulates for  
 4 figuring out whether someone has an infection  
 5 with tuberculosis bacillus.  
 6 Q. My guess is that's not going to be  
 7 meaningful to anybody who listens to this, so  
 8 let me ask the question again.  
 9 You are using -- Bradford Hill in  
 10 this paper lays out various criteria for  
 11 making a causation assessment; correct?  
 12 A. Yes.  
 13 Q. And you follow that methodology and  
 14 look at the same criteria in making your  
 15 causation assessment; correct?  
 16 A. Yes.  
 17 Q. But in making your assessment in  
 18 this case, you do not require as a predicate,  
 19 the way Sir Bradford Hill would, that you  
 20 start off with a statistically significant  
 21 increased risk that cannot be attributed to  
 22 chance or -- to confounding or bias; correct?  
 23 A. I think in modern epidemiology,  
 24 it's not necessarily required, and I will  
 25 base it on the -- the meta-analysis that says

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1 that there is an elevated association.  
 2 Q. Let me just make sure I understand  
 3 your testimony. With respect to the Bradford  
 4 Hill criteria, you are -- you do not consider  
 5 there to be, or maybe you do, but in  
 6 conducting your analysis, am I correct in my  
 7 understanding that you do not believe you  
 8 need to have a statistically significant  
 9 increased risk that cannot be attributed to  
 10 confounding or bias, to then consider the  
 11 Bradford Hill criteria?  
 12 A. You would never know, you can never  
 13 know ever whether something is causal or not  
 14 with 100 percent surety. That is the whole  
 15 point. So, when -- what would be causal or  
 16 not?  
 17 Q. Well, I think we are missing each  
 18 other. I'm asking a simple question here.  
 19 In applying the Bradford Hill  
 20 criteria in this case, am I correct that you  
 21 did not require for -- before reaching the  
 22 criteria, the -- that you start off, as Sir  
 23 Bradford Hill states in his setting forth of  
 24 the methodology, with an association that is  
 25 statistically significant, positive, that

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1 cannot be explained by confounding and bias.  
 2 A. That doesn't exist.  
 3 Q. Okay. So am I correct then that  
 4 you do not believe that you need to have an  
 5 observation that reveals an association  
 6 between two variables that is perfectly  
 7 clearcut and beyond what we would care to  
 8 attribute to the play of chance before  
 9 considering the Bradford Hill criteria?  
 10 MR. TRAVERS: Objection, asked and  
 11 answered.  
 12 A. If there were a statistical  
 13 association between two variables that could  
 14 not be explained by bias or confounding, then  
 15 it would almost -- you almost wouldn't have  
 16 to have the Bradford Hill criteria to discuss  
 17 it further.  
 18 It's -- secondly, the Bradford Hill  
 19 criteria are not criteria in the sense of  
 20 requirements. They are guidelines in the  
 21 sense of how to approach thinking about  
 22 causality. Whether you are quoting some  
 23 speech of his, the point is that they're --  
 24 they're guidelines for how to think, how to  
 25 think about causality, not how -- they are

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1 not rules that are required, you have to have  
 2 this, you have to have that, you have to have  
 3 a third thing.  
 4 Some, they -- are judgment  
 5 criteria, rules of judgment that we apply in  
 6 thinking about whether the association  
 7 between an exposed -- putative association  
 8 and outcome are associated with each other,  
 9 that I can evaluate -- you can evaluate or  
 10 some other -- your expert can evaluate, and  
 11 we can agree or disagree about.  
 12 Q. But just so I am clear, because  
 13 it's a pretty long answer, you do not  
 14 consider in your approach to the Bradford  
 15 Hill criteria, you do not believe that you  
 16 would need to have this association between  
 17 two variables that are perfectly clearcut and  
 18 beyond what we care to attribute to the play  
 19 of chance before then going to the criteria  
 20 laid out. Is that correct?  
 21 MR. TRAVERS: Objection, asked and  
 22 answered.  
 23 A. I think they need to have an  
 24 association -- a putative association or a  
 25 suspected association between an exposure and



1 an outcome, where there may or may not be the  
2 possibility of bias or confounding, and I am  
3 evaluating whether bias or confounding are  
4 playing a role or whether causality or some  
5 other association or some other factor is  
6 leading to the association.

7 Q. So, your methodology then in  
8 applying the Bradford Hill criteria, at least  
9 to that extent, is different than the  
10 methodology that Dr. Bradford Hill would have  
11 followed. Is that fair to say?

12 A. Different than Dr. Bradford Hill  
13 would have applied in 1965.

14 Q. Correct?

15 A. Possibly.

16 Q. Now, with respect to these  
17 criteria, the first Bradford Hill criteria  
18 you discuss in your expert report is  
19 temporality; correct?

20 A. Yes.

21 Q. And you state in your expert report  
22 that there is no doubt that this criteria was  
23 met with the glyphosate epidemiology;  
24 correct?

25 A. Yes.

1 formed an opinion one way or the other on  
2 latency; correct?

3 A. With regard to how long the latency  
4 needs to be.

5 Q. Right.

6 So, depending on the answer to that  
7 question of latency, for non-Hodgkin's  
8 lymphoma and glyphosate, temporality may be  
9 satisfied or it may not be satisfied for some  
10 of the glyphosate epidemiology; correct?

11 A. The question is whether there is --  
12 if there is an association between glyphosate  
13 and non-Hodgkin's lymphoma -- the question is  
14 whether there is an association between  
15 glyphosate and non-Hodgkin's lymphoma. If  
16 there is an association between the two, then  
17 either glyphosate precedes non-Hodgkin's  
18 lymphoma, or non-Hodgkin's lymphoma precedes  
19 glyphosate.

20 So either glyphosate is -- now,  
21 from all the studies that we seem to have  
22 been reading, people, as you yourself have  
23 pointed out, and for most of the studies,  
24 15 years, ten years, five years, whatever,  
25 glyphosate exposure preceded the onset of the

1 Q. But as we discussed earlier, with  
2 respect to cancer epidemiology, temporality  
3 also has to consider latency issues; correct?

4 A. Does it?

5 Q. Well, that's a question to you. If  
6 there is a latent disease, like cancer, and  
7 you are trying to determine whether an  
8 exposure is in the proper time frame to be a  
9 causal association -- for a causal  
10 association to be --

11 A. Well, since I don't -- again, since  
12 I am agnostic on the subject of latency,  
13 latency to me is not a key issue here  
14 personally. Again, Dr. Weisenburger or  
15 Dr. Ritz can address it in their own rules.

16 To me, the question is, did  
17 glyphosate exposure precede the onset of  
18 non-Hodgkin's lymphoma. That's what  
19 temporality means to me. And I think in at  
20 least all the studies that I am seeing, that  
21 was -- that was pretty clearcut.

22 Q. Okay. Well, if I -- just if I  
23 understand correctly, and I understand you  
24 have said you are agnostic on the issue of  
25 latency, which means you don't -- you haven't

1 disease. Now, if there is an association,  
2 indeed it seems like that would be consistent  
3 with the causal association.

4 Our other interpretation or Plan B  
5 would be to say that getting a lymphoma makes  
6 you want to have glyphosate. Monsanto could  
7 have another remedy, could have another use  
8 for using Roundup to give to people who have  
9 lymphoma, if that's their preference, but the  
10 arrow has to go one way or the other. It's  
11 either glyphosate precedes lymphoma, or  
12 lymphoma precedes glyphosate.

13 Q. Dr. Neugut, to be clear, what you  
14 are purporting to try to do with Bradford  
15 Hill is answer the question of causation, not  
16 association; right?

17 A. Association, I think what Bradford  
18 Hill was saying, or what you were  
19 interpreting in his paragraph earlier, is  
20 that there -- that the -- that to address the  
21 question of causality, first there has to be  
22 an association between the exposure and the  
23 outcome.

24 Q. And then you look at temporality as  
25 one of the factors.

1 A. Then you look at these criteria to  
2 see what the interpretation of the  
3 association is, whether it's causal or  
4 confounding or bias or some other -- or  
5 whether the arrow goes in the opposite  
6 direction, protopathic bias or something of  
7 that sort.

8 Q. With respect to temporality for  
9 cancer outcome, for it to support a  
10 conclusion of causation, you would want to  
11 consider latency; isn't that fair?

12 A. Yes, but since latency can be  
13 anything or can be -- I don't see that it's  
14 an issue in this particular case.

15 Q. When you did your breast cancer  
16 epidemiological research, if you were looking  
17 at somebody and they said I used pesticides  
18 yesterday and then today I went to the  
19 doctor -- the first time I used it, and today  
20 I went to the doctor and they diagnosed me  
21 with breast cancer, would you say that  
22 temporality had been met for that exposure?

23 A. Of course not. But now you are  
24 talking about something absurd.

25 Q. Okay. So, it's not just the case

1 ambiguity.

2 If you are talking about being  
3 exposed to cigarette smoking and lung cancer,  
4 so either you are going to say that the  
5 cigarette smoking causes the lung cancer, or  
6 you are going to say that having lung cancer  
7 makes you -- cigarette smoking makes someone  
8 with lung cancer feel better when they smoke,  
9 so you have your choice of which way to  
10 interpret the association between the two.

11 So, on some level, if you want to  
12 say that glyphosate follows -- glyphosate  
13 exposure follows having a lymphoma, that may  
14 be your interpretation of the association  
15 between the two. But I don't think that is  
16 the logical, or that is not what seems to  
17 arise from the various case-control and  
18 cohort studies here.

19 Q. Dr. Neugut, that wasn't what I  
20 said, and I am not sure why we are  
21 miscommunicating here.

22 For purposes of cancer, when you  
23 are looking at epidemiological studies, and  
24 we have already discussed the fact that  
25 cancer epidemiology studies will include

1 that exposure has to be before the diagnosis.  
2 It has to be before the diagnosis in the  
3 proper time frame for latency; correct?

4 A. I think in this particular  
5 instance, with regard to glyphosate and  
6 lymphoma, I think the criteria is fairly  
7 straightforward.

8 Q. And you say that without having any  
9 opinion one way or the other on what the  
10 latency period is.

11 A. If it's more than a couple of  
12 years, then I think that that is a fair  
13 statement. The ambiguity with regard to  
14 temporality in most cancer epidemiology  
15 studies arises in the context of physiologic  
16 phenomena, not in the context of external  
17 exposures.

18 So, I mean, when you are talking  
19 about something like weight loss, where you  
20 don't know if someone lost weight because  
21 they had the disease or if the weight loss  
22 somehow led to the disease, you can have  
23 ambiguity with regard to what the direction  
24 of the arrow is, if the two are associated  
25 with each other. So, there you can have

1 things like lag time; correct?

2 A. Yes.

3 Q. In the analysis, and a variety of  
4 different analyses, in cancer epidemiology in  
5 particular, to make sure that you have taken  
6 into account --

7 A. Yes. Yes.

8 Q. -- latency; correct?

9 MR. TRAVERS: Objection.

10 A. But latency can be as little as a  
11 year.

12 Q. I understand that. But for you,  
13 for glyphosate and non-Hodgkin's lymphoma,  
14 you don't have an opinion about what the  
15 latency is. It could be a year, it could be  
16 ten years, you don't know. Is that your  
17 testimony?

18 A. That's correct, but --

19 Q. And --

20 A. But the key thing is that the  
21 exposure to glyphosate was more than a year  
22 prior to the development of lymphoma.

23 Q. Or more than ten years prior.

24 A. Or more than ten years, fine. I'm  
25 happy with that, too.

1 Q. And if that were the criteria, that  
2 the exposure of glyphosate for temporality  
3 has to be more than ten years before  
4 exposure, then at least for De Roos 2003, we  
5 don't have temporality that has been  
6 satisfied; correct?

7 MR. TRAVERS: Objection, asked and  
8 answered.

9 A. Disagree.

10 Q. There are no exposures in the  
11 De Roos or -- study, or that would have  
12 exposures more than ten years before  
13 diagnosis.

14 A. Temporality is not a question of  
15 whether latency applies. Temporality is a  
16 question of does the cause precede the  
17 effect. As long as the glyphosate exposure  
18 is prior to the disease, temporality is met.

19 Q. Let's talk about the next criteria  
20 you mention, which is -- Bradford Hill  
21 criteria, which is consistency; correct?

22 A. Correct.

23 Q. And this is -- now, again, Sir  
24 Bradford Hill in his assessment, when he was  
25 talking about consistency, he was looking to

1 You have stated in your report that  
2 you believe the criteria for consistency to  
3 be met, because the reported odds ratios in  
4 each -- all of the reported odds ratios in  
5 the epidemiological literature that you  
6 reviewed were above 1.0; correct?

7 A. Yes.

8 Q. Now, first of all, that would not  
9 include the dose-response analysis in the  
10 2005 De Roos study; correct?

11 A. In the --

12 Q. The 2005 De Roos study, the  
13 dose-response analysis, the highest exposures  
14 were below 1.0 for the odds ratio; correct?  
15 So that finding in De Roos 2005 is  
16 inconsistent.

17 A. Okay.

18 Q. Is that correct?

19 A. Yes.

20 Q. And in order for you to also reach  
21 the conclusion -- well, strike that.

22 Your conclusion that all of the  
23 odds ratios are above 1.0 is based upon your  
24 analysis following the IARC methodology and  
25 not considering the updated Agricultural

1 consistency across studies finding  
2 statistically significant results; correct?

3 A. Yes.

4 Q. You do not define in your  
5 methodology "consistency" that way; is that  
6 correct?

7 A. The modern epidemiologic -- in  
8 modern epidemiology, statistical significance  
9 isn't considered essential.

10 Q. That is not my question. In your  
11 application of the Bradford Hill criteria,  
12 you are defining "consistency" differently  
13 than Bradford Hill did; correct?

14 MR. TRAVERS: Objection, asked and  
15 answered.

16 A. I don't know how he exactly defined  
17 it, but I would assume that he was more  
18 strict about statistical significance.

19 Q. And you have stated in your report,  
20 as a basis for your conclusion that there is  
21 consistency in the epidemiological studies,  
22 that all of the reported odds ratios --

23 (Telephone interruption.)

24 A. Sorry.

25 Q. I will start again.

1 Health Study data; correct?

2 A. Yes.

3 Q. And it also doesn't consider the  
4 self-respondent data that we looked at for  
5 the North American Pooled Project; correct?

6 A. Yes.

7 Q. And if those analyses are  
8 considered, there is no consistency among the  
9 epidemiological studies; correct?

10 MR. TRAVERS: Objection,  
11 mischaracterizes.

12 A. I don't know.

13 Q. Well, there would be then the AHS  
14 study, updated study that's below 1.0;  
15 correct?

16 A. So, again, I don't know the quality  
17 of the study or whether to consider it or how  
18 to consider it.

19 Q. I understand.

20 A. So, I am not going to give credit  
21 to a study that I don't know anything about  
22 or that I don't know much about.

23 Q. But just to understand your  
24 consistency analysis, and I understand you  
25 can't opine, you didn't look at the AHS 2013,

1 you didn't look at the NAPP data, but I'm  
2 just understanding your definition of  
3 "consistency."

4 If we were to consider the updated  
5 AHS data from 2013, that has an odds ratio of  
6 0.9, so that would be below 1.0; correct?

7 MR. TRAVERS: Objection, assumes  
8 facts not in evidence.

9 A. Yes.

10 Q. And we would have the Orsi study,  
11 which is exactly 1.0; correct?

12 A. Yes.

13 Q. And we would have the NAPP data,  
14 which is either just above 1.0, if we include  
15 proxy respondents, or just below 1.0, if we  
16 only look at self-respondents; correct?

17 A. Yes.

18 Q. And then we would have the Swedish  
19 case-control study, the Eriksson study, which  
20 would be slightly above 1.0; correct?

21 A. Um-hum. Yes.

22 Q. So those data points, if those were  
23 the correct data points, and I understand you  
24 have not reviewed some of them, but those  
25 data points would not be consistent; correct?

1 A. Might or might not be. Again, I  
2 haven't looked at them, so I am not willing  
3 to opine on that.

4 Q. But we would have some above one,  
5 some below one, some directly at one;  
6 correct?

7 A. Um-hum.

8 Q. Yes?

9 A. Yes.

10 Q. And we already talked about  
11 dose-response. We talked about biological  
12 plausibility, and biological plausibility, I  
13 take it you defer to the toxicologists;  
14 correct?

15 A. To the degree that I am able to  
16 opine, I think it seems decent to me, but I  
17 would defer.

18 Q. And then the final criteria you  
19 discuss is strength of association; correct?  
20 In your expert report, that is the final  
21 criteria you mentioned.

22 A. Don't I mention specificity?

23 Q. You may mention specificity. You  
24 say that is not important.

25 A. I don't?

1 Q. Okay. Well, we will talk about  
2 specificity then.

3 In your opinion, you believe -- let  
4 me see if I am correct. It's your opinion  
5 that glyphosate has not been associated with  
6 any cancer other than non-Hodgkin's lymphoma;  
7 correct?

8 A. That is specificity?

9 Q. Well, I'm asking this question.

10 A. Or is that strength?

11 Q. Is it your opinion that glyphosate  
12 and glyphosate-based herbicides have not been  
13 shown to be a cause of any type of cancer  
14 other than non-Hodgkin's lymphoma?

15 A. That's my sense of the literature,  
16 yes.

17 Q. So, if glyphosate or  
18 glyphosate-based herbicides causes any  
19 cancer, it would be non-Hodgkin's lymphoma.  
20 That is the only --

21 A. Based on the literature as I have  
22 read it to date, yes. I mean, obviously,  
23 everything I am saying today is based on --

24 Q. Your review.

25 A. -- what I have read until today.

1 If anything changes --

2 Q. Right, I understand that.

3 But you looked at, for example, the  
4 IARC monograph, and they reviewed other types  
5 of cancer as well, and you agree that there  
6 is no association shown there between  
7 glyphosate and those other types of cancer,  
8 correct, besides NHL?

9 A. Yes.

10 Q. So, then for you, is it -- am I  
11 correct in my understanding that you think  
12 specificity has been met because if it causes  
13 any cancer, it only causes non-Hodgkin's  
14 lymphoma?

15 A. Yes.

16 Q. You would agree that there are lots  
17 of other causes for non-Hodgkin's lymphoma,  
18 though; correct?

19 A. I don't know lots. I mean, I have  
20 trouble thinking of more than a few, but I  
21 don't know how many would apply generally,  
22 but --

23 Q. Non-Hodgkin's lymphoma, certainly  
24 it's not a signature disease for glyphosate;  
25 correct. Like mesothelioma or -- and

<p style="text-align: right;">Page 330</p> <p>1 asbestos.</p> <p>2 A. I don't know how to answer that</p> <p>3 question.</p> <p>4 Q. Okay. Well, that's fair.</p> <p>5 Is it your opinion that</p> <p>6 non-Hodgkin's lymphoma may be a signature</p> <p>7 disease for glyphosate?</p> <p>8 A. I don't know what a signature</p> <p>9 disease means.</p> <p>10 Q. Ah, okay. You would agree that</p> <p>11 there are lots of other causes for</p> <p>12 non-Hodgkin's lymphoma, either known or</p> <p>13 unknown, besides glyphosate; correct?</p> <p>14 A. I think most lymphoma is</p> <p>15 unexplained.</p> <p>16 Q. So, you can't say that if you see</p> <p>17 NHL, you would think that it would have to be</p> <p>18 glyphosate; correct?</p> <p>19 A. No, that's correct.</p> <p>20 Q. All right. So then the -- you are</p> <p>21 correct, the fifth, I think, of the criteria,</p> <p>22 you talk about analogy, which you say is not</p> <p>23 applicable, and then specificity. But before</p> <p>24 that, you talk about strength; correct?</p> <p>25 A. Yes.</p>	<p style="text-align: right;">Page 332</p> <p>1 in other cases that that 1.3 to 1.5 is, I</p> <p>2 think the term you used was bukpi; right?</p> <p>3 A. Have I used that expression?</p> <p>4 Q. You've used that expression with</p> <p>5 respect to 1.3 to 1.5, haven't you?</p> <p>6 A. I don't know. But as I say, it's</p> <p>7 not a large number.</p> <p>8 Q. So, 1.3 to 1.5 is not what you</p> <p>9 would -- well, strike that.</p> <p>10 When you have a number like 1.3 to</p> <p>11 1.5, you would have concerns that those</p> <p>12 findings can be explained by something other</p> <p>13 than causation, such as bias and confounding;</p> <p>14 correct?</p> <p>15 A. I would have that concern for even</p> <p>16 larger numbers, but -- so, again, the number</p> <p>17 that you see, we are talking about</p> <p>18 ever/never, generally we are talking about</p> <p>19 ever/never. You know, when you see a number</p> <p>20 like that number, there is also the issue of</p> <p>21 dose-response. So that means there are those</p> <p>22 who are more exposed and therefore</p> <p>23 potentially have higher risk. So that may</p> <p>24 reflect a subgroup that might have a</p> <p>25 significantly higher risk within it, but on</p>
<p style="text-align: right;">Page 331</p> <p>1 Q. And that in fact is the first</p> <p>2 criteria that Dr. Bradford Hill, or Sir</p> <p>3 Bradford Hill discusses, correct, in his</p> <p>4 criteria?</p> <p>5 A. I didn't follow his order.</p> <p>6 Q. That's fine.</p> <p>7 And with respect to strength, you</p> <p>8 are pointing to that range of 1.3 to 1.5;</p> <p>9 correct?</p> <p>10 A. Yes.</p> <p>11 Q. And that is based upon that earlier</p> <p>12 meta-analyses that you not take into account</p> <p>13 the 2013 AHS data or the NAPP data; correct?</p> <p>14 A. It did not take into account the</p> <p>15 follow-up AHS data, correct.</p> <p>16 Q. Now, with respect to that, that --</p> <p>17 those numbers, 1.3 to 1.5, you would agree</p> <p>18 that that is not a very convincing number</p> <p>19 with respect to strength; correct?</p> <p>20 A. Call it modest to moderate.</p> <p>21 Q. You would agree it did not provide</p> <p>22 a strong push towards causality; correct?</p> <p>23 A. It's not an overwhelming number,</p> <p>24 no.</p> <p>25 Q. In fact, I think you have testified</p>	<p style="text-align: right;">Page 333</p> <p>1 the whole, it's a modest risk.</p> <p>2 Q. I mean, we have talked about</p> <p>3 dose-response. We can go back to that. That</p> <p>4 is a separate criteria for Bradford Hill;</p> <p>5 correct?</p> <p>6 A. Yes.</p> <p>7 Q. But as far as the strength criteria</p> <p>8 is concerned, it would be fair to say that</p> <p>9 even with your understanding of the</p> <p>10 glyphosate literature, that is not a</p> <p>11 particularly powerful finding for that</p> <p>12 criteria for Bradford Hill; correct?</p> <p>13 A. It's not a number that would --</p> <p>14 that would build your confidence that this</p> <p>15 was a -- that there was a causal</p> <p>16 relationship. It's enough, it's -- what do</p> <p>17 they say -- it's sufficient, but not -- but</p> <p>18 not something that would add to your -- add</p> <p>19 to your confidence that there were a causal</p> <p>20 association.</p> <p>21 MR. LASKER: Why don't we take a</p> <p>22 break now? I'm just going to look and</p> <p>23 see what more questions I have.</p> <p>24 MR. TRAVERS: Yeah, sure.</p> <p>25 THE VIDEOGRAPHER: The time is</p>

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1 5:12 p.m. We are off the record.  
 2 (Recess taken.)  
 3 THE VIDEOGRAPHER: The time is  
 4 5:27 p.m. We are on the record.  
 5 MR. LASKER: Dr. Neugut, I have no  
 6 further questions. Thank you very much.  
 7 THE WITNESS: Oh, thank you.  
 8 MR. TRAVERS: Excellent.  
 9 I have just got a few follow-up  
 10 questions. Let's see. Do we have  
 11 exhibit stickers?  
 12 I want to enter as an exhibit, this  
 13 is the Blair paper from 2011.  
 14 MR. LASKER: So what number is  
 15 this?  
 16 MR. TRAVERS: 14-23.  
 17 (Exhibit 14-23, NIH Public Access,  
 18 Impact of Pesticide Exposure  
 19 Misclassification on estimates of  
 20 Relative Risks in the Agricultural Health  
 21 Study marked for identification, as of  
 22 this date.)  
 23 EXAMINATION  
 24 BY MR. TRAVERS:  
 25 Q. And do you recognize this paper,

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1 Dr. Neugut?  
 2 A. Yes.  
 3 Q. And this paper deals with the  
 4 non-differential misclassification bias; is  
 5 that correct?  
 6 A. Yes.  
 7 Q. And this paper authored by -- and  
 8 you see that Aaron Blair is the lead author  
 9 on this paper; correct?  
 10 A. Yes.  
 11 Q. And it's referencing the AHS study  
 12 cohort?  
 13 A. Yes.  
 14 Q. And I would just like to refer you  
 15 to the conclusion of this paper, and page  
 16 six. You have been there.  
 17 The last paragraph on page six, it  
 18 states, "We draw several conclusions from our  
 19 methodological work in the AHS. First, the  
 20 accuracy of reporting of pesticide use by  
 21 farmers is comparable to that for many other  
 22 factors commonly assessed by questionnaire  
 23 for epidemiological studies."  
 24 MR. LASKER: I lost track. Where  
 25 are you?

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1 MR. TRAVERS: Sorry. The last  
 2 paragraph, page six.  
 3 MR. LASKER: Okay. Starting,  
 4 "First, the accuracy."  
 5 MR. TRAVERS: Yeah.  
 6 MR. LASKER: Okay.  
 7 BY MR. TRAVERS:  
 8 Q. Then it goes on to say, "Second,  
 9 except in situations where exposure  
 10 estimation is quite accurate, i.e.,  
 11 correlations of .7 or greater with true  
 12 exposure, and true relative risk of 3.0 or  
 13 more, pesticide misclassification may  
 14 diminish risk estimates to such an extent  
 15 that no association is obvious, which  
 16 indicates false negative findings might be  
 17 common."  
 18 Do you see that?  
 19 A. Yes.  
 20 Q. And with that bias in the AHS  
 21 study, how would that affect the findings on  
 22 glyphosate from the De Roos 2005 study?  
 23 A. Well, since we are talking about a  
 24 relative risk in a range of 1.3 or -- or  
 25 theoretically, a relative risk in the range

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1 of 1.3 to 1.5, and misclassification error,  
 2 then it would be very easy, based on the  
 3 degree of misclassification error that they  
 4 are talking about, for that kind of a risk  
 5 ratio to be attenuated and to disappear in  
 6 this study, which is basically what they  
 7 are -- what they are describing.  
 8 Q. So, if there is a negative  
 9 finding --  
 10 A. A null finding.  
 11 Q. Okay. And you said you read the  
 12 deposition of Aaron Blair; correct?  
 13 A. Yes.  
 14 Q. And do you recall he is an author  
 15 of the NAPP abstract?  
 16 A. Yes.  
 17 Q. And he is a lead investigator on  
 18 the AHS, AHS study?  
 19 A. Yes.  
 20 Q. And it was still his opinion as the  
 21 chair of the IARC working group that  
 22 glyphosate was a probable human carcinogen;  
 23 correct?  
 24 MR. LASKER: Objection to form.  
 25 A. Yes.

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1 Q. And do you recall at the end of his  
 2 deposition, he stated that his opinion had  
 3 not changed at all after questioning by  
 4 defense counsel? Do you recall that?  
 5 A. I recall that.  
 6 Q. And does Aaron Blair's testimony  
 7 support your -- or support your opinion that  
 8 Roundup can cause cancer in humans?  
 9 A. Yes.  
 10 Q. And after the almost seven hours of  
 11 questioning, do you stand by the conclusion  
 12 in your expert report?  
 13 A. Yes.  
 14 Q. Okay. I would like to get  
 15 Exhibit 14-21, and this is the memo by  
 16 Exponent, the updated meta-analysis.  
 17 MR. LASKER: Excuse me just a  
 18 second.  
 19 Q. And is Exponent a peer-reviewed  
 20 journal?  
 21 A. Exponent is a company, to my  
 22 knowledge.  
 23 Q. And you are not aware of this paper  
 24 being submitted for peer review?  
 25 A. I don't know anything about it.

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1 Q. And I would like to ask, if you  
 2 could, to read footnotes one and two. You  
 3 don't have to read them out loud. If you can  
 4 review footnotes one and two.  
 5 A. On the first page?  
 6 Q. Yes.  
 7 A. Okay.  
 8 Q. And if you recall from earlier in  
 9 the testimony, this -- this memo to  
 10 Hollingsworth, or this meta-analysis, the  
 11 only updated information was the unfinished  
 12 draft manuscript of the 2013 AHS study and  
 13 the abstract from the NAPP study; correct?  
 14 A. Yes.  
 15 MR. LASKER: Objection to form,  
 16 misstates the document.  
 17 Q. And reviewing footnotes one or two,  
 18 can you tell who provided those documents to  
 19 Chang and Delzell?  
 20 A. Mr. Lasker.  
 21 Q. And generally, when you are  
 22 conducting a scientific study that you would  
 23 submit for peer review, if you are going to  
 24 update a study, would you rely solely on data  
 25 provided by an attorney you are consulting

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1 for?  
 2 A. Not commonly.  
 3 Q. Okay. Go back to Aaron Blair's  
 4 deposition. If you could go -- if you could  
 5 go to page 206.  
 6 A. 206?  
 7 Q. Yes. If you go to line 20,  
 8 Mr. Lasker asked of Aaron Blair:  
 9 "But just so the record is clear,  
 10 IARC was not relying upon the most  
 11 updated analysis that you are aware from  
 12 the AHS data with respect to glyphosate  
 13 and non-Hodgkin's lymphoma; correct?"  
 14 And then Aaron Blair answers:  
 15 "Now you present it as if the  
 16 analysis were completed. Analyses were  
 17 done, manuscripts are in description, but  
 18 the work wasn't finished, which means  
 19 it's incomplete, and that you don't want  
 20 to be reporting on, and we didn't."  
 21 Does that support your decision not  
 22 to rely upon the 2013 unpublished manuscript?  
 23 A. Yes. You know, data that is not  
 24 peer reviewed or published is not peer  
 25 reviewed or published. You don't know why

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1 it's not. It might not have been finished,  
 2 might not have been accepted by the journal,  
 3 it might not have been in good shape. You  
 4 have no idea why it's not published.  
 5 Q. I just want to clarify, when you  
 6 reference -- we talked a lot about the AHS  
 7 study. But when you reference the AHS study  
 8 in your report, what are you referring to?  
 9 A. 2005 paper.  
 10 Q. Okay. And I would just like -- if  
 11 you have got your report, I would like to go  
 12 to page three.  
 13 MR. LASKER: Just a moment. Page  
 14 three?  
 15 MR. TRAVERS: Yes.  
 16 Q. And at the top, it says you were  
 17 asked to review the scientific literature on  
 18 glyphosate and glyphosate-based formulations  
 19 and to provide an opinion to a reasonable  
 20 degree of medical and scientific certainty as  
 21 to whether glyphosate and glyphosate-based  
 22 formulations can cause non-Hodgkin's  
 23 lymphoma; correct?  
 24 A. Yes.  
 25 Q. If you were to do a literature

<p style="text-align: right;">Page 342</p> <p>1 review for scientific journals, say like the 2 Lancet, would you rely on unpublished, 3 unpeer-reviewed data? 4 A. I might under certain circumstances 5 report a fact or a bit of information, citing 6 it as un- -- unpublished, but -- but as a -- 7 almost as a -- more in the context of a bit 8 of information, not in the context 9 necessarily of, say, in a data table or 10 something of that sort. So, I might express 11 an opinion by someone or -- that is not 12 published, or a factoid, but I don't think I 13 would express data per se that was not 14 published. 15 Q. And in your report, you also talk 16 about meta-analyses, and there are 17 meta-analyses in the IARC report as well; 18 correct? 19 A. Yes. 20 Q. Those are in fact statistically 21 significant; correct? 22 A. Yes. 23 Q. Okay. And in the -- and also in 24 your report, you note that McDuffie shared an 25 odds ratio, a statistically significant odds</p>	<p style="text-align: right;">Page 344</p> <p>1 Q. What percentage of cases would you 2 say are for defendant -- that you take are 3 for defendants compared to plaintiffs? 4 A. Nowadays, I do about two-thirds 5 plaintiff and about a third defendant. 6 Q. All right. Have you ever turned 7 down -- have you ever turned down cases from 8 plaintiffs' firms? 9 A. Sure. And from Miller. 10 Q. And defense counsel showed you an 11 article from 1965 by Bradford Hill. Let's 12 see. Has the application of Bradford Hill 13 been modified at all from 1965 to present 14 time? 15 MR. LASKER: Objection to form. 16 A. I mean, I don't want to say it's 17 been modified in terms of its skeletal 18 structure, but the interpretation of the 19 nomenclature and the, the intent or the -- 20 the interpretation of the criteria that are 21 there have certainly been modified and 22 adapted and adjusted over the years. They 23 are not the same as they were in 1965. 24 I mean, remarkably, it's actually 25 retained its -- the nomenclature has actually</p>
<p style="text-align: right;">Page 343</p> <p>1 ratio of 2.12 for people who used glyphosate 2 greater than two days per year; correct? 3 A. Yes. 4 Q. And Eriksson showed an odds ratio 5 of 2.36 for people who used glyphosate longer 6 than ten years; correct? 7 MR. LASKER: Objection to form. 8 A. Yes. 9 MR. LASKER: I don't think that's 10 what you meant to say. More than ten 11 years? 12 MR. TRAVERS: Who used glyphosate 13 longer than ten years. 14 MR. LASKER: Is that what he says 15 in his report? Where are you reading? 16 MR. TRAVERS: Page 22. 17 MR. LASKER: Hmm. Okay. It is 18 what he has in his report. 19 Q. And you have worked -- you have 20 worked with the Miller Firm before on the 21 Actos case; correct? 22 A. Yes. 23 Q. Have you ever worked for defendants 24 as an expert? 25 A. Yes.</p>	<p style="text-align: right;">Page 345</p> <p>1 stayed more or less the same as -- for 2 50 years, but the words don't necessarily -- 3 are not applied -- the terminology and the 4 applications are not applied in the same way 5 now as they were 50 years ago. 6 Q. And that would be, what you are 7 saying would be, that would be the general 8 consensus of the scientific community? 9 MR. LASKER: Objection to form. 10 A. Sure. I would think so, yes. 11 Q. Would you -- do you agree with the 12 following statement? Would you -- I'm sorry. 13 Would you agree that IARC is a 14 well-regarded international public health 15 agency? 16 A. Sure. 17 Q. Would you agree that when IARC 18 monographs are available, they are generally 19 recognized as authoritative? 20 A. The ones on carcinogenesis, yes. 21 Q. Let's see. And would you agree 22 that IARC is one of the most well-respected 23 and prestigious scientific bodies? 24 MR. LASKER: Objection to form. 25 A. When you say "most," you sort of</p>



1 have to have a concluding phrase.  
 2 Q. Would you agree that IARC is a  
 3 well-respected and prestigious scientific  
 4 body?  
 5 A. Yes.  
 6 MR. TRAVERS: Those are all the  
 7 questions I have got.  
 8 EXAMINATION  
 9 BY MR. LASKER:  
 10 Q. Just a few follow-ups, Dr. Neugut.  
 11 You do state in your expert report  
 12 that Eriksson showed, on page 22, an odds  
 13 ratio for -- of 2.36 for people who were --  
 14 used glyphosate longer than ten years. Does  
 15 Eriksson actually report that data? Because  
 16 I don't remember that from the glyphosate  
 17 study.  
 18 A. What page are you on?  
 19 Q. In your report, page 22, you say  
 20 that Eriksson showed an odds ratio of 2.36  
 21 for people who used glyphosate longer than  
 22 ten years. You were asked that by  
 23 plaintiffs' counsel and agreed that's what  
 24 Eriksson found. It's on page 22, under  
 25 strength of association.

1 correct?  
 2 A. Right.  
 3 Q. With respect to the 2013 AHS study,  
 4 did you rely upon anything that Dr. Blair  
 5 said in his deposition in deciding not to  
 6 consider or not to even look at that data?  
 7 A. What's the -- oh, the AHS  
 8 follow-up?  
 9 Q. Yes.  
 10 A. No.  
 11 Q. With respect to -- plaintiffs'  
 12 counsel asked you about the Chang and Delzell  
 13 2017 analysis, and he pointed out that the  
 14 AHS 2013 analysis and the NAPP analysis were  
 15 provided to Exponent by myself.  
 16 Now, just to be clear, you agree  
 17 that I did not create that data; correct?  
 18 A. You did not --  
 19 Q. Create that data.  
 20 A. I assume not.  
 21 Q. And you have read Dr. Blair's  
 22 deposition. You know that this was data that  
 23 Dr. Blair had in his files; correct?  
 24 A. Yes.  
 25 Q. And this was data that Dr. Blair

1 A. If I said it, then I must have  
 2 thought it.  
 3 Q. Okay. I believe, and you can --  
 4 you can correct me if I am wrong, that at  
 5 least the number you are citing there is  
 6 greater than ten days, not ten years, from  
 7 Eriksson's report, and this is table two.  
 8 A. You are right. It's greater than  
 9 ten days. I apologize, it's an error.  
 10 Q. Just so we are clear, that is a  
 11 mistake in your expert report.  
 12 A. Um-hum.  
 13 Q. And that 2.36 number that we -- for  
 14 greater than ten days, that is the number  
 15 that we were talking about previously that  
 16 you agreed there is no measure or indication  
 17 that that is statistically different than the  
 18 odds ratio for less than ten days; correct?  
 19 A. There is no number for that, but  
 20 yes, it's larger.  
 21 Q. So, we don't know if -- we don't  
 22 have any statistical indication from this  
 23 study from Eriksson that there is a greater  
 24 odds ratio with greater exposure, because we  
 25 don't have that statistical analysis;

1 did not disclose to IARC; correct?  
 2 A. Yes.  
 3 Q. And this is data that Dr. Blair did  
 4 not disclose to the EPA; correct?  
 5 A. I don't recall offhand about EPA,  
 6 but -- I don't know about that. I don't  
 7 recall.  
 8 Q. And there was no way for  
 9 investigators who were conducting a  
 10 meta-analysis prior to the deposition of  
 11 Dr. Blair, where this data became public, for  
 12 any investigator at IARC or elsewhere doing a  
 13 meta-analysis to include that 2013 data or  
 14 the NAPP data; correct?  
 15 A. Correct.  
 16 Q. With respect to Exhibit 14-23,  
 17 which is the paper, the Blair paper on  
 18 exposure misclassification, plaintiffs'  
 19 counsel asked you a couple of questions about  
 20 that. Do you recall?  
 21 A. Which document?  
 22 Q. This would be Exhibit 14-23, and it  
 23 is a paper by Blair entitled "Impact of  
 24 pesticide exposure misclassification on  
 25 estimates of relative risks in the

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1 Agricultural Health Study." Correct?  
 2 A. Yes.  
 3 Q. And this study again is referring  
 4 to the possibility of misclassification  
 5 biasing results towards the null; correct?  
 6 A. I wouldn't use the word "biasing."  
 7 I would say --  
 8 Q. Shifting towards the null.  
 9 A. Okay.  
 10 Q. And as we discussed previously, if  
 11 the reported odds ratio is below 1.0, then  
 12 this type of exposure misclassification would  
 13 bump those numbers up a little bit.  
 14 MR. TRAVERS: Objection.  
 15 Q. And if it's above 1.0, this type of  
 16 exposure misclassification might lower it.  
 17 Correct?  
 18 MR. TRAVERS: Objection.  
 19 A. Yes.  
 20 MR. TRAVERS: Asked and answered,  
 21 mischaracterizes his previous testimony.  
 22 Q. And with respect to the  
 23 Agricultural Health Study, to the extent that  
 24 there are odds ratios reported for glyphosate  
 25 and non-Hodgkin's lymphoma below 1.0, the

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1 type of exposure misclassification that is  
 2 discussed in the Blair paper would bump those  
 3 numbers up; correct?  
 4 MR. TRAVERS: Objection, asked and  
 5 answered, mischaracterizes previous  
 6 testimony.  
 7 A. A misclassification error would  
 8 work on the opposite side as well.  
 9 Q. It would work in both directions.  
 10 A. Yes.  
 11 Q. And in fact, in this paper, at  
 12 page 11, they have tables that show that if  
 13 the risk ratio is below one, this  
 14 misclassification would -- would tend to  
 15 increase those numbers to make them higher;  
 16 correct?  
 17 A. Yes.  
 18 Q. And so, with the Agricultural  
 19 Health Study, both the 2005 study for their  
 20 dose-response and the 2013 analysis for all  
 21 of its findings, they reported odds ratios  
 22 for glyphosate and non-Hodgkin's lymphoma  
 23 that were below 1.0; correct?  
 24 A. Yes.  
 25 Q. So, the impact of this

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1 misclassification, if it occurred, to -- for  
 2 those numbers in the AHS studies for  
 3 glyphosate and non-Hodgkin's lymphoma would  
 4 actually push those numbers up; correct?  
 5 A. Yes.  
 6 Q. The Blair paper, the 2011 paper,  
 7 Exhibit 14-23, also states that if the  
 8 relative risks are -- the true relative risk  
 9 is 1.0, misclassification -- the  
 10 misclassification that they are discussing  
 11 here does not actually impact the results at  
 12 all; correct?  
 13 A. That's correct.  
 14 Q. And the other finding in this paper  
 15 is that the attempt to make some measurement  
 16 of intensity of exposure, which is what is  
 17 done in the Agricultural Health Study, does  
 18 improve the study as compared to just asking  
 19 whether or not an individual had used or been  
 20 exposed to pesticide in the past; correct?  
 21 A. I'm sorry, say that one again.  
 22 Q. That the Blair 2011 paper reports  
 23 that when they look to their intensity  
 24 measure in the Agricultural Health Study,  
 25 intensity of exposure, that did correlate

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1 with exposure levels better than simply  
 2 asking the individual whether they had been  
 3 exposed or not; correct?  
 4 A. I don't recall that, but -- I don't  
 5 recall seeing that.  
 6 Q. Well, take a look to the last page,  
 7 is actually where you were being asked  
 8 questions by plaintiffs' counsel, on page  
 9 six. And it is right where he stopped off on  
 10 his questioning of you.  
 11 It states, "Third, it appears that  
 12 an algorithm that incorporates several  
 13 exposure determinants into an estimate of  
 14 exposure intensity predicts urinary levels  
 15 better than the individual exposure  
 16 determinants considered here and would result  
 17 in less attenuation of relative risk  
 18 estimates." Correct?  
 19 A. Yes.  
 20 Q. One of the findings in this  
 21 analysis by Blair is that the AHS, through  
 22 using an algorithm to try to estimate  
 23 intensity of exposure, does reduce this  
 24 potential bias as compared to studies that  
 25 don't include an intensity measure; correct?

1 A. Yes.  
 2 Q. And the case-control studies that  
 3 we talked about for glyphosate, none of them  
 4 included any algorithm to try and assess  
 5 intensity of exposure; correct?  
 6 A. I don't think any of them did, no.  
 7 Q. The Blair paper in 2011, that  
 8 resulted in modifications for the algorithm  
 9 for intensity that was used in agricultural  
 10 study analyses going forward; correct?  
 11 A. I don't know.  
 12 MR. LASKER: Let's mark as  
 13 Exhibit -- I'm sorry.  
 14 (Exhibit 14-24, An Updated  
 15 Algorithm for Estimation of Pesticide  
 16 Exposure Intensity in the Agricultural  
 17 Health Study marked for identification,  
 18 as of this date.)  
 19 Q. This is a 2011 paper by Coble,  
 20 et al, including Dr. Blair as well, "An  
 21 updated algorithm for estimation of pesticide  
 22 exposure intensity in the Agricultural Health  
 23 Study." Correct?  
 24 A. Yes.  
 25 Q. And it states in this abstract that

1 algorithm that was being discussed in the  
 2 paper you cited, 14-23, or the updated  
 3 algorithm that was derived subsequently?  
 4 A. I don't know anything about the  
 5 2013 analysis.  
 6 Q. Okay. If in fact the 2013 analysis  
 7 used an updated algorithm cited here in the  
 8 Coble paper, that would at least potentially  
 9 address some of the issues that you raised  
 10 with respect to the Blair 2011 paper;  
 11 correct?  
 12 A. Again, I would have to beg off on  
 13 that. I don't know.  
 14 Q. Okay.  
 15 (Continued on next page  
 16 with witness jurat.)

1 an algorithm developed to estimate pesticide  
 2 exposure intensity for use in epidemiological  
 3 analyses was revised based on data from two  
 4 exposure monitoring studies; correct?  
 5 A. Yes. But I am -- it's a little  
 6 hard for me to absorb. This is a pretty  
 7 complicated paper. It's a little hard for me  
 8 to sit here and absorb here now.  
 9 Q. Okay. But it does appear, and I  
 10 recognize that you have not reviewed this in  
 11 connection with reaching your opinion, but it  
 12 does appear that in response to some of the  
 13 analyses that were in the paper we looked at,  
 14 14-23, there was an update in the algorithm  
 15 for the Agricultural Health Study for  
 16 intensity of exposure; correct?  
 17 A. Perhaps. I don't know, and I don't  
 18 know for what particular exposures, and in  
 19 particular, I don't know whether it applies  
 20 to glyphosate in particular or not.  
 21 Q. And with respect to -- and let's --  
 22 I don't think we marked it, but I think we  
 23 are going to have to now. The 2013  
 24 Agricultural Health Study analyses, do you  
 25 know whether or not that analysis used the

1 MR. LASKER: I have no further  
 2 questions. We are done.  
 3 THE VIDEOGRAPHER: The time is  
 4 6 p.m. We are off the record.  
 5 oOo  
 6 I, ALFRED NEUGUT, M.D., , the witness  
 7 herein, do hereby certify that the foregoing  
 8 testimony of the pages of this deposition to be a  
 9 true and correct transcript, subject to the  
 10 corrections, if any, shown on the attached page.  
 11 \_\_\_\_\_  
 12  
 13 Subscribed and sworn to before me this  
 14 \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.  
 15 \_\_\_\_\_  
 16 NOTARY PUBLIC  
 17  
 18  
 19  
 20  
 21  
 22  
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 25

1 STATE OF NEW YORK ) Pg. of Pgs.  
2 COUNTY OF NEW YORK )

3 I wish to make the following changes  
4 for the following reasons:

5 PAGE LINE

6 \_\_\_\_\_ CHANGE: \_\_\_\_\_

7 REASON: \_\_\_\_\_

8 \_\_\_\_\_ CHANGE: \_\_\_\_\_

9 REASON: \_\_\_\_\_

10 \_\_\_\_\_ CHANGE: \_\_\_\_\_

11 REASON: \_\_\_\_\_

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13 REASON: \_\_\_\_\_

14 \_\_\_\_\_ CHANGE: \_\_\_\_\_

15 REASON: \_\_\_\_\_

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17 REASON: \_\_\_\_\_

18 \_\_\_\_\_ CHANGE: \_\_\_\_\_

19 REASON: \_\_\_\_\_

20 \_\_\_\_\_ CHANGE: \_\_\_\_\_

21 REASON: \_\_\_\_\_

22 \_\_\_\_\_ CHANGE: \_\_\_\_\_

23 REASON: \_\_\_\_\_

24 \_\_\_\_\_  
25 ALFRED NEUGUT, M.D.,

1 C E R T I F I C A T E  
2 STATE OF NEW YORK )  
3 : SS.  
4 COUNTY OF NEW YORK )  
5  
6

7 I, BONNIE PRUSZYNSKI, a Notary  
8 Public with and for the State of New York,  
9 do hereby certify:

10 That ALFRED NEUGUT, M.D., , the witness  
11 whose deposition is hereinbefore set forth,  
12 was duly sworn by me and that such deposition  
13 is a true record of the testimony given by  
14 the witness.

15 I further certify that I am not related  
16 to any of the parties to this action by  
17 blood or marriage, and that I am in no way  
18 interested in the outcome of this matter.

19 IN WITNESS WHEREOF, I have hereunto  
20 set my hand this 7th of August, 2017.

21 \_\_\_\_\_  
22  
23 Bonnie Pruszynski  
24  
25

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