

# **Exhibit 3**

1 UNITED STATES DISTRICT COURT  
2 NORTHERN DISTRICT OF CALIFORNIA  
3

4 IN RE: ROUNDUP PRODUCTS )  
LIABILITY LITIGATION, )  
5 )  
\_\_\_\_\_ ) MDL No. 2741  
6 )  
This document relates to: ) Case No.  
7 ) 16-md-02741-VC  
ALL ACTIONS )  
8 )  
\_\_\_\_\_ )

9  
10  
11  
12  
13  
14  
15 VIDEO DEPOSITION OF  
16 DENNIS WEISENBURGER, M.D.  
17 MONROVIA, CALIFORNIA  
18 MONDAY, JANUARY 22, 2018  
19

20  
21  
22 REPORTED BY:  
23 LISA MOSKOWITZ, CSR 10816, RPR, CRR, CLR,  
24 NCRA REALTIME SYSTEMS ADMINISTRATOR  
25 JOB NO. 136023

Page 2

1  
2  
3  
4  
5           JANUARY 22, 2018  
6           8:41 A.M.  
7  
8  
9           VIDEO DEPOSITION OF DENNIS  
10 WEISENBURGER, M.D., held at Courtyard by  
11 Marriott, 700 West Huntington Drive,  
12 Monrovia, California, before Lisa Moskowicz,  
13 California CSR 10816, RPR, CRR, CLR, NCRA  
14 Realtime Systems Administrator.  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

Page 3

1    **A P P E A R A N C E S:**  
2    ANDRUS WAGSTAFF ATTORNEYS AT LAW  
3    Attorneys for Plaintiffs  
4    7171 West Alaska Drive  
5    Lakewood, Colorado 80226  
6    BY: KATHRYN FORGIE, ESQ.  
7  
8    BAUM HEDLUND ARISTEI & GOLDMAN  
9    Attorneys for Plaintiffs  
10  12100 Wilshire Boulevard  
11  Los Angeles, California 90025  
12  BY: PEDRAM ESFANDIARY, ESQ.  
13  
14  HOLLINGSWORTH  
15  Attorneys for Defendant Monsanto  
16  1350 I Street, N.W.  
17  Washington, D.C. 20005  
18  BY: KIRBY GRIFFIS, ESQ.  
19  BY: ELYSE SHIMADA, ESQ.  
20  
21  ALSO PRESENT:  
22  ANDREW TURNER, VIDEOGRAPHER  
23  
24  
25

Page 4

1    ----- I N D E X -----  
2    WITNESS:       EXAMINATION       PAGE  
3    DENNIS WEISENBURGER, M.D.  
4                    Mr. Griffis           9, 147  
5                    Ms. Forgie            141  
6  
7  
8    ----- E X H I B I T S -----  
9    NUMBER                                MARKED  
10  Exhibit 31-1 Notice to take oral and   10  
11                   videotaped deposition of  
12                   Dr. Dennis D.  
13                   Weisenburger  
14  Exhibit 31-2 Amended Notice to take   10  
15                   oral and videotaped  
16                   deposition of Dr. Dennis  
17                   D. Weisenburger  
18  Exhibit 31-3 Supplemental report of   10  
19                   Dr. Dennis D.  
20                   Weisenburger, M.D.,  
21                   pursuant to PTO number  
22                   34 and in support of  
23                   general causation on  
24                   behalf of plaintiffs  
25

Page 5

1  
2    Exhibit 31-4 Supplemental materials   10  
3                   related to the 2017 AHS  
4                   publication  
5    Exhibit 31-5 Andreotti study        10  
6    Exhibit 31-6 Malathion monograph   18  
7    Exhibit 31-7 Expert report of Dr.   73  
8                   Dennis D. Weisenburger,  
9                   M.D., in support of  
10                   general causation on  
11                   behalf of plaintiffs  
12    Exhibit 31-8 Bonner study           93  
13    Exhibit 31-9 Koutros study          93  
14    Exhibit 31-10 Koutros study         93  
15    Exhibit 31-11 Heltshe study         103  
16    Exhibit 31-12 Montgomery study     122  
17    Exhibit 31-13 Rinsky study          122  
18  
19  
20  
21  
22  
23  
24  
25

Page 6

1	QUESTIONS NOT ANSWERED
2	PAGE LINE
3	20 9
4	20 16
5	21 14
6	22 5
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	

Page 7

1 LOS ANGELES, MONDAY, JANUARY 22, 2018.  
 2 8:41 A.M.  
 3  
 4 THE VIDEOGRAPHER: Good morning.  
 5 This is the start of media labeled  
 6 number 1 of the video-recorded  
 7 deposition of Dennis Weisenburger in the  
 8 matter of Roundup Products liability  
 9 litigation in the court of the U.S.  
 10 District Court, Northern District of  
 11 California, case number 16-MD-02741-VC.  
 12 This deposition is being held at the  
 13 Courtyard Marriott, address 700 West  
 14 Huntington Drive, Monrovia, California  
 15 91016 on January 22 at approximately  
 16 8:41 a.m.  
 17 My name is Andrew Turner. I am the  
 18 legal video specialist from TSG  
 19 Reporting, Incorporated, headquartered  
 20 at 747 Third Avenue, New York, New York.  
 21 The court reporter today is Lisa  
 22 Moskowitz in association with TSG  
 23 Reporting.  
 24 Counsel, will you please introduce  
 25 yourselves.

Page 8

1 MS. FORGIE: Kathryn Forgie for the  
 2 plaintiffs.  
 3 MR. ESFANDIARY: Pedram Esfandiary  
 4 for the plaintiffs.  
 5 MR. GRIFFIS: Kirby Griffis,  
 6 Hollingsworth, LLP, for Monsanto.  
 7 MS. SHIMADA: Elyse Shimada,  
 8 Hollingsworth, LLP, for Monsanto.  
 9 THE VIDEOGRAPHER: Thank you.  
 10 Will the court reporter please  
 11 swear in the witness.  
 12  
 13 Dennis Weisenburger, MD,  
 14 called as a witness, having been  
 15 duly sworn, was examined and  
 16 testified as follows:  
 17  
 18 MS. FORGIE: I want to make a  
 19 statement for the record.  
 20 This deposition is being taken  
 21 pursuant to pre-trial order number 34.  
 22 It is limited to the recent Agricultural  
 23 Health Study publication. It is also  
 24 limited to two-and-a-half hours of  
 25 questioning.

Page 9

1 EXAMINATION  
 2 BY MR. GRIFFIS:  
 3 Q. Good morning, Dr. Weisenburger.  
 4 A. Good morning.  
 5 Q. We met one time at a prior version  
 6 of this deposition; is that right?  
 7 A. Yes.  
 8 Q. You formed your opinions about  
 9 causation in this litigation, i.e., that  
 10 glyphosate causes non-Hodgkin's lymphoma  
 11 without any data from the Agricultural  
 12 Health Study after the DeRoos 2005  
 13 publication; correct?  
 14 MS. FORGIE: Objection.  
 15 THE WITNESS: That's correct.  
 16 BY MR. GRIFFIS:  
 17 Q. At your deposition I showed you an  
 18 unpublished draft of some data through 2013  
 19 from the AHS pool of data, and we discussed  
 20 it. That was not included in your original  
 21 report or in your original assessment of  
 22 causation; right?  
 23 A. That's correct.  
 24 Q. And that data, additional data, has  
 25 now been published in the 2018 publication

Page 10

1 in the "Journal of the National Cancer  
 2 Institute," and we're going to be talking  
 3 about that today; right?  
 4 A. Yes.  
 5 Q. Now, you said in your  
 6 supplemental -- well, let me say what I've  
 7 marked prior to starting the deposition.  
 8 Exhibit 1 is the original notice of  
 9 deposition in this case. Exhibit 2 is a  
 10 second notice of deposition with the time  
 11 corrected because you asked to be deposed at  
 12 9 o'clock, rather than 1 o'clock, the  
 13 original information we had. 3 is your  
 14 supplemental expert report that's marked in  
 15 front of you. 4 is an additional materials  
 16 considered list that we received quite  
 17 recently, and 5 is the National Cancer  
 18 Institute 2018 study.  
 19 (Exhibit Numbers 31-1, 31-2,  
 20 31-3, 31-4, and 31-5 were  
 21 marked for identification.)  
 22 BY MS. FORGIE:  
 23 Q. Correct, sir?  
 24 MS. FORGIE: I don't think we have  
 25 all the copies here, additional copies.

Page 11

1 MR. GRIFFIS: Do you need an  
 2 additional copy of the notice of  
 3 deposition?  
 4 MS. FORGIE: I just want to make  
 5 sure I know what it is.  
 6 THE WITNESS: Everything is here.  
 7 MS. FORGIE: Yeah, but it's not  
 8 here. Let me just look real quick.  
 9 Okay.  
 10 BY MR. GRIFFIS:  
 11 Q. In your supplemental expert report,  
 12 sir, which is Exhibit 3, can you get that  
 13 out, please. On the second page which is  
 14 also the last page, last paragraph, the  
 15 first sentence is "In conclusion, my opinion  
 16 on the role of glyphosate as a cause of NHL  
 17 has not changed based on the  
 18 recently-published update of the AHS";  
 19 correct?  
 20 A. Yes.  
 21 Q. So you don't rely certainly on the  
 22 NCI, National Cancer Institute 2018 study as  
 23 proof that Roundup does cause NHL; right?  
 24 A. I do not.  
 25 Q. And what weight do you give it as

Page 12

1 evidence that Roundup glyphosate-containing  
 2 substances don't cause NHL?  
 3 A. Well, I give it some weight because  
 4 it is now a published study in a reputable  
 5 journal, but there are significant issues  
 6 and flaws in the study which would lead me  
 7 to not give it very much weight or to change  
 8 my opinion.  
 9 Q. Does it weaken your conviction that  
 10 Roundup or glyphosate-containing substances  
 11 cause non-Hodgkin's lymphoma?  
 12 A. No.  
 13 MS. FORGIE: Object to the form.  
 14 THE WITNESS: No.  
 15 BY MR. GRIFFIS:  
 16 Q. If you give it some weight, sir,  
 17 would you please explain how it is that it  
 18 does not weaken your conclusion?  
 19 A. Well, the findings are basically  
 20 the same as the original De Roos study.  
 21 They added more cases. They added more  
 22 follow-up time. They did a bit more  
 23 sophisticated analysis, but the results are  
 24 basically the same in all findings. So I  
 25 don't give it really more -- any more weight

Page 13

1 than I gave the original De Roos study.  
 2 Q. And that weight, the weight that  
 3 the original De Roos study had, was built  
 4 into your original evaluation and your  
 5 original expert report, of course; correct?  
 6 A. Yes.  
 7 Q. Would you please comment on why you  
 8 give it no more weight than you gave to the  
 9 De Roos 2005 paper if it is, as you just  
 10 said, larger and has more follow-up time and  
 11 more sophisticated methods of analysis?  
 12 MS. FORGIE: Object to the form.  
 13 THE WITNESS: Well, as I mentioned,  
 14 there are significant issues and flaws  
 15 with the study that I think call into  
 16 question the validity of the study in  
 17 terms of a negative finding, and, you  
 18 know, if one looks at all of the  
 19 epidemiologic evidence, there are  
 20 multiple case control studies which are  
 21 positive. And there's one cohort study,  
 22 the Agricultural Health study, which is  
 23 negative. So you've got multiple  
 24 positive studies, you've got one  
 25 negative study which is questionable,

1 and so it really doesn't change my  
2 opinion to any degree.  
3 BY MR. GRIFFIS:  
4 Q. I don't want to misrepresent the  
5 methodology you applied, sir. You certainly  
6 don't just count up the positives and the  
7 negatives and compare them. You weigh the  
8 value?  
9 A. Correct.  
10 Q. And reliability of each study  
11 before you reach a conclusion. Fair?  
12 A. Yes, that's correct.  
13 Q. And one important factor in  
14 weighing the reliability and validity of  
15 studies is the size of the study, the number  
16 of exposed cases, the length of follow-up,  
17 the sophistication of the epidemiologic  
18 analysis, et cetera; correct?  
19 MS. FORGIE: Object to the form.  
20 THE WITNESS: Right. You look at  
21 each of the studies individually. You  
22 draw some conclusions about whether they  
23 are acceptable studies or not, and then  
24 you weigh that evidence. And that's  
25 what I did.

1 BY MR. GRIFFIS:  
2 Q. Is it fair to say that the -- you  
3 identified a number of what you consider to  
4 be flaws in the National Cancer Institute  
5 2018 study in your supplemental expert  
6 report; right?  
7 A. Yes.  
8 Q. Is it fair to say that it is  
9 because of those flaws that you believe to  
10 exist in the study that you have given it no  
11 more weight than you originally gave to  
12 De Roos 2005?  
13 A. Yes.  
14 Q. You don't claim that recall bias is  
15 a flaw in the NCI 2018 study; right?  
16 MS. FORGIE: Object to the form.  
17 THE WITNESS: I don't claim that,  
18 no.  
19 BY MR. GRIFFIS:  
20 Q. Recall bias is a concern for case  
21 control studies but generally not a concern  
22 for cohort studies; is that fair?  
23 MS. FORGIE: Object to the form.  
24 THE WITNESS: That's true.  
25 ///

1 BY MR. GRIFFIS:  
2 Q. And recall bias refers not to just  
3 mistakes people might make when asked to  
4 recall but differential recall based on  
5 whether you already have the condition that  
6 the study is looking at or don't have it;  
7 correct?  
8 A. Yes.  
9 Q. And that's why it tends to apply to  
10 case control and not as to cohort studies;  
11 right?  
12 MS. FORGIE: Object to the form.  
13 THE WITNESS: Yes.  
14 BY MR. GRIFFIS:  
15 Q. If someone said recall bias happens  
16 any time you ask anyone to recall, they  
17 wouldn't understand what they were talking  
18 about epidemiologically speaking; right?  
19 MS. FORGIE: Object to the form.  
20 THE WITNESS: Well, in  
21 epidemiologic terms, you're right.  
22 BY MR. GRIFFIS:  
23 Q. Okay. Now, do you know, sir, that  
24 IARC found the AHS to be a highly  
25 informative study including their imputation

1 procedures?  
2 MS. FORGIE: Object to the form.  
3 THE WITNESS: I don't recall that.  
4 BY MR. GRIFFIS:  
5 Q. Have you been shown the malathion  
6 monograph, sir?  
7 A. No.  
8 Q. And you know what I mean when I  
9 refer to the malathion monograph?  
10 A. I assume it's an IARC monograph on  
11 malathion.  
12 Q. Do you know that when the  
13 glyphosate monograph was done, the same  
14 working groups were simultaneously working  
15 on other substances?  
16 A. Yes.  
17 Q. And actually dividing their time  
18 between glyphosate and other substances --  
19 A. Yes.  
20 Q. -- including malathion. You know  
21 that, sir?  
22 A. I don't know what other pesticides  
23 they were considering but yes, they were  
24 considering other pesticides as part of  
25 their work.

1 Q. I'll show you the malathion  
2 monograph.

3 MS. FORGIE: I'm going to object to  
4 this. It's completely beyond the scope.  
5 It's not in his supplemental report and  
6 it's not about the AHS. Unless you can  
7 tie it pretty quickly to the AHS  
8 publication, the actual publication  
9 which was not published at the time --  
10 the publication we're talking about  
11 which was not published at the time the  
12 malathion IARC monograph was, then I'm  
13 going to instruct him not to answer.

14 MR. GRIFFIS: I admonish counsel  
15 not to make speaking objections.

16 MS. FORGIE: That's not an  
17 objection. It's a statement as to what  
18 is going on here.

19 MR. GRIFFIS: I admonish counsel  
20 not to make speaking statements.

21 MS. FORGIE: I'll make whatever  
22 statements I can that are important.  
23 (Exhibit Number 31-6 was marked  
24 for identification.)  
25 ///

1 reviewed this document.

2 Q. Yes, sir. You did review the  
3 monograph for glyphosate; right?

4 A. I did.

5 Q. Take a look on page 7 under  
6 "Exposure assessment."

7 Do you see that?

8 A. Yes.

9 Q. Do you see it says, "This section  
10 summarizes the exposure assessment and  
11 assignment for epidemiological studies of  
12 cancer and exposure to the pesticides  
13 considered in the present volume."

14 MS. FORGIE: Don't answer that.  
15 BY MR. GRIFFIS:

16 Q. And it lists multiple substances  
17 including glyphosate?

18 MS. FORGIE: Don't answer that,  
19 please.

20 This has nothing to do with what  
21 we're here for. I'm going to instruct  
22 him not to answer.

23 MR. GRIFFIS: This is about the AHS  
24 data.

25 MS. FORGIE: No, this is not about

1 BY MR. GRIFFIS:

2 Q. Turn, sir, to what I've marked as  
3 Exhibit 6. It's the same day as the other  
4 monograms.

5 MS. FORGIE: 2015, three years  
6 before the publication.

7 MR. GRIFFIS: Counsel.

8 MS. FORGIE: I'm asking why are we  
9 talking about this when this --

10 MR. GRIFFIS: We're not going to  
11 have a debate on the record. He's not  
12 going to listen to your --

13 MS. FORGIE: I can make whatever  
14 statements I want. Unless you can tie  
15 this into his supplemental report or the  
16 AHS publication we're talking about, I'm  
17 going to instruct him not to answer.  
18 It's not appropriate.

19 MR. GRIFFIS: We'll be back.

20 MS. FORGIE: Fine. We've done that  
21 before.

22 BY MR. GRIFFIS:

23 Q. Counsel.

24 Turn to page 7?

25 A. I'd like to state I haven't

1 the AHS publication. This was published  
2 three years before the publication, and  
3 he's already stated he hasn't reviewed  
4 it.

5 BY MR. GRIFFIS:

6 Q. Sir, you have a criticism of  
7 imputation; correct? Imputation as done in  
8 the NCI 2018?

9 A. I have a criticism of imputation as  
10 it was done with regard to glyphosate.

11 Q. And do you know that the IARC  
12 commented on that very imputation procedure?

13 A. No, I don't know that they --

14 Q. Turn to page 21, sir.

15 MS. FORGIE: No, don't answer that.

16 Don't answer any questions about the  
17 malathion.

18 BY MR. GRIFFIS:

19 Q. Sir, you've said you haven't  
20 reviewed the malathion monograph. You also  
21 haven't reviewed the section that addresses  
22 IARC's assessment of epidemiology from the  
23 agriculture Health Study including  
24 glyphosate; is that right?

25 A. I'm sorry. Repeat -- would you

Page 22

1 repeat the question?  
 2 Q. Yes, sir. You said you haven't  
 3 reviewed the malathion monograph.  
 4 A. That's correct.  
 5 Q. You also haven't reviewed the  
 6 section in the malathion monograph in which  
 7 IARC addressed its view of the Agricultural  
 8 Health Survey data including De Roos 2005  
 9 and multiple subsequent publications that  
 10 they took into account in the glyphosate  
 11 monograph and other monographs and gave its  
 12 assessment of the quality of that data;  
 13 right?  
 14 MS. FORGIE: Don't answer that.  
 15 He's not going to answer questions about  
 16 the malathion monograph.  
 17 BY MR. GRIFFIS:  
 18 Q. Do you agree with the working group  
 19 that the AHS is a highly informative study?  
 20 MS. FORGIE: Could I have that read  
 21 back, please.  
 22 BY MR. GRIFFIS:  
 23 Q. Do you agree with IARC that the AHS  
 24 is a highly informative study?  
 25 MS. FORGIE: Object to the form.

Page 23

1 THE WITNESS: In general, I would  
 2 say yes.  
 3 BY MR. GRIFFIS:  
 4 Q. Do you consider it to be -- let's  
 5 talk specifically about the NCI 2018 data.  
 6 You know, sir, that there have been many,  
 7 many publications from the AHS pool of data;  
 8 right?  
 9 A. Yes.  
 10 Q. And they address many possible  
 11 outcomes, not just non-Hodgkin's lymphoma  
 12 and glyphosate; right?  
 13 A. Yes.  
 14 Q. Many, many substances and other  
 15 exposures and other possible health risks  
 16 have been compared to many, many outcomes,  
 17 and there are multiple publications about  
 18 that; right?  
 19 A. Yes.  
 20 MS. FORGIE: Object to the form.  
 21 BY MR. GRIFFIS:  
 22 Q. Are you aware that there have been  
 23 multiple publications using the same  
 24 imputation method that was used in the NCI  
 25 2018 paper?

Page 24

1 A. Yes, there have been others.  
 2 Q. And there have been multiple  
 3 peer-reviewed papers applying that  
 4 methodology; right?  
 5 A. Yes.  
 6 Q. And you didn't know before today  
 7 that IARC had also looked at that same  
 8 imputation procedure; right?  
 9 MS. FORGIE: Object to the form.  
 10 THE WITNESS: I did not.  
 11 BY MR. GRIFFIS:  
 12 Q. When you say that you agree with  
 13 IARC that -- well, when you say that the NCI  
 14 2018 paper is highly reliable, what do you  
 15 mean by that, sir?  
 16 MS. FORGIE: Object to the form.  
 17 THE WITNESS: I didn't make that  
 18 statement.  
 19 BY MR. GRIFFIS:  
 20 Q. I'm sorry. Highly informative.  
 21 MS. FORGIE: Object to the form.  
 22 BY MR. GRIFFIS:  
 23 Q. Let me ask it again cleanly --  
 24 A. Well, you know, it lays out in  
 25 detail the follow-up that was done, the

Page 25

1 methodology, and, you know, it is  
 2 informative in the sense that it provides  
 3 new information. But as I said before, I  
 4 think that there are significant issues and  
 5 flaws that really take away from the -- call  
 6 the findings into question and take away  
 7 from the validity of the study. And I'm  
 8 speaking specifically about the glyphosate  
 9 study.  
 10 Q. Had you reviewed the NCI 2018  
 11 paper, would you have recommended it for  
 12 publication in the "Journal of the National  
 13 Cancer Institute"?  
 14 A. I probably would have not.  
 15 Q. You disagree with the peer  
 16 reviewers of the "Journal of the National  
 17 Cancer Institute" as to the appropriateness  
 18 of the publication?  
 19 MS. FORGIE: Object to the form.  
 20 THE WITNESS: I think the peer  
 21 reviewers probably didn't address the  
 22 issues and flaws in the study in an  
 23 informative way and so didn't call into  
 24 question the study. I mean, I don't  
 25 know. The peer review is secret; so we

1 don't know who the peer reviewers were,  
2 and we don't know what they said or  
3 didn't say.

4 BY MR. GRIFFIS:

5 Q. Do you peer review for the "Journal  
6 of the National Cancer Institute"?

7 A. I don't remember if I have or not.  
8 Not commonly. Not usually, no.

9 Q. You can't remember if you have; is  
10 that right?

11 A. I can't remember off the top of my  
12 head if I have or not.

13 Q. Okay. Are there any -- what  
14 journals -- are there any epidemiology  
15 journals that you peer review for, sir?

16 A. I have done reviews for "Cancer  
17 Epidemiology, Biomarkers and Prevention." I  
18 may have done reviews for other epidemiology  
19 journals, but in general, I don't accept  
20 reviews from epidemiology journals.

21 Q. Why is that?

22 A. Well, because it's a lot of work,  
23 and I'm a busy man.

24 Q. Why is it a lot of work to do  
25 epidemiology reviews?

1 A. Well, any review is a lot of work.  
2 You have to read the paper critically. You  
3 have to read the literature around it. You  
4 have to understand the methodology. It can  
5 take you literally hours and hours to do a  
6 proper review of a complicated or difficult  
7 article and write a very, I would say,  
8 helpful and critical review of comments to  
9 the editor and to the authors. So it's a  
10 lot of work to do that, and, of course, it's  
11 done in my free time, my weekends, nights,  
12 and holidays. That's when I end up having  
13 to do it because I have a full-time job. So  
14 I don't do it very often. I very carefully  
15 pick the articles that I review, things that  
16 I'm interested in or things that I've  
17 done -- I have myself done research on  
18 usually.

19 Q. Take a look at Exhibit 5, the NCI  
20 2018 paper, sir.

21 I'm going to start out in the  
22 abstract, the part marked "Conclusions. The  
23 author has concluded that in this large  
24 perspective cohort study, no association was  
25 apparent between glyphosate and any solid

1 tumors or lymphoid malignancies overall,  
2 including NHL and its subtypes."

3 Have I read that correctly?

4 A. Yes.

5 Q. And that accurately describes the  
6 findings of the study; right?

7 MS. FORGIE: Object to the form.

8 THE WITNESS: Yes.

9 BY MR. GRIFFIS:

10 Q. In the discussion section, first  
11 paragraph of the discussion section on  
12 page 5 of 8, sir, the authors wrote, "In  
13 this updated evaluation of glyphosate use  
14 and cancer risk in a large perspective study  
15 of pesticide applicators, we observed no  
16 associations between glyphosate use and  
17 overall cancer risk or with total  
18 lymphohematopoietic cancers including NHL  
19 and multiple myeloma."

20 Have I read that right?

21 A. Yes.

22 Q. That's an accurate description of  
23 the finding in the study; right?

24 MS. FORGIE: Object to the form.

25 THE WITNESS: Yes.

1 BY MR. GRIFFIS:

2 Q. On page 7 of 8, sir, in the  
3 right-hand column in the first full  
4 paragraph, the authors of the NCI 2018 study  
5 comment on the scope of this study compared  
6 to the De Roos 2005 publication, and they  
7 write, "In this perspective cohort study, we  
8 expanded a previous analysis of glyphosate  
9 use and cancer risk with more than eleven  
10 years of additional follow-up and more than  
11 four times the number of glyphosate-exposed  
12 cancer cases, n equals 5,779 compared with n  
13 equals 1,324."

14 Did I read that right?

15 A. Yes.

16 Q. That's an accurate comparison of  
17 this study to the De Roos 2005 study;  
18 correct?

19 MS. FORGIE: Object to the form.

20 THE WITNESS: Yes.

21 BY MR. GRIFFIS:

22 Q. On the other -- in the left-hand  
23 column, sir, the first full paragraph, the  
24 authors repeat that they observed no  
25 associations between glyphosate use and NHL

1 overall or any of its subtypes. And then  
2 they say, "This lack of association was  
3 consistent for both exposure metrics,  
4 unlagged and lagged analyses, after further  
5 adjustment for pesticides linked to NHL in  
6 previous AHS analyses and when we excluded  
7 multiple myeloma from the NHL grouping."

8 Have I read that correctly?

9 MS. FORGIE: Object to the form.

10 THE WITNESS: Yes.

11 BY MR. GRIFFIS:

12 Q. And that's accurate. They did all  
13 those adjustments and they still found no  
14 association; correct?

15 MS. FORGIE: Object to the form.

16 THE WITNESS: Yes.

17 BY MR. GRIFFIS:

18 Q. In Table 2, sir, Table 2 of the  
19 data table, these are their findings for all  
20 cancers, multiple and specific, solid and  
21 lymphohematopoietic cancers; correct?

22 A. Yes.

23 Q. For all cancers they found no  
24 association. All of the relative risks were  
25 right around one; correct?

1 association between the substance being  
2 examined and the multiple cancers being  
3 examined; correct?

4 MS. FORGIE: Object to the form.

5 THE WITNESS: Yes.

6 BY MR. GRIFFIS:

7 Q. So we just talked about the all  
8 cancers finding. There are also multiple  
9 breakdown, oral cavity, colon, rectum,  
10 pancreas, lung, melanoma, prostate,  
11 testicular, bladder and kidney --

12 MS. FORGIE: Are you still on  
13 Table 2?

14 MR. GRIFFIS: Yes.

15 MS. FORGIE: Thank you.

16 BY MR. GRIFFIS:

17 Q. And those are all negative as well;  
18 correct?

19 A. I don't know. I didn't look  
20 carefully at them.

21 Q. Yes, sir.

22 A. Yes, I guess, they are all  
23 negative. That's true.

24 Q. So they're all very close to one,  
25 some of the values are above one, some of

1 MS. FORGIE: Object to the form.

2 THE WITNESS: Yes.

3 BY MR. GRIFFIS:

4 Q. And when -- generally speaking,  
5 sir, when an epidemiology study investigates  
6 whether a particular exposure causes a  
7 particular outcome, it looks at a whole  
8 bunch of different outcomes and it finds  
9 relative risks a little bit above one, a  
10 little bit below one, consistently none of  
11 them are statistically significant, the  
12 confidence interval is always straddling the  
13 one, that's what you would expect to see  
14 when a substance does not cause cancer;  
15 right?

16 MS. FORGIE: Object to the form.

17 THE WITNESS: In general, yes.

18 BY MR. GRIFFIS:

19 Q. So, in general, and we'll talk  
20 about your specific criticisms of this in a  
21 moment, of course, sir, but, in general,  
22 this is the pattern of relative risks, point  
23 estimates, and confidence intervals you  
24 would expect to see in a large epidemiology  
25 study where there is, in fact, no

1 the values are below one. All of them are  
2 non-significant and the P-trend, which is a  
3 way of looking at a group of relative risks  
4 and confidence intervals together for  
5 different exposure levels, those are all  
6 non-significant as well; correct?

7 A. Yes.

8 Q. And that was for the solid tumors  
9 to be clear.

10 Let's talk about the  
11 lymphohematopoietic cancers which would be  
12 the lymphomas -- correct? -- and leukemias?

13 A. Yes.

14 Q. The overall figure for  
15 lymphohematopoietic cancers is negative.  
16 Relative risks are all one or below.  
17 Confidence intervals all straddle the null,  
18 the one; correct?

19 MS. FORGIE: Object to the form.

20 THE WITNESS: Yes.

21 BY MR. GRIFFIS:

22 Q. And the subtypes, the Hodgkin  
23 lymphoma breakdown is also negative. The  
24 overall non-Hodgkin's lymphoma breakdown is  
25 negative; correct?

Page 34

1 MS. FORGIE: Are you on Table 3 now  
 2 or Table 2?  
 3 MR. GRIFFIS: Still on Table 2.  
 4 THE WITNESS: Second part of  
 5 Table 2.  
 6 MS. FORGIE: Okay.  
 7 THE WITNESS: So both Hodgkin and  
 8 non-Hodgkin show the same pattern.  
 9 BY MR. GRIFFIS:  
 10 Q. Right. I.e., no association;  
 11 correct?  
 12 A. Correct.  
 13 Q. And then there's a breakdown for  
 14 various subtypes of non-Hodgkin lymphoma;  
 15 correct?  
 16 A. Yes.  
 17 Q. So for non-Hodgkin lymphoma B-cell,  
 18 there's no association. For chronic  
 19 lymphocytic lymphoma and small lymphocytic  
 20 leukemia, there is no association; correct?  
 21 A. Correct.  
 22 Q. For diffuse large B-cell lymphoma,  
 23 no association; correct?  
 24 MS. FORGIE: Object to the form.  
 25 THE WITNESS: Correct.

Page 35

1 BY MR. GRIFFIS:  
 2 Q. For marginal-zone lymphoma, no  
 3 association; correct?  
 4 A. Correct.  
 5 Q. For follicular lymphoma, no  
 6 association; correct?  
 7 A. Correct.  
 8 Q. For multiple myeloma, no  
 9 association; correct?  
 10 A. Correct.  
 11 Q. For non-Hodgkin lymphoma T-cell, we  
 12 have the smallest -- we have a very small  
 13 exposed group so that they have to use  
 14 moieties instead of breaking into three or  
 15 four groups; right?  
 16 A. Right. They can only break them  
 17 into two groups.  
 18 Q. Let's comment on that for a moment.  
 19 When there was enough data, they broke it  
 20 into four groups, into quartiles; right?  
 21 MS. FORGIE: Object to the form.  
 22 THE WITNESS: Tertiles or  
 23 quartiles, yes.  
 24 BY MR. GRIFFIS:  
 25 Q. And when there was slightly less

Page 36

1 data, they broke it into tertiles, and when  
 2 there was the least amount of data, they  
 3 broke it into moieties, into halves; right?  
 4 A. Correct.  
 5 Q. This is one of the ones for which  
 6 they had the least data, and these values  
 7 are above one, but they are not significant;  
 8 correct?  
 9 A. Correct.  
 10 MS. FORGIE: Objection.  
 11 BY MR. GRIFFIS:  
 12 Q. So, again, there's no association  
 13 for non-Hodgkin's lymphoma T-cell in this  
 14 data; correct?  
 15 MS. FORGIE: Object to the form.  
 16 THE WITNESS: There's no  
 17 significant association.  
 18 BY MR. GRIFFIS:  
 19 Q. The .31 is a measure of the  
 20 P-trend -- correct? -- whether there's an  
 21 association across the data?  
 22 A. .31 just looks at trend by  
 23 comparing the different groups. So what the  
 24 .31 is telling you is that the M2 group does  
 25 not have a higher risk ratio than the M1; so

Page 37

1 that's why it's not significant.  
 2 Q. This data would show -- you said  
 3 there's an association but not a  
 4 statistically significant one; right, sir?  
 5 Is that what you said?  
 6 A. Right. So you can see in the M1  
 7 there's an over fourfold increase odds ratio  
 8 for T-cell lymphoma, but since there's only  
 9 six cases in the M2 group, there wasn't an  
 10 increased -- there was a small increased  
 11 odds ratio. So what this is telling you  
 12 there isn't really what I would call a  
 13 dose-response effect here, although it's a  
 14 very crude analysis with very few cases and  
 15 only two groups so . . .  
 16 Q. So the data shows no-dose response?  
 17 MS. FORGIE: Object to the form.  
 18 THE WITNESS: Well, the data is so  
 19 small that it's hard to draw any  
 20 conclusions from that.  
 21 MS. FORGIE: Counsel, when you get  
 22 a chance, the reason I keep asking if  
 23 we're still on Table 2 is maybe when you  
 24 finish Table 2, we can take a break. I  
 25 left my phone, I think, in the room so

Page 38

1 when you get to a good breaking point.  
 2 That's why I keep saying are you still  
 3 on table 2.  
 4 MR. GRIFFIS: Okay. I'll stop when  
 5 we're done with table 2.  
 6 MS. FORGIE: Okay, or if there's an  
 7 earlier one, whatever is best for you.  
 8 BY MR. GRIFFIS:  
 9 Q. So the data for non-Hodgkin  
 10 lymphoma T-cell is so small you can't draw a  
 11 reasonable conclusion; is that --  
 12 MS. FORGIE: Object to the form.  
 13 THE WITNESS: I would say that is  
 14 true.  
 15 BY MR. GRIFFIS:  
 16 Q. You made a distinction earlier, and  
 17 I'm not talking about non-Hodgkin lymphoma  
 18 T-cell in particular, I'm talking in  
 19 general. You made a distinction between  
 20 whether there's an association or not and  
 21 whether that association is statistically  
 22 significant; right?  
 23 A. Right.  
 24 Q. What does "statistically  
 25 significant" mean in epidemiology, sir?

Page 39

1 A. Well, it's a measure of the  
 2 likelihood of -- that the association is due  
 3 to chance. So if it is statistically  
 4 significant, it's unlikely to be due to  
 5 chance. It's very likely to be real.  
 6 Q. When we're looking at each of these  
 7 point estimates like under follicular  
 8 lymphoma, the point estimate for the first  
 9 tertile is 0.89; correct?  
 10 A. Right.  
 11 Q. Where we looked to see if it's  
 12 statistically significant is the confidence  
 13 interval, the parenthetical afterwards and  
 14 to see if that spans or does not span the 1,  
 15 the null value; correct?  
 16 A. Yes.  
 17 Q. If somebody said statistically  
 18 significant means greater than one, and  
 19 that's all it means, they don't know what  
 20 they're talking about; right?  
 21 MS. FORGIE: Well, object to the  
 22 form.  
 23 THE WITNESS: Well, it depends  
 24 where the one is.  
 25 ///

Page 40

1 BY MR. GRIFFIS:  
 2 Q. A point estimate of greater than  
 3 one without regard to the confidence  
 4 interval.  
 5 A. Yes, that's true.  
 6 MR. GRIFFIS: We can take a break.  
 7 MS. FORGIE: Thank you.  
 8 THE VIDEOGRAPHER: We are going off  
 9 the record at 9:14 a.m.  
 10 (Recess taken from 9:14 a.m. to  
 11 9:24 a.m.)  
 12 THE VIDEOGRAPHER: This continues  
 13 disk number 1. We are going back on the  
 14 record. The time is 9:24 a.m.  
 15 BY MR. GRIFFIS:  
 16 Q. All right, Dr. Weisenburger, I'd  
 17 like to go to Exhibit 3, which is your  
 18 supplemental expert report.  
 19 You told me earlier that there are  
 20 a number of what you consider to be errors  
 21 or weaknesses or flaws in the NCI 2018 paper  
 22 that caused you to give it no more weight  
 23 than you gave to De Roos 2005. What I want  
 24 to do first is just enumerate the flaws you  
 25 see in the NCI 2018 paper. Let's get that

Page 41

1 done first, and then we'll talk about them.  
 2 So I'll give you some guidance but  
 3 tell me if I'm wrong about anything. It  
 4 seems to me that the first one that you  
 5 identified, sir, is a response rate one.  
 6 This is in the first -- the second  
 7 paragraph. You raised the issue of problems  
 8 that could happen if response rates to  
 9 follow-up surveys are low, and then you say,  
 10 "Only 44 percent of enrolled applicators  
 11 completed and returned a supplemental  
 12 questionnaire"; correct?  
 13 A. Yes.  
 14 Q. That 44 percent does not -- doesn't  
 15 reflect a questionnaire that was actually  
 16 used in the NCI 2018; right?  
 17 A. Oh, I'm sure data to perform that  
 18 supplemental questionnaire was used.  
 19 MS. FORGIE: Object to the form.  
 20 BY MR. GRIFFIS:  
 21 Q. The two surveys that were used were  
 22 the original one and the 1999 to 2005 one.  
 23 You go on to describe 37 percent of  
 24 applicators failing to respond to that one;  
 25 correct?

1 A. Right.  
2 Q. And the two that are described in  
3 the study and from which the data are pooled  
4 in the NCI 2018 study and the text of the  
5 study and the methods and analysis are the  
6 1999 -- the original survey, 1993 to '97 and  
7 the '99 to 2005 one; right?

8 A. Well, the supplemental  
9 questionnaire in which only 40 percent of  
10 the applicators responded was a take-home  
11 questionnaire after they filled out the  
12 initial questionnaire for enrollment. Okay?  
13 And that data was used in many of the  
14 studies and was probably used in -- it was  
15 probably used in the analysis of the people  
16 who responded to the second questionnaire.  
17 And it was certainly used in the data from  
18 De Roos 2000 -- the first De Roos paper.

19 Q. 2005?

20 A. Yeah, so it's supplemental  
21 information that they had on a subset and  
22 they used that data. They didn't just  
23 discard that data.

24 Q. Okay. We'll come back to that.

25 A. They used what they had.

1 Q. The first error -- should I call  
2 them errors or biases or flaws or what?

3 A. I think they're flaws.

4 Q. The first flaw that you identified  
5 in your supplemental expert report is the  
6 non- -- the relatively high non-response  
7 rate. The non-response rate; correct?

8 A. In the follow-up and supplemental  
9 questionnaires, yes.

10 Q. Okay. And the way that was  
11 addressed you discuss at the bottom of the  
12 first page, the last paragraph there. The  
13 imputation method; right?

14 A. Right. The imputation methods were  
15 used to address the lack of response to the  
16 first follow-up survey.

17 Q. Okay. So it's kind of --

18 A. Not that it was used to address the  
19 lack of information from the supplemental  
20 survey done at the time of enrollment.

21 Q. These are kind of the same  
22 criticism. It's a lack of follow-up and  
23 then the imputation method that was used to  
24 address that you have critiques of; correct?

25 MS. FORGIE: Object to the form.

1 THE WITNESS: You have to repeat  
2 the question. I don't understand the  
3 question.

4 BY MR. GRIFFIS:

5 Q. I'm just trying to get a list right  
6 now so that we can go through and do them  
7 one by one, a list of what you perceive to  
8 be the flaws in the NCI 2018.

9 A. Okay.

10 Q. I'm trying to know whether the  
11 response rate one goes with the imputation  
12 one so we can address them together or if  
13 they're distinct facets of those.

14 A. So, yeah, the lack of response from  
15 37 percent of the applicators, the authors  
16 of the paper tried to address using this  
17 imputation method. So they basically used  
18 their method to try and guess what the  
19 responses would have been for those  
20 37 percent of people who didn't respond.

21 Q. Okay. So the next flaw that you  
22 identified is in the, if I'm reading it  
23 correctly, it's in the second paragraph at  
24 the end. You said that "For the responders,  
25 pesticide use data was only obtained for the

1 last year of farming prior to the follow-up  
2 survey"; right?

3 MS. FORGIE: Object to the form.

4 THE WITNESS: Let's see. Where is  
5 that?

6 BY MR. GRIFFIS:

7 Q. It's the second paragraph of your  
8 supplemental expert report at the end of  
9 that paragraph.

10 A. Yeah, so they only asked -- in this  
11 first follow-up questionnaire, they only --  
12 which occurred anywhere from, I guess,  
13 probably 6 to 12 years after the initial  
14 questionnaire, they only asked for  
15 information on pesticide use for the last  
16 year of farming. So they didn't ask for any  
17 information in the period of time between  
18 the last year of farming and the last year  
19 that was included in the initial enrollment  
20 questionnaire.

21 Q. So that's a second flaw, the first  
22 one being the low response rate and the  
23 attempt to fix it with imputation which you  
24 feel was unsuccessful, and the second one  
25 was asking only for the last year of farming

1 in the follow-up survey.  
 2 MS. FORGIE: Object to the form.  
 3 BY MR. GRIFFIS:  
 4 Q. Is that right, sir? Is that an  
 5 accurate list so far?  
 6 A. Yes, that's true.  
 7 Q. And then the third that I see if  
 8 I'm correct is that there was an increase in  
 9 glyphosate use that you believe likely  
 10 resulted in significant misclassification of  
 11 some exposures; right?  
 12 A. Right.  
 13 Q. The next thing you write is  
 14 imputation as we discussed. That kind of  
 15 fits with the first criticism.  
 16 MS. FORGIE: Object to the form.  
 17 THE WITNESS: The third one that  
 18 you mentioned, the dramatic increase,  
 19 really reflects on how the cases were  
 20 actually classified in the initial  
 21 enrollment. It also complicates the  
 22 attempt to impute or to guess what  
 23 the -- what the exposure was for those  
 24 that didn't respond. So these things  
 25 are all tied together.

1 digging in. The flaws that you identified  
 2 are the relatively low response rate and the  
 3 attempt to address that through imputation  
 4 which you have criticisms of; two, the fact  
 5 the pesticide use data was obtained on last  
 6 year of farming in the second survey; three,  
 7 that there were secular trends in the use of  
 8 glyphosate that could affect exposure  
 9 analysis and change the figures; four, that  
 10 the relatively high frequency of exposure to  
 11 glyphosate made the distribution among  
 12 exposed and non-exposed non-optimal; and,  
 13 five, that it's too short a study so far in  
 14 terms of exposure and latency; is that  
 15 correct?  
 16 MS. FORGIE: Object to the form.  
 17 THE WITNESS: I would agree. The  
 18 last one is, you know, the median  
 19 exposure was only 8.5 years which is  
 20 really not a long period of exposure in  
 21 a cohort study. And the follow-up  
 22 probably needs to be even longer than it  
 23 is in this most recent publication.  
 24 BY MR. GRIFFIS:  
 25 Q. Okay. But those are the five

1 BY MR. GRIFFIS:  
 2 Q. Okay. The next one that I see --  
 3 and tell me if I've missed one -- is on  
 4 page 2, the first full paragraph, and you  
 5 make the point that there was a high -- high  
 6 usage of glyphosate, and so that's not an  
 7 optimal distribution among exposed and  
 8 unexposed; correct?  
 9 A. That's correct, yes.  
 10 Q. Is that the next one, or did I miss  
 11 one?  
 12 A. I think that's the next one.  
 13 Q. Okay. And then the next, and I  
 14 think last -- but you'll correct me if I'm  
 15 wrong -- is a latency issue. You said, "The  
 16 median lifetime years of glyphosate use was  
 17 only 8.5 years with a median follow-up time  
 18 of only about 18 years which may not be  
 19 enough exposure and/or follow-up time to  
 20 demonstrate an effect," and you called the  
 21 NCI 2018 at best an interim analysis?  
 22 A. Yeah, it's both an exposure and  
 23 latency issue.  
 24 Q. To recap, and again what I'm trying  
 25 to do is get a complete list before we start

1 flaws; right?  
 2 A. Yes.  
 3 MS. FORGIE: Object to the form.  
 4 BY MR. GRIFFIS:  
 5 Q. And there weren't any flaws that I  
 6 missed; correct?  
 7 MS. FORGIE: Object to the form.  
 8 THE WITNESS: Those are the ones  
 9 that I outlined in my report.  
 10 BY MR. GRIFFIS:  
 11 Q. Did you have any in mind that you  
 12 didn't outline in your report?  
 13 A. No.  
 14 Q. All right. I'd like to start with  
 15 flaw number 2, "Pesticide use data was only  
 16 obtained for the last year of farming."  
 17 So tell me if I'm correct here.  
 18 The concern is that someone may have started  
 19 to use glyphosate after the first survey but  
 20 continued to farm and not use glyphosate  
 21 during their last year of farming and then  
 22 reported no use of glyphosate in the second  
 23 survey and thus been undercounted?  
 24 MS. FORGIE: Object to the form.  
 25 THE WITNESS: There are a whole

Page 50

1 variety of errors that could have  
 2 occurred there. That's one of them.  
 3 For example, in the first survey they  
 4 could have been a non-user of  
 5 glyphosate, and in the second survey  
 6 they could have become a user of  
 7 glyphosate, but you wouldn't know when  
 8 they started using glyphosate. Okay?  
 9 There's no way to know that. The  
 10 reverse is true too. So they may have  
 11 not -- they may have been a user of  
 12 glyphosate, and then they discontinued  
 13 glyphosate, and you wouldn't know when  
 14 they discontinued glyphosate. So  
 15 there's no way to fill in the gap of the  
 16 years between the first survey and the  
 17 second survey. So I guess in the  
 18 imputation you just guess what it was.  
 19 BY MR. GRIFFIS:  
 20 Q. The imputation does address those  
 21 issues. We'll discuss your criticisms of  
 22 imputation, but it does address those  
 23 issues; right?  
 24 MS. FORGIE: Object to the form.  
 25 THE WITNESS: Well, it attempts to

Page 51

1 address them.  
 2 BY MR. GRIFFIS:  
 3 Q. Okay. So it's one of the pieces of  
 4 absent data that the imputation procedure is  
 5 designed to address. That's fair?  
 6 MS. FORGIE: Object to the form.  
 7 THE WITNESS: Yes.  
 8 BY MR. GRIFFIS:  
 9 Q. Do you have any evidence that there  
 10 was error introduced by asking people to  
 11 report on their last year of farming?  
 12 A. Well, the reported data probably  
 13 was accurate because it's the most recent  
 14 year of farming. So they should remember  
 15 that pretty accurately. So with regard to  
 16 that there probably was not a lot of error.  
 17 Q. And do you know whether it was the  
 18 best procedure to follow, for example, to  
 19 give people a shorter questionnaire to fill  
 20 out and increase their likelihood of  
 21 responding to it?  
 22 MS. FORGIE: Object to the form.  
 23 THE WITNESS: So that's true, but  
 24 what happens then is you don't have the  
 25 data you really need to answer the

Page 52

1 question. This is a problem with cohort  
 2 studies. They cut short to some extent  
 3 on the way they gather the data, and  
 4 they try to compensate it by having  
 5 many, many more people in the study.  
 6 But what it means is that the quality of  
 7 the data is not as good as it should be.  
 8 And had they taken more time in the  
 9 follow-up questionnaire and asked the  
 10 questions for each of the years, it  
 11 wouldn't have added a lot of time to the  
 12 question because the years were anywhere  
 13 between maybe five and ten, maximum 12.  
 14 So they could have asked three or four  
 15 questions for each year and had all the  
 16 data they needed to really do it  
 17 properly.  
 18 BY MR. GRIFFIS:  
 19 Q. You say on page 2 --  
 20 A. So they have to actually impute the  
 21 data for the respondents too because they  
 22 don't know what they did in between. It's  
 23 not just for the non-respondents, but it's  
 24 also for the respondents.  
 25 Q. You say on page 2, sir, "Since all

Page 53

1 of these various errors and exposure  
 2 classification were non-differential." And  
 3 I don't want to ask you about the whole  
 4 sentence right now, but just tell me what  
 5 you mean by non-differential.  
 6 MS. FORGIE: Object to the form.  
 7 THE WITNESS: Non-differential  
 8 means that the errors were not linked  
 9 specifically to the exposure or to the  
 10 disease in question. They were random  
 11 errors.  
 12 BY MR. GRIFFIS:  
 13 Q. Okay. So one person might slightly  
 14 underreport glyphosate. One person might  
 15 slightly overreport glyphosate, and there's  
 16 no consistency in the lack of data or the  
 17 missing data in association with either  
 18 non-Hodgkin lymphoma or glyphosate exposure.  
 19 That's what non-differential means?  
 20 MS. FORGIE: Object to the form.  
 21 THE WITNESS: Non-differential  
 22 means that it's just as likely that --  
 23 well, it's just as -- it means that  
 24 there's no direction in the bias, that  
 25 the bias is going in both directions,

Page 54

1           yes. I guess that's what you said.  
 2       BY MR. GRIFFIS:  
 3           Q. Okay. And if there are a whole  
 4       bunch of little randomnesses, some of them  
 5       would be pointing in one direction and some  
 6       in the other, and they would kind of tend to  
 7       cancel out; is that right?  
 8           MS. FORGIE: Object to the form.  
 9           THE WITNESS: That's true, but what  
 10       would happen is it decreases the ability  
 11       of the study to detect a true finding.  
 12       It biases any of the results in general.  
 13       It biases the results towards the null.  
 14       BY MR. GRIFFIS:  
 15       Q. And that was the rest of the  
 16       sentence?  
 17       A. Right.  
 18       Q. "Since all of these various errors  
 19       in exposure classification were  
 20       non-differential, they would result in a  
 21       bias toward the null and attenuate or  
 22       obliterate any true positive effect."  
 23       So they wouldn't tend in any  
 24       particular direction, but they would tend to  
 25       obscure in the direction of the null towards

Page 55

1       1.0?  
 2       A. Right.  
 3       Q. So that the outcome that you  
 4       measured, you say I found such and such a  
 5       relative risk, that would, in fact, be  
 6       closer to the null than it should be; is  
 7       that right?  
 8       A. Yeah, so if you have a true  
 9       relative risk of say 3, and you have a  
 10       significant amount of exposure  
 11       misclassification, that could lower the risk  
 12       from a significant 3 to a non-significant 2  
 13       or a non-significant 1.8 or 1.2. So that's,  
 14       in general, the effect of non-differential  
 15       misclassification.  
 16       Q. And bias towards the null when you  
 17       have a point estimate that is below one  
 18       suggests that the true point estimate would  
 19       be even lower; right? It would be .5  
 20       instead of .7, for example?  
 21       MS. FORGIE: Object to the form.  
 22       THE WITNESS: That would be -- that  
 23       would also happen, yes.  
 24       BY MR. GRIFFIS:  
 25       Q. Okay. So last year of farming.

Page 56

1       You've also told us -- the very next thing  
 2       you tell us is that there was a very major  
 3       increase in glyphosate use after the  
 4       introduction of glyphosate-resistant crops;  
 5       right?  
 6       A. Yes.  
 7       Q. Glyphosate is used on -- tell me if  
 8       you know. I don't know whether you do or  
 9       not. Glyphosate is used on some of the most  
 10       widely used crops in the country; right?  
 11       A. Yes.  
 12       Q. And there are glyphosate-resistant  
 13       versions of those meaning -- you're talking  
 14       about Roundup Ready; right?  
 15       A. Yes.  
 16       Q. So because of the introduction of  
 17       Roundup Ready crops, lots of farmers were  
 18       using glyphosate, and they were doing it  
 19       consistently year after year; right?  
 20       MS. FORGIE: Object to the form.  
 21       THE WITNESS: Well, I would say, in  
 22       general, that's true. Farmers do stop  
 23       doing things. They don't continue to  
 24       always do what they did before, but, in  
 25       general, the use of these agents

Page 57

1       increase dramatically because farmers  
 2       found that they could increase their  
 3       yields by doing it. So it was -- it had  
 4       a huge effect on how they farmed for  
 5       certain crops.  
 6       BY MR. GRIFFIS:  
 7       Q. So if a farmer told you -- for  
 8       glyphosate. If a farmer told you for  
 9       glyphosate the last year I was farming I  
 10       didn't use glyphosate, they probably weren't  
 11       using it before then either; right?  
 12       MS. FORGIE: Object to the form.  
 13       THE WITNESS: Probably that's true,  
 14       although we don't really know.  
 15       BY MR. GRIFFIS:  
 16       Q. Okay.  
 17       A. There may have been another reason  
 18       why they switched. They could have switched  
 19       crops; right? They could have decided to  
 20       plant something else in the field that year,  
 21       rotate their crops.  
 22       Q. Sure. We could think of scenarios,  
 23       but it's a relatively unlikely scenario that  
 24       somebody was using glyphosate and then the  
 25       last year they were farming they stopped

Page 58

1 using glyphosate and then they stopped  
 2 farming; right?  
 3 MS. FORGIE: Object to the form.  
 4 THE WITNESS: I don't know. I  
 5 can't speculate.  
 6 BY MR. GRIFFIS:  
 7 Q. It also makes it pretty easy to  
 8 impute and pretty easy to predict if you  
 9 built that into the formula, glyphosate  
 10 users are likely to continue to use  
 11 glyphosate?  
 12 MS. FORGIE: Object to the form.  
 13 Calls for speculation.  
 14 BY MR. GRIFFIS:  
 15 Q. Correct?  
 16 A. I can't answer that question  
 17 either. I don't know whether it was easy or  
 18 hard. The method they used is quite  
 19 complicated. It may be easy to use, but I  
 20 really -- there's no way to know how  
 21 accurate it is or was.  
 22 Q. Well, it should be easier at least,  
 23 in general, to predict glyphosate use and  
 24 you project glyphosate use if glyphosate is  
 25 a widely used crop year after year -- widely

Page 59

1 used product year after year than if it's a  
 2 relatively rarely used herbicide that  
 3 someone might choose to use or not use;  
 4 right?  
 5 MS. FORGIE: Object to the form.  
 6 Asked and answered.  
 7 You can answer it again.  
 8 THE WITNESS: Well, it would -- I  
 9 suppose it would make it easier to  
 10 predict, but again, for example, if you  
 11 had somebody in the first survey they  
 12 weren't using glyphosate, and in the  
 13 second survey they were using  
 14 glyphosate, you really wouldn't know  
 15 when they started using it. You would  
 16 have a window of when they started, but  
 17 you wouldn't know when they started and  
 18 you wouldn't know how many days per year  
 19 they started. You wouldn't know  
 20 anything about the metrics of use during  
 21 that gap period. And so, you know, so,  
 22 again, you've got to use the imputation  
 23 method to guess.  
 24 BY MR. GRIFFIS:  
 25 Q. We'll talk about imputation in a

Page 60

1 minute, but at any point in using the  
 2 imputation method, does any person sit there  
 3 and make a guess, or do they apply a  
 4 formula?  
 5 A. Well, the formula they use is, I  
 6 would say, an educated guess. Okay?  
 7 Q. Have you ever designed an  
 8 imputation formula yourself?  
 9 A. No.  
 10 Q. Would you be qualified to?  
 11 MS. FORGIE: Object to the form.  
 12 THE WITNESS: No.  
 13 BY MR. GRIFFIS:  
 14 Q. What kinds of people -- and I don't  
 15 mean their personality traits but their  
 16 qualifications and professional training  
 17 would be qualified to generate an imputation  
 18 formula?  
 19 MS. FORGIE: Object to the form.  
 20 THE WITNESS: Well, it would have  
 21 to be -- it would have to be an  
 22 epidemiologist or sophisticated  
 23 biostatistician who understands the  
 24 issues around what they're trying to  
 25 impute.

Page 61

1 BY MR. GRIFFIS:  
 2 Q. So an epidemiologist or  
 3 biostatistician?  
 4 A. Yes.  
 5 Q. The optimal distribution issue,  
 6 sir -- and you remember what I mean by that?  
 7 This is on page 2, your statement that since  
 8 lots of people were using glyphosate, you  
 9 don't have an optimal 50 percent, 50 percent  
 10 distribution between exposed and unexposed?  
 11 A. Right. So yes.  
 12 Q. So you're referring to a general  
 13 principle of epidemiology that you can best  
 14 compare two groups if your numbers are  
 15 divided evenly between those two groups;  
 16 right?  
 17 A. Yes.  
 18 MS. FORGIE: Object to the form.  
 19 THE WITNESS: Yes. In fact, you  
 20 know -- for example, in a case control  
 21 study, you design the study to have a  
 22 sometimes two- or three-to-one match of  
 23 controls to cases. So you actually have  
 24 more controls in the case control study  
 25 than you do -- than you do cases. And

1 in this study, because so many of the  
2 applicators used glyphosate, you've got  
3 a balance going in the other direction  
4 where you've got four patients or four  
5 applicators who are exposed versus only  
6 one that's unexposed. So it's balanced  
7 in the wrong direction.

8 BY MR. GRIFFIS:

9 Q. The same math you're talking about  
10 that makes 50/50 distribution give you the  
11 cleanest numbers in your statistical  
12 analysis for ever, never use tell you that  
13 if you're dividing it into four exposed  
14 groups and one unexposed group, then a  
15 20 percent, 20 percent, 20 percent,  
16 20 percent, 20 percent distribution is  
17 optimal; right?

18 MS. FORGIE: Object to the form.

19 BY MR. GRIFFIS:

20 Q. Same numbers in each group?

21 MS. FORGIE: Object to the form.

22 THE WITNESS: In general, you want  
23 it to be 50/50; right? The fact you  
24 divide your cases with disease into  
25 sub-groups really -- I don't think --

1 you know, I think, in general, when you  
2 design the study, you want to have a  
3 50/50 balance to get the best power to  
4 detect a difference.

5 BY MR. GRIFFIS:

6 Q. Okay. So as a biostats matter,  
7 biostatistics matter, do you know whether  
8 it's true or false that you get the most  
9 power in a division into four exposed groups  
10 and one unexposed group if your division is  
11 as close to 20, 20, 20, 20 as you can get?

12 MR. ESFANDIARY: Wait. Object to  
13 the form.

14 THE WITNESS: I don't know the  
15 answer to that. If I was to guess, I  
16 would say the power would be somewhat  
17 less if you did it that way.

18 BY MR. GRIFFIS:

19 Q. Less than what?

20 A. It's less because you have less  
21 people with disease in each group, not  
22 because you have too many controls.

23 Q. In the never ever, you can't do any  
24 sort of dose-response analysis, and in the  
25 group where you have four exposed groups at

1 different levels and an unexposed you can.

2 MS. FORGIE: Wait. Wait for a  
3 question.

4 Is there a question?

5 MR. GRIFFIS: You can; right? --  
6 is the end of the question. You stepped  
7 on it.

8 MS. FORGIE: Object to the form.

9 THE WITNESS: So there are two  
10 different -- you're asking two different  
11 questions, and the answer is the same  
12 for both, that you want to have equal  
13 numbers of cases or diseased and  
14 non-diseased people in your comparative  
15 groups. But if you take your diseased  
16 group and you divide it into three or  
17 four sub-groups, then you're going to  
18 somewhat increase the power to detect  
19 significant changes. But it's not --  
20 but it's because you divided your  
21 diseased group into three or four  
22 groups, okay, and decreased the numbers  
23 in each.

24 BY MR. GRIFFIS:

25 Q. If your intention is to look at

1 dose response by dividing into multiple  
2 exposed groups, a lower-exposed group,  
3 medium-exposed group, higher-exposed group  
4 or four such groups, quartile, then the  
5 optimum distribution in terms of power to  
6 demonstrate or fail to demonstrate a dose  
7 response would be an equal distribution into  
8 each group. Do you know whether that's true  
9 or false?

10 MS. FORGIE: Object to the form.

11 Asked and answered.

12 You can answer it again.

13 THE WITNESS: I would say that --  
14 again I would -- I'm not sure, but I  
15 think that the greater numbers in any of  
16 the groups would improve the power.  
17 Okay? So by decreasing the number of  
18 cases or diseased people in each group  
19 versus controls, if you decrease the  
20 number of controls, again, you decrease  
21 the power to detect anything. So the  
22 fact that you have more controls than  
23 cases helps you. It doesn't hurt you.  
24 Okay?

25 ///

Page 66

1 BY MR. GRIFFIS:  
 2 Q. And power is a --  
 3 MS. FORGIE: Were you finished?  
 4 THE WITNESS: Yes.  
 5 BY MR. GRIFFIS:  
 6 Q. You listed this one under your  
 7 sentence that since all of these various  
 8 errors were non-differential which makes it  
 9 not totally obvious to me --  
 10 MS. FORGIE: What page are you on?  
 11 MR. GRIFFIS: The second.  
 12 BY MR. GRIFFIS:  
 13 Q. Which makes me not know whether you  
 14 mean to include this one in the list of the  
 15 errors that are not differential, do you?  
 16 MS. FORGIE: Object to the form.  
 17 THE WITNESS: No. The issue we're  
 18 talking about is -- has -- has nothing  
 19 to do with classification differential  
 20 or non-differential classification.  
 21 BY MR. GRIFFIS:  
 22 Q. Reducing the power of a study would  
 23 just tend to make it less able to detect a  
 24 variance from the null; correct?  
 25 MS. FORGIE: Object.

Page 67

1 THE WITNESS: True variance from  
 2 the null.  
 3 BY MR. GRIFFIS:  
 4 Q. Right. So the values that you find  
 5 in the study, had you increased the power,  
 6 you would tend to predict that that would be  
 7 farther from the null?  
 8 MS. FORGIE: Object to the form.  
 9 BY MR. GRIFFIS:  
 10 Q. Correct?  
 11 A. As you increase the numbers and you  
 12 increase the power, you're likely to find a  
 13 true and significant result increases.  
 14 Q. So the drift would be as you  
 15 increase power, the drift would tend to be  
 16 further from the null; correct?  
 17 MS. FORGIE: Object to the form.  
 18 Asked and answered.  
 19 THE WITNESS: Not necessarily. But  
 20 you're significant. You would be much  
 21 more likely to show statistically  
 22 significance. You can find the same  
 23 number with small -- you can find the  
 24 same result with smaller numbers, but it  
 25 may not be statistically significant; so

Page 68

1 you increase the numbers in the study to  
 2 allow you to show statistical  
 3 significance.  
 4 MR. GRIFFIS: I want to use the  
 5 bathroom. Can we break for just five  
 6 minutes? Not a long one.  
 7 MS. FORGIE: Can we make it ten so  
 8 we can all get another cup of coffee?  
 9 MR. GRIFFIS: Ten is fine.  
 10 THE VIDEOGRAPHER: We are going off  
 11 the record at 9:58 a.m.  
 12 (Recess taken from 9:58 a.m. to  
 13 10:11 a.m.)  
 14 THE VIDEOGRAPHER: This continues  
 15 disk number 1. The time is 10:11 a.m.  
 16 We are back on the record.  
 17 BY MR. GRIFFIS:  
 18 Q. So the fifth criticism we  
 19 identified earlier that you have of the NCI  
 20 2018 study is what you've titled, I believe,  
 21 exposure and latency. It's a reference to  
 22 the median lifetime years of glyphosate use  
 23 in the study 8.5 and the median follow-up  
 24 time 18 years being too short; correct?  
 25 A. Yes.

Page 69

1 Q. Let's talk about the 8.5 years, the  
 2 median lifetime years of glyphosate use  
 3 first. What is your view of how long a  
 4 person needs to be exposed to glyphosate to  
 5 contract non-Hodgkin lymphoma if they will?  
 6 A. Well, I don't think anybody knows  
 7 the answer to that question. The longer,  
 8 the better. So in typical cohort studies,  
 9 the workers are exposed to a certain  
 10 chemical during their careers, maybe 20,  
 11 even 30 years of exposure with long  
 12 follow-up. So in this situation, the  
 13 exposure is a median of 8.5 years ranging  
 14 from five or six years to 14 years is not a  
 15 very long time of exposure for a cohort  
 16 study.  
 17 Q. Are you talking about cohort  
 18 studies of non-Hodgkin lymphoma?  
 19 A. I'm talking about cohort studies,  
 20 in general.  
 21 Q. Your expert report -- in your  
 22 expert report you claim to be a specialist  
 23 in non-Hodgkin lymphoma, somebody who  
 24 focuses on that.  
 25 A. Yes.

Page 70

1 Q. And you've been involved in a  
 2 number of epidemiology studies as the  
 3 pathologist on the study; correct?  
 4 MS. FORGIE: Object to the form.  
 5 THE WITNESS: Actually not only the  
 6 pathologist, I was in charge and ran the  
 7 studies in Nebraska; so I was the PI on  
 8 the studies.  
 9 BY MR. GRIFFIS:  
 10 Q. Do you have a view as to how much  
 11 exposure a person needs to have for  
 12 non-Hodgkin lymphoma to a suspect substance  
 13 in order to detect any effect?  
 14 MS. FORGIE: Object to the form.  
 15 THE WITNESS: It would depend  
 16 entirely on the substance, whether it  
 17 was a strong carcinogen or a weak  
 18 carcinogen. So it's highly dependent on  
 19 the substance. There's no one number  
 20 for -- there's no one generic number.  
 21 BY MR. GRIFFIS:  
 22 Q. So what is your basis for saying  
 23 that for glyphosate and non-Hodgkin  
 24 lymphoma, 8.5 median years of exposure is  
 25 too short?

Page 71

1 MS. FORGIE: Object to the form.  
 2 THE WITNESS: It's probably too  
 3 short. I don't know that it's too  
 4 short, but it's probably too short based  
 5 on how other cohort studies have  
 6 evaluated other chemicals. In other  
 7 words, the longer the better. In this  
 8 case, it's relatively short. You know,  
 9 what it means is that half of the people  
 10 had less than 8.5 years of exposure.  
 11 BY MR. GRIFFIS:  
 12 Q. Is it the case that the sole basis  
 13 for saying 8.5 years is probably too short  
 14 for glyphosate and non-Hodgkin lymphoma in  
 15 the study your knowledge of other cohort  
 16 studies of other substances and other  
 17 disease outcomes?  
 18 A. I'm just making a general  
 19 statement. If you read about cohort studies  
 20 and how they're designed, you generally want  
 21 a long period of exposure to really be sure  
 22 that you have an adequate exposure to find a  
 23 significant association. If you have short  
 24 exposures or small exposures, your chances  
 25 are much less defined in association than if

Page 72

1 you have long exposures and high exposures.  
 2 Q. Okay. Other than those --  
 3 A. So it's a general statement.  
 4 Q. It's the general statement the  
 5 longer the better for cohort studies; right?  
 6 A. Right.  
 7 MS. FORGIE: Object to the form.  
 8 Asked and answered.  
 9 BY MR. GRIFFIS:  
 10 Q. And there's no specific thing about  
 11 glyphosate and no specific thing about  
 12 non-Hodgkin lymphoma that makes you say that  
 13 8.5 years median is not enough to detect an  
 14 effect; right?  
 15 MS. FORGIE: Object to the form.  
 16 THE WITNESS: Correct.  
 17 BY MR. GRIFFIS:  
 18 Q. The 18 years median follow-up time,  
 19 median follow-up is something we discussed  
 20 in your prior deposition; right?  
 21 A. Correct.  
 22 Q. You said in your expert report,  
 23 your original expert report -- I'll mark  
 24 that so we can look at it. This is  
 25 Exhibit 7.

Page 73

1 (Exhibit Number 31-7 was marked  
 2 for identification.)  
 3 BY MR. GRIFFIS:  
 4 Q. I'm on page 5, sir.  
 5 A. Okay.  
 6 Q. You said -- you're talking about  
 7 the De Roos 2005 study in that paragraph;  
 8 correct?  
 9 A. Yes.  
 10 Q. That first paragraph?  
 11 A. Yes.  
 12 Q. You see in the middle of the  
 13 paragraph, "However, the median follow-up  
 14 time in this study was only 6.7 years, too  
 15 short a time to detect a meaningful increase  
 16 in NHL or other cancers associated with  
 17 glyphosate"; right?  
 18 A. Yes.  
 19 Q. And then at the deposition, sir, do  
 20 you recall that I asked you for an  
 21 association between a pesticide and  
 22 non-Hodgkin lymphoma, "How long a period of  
 23 time do you think you need between the  
 24 exposures and the cancers that you're  
 25 measuring?"

Page 74

1 And you said, "The longer the  
2 better."  
3 And I said, "Well, is ten years too  
4 short?"  
5 And you said "No, probably not?"  
6 MS. FORGIE: Object to the form.  
7 If you're going to ask him questions  
8 about his deposition, I think you have  
9 to show it to him.  
10 BY MR. GRIFFIS:  
11 Q. Do you recall that, sir?  
12 MS. FORGIE: Object to the form.  
13 THE WITNESS: I don't remember  
14 specifically, no.  
15 BY MR. GRIFFIS:  
16 Q. Do you recall me saying, "Okay, the  
17 longer the better, 6.7 is too short, 10 is  
18 probably long enough" and you couldn't be  
19 more specific between those two; is that  
20 fair?"  
21 And you said, "Yes."  
22 MS. FORGIE: Object to the form.  
23 THE WITNESS: I don't remember.  
24 BY MR. GRIFFIS:  
25 Q. Do you agree with that testimony

Page 75

1 today?  
2 A. Well, I agree with the testimony  
3 that the longer would be the better. I  
4 think probably ten years is when you would  
5 begin to see cases that are associated with  
6 the chemical. So what would be the best  
7 latency period? Well, the best latency  
8 period would be long so you would want to  
9 follow locations for 30 or more years, okay?  
10 And the median latency of 20 years is  
11 probably a minimum where you would begin to  
12 see a significant number of cases so that  
13 you could actually demonstrate significant  
14 increased risk.  
15 So the longer the better. Ten  
16 years might be the minimum where you would  
17 begin to see cases, an increase in cases.  
18 Actually, if you look at the Eriksson study,  
19 that's when they began to see statistically  
20 significantly increased cases after ten  
21 years.  
22 Q. Sir, when the data before you was  
23 6.7 years of follow-up in the De Roos 2005  
24 and you said ten years was probably enough  
25 and now you have 18 years of follow-up and

Page 76

1 you say 18 years isn't enough and the study  
2 is not done, you're moving the goalpost,  
3 aren't you?  
4 MS. FORGIE: Object to the form.  
5 It's unfair. You're not showing him the  
6 deposition.  
7 THE WITNESS: So 18 years is  
8 probably not enough. Okay? But it's  
9 interesting, if you look at Table 3 in  
10 the paper where they've got 20 years of  
11 follow-up, you begin to see elevated  
12 odds ratios for non-Hodgkin's lymphoma  
13 and its subtypes. So this sort of  
14 speaks to my point that you have to have  
15 a long period of follow-up after  
16 exposure to begin to see risk. In fact,  
17 if you look at Table 3, you see it.  
18 BY MR. GRIFFIS:  
19 Q. Is that because it takes a long  
20 time for non-Hodgkin lymphoma to show up  
21 after an exposure?  
22 A. Yes.  
23 Q. And is that because it takes a lot  
24 of exposure, like years and years of  
25 exposure, or is this in reference to your

Page 77

1 earlier point about 8.5 years of use in the  
2 study, it takes a lot of years of exposure  
3 to a substance for it to produce  
4 non-Hodgkin's lymphoma?  
5 MS. FORGIE: Object to the form.  
6 THE WITNESS: In general, I would  
7 say yes. The more exposure, the more  
8 likely you are to find elevated risks  
9 that are significant.  
10 BY MR. GRIFFIS:  
11 Q. The charts you're talking about,  
12 sir, Table 3, tell me which one you're  
13 pointing me to.  
14 A. Well, if you look at non-Hodgkin  
15 lymphoma as a group, you can see increased  
16 odds ratios in the higher-exposed group,  
17 15 percent, 12 percent. The same for B-cell  
18 non-Hodgkin lymphoma. And then if you look  
19 at chronic lymphocytic leukemia, anywhere  
20 between 19 and 25 percent increase. If you  
21 look at diffuse large B-cell lymphoma, you  
22 see a 35 percent increase. For T-cell  
23 lymphomas, you actually have a threefold  
24 increase that's statistically significant.  
25 So you're beginning to see increased risk

Page 78

1 ratios when you use a minimum of follow-up  
 2 of 20 years. Okay?  
 3 Q. You don't claim, sir, that any of  
 4 these findings show that glyphosate causes  
 5 those subtypes or causes non-Hodgkin's  
 6 lymphoma; correct? You're not relying on  
 7 this in support of your claim that  
 8 glyphosate --  
 9 (Simultaneous cross-talk  
 10 interrupted by the reporter.)  
 11 BY MR. GRIFFIS:  
 12 Q. You're not relying on this for your  
 13 claim that glyphosate causes non-Hodgkin  
 14 lymphoma or its subtypes; right?  
 15 MS. FORGIE: Object to the form.  
 16 THE WITNESS: I'm not relying on  
 17 it, but it is data that suggests that a  
 18 longer follow-up is required to see  
 19 increased risks. It's possible if we  
 20 follow these patients another ten years  
 21 with a 30-year lag, we'll have  
 22 significantly increased risks. So this  
 23 is why I say in my report that at best  
 24 this is another interim analysis and to  
 25 really know the results of the

Page 79

1 agricultural health study, you'll need  
 2 longer follow-up.  
 3 BY MR. GRIFFIS:  
 4 Q. After a mean of 8.5 years of  
 5 exposure to glyphosate, it's going to take  
 6 more than 20 years to find a doubling of the  
 7 risk in these patients; correct?  
 8 MS. FORGIE: Object to the form.  
 9 Mischaracterizes --  
 10 BY MR. GRIFFIS:  
 11 Q. If it happens?  
 12 MS. FORGIE: Object to the form.  
 13 Mischaracterizes his testimony --  
 14 THE WITNESS: You'll need a  
 15 longer --  
 16 MS. FORGIE: You have to wait until  
 17 I get my --  
 18 THE WITNESS: I'm sorry.  
 19 So what I'm saying is we probably  
 20 need more exposure and we probably need  
 21 longer follow-up if the Agricultural  
 22 Health Study is going to show  
 23 significant increases in risk. The data  
 24 here in Table 3 suggests that now the  
 25 risks are increasing for non-Hodgkin's

Page 80

1 lymphoma with longer follow-up.  
 2 BY MR. GRIFFIS:  
 3 Q. And there are no statistically  
 4 significant associations at five years,  
 5 10 years, 15 years, or 20 years for  
 6 non-Hodgkin lymphoma; correct? It's the  
 7 third row of the -- data row of the chart;  
 8 right?  
 9 A. There are increased risks, but  
 10 they're not statistically significant.  
 11 Q. And you wouldn't say that a  
 12 non-statistically significant increased risk  
 13 shows causation; correct?  
 14 MS. FORGIE: Object to the form.  
 15 THE WITNESS: Well, you would  
 16 interpret it in the context of what you  
 17 know about from other studies.  
 18 BY MR. GRIFFIS:  
 19 Q. There's no dose response even in  
 20 the 20-year period for non-Hodgkin lymphoma;  
 21 correct?  
 22 MS. FORGIE: Object to the form.  
 23 THE WITNESS: Well, the numbers are  
 24 very small, and, you know, so with small  
 25 numbers of cases in the various

Page 81

1 quartiles and tertiles, it's difficult  
 2 to demonstrate. But you don't see a  
 3 dose response here. It's true. You  
 4 don't see a dose response.  
 5 BY MR. GRIFFIS:  
 6 Q. The least-exposed group has a  
 7 higher point estimate than the most-exposed  
 8 group; right?  
 9 MS. FORGIE: Object to the form.  
 10 THE WITNESS: In some of the  
 11 categories that's true.  
 12 BY MR. GRIFFIS:  
 13 Q. For non-Hodgkin lymphoma overall  
 14 that's true; right?  
 15 MS. FORGIE: Object to the form.  
 16 THE WITNESS: Yes.  
 17 BY MR. GRIFFIS:  
 18 Q. And that's one of the things that  
 19 goes into the P-trend analysis; right?  
 20 Whether there's a dose response; correct?  
 21 A. Correct.  
 22 Q. These P trends are all -- what is a  
 23 P-trend? What is a statistically P-trend?  
 24 0.05?  
 25 A. Or less than 0.05.

Page 82

1 Q. And none of these P trends in  
 2 Table 3 are below 0.05; right?  
 3 A. Well, not for non-Hodgkin's  
 4 lymphoma. For acute myeloid leukemia there  
 5 is a P-trend of 0.04.  
 6 Q. For the 20-year lag. That's the  
 7 one we were just talking about --  
 8 A. Okay.  
 9 Q. -- that you were focusing me on?  
 10 A. Right.  
 11 Q. The P trends in Table 3 for a  
 12 20-year lag, what is the smallest P-trend in  
 13 that?  
 14 A. For non-Hodgkin's lymphoma or for  
 15 anything in the table?  
 16 Q. Anything in the table, 0.3 for  
 17 lymphohematopoietic overall; right?  
 18 MS. FORGIE: Now you've got two  
 19 questions pending. Which one do you  
 20 want him to answer?  
 21 Object to the form.  
 22 THE WITNESS: So acute myeloid  
 23 leukemia has a P-trend of 0.04 which is  
 24 statistically significant.  
 25 ///

Page 83

1 BY MR. GRIFFIS:  
 2 Q. Do you believe that glyphosate  
 3 causes AML?  
 4 MS. FORGIE: Object to the form.  
 5 Beyond the scope of this report.  
 6 THE WITNESS: This data would  
 7 suggest that it does, but there isn't  
 8 other data out there to support it. So  
 9 I would say we don't know the answer to  
 10 that.  
 11 BY MR. GRIFFIS:  
 12 Q. So you're not going to give expert  
 13 testimony unless there's more data that  
 14 glyphosate causes AML; right?  
 15 A. Correct.  
 16 Q. That wouldn't be scientifically  
 17 appropriate to do based on this data;  
 18 correct?  
 19 MS. FORGIE: Object to the form.  
 20 THE WITNESS: Based on this data  
 21 alone, you're correct.  
 22 BY MR. GRIFFIS:  
 23 Q. Now, for the 20-year lag, the  
 24 smallest P-trend on the chart in  
 25 supplemental Table 3 is for

Page 84

1 lymphohematopoietic overall 0.3; correct?  
 2 MS. FORGIE: Object to the form.  
 3 THE WITNESS: You're talking about  
 4 the first item on Table 3,  
 5 lymphohematopoietic neoplasms?  
 6 BY MR. GRIFFIS:  
 7 Q. Yeah. The question is is that the  
 8 lowest P-trend in the 20-year lag column;  
 9 right?  
 10 A. Correct. .37.  
 11 Q. Okay.  
 12 A. Actually that's .31.  
 13 Q. .37? What are you looking at, sir?  
 14 A. I'm reading you the P-trend for  
 15 lymphohematopoietic neoplasms.  
 16 Q. In supplemental Table 3, 20-year  
 17 lag?  
 18 A. In supplemental Table 3?  
 19 Q. Yeah.  
 20 MS. FORGIE: What table are you?  
 21 THE WITNESS: I don't have  
 22 supplemental Table 3.  
 23 BY MR. GRIFFIS:  
 24 Q. You don't have the supplementary  
 25 tables for this?

Page 85

1 A. I have them at home. Have you  
 2 attached them to the --  
 3 MS. FORGIE: I don't think they're  
 4 attached to the exhibit -- oh, wait.  
 5 THE WITNESS: Maybe they are. I'm  
 6 sorry. I was looking at Table 3.  
 7 You're talking about supplemental  
 8 Table 3?  
 9 BY MR. GRIFFIS:  
 10 Q. We don't need to. This one shows  
 11 5-year and 20-year lag and supplemental  
 12 Table 3 shows five, ten, 15 and 20; right?  
 13 A. Right.  
 14 Q. So it just shows more columns.  
 15 Table 3 works fine. It's the same data for  
 16 the 20-year.  
 17 MS. FORGIE: There's no question  
 18 pending.  
 19 BY MR. GRIFFIS:  
 20 Q. But -- okay.  
 21 At how many years of follow-up  
 22 would you consider the AHS data to be  
 23 complete, sir?  
 24 MS. FORGIE: Object to the form.  
 25 THE WITNESS: Well, you would want

Page 86

1 to -- actually ideally, you would want  
 2 to follow the people for 20 or 30 or 40  
 3 or more years until almost everyone or  
 4 everyone is dead, and then you would  
 5 have the ultimate database to do your  
 6 final analysis of the data. So that's  
 7 often the case in cohort studies. They  
 8 go for 20, 30, 40 years.  
 9 BY MR. GRIFFIS:  
 10 Q. For the 8.5 years of exposure, sir,  
 11 the exposure categories in the case control  
 12 studies that you rely on are much, much,  
 13 much lower than 8.5 years of exposure;  
 14 correct?  
 15 MS. FORGIE: Object to the form.  
 16 Do you want him to look at those  
 17 studies?  
 18 THE WITNESS: I don't remember the  
 19 details of those studies.  
 20 BY MR. GRIFFIS:  
 21 Q. Like Eriksson is greater or less  
 22 than ten days; right?  
 23 MS. FORGIE: Object to the form.  
 24 BY MR. GRIFFIS:  
 25 Q. Do you remember that?

Page 87

1 MS. FORGIE: Object to the form.  
 2 THE WITNESS: So in Eriksson they  
 3 looked at risk by days of exposure, and  
 4 you're right. If it was less than -- if  
 5 it was greater than ten days of  
 6 exposure, they had a significantly  
 7 elevated risk. That's true.  
 8 BY MR. GRIFFIS:  
 9 Q. And is it your claim that in  
 10 Eriksson the greater than ten days the mean  
 11 was -- the mean of exposure in that was at  
 12 or greater than 8.5 years?  
 13 MS. FORGIE: Object to the form.  
 14 THE WITNESS: Well, again, I don't  
 15 remember the details of Eriksson. I  
 16 think they also looked at the number of  
 17 years of exposure, and they looked at  
 18 the number of days of exposure. In that  
 19 study, the number of days of exposure  
 20 resulted in an increased risk for  
 21 non-Hodgkin's lymphoma, right.  
 22 BY MR. GRIFFIS:  
 23 Q. Do you know -- sorry.  
 24 A. I don't have the study before me,  
 25 and I don't remember the details -- I don't

Page 88

1 remember the details about years of  
 2 exposure.  
 3 Q. Let me just ask you this, sir,  
 4 since you criticized the NCI 2018 study for  
 5 8.5 median years of exposure being too  
 6 short. Do you know of any study on  
 7 glyphosate and non-Hodgkin's lymphoma where  
 8 people were exposed as a median longer?  
 9 MS. FORGIE: Object to the form.  
 10 He doesn't have the studies in front of  
 11 him.  
 12 THE WITNESS: Off the top of my  
 13 head, I don't know. I'd have to go back  
 14 and look at the studies to answer your  
 15 question properly.  
 16 BY MR. GRIFFIS:  
 17 Q. Do you know of any study where the  
 18 median follow-up which you say was too short  
 19 at 18 years in the NCI 2018 study was longer  
 20 than 18 years?  
 21 MS. FORGIE: Object to the form.  
 22 Asked and answered.  
 23 THE WITNESS: This was the only  
 24 cohort study; so that question doesn't  
 25 really apply to the case-control

Page 89

1 studies.  
 2 BY MR. GRIFFIS:  
 3 Q. Do you know of another study where  
 4 the average time lapse between exposure and  
 5 non-Hodgkin lymphoma was greater than  
 6 18 years?  
 7 MS. FORGIE: Object to the form.  
 8 THE WITNESS: What --  
 9 MS. FORGIE: Asked and answered.  
 10 THE WITNESS: Study of glyphosate.  
 11 BY MR. GRIFFIS:  
 12 Q. Yes. Glyphosate and non-Hodgkin  
 13 lymphoma.  
 14 A. No. And, again, I don't have those  
 15 studies before me, and I don't remember the  
 16 details of those studies off the top of my  
 17 head today.  
 18 Q. It could be that your criticisms of  
 19 8.5 years of exposure being too short and  
 20 18 years of follow-up being too short apply  
 21 with even greater force to the case-control  
 22 studies than which you relied; correct?  
 23 MS. FORGIE: Object to the form.  
 24 Asked and answered, mischaracterizes the  
 25 testimony.

Page 90

1 THE WITNESS: I don't know the  
 2 answer to that.  
 3 BY MR. GRIFFIS:  
 4 Q. Have you read Dr. Portier's  
 5 deposition, sir?  
 6 A. Which deposition?  
 7 Q. His recent deposition. Did you  
 8 read it?  
 9 A. Portier's deposition? No.  
 10 Q. Yes. Okay.  
 11 If he said in his deposition that  
 12 the NCI 2018 study allowed for longer  
 13 latency than any published study on  
 14 glyphosate and non-Hodgkin lymphoma, do you  
 15 have any basis to disagree with that?  
 16 MS. FORGIE: Object to the form.  
 17 THE WITNESS: I don't agree or  
 18 disagree. I don't know the answer.  
 19 That's his statement, not mine.  
 20 BY MR. GRIFFIS:  
 21 Q. As we discussed earlier, you have a  
 22 criticism of the NCI 2018 study based on the  
 23 follow-up rate and the imputation procedure  
 24 used to address that; correct?  
 25 MS. FORGIE: Object to the form.

Page 91

1 THE WITNESS: Yes.  
 2 BY MR. GRIFFIS:  
 3 Q. And the AHS investigators published  
 4 their imputation procedure; correct?  
 5 A. Yes, they published a paper on how  
 6 they did it.  
 7 Q. That's the Heltshe paper which you  
 8 reviewed for your expert report; right?  
 9 A. Yes.  
 10 Q. There are also published papers in  
 11 which the investigators assessed -- took  
 12 their exposure calculations and fact-checked  
 13 them with biometric data from actual  
 14 exposures; correct?  
 15 A. Yes.  
 16 Q. The AHS -- the NCI 2018 study is  
 17 the only one out of all the epidemiology on  
 18 glyphosate and non-Hodgkin lymphoma that  
 19 does a weighted analysis that has been  
 20 published and checked with biometrics;  
 21 right?  
 22 MS. FORGIE: Object to the form.  
 23 THE WITNESS: That's correct.  
 24 BY MR. GRIFFIS:  
 25 Q. It's the only one that does any

Page 92

1 kind of sophisticated weighted analysis at  
 2 all; right?  
 3 MS. FORGIE: Object to the form.  
 4 THE WITNESS: That's correct. You  
 5 only could do that kind of analysis in a  
 6 cohort study.  
 7 BY MR. GRIFFIS:  
 8 Q. Being able to do that kind of  
 9 analysis gives you better data than you  
 10 could have otherwise; correct?  
 11 MS. FORGIE: Object to the form.  
 12 THE WITNESS: I'm not sure it gives  
 13 you better data. It gives you some  
 14 confidence, I guess, in the way you did  
 15 your calculations, but the fact that  
 16 correlations between biomonitoring and  
 17 the algorithm that was used were quite  
 18 different for different pesticides and  
 19 different formulations and for some  
 20 there was good correlation and in some  
 21 there was poor correlation.  
 22 So one of the other criticisms of  
 23 the study which I didn't use, although  
 24 it also would result in exposure  
 25 misclassification, is if you use the

Page 93

1 same algorithm for every pesticide,  
 2 you're going to have misclassification  
 3 more or less for each pesticide.  
 4 BY MR. GRIFFIS:  
 5 Q. Do you know if that was done?  
 6 A. That's what was done, yes.  
 7 (Exhibit Numbers 31-8, 31-9 and  
 8 31-10 were marked for identification.)  
 9 BY MR. GRIFFIS:  
 10 Q. Sir, I've marked as Exhibits 8  
 11 through 10 published study by Bonner,  
 12 et al., involving lung cancer from the  
 13 Agricultural Health Study data, published  
 14 study by Koutros, et al., on bladder cancer  
 15 from the Agricultural Health Study, and a  
 16 published study by Koutros, et al., on  
 17 prostate cancer from the Agricultural Health  
 18 Study. Correct, sir?  
 19 A. Yes.  
 20 Q. Have you seen those?  
 21 A. I have not.  
 22 Q. In the --  
 23 MS. FORGIE: I'm going to just put  
 24 a general objection in here to 31-8,  
 25 which talks about lung cancer which he

Page 94

1 has not read or cited in his  
 2 supplemental report. And I object to  
 3 the use of 31-9 which he has not read or  
 4 cited to in his supplemental report that  
 5 talks about bladder cancer, and I object  
 6 to 31-10 that talks about prostate  
 7 cancer, which is also not addressed or  
 8 referenced in his supplemental report.  
 9 I'll decide later depending on the  
 10 questions whether I decide to instruct  
 11 him not to answer.  
 12 BY MR. GRIFFIS:  
 13 Q. In the Bonner study, sir, on  
 14 page 545, middle column, last full  
 15 paragraph, do you see that they describe the  
 16 multiple imputation with logistic regression  
 17 procedure that was used in the AHS study?  
 18 MS. FORGIE: Take your time and  
 19 read whatever you want.  
 20 THE WITNESS: Yes.  
 21 BY MR. GRIFFIS:  
 22 Q. Similarly, sir, on the Koutros  
 23 bladder cancer study, page 794, under  
 24 "Exposure Assessment" towards the end of  
 25 that first paragraph, do you see that they,

Page 95

1 again, describe the imputation procedure?  
 2 A. Yes.  
 3 Q. The prostate cancer study, sir, on  
 4 page 64, do you see that, again, the AHS  
 5 imputation procedure is described? Page 64,  
 6 first column.  
 7 MS. FORGIE: Are you talking about  
 8 31-10? Exhibit 31-10.  
 9 MR. GRIFFIS: Yeah, the one that's  
 10 on prostate cancer.  
 11 MS. FORGIE: I object to him being  
 12 asked questions about this.  
 13 THE WITNESS: Yes.  
 14 BY MR. GRIFFIS:  
 15 Q. We talked in general earlier about  
 16 the fact that there have been multiple  
 17 publications from the AHS and multiple  
 18 publications in which the AHS imputation  
 19 procedure was discussed and went to peer  
 20 review; correct?  
 21 A. Yes, these papers were  
 22 peer-reviewed. The differences between  
 23 these papers and the recent glyphosate paper  
 24 is these papers are mainly looking at  
 25 pesticides in -- which were used in distant

Page 96

1 past or either discontinued or the use was  
 2 pretty stable over time. In those kind of  
 3 situations it's much more plausible to  
 4 impute use. But for glyphosate, as you  
 5 know, the use increased dramatically right  
 6 in the middle of the enrollment period and  
 7 continued to increase dramatically over  
 8 time. It's impossible to capture that kind  
 9 of information which is critical to a cohort  
 10 study if you don't have adequate  
 11 participation in the follow-up  
 12 questionnaires. So that's one of the fatal  
 13 flaws of the Agricultural Health Study.  
 14 They don't have adequate follow-up  
 15 participation in their follow-up  
 16 questionnaires to get real data. So they  
 17 guess what the data is going to be.  
 18 Q. So is your statement that is unique  
 19 to glyphosate?  
 20 MS. FORGIE: Wait, wait. Were you  
 21 finished with your answer?  
 22 THE WITNESS: Yes.  
 23 BY MR. GRIFFIS:  
 24 Q. Is your statement it's unique to  
 25 glyphosate?

Page 97

1 A. It's actually unique to glyphosate,  
 2 yes.  
 3 Q. So the AHS study's imputation, not  
 4 that it's fine --  
 5 MR. ESFANDIARY: Object to the  
 6 form.  
 7 BY MR. GRIFFIS:  
 8 Q. -- works for everything else. It  
 9 doesn't work for glyphosate. Is that your  
 10 testimony?  
 11 MS. FORGIE: Object to the form.  
 12 THE WITNESS: I'm not sure it works  
 13 or doesn't work. They used it for these  
 14 other studies. It's an accepted method,  
 15 in general, when you don't have data and  
 16 you want to fill in blanks for data.  
 17 But for glyphosate, it's particularly  
 18 problematic in a situation where the use  
 19 of the chemical is increasing  
 20 dramatically over a relatively short  
 21 period of time right in the middle of  
 22 the enrollment period and right during  
 23 the first follow-up questionnaire.  
 24 BY MR. GRIFFIS:  
 25 Q. Is your --

1 A. This is very different than it is  
2 for many of the other pesticides that have  
3 been studied in these others' papers.  
4 There's a big difference between what  
5 happened in the use of all these different  
6 pesticides compared to glyphosate.  
7 BY MR. GRIFFIS:

8 Q. Okay. Is it your view that the  
9 imputation method used was scientifically  
10 acceptable for every other substance they  
11 examined except for glyphosate?

12 MS. FORGIE: Asked and answered.

13 You can answer it again. Objection.

14 THE WITNESS: Well, it was  
15 acceptable -- I don't know whether it's  
16 acceptable or not. It was certainly  
17 acceptable to the people who did the  
18 studies and to the people who reviewed  
19 the studies. It's an acceptable method  
20 that epidemiologists use. I can't  
21 answer whether it's acceptable to me or  
22 not because I -- I suppose I would  
23 accept it. I don't know with what  
24 confidence one can accept this kind of  
25 methodology and particularly in the case

1 of glyphosate, I don't have a lot of  
2 confidence in it.

3 BY MR. GRIFFIS:

4 Q. Okay. I'm not asking you to speak  
5 for the peer reviewers of all these  
6 journals, sir, or for the authors of NCI  
7 2018 but just for yourself. For yourself,  
8 is the scientific imputation procedure  
9 applied in the NCI 2018 paper scientifically  
10 acceptable for all those other substances  
11 but not for glyphosate?

12 MS. FORGIE: Objection. Asked and  
13 answered. He's answered it twice, and  
14 you're asking about articles he has not  
15 read and not cited.

16 You can answer the question in the  
17 same way.

18 THE WITNESS: I would just answer  
19 that for me it's not acceptable for  
20 glyphosate. I cannot comment on the  
21 others. I have not reviewed them. I  
22 would say, in general, it's probably  
23 acceptable although it's much less  
24 scientifically valid than actually  
25 gathering the data. Okay? Guessing the

1 data is not as valid as actually  
2 gathering the actual data.

3 BY MR. GRIFFIS:

4 Q. You would agree --

5 A. They didn't do that in this --

6 MS. FORGIE: Wait. Let him finish.

7 THE WITNESS: They didn't do that  
8 in this study, and it's a fatal flaw in  
9 this study particularly in regard to  
10 glyphosate.

11 BY MR. GRIFFIS:

12 Q. You would agree, sir, that not  
13 being able to gather all the data is an  
14 extremely common issue in cohort studies?

15 MS. FORGIE: Object to the form.

16 THE WITNESS: It is in some cohort  
17 studies like the Agricultural Health  
18 Study. It's less common in other  
19 studies. It depends entirely on the  
20 loyalty of the cohort and their  
21 willingness to participate.

22 BY MR. GRIFFIS:

23 Q. You agree that multiple imputation  
24 is a very standard epidemiological technique  
25 for dealing with absent data; correct?

1 MS. FORGIE: Object to the form.

2 THE WITNESS: Yes.

3 MS. FORGIE: Asked and answered  
4 three times. You're starting to badger  
5 the witness.

6 THE WITNESS: Yes.

7 BY MR. GRIFFIS:

8 Q. Do you believe that glyphosate was  
9 not involved in the Koutros study, the other  
10 Koutros study on prostate cancer and the  
11 Bonner study, Exhibits 8, 9, and 10?

12 MS. FORGIE: Object to the form.

13 I'm not going to let him answer any more  
14 questions about these three studies,  
15 31-8, 31-9, and 31-10 which he has not  
16 read, not cited, do not deal with NHL,  
17 until he's had a chance to sit here and  
18 read them. So if you want him to read  
19 them and answer your questions, he can.

20 MR. GRIFFIS: What I want to know  
21 is when he made the statements that he  
22 did about glyphosate and imputation, did  
23 you believe that glyphosate was not  
24 involved in these studies?

25 MS. FORGIE: My objection stands.

Page 102

1 You can read them if you want  
 2 before you answer those questions.  
 3 THE WITNESS: I don't know whether  
 4 they evaluate glyphosate in these  
 5 studies or not. I don't know whether  
 6 they used the same method they used in  
 7 the 2018 study and the data is highly  
 8 questionable.  
 9 BY MR. GRIFFIS:  
 10 Q. The peer reviewers of "The American  
 11 Journal of Epidemiology," "International  
 12 Journal of Epidemiology," and the  
 13 "Environmental Health Perspective" passed  
 14 that procedure; right?  
 15 MS. FORGIE: Object to the form.  
 16 Again, he hasn't looked at these. He's  
 17 already stated he doesn't know what's in  
 18 them. It's not fair. You're badgering  
 19 him.  
 20 You can answer one more time.  
 21 THE WITNESS: They accepted the  
 22 papers for publication but they -- it's  
 23 unlikely that they understood the -- all  
 24 the issues surrounding glyphosate and  
 25 its use. And I . . .

Page 103

1 (Exhibit Number 30-11 was  
 2 marked for identification.)  
 3 BY MR. GRIFFIS:  
 4 Q. Exhibit 11 is the Heltshe Study  
 5 which you cited in your expert report;  
 6 correct?  
 7 A. Yes.  
 8 Q. And this is a paper in which the  
 9 imputation procedure was tested; correct?  
 10 MS. FORGIE: Object to the form.  
 11 THE WITNESS: Yes.  
 12 BY MR. GRIFFIS:  
 13 Q. And it was tested by withdrawing a  
 14 random sample of people who did respond to  
 15 the second survey and pretending that they  
 16 didn't respond and seeing how well the  
 17 imputation procedure predicted the actual  
 18 responses that those people gave; right?  
 19 A. Yes.  
 20 Q. So it compared imputation to real  
 21 responses, data that was actually gathered;  
 22 right?  
 23 A. Right.  
 24 Q. To see how well those two matched  
 25 up.

Page 104

1 In the introduction, sir, the  
 2 left-hand column on the first page, it says  
 3 halfway down first paragraph, "Multiple  
 4 imputation has been widely accepted, and  
 5 it's been used to account for missing data  
 6 in large national surveys and studies," and  
 7 it lists multiple studies including the  
 8 Framingham Heart Study; right?  
 9 A. Yes.  
 10 Q. Do you have any criticism of the  
 11 quality of the studies listed, NHANES III,  
 12 National Assessment of Educational Progress,  
 13 Children's Mental Health Initiative, and the  
 14 Framingham Heart Study?  
 15 MS. FORGIE: Object to the form.  
 16 This deposition is not about those  
 17 studies. I'm going to let him answer  
 18 that question.  
 19 THE WITNESS: I really don't know  
 20 much about any of these studies.  
 21 BY MR. GRIFFIS:  
 22 Q. Are you able -- do you have the  
 23 expertise and experience to be able to  
 24 comment on whether multiple imputation is  
 25 widely used in major national studies that

Page 105

1 are well respected like the ones listed  
 2 here?  
 3 MS. FORGIE: Objection. Asked and  
 4 answered.  
 5 You can answer it again.  
 6 THE WITNESS: I would accept that  
 7 statement.  
 8 BY MR. GRIFFIS:  
 9 Q. And the first sentence of the  
 10 article, sir, "Missing data is a common  
 11 problem in epidemiological studies and the  
 12 statistical implications of ignoring missing  
 13 data are well known, including loss of  
 14 statistical power and potentially biased  
 15 estimates of the association." And then  
 16 they describe multiple imputation technique  
 17 as one way to address that. Do you agree  
 18 with that?  
 19 MS. FORGIE: Objection. Asked and  
 20 answered.  
 21 You can answer it again.  
 22 THE WITNESS: I agree that  
 23 imputation is one way to address this  
 24 problem, yes.  
 25 ///

Page 106

1 BY MR. GRIFFIS:  
 2 Q. In the Heltshe --  
 3 MS. FORGIE: How much time is  
 4 there, please.  
 5 THE VIDEOGRAPHER: Just for this  
 6 tape.  
 7 BY MR. GRIFFIS:  
 8 Q. In the Heltshe study, sir,  
 9 glyphosate was in the middle range for  
 10 relative errors as calculated between the  
 11 actual respondents and the imputed figures;  
 12 correct?  
 13 MS. FORGIE: Object to the form.  
 14 BY MR. GRIFFIS:  
 15 Q. I'm looking, for example, at  
 16 Figure 2.  
 17 A. You're looking at Figure 2?  
 18 Q. Yes. You're welcome to look  
 19 anywhere you like, but that's where I'm  
 20 looking.  
 21 A. Yes, it's kind of at the lower  
 22 edge, but it's close to the middle.  
 23 Q. Close to the middle. Looking at  
 24 Table 3, sir, do you know -- do you know  
 25 what a Brier skill score is and how to

Page 107

1 assess it?  
 2 A. I don't.  
 3 Q. All right. Let's skip that then.  
 4 In the discussion section on  
 5 page 413, sir, of the Heltshe Study, it says  
 6 three sentences in, "In analyses, imputation  
 7 is generally preferable to omitting  
 8 individuals who did not complete phase 2, in  
 9 our case, 37 percent of enrolled  
 10 individuals, due to possible selection bias  
 11 in the subset with complete data and  
 12 decreased precision of parameters estimates  
 13 using only a subset of data."  
 14 Do you see that, sir?  
 15 A. Yes.  
 16 Q. Do you agree that imputation is  
 17 preferable to ignoring the data?  
 18 MS. FORGIE: Objection. Are you  
 19 talking about in general or with  
 20 glyphosate?  
 21 THE WITNESS: So -- yeah, so what  
 22 they're saying here is that imputation  
 23 is preferable to limiting the study to  
 24 those with complete data.  
 25 ///

Page 108

1 BY MR. GRIFFIS:  
 2 Q. And you know that there were  
 3 multiple sensitivity tests that were done in  
 4 the NCI 2018 study to test the accuracy of  
 5 its imputation procedure; right?  
 6 MS. FORGIE: Object to the form.  
 7 THE WITNESS: Yes.  
 8 BY MR. GRIFFIS:  
 9 Q. None of those sensitivity tests  
 10 itself relied on imputation; right? There  
 11 are ways of checking the data without  
 12 looking at it without imputation; right?  
 13 MS. FORGIE: Object to the form.  
 14 THE WITNESS: That's correct.  
 15 BY MR. GRIFFIS:  
 16 Q. And all three of those sensitivity  
 17 checks came up with essentially the same  
 18 result, i.e., no association between  
 19 glyphosate and non-Hodgkin lymphoma;  
 20 correct?  
 21 MS. FORGIE: Object to the form.  
 22 THE WITNESS: It's correct, but  
 23 they all used the same basic flawed data  
 24 due to exposure misclassification. So  
 25 it's not surprising they came up with

Page 109

1 the same result.  
 2 BY MR. GRIFFIS:  
 3 Q. They eliminated imputation entirely  
 4 in those sensitivity analyses; right?  
 5 MS. FORGIE: Objection. Asked and  
 6 answered.  
 7 You can answer it again.  
 8 THE WITNESS: In some of the  
 9 analyses that's true. I don't know  
 10 whether they did in all of them. We'd  
 11 have to talk about them one at a time.  
 12 BY MR. GRIFFIS:  
 13 Q. Let's do. Page 4, first column.  
 14 MS. FORGIE: Are you back to the  
 15 study?  
 16 MR. GRIFFIS: Yeah.  
 17 MS. FORGIE: That --  
 18 THE WITNESS: Page 4? Where are  
 19 you?  
 20 BY MR. GRIFFIS:  
 21 Q. I'm in the first column, first full  
 22 paragraph within the paragraph that starts  
 23 in primary analyses, about three sentences  
 24 in. And the first sensitivity test is  
 25 described -- they say "We conducted several

1 sensitivity analyses."  
 2 Do you see that?  
 3 A. Right.  
 4 Q. Okay. So the first one was they  
 5 restricted to exposure report at enrollment,  
 6 in other words, the first questionnaire;  
 7 correct?  
 8 A. Correct.  
 9 Q. So people that answered the first  
 10 questionnaire, they just looked at that data  
 11 and left out the second questionnaire; so  
 12 they didn't need to impute any missing data;  
 13 right?  
 14 A. Right.  
 15 Q. And when they did that, when they  
 16 used only exposure information reported at  
 17 enrollment, rate ratio in the highest  
 18 exposed quartile was 0.82 percent and they  
 19 report the confidence interval expands one.  
 20 So when they did the first  
 21 sensitivity analysis leaving out imputation,  
 22 there was, again, no association between  
 23 glyphosate and non-Hodgkin lymphoma;  
 24 correct?  
 25 MS. FORGIE: Object to the form and

1 talked about earlier. They had to do it.  
 2 So they didn't include any imputation for  
 3 the 37 percent who didn't complete the  
 4 questionnaire, but they had to do some  
 5 imputation for the people who did complete  
 6 the questionnaire.  
 7 Q. So you believe the imputation  
 8 procedure and not some other statistical  
 9 control is how the gaps were addressed in  
 10 people who answered the second  
 11 questionnaire; is that right?  
 12 MS. FORGIE: Object to the form.  
 13 THE WITNESS: I don't know the  
 14 answer, but I suspect that's how they  
 15 did it.  
 16 BY MR. GRIFFIS:  
 17 Q. They didn't need --  
 18 A. They don't tell you how they did  
 19 it.  
 20 Q. Yes, sir. The 37 percent -- for  
 21 the 37 percent, the second sensitivity  
 22 analysis leaves out that whole imputation  
 23 procedure; correct?  
 24 A. Right, it leaves out all those  
 25 people.

1 asked and answered.  
 2 You can answer it again.  
 3 THE WITNESS: That's correct.  
 4 BY MR. GRIFFIS:  
 5 Q. Then they did a second sensitivity  
 6 analysis a different way. "To evaluate the  
 7 impact of using imputed exposure data for  
 8 participants who did not complete the  
 9 follow-up questionnaire, we limited the  
 10 analysis to the 34,698 participants who  
 11 completed both questionnaires." So if you  
 12 didn't answer the second questionnaire, they  
 13 left you out of this sensitivity test;  
 14 right?  
 15 A. Correct.  
 16 Q. So, again, they didn't need to use  
 17 imputation; right?  
 18 MS. FORGIE: Object to the form.  
 19 BY MR. GRIFFIS:  
 20 Q. There was no imputation in this  
 21 second sensitivity analysis?  
 22 A. Well, there may have been some  
 23 imputation for the people who answered the  
 24 questionnaire because they had to impute  
 25 what their use was during that gap period we

1 Q. And when they're left out, again,  
 2 there's no statistically significant  
 3 association, no association at all between  
 4 glyphosate and non-Hodgkin lymphoma;  
 5 correct?  
 6 MS. FORGIE: Objection. Asked and  
 7 answered.  
 8 You can answer it again.  
 9 THE WITNESS: That's correct.  
 10 BY MR. GRIFFIS:  
 11 Q. Now, the third sensitivity test  
 12 they truncated the follow-up period to 2005  
 13 so that their latest exposure information  
 14 that they had which was 2005 they stopped  
 15 follow-up there; so if they had mistakenly  
 16 imputed any exposures or non-exposures, that  
 17 wouldn't matter because they wouldn't be  
 18 looking into the future at those cancers;  
 19 right?  
 20 MS. FORGIE: Object to the form.  
 21 THE WITNESS: So -- yeah. So they  
 22 imputed it for everyone, but they  
 23 stopped the follow-up at 2005. So  
 24 presumably any exposure  
 25 misclassification that occurred after

Page 114

1 that is not part of the issue.  
 2 BY MR. GRIFFIS:  
 3 Q. Right. It takes out that exposure  
 4 misclassification issue --  
 5 A. Right.  
 6 Q. -- as a sensitivity test; right?  
 7 A. Right.  
 8 MS. FORGIE: Object to the form.  
 9 BY MR. GRIFFIS:  
 10 Q. And once again there is no  
 11 association in the resulting figures; right?  
 12 MS. FORGIE: Objection. Asked and  
 13 answered.  
 14 You can answer it again.  
 15 THE WITNESS: Right, but, again,  
 16 it's not surprising because the  
 17 underlying data and the extent of the  
 18 exposure misclassifications that  
 19 occurred even at the time of enrollment  
 20 you wouldn't see anything. So with each  
 21 of these sensitivity analyses, there are  
 22 still major issues and flaws just as  
 23 there is in the overall analysis.  
 24 BY MR. GRIFFIS:  
 25 Q. Okay. Let's get the imputation

Page 115

1 addressed first. As far as the imputation  
 2 procedure goes, the imputation procedure  
 3 that was used to address the 37 percent  
 4 non-respondents in the second questionnaire,  
 5 the NCI 2018 investigators did three  
 6 separate sensitivity analyses that didn't  
 7 rely on that imputation and came up with the  
 8 same lack of association between glyphosate  
 9 and non-Hodgkin lymphoma; correct?  
 10 MS. FORGIE: Wait. Object to the  
 11 form. You've now asked him this four  
 12 times. He can answer it one more time,  
 13 but you're badgering the witness.  
 14 You can answer it again.  
 15 THE WITNESS: I believe the third  
 16 one did include imputation up to 2005.  
 17 BY MR. GRIFFIS:  
 18 Q. Okay. Left out a big piece of  
 19 imputation?  
 20 MS. FORGIE: Object to the form.  
 21 THE WITNESS: No, it included  
 22 imputation up to 2005.  
 23 BY MR. GRIFFIS:  
 24 Q. And it left out a big piece of  
 25 imputation as well; correct? -- in your

Page 116

1 view?  
 2 MS. FORGIE: Object to the form.  
 3 Asked and answered.  
 4 You can answer it again.  
 5 THE WITNESS: I don't know. I'd  
 6 have to go back and look at that  
 7 carefully but -- I'd have to go back and  
 8 look at it carefully. I thought it did  
 9 include imputation up to 2005.  
 10 BY MR. GRIFFIS:  
 11 Q. You're not sure?  
 12 MS. FORGIE: Object to the form.  
 13 Asked and answered.  
 14 THE WITNESS: Let me look at it.  
 15 I'm unclear on the last one whether the  
 16 imputation was included or not.  
 17 BY MR. GRIFFIS:  
 18 Q. Okay.  
 19 A. I'd have to go back and review the  
 20 methods.  
 21 Q. Okay.  
 22 MS. FORGIE: Do you want him to do  
 23 that?  
 24 BY MR. GRIFFIS:  
 25 Q. Since you're not clear about the

Page 117

1 third one, let's ask about the first two.  
 2 They did two at least sensitivity tests that  
 3 omitted the imputation procedure. Are we --  
 4 THE VIDEOGRAPHER: I should switch.  
 5 BY MR. GRIFFIS:  
 6 Q. That omitted the imputation  
 7 procedure and came up with the same lack of  
 8 association between glyphosate and NHL;  
 9 correct?  
 10 MS. FORGIE: Object to the form.  
 11 Asked and answered like five times.  
 12 You can answer it again.  
 13 THE WITNESS: I'm sorry. Ask the  
 14 question again.  
 15 MR. GRIFFIS: Switch tapes, and  
 16 we'll ask it again.  
 17 THE VIDEOGRAPHER: This will  
 18 complete disk number 1. We're going off  
 19 the record at 11:06 a.m.  
 20 (Recess taken from 11:06 a.m.  
 21 to 11:16 a.m.)  
 22 THE VIDEOGRAPHER: This is the  
 23 beginning of disk number 2. We are  
 24 going back on the record. The time is  
 25 11:16 a.m.

Page 118

1 THE WITNESS: So I'd just like to  
 2 correct myself. For the last  
 3 sensitivity analysis, they didn't use  
 4 imputed data for any of the 37 percent  
 5 who didn't complete the second  
 6 questionnaire.  
 7 BY MR. GRIFFIS:  
 8 Q. For the last one, the third one  
 9 that we were talking about, the truncated  
 10 follow-up period --  
 11 A. Yes.  
 12 Q. -- to 2005, they didn't use any  
 13 imputed data?  
 14 A. Not for the 37 percent.  
 15 Q. Okay. And the purpose of these  
 16 three sensitivity tests was to test how  
 17 reliable imputation was in this study;  
 18 right?  
 19 MS. FORGIE: Object to the form.  
 20 THE WITNESS: Well, they're  
 21 comparing different types of analysis to  
 22 see whether there's any difference, and  
 23 there wasn't any difference. So they're  
 24 assuming that this confirms their  
 25 imputation calculations, but all this --

Page 119

1 all the analyses are using the same  
 2 flawed data; so it's not surprising that  
 3 the results are not different.  
 4 BY MR. GRIFFIS:  
 5 Q. Well, let's talk about imputation  
 6 first, not the same flawed data point which  
 7 we'll discuss with the imputation point.  
 8 As far as imputation goes, these  
 9 are three sensitivity tests that were done  
 10 to set aside imputation and see if similar  
 11 results were reached, and the answer was  
 12 yes. We get similar results without using  
 13 imputation; right?  
 14 MS. FORGIE: Objection. Asked and  
 15 answered. It mischaracterizes his  
 16 answer.  
 17 THE WITNESS: So, yes, you get  
 18 similar results, but there's a real  
 19 selection bias that occurs here because  
 20 you're only analyzing data on people who  
 21 actually answered the two parts of the  
 22 questionnaire. If you look at, you  
 23 know, are the people who didn't respond  
 24 to the second phase of the questionnaire  
 25 different than the ones who did respond,

Page 120

1 they're actually very different. So  
 2 this is the problem with just using this  
 3 kind of data because there's a selection  
 4 bias for people who actually answered  
 5 the questionnaire. And those people are  
 6 very different actually than people who  
 7 didn't answer the second phase of the  
 8 questionnaire; so you're trying to guess  
 9 what the people who didn't answer the  
 10 second phase of the questionnaire --  
 11 you're trying to guess what exposure  
 12 they had when, in fact, they're very  
 13 different than the group that you used  
 14 to train your imputation.  
 15 BY MR. GRIFFIS:  
 16 Q. First of all, you said that you're  
 17 relying on people who answered the second  
 18 questionnaire being similar to people who  
 19 didn't answer the second questionnaire;  
 20 correct?  
 21 A. Yes.  
 22 MS. FORGIE: Objection --  
 23 THE WITNESS: But they aren't --  
 24 they're very different.  
 25 ///

Page 121

1 BY MR. GRIFFIS:  
 2 Q. As to the first sensitivity  
 3 analysis, that's not an accurate criticism  
 4 because that was restricted to data from the  
 5 first questionnaire; right?  
 6 MS. FORGIE: Objection. Asked and  
 7 answered.  
 8 You can answer it again.  
 9 THE WITNESS: Right. So in the  
 10 first -- so in the first sensitivity  
 11 analysis, you just use the initial data,  
 12 right.  
 13 BY MR. GRIFFIS:  
 14 Q. Okay. And you said that we know  
 15 that the people who responded to the second  
 16 questionnaire were different than the people  
 17 who didn't respond to it.  
 18 A. Yes.  
 19 Q. What's the evidence for that?  
 20 A. Well, there's a paper by Montgomery  
 21 which I didn't cite, but there's a paper by  
 22 Rinsky which I did cite which also  
 23 references the paper by Montgomery, and both  
 24 those papers showed that the people who  
 25 answered the second questionnaire were

Page 122

1 actually very different than the people who  
 2 didn't answer the second questionnaire.  
 3 MR. GRIFFIS: Let's mark Rinsky and  
 4 Montgomery.  
 5 (Exhibit Numbers 30-12 and  
 6 30-13 were marked for  
 7 identification.)  
 8 BY MR. GRIFFIS:  
 9 Q. Which one is Exhibit 12, sir?  
 10 MS. SHIMADA: Montgomery.  
 11 THE WITNESS: I'm sorry?  
 12 BY MR. GRIFFIS:  
 13 Q. Montgomery is 12?  
 14 A. Yes.  
 15 Q. In Montgomery, they looked at the  
 16 difference between the people who responded  
 17 to the second questionnaire and the people  
 18 who didn't respond to it; right?  
 19 A. Right. They compared the two  
 20 groups.  
 21 Q. In the abstract under  
 22 "Conclusions," they said "Differences  
 23 between non-participants and participants in  
 24 the follow-up interview were generally  
 25 small, and we did not find significant

Page 123

1 evidence of selection bias"; right?  
 2 MS. FORGIE: Object to the form.  
 3 THE WITNESS: That's what they say.  
 4 BY MR. GRIFFIS:  
 5 Q. In the Rinsky paper, sir, 13, this  
 6 is a comparison of people who did and didn't  
 7 respond to a third interview; right?  
 8 A. Right. Response was even worse in  
 9 the third questionnaire.  
 10 Q. And the third interview doesn't  
 11 have anything to do with NCI 2018; right?  
 12 MS. FORGIE: Object to the form.  
 13 THE WITNESS: It doesn't, but it  
 14 shows you that there are going to be  
 15 even more problems in future analyses if  
 16 they're ever done.  
 17 BY MR. GRIFFIS:  
 18 Q. As far as the critique of the  
 19 non-responders to the second questionnaire  
 20 in NCI 2018, Rinsky doesn't speak to that;  
 21 right?  
 22 A. No, Montgomery does, but the  
 23 findings are the same. And Rinsky  
 24 references Montgomery.  
 25 Q. You've said several times during

Page 124

1 this deposition that glyphosate is uniquely  
 2 problematic for the NCI 2018 study and for  
 3 the AHS dataset, in general, and that  
 4 imputation will be biased with regard to it  
 5 and that the basic data collection will be  
 6 wrong with regard to it; correct?  
 7 MS. FORGIE: Object to the form.  
 8 Mischaracterizes his testimony.  
 9 THE WITNESS: I think the marked  
 10 change in the use of glyphosate right  
 11 during the time of the enrollment and  
 12 during the period after the enrollment  
 13 has resulted in a significant amount of  
 14 exposure misclassification, which is a  
 15 problem for the study because this  
 16 exposure misclassification is  
 17 non-differential, and it biases any  
 18 potential real findings to the null. So  
 19 it gives you a negative study, and this  
 20 is one reason why one in general has  
 21 less confidence in negative studies than  
 22 positive studies because when risk  
 23 ratios are not high, they can just  
 24 disappear with this kind of -- with this  
 25 level of misclassification.

Page 125

1 BY MR. GRIFFIS:  
 2 Q. And you have a hypothesis that  
 3 changes in glyphosate use caused  
 4 non-differential misclassification. Do you  
 5 have any evidence that that is true?  
 6 MS. FORGIE: Object to the form.  
 7 THE WITNESS: No, but if you look  
 8 at how the study was done and  
 9 constructed, you'd know that there was  
 10 significant amounts of exposure  
 11 misclassification just by understanding  
 12 the nature of how the study was done.  
 13 BY MR. GRIFFIS:  
 14 Q. Yes, sir. You have a hypothesis,  
 15 but you don't have any evidence for it;  
 16 right?  
 17 MS. FORGIE: Objection.  
 18 Mischaracterizes his testimony, asked  
 19 and answered.  
 20 You can answer it again.  
 21 THE WITNESS: Well, I'm not part of  
 22 the study; so how can I develop  
 23 evidence? I don't have -- I don't have  
 24 access to the raw data to develop  
 25 evidence. How could I develop evidence?

Page 126

1 BY MR. GRIFFIS:  
 2 Q. Well, for example, sir, the NCI  
 3 2018 paper and the AHS pool of data, in  
 4 general, has all sorts of supporting studies  
 5 validating all sorts of different aspects of  
 6 it, which is something the case-control  
 7 studies don't have; right?  
 8 MS. FORGIE: Object to the form.  
 9 THE WITNESS: And many of those  
 10 studies raised the issue of exposure  
 11 misclassification and how it could be a  
 12 major problem in the Agriculture Health  
 13 Study.  
 14 BY MR. GRIFFIS:  
 15 Q. And none of them detected any  
 16 exposure misclassification with regard to  
 17 the glyphosate; correct?  
 18 MS. FORGIE: Object to the form.  
 19 THE WITNESS: The studies didn't  
 20 necessarily focus on glyphosate.  
 21 BY MR. GRIFFIS:  
 22 Q. To close the loop, you can't point  
 23 us to any evidence as opposed to your  
 24 hypothesis that the glyphosate data  
 25 incorporates differential misclassification;

Page 127

1 right?  
 2 MS. FORGIE: Object to the form.  
 3 Asked and answered.  
 4 You can answer it again.  
 5 THE WITNESS: So if you understand  
 6 how the study was done, you know there  
 7 was a significant amount of exposure  
 8 misclassification, and basically the  
 9 study does not address that issue.  
 10 Okay? The study does not address that  
 11 issue, and it should have been  
 12 addressed.  
 13 BY MR. GRIFFIS:  
 14 Q. And imputation is designed to  
 15 address the problem of exposure  
 16 misclassification?  
 17 MS. FORGIE: Objection.  
 18 THE WITNESS: No, it's designed to  
 19 fill in the gaps in information, but it  
 20 can be also influenced by the initial  
 21 exposure misclassification which  
 22 occurred because that data is used as  
 23 part of imputation method.  
 24 BY MR. GRIFFIS:  
 25 Q. And, again, so that the jury is

Page 128

1 clear, when you say "the exposure  
 2 misclassification that occurred," it is the  
 3 exposure misclassification that you  
 4 hypothesized by looking at the study;  
 5 correct?  
 6 MS. FORGIE: Object to the form.  
 7 THE WITNESS: I think it's pretty  
 8 commonly -- if one studies the way the  
 9 study was done, if one studies the  
 10 methodology carefully, one can see that  
 11 there's a significant likelihood of  
 12 exposure misclassification which can't  
 13 be addressed -- which can't be addressed  
 14 and probably can't be measured because  
 15 of the way the study was done.  
 16 BY MR. GRIFFIS:  
 17 Q. And there are no data or figures  
 18 that you can point to for that?  
 19 MS. FORGIE: Object to the form.  
 20 Asked and answered.  
 21 You can answer it again.  
 22 THE WITNESS: No, other than the  
 23 whole body of information that we know  
 24 about the agricultural health study.  
 25 ///

Page 129

1 BY MR. GRIFFIS:  
 2 Q. All of the flaws or errors,  
 3 whatever term you like to use, that you've  
 4 discussed today and that you believe exist  
 5 with regard to this study, those are  
 6 non-differential, not differential; correct?  
 7 MS. FORGIE: Object to the form.  
 8 Mischaracterizes his testimony.  
 9 THE WITNESS: Yes, I think they're  
 10 non-differential.  
 11 BY MR. GRIFFIS:  
 12 Q. Okay.  
 13 A. The other problem with the  
 14 sensitivity analyses is that they're  
 15 focusing only on people who actually  
 16 responded to the questionnaires. So there's  
 17 a selection bias in just analyzing that  
 18 data, and the study doesn't recommend doing  
 19 that because of the selection bias. That's  
 20 why they decided to use the imputation data.  
 21 Okay?  
 22 Q. Because it was better; right?  
 23 MS. FORGIE: Object to the form.  
 24 THE WITNESS: Because they thought  
 25 it would be better.

<p style="text-align: right;">Page 130</p> <p>1 BY MR. GRIFFIS:  2 Q. They thought it would be better,  3 and there are studies on whether it's better  4 like the Heltshe Study, and you can't point  5 anywhere where they found that it's worse;  6 correct?  7 MS. FORGIE: Object to the form.  8 THE WITNESS: It's not a matter of  9 whether it's worse or not. It's do you  10 use the data, or do you not -- do you  11 just drop out the people who didn't  12 respond, and I think for most of the  13 analysis they did the imputation data is  14 acceptable. But for glyphosate because  15 of the special circumstances, it is  16 highly questionable.  17 BY MR. GRIFFIS:  18 Q. All three of the sensitivity tests  19 that were done would, if they were published  20 as a standalone study, would be the biggest  21 study out there other than NCI 2018 itself  22 on the subject of glyphosate and  23 non-Hodgkin's lymphoma; correct?  24 MS. FORGIE: Object to the form.  25 THE WITNESS: It's true, but they</p>	<p style="text-align: right;">Page 132</p> <p>1 imputation is flawed because of that  2 because they used a group of people who  3 were very different to impute the data  4 to people who -- to another group of  5 people.  6 BY MR. GRIFFIS:  7 Q. Montgomery says "Differences  8 between non-participants and participants in  9 the follow-up interview were generally small  10 and we did not find significant evidence of  11 selection bias"; right?  12 MS. FORGIE: Are you asking him  13 whether you're reading a section  14 correctly?  15 MR. GRIFFIS: I'm asking whether  16 that was their conclusion.  17 MS. FORGIE: Object to the form.  18 THE WITNESS: That's what they say.  19 That's what they say. If you look at  20 the details, the group that didn't  21 respond to the questionnaire were  22 younger. They were less educated. They  23 were more likely non-whites. They had  24 poor health habits. They smoked more.  25 They drank more. They ate -- had diets</p>
<p style="text-align: right;">Page 131</p> <p>1 would never be able to publish them that  2 way because of the tremendous dropout of  3 information and the selection bias that  4 would have been introduced; so that's  5 why they didn't do it.  6 BY MR. GRIFFIS:  7 Q. And in order for the dropout to  8 matter, it would have to be differential;  9 correct? It would have to -- people would  10 have to not respond to the second  11 questionnaire in a way that is correlated  12 with their propensity to be exposed to  13 glyphosate and contract non-Hodgkin's  14 lymphoma from their exposure to glyphosate;  15 correct?  16 MS. FORGIE: Object to the form.  17 THE WITNESS: We can't really know  18 what the effect of having those  19 37 percent of people respond. We can't  20 really know what that is. We can only  21 guess, and that's what they did. The  22 fact is that the group that didn't  23 respond to the second questionnaire was  24 very different from the group that did,  25 and so it's very likely that the</p>	<p style="text-align: right;">Page 133</p> <p>1 that weren't as good. They were less  2 likely to use pesticides, to mix and  3 apply pesticides; so there were all  4 kinds of differences between the  5 non-responders and the responders that  6 call into question the whole imputation  7 process.  8 BY MR. GRIFFIS:  9 Q. What evidence is there that any of  10 those factors is correlated with being  11 exposed to glyphosate and contracting  12 non-Hodgkin's lymphoma?  13 MS. FORGIE: Objection. Asked and  14 answered.  15 You can answer it again.  16 THE WITNESS: We don't know the  17 answer to that because they never  18 gathered the data.  19 BY MR. GRIFFIS:  20 Q. Take a look, sir, again, at Table 2  21 in Exhibit 5, the NCI 2018.  22 A. Table 2?  23 Q. Yes. Let's just look at the data  24 for lymphohematopoietic -- no, let's do  25 non-Hodgkin's lymphoma. Are you there?</p>

Page 134

1 A. Your Table 2 of Andreotti?  
 2 Q. Yes.  
 3 A. Yes.  
 4 Q. Table 2, Exhibit 5, the NCI 2018.  
 5 So we have here data for people who were  
 6 unexposed and people in four different  
 7 quartiles of exposure, Q1 being lowest, Q4  
 8 being highest; correct?  
 9 A. Yes.  
 10 MS. FORGIE: Object to the form.  
 11 BY MR. GRIFFIS:  
 12 Q. The relative risk pointed out to  
 13 Mr. Gibbons 0.83, 0.83, 0.88, and 0.87.  
 14 Those are the respective relative risks for  
 15 quartiles 1 through 4; correct?  
 16 A. Correct.  
 17 Q. If there was non-differential  
 18 classification in this study that biased  
 19 results toward the null, then the true  
 20 relative risks that you would get for  
 21 non-Hodgkin lymphoma if you corrected for  
 22 those would be figures smaller than 0.83,  
 23 0.83, 0.88, and 0.87; correct?  
 24 MS. FORGIE: Object to the form.  
 25 THE WITNESS: If the data is

Page 135

1 correct, that's true. But there's no  
 2 obvious reason to be able to understand  
 3 why the risk ratios are lower than one.  
 4 Okay? So if there's no risk --  
 5 right? -- if there's no risk, they  
 6 should be about one. So the fact that  
 7 they're, you know, almost 20 percent  
 8 lower for some categories tells you that  
 9 there are also some methodologic issues  
 10 in the study which we don't understand.  
 11 Either the control group is very unlike  
 12 the group that got diseased or there's  
 13 some random error. There is some other  
 14 issues here which is hard to understand,  
 15 why would the odds ratios actually be  
 16 lower than one? We don't really believe  
 17 glyphosate is protective for disease;  
 18 right.  
 19 BY MR. GRIFFIS:  
 20 Q. You testified earlier, sir, that  
 21 this pattern, a pattern for all cancers, for  
 22 oral cavity, colon, rectum, pancreas, lung,  
 23 melanoma, prostate, et cetera, is exactly  
 24 what you would expect to see in a substance  
 25 that does not cause cancer, i.e., point

Page 136

1 value is somewhat higher than one, point  
 2 value somewhat lower than one, all clustered  
 3 tightly around one, all not significant,  
 4 except possibly with some multiple  
 5 comparison outliers here and there.  
 6 A. You have --  
 7 MS. FORGIE: Wait. Objection.  
 8 Mischaracterizes his testimony.  
 9 THE WITNESS: If you look at the  
 10 data for most of these other cancers,  
 11 the numbers are clustered around one.  
 12 For non-Hodgkin lymphoma, there's  
 13 significant -- they're lower than one,  
 14 consistently lower than one. So what  
 15 that tells you is there's something  
 16 different here, and we don't understand  
 17 why that is. Okay? So the questions  
 18 about non-differential misclassification  
 19 actually changing a value below one is  
 20 nonsensical to me. It makes no sense.  
 21 Okay?  
 22 BY MR. GRIFFIS:  
 23 Q. So in your epidemiologic view, bias  
 24 towards the null only applies to increasing  
 25 P values -- increasing relative risks that

Page 137

1 start out above one?  
 2 MS. FORGIE: Object to the form.  
 3 THE WITNESS: Well, if -- if they  
 4 start out above one, it will decrease it  
 5 towards the null. If they truly start  
 6 below one, it will increase it towards  
 7 the null, but there's no reason to  
 8 believe that glyphosate actually  
 9 prevents non-Hodgkin lymphoma, is there?  
 10 No, there's not. So it's sort of  
 11 nonsensical to make the argument below  
 12 one. Okay?  
 13 BY MR. GRIFFIS:  
 14 Q. Okay. All of your points about  
 15 non-differential bias, they wouldn't take  
 16 something like the results that we see for  
 17 lymphohematopoietic and move it towards one  
 18 and beyond one and yield a statistically  
 19 significant positive association because  
 20 that would be the wrong direction for  
 21 non-differential bias; right?  
 22 MS. FORGIE: Object to the form.  
 23 THE WITNESS: So if it was lower  
 24 than one?  
 25 ///

1 BY MR. GRIFFIS:  
 2 Q. Yeah, you're not going to get .87  
 3 ticking up towards one and beyond it by  
 4 correcting for non-differential bias by  
 5 definition; right?  
 6 MS. FORGIE: Object to the form.  
 7 THE WITNESS: No, but that's why I  
 8 say that the fact that the odds ratios  
 9 are lower -- consistently lower than  
 10 one, there must be another explanation  
 11 for that. Okay? Other than the fact  
 12 that glyphosate is protective of  
 13 non-Hodgkin's lymphoma. That doesn't  
 14 make any sense either.  
 15 BY MR. GRIFFIS:  
 16 Q. What is it?  
 17 A. Uh-huh?  
 18 Q. What is the other explanation?  
 19 A. I don't know what the other  
 20 explanation is. Either the control group is  
 21 so different from the cases that it doesn't  
 22 allow us to do a valid evaluation, or  
 23 there's some random error. I don't know.  
 24 My guess is that there -- my guess is that  
 25 the control group is probably not a very

1 BY MR. GRIFFIS:  
 2 Q. Are you testifying to a reasonable  
 3 degree of medical certainty that these  
 4 figures represent a difference in the  
 5 control group from the composed group, and  
 6 that's the reason for this, and that's an  
 7 additional source of error in the data? Is  
 8 that your testimony to a reasonable degree  
 9 of medical certainty?  
 10 A. I'm suggesting that that may be an  
 11 explanation for the lower than one odds  
 12 ratios for non-Hodgkin's lymphoma. I'm  
 13 suggesting that.  
 14 Q. That's a speculation?  
 15 MS. FORGIE: No. Objection.  
 16 THE WITNESS: It is speculation  
 17 because no one has explained why they  
 18 are not clustering around one, why  
 19 they're all low. There's some  
 20 methodologic issue here that is not  
 21 addressed in the paper.  
 22 MR. GRIFFIS: Pass the witness.  
 23 MS. FORGIE: Okay. We'll take a  
 24 break.  
 25 THE VIDEOGRAPHER: Going off the

1 good group to use because they're very  
 2 different from the cases, and actually  
 3 that's the reason in the De Roos -- the  
 4 first De Roos paper that they did an  
 5 analysis of the low exposed to the high  
 6 exposed instead of using -- doing the  
 7 analysis of the high exposed versus the  
 8 controls. And, in fact, it would have been  
 9 interesting for these folks to do the same  
 10 thing just to see if there's a difference.  
 11 Okay?  
 12 My guess is that these risk ratios  
 13 that are below one would have come much  
 14 closer and clustered around one. So that's  
 15 another issue with this study. The control  
 16 group that they used probably isn't a very  
 17 representative control group comparing the  
 18 controls to the cases.  
 19 Q. Sir, to be fair, I've got five  
 20 minutes left. You're supposed to be giving  
 21 expert testimony here. None of this is in  
 22 your expert report.  
 23 A. I'm answering your question.  
 24 MS. FORGIE: Wait, wait, wait.  
 25 ///

1 record at 11:41 a.m.  
 2 (Recess taken from 11:41 a.m.  
 3 to 11:55 a.m.)  
 4 THE VIDEOGRAPHER: This is  
 5 continuing disk number 2. The time is  
 6 11:55. We are going back on the record.  
 7  
 8 EXAMINATION  
 9 BY MS. FORGIE:  
 10 Q. Doctor, you were asked a series of  
 11 questions about your opinions about  
 12 misclassification flaws in the AHS  
 13 publication. Do you remember those  
 14 questions?  
 15 A. Yes.  
 16 Q. And do some of those  
 17 misclassification flaws apply to the  
 18 63 percent that answered the second  
 19 questionnaire?  
 20 A. Yes, they do.  
 21 Q. So it's not just the 37 percent  
 22 that did not answer the second question that  
 23 those misclassification flaws applied to;  
 24 correct?  
 25 A. Yes.

1 Q. You were also asked a series of  
2 questions with regard to the 37 percent and  
3 the questionnaires in there. You were asked  
4 a series of questions with regards to the  
5 statement at that follow-up, applicators  
6 reported the number of days each pesticide  
7 was used in the most recent year farm. Do  
8 you remember those questions?

9 A. Yes.

10 Q. With regard to the other years for  
11 which they did not answer that question,  
12 what information, if any, do we have about  
13 pesticide they were using?

14 A. We don't have any -- we don't know.  
15 We don't know what they were using. We  
16 don't know.

17 Q. How many years were involved in the  
18 period which we don't know what they were  
19 using and how long they were using it?

20 A. Somewhere between six and 12 years.

21 Q. And all that data is not in the  
22 study; correct?

23 A. We don't know that data for any of  
24 them.

25 Q. You mentioned that you've never

1 Q. If you collect the data, you don't  
2 need to use an imputation process; correct?

3 A. Right. You want to use real data  
4 whenever possible.

5 Q. And they could have -- the authors  
6 of the AHS study could have gotten that data  
7 if they had asked those questions; is that  
8 correct?

9 A. They could have, yes.

10 Q. Are you aware of any peer-reviewed  
11 publications that discuss the  
12 misclassification flaws in the AHS  
13 publication that you've addressed today?

14 A. Well, yes, there's the article by  
15 Gray that I reference in my report that  
16 talks about the fact that, you know, if you  
17 don't gather data in the follow-up studies,  
18 that there's a significant potential for  
19 exposure misclassification. And then  
20 there's the study by Acquavella and another  
21 study by Blair where they did some  
22 biomonitoring, and they both discuss the  
23 issue of exposure misclassification in the  
24 Agricultural Health Study and how it could  
25 be a significant factor.

1 used an imputation formula in any of your  
2 publications. Do you remember that  
3 testimony?

4 A. Yes.

5 Q. And you mentioned that you don't  
6 know exactly how you would use an imputation  
7 method, but would you have access as  
8 chairman of the department of pathology here  
9 at a large cancer center, City of Hope,  
10 would you have access to people who are  
11 qualified to prepare an imputation process  
12 if you needed it?

13 A. Yeah. So the studies I was  
14 involved in remain case control studies  
15 where we gathered nearly complete data on  
16 all of the cases and controls so we didn't  
17 have a need for imputation. So I never  
18 needed to use imputation to create data for  
19 any of my studies. But, you know, if there  
20 had been a need, I would have engaged the  
21 epidemiologists that I collaborated with to  
22 do that.

23 Q. But if you have the data, you don't  
24 need to use an imputation process?

25 A. Right.

1 Q. So the exposure misclassification  
2 flaws in the AHS publication that you've  
3 discussed today are also mentioned in  
4 peer-reviewed publications, and you just  
5 named three of those; correct?

6 MR. GRIFFIS: Objection. Leading.

7 THE WITNESS: Yes.

8 BY MS. FORGIE:

9 Q. You were asked several questions  
10 about how long it takes to develop  
11 non-Hodgkin's lymphoma after the use of  
12 Roundup. Do you remember those questions?

13 A. Yes.

14 Q. Is it possible to develop  
15 non-Hodgkin's lymphoma in one or two years?

16 A. It is possible after a short  
17 exposure, but it would be quite unlikely.  
18 But it's possible.

19 Q. And with regard to the answers that  
20 you were giving, you were giving answers  
21 about what you would want in an  
22 epidemiological study as compared to what  
23 would be exposure required in an individual;  
24 is that correct?

25 A. Well, we were talking about median

1 times of exposure or median times of  
2 follow-up. So, you know, as I said before,  
3 the more exposure and the longer follow-up,  
4 the better.

5 Q. For purposes of an epidemiological  
6 study; correct?

7 A. Yes.

8 Q. Oh, one more question. You were  
9 asked a question -- is the AHS publication a  
10 prospective study or retrospective study?

11 A. It's actually both because it's  
12 retrospective from the time of enrollment  
13 because that data is all gathered prior to  
14 enrollment. And then it is prospective in  
15 the sense that as you go forward, they will  
16 have additional follow-up questionnaires to  
17 try to update the data and have a complete  
18 and accurate database.

19 Q. Do you agree that the imputation  
20 error with regard to no differential  
21 misclassification of exposure is only asking  
22 about the last year of pesticide use  
23 compounds or makes the flaws in the AHS  
24 publication more severe than in any of the  
25 case-control studies?

1 MR. GRIFFIS: Objection. Leading.  
2 MS. FORGIE: I'll withdraw it. I  
3 don't have anything else.

4  
5 FURTHER EXAMINATION  
6 BY MR. GRIFFIS:

7 Q. Sir, you said that it's possible to  
8 develop non-Hodgkin lymphoma in one to two  
9 years. What's your evidence for that?

10 A. No, what I said is it's possible  
11 that an exposure could cause non-Hodgkin's  
12 lymphoma after a short period of time.  
13 There's some evidence for that in studies of  
14 chemotherapy, high-dose chemotherapy, that  
15 when you use some high-dose chemotherapy  
16 that you can develop non-Hodgkin's lymphoma  
17 as a result of that, using it for another  
18 purpose like for breast cancer or testicular  
19 cancer or acute leukemia. But generally  
20 those are using very toxic agents at high  
21 doses. You could have a very short latency  
22 in that kind of a situation. I discussed  
23 that in my article that is referenced in my  
24 first report.

25 MR. GRIFFIS: No further questions.

1 MS. FORGIE: Thank you.

2 THE VIDEOGRAPHER: We are going off  
3 the record at 12:03 p.m. This will  
4 complete disk number 2 and complete  
5 today's deposition.

6 (Time noted: 12:03 p.m.)  
7

8  
9  
10  
11 \_\_\_\_\_  
12 Dennis Weisenburger, M.D.  
13

14 Subscribed and sworn to before me  
15 this day of , 2018.  
16

17  
18 \_\_\_\_\_  
19 (Notary Public)  
20

21 My Commission expires: \_\_\_\_\_  
22  
23  
24  
25

1 C E R T I F I C A T E  
2 S T A T E O F C A L I F O R N I A :  
3

4 I, LISA MOSKOWITZ, CSR, RPR, CRR, CLR,  
5 NCRA Realtime Systems Administrator,  
6 Certified Shorthand Reporter, do hereby  
7 certify:

8 That the witness whose deposition is  
9 hereinbefore set forth was duly sworn, and  
10 that such deposition is a true record of the  
11 testimony given by such witness.

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

16 IN WITNESS WHEREOF, I have hereunto set  
17 my hand this 22nd day of January, 2018.  
18

19  
20  
21 \_\_\_\_\_  
22 LISA MOSKOWITZ, CSR 10816, RPR, CRR, CLR  
23 NCRA Realtime Systems Administrator  
24  
25

1 NAME OF CASE: Roundup Products Liability Litigation  
2 DATE OF DEPOSITION: January 22, 2018  
3 DEPONENT: DENNIS WEISENBURGER, M.D.  
4 1. To clarify the record.  
5 2. To conform to the facts.  
6 3. To correct transcription error.  
7 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
8 From \_\_\_\_\_ to \_\_\_\_\_  
9 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
10 From \_\_\_\_\_ to \_\_\_\_\_  
11 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
12 From \_\_\_\_\_ to \_\_\_\_\_  
13 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
14 From \_\_\_\_\_ to \_\_\_\_\_  
15 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
16 From \_\_\_\_\_ to \_\_\_\_\_  
17 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
18 From \_\_\_\_\_ to \_\_\_\_\_  
19 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
20 From \_\_\_\_\_ to \_\_\_\_\_  
21 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
22 From \_\_\_\_\_ to \_\_\_\_\_  
23 Page \_\_\_\_\_ Line \_\_\_\_\_ Reason \_\_\_\_\_  
24 From \_\_\_\_\_ to \_\_\_\_\_  
25

<b>A</b>	51:1,5 90:24 105:17 105:23 115:3 127:9 127:10,15	<b>Amended (1)</b> 4:14	128:21 133:15,17 141:22 142:11	88:22 89:9,24 95:12 98:12 99:12 101:3 105:3,19 109:5 111:1 113:6 114:12 115:11 116:3,13 117:11 119:14 121:6 125:18 127:3 128:20 133:13 141:10 142:1,3 144:7 145:9 146:9
<b>a.m (18)</b> 2:6 7:2,16 40:9,10,11 40:14 68:11,12,13 68:15 117:19,20,21 117:25 141:1,2,3	<b>addressed (10)</b> 22:7 43:11 94:7 112:9 115:1 127:12 128:13,13 140:21 144:13	<b>American (1)</b> 102:10	<b>answered (35)</b> 6:1 59:6 65:11 67:18 72:8 88:22 89:9,24 98:12 99:13,13 101:3 105:4,20 109:6 110:9 111:1 111:23 112:10 113:7 114:13 116:3 116:13 117:11 119:15,21 120:4,17 121:7,25 125:19 127:3 128:20 133:14 141:18	<b>asking (10)</b> 19:8 37:22 45:25 51:10 64:10 99:4,14 132:12,15 146:21
<b>ability (1)</b> 54:10	<b>addresses (1)</b> 21:21	<b>amount (4)</b> 36:2 55:10 124:13 127:7	<b>answering (1)</b> 139:23	<b>aspects (1)</b> 126:5
<b>able (7)</b> 66:23 92:8 100:13 104:22,23 131:1 135:2	<b>adequate (3)</b> 71:22 96:10,14	<b>amounts (1)</b> 125:10	<b>answers (2)</b> 145:19,20	<b>assess (1)</b> 107:1
<b>absent (2)</b> 51:4 100:25	<b>adjustment (1)</b> 30:5	<b>analyses (12)</b> 30:4,6 107:6 109:4,9 109:23 110:1 114:21 115:6 119:1 123:15 129:14	<b>anybody (1)</b> 69:6	<b>assessed (1)</b> 91:11
<b>abstract (2)</b> 27:22 122:21	<b>adjustments (1)</b> 30:13	<b>analysis (31)</b> 12:23 13:11 14:18 29:8 37:14 42:5,15 47:21 48:9 62:12 63:24 78:24 81:19 86:6 91:19 92:1,5,9 110:21 111:6,10,21 112:22 114:23 118:3,21 121:3,11 130:13 139:5,7	<b>apparent (1)</b> 27:25	<b>assessment (7)</b> 9:21 20:6,10 21:22 22:12 94:24 104:12
<b>accept (4)</b> 26:19 98:23,24 105:6	<b>Administrator (4)</b> 1:24 2:14 149:5,23	<b>analyzing (2)</b> 119:20 129:17	<b>applicators (8)</b> 28:15 41:10,24 42:10 44:15 62:2,5 142:5	<b>assignment (1)</b> 20:11
<b>acceptable (11)</b> 14:23 98:10,15,16,17 98:19,21 99:10,19 99:23 130:14	<b>admonish (2)</b> 18:14,19	<b>and/or (1)</b> 47:19	<b>applied (3)</b> 14:5 99:9 141:23	<b>associated (2)</b> 73:16 75:5
<b>accepted (3)</b> 97:14 102:21 104:4	<b>affect (1)</b> 48:8	<b>Andreotti (2)</b> 5:5 134:1	<b>applies (1)</b> 136:24	<b>association (33)</b> 7:22 27:24 30:2,14,24 32:1 34:10,18,20,23 35:3,6,9 36:12,17 36:21 37:3 38:20,21 39:2 53:17 71:23,25 73:21 105:15 108:18 110:22 113:3,3 114:11 115:8 117:8 137:19
<b>access (3)</b> 125:24 143:7,10	<b>agents (2)</b> 56:25 147:20	<b>Andrew (2)</b> 3:22 7:17	<b>apply (6)</b> 16:9 60:3 88:25 89:20 133:3 141:17	<b>associations (3)</b> 28:16 29:25 80:4
<b>account (2)</b> 22:10 104:5	<b>agree (14)</b> 22:18,23 24:12 48:17 74:25 75:2 90:17 100:4,12,23 105:17 105:22 107:16 146:19	<b>ANDRUS (1)</b> 3:2	<b>applying (1)</b> 24:3	<b>assume (1)</b> 17:10
<b>accuracy (1)</b> 108:4	<b>agriculture (13)</b> 8:22 9:11 13:22 22:7 79:1,21 93:13,15,17 96:13 100:17 128:24 144:24	<b>Angeles (2)</b> 3:11 7:1	<b>appropriate (2)</b> 19:18 83:17	<b>assuming (1)</b> 118:24
<b>accurate (8)</b> 28:22 29:16 30:12 46:5 51:13 58:21 121:3 146:18	<b>agriculture (2)</b> 21:23 126:12	<b>answer (58)</b> 18:13 19:17 20:14,18 20:22 21:15,16 22:14,15 51:25 58:16 59:7 63:15 64:11 65:12 69:7 82:20 83:9 88:14 90:2,18 94:11 96:21 98:13,21 99:16,18 101:13,19 102:2,20 104:17 105:5,21 109:7 111:2,12 112:14 113:8 114:14 115:12,14 116:4 117:12 119:11,16 120:7,9 120:19 121:8 122:2 125:20 127:4	<b>appropriateness (1)</b> 25:17	<b>associated (2)</b> 85:2,4
<b>accurately (2)</b> 28:5 51:15	<b>AHS (29)</b> 5:3 9:19 11:18 16:24 18:6,7 19:16 20:23 21:1 22:19,23 23:7 30:6 85:22 91:3,16 94:17 95:4,17,18 97:3 124:3 126:3 141:12 144:6,12 145:2 146:9,23	<b>answering (1)</b> 7:15	<b>approximately (1)</b> 7:15	<b>attached (2)</b> 85:2,4
<b>Acquavella (1)</b> 144:20	<b>al (3)</b> 93:12,14,16	<b>argument (1)</b> 137:11	<b>ARISTEI (1)</b> 3:8	<b>attempt (3)</b> 45:23 46:22 48:3
<b>action (1)</b> 149:13	<b>Alaska (1)</b> 3:4	<b>article (4)</b> 27:7 105:10 144:14 147:23	<b>article (2)</b> 27:15 99:14	<b>attempts (1)</b> 50:25
<b>ACTIONS (1)</b> 1:7	<b>algorithm (2)</b> 92:17 93:1	<b>articles (2)</b> 119:10	<b>aside (1)</b> 119:10	<b>attenuate (1)</b> 54:21
<b>actual (5)</b> 18:8 91:13 100:2 103:17 106:11	<b>allow (2)</b> 68:2 138:22	<b>asked (40)</b> 10:11 16:3 45:10,14 52:9,14 59:6 65:11 67:18 72:8 73:20	<b>Attorneys (4)</b> 3:2,3,9,15	<b>author (1)</b>
<b>acute (3)</b> 82:4,22 147:19	<b>allowed (1)</b> 90:12			
<b>added (3)</b> 12:21,21 52:11				
<b>additional (7)</b> 9:24 10:15,25 11:2 29:10 140:7 146:16				
<b>address (20)</b> 7:13 23:10 25:21 43:15,18,24 44:12 44:16 48:3 50:20,22				

27:23	78:23	<b>Boulevard (1)</b>	96:8	<b>chairman (1)</b>
<b>authors (7)</b>	<b>better (14)</b>	3:10	<b>carcinogen (2)</b>	143:8
27:9 28:12 29:4,24	69:8 71:7 72:5 74:2	<b>break (5)</b>	70:17,18	<b>chance (4)</b>
44:15 99:6 144:5	74:17 75:3,15 92:9	35:16 37:24 40:6 68:5	<b>careers (1)</b>	37:22 39:3,5 101:17
<b>Avenue (1)</b>	92:13 129:22,25	140:24	69:10	<b>chances (1)</b>
7:20	130:2,3 146:4	<b>breakdown (4)</b>	<b>carefully (5)</b>	71:24
<b>average (1)</b>	<b>beyond (4)</b>	32:9 33:23,24 34:13	27:14 32:20 116:7,8	<b>change (4)</b>
89:4	18:4 83:5 137:18	<b>breaking (2)</b>	128:10	12:7 14:1 48:9 124:10
<b>aware (2)</b>	138:3	35:14 38:1	<b>case (16)</b>	<b>changed (1)</b>
23:22 144:10	<b>bias (20)</b>	<b>breast (1)</b>	1:6 7:11 10:9 13:20	11:17
	15:14,20 16:2,15	147:18	15:20 16:10 61:20	<b>changes (2)</b>
<b>B</b>	53:24,25 54:21	<b>Brier (1)</b>	61:24 71:8,12 86:7	64:19 125:3
<b>B (1)</b>	55:16 107:10	106:25	86:11 98:25 107:9	<b>changing (1)</b>
4:8	119:19 120:4 123:1	<b>broke (3)</b>	143:14 150:1	136:19
<b>B-cell (4)</b>	129:17,19 131:3	35:19 36:1,3	<b>case-control (4)</b>	<b>charge (1)</b>
34:17,22 77:17,21	132:11 136:23	<b>built (2)</b>	88:25 89:21 126:6	70:6
<b>back (12)</b>	137:15,21 138:4	13:3 58:9	146:25	<b>chart (2)</b>
19:19 22:21 40:13	<b>biased (3)</b>	<b>bunch (2)</b>	<b>cases (22)</b>	80:7 83:24
42:24 68:16 88:13	105:14 124:4 134:18	31:8 54:4	12:21 14:16 29:12	<b>charts (1)</b>
109:14 116:6,7,19	<b>biases (4)</b>	<b>busy (1)</b>	37:9,14 46:19 61:23	77:11
117:24 141:6	43:2 54:12,13 124:17	26:23	61:25 62:24 64:13	<b>checked (1)</b>
<b>badger (1)</b>	<b>big (3)</b>		65:18,23 75:5,12,17	91:20
101:4	98:4 115:18,24	<b>C</b>	75:17,20 80:25	<b>checking (1)</b>
<b>badgering (2)</b>	<b>biggest (1)</b>	<b>C (3)</b>	138:21 139:2,18	108:11
102:18 115:13	130:20	3:1 149:1,1	143:16	<b>checks (1)</b>
<b>balance (2)</b>	<b>Biomarkers (1)</b>	<b>calculated (1)</b>	<b>categories (3)</b>	108:17
62:3 63:3	26:17	106:10	81:11 86:11 135:8	<b>chemical (3)</b>
<b>balanced (1)</b>	<b>biometric (1)</b>	<b>calculations (3)</b>	<b>causation (5)</b>	69:10 75:6 97:19
62:6	91:13	91:12 92:15 118:25	4:23 5:10 9:9,22	<b>chemicals (1)</b>
<b>based (6)</b>	<b>biometrics (1)</b>	<b>California (8)</b>	80:13	71:6
11:17 16:4 71:4 83:17	91:20	1:2,17 2:12,13 3:11	<b>cause (7)</b>	<b>chemotherapy (3)</b>
83:20 90:22	<b>biomonitoring (2)</b>	7:11,14 149:2	11:16,23 12:2,11	147:14,14,15
<b>basic (2)</b>	92:16 144:22	<b>call (6)</b>	31:14 135:25	<b>Children's (1)</b>
108:23 124:5	<b>biostatistician (2)</b>	13:15 25:5,23 37:12	147:11	104:13
<b>basically (4)</b>	60:23 61:3	43:1 133:6	<b>caused (2)</b>	<b>choose (1)</b>
12:19,24 44:17 127:8	<b>biostatistics (1)</b>	<b>called (2)</b>	40:22 125:3	59:3
<b>basis (3)</b>	63:7	8:14 47:20	<b>causes (7)</b>	<b>chronic (2)</b>
70:22 71:12 90:15	<b>biostats (1)</b>	<b>Calls (1)</b>	9:10 31:6 78:4,5,13	34:18 77:19
<b>bathroom (1)</b>	63:6	58:13	83:3,14	<b>circumstances (1)</b>
68:5	<b>bit (3)</b>	<b>cancel (1)</b>	<b>cavity (2)</b>	130:15
<b>BAUM (1)</b>	12:22 31:9,10	54:7	32:9 135:22	<b>cite (2)</b>
3:8	<b>bladder (4)</b>	<b>cancer (28)</b>	<b>center (1)</b>	121:21,22
<b>began (1)</b>	32:11 93:14 94:5,23	10:1,17 11:22 15:4	143:9	<b>cited (5)</b>
75:19	<b>Blair (1)</b>	20:12 25:13,17 26:6	<b>certain (2)</b>	94:1,4 99:15 101:16
<b>beginning (2)</b>	144:21	26:16 28:14,17 29:9	57:5 69:9	103:5
77:25 117:23	<b>blanks (1)</b>	29:12 31:14 93:12	<b>certainly (4)</b>	<b>City (1)</b>
<b>behalf (2)</b>	97:16	93:14,17,25 94:5,7	11:21 14:5 42:17	143:9
4:24 5:11	<b>blood (1)</b>	94:23 95:3,10	98:16	<b>claim (7)</b>
<b>believe (11)</b>	149:14	101:10 135:25	<b>certainty (2)</b>	15:14,17 69:22 78:3,7
15:9 46:9 68:20 83:2	<b>body (1)</b>	143:9 147:18,19	140:3,9	78:13 87:9
101:8,23 112:7	128:23	<b>cancers (13)</b>	<b>Certified (1)</b>	<b>clarify (1)</b>
115:15 129:4	<b>Bonner (4)</b>	28:18 30:20,21,23	149:6	150:4
135:16 137:8	5:12 93:11 94:13	32:2,8 33:11,15	<b>certify (2)</b>	<b>classification (5)</b>
<b>best (8)</b>	101:11	73:16,24 113:18	149:7,12	53:2 54:19 66:19,20
38:7 47:21 51:18	<b>bottom (1)</b>	135:21 136:10	<b>cetera (2)</b>	134:18
61:13 63:3 75:6,7	43:11	<b>capture (1)</b>	14:18 135:23	<b>classified (1)</b>

46:20 <b>cleanest (1)</b> 62:11 <b>cleanly (1)</b> 24:23 <b>clear (3)</b> 33:9 116:25 128:1 <b>close (5)</b> 32:24 63:11 106:22 106:23 126:22 <b>closer (2)</b> 55:6 139:14 <b>CLR (4)</b> 1:23 2:13 149:4,22 <b>clustered (3)</b> 136:2,11 139:14 <b>clustering (1)</b> 140:18 <b>coffee (1)</b> 68:8 <b>cohort (22)</b> 13:21 15:22 16:10 27:24 29:7 48:21 52:1 69:8,15,17,19 71:5,15,19 72:5 86:7 88:24 92:6 96:9 100:14,16,20 <b>collaborated (1)</b> 143:21 <b>collect (1)</b> 144:1 <b>collection (1)</b> 124:5 <b>colon (2)</b> 32:9 135:22 <b>Colorado (1)</b> 3:5 <b>column (8)</b> 29:3,23 84:8 94:14 95:6 104:2 109:13 109:21 <b>columns (1)</b> 85:14 <b>come (2)</b> 42:24 139:13 <b>comment (5)</b> 13:7 29:5 35:18 99:20 104:24 <b>commented (1)</b> 21:12 <b>comments (1)</b> 27:8 <b>Commission (1)</b> 148:20 <b>common (3)</b> 100:14,18 105:10	<b>commonly (2)</b> 26:8 128:8 <b>comparative (1)</b> 64:14 <b>compare (2)</b> 14:7 61:14 <b>compared (7)</b> 23:16 29:5,12 98:6 103:20 122:19 145:22 <b>comparing (3)</b> 36:23 118:21 139:17 <b>comparison (3)</b> 29:16 123:6 136:5 <b>compensate (1)</b> 52:4 <b>complete (14)</b> 47:25 85:23 107:8,11 107:24 111:8 112:3 112:5 117:18 118:5 143:15 146:17 148:4,4 <b>completed (2)</b> 41:11 111:11 <b>completely (1)</b> 18:4 <b>complicated (2)</b> 27:6 58:19 <b>complicates (1)</b> 46:21 <b>composed (1)</b> 140:5 <b>compounds (1)</b> 146:23 <b>concern (3)</b> 15:20,21 49:18 <b>concluded (1)</b> 27:23 <b>conclusion (5)</b> 11:15 12:18 14:11 38:11 132:16 <b>conclusions (4)</b> 14:22 27:22 37:20 122:22 <b>condition (1)</b> 16:5 <b>conducted (1)</b> 109:25 <b>confidence (11)</b> 31:12,23 33:4,17 39:12 40:3 92:14 98:24 99:2 110:19 124:21 <b>confirms (1)</b> 118:24 <b>conform (1)</b>	150:4 <b>consider (4)</b> 15:3 23:4 40:20 85:22 <b>considered (2)</b> 10:16 20:13 <b>considering (2)</b> 17:23,24 <b>consistency (1)</b> 53:16 <b>consistent (1)</b> 30:3 <b>consistently (4)</b> 31:10 56:19 136:14 138:9 <b>constructed (1)</b> 125:9 <b>context (1)</b> 80:16 <b>continue (2)</b> 56:23 58:10 <b>continued (2)</b> 49:20 96:7 <b>continues (2)</b> 40:12 68:14 <b>continuing (1)</b> 141:5 <b>contract (2)</b> 69:5 131:13 <b>contracting (1)</b> 133:11 <b>control (14)</b> 13:20 15:21 16:10 61:20,24 86:11 112:9 135:11 138:20,25 139:15 139:17 140:5 143:14 <b>controls (9)</b> 61:23,24 63:22 65:19 65:20,22 139:8,18 143:16 <b>conviction (1)</b> 12:9 <b>copies (2)</b> 10:25,25 <b>copy (1)</b> 11:2 <b>correct (125)</b> 9:13,15,23 10:23 11:19 13:5 14:9,12 14:18 16:7 21:7 22:4 29:18 30:14,21 30:25 32:3,18 33:6 33:12,18,25 34:11 34:12,15,20,21,23 34:25 35:3,4,6,7,9	35:10 36:4,8,9,14 36:20 39:9,15 41:12 41:25 43:7,24 46:8 47:8,9,14 48:15 49:6,17 58:15 66:24 67:10,16 68:24 70:3 72:16,21 73:8 78:6 79:7 80:6,13,21 81:20,21 83:15,18 83:21 84:1,10 86:14 89:22 90:24 91:4,14 91:23 92:4,10 93:18 95:20 100:25 103:6 103:9 106:12 108:14,20,22 110:7 110:8,24 111:3,15 112:23 113:5,9 115:9,25 117:9 118:2 120:20 124:6 126:17 128:5 129:6 130:6,23 131:9,15 134:8,15,16,23 135:1 141:24 142:22 144:2,8 145:5,24 146:6 150:5 <b>corrected (2)</b> 10:11 134:21 <b>correcting (1)</b> 138:4 <b>correctly (4)</b> 28:3 30:8 44:23 132:14 <b>correlated (2)</b> 131:11 133:10 <b>correlation (2)</b> 92:20,21 <b>correlations (1)</b> 92:16 <b>counsel (6)</b> 7:24 18:14,19 19:7,23 37:21 <b>count (1)</b> 14:6 <b>country (1)</b> 56:10 <b>course (3)</b> 13:5 27:10 31:21 <b>court (5)</b> 1:1 7:9,10,21 8:10 <b>Courtyard (2)</b> 2:10 7:13 <b>create (1)</b> 143:18 <b>critical (2)</b> 27:8 96:9	<b>critically (1)</b> 27:2 <b>criticism (8)</b> 21:6,9 43:22 46:15 68:18 90:22 104:10 121:3 <b>criticisms (5)</b> 31:20 48:4 50:21 89:18 92:22 <b>criticized (1)</b> 88:4 <b>critique (1)</b> 123:18 <b>critiques (1)</b> 43:24 <b>crop (1)</b> 58:25 <b>crops (6)</b> 56:4,10,17 57:5,19,21 <b>cross-talk (1)</b> 78:9 <b>CRR (4)</b> 1:23 2:13 149:4,22 <b>crude (1)</b> 37:14 <b>CSR (4)</b> 1:23 2:13 149:4,22 <b>cup (1)</b> 68:8 <b>cut (1)</b> 52:2
<hr/> <b>D</b> <hr/>				
<b>D (5)</b> 4:1,12,17,19 5:8				
<b>D.C (1)</b> 3:17				
<b>data (115)</b> 9:11,18,19,24,24 20:24 22:8,12 23:5 23:7 30:19 35:19 36:1,2,6,14,21 37:2 37:16,18 38:9 41:17 42:3,13,17,22,23 44:25 48:5 49:15 51:4,12,25 52:3,7 52:16,21 53:16,17 75:22 78:17 79:23 80:7 83:6,8,13,17 83:20 85:15,22 86:6 91:13 92:9,13 93:13 96:16,17 97:15,16 99:25 100:1,2,13,25 102:7 103:21 104:5 105:10,13 107:11 107:13,17,24				

108:11,23 110:10 110:12 111:7 114:17 118:4,13 119:2,6,20 120:3 121:4,11 124:5 125:24 126:3,24 127:22 128:17 129:18,20 130:10 130:13 132:3 133:18,23 134:5,25 136:10 140:7 142:21,23 143:15 143:18,23 144:1,3,6 144:17 146:13,17	<b>degree (3)</b> 14:2 140:3,8 <b>demonstrate (5)</b> 47:20 65:6,6 75:13 81:2 <b>Dennis (11)</b> 1:16 2:9 4:3,12,16,19 5:8 7:7 8:13 148:11 150:3 <b>department (1)</b> 143:8 <b>depend (1)</b> 70:15 <b>dependent (1)</b> 70:18 <b>depending (1)</b> 94:9 <b>depends (2)</b> 39:23 100:19 <b>DEPONENT (1)</b> 150:3 <b>deposed (1)</b> 10:11 <b>deposition (28)</b> 1:15 2:9 4:11,16 7:7 7:12 8:20 9:6,17 10:7,9,10 11:3 72:20 73:19 74:8 76:6 90:5,6,7,9,11 104:16 124:1 148:5 149:8,10 150:2 <b>DeRoos (1)</b> 9:12 <b>describe (4)</b> 41:23 94:15 95:1 105:16 <b>described (3)</b> 42:2 95:5 109:25 <b>describes (1)</b> 28:5 <b>description (1)</b> 28:22 <b>design (2)</b> 61:21 63:2 <b>designed (5)</b> 51:5 60:7 71:20 127:14,18 <b>detail (1)</b> 24:25 <b>details (6)</b> 86:19 87:15,25 88:1 89:16 132:20 <b>detect (8)</b> 54:11 63:4 64:18 65:21 66:23 70:13 72:13 73:15	<b>detected (1)</b> 126:15 <b>develop (7)</b> 125:22,24,25 145:10 145:14 147:8,16 <b>diets (1)</b> 132:25 <b>difference (7)</b> 63:4 98:4 118:22,23 122:16 139:10 140:4 <b>differences (4)</b> 95:22 122:22 132:7 133:4 <b>different (28)</b> 31:8 33:5 36:23 64:1 64:10,10 92:18,18 92:19 98:1,5 111:6 118:21 119:3,25 120:1,6,13,24 121:16 122:1 126:5 131:24 132:3 134:6 136:16 138:21 139:2 <b>differential (7)</b> 16:4 66:15,19 126:25 129:6 131:8 146:20 <b>difficult (2)</b> 27:6 81:1 <b>diffuse (2)</b> 34:22 77:21 <b>digging (1)</b> 48:1 <b>direction (7)</b> 53:24 54:5,24,25 62:3 62:7 137:20 <b>directions (1)</b> 53:25 <b>disagree (3)</b> 25:15 90:15,18 <b>disappear (1)</b> 124:24 <b>discard (1)</b> 42:23 <b>discontinued (3)</b> 50:12,14 96:1 <b>discuss (5)</b> 43:11 50:21 119:7 144:11,22 <b>discussed (8)</b> 9:19 46:14 72:19 90:21 95:19 129:4 145:3 147:22 <b>discussion (3)</b> 28:10,11 107:4 <b>disease (5)</b>	53:10 62:24 63:21 71:17 135:17 <b>diseased (5)</b> 64:13,15,21 65:18 135:12 <b>disk (6)</b> 40:13 68:15 117:18 117:23 141:5 148:4 <b>distant (1)</b> 95:25 <b>distinct (1)</b> 44:13 <b>distinction (2)</b> 38:16,19 <b>distribution (8)</b> 47:7 48:11 61:5,10 62:10,16 65:5,7 <b>District (4)</b> 1:1,2 7:10,10 <b>divide (2)</b> 62:24 64:16 <b>divided (2)</b> 61:15 64:20 <b>dividing (3)</b> 17:17 62:13 65:1 <b>division (2)</b> 63:9,10 <b>Doctor (1)</b> 141:10 <b>document (2)</b> 1:6 20:1 <b>doing (5)</b> 56:18,23 57:3 129:18 139:6 <b>dose (6)</b> 65:1,6 80:19 81:3,4 81:20 <b>dose-response (2)</b> 37:13 63:24 <b>doses (1)</b> 147:21 <b>doubling (1)</b> 79:6 <b>Dr (7)</b> 4:12,16,19 5:7 9:3 40:16 90:4 <b>draft (1)</b> 9:18 <b>dramatic (1)</b> 46:18 <b>dramatically (4)</b> 57:1 96:5,7 97:20 <b>drank (1)</b> 132:25 <b>draw (3)</b> 14:22 37:19 38:10	<b>drift (2)</b> 67:14,15 <b>Drive (3)</b> 2:11 3:4 7:14 <b>drop (1)</b> 130:11 <b>dropout (2)</b> 131:2,7 <b>due (4)</b> 39:2,4 107:10 108:24 <b>duly (2)</b> 8:15 149:9
<hr/> <b>E</b> <hr/>				
			<b>E (6)</b> 3:1,1 4:1,8 149:1,1 <b>earlier (9)</b> 38:7,16 40:19 68:19 77:1 90:21 95:15 112:1 135:20 <b>easier (2)</b> 58:22 59:9 <b>easy (4)</b> 58:7,8,17,19 <b>edge (1)</b> 106:22 <b>editor (1)</b> 27:9 <b>educated (2)</b> 60:6 132:22 <b>Educational (1)</b> 104:12 <b>effect (8)</b> 37:13 47:20 54:22 55:14 57:4 70:13 72:14 131:18 <b>either (7)</b> 53:17 57:11 58:17 96:1 135:11 138:14 138:20 <b>elevated (3)</b> 76:11 77:8 87:7 <b>eleven (1)</b> 29:9 <b>eliminated (1)</b> 109:3 <b>Elyse (2)</b> 3:19 8:7 <b>engaged (1)</b> 143:20 <b>enrolled (2)</b> 41:10 107:9 <b>enrollment (13)</b> 42:12 43:20 45:19 46:21 96:6 97:22 110:5,17 114:19	

124:11,12 146:12 146:14 <b>entirely (3)</b> 70:16 100:19 109:3 <b>enumerate (1)</b> 40:24 <b>Environmental (1)</b> 102:13 <b>epidemiologic (4)</b> 13:19 14:17 16:21 136:23 <b>epidemiological (5)</b> 20:11 100:24 105:11 145:22 146:5 <b>epidemiologically (1)</b> 16:18 <b>epidemiologist (2)</b> 60:22 61:2 <b>epidemiologists (2)</b> 98:20 143:21 <b>epidemiology (14)</b> 21:22 26:14,17,18,20 26:25 31:5,24 38:25 61:13 70:2 91:17 102:11,12 <b>equal (2)</b> 64:12 65:7 <b>equals (2)</b> 29:12,13 <b>Eriksson (5)</b> 75:18 86:21 87:2,10 87:15 <b>error (8)</b> 43:1 51:10,16 135:13 138:23 140:7 146:20 150:5 <b>errors (11)</b> 40:20 43:2 50:1 53:1 53:8,11 54:18 66:8 66:15 106:10 129:2 <b>Esfandiary (5)</b> 3:12 8:3,3 63:12 97:5 <b>ESQ (4)</b> 3:6,12,18,19 <b>essentially (1)</b> 108:17 <b>estimate (5)</b> 39:8 40:2 55:17,18 81:7 <b>estimates (4)</b> 31:23 39:7 105:15 107:12 <b>et (5)</b> 14:18 93:12,14,16 135:23 <b>evaluate (2)</b>	102:4 111:6 <b>evaluated (1)</b> 71:6 <b>evaluation (3)</b> 13:4 28:13 138:22 <b>evenly (1)</b> 61:15 <b>evidence (16)</b> 12:1 13:19 14:24 51:9 121:19 123:1 125:5 125:15,23,25,25 126:23 132:10 133:9 147:9,13 <b>exactly (2)</b> 135:23 143:6 <b>EXAMINATION (4)</b> 4:2 9:1 141:8 147:5 <b>examined (4)</b> 8:15 32:2,3 98:11 <b>example (7)</b> 50:3 51:18 55:20 59:10 61:20 106:15 126:2 <b>excluded (1)</b> 30:6 <b>exhibit (32)</b> 4:10,14,18 5:2,5,6,7 5:12,13,14,15,16,17 10:8,9,19 11:12 18:23 19:3 27:19 40:17 72:25 73:1 85:4 93:7 95:8 103:1,4 122:5,9 133:21 134:4 <b>Exhibits (2)</b> 93:10 101:11 <b>exist (2)</b> 15:10 129:4 <b>expanded (1)</b> 29:8 <b>expands (1)</b> 110:19 <b>expect (3)</b> 31:13,24 135:24 <b>experience (1)</b> 104:23 <b>expert (17)</b> 5:7 10:14 11:11 13:5 15:5 40:18 43:5 45:8 69:21,22 72:22 72:23 83:12 91:8 103:5 139:21,22 <b>expertise (1)</b> 104:23 <b>expires (1)</b> 148:20	<b>explain (1)</b> 12:17 <b>explained (1)</b> 140:17 <b>explanation (4)</b> 138:10,18,20 140:11 <b>exposed (19)</b> 14:16 35:13 47:7 48:12 61:10 62:5,13 63:9,25 65:2 69:4,9 88:8 110:18 131:12 133:11 139:5,6,7 <b>exposure (83)</b> 20:6,10,12 30:3 31:6 33:5 46:23 47:19,22 48:8,10,14,19,20 53:1,9,18 54:19 55:10 68:21 69:11 69:13,15 70:11,24 71:10,21,22 76:16 76:21,24,25 77:2,7 79:5,20 86:10,11,13 87:3,6,11,17,18,19 88:2,5 89:4,19 91:12 92:24 94:24 108:24 110:5,16 111:7 113:13,24 114:3,18 120:11 124:14,16 125:10 126:10,16 127:7,15 127:21 128:1,3,12 131:14 134:7 144:19,23 145:1,17 145:23 146:1,3,21 147:11 <b>exposures (9)</b> 23:15 46:11 71:24,24 72:1,1 73:24 91:14 113:16 <b>extent (2)</b> 52:2 114:17 <b>extremely (1)</b> 100:14	<b>fact-checked (1)</b> 91:12 <b>factor (2)</b> 14:13 144:25 <b>factors (1)</b> 133:10 <b>facts (1)</b> 150:4 <b>fail (1)</b> 65:6 <b>failing (1)</b> 41:24 <b>fair (8)</b> 14:11 15:2,8,22 51:5 74:20 102:18 139:19 <b>false (2)</b> 63:8 65:9 <b>far (5)</b> 46:5 48:13 115:1 119:8 123:18 <b>farm (2)</b> 49:20 142:7 <b>farmed (1)</b> 57:4 <b>farmer (2)</b> 57:7,8 <b>farmers (3)</b> 56:17,22 57:1 <b>farming (13)</b> 45:1,16,18,25 48:6 49:16,21 51:11,14 55:25 57:9,25 58:2 <b>farther (1)</b> 67:7 <b>fatal (2)</b> 96:12 100:8 <b>feel (1)</b> 45:24 <b>field (1)</b> 57:20 <b>fifth (1)</b> 68:18 <b>figure (3)</b> 33:14 106:16,17 <b>figures (6)</b> 48:9 106:11 114:11 128:17 134:22 140:4 <b>fill (4)</b> 50:15 51:19 97:16 127:19 <b>filled (1)</b> 42:11 <b>final (1)</b> 86:6	<b>find (9)</b> 67:4,12,22,23 71:22 77:8 79:6 122:25 132:10 <b>finding (4)</b> 13:17 28:23 32:8 54:11 <b>findings (8)</b> 12:19,24 25:6 28:6 30:19 78:4 123:23 124:18 <b>finds (1)</b> 31:8 <b>fine (4)</b> 19:20 68:9 85:15 97:4 <b>finish (2)</b> 37:24 100:6 <b>finished (2)</b> 66:3 96:21 <b>first (49)</b> 11:15 28:10 29:3,23 39:8 40:24 41:1,4,6 42:18 43:1,4,12,16 45:11,21 46:15 47:4 49:19 50:3,16 59:11 69:3 73:10 84:4 94:25 95:6 97:23 104:2,3 105:9 109:13,21,21,24 110:4,6,9,20 115:1 117:1 119:6 120:16 121:2,5,10,10 139:4 147:24 <b>fits (1)</b> 46:15 <b>five (9)</b> 48:13,25 52:13 68:5 69:14 80:4 85:12 117:11 139:19 <b>fix (1)</b> 45:23 <b>flaw (6)</b> 15:15 43:4 44:21 45:21 49:15 100:8 <b>flawed (4)</b> 108:23 119:2,6 132:1 <b>flaws (23)</b> 12:6 13:14 15:4,9 25:5,22 40:21,24 43:2,3 44:8 48:1 49:1,5 96:13 114:22 129:2 141:12,17,23 144:12 145:2 146:23 <b>focus (1)</b> 126:20
---	--	---	--	---

<p><b>focuses (1)</b> 69:24</p> <p><b>focusing (2)</b> 82:9 129:15</p> <p><b>folks (1)</b> 139:9</p> <p><b>follicular (2)</b> 35:5 39:7</p> <p><b>follow (4)</b> 51:18 75:9 78:20 86:2</p> <p><b>follow-up (50)</b> 12:22 13:10 14:16 24:25 29:10 41:9 43:8,16,22 45:1,11 46:1 47:17,19 48:21 52:9 68:23 69:12 72:18,19 73:13 75:23,25 76:11,15 78:1,18 79:2,21 80:1 85:21 88:18 89:20 90:23 96:11 96:14,15 97:23 111:9 113:12,15,23 118:10 122:24 132:9 142:5 144:17 146:2,3,16</p> <p><b>follows (1)</b> 8:16</p> <p><b>force (1)</b> 89:21</p> <p><b>Forgie (213)</b> 3:6 4:5 8:1,1,18 9:14 10:22,24 11:4,7 12:13 13:12 14:19 15:16,23 16:12,19 17:2 18:3,16,21 19:5,8,13,20 20:14 20:18,25 21:15 22:14,20,25 23:20 24:9,16,21 25:19 28:7,24 29:19 30:9 30:15 31:1,16 32:4 32:12,15 33:19 34:1 34:6,24 35:21 36:10 36:15 37:17,21 38:6 38:12 39:21 40:7 41:19 43:25 45:3 46:2,16 48:16 49:3 49:7,24 50:24 51:6 51:22 53:6,20 54:8 55:21 56:20 57:12 58:3,12 59:5 60:11 60:19 61:18 62:18 62:21 64:2,8 65:10 66:3,10,16,25 67:8 67:17 68:7 70:4,14</p>	<p>71:1 72:7,15 74:6 74:12,22 76:4 77:5 78:15 79:8,12,16 80:14,22 81:9,15 82:18 83:4,19 84:2 84:20 85:3,17,24 86:15,23 87:1,13 88:9,21 89:7,9,23 90:16,25 91:22 92:3 92:11 93:23 94:18 95:7,11 96:20 97:11 98:12 99:12 100:6 100:15 101:1,3,12 101:25 102:15 103:10 104:15 105:3,19 106:3,13 107:18 108:6,13,21 109:5,14,17 110:25 111:18 112:12 113:6,20 114:8,12 115:10,20 116:2,12 116:22 117:10 118:19 119:14 120:22 121:6 123:2 123:12 124:7 125:6 125:17 126:8,18 127:2,17 128:6,19 129:7,23 130:7,24 131:16 132:12,17 133:13 134:10,24 136:7 137:2,22 138:6 139:24 140:15,23 141:9 145:8 147:2 148:1</p> <p><b>form (139)</b> 12:13 13:12 14:19 15:16,23 16:12,19 17:2 22:25 23:20 24:9,16,21 25:19 28:7,24 29:19 30:9 30:15 31:1,16 32:4 33:19 34:24 35:21 36:15 37:17 38:12 39:22 41:19 43:25 45:3 46:2,16 48:16 49:3,7,24 50:24 51:6,22 53:6,20 54:8 55:21 56:20 57:12 58:3,12 59:5 60:11,19 61:18 62:18,21 63:13 64:8 65:10 66:16 67:8,17 70:4,14 71:1 72:7 72:15 74:6,12,22 76:4 77:5 78:15 79:8,12 80:14,22</p>	<p>81:9,15 82:21 83:4 83:19 84:2 85:24 86:15,23 87:1,13 88:9,21 89:7,23 90:16,25 91:22 92:3 92:11 97:6,11 100:15 101:1,12 102:15 103:10 104:15 106:13 108:6,13,21 110:25 111:18 112:12 113:20 114:8 115:11,20 116:2,12 117:10 118:19 123:2,12 124:7 125:6 126:8,18 127:2 128:6,19 129:7,23 130:7,24 131:16 132:17 134:10,24 137:2,22 138:6</p> <p><b>formed (1)</b> 9:8</p> <p><b>formula (6)</b> 58:9 60:4,5,8,18 143:1</p> <p><b>formulations (1)</b> 92:19</p> <p><b>forth (1)</b> 149:9</p> <p><b>forward (1)</b> 146:15</p> <p><b>found (6)</b> 16:24 30:13,23 55:4 57:2 130:5</p> <p><b>four (15)</b> 29:11 35:15,20 48:9 52:14 62:4,4,13 63:9,25 64:17,21 65:4 115:11 134:6</p> <p><b>fourfold (1)</b> 37:7</p> <p><b>Framingham (2)</b> 104:8,14</p> <p><b>free (1)</b> 27:11</p> <p><b>frequency (1)</b> 48:10</p> <p><b>front (2)</b> 10:15 88:10</p> <p><b>full (5)</b> 29:3,23 47:4 94:14 109:21</p> <p><b>full-time (1)</b> 27:13</p> <p><b>further (5)</b></p>	<p>30:4 67:16 147:5,25 149:12</p> <p><b>future (2)</b> 113:18 123:15</p> <hr/> <p style="text-align: center;"><b>G</b></p> <hr/> <p><b>gap (3)</b> 50:15 59:21 111:25</p> <p><b>gaps (2)</b> 112:9 127:19</p> <p><b>gather (3)</b> 52:3 100:13 144:17</p> <p><b>gathered (4)</b> 103:21 133:18 143:15 146:13</p> <p><b>gathering (2)</b> 99:25 100:2</p> <p><b>general (29)</b> 4:23 5:10 23:1 26:19 31:17,19,21 38:19 54:12 55:14 56:22 56:25 58:23 61:12 62:22 63:1 69:20 71:18 72:3,4 77:6 93:24 95:15 97:15 99:22 107:19 124:3 124:20 126:4</p> <p><b>generally (7)</b> 15:21 31:4 71:20 107:7 122:24 132:9 147:19</p> <p><b>generate (1)</b> 60:17</p> <p><b>generic (1)</b> 70:20</p> <p><b>Gibbons (1)</b> 134:13</p> <p><b>give (11)</b> 11:25 12:3,7,16,25 13:8 40:22 41:2 51:19 62:10 83:12</p> <p><b>given (2)</b> 15:10 149:11</p> <p><b>gives (4)</b> 92:9,12,13 124:19</p> <p><b>giving (3)</b> 139:20 145:20,20</p> <p><b>glyphosate (108)</b> 9:10 11:16 17:13,18 20:3,17 21:10,24 22:10 23:12 25:8 27:25 28:13,16 29:8 29:25 46:9 47:6,16 48:8,11 49:19,20,22 50:5,7,8,12,13,14 53:14,15,18 56:3,7</p>	<p>56:9,18 57:8,9,10 57:24 58:1,9,11,23 58:24,24 59:12,14 61:8 62:2 68:22 69:2,4 70:23 71:14 72:11 73:17 78:4,8 78:13 79:5 83:2,14 88:7 89:10,12 90:14 91:18 95:23 96:4,19 96:25 97:1,9,17 98:6,11 99:1,11,20 100:10 101:8,22,23 102:4,24 106:9 107:20 108:19 110:23 113:4 115:8 117:8 124:1,10 125:3 126:17,20,24 130:14,22 131:13 131:14 133:11 135:17 137:8 138:12</p> <p><b>glyphosate-containi...</b> 12:1,10</p> <p><b>glyphosate-exposed...</b> 29:11</p> <p><b>glyphosate-resistan...</b> 56:4,12</p> <p><b>go (9)</b> 40:17 41:23 44:6 86:8 88:13 116:6,7,19 146:15</p> <p><b>goalpost (1)</b> 76:2</p> <p><b>goes (4)</b> 44:11 81:19 115:2 119:8</p> <p><b>going (32)</b> 10:2 18:3,13,18 19:10 19:12,17 20:21 22:15 27:21 40:8,13 53:25 62:3 64:17 68:10 74:7 79:5,22 83:12 93:2,23 96:17 101:13 104:17 117:18,24 123:14 138:2 140:25 141:6 148:2</p> <p><b>GOLDMAN (1)</b> 3:8</p> <p><b>good (8)</b> 7:4 9:3,4 38:1 52:7 92:20 133:1 139:1</p> <p><b>gotten (1)</b> 144:6</p> <p><b>Gray (1)</b> 144:15</p>
--	--	--	---	---

<p><b>greater (9)</b> 39:18 40:2 65:15 86:21 87:5,10,12 89:5,21</p> <p><b>Griffis (220)</b> 3:18 4:4 8:5,5 9:2,16 11:1,10 12:15 14:3 15:1,19 16:1,14,22 17:4 18:14,19 19:1 19:7,10,19,22 20:15 20:23 21:5,18 22:17 22:22 23:3,21 24:11 24:19,22 26:4 28:9 29:1,21 30:11,17 31:3,18 32:6,14,16 33:21 34:3,9 35:1 35:24 36:11,18 38:4 38:8,15 40:1,6,15 41:20 44:4 45:6 46:3 47:1 48:24 49:4,10 50:19 51:2 51:8 52:18 53:12 54:2,14 55:24 57:6 57:15 58:6,14 59:24 60:13 61:1 62:8,19 63:5,18 64:5,24 66:1,5,11,12,21 67:3,9 68:4,9,17 70:9,21 71:11 72:9 72:17 73:3 74:10,15 74:24 76:18 77:10 78:11 79:3,10 80:2 80:18 81:5,12,17 83:1,11,22 84:6,23 85:9,19 86:9,20,24 87:8,22 88:16 89:2 89:11 90:3,20 91:2 91:24 92:7 93:4,9 94:12,21 95:9,14 96:23 97:7,24 98:7 99:3 100:3,11,22 101:7,20 102:9 103:3,12 104:21 105:8 106:1,7,14 108:1,8,15 109:2,12 109:16,20 111:4,19 112:16 113:10 114:2,9,24 115:17 115:23 116:10,17 116:24 117:5,15 118:7 119:4 120:15 121:1,13 122:3,8,12 123:4,17 125:1,13 126:1,14,21 127:13 127:24 128:16 129:1,11 130:1,17</p>	<p>131:6 132:6,15 133:8,19 134:11 135:19 136:22 137:13 138:1,15 140:1,22 145:6 147:1,6,25</p> <p><b>group (36)</b> 22:18 33:3 35:13 36:24 37:9 62:14,20 63:10,21,25 64:16 64:21 65:2,3,3,8,18 77:15,16 81:6,8 120:13 131:22,24 132:2,4,20 135:11 135:12 138:20,25 139:1,16,17 140:5,5</p> <p><b>grouping (1)</b> 30:7</p> <p><b>groups (17)</b> 17:14 35:15,17,20 36:23 37:15 61:14 61:15 62:14 63:9,25 64:15,22 65:2,4,16 122:20</p> <p><b>guess (19)</b> 32:22 44:18 45:12 46:22 50:17,18 54:1 59:23 60:3,6 63:15 92:14 96:17 120:8 120:11 131:21 138:24,24 139:12</p> <p><b>Guessing (1)</b> 99:25</p> <p><b>guidance (1)</b> 41:2</p> <hr/> <p style="text-align: center;"><b>H</b></p> <hr/> <p><b>H (1)</b> 4:8</p> <p><b>habits (1)</b> 132:24</p> <p><b>half (1)</b> 71:9</p> <p><b>halfway (1)</b> 104:3</p> <p><b>halves (1)</b> 36:3</p> <p><b>hand (1)</b> 149:17</p> <p><b>happen (3)</b> 41:8 54:10 55:23</p> <p><b>happened (1)</b> 98:5</p> <p><b>happens (3)</b> 16:15 51:24 79:11</p> <p><b>hard (3)</b></p>	<p>37:19 58:18 135:14</p> <p><b>head (3)</b> 26:12 88:13 89:17</p> <p><b>headquartered (1)</b> 7:19</p> <p><b>health (19)</b> 8:23 9:12 13:22 21:23 22:8 23:15 79:1,22 93:13,15,17 96:13 100:17 102:13 104:13 126:12 128:24 132:24 144:24</p> <p><b>Heart (2)</b> 104:8,14</p> <p><b>HEDLUND (1)</b> 3:8</p> <p><b>held (2)</b> 2:10 7:12</p> <p><b>helpful (1)</b> 27:8</p> <p><b>helps (1)</b> 65:23</p> <p><b>Heltshe (7)</b> 5:15 91:7 103:4 106:2 106:8 107:5 130:4</p> <p><b>herbicide (1)</b> 59:2</p> <p><b>hereinbefore (1)</b> 149:9</p> <p><b>hereunto (1)</b> 149:16</p> <p><b>high (9)</b> 43:6 47:5,5 48:10 72:1 124:23 139:5,7 147:20</p> <p><b>high-dose (2)</b> 147:14,15</p> <p><b>higher (3)</b> 36:25 81:7 136:1</p> <p><b>higher-exposed (2)</b> 65:3 77:16</p> <p><b>highest (2)</b> 110:17 134:8</p> <p><b>highly (8)</b> 16:24 22:19,24 24:14 24:20 70:18 102:7 130:16</p> <p><b>Hodgkin (2)</b> 33:22 34:7</p> <p><b>holidays (1)</b> 27:12</p> <p><b>Hollingsworth (3)</b> 3:14 8:6,8</p> <p><b>home (1)</b> 85:1</p>	<p><b>Hope (1)</b> 143:9</p> <p><b>hours (3)</b> 8:24 27:5,5</p> <p><b>huge (1)</b> 57:4</p> <p><b>Huntington (2)</b> 2:11 7:14</p> <p><b>hurt (1)</b> 65:23</p> <p><b>hypothesis (3)</b> 125:2,14 126:24</p> <p><b>hypothesized (1)</b> 128:4</p> <hr/> <p style="text-align: center;"><b>I</b></p> <hr/> <p><b>i.e (4)</b> 9:9 34:10 108:18 135:25</p> <p><b>IARC (8)</b> 16:24 17:10 18:12 21:11 22:7,23 24:7 24:13</p> <p><b>IARC's (1)</b> 21:22</p> <p><b>ideally (1)</b> 86:1</p> <p><b>identification (6)</b> 10:21 18:24 73:2 93:8 103:2 122:7</p> <p><b>identified (6)</b> 15:3 41:5 43:4 44:22 48:1 68:19</p> <p><b>ignoring (2)</b> 105:12 107:17</p> <p><b>III (1)</b> 104:11</p> <p><b>impact (1)</b> 111:7</p> <p><b>implications (1)</b> 105:12</p> <p><b>important (2)</b> 14:13 18:22</p> <p><b>impossible (1)</b> 96:8</p> <p><b>improve (1)</b> 65:16</p> <p><b>imputation (92)</b> 16:25 21:7,7,9,12 23:24 24:8 43:13,14 43:23 44:11,17 45:23 46:14 48:3 50:18,20,22 51:4 59:22,25 60:2,8,17 90:23 91:4 94:16 95:1,5,18 97:3 98:9</p>	<p>99:8 100:23 101:22 103:9,17,20 104:4 104:24 105:16,23 107:6,16,22 108:5 108:10,12 109:3 110:21 111:17,20 111:23 112:2,5,7,22 114:25 115:1,2,7,16 115:19,22,25 116:9 116:16 117:3,6 118:17,25 119:5,7,8 119:10,13 120:14 124:4 127:14,23 129:20 130:13 132:1 133:6 143:1,6 143:11,17,18,24 144:2 146:19</p> <p><b>impute (8)</b> 46:22 52:20 58:8 60:25 96:4 110:12 111:24 132:3</p> <p><b>imputed (6)</b> 106:11 111:7 113:16 113:22 118:4,13</p> <p><b>include (4)</b> 66:14 112:2 115:16 116:9</p> <p><b>included (4)</b> 9:20 45:19 115:21 116:16</p> <p><b>including (9)</b> 16:25 17:20 20:17 21:23 22:8 28:2,18 104:7 105:13</p> <p><b>Incorporated (1)</b> 7:19</p> <p><b>incorporates (1)</b> 126:25</p> <p><b>increase (19)</b> 37:7 46:8,18 51:20 56:3 57:1,2 64:18 67:11,12,15 68:1 73:15 75:17 77:20 77:22,24 96:7 137:6</p> <p><b>increased (13)</b> 37:10,10 67:5 75:14 75:20 77:15,25 78:19,22 80:9,12 87:20 96:5</p> <p><b>increases (2)</b> 67:13 79:23</p> <p><b>increasing (4)</b> 79:25 97:19 136:24 136:25</p> <p><b>individual (1)</b> 145:23</p>
--	--	---	--	--

<b>individually (1)</b> 14:21	<b>investigators (3)</b> 91:3,11 115:5	32:19 39:19 44:10 48:18 50:7,9,13 51:17 52:22 56:8,8 57:14 58:4,17,20 59:14,17,18,19,21 61:20 63:1,7,14 65:8 66:13 71:3,8 78:25 80:17,24 83:9 87:23 88:6,13,17 89:3 90:1,18 93:5 96:5 98:15,23 101:20 102:3,5,17 104:19 106:24,24 108:2 109:9 112:13 116:5 119:23 121:14 125:9 127:6 128:23 131:17,20 133:16 135:7 138:19,23 142:14 142:15,16,18,23 143:6,19 144:16 146:2	75:7,7,10 90:13 147:21	150:21,22,24
<b>individuals (2)</b> 107:8,10	<b>involved (5)</b> 70:1 101:9,24 142:17 143:14		<b>latest (1)</b> 113:13	<b>linked (2)</b> 30:5 53:8
<b>influenced (1)</b> 127:20	<b>involving (1)</b> 93:12		<b>LAW (1)</b> 3:2	<b>Lisa (5)</b> 1:23 2:12 7:21 149:4 149:22
<b>information (13)</b> 10:13 25:3 42:21 43:19 45:15,17 96:9 110:16 113:13 127:19 128:23 131:3 142:12	<b>issue (14)</b> 41:7 47:15,23 61:5 66:17 100:14 114:1 114:4 126:10 127:9 127:11 139:15 140:20 144:23		<b>lays (1)</b> 24:24	<b>list (6)</b> 10:16 44:5,7 46:5 47:25 66:14
<b>informative (6)</b> 16:25 22:19,24 24:20 25:2,23	<b>issues (11)</b> 12:5 13:14 25:4,22 50:21,23 60:24 102:24 114:22 135:9,14		<b>lead (1)</b> 12:6	<b>listed (3)</b> 66:6 104:11 105:1
<b>initial (6)</b> 42:12 45:13,19 46:20 121:11 127:20	<b>item (1)</b> 84:4		<b>Leading (2)</b> 145:6 147:1	<b>listen (1)</b> 19:12
<b>Initiative (1)</b> 104:13	<hr/> <b>J</b> <hr/>	<b>knowledge (1)</b> 71:15	<b>least-exposed (1)</b> 81:6	<b>lists (2)</b> 20:16 104:7
<b>Institute (7)</b> 10:2,18 11:22 15:4 25:13,17 26:6	<b>January (6)</b> 1:18 2:5 7:1,15 149:17 150:2	<b>known (1)</b> 105:13	<b>leaves (2)</b> 112:22,24	<b>literally (1)</b> 27:5
<b>instruct (4)</b> 18:13 19:17 20:21 94:10	<b>job (2)</b> 1:25 27:13	<b>knows (1)</b> 69:6	<b>leaving (1)</b> 110:21	<b>literature (1)</b> 27:3
<b>intention (1)</b> 64:25	<b>journal (7)</b> 10:1 12:5 25:12,16 26:5 102:11,12	<b>Koutros (7)</b> 5:13,14 93:14,16 94:22 101:9,10	<b>left (7)</b> 37:25 110:11 111:13 113:1 115:18,24 139:20	<b>litigation (4)</b> 1:4 7:9 9:9 150:1
<b>interested (2)</b> 27:16 149:15	<b>journals (5)</b> 26:14,15,19,20 99:6	<hr/> <b>L</b> <hr/>	<b>left-hand (2)</b> 29:22 104:2	<b>little (3)</b> 31:9,10 54:4
<b>interesting (2)</b> 76:9 139:9	<b>jury (1)</b> 127:25	<b>labeled (1)</b> 7:5	<b>legal (1)</b> 7:18	<b>LLP (2)</b> 8:6,8
<b>interim (2)</b> 47:21 78:24	<hr/> <b>K</b> <hr/>	<b>lack (8)</b> 30:2 43:15,19,22 44:14 53:16 115:8 117:7	<b>length (1)</b> 14:16	<b>locations (1)</b> 75:9
<b>International (1)</b> 102:11	<b>Kathryn (2)</b> 3:6 8:1	<b>lag (7)</b> 78:21 82:6,12 83:23 84:8,17 85:11	<b>let's (14)</b> 23:4 33:10 35:18 40:25 45:4 69:1 107:3 109:13 114:25 117:1 119:5 122:3 133:23,24	<b>logistic (1)</b> 94:16
<b>interpret (1)</b> 80:16	<b>keep (2)</b> 37:22 38:2	<b>lagged (1)</b> 30:4	<b>leukemia (5)</b> 34:20 77:19 82:4,23 147:19	<b>long (14)</b> 48:20 68:6 69:3,11,15 71:21 72:1 73:22 74:18 75:8 76:15,19 142:19 145:10
<b>interrupted (1)</b> 78:10	<b>kidney (1)</b> 32:11	<b>Lakewood (1)</b> 3:5	<b>leukemias (1)</b> 33:12	<b>longer (17)</b> 48:22 69:7 71:7 72:5 74:1,17 75:3,15 78:18 79:2,15,21 80:1 88:8,19 90:12 146:3
<b>interval (4)</b> 31:12 39:13 40:4 110:19	<b>kind (14)</b> 43:17,21 46:14 54:6 92:1,5,8 96:2,8 98:24 106:21 120:3 124:24 147:22	<b>lapse (1)</b> 89:4	<b>level (1)</b> 124:25	<b>look (25)</b> 11:8 14:20 20:5 27:19 32:19 64:25 72:24 75:18 76:9,17 77:14 77:18,21 86:16 88:14 106:18 116:6 116:8,14 119:22 125:7 132:19 133:20,23 136:9
<b>intervals (3)</b> 31:23 33:4,17	<b>kinds (2)</b> 60:14 133:4	<b>large (7)</b> 27:23 28:14 31:24 34:22 77:21 104:6 143:9	<b>levels (2)</b> 33:5 64:1	<b>looked (8)</b> 24:7 39:11 87:3,16,17 102:16 110:10 122:15
<b>interview (4)</b> 122:24 123:7,10 132:9	<b>Kirby (2)</b> 3:18 8:5	<b>larger (1)</b> 13:10	<b>liability (3)</b> 1:4 7:8 150:1	<b>looking (13)</b> 16:6 33:3 39:6 84:13 85:6 95:24 106:15
<b>introduce (1)</b> 7:24	<b>know (90)</b> 11:5 13:18 16:23 17:8 17:12,20,22 21:11 21:13 23:6 24:6,24 25:1,25 26:1,2	<b>latency (9)</b> 47:15,23 48:14 68:21	<b>lifetime (3)</b> 47:16 68:22 69:2	
<b>introduced (2)</b> 51:10 131:4			<b>likelihood (3)</b> 39:2 51:20 128:11	
<b>introduction (3)</b> 56:4,16 104:1			<b>limited (3)</b> 8:22,24 111:9	
<b>investigates (1)</b> 31:5			<b>limiting (1)</b> 107:23	
			<b>Line (14)</b> 6:2 150:6,7,9,10,12 150:13,15,16,18,19	

106:17,20,23 108:12 113:18 128:4 <b>looks (3)</b> 13:18 31:7 36:22 <b>loop (1)</b> 126:22 <b>Los (2)</b> 3:11 7:1 <b>loss (1)</b> 105:13 <b>lot (9)</b> 26:22,24 27:1,10 51:16 52:11 76:23 77:2 99:1 <b>lots (2)</b> 56:17 61:8 <b>low (5)</b> 41:9 45:22 48:2 139:5 140:19 <b>lower (14)</b> 55:11,19 86:13 106:21 135:3,8,16 136:2,13,14 137:23 138:9,9 140:11 <b>lower-exposed (1)</b> 65:2 <b>lowest (2)</b> 84:8 134:7 <b>loyalty (1)</b> 100:20 <b>lung (4)</b> 32:10 93:12,25 135:22 <b>lymphocytic (3)</b> 34:19,19 77:19 <b>lymphohematopoie...</b> 28:18 30:21 33:11,15 82:17 84:1,5,15 133:24 137:17 <b>lymphoid (1)</b> 28:1 <b>lymphoma (64)</b> 9:10 12:11 23:11 33:23,24 34:14,17 34:19,22 35:2,5,11 36:13 37:8 38:10,17 39:8 53:18 69:5,18 69:23 70:12,24 71:14 72:12 73:22 76:12,20 77:4,15,18 77:21 78:6,14 80:1 80:6,20 81:13 82:4 82:14 87:21 88:7 89:5,13 90:14 91:18 108:19 110:23	113:4 115:9 130:23 131:14 133:12,25 134:21 136:12 137:9 138:13 140:12 145:11,15 147:8,12,16 <b>lymphomas (2)</b> 33:12 77:23 <hr/> <b>M</b> <hr/> <b>M.D (7)</b> 1:16 2:10 4:3,20 5:9 148:11 150:3 <b>M1 (2)</b> 36:25 37:6 <b>M2 (2)</b> 36:24 37:9 <b>major (4)</b> 56:2 104:25 114:22 126:12 <b>making (1)</b> 71:18 <b>malathion (12)</b> 5:6 17:5,9,11,20 18:1 18:12 21:17,20 22:3 22:6,16 <b>malignancies (1)</b> 28:1 <b>man (1)</b> 26:23 <b>marginal-zone (1)</b> 35:2 <b>mark (2)</b> 72:23 122:3 <b>marked (13)</b> 4:9 10:7,14,21 18:23 19:2 27:22 73:1 93:8,10 103:2 122:6 124:9 <b>marriage (1)</b> 149:14 <b>Marriott (2)</b> 2:11 7:13 <b>match (1)</b> 61:22 <b>matched (1)</b> 103:24 <b>materials (2)</b> 5:2 10:15 <b>math (1)</b> 62:9 <b>matter (7)</b> 7:8 63:6,7 113:17 130:8 131:8 149:15 <b>maximum (1)</b> 52:13	<b>MD (1)</b> 8:13 <b>MDL (1)</b> 1:5 <b>mean (11)</b> 17:8 24:15 25:24 38:25 53:5 60:15 61:6 66:14 79:4 87:10,11 <b>meaning (1)</b> 56:13 <b>meaningful (1)</b> 73:15 <b>means (8)</b> 39:18,19 52:6 53:8,19 53:22,23 71:9 <b>measure (2)</b> 36:19 39:1 <b>measured (2)</b> 55:4 128:14 <b>measuring (1)</b> 73:25 <b>media (1)</b> 7:5 <b>median (18)</b> 47:16,17 48:18 68:22 68:23 69:2,13 70:24 72:13,18,19 73:13 75:10 88:5,8,18 145:25 146:1 <b>medical (2)</b> 140:3,9 <b>medium-exposed (1)</b> 65:3 <b>melanoma (2)</b> 32:10 135:23 <b>Mental (1)</b> 104:13 <b>mentioned (5)</b> 13:13 46:18 142:25 143:5 145:3 <b>met (1)</b> 9:5 <b>method (14)</b> 23:24 43:13,23 44:17 44:18 58:18 59:23 60:2 97:14 98:9,19 102:6 127:23 143:7 <b>methodologic (2)</b> 135:9 140:20 <b>methodology (6)</b> 14:5 24:4 25:1 27:4 98:25 128:10 <b>methods (4)</b> 13:11 42:5 43:14 116:20	<b>metrics (2)</b> 30:3 59:20 <b>middle (7)</b> 73:12 94:14 96:6 97:21 106:9,22,23 <b>mind (1)</b> 49:11 <b>mine (1)</b> 90:19 <b>minimum (3)</b> 75:11,16 78:1 <b>minute (1)</b> 60:1 <b>minutes (2)</b> 68:6 139:20 <b>mischaracterizes (8)</b> 79:9,13 89:24 119:15 124:8 125:18 129:8 136:8 <b>misclassification (31)</b> 46:10 55:11,15 92:25 93:2 108:24 113:25 114:4 124:14,16,25 125:4,11 126:11,16 126:25 127:8,16,21 128:2,3,12 136:18 141:12,17,23 144:12,19,23 145:1 146:21 <b>misclassifications (1)</b> 114:18 <b>misrepresent (1)</b> 14:4 <b>missed (2)</b> 47:3 49:6 <b>missing (5)</b> 53:17 104:5 105:10 105:12 110:12 <b>mistakenly (1)</b> 113:15 <b>mistakes (1)</b> 16:3 <b>mix (1)</b> 133:2 <b>moieties (2)</b> 35:14 36:3 <b>moment (2)</b> 31:21 35:18 <b>MONDAY (2)</b> 1:18 7:1 <b>monograms (1)</b> 19:4 <b>monograph (13)</b> 5:6 17:6,9,10,13 18:2 18:12 20:3 21:20 22:3,6,11,16	<b>monographs (1)</b> 22:11 <b>Monrovia (3)</b> 1:17 2:12 7:14 <b>Monsanto (3)</b> 3:15 8:6,8 <b>Montgomery (10)</b> 5:16 121:20,23 122:4 122:10,13,15 123:22,24 132:7 <b>morning (3)</b> 7:4 9:3,4 <b>Moskowitz (5)</b> 1:23 2:12 7:22 149:4 149:22 <b>most-exposed (1)</b> 81:7 <b>move (1)</b> 137:17 <b>moving (1)</b> 76:2 <b>multiple (24)</b> 13:20,23 20:16 22:9 23:17,23 24:2 28:19 30:7,20 32:2,8 35:8 65:1 94:16 95:16,17 100:23 104:3,7,24 105:16 108:3 136:4 <b>myeloid (2)</b> 82:4,22 <b>myeloma (3)</b> 28:19 30:7 35:8 <hr/> <b>N</b> <hr/> <b>n (4)</b> 3:1 4:1 29:12,12 <b>N.W (1)</b> 3:16 <b>name (2)</b> 7:17 150:1 <b>named (1)</b> 145:5 <b>national (10)</b> 10:1,17 11:22 15:4 25:12,16 26:6 104:6 104:12,25 <b>nature (1)</b> 125:12 <b>NCI (32)</b> 11:22 15:15 21:8 23:5 23:24 24:13 25:10 27:19 29:4 40:21,25 41:16 42:4 44:8 47:21 68:19 88:4,19 90:12,22 91:16 99:6 99:9 108:4 115:5
---	--	--	---	---

123:11,20 124:2 126:2 130:21 133:21 134:4 <b>NCRA (4)</b> 1:24 2:13 149:5,23 <b>nearly (1)</b> 143:15 <b>Nebraska (1)</b> 70:7 <b>necessarily (2)</b> 67:19 126:20 <b>need (15)</b> 11:1 51:25 73:23 79:1 79:14,20,20 85:10 110:12 111:16 112:17 143:17,20 143:24 144:2 <b>needed (3)</b> 52:16 143:12,18 <b>needs (3)</b> 48:22 69:4 70:11 <b>negative (10)</b> 13:17,23,25 32:17,23 33:15,23,25 124:19 124:21 <b>negatives (1)</b> 14:7 <b>neoplasms (2)</b> 84:5,15 <b>never (6)</b> 62:12 63:23 131:1 133:17 142:25 143:17 <b>new (3)</b> 7:20,20 25:3 <b>NHANES (1)</b> 104:11 <b>NHL (11)</b> 11:16,23 12:2 28:2,18 29:25 30:5,7 73:16 101:16 117:8 <b>nights (1)</b> 27:11 <b>no-dose (1)</b> 37:16 <b>non- (1)</b> 43:6 <b>non-differential (18)</b> 53:2,5,7,19,21 54:20 55:14 66:8,20 124:17 125:4 129:6 129:10 134:17 136:18 137:15,21 138:4 <b>non-diseased (1)</b> 64:14	<b>non-exposed (1)</b> 48:12 <b>non-exposures (1)</b> 113:16 <b>non-Hodgkin (34)</b> 34:8,14,17 35:11 38:9 38:17 53:18 69:5,18 69:23 70:12,23 71:14 72:12 73:22 76:20 77:14,18 78:13 80:6,20 81:13 89:5,12 90:14 91:18 108:19 110:23 113:4 115:9 134:21 136:12 137:9 147:8 <b>non-Hodgkin's (23)</b> 9:10 12:11 23:11 33:24 36:13 76:12 77:4 78:5 79:25 82:3,14 87:21 88:7 130:23 131:13 133:12,25 138:13 140:12 145:11,15 147:11,16 <b>non-optimal (1)</b> 48:12 <b>non-participants (2)</b> 122:23 132:8 <b>non-respondents (2)</b> 52:23 115:4 <b>non-responders (2)</b> 123:19 133:5 <b>non-response (2)</b> 43:6,7 <b>non-significant (4)</b> 33:2,6 55:12,13 <b>non-statistically (1)</b> 80:12 <b>non-user (1)</b> 50:4 <b>non-whites (1)</b> 132:23 <b>nonsensical (2)</b> 136:20 137:11 <b>Northern (2)</b> 1:2 7:10 <b>Notary (1)</b> 148:18 <b>noted (1)</b> 148:6 <b>notice (5)</b> 4:10,14 10:8,10 11:2 <b>null (16)</b> 33:17 39:15 54:13,21 54:25 55:6,16 66:24 67:2,7,16 124:18	134:19 136:24 137:5,7 <b>number (30)</b> 4:9,21 7:6,11 8:21 14:15 15:3 18:23 29:11 40:13,20 49:15 65:17,20 67:23 68:15 70:2,19 70:20 73:1 75:12 87:16,18,19 103:1 117:18,23 141:5 142:6 148:4 <b>numbers (15)</b> 10:19 61:14 62:11,20 64:13,22 65:15 67:11,24 68:1 80:23 80:25 93:7 122:5 136:11 <hr/> <b>O</b> <hr/> <b>o'clock (2)</b> 10:12,12 <b>object (144)</b> 12:13 13:12 14:19 15:16,23 16:12,19 17:2 18:3 22:25 23:20 24:9,16,21 25:19 28:7,24 29:19 30:9,15 31:1,16 32:4 33:19 34:24 35:21 36:15 37:17 38:12 39:21 41:19 43:25 45:3 46:2,16 48:16 49:3,7,24 50:24 51:6,22 53:6 53:20 54:8 55:21 56:20 57:12 58:3,12 59:5 60:11,19 61:18 62:18,21 63:12 64:8 65:10 66:16,25 67:8 67:17 70:4,14 71:1 72:7,15 74:6,12,22 76:4 77:5 78:15 79:8,12 80:14,22 81:9,15 82:21 83:4 83:19 84:2 85:24 86:15,23 87:1,13 88:9,21 89:7,23 90:16,25 91:22 92:3 92:11 94:2,5 95:11 97:5,11 100:15 101:1,12 102:15 103:10 104:15 106:13 108:6,13,21 110:25 111:18 112:12 113:20	114:8 115:10,20 116:2,12 117:10 118:19 123:2,12 124:7 125:6 126:8 126:18 127:2 128:6 128:19 129:7,23 130:7,24 131:16 132:17 134:10,24 137:2,22 138:6 <b>objection (23)</b> 9:14 18:17 36:10 93:24 98:13 99:12 101:25 105:3,19 107:18 109:5 113:6 114:12 119:14 120:22 121:6 125:17 127:17 133:13 136:7 140:15 145:6 147:1 <b>objections (1)</b> 18:15 <b>obliterate (1)</b> 54:22 <b>obscure (1)</b> 54:25 <b>observed (2)</b> 28:15 29:24 <b>obtained (3)</b> 44:25 48:5 49:16 <b>obvious (2)</b> 66:9 135:2 <b>occurred (6)</b> 45:12 50:2 113:25 114:19 127:22 128:2 <b>occurs (1)</b> 119:19 <b>odds (7)</b> 37:7,11 76:12 77:16 135:15 138:8 140:11 <b>oh (3)</b> 41:17 85:4 146:8 <b>okay (57)</b> 11:9 16:23 26:13 34:6 38:4,6 42:12,24 43:10,17 44:9,21 47:2,13 48:25 50:8 51:3 53:13 54:3 55:25 57:16 60:6 63:6 64:22 65:17,24 72:2 73:5 74:16 75:9 76:8 78:2 82:8 84:11 85:20 90:10 98:8 99:4,25 110:4 114:25 115:18	116:18,21 118:15 121:14 127:10 129:12,21 135:4 136:17,21 137:12 137:14 138:11 139:11 140:23 <b>omitted (2)</b> 117:3,6 <b>omitting (1)</b> 107:7 <b>once (1)</b> 114:10 <b>ones (4)</b> 36:5 49:8 105:1 119:25 <b>opinion (3)</b> 11:15 12:8 14:2 <b>opinions (2)</b> 9:8 141:11 <b>opposed (1)</b> 126:23 <b>optimal (4)</b> 47:7 61:5,9 62:17 <b>optimum (1)</b> 65:5 <b>oral (4)</b> 4:10,15 32:9 135:22 <b>order (3)</b> 8:21 70:13 131:7 <b>original (12)</b> 9:20,21 10:8,13 12:20 13:1,3,4,5 41:22 42:6 72:23 <b>originally (1)</b> 15:11 <b>others' (1)</b> 98:3 <b>outcome (3)</b> 31:7 55:3 149:15 <b>outcomes (4)</b> 23:11,16 31:8 71:17 <b>outliers (1)</b> 136:5 <b>outline (1)</b> 49:12 <b>outlined (1)</b> 49:9 <b>overall (9)</b> 28:1,17 30:1 33:14,24 81:13 82:17 84:1 114:23 <b>overreport (1)</b> 53:15 <hr/> <b>P</b> <hr/> <b>P (6)</b>
--	--	---	---	--

3:1,1 81:22 82:1,11 136:25	97:17 98:25 100:9	<b>period (18)</b>	134:12	<b>prevents (1)</b>
<b>P-trend (11)</b>	<b>parties (1)</b>	45:17 48:20 59:21	<b>pointing (2)</b>	137:9
33:2 36:20 81:19,23	149:13	71:21 73:22 75:7,8	54:5 77:13	<b>previous (2)</b>
81:23 82:5,12,23	<b>parts (1)</b>	76:15 80:20 96:6	<b>points (1)</b>	29:8 30:6
83:24 84:8,14	119:21	97:21,22 111:25	137:14	<b>primary (1)</b>
<b>p.m (2)</b>	<b>Pass (1)</b>	113:12 118:10	<b>pool (3)</b>	109:23
148:3,6	140:22	124:12 142:18	9:19 23:7 126:3	<b>principle (1)</b>
<b>page (37)</b>	<b>passed (1)</b>	147:12	<b>pooled (1)</b>	61:13
4:2 6:2 11:13,14	102:13	<b>person (5)</b>	42:3	<b>prior (5)</b>
19:24 20:5 21:14	<b>pathologist (2)</b>	53:13,14 60:2 69:4	<b>poor (2)</b>	9:5 10:7 45:1 72:20
28:12 29:2 43:12	70:3,6	70:11	92:21 132:24	146:13
47:4 52:19,25 61:7	<b>pathology (1)</b>	<b>personality (1)</b>	<b>Portier's (2)</b>	<b>probably (25)</b>
66:10 73:4 94:14,23	143:8	60:15	90:4,9	25:14,21 42:14,15
95:4,5 104:2 107:5	<b>patients (3)</b>	<b>perspective (4)</b>	<b>positive (5)</b>	45:13 48:22 51:12
109:13,18 150:6,7,9	62:4 78:20 79:7	27:24 28:14 29:7	13:21,24 54:22	51:16 57:10,13 71:2
150:10,12,13,15,16	<b>pattern (4)</b>	102:13	124:22 137:19	71:4,13 74:5,18
150:18,19,21,22,24	31:22 34:8 135:21,21	<b>pesticide (11)</b>	<b>positives (1)</b>	75:4,11,24 76:8
<b>pancreas (2)</b>	<b>Pedram (2)</b>	28:15 44:25 45:15	14:6	79:19,20 99:22
32:10 135:22	3:12 8:3	48:5 49:15 73:21	<b>possible (10)</b>	128:14 138:25
<b>paper (23)</b>	<b>peer (9)</b>	93:1,3 142:6,13	23:10,15 78:19	139:16
13:9 23:25 24:14	25:15,20,25 26:1,5,15	146:22	107:10 144:4	<b>problem (8)</b>
25:11 27:2,20 40:21	95:19 99:5 102:10	<b>pesticides (10)</b>	145:14,16,18 147:7	52:1 105:11,24 120:2
40:25 42:18 44:16	<b>peer-reviewed (4)</b>	17:22,24 20:12 30:5	147:10	124:15 126:12
76:10 91:5,7 95:23	24:3 95:22 144:10	92:18 95:25 98:2,6	<b>possibly (1)</b>	127:15 129:13
99:9 103:8 121:20	145:4	133:2,3	136:4	<b>problematic (2)</b>
121:21,23 123:5	<b>pending (2)</b>	<b>phase (4)</b>	<b>potential (2)</b>	97:18 124:2
126:3 139:4 140:21	82:19 85:18	107:8 119:24 120:7	124:18 144:18	<b>problems (2)</b>
<b>papers (8)</b>	<b>people (48)</b>	120:10	<b>potentially (1)</b>	41:7 123:15
24:3 91:10 95:21,23	16:3 42:15 44:20	<b>phone (1)</b>	105:14	<b>procedure (21)</b>
95:24 98:3 102:22	51:10,19 52:5 60:14	37:25	<b>power (13)</b>	21:12 24:8 51:4,18
121:24	61:8 63:21 64:14	<b>PI (1)</b>	63:3,9,16 64:18 65:5	90:23 91:4 94:17
<b>paragraph (18)</b>	65:18 71:9 86:2	70:7	65:16,21 66:2,22	95:1,5,19 99:8
11:14 28:11 29:4,23	88:8 98:17,18	<b>pick (1)</b>	67:5,12,15 105:14	102:14 103:9,17
41:7 43:12 44:23	103:14,18 110:9	27:15	<b>pre-trial (1)</b>	108:5 112:8,23
45:7,9 47:4 73:7,10	111:23 112:5,10,25	<b>piece (2)</b>	8:21	115:2,2 117:3,7
73:13 94:15,25	119:20,23 120:4,5,6	115:18,24	<b>precision (1)</b>	<b>procedures (1)</b>
104:3 109:22,22	120:9,17,18 121:15	<b>pieces (1)</b>	107:12	17:1
<b>parameters (1)</b>	121:16,24 122:1,16	51:3	<b>predict (4)</b>	<b>process (4)</b>
107:12	122:17 123:6	<b>plaintiffs (6)</b>	58:8,23 59:10 67:6	133:7 143:11,24
<b>parenthetical (1)</b>	129:15 130:11	3:3,9 4:24 5:11 8:2,4	<b>predicted (1)</b>	144:2
39:13	131:9,19 132:2,4,5	<b>plant (1)</b>	103:17	<b>produce (1)</b>
<b>part (6)</b>	134:5,6 143:10	57:20	<b>preferable (3)</b>	77:3
17:24 27:22 34:4	<b>perceive (1)</b>	<b>plausible (1)</b>	107:7,17,23	<b>product (1)</b>
114:1 125:21	44:7	96:3	<b>prepare (1)</b>	59:1
127:23	<b>percent (30)</b>	<b>please (8)</b>	143:11	<b>Products (3)</b>
<b>participants (4)</b>	41:10,14,23 42:9	7:24 8:10 11:13 12:17	<b>present (2)</b>	1:4 7:8 150:1
111:8,10 122:23	44:15,20 61:9,9	13:7 20:19 22:21	3:21 20:13	<b>professional (1)</b>
132:8	62:15,15,15,16,16	106:4	<b>presumably (1)</b>	60:16
<b>participate (1)</b>	77:17,17,20,22	<b>point (19)</b>	113:24	<b>Progress (1)</b>
100:21	107:9 110:18 112:3	31:22 38:1 39:7,8	<b>pretending (1)</b>	104:12
<b>participation (2)</b>	112:20,21 115:3	40:2 47:5 55:17,18	103:15	<b>project (1)</b>
96:11,15	118:4,14 131:19	60:1 76:14 77:1	<b>pretty (6)</b>	58:24
<b>particular (4)</b>	135:7 141:18,21	81:7 119:6,7 126:22	18:7 51:15 58:7,8	<b>proof (1)</b>
31:6,7 38:18 54:24	142:2	128:18 130:4	96:2 128:7	11:23
<b>particularly (3)</b>	<b>perform (1)</b>	135:25 136:1	<b>Prevention (1)</b>	<b>propensity (1)</b>
	41:17	<b>pointed (1)</b>	26:17	131:12

<b>proper (1)</b> 27:6	<b>quartile (2)</b> 65:4 110:18	<b>ran (1)</b> 70:6	37:22 57:17 124:20 135:2 137:7 139:3 140:6 150:6,7,9,10 150:12,13,15,16,18 150:19,21,22,24	142:4
<b>properly (2)</b> 52:17 88:15	<b>quartiles (5)</b> 35:20,23 81:1 134:7 134:15	<b>random (4)</b> 53:10 103:14 135:13 138:23	<b>reasonable (3)</b> 38:11 140:2,8	<b>regression (1)</b> 94:16
<b>prospective (2)</b> 146:10,14	<b>question (27)</b> 13:16 22:1 25:6,24 44:2,3 52:1,12 53:10 58:16 64:3,4 64:6 69:7 84:7 85:17 88:15,24 99:16 104:18 117:14 133:6 139:23 141:22 142:11 146:8,9	<b>randomnesses (1)</b> 54:4	<b>recall (11)</b> 15:14,20 16:2,4,4,15 16:16 17:3 73:20 74:11,16	<b>related (2)</b> 5:3 149:12
<b>prostate (7)</b> 32:10 93:17 94:6 95:3 95:10 101:10 135:23	<b>questionable (3)</b> 13:25 102:8 130:16	<b>range (1)</b> 106:9	<b>recently-published ...</b> 11:18	<b>relates (1)</b> 1:6
<b>protective (2)</b> 135:17 138:12	<b>questioning (1)</b> 8:25	<b>ranging (1)</b> 69:13	<b>recess (4)</b> 40:10 68:12 117:20 141:2	<b>relative (12)</b> 30:24 31:9,22 33:3,16 55:5,9 106:10 134:12,14,20 136:25
<b>provides (1)</b> 25:2	<b>questionnaire (42)</b> 41:12,15,18 42:9,11 42:12,16 45:11,14 45:20 51:19 52:9 97:23 110:6,10,11 111:9,12,24 112:4,6 112:11 115:4 118:6 119:22,24 120:5,8 120:10,18,19 121:5 121:16,25 122:2,17 123:9,19 131:11,23 132:21 141:19	<b>rarely (1)</b> 59:2	<b>recommend (1)</b> 129:18	<b>relatively (7)</b> 43:6 48:2,10 57:23 59:2 71:8 97:20
<b>PTO (1)</b> 4:21	<b>questions (7)</b> 43:9 96:12,16 111:11 129:16 142:3 146:16	<b>rate (8)</b> 41:5 43:7,7 44:11 45:22 48:2 90:23 110:17	<b>recommended (1)</b> 25:11	<b>reliability (2)</b> 14:10,14
<b>Public (1)</b> 148:18	<b>questions (23)</b> 6:1 21:16 22:15 52:10 52:15 64:11 74:7 82:19 94:10 95:12 101:14,19 102:2 136:17 141:11,14 142:2,4,8 144:7 145:9,12 147:25	<b>rates (1)</b> 41:8	<b>record (13)</b> 8:19 19:11 40:9,14 68:11,16 117:19,24 141:1,6 148:3 149:10 150:4	<b>reliable (2)</b> 24:14 118:17
<b>publication (21)</b> 5:4 8:23 9:13,25 18:8 18:8,10 19:6,16 21:1,2 25:12,18 29:6 48:23 102:22 141:13 144:13 145:2 146:9,24	<b>quizzes (1)</b> 11:8	<b>ratio (4)</b> 36:25 37:7,11 110:17	<b>rectum (2)</b> 32:9 135:22	<b>relied (2)</b> 89:22 108:10
<b>publications (9)</b> 22:9 23:7,17,23 95:17 95:18 143:2 144:11 145:4	<b>quickly (1)</b> 18:7	<b>ratios (9)</b> 76:12 77:16 78:1 124:23 135:3,15 138:8 139:12 140:12	<b>Reducing (1)</b> 66:22	<b>rely (3)</b> 11:21 86:12 115:7
<b>publish (1)</b> 131:1	<b>quizzes (1)</b> 18:7	<b>raw (1)</b> 125:24	<b>refer (1)</b> 17:9	<b>relying (4)</b> 78:6,12,16 120:17
<b>published (14)</b> 9:25 12:4 18:9,11 21:1 90:13 91:3,5 91:10,20 93:11,13 93:16 130:19	<b>quizzes (1)</b> 18:7	<b>reach (1)</b> 14:11	<b>reference (3)</b> 68:21 76:25 144:15	<b>remain (1)</b> 143:14
<b>purpose (2)</b> 118:15 147:18	<b>quizzes (1)</b> 18:7	<b>reached (1)</b> 119:11	<b>referenced (2)</b> 94:8 147:23	<b>remember (17)</b> 26:7,9,11 51:14 61:6 74:13,23 86:18,25 87:15,25 88:1 89:15 141:13 142:8 143:2 145:12
<b>purposes (1)</b> 146:5	<b>quizzes (1)</b> 18:7	<b>read (18)</b> 22:20 27:2,3 28:3,20 29:14 30:8 71:19 90:4,8 94:1,3,19 99:15 101:16,18,18 102:1	<b>referring (1)</b> 61:12	<b>repeat (4)</b> 21:25 22:1 29:24 44:1
<b>pursuant (2)</b> 4:21 8:21	<b>quizzes (1)</b> 18:7	<b>reading (3)</b> 44:22 84:14 132:13	<b>reference (3)</b> 68:21 76:25 144:15	<b>report (31)</b> 4:18 5:7 9:21 10:14 11:11 13:5 15:6 18:5 19:15 40:18 43:5 45:8 49:9,12 51:11 69:21,22 72:22,23 78:23 83:5 91:8 94:2,4,8 103:5 110:5,19 139:22 144:15 147:24
<b>put (1)</b> 93:23	<b>quizzes (1)</b> 18:7	<b>Ready (2)</b> 56:14,17	<b>refers (1)</b> 16:2	<b>reported (5)</b> 1:22 49:22 51:12 110:16 142:6
<hr/> <b>Q</b> <hr/>	<b>quizzes (1)</b> 18:7	<b>real (7)</b> 11:8 39:5 96:16 103:20 119:18 124:18 144:3	<b>reflect (1)</b> 41:15	<b>reporter (4)</b> 7:21 8:10 78:10 149:6
<b>Q1 (1)</b> 134:7	<b>quizzes (1)</b> 18:7	<b>really (19)</b> 12:25 14:1 25:5 37:12 46:19 48:20 51:25 52:16 57:14 58:20 59:14 62:25 71:21 78:25 88:25 104:19 131:17,20 135:16	<b>reflects (1)</b> 46:19	<b>Reporting (2)</b> 7:19,23
<b>Q4 (1)</b> 134:7	<b>quizzes (1)</b> 18:7	<b>Realtime (4)</b> 1:24 2:14 149:5,23	<b>regard (12)</b> 21:10 40:3 51:15 100:9 124:4,6 126:16 129:5 142:2 142:10 145:19 146:20	<b>represent (1)</b> 140:4
<b>qualifications (1)</b> 60:16	<hr/> <b>R</b> <hr/>	<b>reason (20)</b>	<b>regards (1)</b>	<b>representative (1)</b> 139:17
<b>qualified (3)</b> 60:10,17 143:11	<b>R (2)</b> 3:1 149:1			
<b>quality (3)</b> 22:12 52:6 104:11	<b>raised (2)</b> 41:7 126:10			

<b>reputable (1)</b> 12:4	20:2 25:25 26:5,15 27:1,6,8,15 95:20 116:19	123:5,20,23	<b>second (38)</b> 10:10 11:13 34:4 41:6 42:16 44:23 45:7,21 45:24 48:6 49:22 50:5,17 59:13 66:11 103:15 110:11 111:5,12,21 112:10 112:21 115:4 118:5 119:24 120:7,10,17 120:19 121:15,25 122:2,17 123:19 131:10,23 141:18 141:22	<b>sentences (2)</b> 107:6 109:23
<b>required (2)</b> 78:18 145:23	<b>reviewed (10)</b> 20:1 21:3,20,21 22:3 22:5 25:10 91:8 98:18 99:21	<b>risk (22)</b> 28:14,17 29:9 36:25 55:5,9,11 75:14 76:16 77:25 79:7,23 80:12 87:3,7,20 124:22 134:12 135:3,4,5 139:12	<b>secret (1)</b> 25:25	<b>separate (1)</b> 115:6
<b>research (1)</b> 27:17	<b>reviewers (5)</b> 25:16,21 26:1 99:5 102:10	<b>risks (14)</b> 23:15 30:24 31:9,22 33:3,16 77:8 78:19 78:22 79:25 80:9 134:14,20 136:25	<b>section (7)</b> 20:9 21:21 22:6 28:10 28:11 107:4 132:13	<b>series (3)</b> 141:10 142:1,4
<b>respected (1)</b> 105:1	<b>reviews (4)</b> 26:16,18,20,25	<b>role (1)</b> 11:16	<b>secular (1)</b> 48:7	<b>set (3)</b> 119:10 149:9,16
<b>respective (1)</b> 134:14	<b>right (144)</b> 9:6,22 10:3 11:23 14:20 15:6,15 16:11 16:18,21 20:3 21:24 22:13 23:8,12,18 24:4,8 26:10 28:6 28:20,23 29:14 30:25 31:15 34:10 35:15,16,20 36:3 37:4,6 38:22,23 39:10,20 40:16 41:16 42:1,7 43:13 43:14 44:5 45:2 46:4,11,12 49:1,14 50:23 53:4 54:7,17 55:2,7,19 56:5,10 56:14,19 57:11,19 58:2 59:4 61:11,16 62:17,23 64:5 67:4 72:5,6,14,20 73:17 78:14 80:8 81:8,14 81:19 82:2,10,17 83:14 84:9 85:12,13 86:22 87:4,21 91:8 91:21 92:2 96:5 97:21,22 102:14 103:18,22,23 104:8 107:3 108:5,10,12 109:4 110:3,13,14 111:14,17 112:11 112:24 113:19 114:3,5,6,7,11,15 118:18 119:13 121:5,9,12 122:18 122:19 123:1,7,8,11 123:21 124:10 125:16 126:7 127:1 129:22 132:11 135:5,18 137:21 138:5 143:25 144:3	<b>rooms (1)</b> 37:25	<b>see (38)</b> 20:7,9 31:13,24 37:6 39:11,14 40:25 45:4 46:7 47:2 73:12 75:5,12,17,19 76:11 76:16,17 77:15,22 77:25 78:18 81:2,4 94:15,25 95:4 103:24 107:14 110:2 114:20 118:22 119:10 128:10 135:24 137:16 139:10	<b>severe (1)</b> 146:24
<b>respond (15)</b> 41:24 44:20 46:24 103:14,16 119:23 119:25 121:17 122:18 123:7 130:12 131:10,19 131:23 132:21	<b>rights (1)</b> 9:6,22 10:3 11:23 14:20 15:6,15 16:11 16:18,21 20:3 21:24 22:13 23:8,12,18 24:4,8 26:10 28:6 28:20,23 29:14 30:25 31:15 34:10 35:15,16,20 36:3 37:4,6 38:22,23 39:10,20 40:16 41:16 42:1,7 43:13 43:14 44:5 45:2 46:4,11,12 49:1,14 50:23 53:4 54:7,17 55:2,7,19 56:5,10 56:14,19 57:11,19 58:2 59:4 61:11,16 62:17,23 64:5 67:4 72:5,6,14,20 73:17 78:14 80:8 81:8,14 81:19 82:2,10,17 83:14 84:9 85:12,13 86:22 87:4,21 91:8 91:21 92:2 96:5 97:21,22 102:14 103:18,22,23 104:8 107:3 108:5,10,12 109:4 110:3,13,14 111:14,17 112:11 112:24 113:19 114:3,5,6,7,11,15 118:18 119:13 121:5,9,12 122:18 122:19 123:1,7,8,11 123:21 124:10 125:16 126:7 127:1 129:22 132:11 135:5,18 137:21 138:5 143:25 144:3	<b>Roos (15)</b> 12:20 13:1,3,9 15:12 22:8 29:6,17 40:23 42:18,18 73:7 75:23 139:3,4	<b>seeing (1)</b> 103:16	<b>Shimada (4)</b> 3:19 8:7,7 122:10
<b>responded (5)</b> 42:10,16 121:15 122:16 129:16	<b>rotations (1)</b> 57:21	<b>rotate (1)</b> 57:21	<b>short (21)</b> 48:13 52:2 68:24 70:25 71:3,4,4,8,13 71:23 73:15 74:4,17 88:6,18 89:19,20 97:20 145:16 147:12,21	<b>shorter (1)</b> 51:19
<b>respondents (3)</b> 52:21,24 106:11	<b>Roundup (9)</b> 1:4 7:8 11:23 12:1,10 56:14,17 145:12 150:1	<b>row (2)</b> 80:7,7	<b>show (9)</b> 18:1 34:8 37:2 67:21 68:2 74:9 76:20 78:4 79:22	<b>Shorthand (1)</b> 149:6
<b>responders (2)</b> 44:24 133:5	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>RPR (4)</b> 1:23 2:13 149:4,22	<b>showing (1)</b> 76:5	<b>shown (1)</b> 17:5
<b>responding (1)</b> 51:21	<b>row (2)</b> 80:7,7	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>shows (6)</b> 37:16 80:13 85:10,12 85:14 123:14	<b>showing (1)</b> 76:5
<b>response (15)</b> 37:16 41:5,8 43:15 44:11,14 45:22 48:2 65:1,7 80:19 81:3,4 81:20 123:8	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>S (2)</b> 3:1 4:8	<b>significance (2)</b> 67:22 68:3	<b>shown (1)</b> 17:5
<b>respondents (3)</b> 52:21,24 106:11	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>sample (1)</b> 103:14	<b>significant (42)</b> 12:5 13:14 25:4 31:11 36:7,17 37:1,4 38:22,25 39:4,12,18 46:10 55:10,12 64:19 67:13,20,25 71:23 75:12,13 77:9 77:24 79:23 80:4,10 80:12 82:24 113:2 122:25 124:13 125:10 127:7 128:11 132:10 136:3,13 137:19 144:18,25	<b>shows (6)</b> 37:16 80:13 85:10,12 85:14 123:14
<b>responders (2)</b> 44:24 133:5	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>saying (6)</b> 38:2 70:22 71:13 74:16 79:19 107:22	<b>significantly (3)</b> 75:20 78:22 87:6	<b>similar (4)</b> 119:10,12,18 120:18
<b>responding (1)</b> 51:21	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>says (4)</b> 20:9 104:2 107:5 132:7		
<b>response (15)</b> 37:16 41:5,8 43:15 44:11,14 45:22 48:2 65:1,7 80:19 81:3,4 81:20 123:8	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>scenario (1)</b> 57:23		
<b>responses (3)</b> 44:19 103:18,21	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>scenarios (1)</b> 57:22		
<b>rest (1)</b> 54:15	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>scientific (1)</b> 99:8		
<b>restricted (2)</b> 110:5 121:4	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>scientifically (4)</b> 83:16 98:9 99:9,24		
<b>result (7)</b> 54:20 67:13,24 92:24 108:18 109:1 147:17	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>scope (3)</b> 18:4 29:5 83:5		
<b>resulted (3)</b> 46:10 87:20 124:13	<b>RP (4)</b> 1:23 2:13 149:4,22	<b>score (1)</b> 106:25		
<b>resulting (1)</b> 114:11	<b>RP (4)</b> 1:23 2:13 149:4,22			
<b>results (10)</b> 12:23 54:12,13 78:25 119:3,11,12,18 134:19 137:16	<b>RP (4)</b> 1:23 2:13 149:4,22			
<b>retrospective (2)</b> 146:10,12	<b>RP (4)</b> 1:23 2:13 149:4,22			
<b>returned (1)</b> 41:11	<b>RP (4)</b> 1:23 2:13 149:4,22			
<b>reverse (1)</b> 50:10	<b>RP (4)</b> 1:23 2:13 149:4,22			
<b>review (10)</b>	<b>RP (4)</b> 1:23 2:13 149:4,22			

<b>Similarly (1)</b> 94:22	<b>solid (3)</b> 27:25 30:20 33:8	137:1,4,5	98:19 100:14,17,19	<b>subset (3)</b> 42:21 107:11,13
<b>Simultaneous (1)</b> 78:9	<b>somebody (4)</b> 39:17 57:24 59:11	<b>started (6)</b> 49:18 50:8 59:15,16	101:14,24 102:5	<b>substance (8)</b> 31:14 32:1 70:12,16
<b>simultaneously (1)</b> 17:14	69:23	59:17,19	104:6,7,11,17,20,25	70:19 77:3 98:10
<b>sir (63)</b> 10:23 11:12 12:16	<b>somewhat (4)</b> 63:16 64:18 136:1,2	<b>starting (2)</b> 10:7 101:4	105:11 124:21,22	135:24
14:5 16:23 17:6,21	<b>sophisticated (4)</b> 12:23 13:11 60:22	<b>starts (1)</b> 109:22	126:4,7,10,19 128:8	<b>substances (8)</b> 12:2,10 17:15,18
19:2 20:2 21:6,14	92:1	<b>state (2)</b> 19:25 149:2	128:9 130:3 143:13	20:16 23:14 71:16
21:19 22:2 23:6	<b>sophistication (1)</b> 14:17	<b>stated (2)</b> 21:3 102:17	143:14,19 144:17	99:10
24:15 26:15 27:20	<b>sorry (7)</b> 21:25 24:20 79:18	<b>statement (12)</b> 8:19 18:17 24:18 61:7	146:25 147:13	<b>subtypes (7)</b> 28:2 30:1 33:22 34:14
28:12 29:2,23 30:18	85:6 87:23 117:13	71:19 72:3,4 90:19	<b>study (147)</b> 5:5,12,13,14,15,16,17	76:13 78:5,14
31:5,21 32:21 37:4	122:11	96:18,24 105:7	8:23 9:12 10:18	<b>suggest (1)</b> 83:7
38:25 41:5 46:4	<b>sort (3)</b> 63:24 76:13 137:10	142:5	11:22 12:4,6,20	<b>suggesting (2)</b> 140:10,13
52:25 61:6 73:4,19	<b>sorts (2)</b> 126:4,5	<b>statements (4)</b> 18:20,22 19:14	13:1,3,15,16,21,22	<b>suggests (3)</b> 55:18 78:17 79:24
74:11 75:22 77:12	<b>source (1)</b> 140:7	101:21	13:25 14:10,15 15:5	<b>summarizes (1)</b> 20:10
78:3 84:13 85:23	<b>span (1)</b> 39:14	<b>STATES (1)</b> 1:1	15:10,15 16:6,25	<b>supplemental (26)</b> 4:18 5:2 10:6,14
86:10 88:3 90:5	<b>spans (1)</b> 39:14	<b>statistical (5)</b> 62:11 68:2 105:12,14	21:23 22:19,24 25:7	11:11 15:5 18:5
93:10,18 94:13,22	<b>speak (2)</b> 99:4 123:20	112:8	25:9,22,24 27:24	19:15 40:18 41:11
95:3 99:6 100:12	<b>speaking (5)</b> 16:18 18:15,20 25:8	<b>statistically (17)</b> 31:11 37:4 38:21,24	28:6,14,23 29:4,5,7	41:18 42:8,20 43:5
104:1 105:10 106:8	31:4	39:3,12,17 67:21,25	29:17,17 31:5,25	43:8,19 45:8 83:25
106:24 107:5,14	<b>speaks (1)</b> 76:14	75:19 77:24 80:3,10	42:3,4,5 48:13,21	84:16,18,22 85:7,11
112:20 122:9 123:5	<b>special (1)</b> 130:15	81:23 82:24 113:2	52:5 54:11 61:21,21	94:2,4,8
125:14 126:2	<b>specialist (2)</b> 7:18 69:22	137:18	61:24 62:1 63:2	<b>supplementary (1)</b> 84:24
133:20 135:20	<b>specific (5)</b> 30:20 31:20 72:10,11	<b>stepped (1)</b> 64:6	66:22 67:5 68:1,20	<b>support (4)</b> 4:22 5:9 78:7 83:8
139:19 147:7	74:19	64:6	68:23 69:16 70:3	<b>supporting (1)</b> 126:4
<b>sit (2)</b> 60:2 101:17	<b>specifically (4)</b> 23:5 25:8 53:9 74:14	<b>stopped (4)</b> 57:25 58:1 113:14,23	71:15 73:7,14 75:18	<b>suppose (2)</b> 59:9 98:22
<b>situation (3)</b> 69:12 97:18 147:22	<b>speculate (1)</b> 58:5	<b>straddle (1)</b> 33:17	76:1 77:2 79:1,22	<b>supposed (1)</b> 139:20
<b>situations (1)</b> 96:3	<b>speculation (3)</b> 58:13 140:14,16	<b>straddling (1)</b> 31:12	87:19,24 88:4,6,17	<b>sure (8)</b> 11:5 41:17 57:22
<b>six (3)</b> 37:9 69:14 142:20	<b>stable (1)</b> 96:2	<b>Street (1)</b> 3:16	88:19,24 89:3,10	65:14 71:21 92:12
<b>size (1)</b> 14:15	<b>standalone (1)</b> 130:20	<b>strong (1)</b> 70:17	90:12,13,22 91:16	97:12 116:11
<b>skill (1)</b> 106:25	<b>standard (1)</b> 100:24	<b>studied (1)</b> 98:3	92:6,23 93:11,13,14	<b>surprising (3)</b> 108:25 114:16 119:2
<b>skip (1)</b> 107:3	<b>stands (1)</b> 101:25	<b>studies (63)</b> 13:20,24 14:15,21,23	93:15,16,18 94:13	<b>surrounding (1)</b> 102:24
<b>slightly (3)</b> 35:25 53:13,15	<b>start (7)</b> 7:5 27:21 47:25 49:14	15:21,22 16:10	94:17,23 95:3 96:10	<b>survey (16)</b> 22:8 42:6 43:16,20
<b>small (11)</b> 34:19 35:12 37:10,19		20:11 42:14 52:2	96:13 100:8,9,18	45:2 46:1 48:6
38:10 67:23 71:24		69:8,18,19 70:2,7,8	101:9,10,11 102:7	49:19,23 50:3,5,16
80:24,24 122:25		71:5,16,19 72:5	103:4 104:8,14	50:17 59:11,13
132:9		80:17 86:7,12,17,19	106:8 107:5,23	103:15
<b>smaller (2)</b> 67:24 134:22		88:10,14 89:1,15,16	108:4 109:15	<b>surveys (3)</b> 41:9,21 104:6
<b>smallest (3)</b> 35:12 82:12 83:24		89:22 97:14 98:18	118:17 124:2,15,19	<b>suspect (2)</b>
<b>smoked (1)</b> 132:24			125:8,12,22 126:13	
<b>sole (1)</b> 71:12			127:6,9,10 128:4,9	
			128:15,24 129:5,18	
			130:4,20,21 134:18	
			135:10 139:15	
			142:22 144:6,20,21	
			144:24 145:22	
			146:6,10,10	
			<b>study's (1)</b> 97:3	
			<b>sub-groups (2)</b> 62:25 64:17	
			<b>subject (1)</b> 130:22	
			<b>Subscribed (1)</b> 148:14	
			<b>subsequent (1)</b> 22:9	

70:12 112:14 <b>swear (1)</b> 8:11 <b>switch (2)</b> 117:4,15 <b>switched (2)</b> 57:18,18 <b>sworn (3)</b> 8:15 148:14 149:9 <b>Systems (4)</b> 1:24 2:14 149:5,23	118:9 145:25 <b>talks (4)</b> 93:25 94:5,6 144:16 <b>tape (1)</b> 106:6 <b>tapes (1)</b> 117:15 <b>technique (2)</b> 100:24 105:16 <b>tell (9)</b> 41:3 47:3 49:17 53:4 56:2,7 62:12 77:12 112:18 <b>telling (2)</b> 36:24 37:11 <b>tells (2)</b> 135:8 136:15 <b>ten (13)</b> 52:13 68:7,9 74:3 75:4,15,20,24 78:20 85:12 86:22 87:5,10 <b>tend (6)</b> 54:6,23,24 66:23 67:6 67:15 <b>tends (1)</b> 16:9 <b>term (1)</b> 129:3 <b>terms (4)</b> 13:17 16:21 48:14 65:5 <b>tertile (1)</b> 39:9 <b>tertiles (3)</b> 35:22 36:1 81:1 <b>test (6)</b> 108:4 109:24 111:13 113:11 114:6 118:16 <b>tested (2)</b> 103:9,13 <b>testicular (2)</b> 32:11 147:18 <b>testified (2)</b> 8:16 135:20 <b>testifying (1)</b> 140:2 <b>testimony (14)</b> 74:25 75:2 79:13 83:13 89:25 97:10 124:8 125:18 129:8 136:8 139:21 140:8 143:3 149:11 <b>tests (6)</b> 108:3,9 117:2 118:16 119:9 130:18	<b>text (1)</b> 42:4 <b>Thank (4)</b> 8:9 32:15 40:7 148:1 <b>thing (5)</b> 46:13 56:1 72:10,11 139:10 <b>things (5)</b> 27:15,16 46:24 56:23 81:18 <b>think (22)</b> 10:24 13:15 25:4,20 37:25 43:3 47:12,14 57:22 62:25 63:1 65:15 69:6 73:23 74:8 75:4 85:3 87:16 124:9 128:7 129:9 130:12 <b>third (11)</b> 7:20 46:7,17 80:7 113:11 115:15 117:1 118:8 123:7,9 123:10 <b>thought (3)</b> 116:8 129:24 130:2 <b>three (17)</b> 19:5 21:2 35:14 48:6 52:14 64:16,21 101:4,14 107:6 108:16 109:23 115:5 118:16 119:9 130:18 145:5 <b>three-to-one (1)</b> 61:22 <b>threefold (1)</b> 77:23 <b>ticking (1)</b> 138:3 <b>tie (2)</b> 18:7 19:14 <b>tied (1)</b> 46:25 <b>tightly (1)</b> 136:3 <b>time (40)</b> 9:5 10:10 12:22 13:10 16:16 17:17 18:9,11 27:11 40:14 43:20 45:17 47:17,19 52:8 52:11 68:15,24 69:15 72:18 73:14 73:15,23 76:20 89:4 94:18 96:2,8 97:21 102:20 106:3 109:11 114:19 115:12 117:24	124:11 141:5 146:12 147:12 148:6 <b>times (7)</b> 29:11 101:4 115:12 117:11 123:25 146:1,1 <b>titled (1)</b> 68:20 <b>today (8)</b> 7:21 10:3 24:6 75:1 89:17 129:4 144:13 145:3 <b>today's (1)</b> 148:5 <b>told (4)</b> 40:19 56:1 57:7,8 <b>top (3)</b> 26:11 88:12 89:16 <b>total (1)</b> 28:17 <b>totally (1)</b> 66:9 <b>toxic (1)</b> 147:20 <b>train (1)</b> 120:14 <b>training (1)</b> 60:16 <b>traits (1)</b> 60:15 <b>transcription (1)</b> 150:5 <b>tremendous (1)</b> 131:2 <b>trend (1)</b> 36:22 <b>trends (4)</b> 48:7 81:22 82:1,11 <b>tried (1)</b> 44:16 <b>true (28)</b> 15:24 32:23 38:14 40:5 46:6 50:10 51:23 54:9,11,22 55:8,18 56:22 57:13 63:8 65:8 67:1,13 81:3,11,14 87:7 109:9 125:5 130:25 134:19 135:1 149:10 <b>truly (1)</b> 137:5 <b>truncated (2)</b> 113:12 118:9 <b>try (3)</b>	44:18 52:4 146:17 <b>trying (6)</b> 44:5,10 47:24 60:24 120:8,11 <b>TSG (2)</b> 7:18,22 <b>tumors (2)</b> 28:1 33:8 <b>Turn (3)</b> 19:2,24 21:14 <b>Turner (2)</b> 3:22 7:17 <b>twice (1)</b> 99:13 <b>two (18)</b> 35:17 37:15 41:21 42:2 48:4 61:14,15 64:9,10 74:19 82:18 103:24 117:1,2 119:21 122:19 145:15 147:8 <b>two- (1)</b> 61:22 <b>two-and-a-half (1)</b> 8:24 <b>types (1)</b> 118:21 <b>typical (1)</b> 69:8
<b>T</b>		<b>U</b>		
<b>T (3)</b> 4:8 149:1,1 <b>T-cell (6)</b> 35:11 36:13 37:8 38:10,18 77:22 <b>table (35)</b> 30:18,18,19 32:13 34:1,2,3,5 37:23,24 38:3,5 76:9,17 77:12 79:24 82:2,11 82:15,16 83:25 84:4 84:16,18,20,22 85:6 85:8,12,15 106:24 133:20,22 134:1,4 <b>tables (1)</b> 84:25 <b>take (15)</b> 4:10,14 20:5 25:5,6 27:5,19 37:24 40:6 64:15 79:5 94:18 133:20 137:15 140:23 <b>take-home (1)</b> 42:10 <b>taken (6)</b> 8:20 40:10 52:8 68:12 117:20 141:2 <b>takes (5)</b> 76:19,23 77:2 114:3 145:10 <b>talk (8)</b> 23:5 31:19 33:10 41:1 59:25 69:1 109:11 119:5 <b>talked (3)</b> 32:7 95:15 112:1 <b>talking (22)</b> 10:2 16:17 18:10 19:9 19:16 38:17,18 39:20 56:13 62:9 66:18 69:17,19 73:6 77:11 82:7 84:3 85:7 95:7 107:19				

63:10 64:1 134:6 <b>unfair (1)</b> 76:5 <b>unique (3)</b> 96:18,24 97:1 <b>uniquely (1)</b> 124:1 <b>UNITED (1)</b> 1:1 <b>unlagged (1)</b> 30:4 <b>unpublished (1)</b> 9:18 <b>unsuccessful (1)</b> 45:24 <b>update (2)</b> 11:18 146:17 <b>updated (1)</b> 28:13 <b>usage (1)</b> 47:6 <b>use (63)</b> 28:13,16 29:9,25 35:13 44:25 45:15 46:9 47:16 48:5,7 49:15,19,20,22 56:3 56:25 57:10 58:10 58:19,23,24 59:3,3 59:20,22 60:5 62:12 68:4,22 69:2 77:1 78:1 92:23,25 94:3 96:1,4,5 97:18 98:5 98:20 102:25 111:16,25 118:3,12 121:11 124:10 125:3 129:3,20 130:10 133:2 139:1 143:6,18,24 144:2,3 145:11 146:22 147:15 <b>user (2)</b> 50:6,11 <b>users (1)</b> 58:10 <b>usually (2)</b> 26:8 27:18	<b>values (5)</b> 32:25 33:1 36:6 67:4 136:25 <b>variance (2)</b> 66:24 67:1 <b>variety (1)</b> 50:1 <b>various (5)</b> 34:14 53:1 54:18 66:7 80:25 <b>version (1)</b> 9:5 <b>versions (1)</b> 56:13 <b>versus (3)</b> 62:5 65:19 139:7 <b>video (3)</b> 1:15 2:9 7:18 <b>video-recorded (1)</b> 7:6 <b>VIDEOGRAPHER...</b> 3:22 7:4 8:9 40:8,12 68:10,14 106:5 117:4,17,22 140:25 141:4 148:2 <b>videotaped (2)</b> 4:11,15 <b>view (6)</b> 22:7 69:3 70:10 98:8 116:1 136:23 <b>volume (1)</b> 20:13	50:15 52:3 58:20 63:17 92:14 99:17 105:17,23 111:6 128:8,15 131:2,11 149:14 <b>ways (1)</b> 108:11 <b>we'll (10)</b> 19:19 31:19 41:1 42:24 50:21 59:25 78:21 117:16 119:7 140:23 <b>we're (10)</b> 10:2 18:10 19:10,16 20:21 37:23 38:5 39:6 66:17 117:18 <b>We've (1)</b> 19:20 <b>weak (1)</b> 70:17 <b>weaken (2)</b> 12:9,18 <b>weaknesses (1)</b> 40:21 <b>weekends (1)</b> 27:11 <b>weigh (2)</b> 14:7,24 <b>weighing (1)</b> 14:14 <b>weight (10)</b> 11:25 12:3,7,16,25 13:2,2,8 15:11 40:22 <b>weighted (2)</b> 91:19 92:1 <b>Weisenburger (13)</b> 1:16 2:10 4:3,13,17 4:20 5:8 7:7 8:13 9:3 40:16 148:11 150:3 <b>welcome (1)</b> 106:18 <b>went (1)</b> 95:19 <b>weren't (4)</b> 49:5 57:10 59:12 133:1 <b>West (3)</b> 2:11 3:4 7:13 <b>WHEREOF (1)</b> 149:16 <b>widely (5)</b> 56:10 58:25,25 104:4 104:25 <b>willingness (1)</b>	100:21 <b>Wilshire (1)</b> 3:10 <b>window (1)</b> 59:16 <b>withdraw (1)</b> 147:2 <b>withdrawing (1)</b> 103:13 <b>witness (166)</b> 4:2 8:11,14 9:15 11:6 12:14 13:13 14:20 15:17,24 16:13,20 17:3 23:1 24:10,17 25:20 28:8,25 29:20 30:10,16 31:2,17 32:5 33:20 34:4,7 34:25 35:22 36:16 37:18 38:13 39:23 44:1 45:4 46:17 48:17 49:8,25 50:25 51:7,23 53:7,21 54:9 55:22 56:21 57:13 58:4 59:8 60:12,20 61:19 62:22 63:14 64:9 65:13 66:4,17 67:1 67:19 70:5,15 71:2 72:16 74:13,23 76:7 77:6 78:16 79:14,18 80:15,23 81:10,16 82:22 83:6,20 84:3 84:21 85:5,25 86:18 87:2,14 88:12,23 89:8,10 90:1,17 91:1,23 92:4,12 94:20 95:13 96:22 97:12 98:14 99:18 100:7,16 101:2,5,6 102:3,21 103:11 104:19 105:6,22 107:21 108:7,14,22 109:8,18 111:3 112:13 113:9,21 114:15 115:13,15 115:21 116:5,14 117:13 118:1,20 119:17 120:23 121:9 122:11 123:3 123:13 124:9 125:7 125:21 126:9,19 127:5,18 128:7,22 129:9,24 130:8,25 131:17 132:18 133:16 134:25 136:9 137:3,23	138:7 140:16,22 145:7 149:8,11,16 <b>words (2)</b> 71:7 110:6 <b>work (7)</b> 17:25 26:22,24 27:1 27:10 97:9,13 <b>workers (1)</b> 69:9 <b>working (3)</b> 17:14,14 22:18 <b>works (3)</b> 85:15 97:8,12 <b>worse (3)</b> 123:8 130:5,9 <b>wouldn't (15)</b> 16:17 50:7,13 52:11 54:23 59:14,17,18 59:19 80:11 83:16 113:17,17 114:20 137:15 <b>write (3)</b> 27:7 29:7 46:13 <b>wrong (5)</b> 41:3 47:15 62:7 124:6 137:20 <b>wrote (1)</b> 28:12
			<b>X</b>	
			<b>X (2)</b> 4:1,8	
			<b>Y</b>	
			<b>yeah (14)</b> 11:7 42:20 44:14 45:10 47:22 55:8 84:7,19 95:9 107:21 109:16 113:21 138:2 143:13 <b>year (24)</b> 45:1,16,18,18,25 48:6 49:16,21 51:11,14 52:15 55:25 56:19 56:19 57:9,20,25 58:25,25 59:1,1,18 142:7 146:22 <b>years (68)</b> 19:5 21:2 29:10 45:13 47:16,17,18 48:19 50:16 52:10,12 68:22,24 69:1,2,11 69:13,14,14 70:24 71:10,13 72:13,18 73:14 74:3 75:4,9 75:10,16,21,23,24	
<b>V</b> <b>valid (3)</b> 99:24 100:1 138:22 <b>validating (1)</b> 126:5 <b>validity (3)</b> 13:16 14:14 25:7 <b>value (5)</b> 14:8 39:15 136:1,2,19	<b>W</b> <b>WAGSTAFF (1)</b> 3:2 <b>wait (13)</b> 63:12 64:2,2 79:16 85:4 96:20,20 100:6 115:10 136:7 139:24,24,24 <b>want (24)</b> 8:18 11:4 14:4 19:14 40:23 53:3 62:22 63:2 64:12 68:4 71:20 75:8 82:20 85:25 86:1,16 94:19 97:16 101:18,20 102:1 116:22 144:3 145:21 <b>Washington (1)</b> 3:17 <b>wasn't (2)</b> 37:9 118:23 <b>way (18)</b> 25:23 33:3 43:10 50:9			

75:25 76:1,7,10,24 76:24 77:1,2 78:2 78:20 79:4,6 80:4,5 80:5,5 85:21 86:3,8 86:10,13 87:12,17 88:1,5,19,20 89:6 89:19,20 142:10,17 142:20 145:15 147:9	68:13,15 <b>103 (1)</b> 5:15 <b>10816 (3)</b> 1:23 2:13 149:22 <b>11 (1)</b> 103:4 <b>11:06 (2)</b> 117:19,20 <b>11:16 (2)</b> 117:21,25 <b>11:41 (2)</b> 141:1,2 <b>11:55 (2)</b> 141:3,6 <b>12 (6)</b> 45:13 52:13 77:17 122:9,13 142:20 <b>12:03 (2)</b> 148:3,6 <b>12100 (1)</b> 3:10 <b>122 (2)</b> 5:16,17 <b>13 (1)</b> 123:5 <b>1350 (1)</b> 3:16 <b>136023 (1)</b> 1:25 <b>14 (2)</b> 6:5 69:14 <b>141 (1)</b> 4:5 <b>147 (1)</b> 4:4 <b>15 (3)</b> 77:17 80:5 85:12 <b>16 (1)</b> 6:4 <b>16-md-02741-VC (2)</b> 1:7 7:11 <b>18 (11)</b> 5:6 47:18 68:24 72:18 75:25 76:1,7 88:19 88:20 89:6,20 <b>19 (1)</b> 77:20 <b>1993 (1)</b> 42:6 <b>1999 (2)</b> 41:22 42:6	34:2,3,5 37:23,24 38:3,5 47:4 49:15 52:19,25 55:12 61:7 106:16,17 107:8 117:23 133:20,22 134:1,4 141:5 148:4 150:4 <b>20 (21)</b> 6:3,4 62:15,15,15,16 62:16 63:11,11,11 63:11 69:10 75:10 76:10 78:2 79:6 80:5 85:12 86:2,8 135:7 <b>20-year (8)</b> 80:20 82:6,12 83:23 84:8,16 85:11,16 <b>2000 (1)</b> 42:18 <b>20005 (1)</b> 3:17 <b>2005 (19)</b> 9:12 13:9 15:12 22:8 29:6,17 40:23 41:22 42:7,19 73:7 75:23 113:12,14,23 115:16,22 116:9 118:12 <b>2013 (1)</b> 9:18 <b>2015 (1)</b> 19:5 <b>2017 (1)</b> 5:3 <b>2018 (42)</b> 1:18 2:5 7:1 9:25 10:18 11:22 15:5,15 21:8 23:5,25 24:14 25:10 27:20 29:4 40:21,25 41:16 42:4 44:8 47:21 68:20 88:4,19 90:12,22 91:16 99:7,9 102:7 108:4 115:5 123:11 123:20 124:2 126:3 130:21 133:21 134:4 148:15 149:17 150:2 <b>21 (2)</b> 6:5 21:14 <b>22 (6)</b> 1:18 2:5 6:6 7:1,15 150:2 <b>22nd (1)</b> 149:17 <b>25 (1)</b>	77:20 <b>2741 (1)</b> 1:5 <hr/> <b>3</b> <hr/> <b>3 (23)</b> 10:13 11:12 34:1 40:17 55:9,12 76:9 76:17 77:12 79:24 82:2,11 83:25 84:4 84:16,18,22 85:6,8 85:12,15 106:24 150:5 <b>30 (4)</b> 69:11 75:9 86:2,8 <b>30-11 (1)</b> 103:1 <b>30-12 (1)</b> 122:5 <b>30-13 (1)</b> 122:6 <b>30-year (1)</b> 78:21 <b>31 (4)</b> 36:19,22,24 84:12 <b>31-1 (2)</b> 4:10 10:19 <b>31-10 (6)</b> 5:14 93:8 94:6 95:8,8 101:15 <b>31-11 (1)</b> 5:15 <b>31-12 (1)</b> 5:16 <b>31-13 (1)</b> 5:17 <b>31-2 (2)</b> 4:14 10:19 <b>31-3 (2)</b> 4:18 10:20 <b>31-4 (2)</b> 5:2 10:20 <b>31-5 (2)</b> 5:5 10:20 <b>31-6 (2)</b> 5:6 18:23 <b>31-7 (2)</b> 5:7 73:1 <b>31-8 (4)</b> 5:12 93:7,24 101:15 <b>31-9 (4)</b> 5:13 93:7 94:3 101:15 <b>34 (2)</b> 4:22 8:21 <b>34,698 (1)</b> 111:10	<b>35 (1)</b> 77:22 <b>37 (15)</b> 41:23 44:15,20 84:10 84:13 107:9 112:3 112:20,21 115:3 118:4,14 131:19 141:21 142:2 <hr/> <b>4</b> <hr/> <b>4 (4)</b> 10:15 109:13,18 134:15 <b>40 (3)</b> 42:9 86:2,8 <b>413 (1)</b> 107:5 <b>44 (2)</b> 41:10,14 <hr/> <b>5</b> <hr/> <b>5 (8)</b> 6:6 10:17 27:19 28:12 55:19 73:4 133:21 134:4 <b>5-year (1)</b> 85:11 <b>5,779 (1)</b> 29:12 <b>50 (2)</b> 61:9,9 <b>50/50 (3)</b> 62:10,23 63:3 <b>545 (1)</b> 94:14 <hr/> <b>6</b> <hr/> <b>6 (2)</b> 19:3 45:13 <b>6.7 (3)</b> 73:14 74:17 75:23 <b>63 (1)</b> 141:18 <b>64 (2)</b> 95:4,5 <hr/> <b>7</b> <hr/> <b>7 (5)</b> 19:24 20:5 29:2 55:20 72:25 <b>700 (2)</b> 2:11 7:13 <b>7171 (1)</b> 3:4 <b>73 (1)</b> 5:7
<hr/> <b>Y</b> <hr/> <b>yield (1)</b> 137:18 <b>yields (1)</b> 57:3 <b>York (2)</b> 7:20,20 <b>younger (1)</b> 132:22	<hr/> <b>Z</b> <hr/> <b>0</b> <hr/> <b>0.04 (2)</b> 82:5,23 <b>0.05 (3)</b> 81:24,25 82:2 <b>0.3 (2)</b> 82:16 84:1 <b>0.82 (1)</b> 110:18 <b>0.83 (4)</b> 134:13,13,22,23 <b>0.87 (2)</b> 134:13,23 <b>0.88 (2)</b> 134:13,23 <b>0.89 (1)</b> 39:9	<hr/> <b>1</b> <hr/> <b>1 (9)</b> 7:6 10:8,12 39:14 40:13 68:15 117:18 134:15 150:4 <b>1,324 (1)</b> 29:13 <b>1.0 (1)</b> 55:1 <b>1.2 (1)</b> 55:13 <b>1.8 (1)</b> 55:13 <b>10 (9)</b> 4:10,14,18 5:2,5 74:17 80:5 93:11 101:11 <b>10:11 (2)</b>	<hr/> <b>2</b> <hr/> <b>2 (28)</b> 10:9 30:18,18 32:13	

**747 (1)**

7:20

**794 (1)**

94:23

---

**8**

---

**8 (4)**

28:12 29:2 93:10

101:11

**8.5 (16)**

47:17 48:19 68:23

69:1,13 70:24 71:10

71:13 72:13 77:1

79:4 86:10,13 87:12

88:5 89:19

**8:41 (3)**

2:6 7:2,16

**80226 (1)**

3:5

**87 (1)**

138:2

---

**9**

---

**9 (4)**

4:4 6:3 10:12 101:11

**9:14 (2)**

40:9,10

**9:24 (2)**

40:11,14

**9:58 (2)**

68:11,12

**90025 (1)**

3:11

**91016 (1)**

7:15

**93 (3)**

5:12,13,14

**97 (1)**

42:6

**99 (1)**

42:7