

# Exhibit 148

IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF NORTH CAROLINA

-----x

IN RE: Case No: 7:23-cv-00897

CAMP LEJEUNE WATER LITIGATION

-----x

VIDEOTAPED DEPOSITION OF STEVEN BIRD, M.D.

Wednesday, May 14, 2025

9:00 a.m. - 6:00 p.m.

Mandell, Boisclair & Mandell

One Park Row

Providence, RI 02903

Certified Court Stenographer:

Katherine A. Tevnan, CSR/RMR

1 APPEARANCES:

2  
3 U.S. DEPARTMENT OF JUSTICE

4 (Adam Bain, Esq. and

5 Jennifer E. Adams, Esq.)

6 P.O. Box 340

7 Ben Franklin Station

8 Washington, DC 20044

9 (202) 616-8289

10 jennifer.e.adams@usdoj.gov

11 for the Defendants.

12  
13 MANDELL, BOISCLAIR & MANDELL, Ltd.

14 (By Mark Mandell, Esq. and

15 Zachary Mandell, Esq.)

16 One Park Row

17 Providence, Rhode Island 02903

18 401-273-8330

19 mmandell@mbmjustice.com

20 zmandell@mbmjustice.com

21 for the Plaintiff.

22

1       ALSO PRESENT:

2               Robert Martignetti, Videographer

3  
4       PRESENT VIA ZOOM:

5               Mike Dowling, Esq.

6               Dowling PLLC

7               for the Plaintiff

8  
9               WALLACE & GRAHAM, P.A.

10              Whitney Wallace, Esq.

11              525 North Main Street

12              Salisbury, North Carolina 28144

13              704-633-5244

14              wallacegraham.com

15              for the Plaintiff

16  
17              Zina Bash

18              Ted Ruzicka

19              Diana Gjonaj

20              Jenna Bulter

21              Laura Shannon

22              Lucas White

I N D E X

Deposition of: Direct Cross Redirect Recross

STEVEN BIRD

By Mr. Bain 7

Mr. Mandell 342

	E X H I B I T S	
1	Number	Description
2		Page
3		
4	Exhibit 1	Subpoena 10
5	Exhibit 2	Curriculum Vitae 14
6	Exhibit 3	American College of 21
7		Emergency Physician expert
8		witness guidelines
9	Exhibit 4	Report on Bladder Cancer 35
10	Exhibit 5	Report on Kidney Cancer 35
11	Exhibit 6	Report on Parkinson's disease 35
12	Exhibit 7	Report on Leukemia and Non- 35
13		Hodgkin's Lymphoma
14	Exhibit 8	2009 National Research 38
15		Council report
16	Exhibit 9	June 5, 2024 Order 52
17	Exhibit	Dr. Bird's expert report in 56
18	10	the Feindt case
19	Exhibit	Toxicology Reports 85
20	11	article
21	Exhibit	Kern, et al study 98
22	12	
23	Exhibit	Dr. Bird's expert report 103
24	13	in the Hartman case
25	Exhibit	"Workplace exposure to diesel 104
26	14	and gasoline engine exhausts
27		and the risk of colorectal
28		cancer in Canadian men."
29	Exhibit	excerpts-ATSDR's 2018 142
30	15	Morbidity study
31	Exhibit	Excerpts of the ATSDR's 162
32	16	2024 cancer incidence study
33		preprint report
34	Exhibit	2024 ATSDR cancer 175
35	17	incidence study-print version
36	Exhibit	2024 mortality study. 179
37	18	for Camp Lejeune
38	Exhibit	Article by 184
39	19	Sullivan-Baca, et al.
40	Exhibit	Evaluation of mortality 196
41	20	among marines and navy
42		personnel exposed to



P R O C E E D I N G S

THE VIDEOGRAPHER: We are now on the record. My name is Robert Martignetti. I'm a videographer for Golkow. Today's date is May 14th, 2025, and the time is 9:00 a.m.

This video deposition is being held in Providence, Rhode Island, In Re: Camp Lejeune Water Litigation. The deponent is Steven Bird, M.D.

Counsel will be noted on the stenographic record. The court reporter is Kathy Tevnan and will now swear in the witness.

STEVEN BIRD, M.D.

a witness called for examination by counsel for the Defendant, being first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. BAIN:

Q. Good morning, Dr. Bird. Can you please state your name for the record?

A. Surely. Good morning. Steven Bird,



1 B-I-R-D.

2 Q. What is your current address?

3 A. Where I live?

4 Q. Yes.

5 A. 6 Laurel Ridge Lane in Shrewsbury,  
6 Massachusetts.

7 Q. Dr. Bird, my name is Adam Bain, and I'm  
8 representing the United States in this action.  
9 The court proceeding is under oath, so it is a --  
10 as if it is in a courtroom, even though it is  
11 not. Do you understand that?

12 A. Yes.

13 Q. And you understand you're under the  
14 obligation to tell the truth today?

15 A. Absolutely.

16 Q. The court reporter's taking down  
17 everything that we say, so it's important that we  
18 don't talk over each other and that we answer  
19 verbally yes or no, rather than shaking your head  
20 or some other indication. Do you understand  
21 that?

22 A. Yes.

1 Q. Once the deposition is complete, you will  
2 be given an opportunity to review the transcript.  
3 Do you understand that?

4 A. Yes.

5 Q. If you don't understand a question, I  
6 would ask that you let me know so that I can  
7 rephrase it. Is that good with you?

8 A. Yes.

9 MR. MANDELL: Adam, before you start  
10 substance, I don't want to interrupt you, but  
11 Dr. Bird does reserve the right to read and sign.  
12 Okay? Sorry.

13 Q. Is there any reason that you would be  
14 unable to give your most truthful and accurate  
15 testimony today?

16 A. No.

17 Q. At any time, if you need a break, just  
18 let me know, and we'll take a break as long as a  
19 question's not pending. Is that fine?

20 A. Sounds good.

21 Q. Do you have any questions before we begin  
22 the deposition?

1           A. Thank you for the opportunity to ask a  
2 question, but I don't have any.

3           Q. Okay. I'll show you the first exhibit  
4 today marked as Exhibit No. 1.

5                       (Exhibit 1, Subpoena,  
6                       marked for identification.)

7           Q. Dr. Bird, you've been handed Exhibit  
8 No. 1. Do you recognize this document as the  
9 subpoena for your deposition today?

10          A. I do.

11          Q. Have you reviewed the request for  
12 production of documents that's attached to the  
13 subpoena?

14          A. Yes.

15          Q. Do you have any responsive materials to  
16 produce?

17          A. I don't believe so.

18          Q. Are you withholding any materials that  
19 would be responsive, as far as you know?

20          A. No.

21          Q. Dr. Bird, have you ever been disqualified  
22 from testifying in any case?

1           A.    Could you be more specific?

2           Q.    Have you ever had any opinions that  
3    you've offered be excluded in any case that you  
4    know of?

5           A.    I have had limitations placed and/or  
6    exclusions.

7           Q.    Can you describe to me what those are, to  
8    the best of your recollection?

9           A.    Yes.    So an opinion was limited in the  
10   Red Hill litigation, which I think was called  
11   Feindt, F-E-I-N-D-T, versus I guess it was the  
12   U.S.

13                    So I was limited in providing opinions  
14   about long-term needs or long-term monitoring.  
15   There may be some other subtleties to that that  
16   I'm, you know, unfamiliar with.

17                    And in I believe it was Delaware, I was  
18   excluded from -- or limited or excluded relating  
19   to -- that was Zantac litigation.  That's all I'm  
20   familiar with.

21           Q.    Do you know the reason that you were  
22   excluded or limited in the Zantac litigation?

1           A. Well, first, I would say, since I was  
2 excluded, I've testified I think in front of  
3 four judges in the same cases, and that is under  
4 appeal.

5           It in part had to do with testing of  
6 Zantac pills that were expired because the drug  
7 had been withdrawn from the market and there were  
8 no unexpired pills. I think that's the --  
9 largely the substance of it.

10          Q. Do you recall the name of that case?

11          A. I think it's Wilson, but I could be  
12 mistaken.

13          Q. Any other circumstances where your  
14 opinions have been excluded or limited?

15          A. Not that I'm aware of.

16          Q. Have you ever been subject to a  
17 disciplinary action by a licensing body?

18          A. No.

19          Q. Have you ever been subject to a  
20 disciplinary action by a hospital?

21          A. No.

22          Q. By a laboratory?

1 A. Could you be more specific?

2 Q. A laboratory that you worked with, have  
3 you ever had any disciplinary action because of  
4 procedures at the laboratory?

5 A. I didn't have any disciplinary actions.  
6 I had privileges -- I withdrew my privileges and  
7 privileges were suspended for a year with the  
8 ability to reapply, which I did not do.

9 Q. Can you describe the circumstances of  
10 that?

11 A. Sure. So it was a lab. There was a  
12 postdoc from Japan. There was a relationship  
13 between UMass Med School and University of  
14 Sapporo. And this postdoc had been fully trained  
15 but did not follow procedures. I became aware of  
16 that, reported it to the IACUC, I-A-C-U-C,  
17 Institutional Animal Care and Use Committee.

18 There was a retraining, and then he again  
19 did not follow the protocol. So I terminated  
20 him, and that's what led to me voluntarily  
21 withdrawing privileges and having the privileges  
22 suspended for a year with the ability to reapply.

1 Q. And what were the reasons that privileges  
2 were withdrawn for you or you withdrew  
3 privileges, was it because of your supervision of  
4 that postdoc?

5 A. That's right. Yes, I was the PI, so I  
6 took responsibility, I reported him, and I -- and  
7 I withdrew.

8 Q. Have you ever been subject to any  
9 disciplinary action by a college or university?

10 A. No.

11 Q. Okay.

12 (Exhibit 2, Curriculum Vitae,  
13 marked for identification.)

14 MR. MANDELL: This will be 2?

15 MR. BAIN: Yes.

16 MR. MANDELL: Okay.

17 Q. I'm showing you what's been marked  
18 Exhibit No. 2. Can you identify this exhibit as  
19 your curriculum vitae and prior testimony, which  
20 were attached to each of your expert reports in  
21 this case?

22 A. That's what this is.

1 Q. Okay. And according to this curriculum  
2 vitae, you served on the Clinician Well-Being  
3 Cooperative of the National Academy of Medicine;  
4 is that right?

5 A. That's right.

6 Q. The National Academy of Medicine is part  
7 of the National Academies, which include the  
8 National Academies [sic] of Sciences and the  
9 National Academy of Engineering. Does that sound  
10 right?

11 A. Yes.

12 Q. And you're familiar with the National  
13 Academies, I take it?

14 A. Yes.

15 Q. Are you aware that the purpose of the  
16 National Academies is to produce and promote the  
17 adoption of independent, authoritative, trusted  
18 scientific advice ... for the benefit of society?  
19 Does that sound right?

20 A. I don't think I've ever read that. Maybe  
21 you could show me the source of that.

22 Q. What is your understanding of the purpose



1 of the National Academies?

2 A. Oh, I -- you'd have to be more specific  
3 than that.

4 Q. Well, you've been involved with the  
5 National Academy, right?

6 A. I've been involved with the National  
7 Academy of Medicine, that's right.

8 Q. And do you -- do you understand what the  
9 purpose of that body is?

10 A. I think it's got numerous purposes.

11 Q. And do you have any understanding of  
12 all -- of any of the purposes?

13 A. Well, certainly some of them.

14 Q. Okay. What is your understanding of some  
15 of the purposes?

16 A. To set the agenda for -- national  
17 research agenda with regard to certain aspects of  
18 medicine. And specifically that collaborative, I  
19 think it was called, was about physician or  
20 clinician well-being.

21 I don't think they -- they probably fund  
22 some research, but probably on a limited basis.

1 I suspect that there's some advocacy work that  
2 National Academy of Medicine does as well. I  
3 think that's probably the extent of my  
4 understanding.

5 Q. You're familiar with the National  
6 Research Council as an operating and programatic  
7 arm of the National Academies?

8 A. That's my understanding.

9 Q. Other than the Clinician Well-Being  
10 Cooperative, have you ever been a member of any  
11 other committee of the National Academies?

12 A. No.

13 Q. Have you ever been asked to be a member  
14 of any committee of the National Academies other  
15 than the one that you've participated in?

16 A. I don't believe so.

17 Q. Have you ever applied to be a member of  
18 any committee of the National Academies?

19 A. No.

20 Q. Have you cited the work of the National  
21 Academies in any of your publications?

22 A. I think I have about 75 publications. I

1 don't recall everything that I've cited, so I  
2 don't recall.

3 Q. Okay. I understand that. Do you recall  
4 ever having cited the National Academies' work?

5 A. My answer's the same.

6 Q. You don't recall?

7 A. Correct.

8 Q. Are you familiar with an epidemiologist  
9 named David Savitz?

10 A. Yes.

11 Q. How are you familiar with him?

12 A. He's written at least two books, I  
13 believe, so I'm familiar with -- with him to some  
14 degree.

15 Q. Are you aware that he's a professor of  
16 epidemiology at Brown University?

17 A. That was my understanding.

18 Q. Do you consider him an authority in the  
19 field of epidemiology?

20 A. It's not a term I typically use,  
21 authority or authoritative. Certainly he is well  
22 known and respected in the field.

1 Q. Are you familiar with his book,  
2 "Interpreting Epidemiological Evidence:  
3 Connecting Research to Applications"?

4 A. I think he's written at least two books.  
5 I don't -- and I have one of them. I think that  
6 may be the one I have.

7 Q. Okay. And would you consider that to be  
8 an authoritative work in the field of  
9 epidemiology?

10 A. Again, it's not a term I use, "authority"  
11 or "authoritative." It is a book that he wrote  
12 that people use.

13 Q. And that you possess?

14 A. I think I do.

15 Q. Are you familiar with his book called  
16 "Epidemiology and the Law"?

17 A. I've seen that referenced somewhere.  
18 I've never read it.

19 Q. Have you ever cited Dr. Savitz's work in  
20 any scientific materials that you've authored?

21 A. I don't recall.

22 Q. You've never discussed this case with

1 Dr. Savitz, have you?

2 A. I have not.

3 Q. You're aware that Dr. Savitz is an expert  
4 for the plaintiffs in this case, aren't you?

5 A. I know he wrote something. I don't know  
6 if he's an expert or not.

7 Q. Did you read what he wrote in this case?

8 A. I believe so -- well, I don't know what  
9 he wrote in this case. I did read something by  
10 Dr. Savitz.

11 Q. What do you recall reading by Dr. Savitz?

12 A. I believe it was a rebuttal statement to  
13 someone. I can't remember the details.

14 Q. Was it primarily focused on the topic of  
15 statistical significance?

16 A. I don't recall.

17 Q. Okay. You're a member of the American  
18 College of Emergency Physicians; is that right?

19 A. Yes.

20 Q. And you've been a member of that college  
21 since 1998; is that right?

22 A. That sounds about right.

1           Q.   You're familiar with the American College  
2 of Emergency Physicians expert witness  
3 guidelines, aren't you?

4           A.   Oh, I've heard of them or looked at them  
5 a long time ago.

6           Q.   Okay.

7                       (Exhibit 3, American College of  
8                       Emergency Physician expert witness  
9                       guidelines, marked for  
10                      identification.)

11          Q.   Dr. Bird, I'm showing you what has been  
12 marked as Exhibit No. 3, and this is the American  
13 College of Emergency Physician expert witness  
14 guidelines last approved in 2021. Do you see  
15 that?

16          A.   I do.

17          Q.   Do you attempt to bide -- abide by these  
18 guidelines in giving expert testimony in legal  
19 cases?

20          A.   Stand by. I have not seen this one.

21                       (Pause)

22                      MR. MANDELL: Adam, just so I

1 understand, the copy you're marking, is that the  
2 one in front of the doctor?

3 MR. BAIN: What I have done is the  
4 copy that's marking is a clean copy. I'm going  
5 to be pointing Dr. Bird to some particular  
6 provisions, which I've highlighted so that he can  
7 directly get to them.

8 MR. MANDELL: Okay. But -- okay. So  
9 that was my point, though.

10 MR. BAIN: Yes.

11 MR. MANDELL: We're not marking  
12 them -- we're not marking as an exhibit a  
13 premarked copy of it, with orange and green and  
14 yellow, right?

15 MR. BAIN: Right.

16 MR. MANDELL: Okay. All right.

17 A. I'm sorry. What was the question?

18 Q. You attempt to abide by the guidelines of  
19 this particular organization, the American  
20 College of Emergency Physicians expert witness  
21 guidelines?

22 A. Sure, I would agree with that.

1                   MR. MANDELL: Could you just show me  
2     the copy that you have in front of you, Doctor,  
3     that's marked up? I just want to take  
4     two seconds just to read the marked-up part.  
5     Okay?

6                   (Pause)

7                   MR. MANDELL: Thank you.

8           Q.     So, Dr. Bird, I wanted to --

9                   MR. MANDELL: I'm so sorry. It's my  
10    baby.

11           Q.     Directing your attention to the first  
12    yellow highlighted provision, the first of these  
13    guidelines states that "The expert witness should  
14    possess current experience and ongoing knowledge  
15    in the area in which he or she is asked to  
16    testify."

17                   Do you see that?

18           A.     Yes.

19           Q.     And do you abide by that guideline?

20           A.     Sure.

21           Q.     Is it important to you to do so?

22           A.     I don't know. I've seen this for the



1 first time now. I said I abide by the  
2 guidelines. I think that answers it.

3 Q. Is it important that an expert have the  
4 experience and ongoing knowledge in the area in  
5 which they are offering opinions?

6 A. I would generally agree with that.

7 Q. Why is that important?

8 A. To be able to give an opinion, one needs  
9 to have training, expertise, experience to offer  
10 that.

11 Q. Okay. You don't hold any degree in  
12 epidemiology, do you?

13 A. That's correct, I do not.

14 Q. You're not certified by the American  
15 College of Epidemiology?

16 A. That is correct.

17 Q. You've never held a professorship in a  
18 field of epidemiology?

19 A. I agree with that.

20 Q. You've never published in a  
21 epidemiological journal?

22 A. I think that's true.

1           Q.   You have never been the principal  
2   investigator for an epidemiological study, have  
3   you?

4           A.   That's true.

5           Q.   You list several papers and peer-reviewed  
6   journals in the CV that you've attached in this  
7   case as Exhibit No. 2, right?

8           A.   Yes.

9           Q.   There's a section called "Papers and  
10   Peer-Reviewed Journals"; is that right?

11          A.   That's right.

12          Q.   None of those publications involve any of  
13   the chemicals at issue in this case, specifically  
14   PCE, TCE, DCE, vinyl chloride, or benzene; is  
15   that true?

16          A.   That is true.

17          Q.   And none of those publications involve  
18   any of the diseases at issue in this case,  
19   specifically kidney cancer, bladder cancer,  
20   leukemia, NHL, or Parkinson's disease; is that  
21   true?

22          A.   Stand by.

1 MR. MANDELL: Adam, you're referring  
2 to the Tier 1 diseases?

3 MR. BAIN: Yes.

4 MR. MANDELL: Okay.

5 A. I would agree with that.

6 Q. In your CV, you have a list of several  
7 book chapters; is that true?

8 A. Book chapters and book sections, yes.

9 Q. Okay. Book chapters and book sections.  
10 None of those book chapters involve any of the  
11 chemicals at issue in case, PCE, TCE, DCE, vinyl  
12 chloride, or benzene, correct?

13 A. I don't recall all the chapters, but I  
14 suspect that is true.

15 Q. And none of those book chapters involve  
16 any of the diseases at issue in this case, kidney  
17 cancer, bladder cancer, leukemia, NHL, or  
18 Parkinson's disease, the Track 1 diseases; is  
19 that true?

20 A. Stand by.

21 (Pause)

22 A. I believe that's true.

1 Q. Okay. Dr. Bird, you don't hold a legal  
2 degree, do you?

3 A. An illegal degree?

4 Q. A legal degree. J.D., juris doctor.

5 A. Okay. I do not hold a J.D.

6 Q. You're not licensed to practice law?

7 A. That is correct.

8 Q. Have you ever enrolled in law school?

9 A. No.

10 Q. Have you done any legal research in the  
11 topic of legal burdens of proof?

12 A. Oh, I don't understand that question.

13 Q. Okay. Do you know what a legal burden of  
14 proof is?

15 A. No.

16 Q. Let me draw your attention to the next  
17 guideline marked in orange on Exhibit 3. Do you  
18 see where it says, "The expert witness should  
19 review the medical facts in a thorough, fair, and  
20 objective manner and should not exclude any  
21 relevant information to create a view favoring  
22 either the plaintiff or defendant"?

1 A. That's not the second highlighted --

2 Q. Oh, I'm sorry. Excuse me. I don't want  
3 to -- I wanted to turn the page. Actually, go  
4 back to the other page. I skipped ahead a little  
5 bit.

6 I did want to draw your attention to the  
7 one marked in orange, which it says, "The expert  
8 witness should not provide expert medical  
9 testimony that is false, misleading, or without  
10 medical foundation. The key to this process is a  
11 thorough review of available and appropriate  
12 medical records and contemporaneous literature  
13 concerning the case being examined."

14 Do you see that?

15 A. Yes.

16 Q. And do you attempt to abide by that  
17 guideline?

18 A. Sure.

19 Q. Why is that important?

20 A. Well, it includes reviewing relevant  
21 data, contemporaneous literature, as well as  
22 older literature, and so in order to give an

1 expert opinion, I think one should generally  
2 abide by that.

3 Q. Okay. Now turn to the next page. That's  
4 the one that I had read earlier. "The expert  
5 witness should review the medical facts in a  
6 thorough, fair, and objective manner and should  
7 not exclude any relevant information to create a  
8 view favoring either the plaintiff or the  
9 defendant."

10 Do you see that?

11 A. Yes.

12 Q. And do you attempt to abide by that  
13 guideline?

14 A. Sure. Certainly be an objective  
15 reviewer, yes.

16 Q. Why is that important?

17 A. Well, exactly what it says there. In  
18 order to review, give a fair and thorough and,  
19 importantly, objective manner, one should do  
20 that.

21 Q. In particular, why is it important not to  
22 exclude relevant information to create a view

1 favoring either the plaintiff or the defendant?

2 A. Well, there's a difference I think -- I  
3 don't know exactly what they mean about should  
4 [sic] exclude relevant information. Because at  
5 times there is lots and lots of information, and  
6 one can't include all relevant information. So  
7 because it's not always all included doesn't mean  
8 it was excluded.

9 Q. Did you have any staff supporting your  
10 work on this case?

11 A. Any who?

12 Q. Staff.

13 A. No.

14 Q. So you did it all by yourself?

15 A. I did.

16 Q. What percentage of your annual income is  
17 earned from serving as an expert witness in  
18 litigation?

19 A. It historically had been around  
20 15 percent or so.

21 Q. Is your hourly rate in this case the same  
22 as the hourly rate for other cases in which you

1     serve as an expert?

2           A.   Yes.   Well, the same rate as I charged in  
3   2024.

4           Q.   Can you elaborate on that?   So are you  
5   charging the same rate now that you charged in  
6   2024 on the other cases you worked on; is that  
7   what you're saying?

8           A.   I'm saying I became involved in this case  
9   in 2024, and my fees in this case are what I  
10  charged in 2024.

11           In 2025, I changed my fee schedule.   But  
12  since I started work on this in 2024, my fee  
13  schedule from 2024 applies.

14          Q.   Okay.

15          A.   Does that make sense?

16          Q.   I think so.   You worked on the Red Hill  
17  case in 2024 some, correct?

18          A.   Yes.

19          Q.   And did you charge the same rate in the  
20  Red Hill case as you're charging in this case?

21          A.   I think so, although Red Hill started in  
22  '23.



1           Q.   Okay.  So what you're saying is that the  
2   rate that you charge initially, you keep that  
3   rate throughout no matter the -- that you might  
4   change your rate for new cases in subsequent  
5   years; is that right?

6           A.   That's right.

7           Q.   Okay.

8           A.   Was that -- was that clear?  Did I --

9           Q.   I think so.

10          A.   Okay.

11          Q.   Thanks for clarifying that.

12                         MR. MANDELL:  It was clear to me.  
13   Thank you.

14          Q.   Have you ever served as an expert witness  
15   for a defendant in a toxic tort case?

16          A.   Could you ask that again?

17          Q.   Have you ever served as an expert witness  
18   for a defendant in a toxic tort case?

19          A.   I -- I just don't know how to answer that  
20   because I don't know if I have been disclosed or  
21   not.  I probably have not.

22          Q.   So you've never been disclosed as an

1 expert for a defendant in a toxic tort case; is  
2 that correct?

3 A. That I would agree with.

4 Q. But you believe you've been retained by a  
5 defendant in a toxic tort case, but not  
6 disclosed?

7 A. Yes.

8 Q. Prior to this case, have you ever worked  
9 for any of the law firms that are involved in  
10 this case? And I will list some of them that are  
11 in the leadership group. Bell Legal, Keller  
12 Postman, Lieff Cabraser, the Dowling Law Firm,  
13 Weitz & Luxemberg, Wallace & Graham, Motley Rice.  
14 Any of those firms?

15 A. Yes.

16 Q. Which of those firms have you worked for  
17 before?

18 A. So I worked with Motley Rice in the  
19 Hawaii Red Hill. I've worked with Keller Postman  
20 in Zantac litigation. And the Weitz & Luxemberg  
21 sounds familiar, but I don't know for sure.

22 Q. Okay. Have you ever worked with the

1 Mandell firm before?

2 A. No.

3 Q. You produced four general causation  
4 reports in this case; is that correct?

5 A. That's right.

6 Q. There was one report on bladder cancer,  
7 correct?

8 A. Yes.

9 Q. One report on kidney cancer?

10 A. Yes.

11 Q. One report on Parkinson's disease?

12 A. Yes.

13 Q. And one report on leukemia as a  
14 non-Hodgkin's lymphoma; is that right?

15 A. That's correct. And a supplemental  
16 report.

17 Q. Yes. Thanks.

18 MR. BAIN: Can we go off the record  
19 for just a minute?

20 MR. MANDELL: Sure.

21 THE VIDEOGRAPHER: The time is  
22 9:29 a.m., and we're off the record.

1 (Discussion off the record)

2 (Exhibit 4, Report on Bladder Cancer,  
3 marked for identification).

4 (Exhibit 5, Report on Kidney Cancer,  
5 marked for identification.)

6 (Exhibit 6, Report on Parkinson's  
7 Disease, marked  
8 for identification).

9 (Exhibit 7, Report on Leukemia and  
10 Non-Hodgkin's lymphoma,  
11 marked for identification)

12 THE VIDEOGRAPHER: The time is

13 9:31 a.m., and we're on the record.

14 BY MR BAIN:

15 Q. Dr. Bird, while we were off the record,  
16 we got your reports in this case, and we've  
17 identified them as Exhibit No. 4 being your  
18 report on bladder cancer, Exhibit No. 5 being  
19 your report on kidney cancer, Exhibit No. 6 being  
20 your report on Parkinson's disease, and Exhibit  
21 No. 7 being your report on leukemia and  
22 non-Hodgkin's lymphoma. Do you see that?

1 A. Yes.

2 Q. And for each of those reports, you  
3 provided a materials considered list, right, with  
4 the report?

5 A. That's my recollection.

6 Q. And the materials considered list  
7 includes some materials that were provided by  
8 counsel and also additional materials that you  
9 independently gathered?

10 A. I don't know that counsel provided me  
11 anything. I -- well, let's take a look.

12 Q. And we'll go through some of them more  
13 specifically, but if you want to take a look.

14 A. Oh, sure they did. I don't know what  
15 these are called. Law citations --

16 Q. Okay.

17 A. -- maybe.

18 Q. So some were provided by counsel and some  
19 you independently gathered; is that right?

20 A. Yeah. Certainly the law citations I was  
21 provided. The literature was done by me.

22 Q. And the literature that you've included

1 in the materials considered list, how did you  
2 gather that literature?

3 A. Well, I believe I describe it in my  
4 report on page 6.

5 Q. And you're looking at Exhibit No. 4 now,  
6 the bladder cancer report?

7 A. That's right.

8 Q. Just for the record.

9 A. That's right.

10 Q. Okay. And that's the methodology by  
11 which you gathered the literature; is that right?

12 A. Yes.

13 Q. If an item's not listed on one of the  
14 materials considered list, it's fair to assume  
15 that you did not consider that item in forming  
16 your opinions in this case, correct?

17 A. I think that's correct insofar it didn't  
18 specifically rate -- relate to my opinion, but I  
19 reviewed lots of data, which kind of informed my  
20 opinions generally.

21 Q. You understood that you were supposed to  
22 list the -- any facts or data that you considered

1 in forming your opinions as part of your  
2 materials considered list, correct?

3 A. I would generally agree with that.

4 Q. In 2009, the National Research Council of  
5 the National Academies published a report  
6 entitled "Contaminated Water Supplies at  
7 Camp Lejeune: Assessing Potential Health  
8 Effects." Were you aware of that?

9 A. 2009, right. 16 years ago, yes.

10 Q. You were aware of that report?

11 A. Yes.

12 Q. And that document is not listed on your  
13 materials considered list?

14 A. I don't recall.

15 Q. Do you want to take a moment to take a  
16 look at the one for the bladder cancer case?

17 (Pause)

18 A. Yeah, I don't see it listed there.

19 Q. Do you recall reviewing that report?

20 A. Vaguely.

21 (Exhibit 8, 2009 National  
22 Research Council report,

1 marked for identification.)

2 Q. I'm having marked as the next exhibit in  
3 order --

4 MR. MANDELL: It would be 8.

5 Q. -- Exhibit 8 --

6 MR. BAIN: Thank you.

7 Q. -- the 2009 National Research Council  
8 report on "Contaminated Water Supplies at  
9 Camp Lejeune: Assessing Potential Health  
10 Effects."

11 And I want to direct your attention to  
12 page 1 of that report. Do you see --

13 A. Hold on. There's a lot of Roman  
14 numerals.

15 MR. MANDELL: There are.

16 Q. And this is just an excerpt of the  
17 report.

18 A. Oh. Sorry.

19 Q. Yeah. There's tabs to help you find it.

20 A. Thank you.

21 Q. And do you see "The Charge to the  
22 Committee" on page 1 of the report, which says,



1 "The charge had several elements. One was to  
2 review the scientific evidence about the kinds of  
3 adverse health effects that occur -- could occur  
4 after exposure to TCE, PCE, and other  
5 contaminants. The second was to evaluate studies  
6 that were performed or that are under way on  
7 former residents of the base and to consider how  
8 useful it will be to conduct additional studies.  
9 The third element was to identify scientific  
10 considerations that could help the Navy set  
11 priorities on future activities. The  
12 responsibility of the committee was to address  
13 its charge in a dispassionate, expert, and  
14 unbiased way. Analyses and findings were neither  
15 subject to oversight nor influenced by the agenda  
16 of any of the entities with [the responsibility]  
17 for Camp Lejeune, former or current residents of  
18 Camp Lejeune, or any other entity."

19 Do you see that?

20 A. Yes.

21 Q. Directing your attention to page Roman  
22 numeral V.

1 A. Yes.

2 Q. Do you see where it lists the makeup of  
3 the "Committee on Contaminated Drinking Water at  
4 Camp Lejeune"?

5 A. Yes.

6 Q. Do you see that Dr. Savitz is the  
7 chairman of that committee?

8 A. Yes.

9 Q. Including Dr. Savitz, how many scientists  
10 are on the committee, do you see?

11 A. 13.

12 Q. Are you familiar with any of the  
13 scientists on the committee?

14 A. Some of the names look familiar, but I  
15 wouldn't know their face.

16 Q. Would it be fair to say that you have not  
17 co-authored any articles or book chapters with  
18 any -- with any of the members of the committee?

19 A. That's true.

20 Q. Do you know whether you've cited any of  
21 their scientific work in any of the articles or  
22 book chapters that you've published?

1           A. I don't recall.

2           Q. Are you aware that the National Research  
3 Council uses a peer-review process when it  
4 produces a report like this?

5           A. Peer-review process can -- it can be a  
6 number of different ways that's done. So could  
7 you be more specific?

8           Q. What does "peer review" mean to you?

9           A. Well, it depends on context.

10          Q. Okay. And you did work for the National  
11 Academies. Was there any peer review of the work  
12 that you did?

13          A. I don't know that the NAM work I did with  
14 their collaborative had any peer review.

15          Q. Was a report produced?

16          A. There have been a number of reports.

17          Q. From that group?

18          A. Yes.

19          Q. And you're not aware of any peer review  
20 of those reports?

21          A. Correct.

22          Q. Okay. Let me direct your attention to

1 page Roman numeral X. Do you see the yellow  
2 highlighted portion? It says the "report has  
3 been reviewed in draft form by persons chosen for  
4 their diverse perspectives and technical  
5 expertise in accordance with procedures approved  
6 by the National Research Council's Report Review  
7 Committee. The purpose of the independent review  
8 is to provide candid and critical comments that  
9 will assist the institution in making its  
10 published report as sound as possible and to  
11 ensure that the report meets institutional  
12 standards of objectivity, evidence, and  
13 responsiveness to the study charge. The review  
14 comments and draft manuscript remain confidential  
15 to protect the integrity of the deliberative  
16 process. We thank the following for their review  
17 of this report: John L. Adgate, University of  
18 Minnesota; Mary P. Anderson, University of  
19 Wisconsin; Richard Clapp, Boston University;  
20 Mary C. Hill, U.S. Geological Survey; Margot  
21 Krauss, consultant; Lawrence H. Lash, Wayne State  
22 University; Rosalind A. Schoof, Integral

1 Consulting, Inc; Michael A. Stoto, Georgetown  
2 University; Clifford Weisel, University of  
3 Medicine and Dentistry of New Jersey; and  
4 Raymond S. Yang, Colorado State University."

5 Are you familiar with any of the  
6 scientists involved in the peer review of this  
7 report?

8 A. I'm familiar with the name Lash and maybe  
9 Weisel.

10 Q. Okay. How are you familiar with them?

11 A. Again, I couldn't -- I don't know what  
12 they look like, but just through research,  
13 literature review, reviewing documents.

14 Q. Okay. So you haven't collaborated with  
15 them in any investigations or articles; is that  
16 fair?

17 A. That's fair.

18 Q. Or any of the other scientists listed on  
19 the peer review committee?

20 A. That is correct.

21 Q. Turning to a page 8 of the report. Do  
22 you see Box 2, "Categorization of Health Outcomes

1 Reviewed in Relation to TCE, PCE, or Solvent  
2 Mixtures"?

3 A. Yes.

4 Q. Do you see the categories are:  
5 "Sufficient Evidence of a Causal Relationship,"  
6 "Sufficient Evidence of an Association,"  
7 "Limited/Suggestive Evidence of an Association,  
8 Inadequate/Insufficient Evidence to Determine  
9 Whether an Association Exists," and  
10 "Limited/Suggestive Evidence of No Association."

11 Do you see those categories?

12 A. Yes.

13 Q. You're familiar with that categorization  
14 scheme?

15 A. I don't know that I've seen this exact  
16 categorization scheme elsewhere. It's not the  
17 categorization scheme relevant for Camp Lejeune.

18 Q. And when you say it's not relevant to  
19 Camp Lejeune, why do you say that?

20 A. Well, this isn't what the ATSDR said or  
21 Institute of Medicine or the Camp Lejeune Justice  
22 Act, is my understanding.

1           Q.   So it's not the same categorization  
2   scheme used by the ATSDR in its Assessment of  
3   Evidence?

4           A.   That's correct.

5           Q.   Okay.  We're going to get to that a  
6   little bit later.

7                   Is this categorization scheme used in the  
8   work that you do outside of litigation ever?

9           A.   I'm not sure.

10          Q.   And do you see from this box that the  
11   National Research Council committee considering  
12   the Camp Lejeune water contamination in the year  
13   of this report, which I believe was 2009, with  
14   respect to TCE, PCE, and solvent mixtures did not  
15   list any diseases in the category of "Sufficient  
16   Evidence of a Causal Relationship" or "Sufficient  
17   Evidence of Association."  Do you see that?

18          A.   I see that's what it says.

19          Q.   And kidney cancer is listed in the  
20   "Limited/Suggestive Evidence of Association."  Do  
21   you see that?

22          A.   I do.

1 Q. And bladder cancer is listed in  
2 "Limited/Suggestive Evidence of Association" with  
3 respect to PCE. Do you see that?

4 A. Yes.

5 Q. Adult leukemia's listed in  
6 "Limited/Suggestive Evidence of Association" with  
7 respect to "solvent mixtures." Do you see that?

8 A. Yes.

9 Q. Non-Hodgkin lymphoma is listed in  
10 "Inadequate/Insufficient Evidence to Determine  
11 Whether an Association Exists." Do you see that?

12 A. Yes.

13 Q. And Parkinson's disease is listed in  
14 "Inadequate/Insufficient Evidence to Determine  
15 Whether an Association Exists," right?

16 A. That's right.

17 Q. You're unaware of the reasoning process  
18 that the National Research Council Committee of  
19 Scientists used to place the diseases in these  
20 categories because you did not consider this  
21 report in reaching your conclusions in this case,  
22 correct?



1           A. I'm sorry. It was a long one, so I don't  
2 understand it.

3           Q. Okay. Are you familiar with the  
4 reasoning process that the National Research  
5 Council committee used to place the diseases in  
6 the categories that it did here?

7           A. I'm sorry. I don't know what "reasoning  
8 process" means.

9           Q. The analysis it used.

10                   MR. MANDELL: He's just asking if  
11 you're aware of it.

12           A. I'm not aware of it.

13           Q. Okay. Because you did not list this  
14 report in your materials considered list, right?

15                   MR. MANDELL: Objection.

16                   Go ahead.

17           A. Well, it's not -- it's not because I  
18 didn't list it. It's because I don't know.

19           Q. Okay.

20                   MR. MANDELL: Could I just say, give  
21 me a second just to object.

22                   THE WITNESS: Surely.

1                   MR. MANDELL: And then I can put that  
2 on the record, and then you can answer.

3                   THE WITNESS: Got it.

4                   MR. MANDELL: Thank you.

5           Q. Are you aware that the chair of the NRC  
6 committee, Dr. Savitz, was deposed earlier in  
7 this case?

8           A. I don't know that I was aware of that.

9           Q. Okay. Dr. Savitz's deposition is not  
10 listed in your materials considered list for any  
11 of your reports, true?

12          A. That's true.

13          Q. So it's fair to assume that you did not  
14 consider Dr. Savitz's testimony in this case in  
15 reaching your opinions?

16          A. I would agree with that.

17          Q. Okay. You have a section in each of your  
18 reports entitled "'At Least As Likely As Not'  
19 Standard."

20                 So if you look, for example, at  
21 Exhibit 4, on page 7 in the bladder cancer  
22 report, do you see that section entitled "'At

1 Least As Likely As Not' Standard"?

2 A. Conveniently highlighted for me. Thank  
3 you. Yes, I see it.

4 Q. Did plaintiffs' counsel provide you with  
5 the burdens and standard of proof section of the  
6 Camp Lejeune Justice Act?

7 A. I don't recall.

8 Q. You don't recall how you became aware of  
9 that particular provision in the statute?

10 A. Correct.

11 Q. Do you recall how you came to put that  
12 provision of the statute in your report, why you  
13 thought it was significant to put that in your  
14 report?

15 A. Well, I think that's -- it's in there  
16 because it's an important part of this whole  
17 litigation.

18 Q. And what's your understanding that it's  
19 an important part of the whole litigation?

20 A. Well --

21 MR. MANDELL: Objection. I'm going  
22 to instruct you not to answer that to the extent

1 that any of that information comes from  
2 conversations you've had with any plaintiffs'  
3 counsel in this case. If you can answer it  
4 otherwise, please feel free to do that. Okay?

5 THE WITNESS: Thank you.

6 A. Could you ask it again?

7 Q. I'm going to see if I can ask the court  
8 reporter if she can read that for me.

9 (Record read)

10 MR. MANDELL: And again, my  
11 objection. Okay? Thank you.

12 A. I can't answer that question because it  
13 would disclose conversations with counsel.

14 Q. Do you recall whether you have read the  
15 complete language of the statute in addition to  
16 the section that you quote in your report?

17 A. I don't -- I don't recall. I've read  
18 lots of things.

19 Q. If you look on your bladder cancer  
20 report, which is Exhibit 4, I believe, and you  
21 look at the last page of the materials considered  
22 list. I think it's the very last page there.

1 A. Yes.

2 Q. Do you see that you have listed "Order  
3 In re: Camp Lejeune Water Litigation," the case  
4 number's there, Docket No. 227, Eastern District  
5 of North Carolina, June 5, 2024?

6 A. Yes.

7 Q. And was that among the materials that  
8 counsel provided to you?

9 A. That's my recollection.

10 Q. Did you review that order?

11 A. To some degree, yes.

12 Q. Okay.

13 (Exhibit 9, June 5, 2024 Order,  
14 marked for identification.)

15 Q. Dr. Bird, I've marked as Exhibit 9 that  
16 order, which is the June 5, 2024, order, that is  
17 on the last page of your materials considered  
18 list. And I'd like you to turn to -- hold on  
19 just a second -- page 11 of that order.

20 A. Okay.

21 Q. Do you see the highlighted language  
22 there, which states, "Congress's express

1 alteration of the burden of proof in  
2 subsection 804(c) does not demonstrate Congress's  
3 intent to replace the common-law causation  
4 framework"?

5 MR. MANDELL: Just for the record,  
6 the first word.

7 MR. BAIN: Okay.

8 MR. MANDELL: That's okay. I'm sure  
9 you just want to be complete.

10 MR. BAIN: Yeah. I will. I'll  
11 reread it. Thank you for that.

12 MR. MANDELL: No. That's fine.  
13 Yeah. That's fine.

14 Q. So it says, "Yet Congress's express  
15 alteration of the burden of proof in  
16 subsection 804(c) does not demonstrate Congress's  
17 intent to replace the common-law causation  
18 framework."

19 Do you see that?

20 A. Yes.

21 Q. Would it be fair to say that you don't  
22 have legal training to opine on the common-law

1 causation framework?

2 A. I would agree with that.

3 Q. If you'd turn to page 13 of this exhibit.  
4 And do you see the first sentence on page 13,  
5 which states, "The causal framework for a CLJA  
6 claim and the burden of proof applicable to that  
7 framework are interlocking parts, but  
8 Congressional change to one portion does not  
9 necessitate a change to the other."

10 Do you see that?

11 A. Yes.

12 Q. Is it fair to say that you don't have the  
13 legal training to evaluate whether that is a  
14 correct statement of statutory interpretation?

15 A. I would thankfully agree with that.

16 Q. Turn to page 15. And if you look about  
17 halfway down the middle paragraph on that page,  
18 do you see where it says, "Although the same  
19 language canon could apply to the phrase 'as  
20 likely as not,' that phrase pertains to burdens  
21 of proof, not causation."

22 Do you see that?

1           A.    Yes.

2           Q.    And again, you're not a lawyer and don't  
3   have legal training to opine whether a burden of  
4   proof used to evaluate evidence in a legal case  
5   is the same as a standard that a scientist uses  
6   to evaluate epidemiological and toxicological  
7   findings in support of a scientific conclusion?

8           A.    I agree with that.

9           Q.    Okay.  You've done a lot of expert work  
10  over the past four years.  Would you agree with  
11  that?

12          A.    I've done some.

13          Q.    Your report lists approximately 40 cases  
14  in which you've testified at trial or deposition  
15  in the last four years.  If you look at your  
16  exhibit I believe 2, which is your CV.

17          A.    Yes.

18          Q.    You prepared expert reports in many of  
19  those cases, didn't you?

20          A.    I don't recall.  Certainly some of them.

21          Q.    For those cases in federal court where  
22  you testified, you're required to produce an



1 expert report; is that true?

2 A. I don't know what a federal court is or  
3 not a federal court.

4 Q. Okay. But you have produced some reports  
5 in some of those cases?

6 A. Yes.

7 Q. Is it fair to say that you did not quote  
8 sections of the applicable statute in any reports  
9 for those cases other than this case?

10 MR. MANDELL: Objection.

11 A. Oh, I don't recall.

12 Q. You don't recall whether you've ever  
13 cited sections of the statute in other reports?

14 MR. MANDELL: Objection.

15 A. I just don't recall.

16 Q. Let me show you an example of an expert  
17 report that you did in a prior case.

18 (Exhibit 10, Dr. Bird's expert report  
19 in the Feindt case,  
20 marked for identification.)

21 Q. I've had marked as Exhibit 10 your expert  
22 report -- or at least the start of your expert

1 report in the Feindt case. Do you see that?

2 A. I don't have a copy.

3 Q. Okay. Well, I'm sorry. I'm holding it.

4 MR. MANDELL: Could I just ask, Adam.

5 MR. BAIN: Yeah.

6 MR. MANDELL: I know you've marked  
7 this as Exhibit 10. But on the very first page,  
8 it says "Exhibit A."

9 MR. BAIN: Yes.

10 MR. MANDELL: Could you just clarify  
11 so it doesn't get confusing?

12 MR. BAIN: Yes, I will. So this is  
13 taken from a filing in the Feindt case, I  
14 believe. It was Exhibit A to some type of  
15 filing, as I recall.

16 MR. MANDELL: That's fine. So  
17 Exhibit 10 in this case is Exhibit A in a  
18 different case?

19 MR. BAIN: Yes.

20 MR. MANDELL: Okay.

21 Q. Do you recognize this as the first  
22 six pages of your report in the Feindt case?

1           A. Well, I'm glad you clarified that because  
2 I didn't recall a six-page report. So I think --

3           Q. Okay.

4           A. -- yeah, this looks to be the first  
5 six pages of a report.

6           Q. Do you know what the applicable statute  
7 was in the Feindt case?

8           A. No.

9           Q. You weren't aware that it was a Federal  
10 Tort Claims Act?

11                   MR. MANDELL: Objection.

12                   Go ahead.

13           A. I don't know.

14           Q. You did not cite any section of the  
15 Federal Tort Claims Act in the expert report you  
16 prepared in Feindt v. The United States, did you?

17                   MR. MANDELL: Objection.

18                   Go ahead.

19           A. Stand by.

20                   (Pause)

21           A. But at least not in the first six pages.

22           Q. As you sit here today, can you recall

1 having cited language of the statute in any prior  
2 report that you've written other than this case?

3 MR. MANDELL: Objection.

4 Go ahead.

5 A. Stand by.

6 (Pause)

7 A. I don't recall.

8 Q. If you look at Exhibit 10 again, which is  
9 the first six pages of your report in the Feindt  
10 case, do you see on page 5 and 6 you have a  
11 "Summary of Opinions" in that case?

12 A. Stand by.

13 (Pause)

14 A. Yes.

15 Q. And for the second opinion that you have  
16 in the summary of opinions, you state that, "The  
17 dose and duration of JP-5 exposure were  
18 sufficient to cause acute and long-term  
19 injuries," correct?

20 A. Yes.

21 Q. You didn't express an opinion that the  
22 JP-5 exposure was more likely than not sufficient

1 to cause acute and long-term injuries, did you?

2 MR. MANDELL: Objection.

3 A. I -- my words here are as you read them.

4 Q. Okay. So you did not include the phrase  
5 "more likely than not" in that opinion?

6 MR. MANDELL: Objection.

7 Go ahead.

8 A. I did not.

9 Q. And you did not express an opinion that  
10 JP-5 exposure was as likely as not sufficient to  
11 cause acute and long-term injuries, did you?

12 MR. MANDELL: Objection.

13 A. I did not.

14 Q. You've used the phrase "reasonable degree  
15 of scientific certainty" before, haven't you?

16 A. Yes.

17 Q. What does that phrase mean to you?

18 A. "Reasonable degree of scientific  
19 certainty" to me means more than 50 percent.

20 Q. Have you ever used the phrase "reasonable  
21 degree of scientific probability"?

22 A. Probably.

1 Q. And what does that phrase mean to you?

2 A. The same as scientific certainty. More  
3 than -- a hair more than 50 percent.

4 Q. How does that compare to "as likely as  
5 not"?

6 MR. MANDELL: Objection.

7 Go ahead.

8 A. Well, I think "as likely is [sic] not" is  
9 really a framework for weighing the evidence,  
10 whereby scientific probability or medical  
11 certainty is an opinion about causation.

12 Q. Can you elaborate on that?

13 MR. MANDELL: Objection.

14 Go ahead.

15 A. I don't think I can.

16 Q. Okay. Are you aware of any published  
17 guidelines on how to apply the "as likely as not"  
18 standard to scientific evidence?

19 A. Sorry. I thought you were going  
20 somewhere else. Can you say that one again?

21 Q. Okay. Are you aware of any published  
22 guidelines on how to apply the "as likely as not"

1 standard to scientific evidence?

2 A. I don't recall seeing that anywhere.

3 Q. You need a break? Do you want to take a  
4 five-minute break?

5 MR. MANDELL: I'm doing fine.

6 Are you okay?

7 THE WITNESS: Yeah. Let's go a  
8 little bit more.

9 MR. BAIN: Okay.

10 Q. You cite the Bradford Hill criteria in  
11 each of your reports, correct?

12 A. Stand by.

13 (Pause)

14 A. Yeah. The Bradford Hill viewpoints,  
15 that's right.

16 Q. What's your understanding of the Bradford  
17 Hill criteria? What are they used for?

18 A. Bradford Hill criteria came out of a  
19 lecture from Sir Austin Bradford Hill in 1965,  
20 discussing nine considerations when evaluating  
21 epidemiologic evidence and causation.

22 Q. And one of the Bradford Hill criteria is

1 strength of association, right?

2 A. Yes.

3 Q. And in your reports, applying the  
4 Bradford Hill criteria of strength of association  
5 comparing the chemical and disease, you reference  
6 an odds ratio of greater than 1.1, which you  
7 reference as statistical significance and as  
8 fulfilling this criteria. Is that correct?

9 MR. MANDELL: Objection.

10 You can answer.

11 A. Let me just see where.

12 (Pause)

13 A. Can you show me --

14 Q. Yeah. Let me reference you to the  
15 leukemia report, which is No. -- Exhibit No. 7.  
16 And if you turn to page 53.

17 A. Stand by.

18 Q. Okay. I can read there where -- the  
19 "Strength of Association" criteria you have there  
20 at the bottom of the page. And it says,  
21 "Strength of association is demonstrated by  
22 statistical significance. That is, an odds ratio



1 for the occurrence of an adverse health effect in  
2 those exposed to benzene of greater than 1.1  
3 (given the as likely as not standard applicable  
4 to Camp Lejeune)."

5 Do you see that?

6 A. Yes.

7 Q. And is it true that you use identical  
8 language essentially for every chemical and  
9 disease across the reports in which you apply the  
10 Bradford Hill criteria in this case?

11 A. Oh, I don't know that that's true.

12 Q. Okay. Do we need to look at every one?

13 A. My answer is I -- I don't know that  
14 that's true.

15 Q. Okay. Let's take a look at each one,  
16 because this is an important point, I think.

17 MR. MANDELL: Objection. I move to  
18 strike the editorialization. Okay?

19 Q. Okay. On Exhibit I guess that would be  
20 6, which is the Parkinson's report, if you look  
21 at page 35.

22 A. Okay. I'm there.

1           Q. Do you see where you use the same  
2 language in the first -- it says, I'll just read  
3 it, "Strength of association is demonstrated by  
4 statistical significance. That is, an odds ratio  
5 for the occurrence of an adverse health effect in  
6 those exposed to the contaminated Camp Lejeune  
7 water of greater than 1.1."

8                   Is that what it says there?

9           A. It does. Those aren't the same words in  
10 the other report.

11          Q. Okay. But it's essentially the same  
12 statement, correct, would you agree with that?

13                   MR. MANDELL: Objection.

14                   You can answer.

15          A. I mean, the words are the words.

16          Q. Okay. And then if you look at Exhibit 4.

17          A. Is that kidney or bladder?

18          Q. Bladder. Page 45.

19          A. Okay.

20          Q. "Strength of Association. Strength of  
21 association is demonstrated by statistical  
22 significance. That is, an odds ratio for the

1 occurrence of an adverse health effect in those  
2 exposed to TCE of greater than 1.1" is what you  
3 state there, correct?

4 A. That's right.

5 Q. And then for the kidney cancer report.  
6 Have you found it in that report? Go to page 46.

7 A. Okay.

8 Q. First full paragraph, it says, "Strength  
9 of association is demonstrated by statistical  
10 significance. That is, an odds ratio for the  
11 occurrence of an adverse health effect in those  
12 exposed to TCE water of greater than 1.1," is  
13 what you state in that report; is that right?

14 A. That's right.

15 Q. Okay. Would you agree it's important to  
16 analyze the risk ratios in a study's results?

17 A. Sure.

18 Q. The risk ratio indicates the level of an  
19 association observed; is that true?

20 A. That is a numerical representation of the  
21 association that they found, and then one can use  
22 that to opine or give a conclusion about

1 causation.

2 Q. A risk ratio of 1.0 indicates no  
3 association, correct?

4 A. I would agree with that.

5 Q. Would you agree that an odds ratio of  
6 just a little more than 1 is weak?

7 A. You'd have to be more specific or give me  
8 context for that.

9 Q. Okay. What about an odds ratio of 1.05,  
10 would that be weak?

11 MR. MANDELL: Objection.

12 Go ahead.

13 A. I don't know that people generally or I  
14 attach adjectives, so I don't know that I can  
15 agree with that.

16 Q. Are you aware that Dr. Savitz has written  
17 in his book "Epidemiology and the Law" that a  
18 risk ratio of 1.2 is a modest association?

19 MR. MANDELL: Objection.

20 You can answer.

21 A. I'm not familiar with that.

22 Q. Would you agree with that?

1 MR. MANDELL: Objection.

2 Go ahead.

3 A. The -- it has to be taken in the full  
4 context.

5 Q. Have you used the 1.1 odds ratio as a  
6 benchmark in any other expert reports?

7 MR. MANDELL: Objection.

8 You can answer.

9 A. Outside of the Camp Lejeune?

10 Q. Yes.

11 A. I don't recall.

12 Q. Do you recall whether you used it in the  
13 Feindt litigation?

14 MR. MANDELL: Objection.

15 You can answer.

16 A. I don't recall.

17 Q. Have you used the 1.1 odds ratio as a  
18 benchmark in any peer-reviewed publication that  
19 you've authored or coauthored?

20 MR. MANDELL: Objection.

21 Go ahead. You can answer.

22 A. I don't recall.

1 Q. Are you aware that the EPA has  
2 characterized an odds ratio between 1.0 and 1.3  
3 as evidence of a slight positive association?

4 MR. MANDELL: Objection.

5 A. I'm not aware of that.

6 Q. Do you agree with that characterization?

7 MR. MANDELL: Objection. Lack of  
8 foundation.

9 You can answer.

10 A. I mean, I'm happy to review it if you  
11 have a source document. I don't know that I  
12 have -- I can otherwise give an opinion out of --  
13 out of context.

14 Q. Okay. Are you aware that EPA has  
15 characterized an odds ratio between 1.3 and 2.0  
16 as evidence of a positive association?

17 MR. MANDELL: Objection. Foundation.

18 A. I'm not aware of that.

19 Q. Is it important to analyze confidence  
20 intervals in a study's results?

21 A. Confidence interval are part of the  
22 results, just like the point estimate. So one

1     should consider the data provided.

2           Q.   Is it important to consider them  
3     together?

4                   MR. MANDELL:   Objection.

5                   You can answer.

6           A.   I would generally agree with that.

7           Q.   You'd agree that you can't just base an  
8     opinion on the effects size alone, right?

9                   MR. MANDELL:   Objection.

10          A.   You'd have to give me a lot more context  
11     for me to answer that.

12          Q.   Okay.   Would you agree that confidence  
13     intervals evaluate how precise the risk estimate  
14     is?

15          A.   That may be one interpretation.   It also  
16     has to do with the amount of power of a study,  
17     which is perhaps a better way to look at it.

18          Q.   Can you describe what you mean by the  
19     "power of a study"?

20          A.   The ability of a study to detect a  
21     difference between here it's two cohorts.  
22     Power's often -- mostly related to sample size

1 and the N, that is, the number of whatever the  
2 occurrence is.

3 Q. Is power related to precision?

4 MR. MANDELL: Objection.

5 Go ahead.

6 A. I have never considered that. I'm not  
7 sure.

8 Q. Are they -- are they distinct in your  
9 mind?

10 A. I think there's a lot of overlap and blur  
11 between the two.

12 Q. Would you agree that the evaluation of  
13 the strength of association criterion of the  
14 Bradford Hill analysis includes consideration of  
15 the odds ratio along with the confidence  
16 interval?

17 MR. MANDELL: Objection.

18 Go ahead.

19 A. Perhaps. I mean, the point estimate is  
20 the risk. So the most important thing is the  
21 point estimate. That's what the data resulted.

22 Q. But if there is a very wide confidence



1 interval, including the lower end being well  
2 under 1, that's important to determining whether  
3 there's a strength and association that's real,  
4 correct?

5 MR. MANDELL: Objection.

6 A. I can't answer that out of context.

7 Q. Okay. Would you agree that the wider the  
8 confidence interval is, the less confidence there  
9 is in the point estimate?

10 MR. MANDELL: Objection.

11 You can answer.

12 A. Oh, I -- I don't agree with that --

13 Q. Why not?

14 A. -- in principle. The point estimate is  
15 the point estimate. That's what the data showed.

16 Q. But confidence interval has the term  
17 "confidence" in its -- in its name. What does  
18 the confidence in "confidence interval" mean?

19 MR. MANDELL: Objection. Form.

20 A. We could be here a long time. So  
21 "95 percent confidence interval" means that if  
22 you were to take those data and redo the study,

1 if you will, that 95 percent of the time the  
2 point estimate would be between those upper and  
3 lower 95 percent confidence interval bounds. But  
4 the data are consistent with the point estimate  
5 that's given.

6 Q. You would agree that a 95 percent  
7 confidence interval of .9 to 1.1 is precise,  
8 wouldn't you?

9 MR. MANDELL: Objection.

10 Go ahead.

11 A. I can't answer than out of context.

12 Q. What type of context would you need?

13 A. The specific study, the number of  
14 subjects, how the study was conducted, follow-up,  
15 disease verification, etc. And many others.

16 Q. Would the same be true to the question of  
17 a confidence interval of 0.1 to 10.0 being very  
18 imprecise?

19 MR. MANDELL: Objection.

20 You can answer.

21 A. Again, I would need to see -- I'd need to  
22 see that in context.

1 Q. Have you ever used the terms "narrow" and  
2 "wide" in relationship to confidence intervals?

3 A. Perhaps. I don't recall.

4 Q. If you were to use the word "wide" in  
5 relationship to a confidence interval, what would  
6 it mean to you?

7 MR. MANDELL: Objection.

8 Go ahead.

9 A. I can't answer that out of context. I  
10 would have to see how it was used.

11 Q. Are you familiar with the term  
12 "confidence interval ratio"?

13 A. I am familiar with that.

14 Q. What is your understanding of how a  
15 confidence interval ratio is determined?

16 A. My understanding, it is the upper bound  
17 of the 95 percent confidence interval divided by  
18 the lower bound of the 95 percent confidence  
19 interval.

20 Q. Have you ever used a confidence interval  
21 ratio in any work that you've done?

22 MR. MANDELL: Objection. Form.

1           A.   No.

2           Q.   And that would include both expert  
3 reports and peer-reviewed studies?

4                   MR. MANDELL:   Same objection.

5           A.   Well, certainly applies to my  
6 peer-reviewed publications.   I don't know about  
7 expert reports.

8           Q.   So you've never used it in peer-reviewed  
9 publications, and you're not sure about expert  
10 reports; is that true?

11                   MR. MANDELL:   Objection.

12                   Go ahead.

13           A.   I think that accurately summarizes my  
14 answer.

15           Q.   Do you recall seeing Dr. Bove use the  
16 term "confidence interval ratios" in his studies?

17           A.   Well, I've seen it in some of his  
18 studies.

19           Q.   How do you understand that Dr. Bove used  
20 confidence interval ratios?

21                   MR. MANDELL:   Objection.

22                   Go ahead.

1           A. I can't recall in which of the Dr. Bove  
2 studies he used that. And I think it describes  
3 that in the articles. I just don't have them  
4 committed to memory.

5           Q. When you read Dr. Bove's use of  
6 confidence interval ratios in his studies, did  
7 you agree how he used them, do you recall?

8           A. I don't think I've got an opinion.

9           Q. What is your understanding of statistical  
10 significance?

11          A. I'm sorry. I don't understand that  
12 question.

13          Q. Well, you used "statistical significance"  
14 in your reports. What do you understand  
15 statistical significance to mean in terms of  
16 associations in this case?

17                   MR. MANDELL: Objection.

18                   You can answer.

19          A. Could you repeat that question?

20                   (Record read)

21          A. Yeah. As I say in my report, for  
22 instance, in the kidney report, I don't know what

1 exhibit it is --

2 MR. MANDELL: It's 5.

3 Q. It's Exhibit No. 5.

4 A. 5 on page 46. Actually, I think you read  
5 this into the record, "-- by statistical  
6 significance. That is, an odds ratio for the  
7 occurrence" in this case of kidney cancer, "in  
8 those exposed to TCE ... of greater than 1.1."

9 Q. So you're using the term "statistical  
10 significance" in this case to mean an odds ratio  
11 of an adverse health effect in those exposed to  
12 TCE in relation to this particular report, which  
13 is the bladder cancer report, of being greater  
14 than 1.1?

15 MR. MANDELL: Just for the record --  
16 just for the record, it's kidney.

17 MR. BAIN: Oh.

18 MR. MANDELL: That's okay. I just  
19 want to -- I know you want it to be accurate.

20 MR. BAIN: Yes, I appreciate that.

21 Q. Let's go back and do it over again.

22 In terms of your use of statistical

1     significance in the kidney cancer report, it's a  
2     relationship between an adverse health effect in  
3     those exposed to TCE water of greater than 1.1?

4         A.   That's right.

5         Q.   And so when you use the term "statistical  
6     significance," it's how you describe it in each  
7     of your reports given the language that you used;  
8     is that right?

9         A.   Well, I think there's 220 pages of  
10    report, so I don't -- I can't answer about every  
11    page in the reports, but that's my intent  
12    certainly here (indicating).

13        Q.   Okay. Do you use it in any other ways?

14        A.   Well, that's -- I don't have 220 pages  
15    committed to memory, so I don't recall.

16        Q.   I understand. But you're using the word  
17    "statistical significance." I just want to make  
18    sure I understand what you mean generally when  
19    you use that term.

20        A.   I'm using it as we just entered in the  
21    record on page 46 of the kidney cancer report.

22        Q.   Um-hmm. Do you understand how

1 statistical significance is used in terms of  
2 determining whether an association is potentially  
3 the product of random chance?

4 MR. MANDELL: Objection.

5 A. I'm sorry. Can you say that one again?

6 Q. Okay.

7 Do you understand when the term  
8 "statistical significance" is used in the context  
9 of determining whether an association can be the  
10 product of random chance?

11 MR. MANDELL: Objection.

12 A. I'm not sure how to answer. I've never  
13 considered that question before.

14 Q. Do you have a background in statistics at  
15 all?

16 A. Oh, I've used statistics a lot in my -- I  
17 don't -- how many years of education I had in my  
18 residency training, my fellowship training. So  
19 I've done lots of statistics.

20 Q. In terms of epidemiology, do you know how  
21 statistical significance is used?

22 A. Again, I've used epidemiology for my



1 30-years career. So it -- again, it depends on  
2 the context.

3 Q. Okay. When you have a confidence  
4 interval and the lower bound of that confidence  
5 interval is less than 1, have you ever had that  
6 related to the concept of statistical  
7 significance?

8 MR. MANDELL: Objection. Form.

9 A. Oh, sure. So -- I mean, formerly, people  
10 rigidly adhered to that concept, and certainly  
11 far less now.

12 Q. Okay.

13 A. The point estimate is really what's  
14 important.

15 Q. So in that context, what does statistical  
16 significance mean?

17 MR. MANDELL: Objection.

18 A. So if the lower bound -- traditionally  
19 and rigidly, if the lower bound of the 95 percent  
20 confidence interval was below 1.00, again, it  
21 could be -- there can be different confidence  
22 interval widths.

1 But traditionally, that could be  
2 interpreted as not statistically significant --  
3 statistically significant, not clinically  
4 significant.

5 Q. Okay. Meaning what in that context?

6 MR. MANDELL: Objection. Form.

7 A. Well, it depends on what the point  
8 estimate in the confidence intervals are. It  
9 could mean that -- well, it can mean a lot of --  
10 it depends on all of the data.

11 Q. Okay. I think we'll get into more  
12 questions with context on that as we go along  
13 here.

14 But I do want to show you in your  
15 leukemia report, which is Exhibit 7, if you turn  
16 to page 6. Do you see the last paragraph here,  
17 you have a discussion of the concept of  
18 statistical significance. Do you see that?

19 A. Yes.

20 Q. And some of what we were just discussing,  
21 you say here, "Even though some of the  
22 epidemiological results presented in this report

1 are not statistical significant under traditional  
2 methods, they are important and relevant  
3 information with regards to causation where the  
4 standard is equipoise because the concept of  
5 equipoise refers to genuine uncertainty within  
6 the expert medical community."

7 Do you see that?

8 A. Yes.

9 Q. You state, "Many of the results are very  
10 nearly statistically significant and are clearly  
11 not directed towards a decrease in occurrence or  
12 risk of the cancers."

13 Do you see that?

14 A. Yes.

15 Q. You then say, "Furthermore, the use of  
16 traditional statistical significance does not  
17 capture or account for biological plausibility of  
18 cancer causation," right?

19 A. Yes.

20 Q. And you also state, "Likewise, relying on  
21 traditional statistical significance ignores  
22 known carcinogenic properties of a substance."

1 Do you see that?

2 A. Yes.

3 Q. You then say, "Lastly, biostatist- --  
4 biostatisticians have largely abandoned the  
5 dichotomous interpretation of statistical  
6 significance (i.e., significant vs.  
7 non-significant) and instead focus on the  
8 estimate -- estimation of effect size [sic]."

9 Do you see that?

10 A. Yes.

11 Q. Why do studies test for statistical  
12 significance at all then?

13 MR. MANDELL: Objection.

14 You can go ahead.

15 A. Well, that's been traditionally done. It  
16 also gives an estimate of the power of the study  
17 to detect that change.

18 Q. Have you relied on what you call  
19 "traditional statistical significance" in any  
20 articles you've published?

21 A. Oh, I'm sure I have.

22 Q. Have you ever referenced traditional

1 statistical significance in any expert reports  
2 that you've written?

3 MR. MANDELL: Objection.

4 Go ahead.

5 A. Probably. I don't recall.

6 MR. BAIN: Okay. Is this a good time  
7 to take a break?

8 MR. MANDELL: Sure. How long would  
9 you like to take?

10 THE VIDEOGRAPHER: The time is  
11 10:29 a.m., and we're off the record.

12 (Recess taken)

13 THE VIDEOGRAPHER: The time is  
14 10:40 a.m., and we're on the record.

15 BY MR. BAIN:

16 Q. Back from a break, Dr. Bird. You  
17 recently published a study in toxicological  
18 reports entitled "Antipsychotic-induced  
19 hyperprolactinemia: Toxicological mechanism and  
20 the increased risk of breast cancer," is that  
21 right?

22 A. That's right.

1 Q. And that was published in  
2 Toxicological -- Toxicology Reports; is that  
3 true?

4 A. That's right.

5 Q. And that's a peer-reviewed journal?

6 A. Yes.

7 Q. Let me show you --

8 MR. BAIN: I'll have this marked.

9 (Exhibit 11, Toxicology Reports  
10 article, marked for identification.)

11 MR. MANDELL: Thank you very much.

12 Q. Dr. Bird, I've handed you what's been  
13 marked as Exhibit 11, which is the recently  
14 published study in Toxicology Reports, which we  
15 just discussed. Is this that published article?

16 A. Yes.

17 Q. And this article was a review of studies  
18 published examining the association of  
19 antipsychotic drug use in breast cancer, correct?

20 A. Yes.

21 Q. And to find the published studies for  
22 this review, you used "The Preferred Reporting

1 Items for Systematic Reviews and Meta-Analysis"  
2 checklist known as "PRISMA," right?

3 A. I did.

4 Q. And you show the search terms that you  
5 used on page 2, correct? Do you see, "The  
6 specific" --

7 A. Oh, yes.

8 Q. -- "search terms were the following"? Do  
9 you see that?

10 A. Yes.

11 Q. And Figure 1 on the next page, page 3,  
12 shows the PRISMA flow diagram that you used to  
13 screen studies to come up with 15 studies that  
14 were included in your review, correct?

15 A. That's right.

16 Q. Did you use PRISMA for your work in this  
17 case?

18 A. I did not prepare a PRISMA flow diagram  
19 for this case, but search -- literature search  
20 and review is effectively identical.

21 Q. So you would have used the same process  
22 that's reflected in the flow diagram, but you

1 didn't create a flow diagram; is that what you're  
2 saying?

3 A. Correct, yeah. PRISMA is used for  
4 scientific publications.

5 Q. Would you say that you used PRISMA for  
6 the work that you did in this case?

7 A. Well, no. I would -- we don't use PRISMA  
8 that way. My methodology was the same.

9 Q. And when you say, "We don't use PRISMA in  
10 that way," what do you mean?

11 A. I have only ever seen PRISMA related to a  
12 review or a meta-analysis in the scientific  
13 literature. I've never seen it used elsewhere.

14 Q. Did you consider what you did in this  
15 case to be either a review or a meta-analysis?

16 A. It -- that's exactly what this is  
17 (indicating).

18 Q. No. I mean in the case, in the  
19 Camp Lejeune case.

20 A. Oh. In part, yeah. There was a lot more  
21 to this Camp Lejeune, but the methodology was the  
22 same.



1 Q. Do you have a record of how many studies  
2 were retrieved in your searches for this case and  
3 how they were excluded, as you have described  
4 here in this particular article?

5 MR. MANDELL: Objection to form.

6 Go ahead.

7 A. No. Because they're com- -- they're  
8 apples and oranges. You can't compare the  
9 Camp Lejeune work and this (indicating).

10 Q. Why not?

11 A. Because Camp Lejeune includes mechanistic  
12 studies, animal studies, other studies. This  
13 (indicating) was a review of case-control and  
14 cohort studies only.

15 Q. With respect to the epidemiological  
16 studies that you reviewed for your Camp Lejeune  
17 work, did you follow the same methodology that  
18 you followed for this particular study?

19 A. Largely, yes. I did the search. I  
20 reviewed the articles. It's the same.

21 Q. Is there any record of your collection  
22 and methodology with respect to epidemiological

1 studies for Camp Lejeune that is similar to what  
2 you did for this study on antipsychotic drugs?

3 A. Say that one again.

4 Q. Okay. Is there any record of your  
5 collection methodology with respect to the  
6 epidemiological studies for Camp Lejeune that is  
7 similar to the methodology that you demonstrate  
8 here in this particular paper with respect to use  
9 of PRISMA?

10 A. Not specifically a diagram, but the  
11 methodology is the same.

12 Q. Do you have any record of what studies  
13 from your search in the Camp Lejeune work with  
14 respect to epidemiological studies were excluded  
15 and what the basis for the exclusion was?

16 MR. MANDELL: Objection. Form.

17 A. No, there's no record of that.

18 Q. Okay. With respect to epidemiological  
19 studies in Camp Lejeune, did you screen out  
20 studies based on study design, outcome, and  
21 exposure?

22 A. Well, that's all part of the evaluation

1 of the literature. So you have to look at each  
2 study individually. I can't just give you a  
3 blanket answer to that.

4 Q. Okay. But you didn't keep a record of  
5 which studies you kept in and which studies you  
6 left out?

7 MR. MANDELL: Objection.

8 Go ahead.

9 A. No, of course not.

10 Q. Okay. Did you exclude epidemiological  
11 studies based upon an incompatible control group  
12 or incompatible statistical methods?

13 MR. MANDELL: Objection.

14 Go ahead.

15 A. That is all part of the evaluation of a  
16 study. That's what we do.

17 Q. So you did do that with respect to  
18 Camp Lejeune?

19 A. You consider all of the aspects of how a  
20 study is conducted when you're evaluating it.

21 Q. And do you exclude some studies based on  
22 incompatible control groups or incompatible

1 statistical methods?

2 MR. MANDELL: Objection.

3 Go ahead.

4 A. It -- I don't recall specifically all of  
5 the study design from all the studies that I've  
6 read.

7 Q. Okay. And you don't have a record for  
8 Camp Lejeune as you would have a record for what  
9 you did here in the antipsychotic study?

10 MR. MANDELL: Objection.

11 You can answer.

12 A. Yeah. I've already told you my  
13 methodology.

14 Q. Okay. And you already told me you don't  
15 have a record --

16 MR. MANDELL: Objection.

17 Go ahead.

18 Q. -- right?

19 A. That's right.

20 Q. I want to ask you a few questions about  
21 your discussion of the studies that you reviewed  
22 in this particular article. If you look at

1 page 7 of the article.

2 A. Um-hmm.

3 Q. You discuss a 2024 publication by Solmi  
4 and Solmi [sic] in the first paragraph, which is  
5 a -- case-control studies of Swedish registries.  
6 Do you see that? It's in the first full  
7 paragraph on page 7.

8 A. Yes, I see that. I don't -- was there a  
9 question?

10 Q. Yes. You discussed those -- that study  
11 here in the report, right?

12 A. Yes.

13 Q. Okay. You state that [as read] "The  
14 authors identified an odds ratio of breast cancer  
15 in women with the use of prolactin-increasing  
16 antipsychotics for 1-4 years (OR 1.20, 1.03-1.41),  
17 and for greater than or equal to 5 years  
18 (OR 1.47, 1.26-1.71). They did not detect an  
19 increased odds of breast cancer with the use of  
20 prolactin-sparing antipsychotics of either  
21 1-4 years (OR 1.17, 0.98-1.4) or greater than  
22 equal to 5 years (OR 0.99, 7 -- 0.78," excuse me,

1       "-1.26)."

2               Do you see that?

3       A.   Yes.

4       Q.   And when you have the odds ratio, that's  
5   the point estimate that you've been referring to,  
6   right?

7       A.   That's right.

8       Q.   And what follows that after the comma is  
9   the confidence interval; is that correct?

10      A.   Technically after the semicolon, yes.

11      Q.   Okay.

12               MR. MANDELL:   See, I didn't correct  
13   that actually.

14               MR. BAIN:   Yeah.   Wow, my eyes are  
15   not catching that.

16      Q.   Thank you for correcting that.

17               So that's the confidence interval; is  
18   that right?   After the semicolon --

19      A.   Yes.

20      Q.   -- that range of numbers; is that right?

21      A.   Yes.

22      Q.   And are those 95 percent confidence

1 intervals, as far as you know?

2 A. That's what it says.

3 Q. Okay. As for the first finding, the  
4 prolactin-increasing antipsychotics for 1 to  
5 4 years, that was an increased -- or that was a  
6 positive finding because there was a 20 percent  
7 increase in breast cancer represented by the  
8 1.20 point estimate, right?

9 MR. MANDELL: Objection.

10 A. Yes, I agree with that.

11 Q. And you would also agree that the lower  
12 end of the confidence interval was above 1,  
13 right?

14 A. That's right.

15 Q. And meaning that was -- under the  
16 traditional understanding of statistical  
17 significance, it was statistically significant,  
18 right?

19 MR. MANDELL: Objection.

20 Go ahead.

21 A. Yes, I agree with that.

22 Q. And for the second finding for

1 prolactin-increasing antipsychotics for greater  
2 than or equal to five years, the positive finding  
3 was because there was a 47 percent increase in  
4 breast cancer represented by the 1.47; is that  
5 right?

6 MR. MANDELL: Objection.

7 A. I agree with that.

8 Q. And the lower end of the confidence  
9 interval was above 1, at 1.26, meaning that it  
10 was statistically significant, right?

11 MR. MANDELL: Objection.

12 A. Under traditional statistical methods,  
13 yes, I agree with that.

14 Q. Um-hmm. In the next sentence you say  
15 that they did not detect an increased odds of  
16 breast cancer with a -- prolactin-sparing  
17 antipsychotic use, right?

18 MR. MANDELL: Objection.

19 A. That's what it says.

20 Q. And the third finding discussed in these  
21 sentences for prolactin-sparing antipsychotics  
22 for 1 to 4 years, it was because there was a



1 17 percent increase in breast cancer, represented  
2 by 1.17, but the lower end of the confidence  
3 interval, that was below 1; is that correct?

4 MR. MANDELL: Objection.

5 Go ahead.

6 A. That's what those numbers are, right.

7 Q. And that means the finding was not  
8 statistically significant, right?

9 MR. MANDELL: Objection.

10 A. Well, two things. One, we should look at  
11 the Solmi article. I suspect that I used the  
12 language that they did. So in order for me to  
13 really answer that question, we need to look at  
14 Solmi article.

15 Q. Okay. So you think that you just used  
16 the language from the Solmi article?

17 MR. MANDELL: Objection.

18 A. That's likely the case. I can't really  
19 comment further without looking at Solmi.

20 Q. Okay. And for the fourth finding in the  
21 sentences for prolactin-sparing antipsychotics  
22 for greater than or equal to 5 years, it was

1 because there was a 1 percent decrease in breast  
2 cancer, represented by the .99 point estimate,  
3 right?

4 MR. MANDELL: Objection.

5 A. Right. The odds ratio is the same as --  
6 .99 is the same as 1.00.

7 Q. In the next paragraph, you state, "While  
8 the summary" --

9 MR. MANDELL: Can I just say -- go  
10 ahead. I'm sorry. No, no, no. You go ahead.

11 MR. BAIN: Okay.

12 Q. You state, "While the summary statistic  
13 of studies reviewed here show a positive  
14 association of antipsychotic use and breast  
15 cancer, not every study that has examined  
16 antipsychotic use and breast cancer has found  
17 such an association. For instance, the study by  
18 Kern et al. examined the occurrence of breast  
19 cancer in women who used high prolactin-increasing  
20 antipsychotics to those who used a low-prolactin  
21 increasing medication, with a minimum use ... of  
22 180 days," right?

1           A.   That's right.

2           Q.   And you state, "This industry-sponsored  
3   study did not detect a statistically-significant  
4   increase in breast cancer among the  
5   high-prolactin increasing group," right?

6           A.   That's right.

7           Q.   So in this article, you state that Kern  
8   did not find a positive association between  
9   antipsychotic use and breast cancer; is that  
10   right?

11          A.   Sorry. I was -- I was reading it  
12   while -- I apologize. I was reading while you  
13   were asking a question.

14          Q.   Okay. The question is -- and this is to  
15   restate what you state here, is that in this  
16   article you state that Kern did not find a  
17   positive association between antipsychotic use  
18   and breast cancer?

19                   MR. MANDELL:  Objection.

20          A.   That's what it says, yeah.

21                   MR. MANDELL:  Go ahead.

22                   (Exhibit 12, Kern, et al study,

1 marked for identification.)

2 Q. I'm showing you what has been marked as  
3 Exhibit 12, which is a study entitled  
4 "Association between prolactin increasing  
5 antipsychotic use and the risk of breast cancer:  
6 A retrospective observational cohort study in a  
7 United States Medicaid population," by Kern,  
8 et al. Do you see that?

9 A. Yes.

10 Q. And is this the study that is referenced  
11 in your study, Exhibit No. 11?

12 A. Yes.

13 Q. Take a look at page 7. And do you see  
14 Table 3 there?

15 A. Yes.

16 Q. This shows the "Relative risk for [sic]  
17 breast cancer for high prolactin-increasing  
18 antipsychotic users, compared to  
19 non-prolactin-increasing antipsychotic users,"  
20 correct?

21 A. That's what it says, yes.

22 Q. Do you see the PS-stratified risk ratio

1 for those on treatment under the Rahman  
2 definition?

3 A. Stand by.

4 (Pause)

5 A. Oh, yes.

6 Q. What does that mean, the PS-stratified  
7 odds ratio for those on treatment under the  
8 Rahman definition?

9 A. Well, "PS" means propensity score.

10 Q. Um-hmm.

11 A. I don't recall the Rahman definition.

12 Q. Okay. If you look at that particular  
13 figure though, which is in the last row in the  
14 column for PS-stratified hazard ratio 95 percent  
15 confidence interval, do you see that the ratio is  
16 1.28, with a confidence interval of .40 to 4.07?

17 A. Yes.

18 Q. And that number represents a 20 --  
19 28 percent increase in breast cancer for the  
20 group on treatment of the antipsychotic; is that  
21 correct?

22 MR. MANDELL: Objection.

1           Go ahead.

2           A.   Yes.   That's right, with the Rahman  
3 definition.   That's right.

4           Q.   Okay.   But it's not considered a positive  
5 association because the lower end of the  
6 confidence interval is below 1, right?

7                   MR. MANDELL:   Objection.

8           Go ahead.

9           A.   So no.   So I did not -- I haven't  
10 reviewed this article in months.

11          Q.   Um-hmm.

12          A.   So to fully answer the question, I'd have  
13 to review it.   Because in my manuscripts that  
14 we've been talking about, I don't cite to a  
15 specific number from the Kern study.

16                Because in the intent-to-treat analysis,  
17 the hazard ratio was 1.00 and 0.96, which are not  
18 statistically significant, which is what I say in  
19 my article.

20                   MR. MANDELL:   Objection.

21          Q.   Well, you state in your article that  
22 "This industry-sponsored study did not detect a

1 statistically-significant increase in breast  
2 cancer among the high-prolactin increasing  
3 group," right?

4 A. That's right. In the intent-to-treat  
5 analysis, that's exactly right.

6 Q. Okay. But you didn't reference this  
7 28 percent increase in cancer that's referenced  
8 in -- the particular number with the Rahman  
9 definition, correct?

10 MR. MANDELL: Objection.

11 Go ahead.

12 A. There are a number of numbers here. I  
13 did not cite any of the numbers specifically.

14 Q. Um-hmm. So you do not cite any finding  
15 of an increased risk in cancer from this study?

16 MR. MANDELL: Objection.

17 Go ahead.

18 A. Right. Because there's -- there's  
19 numbers kind of all over the place here. It did  
20 not detect a statistically significant increase.  
21 Absolutely.

22 Q. Okay. Do you recall the Hartman case

1     that you were involved in?

2             A.   Yes, I think so.

3                     (Exhibit 13, Dr. Bird's expert report  
4                     in the Hartman case, marked for  
5                     identification.)

6             MR. MANDELL:   Thank you.

7             Q.   Dr. Bird, I've handed you what has been  
8             marked as Exhibit 13, which is the report that  
9             you issued in the Hartman case; is that correct?

10            A.   Yes.

11            Q.   And this case involved the toxicity of  
12            diesel exhaust.   Do you recall that?

13            A.   Yes.

14            Q.   If you turn to page 5 of this report, do  
15            you see where you reference some statistically  
16            significant increased risk for certain conditions  
17            with diesel exhaust exposure?

18            A.   Yes.

19            Q.   And at the bottom paragraph, you note the  
20            Kachuri study.   Do you see that?

21            A.   Yes.

22            Q.   And with respect to the Kachuri study,



1 you note the increased risk for diesel exhaust  
2 for colorectal cancer, but state that "There were  
3 no statistically significant associations  
4 observed for gasoline emissions."

5 Do you see that?

6 A. Yes.

7 (Exhibit 14, "Workplace exposure to  
8 diesel and gasoline engine exhausts and the risk  
9 of colorectal cancer in Canadian men.", marked  
10 for identification.)

11 Q. Dr. Bird, I've handed you what has been  
12 marked as Exhibit 14, which is "Workplace  
13 exposure to diesel and gasoline engine exhausts  
14 and the risk of colorectal cancer in Canadian  
15 men." Do you see that?

16 A. Yes.

17 Q. And this particular study analyzes the  
18 relationship between diesel exhaust, gasoline  
19 emission -- emissions with rectal, colorectal,  
20 and colon cancer; is that right?

21 A. I believe that's true.

22 Q. And if you look at Table 4 on page 8. Do

1     you see that?

2             A.   Stand by.

3                     (Pause)

4             A.   Yes.

5             Q.   And Table 4 is the "Adjusted odds  
6     ratio ... and corresponding 95% confidence  
7     intervals ... for rectal cancer and colon cancer  
8     in relation to occupational exposure to diesel  
9     emissions," right?

10            A.   Yes.

11            Q.   And then Table 5, which is on the next  
12   page, is the "Adjusted odds ratio ... and  
13   corresponding 95% confidence intervals ... for  
14   rectal cancer and colon cancer in relation to  
15   occupational exposure to gasoline emissions,"  
16   right?

17            A.   Yes.

18            Q.   The odds ratio that you pull out in the  
19   Hartman report is 1.98 for high exposure and  
20   colorectal cancer, right?  If you look back at  
21   your Hartman report.

22            A.   Yes.

1           Q.   If you look at the abstract for Kachuri,  
2   the 1.98 figure that you reference is actually  
3   for rectal cancer, not for colorectal cancer; is  
4   that right?

5           A.   Stand by.

6                   (Pause)

7           A.   Yeah.   Let me just look something up.

8                   (Pause)

9           A.   Yes.   My recollection is Mr. Hartman had  
10   rectal cancer.

11          Q.   Okay.   So even though you said  
12   "colorectal" in the report, it is actually  
13   specifically rectal cancer; is that right?

14          A.   That's what it looks like, yes.

15          Q.   Okay.   And that number is considered to  
16   be a statistically significant result with a  
17   98 percent increase because the lower end of the  
18   confidence interval is above 1, right?

19                   MR. MANDELL:   Objection.

20                   Go ahead.

21          A.   Well, no.   It's considered a 98 percent  
22   increase because the odds ratio was 1.98.

1 Q. Okay. And the result is considered  
2 positive because the lower end of the confidence  
3 interval is above 1, right?

4 MR. MANDELL: Objection.

5 Go ahead.

6 A. Well, no. 98 percent is a clinically  
7 significant increase, so doubling of the risk.

8 Q. But it is considered traditionally  
9 statistically significant because the lower ends  
10 of the confidence interval is above 1, right?

11 MR. MANDELL: Objection.

12 Go ahead.

13 A. I would agree with that, under  
14 traditional statistical methods.

15 Q. Okay. Now if you turn to -- back to  
16 Table 5, which is the table looking at the  
17 relationship between gas emissions and rectal  
18 cancer and colon cancer. Are you there?

19 MR. MANDELL: It's on page 9 I think.

20 A. Yes.

21 Q. Okay. Do you see that there are several  
22 relationships there where the odds ratio is

1 above 1. For example, if you look at the -- and  
2 I think they've been highlighted for you, the  
3 duration of exposure at high concentration years  
4 greater than or equal to 5, the odds ratio for  
5 colon cancer is 1.13. Do you see that?

6 A. Except he didn't have colon cancer. He  
7 had -- he had rectal cancer.

8 Q. I understand.

9 A. So it's not relevant.

10 Q. So it wasn't relevant to the report,  
11 but -- is that what you're saying?

12 A. Yeah. He -- I'm talking about -- he had  
13 rectal cancer. I gave rectal cancer results.  
14 And the odds ratio for rectal cancer was 1.00  
15 with gasoline emissions.

16 Q. Okay. So he had rectal cancer. Are you  
17 sure of that?

18 A. Well, he had low anterior resection.

19 Q. Okay. So there would have been -- that's  
20 why you're saying there's no reason to discuss  
21 these colon cancer results; is that right?

22 A. Yes.

1 Q. Okay.

2 Okay. I want to go back to the Bradford  
3 Hill criteria. In addition to strength of  
4 association, which we already discussed, another  
5 one of the Bradford Hill criteria is consistency,  
6 right?

7 A. That is one of the other viewpoints,  
8 that's right.

9 Q. And you say "viewpoints." Why do you use  
10 that word?

11 A. Well, they were never intended to be  
12 criteria. They're not a checklist. So I put  
13 criteria in air -- in quotes, not air quotes, in  
14 my report and then review -- refer to them as  
15 viewpoints.

16 Q. So when you say viewpoints, you say  
17 they're not meant to be as a checklist?

18 A. Well, that were -- they were his views in  
19 that lecture he gave 60 years ago.

20 Q. I want to refer to one of your reports.  
21 Just look at the bladder cancer report, which is  
22 Exhibit 4, and turn to page 45.

1           With respect to consistency, you state,  
2       "The Bradford Hill term of consistency refers to  
3       the concept that studies done in different  
4       populations or that studies of different designs  
5       yield similar results. This criterion is also  
6       met in that studies consistently demonstrate  
7       bladder cancer after exposure to TCE."

8           Do you see that?

9           A. Yes.

10          Q. So that's your understanding of  
11       consistency, is referring "to the concept that  
12       studies done in different populations or that  
13       studies of different designs yield similar  
14       results," right?

15         A. Yes.

16         Q. And you do call it "criterion" here,  
17       don't you?

18         A. I do.

19         Q. Okay. Do you agree with the statement  
20       that "Rarely, if ever, does a single study  
21       persuasively demonstrate a cause-effect  
22       relationship"?

1 MR. MANDELL: Objection.

2 A. Oh. Yeah. Can you show me kind of where  
3 that comes from so I can understand the context?

4 Q. Yeah. The context is the "Reference  
5 Guide on Epidemiology" states, "Rarely, if ever,  
6 does a single study persuasively demonstrate a  
7 cause-effect relationship."

8 Do you agree with that?

9 MR. MANDELL: Objection.

10 A. At times that may be true.

11 Q. But not always?

12 MR. MANDELL: Objection.

13 Go ahead.

14 A. At times it may be true.

15 Q. But it -- you don't consider it to be a  
16 criterion?

17 MR. MANDELL: Objection.

18 Go ahead.

19 A. I don't -- I'm sorry.

20 Q. You don't consider it to be a requirement  
21 or that you must have more than one study to  
22 demonstrate a cause-effect relationship?



1 MR. MANDELL: Objection.

2 Go ahead.

3 A. Consistency is one of the Bradford Hill  
4 viewpoints, one of nine. I gave some examples  
5 here. I don't know that I can say much else.

6 Q. Okay. Do you agree that "It is important  
7 that a study be replicated in different  
8 populations and by different investigators before  
9 a causal relationship is accepted by  
10 epidemiologists and other scientists"?

11 MR. MANDELL: Objection.

12 Go ahead.

13 A. It may.

14 Q. It may be important?

15 MR. MANDELL: Objection.

16 Go ahead.

17 A. It may be relevant.

18 Q. Do you believe that your opinions in this  
19 case are supported by consistent findings that  
20 have been replicated in different populations by  
21 different investigators?

22 A. Yes. Most of the data here are from

1 the -- the relevant population, that is, the  
2 civilians and Marine and Navy personnel at  
3 Camp Lejeune. There are a number of studies from  
4 Camp Lejeune, which is the most relevant. I've  
5 gone through that in my report.

6 And I mentioned some other studies here.  
7 The Hadkhale and including the ATSDR 2018  
8 morbidity study.

9 Q. Generally, for your opinions in this  
10 case, do you believe that they are supported by  
11 consistent findings? Are any opinions that you  
12 have that you do not have consistent finding for?

13 MR. MANDELL: Objection. Form.  
14 Go ahead.

15 A. Oh, I imagine with -- there are some  
16 analyses somewhere that are not entirely  
17 consistent. That wouldn't surprise me at all.  
18 The nature of science.

19 Q. Do you believe that your opinions in this  
20 case have been generally accepted by  
21 epidemiologists and other scientists?

22 MR. MANDELL: Objection.

1           A. I don't know if my opinions have been  
2 seen by many other people. I can't answer that  
3 question.

4           Q. Have you reviewed the conclusions of the  
5 other plaintiffs' experts in this case?

6                     MR. MANDELL: Objection.

7           A. I don't know who all of the plaintiffs'  
8 experts are in these cases.

9           Q. Have you reviewed any other expert  
10 reports for experts who have been retained by  
11 plaintiffs in this case?

12                    MR. MANDELL: Objection.

13          A. Oh, I'm sorry. I thought -- I was  
14 thinking of government. So, sorry, can you say  
15 that again?

16          Q. Yeah. Have you reviewed the conclusions  
17 of the other plaintiffs' experts in this case?

18                    MR. MANDELL: Objection.

19          A. I have seen some. I suspect not all.

20          Q. Do you recall which ones you've seen?

21                    MR. MANDELL: Objection.

22                    Go ahead.

1           A. I don't. I may not have seen them. I  
2 think I've seen defense expert reports.

3           Q. Any reports that you've seen would be  
4 listed on your materials considered list; is that  
5 correct?

6           A. Oh, no. Because I -- whatever I saw  
7 would have been after my report was written and I  
8 had formed my opinions.

9           Q. Okay. Are you aware that there have been  
10 supplemental materials considered lists that have  
11 been produced for you?

12          A. Oh, I'm sure there have been.

13          Q. And did you review those to make sure  
14 they were accurate?

15          A. I don't recall.

16          Q. Okay.

17                 Are you aware whether other plaintiffs'  
18 experts have reached conclusions consistent with  
19 your opinions regarding whether individual  
20 chemicals, PCE, TCE, benzene, and vinyl chloride,  
21 can, as you phrase it, at least as likely as not  
22 cause kidney cancer, bladder cancer, leukemia,

1 non-Hodgkin's lymphoma, and Parkinson's disease?

2 MR. MANDELL: Objection. Form and  
3 foundation.

4 Go ahead.

5 A. What was the first part of the question?

6 Q. Are you aware of whether other  
7 plaintiffs' experts have reached conclusions  
8 consistent with your opinions regarding whether  
9 the chemicals, PCE, TCE, benzene and, vinyl  
10 chloride, can, as you phrase it, as likely as not  
11 cause kidney cancer, bladder cancer, leukemia,  
12 non-Hodgkin's lymphoma, and Parkinson's disease?

13 MR. MANDELL: Objection. Form and  
14 foundation.

15 A. Yeah. I'm not aware of other plaintiffs'  
16 experts' full opinions.

17 Q. Okay. So you never -- I think your  
18 testimony was that, prior to your completion of  
19 your expert reports, you hadn't reviewed the  
20 reports of any of the other plaintiffs' experts;  
21 is that right?

22 A. That's right.

1 Q. But you may have reviewed some of them  
2 after you finished your expert report?

3 A. Maybe.

4 Q. Okay. You're not sure as you sit here  
5 today?

6 A. That's right.

7 Q. Okay. And you may have reviewed some  
8 materials considered list supplemental that were  
9 produced after your report, you can't remember?

10 A. Correct.

11 Q. Okay. And you're aware that we are  
12 entitled to know any materials that you  
13 considered in this case?

14 A. Sure.

15 Q. Okay. Have you reviewed the IARC  
16 evaluations for each of the individual chemicals,  
17 PCE, TCE, benzene, and vinyl chloride, with  
18 respect to those chemical relationships to kidney  
19 cancer, bladder cancer, leukemia, non-Hodgkin's  
20 lymphoma, and Parkinson's disease?

21 A. I have seen those reports. I can't  
22 remember if they are separate reports or if

1 they're all combined.

2 Q. Okay. But you have reviewed some IARC  
3 reports related to those chemicals?

4 A. Yes.

5 Q. And you reviewed those with respect to  
6 what IARC concluded with respect to the  
7 relationships to the Track 1 diseases that we're  
8 discussing in this case?

9 A. What's Track 1?

10 Q. I'm sorry. The diseases, kidney cancer,  
11 bladder cancer, Parkinson's disease, leukemia,  
12 non-Hodgkin's lymphoma.

13 A. I'm sorry. So what was the question?

14 Q. You mentioned that you've reviewed some  
15 IARC -- IARC reports with respect to the  
16 chemicals in this case, PCE, TCE, benzene, and  
17 vinyl chloride. And I'm just asking you whether  
18 you reviewed those reports to see what IARC's  
19 conclusions were with respect to the relationship  
20 that they found between those chemicals and the  
21 diseases we're talking about in this case, which  
22 are kidney cancer, bladder cancer, leukemia,

1 non-Hodgkin's lymphoma, and Parkinson's disease.

2 MR. MANDELL: Objection.

3 Go ahead.

4 A. Well, certainly that's part of why I  
5 review IARC monograph. That's not the only  
6 reason certainly.

7 Q. And this report, you did review that for  
8 that reason?

9 MR. MANDELL: Objection.

10 Go ahead.

11 A. I don't recall specifically, but I  
12 suspect I did.

13 Q. Okay.

14 Do you recall whether, as you sit here  
15 today, and we'll go through some of them, whether  
16 the IARC evaluation supported your opinions?

17 MR. MANDELL: Objection.

18 Go ahead.

19 A. Oh, you'd have to be way more specific  
20 than that.

21 Q. Okay. We'll get into that.

22 One of the Bradford Hill criteria or



1 viewpoints, as you call them, is biological  
2 gradient, right?

3 A. Yes.

4 Q. And I'm going to refer you again to your  
5 report on bladder cancer, which is Exhibit No. 4.

6 Are you there?

7 A. Yes.

8 Q. Okay. If you look at the biological  
9 gradient.

10 MR. MANDELL: Can I just ask what  
11 page, section?

12 MR. BAIN: Page 45.

13 MR. MANDELL: Thank you.

14 MR. BAIN: Are you there?

15 MR. MANDELL: I am. Thank you very  
16 much.

17 Q. Do you see where it says, "The concept of  
18 a biological gradient is that a dose-response  
19 relationship exists. That is ... the greater the  
20 dose (i.e., exposure), the more likely a response  
21 (i.e., presence of disease)"?

22 A. Yes.

1 Q. And I take it you considered that  
2 criterion or viewpoint in doing your analyses in  
3 each of these reports that you did?

4 A. Sure.

5 Q. If a dose-response analysis shows an  
6 increased response for a disease with an increase  
7 in dose or exposure, that would support a finding  
8 of a causal relationship; is that right?

9 A. Well, that is part of biological  
10 gradient, which is a part of the Bradford Hill  
11 viewpoints.

12 Q. Um-hmm.

13 A. It's a piece of information.

14 Q. So I'm not sure I got an answer though.

15 If a dose-response analysis shows an  
16 increased response for a disease with an increase  
17 in dose, that would support a finding of a causal  
18 relationship; is that right?

19 MR. MANDELL: Objection to form.

20 A. My answer is the same. It is a piece of  
21 information.

22 Q. Is it supportive or non-supportive though?

1 MR. MANDELL: Objection.

2 A. You have to understand the context in the  
3 study in which you're talking about. So taking  
4 that just in isolation I don't think is valid.

5 Q. Can you tell me what you mean by "taking  
6 that in isolation, I don't think that's valid"?  
7 What does that mean?

8 MR. MANDELL: Objection.

9 Go ahead.

10 A. The question about -- the question you  
11 asked is a small part of how one evaluates a --  
12 scientific literature, and it's only a small part  
13 of the Bradford Hill viewpoints. So I don't  
14 think I can answer that question without more  
15 details or context. It's -- it's just not a  
16 valid question.

17 Q. So if the Bradford Hill criteria said  
18 that a dose-response analysis that shows an  
19 increased response for a disease with an increase  
20 in dose supports a finding of causal  
21 relationship, you're saying that that's not  
22 correct?

1 MR. MANDELL: Objection.

2 A. No. It's a piece of information, but you  
3 have to understand the context, particularly the  
4 details of the study in order for me to answer  
5 that question any differently.

6 Q. But you're not willing to say that a  
7 positive dose-response relationship is supportive  
8 of causation?

9 MR. MANDELL: Objection.

10 A. My answer is the same. I don't have  
11 anything else to add.

12 Q. Okay. So you can't answer it in  
13 isolation like that; is that what you're saying?

14 MR. MANDELL: Objection.

15 Go ahead.

16 A. My answer -- I gave my answer. I can't  
17 clarify or qualify it any further.

18 Q. Okay. If a dose-response analysis does  
19 not show increased response for a disease with an  
20 increase in dose, that analysis does not support  
21 a finding of a causal relationship; is that  
22 correct?

1 MR. MANDELL: Objection.

2 A. No, same thing. You have to understand  
3 the context, the details of how a study was done,  
4 in order for me to answer that question.

5 Q. Okay. So you wouldn't agree with that?

6 MR. MANDELL: Objection.

7 Go ahead.

8 A. My answer is the same.

9 Q. That you can't answer that question  
10 without knowing the whole study; is that what  
11 you're saying?

12 MR. MANDELL: Objection.

13 Go ahead.

14 A. You have to understand how a study was  
15 done, how the study results are presented in  
16 order to answer that question.

17 Q. In your report, you state -- on page 47,  
18 the bladder cancer report, which is Exhibit 4.  
19 Is that right?

20 MR. MANDELL: Yes, that is right.

21 Q. Under the biological gradient section,  
22 you say, "We now know that complex dose-response

1 relationships can occur (e.g. hormesis)" --

2 A. Wait. I'm sorry. You're on page 47  
3 where?

4 MR. MANDELL: Yeah. He didn't start  
5 at the beginning of the sentence. It's the  
6 second sentence.

7 THE WITNESS: Okay.

8 MR. MANDELL: No. The third  
9 sentence.

10 That's okay.

11 THE WITNESS: Oh, I see. Okay.

12 MR. MANDELL: It's not a criticism.  
13 I'm just saying.

14 Q. You say, "However, we know that complex  
15 dose-response relationships can occur  
16 (e.g., hormesis) and that dose-response  
17 relationships are not all (or necessarily)  
18 linear."

19 Do you see that?

20 A. Yes.

21 Q. In terms of a cancer, can you cite an  
22 example where a lower dose of a carcinogen is

1 considered more risky than a higher dose?

2 MR. MANDELL: Objection.

3 Go ahead.

4 A. For a carcinogen, not specifically.

5 Q. Okay. One of the Bradford Hill criteria  
6 is specificity, correct?

7 A. Yes.

8 Q. And looking here on page 47 of Exhibit 4,  
9 which is your bladder cancer report, you state,  
10 "Specificity in Bradford Hill's time meant that  
11 an exposure causes a single disease without any  
12 other likely explanation other than the exposure  
13 under consideration."

14 Do you see that?

15 A. Yes.

16 Q. Okay. In relation to that, I want to  
17 talk to you a little bit about leukemia, even  
18 though this was from a bladder cancer report.

19 You're aware that leukemia's divided into  
20 subtypes, aren't you?

21 A. Yes.

22 Q. And you're familiar with some of the

1 different subtypes of leukemia?

2 A. Yes.

3 Q. What are the different subtypes of  
4 leukemia that you're familiar with?

5 A. AML, ALL. CLL formerly was considered  
6 part of that, but it's generally lumped under NHL  
7 now. Those -- ALL and AML are the most common of  
8 the leukemias.

9 Q. Okay. In your report on  
10 leukemia/non-Hodgkin's lymphoma, which is  
11 Exhibit 7 -- do you have that in front of you?

12 A. Yes.

13 Q. You have cited several studies in this  
14 report regarding leukemia, right?

15 A. Sure.

16 Q. And some of the studies that you cite  
17 break down leukemias into their separate  
18 subtypes, don't they?

19 A. Yes.

20 Q. So I want to direct you to page 32 of  
21 this report. For example, you cite the Talibov  
22 study. Do you see that?



1 A. Yes.

2 Q. And that study investigated whether there  
3 were elevated risks of AML, acute myelogenous  
4 leukemia, with solvent exposures, correct?

5 A. That's right.

6 Q. And then you also cite the Cocco report.  
7 Do you see that?

8 A. Yes.

9 Q. That study looked at the increased risk  
10 of chronic lymphocytic leukemia, CLL, with TCE  
11 exposure, right?

12 A. They also looked at follicular lymphoma.

13 Q. Okay.

14 A. That's what it says here. I don't recall  
15 that study.

16 Q. Okay. So it looked at follicular  
17 lymphoma and CLL, right --

18 A. That's what it says.

19 Q. -- according to what you put in your  
20 report?

21 The -- you see the Linet report under the  
22 benzene section?

1 A. Yes.

2 Q. That particular study looked at the  
3 increased risk of chronic myeloid leukemia, CML,  
4 in Chinese benzene-exposed workers, right?

5 A. I believe they also looked at AML.

6 Q. Okay. So looked at both AML and CML in  
7 those particular workers, right?

8 A. And some other non-Hodgkin lymphomas.

9 Q. Okay. I see that. Thank you.

10 You'd agree that AML, CLL, and CML are  
11 distinct diseases, wouldn't you?

12 A. Yes, I agree with that.

13 Q. And the rate of progression of those  
14 different subtypes varies greatly, doesn't it?

15 A. It can.

16 Q. Would you agree that the course of  
17 treatment is different based on the different  
18 leukemia subtype?

19 A. It can.

20 Q. You agree that chronic leukemias progress  
21 slowly and may never need treatment?

22 A. At times.

1           Q.   You -- would you agree that acute  
2   leukemias progress rapidly and can require  
3   immediate treatment?

4           A.   I do agree with that.

5           Q.   Would you agree that the different  
6   subtypes have different risk factors?

7           A.   They may.

8           Q.   Would you agree that benzene at high  
9   exposures have been linked to AML?

10          A.   I agree that benzene causes AML.

11          Q.   Okay.  You don't qualify that as high  
12   versus low exposures?

13          A.   No.  I said I agree that benzene causes  
14   AML.

15          Q.   Benzene has not been linked to other  
16   specific subtypes of leukemia, has it?

17                   MR. MANDELL:  Objection.

18                   Go ahead.

19          A.   We'd have to go through my report.  I  
20   don't remember all the details about benzene and  
21   hematologic malignancies.

22          Q.   Um-hmm.  Are you aware that CLL has a

1 genetic risk factor?

2 MR. MANDELL: Objection.

3 Go ahead.

4 A. I suspect that's -- there are genetic  
5 risk to some of these, including CLL.

6 Q. Are you aware specifically though that  
7 CLL has an identified genetic risk factor?

8 A. Well, stand by. Let's look at my report.  
9 I may address that.

10 (Pause)

11 A. I don't recall specifics of everything I  
12 reviewed with CLL.

13 Q. Okay. Do you know whether there are any  
14 genetic risk factors for AML that have been  
15 identified?

16 A. I suspect there are, but I couldn't tell  
17 you what they are.

18 Q. Okay. Would you agree that different  
19 subtypes of leukemia have different latency  
20 periods?

21 A. They may.

22 Q. Do you know what the latency period

1 generally is considered to be for acute  
2 leukemias?

3 A. Oh, it would depend on what the exposure  
4 was, the intensity of the exposure, etc., and the  
5 age of the person, so I don't think I can answer  
6 that question.

7 Q. Are you aware generally that the latency  
8 for chronic leukemias is longer than the latency  
9 for acute leukemias?

10 A. I would generally agree with that.

11 Q. Okay. Would you agree that different  
12 leukemia subtypes arise in different types of  
13 cells?

14 A. They can, sure.

15 Q. Are you aware that IARC distinguishes  
16 between different leukemia subtypes in its cancer  
17 classifications?

18 MR. MANDELL: Objection.

19 Go ahead.

20 A. I don't recall.

21 Q. As a practicing doctor, do you  
22 distinguish between different leukemia subtypes

1 when you diagnose patients?

2 MR. MANDELL: Objection.

3 Go ahead.

4 A. Usually not.

5 Q. You usually don't? Okay.

6 Do you have many leukemia patients in  
7 your practice?

8 A. Fortunately, leukemia is fairly rare.  
9 Although I did diagnose someone with leukemia in  
10 the last couple months.

11 Q. And you didn't specify what type of  
12 leukemia that person had?

13 A. No. I was trying to save his life.

14 Q. Okay. So can you describe what the  
15 circumstances of that were? Did you refer them  
16 to another specialist, or what happened?

17 MR. MANDELL: Objection.

18 A. He was almost dead when he came to me  
19 from his acute leukemia, and so we did everything  
20 we could do to save his life.

21 Q. Would you agree that leukemia in children  
22 is very different than leukemia in adults?

1 MR. MANDELL: Objection.

2 A. You'd have to be more specific.

3 Q. Okay. As a general matter -- you can't  
4 answer that question as a general matter, it  
5 needs to be more specific?

6 MR. MANDELL: Objection.

7 Go ahead.

8 A. There are different types of leukemia, so  
9 you'd have to be more specific.

10 Q. Do you understand the difference between  
11 DNA mutations and DNA alterations?

12 MR. MANDELL: Objection. Foundation.

13 A. Generally, yes.

14 Q. Do you understand that adults with AML  
15 have more DNA mutations than children with AML?

16 MR. MANDELL: Objection.

17 A. I'm not familiar with that literature.

18 Q. And would that also be true with respect  
19 to the statement that children with AML have more  
20 structural DNA alterations than adults with AML?

21 MR. MANDELL: Objection.

22 Go ahead.

1 A. I'm not familiar with that literature.

2 Q. You just mentioned a patient that you had  
3 with leukemia. How often do you see a patient  
4 with leukemia?

5 A. Do you mean do I diagnose leukemia or  
6 treat someone who has or had leukemia?

7 Q. Well, you can answer both if there's a  
8 distinction between the two.

9 MR. MANDELL: Objection.

10 Go ahead.

11 A. So diagnosing leukemia, that is, the  
12 person comes in, didn't know they had leukemia  
13 till I tell them, that is fortunately rare.

14 Q. Um-hmm.

15 A. Treating someone who has a leukemia or  
16 hematopoietic cancer is certainly more common. I  
17 couldn't tell you how often that is.

18 Q. Okay. Can you just generally describe,  
19 you know, what your clinical practice is? You're  
20 an emergency room physician, right, as a  
21 clinician?

22 A. So I'm board certified in emergency



1 medicine as well as medical toxicology.

2 Q. Um-hmm.

3 A. So my clinical practice is working in the  
4 ER as well a clinical practice of medical  
5 toxicology. So that includes -- we have a  
6 consultation service, so we are consulted and  
7 round and see patients in ERs, ICUs, floors. We  
8 take call for all of New England. We cover the  
9 Mass./Rhode Island Poison Center at night. We  
10 have a toxicology clinic where we see patients.

11 And so -- and then when I'm working in  
12 the ER there is nearly invariably some toxicology  
13 component to that as well.

14 Q. Okay. How much of your time is -- what  
15 percentage is devoted to the ER practice versus  
16 the toxicology consulting?

17 A. There's no way to break that up. For  
18 instance, when I'm on call, I'm on call for  
19 24 hours at a time, and I may be doing tox --  
20 getting tox consults while I'm working in the ER.

21 Q. Okay.

22 A. So I can't break it up.

1 Q. How often are you on call at the ER?

2 A. I'm not on call at the ER.

3 Q. Okay. I thought you just said you are.

4 A. I think I know the question you want to  
5 ask, but I'll just let ask you it.

6 Q. Can you describe kind of what your  
7 week-to-week work is as far as your relationship  
8 to working at the ER?

9 A. It varies. I work day shifts, evening  
10 shifts, weekend, holidays. I fortunately don't  
11 work night shifts anymore.

12 Q. Um-hmm. Are you affiliated with a  
13 particular ER?

14 A. So UMass Memorial Health is the health  
15 system. We have technically seven hospitals. I  
16 work at two or three of those hospitals.

17 Q. And how do you like receive your  
18 assignments for those hospitals? Is there some  
19 supervisor who assigns you to different times at  
20 different hospitals?

21 A. An administrative -- administrative  
22 assistant does that.

1 Q. Okay. Let's go back to the Bradford Hill  
2 criteria. And since we're in the leukemia  
3 report, if you look at page 54.

4 A. 5-4?

5 Q. Yeah. Do you see the criteria identified  
6 as plausibility?

7 A. Yes.

8 Q. And you state that "Plausibility:  
9 Biological plausibility refers to the concept  
10 that a relationship between an exposure and an  
11 adverse health outcome can be attributed to  
12 causation based on existing biomedical and  
13 epidemiological knowledge."

14 Do you see that?

15 A. Yes.

16 Q. And can you describe how you apply that  
17 criteria?

18 A. Sure. So it's considering mechanistic  
19 data, it includes in vitro or in vivo studies as  
20 well as epidemiologic evidence, and combining  
21 those.

22 Q. Okay. Did you weigh the Bradford Hill

1 criteria in reaching your conclusions in this  
2 case?

3 MR. MANDELL: Objection.

4 Go ahead.

5 A. What do you mean by weigh them?

6 Q. Did you evaluate each of them for  
7 reaching your opinions in the case in any  
8 particular way?

9 MR. MANDELL: Objection.

10 A. I evaluated the nine Bradford Hill  
11 viewpoints. There is no scoring system or  
12 scorecard for them.

13 Q. How would you describe your methodology  
14 for evaluating the criteria?

15 MR. MANDELL: Objection.

16 Go ahead.

17 A. "Weight of the evidence" approach.

18 Q. Can you elaborate how the "weight of the  
19 evidence" approach is used?

20 A. It's a qualitative assessment using my  
21 education, training, and 30 years of experience  
22 in evaluating all of the data.

1 Q. Are there any particular criteria or  
2 criterion that you gave the most weight to?

3 A. I don't think so. As it's not a  
4 scorecard, it's not a -- I don't know that I can  
5 answer it any differently.

6 Q. Are there any criteria or criterion that  
7 you gave the least weight to?

8 A. Well, I think specifically here it would  
9 be specificity.

10 Q. Why is that?

11 A. Well, as I say on my report on page 54,  
12 "Specificity in Bradford Hill's time meant that  
13 exposure causes a single disease without any  
14 other likely explanation other than the exposure  
15 under consideration."

16 But we know that's not -- that's not  
17 true, that exposures often usually cause more  
18 than one effect. And that's why I said the  
19 specificity viewpoint is difficult to meet.

20 Q. Other than your education and experience,  
21 is there any other source that you used to apply  
22 the Bradford Hill criterion that you looked to?

1 MR. MANDELL: Objection.

2 A. I don't think you mentioned my 30 years  
3 of experience.

4 Q. I said other than your education and  
5 experience. I didn't say 30 years, but...

6 A. Oh, okay. My training, I am the division  
7 chief of our medical toxicology. We have four  
8 fellows, so these are the things that I teach  
9 residents and fellows as well.

10 Q. Okay. But you didn't consult any  
11 resource with respect to this particular case in  
12 like how to apply the Bradford Hill criteria, you  
13 just used your education, experience, training;  
14 is that true?

15 MR. MANDELL: Object.

16 A. I would agree with that.

17 Q. Okay. You reviewed the ATSDR's  
18 epidemiological studies of the Camp Lejeune  
19 population, didn't you?

20 A. Yes.

21 Q. In fact, you site the ATSDR studies as  
22 providing support for your conclusions in

1 your case -- in this case in each of your  
2 reports. Do you recall that?

3 A. I'm sure I did.

4 Q. Would you agree that those studies  
5 examined potential effects of the contaminants in  
6 the Camp Lejeune water on persons exposed to that  
7 water at Camp Lejeune?

8 A. Can you say that again?

9 Q. Would you agree that the studies examined  
10 potential effects of the contamination in the  
11 Camp Lejeune water on persons exposed to that  
12 water at Camp Lejeune?

13 MR. MANDELL: Objection.

14 Go ahead.

15 A. Well, I think that's why they were  
16 constructed, to examine potential effects.

17 Q. Okay.

18 A. It's my opinion they demonstrate  
19 causation.

20 Q. I want to show you --

21 (Exhibit 15, Excerpts from the  
22 ATSDR's 2018 morbidity study, marked

1                   for identification.)

2           A.   Do you have another clip?  This thing  
3   pops off when I flip them.  No.  No.  Like one of  
4   these (indicating).  Just -- no?  Here, let me do  
5   this.  It's just easier to flip through pages.

6           Q.   Yeah.  I'm sure we could probably find  
7   some.

8           A.   I'll just keep that separate.  Put that  
9   clip back on.  Okay.  Thanks.

10          Q.   Dr. Bird, I show you what has been marked  
11   as Exhibit 15.  This is excerpts from the ATSDR's  
12   2018 morbidity study.  Do you see that?

13          A.   Oh, all the pages are not here, that's  
14   why it's an excerpt?

15          Q.   Yes.  It's excerpts, yes.

16          A.   Yes.

17          Q.   And this is one of the studies that you  
18   cited in at least some of your reports, right?

19          A.   Yes.

20          Q.   You're aware that this study was based on  
21   a survey, aren't you?

22          A.   Yes.



1 Q. And you are aware that this study was  
2 never published in a peer-reviewed journal?

3 A. My understanding, it was peer-reviewed,  
4 but not published in a peer-reviewed journal.

5 Q. So with respect to peer review, you  
6 believe it was peer-reviewed internally by the  
7 ATSDR, but not submitted for peer review by the  
8 journal?

9 A. Well, I think -- my understanding, it  
10 goes -- it underwent both internal ATSDR peer  
11 review and external peer review. I may be  
12 mistaken, but that's my understanding.

13 Q. But we agree that it was never published  
14 in a peer-reviewed journal; is that correct?

15 A. I agree with that.

16 Q. Are you aware that selection bias was a  
17 significant limitation of this study because  
18 those at Camp Lejeune with health problems would  
19 be more likely to return a survey due to  
20 publicity around the Camp Lejeune water  
21 contamination than those at Camp Pendleton?

22 MR. MANDELL: Objection.

1 A. Where are you reading from?

2 Q. I'm just aware -- I'm just asking, are  
3 you aware that selection bias was a significant  
4 limitation, given publicity around the  
5 Camp Lejeune situation?

6 MR. MANDELL: Objection.

7 A. That is a potential limitation, sure.

8 Q. And you're familiar with selection bias,  
9 aren't you?

10 A. Yes.

11 Q. What is your understanding of selection  
12 bias?

13 A. Well, there can be different types of  
14 selection bias. Generally it would be that the  
15 people included in a study do not have  
16 characteristics identical or nearly identical to  
17 people who did not respond.

18 Q. And what type of problem does that  
19 present?

20 MR. MANDELL: Objection.

21 A. It depends. There's -- you need more  
22 details about how a study's constructed and how

1 it would affect it.

2 Q. If you turn to page 11 of the study. Do  
3 you see the first complete sentence at the top of  
4 page 11, which states, "Second, selection bias  
5 could have impacted analyses comparing  
6 Camp Lejeune to Camp Pendleton, likely biasing  
7 results away from the null (potentially  
8 overestimating the effect of the exposures)  
9 because those at Camp Lejeune with health  
10 problems may have been more likely to participate  
11 than those at Camp Pendleton with health  
12 problems."

13 Do you see that?

14 A. I see that.

15 Q. You did not reference the issue of  
16 selection bias in any of your reports when  
17 discussing this study, did you?

18 A. I don't recall if I specifically  
19 mentioned that in my report, but it's part of my  
20 consideration in evaluating studies.

21 Q. You say it's a consideration that you  
22 have in evaluating studies. Is it important when

1 discussing studies to discuss significant  
2 limitations of those studies?

3 MR. MANDELL: Objection.

4 A. It depends. I cited lots of studies. I  
5 couldn't describe all limitations or strengths to  
6 every study, but I considered that in my weighing  
7 of the evidence.

8 Q. With respect to selection bias for this  
9 particular study, did you consider that to be a  
10 significant limitation?

11 MR. MANDELL: Objection.

12 A. My recollection is that they looked at  
13 the response rate to try to evaluate selection  
14 bias. I think this is -- yeah, it's 115 pages.  
15 I don't recall -- well, let's see here. Hold on.

16 It may be addressed in their sensitivity  
17 analyses on page 20 -- starting on page 26 of the  
18 study. So I'm happy to look at the whole study  
19 if you have it.

20 Q. Well, with respect to the participation  
21 in the survey, the study found that a higher  
22 percentage of Camp Lejeune participants responded

1 to the study than Camp Pendleton participants.  
2 Would that be an indication of selection bias if  
3 that were true?

4 MR. MANDELL: Objection. Form and  
5 foundation.

6 A. Can you show me where that is? Because I  
7 don't recall that.

8 Q. Okay. I don't have that in this excerpt,  
9 but I do have -- if you turn to page 50, if you  
10 see there on the paragraph -- first full  
11 paragraph, it says, "We compared the percentages  
12 of completed HIPAA forms and medical record  
13 confirmation by diseases between the cohorts ....  
14 For the majority of diseases, the Camp Lejeune  
15 cohorts had higher percentages of completed HIPAA  
16 forms and medical record confirmations than did  
17 the Camp Pendleton cohorts."

18 Do you see that?

19 A. Stand by.

20 (Pause)

21 A. I do, and they're referencing Table 16  
22 and 17, which we don't have here (indicating).

1 Q. Okay. Well, maybe at a break we'll get  
2 those. But if that is a correct statement, would  
3 that be an indication of selection bias?

4 MR. MANDELL: Objection.

5 A. It could be. But they also discuss other  
6 sensitivity analyses trying to determine that.

7 Q. Okay. In any case, you didn't reference  
8 the percentage of return on surveys or HIPAA  
9 forms in discussing this study in any of your  
10 reports, did you?

11 MR. MANDELL: Objection.

12 A. That's right, I did not.

13 Q. Take a look at Table 6 on page 74. And  
14 again, we're referring to the mort- -- morbidity  
15 study, which is Exhibit 15.

16 If you look at the results of the  
17 morbidity study in comparing the Camp Lejeune  
18 Marine and the Camp Pendleton Marine cohort of  
19 the five diseases that your reports cover, which  
20 are bladder cancer, kidney cancer, Parkinson's  
21 disease, non-Hodgkin's lymphoma, and leukemias,  
22 is it fair to say that only bladder cancer had an

1 odds ratio of above 1.5?

2 MR. MANDELL: Objection.

3 A. Sorry. I was confused because not  
4 everything is highlighted.

5 Q. Okay.

6 A. Not all of these diseases we're talking  
7 about today is highlighted, so I -- I was  
8 confused.

9 Q. Okay. Well, I can go through them in  
10 more detail to make it clearer for you. I don't  
11 want to confuse you.

12 So, for example, leukemia is at .97. Do  
13 you see that?

14 A. Yes.

15 Q. And bladder cancer is at 1.64. Do you  
16 see that?

17 A. Yes.

18 Q. Kidney cancer is at 1.31. Do you see  
19 that?

20 A. Yes.

21 Q. And Parkinson's disease is at .89. Do  
22 you see that?

1           A.    Yes.

2           Q.    I don't think non-Hodgkin's lymphoma is  
3   called out specifically, but they do have  
4   lymphomas right below leukemia, and that's  
5   at 1.06.   Do you see?

6                   MR. MANDELL:   Objection.

7                   Go ahead.

8           A.    Yes.

9           Q.    So bladder cancer is the only one of  
10   those that we just went through that it was  
11   above 1.5, right?

12          A.    Yes.

13          Q.    And if you turn to page 76 and if you  
14   look at the bladder cancer on page 76.   And these  
15   are the odds ratios for cumulative TC exposure in  
16   Marines at Camp Lejeune compared with those at  
17   Camp Pendleton, and it's broken down between low  
18   exposure, medium exposure, and high exposure.   Do  
19   you see that?

20          A.    Yes.

21          Q.    And if you go to the high-exposure odds  
22   ratio for bladder cancer, it's dropping below 1,



1 to .93. Do you see that?

2 A. Yes.

3 Q. And you don't mention that particular  
4 figure in your bladder cancer report, do you,  
5 the .93 for the high exposure?

6 MR. MANDELL: Objection.

7 A. I don't recall.

8 Q. Okay. If you look at your bladder cancer  
9 report, which is Exhibit 4, and turn to page 39.

10 A. 49?

11 Q. 39.

12 A. Okay.

13 Q. And if you turn back to page 38, do you  
14 see you're discussing the 2018 morbidity study at  
15 this part of your report?

16 A. Yes.

17 Q. If you turn to the next page on 39, you  
18 state [As read], "Marines at Camp Lejeune with  
19 any/low exposure to TCE (defined less than  
20 110 ppb-months) had an odd -- had the odds ratio  
21 of bladder cancer of 1.28," and you then have a  
22 95% confidence interval of .76 to 2.15, "a

1 28% increase versus their peers at Camp Pendleton."

2 Then you state, "The odds ratio for  
3 Marines at Camp Lejeune with medium exposure to  
4 TCE (defined as between 110 and 11,030 ppb-months)  
5 increased for bladder cancer to 1.68," a  
6 95% confidence interval of 1.0 to 2.82, "a 68%  
7 increased risk versus their peers at  
8 Camp Pendleton."

9 Do you see that?

10 A. Yes.

11 Q. And those correspond to the table that we  
12 looked at just a moment ago, don't -- doesn't it?

13 A. Yes.

14 Q. But you don't mention the third group,  
15 which is the high exposure, in which the odds  
16 ratio is .93 in this paragraph, do you?

17 A. That's right, I don't.

18 Q. Okay. If you go back to this particular  
19 exhibit, Exhibit 15.

20 A. Is this the excerpt?

21 Q. Yes. Yes.

22 And you turn to Table 6, which is on

1 page 74.

2 A. Okay.

3 Q. The odds ratios for leukemia and  
4 Parkinson's disease, do you see those? For  
5 leukemias is .97, for Parkinson's disease,  
6 it's .89, do you see that?

7 A. Yes.

8 Q. Because those were below 1, that means  
9 that there was a higher percentage of these  
10 diseases in the Camp Pendleton cohort compared to  
11 the Camp Lejeune cohort, right?

12 A. Well, first of all, you have to  
13 understand about Parkinson's disease, which is a  
14 disease of older people, you're comparing a  
15 low-incidence disease in one population to a  
16 low-incidence disease in another population of  
17 young people. So you're going to get a low odds  
18 ratio.

19 Q. Okay.

20 A. You just know that's going to happen.

21 This just says that -- this .89 says that  
22 there was an 11 percent decreased risk in those

1 at Camp Lejeune.

2 Q. Okay. And what about --

3 A. What did I say, a -- did I say 11?

4 MR. MANDELL: You did say 11.

5 A. Okay. I just wanted to make sure I did.

6 MR. MANDELL: I think you did, yeah.

7 A. Okay. Good.

8 Q. And for leukemia, it is below 1 there as  
9 well, right?

10 A. There was a 3 percent decreased risk in  
11 those at Camp Lejeune.

12 Q. And you don't cite those particular  
13 figures in your reports, do you?

14 A. I cite a lot of data, and there's lots of  
15 tables. I don't recall.

16 Q. I want to go back to the leukemia report,  
17 Exhibit 7. Turn to page 42.

18 A. Okay.

19 Q. With respect to the leukemia findings --  
20 and again, this is in reference, if you go back  
21 to the prior page, to the 2018 study.

22 A. Okay.

1           Q. You reference civilians exposed to medium  
2 levels of TCE and PCE and you combined and you  
3 have the 10,868 to 50,563 ppb-months for TCE or  
4 457 to 2,118 ppb-months for PCE and you  
5 referenced an odds ratio of 1.41. Do you see  
6 that?

7           A. Yes.

8           Q. And you say that that reflects a  
9 41 percent increased risk of leukemia compared to  
10 Camp Pendleton civilians, right?

11          A. That's what it says.

12          Q. You don't comment on the confidence  
13 interval, do you, in your -- in the text of that  
14 finding?

15          A. Yeah. I list the confidence interval.

16          Q. You have the confidence interval, but you  
17 don't comment on it, do you? I mean, you comment  
18 that there's a -- that there is a 41 percent  
19 increased risk of leukemia, but you don't discuss  
20 the confidence interval, do you?

21          A. That's right.

22          Q. And isn't -- the confidence interval

1 reflected for that particular result, would you  
2 agree that that's a very wide confidence  
3 interval?

4 A. No.

5 Q. You would not, why not?

6 A. Because it's not.

7 Q. So you don't consider 0.38 to 5.28 to be  
8 a wide confidence interval?

9 MR. MANDELL: Objection.

10 A. As I said, I tend not to use adjectives.  
11 I think I said that previously. The numbers are  
12 the numbers.

13 Q. But doesn't that give you less confidence  
14 in there being a 41 percent increased risk of  
15 leukemia?

16 MR. MANDELL: Objection.

17 Go ahead.

18 A. No. The numbers show a 41 percent  
19 increased risk.

20 Q. Would you ever think that there was an  
21 occasion where it would be appropriate to comment  
22 on the confidence interval --

1 MR. MANDELL: Objection.

2 Q. -- when discussing the increased risk?

3 MR. MANDELL: Objection, please.

4 A. Maybe. It depends on the context.

5 Q. If you look back on -- if you go back to  
6 Exhibit 15. Do you have that in front of you?

7 A. What's 15?

8 Q. It's the morbidity study.

9 MR. MANDELL: The excerpt.

10 A. Yours are all labeled. Mine don't have  
11 numbers on them.

12 Q. Oh, okay. We should maybe --

13 A. That's why I keep asking.

14 MR. MANDELL: That's okay.

15 MR. BAIN: We should maybe put a  
16 number on them as we hand them to him.

17 Q. The 1.41 number for leukemias that you --  
18 that we just saw in your leukemia report, is from  
19 Table 12 on page 86; is that right? If you take  
20 a look at Table 12 on page 86.

21 A. Stand by. Let me just familiarize myself  
22 with this.

1 (Pause)

2 A. Okay. Your question?

3 Q. The 1.41 increased -- or odds ratio  
4 representing a 41 percent increased risk is from  
5 this table, the middle column, for medium  
6 exposure; is that right?

7 A. Yes.

8 Q. And with respect to the low exposure  
9 group, do you see that the odds ratio is .84?

10 A. Yes.

11 Q. And you don't reference that particular  
12 finding in your report, do you?

13 A. That's correct.

14 Q. And you don't note the fact that the  
15 numbers analyzed in each group were very low,  
16 three cases for low exposure, four cases for  
17 medium exposure, and one case for high exposure,  
18 do you?

19 A. That's right.

20 Q. And you don't know that this was -- this  
21 was part of a dose-response analysis which failed  
22 to show a linear dose response?



1 MR. MANDELL: Objection.

2 Go ahead.

3 A. Yeah, I don't mention that.

4 Q. Okay. Would you agree that this does not  
5 show a linear dose response?

6 MR. MANDELL: Objection.

7 Go ahead.

8 A. I think it's difficult to comment on a  
9 dose response with only one in the high exposures.

10 Q. Okay. That's fair.

11 Okay. I want to ask you about the  
12 results of some of the other ATSDR studies, which  
13 were in published journals.

14 THE WITNESS: Before we get a  
15 question on the record.

16 MR. BAIN: Yeah.

17 THE WITNESS: Lunch soon? Like is  
18 this a good place to break or --

19 MR. BAIN: It's good for me.

20 MR. MANDELL: Sure, it's fine. How  
21 long --

22 THE WITNESS: It just seems like

1 we're going in a new direction.

2 MR. MANDELL: Yeah. And this is off  
3 the record.

4 THE VIDEOGRAPHER: The time is  
5 12:05 p.m., and we're off the record.

6 (Lunch recess taken)

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

1 A F T E R N O O N S E S S I O N

2 THE VIDEOGRAPHER: The time is  
3 12:55 p.m., and we're on the record.

4 BY MR. BAIN:

5 Q. Okay. Dr. Bird, we're back on the  
6 record. You understand you're still under oath?

7 A. Yes.

8 MR. BAIN: I'd like to have this  
9 marked as the next exhibit.

10 (Exhibit 16, Excerpts of the ATSDR's  
11 2024 cancer incidence study preprint  
12 report, marked for identification.)

13 Q. I'm showing you what will be marked as  
14 Exhibit No. 16. This is excerpts of the ATSDR's  
15 2024 cancer incidence study preprint report. And  
16 I'd like you to turn to Table 2, which is I think  
17 the first page.

18 And do you see that this is the  
19 standardized incidence rates and Poisson  
20 regression results for the Marine/Navy personnel  
21 subgroup?

22 A. Yes.

1           Q.   And there's various diseases there in  
2   that table, right?

3           A.   Yes.

4           Q.   It compares the standard incidence rates  
5   of disease in the Camp Lejeune and Camp Pendleton  
6   populations adjusted for sex, race, and age; is  
7   that your understanding?

8           A.   Yes.

9           Q.   And the standard incidence rates that --  
10   for example, Camp Lejeune, that's listed in the  
11   first column, that's comparing the incidence of  
12   the disease at Camp Lejeune to the general  
13   population adjusted for race, age, and sex; is  
14   that correct?

15          A.   That's my understanding.

16          Q.   Okay.  So if you look at urinary bladder  
17   cancer, the standard incidence rate for  
18   Camp Lejeune cohort is listed at .90.  Do you see  
19   that?

20          A.   Yes.

21          Q.   And that would show that, adjusted for  
22   sex, race, and age, there are 10 percent fewer

1 bladder cancers in the Camp Lejeune cohort than  
2 for the general population, right?

3 A. That's right.

4 Q. And the confidence interval for that is  
5 from .8 to .99, correct?

6 A. Yes.

7 Q. Would you consider that to be a narrow  
8 confidence interval?

9 A. Again, I don't think that adding an  
10 adjective does much for a confidence interval.

11 Q. Okay. The result for the decreased risk  
12 is statistically significant, would you agree,  
13 under traditional consideration?

14 MR. MANDELL: Objection.

15 Go ahead.

16 Q. The upper end of the confidence interval  
17 is less than 1?

18 A. It is.

19 MR. MANDELL: Objection.

20 Q. And that would be statistically  
21 significant?

22 MR. MANDELL: Objection.

1 A. In traditional statistical methods, yes.

2 Q. Would you agree that that result does not  
3 reflect a strong association between exposure to  
4 contaminants at Camp Lejeune and bladder cancer  
5 in relation to the general population?

6 MR. MANDELL: Objection.

7 A. Well, importantly, that last part of the  
8 question, compared to the general population,  
9 right? So there's lots of reasons why the  
10 Marines have decreased incidence compared to the  
11 general population, namely the healthy Marine  
12 effect and others. So I agree with that.

13 Q. Okay. Looking at kidney and renal pelvis  
14 cancers, the next row. Do you see that?

15 A. Yes.

16 Q. The standard incidence rate for the  
17 Camp Lejeune cohort is 1.03; is that correct?

18 A. Yes.

19 Q. And that would reflect that, adjusted for  
20 sex, race, and age, there are 3 percent more  
21 kidney and renal pelvis cancers in the  
22 Camp Lejeune cohort than in the general

1 population, right?

2 MR. MANDELL: Objection.

3 A. That's what that number means, right.

4 Q. Under traditional concepts of statistical  
5 significance, that result is not statistically  
6 significant, correct?

7 MR. MANDELL: Objection.

8 Go ahead.

9 A. I would agree with that.

10 Q. The confidence interval there ranges from  
11 .95 to 1.10, correct?

12 A. Yes.

13 Q. That result does not reflect a strong  
14 association between exposure to contaminants at  
15 Camp Lejeune and kidney and renal pelvis cancer  
16 when compared to the general population, would  
17 you agree?

18 MR. MANDELL: Objection.

19 A. Similar to my answer with urinary  
20 bladder, correct, not unexpectedly.

21 Q. Okay. Take a look at non-Hodgkin's  
22 lymphoma, NHL. Do you see that?

1 A. Yes.

2 Q. The standard incidence rate for the  
3 Camp Lejeune cohort is .86; is that right?

4 A. That's right.

5 Q. So the results shows that, adjusted for  
6 sex, race, and age, there are 14 percent fewer  
7 non-Hodgkin's lymphoma cases in the Camp Lejeune  
8 cohort than in the general population, right?

9 A. That's what the numbers mean.

10 Q. And the confidence interval ranges from  
11 .79 to .93; is that right?

12 A. Yes.

13 Q. And since the upper end of the confidence  
14 interval is below 1, under traditional  
15 statistical significance, that result is  
16 statistically significant, correct?

17 MR. MANDELL: Objection.

18 Go ahead.

19 A. I agree with that.

20 Q. That result does not reflect a strong  
21 association between exposure to contaminants at  
22 Camp Lejeune in non-Hodgkin's lymphoma in



1 comparison to the general population, right?

2 MR. MANDELL: Objection.

3 A. That's generally -- that would be  
4 interpreted.

5 Q. Okay. For leukemias, do you see that  
6 row?

7 A. Yes.

8 Q. The standard incidence rate for the  
9 Camp Lejeune cohort is .87. Do you see that?

10 A. Yes.

11 Q. And that means that, adjusted for sex,  
12 race, and age, there are 13 percent fewer  
13 leukemias in the Camp Lejeune cohort than the  
14 general population, right?

15 A. That's right.

16 Q. And as with the previous result, because  
17 the upper end of the confidence interval is less  
18 than 1, that decrease is statistically  
19 significant, correct?

20 MR. MANDELL: Objection.

21 Go ahead.

22 A. That's what that means.

1 Q. And that result does not reflect a strong  
2 association between exposure to contaminants at  
3 Camp Lejeune and leukemias in comparison to the  
4 general population, right?

5 MR. MANDELL: Objection.

6 A. That's what that would mean.

7 Q. Okay. I want to look now for these  
8 diseases at the third column, which is the  
9 relative risk of Camp Lejeune versus  
10 Camp Pendleton. Do you see that column?

11 A. I do. I'm trying to figure out why there  
12 is an asterisk. Oh, it's on the next page.  
13 Okay. Yes.

14 Q. The asterisk represents that the -- the  
15 regression controls for sex, race, and five-year  
16 age groups, correct?

17 A. Yes.

18 Q. Okay. For bladder cancer, the relative  
19 risk in comparing Camp Lejeune to Camp Pendleton  
20 is 1.08, right?

21 A. That's right.

22 Q. And that's not above 1.1, is it?

1 A. Correct.

2 Q. The lower end of confidence interval  
3 is .98. Do you see that?

4 A. Yes.

5 Q. And the higher end is 1.18, right?

6 A. That's right.

7 Q. So under traditional understanding of  
8 statistical significance, this result is not  
9 statistically significant, right?

10 MR. MANDELL: Objection.

11 A. I would agree with that.

12 Q. The next line is kidney and renal pelvis.  
13 Do you see that?

14 A. Yes.

15 Q. And same as with bladder cancer, the  
16 relative risk in comparing Camp Lejeune to  
17 Camp Pendleton's 1.08, right?

18 A. Right.

19 Q. That's not above 1.1, is it?

20 A. It is not.

21 Q. And the lower end of the confidence  
22 interval is .99, correct?

1 A. That's right.

2 Q. The upper end is 1.18; is that right?

3 A. Right.

4 Q. So that result, under traditional  
5 statistical significance, is not statistically  
6 significant, correct?

7 MR. MANDELL: Objection.

8 A. Correct.

9 Q. For non-Hodgkin's lymphoma, the relative  
10 risk in comparing Camp Lejeune to Camp Pendleton  
11 is 1.01. Do you see that?

12 A. Yes.

13 Q. And that's not above 1.1, is it?

14 A. It is not.

15 Q. The lower end of the confidence interval  
16 is .92, and the upper end is 1.11, correct?

17 A. That's right.

18 Q. So under traditional understanding of  
19 statistical significance, that result is not  
20 statistically significant, is it?

21 MR. MANDELL: Objection.

22 A. I would agree with that.

1 Q. And finally, for leukemias, the relative  
2 risk in comparing Camp Lejeune to Camp Pendleton  
3 is 1.08, right?

4 A. Yes.

5 Q. And that's not above 1.1, is it?

6 A. It is not.

7 Q. The lower end of the confidence interval  
8 is .96 and the upper end is 1.22, correct?

9 A. Yes.

10 Q. So again, under traditional statistical  
11 significance, that result is not statistically  
12 significant, correct?

13 MR. MANDELL: Objection.

14 A. That's correct.

15 Q. Okay. Could you please turn to Table 6  
16 in this study.

17 A. Okay. Hold on a second.

18 Q. Have you had a chance to look at Table 6?

19 A. I'm trying to familiarize myself with it.  
20 Just one moment.

21 (Pause)

22 A. Okay.

1           Q. Table 6 is a dose-response analysis based  
2           on duration stationed at Camp Lejeune, with  
3           Camp Pendleton as a reference. Do you see that?  
4           And it's for Marine/Navy personnel subgroup; is  
5           that correct?

6           A. Yes.

7           Q. And if you look at the second page, I  
8           want to go through some of the diseases that are  
9           at issue in this case.

10                  First of all, going to urinary bladder.  
11           Do you see that one?

12           A. Yes.

13           Q. It looks like there's a general category  
14           for that, and there's some subtypes for urinary  
15           bladder under that. Do you see that?

16           A. Yes.

17           Q. I just want to look at the general  
18           category for urinary bladder. Would you agree  
19           that there's not a linear dose-response  
20           relationship reflected in that analysis?

21           A. Well, it is actually probably very  
22           linear.

1 Q. You say very linear. Is that the -- a  
2 term, "very linear"?

3 A. Well, 1.16 -- there's .86, then 1.18 and  
4 1.19. So that would -- that would probably be  
5 very close to a line.

6 Q. Okay. But would you agree that each  
7 increase in duration does not result in an  
8 increase in risk?

9 MR. MANDELL: Objection.

10 Go ahead.

11 A. With these numbers, I agree with that.  
12 Interestingly -- this is preprint?

13 Q. Yes.

14 A. So the durations are different than the  
15 published?

16 Q. Yes. And I can get to that and maybe ask  
17 you right now if you understand that there was  
18 this analysis in the published version, but they  
19 reduced the categories from four categories to  
20 three categories. Were you aware of that?

21 A. That's my understanding.

22 Q. Do you know why they did that?

1           A.    I don't.

2           Q.    Okay.  And we can go over the ones in the  
3   print version if you have the next exhibit.  Oh,  
4   we can do both.

5                   (Exhibit 17, 2024 ATSDR cancer  
6                   incidence study-print version,  
7                   marked for identification.)

8           Q.    I'm showing you what's been marked as  
9   Exhibit 17, which is the print version of the  
10  2024 ATSDR cancer incidence study.  Do you see  
11  that?

12          A.    Yes.

13          Q.    Okay.  And if you look at Table 5.  And I  
14  believe it's the dose-response analysis table for  
15  the same subgroup that we were looking at for the  
16  preprint version of the durations reduced from 4  
17  to 3.  Do you see that?

18          A.    That's right, yes.

19          Q.    Okay.  So if you look at urinary bladder  
20  with respect to Table 5 of the print version, do  
21  you see it goes from 1.02 to 1.18 to 1.20?

22          A.    That's right.



1 Q. So there, there is an increase with each  
2 increased duration, correct?

3 A. That's a monotonic dose response.

4 Q. Okay. So this reflects a monotonic dose  
5 response, whereas the prior table did not reflect  
6 that; is that true?

7 A. That's right, the unpublished version  
8 does not --

9 Q. Okay.

10 A. -- with different categories.

11 Q. Okay. If we look at kidney cancer. And  
12 if you look at the preprint version, where you  
13 have four categories. Do you see that? It goes  
14 from 1.19 to 1.08 to 1.00 to .91. Do you see  
15 that?

16 A. Yes.

17 Q. And that's not a monotonic dose-response  
18 relationship, is it?

19 A. It is not.

20 Q. And if we look at kidney on the print  
21 version, it goes from 1.12 to 1.01 to .94. That  
22 is also not a monotonic dose-response

1 relationship, correct?

2 A. That's correct.

3 Q. For NHL, on the preprint version, it goes  
4 from .94 to 1.15 to 1.00 to .94. Do you see  
5 that?

6 A. Yes.

7 Q. And on the print version, it goes from  
8 1.02 to 1.01 to 1.00. Do you see that?

9 A. Yes.

10 Q. Neither of those are a monotonic  
11 dose-response relationship, correct?

12 A. I agree with that.

13 Q. Okay. And then for leukemias, it's the  
14 next page on the preprint version, top row.

15 A. Just one second.

16 Okay.

17 Q. Do you see it goes from 1.25 to .99 to  
18 .90 to 1.09?

19 A. Yes.

20 Q. And that's not a monotonic dose-response  
21 relationship, correct?

22 A. That's correct.

1 Q. And then just to close this out, on the  
2 print version, it goes from 1.11 to .91 to 1.15.  
3 Do you see that?

4 A. Yes.

5 Q. And that's not a monotonic dose-response  
6 relationship, is it?

7 A. It is not.

8 Q. Do any of those dose-response analyses  
9 support an inference of causation?

10 MR. MANDELL: Objection.

11 Go ahead.

12 A. Well, we just looked at a few numbers  
13 from these articles. I don't have the articles  
14 committed to memory for where the discussion of  
15 these results take place in the article.

16 So just in isolation with these one  
17 numbers in this one table, I would largely agree  
18 with that, but you have to understand the whole  
19 context.

20 Q. Um-hmm. Well, if I were to tell you that  
21 these results were not called out as monotonic  
22 dose-response relationships supporting causation

1 in the main body of these articles, would you  
2 agree then that these analyses do not support it  
3 with respect to these diseases?

4 MR. MANDELL: Objection. Form.  
5 Foundation.

6 A. Well, I don't know what they -- actually  
7 the authors say in the manuscript about those  
8 numbers, so I don't know that I can comment  
9 without --

10 Q. Okay.

11 A. -- seeing what they -- their  
12 interpretation as well.

13 Q. Okay.

14 MR. BAIN: Okay. We can go to the  
15 next one.

16 (Exhibit 18, 2024 mortality study.  
17 for Camp Lejeune,.  
18 marked for identification.)

19 Q. Dr. Bird, I'm showing you what has been  
20 marked as Exhibit 18. Do you see this and  
21 recognize it as the 2024 mortality study for  
22 Camp Lejeune?

1           A.    I do.

2           Q.    I'd like to show you Table 2 on page 6.  
3    This shows the standard mortality rates and  
4    Poisson regression risk ratios from the Navy and  
5    Marine personnel for various diseases, correct?

6           A.    Yes.   Just one second.   Let me just  
7    verify something.

8                       (Pause)

9           A.    Okay.   Yes, I'm ready.

10          Q.    Okay.   So this compares the standard  
11   mortality rates of disease in -- or of death,  
12   right?   Mortality rates are the rates of death,  
13   correct, in the Camp Lejeune and Camp Pendleton  
14   populations adjusted for sex, race, and age; is  
15   that correct?

16          A.    Yes.

17          Q.    And for urinary bladder cancer, the  
18   standard mortality rate for the Camp Lejeune  
19   cohort is .97; is that right?

20          A.    That's right.

21          Q.    So this result shows, that adjusted for  
22   sex, race, and age, there are 3 percent fewer

1 deaths from bladder cancer in the Camp Lejeune  
2 cohort than in the general population, right?

3 A. Correct.

4 Q. And the confidence interval is .74 to  
5 1.24, correct?

6 A. That's right.

7 Q. Okay. This reflect -- this result does  
8 not reflect an association between exposure to  
9 contaminants at Camp Lejeune and death from  
10 bladder cancer in comparison to the general  
11 population, right?

12 MR. MANDELL: Objection.

13 A. That's right. That's what the numbers  
14 mean.

15 Q. Okay. For kidney and renal pelvis  
16 cancer, the standard mortality rate for the  
17 Camp Lejeune cohort is 1.11, correct?

18 A. Yes.

19 Q. So this result would indicate that,  
20 adjusted for sex, race, and age, there are  
21 11 percent more deaths from kidney and renal  
22 pelvis cancers in the Camp Lejeune cohort than in

1 the general population?

2 A. That's right.

3 Q. And the confidence interval there is from  
4 .93 to 1.31; is that right?

5 A. That's right.

6 Q. And under the traditional understanding  
7 of statistical significance, that result then is  
8 not statistically significant, correct?

9 MR. MANDELL: Objection.

10 A. I would agree with that.

11 Q. And this result does not reflect a strong  
12 association between exposure to contaminants in  
13 Camp Lejeune and death from kidney and renal  
14 pelvis cancer in comparison to the general  
15 population. Do you agree?

16 MR. MANDELL: Objection.

17 A. Well, I think this is evidence of a  
18 causal relationship between Camp Lejeune toxic  
19 water and death from kidney and renal pelvis  
20 cancer.

21 Q. Okay. Can you explain why?

22 A. The SMR is greater than 1.10.

1           Q.   Okay.  And even though this doesn't meet  
2   traditional statistical significance, you still  
3   hold that it is evidence of a causal  
4   relationship?

5                       MR. MANDELL:  Objection.

6                       Go ahead.

7           A.   Yes.  And also considering the healthy  
8   veteran effect.

9           Q.   Okay.  Let me ask you, you mentioned that  
10   a couple times now, what is your understanding of  
11   the healthy veteran effect?

12          A.   Actually, on the previous page, Bove --  
13   Dr. Bove et al. described that.  They say,  
14   "Factors producing a healthy veteran effect  
15   include the initial recruitment physical  
16   screening, fitness standards during military  
17   service, and access to health care during and  
18   after service.  The effect was likely strong in  
19   the Marines/Navy personnel subgroup because most  
20   were aged < 65 years at the end of follow-up."

21          Q.   Have you done any research into studies  
22   on the healthy veteran effect?



1           A. I'm familiar with the healthy veteran  
2 effect.

3           Q. Have you reviewed any articles on it?

4           A. Oh, at some point, I'm sure I have.

5           Q. Okay. We'll get back to that.

6                       (Exhibit 19, Article by  
7 Sullivan-Baca, et al.,,  
8 marked for identification.)

9           Q. I'm showing you what has been marked as  
10 Exhibit 19, which is an article called "An Update  
11 on the Healthy Soldier Effect in U.S. Veterans,"  
12 by Sullivan-Baca et al. Do you see that?

13          A. Yes.

14          Q. And the date on that particular article  
15 is 2023; is that correct?

16          A. Yes.

17          Q. Have you reviewed this article before?

18          A. I have not.

19          Q. Okay. It's not in your materials  
20 considered list, correct, since you haven't  
21 reviewed it before?

22          A. That's correct.

1 Q. Would you expect the healthy veteran  
2 effect to dissipate as a person gets older?

3 A. I'm sorry. I couldn't hear you.

4 Q. Would you expect the healthy veteran  
5 effect to dissipate as a person gets older?

6 A. It may.

7 Q. If you look at the table on page 3203.  
8 And do you see Figure 3 is represented as  
9 "Standardized mortality ratios for males and  
10 females in the Veterans Health Administration vs.  
11 U.S. population for different age groups"? Do  
12 you see that?

13 A. Yes.

14 Q. And if you look at the age 55 to 64  
15 cohort. Do you see that?

16 A. Yes.

17 Q. And do you see that the numbers are  
18 above 1 for the standard mortality ratios?

19 A. Yes.

20 Q. What does that reflect as far as you  
21 understand?

22 A. Well, this may reflect increased

1 mortality in older service personnel who were  
2 exposed to toxic water.

3 Q. That's your interpretation of it?

4 A. That's one interpretation of it.

5 Q. Okay. And do you have any idea what  
6 percentage of individuals that are included in  
7 this table might have been exposed to toxic  
8 water?

9 A. Oh, I don't. I would have to take time  
10 to review this article.

11 Q. Okay. Let's turn back to Exhibit 18. I  
12 think we had covered urinary bladder and kidney  
13 cancer. I wanted to go through the other ones.

14 A. What table?

15 Q. Table 2.

16 A. Okay.

17 Q. Okay. If you look at non-Hodgkin's  
18 lymphoma. You see that? The standard mortality  
19 rate for the Camp Lejeune cohort is .73. Do you  
20 see that?

21 A. Yes.

22 Q. So that result would show that, adjusted

1 for sex, race, and age, there are 27 percent  
2 fewer deaths from non-Hodgkin's lymphoma in the  
3 Camp Lejeune cohort than in the general  
4 population, right?

5 MR. MANDELL: Objection.

6 A. That's what that number means.

7 Q. And the confidence interval there is from  
8 .60 to .87, correct?

9 A. Yes.

10 Q. And since the upper end of the confidence  
11 interval is below 1, that decreased risk is  
12 statistically significant, correct?

13 MR. MANDELL: Objection.

14 A. According to the kind of standard or  
15 traditional interpretations of statistical  
16 significance.

17 Q. Okay. So this result does not reflect an  
18 association between exposure to contaminants at  
19 Camp Lejeune and death from non-Hodgkin's  
20 lymphoma in comparison to the general population?

21 MR. MANDELL: Objection.

22 A. That's an interpretation of those

1 numbers.

2 Q. For leukemia, do you see that row?

3 A. Yes.

4 Q. The standard mortality rate for the  
5 Camp Lejeune cohort is .87, correct?

6 A. Yes.

7 Q. So that result shows that, adjusted for  
8 sex, race, and age, there are 13 percent fewer  
9 leukemias in the Camp Lejeune cohort than the  
10 general population, right?

11 MR. MANDELL: Objection.

12 A. 13 percent fewer deaths due to leukemia.

13 Q. Yes. That's right. Thank you.

14 That result does not reflect an  
15 association between exposure to contaminants at  
16 Camp Lejeune and death from leukemias in the  
17 general population, correct?

18 MR. MANDELL: Objection.

19 A. That's one interpretation of those  
20 numbers.

21 Q. Okay. Let's look at the relative risk  
22 comparisons between Camp Lejeune and

1 Camp Pendleton.

2 For urinary bladder, the relative risk in  
3 comparing Camp Lejeune to Camp Pendleton is 1.02.  
4 Do you see that?

5 A. That's 1.21.

6 Q. Urinary bladder.

7 A. I'm sorry. Yes, it's 1.02.

8 Q. Okay. And that's not above 1.1, is it?

9 A. It is not.

10 Q. And the lower end of the confidence  
11 interval is .72, correct?

12 A. Yes.

13 Q. So under traditional statistical  
14 significance, that's not statistically  
15 significant, correct?

16 MR. MANDELL: Objection.

17 A. I would agree with that.

18 Q. Okay. Then the one I think that you just  
19 referred to a minute ago, the death from kidney  
20 and renal pelvis cancer, the relative risk in  
21 comparing Camp Lejeune to Camp Pendleton is 1.21,  
22 correct?

1 A. That's right.

2 Q. And that is above 1.1, right?

3 A. Correct.

4 Q. The lower end of the confidence interval  
5 is .95 and the upper end is 1.54, correct?

6 A. That's right.

7 Q. So under the traditional understanding of  
8 statistical significance, that is not a  
9 statistically significant increase, correct?

10 MR. MANDELL: Objection.

11 A. I agree with that.

12 Q. Okay. For death from NHL, the relative  
13 risk in comparing Camp Lejeune to Camp Pendleton  
14 is .87, correct?

15 A. Right.

16 Q. This would mean that there are 13 percent  
17 fewer deaths from NHL at Camp Lejeune in  
18 comparison to Camp Pendleton adjusted for race,  
19 age, and sex, correct?

20 A. That's how that would be interpreted,  
21 yes.

22 Q. And with respect to the healthy veteran

1 effect, these comparisons from Camp Lejeune to  
2 Camp Pendleton would in theory control for the  
3 healthy veteran effect, correct?

4 MR. MANDELL: Objection.

5 A. I'm sorry. Say that one again.

6 Q. The comparison between the Camp Lejeune  
7 and the Camp Pendleton cohorts would in theory  
8 control for the healthy veteran effect, would you  
9 agree with that?

10 MR. MANDELL: Objection.

11 A. In theory, the healthy veteran effect  
12 would be present in both groups. When you have  
13 low incidence of a disease due to healthy veteran  
14 effect in two populations, you're going to get a  
15 small number because they're -- both have --  
16 they're young and healthy veteran effect.

17 Q. So in comparing the two populations, you  
18 wouldn't say that the increase or decrease  
19 between the two would be -- would be a result of  
20 the healthy veteran effect because they both have  
21 a healthy veteran effect, correct?

22 MR. MANDELL: Objection.



1           A.   What I'm saying is -- so it may.   What  
2   I'm getting at is, when you have a disease of low  
3   incidence due to the study population, that is  
4   young and healthy veterans in both enumerator and  
5   denominator, you're going to get smaller numbers.

6           Q.   Okay.   I don't think I have done  
7   leukemia, so I need to do one more, which is, if  
8   you look at leukemias, the number is 1.13  
9   comparing the deaths from Camp Lejeune to  
10   Camp Pendleton, correct?

11          A.   That's right.

12          Q.   And the lower end of the confidence  
13   interval is .89, right?

14          A.   That's right.

15          Q.   So under traditional statistical  
16   significance, that result is not statistically  
17   significant, correct?

18                   MR. MANDELL:   Objection.

19          A.   That is an interpretation of that.

20          Q.   Okay.   You don't reference the standard  
21   incidence ratios or the standard mortality ratios  
22   data in any of your reports, do you?

1           A. I cite a lot of data from a lot of  
2 studies in my reports. I don't recall. I'm  
3 happy to look at a specific area.

4           Q. Do you recall as you sit here today, you  
5 know, citing these figures comparing the  
6 incidence of diseases at Camp Lejeune to the  
7 general population or the deaths at Camp Lejeune  
8 in comparison to the general population?

9                       MR. MANDELL: Objection.

10          A. I cited lots of studies and lots of data  
11 in my reports. I'm happy to look at a specific  
12 area of the report. I don't recall all of the  
13 data that I cited.

14          Q. Okay. You understand there's both a  
15 civilian population and military population that  
16 was at Camp Lejeune, correct?

17          A. Yes.

18          Q. Do you believe that the healthy veteran  
19 effect applies to both populations?

20          A. I think for the civilians, the healthy  
21 worker effect applies.

22          Q. Okay.

1 MR. BAIN: 21. I'm going to skip  
2 that one (indicating).

3 (Exhibit 20, Evaluation of mortality  
4 among marines and navy personnel  
5 exposed to contaminated drinking  
6 water at USMC base Camp Lejeune,  
7 marked for identification.)

8 (Exhibit 21, "Mortality study of  
9 civilian employees exposed to  
10 contaminated drinking water at USMC  
11 Base Camp Lejeune," marked for  
12 identification.)

13 Q. Dr. Bird, I've handed you what has been  
14 marked as Exhibits 20 and 21. Exhibit 20 do you  
15 see is the "Evaluation of mortality among marines  
16 and navy personnel exposed to contaminated  
17 drinking water at USMC base Camp Lejeune," 2014?

18 A. I do.

19 Q. And Exhibit 21 is a "Mortality study of  
20 civilian employees exposed to contaminated  
21 drinking water at USMC Base Camp Lejeune," also  
22 dated 2014.

1           A.   That's right.

2           Q.   You discuss some of these mortality  
3 studies in your reports, don't you?

4           A.   Yes.

5           Q.   Do you recall whether you cite each of  
6 these studies in each of your reports, or do we  
7 need to go through them individually?

8           A.   I don't recall.

9           Q.   Okay.   Okay.   Well, let's look at the  
10 bladder cancer report, which is Exhibit 4, I  
11 believe.

12           Okay.   In the bladder cancer report,  
13 starting on page 37, do you see you have a  
14 section called "Evidence From Camp Lejeune  
15 studies Confirms That These Chemicals Cause  
16 Bladder Cancer At Detected Concentrations"?

17           A.   Yes.

18           Q.   And the first report that you go into  
19 detail in the subsection is the ATSDR 2018 study,  
20 the morbidity study.   Do you see that?

21           A.   Oh, I'm sorry.   Yes.

22           Q.   And then on page 39, you discuss the

1 2024b study, the cancer incidence study by the  
2 ATSDR, correct?

3 A. That's right.

4 Q. Okay. But in this particular report, you  
5 do not discuss the ATSDR's 2014 studies in this  
6 section; is that correct?

7 A. Stand by.

8 (Pause)

9 A. I'm sorry. What was the question?

10 Q. The question was, in this section of the  
11 study where -- or section of your report where  
12 you're discussing various studies in support of  
13 your opinion, you do not reference the  
14 2014 mortality studies of either Navy/Marine  
15 personnel, or civilian personnel; is that  
16 correct?

17 A. That's correct -- well, I do mention  
18 them. I don't call out specific numbers.

19 Q. Okay. Where do you mention them?

20 A. In the first paragraph, it's not a  
21 complete paragraph or full paragraph, first  
22 paragraph of page 38.

1 Q. Can you point that out to me  
2 specifically?

3 A. Yeah. I'll just read it into the record.

4 Q. Okay.

5 A. Beginning in the last sentence on  
6 page 37, "First, bladder cancer has a relatively  
7 higher survival rate compared to other cancers  
8 the epidemiology looked at. Therefore, the  
9 studies that look at mortality do not fully  
10 capture the group of people whose bladder cancer  
11 was caused by water exposure at Camp Lejeune.

12 "Second, bladder cancer occurs primarily  
13 in older adults. Consequently, earlier  
14 epidemiology likely failed to identify  
15 individuals who would later be diagnosed with  
16 bladder cancer as a result of their exposure at  
17 Camp Lejeune, thereby understating the effect of  
18 exposure. ATSDR recognized these shortcomings in  
19 its assessment: 'Bladder cancer occurs mainly in  
20 older people and has a five-year survival  
21 percentage of over 77 percent. Because the  
22 Camp Lejeune cohorts were relatively young at the

1 end of follow-up, few deaths due to bladder  
2 cancer occurred.'" And that's citing ATSDR 2017.

3 And I further say, "This helped explain  
4 the lack of causal relationship seen in the  
5 2014 Bove studies."

6 Q. Okay. Thanks for that.

7 So you reference the fact that there is a  
8 lack of causal relationship seen in the 2014 Bove  
9 studies, but your paragraph explains why that  
10 might be the case; is that true?

11 A. Correct.

12 Q. Okay.

13 A. I think that explains why -- explains the  
14 case.

15 Q. Okay.

16 A. Not why it could be the case.

17 Q. So that's an explanation for not going  
18 over the statistics in those earlier  
19 2014 mortality studies for bladder cancer?

20 MR. MANDELL: Objection.

21 A. You lost me on that one.

22 Q. So that -- that explains why you didn't

1 report the particular statistics for the  
2 2014 ATSDR studies in relationship to bladder  
3 cancer?

4 MR. MANDELL: Objection.

5 Go ahead.

6 A. I don't remember precisely when I wrote  
7 this, but that would certainly be part of it.

8 Q. Okay. Okay. Let's take a look at your  
9 leukemia/NHL report, which I believe is  
10 Exhibit 7.

11 Okay. On -- starting on page 38, you  
12 have a section entitled "Evidence From the [sic]  
13 Camp Lejeune Studies" --

14 A. Stand by.

15 Q. Okay. I'm sorry.

16 A. Okay.

17 Q. On page 38, you have a section entitled  
18 "Evidence From Camp Lejeune Studies Confirms That  
19 These Chemicals Cause Leukemia and NHL At  
20 Detected Concentrations"?

21 A. That's right.

22 Q. And if you look on page 39, you cite the



1 Bove cancer mortality study of Marines and Navy  
2 personnel exposed to contaminated drinking water  
3 at Camp Lejeune, correct?

4 A. Just stand by. I'm refamiliarizing  
5 myself with this section.

6 I'm sorry. The question?

7 Q. You cite the Bove 2014 study of the  
8 cancer mortality in Marines and Navy personnel  
9 exposed to contaminated drinking water at  
10 Camp Lejeune, correct?

11 A. That's right.

12 Q. And you do cite the odds ratio of 1.11  
13 for leukemias. Do you see that in the second  
14 paragraph?

15 A. Yeah. Hold on. Let me read that  
16 paragraph.

17 (Pause)

18 A. I do cite the hazard ratio of 1.11,  
19 that's right.

20 Q. And that's from Table 5 of the  
21 2014 study, which is Exhibit 20, right?

22 A. Yes.

1 Q. Okay. Do you see the two rows above  
2 that, there is a hazard ratio for non-Hodgkin's  
3 lymphoma at .81?

4 A. Yes. I'm trying to see what the double  
5 asterisk means. Hold on.

6 Oh, I see. It's referencing back to  
7 Table 4, the double asterisk, simply saying that  
8 NHL is non-Hodgkin's lymphoma.

9 Q. Okay. So you see that the .81 hazard  
10 ratio there for non-Hodgkin's lymphoma, right?

11 A. Yes.

12 Q. And that reflects that the risk of  
13 mortality from non-Hodgkin's lymphoma, comparing  
14 Camp Lejeune to Camp Pendleton, is .81, meaning  
15 there's 19 percent fewer deaths; is that true?

16 MR. MANDELL: Objection.

17 Go ahead.

18 A. Yeah. That's the interpretation of those  
19 numbers.

20 Q. And you do not include that figure in  
21 your report on leukemias and non-Hodgkin's  
22 lymphoma with respect to this particular study,

1 did you?

2 A. Let's see. In that section, I describe  
3 data around leukemia only.

4 Q. But the report is for both leukemia and  
5 non-Hodgkin's lymphoma, correct?

6 A. Sure, the whole report is. This section,  
7 I discuss leukemia only.

8 Q. In this Section IX(A)? Section IX covers  
9 both leukemia and NHL, correct?

10 A. Section IX(A), I discuss only leukemia.

11 Q. But Section IX as a whole is intended to  
12 cover both leukemia and NHL, correct?

13 A. Both leukemia and NHL is discussed to  
14 some degree within Section IX. Section IX(A), I  
15 discuss only leukemia.

16 Q. Okay. So similarly, you don't reference  
17 the hazard ratio for the civilian study, which is  
18 reflected on Exhibit 21 in Table 4?

19 A. Okay. Hold on.

20 Q. Okay.

21 A. Let me just refamiliarize myself with  
22 Table 4.

1 (Pause)

2 A. Just one second.

3 Okay. I'm ready.

4 Q. So in Table 4, the hazard ratio for  
5 non-Hodgkin's lymphoma comparing the civilian  
6 populations is .83, correct?

7 A. That's right.

8 Q. Which reflects a 17 percent decrease in  
9 the risk of death from NHL in comparing the  
10 Camp Lejeune to Camp Pendleton populations,  
11 correct?

12 A. That's right.

13 Q. And that result is not referenced in  
14 Section IX(A) of your report, is it?

15 A. Well, IX(A) is the Navy and Marines  
16 section.

17 Q. Oh, that's correct. Thank you for  
18 pointing that out. IX(B)?

19 A. Stand by. Let me look at IX(B).

20 (Pause)

21 A. Okay. So I'm sorry, what was the  
22 question?

1 Q. You don't reference this hazard ratio in  
2 Section IX(B) of your report, do you?

3 A. That's correct.

4 Q. And in Section 20 -- in Section IX(D),  
5 you discuss the 2024 mortality study, correct?

6 A. Yes.

7 Q. And if you look back to Exhibit 18.

8 A. Okay. Hold on. Let me just familiarize  
9 myself with this.

10 Okay.

11 Q. If you look at Exhibit 18, Table 2,  
12 page 6.

13 A. Okay.

14 Q. The comparison of the standard mortality  
15 rates between Camp Lejeune and Camp Pendleton  
16 is .87, correct?

17 A. Yes.

18 Q. Which reflects a 13 percent decrease in  
19 the risk between Camp Lejeune and Camp Pendleton,  
20 right?

21 A. Of dying. That's right.

22 Q. And you don't reference that in

1 Section IX(D) of your report, do you?

2 A. Stand by.

3 (Pause)

4 A. Okay. I oriented myself to Tables 2, 3  
5 and 4. So what was the question?

6 Q. With respect to Table 3, which is the  
7 civilian comparison between Camp Lejeune and  
8 Camp Pendleton for death from NHL, you see the  
9 number is .98?

10 A. Comparing Camp Lejeune to Camp Pendleton?

11 Q. Yes.

12 A. Yes.

13 Q. Okay. And that, likewise, is not  
14 mentioned in Section IX(D) of your report, is it?

15 A. That's correct.

16 Q. Okay. Turn to your Parkinson's report.

17 A. Stand by.

18 (Pause)

19 A. Okay.

20 Q. In Section VIII(A), which is part of your  
21 literature review, you discuss the 2014A cancer  
22 mortality study of Marines and Navy personnel.

1 Do you see that?

2 A. Did you say Section VIII(A)?

3 Q. Yes.

4 A. What page?

5 Q. 27.

6 A. Okay. VIII(A).

7 Q. You see the second paragraph of that  
8 section, you say, "Although this study showed a  
9 link between the water and several other  
10 diseases, the sample size was too small to  
11 calculate the relative risk for PD," Parkinson's  
12 disease, right?

13 A. Yes.

14 Q. Your report references the -- in the next  
15 section, the civilian study and odds ratio of  
16 3.13, which is on the next page in the second --  
17 or the first full paragraph. Do you see that?

18 A. Yeah. Just let me familiarize myself  
19 with it.

20 (Pause)

21 A. Okay.

22 Q. You indicate that the civilians at

1 Camp Lejeune had a 213 percent higher risk of  
2 Parkinson's disease than those at Camp Pendleton,  
3 which is more than a doubling of the risk,  
4 correct?

5 A. Yes.

6 Q. You say, "This reenforces the idea that  
7 the chemicals at Camp Lejeune were present in  
8 sufficient quantities to cause Parkinson's  
9 disease"?

10 A. That's right.

11 Q. The confidence interval there is from .76  
12 to 12.86, correct?

13 A. Yes. But let me -- I just want to verify  
14 a number. I'm just trying to familiarize myself  
15 with the -- all of the various tables again.

16 Q. Okay. Are you looking at Exhibit 21?

17 A. I'm looking at Exhibit 18.

18 Q. Okay. I think this is from the  
19 2014 study that I'm talking about, which is --

20 A. Yeah. Yup. That's why.

21 Q. -- Exhibit --

22 A. 21.



1 Q. -- 21. I know there's a lot of exhibits.  
2 I'm sorry about that.

3 So if you look at Table 4, referencing  
4 Parkinson's disease, I think this is where the  
5 3.13 number comes from. Do you see that?

6 A. Yes.

7 Q. And it shows that the confidence interval  
8 goes from .76 to 12.86. Do you see that?

9 A. That's right.

10 Q. And you do reference the confidence  
11 interval in your report, but you don't have any  
12 other comment on it, do you?

13 A. No.

14 Q. And you don't comment on the number of  
15 people at Camp Lejeune who have Parkinson's  
16 disease versus the number of people at  
17 Camp Pendleton who have Parkinson's disease that  
18 accounts for this difference, do you?

19 A. What I say about it is in the paragraph  
20 on page 28 of my report.

21 Q. Okay. So you don't -- you don't  
22 reference the raw numbers of people who died of

1     Parkinson's disease, correct?

2             A.    That's correct.

3             Q.    And do you see on this table that it  
4     was -- it was five people at Camp Lejeune who  
5     have Parkinson's disease versus four people at  
6     Camp Pendleton who died of Parkinson's disease?

7             A.    That's right.

8             Q.    Okay.  I think we're going to turn to  
9     another topic now.  You can put those exhibits  
10    aside.

11            We discussed the Bradford Hill criteria  
12    that is known as biological gradient or dose  
13    response.  Do you recall that?

14            A.    Yes.

15            Q.    And are you familiar with how the  
16    dose-response analyses were done for the ATSDR  
17    cohort studies?

18            A.    I don't recall.

19            Q.    Are you familiar with the fact that the  
20    ATSDR had a water model, which provided monthly  
21    mean concentrations for the different chemicals?

22            A.    Yes.

1 Q. Do you know whether the ATSDR's water  
2 model was used in the dose-response analyses that  
3 were done in 2014, 2018, and 2024?

4 A. That is my understanding, except not  
5 maybe 2024, they used duration on base.

6 Q. Do you know why that change was made?

7 A. I don't.

8 Q. The ATSDR reports distinguish between  
9 monotonic exposure response trend and  
10 non-monotonic exposure response. Do you recall  
11 that?

12 A. No.

13 Q. You referred to monotonic exposure  
14 response previously in your testimony. How would  
15 you -- what would you describe that as?

16 A. That there's an increased risk observed  
17 with increasing dose.

18 Q. Okay. So would that be true, with each  
19 increase in dose, there must be an increase in  
20 risk?

21 A. Technically, yes.

22 Q. I noticed that you point out some

1 non-monotonic exposure trends in your report. Do  
2 you recall that?

3 A. No. I wrote over 200 pages. I don't  
4 recall.

5 Q. Okay. Is it your opinion that a  
6 non-monotonic exposure trend can support  
7 causality for these chemicals?

8 A. Yes.

9 MR. MANDELL: Objection.  
10 Go ahead.

11 Q. Okay. What is the basis for that?

12 A. Well, it depends on the particulars of a  
13 study, how the data -- how the study is  
14 conducted.

15 Monotonic dose response curves are not  
16 commonly seen -- strictly speaking, monotonic  
17 dose response curves are not commonly seen in  
18 epidemiologic studies. And there may be a lot of  
19 reasons for that. So it's a piece of the puzzle,  
20 but it is not everything.

21 Q. Is there any literature that you're aware  
22 of that says these particular chemicals can

1 exhibit non-monotonic exposure response?

2 A. I believe there is something about that  
3 in my report. Stand by.

4 Q. Okay. Page 47 of your bladder cancer  
5 report, which is Exhibit 4, may be where you're  
6 thinking of.

7 A. I'm actually thinking of the leukemia  
8 one. Stand by.

9 (Pause)

10 Q. Page 56.

11 A. Yeah. So in my various reports, under  
12 biological gradient -- for the various reports, I  
13 discuss various aspect of biological gradient and  
14 that they don't -- the dose response does not  
15 have to be monotonic, it's not necessarily  
16 linear, etc.

17 Q. And what is your -- what's your basis for  
18 those statements? For example, I'm seeing on  
19 page 56 of your leukemia report, you say,  
20 "However, we now know that complex dose-response  
21 relationships can occur (e.g. hormesis) and that  
22 dose-response relationships are not all (or

1 necessarily) linear."

2 What's the basis for that?

3 A. My education, training, and experience.

4 Q. Okay.

5 A. And there's lots of -- published about  
6 that.

7 Q. Is there anything that you can -- you can  
8 cite to me today that supports that published  
9 literature?

10 A. Well, specifically with hormesis, there's  
11 a group out of UMass-Amherst. I think the main  
12 guy is dead now. I can't remember the group's  
13 name. And I've certainly read other things.  
14 Maybe there's an article by Stayner,  
15 S-T-A-Y-N-E-R or N-O-R. There -- I believe I've  
16 read something maybe by Steenland,  
17 S-T-E-E-N-L-A-N-D.

18 I've read lots in my career, and those  
19 are what kind of come to mind.

20 Q. Okay.

21 (Exhibit 22, excerpts from the  
22 ATSDR's 2017 Assessment of Evidence,

1 marked for identification.)

2 Q. Okay. I'm showing you what's been marked  
3 as Exhibit 22. This is -- you recognize this as  
4 excerpts from the ATSDR's 2017 Assessment of  
5 Evidence?

6 A. Yes.

7 Q. And you reviewed this particular report,  
8 didn't you?

9 A. I did.

10 Q. In your experience, how long does a  
11 systematic literature review take to perform?

12 A. I don't think I can give you an answer.

13 Q. Well, let me maybe refer you back to  
14 something that would help you give an answer.

15 For that review that you did on the drugs  
16 that we looked at earlier, how long did it take  
17 you to do that systematic review of the  
18 literature?

19 A. Oh, I've been working on that for over a  
20 year. But how much time actually spent doing it,  
21 couldn't tell you.

22 Q. Couldn't give me an estimate even?

1 A. Couldn't give you an estimate.

2 Q. But it took over a year from start to  
3 finish?

4 A. Well, I was working on it for over a  
5 year. I couldn't tell you how many -- how much  
6 time it took to actually do it.

7 Q. And that just had to do with one  
8 particular drug and one particular outcome that  
9 you were looking at, right?

10 A. Well, there were more than -- there's one  
11 class of drugs.

12 Q. One class of drugs and one outcome?

13 A. Correct.

14 Q. And the class of drugs was antipsychotic  
15 drugs, and the outcome was breast cancer, right?

16 A. That's right.

17 Q. From start to finish, for your work in  
18 this case, how long did that take?

19 A. How long did what take?

20 Q. From start to finish of your work in this  
21 case, looking at these five chemicals and the  
22 five particular diseases here.



1 MR. MANDELL: Objection.

2 A. When did I start work on this case?  
3 Sometime last summer until the reports I think  
4 were finished, December 9th. I don't remember  
5 how many hours I spent on it.

6 Q. Okay. So around six months, but you  
7 can't say how many hours?

8 A. It would be on my invoice.

9 Q. Have you produced your invoices in this  
10 case to counsel?

11 A. Yes.

12 MR. MANDELL: And we have sent them  
13 to you.

14 MR. BAIN: Okay.

15 Q. You read Dr. Bove's deposition, didn't  
16 you?

17 A. I did.

18 Q. So you're aware that he testified that he  
19 performed ATSDR's systematic review of 4 chemicals  
20 and 16 health outcomes in six weeks.

21 A. I recall something like that.

22 Q. And he did it by himself. Do you recall

1 him saying that?

2 A. I don't recall that.

3 Q. Do you recall that Dr. Bove testified  
4 that the 2017 Assessment of Evidence was done in  
5 order to add diseases to the VA's presumptive  
6 disease list for Camp Lejeune?

7 A. Well, that wasn't my interpretation.

8 Q. What was your interpretation?

9 A. They weren't trying to add things to the  
10 presumptive diagnosis list. They were just  
11 seeing what the data looked like.

12 Q. And what was the purpose of looking at  
13 the data do you recall from Dr. Bove's testimony?

14 A. I thought he said something to the effect  
15 as Congress wanted it done.

16 Q. You don't recall him testifying that the  
17 Community Action Panel, the CAP, and several  
18 senators pushed the VA to do this assessment  
19 because they wanted more diseases listed?

20 MR. MANDELL: Objection.

21 A. I don't recall that.

22 Q. The 2017 assessment did not use

1 statistical significance testing to assess the  
2 evidence for causality. Do you recall that?

3 MR. MANDELL: Objection.

4 A. I do recall reading that.

5 Q. Okay. Let me ask you to take a look at  
6 page 8 of the report. Do you see at the bottom  
7 of page 8, the last paragraph there, where he  
8 states, "In our assessment, we did not use  
9 confidence intervals to determine whether a  
10 finding was 'statistically significant' nor did  
11 we use significance testing to assess the  
12 evidence for causality."

13 Do you see that?

14 A. I do.

15 Q. And you recall that?

16 A. I recall reading that.

17 Q. And if you look just above that, do you  
18 see where it states that "An effect estimate  
19 (e.g., risk ratio, odds ratio, or standardized  
20 mortality ratio) was considered to have good  
21 precision (or less uncertainty) if the ratio of  
22 the upper limit to the lower limit of its

1 95% confidence interval was less than or equal  
2 to 2."

3 Do you see that?

4 A. Yes. That's what it says.

5 Q. In your opinion, is it generally accepted  
6 in epidemiology to use confidence interval  
7 ratios?

8 MR. MANDELL: Objection.

9 Go ahead.

10 A. I don't think I have an opinion on that.

11 Q. Have you ever seen a reference to a  
12 confidence interval equal to or less than 2 as  
13 indicating good precision other than this report?

14 A. I don't believe so.

15 Q. Have you personally ever used a  
16 confidence interval ratio of equal or less than 2  
17 to indicate good precision in any work that  
18 you've done?

19 A. No.

20 Q. If you look on pages 6 and 7, starting at  
21 the bottom of page 6.

22 A. Just one second.

1 Q. Okay.

2 A. Okay.

3 Q. Do you where see the Assessment of  
4 Evidence uses the "Equipoise and above evidence  
5 for causation" to describe the state of the  
6 evidence with respect to the relationship between  
7 some chemicals and diseases?

8 A. No. I didn't see that at all.

9 Q. Okay. Do you see at the bottom of  
10 page 6, there's a section called "Equipoise and  
11 above evidence for causation"?

12 A. Yes.

13 Q. It states, "The evidence is sufficient to  
14 conclude that a causal relationship is at least  
15 as likely as not, but not sufficient to conclude  
16 that a causal relationship exists," and it then  
17 has some criteria for whether this category is  
18 met.

19 Do you see that?

20 A. Yes.

21 Q. Have you ever used the phrase "equipoise  
22 and above" to describe the scientific evidence in

1 an article that you've published?

2 A. In an article? I don't think so.

3 Q. What about in an expert report in  
4 litigation?

5 A. I don't think so.

6 Q. Would you agree that the phrase  
7 "equipoise and above" is not the sort of  
8 vernacular used in scientific literature?

9 MR. MANDELL: Objection.

10 A. Well, I think we use "equipoise" a lot in  
11 medicine.

12 Q. Okay. Can you describe how it's used?

13 A. It's the basis for most drug trials,  
14 intervention trials. It's the basis for  
15 non-inferiority trials. Equipoise is a constant  
16 in medicine.

17 Q. What about epidemiology?

18 A. I don't know. I don't have an opinion on  
19 that.

20 Q. Do you equate "equipoise and above" with  
21 "as likely as not"?

22 A. "Equipoise and above" to me means "as

1     likely as not or greater."    "As likely as not"  
2     means to me 50/50.

3           Q.   If you say that something is equipoise or  
4     50/50, does that mean it's not sufficient to meet  
5     a "more likely than not" standard?

6                   MR. MANDELL:  Objection.

7                   Go ahead.

8           A.   Say that one again.

9           Q.   If you say that the evidence is equipoise  
10    or 50/50, does that mean that the evidence is not  
11    sufficient to meet a "more likely than not"  
12    standard?

13                   MR. MANDELL:  Objection.

14           A.   I don't know.  I don't know that I've  
15    ever used the -- that term of -- okay.  It sounds  
16    a -- kind of a legal term rather than a medical  
17    expert term.

18           Q.   Which term is that?

19           A.   The question that you just asked.

20           Q.   Okay.  Let's repeat that question, and  
21    you can identify what the legal term is versus  
22    the scientific term.

1 (Record read)

2 A. Yeah. That sounds like a legal standard.

3 Q. What part of that question, the whole  
4 thing?

5 A. Yes.

6 Q. Okay. Other than the assessment of the  
7 evidence, did any literature that you reviewed  
8 for this case have the "equipoise and above"  
9 standard in it?

10 A. Just so we're clear, when you say  
11 "assessment of the evidence," are you referring  
12 to this 2017 USATSDR?

13 Q. Yes.

14 A. So the question, sorry, was: Besides  
15 that, did anything else use that term?

16 Q. Any other literature you considered in  
17 this case use the term "equipoise and above"?

18 A. Was it the Camp Lejeune Justice Act  
19 maybe?

20 Q. The term "equipoise and above"?

21 A. Maybe.

22 Q. Do you want to look back at it in your



1 report?

2 A. Yeah. I don't know. I may be  
3 misremembering. So I guess the answer is: I  
4 don't know.

5 Q. Okay. Do you recall Dr. Bove testifying  
6 that the ATSDR's classification scheme that it  
7 used in its Assessment of Evidence was the same  
8 as the IOM scheme for VA presumptive --  
9 presumption determinations?

10 A. That's where I read it. So it was in the  
11 Institute of Medicine 2008.

12 Q. Okay.

13 A. And the other -- I just recalled. The  
14 other place I've seen that was an article  
15 authored by Dr. Goodman in 2018.

16 Q. Okay. Yeah. I want to point you to  
17 where I think you referenced that in one of your  
18 reports. So let's take a look at the leukemia  
19 report, which is Exhibit 7, page 8.

20 MR. MANDELL: When you get to a  
21 breaking point, maybe take a five-minute break.

22 MR. BAIN: Okay. Let me just cover

1 this part.

2 MR. MANDELL: No. Of course. Of  
3 course.

4 Q. Do you see in the middle of the page,  
5 where it says, "Similar standards have been used  
6 in other areas of toxicology, epidemiology, and  
7 by other governmental bodies. For example, as  
8 ATSDR notes, the classification scheme used in  
9 the 2017 assessment of the evidence is one  
10 'recommended by an IOM panel that reviewed the  
11 VA's presumptive disability decision-making  
12 process for veterans (IOM 2008).'

13 Do you see that?

14 A. That's what I was trying to remember.

15 Q. Okay. Are you aware that Dr. Bove  
16 testified that the ATSDR picked this  
17 classification scheme due to time constraints and  
18 to add diseases to the VA presumptive list?

19 MR. MANDELL: Objection.

20 A. That's not my recollection of his  
21 testimony. I'm happy to review it with you.

22 Q. Do you -- did you compare how the ATSDR

1 defined the "equipoise and above" standard and  
2 how the Institute of Medicine defined the  
3 "equipoise and above" standard in its  
4 2008 document?

5 A. I did.

6 Q. You did? Okay.

7 (Exhibit 23, Excerpt from the IOM  
8 2008 document, marked for  
9 identification.)

10 A. It's been helpful when you number them.  
11 I appreciate that. But this one didn't get  
12 numbered. I don't know what the -- thank you.  
13 That's very helpful.

14 Q. So I've marked, as Exhibit 23, an excerpt  
15 from the IOM 2008 document, "Improving the  
16 Presumptive Disability Decision-Making Process  
17 for Veterans." Do you see that?

18 A. Yes.

19 Q. And if you look at page 191 of that  
20 document. Do you see there's a section called  
21 "Equipoise and Above"?

22 A. Just one second.

1 Yes.

2 Q. And do you see where it states, "To be  
3 categorized as Equipoise and Above, the  
4 scientific community should categorize the  
5 overall evidence as making it more confident in  
6 the existence of a causal relationship than in  
7 the non-existence of a causal relationship, but  
8 not sufficient to conclude causation.

9 "For example, if there are several  
10 high-quality epidemiological studies, the  
11 preponderance of which show evidence of an  
12 association that cannot readily be explained by  
13 plausible noncausal alternatives (e.g., chance,  
14 bias, or confounding), and the causal  
15 relationship is consistent with the animal  
16 evidence and the [sic] biological knowledge, then  
17 ... overall evidence might be categorized as  
18 Equipoise and Above. Alternatively, if there is strong  
19 evidence from animal studies or mechanistic  
20 evidence, not contradicted by human or other  
21 evidence, then the overall evidence might be  
22 categorized as Equipoise and Above."

1 Do you see that?

2 A. Yes.

3 Q. Now if you look at the ATSDR's Assessment  
4 of the Evidence, which is Exhibit 22.

5 A. Hold on.

6 Okay. Page?

7 Q. Page 6. Do you see where they have the  
8 section on "Equipoise and above evidence for  
9 causation"? Do you see that?

10 A. Yes.

11 Q. And it states, "The evidence is  
12 sufficient to conclude that a causal relationship  
13 is at least as likely as not, but not sufficient  
14 to conclude that a causal relationship exists.  
15 This category would be met, for example, if:

16 "1. The degree of evidence from human  
17 studies is less than sufficient but there is  
18 supplementary evidence from animal studies and/or  
19 mechanistic studies that supports causality, or

20 "[2] A meta-analysis does not provide  
21 convincing evidence (e.g., the summary risk  
22 estimate is close to the null value of 1.0, i.e.,

1 less than or equal to 1.1), or if the  
2 meta-analysis observes a non-monotonic  
3 exposure-response relationship) but there is at  
4 least one epidemiological study considered to be  
5 of high utility occurring after the meta-analysis  
6 has been conducted, in which an association  
7 between the exposure and increased risk of the  
8 disease of interest has been found and in which  
9 chance and biases can be ruled out with  
10 reasonable confidence.

11 "3. A meta-analysis had not been  
12 conducted, but there is at least one  
13 epidemiological study considered to be of high  
14 utility in which an association between the  
15 exposure and increased risk of ... disease of  
16 interest has been found ... in which chance and  
17 biases can be ruled out with reasonable  
18 confidence."

19 Do you see that?

20 A. Yes.

21 Q. Would you agree that the standards that  
22 the IOM articulated and the ATSDR used are not

1 the same?

2 MR. MANDELL: Objection.

3 A. I'm going to go back to page 189 because  
4 I think that may be informative. That's page 189  
5 of Exhibit 23.

6 Q. Okay.

7 A. So the categories used by IOM in 2008 and  
8 the assessment of the evidence are the same. The  
9 details about how they grade specific things --  
10 not grade, the details about what is required for  
11 each of those levels are not identical.

12 Q. Okay. With respect to details, which of  
13 the -- of the two did you use in your assessment?

14 A. Well, let's look at my report.

15 Q. Can you tell me what report you're  
16 referring to?

17 A. I'm in -- I don't have a number on it.  
18 The hematopoietic --

19 Q. That's Exhibit No. 7. And what page are  
20 you on?

21 A. On page 7 and 8.

22 Q. Okay. It looks like you've copied the

1 same standard that the ATSDR articulated, if  
2 you're looking at pages 7 and 8; is that right?

3 A. That's exactly what I was looking for,  
4 yes.

5 Q. Okay. So with respect to the details,  
6 you follow the ATSDR's approach?

7 A. Yes.

8 MR. BAIN: Okay. Let's take a break  
9 here.

10 MR. MANDELL: Fine. Okay.

11 THE VIDEOGRAPHER: The time is  
12 2:26 p.m., and we're off the record.

13 (Recess taken)

14 THE VIDEOGRAPHER: The time is  
15 2:42 p.m., and we're on the record.

16 BY MR. BAIN:

17 Q. Dr. Bird, we're back on the record. We  
18 were talking about the term "equipoise and  
19 above." Have you ever heard the term "equipoise"  
20 used in the scientific community as denoting a  
21 lack of consensus among the community?

22 A. I don't know if I've heard that



1 specifically.

2 (Exhibit 24, "Review of the  
3 Department of Veterans Affairs  
4 Presumption Decision Process.",  
5 marked for identification.)

6 Q. I'm showing you what has been marked as  
7 Exhibit No. 24, and this is a "Review of the  
8 Department of Veterans Affairs Presumption  
9 Decision Process." Do you see that?

10 A. Yes. I've never seen this before.

11 Q. You have not seen that? If you look on  
12 page 104. Do you see where it says, "The  
13 committee concludes that the term 'equipoise'  
14 denotes a lack of consensus across the medical  
15 community and that the term as required by law to  
16 be used in the presumption decision process is  
17 inconsistent with the current scientific  
18 use ...."

19 Do you see that?

20 A. I see that's what it says.

21 Q. But you have not seen that before?

22 A. No. I would say that that is one

1 sentence on page 104 of a 160-page report that  
2 I've never read. I can't really comment on that.

3 Q. And you've never heard the term "denoting  
4 a lack of consensus" among the medical community?

5 A. I've never heard that term.

6 Q. Okay. Would you agree that the  
7 "equipoise and above" standard gives the veterans  
8 the benefit of the doubt when its used in the  
9 presumptive decision-making process?

10 A. Oh, say it again.

11 Q. Would you agree that the "equipoise and  
12 above" standard gives the veteran the benefit of  
13 the doubt when it's used in the presumptive  
14 disease process?

15 A. What is -- I guess I'm hung up on: What  
16 does "benefit of the doubt" mean?

17 Q. Okay. Did you see that in Dr. Bove's  
18 testimony where he was asked, "How does the  
19 classification scheme in your view give the  
20 veteran the benefit of the doubt?"

21 And his answer was, "Well, having an  
22 equipoise and above does that, and I think that's

1     what the IOM thought."

2                     MR. MANDELL:  Objection.

3             A.  What -- I don't recall reading that, but  
4     he didn't use the term "benefit of the doubt."  
5     That was used in the question to him.

6             Q.  But he said that's what the "equipoise  
7     and above" does.

8             A.  Yeah.  I don't really recall it.

9                     MR. MANDELL:  Objection.

10            Q.  Okay.  Are you familiar with the term  
11     "publication bias"?

12            A.  Yes.

13            Q.  Would you agree that it's the tendency  
14     for medical journals to prefer studies that find  
15     an effect?

16                     MR. MANDELL:  Objection.

17            A.  That's part of it, sure.

18            Q.  Did you account for publication bias in  
19     any of your reports in this case?

20                     MR. MANDELL:  Objection.

21            A.  Well, it's difficult to account for  
22     publication bias, except to the degree I did by

1 looking at abstracts, etc., that were not  
2 published.

3 But if someone did a study and didn't  
4 publish it in any form at all, wouldn't have a  
5 way of determining that.

6 Q. To search the medical and scientific  
7 literature, you conducted searches of the PubMed  
8 database; is that right?

9 A. PubMed as well as Google Scholar.

10 Q. Okay. You used the Google Scholar as  
11 well; is that right?

12 A. Yes.

13 Q. And you include some of the search terms  
14 that you used in each of your reports. If we can  
15 look at one for an example.

16 Okay. So, for example, if you look at  
17 Exhibit 4, which is your report on bladder  
18 cancer.

19 MR. MANDELL: What page?

20 Q. Page 6.

21 A. Yes.

22 Q. And you state, under your "Methodology"

1 section, "In my search of the medical and  
2 scientific literature, I conducted many searches  
3 of the PubMed database, using terms including  
4 (but not exclusive to)," and then you have the  
5 search terms that you used.

6 Do you see that?

7 A. Yes.

8 Q. When you say "using terms including (but  
9 not exclusive to)," are you indicating that you  
10 used additional terms or additional search  
11 strings in addition to what is listed in your  
12 report?

13 A. Potentially. I don't recall all of those  
14 details. These are largely the terms. Sometimes  
15 when you do a search or you read another  
16 manuscript, you see another term used. But, in  
17 general, these are the terms that I used.

18 And of course I read agency reports,  
19 which had largely done these searches as well.

20 Q. You also indicated you identified  
21 additional articles as you were reviewing  
22 articles in the manuscripts you reviewed, right?

1           A. That's right. The references at the back  
2 of studies that I reviewed.

3           Q. But with respect to the search terms, we  
4 can't say that this is the only search that you  
5 did because you're indicating you might have done  
6 additional searches?

7           A. Correct.

8           Q. Okay. Did you consider the searches that  
9 you did to be comprehensive searches?

10          A. Yes.

11          Q. With respect to the chemicals and  
12 diseases that are at issue, are you confident  
13 that you identified all of the published articles  
14 analyzing whether the chemicals could or could  
15 not cause one of the effects at issue in this  
16 case?

17          A. I'm sorry. Say that again.

18                   MR. BAIN: Okay. I'm going to ask  
19 the court reporter to read it.

20                   (Record read)

21                   MR. MANDELL: Objection.

22                   Go ahead.

1           A. It would not surprise me if there were  
2 articles that I did not find with my search or  
3 review, particularly around mechanistic issues,  
4 in vitro studies that may be applicable to some  
5 degree here. But the relevant studies, I have --  
6 I've cited in reports.

7           Q. Well, let me then limit the question to  
8 epidemiological studies. With respect to the  
9 chemicals and diseases at issue, would you be  
10 confident that you identified all the published  
11 epidemiological studies analyzing whether the  
12 chemicals could or could not cause one of the  
13 diseases at issue in this case?

14          A. I think so. I can imagine a scenario  
15 where the keywords of a study were not PCE or  
16 perchloroethylene or tetrachlorethylene, but they  
17 used some other word, like laundry, which  
18 potentially I may not have seen. I mean, I'm  
19 speculating.

20          Q. Okay. Let's look at your literature  
21 review for kidney cancer, which would be  
22 Exhibit 5. Your literature review starts at

1 page 31.

2 So Section VIII is your section on your  
3 literature review, correct?

4 A. Yes.

5 Q. And Section VIII(A) is "Occupational  
6 Studies"; is that right?

7 A. Yes.

8 Q. And Section VIII(B) is  
9 "Water-Contamination Studies," correct?

10 A. Yes.

11 Q. Under water contamination studies, you  
12 cite Aschengrau. I'm not sure if I pronounced  
13 that correct. Is that right?

14 A. Yes.

15 Q. And that's from 1993, right?

16 A. That's right.

17 Q. And you cite the Andrew study from 2022;  
18 is that correct?

19 A. That's right.

20 Q. You cite the Alanee study from 2015?

21 A. And it's A-L-A-N-E-E.

22 Q. Yes.



1 (Reporter requested clarification)

2 A. A-L-A-N-E-E.

3 Q. The Section C is evidence from the  
4 Camp Lejeune studies, right?

5 A. Yes.

6 Q. And in that section, you cite the Bove  
7 studies from 2014 and 2024, right?

8 A. Yes. As well as a 2018 morbidity study.

9 Q. Right. And you cite Rosenfeld from 2024,  
10 right?

11 A. Yes.

12 Q. You also have a section entitled  
13 "Studies," that did not show an association  
14 between the Camp Lejeune chemicals and kidney  
15 cancers. It's page 40. Right?

16 A. Yes.

17 Q. And in this section, you cite the  
18 1997 McLaughlin and Blot study looking at TCE and  
19 PCE and kidney cancer, right?

20 A. Yes.

21 Q. You note that "This study was published  
22 in 1997, and subsequent studies have reliably

1 found an association with kidney cancer," right?

2 A. That's right.

3 Q. You state, "This is one example of how it  
4 takes time for science evidence to accumulate and  
5 evolve," right?

6 A. That's right.

7 Q. And in this section, on the next page,  
8 you also cite the Vlaanderen 2013 study looking  
9 at the relationship between PC and TC and kidney  
10 cancer, right?

11 A. Yes.

12 Q. And you cite the DeMoulin study in the  
13 next paragraph with respect to the relationship  
14 between benzene exposure and kidney cancer,  
15 right?

16 A. Yes.

17 Q. And you cite in the next paragraph the  
18 Bosetti study from 2003 and the Wong study from  
19 1991 with respect to vinyl chloride and kidney  
20 cancer, correct?

21 A. That's right.

22 Q. Have you reviewed Dr. Goodman's report on

1 kidney cancer that was produced in this case?

2 A. I did.

3 Q. Okay.

4 A. Wait a second. Dr. Goodman's, which --  
5 which report?

6 Q. Dr. Goodman was the United States  
7 toxicology expert and --

8 MR. MANDELL: No. He asked which  
9 report.

10 Q. Which report? Yeah. She did a report on  
11 kidney cancer.

12 A. Yes.

13 Q. Okay.

14 (Exhibit 25, Table with cohort  
15 studies, marked for identification.)

16 Q. Did you review the tables at the end of  
17 the report?

18 A. I don't recall.

19 Q. Okay. Let me direct your table --  
20 your -- let me direct you to Table D.1. Do you  
21 see it?

22 A. Yes.

1 Q. D.1 is entitled "TCE and Kidney Cancer  
2 Cohort Study Characteristics," correct?

3 A. Yes.

4 Q. And do you see that this table lists over  
5 25 cohort studies?

6 A. Yes.

7 Q. And the dates of the studies extend from  
8 1988 to 2018. Do you see that?

9 A. Yes.

10 Q. And do you see the next table is  
11 Table D.2, which is "TCE and Kidney Cancer Cohort  
12 Study Results." Do you see that?

13 A. Yes.

14 Q. And this is the statistical findings of  
15 those cohort studies, right -- or the statistical  
16 analysis?

17 A. Well, it's some information about these  
18 studies.

19 Q. Okay. Do you see a table -- the next  
20 table is D.3, which is "TCE and Kidney Cancer  
21 Case-Control Studies"?

22 A. Yes.

1 Q. And the table lists over 25 case-control  
2 studies, correct?

3 A. Yes.

4 Q. And those studies extend from 1988 to  
5 2022, right?

6 A. That's right.

7 Q. And as with D.1, which was the cohort  
8 studies, in D.3, the case-control studies  
9 indicate some of the characteristics of the  
10 study, such as where it was conducted, what type  
11 of study it was, you know, what disease it looked  
12 at, what the period of the study was,  
13 characteristics of the study population, correct?

14 MR. MANDELL: Objection.

15 Go ahead.

16 A. Some of those characteristics, yes.

17 Q. Okay. And if you look at table D.4,  
18 which is the next table, it presents some of the  
19 statistical findings from those cohort studies,  
20 correct?

21 A. Some of them, sure.

22 Q. Okay. So if you look at page D26.

1 A. Okay.

2 Q. Do you see there's a reference to the  
3 Vlaanderen 2013 case-control study?

4 A. Yeah. Just one second.

5 (Pause)

6 A. Yes.

7 Q. And that's a study that you reference in  
8 your report, right? Page 41 at the top.

9 A. Yes.

10 Q. If you look at the study above the  
11 Vlaanderen case-control study, do you see the  
12 Christensen case-control study, 2013?

13 A. Yes.

14 Q. And were you aware that that study was  
15 also cited in the ATSDR's 2017 assessment of the  
16 evidence?

17 A. Oh, I don't remember everything that the  
18 2017 cited.

19 Q. Well, if you look at Exhibit 22, page 17.

20 A. Page?

21 Q. 17.

22 A. Okay.

1 Q. Do you see the Christensen study cited  
2 there?

3 A. Yes.

4 Q. You don't cite the Christensen study in  
5 your report, do you?

6 A. No. I think they had some -- maybe  
7 two people with cancer. I didn't cite this  
8 study.

9 Q. That study did not find an increased risk  
10 for kidney cancer in any of the TCE exposure  
11 groups, did it?

12 A. That's right. In fact they said, "This  
13 study was subject to limitations related to the  
14 low prevalence of exposure to  
15 perchloroethylene and TCE in the Nordic  
16 population and a limited exposure assessment  
17 strategy ...." And only two of them had cancer.

18 Q. So there was no increased risk for either  
19 the "Any TCE exposure" group or the "Substantial  
20 TCE exposure" group in the Christensen study,  
21 correct?

22 A. I'm sorry?

1 Q. If you look on page D26.

2 A. Yes.

3 Q. There was no increased risk for the  
4 "Any TCE exposure" group or the "Substantial TCE  
5 exposure" group, correct? Is that correct?

6 A. Yeah. Not unexpectedly. That's exactly  
7 right.

8 Q. Okay. Look on page at D12.

9 Are you there?

10 A. No. I'm -- okay.

11 Q. Do you see the Silver cohort study in  
12 2014?

13 A. Yes.

14 Q. Do you see the SMRs for the salaried  
15 employees?

16 A. Yes.

17 Q. 13 exposed males, do you see that?

18 A. Yes.

19 Q. And there's no increased risk for that  
20 group; is that correct?

21 A. That's what it says. I don't remember  
22 the details of the Silver study to comment any



1 further. I would have to review that study to  
2 give you a full answer.

3 Q. Okay. You don't cite the Silver study --  
4 the Silver cohort study in your kidney cancer  
5 report, do you?

6 A. That's correct, I do not.

7 Q. And you're aware that the Silver study  
8 was referenced in the 2017 Assessment of Evidence  
9 on page 16 of Exhibit 22?

10 A. Let's take a look.

11 (Pause)

12 A. I see it there.

13 Q. Okay.

14 A. Although, strictly speaking, I'm sure it  
15 was referenced in here. It's included in a  
16 table. I don't know that it's referenced within  
17 this report.

18 Q. Okay. It's -- to be precise, it's  
19 included in that table in the report, we don't  
20 know whether it's in the text of the report; is  
21 that what you're saying?

22 A. That I agree with.

1 Q. Okay. Would you agree, looking at  
2 Dr. Goodman's tables, that there are a number of  
3 studies looking at the relationship between TCE  
4 and kidney cancer, including some that failed to  
5 find a statistically significant effect that  
6 aren't mentioned in your report?

7 MR. MANDELL: Objection.

8 A. Sure. I agree with that.

9 Q. Okay.

10 A. I reviewed them. I did not cite every  
11 study. I agree with that.

12 Q. Okay. For example, there are some cohort  
13 studies that fail to find a statistically  
14 significant current relationship between TCE and  
15 kidney cancer, including Garabrant, Blair,  
16 Axelson, Anttila, Morgan, Ritz, Hansen, Travier,  
17 Chang, Boice, Sung, Radican, Bahr, Lipworth,  
18 Silver, and Buhagen, that are included in  
19 Dr. Goodman's tables, but are not referenced in  
20 your report.

21 MR. MANDELL: Objection.

22 Q. Do you agree with that?

1           A. I agree with that.

2           Q. And there are case-control studies,  
3 including Brownson, Jensen, Aupiaisrin, Mellemgaard,  
4 Delahunt, Dosameche, Matteoli, Christensen, and  
5 Michelet, which are included in Dr. Goodman's  
6 tables, but are not referenced in your report.  
7 Do you agree with that?

8                       MR. MANDELL: Objection.

9           A. I agree with that.

10          Q. Okay. Let's look at your report on  
11 leukemia and NHL, which is Exhibit 7. Go to  
12 page 33 of that report.

13                 With respect to PCE and leukemia, under  
14 your PCE section on that page, you reference the  
15 Callahan 2019 report or study that discussed  
16 lymphatic hematopoietic malignancies, including  
17 leukemia, and there was a hazard ratio of 4.3 and  
18 a confidence interval of 1.4 to 13.6. Do you see  
19 that?

20          A. Yes.

21          Q. So would that statistic include not only  
22 leukemias, but also lymphomas, in your

1 understanding?

2 A. I don't recall all the details of the  
3 Callahan study.

4 Q. Okay. So you don't know, as you sit here  
5 today, whether it would include leukemias or  
6 lymphomas?

7 MR. MANDELL: Objection.

8 Go ahead.

9 A. My answer was I don't recall the details  
10 of the Callahan study.

11 Q. After that particular section, you cite  
12 some water contamination studies. Do you see  
13 that section?

14 A. Yes.

15 Q. And -- give me a second.

16 Okay. I'm sorry. If you turn to  
17 section XI on page 48.

18 A. Yes.

19 Q. You have a section here on "Studies That  
20 Did Not Show an Association Between Camp Lejeune  
21 Chemicals and Leukemias," right?

22 A. That's right.

1 Q. And that's followed by a section of  
2 "Studies That Did Not Show an Association Between  
3 Camp Lejeune Chemicals and NHL," right?

4 A. That's right.

5 Q. And with respect to the studies that did  
6 not show an association between the chemicals and  
7 leukemias, you cite the Christensen study from  
8 2013; is that right?

9 A. That's one of them, yes.

10 Q. And you also cite the Selden and Ahlborg  
11 study from 2011 with no significant findings  
12 relating PCE to leukemias?

13 A. That's one of them, right.

14 Q. Okay. The Selden and Ahlborg study had  
15 an SIR that was 1.01 with a 95 percent confidence  
16 interval of .51 to point -- 1.18, correct --  
17 1.81?

18 A. That's correct.

19 Q. Okay. Did you review Dr. Goodman's  
20 report on leukemia that was produced in this  
21 case?

22 A. I've certainly read parts of it at least,

1 if not the whole thing.

2 (Exhibit 26, Cohort study,  
3 marked for identification.)

4 Q. Did you review the tables at the end of  
5 the report? Do you recall that?

6 A. I've seen them. The degree to which I  
7 retained any of them, couldn't tell you.

8 Q. Okay. Do you see that there's a Table  
9 F.1 that has the cohort study characteristics for  
10 PCE and leukemia?

11 A. Yes.

12 Q. And this table lists over ten studies.  
13 Do you see that?

14 A. Yes.

15 Q. And the dates of those studies extend  
16 from 1989 to 2019?

17 A. No.

18 Q. Okay. What was wrong about that?

19 A. It looks like the latest one is 2011.

20 Q. Are you looking at page F3? It looks  
21 like there's a Callahan study from 2019.

22 A. Oh, I was -- I was not on F3.

1 Q. Okay.

2 A. So it looks like they go through 2019.

3 Q. Okay. So from 1989 to 2019, right?

4 A. Yes.

5 Q. And do you see the next table is the  
6 results from the PC and leukemia cohort studies?

7 A. Yes.

8 Q. And it includes some of the statistical  
9 findings from those studies, right?

10 A. I agree with that.

11 Q. Okay. Then if you look at Table F.6,  
12 starting on page F11.

13 A. Okay.

14 Q. Do you see that this table includes PC  
15 and leukemia case-control study characteristics,  
16 right?

17 A. Yes.

18 Q. And the table lists over seven  
19 case-control studies, right?

20 A. No, not over seven.

21 Q. Seven?

22 A. That's right.

1 Q. Okay. Thanks for being precise there.

2 The dates of those studies extend from  
3 1984 to 2014, right?

4 A. Yes.

5 Q. And the next table, which is Table F.7,  
6 is PCE and leukemia case-control study results,  
7 which include some of the statistical findings of  
8 those studies, right?

9 A. Yes.

10 Q. If you look back at page F4.

11 A. Okay.

12 Q. Do you see the Selden and Ahlborg 2011  
13 study cited there?

14 A. Yes.

15 Q. And that's the study you mentioned in  
16 your report, right? Page 49 of Exhibit 7.

17 A. Yes.

18 Q. If you look back at the table at the  
19 study, above the Selden and Ahlborg cohort study,  
20 do you see the Pukkala cohort study in 2009?

21 A. Yes.

22 Q. You don't cite that study in your report,



1 do you?

2 A. I don't recall. The name sounds  
3 familiar.

4 Q. Okay. The -- that particular study did  
5 not find an increased risk with respect to PC and  
6 leukemia; is that correct?

7 A. I don't have that study committed to  
8 memory, so I don't know the results of the study  
9 other than what's in this one part of one table,  
10 F4.

11 Q. With respect to what's reported in  
12 Table F.2 on page F4, the particular risk  
13 estimates shown there do not reflect a -- an  
14 increased risk from PC exposure to those  
15 particular exposed cases, correct?

16 MR. MANDELL: Objection.

17 A. Well, it -- it wasn't a case-control  
18 study. So you said "cases." So it looks like it  
19 was a study of launderers with -- which don't  
20 have solvent exposure, and dry cleaners. I can't  
21 tell you anything else more about it.

22 Q. With respect to launderers and dry

1 cleaners to this cohort study, the -- for the  
2 men, the risk ratio was .71; is that right?

3 A. That's right.

4 Q. And that reflects as decreased risk,  
5 correct, to the group it was being compared to,  
6 right?

7 A. It demonstrates a 29 percent decreased  
8 risk of whatever they were -- their outcomes  
9 were.

10 Q. Okay. And for the women, the risk ratio  
11 is 1.03, which is not greater than 1.1, right?

12 A. That's correct.

13 Q. So you would not consider that to be an  
14 increased risk, would you?

15 A. 3 percent in -- I would not.

16 Q. If you look at page F13.

17 A. Okay.

18 Q. Do you see the Costantini case control  
19 study for 2008?

20 A. Yes.

21 Q. Do you see the odds ratios for the very  
22 low/low exposure group as being .6?

1 A. Yes.

2 Q. That doesn't reflect an increased risk of  
3 leukemia, does it?

4 A. Well, importantly, you can't take these  
5 numbers out of context. You have to understand  
6 how a study was conducted in order to really --  
7 to give you an answer.

8 Q. Okay. But that number alone does not  
9 reflect an increased risk, does it?

10 MR. MANDELL: Objection.

11 A. My answer is the same.

12 Q. And for the medium/high group, do you see  
13 that the risk estimate is 1.0?

14 A. I see that.

15 Q. And that's essentially the null value,  
16 right?

17 A. Well, that's what 1.0 is. Again, I can't  
18 comment more because I don't know the details of  
19 how this study was conducted.

20 Q. And the Costantini study in 2008 was not  
21 listed or referenced in your report was it?

22 A. I believe that's correct.

1           Q. In fact, there are a number of studies in  
2 this table -- in the tables that we looked at  
3 regarding the relationship between PC and  
4 leukemias that failed to report a statistically  
5 significant effect that aren't mentioned in your  
6 report; is that true?

7                       MR. MANDELL: Objection.

8           A. That's right. And as I acknowledged in  
9 my report. I think specifically I said in my --  
10 "In my review of the literature, I also  
11 considered studies that did not demonstrate an  
12 association between the Camp Lejeune water  
13 contaminants and leukemia. I note a few below."

14          Q. Um-hmm. So you did note some, but  
15 there's some that you did not note, correct?

16                       MR. MANDELL: Objection.

17          A. That's exactly what it says.

18          Q. Okay. So among the case -- the studies  
19 that you did not note with respect to the  
20 relationship between PC and kidney -- excuse me,  
21 PC and leukemias, there are cohort studies,  
22 including Blair, Ruder, Chang, Lipworth, and

1 Silver that you did not reference by name in your  
2 report, right?

3 MR. MANDELL: Objection.

4 A. That's probably true.

5 Q. And there are also case-control studies  
6 looking at the relationship between PCE and  
7 leukemias, including Wilcosky, Miligi,  
8 Costantini, and McLean, that you didn't reference  
9 by name in your report, correct?

10 MR. MANDELL: Objection.

11 A. I think that's true.

12 Q. Okay. We'll move to another topic now.  
13 I want to ask you some questions about bladder  
14 cancer in particular for a while.

15 Do you have any experience in diagnosing,  
16 treating, or consulting with plaintiffs [sic] who  
17 have bladder cancer?

18 A. With who?

19 Q. Do you have any experience in diagnosing,  
20 treating, or consulting patients who have bladder  
21 cancer?

22 MR. MANDELL: I think you said

1 "plaintiffs."

2 Q. Plaintiffs/patients.

3 MR. MANDELL: That's okay.

4 A. Patients, yes. Plaintiffs, no.

5 Q. Okay. What is -- what has your  
6 experience been with patients with bladder  
7 cancer?

8 A. Evaluating people potentially with  
9 bladder cancer, telling someone they have bladder  
10 cancer, referring someone to urology when they  
11 have bladder cancer, or treating them when  
12 they're undergoing treatment or after treatment  
13 for their bladder cancer.

14 Q. Your mic fell off.

15 (Discussion off the record)

16 MR. BAIN: Do you want to go off the  
17 record for a minute?

18 THE WITNESS: I'm good.

19 MR. MANDELL: We're okay.

20 Q. Do you have occasion to, you know, order  
21 MRIs or cycoscopies [sic] to patients to detect  
22 bladder cancer?

1           A. I'm sorry. I have to do this with you,  
2 but cyc- -- that word isn't a word.

3           Q. Okay. Yeah. You know what the word is  
4 though, right?

5           A. No. There's two different -- there's two  
6 different things that are similar.

7           Q. Okay. What are those?

8           A. Cystoscopy or cytology.

9           Q. Okay. And what's the distinction between  
10 those two?

11          A. Cytology is looking at cells from urine,  
12 where bladder washes, to look for cancer cells.  
13 Cystoscopy is to look into someone's bladder with  
14 a camera.

15          Q. Okay. Have you ordered either of those  
16 tests?

17          A. I have. I try not to.

18          Q. Why do you try not to?

19          A. Because with cytology, my understanding  
20 is the cells need to be looked at fairly quickly  
21 after collecting them, and I worry sometimes  
22 if -- in an ER setting, that the cells are just

1 going to sit around on a lab bench for a while  
2 and not get looked at.

3 Q. Can you estimate how often you have  
4 patients who have bladder cancer that you treat?

5 A. Couldn't tell you.

6 Q. You don't have any certificate in  
7 urology, do you?

8 A. I do not.

9 Q. Or oncology?

10 A. I'm not a board-certified oncologist.

11 Q. Do you know what the background risk for  
12 bladder cancer is in the adult population?

13 A. I don't.

14 Q. Do you know what the most common age  
15 range is for diagnosis of bladder cancer?

16 A. Well, older individuals. The five-year  
17 or decile of years that is highest risk, I don't  
18 know, but it would be older individuals.

19 Q. Do you know what the most common risk  
20 factors for bladder cancer are?

21 A. Likely the greatest modifiable risk  
22 factor is smoking.



1 Q. Are you aware of any other common risk  
2 factors besides smoking?

3 A. I suspect that being overweight or obese,  
4 working in the aniline dye industry, having  
5 schistosomiasis infection, which is an issue in  
6 Africa. I suspect -- I think that recurrent or  
7 chronic urinary infections. Those are probably  
8 the big ones.

9 Q. Are you aware of any geographic  
10 correlation with bladder cancer?

11 A. Geographic -- I'm sorry. I don't  
12 understand.

13 Q. Geographic location as being a risk  
14 factor for bladder cancer. People in certain  
15 areas of the country, certain area of the world  
16 that are greater risk of bladder cancer?

17 A. Well, short of chronic schistosomiasis  
18 infection, I don't.

19 Q. Have you ever had occasion to do a PubMed  
20 search for a patient you see in the ER?

21 A. Oh, sure, I do literature searches.

22 Q. Okay. Like can you give me an example of

1     what circumstance that would occur?

2           A.   I'm trying to think this weekend when I  
3     worked.

4           I mean, I can't remember from this  
5     weekend, but it's a routine part of my medical  
6     care, particularly when I'm working with  
7     residents or trainees.

8           Q.   So let me refer you back to your bladder  
9     cancer report, which is Exhibit 4.  And if you  
10    can look at page 15.  Are you there?

11          A.   Yes.

12          Q.   You state in the section on  
13     trichloroethylene, second paragraph, that "The  
14     scientific community agrees that TCE is  
15     carcinogenic."  IRC, otherwise known as IARC,  
16     "classifies it as a known human carcinogen,  
17     citing 'sufficient evidence in humans for the  
18     carcinogenicity of trichloroethylene,'" and you  
19     cite IRC 2014 at 189, correct?

20          A.   Yes.

21          Q.   Okay.

22                     (Exhibit 27, Excerpts from the 2014

1 IARC report, marked for  
2 identification.)

3 Q. Okay. Dr. Bird, I've handed you what's  
4 been marked as Exhibit 27, which is excerpts from  
5 the 2014 IARC report on "Trichloroethylene,  
6 Tetrachloroethylene, and Some Other Chlorinated  
7 Agents." Do you see that?

8 A. Yes.

9 Q. And if you look at page 189, which is the  
10 page you cited in your report. Are you there?

11 A. Yes.

12 Q. In this evaluation, IARC identifies TCE  
13 as causing kidney cancer. It says, "There is  
14 sufficient evidence ... for the carcinogenicity  
15 of trichloroethylene. Trichloroethylene causes  
16 cancer of the kidney. A positive association has  
17 been observed between exposure to  
18 trichloroethylene in non-Hodgkin lymphoma and  
19 liver cancer."

20 Do you see that?

21 A. Yes.

22 Q. It doesn't identify a bladder cancer in

1     that section, does it?

2           A.   In that section, in 2014, no.

3           Q.   It doesn't identify any leukemias either,  
4     does it?

5           A.   Stand by.

6                     (Pause)

7           A.   In this one page of this monograph, it  
8     does not.

9           Q.   Are you aware of there being a subsequent  
10    IR -- IARC monograph on TCE and  
11    tetrachlorethylene to this one in 2014?

12          A.   I seem to recall only this Volume 106,  
13    which was 2014.

14          Q.   Okay.  If you go back to your bladder  
15    cancer report, on page, 15 you also have a  
16    section on benzene.  Do you see that?

17          A.   Stand by.

18                     (Pause)

19          A.   Yes.

20          Q.   And on the next page, you have a  
21    section -- or you have a statement at the top of  
22    page 16, "Every regulatory body agrees benzene is

1 a known human carcinogen," and you cite IARC 2018,  
2 right?

3 A. Yes.

4 Q. Okay.

5 A. As well as National Toxicology  
6 Program 2021 and the United States EPA 2007.

7 Q. Okay.

8 (Exhibit 28, 2018 IARC monograph.  
9 on benzene, marked for  
10 identification.)

11 Q. I'm showing you what has been marked  
12 Exhibit 28. Do you recognize this as the  
13 2018 IARC monograph on benzene?

14 A. I do.

15 Q. And I want to refer you to pages 292 and  
16 293.

17 A. Okay.

18 Q. Actually I want to refer you to page 297.  
19 In the evaluation section of this report,  
20 page 297, with respect to cancer in humans, the  
21 report concludes, "There is sufficient evidence  
22 in humans for the carcinogenicity of benzene.

1 Benzene causes acute myeloid leukemia in adults.

2 "Positive associations have been observed  
3 for non-Hodgkin lymphoma, chronic lymphoid  
4 leukemia, multiple myeloma, chronic myeloid  
5 leukemia, acute myeloid leukemia in children, and  
6 cancer of the lung.

7 "A small minority of the Working Group  
8 considered that benzene also causes non-Hodgkin  
9 lymphoma. A separate small minority considered  
10 the [sic] positive association was not observed  
11 for cancer of the lung."

12 Do you see that?

13 A. Yes, that's what it says.

14 Q. The conclusion of the IARC evaluation of  
15 cancer in humans does not list benzene as causing  
16 bladder cancer, right?

17 A. On this one page, 297, it does not.

18 Q. And you agree, 297 is the evaluation and  
19 rationale, which is essentially the conclusion of  
20 the report, right?

21 A. Well, that's what it's titled.

22 Q. And it also does not identify bladder

1 cancer as having a positive association with  
2 benzene, correct?

3 A. Right. This was published in 2018. So  
4 the data evaluation was earlier than that. And  
5 on page 16 of my report, I reference at least  
6 two studies that were published subsequent to  
7 this IARC monograph.

8 Q. Okay. This IARC monograph doesn't even  
9 reference there being positive associations  
10 observed between benzene and bladder cancer, does  
11 it?

12 A. Oh, stand by.

13 (Pause)

14 A. Sorry. I'm sorry. What was your  
15 question?

16 Q. That this evaluation and rationale at the  
17 end of the IARC report does in the even recognize  
18 bladder cancer as having a positive association  
19 observed with respect to benzene.

20 A. On --

21 MR. MANDELL: Objection.

22 A. On page 297, that is correct.

1 Q. Okay. Have you reviewed the IARC reports  
2 on -- have you reviewed the IARC report on vinyl  
3 chloride?

4 A. Stand by.

5 (Pause)

6 A. Yes. I cite that on page 16 of my  
7 report. Monograph 100F.

8 Q. Okay. Would you agree IARC's report on  
9 vinyl chloride did not conclude that there was  
10 either a causation or association between vinyl  
11 chloride and bladder cancer specifically?

12 MR. MANDELL: Objection.

13 A. I do not have that monograph committed to  
14 memory, so couldn't tell you.

15 Q. Okay. Have you reviewed the IARC report  
16 on perchloroethylene?

17 A. I thought we already looked at that.

18 Q. So that is the same report as the one for  
19 trichloroethylene; is that right?

20 A. That's my understanding.

21 Q. Okay.

22 A. That's my recollection.



1           Q. You mentioned that smoking is an  
2 established risk factor for bladder cancer; is  
3 that right?

4           A. I don't think that's a term I used, but  
5 it is a risk factor for bladder cancer.

6           Q. And I think you mentioned that age is  
7 also a risk factor for bladder cancer; is that  
8 right? Or do you consider it to be a risk  
9 factor?

10          A. Well, it's not modifiable, but bladder  
11 cancer's more common in older individuals.

12          Q. And what about sex, is there a  
13 distinction between the sexes with respect to the  
14 occurrence of bladder cancer?

15          A. Oh, the -- oh, I don't recall. There  
16 probably is. I just don't recall.

17          Q. For the bladder cancer epidemiology  
18 studies that you reviewed, did you consider  
19 whether or not smoking, age, and sex were taken  
20 into account in those studies?

21          A. Yes.

22          Q. Okay. Are you aware that the American

1 Cancer Society has stated that "Smoking is a  
2 major risk factor for bladder cancer. People who  
3 smoke are at least 3 times as likely to get  
4 bladder cancer as people would don't" smoke?

5 MR. MANDELL: Objection.

6 Q. And "Smoking causes about half of all  
7 bladder cancers." Are you aware of that  
8 statement?

9 A. I'm not aware, no. It seems about right.

10 Q. Do you believe that epidemiological  
11 studies looking at bladder cancer should control  
12 for smoking?

13 A. I can't just say yes or no to that  
14 because it depends on the specifics of a study.  
15 In general, one should try to account for  
16 potential confounders, but you have to take the  
17 entire study into consideration.

18 Q. Okay. In -- on page 15, back on page 15  
19 of your report, if you look at -- this is the  
20 section I believe on PCE, but at the very end,  
21 you're discussing an EPA report, it appears, from  
22 2012 regarding PCE and potential relationship

1 with bladder cancer. Do you see that?

2 A. Yes.

3 Q. And at the end of that section, you say  
4 that the -- I think you're saying here that the  
5 EPA "concluded that 'Confounding by smoking is an  
6 unlikely explanation for the findings, given the  
7 adjustment for smoking by Pesch et al.,"  
8 referring to a 2000 study, "'and other  
9 case-control studies.'"

10 Do you see that?

11 A. Yes, that's what it says.

12 Q. So that -- you thought that that was  
13 significant, to reference the "confounding by  
14 smoking" was taken into account by those  
15 particular studies, right?

16 A. Well, specifically, the EPA felt that was  
17 important.

18 Q. Okay. And do you feel that's important,  
19 the confounding by smoking be taken into account  
20 by epidemiological studies?

21 A. So, in general, I would say yes, but more  
22 importantly, it depends on how a study is

1 conducted. And there's various ways to account  
2 for something like smoking. So I guess my answer  
3 is: In general, yes, but it depends.

4 Q. Okay.

5 MR. BAIN: You want to take a break  
6 now?

7 MR. MANDELL: Sure. How long you  
8 want to take?

9 THE VIDEOGRAPHER: The time is  
10 3:41 p.m., and we're off the record.

11 (Recess taken)

12 THE VIDEOGRAPHER: The time is  
13 3:56 p.m. We're on the record.

14 BY MR. BAIN:

15 Q. Okay, Dr. Bird. We are back from a  
16 break, and I want to continue to refer to your  
17 bladder cancer study and report and refer you to  
18 page 45.

19 A. Yes.

20 Q. And under the consistency criteria in the  
21 Bradford Hill analysis, you refer, as an example,  
22 to the Hadkhale study from 2017. Do you see

1 that?

2 A. Yes.

3 Q. And I'd like to refer you to that study.

4 (Exhibit 29, Hadkhale study,

5 Marked for identification?)

6 Q. Dr. Bird, I've marked as Exhibit 29 the  
7 study "Occupational exposure to solvents and  
8 bladder cancer: A population-based case control  
9 study in Nordic countries," by Hadkhale, et al.  
10 Do you see that?

11 A. Yes.

12 Q. And are you aware whether the Hadkhale  
13 study controlled for smoking?

14 A. Let's see. I don't have this committed  
15 to memory.

16 Q. Okay. If I can have you turn to the  
17 second page, page 1737. Do you see the reference  
18 under the methods section that "Information on  
19 smoking, socioeconomic status and other  
20 non-occupational risk factors were [sic] not  
21 available"?

22 A. Yes.

1 Q. Would that be a weakness of a study, in  
2 your opinion?

3 A. It's a limitation.

4 Q. And that's only --

5 A. Hold on.

6 Q. Okay.

7 A. However, I would have to review all this  
8 to see if they did some sensitivity analyses or  
9 looked at other diseases associated with smoking,  
10 such as COPD or lung cancer, in order to fully  
11 answer that question.

12 Q. Okay.

13 A. I -- hold on. I think -- actually, I  
14 think maybe that was done.

15 Q. Well, if you look at the page 1745. Do  
16 you see the first full paragraph, where it  
17 states, "The confirmed association between  
18 smoking and bladder cancer makes it important to  
19 estimate the role of smoking as a potential  
20 confounder. We did not have direct information  
21 about smoking of the individuals of the NOCCA  
22 cohort, but the aggregate level information can

1 be estimated ... on the basis of lung cancer risk  
2 in each of the occupations."

3 Is that what you're referring to?

4 A. That's exactly what I'm referring to.

5 Q. Okay. And in your view, is that an  
6 adequate substitute for having direct information  
7 on smoking?

8 A. It's a way to attempt to account for  
9 confounders, and it looks like they did it here.

10 Q. And you're -- are you aware of how the  
11 ATSDR studies attempted to account for smoking?

12 A. Just one second. It occurred to me, I  
13 think I may have misspoken earlier. Just one  
14 second. I want to -- I thought maybe I misspoke  
15 a while ago now that I see the Hadkhale study,  
16 but I -- I can't recall.

17 Which Bove study are you talking about?

18 Q. Let's say, for example, the 2024 Bove  
19 study, do you know if there was an attempt to  
20 account for smoking?

21 A. This feels like a memory test, but I  
22 believe they looked at other diseases associated

1 with smoking, such as COPD and lung cancer, in  
2 Bove 2024, but I may be misremembering.

3 Q. Okay. That's okay.

4 The -- with respect to the consistency  
5 criteria on page 45, you reference the Hadkhale  
6 study and ATSDR 2018 morbidity study, right?

7 A. Yes.

8 Q. It showed an increased risk of bladder  
9 cancer.

10 However, as we went over earlier today,  
11 the other -- some of the ATSDR studies did not  
12 indicate an increased hazard ratio of over 1.1  
13 for bladder cancer.

14 For example, the 2024 cancer incidence  
15 study with the Marine/Navy cohort was at 1.09,  
16 the 2024 incidence cancer study for the civilian  
17 cohort was at 1.10, the 2024 mortality study for  
18 the Navy/Marine cohort was at 1.02, and the  
19 2024 mortality study for the civilian cohort was  
20 at 2.65.

21 Those studies do not meet your standard  
22 for an increased risk for bladder cancer; is that



1 correct?

2 MR. MANDELL: Objection.

3 A. Not every study has the same --  
4 demonstrates the same increased risk. It's the  
5 nature of the science. I specifically mention  
6 Hadkhale here and AT- -- United States ATSDR  
7 2018.

8 Q. Yes. But you don't mention these other  
9 studies where the hazard ratio was below 1.1.

10 MR. MANDELL: Objection.

11 A. I don't specifically mention in this  
12 section all other studies. I agree with that.

13 Q. Would you agree that the other studies  
14 where there wasn't an increased risk of over 1.1  
15 do not reflect consistency with the studies that  
16 you do cite?

17 MR. MANDELL: Objection.

18 A. Well, I don't recall. You just mentioned  
19 some hazard ratios from studies.

20 Q. Um-hmm.

21 A. I don't know that that's true because I  
22 don't have them committed to memory.

1 Not every study will show the same or  
2 similar increased risk. I cite two studies that  
3 are consistent.

4 Q. The -- well, at least the civilian study,  
5 and I can -- I can show you that one. That's  
6 2024 mortality studies. It's Exhibit 17.

7 If you look, for example --

8 A. Hold on for a second. I'm in my pile. I  
9 don't think it's in there. Did you label 17 with  
10 a 17?

11 Q. No. I'm sorry. I'm looking at No. 18.  
12 I'm sorry. 18, the mortality study. I'm sorry.

13 MR. MANDELL: That's okay.

14 Q. There are too many exhibits.

15 A. I saw -- I saw 18 in here. Hold on.

16 No, I got it right here.

17 Q. Page 10.

18 A. Okay.

19 Q. You see for urinary bladder, the  
20 comparison between Camp Lejeune and  
21 Camp Pendleton with respect to mortality for  
22 civilians is .65. Do you see that?

1 A. Yes.

2 Q. And so that shows a decreased risk of  
3 35 percent when comparing mortality at  
4 Camp Lejeune to Camp Pendleton, right?

5 A. In civilian workers, that's what those  
6 numbers mean.

7 Q. And that would be inconsistent with  
8 these -- the Hadkhale study and the ATSDR 2018  
9 morbidity that you cite in the consistency part  
10 of your report.

11 A. It's different than those.

12 Q. You're not willing to say "inconsistent,"  
13 you're just saying "different"?

14 MR. MANDELL: Objection.

15 A. My answer is the same.

16 Q. Do you recall some of the other studies  
17 that we looked at in Dr. Goodman's tables in  
18 which there was no increased risk detected  
19 between TC and bladder cancer?

20 MR. MANDELL: Objection.

21 A. I remember looking at her table, which  
22 had some statistics on it.

1 Q. And to the extent that those studies did  
2 not find an increased risk, that would be  
3 inconsistent with the two studies you cite here,  
4 Hadkhale and ATSDR 2018, right?

5 MR. MANDELL: Objection.

6 A. That's an oversimplification. To fully  
7 answer that question, you have to consider the  
8 details of how each study was conducted.

9 Q. Okay. Take a look at the Hadkhale study  
10 again, which is Exhibit 29. I hope it's --

11 A. It's on top.

12 Q. Okay. If you look at page 1737. And do  
13 you see in the text on the right-hand column, the  
14 paragraph that begins, "Exposure was assumed to  
15 start at the age of 20 years and end at the index  
16 date or at 65 years"?

17 A. Yes.

18 Q. How did you -- or did you take that into  
19 consideration at all in comparison to the  
20 potential exposure at Camp Lejeune?

21 A. I'm sorry. I don't understand the  
22 question.

1 Q. Well, do you know what the average length  
2 of a person residing in Camp Lejeune was?

3 A. Well, it depends on their role.

4 Q. What's your understanding?

5 A. That the mean duration for Navy and  
6 Marine Corps was 18 months. And I can't remember  
7 what the civilian was, but -- it was longer than  
8 that, but I can't remember the number.

9 Q. Did you take into account that the  
10 duration of exposure in the Hadkhale study was  
11 likely much longer than the duration of exposure  
12 for most people who were at Camp Lejeune?

13 MR. MANDELL: Objection.

14 A. Yes. That the duration of exposure was  
15 likely longer, that's true.

16 Q. In addition to TCE and PCE and benzene,  
17 there were some other exposures -- or other  
18 chemicals involved in the exposures at issue in  
19 the Hadkhale study, weren't there?

20 If you look in the shaded section at the  
21 top, it mentions some other "aromatic hydrocarbon  
22 solvents." Do you see that?

1 A. Yes.

2 Q. And one of those is trichloroethylene.  
3 Do you see that?

4 A. Yes.

5 Q. And this was based on occupational  
6 exposure levels for dry cleaners, correct, or  
7 people working in the dry cleaning industry?

8 A. I think it was not dry cleaning alone.  
9 I'd have to look at the details. I thought this  
10 was -- sorry. I don't want to misremember.

11 Q. Well, yeah, look at Table 2. I guess it  
12 wasn't dry cleaning alone. There's the different  
13 occupations that were looked at here.

14 A. There you go.

15 Q. Is that correct?

16 A. Yes.

17 Q. Okay. And again, this was an estimated  
18 lifetime exposure or lifetime work exposure, at  
19 least?

20 A. Stand by. I don't have this committed to  
21 memory.

22 Q. Okay.

1 A. I'm sorry. The question was?

2 Q. The exposure period was an assumed work  
3 life from 20 to age 65, I think we talked about  
4 that before, right?

5 A. Or the -- or an index date if before 65.

6 Q. Okay. Would you agree that how exposure  
7 was measured in this study can result in exposure  
8 misclassification?

9 A. Sure. Exposure misclassification can  
10 happen.

11 Q. Did you account for that in evaluating  
12 this study?

13 A. Sure. It's part of an overall evaluation  
14 of a study.

15 Q. And if you look at page 1745, at the very  
16 conclusion of the study, do you see where it  
17 says, "Future studies are required with  
18 high-quality" --

19 A. Can you --

20 MR. MANDELL: It's the last sentence  
21 in the study.

22 A. Okay. The very last sentence?

1 Q. Yeah.

2 A. All right.

3 Q. You see where it says, "Future studies  
4 are required with high-quality quantitative  
5 exposure measurement to explore in more detail  
6 the association of agent-specific exposure and  
7 the risk of bladder cancer"? Do you see that?

8 A. Yes.

9 Q. And did you account for that in your  
10 consideration of the report?

11 A. I read that. That's part of my  
12 evaluation of the study. I don't know how you  
13 specifically account for that one sentence.

14 Q. Okay. All right. Let me turn to  
15 leukemia and NHL and ask you some questions about  
16 that report.

17 A. While I'm thinking of it, I think I  
18 misspoke at one point. It had something to do  
19 with the Hadkhale study, and I think I may have  
20 misspoken about TCE versus PCE versus  
21 perchloroethylene versus tetrachlorethylene. So  
22 tetrachlorethylene, perchloroethylene, and PCE



1 are the same.

2 Q. Um-hmm.

3 A. But I think I may have misspoken at  
4 one point.

5 Q. Well, if you -- if you mix that up, you  
6 have a chance to look at your deposition  
7 transcript, and I think something like that can  
8 be corrected.

9 A. Got it.

10 Q. Like if you said PCE and you meant to say  
11 TCE --

12 A. Right.

13 Q. -- that's something you can correct.

14 A. Okay.

15 Q. With respect to leukemia, do you know  
16 what the background risk for leukemia in the  
17 adult population is?

18 A. Low.

19 Q. Okay. And what about non-Hodgkin's  
20 lymphoma?

21 A. Low, but higher than acute leukemia.

22 Q. Do you know what the most common risk

1 factors for leukemia are?

2 A. I don't recall, but it probably -- I  
3 estimate it depends on the type of leukemia.

4 Q. Okay. And why is the type of leukemia  
5 important with respect to risk factors?

6 A. Well, I didn't say it's important.

7 Q. Okay. Well, why does it depend on the  
8 type of leukemia?

9 A. I suspect the type of leukemia risk  
10 factors may differentially increase the risk for  
11 different kind of leukemias.

12 Q. And can you name any of the risk factors  
13 for any different types of leukemia?

14 A. Ionizing radiation, Philadelphia  
15 chromosome. Those are the only ones that are  
16 coming to mind.

17 Q. What about risk factors for non-Hodgkin's  
18 lymphoma, are you aware of any of those?

19 A. Certainly age, but that's non-modifiable.  
20 I don't know about ionizing radiation.  
21 Immunosuppression. That's what comes to mind.

22 Q. Do you know whether smoking is a risk

1 factor for either leukemia or non-Hodgkin's  
2 lymphoma?

3 A. Oh, I don't recall.

4 Q. Okay. Turning to your  
5 leukemia/non-Hodgkin's lymphoma report, which is  
6 Exhibit 7. And if you can look at page 9.

7 A. Um-hmm.

8 Q. Do you see on the top of that page, you  
9 state, "Moreover, ATSDR has concluded that there  
10 is 'sufficient evidence for causation for benzene  
11 and all leukemia types, i.e., ALL, CLL, AML, and  
12 CML' as well as for benzene exposure with NHL."

13 Do you see that?

14 A. Yes.

15 Q. Is it also your opinion that benzene  
16 causes those different subtypes of leukemia, all  
17 those different somebody types, ALL, CLL, AML,  
18 and CML?

19 A. Let's see what I wrote.

20 Q. What page of your report are you  
21 referring to?

22 A. Page 8, "Summary of Opinions."

1 Q. Um-hmm.

2 A. So I'm sorry, the question?

3 Q. The question, is it your opinion that  
4 benzene causes all types of leukemia, including  
5 ALL, CLL, AML, and CML?

6 A. Yeah. My -- I did not specifically call  
7 that out, I think, or specify that in my report.  
8 I used NHL and leukemia overall.

9 And then I -- I don't have my report  
10 committed to memory, but I specifically cite the  
11 ATSDR for saying that there's sufficient evidence  
12 for all of the -- ALL, CLL, AML, and CML.

13 Q. And do you agree with that?

14 A. I don't recall, as I sit here today,  
15 going through each type of leukemia specifically,  
16 so my report stands for itself.

17 Q. Well, for example, there's a plaintiff in  
18 this case that has CML. Would you be offering a  
19 general causation opinion in that particular case  
20 that exposure to benzene is a -- can be a cause  
21 of that particular person's CML?

22 MR. MANDELL: Objection.

1           A. That sounds like a specific causation  
2 opinion. I'm here to talk about general  
3 causation.

4           Q. No. I don't think this is specific  
5 causation. The question, is benzene exposure  
6 capable of causing CML, will you be offering that  
7 opinion in any cases?

8                       MR. MANDELL: Objection.

9           A. My answer's the same. I think I'm here  
10 to talk about general causation. I've listed  
11 leukemia and NHL. And to ask about a specific  
12 plaintiff or a specific disease I think is  
13 specific causation.

14           Q. So you think asking about whether a  
15 chemical could cause a particular subtype of  
16 leukemia is a specific causation question?

17                       MR. MANDELL: Objection.

18           A. I do.

19           Q. Okay. So if you look at page 49 of your  
20 report.

21           A. Did you say 45 or 49?

22           Q. 49. Look at the last paragraph in

1 Section 12. Do you see that?

2 A. Yes.

3 Q. It says, "In 2009, Lamb et al published a  
4 systematic review and meta-analysis of  
5 case-control studies and concluded that chronic  
6 myelogenous leukemia ... does not appear to be  
7 related to benzene exposure."

8 Do you see that?

9 A. Yes.

10 Q. Do you agree with that?

11 A. I'm trying to -- I don't have this report  
12 committed to memory. Stand by. Let me -- I may  
13 be able to get that another way.

14 Q. Do you need to go off the record?

15 A. No. I'm just about ready.

16 So the question was, do I disagree with  
17 the results presented on page 49 with the Lamb  
18 study?

19 Q. Yes.

20 A. I do.

21 Q. You disagree with that?

22 A. Yes.

1 Q. Okay. And what's the basis of your  
2 disagreement?

3 A. Well, I'm trying to -- during that time,  
4 I was trying to refresh myself with my report.  
5 And earlier I cite studies that did show causal  
6 relationship between benzene and CML, along with  
7 the other citations I gave. So I do disagree  
8 with that.

9 Q. Okay. Okay. Turning back to the  
10 2017 Assessment of Evidence, which is  
11 Exhibit 22 --

12 A. Stand by.

13 Q. -- I ask you to look at page 55.

14 A. 22?

15 Q. Yes. There it is. Turn to page 55.

16 A. Okay.

17 Q. And do you see, under "Benzene," where  
18 there is the remark that "AML is known to be  
19 caused by benzene exposure," citing IARC 2012.  
20 "IARC ... has concluded that positive  
21 associations exist for ALL and CLL. The  
22 epidemiological evidence from the meta-analyses,"

1 and it's citing Khalade 2010 and Vlaanderen 2011,  
2 2012, "indicate [sic] that benzene causes all  
3 types of leukemia."

4 Do you see that?

5 A. Yes.

6 Q. Did you review those meta-analyses  
7 yourself?

8 A. Yes.

9 Q. Okay.

10 A. Well, I -- I remember one Vlaanderen. I  
11 don't know if that was 2011 or 2012.

12 Q. Did you review Khalade 2010?

13 A. It certainly -- the name sounds familiar.

14 Q. Okay.

15 (Exhibit 30, Khalade 2010 study,  
16 marked for identification?)

17 Q. I'm showing you what's been marked as  
18 Exhibit 30, which is "Exposure to benzene at work  
19 and the risk of leukemia: A systematic review  
20 and meta-analysis." Do you see that?

21 A. Yes.

22 Q. And that's the Khalade study that the



1 ATSDR cited, right, Khalade 2010?

2 A. Yes.

3 Q. And if you look at page 6.

4 A. Okay.

5 Q. Do you see at the bottom of the first  
6 column, there is a couple of sentences that say,  
7 "Although there was a significant association  
8 between exposure to benzene and the broad  
9 category of any leukemia," referring to ICD C91  
10 to 95, "there was substantial heterogeneity in  
11 the effects on specific leukemias [sic] ranging  
12 from a strong summary effect from AML to no  
13 effect for CML. Our results indicate that the  
14 use of the broad category of any leukemia  
15 underestimates the magnitude of the effect on  
16 AML."

17 Do you see that?

18 A. Yes.

19 Q. And were you aware that Khalade did not  
20 find an association between benzene and the  
21 subtypes of CML or AM -- ALL?

22 And if you look on page 3, it's referring

1 to the different articles. There's no articles  
2 for ALL, and the section we just read indicated  
3 no effect for CML. Are you aware of that?

4 A. Stand by.

5 (Pause)

6 A. You didn't provide the supplemental file,  
7 so I can't comment on that. It's -- I don't --  
8 I'm not provided any of the data.

9 Q. Okay. So without having a supplemental  
10 table, you can't comment on that?

11 A. Well, that's where all the data lies, is  
12 in Supplemental Table 1.

13 Q. Even though it's summarized in the  
14 results here?

15 A. Oh, I would -- I need to see the data.

16 Q. Okay.

17 A. So I can't comment.

18 Q. I want to discuss another subtype in more  
19 detail, which is ALL, acute lymphocytic leukemia.  
20 You cite only one study that identified an  
21 elevated risk of ALL on page 15, which is  
22 Cohn 1994, if you look at your report on page 15.

1 A. Page 15?

2 Q. Yes.

3 A. Okay.

4 Q. Let me hand you the Cohn study.

5 (Exhibit 31, Cohn study,  
6 marked for identification.)

7 Q. Are you familiar with the Cohn study?  
8 Did you review this?

9 A. Oh, absolutely. I don't have it  
10 committed to memory.

11 Q. And this has been marked as Exhibit 31;  
12 is that right?

13 A. It has.

14 Q. Would you agree the study was an  
15 ecological study? Do you know what an ecological  
16 study is?

17 A. I do. I -- hold on because I don't think  
18 this is an ecological study.

19 Q. If you look under the study populations  
20 and methods, doesn't that show that it was an  
21 ecological study?

22 A. No. You have to look at the details of

1     how they did the study.  So, for instance, on  
2     page 557, they actually estimated exposure.  
3     That's the last paragraph in the left-hand  
4     column.

5           Q.  Um-hmm.

6           A.  So without taking time to review this  
7     whole study, if they are doing exposure  
8     estimates, then I would not classify this as an  
9     ecological study.

10          Q.  Okay.  How would you classify this study?

11          A.  As an epidemiologic study.

12          Q.  What type of epidemiological study?

13          A.  Well, let's review the details.

14                 I think it was a cohort study, not a case  
15     control.

16          Q.  Okay.

17          A.  Oh, yeah.  They -- they estimated  
18     exposures.  So this is not ecological.

19          Q.  What page are you referring to?

20          A.  Page 560, Table 4; page 560, Table 3;  
21     page 559, Table 2; page 558, Table 1.

22          Q.  Okay.  So according to those tables,

1 based on your review of those, you do not believe  
2 this is an ecological study, but an  
3 epidemiological study, a cohort study?

4 A. Again, I did not take the time to review  
5 every word in this, but that is my recollection.

6 Q. Okay. And what is your understanding of  
7 what an ecological study is?

8 A. Ecological studies are typically when  
9 you're -- one is looking at an area or a  
10 population comparing that to another area or  
11 another population when you don't have exposure  
12 assessments, typically.

13 Q. Are your -- is your understanding that  
14 this study gathered individual specific  
15 information regarding exposure and development of  
16 ALL?

17 A. Can you -- so I can understand the  
18 context, can you direct me where you're reading?

19 Q. Well, I'm just asking you, is it your  
20 understanding that this study gathered individual  
21 specific information regarding exposure to TCE  
22 and PCE and development of ALL?

1           A. Oh, I would have to look in the methods  
2 more to give you that exact thing. But they --  
3 they categorized exposures to TCE throughout  
4 this.

5           Q. Okay. Turn to page 56 of your report.  
6 Are you there?

7           A. Yes. Sorry.

8           Q. In your Bradford Hill analysis for  
9 consistency criteria, you reference the  
10 Vlaanderen 2011 manuscript and the Bassig 2024  
11 study; is that correct?

12          A. Let me read that.

13                       (Pause)

14          A. Yes.

15          Q. And those were the only two studies you  
16 cite with respect to this consistency analysis,  
17 right?

18          A. For the consistency, yes.

19          Q. You're aware that the 2024 cancer  
20 incidence study for the Navy/Marine cohort did  
21 not find a hazard ranking -- or ratio above 1.1  
22 for leukemias generally or for NHL?

1 MR. MANDELL: Objection.

2 A. I don't recall.

3 Q. Okay. Take a look at Exhibit 17.

4 A. 17's not marked, so which one is it  
5 again?

6 Q. Oh, it's the cancer incidence study.

7 A. Okay.

8 MR. MANDELL: Do you want to borrow  
9 mine?

10 THE WITNESS: Sure.

11 MR. BAIN: Thank you.

12 Q. If you look to --

13 MR. MANDELL: I need to borrow yours.

14 MR. BAIN: That would be difficult.

15 MR. MANDELL: It's okay. It's okay.

16 Q. If you look at page -- or Table 3.

17 A. Okay.

18 Q. Do you see that the adjusted hazard  
19 ratios for leukemias is at 1.07. Do you see  
20 that?

21 A. Yes.

22 Q. And for non-Hodgkin's lymphoma,

1     it's 1.01. Do you see that?

2           A. Yes.

3           Q. And neither of those are above 1.1,  
4     correct?

5           A. That's correct.

6           Q. And if you look at Table 4, which is the  
7     comparison of civilian outcomes for Camp Lejeune  
8     versus Camp Pendleton.

9                   Do you see, for leukemias, the adjusted  
10    hazard ratio is .86?

11          A. No. I think that's -- oh, you're right.  
12    Yes.

13          Q. And for non-Hodgkin's lymphomas?

14          A. 1.19.

15          Q. 1.19, okay. You didn't cite any of these  
16    particular findings in your report regarding  
17    consistency; is that correct?

18          A. In that consistency paragraph, I did not.  
19    That's right.

20          Q. And with respect to leukemias for the  
21    civilian population with the .86 hazard ratio,  
22    would you agree that that's inconsistent with



1 these other findings that you cite with respect  
2 to a relationship between the Camp Lejeune  
3 chemicals and leukemia?

4 A. That result for leukemia is lower.

5 Q. And it's inconsistent, isn't it?

6 MR. MANDELL: Objection.

7 Go ahead.

8 A. It's lower.

9 Q. It's lower than 1, right?

10 A. It is -- 0.86 is lower than one.

11 Q. And that reflects that there's a  
12 decreased risk of leukemia for the civilian  
13 population of Camp Lejeune versus Camp Pendleton?

14 MR. MANDELL: Objection.

15 A. In this study of civilians, it represents  
16 a 14 percent decreased risk.

17 Q. Okay.

18 MR. BAIN: Can we go off the record  
19 for a minute?

20 MR. MANDELL: Of course.

21 THE VIDEOGRAPHER: The time is  
22 4:41 p.m., and we're off the record.

1 (Recess taken)

2 THE VIDEOGRAPHER: The time is  
3 4:53 p.m., and we're on the record.

4 BY MR. BAIN,

5 Q. Dr. Bird, how often do you treat patients  
6 with kidney cancer?

7 A. It's hard to say how many times or how  
8 often I treat someone with one specific disease.  
9 It happens. It's not a daily occurrence. It's  
10 not a weekly occurrence.

11 Q. So is your testimony that you've treated  
12 patients with each of the conditions that are at  
13 issue here, bladder cancer, kidney cancer,  
14 Parkinson's disease, leukemia, non-Hodgkin's  
15 lymphoma?

16 A. Certainly.

17 Q. You have? On more than one occasion for  
18 each of those diseases?

19 A. Absolutely.

20 Q. Okay. What is the background risk for  
21 kidney cancer in the general population?

22 A. Oh, I don't know the background risk.

1 It's very similar to -- it would be very similar  
2 to bladder cancer.

3 Q. And what's the most common age for  
4 diagnosis of kidney cancer?

5 A. Age is a non-modifiable factor for kidney  
6 cancer, so typically older age has an increased  
7 risk.

8 Q. What are the most common risk factors for  
9 kidney cancer?

10 A. So male gender, some genetic things like  
11 Wilms tumor. There are others that -- it's not  
12 coming to me.

13 Q. Smoking and --

14 A. Oh, I'm sorry. Sorry. So hypertension.  
15 Chronic renal disease, so being on dialysis. I  
16 believe smoking as well, being overweight or  
17 obese. Those are the ones that come to mind.

18 Q. Okay. I'm going to ask you about just a  
19 few of the studies that you cite with respect to  
20 kidney cancer. You're kidney cancer report is  
21 Exhibit 5. Do you have that in front of you?

22 A. I do.

1 Q. If you turn to page 33.

2 A. Okay.

3 Q. Do you see that one of the studies that  
4 you cited supporting the relationship between TCE  
5 and kidney cancer is the A-L-A-N-E-E 2015 study?

6 A. Yes.

7 Q. And specifically, you cite the study and  
8 state that "the data indicate that TCE exposure  
9 is predisposing patients to a more aggressive  
10 form of kidney cancer with a resultant higher  
11 mortality rate."

12 Do you see that?

13 A. Yes.

14 (Exhibit 32, Alanee report,  
15 marked for identification.)

16 Q. I've marked as Exhibit 34 the study  
17 "Trichloroethylene" --

18 MS. ADAMS: 32.

19 Q. Excuse me. I meant -- marked as  
20 Exhibit 32 the study "Trichloroethylene is  
21 Associated with Kidney Cancer Mortality: A  
22 Population-based Analysis," by Alanee,

1 A-L-A-N-E-E, et al. Do you see that?

2 A. Yes.

3 Q. If you look on page 4011 of the study  
4 with the discussion.

5 A. Um-hmm.

6 Q. Do you see where it says in the first  
7 full paragraph in the right-hand column, "In this  
8 analysis, we found TCE to be significantly  
9 associated with mortality from kidney cancer.  
10 Due to lack of extensive research, and difficulty  
11 of measuring environmental exposure, it is still  
12 hard to conclude that TCE exposure is definitely  
13 associated with kidney cancer."

14 Do you see that?

15 A. I see that. They cite the National  
16 Toxicology Program report from 2000.

17 Q. Okay. And do you see further down on  
18 that paragraph, it states, "Our results show  
19 absence of any association between TCE exposure  
20 and kidney cancer incidence."

21 Do you see that?

22 A. Yes.

1 Q. You mentioned previously some of the  
2 established risk factors for kidney cancer,  
3 including high blood pressure, smoking. I don't  
4 know, did you mention obesity?

5 A. I said overweight or obese.

6 Q. Okay. And age as well?

7 A. Yes. That's obviously non-modifiable.

8 Q. In your opinion, is it important to  
9 control for these risk factors in an  
10 epidemiological study?

11 A. In general, one should try to account for  
12 confounders, but it depends on the details of  
13 each study.

14 Q. To the extent these factors are not  
15 controlled for in the study, in the details of  
16 the study, there's a risk of confounding, would  
17 you agree with that?

18 A. I would generally agree with that.

19 Q. For each of the epidemiological studies  
20 you cited in your kidney cancer report, did you  
21 determine whether the study controlled for the  
22 risk factors of smoking, obesity, high blood

1 pressure, and age?

2 A. That is part of my standard evaluation of  
3 a study.

4 Q. If you turn to page 8 of your study -- or  
5 your report, I'm sorry, on kidney cancer, which  
6 is Exhibit No. 5.

7 A. Okay.

8 Q. Do you see where you state that  
9 "Numerous studies provide evidence of specific  
10 levels of exposure - some of which are similar in  
11 intensity with the contamination observed at  
12 Camp Lejeune ...."

13 Do you see that?

14 A. And the rest of the sentence is "that are  
15 associated with increased risks for kidney cancer  
16 [sic]."

17 Q. Yes. "Cancery," but I think that's a  
18 typo.

19 A. Yes. It should be "cancer," not cancery.

20 Q. And after that particular sentence, you  
21 cite several studies, and you have the exposure  
22 levels for those studies, right?

1 A. That's right.

2 Q. Would you agree that an occupational  
3 exposure of a person who worked with TCE for  
4 13 1/2 years would not be an exposure similar of  
5 intensity for people who were at Camp Lejeune?

6 A. It may.

7 Q. It may be similar?

8 A. It may be similar. It may be different.  
9 It depends on the details of a specific person.

10 Q. If a person was in the military and was  
11 stationed at Camp Lejeune for -- between one to  
12 three years, would you say that that exposure was  
13 similar to an occupational exposure of a person  
14 would worked with TCE for 3 1/2 -- 3 --  
15 13 1/2 years?

16 A. Again, it depends on the specifics of  
17 those individuals.

18 Q. So you're saying there could be people  
19 who were stationed at Camp Lejeune for one to  
20 three years who would have an occupational  
21 exposure similar to a person who worked with TC  
22 for 13 1/2 years?



1           A.   That -- Camp Lejeune's not an  
2   occupational exposure.

3           Q.   That's the point I'm getting at.

4           A.   But you said -- well, you can read back  
5   the question.

6           Q.   Okay. Well, let me correct. It's  
7   getting a little late in the day, so maybe I did  
8   make a misstatement. I appreciate you pointing  
9   that out.

10                  Would you say that a person who was  
11   stationed at Camp Lejeune for one to three years,  
12   any person, could have a similar exposure to an  
13   occupational exposure of a person who has worked  
14   with TCE for 13 1/2 years?

15           A.   Depending on the individuals, what they  
16   did, what their exposure was, yes, it could be  
17   similar. I go through that in my report.

18           Q.   Can you give me a hypothetical example of  
19   a person who was at Camp Lejeune between one to  
20   three years who would have a similar exposure to  
21   someone who worked with TCE for 13 1/2 years?

22           A.   You said TCE for 13 1/2 years?

1 Q. Yeah.

2 A. Didn't you say PCE before?

3 Q. Yes.

4 A. So what -- I'm sorry.

5 Q. Can you give me an example, a  
6 hypothetical example, of a person who was at  
7 Camp Lejeune for one to three years who had a  
8 similar exposure to a person who worked with TCE  
9 for 13 1/2 years?

10 MR. MANDELL: Objection.

11 A. I think I actually do that in my report.  
12 I think I do exactly or similar to that in my  
13 report. I just have to find it.

14 Q. We'll go off the record while you find  
15 that.

16 THE VIDEOGRAPHER: The time is  
17 5:04 p.m. We're off the record.

18 (Recess taken)

19 THE VIDEOGRAPHER: The time is 5:06  
20 p.m., and we're on the record.

21 A. So in reviewing my kidney cancer report  
22 pages 32 and 33, I gave example of someone

1     stationed at Lejeune and their PCE exposure  
2     relative to the concentration that's been shown  
3     to cause kidney cancer from the Aschengrau study.

4             I have not done that same calculation, if  
5     you will, for TCE.

6             Q.    Okay.  To be clear, though, the  
7     Aschengrau study is a water contamination study,  
8     not an occupational study, right?

9             A.    That's true.

10            Q.    And we were talking -- the question was  
11     about an occupational exposure for someone  
12     working with TCE for 13 1/2 years.

13                   MR. MANDELL:  Objection.

14            A.    That's right.

15            Q.    You don't have that comparison in your  
16     report?

17            A.    Correct.

18            Q.    And you cited a number of occupational  
19     studies on the association between TCE and kidney  
20     cancer in your report, including Scott 2011,  
21     Karami 2012, Ruder 2001, and Callahan 2019.

22                   You didn't do a quantitative comparison

1 between the levels of TCE at issue in that -- in  
2 those studies and what exposures might have been  
3 at Camp Lejeune, did you?

4 A. Let's look. I don't recall doing that.  
5 But, just to speed things up, what page do I cite  
6 those studies?

7 Q. I don't have that here.

8 A. Let's see.

9 (Pause)

10 A. Oh, I kind of answered that question on  
11 page 31 and 32 of my report. It's the last  
12 sentence on page 31. I say, "A Marine stationed  
13 at Camp Lejeune could have a daily exposure 'as  
14 high as 3.6 mg/day'" of TCE. "This rate of  
15 exposure is entirely comparable to that seen in  
16 occupational exposure literature."

17 Q. Okay.

18 A. But the question you asked about Scott.

19 MR. MANDELL: I can help you if you  
20 want.

21 MR. BAIN: Where is that? Yeah.

22 MR. MANDELL: I see it on page 13.

1 Q. With respect to those particular reports,  
2 do you recall doing a report-by-report comparison  
3 of those exposure levels rather than the general  
4 statement you just pointed us to?

5 A. I'm sorry. I don't understand that.

6 MR. BAIN: Can you reread it?

7 MR. MANDELL: I think you meant  
8 studies. You said "report."

9 (Record read)

10 Q. So with respect to those particular  
11 studies, do you recall doing a comparison for  
12 each particular study with respect to what the  
13 levels were in comparison to Camp Lejeune?

14 A. I did do that. I don't know that I did  
15 it for every study, and I don't -- if I didn't  
16 write it down in my report, I don't have those  
17 memorized.

18 Q. When you did it, did you make notes of  
19 it, or did you just do it in your -- when you  
20 reviewed the study?

21 A. Just do it while I'm writing a report.

22 Q. And so on pages 31 and 32 that you

1 pointed to, you used Dr. Bove's estimated  
2 exposure at Camp Lejeune of 3.6 milligrams of TCE  
3 per day and stated it's "entirely comparable to  
4 that seen in occupational exposure literature,"  
5 right?

6 A. That's right.

7 Q. And can you point me to an occupational  
8 TCE study that you can recall and that you cited  
9 in your report that has an exposure that is  
10 quantitatively comparable to 3.6 milligrams per  
11 day?

12 A. Go back to page 13.

13 I don't quantitate it any further than I  
14 mention on pages 31, 32.

15 Q. Okay. Going back to page 8 of your  
16 report, the first study that you cite is the  
17 Aschengrau study. Do you see that?

18 A. Yes.

19 Q. It's No. 1 under the statement that  
20 "Numerous studies provide evidence of specific  
21 levels of exposure - some of which are similar in  
22 intensity with the contamination observed at

1 Camp Lejeune - that are associated with increased  
2 risks for kidney cancer [sic]"; is that right?

3 A. Yes.

4 Q. And specifically with respect to  
5 Aschengrau, you reference the 27 to 44 milligrams  
6 of PCE, right?

7 A. Yes.

8 Q. And it's your understanding that the  
9 people exposed to 27 to 44 milligrams of PCE had  
10 higher kidney cancer risks than the controls in  
11 that study; is that right?

12 A. That's my recollection.

13 Q. Okay.

14 (Exhibit 33, Aschengrau et al.  
15 article, marked for identification.)

16 Q. Dr. Bird, I've handed you what has been  
17 marked as Exhibit 33. This is, "Cancer Risk and  
18 Tetrachloroethylene-contaminated Drinking Water  
19 in Massachusetts," by Aschengrau et al., correct?

20 A. That's right.

21 Q. If you go to page 285.

22 A. Yes.

1           Q. Under the methods, do you see in the  
2 second paragraph where it states, "Controls were  
3 selected to represent the population that gave  
4 rise to the cases, characterized as  
5 demographically similar permanent residents of  
6 the same towns during the period 1983-1986"?

7           A. Yes.

8           Q. Do you recall where in this study you got  
9 the figure of 27 to 44 milligrams?

10          A. Yes. It is on page 289. It's actually  
11 highlighted here. The left-hand column, the  
12 first full paragraph, last sentence, says, "The  
13 90th percentiles among exposed controls were 27.1  
14 and 44.1 mg, respectively."

15          Q. So wasn't that actually referring to then  
16 the control group's exposure, not the kidney  
17 cancer cases exposure?

18          A. No. Because then when you go through the  
19 results, they call out that exposure -- that  
20 exposure level, if you will. Let's see if I can  
21 give you an example.

22               Yes. For -- for instance, in the



1 paragraph below the one I just quoted, so  
2 page 289, left-hand column, last paragraph, about  
3 halfway through, it says, "There was a 7" -- I'm  
4 sorry. "There was a 1.72-fold increase in the  
5 crude relative risk of leukemia among ever  
6 exposed subjects ... that increased to 5.78 among  
7 exposed subjects whose RDD was above the  
8 90th percentile ...."

9 Q. So how does that show that the cases had  
10 the exposure levels of 27.1 and 44.1 milligrams  
11 when the text referred to that as the exposed  
12 controls exposure?

13 A. That's my interpretation of this.

14 Q. Okay. You understand --

15 A. I think -- well, let me -- I -- because I  
16 think that it may come up again here in the --

17 Q. Okay.

18 A. -- like two paragraphs.

19 Yeah. Similar verbiage about  
20 90th percentile exists in the next few  
21 paragraphs, but it may exist with a discussion of  
22 Table 4. Where's the description of Table 4?

1           That is -- I thought it addressed it in  
2 other places and differently, but that is my  
3 interpretation of the 27.1 to 44.1 milligrams.

4           Q. Well, you understand the reference to  
5 exposed controls means those people who were  
6 exposed but did not get kidney cancer, correct?  
7 The control is the one -- someone who did not get  
8 the disease, right?

9           A. That's right.

10          Q. Okay. And the way the case-control  
11 studies work is you're looking at people who have  
12 the disease and people who don't have the disease  
13 and you're comparing their exposures, right?

14          A. I would generally agree with that.

15          Q. Okay. The 27.1 and the 44.1 milligrams  
16 of TCE would be equivalent to 27,100 and 44,100  
17 parts per billion of PCE; is that correct?

18          A. I'm sorry. I think you said the wrong  
19 chemical to begin with, so can you --

20          Q. Okay.

21          A. -- state it.

22          Q. The 27.1 and 44.1 milligrams of PCE is

1 equivalent -- you're right, so thank me -- thank  
2 you for that. So let me go over and start over  
3 again.

4 The 27.1 and 44.1 milligrams of PCE is  
5 equivalent to 27,100 and 44,100 parts per billion  
6 of PCE, correct?

7 A. Maybe. We usually think of parts per  
8 billion as a concentration. This is a mass.  
9 This is not a concentration.

10 Q. Okay. So that is a mass of exposure over  
11 time rather than a concentration of exposure in  
12 an element or in water, for example?

13 A. Correct.

14 Q. That's your understanding of it?

15 A. Correct.

16 Q. Okay. Do you ever translate, though,  
17 milligrams of mass to part per billion of mass?  
18 Is that something that is done?

19 A. Probably.

20 Q. Okay.

21 A. Or maybe. I'm not sure.

22 Q. Okay. If you look at the crude odds

1 ratios in Table 4. Do you see those for kidney  
2 cancer?

3 A. Yes.

4 Q. And, with the exception of the one which  
5 is 6.04 odds ratio, none of the other odds ratios  
6 are statistically significant under the  
7 traditional understanding of statistical  
8 significance, correct?

9 MR. MANDELL: Objection.

10 A. Most of these point estimates are -- meet  
11 the standard of greater than 1.1 in this case,  
12 but the 6.04 is the only one that would, under  
13 traditional methods, meet the criteria for  
14 statistical significance.

15 Q. Okay. Let's turn to page 48 of your  
16 report, Exhibit No. 5. Actually, I'm going to  
17 skip that. I'm going to turn to Parkinson's  
18 disease now.

19 A. Okay.

20 Q. So you have had patients that you  
21 diagnosed or treated with Parkinson's disease,  
22 right?

1           A.   True.

2           Q.   Okay.  And if you were to encounter a  
3   patient in your emergency medicine practice who  
4   you suspected had Parkinson's disease, would you  
5   normally refer that patient to a neurologist or  
6   other neurological specialist?

7           A.   Typically.  But let me correct you.  It's  
8   not just in emergency medicine.  Also in  
9   toxicology.

10          Q.   In your toxicology practice, is there  
11   occasions when you encounter a patient for the  
12   first time as part of that practice that come in  
13   to see you as a toxicologist?

14          A.   Yes.

15          Q.   Okay.  And it's because they suspect  
16   they've had some type of toxic exposure; is that  
17   what usually happens?

18          A.   That's right.

19          Q.   And has that occurred, for example, with  
20   patients then you've determined had Parkinson's  
21   disease as a result of a toxic exposure?

22          A.   Technically Parkinsonism, not Parkinson's

1 disease. They look nearly identical, but they're  
2 different.

3 Q. Um-hmm. How are they different?

4 A. Well, for instance, Parkinsonism as a  
5 consequence of carbon monoxide poisoning destroys  
6 cells in the basal ganglia, and it looks -- the  
7 patients look like a Parkinson's disease, but  
8 it's technically Parkinsonism. It was a -- it's  
9 technically different.

10 Q. Okay. Aside from Parkinsonism, do you  
11 encounter patients in your toxicology practice  
12 that have Parkinson's disease?

13 A. Yes. But I don't know that I've told  
14 someone they have a toxic reason for their  
15 Parkinson's disease.

16 Because -- let me just clarify. Because  
17 they come in with known Parkinson's disease. I  
18 don't -- can't think of a scenario where I am  
19 then diagnosing them with Parkinson's disease  
20 from a toxicology perspective.

21 Q. Do you know what the most common age  
22 range for diagnosis of Parkinson's disease is?

1           A. I would estimate it's in the  
2 eighth decade.

3           Q. Do you know what the prevalence of  
4 Parkinson's disease is in the population?

5           A. I don't.

6           Q. Do you know what the most common risk  
7 factors are for Parkinson's disease?

8           A. Non-modifiable would be age, likely male  
9 gender. I can't think of any others off the top  
10 of my head right now.

11          Q. Okay. If you turn to page 10 of your  
12 Parkinson's disease report, Exhibit No. 6.

13                On page 10, you stated, "[it is] my  
14 opinion [that] water at Camp Lejeune more likely  
15 than not causes Parkinson's Disease --  
16 comfortably exceeding the at least as likely [as  
17 not] standard set forth by Congress." Is that  
18 correct?

19          A. Yes.

20          Q. Is it your opinion that the scientific  
21 evidence supports a general causation finding  
22 that each of the individual chemicals, TCE, PCE,

1 benzene, and vinyl chloride, more likely than not  
2 can cause Parkinson's disease?

3 A. Hold on. I'm looking; at page 7 and 8 of  
4 my report. In your question, did you include  
5 benzene?

6 Q. Let me restate it just so it's clear. Is  
7 it your opinion that the scientific evidence  
8 supports a general causation finding that each of  
9 the individual chemicals, TCE, PCE, benzene,  
10 vinyl chloride, more likely than not caused  
11 Parkinson's disease?

12 A. Okay.

13 (Pause)

14 A. Sorry. I'm just getting a little tired  
15 and don't have this committed to memory. Because  
16 I think I do not say vinyl chloride in my  
17 analysis. I say that the water is contaminated  
18 with those, including vinyl chloride, but I don't  
19 think I specifically called out vinyl chloride.

20 Q. Okay.

21 A. But I don't want to misstate it, but I'm  
22 just tired and having difficulty. Just one



1 second.

2 MR. MANDELL: Okay. So what they  
3 want is an honest answer to your -- to the  
4 questions. Do you need a five-minute break?  
5 When you say you're having difficulty, it makes  
6 me a little worried. So do you need a  
7 five-minute break? Because the last thing we --  
8 anybody wants you to do is just blitz through  
9 this just to get through it.

10 Can you give an honest answer to that  
11 question, or do you need a five-minute break?

12 THE WITNESS: With 60 seconds, I  
13 could probably give an honest answer.

14 MR. MANDELL: Okay. So how about if  
15 we just go off the record for 60 seconds.  
16 That's -- way you don't lose your time.

17 MR. BAIN: Okay.

18 THE VIDEOGRAPHER: The time is  
19 5:30 p.m. We're off the record.

20 (Recess taken)

21 THE VIDEOGRAPHER: The time is  
22 5:33 p.m., and we're on the record.

1 BY MR. BAIN:

2 Q. Can you answer that question?

3 A. I'm sorry.

4 MR. MANDELL: Do you want it  
5 repeated?

6 A. Yeah. Can you repeat the question?

7 (Record read)

8 A. Not all four, but TCE, PCE, and vinyl  
9 chloride.

10 Q. Did you review the individual reports of  
11 plaintiffs' Parkinson's disease experts in this  
12 case, for example, Dr. Freeman and Dr. Miller,  
13 and Dr. De Miranda?

14 A. I don't believe so.

15 Q. So have you been made aware that the  
16 opinion of Dr. Freeman was that the evidence of a  
17 relationship between vinyl chloride and  
18 Parkinson's disease was below equipoise?

19 A. No.

20 Q. And were you aware of the opinion of  
21 Dr. Moranda that the relationship between PC and  
22 Parkinson's disease was a premise and not proven?

1 A. I'm not aware of that.

2 Q. Outside of your interpretation of the  
3 Camp Lejeune studies, are you aware of any  
4 studies showing an association between vinyl  
5 chloride and Parkinson's disease?

6 A. Did you say outside of Camp Lejeune  
7 studies?

8 Q. Yes.

9 A. I think I address that. I am not aware  
10 of other studies other than Camp Lejeune for  
11 that.

12 Q. Okay. I want to direct you to the  
13 Sallmen2024 study.

14 (Exhibit 34, Sallmen2024 study,  
15 marked for identification.)

16 Q. Dr. Bird, I've handed you what has been  
17 marked as Exhibit 34, which is "Parkinson's  
18 disease and occupational exposure to organic  
19 solvents in Finland: a nationwide case-control  
20 study." Do you see that?

21 A. Yes.

22 Q. Was this article returned on your PubMed

1 or Google Scholar searches, do you recall?

2 A. I don't recall.

3 Q. Are you aware that this article has been  
4 available since 2023 online?

5 A. No.

6 Q. This article is not mentioned in your  
7 Parkinson's report, is it?

8 A. It is not.

9 Q. Since your report, have you become  
10 familiar with this study?

11 A. Well, I don't know that I was ever  
12 unfamiliar with it.

13 Q. Were you familiar with the study before  
14 you did your report?

15 A. I don't recall.

16 Q. Have you become familiar with this study,  
17 or are you familiar with this study?

18 A. I don't recall.

19 Q. As you sit here today, do you recall  
20 anything about this study?

21 A. I don't recall anything about this study.

22 Q. Okay. Take a look at Table 2 on page 43.

1 First of all, let me refer you to  
2 Table 1. And do you see where there is an  
3 indication of the cases and controls and the  
4 number of people in each group?

5 A. Yes.

6 Q. And for the cases, there were 17,187.  
7 For the controls, there were 35,738. Do you see  
8 that?

9 A. Yes.

10 Q. And were you aware that the authors  
11 identified 17,187 individuals with Parkinson's  
12 disease or comparable movement disorders based on  
13 prescription reimbursement registered under the  
14 Social Insurance Institution of Finland, and a  
15 total of 35,738 controls were also selected based  
16 on matches for sex, birth year, and Finland  
17 residency? Are you aware of that?

18 A. No. And I don't see where you read that.

19 Q. Okay. It's under the Method section.

20 In any case, let's -- let's just look at  
21 Table 2. Do you see that Table 2 has statistics  
22 for perchloroethylene, trichloroethylene, and

1 benzene?

2 A. Yes.

3 Q. And do you see that for  
4 perchloroethylene, they group individuals by  
5 PPM years of exposure?

6 A. Yes.

7 Q. And for perchloroethylene, the risk ratio  
8 for the 0 to 4.9 group is .96. Do you see that?

9 A. That's what it says.

10 Q. And for the exposure group of 5 to 145,  
11 the risk ratio is 1.03. Do you see that?

12 A. That's what it says.

13 Q. And neither of those are above 1.1, are  
14 they?

15 A. That's true.

16 Q. And if you look at trichloroethylene, do  
17 you see that, for the greater than 0 to  
18 4.9 group, the risk ratio is .95? Do you see  
19 that?

20 A. Yes.

21 Q. And for the 5 to 14.9 group, the risk  
22 ratio is .97. Do you see that?

1 A. Yes.

2 Q. And for the 15 to 225 group, the risk  
3 ratio is 1.03. Do you see that?

4 A. Yes.

5 Q. And none of those are above 1.1, are  
6 they?

7 A. Correct.

8 Q. And then finally if you look down to  
9 benzene. And benzene is the one chemical that  
10 you're not -- is that correct, the one chemical  
11 you're not relating to Parkinson's disease?

12 A. Correct.

13 Q. Okay. So we don't need to go through  
14 that.

15 On page 27, of your Parkinson's disease  
16 report --

17 A. Okay.

18 Q. I don't see that. Tab 6. Strike that.

19 Is your opinion that the studies and  
20 scientific literature that you reviewed suggests  
21 that the exposures of these different chemicals  
22 "are not merely additive but ... interact

1 synergistically, creating a combined risk that is  
2 greater than the sum of the individual risks"; is  
3 that true?

4 A. Let's look at my report where I  
5 specifically address that.

6 Q. Yeah. It is on page 27, and -- I just  
7 found it now. It's in the first full paragraph,  
8 in about the middle of the paragraph. Do you see  
9 that, where it says, "Studies and scientific  
10 literature suggest that these exposures are not  
11 merely additive but could interact  
12 synergistically, creating a combined risk that is  
13 greater than the sum of individual risk [sic]"?  
14 Do you see that?

15 A. Yes.

16 Q. And you cite Rosenfeld 2024 at page 14;  
17 is that right?

18 A. Here on page 27, I cite Rosenfeld.  
19 Elsewhere in my report I cite others.

20 Q. Okay.

21 A. Bruckner is one of the authors.

22 Q. Okay. Can you think of any others off



1 the top of your head?

2 A. There's one other I cite. I'm blanking  
3 on the name.

4 Oh, here we go.

5 Q. What page are you looking at?

6 A. Page 32 and 33 and 34.

7 Q. Okay. This is where you discuss the  
8 additive and synergistic effects of solvents and  
9 toxins, correct?

10 A. That's right.

11 Q. Okay.

12 A. Yes.

13 Q. But going back to Rosenfeld, which you  
14 site with relationship to Parkinson's disease.

15 (Exhibit 35, Rosenfeld 2024 article,  
16 marked for identification.)

17 A. Is this for me?

18 Q. Yes. I've handed you what has been  
19 marked as Exhibit 35, which is --

20 (Discussion off the record)

21 MR. MANDELL: Adam.

22 MR. BAIN: I've got to get my last

1 five minutes in.

2 Q. I've shown you what has been marked  
3 Exhibit 35. This is the Rosenfeld 2024 article  
4 that's referenced in your report, correct?

5 A. That's right.

6 Q. And if you look at page 14?

7 A. Does that say "14 of 17"?

8 Q. Yes.

9 A. Okay.

10 Q. Do you see that Rosenfeld says that the  
11 "health effects should be the primary focus of  
12 [sic] ongoing cancer incidence study being  
13 prepared by the ATSDR, with further research  
14 conducted on the synergistic effects of these  
15 VOCs on human health"? Do you see that?

16 A. Yes.

17 Q. And the Rosenfeld study, to be clear, is  
18 a cancer risk assessment for the contaminated  
19 water at Camp Lejeune, right?

20 A. That's right.

21 Q. So it's not dealing with Parkinson's  
22 disease; is that correct?

1           A. I think that is true. I don't think  
2       Parkinson's disease is mentioned in this article.

3           Q. Would you agree that the exact  
4       relationship between the interactions of TCE,  
5       PCE, benzene, and vinyl chloride is not known?

6                       MR. MANDELL: Objection.

7           A. Some is known, and a lot is unknown. I  
8       would agree with that.

9           Q. Would you agree that synergy  
10      determinations require empirical scientific  
11      evidence, not just theoretical plausibility?

12                      MR. MANDELL: Objection.

13                      Go ahead.

14           A. Say that one again.

15           Q. Would you agree that synergy requires  
16      empirical scientific evidence, not just  
17      theoretical plausibility?

18           A. I'm sorry, but that question doesn't make  
19      any sense to me.

20           Q. Okay. I'll try to rephrase it.

21                      Would you agree that having an opinion  
22      that these chemicals are synergistic requires

1 empirical scientific evidence, not just  
2 theoretical plausibility?

3 MR. MANDELL: Objection.

4 Go ahead.

5 A. Well, I discuss, actually in about  
6 three pages in my report, about that and about --  
7 and give examples of synergism in toxins.

8 Q. Empirical evidence of that?

9 A. Yes.

10 Q. Okay. So that's in those pages of the  
11 report you cited?

12 A. Yes.

13 Q. Okay. Are you aware of any peer-reviewed  
14 epidemiological or toxicological studies showing  
15 an increased cancer risk due to the combination  
16 of TC, PC, benzene, and vinyl chloride in  
17 drinking water aside from the Camp Lejeune  
18 studies?

19 A. I know that was a -- I -- just if you  
20 repeat the beginning of the question is good  
21 enough for me.

22 Q. Are you aware of any peer-reviewed

1 epidemiological or toxicological studies  
2 regarding the increased cancer risk due to a  
3 combination of TCE, PCE, benzene, and vinyl  
4 chloride in drinking water?

5 A. I believe so, in studies looking at  
6 TVOCs. I can't after however many hours this has  
7 been, I can't remember if it's a Camp Lejeune  
8 study or not.

9 Q. Okay. Would those be in those -- that  
10 section of the report that you cited if there  
11 were such studies?

12 A. Well, it could be in a number of areas.  
13 I'm looking specifically at the section that's  
14 Summary of Opinions and it gives exposures to a  
15 chemical at a concentration and I give a  
16 reference. And this report for -- this is kidney  
17 report.

18 Q. Are you looking at the kidney report?

19 A. Yeah. I'm looking at the kidney -- I  
20 don't know it's in this one versus another one.

21 Oh, that's -- it's a Bove that looked at  
22 TVOCs. And if we go to the bladder report, the

1 TVOC is another Bove. So off the top of my head  
2 now, I can't tell you another one.

3 Q. Okay. I'm at the limit of my time, but I  
4 just wanted to ask you very quickly, did you  
5 review the public health assessment that the  
6 ATSDR did for Camp Lejeune?

7 A. Yes.

8 Q. And are you aware that in the public  
9 health assessment, the ATSDR used an additive  
10 approach to its risk assessment?

11 A. I don't recall that.

12 Q. Okay. And you don't recall that it  
13 stated in its public health assessment the  
14 additive approach was considered to be  
15 conservative or a health-protective assumption?  
16 Do you recall that?

17 A. I don't --

18 MR. MANDELL: Objection.

19 A. I don't recall that. I'm not sure I  
20 understand what that means.

21 Q. Okay. You don't understand what the term  
22 "conservative, health-protective assumption" to

1 be?

2 A. Correct.

3 Q. Okay.

4 MR. BAIN: I'm done with my time. I  
5 have probably a couple hours more of questions,  
6 but these guys won't let me do it because I  
7 didn't answer that question. Thank you for your  
8 time today.

9 THE WITNESS: Thank you for your  
10 professionalism.

11 MR. MANDELL: I do have a few  
12 questions.

13 THE WITNESS: Okay.

14 MR. MANDELL: I just want to clarify  
15 one area.

16 CROSS-EXAMINATION

17 BY MR. MANDELL:

18 Q. And I know we've been going for a little  
19 over seven hours now of questioning. So I'm  
20 prepared to do this right now, or do you want a  
21 five-minute break? It's up to you. I want to  
22 make sure you're clear-headed.

1 A. I'm clear-headed now.

2 Q. Okay. All right.

3 So could you take Exhibit No. 7, your  
4 "Hematopoietic Cancers: Leukemia & Non-Hodgkin's  
5 Lymphoma" general causation report?

6 A. Okay.

7 Q. All right. You were asked a number of  
8 questions by Mr. Bain, and some of them emanated  
9 from some language on page 9 of your report. So  
10 could you go to page 9 of the Exhibit No. 7.

11 A. Yes.

12 Q. You were asked some questions about the  
13 sentence in the very top of page 9 that reads,  
14 "Moreover, ATSDR has concluded that there is  
15 'sufficient evidence for causation for benzene  
16 and all leukemia types, i.e., ALL, CLL, AML, and  
17 CML' as well as for benzene exposure with NHL."

18 So do you see where I read that --

19 A. Yes.

20 Q. -- Dr. Bird? All right.

21 And during that questioning, do you  
22 recall there being a reference by Mr. Bain to in



1     this case there was -- I think the language was  
2     one Marine, and I think it was with CML. And you  
3     were posed a question about that Marine. Do you  
4     remember that?

5             A. Yes.

6             Q. All right. So I want to --

7                     MR. MANDELL: So just to be clear and  
8     so that there's no confusion, Adam, it was CML,  
9     just for the record?

10                    MR. BAIN: I can't recall in  
11     particular.

12                    MR. MANDELL: Okay. That's fine.

13                    MR. BAIN: I think it probably was,  
14     but --

15             A. That is my recollection.

16             Q. Okay. I just wanted to be clear. All  
17     right. Thank you.

18                    And your response was that you perceived  
19     that to be a question concerning specific  
20     causation, not general causation.

21             A. That's right.

22             Q. And then Mr. Bain went on to a different

1 area of questioning. Do you recall that  
2 dialogue?

3 A. I do.

4 Q. All right. Now, you were asked a number  
5 of questions about not being a lawyer and whether  
6 you understood legal terminologies, etc.

7 But what makes you think it was a  
8 specific-cause question when he posed that to you  
9 about the -- that one Marine with CML?

10 A. Just hearing about a person and a disease  
11 to me sounded like specific causation.

12 Q. Okay. All right. Well, let me ask you  
13 this. Whether you consider -- whether you  
14 consider it general causation or specific  
15 causation, I just want to ask you a very few  
16 questions about your opinions about that  
17 sentence.

18 A. Okay.

19 Q. Because my recollection is the way it  
20 began was Mr. Bain asked you, "Do you agree with  
21 that sentence that I just read to you that  
22 referred to ATSDR?" Okay?

1 A. Okay.

2 Q. All right. So do you have an opinion to  
3 a reasonable degree of scientific certainty,  
4 based on your training and experience and your  
5 work and studies and research up until today, do  
6 you have an opinion as to whether or not there is  
7 sufficient evidence for causation for benzene and  
8 all leukemia types, including ALL, CLL, AML, and  
9 CML, as well as for benzene exposure with NHL?  
10 Do you have an opinion?

11 A. I do.

12 Q. All right.

13 And do you have an opinion as to whether  
14 or not benzene causes leukemia as a matter of  
15 general causation and scientific knowledge to a  
16 reasonable degree of scientific certainty?

17 A. Yes.

18 Q. All right. As to your opinions that --  
19 concerning that subject matter, as to whether or  
20 not benzene causes leukemia, including ALL, CLL,  
21 AML and NHL and CML, what is that opinion,  
22 Dr. Bird, to a reasonable degree of scientific

1 certainty?

2 A. That it is causative of all leukemias,  
3 including ALL, CLL, AML, and CML.

4 Q. Great. Okay.

5 And do you have an opinion, based on your  
6 training, your experience, studies, research, and  
7 work in these cases, as to whether or not the  
8 levels of exposure that you set forth in your  
9 bladder -- excuse me, in your hematopoietic cancer  
10 report, Exhibit No. 7, whether those levels of  
11 exposure are or are not known to be hazardous to  
12 human health generally? Do you have an opinion  
13 to a reasonable degree of scientific certainty?

14 A. I do, and that is that they are hazardous  
15 to human health generally.

16 Q. Okay.

17 MR. MANDELL: I have no further  
18 questions. Thank you very much.

19 MR. BAIN: Okay. Thank you.

20 THE VIDEOGRAPHER: The time is  
21 5:57 p.m. This deposition has concluded, and  
22 we're off the record.

1 (Whereupon the deposition was concluded  
2 at 5:57 p.m.)  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22

C E R T I F I C A T E

I, STEVEN BIRD, M.D., do hereby certify that  
I have read the foregoing transcript of my  
testimony, and further certify that said  
transcript is a true and accurate record of said  
testimony (with the exception of the following  
corrections listed below):

Page	Line	Correction
------	------	------------

STEVEN BIRD, M.D.

Sworn to and subscribed before me this  
day of , 2025.

Notary Public

My commission expires:

COMMONWEALTH OF MASSACHUSETTS)

)

SUFFOLK, SS.

)

I, Katherine A. Tevnan, Registered Merit Reporter, Certified Shorthand Reporter No. 129093 and Notary Public in and for the Commonwealth of Massachusetts, do hereby certify that STEVEN BIRD, M.D., the witness whose deposition is hereinbefore set forth, was duly sworn by me and that such deposition is a true record of the testimony given by the witness.

I further certify that I am neither related to or employed by any of the parties or counsel to this action, nor am I financially interested in the outcome of this action.

In witness whereof, I have hereunto set my hand and seal this 29th day of May, 2025.



---

Katherine A. Tevnan,  
Registered Merit Reporter  
CSR # 129093

Notary Public

My commission expires March 10, 2028

<b>&amp;</b>	304:9 317:19	77:14 78:3	<b>1.21</b> 189:21
<b>&amp;</b> 1:12 2:13 3:9 33:13,13,20 343:4	332:2 <b>1-4</b> 92:16,21 <b>1.0</b> 67:2 69:2 153:6 228:22 258:13,17	169:22 170:19 171:13 172:5 189:8 190:2 229:1 257:11 279:12 280:14 301:21 303:3 323:11 333:13 334:5	<b>1.21.</b> 189:5 <b>1.22</b> 172:8 <b>1.24</b> 181:5 <b>1.25</b> 177:17 <b>1.26</b> 93:1 95:9 <b>1.26-1.71</b> 92:18 <b>1.28</b> 100:16 152:21
<b>0</b>	<b>1.00</b> 80:20 101:17 108:14 176:14 177:4	<b>1.1.</b> 65:7 77:8 280:9	<b>1.3</b> 69:2,15 <b>1.31</b> 182:4 <b>1.31.</b> 150:18 <b>1.4</b> 250:18 <b>1.41</b> 158:17 159:3
<b>0</b> 333:8,17 <b>0.1</b> 73:17 <b>0.38</b> 157:7 <b>0.78</b> 92:22 <b>0.86</b> 304:10 <b>0.96</b> 101:17 <b>0.98-1.4</b> 92:21 <b>0.99</b> 92:22 <b>00897</b> 1:5 <b>02903</b> 1:14 2:17	<b>1.00.</b> 97:6 177:8 <b>1.01</b> 176:21 177:8 252:15 <b>1.01.</b> 171:11 303:1 <b>1.02</b> 175:21 177:8 279:18 <b>1.02.</b> 189:3,7 <b>1.03</b> 165:17 257:11 <b>1.03-1.41</b> 92:16 <b>1.03.</b> 333:11 334:3 <b>1.05</b> 67:9 <b>1.06.</b> 151:5 <b>1.07.</b> 302:19 <b>1.08</b> 169:20 170:17 172:3 176:14 <b>1.09</b> 177:18 279:15 <b>1.1</b> 63:6 64:2 66:2,12 68:5 68:17 73:7	<b>1.10</b> 166:11 279:17 <b>1.10.</b> 182:22 <b>1.11</b> 171:16 178:2 181:17 200:12,18 <b>1.12</b> 176:21 <b>1.13</b> 192:8 <b>1.13.</b> 108:5 <b>1.15</b> 177:4 <b>1.15.</b> 178:2 <b>1.16</b> 174:3 <b>1.17</b> 92:21 96:2 <b>1.18</b> 170:5 171:2 174:3 175:21 252:16 <b>1.19</b> 176:14 303:15 <b>1.19.</b> 174:4 303:14 <b>1.2</b> 67:18 <b>1.20</b> 92:16 94:8 175:21	<b>1.41.</b> 156:5 <b>1.47</b> 92:18 95:4 <b>1.5</b> 150:1 151:11 <b>1.54</b> 190:5 <b>1.64.</b> 150:15 <b>1.68</b> 153:5 <b>1.72</b> 320:4 <b>1.81</b> 252:17 <b>1.98</b> 105:19 106:2 <b>1.98.</b> 106:22 <b>1/2</b> 311:4,14,15 311:22 312:14 312:21,22 313:9 314:12 <b>10</b> 5:3,10 56:18 56:21 57:7,17 59:8 163:22
<b>1</b>	<b>1</b> 5:3 10:4,5,8 26:2,18 39:12 39:22 67:6 72:2 80:5 86:11 94:4,12 95:9,22 96:3 97:1 101:6 106:18 107:3 107:10 108:1 118:7,9 151:22 154:8 155:8 164:17 167:14 168:18 185:18 187:11 228:16 297:12 299:21		



281:17 326:11 326:13 350:22 <b>10,868</b> 156:3 <b>10.0</b> 73:17 <b>100f</b> 271:7 <b>103</b> 5:13 <b>104</b> 5:14 232:12 233:1 <b>106</b> 267:12 <b>10:29</b> 84:11 <b>10:40</b> 84:14 <b>11</b> 5:11 52:19 85:9,13 99:11 146:2,4 154:22 155:3,4 181:21 <b>11,030</b> 153:4 <b>110</b> 152:20 153:4 <b>115</b> 147:14 <b>12</b> 5:12 98:22 99:3 158:19,20 293:1 <b>12.86</b> 207:12 <b>12.86.</b> 208:8 <b>129093</b> 350:4 350:20 <b>12:05</b> 161:5 <b>12:55</b> 162:3 <b>13</b> 5:13 41:11 54:3,4 103:3,8 168:12 188:8 188:12 190:16 204:18 247:17 311:4,15,22	312:14,21,22 313:9 314:12 315:22 317:12 <b>13.6.</b> 250:18 <b>14</b> 1:10 5:4,14 104:7,12 167:6 304:16 335:16 337:6,7 <b>14.9</b> 333:21 <b>142</b> 5:16 <b>145</b> 333:10 <b>14th</b> 7:5 <b>15</b> 5:16 30:20 54:16 86:13 142:21 143:11 149:15 153:19 158:6,7 265:10 267:15 273:18 273:18 297:21 297:22 298:1 334:2 <b>16</b> 5:17 38:9 148:21 162:10 162:14 216:20 248:9 267:22 270:5 271:6 <b>160</b> 233:1 <b>162</b> 5:17 <b>17</b> 5:19 96:1 148:22 175:5,9 203:8 245:19 245:21 281:6,9 281:10 302:3 337:7	<b>17's</b> 302:4 <b>17,187</b> 332:6,11 <b>1737</b> 276:17 283:12 <b>1745</b> 277:15 286:15 <b>175</b> 5:18 <b>179</b> 5:19 <b>18</b> 5:20 179:16 179:20 186:11 204:7,11 207:17 281:11 281:12,15 284:6 <b>180</b> 97:22 <b>184</b> 5:20 <b>189</b> 230:3,4 265:19 266:9 <b>19</b> 5:21 184:6 184:10 201:15 <b>191</b> 226:19 <b>194</b> 6:2 <b>196</b> 5:21 <b>1965</b> 62:19 <b>1983-1986</b> 319:6 <b>1984</b> 255:3 <b>1988</b> 243:8 244:4 <b>1989</b> 253:16 254:3 <b>1991</b> 241:19 <b>1993</b> 239:15	<b>1994</b> 297:22 <b>1997</b> 240:18,22 <b>1998</b> 20:21 <b>2</b> <b>2</b> 5:4 14:12,14 14:18 25:7 44:22 55:16 86:5 162:16 180:2 186:15 204:11 205:4 219:2,12,16 228:20 285:11 299:21 331:22 332:21,21 <b>2,118</b> 156:4 <b>2.0</b> 69:15 <b>2.15</b> 152:22 <b>2.65.</b> 279:20 <b>2.82</b> 153:6 <b>20</b> 5:22 94:6 100:18 147:17 194:3,14,14 200:21 204:4 283:15 286:3 <b>200</b> 211:3 <b>2000</b> 274:8 308:16 <b>2001</b> 314:21 <b>2003</b> 241:18 <b>20044</b> 2:8 <b>2007</b> 268:6 <b>2008</b> 6:5 224:11 225:12
--	---	--	--

226:4,8,15 230:7 257:19 258:20 <b>2009</b> 5:8 38:4,9 38:21 39:7 46:13 255:20 293:3 <b>2010</b> 6:13 295:1,12,15 296:1 <b>2011</b> 252:11 253:19 255:12 295:1,11 301:10 314:20 <b>2012</b> 273:22 294:19 295:2 295:11 314:21 <b>2013</b> 241:8 245:3,12 252:8 <b>2014</b> 6:10 194:17,22 196:5,14 198:5 198:8,19 199:2 200:7,21 207:19 210:3 240:7 247:12 255:3 265:19 265:22 266:5 267:2,11,13 <b>2014a</b> 205:21 <b>2015</b> 239:20 307:5 <b>2017</b> 6:5 198:2 213:22 214:4	217:4,22 223:12 225:9 245:15,18 248:8 275:22 294:10 <b>2018</b> 5:16 6:11 113:7 142:22 143:12 152:14 155:21 195:19 210:3 224:15 240:8 243:8 268:1,8,13 270:3 279:6 280:7 282:8 283:4 <b>2019</b> 250:15 253:16,21 254:2,3 314:21 <b>202</b> 2:9 <b>2021</b> 21:14 268:6 <b>2022</b> 239:17 244:5 <b>2023</b> 184:15 331:4 <b>2024</b> 5:9,17,18 5:19 6:17,18 31:3,6,9,10,12 31:13,17 52:5 52:13,16 92:3 162:11,15 175:5,10 179:16,21 204:5 210:3,5	240:7,9 278:18 279:2,14,16,17 279:19 281:6 301:10,19 335:16 336:15 337:3 <b>2024b</b> 196:1 <b>2025</b> 1:10 7:5 31:11 349:17 350:16 <b>2028</b> 350:22 <b>20773</b> 350:18 <b>21</b> 5:4 6:3 194:1,8,14,19 202:18 207:16 207:22 208:1 <b>213</b> 6:4 207:1 <b>22</b> 6:5 213:21 214:3 228:4 245:19 248:9 294:11,14 <b>220</b> 78:9,14 <b>225</b> 334:2 <b>226</b> 6:5 <b>227</b> 52:4 <b>23</b> 6:6 31:22 226:7,14 230:5 <b>232</b> 6:6 <b>24</b> 6:7 136:19 232:2,7 <b>242</b> 6:8 <b>25</b> 6:9 242:14 243:5 244:1	<b>253</b> 6:9 <b>26</b> 6:10 147:17 253:2 <b>265</b> 6:10 <b>268</b> 6:11 <b>27</b> 6:11 187:1 206:5 265:22 266:4 318:5,9 319:9 334:15 335:6,18 <b>27,100</b> 321:16 322:5 <b>27.1</b> 319:13 320:10 321:3 321:15,22 322:4 <b>276</b> 6:12 <b>28</b> 6:12 100:19 102:7 153:1 208:20 268:8 268:12 <b>28144</b> 3:12 <b>285</b> 318:21 <b>289</b> 319:10 320:2 <b>29</b> 6:13 257:7 276:4,6 283:10 <b>292</b> 268:15 <b>293</b> 268:16 <b>295</b> 6:13 <b>297</b> 268:18,20 269:17,18 270:22
--	---	---	---

<b>298</b> 6:14 <b>29th</b> 350:16 <b>2:26</b> 231:12 <b>2:42</b> 231:15 <hr/> <b>3</b> <hr/> <b>3</b> 5:4 21:7,12 27:17 86:11 99:14 155:10 165:20 175:17 180:22 185:8 205:4,6 229:11 257:15 273:3 296:22 299:20 302:16 311:14 311:14 <b>3.13</b> 206:16 208:5 <b>3.6</b> 315:14 317:2,10 <b>30</b> 6:14 80:1 139:21 141:2,5 295:15,18 <b>307</b> 6:15 <b>31</b> 6:15 239:1 298:5,11 315:11,12 316:22 317:14 <b>318</b> 6:16 <b>32</b> 6:16 127:20 307:14,18,20 313:22 315:11 316:22 317:14 336:6	<b>3203</b> 185:7 <b>33</b> 6:17 250:12 307:1 313:22 318:14,17 336:6 <b>330</b> 6:17 <b>336</b> 6:18 <b>34</b> 6:18 307:16 330:14,17 336:6 <b>340</b> 2:6 <b>342</b> 4:5 <b>35</b> 5:6,6,7,7 6:19 64:21 282:3 336:15 336:19 337:3 <b>35,738</b> 332:7,15 <b>37</b> 195:13 197:6 <b>38</b> 5:8 152:13 196:22 199:11 199:17 <b>39</b> 152:9,11,17 195:22 199:22 <b>3:41</b> 275:10 <b>3:56</b> 275:13 <hr/> <b>4</b> <hr/> <b>4</b> 5:6 35:2,17 37:5 49:21 51:20 65:16 94:5 95:22 104:22 105:5 109:22 120:5	124:18 126:8 152:9 175:16 195:10 201:7 202:18,22 203:4 205:5 208:3 212:5 216:19 235:17 265:9 299:20 303:6 320:22 320:22 323:1 <b>4.07</b> 100:16 <b>4.3</b> 250:17 <b>4.9</b> 333:8,18 <b>40</b> 55:13 100:16 240:15 <b>401-273-8330</b> 2:18 <b>4011</b> 308:3 <b>41</b> 156:9,18 157:14,18 159:4 245:8 <b>42</b> 155:17 <b>43</b> 331:22 <b>44</b> 318:5,9 319:9 <b>44,100</b> 321:16 322:5 <b>44.1</b> 319:14 320:10 321:3 321:15,22 322:4 <b>45</b> 65:18 109:22 120:12 275:18 279:5	292:21 <b>457</b> 156:4 <b>46</b> 66:6 77:4 78:21 <b>47</b> 95:3 124:17 125:2 126:8 212:4 <b>48</b> 251:17 323:15 <b>49</b> 152:10 255:16 292:19 292:21,22 293:17 <b>4:41</b> 304:22 <b>4:53</b> 305:3 <hr/> <b>5</b> <hr/> <b>5</b> 5:6,9 35:4,18 52:5,13,16 59:10,17,22 60:10 77:2,3,4 92:17,22 96:22 103:14 105:11 107:16 108:4 175:13,20 200:20 238:22 306:21 310:6 323:16 333:10 333:21 <b>5-4</b> 138:4 <b>5.28</b> 157:7 <b>5.78</b> 320:6 <b>50</b> 60:19 61:3 148:9
---	---	---	--

<b>50,563</b> 156:3	296:3 326:12	<b>74</b> 149:13	<b>9</b>
<b>50/50</b> 222:2,4	334:18	154:1 181:4	<b>9</b> 5:9 52:13,15
222:10	<b>6.04</b> 323:5,12	<b>75</b> 17:22	73:7 107:19
<b>51</b> 252:16	<b>60</b> 109:19	<b>76</b> 151:13,14	290:6 343:9,10
<b>52</b> 5:9	187:8 328:12	152:22 207:11	343:13
<b>525</b> 3:11	328:15	208:8	<b>90</b> 163:18
<b>53</b> 63:16	<b>616-8289</b> 2:9	<b>77</b> 197:21	177:18
<b>54</b> 138:3	<b>64</b> 185:14	<b>79</b> 167:11	<b>90th</b> 319:13
140:11	<b>65</b> 183:20	<b>7:23</b> 1:5	320:8,20
<b>55</b> 185:14	281:22 283:16	<b>8</b>	<b>91</b> 176:14
294:13,15	286:3,5	<b>8</b> 5:8 38:21	178:2
<b>557</b> 299:2	<b>68</b> 153:6	39:4,5 44:21	<b>92</b> 171:16
<b>558</b> 299:21	<b>6:00</b> 1:11	104:22 164:5	<b>93</b> 152:1,5
<b>559</b> 299:21	<b>7</b>	218:6,7 224:19	153:16 167:11
<b>56</b> 5:10 212:10	<b>7</b> 4:4 5:7 35:9	230:21 231:2	182:4
212:19 301:5	35:21 49:21	290:22 310:4	<b>94</b> 176:21
<b>560</b> 299:20,20	63:15 81:15	317:15 327:3	177:4,4
<b>5:04</b> 313:17	92:1,7,22	<b>804</b> 53:2,16	<b>95</b> 72:21 73:1,3
<b>5:30</b> 328:19	99:13 127:11	<b>81</b> 201:3,9,14	73:6 74:17,18
<b>5:33</b> 328:22	155:17 199:10	<b>83</b> 203:6	80:19 93:22
<b>5:57</b> 347:21	219:20 224:19	<b>84</b> 159:9	100:14 105:6
348:2	230:19,21	<b>85</b> 5:11	105:13 152:22
<b>6</b>	231:2 250:11	<b>86</b> 158:19,20	153:6 166:11
<b>6</b> 5:7 8:5 35:6	255:16 290:6	167:3 174:3	190:5 219:1
35:19 37:4	320:3 327:3	303:10,21	252:15 296:10
59:10 64:20	343:3,10	<b>87</b> 168:9 187:8	333:18
81:16 149:13	347:10	188:5 190:14	<b>96</b> 172:8 333:8
153:22 172:15	<b>704-633-5244</b>	204:16	<b>97</b> 150:12
172:18 173:1	3:13	<b>89</b> 150:21	154:5 180:19
180:2 204:12	<b>71</b> 257:2	154:6,21	333:22
219:20,21	<b>72</b> 189:11	192:13	<b>98</b> 5:12 106:17
220:10 228:7	<b>73</b> 186:19		106:21 107:6
235:20 257:22			170:3 205:9

<b>99</b> 97:2,6 164:5 170:22 177:17 <b>9:00</b> 1:11 7:5 <b>9:29</b> 34:22 <b>9:31</b> 35:13 <b>9th</b> 216:4	227:3,18,22 228:8 231:19 233:7,12,22 234:7 245:10 255:19 301:21 303:3 320:7 333:13 334:5 <b>absence</b> 308:19 <b>absolutely</b> 8:15 102:21 298:9 305:19 <b>abstract</b> 106:1 <b>abstracts</b> 235:1 <b>academies</b> 15:7 15:8,13,16 16:1 17:7,11 17:14,18,21 18:4 38:5 42:11 <b>academy</b> 15:3,6 15:9 16:5,7 17:2 <b>accepted</b> 112:9 113:20 219:5 <b>access</b> 183:17 <b>accordance</b> 43:5 <b>account</b> 82:17 234:18,21 272:20 273:15 274:14,19 275:1 278:8,11 278:20 284:9 286:11 287:9	287:13 309:11 <b>accounts</b> 208:18 <b>accumulate</b> 241:4 <b>accurate</b> 9:14 77:19 115:14 349:5 <b>accurately</b> 75:13 <b>acknowledged</b> 259:8 <b>act</b> 45:22 50:6 58:10,15 223:18 <b>action</b> 8:8 12:17,20 13:3 14:9 217:17 350:13,14 <b>actions</b> 13:5 <b>activities</b> 40:11 <b>actually</b> 28:3 77:4 93:13 106:2,12 173:21 179:6 183:12 212:7 214:20 215:6 268:18 277:13 299:2 313:11 319:10,15 323:16 339:5 <b>acute</b> 59:18 60:1,11 128:3 130:1 132:1,9	133:19 269:1,5 288:21 297:19 <b>adam</b> 2:4 8:7 9:9 21:22 26:1 57:4 336:21 344:8 <b>adams</b> 2:5 307:18 <b>add</b> 123:11 217:5,9 225:18 <b>adding</b> 164:9 <b>addition</b> 51:15 109:3 236:11 284:16 <b>additional</b> 36:8 40:8 236:10,10 236:21 237:6 <b>additive</b> 334:22 335:11 336:8 341:9,14 <b>address</b> 8:2 40:12 131:9 330:9 335:5 <b>addressed</b> 147:16 321:1 <b>adequate</b> 278:6 <b>adgate</b> 43:17 <b>adhered</b> 80:10 <b>adjective</b> 164:10 <b>adjectives</b> 67:14 157:10 <b>adjusted</b> 105:5 105:12 163:6
<b>a</b>			
<b>a.m.</b> 1:11 7:5 34:22 35:13 84:11,14 <b>abandoned</b> 83:4 <b>abide</b> 21:17 22:18 23:19 24:1 28:16 29:2,12 <b>ability</b> 13:8,22 70:20 <b>able</b> 24:8 293:13 <b>above</b> 94:12 95:9 106:18 107:3,10 108:1 150:1 151:11 169:22 170:19 171:13 172:5 185:18 189:8 190:2 201:1 218:17 220:4 220:11,22 221:7,20,22 223:8,17,20 226:1,3,21			

163:13,21 165:19 167:5 168:11 180:14 180:21 181:20 186:22 188:7 190:18 302:18 303:9 <b>adjustment</b> 274:7 <b>administration</b> 185:10 <b>administrative</b> 137:21,21 <b>adoption</b> 15:17 <b>adult</b> 47:5 263:12 288:17 <b>adults</b> 133:22 134:14,20 197:13 269:1 <b>adverse</b> 40:3 64:1 65:5 66:1 66:11 77:11 78:2 138:11 <b>advice</b> 15:18 <b>advocacy</b> 17:1 <b>affairs</b> 6:7 232:3,8 <b>affect</b> 146:1 <b>affiliated</b> 137:12 <b>africa</b> 264:6 <b>age</b> 132:5 163:6 163:13,22 165:20 167:6	168:12 169:16 180:14,22 181:20 185:11 185:14 187:1 188:8 190:19 263:14 272:6 272:19 283:15 286:3 289:19 306:3,5,6 309:6 310:1 325:21 326:8 <b>aged</b> 183:20 <b>agency</b> 236:18 <b>agenda</b> 16:16 16:17 40:15 <b>agent</b> 287:6 <b>agents</b> 266:7 <b>aggregate</b> 277:22 <b>aggressive</b> 307:9 <b>ago</b> 21:5 38:9 109:19 153:12 189:19 278:15 <b>agree</b> 22:22 24:6,19 26:5 33:3 38:3 49:16 54:2,15 55:8,10 65:12 66:15 67:4,5 67:15,22 69:6 70:6,7,12 71:12 72:7,12 73:6 76:7	94:10,11,21 95:7,13 107:13 110:19 111:8 112:6 124:5 129:10,12,16 129:20 130:1,4 130:5,8,10,13 131:18 132:10 132:11 133:21 141:16 142:4,9 144:13,15 157:2 160:4 164:12 165:2 165:12 166:9 166:17 167:19 170:11 171:22 173:18 174:6 174:11 177:12 178:17 179:2 182:10,15 189:17 190:11 191:9 221:6 229:21 233:6 233:11 234:13 248:22 249:1,8 249:11,22 250:1,7,9 254:10 269:18 271:8 280:12 280:13 286:6 291:13 293:10 298:14 303:22 309:17,18 311:2 321:14	338:3,8,9,15,21 345:20 <b>agrees</b> 265:14 267:22 <b>ahead</b> 28:4 48:16 58:12,18 59:4 60:7 61:7 61:14 67:12 68:2,21 71:5 71:18 73:10 74:8 75:12,22 83:14 84:4 88:6 90:8,14 91:3,17 94:20 96:5 97:10,10 98:21 101:1,8 102:11,17 106:20 107:5 107:12 111:13 111:18 112:2 112:12,16 113:14 114:22 116:4 119:3,10 119:18 122:9 123:15 124:7 124:13 126:3 130:18 131:3 132:19 133:3 134:7,22 135:10 139:4 139:16 142:14 151:7 157:17 160:2,7 164:15 166:8 167:18
---	--	--	---

168:21 174:10 178:11 183:6 199:5 201:17 211:10 219:9 222:7 237:22 244:15 251:8 304:7 338:13 339:4 <b>ahlborg</b> 252:10 252:14 255:12 255:19 <b>air</b> 109:13,13 <b>al</b> 5:12,21 6:16 97:18 98:22 99:8 183:13 184:7,12 274:7 276:9 293:3 308:1 318:14 318:19 <b>alanee</b> 6:15 239:20 307:14 307:22 <b>alteration</b> 53:1 53:15 <b>alterations</b> 134:11,20 <b>alternatively</b> 227:18 <b>alternatives</b> 227:13 <b>american</b> 5:4 20:17 21:1,7 21:12 22:19 24:14 272:22	<b>amherst</b> 213:11 <b>aml</b> 127:5,7 128:3 129:5,6 129:10 130:9 130:10,14 131:14 134:14 134:15,19,20 290:11,17 291:5,12 294:18 296:12 296:16 343:16 346:8,21 347:3 <b>amount</b> 70:16 <b>analyses</b> 40:14 113:16 121:2 146:5 147:17 149:6 178:8 179:2 209:16 210:2 277:8 294:22 295:6 <b>analysis</b> 48:9 71:14 86:1 87:12,15 101:16 102:5 121:5,15 122:18 123:18 123:20 159:21 173:1,20 174:18 175:14 228:20 229:2,5 229:11 243:16 275:21 293:4 295:20 301:8 301:16 307:22	308:8 327:17 <b>analyze</b> 66:16 69:19 <b>analyzed</b> 159:15 <b>analyzes</b> 104:17 <b>analyzing</b> 237:14 238:11 <b>anderson</b> 43:18 <b>andrew</b> 239:17 <b>aniline</b> 264:4 <b>animal</b> 13:17 88:12 227:15 227:19 228:18 <b>annual</b> 30:16 <b>answer</b> 8:18 32:19 49:2 50:22 51:3,12 63:10 64:13 65:14 67:20 68:8,15,21 69:9 70:5,11 72:6,11 73:11 73:20 74:9 75:14 76:18 78:10 79:12 90:3 91:11 96:13 101:12 114:2 121:14 121:20 122:14 123:4,10,12,16 123:16 124:4,8 124:9,16 132:5	134:4 135:7 140:5 166:19 214:12,14 224:3 233:21 248:2 251:9 258:7,11 275:2 277:11 282:15 283:7 328:3,10 328:13 329:2 342:7 <b>answer's</b> 18:5 292:9 <b>answered</b> 315:10 <b>answers</b> 24:2 <b>anterior</b> 108:18 <b>antipsychotic</b> 84:18 85:19 89:2 91:9 95:17 97:14,16 98:9,17 99:5 99:18,19 100:20 215:14 <b>antipsychotics</b> 92:16,20 94:4 95:1,21 96:21 97:20 <b>anttila</b> 249:16 <b>anybody</b> 328:8 <b>anymore</b> 137:11 <b>apologize</b> 98:12 <b>appeal</b> 12:4
---	--	---	--

<b>appear</b> 293:6	300:10 342:15	318:5,14,19	<b>assignments</b>
<b>appearances</b>	345:1	<b>aside</b> 209:10	137:18
2:1	<b>areas</b> 225:6	325:10 339:17	<b>assigns</b> 137:19
<b>appears</b> 273:21	264:15 340:12	<b>asked</b> 17:13	<b>assist</b> 43:9
<b>apples</b> 88:8	<b>arm</b> 17:7	23:15 122:11	<b>assistant</b>
<b>applicable</b> 54:6	<b>aromatic</b>	222:19 233:18	137:22
56:8 58:6 64:3	284:21	242:8 315:18	<b>associated</b>
238:4	<b>article</b> 5:11,20	343:7,12 345:4	277:9 278:22
<b>applications</b>	6:16,18 85:10	345:20	307:21 308:9
19:3	85:15,17 88:4	<b>asking</b> 48:10	308:13 310:15
<b>applied</b> 17:17	91:22 92:1	98:13 118:17	318:1
<b>applies</b> 31:13	96:11,14,16	145:2 158:13	<b>association</b>
75:5 193:19,21	98:7,16 101:10	292:14 300:19	45:6,7,9,10
<b>apply</b> 54:19	101:19,21	<b>aspect</b> 212:13	46:17,20 47:2
61:17,22 64:9	178:15 184:6	<b>aspects</b> 16:17	47:6,11,15
138:16 140:21	184:10,14,17	90:19	63:1,4,19,21
141:12	186:10 213:14	<b>assess</b> 218:1,11	65:3,20,21
<b>applying</b> 63:3	221:1,2 224:14	<b>assessing</b> 38:7	66:9,19,21
<b>appreciate</b>	318:15 330:22	39:9	67:3,18 69:3
77:20 226:11	331:3,6 336:15	<b>assessment</b> 6:5	69:16 71:13
312:8	337:3 338:2	46:2 139:20	72:3 79:2,9
<b>approach</b>	<b>articles</b> 41:17	197:19 213:22	85:18 97:14,17
139:17,19	41:21 44:15	214:4 217:4,18	98:8,17 99:4
231:6 341:10	76:3 83:20	217:22 218:8	101:5 109:4
341:14	88:20 178:13	220:3 223:6,11	165:3 166:14
<b>appropriate</b>	178:13 179:1	224:7 225:9	167:21 169:2
28:11 157:21	184:3 236:21	228:3 230:8,13	181:8 182:12
<b>approved</b>	236:22 237:13	245:15 246:16	187:18 188:15
21:14 43:5	238:2 297:1,1	248:8 294:10	227:12 229:6
<b>approximately</b>	<b>articulated</b>	337:18 341:5,9	229:14 240:13
55:13	229:22 231:1	341:10,13	241:1 251:20
<b>area</b> 23:15 24:4	<b>aschengrau</b>	<b>assessments</b>	252:2,6 259:12
193:3,12	6:16 239:12	300:12	266:16 269:10
264:15 300:9	314:3,7 317:17		270:1,18



271:10 277:17 287:6 296:7,20 308:19 314:19 330:4 <b>associations</b> 76:16 104:3 269:2 270:9 294:21 <b>assume</b> 37:14 49:13 <b>assumed</b> 283:14 286:2 <b>assumption</b> 341:15,22 <b>asterisk</b> 169:12 169:14 201:5,7 <b>atsdr</b> 5:18 45:20 46:2 113:7 141:21 144:7,10 160:12 175:5 175:10 195:19 196:2 197:18 198:2 199:2 209:16,20 210:8 225:8,16 225:22 229:22 231:1 278:11 279:6,11 280:6 282:8 283:4 290:9 291:11 296:1 337:13 341:6,9 343:14 345:22	<b>atsdr's</b> 5:16,17 6:4 141:17 142:22 143:11 162:10,14 196:5 210:1 213:22 214:4 216:19 224:6 228:3 231:6 245:15 <b>attach</b> 67:14 <b>attached</b> 10:12 14:20 25:6 <b>attempt</b> 21:17 22:18 28:16 29:12 278:8,19 <b>attempted</b> 278:11 <b>attention</b> 23:11 27:16 28:6 39:11 40:21 42:22 <b>attributed</b> 138:11 <b>aupig</b> 250:3 <b>austin</b> 62:19 <b>authored</b> 19:20 41:17 68:19 224:15 <b>authoritative</b> 15:17 18:21 19:8,11 <b>authority</b> 18:18 18:21 19:10	<b>authors</b> 92:14 179:7 332:10 335:21 <b>available</b> 28:11 276:21 331:4 <b>average</b> 284:1 <b>aware</b> 12:15 13:15 15:15 18:15 20:3 38:8,10 42:2 42:19 48:11,12 49:5,8 50:8 58:9 61:16,21 67:16 69:1,5 69:14,18 115:9 115:17 116:6 116:15 117:11 126:19 130:22 131:6 132:7,15 143:20 144:1 144:16 145:2,3 174:20 211:21 216:18 225:15 245:14 248:7 264:1,9 267:9 272:22 273:7,9 276:12 278:10 289:18 296:19 297:3 301:19 329:15,20 330:1,3,9 331:3 332:10 332:17 339:13 339:22 341:8	<b>axelson</b> 249:16 <b>b</b> <b>b</b> 5:1 8:1 203:18,19 204:2 239:8 <b>baby</b> 23:10 <b>baca</b> 5:21 184:7,12 <b>back</b> 28:4 77:21 84:16 105:20 107:15 109:2 138:1 143:9 152:13 153:18 155:16 155:20 158:5,5 162:5 184:5 186:11 201:6 204:7 214:13 223:22 230:3 231:17 237:1 255:10,18 265:8 267:14 273:18 275:15 294:9 312:4 317:12,15 336:13 <b>background</b> 79:14 263:11 288:16 305:20 305:22 <b>bahr</b> 249:17 <b>bain</b> 2:4 4:4 7:19 8:7 14:15
--	--	---	--

22:3,10,15	300:1 307:22	<b>ben</b> 2:7	<b>bias</b> 144:16
26:3 34:18	332:12,15	<b>bench</b> 263:1	145:3,8,12,14
35:14 39:6	346:4 347:5	<b>benchmark</b>	146:4,16 147:8
53:7,10 57:5,9	<b>bash</b> 3:17	68:6,18	147:14 148:2
57:12,19 62:9	<b>basis</b> 16:22	<b>benefit</b> 15:18	149:3 227:14
77:17,20 84:6	89:15 211:11	233:8,12,16,20	234:11,18,22
84:15 85:8	212:17 213:2	234:4	<b>biases</b> 229:9,17
93:14 97:11	221:13,14	<b>benzene</b> 6:12	<b>biasing</b> 146:6
120:12,14	278:1 294:1	25:14 26:12	<b>bide</b> 21:17
158:15 160:16	<b>bassig</b> 301:10	64:2 115:20	<b>big</b> 264:8
160:19 162:4,8	<b>began</b> 345:20	116:9 117:17	<b>billion</b> 321:17
179:14 194:1	<b>beginning</b>	118:16 128:22	322:5,8,17
216:14 224:22	125:5 197:5	129:4 130:8,10	<b>biological</b>
231:8,16	339:20	130:13,15,20	82:17 120:1,8
237:18 261:16	<b>begins</b> 283:14	241:14 267:16	120:18 121:9
275:5,14	<b>believe</b> 10:17	267:22 268:9	124:21 138:9
302:11,14	11:17 17:16	268:13,22	209:12 212:12
304:18 305:4	18:13 20:8,12	269:1,8,15	212:13 227:16
315:21 316:6	26:22 33:4	270:2,10,19	<b>biomedical</b>
328:17 329:1	37:3 46:13	284:16 290:10	138:12
336:22 342:4	51:20 55:16	290:12,15	<b>biostatist</b> 83:3
343:8,22	57:14 104:21	291:4,20 292:5	<b>biostatisticians</b>
344:10,13,22	112:18 113:10	293:7 294:6,17	83:4
345:20 347:19	113:19 129:5	294:19 295:2	<b>bird</b> 1:9 4:3 7:8
<b>basal</b> 325:6	144:6 175:14	295:18 296:8	7:12,20,22 8:7
<b>base</b> 6:1,4 40:7	193:18 195:11	296:20 327:1,5	9:11 10:7,21
70:7 194:6,11	199:9 212:2	327:9 333:1	21:11 22:5
194:17,21	213:15 219:14	334:9,9 338:5	23:8 27:1
210:5	258:22 273:10	339:16 340:3	35:15 52:15
<b>based</b> 89:20	273:20 278:22	343:15,17	84:16 85:12
90:11,21	300:1 306:16	346:7,9,14,20	103:7 104:11
129:17 138:12	329:14 340:5	<b>best</b> 11:8	143:10 162:5
143:20 173:1	<b>bell</b> 33:11	<b>better</b> 70:17	179:19 194:13
276:8 285:5			231:17 266:3

275:15 276:6	195:10,12,16	<b>board</b> 135:22	<b>bove's</b> 76:5
305:5 318:16	197:6,10,12,16	263:10	216:15 217:13
330:16 343:20	197:19 198:1	<b>bodies</b> 225:7	233:17 317:1
346:22 349:2	198:19 199:2	<b>body</b> 12:17	<b>box</b> 2:6 44:22
349:15 350:6	212:4 235:17	16:9 179:1	46:10
<b>bird's</b> 5:10,13	260:13,17,20	267:22	<b>bradford</b> 62:10
56:18 103:3	261:6,9,9,11,13	<b>boice</b> 249:17	62:14,16,18,19
<b>birth</b> 332:16	261:22 262:12	<b>boisclair</b> 1:12	62:22 63:4
<b>bit</b> 28:5 46:6	262:13 263:4	2:13	64:10 71:14
62:8 126:17	263:12,15,20	<b>book</b> 19:1,11	109:2,5 110:2
<b>bladder</b> 5:6	264:10,14,16	19:15 26:7,8,8	112:3 119:22
25:19 26:17	265:8 266:22	26:9,9,10,15	121:10 122:13
34:6 35:2,18	267:14 269:16	41:17,22 67:17	122:17 126:5
37:6 38:16	269:22 270:10	<b>books</b> 18:12	126:10 138:1
47:1 49:21	270:18 271:11	19:4	138:22 139:10
51:19 65:17,18	272:2,5,7,10,14	<b>borrow</b> 302:8	140:12,22
77:13 109:21	272:17 273:2,4	302:13	141:12 209:11
110:7 115:22	273:7,11 274:1	<b>bosetti</b> 241:18	275:21 301:8
116:11 117:19	275:17 276:8	<b>boston</b> 43:19	<b>break</b> 9:17,18
118:11,22	277:18 279:8	<b>bottom</b> 63:20	62:3,4 84:7,16
120:5 124:18	279:13,22	103:19 218:6	127:17 136:17
126:9,18	281:19 282:19	219:21 220:9	136:22 149:1
149:20,22	287:7 305:13	296:5	160:18 224:21
150:15 151:9	306:2 340:22	<b>bound</b> 74:16,18	231:8 275:5,16
151:14,22	347:9	80:4,18,19	328:4,7,11
152:4,8,21	<b>blair</b> 249:15	<b>bounds</b> 73:3	342:21
153:5 163:16	259:22	<b>bove</b> 75:15,19	<b>breaking</b>
164:1 165:4	<b>blanket</b> 90:3	76:1 183:12,13	224:21
166:20 169:18	<b>blanking</b> 336:2	198:5,8 200:1	<b>breast</b> 84:20
170:15 173:10	<b>blitz</b> 328:8	200:7 217:3	85:19 92:14,19
173:15,18	<b>blood</b> 309:3,22	224:5 225:15	94:7 95:4,16
175:19 180:17	<b>blot</b> 240:18	240:6 278:17	96:1 97:1,14
181:1,10	<b>blur</b> 71:10	278:18 279:2	97:16,18 98:4
186:12 189:2,6		340:21 341:1	98:9,18 99:5

99:17 100:19 102:1 215:15 <b>broad</b> 296:8,14 <b>broken</b> 151:17 <b>brown</b> 18:16 <b>brownson</b> 250:3 <b>bruckner</b> 335:21 <b>buhagen</b> 249:18 <b>bulter</b> 3:20 <b>burden</b> 27:13 53:1,15 54:6 55:3 <b>burdens</b> 27:11 50:5 54:20	<b>callahan</b> 250:15 251:3 251:10 253:21 314:21 <b>called</b> 7:14 11:10 16:19 19:15 25:9 36:15 151:3 178:21 184:10 195:14 220:10 226:20 327:19 <b>camera</b> 262:14 <b>camp</b> 1:7 5:20 6:2,4 7:7 38:7 39:9 40:17,18 41:4 45:17,19 45:21 46:12 50:6 52:3 64:4 65:6 68:9 87:19,21 88:9 88:11,16 89:1 89:6,13,19 90:18 91:8 113:3,4 141:18 142:6,7,11,12 144:18,20,21 145:5 146:6,6 146:9,11 147:22 148:1 148:14,17 149:17,18 151:16,17 152:18 153:1,3 153:8 154:10	154:11 155:1 155:11 156:10 163:5,5,10,12 163:18 164:1 165:4,17,22 166:15 167:3,7 167:22 168:9 168:13 169:3,9 169:10,19,19 170:16,17 171:10,10 172:2,2 173:2 173:3 179:17 179:22 180:13 180:13,18 181:1,9,17,22 182:13,18 186:19 187:3 187:19 188:5,9 188:16,22 189:1,3,3,21,21 190:13,13,17 190:18 191:1,2 191:6,7 192:9 192:10 193:6,7 193:16 194:6 194:11,17,21 195:14 197:11 197:17,22 199:13,18 200:3,10 201:14,14 203:10,10 204:15,15,19	204:19 205:7,8 205:10,10 207:1,2,7 208:15,17 209:4,6 217:6 223:18 240:4 240:14 251:20 252:3 259:12 281:20,21 282:4,4 283:20 284:2,12 303:7 303:8 304:2,13 304:13 310:12 311:5,11,19 312:1,11,19 313:7 315:3,13 316:13 317:2 318:1 326:14 330:3,6,10 337:19 339:17 340:7 341:6 <b>canadian</b> 5:15 104:9,14 <b>cancer</b> 5:6,6,15 5:17,18 25:19 25:19 26:17,17 34:6,9 35:2,4 35:18,19 37:6 38:16 46:19 47:1 49:21 51:19 66:5 77:7,13 78:1 78:21 82:18 84:20 85:19
<b>c</b>			
<b>c</b> 7:1 13:16,16 43:20 53:2,16 240:3 349:1,1 <b>c91</b> 296:9 <b>cabraser</b> 33:12 <b>calculate</b> 206:11 <b>calculation</b> 314:4 <b>call</b> 83:18 110:16 120:1 136:8,18,18 137:1,2 196:18 291:6 319:19			

92:14,19 94:7	186:13 189:20	301:19 302:6	<b>carcinogenic</b>
95:4,16 96:1	195:10,12,16	305:6,13,13,21	82:22 265:15
97:2,15,16,19	196:1 197:6,10	306:2,4,6,9,20	<b>carcinogenicity</b>
98:4,9,18 99:5	197:12,16,19	306:20 307:5	265:18 266:14
99:17 100:19	198:2,19 199:3	307:10,21	268:22
102:2,7,15	200:1,8 205:21	308:9,13,20	<b>care</b> 13:17
104:2,9,14,20	212:4 215:15	309:2,20 310:5	183:17 265:6
105:7,7,14,14	235:18 238:21	310:15,19	<b>career</b> 80:1
105:20 106:3,3	240:19 241:1	313:21 314:3	213:18
106:10,13	241:10,14,20	314:20 318:2	<b>carolina</b> 1:2
107:18,18	242:1,11 243:1	318:10,17	3:12 52:5
108:5,6,7,13,13	243:11,20	319:17 321:6	<b>case</b> 1:5 5:10
108:14,16,21	246:7,10,17	323:2 337:12	5:13 10:22
109:21 110:7	248:4 249:4,15	337:18 339:15	11:3 12:10
115:22,22	260:14,17,21	340:2 347:9	14:21 19:22
116:11,11	261:7,9,10,11	<b>cancer's</b> 272:11	20:4,7,9 25:7
117:19,19	261:13,22	<b>cancers</b> 82:12	25:13,18 26:11
118:10,11,22	262:12 263:4	164:1 165:14	26:16 28:13
118:22 120:5	263:12,15,20	165:21 181:22	30:10,21 31:8
124:18 125:21	264:10,14,16	197:7 240:15	31:9,17,20,20
126:9,18	265:9 266:13	273:7 343:4	32:15,18 33:1
132:16 135:16	266:16,19,22	<b>cancery</b> 310:17	33:5,8,10 34:4
149:20,20,22	267:15 268:20	310:19	35:16 37:16
150:15,18	269:6,11,15,16	<b>candid</b> 43:8	38:16 47:21
151:9,14,22	270:1,10,18	<b>canon</b> 54:19	49:7,14 51:3
152:4,8,21	271:11 272:2,5	<b>cap</b> 217:17	52:3 55:4 56:9
153:5 162:11	272:7,14,17	<b>capable</b> 292:6	56:17,19 57:1
162:15 163:17	273:1,2,4,11	<b>capture</b> 82:17	57:13,17,18,22
165:4 166:15	274:1 275:17	197:10	58:7 59:2,10
169:18 170:15	276:8 277:10	<b>carbon</b> 325:5	59:11 64:10
175:5,10	277:18 278:1	<b>carcinogen</b>	76:16 77:7,10
176:11 180:17	279:1,9,13,14	125:22 126:4	86:17,19 87:6
181:1,10,16	279:16,22	265:16 268:1	87:15,18,19
182:14,20	282:19 287:7		88:2,13 92:5

96:18 102:22	159:16,16	228:19	290:16 291:4
103:4,9,11	167:7 256:15	<b>causation</b> 34:3	295:2 326:15
112:19 113:10	256:18 292:7	53:3,17 54:1	346:14,20
113:20 114:5	319:4,17 320:9	54:21 61:11	<b>causing</b> 266:13
114:11,17	332:3,6 347:7	62:21 67:1	269:15 292:6
117:13 118:8	<b>catching</b> 93:15	82:3,18 123:8	<b>cells</b> 132:13
118:16,21	<b>categories</b> 45:4	138:12 142:19	262:11,12,20
139:2,7 141:11	45:11 47:20	178:9,22 220:5	262:22 325:6
142:1,1 149:7	48:6 174:19,19	220:11 227:8	<b>center</b> 136:9
159:17 173:9	174:20 176:10	228:9 271:10	<b>certain</b> 16:17
198:10,14,16	176:13 230:7	290:10 291:19	103:16 264:14
215:18,21	<b>categorization</b>	292:1,3,5,10,13	264:15
216:2,10 223:8	44:22 45:13,16	292:16 326:21	<b>certainly</b> 16:13
223:17 234:19	45:17 46:1,7	327:8 343:5,15	18:21 29:14
237:16 238:13	<b>categorize</b>	344:20,20	36:20 55:20
242:1 243:21	227:4	345:11,14,15	75:5 78:12
244:1,8 245:3	<b>categorized</b>	346:7,15	80:10 119:4,6
245:11,12	227:3,17,22	<b>causative</b> 347:2	135:16 199:7
250:2 252:21	301:3	<b>cause</b> 59:18	213:13 252:22
254:15,19	<b>category</b> 46:15	60:1,11 110:21	289:19 295:13
255:6 256:17	173:13,18	111:7,22	305:16
257:18 259:18	220:17 228:15	115:22 116:11	<b>certainty</b> 60:15
260:5 274:9	296:9,14	140:17 195:15	60:19 61:2,11
276:8 291:18	<b>causal</b> 45:5	199:19 207:8	346:3,16 347:1
291:19 293:5	46:16 54:5	237:15 238:12	347:13
299:14 321:10	112:9 121:8,17	291:20 292:15	<b>certificate</b>
323:11 329:12	122:20 123:21	314:3 327:2	263:6
330:19 332:20	182:18 183:3	345:8	<b>certified</b> 1:21
344:1	198:4,8 220:14	<b>caused</b> 197:11	24:14 135:22
<b>cases</b> 12:3	220:16 227:6,7	294:19 327:10	263:10 350:4
21:19 30:22	227:14 228:12	<b>causes</b> 126:11	<b>certify</b> 349:2,4
31:6 32:4	228:14 294:5	130:10,13	350:6,11
55:13,19,21	<b>causality</b> 211:7	140:13 266:15	<b>chair</b> 49:5
56:5,9 114:8	218:2,12	269:1,8 273:6	

<b>chairman</b> 41:7	340:15	<b>chosen</b> 43:3	255:22 265:19
<b>chance</b> 79:3,10	<b>chemicals</b>	<b>christensen</b>	268:1 271:6
172:18 227:13	25:13 26:11	245:12 246:1,4	280:16 281:2
229:9,16 288:6	115:20 116:9	246:20 250:4	282:9 283:3
<b>chang</b> 249:17	117:16 118:3	252:7	291:10 294:5
259:22	118:16,20	<b>chromosome</b>	297:20 301:16
<b>change</b> 32:4	195:15 199:19	289:15	303:15 304:1
54:8,9 83:17	207:7 209:21	<b>chronic</b> 128:10	306:19 307:7
210:6	211:7,22	129:3,20 132:8	308:15 310:21
<b>changed</b> 31:11	215:21 216:19	264:7,17 269:3	315:5 317:16
<b>chapters</b> 26:7,8	220:7 237:11	269:4 293:5	335:16,18,19
26:9,10,13,15	237:14 238:9	306:15	336:2
41:17,22	238:12 240:14	<b>circumstance</b>	<b>cited</b> 17:20
<b>characteristics</b>	251:21 252:3,6	265:1	18:1,4 19:19
145:16 243:2	284:18 304:3	<b>circumstances</b>	41:20 56:13
244:9,13,16	326:22 327:9	12:13 13:9	59:1 127:13
253:9 254:15	334:21 338:22	133:15	143:18 147:4
<b>characterizati...</b>	<b>chief</b> 141:7	<b>citations</b> 36:15	193:10,13
69:6	<b>children</b>	36:20 294:7	238:6 245:15
<b>characterized</b>	133:21 134:15	<b>cite</b> 58:14 62:10	245:18 246:1
69:2,15 319:4	134:19 269:5	101:14 102:13	255:13 266:10
<b>charge</b> 31:19	<b>chinese</b> 129:4	102:14 125:21	296:1 307:4
32:2 39:21	<b>chloride</b> 25:14	127:16,21	309:20 314:18
40:1,13 43:13	26:12 115:20	128:6 155:12	317:8 339:11
<b>charged</b> 31:2,5	116:10 117:17	155:14 193:1	340:10
31:10	118:17 241:19	195:5 199:22	<b>citing</b> 193:5
<b>charging</b> 31:5	271:3,9,11	200:7,12,18	198:2 265:17
31:20	327:1,10,16,18	213:8 239:12	294:19 295:1
<b>checklist</b> 86:2	327:19 329:9	239:17,20	<b>civilian</b> 6:3
109:12,17	329:17 330:5	240:6,9,17	193:15 194:9
<b>chemical</b> 63:5	338:5 339:16	241:8,12,17	194:20 196:15
64:8 117:18	340:4	246:4,7 248:3	202:17 203:5
292:15 321:19	<b>chlorinated</b>	249:10 251:11	205:7 206:15
334:9,10	266:6	252:7,10	279:16,19

281:4 282:5 284:7 303:7,21 304:12 <b>civilians</b> 113:2 156:1,10 193:20 206:22 281:22 304:15 <b>claim</b> 54:6 <b>claims</b> 58:10,15 <b>clapp</b> 43:19 <b>clarification</b> 240:1 <b>clarified</b> 58:1 <b>clarify</b> 57:10 123:17 325:16 342:14 <b>clarifying</b> 32:11 <b>class</b> 215:11,12 215:14 <b>classification</b> 224:6 225:8,17 233:19 <b>classifications</b> 132:17 <b>classifies</b> 265:16 <b>classify</b> 299:8 299:10 <b>clean</b> 22:4 <b>cleaners</b> 256:20 257:1 285:6 <b>cleaning</b> 285:7 285:8,12	<b>clear</b> 32:8,12 223:10 314:6 327:6 337:17 342:22 343:1 344:7,16 <b>clearer</b> 150:10 <b>clearly</b> 82:10 <b>clifford</b> 44:2 <b>clinic</b> 136:10 <b>clinical</b> 135:19 136:3,4 <b>clinically</b> 81:3 107:6 <b>clinician</b> 15:2 16:20 17:9 135:21 <b>clip</b> 143:2,9 <b>clja</b> 54:5 <b>cll</b> 127:5 128:10,17 129:10 130:22 131:5,7,12 290:11,17 291:5,12 294:21 343:16 346:8,20 347:3 <b>close</b> 174:5 178:1 228:22 <b>cml</b> 129:3,6,10 290:12,18 291:5,12,18,21 292:6 294:6 296:13,21 297:3 343:17	344:2,8 345:9 346:9,21 347:3 <b>coauthored</b> 68:19 <b>cocco</b> 128:6 <b>cohn</b> 6:14 297:22 298:4,5 298:7 <b>cohort</b> 6:8,9 88:14 99:6 149:18 154:10 154:11 163:18 164:1 165:17 165:22 167:3,8 168:9,13 180:19 181:2 181:17,22 185:15 186:19 187:3 188:5,9 209:17 242:14 243:2,5,11,15 244:7,19 247:11 248:4 249:12 253:2,9 254:6 255:19 255:20 257:1 259:21 277:22 279:15,17,18 279:19 299:14 300:3 301:20 <b>cohorts</b> 70:21 148:13,15,17 191:7 197:22	<b>collaborated</b> 44:14 <b>collaborative</b> 16:18 42:14 <b>collecting</b> 262:21 <b>collection</b> 88:21 89:5 <b>college</b> 5:4 14:9 20:18,20 21:1 21:7,13 22:20 24:15 <b>colon</b> 104:20 105:7,14 107:18 108:5,6 108:21 <b>colorado</b> 44:4 <b>colorectal</b> 5:15 104:2,9,14,19 105:20 106:3 106:12 <b>column</b> 100:14 159:5 163:11 169:8,10 283:13 296:6 299:4 308:7 319:11 320:2 <b>com</b> 88:7 <b>combination</b> 339:15 340:3 <b>combined</b> 118:1 156:2 335:1,12
---	---	--	---



<b>combining</b> 138:20	17:18 39:22 40:12 41:3,7	<b>compares</b> 163:4 180:10	212:20
<b>come</b> 86:13 213:19 306:17 320:16 324:12 325:17	41:10,13,18 43:7 44:19 46:11 47:18 48:5 49:6 232:13	<b>comparing</b> 63:5 146:5 149:17 154:14 163:11 169:19 170:16 171:10 172:2 189:3,21 190:13 191:17 192:9 193:5 201:13 203:5,9 205:10 282:3 300:10 321:13	<b>component</b> 136:13 <b>comprehensive</b> 237:9 <b>concentration</b> 108:3 314:2 322:8,9,11 340:15 <b>concentrations</b> 195:16 199:20 209:21 <b>concept</b> 80:6,10 81:17 82:4 110:3,11 120:17 138:9 <b>concepts</b> 166:4 <b>concerning</b> 28:13 344:19 346:19 <b>conclude</b> 220:14,15 227:8 228:12 228:14 271:9 308:12 <b>concluded</b> 118:6 274:5 290:9 293:5 294:20 343:14 347:21 348:1 <b>concludes</b> 232:13 268:21 <b>conclusion</b> 55:7 66:22 269:14
<b>comes</b> 51:1 111:3 135:12 208:5 289:21	<b>common</b> 53:3 53:17,22 127:7 135:16 263:14 263:19 264:1 272:11 288:22 306:3,8 325:21 326:6	<b>comparison</b> 168:1 169:3 181:10 182:14 187:20 190:18 191:6 193:8 204:14 205:7 281:20 283:19 303:7 314:15 314:22 316:2 316:11,13 <b>comparisons</b> 188:22 191:1 <b>complete</b> 9:1 51:15 53:9 146:3 196:21 <b>completed</b> 148:12,15 <b>completion</b> 116:18 <b>complex</b> 124:22 125:14	
<b>comfortably</b> 326:16	<b>commonly</b> 211:16,17		
<b>coming</b> 289:16 306:12	<b>commonwealth</b> 350:1,5		
<b>comma</b> 93:8	<b>community</b> 82:6 217:17 227:4 231:20 231:21 232:15 233:4 265:14		
<b>comment</b> 96:19 156:12,17,17 157:21 160:8 179:8 208:12 208:14 233:2 247:22 258:18 297:7,10,17	<b>comparable</b> 315:15 317:3 317:10 332:12		
<b>comments</b> 43:8 43:14	<b>compare</b> 61:4 88:8 225:22		
<b>commission</b> 349:20 350:22	<b>compared</b> 99:18 148:11 151:16 154:10 156:9 165:8,10 166:16 197:7 257:5		
<b>committed</b> 76:4 78:15 178:14 256:7 271:13 276:14 280:22 285:20 291:10 293:12 298:10 327:15			
<b>committee</b> 13:17 17:11,14			

269:19 286:16 <b>conclusions</b> 47:21 114:4,16 115:18 116:7 118:19 139:1 141:22 <b>conditions</b> 103:16 305:12 <b>conduct</b> 40:8 <b>conducted</b> 73:14 90:20 211:14 229:6 229:12 235:7 236:2 244:10 258:6,19 275:1 283:8 337:14 <b>confidence</b> 69:19,21 70:12 71:15,22 72:8 72:8,16,17,18 72:18,21 73:3 73:7,17 74:2,5 74:12,15,17,18 74:20 75:16,20 76:6 80:3,4,20 80:21 81:8 93:9,17,22 94:12 95:8 96:2 100:15,16 101:6 105:6,13 106:18 107:2 107:10 152:22 153:6 156:12 156:15,16,20	156:22 157:2,8 157:13,22 164:4,8,10,16 166:10 167:10 167:13 168:17 170:2,21 171:15 172:7 181:4 182:3 187:7,10 189:10 190:4 192:12 207:11 208:7,10 218:9 219:1,6,12,16 229:10,18 250:18 252:15 <b>confident</b> 227:5 237:12 238:10 <b>confidential</b> 43:14 <b>confirmation</b> 148:13 <b>confirmations</b> 148:16 <b>confirmed</b> 277:17 <b>confirms</b> 195:15 199:18 <b>confounder</b> 277:20 <b>confounders</b> 273:16 278:9 309:12 <b>confounding</b> 227:14 274:5	274:13,19 309:16 <b>confuse</b> 150:11 <b>confused</b> 150:3 150:8 <b>confusing</b> 57:11 <b>confusion</b> 344:8 <b>congress</b> 217:15 326:17 <b>congress's</b> 52:22 53:2,14 53:16 <b>congressional</b> 54:8 <b>connecting</b> 19:3 <b>consensus</b> 231:21 232:14 233:4 <b>consequence</b> 325:5 <b>consequently</b> 197:13 <b>conservative</b> 341:15,22 <b>consider</b> 18:18 19:7 37:15 40:7 47:20 49:14 70:1,2 87:14 90:19 111:15,20 147:9 157:7	164:7 237:8 257:13 272:8 272:18 283:7 345:13,14 <b>consideration</b> 71:14 126:13 140:15 146:20 146:21 164:13 273:17 283:19 287:10 <b>considerations</b> 40:10 62:20 <b>considered</b> 36:3,6 37:1,14 37:22 38:2,13 48:14 49:10 51:21 52:17 71:6 79:13 101:4 106:15 106:21 107:1,8 115:4,10 117:8 117:13 121:1 126:1 127:5 132:1 147:6 184:20 218:20 223:16 229:4 229:13 259:11 269:8,9 341:14 <b>considering</b> 46:11 138:18 183:7 <b>consistency</b> 109:5 110:1,2 110:11 112:3
--	--	--	---

275:20 279:4	259:13	245:11,12	<b>correct</b> 18:7
280:15 282:9	<b>contaminated</b>	250:2 254:15	24:13,16 26:12
301:9,16,18	6:1,3 38:6 39:8	254:19 255:6	27:7 31:17
303:17,18	41:3 65:6	256:17 257:18	33:2 34:4,7,15
<b>consistent</b> 73:4	194:5,10,16,20	260:5 273:11	37:16,17 38:2
112:19 113:11	200:2,9 318:18	274:9 276:8	42:21 44:20
113:12,17	327:17 337:18	293:5 299:15	46:4 47:22
115:18 116:8	<b>contamination</b>	309:9 319:16	50:10 54:14
227:15 281:3	46:12 142:10	321:7,10	59:19 62:11
<b>consistently</b>	144:21 239:9	330:19	63:8 65:12
110:6	239:11 251:12	<b>controlled</b>	66:3 67:3 72:4
<b>constant</b>	310:11 314:7	276:13 309:15	85:19 86:5,14
221:15	317:22	309:21	87:3 93:9,12
<b>constraints</b>	<b>contemporan...</b>	<b>controls</b> 169:15	96:3 99:20
225:17	28:12,21	318:10 319:2	100:21 102:9
<b>constructed</b>	<b>context</b> 42:9	319:13 320:12	103:9 115:5
142:16 145:22	67:8 68:4	321:5 332:3,7	117:10 122:22
<b>consult</b> 141:10	69:13 70:10	332:15	123:22 126:6
<b>consultant</b>	72:6 73:11,12	<b>conveniently</b>	128:4 144:14
43:21	73:22 74:9	50:2	149:2 159:13
<b>consultation</b>	79:8 80:2,15	<b>conversations</b>	163:14 164:5
136:6	81:5,12 111:3	51:2,13	165:17 166:6
<b>consulted</b>	111:4 122:2,15	<b>convincing</b>	166:11,20
136:6	123:3 124:3	228:21	167:16 168:19
<b>consulting</b> 44:1	158:4 178:19	<b>cooperative</b>	169:16 170:1
136:16 260:16	258:5 300:18	15:3 17:10	170:22 171:6,8
260:20	<b>continue</b>	<b>copd</b> 277:10	171:16 172:8
<b>consults</b> 136:20	275:16	279:1	172:12,14
<b>contaminants</b>	<b>contradicted</b>	<b>copied</b> 230:22	173:5 176:2
40:5 142:5	227:20	<b>copy</b> 22:1,4,4	177:1,2,11,21
165:4 166:14	<b>control</b> 88:13	22:13 23:2	177:22 180:5
167:21 169:2	90:11,22 92:5	57:2	180:13,15
181:9 182:12	191:2,8 243:21	<b>corps</b> 284:6	181:3,5,17
187:18 188:15	244:1,8 245:3		182:8 184:15

184:20,22	322:13,15	<b>countries</b> 276:9	323:13
187:8,12 188:5	323:8 324:7	<b>country</b> 264:15	<b>criterion</b> 71:13
188:17 189:11	326:18 334:7	<b>couple</b> 133:10	110:5,16
189:15,22	334:10,12	183:10 296:6	111:16 121:2
190:3,5,9,14,19	336:9 337:4,22	342:5	140:2,6,22
191:3,21	342:2	<b>course</b> 90:9	<b>critical</b> 43:8
192:10,17	<b>corrected</b> 288:8	129:16 225:2,3	<b>criticism</b>
193:16 196:2,6	<b>correcting</b>	236:18 304:20	125:12
196:16,17	93:16	<b>court</b> 1:1,21	<b>cross</b> 4:2
198:11 200:3	<b>correction</b>	7:10 8:9,16	342:16
200:10 202:5,9	349:8	51:7 55:21	<b>crude</b> 320:5
202:12 203:6	<b>corrections</b>	56:2,3 237:19	322:22
203:11,17	349:7	<b>courtroom</b> 8:10	<b>csr</b> 1:22 350:20
204:3,5,16	<b>correlation</b>	<b>cover</b> 136:8	<b>cumulative</b>
205:15 207:4	264:10	149:19 202:12	151:15
207:12 209:1,2	<b>correspond</b>	224:22	<b>current</b> 8:2
215:13 237:7	153:11	<b>covered</b> 186:12	23:14 40:17
239:3,9,13,18	<b>corresponding</b>	<b>covers</b> 202:8	232:17 249:14
241:20 243:2	105:6,13	<b>create</b> 27:21	<b>curriculum</b> 5:4
244:2,13,20	<b>costantini</b>	29:7,22 87:1	14:12,19 15:1
246:21 247:5,5	257:18 258:20	<b>creating</b> 335:1	<b>curves</b> 211:15
247:20 248:6	260:8	335:12	211:17
252:16,18	<b>council</b> 5:9	<b>criteria</b> 62:10	<b>cv</b> 1:5 25:6 26:6
256:6,15 257:5	17:6 38:4,22	62:17,18,22	55:16
257:12 258:22	39:7 42:3	63:4,8,19	<b>cyc</b> 262:2
259:15 260:9	46:11 47:18	64:10 109:3,5	<b>cycoscopies</b>
265:19 270:2	48:5	109:12,13	261:21
270:22 280:1	<b>council's</b> 43:6	119:22 122:17	<b>cystoscopy</b>
285:6,15	<b>counsel</b> 7:9,14	126:5 138:2,5	262:8,13
288:13 301:11	36:8,10,18	138:17 139:1	<b>cytology</b> 262:8
303:4,5,17	50:4 51:3,13	139:14 140:1,6	262:11,19
312:6 314:17	52:8 216:10	141:12 209:11	
318:19 321:6	350:12	220:17 275:20	
321:17 322:6		279:5 301:9	

<b>d</b>	<b>dated</b> 194:22	<b>decrease</b> 82:11	<b>delaware</b> 11:17
<b>d</b> 4:1 7:1 8:1	<b>dates</b> 243:7	97:1 168:18	<b>deliberative</b>
11:11 204:4	253:15 255:2	191:18 203:8	43:15
205:1,14	<b>david</b> 18:9	204:18	<b>demographic...</b>
213:17	<b>day</b> 137:9	<b>decreased</b>	319:5
<b>d.1</b> 243:1 244:7	312:7 315:14	154:22 155:10	<b>demonstrate</b>
<b>d.1.</b> 242:20	317:3,11	164:11 165:10	53:2,16 89:7
<b>d.2</b> 243:11	349:17 350:16	187:11 257:4,7	110:6,21 111:6
<b>d.3</b> 243:20	<b>days</b> 97:22	282:2 304:12	111:22 142:18
244:8	<b>dc</b> 2:8	304:16	259:11
<b>d.4</b> 244:17	<b>dce</b> 25:14 26:11	<b>defendant</b> 7:15	<b>demonstrated</b>
<b>d12</b> 247:8	<b>de</b> 329:13	27:22 29:9	63:21 65:3,21
<b>d26</b> 244:22	<b>dead</b> 133:18	30:1 32:15,18	66:9
247:1	213:12	33:1,5	<b>demonstrates</b>
<b>daily</b> 305:9	<b>dealing</b> 337:21	<b>defendants</b>	257:7 280:4
315:13	<b>death</b> 180:11	2:11	<b>demoulin</b>
<b>data</b> 28:21	180:12 181:9	<b>defense</b> 115:2	241:12
37:19,22 70:1	182:13,19	<b>defined</b> 152:19	<b>denominator</b>
71:21 72:15,22	187:19 188:16	153:4 226:1,2	192:5
73:4 81:10	189:19 190:12	<b>definitely</b>	<b>denotes</b> 232:14
112:22 138:19	203:9 205:8	308:12	<b>denoting</b>
139:22 155:14	<b>deaths</b> 181:1	<b>definition</b>	231:20 233:3
192:22 193:1	181:21 187:2	100:2,8,11	<b>dentistry</b> 44:3
193:10,13	188:12 190:17	101:3 102:9	<b>department</b> 2:3
202:3 211:13	192:9 193:7	<b>degree</b> 18:14	6:6 232:3,8
217:11,13	198:1 201:15	24:11 27:2,3,4	<b>depend</b> 132:3
270:4 297:8,11	<b>decade</b> 326:2	52:11 60:14,18	289:7
297:15 307:8	<b>december</b>	60:21 202:14	<b>depending</b>
<b>database</b> 235:8	216:4	228:16 234:22	312:15
236:3	<b>decile</b> 263:17	238:5 253:6	<b>depends</b> 42:9
<b>date</b> 7:4 184:14	<b>decision</b> 6:7	346:3,16,22	80:1 81:7,10
283:16 286:5	225:11 226:16	347:13	145:21 147:4
	232:4,9,16	<b>delahunt</b> 250:4	158:4 211:12
	233:9		273:14 274:22

275:3 284:3 289:3 309:12 311:9,16 <b>deponent</b> 7:8 <b>deposed</b> 49:6 <b>deposition</b> 1:9 4:2 7:6 9:1,22 10:9 49:9 55:14 216:15 288:6 347:21 348:1 350:7,9 <b>describe</b> 11:7 13:9 37:3 70:18 78:6 133:14 135:18 137:6 138:16 139:13 147:5 202:2 210:15 220:5,22 221:12 <b>described</b> 88:3 183:13 <b>describes</b> 76:2 <b>description</b> 5:2 320:22 <b>design</b> 89:20 91:5 <b>designs</b> 110:4 110:13 <b>destroys</b> 325:5 <b>detail</b> 150:10 195:19 287:5 297:19	<b>details</b> 20:13 122:15 123:4 124:3 130:20 145:22 230:9 230:10,12 231:5 236:14 247:22 251:2,9 258:18 283:8 285:9 298:22 299:13 309:12 309:15 311:9 <b>detect</b> 70:20 83:17 92:18 95:15 98:3 101:22 102:20 261:21 <b>detected</b> 195:16 199:20 282:18 <b>determinations</b> 224:9 338:10 <b>determine</b> 45:8 47:10,14 149:6 218:9 309:21 <b>determined</b> 74:15 324:20 <b>determining</b> 72:2 79:2,9 235:5 <b>development</b> 300:15,22 <b>devoted</b> 136:15 <b>diagnose</b> 133:1 133:9 135:5	<b>diagnosed</b> 197:15 323:21 <b>diagnosing</b> 135:11 260:15 260:19 325:19 <b>diagnosis</b> 217:10 263:15 306:4 325:22 <b>diagram</b> 86:12 86:18,22 87:1 89:10 <b>dialogue</b> 345:2 <b>dialysis</b> 306:15 <b>diana</b> 3:19 <b>dichotomous</b> 83:5 <b>died</b> 208:22 209:6 <b>diesel</b> 5:14 103:12,17 104:1,8,13,18 105:8 <b>difference</b> 30:2 70:21 134:10 208:18 <b>different</b> 42:6 57:18 80:21 110:3,4,12,13 112:7,8,20,21 127:1,3 129:14 129:17,17 130:5,6 131:18 131:19 132:11 132:12,16,22	133:22 134:8 137:19,20 145:13 174:14 176:10 185:11 209:21 262:5,6 282:11,13 285:12 289:11 289:13 290:16 290:17 297:1 311:8 325:2,3 325:9 334:21 344:22 <b>differentially</b> 289:10 <b>differently</b> 123:5 140:5 321:2 <b>difficult</b> 140:19 160:8 234:21 302:14 <b>difficulty</b> 308:10 327:22 328:5 <b>direct</b> 4:2 7:18 39:11 42:22 127:20 242:19 242:20 277:20 278:6 300:18 330:12 <b>directed</b> 82:11 <b>directing</b> 23:11 40:21 <b>direction</b> 161:1
--	--	---	---

<b>directly</b> 22:7	<b>discussion</b> 35:1	326:4,7,12,15	<b>distinction</b>
<b>disability</b>	81:17 91:21	327:2,11	135:8 262:9
225:11 226:16	178:14 261:15	329:11,18,22	272:13
<b>disagree</b>	308:4 320:21	330:5,18	<b>distinguish</b>
293:16,21	336:20	332:12 334:11	132:22 210:8
294:7	<b>disease</b> 5:7	334:15 336:14	<b>distinguishes</b>
<b>disagreement</b>	25:20 26:18	337:22 338:2	132:15
294:2	34:11 35:7,20	345:10	<b>district</b> 1:1,2
<b>disciplinary</b>	47:13 63:5	<b>diseases</b> 25:18	52:4
12:17,20 13:3	64:9 73:15	26:2,16,18	<b>diverse</b> 43:4
13:5 14:9	116:1,12	46:15 47:19	<b>divided</b> 74:17
<b>disclose</b> 51:13	117:20 118:11	48:5 118:7,10	126:19
<b>disclosed</b> 32:20	119:1 120:21	118:21 129:11	<b>division</b> 141:6
32:22 33:6	121:6,16	148:13,14	<b>dna</b> 134:11,11
<b>discuss</b> 92:3	122:19 123:19	149:19 150:6	134:15,20
108:20 147:1	126:11 140:13	154:10 163:1	<b>docket</b> 52:4
149:5 156:19	149:21 150:21	169:8 173:8	<b>doctor</b> 22:2
195:2,22 196:5	154:4,5,13,14	179:3 180:5	23:2 27:4
202:7,10,15	154:15,16	193:6 206:10	132:21
204:5 205:21	163:5,12	215:22 217:5	<b>document</b> 6:6
212:13 297:18	180:11 191:13	217:19 220:7	10:8 38:12
336:7 339:5	192:2 206:12	225:18 237:12	69:11 226:4,8
<b>discussed</b> 19:22	207:2,9 208:4	238:9,13 277:9	226:15,20
85:15 92:10	208:16,17	278:22 305:18	<b>documents</b>
95:20 109:4	209:1,5,6	<b>disorders</b>	6:22 10:12
202:13 209:11	217:6 229:8,15	332:12	44:13
250:15	233:14 244:11	<b>dispassionate</b>	<b>doing</b> 62:5
<b>discussing</b>	292:12 305:8	40:13	121:2 136:19
62:20 81:20	305:14 306:15	<b>disqualified</b>	214:20 299:7
118:8 146:17	321:8,12,12	10:21	315:4 316:2,11
147:1 149:9	323:18,21	<b>dissipate</b> 185:2	<b>dosameche</b>
152:14 158:2	324:4,21 325:1	185:5	250:4
196:12 273:21	325:7,12,15,17	<b>distinct</b> 71:8	<b>dose</b> 59:17
	325:19,22	129:11	120:18,20

121:5,7,15,17 122:18,20 123:7,18,20 124:22 125:15 125:16,22 126:1 159:21 159:22 160:5,9 173:1,19 175:14 176:3,4 176:17,22 177:11,20 178:5,8,22 209:12,16 210:2,17,19 211:15,17 212:14,20,22 <b>double</b> 201:4,7 <b>doubling</b> 107:7 207:3 <b>doubt</b> 233:8,13 233:16,20 234:4 <b>dowling</b> 3:5,6 33:12 <b>dr</b> 5:10,13 7:20 8:7 9:11 10:7 10:21 19:19 20:1,3,10,11 21:11 22:5 23:8 27:1 35:15 41:6,9 49:6,9,14 52:15 56:18 67:16 75:15,19	76:1,5 84:16 85:12 103:3,7 104:11 143:10 162:5 179:19 183:13 194:13 216:15 217:3 217:13 224:5 224:15 225:15 231:17 233:17 241:22 242:4,6 249:2,19 250:5 252:19 266:3 275:15 276:6 282:17 305:5 317:1 318:16 329:12,12,13 329:16,21 330:16 343:20 346:22 <b>draft</b> 43:3,14 <b>draw</b> 27:16 28:6 <b>drinking</b> 6:1,3 41:3 194:5,10 194:17,21 200:2,9 318:18 339:17 340:4 <b>dropping</b> 151:22 <b>drug</b> 12:6 85:19 215:8 221:13 <b>drugs</b> 89:2 214:15 215:11	215:12,14,15 <b>dry</b> 256:20,22 285:6,7,8,12 <b>due</b> 144:19 188:12 191:13 192:3 198:1 225:17 308:10 339:15 340:2 <b>duly</b> 7:15 350:8 <b>duration</b> 59:17 108:3 173:2 174:7 176:2 210:5 284:5,10 284:11,14 <b>durations</b> 174:14 175:16 <b>dye</b> 264:4 <b>dying</b> 204:21	270:4 278:13 279:10 294:5 <b>earned</b> 30:17 <b>easier</b> 143:5 <b>eastern</b> 1:2 52:4 <b>ecological</b> 298:15,15,18 298:21 299:9 299:18 300:2,7 300:8 <b>editorialization</b> 64:18 <b>education</b> 79:17 139:21 140:20 141:4 141:13 213:3 <b>effect</b> 64:1 65:5 66:1,11 77:11 78:2 83:8 110:21 111:7 111:22 140:18 146:8 165:12 183:8,11,14,18 183:22 184:2 184:11 185:2,5 191:1,3,8,11,14 191:16,20,21 193:19,21 197:17 217:14 218:18 234:15 249:5 259:5 296:12,13,15 297:3
		<b>e</b>	
		<b>e</b> 2:5 4:1 5:1 7:1 7:1 11:11 162:1,1 213:15 213:17,17 239:21,21 240:2,2 307:5 307:5 308:1,1 349:1,1 <b>e.g.</b> 125:1,16 212:21 218:19 227:13 228:21 <b>earlier</b> 29:4 49:6 197:13 198:18 214:16	



<b>effectively</b> 86:20	108:15	<b>environmental</b> 308:11	<b>equal</b> 92:17,22 95:2 96:22
<b>effects</b> 38:8 39:10 40:3 70:8 142:5,10 142:16 237:15 296:11 336:8 337:11,14	<b>empirical</b> 338:10,16 339:1,8	<b>epa</b> 69:1,14 268:6 273:21 274:5,16	108:4 219:1,12 219:16 229:1
<b>eighth</b> 326:2	<b>employed</b> 350:12	<b>epidemiologic</b> 62:21 138:20 211:18 299:11	<b>equate</b> 221:20
<b>either</b> 27:22 29:8 30:1 87:15 92:20 196:14 246:18 262:15 267:3 271:10 290:1	<b>employees</b> 6:3 194:9,20 247:15	<b>epidemiologi...</b> 19:2 24:21 25:2 55:6 81:22 88:15,22 89:6,14,18 90:10 138:13 141:18 227:10 229:4,13 238:8 238:11 273:10 274:20 294:22 299:12 300:3 309:10,19 339:14 340:1	<b>equipoise</b> 82:4 82:5 220:4,10 220:21 221:7 221:10,15,20 221:22 222:3,9 223:8,17,20 226:1,3,21 227:3,18,22 228:8 231:18 231:19 232:13 233:7,11,22 234:6 329:18
<b>elaborate</b> 31:4 61:12 139:18	<b>encounter</b> 324:2,11 325:11	<b>ends</b> 107:9	<b>equivalent</b> 321:16 322:1,5
<b>element</b> 40:9 322:12	<b>engine</b> 5:14 104:8,13	<b>engineer</b> 15:9	<b>er</b> 136:4,12,15 136:20 137:1,2 137:8,13 262:22 264:20
<b>elements</b> 40:1	<b>england</b> 136:8	<b>enrolled</b> 27:8	<b>ers</b> 136:7
<b>elevated</b> 128:3 297:21	<b>ensure</b> 43:11	<b>ensure</b> 43:11	<b>esq</b> 2:4,5,14,15 3:5,10
<b>emanated</b> 343:8	<b>entered</b> 78:20	<b>entire</b> 273:17	<b>essentially</b> 64:8 65:11 258:15 269:19
<b>emergency</b> 5:5 20:18 21:2,8 21:13 22:20 135:20,22 324:3,8	<b>entirely</b> 113:16 315:15 317:3	<b>epidemiologist</b> 18:8	<b>established</b> 272:2 309:2
<b>emission</b> 104:19	<b>entities</b> 40:16	<b>epidemiologi...</b> 112:10 113:21	<b>estimate</b> 69:22 70:13 71:19,21 72:9,14,15
<b>emissions</b> 104:4,19 105:9 105:15 107:17	<b>entitled</b> 38:6 49:18,22 84:18 99:3 117:12 199:12,17 240:12 243:1	<b>epidemiology</b> 18:16,19 19:9 19:16 24:12,15 24:18 67:17 79:20,22 111:5 197:8,14 219:6 221:17 225:6 272:17	
	<b>entity</b> 40:18		
	<b>enumerator</b> 192:4		

73:2,4 80:13	261:8 286:11	227:20,21,21	150:12 163:10
81:8 83:8,16	<b>evaluation</b> 5:21	228:4,8,11,16	212:18 225:7
93:5 94:8 97:2	71:12 89:22	228:18,21	227:9 228:15
214:22 215:1	90:15 119:16	230:8 240:3	235:15,16
218:18 228:22	194:3,15	241:4 245:16	241:3 249:12
258:13 263:3	266:12 268:19	248:8 265:17	264:22 275:21
277:19 289:3	269:14,18	266:14 268:21	278:18 279:14
326:1	270:4,16	290:10 291:11	281:7 291:17
<b>estimated</b>	286:13 287:12	294:10,22	312:18 313:5,6
278:1 285:17	310:2	310:9 317:20	313:22 319:21
299:2,17 317:1	<b>evaluations</b>	326:21 327:7	322:12 324:19
<b>estimates</b>	117:16	329:16 338:11	329:12
256:13 299:8	<b>evening</b> 137:9	338:16 339:1,8	<b>examples</b> 112:4
323:10	<b>evidence</b> 6:5	343:15 346:7	339:7
<b>estimation</b> 83:8	19:2 40:2	<b>evolve</b> 241:5	<b>exceeding</b>
<b>et</b> 5:12,21 6:16	43:12 45:5,6,7	<b>exact</b> 45:15	326:16
97:18 98:22	45:8,10 46:3	301:2 338:3	<b>except</b> 108:6
99:8 183:13	46:16,17,20	<b>exactly</b> 29:17	210:4 234:22
184:7,12 274:7	47:2,6,10,14	30:3 87:16	<b>exception</b>
276:9 293:3	55:4 61:9,18	102:5 231:3	323:4 349:6
308:1 318:14	62:1,21 69:3	247:6 259:17	<b>excerpt</b> 6:5
318:19	69:16 138:20	278:4 313:12	39:16 143:14
<b>evaluate</b> 40:5	139:17,19	<b>examination</b>	148:8 153:20
54:13 55:4,6	147:7 182:17	7:14,18 342:16	158:9 226:7,14
70:13 139:6	183:3 195:14	<b>examine</b>	<b>excerpts</b> 5:16
147:13	199:12,18	142:16	5:17 6:4,10
<b>evaluated</b>	213:22 214:5	<b>examined</b> 7:16	142:21 143:11
139:10	217:4 218:2,12	28:13 97:15,18	143:15 162:10
<b>evaluates</b>	220:4,4,6,11,13	142:5,9	162:14 213:21
122:11	220:22 222:9	<b>examining</b>	214:4 265:22
<b>evaluating</b>	222:10 223:7	85:18	266:4
62:20 90:20	223:11 224:7	<b>example</b> 49:20	<b>exclude</b> 27:20
139:14,22	225:9 227:5,11	56:16 108:1	29:7,22 30:4
146:20,22	227:16,17,19	125:22 127:21	90:10,21

<b>excluded</b> 11:3 11:18,18,22 12:2,14 30:8 88:3 89:14 <b>exclusion</b> 89:15 <b>exclusions</b> 11:6 <b>exclusive</b> 236:4 236:9 <b>excuse</b> 28:2 92:22 259:20 307:19 347:9 <b>exhaust</b> 103:12 103:17 104:1 104:18 <b>exhausts</b> 5:14 104:8,13 <b>exhibit</b> 5:3,4,4 5:6,6,7,7,8,9,10 5:11,12,13,14 5:16,17,18,19 5:20,21 6:2,4,5 6:6,8,9,10,11 6:12,13,14,15 6:16,17,18 10:3,4,5,7 14:12,18,18 21:7,12 22:12 25:7 27:17 35:2,4,6,9,17 35:18,19,20 37:5 38:21 39:2,5 49:21 51:20 52:13,15 54:3 55:16	56:18,21 57:7 57:8,14,17,17 59:8 63:15 64:19 65:16 77:1,3 81:15 85:9,13 98:22 99:3,11 103:3 103:8 104:7,12 109:22 120:5 124:18 126:8 127:11 142:21 143:11 149:15 152:9 153:19 153:19 155:17 158:6 162:9,10 162:14 175:3,5 175:9 179:16 179:20 184:6 184:10 186:11 194:3,8,14,19 195:10 199:10 200:21 202:18 204:7,11 207:16,17,21 212:1,5 213:21 214:3 224:19 226:7,14 228:4 230:5,19 232:2 232:7 235:17 238:22 242:14 245:19 248:9 250:11 253:2 255:16 265:9 265:22 266:4	268:8,12 276:4 276:6 281:6 283:10 290:6 294:11 295:15 295:18 298:5 298:11 302:3 306:21 307:14 307:16,20 310:6 318:14 318:17 323:16 326:12 330:14 330:17 336:15 336:19 337:3 343:3,10 347:10 <b>exhibits</b> 194:14 208:1 209:9 281:14 <b>exist</b> 294:21 320:21 <b>existence</b> 227:6 227:7 <b>existing</b> 138:12 <b>exists</b> 45:9 47:11,15 120:19 220:16 228:14 320:20 <b>expect</b> 185:1,4 <b>experience</b> 23:14 24:4,9 139:21 140:20 141:3,5,13 213:3 214:10 260:15,19	261:6 346:4 347:6 <b>expert</b> 5:5,10 5:13 14:20 20:3,6 21:2,8 21:13,18 22:20 23:13 24:3 27:18 28:7,8 29:1,4 30:17 31:1 32:14,17 33:1 40:13 55:9,18 56:1 56:16,18,21,22 58:15 68:6 75:2,7,9 82:6 84:1 103:3 114:9 115:2 116:19 117:2 221:3 222:17 242:7 <b>expertise</b> 24:9 43:5 <b>experts</b> 114:5,8 114:10,17 115:18 116:7 116:16,20 329:11 <b>expired</b> 12:6 <b>expires</b> 349:20 350:22 <b>explain</b> 182:21 198:3 <b>explained</b> 227:12
--	---	--	--

<b>explains</b> 198:9 198:13,13,22 <b>explanation</b> 126:12 140:14 198:17 274:6 <b>explore</b> 287:5 <b>exposed</b> 5:22 6:3 64:2 65:6 66:2,12 77:8 77:11 78:3 129:4 142:6,11 156:1 186:2,7 194:5,9,16,20 200:2,9 247:17 256:15 318:9 319:13 320:6,7 320:11 321:5,6 <b>exposure</b> 5:14 40:4 59:17,22 60:10 89:21 103:17 104:7 104:13 105:8 105:15,19 108:3 110:7 120:20 121:7 126:11,12 128:11 132:3,4 138:10 140:13 140:14 151:15 151:18,18,18 151:21 152:5 152:19 153:3 153:15 159:6,8 159:16,17,17	165:3 166:14 167:21 169:2 181:8 182:12 187:18 188:15 197:11,16,18 210:9,10,13 211:1,6 212:1 229:3,7,15 241:14 246:10 246:14,16,19 246:20 247:4,5 256:14,20 257:22 266:17 276:7 283:14 283:20 284:10 284:11,14 285:6,18,18 286:2,6,7,9 287:5,6 290:12 291:20 292:5 293:7 294:19 295:18 296:8 299:2,7 300:11 300:15,21 307:8 308:11 308:12,19 310:10,21 311:3,4,12,13 311:21 312:2 312:12,13,16 312:20 313:8 314:1,11 315:13,15,16 316:3 317:2,4	317:9,21 319:16,17,19 319:20 320:10 320:12 322:10 322:11 324:16 324:21 330:18 333:5,10 343:17 346:9 347:8,11 <b>exposures</b> 128:4 130:9,12 140:17 146:8 160:9 284:17 284:18 299:18 301:3 315:2 321:13 334:21 335:10 340:14 <b>express</b> 52:22 53:14 59:21 60:9 <b>extend</b> 243:7 244:4 253:15 255:2 <b>extensive</b> 308:10 <b>extent</b> 17:3 50:22 283:1 309:14 <b>external</b> 144:11 <b>eyes</b> 93:14 <b>f</b> <b>f</b> 11:11 162:1 349:1	<b>f.1</b> 253:9 <b>f.2</b> 256:12 <b>f.6</b> 254:11 <b>f.7</b> 255:5 <b>f11</b> 254:12 <b>f13</b> 257:16 <b>f3</b> 253:20,22 <b>f4</b> 255:10 256:10,12 <b>face</b> 41:15 <b>fact</b> 141:21 159:14 198:7 209:19 246:12 259:1 <b>factor</b> 131:1,7 263:22 264:14 272:2,5,7,9 273:2 290:1 306:5 <b>factors</b> 130:6 131:14 183:14 263:20 264:2 276:20 289:1,5 289:10,12,17 306:8 309:2,9 309:14,22 326:7 <b>facts</b> 27:19 29:5 37:22 <b>fail</b> 249:13 <b>failed</b> 159:21 197:14 249:4 259:4
---	---	--	---

<b>fair</b> 27:19 29:6 29:18 37:14 41:16 44:16,17 49:13 53:21 54:12 56:7 149:22 160:10 <b>fairly</b> 133:8 262:20 <b>false</b> 28:9 <b>familiar</b> 11:20 15:12 17:5 18:8,11,13 19:1,15 21:1 33:21 41:12,14 44:5,8,10 45:13 48:3 67:21 74:11,13 126:22 127:4 134:17 135:1 145:8 184:1 209:15,19 234:10 256:3 295:13 298:7 331:10,13,16 331:17 <b>familiarize</b> 158:21 172:19 204:8 206:18 207:14 <b>far</b> 10:19 80:11 94:1 137:7 185:20 <b>favoring</b> 27:21 29:8 30:1	<b>federal</b> 55:21 56:2,3 58:9,15 <b>fee</b> 31:11,12 <b>feel</b> 51:4 274:18 <b>feels</b> 278:21 <b>fees</b> 31:9 <b>feindt</b> 5:10 11:11 56:19 57:1,13,22 58:7,16 59:9 68:13 <b>fell</b> 261:14 <b>fellows</b> 141:8,9 <b>fellowship</b> 79:18 <b>felt</b> 274:16 <b>females</b> 185:10 <b>fewer</b> 163:22 167:6 168:12 180:22 187:2 188:8,12 190:17 201:15 <b>field</b> 18:19,22 19:8 24:18 <b>figure</b> 86:11 100:13 106:2 152:4 169:11 185:8 201:20 319:9 <b>figures</b> 155:13 193:5 <b>file</b> 297:6 <b>filing</b> 57:13,15	<b>finally</b> 172:1 334:8 <b>financially</b> 350:13 <b>find</b> 39:19 85:21 98:8,16 143:6 234:14 238:2 246:9 249:5,13 256:5 283:2 296:20 301:21 313:13 313:14 <b>finding</b> 94:3,6 94:22 95:2,20 96:7,20 102:14 113:12 121:7 121:17 122:20 123:21 156:14 159:12 218:10 326:21 327:8 <b>findings</b> 40:14 55:7 112:19 113:11 155:19 243:14 244:19 252:11 254:9 255:7 274:6 303:16 304:1 <b>fine</b> 9:19 53:12 53:13 57:16 62:5 160:20 231:10 344:12 <b>finish</b> 215:3,17 215:20	<b>finished</b> 117:2 216:4 <b>finland</b> 330:19 332:14,16 <b>firm</b> 33:12 34:1 <b>firms</b> 33:9,14 33:16 <b>first</b> 7:15 10:3 12:1 23:11,12 24:1 53:6 54:4 57:7,21 58:4 58:21 59:9 65:2 66:8 92:4 92:6 94:3 116:5 146:3 148:10 154:12 162:17 163:11 173:10 195:18 196:20,21 197:6 206:17 277:16 296:5 308:6 317:16 319:12 324:12 332:1 335:7 <b>fitness</b> 183:16 <b>five</b> 62:4 95:2 149:19 169:15 197:20 209:4 215:21,22 224:21 263:16 328:4,7,11 337:1 342:21 <b>flip</b> 143:3,5
--	--	--	--

<b>floors</b> 136:7 <b>flow</b> 86:12,18 86:22 87:1 <b>focus</b> 83:7 337:11 <b>focused</b> 20:14 <b>fold</b> 320:4 <b>follicular</b> 128:12,16 <b>follow</b> 13:15,19 73:14 88:17 183:20 198:1 231:6 <b>followed</b> 88:18 252:1 <b>following</b> 43:16 86:8 349:6 <b>follows</b> 7:16 93:8 <b>foregoing</b> 349:3 <b>form</b> 43:3 72:19 74:22 80:8 81:6 88:5 89:16 113:13 116:2,13 121:19 148:4 179:4 235:4 307:10 <b>formed</b> 115:8 <b>former</b> 40:7,17 <b>formerly</b> 80:9 127:5	<b>forming</b> 37:15 38:1 <b>forms</b> 148:12 148:16 149:9 <b>forth</b> 326:17 347:8 350:8 <b>fortunately</b> 133:8 135:13 137:10 <b>found</b> 66:6,21 97:16 118:20 147:21 229:8 229:16 241:1 308:8 335:7 <b>foundation</b> 28:10 69:8,17 116:3,14 134:12 148:5 179:5 <b>four</b> 12:3 34:3 55:10,15 141:7 159:16 174:19 176:13 209:5 329:8 <b>fourth</b> 96:20 <b>framework</b> 53:4,18 54:1,5 54:7 61:9 <b>franklin</b> 2:7 <b>free</b> 51:4 <b>freeman</b> 329:12 329:16 <b>front</b> 12:2 22:2 23:2 127:11	158:6 306:21 <b>fulfilling</b> 63:8 <b>full</b> 66:8 68:3 92:6 116:16 148:10 196:21 206:17 248:2 277:16 308:7 319:12 335:7 <b>fully</b> 13:14 101:12 197:9 277:10 283:6 <b>fund</b> 16:21 <b>further</b> 96:19 123:17 198:3 248:1 308:17 317:13 337:13 347:17 349:4 350:11 <b>furthermore</b> 82:15 <b>future</b> 40:11 286:17 287:3	<b>gathered</b> 36:9 36:19 37:11 300:14,20 <b>gender</b> 306:10 326:9 <b>general</b> 34:3 134:3,4 163:12 164:2 165:5,8 165:11,22 166:16 167:8 168:1,14 169:4 173:13,17 181:2,10 182:1 182:14 187:3 187:20 188:10 188:17 193:7,8 236:17 273:15 274:21 275:3 291:19 292:2 292:10 305:21 309:11 316:3 326:21 327:8 343:5 344:20 345:14 346:15 <b>generally</b> 24:6 29:1 37:20 38:3 67:13 70:6 78:18 113:9,20 127:6 132:1,7,10 134:13 135:18 145:14 168:3 219:5 301:22 309:18 321:14
		<b>g</b>	
		<b>g</b> 7:1 <b>ganglia</b> 325:6 <b>garabrant</b> 249:15 <b>gas</b> 107:17 <b>gasoline</b> 5:14 104:4,8,13,18 105:15 108:15 <b>gather</b> 37:2	

347:12,15 <b>genetic</b> 131:1,4 131:7,14 306:10 <b>genuine</b> 82:5 <b>geographic</b> 264:9,11,13 <b>geological</b> 43:20 <b>georgetown</b> 44:1 <b>getting</b> 136:20 192:2 312:3,7 327:14 <b>give</b> 9:14 24:8 28:22 29:18 48:20 66:22 67:7 69:12 70:10 90:2 157:13 214:12 214:14,22 215:1 233:19 248:2 251:15 258:7 264:22 301:2 312:18 313:5 319:21 328:10,13 339:7 340:15 <b>given</b> 9:2 64:3 73:5 78:7 145:4 274:6 350:9 <b>gives</b> 83:16 233:7,12	340:14 <b>giving</b> 21:18 <b>gjonaj</b> 3:19 <b>glad</b> 58:1 <b>go</b> 28:3 34:18 36:12 48:16 58:12,18 59:4 60:7 61:7,14 62:7 66:6 67:12 68:2,21 71:5,18 73:10 74:8 75:12,22 77:21 81:12 83:14 84:4 88:6 90:8,14 91:3,17 94:20 96:5 97:9,10 98:21 101:1,8 102:11,17 106:20 107:5 107:12 109:2 111:13,18 112:2,12,16 113:14 114:22 116:4 119:3,10 119:15,18 122:9 123:15 124:7,13 126:3 130:18,19 131:3 132:19 133:3 134:7,22 135:10 138:1 139:4,16 142:14 150:9	151:7,21 153:18 155:16 155:20 157:17 158:5 160:2,7 164:15 166:8 167:18 168:21 173:8 174:10 175:2 178:11 179:14 183:6 186:13 195:7 195:18 199:5 201:17 211:10 219:9 222:7 230:3 237:22 244:15 250:11 251:8 254:2 261:16 267:14 285:14 293:14 304:7,18 312:17 313:14 317:12 318:21 319:18 322:2 328:15 334:13 336:4 338:13 339:4 340:22 343:10 <b>goes</b> 144:10 175:21 176:13 176:21 177:3,7 177:17 178:2 208:8 <b>going</b> 22:4 46:5 50:21 51:7 61:19 120:4	154:17,20 161:1 173:10 191:14 192:5 194:1 198:17 209:8 230:3 237:18 263:1 291:15 306:18 317:15 323:16 323:17 336:13 342:18 <b>golkow</b> 7:4 <b>good</b> 7:20,22 9:7,20 84:6 155:7 160:18 160:19 218:20 219:13,17 261:18 339:20 <b>goodman</b> 224:15 242:6 <b>goodman's</b> 241:22 242:4 249:2,19 250:5 252:19 282:17 <b>google</b> 235:9,10 331:1 <b>government</b> 114:14 <b>governmental</b> 225:7 <b>grade</b> 230:9,10 <b>gradient</b> 120:2 120:9,18 121:10 124:21 209:12 212:12
---	--	--	--

212:13 <b>graham</b> 3:9 33:13 <b>great</b> 347:4 <b>greater</b> 63:6 64:2 65:7 66:2 66:12 77:8,13 78:3 92:17,21 95:1 96:22 108:4 120:19 182:22 222:1 257:11 264:16 323:11 333:17 335:2,13 <b>greatest</b> 263:21 <b>greatly</b> 129:14 <b>green</b> 22:13 <b>group</b> 33:11 42:17 90:11 98:5 100:20 102:3 153:14 159:9,15 197:10 213:11 246:19,20 247:4,5,20 257:5,22 258:12 269:7 332:4 333:4,8 333:10,18,21 334:2 <b>group's</b> 213:12 319:16 <b>groups</b> 90:22 169:16 185:11	191:12 246:11 <b>guess</b> 11:11 64:19 224:3 233:15 275:2 285:11 <b>guide</b> 111:5 <b>guideline</b> 23:19 27:17 28:17 29:13 <b>guidelines</b> 5:5 21:3,9,14,18 22:18,21 23:13 24:2 61:17,22 <b>guy</b> 213:12 <b>guys</b> 342:6 <b>h</b> <b>h</b> 5:1 43:21 <b>hadkhale</b> 6:12 113:7 275:22 276:4,9,12 278:15 279:5 280:6 282:8 283:4,9 284:10 284:19 287:19 <b>hair</b> 61:3 <b>half</b> 273:6 <b>halfway</b> 54:17 320:3 <b>hand</b> 158:16 283:13 298:4 299:3 308:7 319:11 320:2 350:16	<b>handed</b> 10:7 85:12 103:7 104:11 194:13 266:3 318:16 330:16 336:18 <b>hansen</b> 249:16 <b>happen</b> 154:20 286:10 <b>happened</b> 133:16 <b>happens</b> 305:9 324:17 <b>happy</b> 69:10 147:18 193:3 193:11 225:21 <b>hard</b> 305:7 308:12 <b>hartman</b> 5:13 102:22 103:4,9 105:19,21 106:9 <b>hawaii</b> 33:19 <b>hazard</b> 100:14 101:17 200:18 201:2,9 202:17 203:4 204:1 250:17 279:12 280:9,19 301:21 302:18 303:10,21 <b>hazardous</b> 347:11,14 <b>head</b> 8:19 326:10 336:1	341:1 <b>headed</b> 342:22 343:1 <b>health</b> 38:7 39:9 40:3 44:22 64:1 65:5 66:1,11 77:11 78:2 137:14,14 138:11 144:18 146:9,11 183:17 185:10 216:20 337:11 337:15 341:5,9 341:13,15,22 347:12,15 <b>healthy</b> 165:11 183:7,11,14,22 184:1,11 185:1 185:4 190:22 191:3,8,11,13 191:16,20,21 192:4 193:18 193:20 <b>hear</b> 185:3 <b>heard</b> 21:4 231:19,22 233:3,5 <b>hearing</b> 345:10 <b>held</b> 7:6 24:17 <b>help</b> 39:19 40:10 214:14 315:19
---	---	--	---



<b>helped</b> 198:3	<b>highest</b> 263:17	299:5 308:5	<b>honest</b> 328:3
<b>helpful</b> 226:10	<b>highlighted</b>	325:3	328:10,13
226:13	22:6 23:12	<b>hodgkin</b> 47:9	<b>hope</b> 283:10
<b>hematologic</b>	28:1 43:2 50:2	129:8 266:18	<b>hormesis</b> 125:1
130:21	52:21 108:2	269:3,8	125:16 212:21
<b>hematopoetic</b>	150:4,7 319:11	<b>hodgkin's</b> 5:8	213:10
135:16 250:16	<b>hill</b> 11:10 31:16	34:14 35:10,22	<b>hospital</b> 12:20
347:9	31:20,21 33:19	116:1,12	<b>hospitals</b>
<b>hematopoietic</b>	43:20 62:10,14	117:19 118:12	137:15,16,18
230:18 343:4	62:17,18,19,22	119:1 127:10	137:20
<b>hereinbefore</b>	63:4 64:10	149:21 151:2	<b>hourly</b> 30:21
350:7	71:14 109:3,5	166:21 167:7	30:22
<b>hereunto</b>	110:2 112:3	167:22 171:9	<b>hours</b> 136:19
350:15	119:22 121:10	186:17 187:2	216:5,7 340:6
<b>heterogeneity</b>	122:13,17	187:19 201:2,8	342:5,19
296:10	126:5 138:1,22	201:10,13,21	<b>human</b> 227:20
<b>high</b> 97:19 98:5	139:10 140:22	202:5 203:5	228:16 265:16
99:17 102:2	141:12 209:11	288:19 289:17	268:1 337:15
105:19 108:3	275:21 301:8	290:1,5 302:22	347:12,15
130:8,11	<b>hill's</b> 126:10	303:13 305:14	<b>humans</b> 265:17
151:18,21	140:12	343:4	268:20,22
152:5 153:15	<b>hipaa</b> 148:12	<b>hold</b> 24:11 27:1	269:15
159:17 160:9	148:15 149:8	27:5 39:13	<b>hung</b> 233:15
227:10 229:5	<b>historically</b>	52:18 147:15	<b>hydrocarbon</b>
229:13 258:12	30:19	172:17 183:3	284:21
286:18 287:4	<b>hmm</b> 78:22	200:15 201:5	<b>hyperprolacti...</b>
309:3,22	92:2 95:14	202:19 204:8	84:19
315:14	100:10 101:11	228:5 277:5,13	<b>hypertension</b>
<b>higher</b> 126:1	102:14 121:12	281:8,15	306:14
147:21 148:15	130:22 135:14	298:17 327:3	<b>hypothetical</b>
154:9 170:5	136:2 137:12	<b>holding</b> 57:3	312:18 313:6
197:7 207:1	178:20 259:14	<b>holidays</b>	
288:21 307:10	280:20 288:2	137:10	
318:10	290:7 291:1		

<b>i</b>	143:1 162:12	50:16,19 64:16	251:5 255:7
<b>i.e.</b> 83:6 120:20	175:7 179:18	66:15 69:19	327:4
120:21 228:22	184:8 194:7,12	70:2 71:20	<b>included</b> 30:7
290:11 343:16	214:1 226:9	72:2 80:14	36:22 86:14
<b>iacuc</b> 13:16	232:5 242:15	82:2 112:6,14	145:15 186:6
<b>iarc</b> 6:10,11	253:3 266:2	146:22 274:17	248:15,19
117:15 118:2,6	268:10 276:5	274:18 277:18	249:18 250:5
118:15,15	295:16 298:6	289:5,6 309:8	<b>includes</b> 28:20
119:5,16	307:15 318:15	<b>importantly</b>	36:7 71:14
132:15 265:15	330:15 336:16	29:19 165:7	88:11 136:5
266:1,5,12	<b>identified</b>	258:4 274:22	138:19 254:8
267:10 268:1,8	35:17 92:14	<b>imprecise</b>	254:14
268:13 269:14	131:7,15 138:5	73:18	<b>including</b> 41:9
270:7,8,17	236:20 237:13	<b>improving</b>	72:1 113:7
271:1,2,15	238:10 297:20	226:15	131:5 236:3,8
294:19,20	332:11	<b>inadequate</b>	249:4,15 250:3
<b>iarc's</b> 118:18	<b>identifies</b>	45:8 47:10,14	250:16 259:22
271:8	266:12	<b>incidence</b> 5:17	260:7 291:4
<b>icd</b> 296:9	<b>identify</b> 14:18	5:19 154:15,16	309:3 314:20
<b>icus</b> 136:7	40:9 197:14	162:11,15,19	327:18 346:8
<b>idea</b> 186:5	222:21 266:22	163:4,9,11,17	346:20 347:3
207:6	267:3 269:22	165:10,16	<b>income</b> 30:16
<b>identical</b> 64:7	<b>ignores</b> 82:21	167:2 168:8	<b>incompatible</b>
86:20 145:16	<b>illegal</b> 27:3	175:6,10	90:11,12,22,22
145:16 230:11	<b>imagine</b> 113:15	191:13 192:3	<b>inconsistent</b>
325:1	238:14	192:21 193:6	232:17 282:7
<b>identification</b>	<b>immediate</b>	196:1 279:14	282:12 283:3
10:6 14:13	130:3	279:16 301:20	303:22 304:5
21:10 35:3,5,8	<b>immunosupp...</b>	302:6 308:20	<b>increase</b> 94:7
35:11 39:1	289:21	337:12	95:3 96:1 98:4
52:14 56:20	<b>impacted</b> 146:5	<b>include</b> 15:7	100:19 102:1,7
85:10 99:1	<b>important</b> 8:17	30:6 60:4 75:2	102:20 106:17
103:5 104:10	23:21 24:3,7	183:15 201:20	106:22 107:7
	28:19 29:16,21	235:13 250:21	121:6,16

122:19 123:20 153:1 174:7,8 176:1 190:9 191:18 210:19 210:19 289:10 320:4 <b>increased</b> 84:20 92:19 94:5 95:15 102:15 103:16 104:1 121:6,16 122:19 123:19 128:9 129:3 153:5,7 156:9 156:19 157:14 157:19 158:2 159:3,4 176:2 185:22 210:16 229:7,15 246:9 246:18 247:3 247:19 256:5 256:14 257:14 258:2,9 279:8 279:12,22 280:4,14 281:2 282:18 283:2 306:6 310:15 318:1 320:6 339:15 340:2 <b>increasing</b> 92:15 94:4 95:1 97:19,21 98:5 99:4,17 99:19 102:2	210:17 <b>independent</b> 15:17 43:7 <b>independently</b> 36:9,19 <b>index</b> 283:15 286:5 <b>indicate</b> 181:19 206:22 219:17 244:9 279:12 295:2 296:13 307:8 <b>indicated</b> 236:20 297:2 <b>indicates</b> 66:18 67:2 <b>indicating</b> 78:12 87:17 88:9,13 143:4 148:22 194:2 219:13 236:9 237:5 <b>indication</b> 8:20 148:2 149:3 332:3 <b>individual</b> 115:19 117:16 300:14,20 326:22 327:9 329:10 335:2 335:13 <b>individually</b> 90:2 195:7	<b>individuals</b> 186:6 197:15 263:16,18 272:11 277:21 311:17 312:15 332:11 333:4 <b>induced</b> 84:18 <b>industry</b> 98:2 101:22 264:4 285:7 <b>infection</b> 264:5 264:18 <b>infections</b> 264:7 <b>inference</b> 178:9 <b>inferiority</b> 221:15 <b>influenced</b> 40:15 <b>information</b> 27:21 29:7,22 30:4,5,6 51:1 82:3 121:13,21 123:2 243:17 276:18 277:20 277:22 278:6 300:15,21 <b>informative</b> 230:4 <b>informed</b> 37:19 <b>initial</b> 183:15 <b>initially</b> 32:2 <b>injuries</b> 59:19 60:1,11	<b>insofar</b> 37:17 <b>instance</b> 76:22 97:17 136:18 299:1 319:22 325:4 <b>institute</b> 45:21 224:11 226:2 <b>institution</b> 43:9 332:14 <b>institutional</b> 13:17 43:11 <b>instruct</b> 50:22 <b>insufficient</b> 45:8 47:10,14 <b>insurance</b> 332:14 <b>integral</b> 43:22 <b>integrity</b> 43:15 <b>intended</b> 109:11 202:11 <b>intensity</b> 132:4 310:11 311:5 317:22 <b>intent</b> 53:3,17 78:11 101:16 102:4 <b>interact</b> 334:22 335:11 <b>interactions</b> 338:4 <b>interest</b> 229:8 229:16 <b>interested</b> 350:13
---	---	--	--

<b>interestingly</b> 174:12	107:3,10 152:22 153:6	<b>invoice</b> 216:8	<b>items</b> 86:1
<b>interlocking</b> 54:7	156:13,15,16 156:20,22	<b>invoices</b> 216:9	<b>ix</b> 202:8,8,10 202:11,14,14 203:14,15,18 203:19 204:2,4 205:1,14
<b>internal</b> 144:10	157:3,8,22	<b>involve</b> 25:12 25:17 26:10,15	
<b>internally</b> 144:6	164:4,8,10,16 166:10 167:10	<b>involved</b> 16:4,6 31:8 33:9 44:6 103:1,11 284:18	<b>j</b>
<b>interpretation</b> 54:14 70:15 83:5 179:12 186:3,4 187:22 188:19 192:19 201:18 217:7,8 320:13 321:3 330:2	167:14 168:17 170:2,22 171:15 172:7 181:4 182:3 187:7,11 189:11 190:4 192:13 207:11 208:7,11 219:1 219:6,12,16 250:18 252:16	<b>iom</b> 6:5 224:8 225:10,12 226:7,15 229:22 230:7 234:1	<b>j.d.</b> 27:4,5 <b>japan</b> 13:12 <b>jenna</b> 3:20 <b>jennifer</b> 2:5 <b>jennifer.e.ada...</b> 2:10
<b>interpretations</b> 187:15	<b>intervals</b> 69:20 70:13 74:2 81:8 94:1 105:7,13 218:9	<b>ionizing</b> 289:14 289:20	<b>jensen</b> 250:3 <b>jersey</b> 44:3 <b>john</b> 43:17 <b>journal</b> 24:21 85:5 144:2,4,8 144:14
<b>interpreted</b> 81:2 168:4 190:20	<b>intervention</b> 221:14	<b>ir</b> 267:10	<b>journals</b> 25:6 25:10 160:13 234:14
<b>interpreting</b> 19:2	<b>invariably</b> 136:12	<b>irc</b> 265:15,19	<b>jp</b> 59:17,22 60:10
<b>interrupt</b> 9:10	<b>investigated</b> 128:2	<b>island</b> 2:17 7:7 136:9	<b>judges</b> 12:3
<b>interval</b> 69:21 71:16 72:1,8 72:16,18,21 73:3,7,17 74:5 74:12,15,17,19 74:20 75:16,20 76:6 80:4,5,20 80:22 93:9,17 94:12 95:9 96:3 100:15,16 101:6 106:18	<b>investigations</b> 44:15	<b>isolation</b> 122:4 122:6 123:13 178:16	<b>june</b> 5:9 52:5 52:13,16
	<b>investigator</b> 25:2	<b>issue</b> 25:13,18 26:11,16 146:15 173:9 237:12,15 238:9,13 264:5 284:18 305:13 315:1	<b>juris</b> 27:4
	<b>investigators</b> 112:8,21	<b>issued</b> 103:9	<b>justice</b> 2:3 45:21 50:6 223:18
		<b>issues</b> 238:3	
		<b>item</b> 37:15	
		<b>item's</b> 37:13	

<b>k</b>	181:15,21	41:15,20 42:13	326:3,6 331:11
<b>kachuri</b> 103:20	182:13,19	44:11 45:15	339:19 340:20
103:22 106:1	186:12 189:19	48:7,18 49:8	342:18
<b>karami</b> 314:21	238:21 240:14	56:2 57:6 58:6	<b>knowing</b>
<b>katherine</b> 1:22	240:19 241:1,9	58:13 64:11,13	124:10
350:3,19	241:14,19	67:13,14 69:11	<b>knowledge</b>
<b>kathy</b> 7:10	242:1,11 243:1	75:6 76:22	23:14 24:4
<b>keep</b> 32:2 90:4	243:11,20	77:19 79:20	138:13 227:16
143:8 158:13	246:10 248:4	94:1 112:5	346:15
<b>keller</b> 33:11,19	249:4,15	114:1,7 117:12	<b>known</b> 18:22
<b>kept</b> 90:5	259:20 266:13	124:22 125:14	82:22 86:2
<b>kern</b> 5:12 97:18	266:16 305:6	131:13,22	209:12 265:15
98:7,16,22	305:13,21	135:12,19	265:16 268:1
99:7 101:15	306:4,5,9,20,20	137:4 140:4,16	294:18 325:17
<b>key</b> 28:10	307:5,10,21	154:20 159:20	338:5,7 347:11
<b>keywords</b>	308:9,13,20	174:22 179:6,8	<b>krauss</b> 43:21
238:15	309:2,20 310:5	193:5 208:1	<b>l</b>
<b>khalade</b> 6:13	310:15 313:21	210:1,6 212:20	<b>l</b> 43:17 213:17
295:1,12,15,22	314:3,19 318:2	221:18 222:14	239:21 240:2
296:1,19	318:10 319:16	222:14 224:2,4	307:5 308:1
<b>kidney</b> 5:6	321:6 323:1	226:12 231:22	<b>lab</b> 13:11 263:1
25:19 26:16	340:16,18,19	244:11 248:16	<b>label</b> 281:9
34:9 35:4,19	<b>kind</b> 37:19	248:20 251:4	<b>labeled</b> 158:10
46:19 65:17	102:19 111:2	256:8 258:18	<b>laboratory</b>
66:5 76:22	137:6 187:14	261:20 262:3	12:22 13:2,4
77:7,16 78:1	213:19 222:16	263:11,14,18	<b>lack</b> 69:7 198:4
78:21 115:22	289:11 315:10	263:19 278:19	198:8 231:21
116:11 117:18	<b>kinds</b> 40:2	280:21 284:1	232:14 233:4
118:10,22	<b>know</b> 9:6,18	287:12 288:15	308:10
149:20 150:18	10:19 11:4,16	288:22 289:20	<b>lamb</b> 293:3,17
165:13,21	11:21 20:5,5,8	289:22 295:11	<b>lane</b> 8:5
166:15 170:12	23:22 27:13	298:15 305:22	<b>language</b> 51:15
176:11,20	30:3 32:19,20	309:4 316:14	52:21 54:19
	33:21 36:10,14	325:13,21	

59:1 64:8 65:2 78:7 96:12,16 343:9 344:1 <b>largely</b> 12:9 83:4 88:19 178:17 236:14 236:19 <b>lash</b> 43:21 44:8 <b>lastly</b> 83:3 <b>late</b> 312:7 <b>latency</b> 131:19 131:22 132:7,8 <b>latest</b> 253:19 <b>launderers</b> 256:19,22 <b>laundry</b> 238:17 <b>laura</b> 3:21 <b>laurel</b> 8:5 <b>law</b> 19:16 27:6 27:8 33:9,12 36:15,20 53:3 53:17,22 67:17 232:15 <b>lawrence</b> 43:21 <b>lawyer</b> 55:2 345:5 <b>leadership</b> 33:11 <b>lecture</b> 62:19 109:19 <b>led</b> 13:20 <b>left</b> 90:6 299:3 319:11 320:2	<b>legal</b> 21:18 27:1,4,10,11,13 33:11 53:22 54:13 55:3,4 222:16,21 223:2 345:6 <b>lejeune</b> 1:7 5:20 6:2,4 7:7 38:7 39:9 40:17,18 41:4 45:17,19,21 46:12 50:6 52:3 64:4 65:6 68:9 87:19,21 88:9,11,16 89:1,6,13,19 90:18 91:8 113:3,4 141:18 142:6,7,11,12 144:18,20 145:5 146:6,9 147:22 148:14 149:17 151:16 152:18 153:3 154:11 155:1 155:11 163:5 163:10,12,18 164:1 165:4,17 165:22 166:15 167:3,7,22 168:9,13 169:3 169:9,19 170:16 171:10 172:2 173:2	179:17,22 180:13,18 181:1,9,17,22 182:13,18 186:19 187:3 187:19 188:5,9 188:16,22 189:3,21 190:13,17 191:1,6 192:9 193:6,7,16 194:6,11,17,21 195:14 197:11 197:17,22 199:13,18 200:3,10 201:14 203:10 204:15,19 205:7,10 207:1 207:7 208:15 209:4 217:6 223:18 240:4 240:14 251:20 252:3 259:12 281:20 282:4 283:20 284:2 284:12 303:7 304:2,13 310:12 311:5 311:11,19 312:11,19 313:7 314:1 315:3,13 316:13 317:2	318:1 326:14 330:3,6,10 337:19 339:17 340:7 341:6 <b>lejeune's</b> 312:1 <b>length</b> 284:1 <b>leukemia</b> 5:7 25:20 26:17 34:13 35:9,21 63:15 81:15 115:22 116:11 117:19 118:11 118:22 126:17 127:1,4,10,14 128:4,10 129:3 129:18 130:16 131:19 132:12 132:16,22 133:6,8,9,12,19 133:21,22 134:8 135:3,4 135:5,6,11,12 135:15 138:2 150:12 151:4 154:3 155:8,16 155:19 156:9 156:19 157:15 158:18 188:2 188:12 192:7 199:9,19 202:3 202:4,7,9,10,12 202:13,15 212:7,19 224:18 250:11
---	--	---	--

250:13,17	267:3 289:11	284:15 326:8	48:13,14,18
252:20 253:10	296:11 301:22	326:14,16	49:10 51:22
254:6,15 255:6	302:19 303:9	327:1,10	52:18 115:4
256:6 258:3	303:20 347:2	<b>likewise</b> 82:20	117:8 156:15
259:13 269:1,4	<b>level</b> 66:18	205:13	184:20 217:6
269:5,5 287:15	277:22 319:20	<b>limit</b> 218:22,22	217:10 225:18
288:15,16,21	<b>levels</b> 156:2	238:7 341:3	269:15
289:1,3,4,8,9	230:11 285:6	<b>limitation</b>	<b>listed</b> 37:13
289:13 290:1,5	310:10,22	144:17 145:4,7	38:12,18 44:18
290:11,16	315:1 316:3,13	147:10 277:3	46:19 47:1,5,9
291:4,8,15	317:21 320:10	<b>limitations</b>	47:13 49:10
292:11,16	347:8,10	11:5 147:2,5	52:2 115:4
293:6 295:3,19	<b>licensed</b> 27:6	246:13	163:10,18
296:9,14	<b>licensing</b> 12:17	<b>limited</b> 11:9,13	217:19 236:11
297:19 304:3,4	<b>lieff</b> 33:12	11:18,22 12:14	258:21 292:10
304:12 305:14	<b>lies</b> 297:11	16:22 45:7,10	349:7
320:5 343:4,16	<b>life</b> 133:13,20	46:20 47:2,6	<b>lists</b> 41:2 55:13
346:8,14,20	286:3	246:16	115:10 243:4
<b>leukemia's</b> 47:5	<b>lifetime</b> 285:18	<b>line</b> 170:12	244:1 253:12
126:19	285:18	174:5 349:8	254:18
<b>leukemias</b>	<b>likely</b> 49:18	<b>linear</b> 125:18	<b>literature</b>
127:8,17	50:1 54:20	159:22 160:5	28:12,21,22
129:20 130:2	59:22 60:5,10	173:19,22	36:21,22 37:2
132:2,8,9	61:4,8,17,22	174:1,2 212:16	37:11 44:13
149:21 154:5	64:3 96:18	213:1	86:19 87:13
158:17 168:5	115:21 116:10	<b>linet</b> 128:21	90:1 122:12
168:13 169:3	120:20 126:12	<b>link</b> 206:9	134:17 135:1
172:1 177:13	140:14 144:19	<b>linked</b> 130:9,15	205:21 211:21
188:9,16 192:8	146:6,10	<b>lipworth</b>	213:9 214:11
200:13 201:21	183:18 197:14	249:17 259:22	214:18 221:8
250:22 251:5	220:15 221:21	<b>list</b> 25:5 26:6	223:7,16 235:7
251:21 252:7	222:1,1,5,11	33:10 36:3,6	236:2 238:20
252:12 259:4	228:13 263:21	37:1,14,22	238:22 239:3
259:21 260:7	273:3 284:11	38:2,13 46:15	259:10 264:21

315:16 317:4	96:10,13 99:13	266:9 273:19	215:21 217:12
334:20 335:10	100:12 104:22	277:15 281:7	231:2,3 235:1
<b>litigation</b> 1:7	105:20 106:1,7	283:9,12	240:18 241:8
7:8 11:10,19	108:1 109:21	284:20 285:9	249:1,3 253:20
11:22 30:18	120:8 131:8	285:11 286:15	260:6 262:11
33:20 46:8	138:3 147:18	288:6 290:6	273:11 281:11
50:17,19 52:3	149:13,16	292:19,22	282:21 300:9
68:13 221:4	151:14 152:8	294:13 296:3	321:11 327:3
<b>little</b> 28:4 46:6	158:5,20	296:22 297:22	336:5 340:5,13
62:8 67:6	163:16 166:21	298:19,22	340:18,19
126:17 312:7	169:7 172:18	301:1 302:3,12	<b>looks</b> 58:4
327:14 328:6	173:7,17	302:16 303:6	106:14 173:13
342:18	175:13,19	308:3 315:4	230:22 253:19
<b>live</b> 8:3	176:11,12,20	322:22 325:1,7	253:20 254:2
<b>liver</b> 266:19	185:7,14	331:22 332:20	256:18 278:9
<b>location</b> 264:13	186:17 188:21	333:16 334:8	325:6
<b>long</b> 9:18 11:14	192:8 193:3,11	335:4 337:6	<b>lose</b> 328:16
11:14 21:5	195:9 197:9	<b>looked</b> 21:4	<b>lost</b> 198:21
48:1 59:18	199:8,22	128:9,12,16	<b>lot</b> 39:13 55:9
60:1,11 72:20	203:19 204:7	129:2,5,6	70:10 71:10
84:8 160:21	204:11 208:3	140:22 147:12	79:16 81:9
214:10,16	218:5,17	153:12 178:12	87:20 155:14
215:18,19	219:20 223:22	197:8 214:16	193:1,1 208:1
275:7	224:18 226:19	217:11 244:11	211:18 221:10
<b>longer</b> 132:8	228:3 230:14	259:2 262:20	338:7
284:7,11,15	232:11 235:15	263:2 271:17	<b>lots</b> 30:5,5
<b>look</b> 36:11,13	235:16 238:20	277:9 278:22	37:19 51:18
38:16 41:14	244:17,22	282:17 285:13	79:19 147:4
44:12 49:20	245:10,19	340:21	155:14 165:9
51:19,21 54:16	247:1,8 248:10	<b>looking</b> 37:5	193:10,10
55:15 59:8	250:10 254:11	96:19 107:16	213:5,18
64:12,15,20	255:10,18	126:8 165:13	<b>low</b> 97:20
65:16 70:17	257:16 262:12	175:15 207:16	108:18 130:12
90:1 91:22	262:13 265:10	207:17 215:9	151:17 152:19



154:15,16,17 159:8,15,16 191:13 192:2 246:14 257:22 257:22 288:18 288:21 <b>lower</b> 72:1 73:3 74:18 80:4,18 80:19 94:11 95:8 96:2 101:5 106:17 107:2,9 125:22 170:2,21 171:15 172:7 189:10 190:4 192:12 218:22 304:4,8,9,10 <b>lucas</b> 3:22 <b>lumped</b> 127:6 <b>lunch</b> 160:17 161:6 <b>lung</b> 269:6,11 277:10 278:1 279:1 <b>luxemburg</b> 33:13,20 <b>lymphatic</b> 250:16 <b>lymphocytic</b> 128:10 297:19 <b>lymphoid</b> 269:3 <b>lymphoma</b> 5:8 34:14 35:10,22	47:9 116:1,12 117:20 118:12 119:1 127:10 128:12,17 149:21 151:2 166:22 167:7 167:22 171:9 186:18 187:2 187:20 201:3,8 201:10,13,22 202:5 203:5 266:18 269:3,9 288:20 289:18 290:2,5 302:22 305:15 343:5 <b>lymphomas</b> 129:8 151:4 250:22 251:6 303:13  <b>m</b>  <b>m.d.</b> 1:9 7:8,12 349:2,15 350:7 <b>made</b> 210:6 329:15 <b>magnitude</b> 296:15 <b>main</b> 3:11 179:1 213:11 <b>major</b> 273:2 <b>majority</b> 148:14 <b>make</b> 31:15 78:17 115:13	150:10 155:5 312:8 316:18 338:18 342:22 <b>makes</b> 277:18 328:5 345:7 <b>makeup</b> 41:2 <b>making</b> 43:9 225:11 226:16 227:5 233:9 <b>male</b> 306:10 326:8 <b>males</b> 185:9 247:17 <b>malignancies</b> 130:21 250:16 <b>mandell</b> 1:12 1:12 2:13,13 2:14,15 4:5 9:9 14:14,16 21:22 22:8,11,16 23:1,7,9 26:1,4 32:12 34:1,20 39:4,15 48:10 48:15,20 49:1 49:4 50:21 51:10 53:5,8 53:12 56:10,14 57:4,6,10,16,20 58:11,17 59:3 60:2,6,12 61:6 61:13 62:5 63:9 64:17 65:13 67:11,19 68:1,7,14,20	69:4,7,17 70:4 70:9 71:4,17 72:5,10,19 73:9,19 74:7 74:22 75:4,11 75:21 76:17 77:2,15,18 79:4,11 80:8 80:17 81:6 83:13 84:3,8 85:11 88:5 89:16 90:7,13 91:2,10,16 93:12 94:9,19 95:6,11,18 96:4,9,17 97:4 97:9 98:19,21 100:22 101:7 101:20 102:10 102:16 103:6 106:19 107:4 107:11,19 111:1,9,12,17 112:1,11,15 113:13,22 114:6,12,18,21 116:2,13 119:2 119:9,17 120:10,13,15 121:19 122:1,8 123:1,9,14 124:1,6,12,20 125:4,8,12 126:2 130:17
--	---	--	---

131:2 132:18	222:6,13	<b>manner</b> 27:20	104:12 142:22
133:2,17 134:1	224:20 225:2	29:6,19	143:10 162:9
134:6,12,16,21	225:19 230:2	<b>manuscript</b>	162:12,13
135:9 139:3,9	231:10 234:2,9	43:14 179:7	175:7,8 179:18
139:15 141:1	234:16,20	236:16 301:10	179:20 184:8,9
141:15 142:13	235:19 237:21	<b>manuscripts</b>	194:7,11,14
144:22 145:6	242:8 244:14	101:13 236:22	214:1,2 226:8
145:20 147:3	249:7,21 250:8	<b>march</b> 350:22	226:14 232:5,6
147:11 148:4	251:7 256:16	<b>margot</b> 43:20	242:15 253:3
149:4,11 150:2	258:10 259:7	<b>marine</b> 113:2	266:1,4 268:9
151:6 152:6	259:16 260:3	149:18,18	268:11 276:5,6
155:4,6 157:9	260:10,22	162:20 165:11	295:16,17
157:16 158:1,3	261:3,19	173:4 180:5	298:6,11 302:4
158:9,14 160:1	270:21 271:12	196:14 279:15	307:15,16,19
160:6,20 161:2	273:5 275:7	279:18 284:6	318:15,17
164:14,19,22	280:2,10,17	301:20 315:12	330:15,17
165:6 166:2,7	281:13 282:14	344:2,3 345:9	336:16,19
166:18 167:17	282:20 283:5	<b>marines</b> 5:22	337:2
168:2,20 169:5	284:13 286:20	151:16 152:18	<b>market</b> 12:7
170:10 171:7	291:22 292:8	153:3 165:10	<b>marking</b> 22:1,4
171:21 172:13	292:17 302:1,8	183:19 194:4	22:11,12
174:9 178:10	302:13,15	194:15 200:1,8	<b>martignetti</b> 3:2
179:4 181:12	304:6,14,20	203:15 205:22	7:3
182:9,16 183:5	313:10 314:13	<b>mark</b> 2:14	<b>mary</b> 43:18,20
187:5,13,21	315:19,22	<b>marked</b> 10:4,6	<b>mass</b> 136:9
188:11,18	316:7 323:9	14:13,17 21:9	322:8,10,17,17
189:16 190:10	328:2,14 329:4	21:12 23:3,4	<b>massachusetts</b>
191:4,10,22	336:21 338:6	27:17 28:7	8:6 318:19
192:18 193:9	338:12 339:3	35:3,5,7,11	350:1,6
198:20 199:4	341:18 342:11	39:1,2 52:14	<b>matches</b> 332:16
201:16 211:9	342:14,17	52:15 56:20,21	<b>materials</b> 10:15
216:1,12	344:7,12	57:6 85:8,10	10:18 19:20
217:20 218:3	347:17	85:13 99:1,2	36:3,6,7,8 37:1
219:8 221:9		103:4,8 104:9	37:14 38:2,13

48:14 49:10 51:21 52:7,17 115:4,10 117:8 117:12 184:19 <b>matteoli</b> 250:4 <b>matter</b> 32:3 134:3,4 346:14 346:19 <b>mbmjustice.c...</b> 2:19,20 <b>mclaughlin</b> 240:18 <b>mclean</b> 260:8 <b>mean</b> 30:3,7 42:8 60:17 61:1 65:15 69:10 70:18 71:19 72:18 74:6 76:15 77:10 78:18 80:9,16 81:9,9 87:10,18 100:6 122:5,7 135:5 139:5 156:17 167:9 169:6 181:14 190:16 209:21 222:4 222:10 233:16 238:18 265:4 282:6 284:5 <b>meaning</b> 81:5 94:15 95:9 201:14	<b>means</b> 48:8 60:19 72:21 96:7 100:9 154:8 166:3 168:11,22 187:6 201:5 221:22 222:2 321:5 341:20 <b>meant</b> 109:17 126:10 140:12 288:10 307:19 316:7 <b>measured</b> 286:7 <b>measurement</b> 287:5 <b>measuring</b> 308:11 <b>mechanism</b> 84:19 <b>mechanistic</b> 88:11 138:18 227:19 228:19 238:3 <b>med</b> 13:13 <b>medicaid</b> 99:7 <b>medical</b> 27:19 28:8,10,12 29:5 61:10 82:6 136:1,4 141:7 148:12 148:16 222:16 232:14 233:4 234:14 235:6	236:1 265:5 <b>medication</b> 97:21 <b>medicine</b> 15:3 15:6 16:7,18 17:2 44:3 45:21 136:1 221:11,16 224:11 226:2 324:3,8 <b>medium</b> 151:18 153:3 156:1 159:5,17 258:12 <b>meet</b> 140:19 183:1 222:4,11 279:21 323:10 323:13 <b>meets</b> 43:11 <b>mellemgaard</b> 250:3 <b>member</b> 17:10 17:13,17 20:17 20:20 <b>members</b> 41:18 <b>memorial</b> 137:14 <b>memorized</b> 316:17 <b>memory</b> 76:4 78:15 178:14 256:8 271:14 276:15 278:21 280:22 285:21	291:10 293:12 298:10 327:15 <b>men</b> 5:15 104:9 104:15 257:2 <b>mention</b> 152:3 153:14 160:3 196:17,19 280:5,8,11 309:4 317:14 <b>mentioned</b> 113:6 118:14 135:2 141:2 146:19 183:9 205:14 249:6 255:15 259:5 272:1,6 280:18 309:1 331:6 338:2 <b>mentions</b> 284:21 <b>merely</b> 334:22 335:11 <b>merit</b> 350:3,19 <b>met</b> 110:6 220:18 228:15 <b>meta</b> 86:1 87:12,15 228:20 229:2,5 229:11 293:4 294:22 295:6 295:20 <b>method</b> 332:19 <b>methodology</b> 37:10 87:8,21
--	--	---	---

88:17,22 89:5 89:7,11 91:13 139:13 235:22 <b>methods</b> 82:2 90:12 91:1 95:12 107:14 165:1 276:18 298:20 301:1 319:1 323:13 <b>mg</b> 315:14 319:14 <b>mic</b> 261:14 <b>michael</b> 44:1 <b>michelet</b> 250:5 <b>middle</b> 54:17 159:5 225:4 335:8 <b>mike</b> 3:5 <b>miligi</b> 260:7 <b>military</b> 183:16 193:15 311:10 <b>miller</b> 329:12 <b>milligrams</b> 317:2,10 318:5 318:9 319:9 320:10 321:3 321:15,22 322:4,17 <b>mind</b> 71:9 213:19 289:16 289:21 306:17 <b>mine</b> 158:10 302:9	<b>minimum</b> 97:21 <b>minnesota</b> 43:18 <b>minority</b> 269:7 269:9 <b>minute</b> 34:19 62:4 189:19 224:21 261:17 304:19 328:4,7 328:11 342:21 <b>minutes</b> 337:1 <b>miranda</b> 329:13 <b>misclassificat...</b> 286:8,9 <b>misleading</b> 28:9 <b>misremember</b> 285:10 <b>misremember...</b> 224:3 279:2 <b>misspoke</b> 278:14 287:18 <b>misspoken</b> 278:13 287:20 288:3 <b>misstate</b> 327:21 <b>misstatement</b> 312:8 <b>mistaken</b> 12:12 144:12 <b>mix</b> 288:5	<b>mixtures</b> 45:2 46:14 47:7 <b>mmandell</b> 2:19 <b>model</b> 209:20 210:2 <b>modest</b> 67:18 <b>modifiable</b> 263:21 272:10 289:19 306:5 309:7 326:8 <b>moment</b> 38:15 153:12 172:20 <b>monitoring</b> 11:14 <b>monograph</b> 6:11 119:5 267:7,10 268:8 268:13 270:7,8 271:7,13 <b>monotonic</b> 176:3,4,17,22 177:10,20 178:5,21 210:9 210:10,13 211:1,6,15,16 212:1,15 229:2 <b>monoxide</b> 325:5 <b>monthly</b> 209:20 <b>months</b> 101:10 133:10 152:20 153:4 156:3,4 216:6 284:6	<b>moranda</b> 329:21 <b>morbidity</b> 5:16 113:8 142:22 143:12 149:14 149:17 152:14 158:8 195:20 240:8 279:6 282:9 <b>morgan</b> 249:16 <b>morning</b> 7:20 7:22 <b>mort</b> 149:14 <b>mortality</b> 5:19 5:21 6:2 179:16,21 180:3,11,12,18 181:16 185:9 185:18 186:1 186:18 188:4 192:21 194:3,8 194:15,19 195:2 196:14 197:9 198:19 200:1,8 201:13 204:5,14 205:22 218:20 279:17,19 281:6,12,21 282:3 307:11 307:21 308:9 <b>motley</b> 33:13 33:18
---	---	---	--

<b>move</b> 64:17 260:12	15:16 16:1,5,6 16:16 17:2,5,7 17:11,14,18,20 18:4 38:4,5,21 39:7 42:2,10 43:6 46:11 47:18 48:4 268:5 308:15	262:20 293:14 297:15 302:13 328:4,6,11 334:13	301:22 343:17 346:9,21
<b>movement</b> 332:12		<b>needs</b> 11:14 24:8 134:5	<b>night</b> 136:9 137:11
<b>mr</b> 261:21		<b>neither</b> 40:14 177:10 303:3 333:13 350:11	<b>nine</b> 62:20 112:4 139:10
<b>multiple</b> 269:4		<b>neurological</b> 324:6	<b>nocca</b> 277:21
<b>mutations</b> 134:11,15	<b>nationwide</b> 330:19	<b>neurologist</b> 324:5	<b>non</b> 5:7 34:14 35:10,22 47:9 83:7 99:19 116:1,12 117:19 118:12 119:1 121:22 127:10 129:8 149:21 151:2 166:21 167:7 167:22 171:9 186:17 187:2 187:19 201:2,8 201:10,13,21 202:5 203:5 210:10 211:1,6 212:1 221:15 227:7 229:2 266:18 269:3,8 276:20 288:19 289:17,19 290:1,5 302:22 303:13 305:14 306:5 309:7 326:8 343:4
<b>myelogenous</b> 128:3 293:6	<b>nature</b> 113:18 280:5	<b>never</b> 19:18,22 24:17,20 25:1 32:22 71:6 75:8 79:12 87:13 109:11 116:17 129:21 144:2,13 232:10 233:2,3 233:5	
<b>myeloid</b> 129:3 269:1,4,5	<b>navy</b> 5:22 40:10 113:2 162:20 173:4 180:4 183:19 194:4,16 196:14 200:1,8 203:15 205:22 279:15,18 284:5 301:20	<b>nhl</b> 25:20 26:17 127:6 166:22 177:3 190:12 190:17 199:9 199:19 201:8 202:9,12,13 203:9 205:8 250:11 252:3 287:15 290:12 291:8 292:11	
<b>myeloma</b> 269:4			
<b>n</b>			
<b>n</b> 4:1 7:1 11:11 71:1 162:1,1,1 213:15,15,17 213:17 239:21 240:2 307:5 308:1	<b>nearly</b> 82:10 136:12 145:16 325:1		
<b>nam</b> 42:13	<b>necessarily</b> 125:17 212:15 213:1		
<b>name</b> 7:3,21 8:7 12:10 44:8 72:17 213:13 256:2 260:1,9 289:12 295:13 336:3	<b>necessitate</b> 54:9		
<b>named</b> 18:9	<b>need</b> 9:17 62:3 64:12 73:12,21 73:21 96:13 129:21 145:21 192:7 195:7		
<b>names</b> 41:14			
<b>narrow</b> 74:1 164:7			
<b>national</b> 5:8 15:3,6,7,8,9,12			
			<b>noncausal</b> 227:13

<b>nordic</b> 246:15 276:9 <b>normally</b> 324:5 <b>north</b> 1:2 3:11 3:12 52:5 <b>notary</b> 349:19 350:5,21 <b>note</b> 103:19 104:1 159:14 240:21 259:13 259:14,15,19 <b>noted</b> 7:9 <b>notes</b> 225:8 316:18 <b>noticed</b> 210:22 <b>nrc</b> 49:5 <b>null</b> 146:7 228:22 258:15 <b>number</b> 5:2 42:6,16 71:1 73:13 100:18 101:15 102:8 102:12 106:15 113:3 158:16 158:17 166:3 187:6 191:15 192:8 205:9 207:14 208:5 208:14,16 226:10 230:17 249:2 258:8 259:1 284:8 314:18 332:4 340:12 343:7	345:4 <b>number's</b> 52:4 <b>numbered</b> 226:12 <b>numbers</b> 93:20 96:6 102:12,13 102:19 157:11 157:12,18 158:11 159:15 167:9 174:11 178:12,17 179:8 181:13 185:17 188:1 188:20 192:5 196:18 201:19 208:22 258:5 282:6 <b>numeral</b> 40:22 43:1 <b>numerals</b> 39:14 <b>numerical</b> 66:20 <b>numerous</b> 16:10 310:9 317:20	<b>object</b> 48:21 141:15 <b>objection</b> 48:15 50:21 51:11 56:10,14 58:11 58:17 59:3 60:2,6,12 61:6 61:13 63:9 64:17 65:13 67:11,19 68:1 68:7,14,20 69:4,7,17 70:4 70:9 71:4,17 72:5,10,19 73:9,19 74:7 74:22 75:4,11 75:21 76:17 79:4,11 80:8 80:17 81:6 83:13 84:3 88:5 89:16 90:7,13 91:2 91:10,16 94:9 94:19 95:6,11 95:18 96:4,9 96:17 97:4 98:19 100:22 101:7,20 102:10,16 106:19 107:4 107:11 111:1,9 111:12,17 112:1,11,15 113:13,22	114:6,12,18,21 116:2,13 119:2 119:9,17 121:19 122:1,8 123:1,9,14 124:1,6,12 126:2 130:17 131:2 132:18 133:2,17 134:1 134:6,12,16,21 135:9 139:3,9 139:15 141:1 142:13 144:22 145:6,20 147:3 147:11 148:4 149:4,11 150:2 151:6 152:6 157:9,16 158:1 158:3 160:1,6 164:14,19,22 165:6 166:2,7 166:18 167:17 168:2,20 169:5 170:10 171:7 171:21 172:13 174:9 178:10 179:4 181:12 182:9,16 183:5 187:5,13,21 188:11,18 189:16 190:10 191:4,10,22 192:18 193:9 198:20 199:4
	<b>o</b>		
	<b>o</b> 7:1 162:1,1,1 213:15 <b>oath</b> 8:9 162:6 <b>obese</b> 264:3 306:17 309:5 <b>obesity</b> 309:4 309:22		

201:16 211:9	317:22	<b>odd</b> 152:20	115:12 119:19
216:1 217:20	<b>observes</b> 229:2	<b>odds</b> 63:6,22	125:11 132:3
218:3 219:8	<b>obviously</b>	65:4,22 66:10	141:6 143:13
221:9 222:6,13	309:7	67:5,9 68:5,17	158:12 169:12
225:19 230:2	<b>occasion</b>	69:2,15 71:15	175:3 184:4
234:2,9,16,20	157:21 261:20	77:6,10 92:14	186:9 195:21
237:21 244:14	264:19 305:17	92:19 93:4	201:6 203:17
249:7,21 250:8	<b>occasions</b>	95:15 97:5	214:19 233:10
251:7 256:16	324:11	100:7 105:5,12	245:17 253:22
258:10 259:7	<b>occupational</b>	105:18 106:22	264:21 270:12
259:16 260:3	105:8,15 239:5	107:22 108:4	272:15,15
260:10 270:21	276:7,20 285:5	108:14 150:1	290:3 297:15
271:12 273:5	311:2,13,20	151:15,21	298:9 299:17
280:2,10,17	312:2,13 314:8	152:20 153:2	301:1 302:6
282:14,20	314:11,18	153:15 154:3	303:11 305:22
283:5 284:13	315:16 317:4,7	154:17 156:5	306:14 315:10
291:22 292:8	330:18	159:3,9 200:12	336:4 340:21
292:17 302:1	<b>occupations</b>	206:15 218:19	<b>okay</b> 9:12 10:3
304:6,14	278:2 285:13	257:21 322:22	14:11,16 15:1
313:10 314:13	<b>occur</b> 40:3,3	323:5,5	16:14 18:3
323:9 338:6,12	125:1,15	<b>offer</b> 24:9	19:7 20:17
339:3 341:18	212:21 265:1	<b>offered</b> 11:3	21:6 22:8,8,16
<b>objective</b> 27:20	<b>occurred</b> 198:2	<b>offering</b> 24:5	23:5 24:11
29:6,14,19	278:12 324:19	291:18 292:6	26:4,9 27:1,5
<b>objectivity</b>	<b>occurrence</b>	<b>oh</b> 16:2 21:4	27:13 29:3
43:12	64:1 65:5 66:1	27:12 28:2	31:14 32:1,7
<b>obligation</b> 8:14	66:11 71:2	36:14 39:18	32:10 33:22
<b>observational</b>	77:7 82:11	56:11 64:11	36:16 37:10
99:6	97:18 272:14	72:12 77:17	42:10,22 44:10
<b>observed</b> 66:19	305:9,10	79:16 80:9	44:14 46:5
104:4 210:16	<b>occurring</b>	83:21 86:7	48:3,13,19
266:17 269:2	229:5	87:20 100:5	49:9,17 51:4
269:10 270:10	<b>occurs</b> 197:12	111:2 113:15	51:11 52:12,20
270:19 310:11	197:19	114:13 115:6	53:7,8 55:9

56:4 57:3,20	131:13,18	192:20 193:14	247:10 248:3
58:3 60:4	132:11 133:5	193:22 195:9,9	248:13,18
61:16,21 62:6	133:14 134:3	195:12 196:4	249:1,9,12
62:9 63:18	135:18 136:14	196:19 197:4	250:10 251:4
64:12,15,18,19	136:21 137:3	198:6,12,15	251:16 252:14
64:22 65:11,16	138:1,22 141:6	199:8,8,11,15	252:19 253:8
65:19 66:7,15	141:10,17	199:16 201:1,9	253:18 254:1,3
67:9 69:14	142:17 143:9	202:16,19,20	254:11,13
70:12 72:7	148:8 149:1,7	203:3,21 204:8	255:1,11 256:4
77:18 78:13	150:5,9 152:8	204:10,13	257:10,17
79:6 80:3,12	152:12 153:18	205:4,13,16,19	258:8 259:18
81:5,11 84:6	154:2,19 155:2	206:6,21	260:12 261:3,5
89:4,18 90:4	155:5,7,18,22	207:16,18	261:19 262:3,7
90:10 91:7,14	158:12,14	208:21 209:8	262:9,15
92:13 93:11	159:2 160:4,10	210:18 211:5	264:22 265:21
94:3 96:15,20	160:11 162:5	211:11 212:4	266:3 267:14
97:11 98:14	163:16 164:11	213:4,20 214:2	268:4,7,17
100:12 101:4	165:13 166:21	216:6,14 218:5	270:8 271:1,8
102:6,22	168:5 169:7,13	220:1,2,9	271:15,21
106:11,15	169:18 172:15	221:12 222:15	272:22 273:18
107:1,15,21	172:17,22	222:20 223:6	274:18 275:4
108:16,19	174:6 175:2,13	224:5,12,16,22	275:15 276:16
109:1,2 110:19	175:19 176:4,9	225:15 226:6	277:6,12 278:5
112:6 115:9,16	176:11 177:13	228:6 230:6,12	279:3,3 281:13
116:17 117:4,7	177:16 179:10	230:22 231:5,8	281:18 283:9
117:11,15	179:13,14	231:10 233:6	283:12 285:17
118:2 119:13	180:9,10 181:7	233:17 234:10	285:22 286:6
119:21 120:8	181:15 182:21	235:10,16	286:22 287:14
123:12,18	183:1,9 184:5	237:8,18	288:14,19
124:5 125:7,10	184:19 186:5	238:20 242:3	289:4,7 290:4
125:11 126:5	186:11,16,17	242:13,19	292:19 294:1,9
126:16 127:9	187:17 188:21	243:19 244:17	294:9,16 295:9
128:13,16	189:8,18	244:22 245:1	295:14 296:4
129:6,9 130:11	190:12 192:6	245:22 247:8	297:9,16 298:3



299:10,16,22 300:6 301:5 302:3,7,15,15 302:17 303:15 304:17 305:20 306:18 307:2 308:17 309:6 310:7 312:6 314:6 315:17 317:15 318:13 320:14,17 321:10,15,20 322:10,16,20 322:22 323:15 323:19 324:2 324:15 325:10 326:11 327:12 327:20 328:2 328:14,17 330:12 331:22 332:19 334:13 334:17 335:20 335:22 336:7 336:11 337:9 338:20 339:10 339:13 340:9 341:3,12,21 342:3,13 343:2 343:6 344:12 344:16 345:12 345:18,22 346:1 347:4,16 347:19	<b>older</b> 28:22 154:14 185:2,5 186:1 197:13 197:20 263:16 263:18 272:11 306:6 <b>once</b> 9:1 <b>oncologist</b> 263:10 <b>oncology</b> 263:9 <b>ones</b> 114:20 175:2 186:13 264:8 289:15 306:17 <b>ongoing</b> 23:14 24:4 337:12 <b>online</b> 331:4 <b>operating</b> 17:6 <b>opine</b> 53:22 55:3 66:22 <b>opinion</b> 11:9 24:8 29:1 37:18 59:15,21 60:5,9 61:11 69:12 70:8 76:8 142:18 196:13 211:5 219:5,10 221:18 277:2 290:15 291:3 291:19 292:2,7 309:8 326:14 326:20 327:7 329:16,20	334:19 338:21 346:2,6,10,13 346:21 347:5 347:12 <b>opinions</b> 11:2 11:13 12:14 24:5 37:16,20 38:1 49:15 59:11,16 112:18 113:9 113:11,19 114:1 115:8,19 116:8,16 119:16 139:7 290:22 340:14 345:16 346:18 <b>opportunity</b> 9:2 10:1 <b>orange</b> 22:13 27:17 28:7 <b>oranges</b> 88:8 <b>order</b> 5:9 28:22 29:18 39:3 52:2,10,13,16 52:16,19 96:12 123:4 124:4,16 217:5 258:6 261:20 277:10 <b>ordered</b> 262:15 <b>organic</b> 330:18 <b>organization</b> 22:19 <b>oriented</b> 205:4	<b>outcome</b> 89:20 138:11 215:8 215:12,15 350:14 <b>outcomes</b> 44:22 216:20 257:8 303:7 <b>outside</b> 46:8 68:9 330:2,6 <b>overall</b> 227:5 227:17,21 286:13 291:8 <b>overestimating</b> 146:8 <b>overlap</b> 71:10 <b>oversight</b> 40:15 <b>oversimplific...</b> 283:6 <b>overweight</b> 264:3 306:16 309:5
<b>p</b>			
<b>p</b> 7:1 43:18 <b>p.a.</b> 3:9 <b>p.m.</b> 1:11 161:5 162:3 231:12 231:15 275:10 275:13 304:22 305:3 313:17 313:20 328:19 328:22 347:21 348:2			

<b>p.o.</b> 2:6	199:11,17,22	297:21,22	148:10,11
<b>page</b> 5:2 28:3,4	204:12 206:4	298:1 299:2,19	153:16 196:20
29:3 37:4	206:16 208:20	299:20,20,21	196:21,21,22
39:12,22 40:21	212:4,10,19	299:21 301:5	198:9 200:14
43:1 44:21	218:6,7 219:21	302:16 307:1	200:16 206:7
49:21 51:21,22	220:10 224:19	308:3 310:4	206:17 208:19
52:17,19 54:3	225:4 226:19	315:5,11,12,22	218:7 241:13
54:4,16,17	228:6,7 230:3	317:12,15	241:17 265:13
57:7 58:2	230:4,19,21	318:21 319:10	277:16 283:14
59:10 63:16,20	232:12 233:1,1	320:2 323:15	292:22 299:3
64:21 65:18	235:19,20	326:11,13	303:18 308:7
66:6 77:4	239:1 240:15	327:3 331:22	308:18 319:2
78:11,21 81:16	241:7 244:22	334:15 335:6	319:12 320:1,2
86:5,11,11	245:8,19,20	335:16,18	335:7,8
92:1,7 99:13	247:1,8 248:9	336:5,6 337:6	<b>paragraphs</b>
103:14 104:22	250:12,14	343:9,10,13	320:18,21
105:12 107:19	251:17 253:20	349:8	<b>park</b> 1:13 2:16
109:22 120:11	254:12 255:10	<b>pages</b> 57:22	<b>parkinson's</b> 5:7
120:12 124:17	255:16 256:12	58:5,21 59:9	25:20 26:18
125:2 126:8	257:16 265:10	78:9,14 143:5	34:11 35:6,20
127:20 138:3	266:9,10 267:7	143:13 147:14	47:13 64:20
140:11 146:2,4	267:15,20,22	211:3 219:20	116:1,12
147:17,17	268:18,20	231:2 268:15	117:20 118:11
148:9 149:13	269:17 270:5	313:22 316:22	119:1 149:20
151:13,14	270:22 271:6	317:14 339:6	150:21 154:4,5
152:9,13,17	273:18,18	339:10	154:13 205:16
154:1 155:17	275:18 276:17	<b>panel</b> 217:17	206:11 207:2,8
155:21 158:19	276:17 277:15	225:10	208:4,15,17
158:20 162:17	279:5 281:17	<b>paper</b> 89:8	209:1,5,6
169:12 173:7	283:12 286:15	<b>papers</b> 25:5,9	305:14 323:17
177:14 180:2	290:6,8,20,22	<b>paragraph</b>	323:21 324:4
183:12 185:7	292:19 293:17	54:17 66:8	324:20,22
195:13,22	294:13,15	81:16 92:4,7	325:7,12,15,17
196:22 197:6	296:3,22	97:7 103:19	325:19,22

326:4,7,12,15 327:2,11 329:11,18,22 330:5,17 331:7 332:11 334:11 334:15 336:14 337:21 338:2 <b>parkinsonism</b> 324:22 325:4,8 325:10 <b>part</b> 12:5 15:6 23:4 38:1 50:16,19 69:21 87:20 89:22 90:15 116:5 119:4 121:9,10 122:11,12 127:6 146:19 152:15 159:21 165:7 199:7 205:20 223:3 225:1 234:17 256:9 265:5 282:9 286:13 287:11 310:2 322:17 324:12 <b>participants</b> 147:22 148:1 <b>participate</b> 146:10 <b>participated</b> 17:15 <b>participation</b> 147:20	<b>particular</b> 22:5 22:19 29:21 50:9 77:12 88:4,18 89:8 91:22 100:12 102:8 104:17 129:2,7 137:13 139:8 140:1 141:11 147:9 152:3 153:18 155:12 157:1 159:11 184:14 196:4 199:1 201:22 211:22 214:7 215:8,8 215:22 251:11 256:4,12,15 260:14 274:15 291:19,21 292:15 303:16 310:20 316:1 316:10,12 344:11 <b>particularly</b> 123:3 238:3 265:6 <b>particulars</b> 211:12 <b>parties</b> 350:12 <b>parts</b> 54:7 252:22 321:17 322:5,7 <b>past</b> 55:10	<b>patient</b> 135:2,3 264:20 324:3,5 324:11 <b>patients</b> 133:1 133:6 136:7,10 260:20 261:2,4 261:6,21 263:4 305:5,12 307:9 323:20 324:20 325:7,11 <b>pause</b> 21:21 23:6 26:21 38:17 58:20 59:6,13 62:13 63:12 100:4 105:3 106:6,8 131:10 148:20 159:1 172:21 180:8 196:8 200:17 203:1 203:20 205:3 205:18 206:20 212:9 245:5 248:11 267:6 267:18 270:13 271:5 297:5 301:13 315:9 327:13 <b>pc</b> 241:9 254:6 254:14 256:5 256:14 259:3 259:20,21 329:21 339:16	<b>pce</b> 25:14 26:11 40:4 45:1 46:14 47:3 115:20 116:9 117:17 118:16 156:2,4 238:15 240:19 250:13 250:14 252:12 253:10 255:6 260:6 273:20 273:22 284:16 287:20,22 288:10 300:22 313:2 314:1 318:6,9 321:17 321:22 322:4,6 326:22 327:9 329:8 338:5 340:3 <b>pd</b> 206:11 <b>peer</b> 25:5,10 42:3,5,8,11,14 42:19 44:6,19 68:18 75:3,6,8 85:5 144:2,3,4 144:5,6,7,10,11 144:14 339:13 339:22 <b>peers</b> 153:1,7 <b>pelvis</b> 165:13 165:21 166:15 170:12 181:15 181:22 182:14 182:19 189:20
--	--	---	--

<b>pending</b> 9:19	321:12 332:4	<b>percentile</b>	196:15,15
<b>pendleton</b>	<b>perceived</b>	320:8,20	200:2,8 205:22
144:21 146:6	344:18	<b>percentiles</b>	<b>persons</b> 43:3
146:11 148:1	<b>percent</b> 30:20	319:13	142:6,11
148:17 149:18	60:19 61:3	<b>perchloroeth...</b>	<b>perspective</b>
151:17 153:1,8	72:21 73:1,3,6	238:16 246:15	325:20
154:10 156:10	74:17,18 80:19	271:16 287:21	<b>perspectives</b>
163:5 169:10	93:22 94:6	287:22 332:22	43:4
169:19 171:10	95:3 96:1 97:1	333:4,7	<b>persuasively</b>
172:2 173:3	100:14,19	<b>perform</b> 214:11	110:21 111:6
180:13 189:1,3	102:7 106:17	<b>performed</b> 40:6	<b>pertains</b> 54:20
189:21 190:13	106:21 107:6	216:19	<b>pesch</b> 274:7
190:18 191:2,7	154:22 155:10	<b>period</b> 131:22	<b>philadelphia</b>
192:10 201:14	156:9,18	244:12 286:2	289:14
203:10 204:15	157:14,18	319:6	<b>phrase</b> 54:19
204:19 205:8	159:4 163:22	<b>periods</b> 131:20	54:20 60:4,14
205:10 207:2	165:20 167:6	<b>permanent</b>	60:17,20 61:1
208:17 209:6	168:12 180:22	319:5	115:21 116:10
281:21 282:4	181:21 187:1	<b>person</b> 132:5	220:21 221:6
303:8 304:13	188:8,12	133:12 135:12	<b>physical</b> 183:15
<b>pendleton's</b>	190:16 197:21	185:2,5 284:2	<b>physician</b> 5:5
170:17	201:15 203:8	311:3,9,10,13	16:19 21:8,13
<b>people</b> 19:12	204:18 207:1	311:21 312:10	135:20
67:13 80:9	252:15 257:7	312:12,13,19	<b>physicians</b>
114:2 145:15	257:15 282:3	313:6,8 345:10	20:18 21:2
145:17 154:14	304:16	<b>person's</b>	22:20
154:17 197:10	<b>percentage</b>	291:21	<b>pi</b> 14:5
197:20 208:15	30:16 136:15	<b>personally</b>	<b>picked</b> 225:16
208:16,22	147:22 149:8	219:15	<b>piece</b> 121:13,20
209:4,5 246:7	154:9 186:6	<b>personnel</b> 5:22	123:2 211:19
261:8 264:14	197:21	113:2 162:20	<b>pile</b> 281:8
273:2,4 284:12	<b>percentages</b>	173:4 180:5	<b>pills</b> 12:6,8
285:7 311:5,18	148:11,15	183:19 186:1	<b>place</b> 47:19
318:9 321:5,11		194:4,16	48:5 102:19

160:18 178:15 224:14 <b>placed</b> 11:5 <b>places</b> 321:2 <b>plaintiff</b> 2:21 3:7,15 27:22 29:8 30:1 291:17 292:12 <b>plaintiffs</b> 20:4 50:4 51:2 114:5,7,11,17 115:17 116:7 116:15,20 260:16 261:1,2 261:4 329:11 <b>plausibility</b> 82:17 138:6,8 138:9 338:11 338:17 339:2 <b>plausible</b> 227:13 <b>please</b> 7:20 51:4 158:3 172:15 <b>pllc</b> 3:6 <b>point</b> 22:9 64:16 69:22 71:19,21 72:9 72:14,15 73:2 73:4 80:13 81:7 93:5 94:8 97:2 184:4 197:1 210:22 224:16,21	252:16 287:18 288:4 312:3 317:7 323:10 <b>pointed</b> 316:4 317:1 <b>pointing</b> 22:5 203:18 312:8 <b>poison</b> 136:9 <b>poisoning</b> 325:5 <b>poisson</b> 162:19 180:4 <b>pops</b> 143:3 <b>population</b> 99:7 113:1 141:19 154:15 154:16 163:13 164:2 165:5,8 165:11 166:1 166:16 167:8 168:1,14 169:4 181:2,11 182:1 182:15 185:11 187:4,20 188:10,17 192:3 193:7,8 193:15,15 244:13 246:16 263:12 276:8 288:17 300:10 300:11 303:21 304:13 305:21 307:22 319:3 326:4	<b>populations</b> 110:4,12 112:8 112:20 163:6 180:14 191:14 191:17 193:19 203:6,10 298:19 <b>portion</b> 43:2 54:8 <b>posed</b> 344:3 345:8 <b>positive</b> 69:3 69:16 94:6 95:2 97:13 98:8,17 101:4 107:2 123:7 266:16 269:2 269:10 270:1,9 270:18 294:20 <b>possess</b> 19:13 23:14 <b>possible</b> 43:10 <b>postdoc</b> 13:12 13:14 14:4 <b>postman</b> 33:12 33:19 <b>potential</b> 38:7 39:9 142:5,10 142:16 145:7 273:16,22 277:19 283:20 <b>potentially</b> 79:2 146:7 236:13 238:18	261:8 <b>power</b> 70:16,19 71:3 83:16 <b>power's</b> 70:22 <b>ppb</b> 152:20 153:4 156:3,4 <b>ppm</b> 333:5 <b>practice</b> 27:6 133:7 135:19 136:3,4,15 324:3,10,12 325:11 <b>practicing</b> 132:21 <b>precise</b> 70:13 73:7 248:18 255:1 <b>precisely</b> 199:6 <b>precision</b> 71:3 218:21 219:13 219:17 <b>predisposing</b> 307:9 <b>prefer</b> 234:14 <b>preferred</b> 85:22 <b>premarked</b> 22:13 <b>premise</b> 329:22 <b>prepare</b> 86:18 <b>prepared</b> 55:18 58:16 337:13 342:20
--	---	---	--

<b>preponderance</b> 227:11	<b>previously</b> 157:11 210:14	322:19 328:13 342:5 344:13	<b>professor</b> 18:15
<b>preprint</b> 5:18 162:11,15 174:12 175:16 176:12 177:3 177:14	309:1 <b>primarily</b> 20:14 197:12	<b>problem</b> 145:18	<b>professorship</b> 24:17
<b>prescription</b> 332:13	<b>primary</b> 337:11	<b>problems</b> 144:18 146:10 146:12	<b>program</b> 268:6 308:16
<b>presence</b> 120:21	<b>principal</b> 25:1	<b>procedures</b> 13:4,15 43:5	<b>programatic</b> 17:6
<b>present</b> 3:1,4 145:19 191:12 207:7	<b>principle</b> 72:14	<b>proceeding</b> 8:9	<b>progress</b> 129:20 130:2
<b>presented</b> 81:22 124:15 293:17	<b>print</b> 5:19 175:3,6,9,20 176:20 177:7 178:2	<b>process</b> 6:8 28:10 42:3,5 43:16 47:17 48:4,8 86:21 225:12 226:16 232:4,9,16 233:9,14	<b>progression</b> 129:13
<b>presents</b> 244:18	<b>prior</b> 14:19 33:8 56:17 59:1 116:18 155:21 176:5	<b>produce</b> 10:16 15:16 55:22	<b>prolactin</b> 92:15 92:20 94:4 95:1,16,21 96:21 97:19,20 98:5 99:4,17 99:19 102:2
<b>pressure</b> 309:3 310:1	<b>priorities</b> 40:11	<b>produced</b> 34:3 42:15 56:4 115:11 117:9 216:9 242:1 252:20	<b>promote</b> 15:16
<b>presumption</b> 6:7 224:9 232:4,8,16	<b>prisma</b> 86:2,12 86:16,18 87:3 87:5,7,9,11 89:9	<b>produces</b> 42:4	<b>pronounced</b> 239:12
<b>presumptive</b> 217:5,10 224:8 225:11,18 226:16 233:9 233:13	<b>privileges</b> 13:6 13:6,7,21,21 14:1,3	<b>producing</b> 183:14	<b>proof</b> 27:11,14 50:5 53:1,15 54:6,21 55:4
<b>prevalence</b> 246:14 326:3	<b>probability</b> 60:21 61:10	<b>product</b> 79:3 79:10	<b>propensity</b> 100:9
<b>previous</b> 168:16 183:12	<b>probably</b> 16:21 16:22 17:3 32:21 60:22 84:5 143:6 173:21 174:4 260:4 264:7 272:16 289:2	<b>production</b> 10:12	<b>properties</b> 82:22
		<b>professional...</b> 342:10	<b>protect</b> 43:15
			<b>protective</b> 341:15,22
			<b>protocol</b> 13:19
			<b>proven</b> 329:22
			<b>provide</b> 28:8 43:8 50:4

228:20 297:6 310:9 317:20 <b>provided</b> 36:3 36:7,10,18,21 52:8 70:1 209:20 297:8 <b>providence</b> 1:14 2:17 7:7 <b>providing</b> 11:13 141:22 <b>provision</b> 23:12 50:9,12 <b>provisions</b> 22:6 <b>ps</b> 99:22 100:6 100:9,14 <b>public</b> 341:5,8 341:13 349:19 350:5,21 <b>publication</b> 68:18 92:3 234:11,18,22 <b>publications</b> 17:21,22 25:12 25:17 75:6,9 87:4 <b>publicity</b> 144:20 145:4 <b>publish</b> 235:4 <b>published</b> 24:20 38:5 41:22 43:10 61:16,21 83:20 84:17 85:1,14 85:15,18,21	144:2,4,13 160:13 174:15 174:18 213:5,8 221:1 235:2 237:13 238:10 240:21 270:3,6 293:3 <b>pubmed</b> 235:7 235:9 236:3 264:19 330:22 <b>pukkala</b> 255:20 <b>pull</b> 105:18 <b>purpose</b> 15:15 15:22 16:9 43:7 217:12 <b>purposes</b> 16:10 16:12,15 <b>pushed</b> 217:18 <b>put</b> 49:1 50:11 50:13 109:12 128:19 143:8 158:15 209:9 <b>puzzle</b> 211:19	<b>quantitative</b> 287:4 314:22 <b>quantitatively</b> 317:10 <b>quantities</b> 207:8 <b>question</b> 9:5 10:2 22:17 27:12 51:12 73:16 76:12,19 79:13 92:9 96:13 98:13,14 101:12 114:3 116:5 118:13 122:10,10,14 122:16 123:5 124:4,9,16 132:6 134:4 137:4 159:2 160:15 165:8 196:9,10 200:6 203:22 205:5 222:19,20 223:3,14 234:5 238:7 270:15 277:11 283:7 283:22 286:1 291:2,3 292:5 292:16 293:16 312:5 314:10 315:10,18 327:4 328:11 329:2,6 338:18 339:20 342:7	344:3,19 345:8 <b>question's</b> 9:19 <b>questioning</b> 342:19 343:21 345:1 <b>questions</b> 9:21 81:12 91:20 260:13 287:15 328:4 342:5,12 343:8,12 345:5 345:16 347:18 <b>quickly</b> 262:20 341:4 <b>quote</b> 51:16 56:7 <b>quoted</b> 6:22 320:1 <b>quotes</b> 109:13 109:13
			<b>r</b>
			<b>r</b> 7:1 8:1 162:1 213:15,15 349:1 <b>race</b> 163:6,13 163:22 165:20 167:6 168:12 169:15 180:14 180:22 181:20 187:1 188:8 190:18 <b>radiation</b> 289:14,20

<b>radican</b> 249:17	<b>ratio</b> 63:6,22	180:4 185:9,18	<b>readily</b> 227:12
<b>rahman</b> 100:1	65:4,22 66:10	192:21,21	<b>reading</b> 20:11
100:8,11 101:2	66:18 67:2,5,9	219:7 257:21	98:11,12 145:1
102:8	67:18 68:5,17	280:19 302:19	218:4,16 234:3
<b>random</b> 79:3	69:2,15 71:15	323:1,5	300:18
79:10	74:12,15,21	<b>raw</b> 208:22	<b>reads</b> 343:13
<b>range</b> 93:20	77:6,10 92:14	<b>raymond</b> 44:4	<b>ready</b> 180:9
263:15 325:22	93:4 97:5	<b>rdd</b> 320:7	203:3 293:15
<b>ranges</b> 166:10	99:22 100:7,14	<b>reached</b> 115:18	<b>real</b> 72:3
167:10	100:15 101:17	116:7	<b>really</b> 61:9
<b>ranging</b> 296:11	105:6,12,18	<b>reaching</b> 47:21	80:13 96:13,18
<b>ranking</b> 301:21	106:22 107:22	49:15 139:1,7	233:2 234:8
<b>rapidly</b> 130:2	108:4,14 150:1	<b>read</b> 6:22 9:11	258:6
<b>rare</b> 133:8	151:22 152:20	15:20 19:18	<b>reapply</b> 13:8,22
135:13	153:2,16	20:7,9 23:4	<b>reason</b> 9:13
<b>rarely</b> 110:20	154:18 156:5	29:4 51:8,9,14	11:21 108:20
111:5	159:3,9 200:12	51:17 60:3	119:6,8 325:14
<b>rate</b> 30:21,22	200:18 201:2	63:18 65:2	<b>reasonable</b>
31:2,5,19 32:2	201:10 202:17	76:5,20 77:4	60:14,18,20
32:3,4 37:18	203:4 204:1	91:6 92:13	229:10,17
129:13 147:13	206:15 218:19	152:18 197:3	346:3,16,22
163:17 165:16	218:19,20,21	200:15 213:13	347:13
167:2 168:8	219:16 250:17	213:16,18	<b>reasoning</b>
180:18 181:16	257:2,10	216:15 223:1	47:17 48:4,7
186:19 188:4	279:12 280:9	224:10 233:2	<b>reasons</b> 14:1
197:7 307:11	301:21 303:10	236:15,18	165:9 211:19
315:14	303:21 323:5	237:19,20	<b>rebuttal</b> 20:12
<b>rates</b> 162:19	333:7,11,18,22	252:22 287:11	<b>recall</b> 12:10
163:4,9 180:3	334:3	297:2 301:12	18:1,2,3,6
180:11,12,12	<b>rationale</b>	312:4 316:9	19:21 20:11,16
204:15	269:19 270:16	329:7 332:18	26:13 38:14,19
<b>rather</b> 8:19	<b>ratios</b> 66:16	343:18 345:21	42:1 50:7,8,11
222:16 316:3	75:16,20 76:6	349:3	51:14,17 55:20
322:11	151:15 154:3		56:11,12,15



57:15 58:2,22	341:12,16,19	89:17 90:4	<b>redo</b> 72:22
59:7 62:2	343:22 344:10	91:7,8,15	<b>reduced</b> 174:19
68:11,12,16,22	345:1	148:12,16	175:16
74:3 75:15	<b>recalled</b> 224:13	160:15 161:3,5	<b>reenforces</b>
76:1,7 78:15	<b>receive</b> 137:17	162:3,6 197:3	207:6
84:5 91:4	<b>recently</b> 84:17	223:1 231:12	<b>refamiliarize</b>
100:11 102:22	85:13	231:15,17	202:21
103:12 114:20	<b>recess</b> 84:12	237:20 261:15	<b>refamiliarizing</b>
115:15 119:11	161:6 231:13	261:17 275:10	200:4
119:14 128:14	275:11 305:1	275:13 293:14	<b>refer</b> 109:14,20
131:11 132:20	313:18 328:20	304:18,22	120:4 133:15
142:2 146:18	<b>recognize</b> 10:8	305:3 313:14	214:13 265:8
147:15 148:7	57:21 179:21	313:17,20	268:15,18
152:7 155:15	214:3 268:12	316:9 328:15	275:16,17,21
193:2,4,12	270:17	328:19,22	276:3 324:5
195:5,8 209:13	<b>recognized</b>	329:7 336:20	332:1
209:18 210:10	197:18	344:9 347:22	<b>reference</b> 63:5
211:2,4 216:21	<b>recollection</b>	349:5 350:9	63:7,14 102:6
216:22 217:2,3	11:8 36:5 52:9	<b>records</b> 28:12	103:15 106:2
217:13,16,21	106:9 147:12	<b>recross</b> 4:2	111:4 146:15
218:2,4,15,16	225:20 271:22	<b>recruitment</b>	149:7 155:20
224:5 234:3,8	300:5 318:12	183:15	156:1 159:11
236:13 242:18	344:15 345:19	<b>rectal</b> 104:19	173:3 192:20
251:2,9 253:5	<b>recommended</b>	105:7,14 106:3	196:13 198:7
256:2 267:12	225:10	106:10,13	202:16 204:1
272:15,16	<b>record</b> 6:22 7:3	107:17 108:7	204:22 208:10
278:16 280:18	7:10,21 34:18	108:13,13,14	208:22 219:11
282:16 289:2	34:22 35:1,13	108:16	245:2,7 250:14
290:3 291:14	35:15 37:8	<b>recurrent</b>	260:1,8 270:5
302:2 315:4	49:2 51:9 53:5	264:6	270:9 274:13
316:2,11 317:8	76:20 77:5,15	<b>red</b> 11:10 31:16	276:17 279:5
319:8 331:1,2	77:16 78:21	31:20,21 33:19	301:9 318:5
331:15,18,19	84:11,14 88:1	<b>redirect</b> 4:2	321:4 340:16
331:21 341:11	88:21 89:4,12		343:22

<b>referenced</b> 19:17 83:22 99:10 102:7 156:5 203:13 224:17 248:8 248:15,16 249:19 250:6 258:21 337:4	<b>reflected</b> 86:22 157:1 173:20 202:18 <b>reflects</b> 156:8 176:4 201:12 203:8 204:18 257:4 304:11 <b>refresh</b> 294:4 <b>regard</b> 16:17 <b>regarding</b> 115:19 116:8 127:14 259:3 273:22 300:15 300:21 303:16 340:2 <b>regards</b> 82:3 <b>registered</b> 332:13 350:3 350:19 <b>registries</b> 92:5 <b>regression</b> 162:20 169:15 180:4 <b>regulatory</b> 267:22 <b>reimbursement</b> 332:13 <b>relate</b> 37:18 <b>related</b> 70:22 71:3 80:6 87:11 118:3 246:13 293:7 350:11	<b>relating</b> 11:18 252:12 334:11 <b>relation</b> 45:1 77:12 105:8,14 126:16 165:5 <b>relationship</b> 13:12 45:5 46:16 74:2,5 78:2 104:18 107:17 110:22 111:7,22 112:9 118:19 120:19 121:8,18 122:21 123:7 123:21 137:7 138:10 173:20 176:18 177:1 177:11,21 178:6 182:18 183:4 198:4,8 199:2 220:6,14 220:16 227:6,7 227:15 228:12 228:14 229:3 241:9,13 249:3 249:14 259:3 259:20 260:6 273:22 294:6 304:2 307:4 329:17,21 336:14 338:4 <b>relationships</b> 107:22 117:18 118:7 125:1,15	125:17 178:22 212:21,22 <b>relative</b> 99:16 169:9,18 170:16 171:9 172:1 188:21 189:2,20 190:12 206:11 314:2 320:5 <b>relatively</b> 197:6 197:22 <b>relevant</b> 27:21 28:20 29:7,22 30:4,6 45:17 45:18 82:2 108:9,10 112:17 113:1,4 238:5 <b>reliably</b> 240:22 <b>relied</b> 83:18 <b>relying</b> 82:20 <b>remain</b> 43:14 <b>remark</b> 294:18 <b>remember</b> 20:13 117:9,22 130:20 199:6 213:12 216:4 225:14 245:17 247:21 265:4 282:21 284:6,8 295:10 340:7 344:4 <b>renal</b> 165:13,21 166:15 170:12
--	--	---	---

181:15,21	78:10,21 81:15	242:5,9,10,10	331:14 334:16
182:13,19	81:22 92:11	242:17 245:8	335:4,19 337:4
189:20 306:15	103:3,8,14	246:5 248:5,17	339:6,11
<b>repeat</b> 76:19	105:19,21	248:19,20	340:10,16,17
222:20 329:6	106:12 108:10	249:6,20 250:6	340:18,22
339:20	109:14,21	250:10,12,15	343:5,9 347:10
<b>repeated</b> 329:5	113:5 115:7	252:20 253:5	<b>reported</b> 13:16
<b>rephrase</b> 9:7	117:2,9 119:7	255:16,22	14:6 256:11
338:20	120:5 124:17	258:21 259:4,6	<b>reporter</b> 7:10
<b>replace</b> 53:3,17	124:18 126:9	259:9 260:2,9	51:8 237:19
<b>replicated</b>	126:18 127:9	265:9 266:1,5	240:1 350:4,4
112:7,20	127:14,21	266:10 267:15	350:19
<b>report</b> 5:6,6,7,7	128:6,20,21	268:19,21	<b>reporter's</b> 8:16
5:9,10,13,18	130:19 131:8	269:20 270:5	<b>reporting</b>
6:11,15 34:6,9	138:3 140:11	270:17 271:2,7	85:22
34:11,13,16	146:19 152:4,9	271:8,15,18	<b>reports</b> 5:11
35:2,4,6,9,18	152:15 155:16	273:19,21	14:20 34:4
35:19,20,21	158:18 159:12	275:17 282:10	35:16 36:2
36:4 37:4,6	162:12,15	287:10,16	42:16,20 49:11
38:5,10,19,22	193:12 195:10	290:5,20 291:7	49:18 55:18
39:8,12,17,22	195:12,18	291:9,16	56:4,8,13
42:4,15 43:2,6	196:4,11 199:1	292:20 293:11	62:11 63:3
43:10,11,17	199:9 201:21	294:4 297:22	64:9 68:6 75:3
44:7,21 46:13	202:4,6 203:14	301:5 303:16	75:7,10 76:14
47:21 48:14	204:2 205:1,14	306:20 307:14	78:7,11 84:1
49:22 50:12,14	205:16 206:14	308:16 309:20	84:18 85:2,9
51:16,20 55:13	208:11,20	310:5 312:17	85:14 109:20
56:1,17,18,22	211:1 212:3,5	313:11,13,21	114:10 115:2,3
57:1,22 58:2,5	212:19 214:7	314:16,20	116:19,20
58:15 59:2,9	218:6 219:13	315:11 316:2,2	117:21,22
63:15 64:20	221:3 224:1,19	316:8,16,21	118:3,15,18
65:10 66:5,6	230:14,15	317:9,16	121:3 142:2
66:13 76:21,22	233:1 235:17	323:16 326:12	143:18 146:16
77:12,13 78:1	236:12 241:22	327:4 331:7,9	149:10,19

155:13 192:22 193:2,11 195:3 195:6 210:8 212:11,12 216:3 224:18 234:19 235:14 236:18 238:6 271:1 316:1 329:10 <b>represent</b> 319:3 <b>representation</b> 66:20 <b>represented</b> 94:7 95:4 96:1 97:2 185:8 <b>representing</b> 8:8 159:4 <b>represents</b> 100:18 169:14 304:15 <b>request</b> 10:11 <b>requested</b> 240:1 <b>require</b> 130:2 338:10 <b>required</b> 55:22 230:10 232:15 286:17 287:4 <b>requirement</b> 111:20 <b>requires</b> 338:15,22	<b>reread</b> 53:11 316:6 <b>research</b> 5:8 16:17,22 17:6 19:3 27:10 38:4,22 39:7 42:2 43:6 44:12 46:11 47:18 48:4 183:21 308:10 337:13 346:5 347:6 <b>resection</b> 108:18 <b>reserve</b> 9:11 <b>residency</b> 79:18 332:17 <b>residents</b> 40:7 40:17 141:9 265:7 319:5 <b>residing</b> 284:2 <b>resource</b> 141:11 <b>respect</b> 46:14 47:3,7 88:15 88:22 89:5,8 89:14,18 90:17 103:22 110:1 117:18 118:5,6 118:15,19 134:18 141:11 144:5 147:8,20 155:19 159:8 175:20 179:3	190:22 201:22 205:6 220:6 230:12 231:5 237:3,11 238:8 241:13,19 250:13 252:5 256:5,11,22 259:19 268:20 270:19 272:13 279:4 281:21 288:15 289:5 301:16 303:20 304:1 306:19 316:1,10,12 318:4 <b>respected</b> 18:22 <b>respectively</b> 319:14 <b>respond</b> 145:17 <b>responded</b> 147:22 <b>response</b> 120:18,20 121:5,6,15,16 122:18,19 123:7,18,19 124:22 125:15 125:16 147:13 159:21,22 160:5,9 173:1 173:19 175:14 176:3,5,17,22 177:11,20	178:5,8,22 209:13,16 210:2,9,10,14 211:15,17 212:1,14,20,22 229:3 344:18 <b>responsibility</b> 14:6 40:12,16 <b>responsive</b> 10:15,19 <b>responsiveness</b> 43:13 <b>rest</b> 310:14 <b>restate</b> 98:15 327:6 <b>result</b> 106:16 107:1 157:1 164:11 165:2 166:5,13 167:15,20 168:16 169:1 170:8 171:4,19 172:11 174:7 180:21 181:7 181:19 182:7 182:11 186:22 187:17 188:7 188:14 191:19 192:16 197:16 203:13 286:7 304:4 324:21 <b>resultant</b> 307:10
---	--	--	--

<b>resulted</b> 71:21	87:15 88:13	271:15 272:18	96:6,8 97:3,5
<b>results</b> 66:16	101:13 109:14	316:20 334:20	97:22 98:1,5,6
69:20,22 81:22	115:13 119:5,7	339:13,22	98:10 101:2,3
82:9 108:13,21	144:5,7,11,11	<b>reviewer</b> 29:15	101:6 102:3,4
110:5,14	186:10 205:21	<b>reviewing</b>	102:5,18
124:15 146:7	214:11,15,17	28:20 38:19	104:20 105:9
149:16 160:12	216:19 225:21	44:13 236:21	105:16,20
162:20 167:5	232:2,7 238:3	313:21	106:4,13,18
178:15,21	238:21,22	<b>reviews</b> 86:1	107:3,10
243:12 254:6	239:3 242:16	<b>rhode</b> 2:17 7:7	108:21 109:6,8
255:6 256:8	248:1 252:19	136:9	110:14 116:21
293:17 296:13	253:4 259:10	<b>ri</b> 1:14	116:22 117:6
297:14 308:18	277:7 293:4	<b>rice</b> 33:13,18	120:2 121:8,18
319:19	295:6,12,19	<b>richard</b> 43:19	124:19,20
<b>retained</b> 33:4	298:8 299:6,13	<b>ridge</b> 8:5	127:14 128:5
114:10 253:7	300:1,4 329:10	<b>right</b> 9:11 14:5	128:11,17
<b>retraining</b>	341:5	15:4,5,10,19	129:4,7 135:20
13:18	<b>reviewed</b> 10:11	16:5,7 20:18	143:18 149:12
<b>retrieved</b> 88:2	25:5,10 37:19	20:21,22 22:14	151:4,11
<b>retrospective</b>	43:3 45:1	22:15,16 25:7	153:17 154:11
99:6	68:18 75:3,6,8	25:10,11 32:5	155:9 156:10
<b>return</b> 144:19	85:5 88:16,20	32:6 34:5,14	156:21 158:19
149:8	91:21 97:13	36:3,19 37:7,9	159:6,19 163:2
<b>returned</b>	101:10 114:4,9	37:11 38:9	164:2,3 165:9
330:22	114:16 116:19	47:15,16 48:14	166:1,3 167:3
<b>review</b> 6:6 9:2	117:1,7,15	62:15 63:1	167:4,8,11
27:19 28:11	118:2,5,14,18	66:4,13,14	168:1,14,15
29:5,18 40:2	131:12 141:17	70:8 78:4,8	169:4,20,21
42:3,5,8,11,14	144:2,3,4,6,14	82:18 84:21,22	170:5,6,9,17,18
42:19 43:6,7	184:3,17,21	85:4 86:2,15	171:1,2,3,17
43:13,16 44:6	214:7 223:7	91:18,19 92:11	172:3 174:17
44:13,19 52:10	225:10 236:22	93:6,7,18,20	175:18,22
69:10 85:17,22	237:2 241:22	94:8,13,14,18	176:7 180:12
86:14,20 87:12	249:10 271:1,2	95:5,10,17	180:19,20

181:2,6,11,13	271:19 272:3,8	107:7 128:9	288:22 289:5,9
182:2,4,5	273:9 274:15	129:3 130:6	289:10,12,17
187:4 188:10	279:6 281:16	131:1,5,7,14	289:22 295:19
188:13 190:1,2	282:4 283:4,13	153:7 154:22	297:21 304:12
190:6,15	286:4 287:2,14	155:10 156:9	304:16 305:20
192:11,13,14	288:12 296:1	156:19 157:14	305:22 306:7,8
195:1 196:3	298:12 301:17	157:19 158:2	309:2,9,16,22
199:21 200:11	303:11,19	159:4 164:11	318:17 320:5
200:19,21	304:9 308:7	169:9,19	326:6 333:7,11
201:10 203:7	310:22 311:1	170:16 171:10	333:18,21
203:12 204:20	314:8,14 317:5	172:2 174:8	334:2 335:1,12
204:21 206:12	317:6 318:2,6	180:4 187:11	335:13 337:18
207:10 208:9	318:11,20	188:21 189:2	339:15 340:2
209:7 215:9,15	321:8,9,13	189:20 190:13	341:10
215:16 231:2	322:1 323:22	201:12 203:9	<b>risks</b> 128:3
235:8,11	324:18 326:10	204:19 206:11	310:15 318:2
236:22 237:1	335:17 336:10	207:1,3 210:16	318:10 335:2
239:6,13,15,16	337:5,19,20	210:20 218:19	<b>risky</b> 126:1
239:19 240:4,7	342:20 343:2,7	228:21 229:7	<b>ritz</b> 249:16
240:9,10,15,19	343:20 344:6	229:15 246:9	<b>rmr</b> 1:22
241:1,2,5,6,10	344:17,21	246:18 247:3	<b>robert</b> 3:2 7:3
241:15,21	345:4,12 346:2	247:19 256:5	<b>role</b> 277:19
243:15 244:5,6	346:12,18	256:12,14	284:3
245:8 246:12	<b>rigidly</b> 80:10	257:2,4,8,10,14	<b>roman</b> 39:13
247:7 251:21	80:19	258:2,9,13	40:21 43:1
251:22 252:3,4	<b>rin</b> 250:3	263:11,17,19	<b>room</b> 135:20
252:8,13 254:3	<b>rise</b> 319:4	263:21 264:1	<b>rosalind</b> 43:22
254:9,16,19,22	<b>risk</b> 5:15 66:16	264:13,16	<b>rosenfeld</b> 6:18
255:3,8,16	66:18 67:2,18	272:2,5,7,8	240:9 335:16
257:2,3,6,11	70:13 71:20	273:2 276:20	335:18 336:13
258:16 259:8	82:12 84:20	278:1 279:8,22	336:15 337:3
260:2 262:4	99:5,16,22	280:4,14 281:2	337:10,17
268:2 269:16	102:15 103:16	282:2,18 283:2	<b>round</b> 136:7
269:20 270:3	104:1,8,14	287:7 288:16	

<b>routine</b> 265:5 <b>row</b> 1:13 2:16 100:13 165:14 168:6 177:14 188:2 <b>rows</b> 201:1 <b>runder</b> 259:22 314:21 <b>ruled</b> 229:9,17 <b>ruzicka</b> 3:18	<b>saying</b> 31:7,8 32:1 87:2 108:11,20 122:21 123:13 124:11 125:13 192:1 201:7 217:1 248:21 274:4 282:13 291:11 311:18 <b>says</b> 27:18 28:7 29:17 39:22 43:2 46:18 53:14 54:18 57:8 63:20 65:2,8 66:8 94:2 95:19 98:20 99:21 120:17 128:14 128:18 148:11 154:21,21 156:11 211:22 219:4 225:5 232:12,20 247:21 259:17 266:13 269:13 274:11 286:17 287:3 293:3 308:6 319:12 320:3 333:9,12 335:9 337:10 <b>scenario</b> 238:14 325:18 <b>schedule</b> 31:11 31:13	<b>scheme</b> 45:14 45:16,17 46:2 46:7 224:6,8 225:8,17 233:19 <b>schistosomia...</b> 264:5,17 <b>scholar</b> 235:9 235:10 331:1 <b>schoof</b> 43:22 <b>school</b> 13:13 27:8 <b>science</b> 113:18 241:4 280:5 <b>sciences</b> 15:8 <b>scientific</b> 15:18 19:20 40:2,9 41:21 55:7 60:15,18,21 61:2,10,18 62:1 87:4,12 122:12 220:22 221:8 222:22 227:4 231:20 232:17 235:6 236:2 265:14 326:20 327:7 334:20 335:9 338:10,16 339:1 346:3,15 346:16,22 347:13 <b>scientist</b> 55:5	<b>scientists</b> 41:9 41:13 44:6,18 47:19 112:10 113:21 <b>score</b> 100:9 <b>scorecard</b> 139:12 140:4 <b>scoring</b> 139:11 <b>scott</b> 314:20 315:18 <b>screen</b> 86:13 89:19 <b>screening</b> 183:16 <b>seal</b> 350:16 <b>search</b> 86:4,8 86:19,19 88:19 89:13 235:6,13 236:1,5,10,15 237:3,4 238:2 264:20 <b>searches</b> 88:2 235:7 236:2,19 237:6,8,9 264:21 331:1 <b>second</b> 28:1 40:5 48:21 52:19 59:15 94:22 125:6 146:4 172:17 173:7 177:15 180:6 197:12 200:13 203:2 206:7,16
<b>s</b>			
<b>s</b> 5:1 7:1 44:4 162:1,1,1 213:15,17 <b>salaried</b> 247:14 <b>salisbury</b> 3:12 <b>sallmen</b> 6:17 <b>sallmen2024</b> 330:13,14 <b>sample</b> 70:22 206:10 <b>sapporo</b> 13:14 <b>save</b> 133:13,20 <b>savitz</b> 18:9 20:1 20:3,10,11 41:6,9 49:6 67:16 <b>savitz's</b> 19:19 49:9,14 <b>saw</b> 115:6 158:18 281:15 281:15			

219:22 226:22	293:1 297:2	128:21 129:9	225:13 226:17
242:4 245:4	332:19 340:10	135:3 136:7,10	226:20 227:2
251:15 265:13	340:13	138:5,14	228:1,7,9
276:17 278:12	<b>sections</b> 26:8,9	143:12 146:3	229:19 232:9
278:14 281:8	56:8,13	146:13,14	232:12,19,20
319:2 328:1	<b>see</b> 21:14 23:17	147:15 148:10	233:17 236:6
<b>seconds</b> 23:4	27:18 28:14	148:18 150:13	236:16 242:21
328:12,15	29:10 35:22	150:16,18,22	243:4,8,10,12
<b>section</b> 25:9	38:18 39:12,21	151:5,19 152:1	243:19 245:2
49:17,22 50:5	40:19 41:2,6	152:14 153:9	245:11 246:1
51:16 58:14	41:10 43:1	154:4,6 156:5	247:11,14,17
120:11 124:21	44:22 45:4,11	159:9 162:18	248:12 250:18
128:22 195:14	46:10,17,18,21	163:18 165:14	251:12 253:8
196:6,10,11	47:3,7,11	166:22 168:5,9	253:13 254:5
199:12,17	49:22 50:3	169:10 170:3	254:14 255:12
200:5 202:2,6	51:7 52:2,21	170:13 171:11	255:20 257:18
202:8,8,10,11	53:19 54:4,10	173:3,11,15	257:21 258:12
202:14,14	54:18,22 57:1	175:10,17,21	258:14 264:20
203:14,16	59:10 63:11	176:13,14	266:7,20
204:2,4,4	64:5 65:1	177:4,8,17	267:16 269:12
205:1,14,20	73:21,22 74:10	178:3 179:20	274:1,10
206:2,8,15	81:16,18 82:7	184:12 185:8	275:22 276:10
220:10 226:20	82:13 83:1,9	185:12,15,17	276:14,17
228:8 236:1	86:5,9 92:6,8	186:18,20	277:8,16
239:2,2,5,8	93:2,12 99:8	188:2 189:4	278:15 281:19
240:3,6,12,17	99:13,22	194:15 195:13	281:22 283:13
241:7 250:14	100:15 103:15	195:20 200:13	284:22 285:3
251:11,13,17	103:20 104:5	201:1,4,6,9	286:16 287:3,7
251:19 252:1	104:15 105:1	202:2 205:8	290:8,13,19
265:12 267:1,2	107:21 108:5	206:1,7,17	293:1,8 294:17
267:16,21	110:8 118:18	208:5,8 209:3	295:4,20 296:5
268:19 273:20	120:17 125:11	218:6,13,18	296:17 297:15
274:3 276:18	125:19 126:14	219:3 220:3,8	302:18,19
280:12 284:20	127:22 128:7	220:9,19 225:4	303:1,9 307:3



307:12 308:1,6 308:14,15,17 308:21 310:8 310:13 315:8 315:22 317:17 319:1,20 323:1 324:13 330:20 332:2,7,18,21 333:3,8,11,17 333:18,22 334:3,18 335:8 335:14 337:10 337:15 343:18 <b>seeing</b> 62:2 75:15 179:11 212:18 217:11 <b>seem</b> 267:12 <b>seems</b> 160:22 273:9 <b>seen</b> 19:17 21:20 23:22 45:15 75:17 87:11,13 114:2 114:19,20 115:1,2,3 117:21 198:4,8 211:16,17 219:11 224:14 232:10,11,21 238:18 253:6 315:15 317:4 <b>selden</b> 252:10 252:14 255:12 255:19	<b>selected</b> 319:3 332:15 <b>selection</b> 144:16 145:3,8 145:11,14 146:4,16 147:8 147:13 148:2 149:3 <b>semicolon</b> 93:10,18 <b>senators</b> 217:18 <b>sense</b> 31:15 338:19 <b>sensitivity</b> 147:16 149:6 277:8 <b>sent</b> 216:12 <b>sentence</b> 54:4 95:14 125:5,6 125:9 146:3 197:5 233:1 286:20,22 287:13 310:14 310:20 315:12 319:12 343:13 345:17,21 <b>sentences</b> 95:21 96:21 296:6 <b>separate</b> 117:22 127:17 143:8 269:9 <b>serve</b> 31:1	<b>served</b> 15:2 32:14,17 <b>service</b> 136:6 183:17,18 186:1 <b>serving</b> 30:17 <b>set</b> 16:16 40:10 326:17 347:8 350:8,15 <b>setting</b> 262:22 <b>seven</b> 137:15 254:18,20,21 342:19 <b>several</b> 25:5 26:6 40:1 107:21 127:13 206:9 217:17 227:9 310:21 <b>sex</b> 163:6,13,22 165:20 167:6 168:11 169:15 180:14,22 181:20 187:1 188:8 190:19 272:12,19 332:16 <b>sexes</b> 272:13 <b>shaded</b> 284:20 <b>shaking</b> 8:19 <b>shannon</b> 3:21 <b>shifts</b> 137:9,10 137:11 <b>short</b> 264:17	<b>shortcomings</b> 197:18 <b>shorthand</b> 350:4 <b>show</b> 10:3 15:21 23:1 56:16 63:13 81:14 85:7 86:4 97:13 111:2 123:19 142:20 143:10 148:6 157:18 159:22 160:5 163:21 180:2 186:22 227:11 240:13 251:20 252:2,6 281:1 281:5 294:5 298:20 308:18 320:9 <b>showed</b> 72:15 206:8 279:8 <b>showing</b> 14:17 21:11 99:2 162:13 175:8 179:19 184:9 214:2 232:6 268:11 295:17 330:4 339:14 <b>shown</b> 256:13 314:2 337:2 <b>shows</b> 86:12 99:16 121:5,15 122:18 167:5
--	--	--	--

180:3,21 188:7 208:7 282:2 <b>shrewsbury</b> 8:5 <b>sic</b> 15:8 30:4 61:8 83:8 92:4 99:16 199:12 227:16 260:16 261:21 269:10 276:20 295:2 296:11 310:16 318:2 335:13 337:12 <b>sign</b> 9:11 <b>signature</b> 350:18 <b>significance</b> 20:15 63:7,22 65:4,22 66:10 76:10,13,15 77:6,10 78:1,6 78:17 79:1,8 79:21 80:7,16 81:18 82:16,21 83:6,12,19 84:1 94:17 166:5 167:15 170:8 171:5,19 172:11 182:7 183:2 187:16 189:14 190:8 192:16 218:1 218:11 323:8 323:14	<b>significant</b> 50:13 81:2,3,4 82:1,10 83:6,7 94:17 95:10 96:8 98:3 101:18 102:1 102:20 103:16 104:3 106:16 107:7,9 144:17 145:3 147:1,10 164:12,21 166:6 167:16 168:19 170:9 171:6,20 172:12 182:8 187:12 189:15 190:9 192:17 218:10 249:5 249:14 252:11 259:5 274:13 296:7 323:6 <b>significantly</b> 308:8 <b>silver</b> 247:11 247:22 248:3,4 248:7 249:18 260:1 <b>similar</b> 89:1,7 110:5,13 166:19 225:5 262:6 281:2 306:1,1 310:10 311:4,7,8,13,21 312:12,17,20	313:8,12 317:21 319:5 320:19 <b>similarly</b> 202:16 <b>simply</b> 201:7 <b>single</b> 110:20 111:6 126:11 140:13 <b>sir</b> 62:19 252:15 <b>sit</b> 58:22 117:4 119:14 193:4 251:4 263:1 291:14 331:19 <b>site</b> 141:21 336:14 <b>situation</b> 145:5 <b>six</b> 57:22 58:2,5 58:21 59:9 216:6,20 <b>size</b> 70:8,22 83:8 206:10 <b>skip</b> 194:1 323:17 <b>skipped</b> 28:4 <b>slight</b> 69:3 <b>slowly</b> 129:21 <b>small</b> 122:11,12 191:15 206:10 269:7,9 <b>smaller</b> 192:5 <b>smoke</b> 273:3,4	<b>smoking</b> 263:22 264:2 272:1,19 273:1 273:6,12 274:5 274:7,14,19 275:2 276:13 276:19 277:9 277:18,19,21 278:7,11,20 279:1 289:22 306:13,16 309:3,22 <b>smr</b> 182:22 <b>smrs</b> 247:14 <b>social</b> 332:14 <b>society</b> 15:18 273:1 <b>socioeconomic</b> 276:19 <b>soldier</b> 184:11 <b>solmi</b> 92:3,4 96:11,14,16,19 <b>solvent</b> 45:1 46:14 47:7 128:4 256:20 <b>solvents</b> 276:7 284:22 330:19 336:8 <b>somebody</b> 290:17 <b>someone's</b> 262:13 <b>soon</b> 160:17
--	--	--	--

<b>sorry</b> 9:12 22:17 23:9 28:2 39:18 48:1,7 57:3 61:19 76:11 79:5 97:10 98:11 111:19 114:13,14 118:10,13 125:2 150:3 185:3 189:7 191:5 195:21 196:9 199:15 200:6 203:21 208:2 223:14 237:17 246:22 251:16 262:1 264:11 270:14 270:14 281:11 281:12,12 283:21 285:10 286:1 291:2 301:7 306:14 306:14 310:5 313:4 316:5 320:4 321:18 327:14 329:3 338:18 <b>sort</b> 221:7 <b>sound</b> 15:9,19 43:10 <b>sounded</b> 345:11	<b>sounds</b> 9:20 20:22 33:21 222:15 223:2 256:2 292:1 295:13 <b>source</b> 15:21 69:11 140:21 <b>sparing</b> 92:20 95:16,21 96:21 <b>speaking</b> 211:16 248:14 <b>specialist</b> 133:16 324:6 <b>specific</b> 11:1 13:1 16:2 42:7 67:7 73:13 86:6 101:15 119:19 130:16 134:2,5,9 193:3,11 196:18 230:9 287:6 292:1,4 292:11,12,13 292:16 296:11 300:14,21 305:8 310:9 311:9 317:20 344:19 345:8 345:11,14 <b>specifically</b> 16:18 25:13,19 36:13 37:18 89:10 91:4 102:13 106:13	119:11 126:4 131:6 140:8 146:18 151:3 197:2 213:10 232:1 259:9 271:11 274:16 280:5,11 287:13 291:6 291:10,15 307:7 318:4 327:19 335:5 340:13 <b>specificity</b> 126:6,10 140:9 140:12,19 <b>specifics</b> 131:11 273:14 311:16 <b>specify</b> 133:11 291:7 <b>speculating</b> 238:19 <b>speed</b> 315:5 <b>spent</b> 214:20 216:5 <b>sponsored</b> 98:2 101:22 <b>ss</b> 350:2 <b>staff</b> 30:9,12 <b>stand</b> 21:20 25:22 26:20 58:19 59:5,12 62:12 63:17 100:3 105:2	106:5 131:8 148:19 158:21 196:7 199:14 200:4 203:19 205:2,17 212:3 212:8 267:5,17 270:12 271:4 285:20 293:12 294:12 297:4 <b>standard</b> 49:19 50:1,5 55:5 61:18 62:1 64:3 82:4 163:4,9,17 165:16 167:2 168:8 180:3,10 180:18 181:16 185:18 186:18 187:14 188:4 192:20,21 204:14 222:5 222:12 223:2,9 226:1,3 231:1 233:7,12 279:21 310:2 323:11 326:17 <b>standardized</b> 162:19 185:9 218:19 <b>standards</b> 43:12 183:16 225:5 229:21 <b>stands</b> 291:16
--	---	---	--

<b>start</b> 9:9 56:22 125:4 215:2,17 215:20 216:2 283:15 322:2 <b>started</b> 31:12 31:21 <b>starting</b> 147:17 195:13 199:11 219:20 254:12 <b>starts</b> 238:22 <b>state</b> 7:21 43:21 44:4 59:16 66:3,13 82:9,20 92:13 97:7,12 98:2,7 98:15,16 101:21 104:2 110:1 124:17 126:9 138:8 152:18 153:2 220:5 235:22 241:3 265:12 290:9 307:8 310:8 321:21 <b>stated</b> 273:1 317:3 326:13 341:13 <b>statement</b> 20:12 54:14 65:12 110:19 134:19 149:2 267:21 273:8 316:4 317:19	<b>statements</b> 212:18 <b>states</b> 1:1 8:8 23:13 52:22 54:5 58:16 99:7 111:5 146:4 218:8,18 220:13 227:2 228:11 242:6 268:6 277:17 280:6 308:18 319:2 <b>station</b> 2:7 <b>stationed</b> 173:2 311:11,19 312:11 314:1 315:12 <b>statistic</b> 97:12 250:21 <b>statistical</b> 20:15 63:7,22 65:4,21 66:9 76:9,13,15 77:5,9,22 78:5 78:17 79:1,8 79:21 80:6,15 81:18 82:1,16 82:21 83:5,11 83:19 84:1 90:12 91:1 94:16 95:12 107:14 165:1 166:4 167:15 170:8 171:5,19	172:10 182:7 183:2 187:15 189:13 190:8 192:15 218:1 243:14,15 244:19 254:8 255:7 323:7,14 <b>statistically</b> 81:2,3 82:10 94:17 95:10 96:8 98:3 101:18 102:1 102:20 103:15 104:3 106:16 107:9 164:12 164:20 166:5 167:16 168:18 170:9 171:5,20 172:11 182:8 187:12 189:14 190:9 192:16 218:10 249:5 249:13 259:4 323:6 <b>statistics</b> 79:14 79:16,19 198:18 199:1 282:22 332:21 <b>status</b> 276:19 <b>statute</b> 50:9,12 51:15 56:8,13 58:6 59:1 <b>statutory</b> 54:14	<b>stayner</b> 213:14 <b>steenland</b> 213:16 <b>stenographer</b> 1:21 <b>stenographic</b> 7:9 <b>steven</b> 1:9 4:3 7:8,12,22 349:2,15 350:6 <b>stoto</b> 44:1 <b>strategy</b> 246:17 <b>stratified</b> 99:22 100:6,14 <b>street</b> 3:11 <b>strength</b> 63:1,4 63:19,21 65:3 65:20,20 66:8 71:13 72:3 109:3 <b>strengths</b> 147:5 <b>strictly</b> 211:16 248:14 <b>strike</b> 64:18 334:18 <b>strings</b> 236:11 <b>strong</b> 165:3 166:13 167:20 169:1 182:11 183:18 227:18 296:12 <b>structural</b> 134:20
--	--	---	---

<b>studies</b> 6:8 40:5	244:2,4,8,8,19	70:16,19,20	196:1,1,11
40:8 75:3,16	249:3,13 250:2	72:22 73:13,14	200:1,7,21
75:18 76:2,6	251:12,19	83:16 84:17	201:22 202:17
83:11 85:17,21	252:2,5 253:12	85:14 88:18	204:5 205:22
86:13,13 88:1	253:15 254:6,9	89:2,20 90:2	206:8,15
88:12,12,12,14	254:19 255:2,8	90:16,20 91:5	207:19 211:13
88:16 89:1,6	259:1,11,18,21	91:9 92:10	211:13 229:4
89:12,14,19,20	260:5 270:6	97:15,17 98:3	229:13 235:3
90:5,5,11,21	272:18,20	98:22 99:3,6	238:15 239:17
91:5,21 92:5	273:11 274:9	99:10,11	239:20 240:8
97:13 110:3,4	274:15,20	101:15,22	240:18,21
110:6,12,13	278:11 279:11	102:15 103:20	241:8,12,18,18
113:3,6 127:13	279:21 280:9	103:22 104:17	243:2,12
127:16 138:19	280:12,13,15	110:20 111:6	244:10,11,12
141:18,21	280:19 281:2,6	111:21 112:7	244:13 245:3,7
142:4,9 143:17	282:16 283:1,3	113:8 122:3	245:10,11,12
146:20,22	286:17 287:3	123:4 124:3,10	245:14 246:1,4
147:1,2,4	293:5 294:5	124:14,15	246:8,9,13,20
160:12 183:21	300:8 301:15	127:22 128:2,9	247:11,22
193:2,10 195:3	306:19 307:3	128:15 129:2	248:1,3,4,7
195:6,15 196:5	309:19 310:9	142:22 143:12	249:11 250:15
196:12,14	310:21,22	143:20 144:1	251:3,10 252:7
197:9 198:5,9	314:19 315:2,6	144:17 145:15	252:11,14
198:19 199:2	316:8,11	146:2,17 147:6	253:2,9,21
199:13,18	317:20 321:11	147:9,18,18,21	254:15 255:6
209:17 211:18	330:3,4,7,10	148:1 149:9,15	255:13,15,19
227:10,19	334:19 335:9	149:17 152:14	255:19,20,22
228:17,18,19	339:14,18	155:21 158:8	256:4,7,8,18,19
234:14 237:2	340:1,5,11	162:11,15	257:1,19 258:6
238:4,5,8,11	346:5 347:6	172:16 175:6	258:19,20
239:6,9,11	<b>study</b> 5:12,16	175:10 179:16	273:14,17
240:4,7,13,22	5:17,19,19 6:2	179:21 192:3	274:8,22
242:15 243:5,7	6:9,12,13,14,17	194:8,19	275:17,22
243:15,18,21	25:2 43:13	195:19,20	276:3,4,7,9,13

277:1 278:15 278:17,19 279:6,6,15,16 279:17,19 280:3 281:1,4 281:12 282:8 283:8,9 284:10 284:19 286:7 286:12,14,16 286:21 287:12 287:19 293:18 295:15,22 297:20 298:4,5 298:7,14,15,16 298:18,19,21 299:1,7,9,10,11 299:12,14 300:2,3,3,7,14 300:20 301:11 301:20 302:6 304:15 307:5,7 307:16,20 308:3 309:10 309:13,15,16 309:21 310:3,4 314:3,7,7,8 316:12,15,20 317:8,16,17 318:11 319:8 330:13,14,20 331:10,13,16 331:17,20,21 337:12,17 340:8	<b>study's</b> 66:16 69:20 145:22 <b>subgroup</b> 162:21 173:4 175:15 183:19 <b>subject</b> 12:16 12:19 14:8 40:15 246:13 346:19 <b>subjects</b> 73:14 320:6,7 <b>submitted</b> 144:7 <b>subpoena</b> 5:3 10:5,9,13 <b>subscribed</b> 349:16 <b>subsection</b> 53:2 53:16 195:19 <b>subsequent</b> 32:4 240:22 267:9 270:6 <b>substance</b> 9:10 12:9 82:22 <b>substantial</b> 246:19 247:4 296:10 <b>substitute</b> 278:6 <b>subtleties</b> 11:15 <b>subtype</b> 129:18 292:15 297:18 <b>subtypes</b> 126:20 127:1,3	127:18 129:14 130:6,16 131:19 132:12 132:16,22 173:14 290:16 296:21 <b>sufficient</b> 45:5 45:6 46:15,16 59:18,22 60:10 207:8 220:13 220:15 222:4 222:11 227:8 228:12,13,17 265:17 266:14 268:21 290:10 291:11 343:15 346:7 <b>suffolk</b> 350:2 <b>suggest</b> 335:10 <b>suggestive</b> 45:7 45:10 46:20 47:2,6 <b>suggests</b> 334:20 <b>sullivan</b> 5:21 184:7,12 <b>sum</b> 335:2,13 <b>summarized</b> 297:13 <b>summarizes</b> 75:13 <b>summary</b> 59:11 59:16 97:8,12 228:21 290:22 296:12 340:14	<b>summer</b> 216:3 <b>sung</b> 249:17 <b>supervision</b> 14:3 <b>supervisor</b> 137:19 <b>supplemental</b> 34:15 115:10 117:8 297:6,9 297:12 <b>supplementary</b> 228:18 <b>supplies</b> 38:6 39:8 <b>support</b> 55:7 121:7,17 123:20 141:22 178:9 179:2 196:12 211:6 <b>supported</b> 112:19 113:10 119:16 <b>supporting</b> 30:9 178:22 307:4 <b>supportive</b> 121:22,22 123:7 <b>supports</b> 122:20 213:8 228:19 326:21 327:8 <b>supposed</b> 37:21
---	--	--	--

<b>sure</b> 13:11 22:22 23:20 28:18 29:14 33:21 34:20 36:14 46:9 53:8 66:17 71:7 75:9 78:18 79:12 80:9 83:21 84:8 108:17 115:12,13 117:4,14 121:4 121:14 127:15 132:14 138:18 142:3 143:6 145:7 155:5 160:20 184:4 202:6 234:17 239:12 244:21 248:14 249:8 264:21 275:7 286:9,13 302:10 322:21 341:19 342:22	<b>suspect</b> 17:1 26:14 96:11 114:19 119:12 131:4,16 264:3 264:6 289:9 324:15 <b>suspected</b> 324:4 <b>suspended</b> 13:7 13:22 <b>swear</b> 7:11 <b>swedish</b> 92:5 <b>sworn</b> 7:15 349:16 350:8 <b>synergism</b> 339:7 <b>synergistic</b> 336:8 337:14 338:22 <b>synergistically</b> 335:1,12 <b>synergy</b> 338:9 338:15 <b>system</b> 137:15 139:11 <b>systematic</b> 86:1 214:11,17 216:19 293:4 295:19	<b>tab</b> 334:18 <b>table</b> 6:8 99:14 104:22 105:5 105:11 107:16 107:16 148:21 149:13 153:11 153:22 158:19 158:20 159:5 162:16 163:2 172:15,18 173:1 175:13 175:14,20 176:5 178:17 180:2 185:7 186:7,14,15 200:20 201:7 202:18,22 203:4 204:11 205:6 208:3 209:3 242:14 242:19,20 243:4,10,11,19 243:20 244:1 244:17,18 248:16,19 253:8,12 254:5 254:11,14,18 255:5,5,18 256:9,12 259:2 282:21 285:11 297:10,12 299:20,20,21 299:21 302:16 303:6 320:22	320:22 323:1 331:22 332:2 332:21,21 <b>tables</b> 155:15 205:4 207:15 242:16 249:2 249:19 250:6 253:4 259:2 282:17 299:22 <b>tabs</b> 39:19 <b>take</b> 9:18 15:13 23:3 36:11,13 38:15,15 62:3 64:15 72:22 84:7,9 99:13 121:1 136:8 149:13 158:19 166:21 178:15 186:9 199:8 214:11,16 215:18,19 218:5 224:18 224:21 231:8 248:10 258:4 273:16 275:5,8 283:9,18 284:9 300:4 302:3 331:22 343:3 <b>taken</b> 57:13 68:3 84:12 161:6 231:13 272:19 274:14 274:19 275:11 305:1 313:18
<b>surely</b> 7:22 48:22 <b>surprise</b> 113:17 238:1 <b>survey</b> 43:20 143:21 144:19 147:21 <b>surveys</b> 149:8 <b>survival</b> 197:7 197:20	<b>t</b> <b>t</b> 5:1 11:11 162:1 213:15 213:17 349:1,1		

328:20 <b>takes</b> 241:4 <b>talibov</b> 127:21 <b>talk</b> 8:18 126:17 292:2 292:10 <b>talked</b> 286:3 <b>talking</b> 101:14 108:12 118:21 122:3 150:6 207:19 231:18 278:17 314:10 <b>tc</b> 151:15 241:9 282:19 311:21 339:16 <b>tce</b> 25:14 26:11 40:4 45:1 46:14 66:2,12 77:8,12 78:3 110:7 115:20 116:9 117:17 118:16 128:10 152:19 153:4 156:2,3 240:18 243:1,11,20 246:10,15,19 246:20 247:4,4 249:3,14 265:14 266:12 267:10 284:16 287:20 288:11 300:21 301:3 307:4,8 308:8 308:12,19	311:3,14 312:14,21,22 313:8 314:5,12 314:19 315:1 315:14 317:2,8 321:16 326:22 327:9 329:8 338:4 340:3 <b>teach</b> 141:8 <b>technical</b> 43:4 <b>technically</b> 93:10 137:15 210:21 324:22 325:8,9 <b>ted</b> 3:18 <b>tell</b> 8:14 122:5 131:16 135:13 135:17 178:20 214:21 215:5 230:15 253:7 256:21 263:5 271:14 341:2 <b>telling</b> 261:9 <b>ten</b> 253:12 <b>tend</b> 157:10 <b>tendency</b> 234:13 <b>term</b> 11:14,14 18:20 19:10 59:18 60:1,11 72:16 74:11 75:16 77:9 78:5,19 79:7 110:2 174:2	222:15,16,17 222:18,21,22 223:15,17,20 231:18,19 232:13,15 233:3,5 234:4 234:10 236:16 272:4 341:21 <b>terminated</b> 13:19 <b>terminologies</b> 345:6 <b>terms</b> 74:1 76:15 77:22 79:1,20 86:4,8 125:21 235:13 236:3,5,8,10,14 236:17 237:3 <b>test</b> 83:11 278:21 <b>testified</b> 7:16 12:2 55:14,22 216:18 217:3 225:16 <b>testify</b> 23:16 <b>testifying</b> 10:22 217:16 224:5 <b>testimony</b> 9:15 14:19 21:18 28:9 49:14 116:18 210:14 217:13 225:21 233:18 305:11 349:4,6 350:9	<b>testing</b> 12:5 218:1,11 <b>tests</b> 262:16 <b>tetrachloreth...</b> 238:16 267:11 287:21,22 <b>tetrachloroet...</b> 266:6 318:18 <b>tevnan</b> 1:22 7:10 350:3,19 <b>text</b> 156:13 248:20 283:13 320:11 <b>thank</b> 10:1 23:7 32:13 39:6,20 43:16 49:4 50:2 51:5,11 53:11 85:11 93:16 103:6 120:13,15 129:9 188:13 203:17 226:12 302:11 322:1,1 342:7,9 344:17 347:18,19 <b>thankfully</b> 54:15 <b>thanks</b> 32:11 34:17 143:9 198:6 255:1 <b>theoretical</b> 338:11,17 339:2
---	---	---	---



<b>theory</b> 191:2,7 191:11 <b>thing</b> 71:20 124:2 143:2 223:4 253:1 301:2 328:7 <b>things</b> 51:18 96:10 141:8 213:13 217:9 230:9 262:6 306:10 315:5 <b>think</b> 11:10 12:2,8,11 15:20 16:10,19 16:21 17:3,22 19:4,5,14 24:2 24:22 29:1 30:2 31:16,21 32:9 37:17 50:15 51:22 58:2 61:8,15 64:16 71:10 75:13 76:2,8 77:4 78:9 81:11 96:15 103:2 107:19 108:2 115:2 116:17 122:4,6 122:14 132:5 137:4 140:3,8 141:2 142:15 144:9 147:14 151:2 155:6 157:11,20	160:8 162:16 164:9 182:17 186:12 189:18 192:6 193:20 198:13 207:18 208:4 209:8 213:11 214:12 216:3 219:10 221:2,5,10 224:17 230:4 233:22 238:14 246:6 259:9 260:11,22 264:6 265:2 272:4,6 274:4 277:13,14 278:13 281:9 285:8 286:3 287:17,19 288:3,7 291:7 292:4,9,12,14 298:17 299:14 303:11 310:17 313:11,12 316:7 320:15 320:16 321:18 322:7 325:18 326:9 327:16 327:19 330:9 335:22 338:1,1 344:1,2,13 345:7 <b>thinking</b> 114:14 212:6,7	287:17 <b>third</b> 40:9 95:20 125:8 153:14 169:8 <b>thorough</b> 27:19 28:11 29:6,18 <b>thought</b> 50:13 61:19 114:13 137:3 217:14 234:1 271:17 274:12 278:14 285:9 321:1 <b>three</b> 137:16 159:16 174:20 311:12,20 312:11,20 313:7 339:6 <b>tier</b> 26:2 <b>till</b> 135:13 <b>time</b> 7:5 9:17 21:5 24:1 34:21 35:12 72:20 73:1 84:6,10,13 126:10 136:14 136:19 140:12 161:4 162:2 186:9 214:20 215:6 225:17 231:11,14 241:4 275:9,12 294:3 299:6 300:4 304:21 305:2 313:16	313:19 322:11 324:12 328:16 328:18,21 341:3 342:4,8 347:20 <b>times</b> 30:5 111:10,14 129:22 137:19 183:10 273:3 305:7 <b>tired</b> 327:14,22 <b>titled</b> 269:21 <b>today</b> 8:14 9:15 10:4,9 58:22 117:5 119:15 150:7 193:4 213:8 251:5 279:10 291:14 331:19 342:8 346:5 <b>today's</b> 7:4 <b>together</b> 70:3 <b>told</b> 91:12,14 325:13 <b>took</b> 14:6 215:2 215:6 <b>top</b> 146:3 177:14 245:8 267:21 283:11 284:21 290:8 326:9 336:1 341:1 343:13 <b>topic</b> 20:14 27:11 209:9
--	--	--	--

260:12 <b>tort</b> 32:15,18 33:1,5 58:10 58:15 <b>total</b> 332:15 <b>towards</b> 82:11 <b>towns</b> 319:6 <b>tox</b> 136:19,20 <b>toxic</b> 32:15,18 33:1,5 182:18 186:2,7 324:16 324:21 325:14 <b>toxicity</b> 103:11 <b>toxicological</b> 55:6 84:17,19 85:2 339:14 340:1 <b>toxicologist</b> 324:13 <b>toxicology</b> 5:11 85:2,9,14 136:1,5,10,12 136:16 141:7 225:6 242:7 268:5 308:16 324:9,10 325:11,20 <b>toxins</b> 336:9 339:7 <b>track</b> 26:18 118:7,9 <b>traditional</b> 82:1,16,21 83:19,22 94:16	95:12 107:14 164:13 165:1 166:4 167:14 170:7 171:4,18 172:10 182:6 183:2 187:15 189:13 190:7 192:15 323:7 323:13 <b>traditionally</b> 80:18 81:1 83:15 107:8 <b>trained</b> 13:14 <b>trainees</b> 265:7 <b>training</b> 24:9 53:22 54:13 55:3 79:18,18 139:21 141:6 141:13 213:3 346:4 347:6 <b>transcribed</b> 6:22 <b>transcript</b> 9:2 288:7 349:3,5 <b>translate</b> 322:16 <b>travier</b> 249:16 <b>treat</b> 101:16 102:4 135:6 263:4 305:5,8 <b>treated</b> 305:11 323:21 <b>treating</b> 135:15 260:16,20	261:11 <b>treatment</b> 100:1,7,20 129:17,21 130:3 261:12 261:12 <b>trend</b> 210:9 211:6 <b>trends</b> 211:1 <b>trial</b> 55:14 <b>trials</b> 221:13,14 221:15 <b>trichloroethyl...</b> 265:13,18 266:5,15,15,18 271:19 285:2 307:17,20 332:22 333:16 <b>true</b> 24:22 25:4 25:15,16,21 26:7,14,19,22 41:19 49:11,12 56:1 64:7,11 64:14 66:19 73:16 75:10 85:3 104:21 111:10,14 134:18 140:17 141:14 148:3 176:6 198:10 201:15 210:18 259:6 260:4,11 280:21 284:15 314:9 324:1	333:15 335:3 338:1 349:5 350:9 <b>trusted</b> 15:17 <b>truth</b> 8:14 <b>truthful</b> 9:14 <b>try</b> 147:13 262:17,18 273:15 309:11 338:20 <b>trying</b> 133:13 149:6 169:11 172:19 201:4 207:14 217:9 225:14 265:2 293:11 294:3,4 <b>tumor</b> 306:11 <b>turn</b> 28:3 29:3 52:18 54:3,16 63:16 81:15 103:14 107:15 109:22 146:2 148:9 151:13 152:9,13,17 153:22 155:17 162:16 172:15 186:11 205:16 209:8 251:16 276:16 287:14 294:15 301:5 307:1 310:4 323:15,17 326:11
--	---	---	--

<b>turning</b> 44:21 290:4 294:9 <b>tvoc</b> 341:1 <b>tvocs</b> 340:6,22 <b>two</b> 18:12 19:4 23:4 70:21 71:11 96:10 135:8 137:16 191:14,17,19 201:1 230:13 246:7,17 262:5 262:5,10 270:6 281:2 283:3 301:15 320:18 <b>type</b> 57:14 73:12 133:11 145:18 244:10 289:3,4,8,9 291:15 299:12 324:16 <b>types</b> 132:12 134:8 145:13 289:13 290:11 290:17 291:4 295:3 343:16 346:8 <b>typically</b> 18:20 300:8,12 306:6 324:7 <b>typo</b> 310:18	<b>u.s.</b> 2:3 11:12 43:20 184:11 185:11 <b>um</b> 78:22 92:2 95:14 100:10 101:11 102:14 121:12 130:22 135:14 136:2 137:12 178:20 259:14 280:20 288:2 290:7 291:1 299:5 308:5 325:3 <b>umass</b> 13:13 137:14 213:11 <b>unable</b> 9:14 <b>unaware</b> 47:17 <b>unbiased</b> 40:14 <b>uncertainty</b> 82:5 218:21 <b>under</b> 8:9,13 12:3 40:6 72:2 82:1 94:15 95:12 100:1,7 107:13 124:21 126:13 127:6 128:21 140:15 162:6 164:13 166:4 167:14 170:7 171:4,18 172:10 173:15 182:6 189:13 190:7 192:15 212:11 235:22	239:11 250:13 275:20 276:18 294:17 298:19 317:19 319:1 323:6,12 332:13,19 <b>underestimates</b> 296:15 <b>undergoing</b> 261:12 <b>understand</b> 8:11,13,20 9:3 9:5 16:8 18:3 22:1 27:12 48:2 75:19 76:11,14 78:16 78:18,22 79:7 108:8 111:3 122:2 123:3 124:2,14 134:10,14 154:13 162:6 174:17 178:18 185:21 193:14 258:5 264:12 283:21 300:17 316:5 320:14 321:4 341:20 341:21 <b>understanding</b> 15:22 16:11,14 17:4,8 18:17 45:22 50:18 62:16 74:14,16	76:9 94:16 110:10 144:3,9 144:12 145:11 163:7,15 170:7 171:18 174:21 182:6 183:10 190:7 210:4 251:1 262:19 271:20 284:4 300:6,13,20 318:8 322:14 323:7 <b>understating</b> 197:17 <b>understood</b> 37:21 345:6 <b>underwent</b> 144:10 <b>unexpectedly</b> 166:20 247:6 <b>unexpired</b> 12:8 <b>unfamiliar</b> 11:16 331:12 <b>united</b> 1:1 8:8 58:16 99:7 242:6 268:6 <b>university</b> 13:13 14:9 18:16 43:17,18 43:19,22 44:2 44:2,4 <b>unknown</b> 338:7 <b>unpublished</b> 176:7
<b>u</b>			
<b>u</b> 13:16			

<b>untied</b> 280:6 <b>update</b> 184:10 <b>upper</b> 73:2 74:16 164:16 167:13 168:17 171:2,16 172:8 187:10 190:5 218:22 <b>urinary</b> 163:16 166:19 173:10 173:14,18 175:19 180:17 186:12 189:2,6 264:7 281:19 <b>urine</b> 262:11 <b>urology</b> 261:10 263:7 <b>usatsdr</b> 223:12 <b>usdoj.gov</b> 2:10 <b>use</b> 13:17 18:20 19:10,12 64:7 65:1 66:21 74:4 75:15 76:5 77:22 78:5,13,19 82:15 85:19 86:16 87:7,9 89:8 92:15,19 95:17 97:14,16 97:21 98:9,17 99:5 109:9 157:10 217:22 218:8,11 219:6 221:10 223:15	223:17 230:13 232:18 234:4 296:14 <b>used</b> 46:2,7 47:19 48:5,9 55:4 60:14,20 62:17 68:5,12 68:17 74:1,10 74:20 75:8,19 76:2,7,13 78:7 79:1,8,16,21,22 85:22 86:5,12 86:21 87:3,5 87:13 96:11,15 97:19,20 139:19 140:21 141:13 210:2,5 219:15 220:21 221:8,12 222:15 224:7 225:5,8 229:22 230:7 231:20 232:16 233:8 233:13 234:5 235:10,14 236:5,10,16,17 238:17 272:4 291:8 317:1 341:9 <b>useful</b> 40:8 <b>users</b> 99:18,19 <b>uses</b> 42:3 55:5 220:4	<b>using</b> 77:9 78:16,20 139:20 236:3,8 <b>usmc</b> 6:1,4 194:6,10,17,21 <b>usually</b> 133:4,5 140:17 322:7 324:17 <b>utility</b> 229:5,14 <hr/> <b>v</b> <hr/> <b>v</b> 40:22 58:16 <b>va</b> 217:18 224:8 225:18 <b>va's</b> 217:5 225:11 <b>vaguely</b> 38:20 <b>valid</b> 122:4,6 122:16 <b>value</b> 228:22 258:15 <b>varia</b> 212:13 <b>varies</b> 129:14 137:9 <b>various</b> 163:1 180:5 196:12 207:15 212:11 212:12 275:1 <b>verbally</b> 8:19 <b>verbiage</b> 320:19 <b>verification</b> 73:15	<b>verify</b> 180:7 207:13 <b>vernacular</b> 221:8 <b>version</b> 5:19 174:18 175:3,6 175:9,16,20 176:7,12,21 177:3,7,14 178:2 <b>versus</b> 11:11 130:12 136:15 153:1,7 169:9 208:16 209:5 222:21 287:20 287:20,21 303:8 304:13 340:20 <b>veteran</b> 183:8 183:11,14,22 184:1 185:1,4 190:22 191:3,8 191:11,13,16 191:20,21 193:18 233:12 233:20 <b>veterans</b> 6:7 184:11 185:10 192:4 225:12 226:17 232:3,8 233:7 <b>video</b> 7:6 <b>videographer</b> 3:2 7:2,4 34:21
--	---	---	--

35:12 84:10,13 161:4 162:2 231:11,14 275:9,12 304:21 305:2 313:16,19 328:18,21 347:20 <b>videotaped</b> 1:9 <b>view</b> 27:21 29:8 29:22 233:19 278:5 <b>viewpoint</b> 121:2 140:19 <b>viewpoints</b> 62:14 109:7,9 109:15,16 112:4 120:1 121:11 122:13 139:11 <b>views</b> 109:18 <b>viii</b> 205:20 206:2,6 239:2 239:5,8 <b>vinyl</b> 25:14 26:11 115:20 116:9 117:17 118:17 241:19 271:2,9,10 327:1,10,16,18 327:19 329:8 329:17 330:4 338:5 339:16 340:3	<b>vitae</b> 5:4 14:12 14:19 15:2 <b>vitro</b> 138:19 238:4 <b>vivo</b> 138:19 <b>vlaanderen</b> 241:8 245:3,11 295:1,10 301:10 <b>vocs</b> 337:15 <b>volume</b> 267:12 <b>voluntarily</b> 13:20 <b>vs</b> 83:6 185:10 <b>w</b> <b>wait</b> 125:2 242:4 <b>wallace</b> 3:9,10 33:13 <b>wallacegraha...</b> 3:14 <b>want</b> 9:10 23:3 28:2,6 36:13 38:15 39:11 53:9 62:3 77:19,19 78:17 81:14 91:20 109:2,20 126:16 127:20 137:4 142:20 150:11 155:16 160:11 169:7 173:8,17	207:13 223:22 224:16 260:13 261:16 268:15 268:18 275:5,8 275:16 278:14 285:10 297:18 302:8 315:20 327:21 328:3 329:4 330:12 342:14,20,21 344:6 345:15 <b>wanted</b> 23:8 28:3 155:5 186:13 217:15 217:19 341:4 344:16 <b>wants</b> 328:8 <b>washes</b> 262:12 <b>washington</b> 2:8 <b>water</b> 1:7 6:1,3 7:8 38:6 39:8 41:3 46:12 52:3 65:7 66:12 78:3 142:6,7,11,12 144:20 182:19 186:2,8 194:6 194:10,17,21 197:11 200:2,9 206:9 209:20 210:1 239:9,11 251:12 259:12 314:7 318:18 322:12 326:14	327:17 337:19 339:17 340:4 <b>way</b> 40:6,14 70:17 87:8,10 119:19 136:17 139:8 235:5 278:8 293:13 321:10 328:16 345:19 <b>wayne</b> 43:21 <b>ways</b> 42:6 78:13 275:1 <b>we've</b> 35:16 101:14 342:18 <b>weak</b> 67:6,10 <b>weakness</b> 277:1 <b>wednesday</b> 1:10 <b>week</b> 137:7,7 <b>weekend</b> 137:10 265:2,5 <b>weekly</b> 305:10 <b>weeks</b> 216:20 <b>weigh</b> 138:22 139:5 <b>weighing</b> 61:9 147:6 <b>weight</b> 139:17 139:18 140:2,7 <b>weisel</b> 44:2,9 <b>weitz</b> 33:13,20 <b>went</b> 151:10 279:10 344:22
--	---	--	--

<b>whereof</b> 350:15	342:13 350:7	<b>working</b> 136:3	58:4 62:7,14
<b>white</b> 3:22	350:10,15	136:11,20	63:14 76:21
<b>whitney</b> 3:10	<b>women</b> 92:15	137:8 214:19	87:3,20 91:12
<b>wide</b> 71:22	97:19 257:10	215:4 264:4	93:14 98:20
74:2,4 157:2,8	<b>wong</b> 241:18	265:6 269:7	106:7 108:12
<b>wider</b> 72:7	<b>word</b> 53:6 74:4	285:7 314:12	111:2,4 114:16
<b>widths</b> 80:22	78:16 109:10	<b>workplace</b> 5:14	116:15 125:4
<b>wilcosky</b> 260:7	238:17 262:2,2	104:7,12	138:5 143:6
<b>willing</b> 123:6	262:3 300:5	<b>world</b> 264:15	147:14 155:6
282:12	<b>words</b> 60:3	<b>worried</b> 328:6	156:15 160:3
<b>wilms</b> 306:11	65:9,15,15	<b>worry</b> 262:21	160:16 161:2
<b>wilson</b> 12:11	<b>work</b> 17:1,20	<b>wow</b> 93:14	197:3 200:15
<b>wisconsin</b>	18:4 19:8,19	<b>write</b> 316:16	201:18 206:18
43:19	30:10 31:12	<b>writing</b> 316:21	207:20 212:11
<b>withdrawing</b>	41:21 42:10,11	<b>written</b> 18:12	223:2 224:2,16
13:21	42:13 46:8	19:4 59:2	234:8 242:10
<b>withdrawn</b>	55:9 74:21	67:16 84:2	245:4 247:6
12:7 14:2	86:16 87:6	115:7	262:3 285:11
<b>withdrew</b> 13:6	88:9,17 89:13	<b>wrong</b> 253:18	287:1 291:6
14:2,7	137:7,9,11,16	321:18	299:17 313:1
<b>withholding</b>	215:17,20	<b>wrote</b> 19:11	315:21 320:19
10:18	216:2 219:17	20:5,7,9 199:6	329:6 335:6
<b>witness</b> 5:5	285:18 286:2	211:3 290:19	340:19
7:11,14 21:2,8	295:18 321:11	<b>x</b>	<b>year</b> 13:7,22
21:13 22:20	346:5 347:7	<b>x</b> 1:4,8 4:1 5:1	46:12 169:15
23:13 27:18	<b>worked</b> 13:2	43:1	197:20 214:20
28:8 29:5	31:6,16 33:8	<b>xi</b> 251:17	215:2,5 263:16
30:17 32:14,17	33:16,18,19,22	<b>y</b>	332:16
48:22 49:3	265:3 311:3,14	<b>y</b> 213:15	<b>years</b> 32:5 38:9
51:5 62:7	311:21 312:13	<b>yang</b> 44:4	55:10,15 79:17
125:7,11	312:21 313:8	<b>yeah</b> 36:20	80:1 92:16,17
160:14,17,22	<b>worker</b> 193:21	38:18 39:19	92:21,22 94:5
261:18 302:10	<b>workers</b> 129:4	53:10,13 57:5	95:2,22 96:22
328:12 342:9	129:7 282:5		108:3 109:19

<p>139:21 141:2,5  183:20 263:17  283:15,16  311:4,12,15,20  311:22 312:11  312:14,20,21  312:22 313:7,9  314:12 333:5  <b>yellow</b> 22:14  23:12 43:1  <b>yield</b> 110:5,13  <b>young</b> 154:17  191:16 192:4  197:22  <b>yup</b> 207:20</p>
<b>z</b>
<p><b>zachary</b> 2:15  <b>zantac</b> 11:19  11:22 12:6  33:20  <b>zina</b> 3:17  <b>zmandell</b> 2:20  <b>zoom</b> 3:4</p>

Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.



VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted

fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

Veritext Legal Solutions complies with all federal and State regulations with respect to the provision of court reporting services, and maintains its neutrality and independence regardless of relationship or the financial outcome of any litigation. Veritext requires adherence to the foregoing professional and ethical standards from all of its subcontractors in their independent contractor agreements.

Inquiries about Veritext Legal Solutions' confidentiality and security policies and practices should be directed to Veritext's Client Services Associates indicated on the cover of this document or at [www.veritext.com](http://www.veritext.com).