Exhibit 3

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

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IN RE: ROUNDUP PRODUCTS LIABILITY LITIGATION — MDL No. 2741

Case No. 16-MD-02741-VC

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THIS DOCUMENT RELATES TO ALL CASES

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VIDEOTAPED DEPOSITION OF

WILLIAM H. FLEMING, MD, PHD

September 19, 2017

9:14 a.m.

1350 I Street NW

Washington, DC 20005

Reported by: Denise D. Vickery, CRR, RMR

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Also Present:
Michael Gay, Videographer

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EXHIBITS

PROCEEDINGS

THE VIDEOGRAPHER: We are on the record. The time now is 9:14.

This marks the beginning of Disk No. 1 for the videotaped deposition testimony of Dr. William H. Fleming in the matter of In re: Roundup Products Liability Litigation. This case is pending in the United States District Court for the Northern District of California, Case No. 16-MD-02741-VC.

Today's date is September 19, 2017. This deposition is being conducted at 1350 I Street, Northwest, Washington, DC.

Will all attorneys present please identify themselves and who they represent.

MR. LITZENBURG: Timothy Litzenburg for the plaintiffs.

MR. ESFANDIARY: Pedram Esfandiary for the plaintiffs.

MR. JOHNSTON: Robert Johnston for Monsanto.

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MS. KLENICKI: Erica Klenicki for Monsanto.
THE VIDEOGRAPHER: Those on the telephone please identify yourself.
MS. LUKIC: Maja Lukic from Weitz & Luxenberg for plaintiffs.
THE VIDEOGRAPHER: My name is Michael Gay. I'm with Golkow Technologies. Our court reporter today is Denise Vickery, also with Golkow Technologies, and will now swear in our witness.

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WILLIAM H. FLEMING, MD, PH.D., called for examination, and, after having been duly sworn, was examined and testified as follows:

THE VIDEOGRAPHER: You may proceed.

EXAMINATION

BY MR. LITZENBURG:

Q. Good morning, Dr. Fleming. My name is Tim Litzenburg. We just met off the record, but do you understand I represent several thousand non-Hodgkin lymphoma patients?

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A. I was not aware of -- of those details, no.
Q. Okay. You understand that I represent the plaintiffs, the people that are suing Monsanto for their injuries?
A. I, you know, again, I'm not, you know, I'm not privy to, you know, a lot of details of the case.
Q. What did you think this was today?
A. This was a deposition to give you an opportunity to discuss my expert report. My expert report in a -- in a sentence was: I was charged with reviewing, you know, the literature and discussing the etiology of non-Hodgkin's lymphoma. And as part of this I was asked to, you know, look at any data which may actually link glyphosate use with NHL.
Q. Okay. That's what I was going to ask you next. I'm going to hand you this. Marking. She'll have to mark it.

(Document marked for identification purposes as Fleming Exhibit 20-1.)

BY MR. LITZENBURG:

Q. I have marked as Exhibit 1 the

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expert report of William Fleming, M.D., Ph.D.
Is that the report you're referring to?
A. Yes, it is.
Q. Okay. Now, funny you said that because it was almost exactly what I was going to ask you.
Concisely what would you say is the question that you were asked to answer?
A. I was -- I was asked to do three things. I was asked to give what is essentially a lay description of what the immune system was and what lymphoma was and spend some time discussing what is known in the medical literature about the etiology of lymphoma.
And I was then asked to, you know, address the question of whether glyphosate was in any way implicated based on the literature available for review.
Q. So were you asked to answer the question of whether Roundup could cause non-Hodgkin lymphoma?
A. I was asked about glyphosate specifically.
Q. You don't know anything about the

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formulated product Roundup?
A. The details of its formulation, no.
Q. Have you looked at any literature or studies involving the actual formulated product that people use rather than the technical glyphosate?
A. No, I have not.
Q. Okay. Do you think that that would be an important thing for a scientist to look at in determining whether the product Roundup could cause cancer? Do you think they should look at the formulated product that people use or the technical salt that goes into it?
A. I think that what you have to do is, you know, look at the most credible scientific data to address that question and the -- I focused on the epidemiology literature. And on my review, there was no epidemiology literature reviewing various formulations of Roundup.
Q. Okay. My question --
A. Or various formulations of glyphosate. I'm sorry.
Q. Right. I'm going to make a representation that none of our clients used technical glyphosate. They all used formulated

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products which contains a surfactant.
Do you understand what a surfactant is?
A. It --
MR. JOHNSTON: Objection. Compound.
BY MR. LITZENBURG:
Q. Do you know what a surfactant is?
A. I know what the term "surfactant" means. I do not have any expertise as it relates to the use of surfactants in chemical compounds.
Q. Okay.
A. I am aware of the medical usage of the term "surfactant."
Q. Do you know what the surfactant makeup is in formulated Roundup products?
A. No, I don't. You would have to ask, you know, a chemical toxicologist that question.
Q. Do you know -- you don't even know what it's called, the name of the surfactant they use in any of these products?
MR. JOHNSTON: Objection. Misrepresents the record and compounds since there's multiple surfactants in these products.

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THE WITNESS: I have not delved into the chemical composition of -- of what -- of glyphosate. No, I have not.
BY MR. LITZENBURG:
Q. Do you -- can cancer be multifactorial?
A. I think it's fair to say that in many cases it's been shown to be multifactorial.
Q. Okay. So, again, we want to take the question of whether -- well, let me ask you this.
Do you have an opinion as we sit here today to a reasonable degree of medical certainty whether exposure to Roundup can contribute to lymphoma?
A. The literature I have reviewed has looked at glyphosate exposure and its potential to or its potential relationship to NHL. None of this literature I'm aware of has -- has ever addressed Roundup as a product.
Q. Okay. Well, let's -- let's stop for a minute and talk about glyphosate.
Do you have an opinion to a reasonable degree of certainty here, Doctor, today whether or not glyphosate can contribute to

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the development of non-Hodgkin lymphoma?
A. I'm not aware of any credible scientific evidence that glyphosate is linked to the development of NHL.
Q. Well, it's a little bit different question. There's lots of sources, and I'm sure we'll talk about them throughout the day.
Do you hold any opinion to a reasonable degree of medical certainty about whether glyphosate can or cannot contribute to the development of lymphoma?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: Again, I have -- I am not aware of any, you know, critical, you know, credible science that -- that suggests that there's a causative relationship between glyphosate and NHL, no.
BY MR. LITZENBURG:
Q. Okay. Are you aware of any science that says that there's a relationship between glyphosate and non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Asked and answered.

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THE WITNESS: I have -- I have focused on the human epidemiology of this question, and I find no evidence to support that conclusion.
BY MR. LITZENBURG:
Q. Are you aware of any what I'll call positive epidemiological studies?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: It would -- it does depend how -- how one defines "positive."
BY MR. LITZENBURG:
Q. Are there any papers that you're aware of that looked at epidemiological studies and reached the conclusion that there was an association?
A. There are --
MR. JOHNSTON: Objection. Vague. Go ahead.
THE WITNESS: There are case reports or -- pard me -- case-control studies in literature that -- that suggest the possibility of a relationship.
However, there is no data that I felt in my scientific opinion, no credible scientific data that -- that demonstrated

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this.
BY MR. LITZENBURG:
Q. Okay. What papers reached a positive result?
A. Again, given the complexity of trying to sort out all the different potential causative agents in the agricultural business, it was recognized in the late '80s that a large prospective study was going to be the only way to unravel all the details.
And, consequently, we have a large prospective cohort study of more than 57,000 pesticide applicators, and I weighed this study very heavily in reaching my conclusion.
MR. LITZENBURG: Would you please read that question back to the witness?
(The reporter read the record on page 14 lines 2-3.)
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Again, we would have to look at specific papers, and I would have -- I would have to review the abstracts of the papers to see where that conclusion was made.
BY MR. LITZENBURG:

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Q. How many epidemiological papers did you review in looking at this?
A. I would have to, to give you an exact number, look at my MCL list here, but I suspect it's in the range of five to six case-control studies and one prospective cohort study, but I considered but did not rely on the case-control studies.
Q. Okay. You relied, I am assuming, on some unpublished manuscripts in reaching your opinion; right?
A. No.
Q. Okay. So in considering the Agricultural Health Study data, did you rely only on De Roos 2003 or De Roos 2005?
A. De Roos 2005.
Q. Okay. What about the 2003 paper?
A. Again, it was, you know, not a prospective cohort study.
Q. Okay. So you haven't looked at the unpublished AHS data?
A. I did not say that.
Q. What did you -- I'm sorry. I thought you said that a moment ago.
A. No.

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Q. Okay. So have you looked at this unpublished AHS manuscript with comments off in the margins that was produced by Dr. Blair?
A. Yes, I did but, again, in answer to your earlier question, I did not rely on this to form my opinion.
Q. Okay. You relied only on negative studies, is that fair, to formulate?
MR. JOHNSTON: Object. Objection. Misstates the record and his testimony.
THE WITNESS: I -- this -- this was -- the AHS study is not a negative study. It is a negative study for glyphosate and NHL.
BY MR. LITZENBURG:
Q. Do you know what a meta-analysis is?
A. Yes.
Q. What is a meta-analysis, Dr. Fleming?
A. A meta-analysis is a statistical technique that epidemiologists will use to look at data from a great many studies and -- and combine them in order to see how the power of the extra individuals, you know, influences the

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outcome.
This is something I have no expertise in. I'm not an epidemiologist.
Q. What are you an expert in, Dr. Fleming?
A. I'm an expert in medical oncology, particularly lymphoma. I've specialized in hematologic malignancies and have treated patients with NHL and its subtypes now for more than 25 years.
Q. What of a -- as a medical oncologist, what makes you uniquely qualified to comment on the causality of this chemical in non-Hodgkin lymphoma?
A. Uniquely qualified?
MR. JOHNSTON: Yeah. Objection. Misstates the legal standard.
BY MR. LITZENBURG:
Q. Do you think there's anything that makes you uniquely qualified among medical oncologists to look at this question?
MR. JOHNSTON: Objection. Misstates the legal standard. Calls for speculation and a hypothetical.
THE WITNESS: I -- I do not

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believe I'm uniquely qualified, no.
BY MR. LITZENBURG:
Q. Okay. You're a pediatrician, aren't you?
A. No.
Q. You're not?
A. No.
Q. Are you boarded in pediatrics?
A. No.
Q. Okay.
A. I am boarded initially in internal medicine and subsequently have maintained my subspecialty accreditation in medical oncology with the American Board of Internal Medicine, as is indicated on my CV.
Q. Are you a professor of pediatrics?
A. Yes.
Q. Okay. But you do not consider yourself a pediatrician?
A. No.
Q. Okay. Have you let Oregon Health State University -- I'm probably saying that wrong.
What do you call it?
A. OHSU.

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Q. OHSU. Have you let OHSU know that you're not a pediatrician?
A. They've appointed me as a professor in three different departments and are well aware of my qualifications.
Q. Okay. Do you train pediatricians?
A. No. Well, there are pediatric trainees in hematology and oncology who come and do research in my lab.
So in that context of laboratory medicine, yes. In the context of clinical pediatrics, no.
Q. Okay. Do you treat patients?
A. Yes.
Q. How often? How many days a week?
A. One day a week now for the last, you know, since 1993.
Q. '93 did you say?
A. Uh-huh.
Q. So for the last 24 years, what has the other 8 percent of your time been done?
A. A combination of research and administration and teaching.
Q. Okay. In the last year, what has been the proportion of your patients that were

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pediatric patients versus adults?
A. Oh, that's easy. Zero pediatric patients. 100 percent adults.
Q. Okay. You, again, are in the department of medicine and pediatrics; is that right?
A. Correct.
I'd be happy to expand if you like.
Q. But you don't treat any juvenile patients?
A. There are patients on the border in their late teens that can go either way. So I have absolutely treated 17-year-olds who wanted to be treated on an adult oncology service and, yes. So I've, you know, there's -- there's that gray area, but patients below that age are exclusively treated by the pediatricians.
Q. When is the last time you treated a patient that was younger than 17?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Younger than 17? A very long time ago.
BY MR. LITZENBURG:
Q. Okay. How many 17-year-old patients have you had in the last year?

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A. None.
Q. None?
When is the last time you treated a 17-year-old?
A. I can't put a time and date on it. It would have been on the bone marrow transplant leukemia service sometime probably 2010, 2012. It's been a while.
Q. Since 2012, for the last five years, you have not had a single patient under the age of 18?
A. Correct.
Q. Okay. Do you know why I asked you if you were a pediatrician?
A. Well, I'm a professor of pediatrics, professor of medicine, professor of immunology and microbiology, and I have -- also have an appointment in -- in cellular and molecular biology.
Q. Okay.
A. So all of these are on my CV.
Q. Okay. You teach in the department of medicine and pediatrics; correct?
A. I -- I teach medical students and I teach postgrad or postgraduate trainees. They

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see patients with me in clinic.
Q. So you are within the department of medicine and pediatrics, are you not?
A. Yes.
Q. Okay. Is there an oncology department at OHSU?
A. It's the Knight Cancer Center runs an oncology program that is technically within the department of medicine, but it's also administered by the Knight Cancer Institute.
Q. There's no department of medical oncology at OHSU?
A. There's about 70 physicians who practice medical oncology in what was originally called the division of hematology and medical oncology, which was part of the department of medicine.
The development of the Knight Cancer Center over the past several years has changed the administrative structure of this somewhat. So that they are responsible for many of the faculty activities, while the department of medicine is responsible for promotion.
Q. Okay. Are there -- among those 70 physicians, are there some that don't teach

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pediatrics?
A. We have joint conferences. Hematology -- heme malignancies, which I have expertise in, has a lot of similarity to pediatric hematology because of the frequency of leukemia in both age groups.
So we often have joint conferences for specific topics. Joint conferences for visiting professors because it's interesting to pediatricians who treat ALL and adults who treat ALL, for instance, is, you know, very similar.
This is not true of the rest of medical oncology where there are adult tumors that do not occur in pediatrics, such as colon cancer, and there are many pediatric tumors that do not -- that do not occur in adults.
Q. What are some of the pediatric tumors that don't occur in adults?
A. Rhabdomyosarcoma. Ewing sarcoma. They're very -- I shouldn't say never, but they're very unusual to see them -- to see them in adults. Retinal blastoma.
Q. Okay. So did you -- of those three cancers that you just mentioned, did you need to look at any of them today -- I'm sorry -- before

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today for the purposes of this lawsuit in your expert role?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I'm sorry. I don't follow your question.
BY MR. LITZENBURG:
Q. You just named three types of malignancies?
A. Uh-huh.
Q. Okay. Okay. Of those three, did you look at any of those malignancies, study any of them in preparation for your deposition today or to answer the question that you were supposed to answer?
A. No.
Q. Okay. I'll ask you the same question two questions ago.
Are there medical oncologists at your university who do not teach pediatrics?
MR. JOHNSTON: Objection. Asked and answered by counsel's own admission.
THE WITNESS: There would be medical oncologists who do not train or interact with pediatric trainees in their adult clinic but, again, many people have

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laboratory studies.
Many people have protocols that cross between adults and pediatrics and, in fact, we have a number of trainees who are jointly trained.
There's a joint program where you can come out board certified in internal medicine and pediatrics, and we have several such individuals.
MR. LITZENBURG: Could you read the question back?
(The reporter read the record on page 24 lines 18-19.)
MR. JOHNSTON: Wait. Wait. Wait. He hasn't asked you a question. He just had her read the record.
MR. LITZENBURG: Really?
MR. JOHNSTON: If that's the question, it's asked and answered twice.
MR. LITZENBURG: Let's see.
MR. JOHNSTON: If you read his answer, it answers the question.
BY MR. LITZENBURG:
Q. Are there any medical oncologists associated with your university who do not teach

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in pediatrics, would not be called a professor of pediatrics?
MR. JOHNSTON: Objection. Misstates his title and is asked and answered.
THE WITNESS: I -- I do not understand the substance of your question and can't answer it.
BY MR. LITZENBURG:
Q. You do not know if there are oncologists at your university that are not professors of pediatrics?
MR. JOHNSTON: Objection. Misstates the record and his testimony. Misstates his -- his resume¿½ and vague.
THE WITNESS: Again, I am not able to answer your question the way you've posed it.
BY MR. LITZENBURG:
Q. Okay. Okay. Again, going back to -- I think the question of the day is: Do you hold an opinion about whether or not glyphosate can cause non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Vague. Asked and answered.

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THE WITNESS: Based on my review of the medical literature and -- I have found no credible evidence that links glyphosate to the development of NHL in humans.
BY MR. LITZENBURG:
Q. Would you allow -- if one of your lymphoma patients came to you and asked if it was safe to continue using Roundup in his yard, what would you say as the physician?
MR. JOHNSTON: Objection. Incomplete hypothetical. Assumes facts not in evidence. I'll go with those two.
THE WITNESS: I would tell him that there is no credible medical evidence linking glyphosate to NHL at this time.
BY MR. LITZENBURG:
Q. You know what Category 2A is in the context of IARC?
A. My recollection is, is that it's probably carcinogenic according to IARC, but I would have to check --
Q. Okay.
A. -- their.
Q. What other substances that are

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probably carcinogenic according to IARC would you encourage your lymphoma patients to continue using in such a way, sir?
MR. JOHNSTON: Objection. Misstates his testimony. Misstates the record. Beyond the scope of his opinion and not relevant to this case.
THE WITNESS: I do not advise my patients based on IARC's assessment of carcinogens specifically.
BY MR. LITZENBURG:
Q. Okay. Have you -- of the portion of papers that you've done, how many of them have been on the subject of pediatric treatment or etiology, anything having to do with juveniles?
MR. JOHNSTON: Objection. Vague as to "have done."
Do you mean that he's written? Or he's an author on?
BY MR. LITZENBURG:
Q. You have your publication list right there.
MR. JOHNSTON: So you're withdrawing the question?
THE WITNESS: Sure. Could you

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repeat the question?
BY MR. LITZENBURG:
Q. Sure. Starting in these publications -- hang on. We'll look at that in another 10 minutes at a break.
Okay. Who are the other medical oncologists at OHSU who teach pediatrics?
MR. JOHNSTON: Objection. Asked and answered. You want their names?
MR. LITZENBURG: That's generally what "who" means.
MR. JOHNSTON: Objection. Irrelevant. Beyond the scope of his expert opinion.
THE WITNESS: I agree. I don't know the answer to that question.
BY MR. LITZENBURG:
Q. You cannot name another professor of oncology at OHSU who teaches pediatrics?
MR. JOHNSTON: Objection. Misstates his testimony. Argumentative.
THE WITNESS: Again, there's a lot of complex activities where adult medical oncologists interact with pediatric trainees.

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They are not necessarily teaching them pediatrics. They are teaching them cancer biology. They are teaching them cancer epidemiology, if that's their area of interest, but they are not, you know, teaching them how to take care of specific diseases in specific pediatric patients.

BY MR. LITZENBURG:

Q. Would you be comfortable with the American Board of -- you understand the American Board of Internal Medicine has guidelines on expert testimony?

A. I'm not aware of those guidelines.

Q. So you didn't look into what guidelines there might control you professionally before doing this?

MR. JOHNSTON: Objection. Assumes facts not in the record that anything controls him professionally.

THE WITNESS: Right. I believe I'm free to give my expert testimony or opinion as I see fit.

BY MR. LITZENBURG:

Q. Would you be comfortable with the American Board of Internal Medicine reading this

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expert report that you've drafted for Monsanto?

A. I would have no problem with anybody reading this report.

Q. Has your -- has anyone in your department read it?

MR. JOHNSTON: Objection, counsel. You know this is for litigation. It's not something he passes around to his department.

THE WITNESS: I --

MR. JOHNSTON: You're harassing the witness.

THE WITNESS: I have -- I have no reason to get -- to distribute this to my colleagues, no.

BY MR. LITZENBURG:

Q. Okay. Why as a clinician would the etiology of non-Hodgkin lymphoma interest you?

A. Because it comes up virtually every day in clinic.

Q. Okay. Are you interested in modifiable things -- exposures more so than unmodifiable?

MR. JOHNSTON: Objection. Vague and compound.

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BY MR. LITZENBURG:

Q. In what context does it come up every day in clinic?

A. Gee, doc, why do I have this lymphoma?

Q. Uh-huh. Do you --

A. Gee, doc, why are my, you know, what is the relative risk of my brother and sister getting this? My aging grandmother getting this? My children getting this?

Q. Do you ever answer those questions?

A. I answer them all the time.

Q. Okay. When is the last time you told a patient what you believe caused his non-Hodgkin lymphoma?

A. I -- I can't put an exact time and date on it, but it would almost certainly be a patient in the context of prior immunosuppression for either a rheumatologic disease or organ transplant because those are -- those are the most common.

Q. And so in that context, you would tell him that his previous immunosuppression therapy you believe contributed to the lymphoma?

A. It would not usually be previous.

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It would usually be ongoing.

When you remove immunosuppression, typically immunosuppression-driven lymphomas disappear.

Q. Okay. Is there anything else that causes lymphoma other than immunosuppression?

A. Sure. Patients who have Hodgkin's disease have a significantly higher risk of developing non-Hodgkin's lymphoma five to 10 years later.

Q. Okay. So --

A. Whether this is due to the chemotherapy that they've been given in the context of their Hodgkin's disease or the radiation therapy, or a combination of all three, is not known.

Q. Hodgkin disease, immunosuppression. Anything else that you're aware of that causes non-Hodgkin lymphoma?

A. A number of different viral infections can predispose to it.

Q. Okay.

A. They come in two different general subtypes. One where you actually have the virus driving the lymphoma, such as reactivation of

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Epstein-Barr virus, or, two, HIV which actually acts an immunosuppressant. It doesn't cause the lymphoma cells to proliferate and give rise to lymphoma. It suppresses the immune system.

Again, if you suppress the immune system with HIV, when you treat that successfully with the, you know, great therapies we have today, then these lymphomas tend to regress or not -- not occur.

Q. Other than diseases, malignancies, and medical treatments, are you aware of anything that can cause non-Hodgkin lymphoma?

MR. JOHNSTON: Objection. Vague.

THE WITNESS: There is emerging evidence from the American Health Study that's recently published that implicates certain insecticides in this regard.

BY MR. LITZENBURG:

Q. Okay. So are there some insecticides that you would advise a patient to stop using if they asked?

MR. JOHNSTON: Objection. Assumes facts not in the record.

THE WITNESS: Right. I --

MR. JOHNSTON: And a

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hypothetical.

THE WITNESS: I agree. I would need a more detailed or a more focused question to answer it meaningfully.

BY MR. LITZENBURG:

Q. How many meta-analyses have been published on the topic with which you have concerned yourself in this litigation?

A. In the issue of glyphosate and NHL?

Q. Uh-huh.

A. Yeah. I did not rely on these meta-analyses to -- to come to my conclusion, my expert opinion.

What I did with them is what I did with every review article and the IARC report itself is that I used them to be sure I wasn't missing any peer-reviewed published primary data that would influence my opinion.

Q. Doctor, how many meta-analyses have been published on this topic?

A. I can't give you an exact number.

Q. Can you name a single one?

A. I did not rely on meta-analyses for my opinion.

Q. Dr. Fleming, you're here today to

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testify on whether a chemical can cause non-Hodgkin lymphoma, and you can't name a single published meta-analysis on the topic?

MR. JOHNSTON: Objection. Argumentative.

Counsel laughed when he asked the question let the record reflect.

THE WITNESS: Meta-analysis, while of some use in the epidemiology, field is not something I would rely on when I have a prospective cohort study.

BY MR. LITZENBURG:

Q. Is that a no?

MR. JOHNSTON: Again, let the record reflect that counsel laughed.

BY MR. LITZENBURG:

Q. Is that answer a no?

A. I do not rely on meta-analysis of retrospective studies when I have a robust prospective cohort study.

Q. Okay. What other papers did you ignore?

MR. JOHNSTON: Objection. Argumentative. Misstates the record.

THE WITNESS: I considered the

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papers on my Materials Considered List.

You would have to provide me with examples that weren't on there and ask me specifically why I did not look at it.

BY MR. LITZENBURG:

Q. Can you name a single positive paper?

A. Positive in what respect?

MR. JOHNSTON: Yeah. Objection. Vague.

BY MR. LITZENBURG:

Q. It reached a statistically significant result for the association of glyphosate and non-Hodgkin lymphoma?

MR. JOHNSTON: Objection. Vague.

THE WITNESS: I do not recall a case-control study examining glyphosate and NHL that showed a statistically significant increased odds ratio after adjustment for other pesticides.

BY MR. LITZENBURG:

Q. So how many do exactly that, what you just said? How many studies do that?

A. They -- it's challenging to do that because you have to have a lot of patients

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enrolled in the study. Again, this is why you need a prospective cohort study.
Q. Dr. Fleming, how many studies meet the criteria that you just set forth?
A. The Agricultural Health Study does.
Q. Okay. And what -- that's a case-control study?
A. No. No. I don't -- there isn't a case-control study that I have had the opportunity to review that I know of that shows a statistically significant increase in odds ratio after confounding factors have been taken into account.
Q. Are you aware of any case-control studies examining glyphosate and NHL that adjust for other pesticides?
MR. JOHNSTON: To the extent you recall.
THE WITNESS: Not to the extent I recall. I'd have to review the specific data you're talking about.
BY MR. LITZENBURG:
Q. Dr. Fleming, what are you here to tell us today?
MR. JOHNSTON: Objection.

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Argumentative.
He's here because you subpoenaed -- you served a notice of deposition on him. He's not here to tell you anything.
BY MR. LITZENBURG:
Q. You can't name a single meta-analysis on this topic, you can't name a single positive paper on this topic, and you can't name a single study that meets the criteria that you just set forth?
MR. JOHNSTON: Objection. Misstates the record. Argumentative.
THE WITNESS: The AHS study does correct for pesticide exposure.
BY MR. LITZENBURG:
Q. Okay. And where was the AHS study published? Any published results of that?
A. The -- there are several published results. The first one is De Roos 2005.
Q. Okay. And that was a case-control study?
A. No. This was cohort study.
Q. Okay. Let's see if we can get an answer to that last question.

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MR. JOHNSTON: Go with a compound question.
BY MR. LITZENBURG:
Q. You said that in order to answer this question, is that correct, that you would have to look at a case-control study?
MR. JOHNSTON: Yeah. I think you're asking your -- what you said.
BY MR. LITZENBURG:
Q. In order to answer the question, are you telling us you would need a case-control study examining glyphosate and NHL that adjusted for other pesticides?
MR. JOHNSTON: Objection. Vague. What question?
THE WITNESS: Again, I'm not sure what your question is.
BY MR. LITZENBURG:
Q. What was -- what was -- when you gave me that -- that description, what were you talking about, Doc?
MR. JOHNSTON: Objection. Improper. Argumentative.
BY MR. LITZENBURG:
Q. A case --

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MR. JOHNSTON: You're asking questions. He's giving answers, counsel. So ask him a question and then he'll give you an answer.
BY MR. LITZENBURG:
Q. A case-control study examining glyphosate and NHL with adjustment for other pesticides.
A. Right. I did not --
Q. When you --
A. I did not see that, and the reason I -- and this -- this is conjecture is the reason is that most of these case-control studies did not have an adequate number of patients to adequately control for all the additional exposures.
Q. So you looked at zero studies --
A. I looked --
Q. -- that could answer this question to your satisfaction?
A. I looked at every study that's on my MCL.
Q. Okay. What --
A. And I considered every study on MCL, and the only human epidemiology study I placed

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any weight on was the AHS study.
Q. It was not a case-control study?
A. No.
Q. Okay.
A. It was a cohort study.
Q. Okay. So what was all that about how you needed a case-control study to answer the question?
MR. JOHNSTON: Objection. He didn't say that. You said that, counsel. Objection. Misstates the record.
THE WITNESS: If you showed me a case-control study that could address this issue of confounding variables, specifically the use of other pesticides, it could theoretically, you know, be important, but none of these studies adjusted for that.
BY MR. LITZENBURG:
Q. And none has been done to date to your knowledge; right?
A. Correct.
MR. JOHNSTON: Objection. Vague.
BY MR. LITZENBURG:
Q. Okay. So is it more fair to say

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that you don't know whether or not non-Hodgkin lymphoma can be caused by glyphosate or is it more -- or is your opinion actually that it cannot cause non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Misstates the legal standard. Asked and answered.
THE WITNESS: My opinion is it is not known.
BY MR. LITZENBURG:
Q. Okay. And so have you looked at any case specific -- are you going to be a case-specific expert in this litigation?
MR. JOHNSTON: Objection. You have his expert report, counsel. He has no case-specific opinions.
THE WITNESS: I have not been asked to do any future work in a case-specific matter.
BY MR. LITZENBURG:
Q. Have you looked at anybody's medical records in the context of this glyphosate/Roundup litigation?
A. Oh, okay. Sure. I understand the question.

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MR. JOHNSTON: Wait a minute. Hold on. Hold on. I need to take a break before he can answer that question.
MR. ESFANDIARY: Not when a question is pending.
MR. JOHNSTON: Well, then I instruct him not to answer the question.
MR. ESFANDIARY: On what grounds, counsel?
MR. JOHNSTON: On the grounds that you here are noticed under the federal system -- federal case. He did not offer a case-specific case in any federal cases.
MR. LITZENBURG: We're not asking about what his opinion is.
MR. JOHNSTON: You can't ask him whatever you want.
MR. ESFANDIARY: Yeah, we can.
MR. LITZENBURG: I'm not asking him about his opinion in his report.
MR. JOHNSTON: This line of questioning is improper.
MR. LITZENBURG: I can't ask him about other expert reports?

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MR. JOHNSTON: You know what the answer is. You know what -- that he provided a declaration in Dee Johnson.
MR. LITZENBURG: I can't ask him about other expert work, Bob?
MR. JOHNSTON: What? In this case?
MR. LITZENBURG: That he has done.
MR. JOHNSTON: Anywhere? An expert opinion anywhere on anything?
MR. LITZENBURG: Yeah. Do you know if there's federal rules about disclosing expert work? What do you think is the --
MR. JOHNSTON: Sorry. That wasn't your question. Your question was specific to this case. If you want to ask him if he's ever asked -- offered a case-specific opinion ever in any case, I'll let him answer that question.
BY MR. LITZENBURG:
Q. Have you been retained to perform expert work on specific patients in the context of this glyphosate litigation?

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A. I have been asked to review one very specific question in one case.
Q. Okay. And did you look at whether glyphosate could contribute to his non-Hodgkin lymphoma?
MR. JOHNSTON: I'm going to object to this, counsel. The question that he provided a declaration on you know has been resolved. You guys have agreed on a trial schedule.
You know that that was not a causation issue. It was a question of life expectancy for someone with NHL. These are improper questions in this deposition.
MR. LITZENBURG: Bob, I think you've said more words on the record today than Dr. Fleming has.
BY MR. LITZENBURG:
Q. With that preamble from your counsel, do you want to answer the question --
MR. JOHNSTON: And I'm objecting to this question.
BY MR. LITZENBURG:
Q. -- of whether or not you've looked

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at a patient's records with an eye towards whether glyphosate contributed to his non-Hodgkin lymphoma?
MR. JOHNSTON: Go ahead.
THE WITNESS: I have looked at a single patient's record in one context only, and that was to provide my professional opinion on whether this individual was expected to live less than six months.
BY MR. LITZENBURG:
Q. Was --
A. That was the focus of it. The -- any other aspect of it was beyond the scope of the evaluation I was asked to perform.
Q. Was he a pediatric patient?
A. No. He was 40 -- is 47 years old, approximately.
Q. Okay. Here's the question I'm interested in.
Would there be anything within a person's medical records or medical history that could lead you to conclude that glyphosate contributed to their non-Hodgkin lymphoma?
A. Would there ever? Absolutely no.

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MR. JOHNSTON: Objection. Vague. Hypothetical.
BY MR. LITZENBURG:
Q. Okay.
A. No.
Q. So in order for you to determine whether glyphosate contributed to a person's non-Hodgkin lymphoma or not, you don't need to look at any of their medical records; is that -- is that true?
MR. JOHNSTON: Objection, counsel. You're confusing the issue of general causation and specific causation.
He is here on general causation. That's what his report is about in this litigation. I object to these questions as outside the scope of his report.
BY MR. LITZENBURG:
Q. He didn't tell you not to answer. He just gave you a long-winded way to answer, but I'll ask the question again.
In order for you to determine whether glyphosate contributed to a specific person's lymphoma, you wouldn't need to look at their medical records at all, would you?

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MR. JOHNSTON: You'd have to have evidence that it causes it first, counsel. You haven't -- that's what he's here to talk about.
MR. LITZENBURG: Bob, you just literally answered the question. There's no objection. You literally answered the question with a statement.
MR. JOHNSTON: I'm objecting that this is an abusive question. You know the scope of his report. The scope of his report is general causation. He says there's no evidence of general causation.
So you're asking a question that is beyond the scope of this report.
BY MR. LITZENBURG:
Q. Dr. Fleming, is there anything that you could know about a patient that can cause you -- cause you to conclude that glyphosate exposure contributed to their non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Calls for speculation. Hypothetical.
THE WITNESS: I am not aware of any credible scientific evidence that

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links glyphosate exposure to the development of NHL --
BY MR. LITZENBURG:
Q. So --
A. -- in a general sense.
Q. So if you're answering that question for any specific patient, you don't need to look at anything, their medical record, their medical history, their exposure history?
MR. JOHNSTON: Objection. Hypothetical. Vague. Speculation. Go ahead.
THE WITNESS: I would agree. If I -- if I were to offer a specific causation opinion, which I have not ever offered for glyphosate and NHL, I would want to look at all the potential records I could.
BY MR. LITZENBURG:
Q. And so if -- no, I'm asking.
You understand that the plaintiffs in this litigation are not looking at other chemicals, right, or other products?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I -- I'm not -- I'm

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not aware of the scope of this litigation.
BY MR. LITZENBURG:
Q. Okay. So backing up.
You said that you don't know whether glyphosate can cause non-Hodgkin lymphoma; is that correct?
A. I said it is not known.
Q. Okay.
A. Meaning there is no credible scientific evidence supporting a relationship.
Q. It is not known?
A. What --
MR. JOHNSTON: Hold on. Objection. Vague.
Is that a question or a statement?
BY MR. LITZENBURG:
Q. Well, complete that sentence. It is not known --
MR. JOHNSTON: He just --
BY MR. LITZENBURG:
Q. -- that what?
MR. JOHNSTON: Objection. Asked and answered. You can read it. It's on the screen. Go ahead.

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THE WITNESS: Please repeat the whole question.
BY MR. LITZENBURG:
Q. Are you able to answer the question of whether or not glyphosate can contribute to non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Asked and answered repeatedly.
THE WITNESS: I am not aware of any credible scientific evidence that links glyphosate exposure to the development of NHL.
BY MR. LITZENBURG:
Q. And until you become aware of such credible evidence, you would continue to advise pediatric patients, for example, with lymphoma to continue to use glyphosate?
A. I do not advise pediatric patients in any capacity.
Q. How about adult patients?
A. I would not advise adult patients one way or another about glyphosate.
Q. Would you present this expert report to your department at the university?
A. Happily.

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MR. JOHNSTON: Objection. Asked and answered.
BY MR. LITZENBURG:
Q. Okay. All right. Who told you -- how did you come up with this method of the two maps and the overlays?
A. I reviewed the medical literature, recognized that the AHS study was the gold standard of a prospective cohort study that could adjust for these pesticides, and it did not show any increase in relative risk for individuals exposed to glyphosate.
So at this point, to think about this issue further after having reached that scientific conclusion based on that data, I decided could there be other data sets out there, perhaps not necessarily linked together to address this question, that I could query to find out if there were, what would, you know, the expected associations you would see if there was some linkage.
So the answer to that question was yes, and I was able to take the NCI data at the county level for the incidence of non-Hodgkin's lymphoma and, again, this is a robust data set.

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It just allows you basically to -- to bring up that one graph -- all the calculations have been done for you -- and basically compare that to the US Geological Services' map of glyphosate usage in the United States.

And if there were to be some potential linkage, one would expect that high levels of glyphosate would correspond to a high incidence of NHL nationwide.

Q. How much time did you spend reading scientific papers in this case?

A. Which case? The entire? You mean -- you mean on the entire case? It's -- it's hard to quantify that.

Q. You don't know?

A. Some papers I looked at, you know, very quickly. Read the abstract, read the title, decided in my expert opinion it was not worth pursuing further. There were others I read in more detail, and there were others I read several times.

Q. Dr. Fleming --

A. It just -- it all depends.

Q. Yeah. Other than De Roos 2005, how

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many -- what other papers did you read several times?

A. I looked at the case-control studies.

Q. What were they?

A. They are listed here. There's about five of them.

Q. Okay. Can you name one off the top of your head?

A. Sure. Eriksson '08.

Q. Okay. And that was a positive study; correct?

MR. JOHNSTON: Objection. Vague as to "positive."

THE WITNESS: In my view -- in my view, it was a hypothesis-generating study that did not show a statistically significant relationship between glyphosate exposure and NHL when even corrected for the -- the multivaried analysis, which was a short list of variables and did not include all the other potential exposures.

BY MR. LITZENBURG:

Q. Your criticism is it considered and

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oversimplified in only considering a few variables?

MR. JOHNSTON: Objection. Misstates his testimony.

THE WITNESS: No. I am suggesting it doesn't provide statistically significant data indicating a clear relationship between glyphosate and NHL.

BY MR. LITZENBURG:

Q. And no study has been performed to date that could -- regardless of what the data generated was -- could provide that data for you to convince you otherwise?

A. Once --

MR. JOHNSTON: Objection. Vague.

THE WITNESS: The AHS study does a very comprehensive look at all the pesticides in this, you know, important prospective study.

BY MR. LITZENBURG:

Q. How much time did you spend looking at the AHS study?

A. Again, I didn't have a particular time run. I've looked at it on several different

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occasions for different -- different lengths of time.

Q. Okay. How much time did you spend looking at the AHS study versus the two published meta-analyses?

MR. JOHNSTON: Objection. Calls for speculation.

THE WITNESS: Again, I decided early on to use meta-analysis as I would any other review article.

So I read the title and the abstract and then went immediately to the reference section just to make sure that they did not reference in that manuscript any, you know, any primary data in the literature that I had missed.

BY MR. LITZENBURG:

Q. What review articles on this subject were written by Monsanto employees in part?

A. I am -- again, review articles I used simply to look.

I didn't -- I did not base my scientific opinion on the opinions provided in any review article, and that would include the IARC monograph and any review articles on this

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topic. So I did not -- I did not delve into those details.
Q. Would you be comfortable presenting to a professional organization of internal medicine physicians and telling them that in your opinion glyphosate cannot contribute to non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Misstates his testimony and asked and answered. Go ahead.
THE WITNESS: I would be comfortable testifying to any professional body that based on the available scientific evidence that there is no credible association between glyphosate and NHL.
BY MR. LITZENBURG:
Q. Would you use those two maps? Would you present those to professional organization physicians?
A. I would -- yes, I'd be very happy to present them, and I'll tell you why. Because they -- they are illustrative of the point. So the literature does not support an association.
Let's look beyond the literature.

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Let's look at huge data sets we have and let's look at very obvious questions we can answer.
So those two maps have to be looked at in context of the additional data on incidence of NHL and, put together, they tell you that as glyphosate usage has increased over time, NHL incidence has plateaued and then fallen off.
Interesting but doesn't address local regional differences in the use of glyphosate. Well, gee, is there any way we can address that? Just to get an idea, an illustrative example, and the answer is yes.
As it turns out US EPA have a map of glyphosate use. The NCI has a very handy map of county incidence of NHL.
Q. How much time did you spend prior to this week working on this case?
A. Prior to which? This week?
Q. This week, yeah.
A. On what? I'm sorry. Could you complete the question?
Q. The Roundup lymphoma litigation.
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I would have to look at my invoices and add them up.

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BY MR. LITZENBURG:
Q. Okay. How much time have you spent this week on this litigation?
A. This week?
Q. Uh-huh.
A. What time is it now?
MR. JOHNSTON: 10:08.
BY MR. LITZENBURG:
Q. It's 10 a.m.
A. Reviewing my report, reviewing documents, sitting here today, maybe four hours.
Q. You've been here -- you got here before 6 a.m. today?
A. No.
Q. Okay. How long have you spent --
A. Yes. Well, I didn't -- I didn't arrive today.
Q. How long have you spent meeting with the defense lawyers for Monsanto this week?
A. This week. Again, I can't give you an exact number. A few hours.
Q. Okay.
MR. JOHNSTON: Counsel, we've been going about an hour. As soon as you get to a convenient point, can we take a

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break?
MR. LITZENBURG: Yeah, sure. Give me one or two more minutes and that's a good idea.
MR. JOHNSTON: Sure.
BY MR. LITZENBURG:
Q. All right. I'm looking at your invoices. In fact, I'll give you a copy of that --
A. Sure.
Q. -- as Exhibit 2.
(Document marked for identification purposes as Fleming Exhibit 20-2.)
THE WITNESS: (Reviewing document).
MR. JOHNSTON: Do you have a copy for me, counsel?
MR. LITZENBURG: Yeah.
MR. JOHNSTON: Thank you.
BY MR. LITZENBURG:
Q. All right. We're looking at Exhibit 2.
Do you recognize what this is?
A. Yes.

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Q. What is it?
A. It is a collection of billings I have submitted for my time working on this question of NHL.
Q. And were you contacted before -- there's a retention letter dated January of 2017.
Did you have any contact with the lawyers from Hollingsworth prior to 2017?
A. I believe in -- yes. Yes. I believe at some date -- I can't tell you when -- in relatively late 2016, I was called up and asked what I thought about the -- about providing an expert report on the etiology of lymphoma.
Q. Okay. When did they contact you?
A. Again, I --
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: I can't give you an exact date.
BY MR. LITZENBURG:
Q. Okay. And you agreed to -- to write a report on whether or not Roundup could cause cancer?
A. I agreed to do several things. Hollingsworth has used me as a resource for

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general information on the biology of lymphoma, the treatment of lymphoma.
I've answered a great many of their questions that are, you know, not necessarily directly in this report because they were, you know, I provided general expertise on -- on the, you know, clinical management of -- of NHL. So I did a great -- a great many things that are reflected here.
Q. Okay. And when we look at this packet, things that say Johnson versus Monsanto, that was -- that was work on a specific case; right?
A. A specific case addressing a very specific issue.
Q. What -- so, and that's what I'm getting at.
None of that time was spent determining whether or not glyphosate is capable of causing non-Hodgkin lymphoma.
That was spent looking at prognoses and medical records; is that right?
A. That is correct.
Q. Okay. So let's set aside anything that says it's for Johnson. You and I understand

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that that is another case that we have separate from this.
Prior to drafting your report on this, once you relied on the medical literature, how much time did you spend reading the medical literature?
A. Again, I did combinations of draft -- where it says "draft report," draft report includes reading the literature and taking notes. I did not break out that -- those times specifically.
Q. Well, you wrote "literature review" on the first page 3/9/17; right?
A. Uh-huh.
Q. Okay.
A. Yeah.
Q. And that's you put 2.25 hours there; right?
A. Right.
Q. All right. Between March of 2017 and when you began drafting this report say in June 1 of 2017, you'll agree with me that's the first time it says that you were drafting?
A. Well, I see -- I see a teleconference on May 17th. So that would be

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before.
Q. Were you taking dictation, sir, with that time?
MR. JOHNSTON: Objection.
BY MR. LITZENBURG:
Q. Did you take any --
MR. JOHNSTON: Vague.
BY MR. LITZENBURG:
Q. -- dictation from the Hollingsworth lawyers?
MR. JOHNSTON: Objection. Well, first of all, we have an agreement in this case that you're not going to ask about the substance of communications with the counsel.
So I'm going to object to that question and instruct him not to answer.
MR. ESFANDIARY: He's not talking about the substance. He's talking about the contract.
MR. JOHNSTON: Yeah, he is. He's asking whether he took dictation from counsel is about substance. So I'm not --
MR. LITZENBURG: No, I'm asking about --

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MR. JOHNSTON: He's not going to answer that question.

Just like you guys have objected to similar questions in prior depositions so far, particularly the Weisenberger deposition.

BY MR. LITZENBURG:

Q. Dr. Fleming --

MR. JOHNSTON: You want to ask a different question?

BY MR. LITZENBURG:

Q. -- did you type anything out that Hollingsworth asked you to verbatim?

MR. JOHNSTON: Objection. That's -- look, you know the federal rules prevent you from asking questions about the creation of his expert reports. That is outside the scope of the rules and the agreement in this case.

I'm instructing you not to answer.

MR. LITZENBURG: You're instructing him not to answer --

MR. JOHNSTON: Yes I am.

MR. LITZENBURG: -- about

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anything about the creation of his expert report?

MR. JOHNSTON: Whether -- yes, that's what the federal rules provide.

MR. ESFANDIARY: That's not true.

MR. JOHNSTON: Communication between counsel and the expert about the report is protected under the federal rules.

MR. LITZENBURG: Okay. Well, I guess we'll mark that for later.

Prior to June 1st --

MR. JOHNSTON: That's fine. If you want to do that, we can go back and re-depose all of the experts who you've instructed not to answer on similar grounds.

BY MR. LITZENBURG:

Q. Prior to June 1st of 2017, how many times have you spent reviewing literature?

A. It's difficult to tell because only once in all of these pieces of paper in front of me here can I find -- well, let's see.

Only a couple times did I break out literature and document review. Actually, that

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was on Johnson's. So strike that.

I basically at the end of the day did not specifically put literature review or document review down separately from, you know, working on the report.

Q. But you did?

A. I did, but I did not do it consistently because I learned that it wasn't particularly important to do so. So I -- I basically changed, you know, I basically changed the heading, if you will, and -- and billed the time.

I'm paid for my time whether it's reviewing the literature, having a teleconference, or actually writing a report.

Q. So when did you alter these bills?

A. I have never altered these bills.

Q. You said --

A. I just said --

Q. -- you went back and you changed?

A. No. I said on March 3rd or -- pard me -- March 9, 2017, I had literature review. On April 3rd, it says "meeting preparation." Meeting preparation almost certainly involved some aspect of review of the literature I was

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going to discuss when I met at Hollingsworth.

I did not break out meeting preparation into literature review, you know, drafting, you know, report or anything else. I just -- I just gave it that title which --

Q. You didn't do any drafting at all in March or April of this year; right?

A. You know, as soon as I begin the literature review and handwrite some notes, that's in my view beginning the -- that -- in my view that's beginning the -- the draft report.

Q. Why didn't you write that?

A. It just did not seem important.

Q. Dr. Fleming, in the first 10 hours you spent on this case, two of them were spent looking at the medical literature; right?

MR. JOHNSTON: Objection. Misstates his testimony. Vague. Asked and answered.

THE WITNESS: The meeting preparation from April 3, 2017 almost certainly contains the component of literature review.

I needed to put down the sort of general subject matter for that -- for

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that time period that -- that I've recorded there, that 1.25 hours, and that -- that is not meant to be a detailed, you know, inclusive statement. It's a general statement.

BY MR. LITZENBURG:

Q. Through June 3rd of 2017, you had billed 57 hours in this case and two of them are reviewing literature; is that correct?

A. That's because I did not specifically, except in a couple of cases, actually break out literature review from the rest of the process.

Q. Dr. Fleming, between March and June 3rd -- up through June 3rd, you did not spend more than 2.25 hours out of 57 hours looking at the literature; isn't that correct? Isn't that what you've written down?

MR. JOHNSTON: Objection. Compound. Asked and answered.

THE WITNESS: I'd like --

MR. JOHNSTON: Misrepresents the record.

THE WITNESS: I'd like to answer it one more time and say, I did not record

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reviewing the literature other than when it is recorded.

However, the activities, such as meeting preparation and draft report, often included literature reviews as part of that. I was told there is no need to break it down into granular detail. So I didn't.

BY MR. LITZENBURG:

Q. Okay. There's fair --

A. So there may have been -- there may have been a couple instances where that's what I primarily did for those 2.2 hours, and I did not review any -- any other materials and I did not write too much down and that was purely just perhaps -- you know, I can't speak to the granular nature of that, but I did not mean to exclude anything by the headings I have used in my billing.

Q. Let's look at the June -- that second page, the June 3rd bill.

Between 5/5/17 and 5/25/17, all of those entries are meetings with Hollingsworth attorneys; right?

A. (Reviewing document). Yes.

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Q. Okay. So through June 3rd, we're still at 2.25 hours of literature review; right?

A. My billings do not accurately reflect the amount of time I spent reviewing the literature. I was unaware that there would be any need to do so.

Q. Your billings do not accurately reflect the time you spent?

A. No.

MR. JOHNSTON: Objection. Misstates his testimony. Go ahead.

BY MR. LITZENBURG:

Q. Go ahead.

A. My testimony is that my billings do not accurately reflect each hour of literature review as this was often done in the context of writing the draft report, and there was no reason to separate these out.

Q. Okay. By the time that you started drafting the report on June 1st of 2017, you had spent some, geez, 60 -- no, 57 hours or so working on this case, two of which were looking at the medical literature; right?

A. That is not correct.

MR. JOHNSTON: Objection.

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Compound. Asked and answered. Misrepresents the record.

BY MR. LITZENBURG:

Q. Okay. Name me again a single meta-analysis looking at this question of the association --

MR. JOHNSTON: Wait, counsel. Can we take a break?

BY MR. LITZENBURG:

Q. -- between glyphosate and non-Hodgkin lymphoma?

As soon as he answers that, we'll take our break.

MR. JOHNSTON: Asked and answered. Harassing the witness. He's already talked with you about this.

THE WITNESS: I did not rely on any meta-analysis to form my opinion.

BY MR. LITZENBURG:

Q. Do you know if they exist? Can you name any?

A. I know they exist. I can't give you authors, journals, and dates of publication off the top of my head.

Q. But you're here to tell you us

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whether or not glyphosate can cause non-Hodgkin lymphoma?
A. I'm here to tell you that in my medical expert opinion I find no credible scientific evidence linking glyphosate to the development of NHL.
Q. All right. Let's take a break.
MR. JOHNSTON: Hold on. Before we do that, I just want to mark for the record the fact -- or state for the record that my instruction not to answer was based on Pretrial Order 7 in this case, Section B1, which provides:
No party will seek discovery of any expert's notes, drafts of expert reports, or communications with counsel.
And also on Federal Rule of Civil Procedure 26(b)(4)(B) and (C) which provides that communications with counsel -- between an expert and counsel are not discoverable.
THE VIDEOGRAPHER: Time now is 10:22. We are going off the record.
(A brief recess was taken.)
THE VIDEOGRAPHER: The time now

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is 10:38. We are back on the record.
This is the beginning of Disk No. 2.
BY MR. LITZENBURG:
Q. Dr. Fleming, would you agree with me that correlation and causation are not the same thing?
A. It, again, depends on the -- on how you define it. There's several different -- different ways to define "causation."
Q. Are correlation and causation the same thing?
A. I do not believe they are, no.
Q. Okay. Can you tell me, please, how do we determine causality in humans? What is the generally accepted way that cancer doctors do?
A. Cancer doctors do this by, you know, linking, you know, various outcomes with various exposures and looking for statistically significant differences in those outcomes, and we do it for the most part obviously in the setting of treatment for malignant disease.
Q. And, again, I'm sort of talking more -- well, why is it important to your treatment?
A. Well, because if the treatment works, it will cause more patients to survive.

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It will cause some patients to be cured, and these are really important end points, which in many ways are actually kind of similar to what the epidemiology literature does with exposures to various environmental agents.
Q. Why does etiology matter to your -- your treatment plan?
A. Oh. Well, if somebody has had a prior, you know, history of Hodgkin's disease and chemotherapy, I'm going to think of their lymphoma very differently because it's a secondary lymphoma, and this will not necessarily be cured by the standard chemotherapy we would give if it was de novo disease.
Q. Okay.
A. This is true for a number of secondary malignancies.
Q. What chemicals cause non-Hodgkin lymphoma?
A. I am --
MR. JOHNSTON: Objection. Beyond the scope of his report.
THE WITNESS: Yeah. I was -- I was asked to address glyphosate and NHL. Hodgkin's disease is, as you know, a

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completely separate disease entity.
BY MR. LITZENBURG:
Q. Do you hold the opinion as a cancer doctor, oncologist, that any chemical is capable of causing non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Beyond scope of his report.
THE WITNESS: Again, I've been focusing on glyphosate and NHL.
BY MR. LITZENBURG:
Q. Okay. What has the science disclosed on Hodgkin's lymphoma?
MR. JOHNSTON: Objection. Beyond the scope of his report.
THE WITNESS: There are associations between certain pesticides and NHL that are listed in my report.
BY MR. LITZENBURG:
Q. Is there is an association between glyphosate and NHL in the literature?
A. Not in the literature I choose to rely on to formulate my report.
Q. Okay. What are the Bradford Hill criteria?
A. The Bradford Hill criteria are a

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list of criteria that are named after their author which basically have been set up to guide epidemiologic studies.
Q. Okay. What are they?
A. Well --
MR. JOHNSTON: Objection. Beyond the scope of his report. Go ahead.
THE WITNESS: I -- again, I do not use Bradford Hill on a regular basis. I use related evidence-based medicine algorithms on a regular basis, which are very similar to Bradford Hill.
BY MR. LITZENBURG:
Q. When you perform --
A. Any of them are.
Q. -- like regression analyses yourself; is that what you're saying?
A. No.
Q. Oh, okay. Well, answer.
A. When I -- when I look at, you know, the temporality of -- of exposures or dose-responses, these sorts of things, they are listed as Bradford Hill criteria. They're also criteria in evidence-based medicine, you know, going back many years.

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Q. So there are no pesticides that in your opinion cause non-Hodgkin lymphoma?
A. There are pesticides in a recent publication from the Agricultural Health Study that are statistically associated with a trend towards increased NHL.
Q. What are they?
A. I refer back to my report for the list and the citation.
Alavanja 2014 published a report based on the AHS cohort that found that certain subtypes of NHL were correlated to exposure to lindane, permethrin, diazinon, Tribufos, and DDT.
The authors concluded that while pesticides from different chemical and functional classes were associated with an increased risk of NHL, not all members of a given class were associated with an elevated risk of NHL, total NHL or its subtypes.
Q. That's -- that study didn't look at glyphosate, did it? That paper 2014?
A. This paper was derived from the same cohort, therefore, data set, if you will, as the 2005 De Roos publication that they did not address the question of glyphosate.

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Q. How many other chemicals did you read studies on -- let's see. How many other -- yeah. How many other chemicals did you study the causality of these articles that don't even mention glyphosate?
MR. JOHNSTON: Objection. Assumes facts not in the record and goes beyond the scope of his expert report.
THE WITNESS: What I did in terms of the scope of my expert report was to look at NHL outcomes that were from the AHS study.
So there was this pesticide Alavanja 2014, and there was a second very interesting study looking at allergies and their effect on the risk of NHL. This would be Hofmann 2015.
BY MR. LITZENBURG:
Q. Those are the two papers not mentioning glyphosate that you relied upon?
A. I relied --
MR. JOHNSTON: Objection. Vague. Go ahead.
THE WITNESS: I relied upon -- I did not rely upon these papers to draw my

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scientific conclusion.
I relied upon these papers to show that there was plenty of evidence in the AHS cohort of significant differences in NHL outcome under certain circumstances.
BY MR. LITZENBURG:
Q. Uh-huh. Do you know how Hollingsworth or Monsanto came to you as an expert?
A. I don't know the details of how they did that, no.
Q. You just got a cold call?
A. Well --
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Yeah. Essentially -- essentially I was called up, yes, on the telephone and asked if I would be willing to review the question of NHL etiology in general and with a specific emphasis on glyphosate.
BY MR. LITZENBURG:
Q. Okay. Who called you? Was it somebody from Hollingsworth?
A. Yes.

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Q. Okay. And that was late 2016 you said?
A. Approximately, yes.
Q. Okay. Why did you use, sir, Bradford Hill criteria in your 9 -- 11-page report?
MR. JOHNSTON: Objection. Misstates his report.
THE WITNESS: I didn't use the Bradford Hill criteria.
I cross-referenced, as it says here in my report, a couple of the Bradford Hill criteria, of which there are nine. Specifically the biological gradient question or dose-response and the temporality question, exposures, you know, predating the development of it.
And I did this in the context of looking -- after looking at other expert reports that have used Bradford Hill criteria to make the argument that glyphosate exposure increases the risk of NHL.
So to make my report cogent with their reports, I restated the Bradford

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Hill criteria, but I could have simply just talked about temporality, biological gradients, as I have provided that data in -- in several of the figures in my report.
BY MR. LITZENBURG:
Q. What proportion of your patients are you treating for non-Hodgkin lymphoma?
A. That's a tough question.
70 percent.
Q. Okay.
A. 60 percent. I don't know.
Q. Okay. Do you tell your patients -- do you ever use the word "latency" in talking with your patients?
A. The term seldom, if ever, comes up.
Q. What does it mean to you as a scientist?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Latency to me means the time from an exposure to an agent, such as a chemotherapy agent for breast cancer, and the development of a second malignancy, such as AML, in patients who are -- who are treated for breast cancer.

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So we've got a known exposure time and dose and you've got -- you've got an outcome, and the time between those two is your latency period.
BY MR. LITZENBURG:
Q. Does that vary -- that latency period vary among cancers?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I didn't review latency amongst cancer in general as part of my expert report.
BY MR. LITZENBURG:
Q. Dr. Fleming, do you know whether latency in solid organ tumors is longer, about the same as, or shorter than length for blood cancer?
A. It --
MR. JOHNSTON: Objection. Vague as to the exposure involved.
THE WITNESS: It all depends. We'd have to be much more specific.
BY MR. LITZENBURG:
Q. It all depends on the cancer subtype; right?
MR. JOHNSTON: Objection. Vague.

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Incomplete hypothetical.
THE WITNESS: The subtype is one of many factors that you need to consider when discussing latency. Sure.
BY MR. LITZENBURG:
Q. It depends on what exposures there were?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: It depends on a great number of criteria.
BY MR. LITZENBURG:
Q. Okay. Well, you told us in this paper that latency is 10 years?
A. I'm saying with the best available data we have, that's a very reasonable time frame in which to expect lymphoma to develop.
Q. Are there children with lymphoma or other blood cancers under the age of 10 that come through your hospital?
A. Not through my clinic, but I'm sure they come through the hospital and the pediatric clinics.
Q. Okay.
A. Of which I am not a part.
Q. Okay. All right. Tell us how you

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arrived at this 10-year latency.
A. I arrived at this 10-year latency by reviewing the literature for secondary cancers, which is well established for the treatment of solid tumors, and the development -- with a variety of different chemotherapy agents, and the development of secondary malignancies, which are almost exclusively acute myeloid leukemia.
There is relatively little data on NHL as NHL is not typically a secondary cancer in patients that have been treated for other tumors. There are two notable exceptions to this.
One, as we've discussed, is the development of NHL in patients that have previously had Hodgkin's disease, and there are additional reports this time in the pediatric literature just suggesting the development of NHL that follows the treatment of a variety of rare pediatric tumors.
And these, you know, fit quite nicely with the, you know, the basic latency period, which is, you know, in the six to 10-year range. So this is a -- I thought a very reasonable place to start.
Q. It fits quite nicely with the

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conclusion that -- well, scratch that.
You hold the opinion that outside of the context of prior chemotherapy, radiation therapy, and immunosuppression, the latency of NHL is unknown; isn't that right?
A. It is not well-defined, no.
Q. Do you hold the opinion that outside of the context of prior chemotherapy, radiation therapy, and immunosuppression, the latency of NHL is unknown?
A. Outside of those contexts, yes, I would agree with that statement.
Q. Okay. So anything where you are factoring in latency in this 11-page report we can set that aside, right, in terms of causality and plausibility?
If it takes -- if you're making an assumption about latency, we can set that aside from your report; right?
MR. JOHNSTON: Objection. Misstates his report.
THE WITNESS: Right. I would disagree with that.
I think there is no question that latency exists. I think there's going to

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be significant variability in it.
I think an average time based upon the data that we do have is a reasonable time frame in which to -- to begin to evaluate that.
BY MR. LITZENBURG:
Q. Okay. Can you give me a citation to a textbook or an article stating that a 10-year latency is a valid assumption to -- to make in terms of non-Hodgkin lymphoma?
A. There is very little literature on latency periods in NHL in the scientific literature.
Q. Okay. This is new work that you're doing here with these two maps?
A. I'm sorry. New work?
Q. Yeah. This is like a novel approach. You agree with me?
A. Taking robust data sets and querying them to see if there's relationships is what we've done historically over time. Now, with high-powered computing and centralization of databases, we can just do it much better.
Q. Okay. Well, let's look at these maps on page 8 there.

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Is part of your opinion for this litigation the fact that the noncorrelation of these maps is supportive of non-causality of glyphosate in non-Hodgkin lymphoma?
A. The --
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Could you restate the question?
BY MR. LITZENBURG:
Q. Who was your criticism of the Eriksson 2008 study?
A. My criticism with that is that the difference in odds ratio did not survive multivaried analysis.
Q. Okay. What's multivaried analysis?
A. Is when -- well, there's different -- different definitions.
Q. Okay.
A. In the Eriksson paper, after correcting for a modest handful of variables that they thought may affect the outcome, the statistical significance disappeared.
And then there's the other level where I believe you need to correct for other exposures that was not addressed in the paper at

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all.
Q. What exposure?
A. Other exposures to pesticides --
Q. Okay.
A. -- and others that was not fully addressed.
Q. Okay. Well, let's look at these maps on page 8.
A. Uh-huh.
Q. How many variables did you control for in this comparison?
A. I didn't control for variables.
This is -- this is -- this is data that's, you know, this is the best available data we have on glyphosate usage per the US Geological Survey mapping, and this is the best NHL incidence.
And I have put them side to side as an illustrative point that there were many areas of very high glyphosate usage. I draw your attention to the Central Valley of California, and when you look there it at Fresno and Sacramento counties, they actually have a relatively low incidence of NHL.
This is not what one would

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anticipate if there was a positive association between glyphosate exposure and NHL. This is also true, you can see very clearly, in Central Florida where there's a tremendous amount of -- of glyphosate usage, yet at the same time the NHL rates are quite low.
So one would not anticipate this result if there was a positive association. Yet here it is.
Q. Can you tell me some things about the population -- let me back that up.
What are the demographics of people exposed to glyphosate in the Central Valley of California?
A. The demographics?
Q. Yeah.
A. Residents of -- of that area. Many of them who work in the agricultural industry and, therefore, exposed to high levels of glyphosate.
Q. Okay. What proportion of those are migrant workers?
A. I don't know what percentage of migrant workers have, you know, high, low, or medium levels of exposure. I'm not aware of that

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data.
Q. Is there any familial relationship for non-Hodgkin lymphoma?
A. No.
Q. Okay. Does it depend on race or sex?
A. Men the incidence is very slightly higher than women.
Q. Race?
A. The incidence in African Americans and Hispanics is somewhat lower than it is in Caucasians.
Q. Okay. What is the incidence of -- well, are you aware of something called the "Hispanic paradox"?
MR. JOHNSTON: Objection. Goes beyond the scope of his report.
THE WITNESS: I have not heard that term before.
BY MR. LITZENBURG:
Q. The healthy migrant effect?
A. No.
Q. These are -- these are pillars of epidemiology when considering anything with an Hispanic population.

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You can't tell me what either of those are or stand for?
MR. JOHNSTON: Objection to counsel's testimony regarding what is a pillar of epidemiology. Improper question.
THE WITNESS: The data I presented here on glyphosate usage in the United States and NHL incidence by county is not detailed epidemiologic data.
What it is is it's a snapshot of two factors. Glyphosate usage which remains concentrated in agricultural areas and subsequent NHL incidence eight to 12 years later.
BY MR. LITZENBURG:
Q. Okay.
A. That's all that is. I'm not drawing any statistical or numeric conclusions from this.
I am saying the expected association one might see is often not seen, and that is basically the extent to which this data could be used as an illustrative example of that fact only.
Q. Are you talking is it a six to

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nine-year latency period you thought was a reasonable one?
A. Six to nine, eight to 10. I chose --
Q. Which one?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: I don't -- I don't think that there's a data-driven distinction between six -- six to 10, eight to 12. I think -- I think they're overlapping and the same.
I think, you know, two years or less is different from eight to 10 and six or eight to 12 and six to 10.
BY MR. LITZENBURG:
Q. You think that two years or less is different from six to 10?
A. Yeah, very likely. I think --
Q. That's your professional medical opinion?
A. This -- this doesn't --
MR. JOHNSTON: Objection. Argumentative.
THE WITNESS: Yes. This doesn't

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fall within the scope of a professional medical opinion.
I am just saying that overlapping ranges near 10 are similar, whereas, something that is 80 percent less, namely, two or 90 percent less, namely one year, would be different.
BY MR. LITZENBURG:
Q. You agree --
A. This -- I'm sorry.
Q. So you agree this couldn't -- this manner of approach could never be part of a professional medical opinion?
A. No.
MR. JOHNSTON: Objection. Vague.
BY MR. LITZENBURG:
Q. Okay.
A. No, I disagree.
Q. You did --
A. This is an illustrative example of the lack of correlation between glyphosate -- glyphosate use and NHL incidence using the best available data that allows one to, looking at a snapshot, illustrate that -- that issue.
And you can -- you'd spent as much

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time and energy as you like doing it, but I think it clearly illustrates the point that a positive relationship is not evident in these two data sets when you put them together. That's all I'm saying.
Q. You think that clearly illustrates a point that there's no positive relationship? These two maps?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: I believe that this -- these maps are illustrative of the robust epidemiologic data we have in the Agricultural Health Study which does not indicate any clear association between glyphosate usage and NHL.
BY MR. LITZENBURG:
Q. What does this have to do with the Agricultural Health Study? Which of these maps came from the Agricultural Health Study?
A. Neither. I am saying that --
Q. They illustrate the Agricultural Health Study?
A. They --
MR. JOHNSTON: Objection.

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Misstates his testimony.
THE WITNESS: They illustrate the principal -- the principal finding of the AHS study vis-a-vis glyphosate and NHL.
BY MR. LITZENBURG:
Q. You agree we should ask Aaron Blair what the principal is of the Agricultural Health Study rather than Dr. Fleming?
A. I think there's a principal finding as it relates to glyphosate and NHL. I'm not saying that that is the main focus of the H -- AHS study. That is the focus upon which I was asked to render an opinion.
Q. Okay. And --
A. And I used all available data to me to test the hypothesis as to whether there could be an association or what one would, you know, look at what one would expect if there was an association.
I used very robust databases and, interestingly enough, there was no association. Had we, you know, tried to associate cigarette sales with lung cancer, this type of approach, you know, would be -- would be successful. It has not been successful in demonstrating any --

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any link between the two here.
There is an absence of the expected outcomes here in several geographic areas if the expectation was there was a positive relationship. There is no real evidence for it here.
Q. Have you done a map for cigarette sales?
MR. JOHNSTON: Objection. Vague. Outside the scope of his report.
THE WITNESS: I'm not aware of any maps for -- for cigarettes. I'm talking about data that's now many, many years old that -- that correlated the -- the commercial production of cigarettes and the subsequent rise in lung cancer.
Where you're looking at, you know, two disparate things and you put them together and you see a relationship that you would anticipate from -- from your hypothesis which was that the two are linked.
BY MR. LITZENBURG:
Q. You just told me that if you made a map of cigarette sales here, it would show

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positive results.
A. I did not --
Q. Did you mean that?
A. I did not mean to use the word "map." I did not say "map."
I said cigarette -- commercial cigarette production in the United States at the turn of the last century was followed by an increase in lung cancer. In looking at those types of kind of large picture statistics is -- is useful.
Q. Okay.
A. And it can provide an illustrative example of a relationship. Not a statistically epidemiologically-driven conclusion but, rather, a real world conclusion that -- a real world data that can -- can aid that conclusion.
Q. This second figure, it says "NHL incidence by county"?
A. Yes.
Q. Did you -- did you pull this map from somewhere or did you make it with data taken from somewhere?
A. What's really nice about the SEER program is it allows you to go ahead and to

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select different variables and different time periods, and it plots the map for you.
So the folks at SEER have already gone through the data, and they know which parameters are reasonable to look at and which ones are not. And this is a publicly available database, and you can go in there and -- and look at these different parameters over time.
And as you'll see all races are included, non-Hodgkin's lymphoma for both sexes included, and the year is 2008 to 2012. I could have chosen different races. I could have chosen different diseases. I could have chosen just males. I could have chosen just females. But it was that relatively narrow menu of choices.
I was, you know, couldn't ask it to query NHL in people with blue eyes because that was not a pull-down option. So they only let you graphically represent what they have gone over and feel is accurate data.
Q. Does the incidence of the AIDS virus affect the incidence of non-Hodgkin lymphoma?
A. No, absolutely not.
Q. Autoimmune diseases have no effect --

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A. That wasn't your statement, sir.
Q. -- on non-Hodgkin lymphoma?
A. That wasn't your question.
Q. The incidence of AIDS does not track in any way the incidence of non-Hodgkin lymphoma?
A. Sir, you said does the incidence of the AIDS virus track with that, and the answer is no. It has not tracked with it now for more than 15 years.
Q. Okay. What auto --
A. I'd be happy to tell you why.
Q. What autoimmune diseases are closely related with non-Hodgkin lymphoma?
A. There's a variety of them listed in my -- in my report. Everything from Sjogren's syndrome to rheumatoid arthritis.
Q. Okay. And where do -- how do we factor for autoimmune disease on this map?
A. Well, we actually don't, but autoimmune disease distribution is not 80-fold different as the -- as the -- or 25-fold different as the glyphosate data is.
So the difference of glyphosate and the difference in incidences here are -- are of a -- of a different magnitude.

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Q. This gives us no data. It doesn't anything to do with --
A. Well, it's like comparing males and females. Your lifetime risk of developing NHL if you're male is about 2.1 to 2.2 percent. If you're female, it's 1.8 percent. For simplicity, we say it's 2 percent overall.
Can you, you know, categorize it by sex? You can. Is it meaningful to do so? For the most part not because these are very small differences that would basically come out -- come out in the wash at the end of the day.
Q. You agree with me that this approach doesn't take into account the distribution of autoimmune disease?
A. I am not aware of any data showing marked regional differences in autoimmune diseases.
Q. You weren't aware of any data stream marked regional differences in pesticide decision until you looked at this data, were you?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I would have hypothesized that glyphosate usage would be highest in agricultural areas. I then

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went and got the data which shows that and confirmed that hypothesis.
BY MR. LITZENBURG:
Q. What about immunosuppressive therapy? Has that come forward on this approach?
A. Immunosuppressive therapy, while a practical day-to-day problem in patients treated with significant degrees of immunosuppression for organ transplantation and rheumatologic disorders, represent a very small percentage of the US population and would not be expected to affect county-wide incidences of -- of NHL.
Q. What's the incidence of that kind of therapy in the Central Valley of California?
A. Probably not much different than it -- than it is, you know, north or south of that, or if there is a difference, it's a very modest difference.
Q. Did you look into it?
A. Highly immunosuppressed individuals are not geographically defined. I know this from my treatment of making people profoundly immunosuppressive during their bone marrow transplant therapy, and half of those individuals lived in urban areas and the other half drove

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many hours from rural areas to see me. And the one thing they had -- all had in common was that.
And this would also be true of other types of transplant programs and, again, the distribution of rheumatologic diseases would likely follow that.
Q. Doc, you're telling me that your reason for that conclusion is anecdotal from your practice?
A. Conclusion of what? I'm sorry.
Q. How can you account for -- well, tell me what the rate of immunosuppressive therapy is in the Central Valley of California as opposed to other places in the country?
You answered something about all these folks that drive into your clinic.
A. Sure.
Q. What's that have to do with anything? Is that anecdotal evidence?
MR. JOHNSTON: Objection. Argumentative and vague.
THE WITNESS: I described to you a population of patients I have a lot of familiarity with on a firsthand basis who are immunosuppressed and dispersed evenly

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throughout the country, evenly throughout the state of Oregon, Southwest Washington, Idaho, Northern California, in a rural/urban distribution.
BY MR. LITZENBURG:
Q. Did you do anything to look into the incidence of immunosuppressive therapy in the Central Valley of California when writing this 11-page report?
A. I did not.
Q. Okay. Speaking of anecdotal and people driving into your clinic, you say you see people from three states? Is that about --
A. We had a referral base at the bone marrow transplant program at OHSU that includes Southwest Washington and Idaho and individuals who were far enough north in California that they were part of our referral base, yes.
Q. Okay.
A. I had plenty of patients who were immunosuppressed, got in their car and drove four hours to see me in Portland, Oregon. I would say about half of my patients actually were from a rural area and half of them were from the urban area which, roughly, you know, is the population

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distribution in the United States today.
Q. Okay.
A. So I don't believe you have pockets of highly immunocompromised patients in the Central Valley or pockets of people who are not at all immunocompromised in any particular county or -- or agricultural area.
Q. But you haven't done anything to look into that?
A. I am --
MR. JOHNSTON: Objection. Misstates his testimony.
THE WITNESS: I am telling you my 20 years of anecdotal experience in the tertiary care hospital that cares for all people in a certain geographic catchment area regardless of whether they are urban or rural individuals.
BY MR. LITZENBURG:
Q. Dr. Fleming, you're telling me that based on your anecdotal evidence in Oregon you -- that's how you know the incidence of autoimmune or immunosuppressive therapy in the central coast of California -- I'm sorry -- the Central Valley of California?

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MR. JOHNSTON: Objection. Beyond the scope of his report and not an opinion offered in this litigation. Go ahead.
THE WITNESS: This has been my experience in Portland, Oregon, in Stanford, California, and Atlanta, Georgia over the last 30 years.
BY MR. LITZENBURG:
Q. Okay.
A. So this --
Q. How many of your patients in Atlanta, Georgia lived in the Central Valley of California?
A. I don't know the answer to that.
Q. Do you think that we can use this anecdotal evidence to draw determinations about causality -- any conclusions about causality?
MR. JOHNSTON: Objection. Misstates his testimony. Asks a hypothetical. Beyond the scope of his report.
THE WITNESS: I was answering an earlier question that you raised about the geographic distribution of immunocompromised individuals and how that

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may impact the NHL incidence by county in Figure 5 of my report.
And my professional opinion based on lots of experience is, I do not believe it was a major factor. I cannot provide specific published data to support that.
BY MR. LITZENBURG:
Q. It's based only on anecdote and no data; correct?
A. It's based on -- it's based on 25 years of experience.
Q. Anecdote?
MR. JOHNSTON: Objection. Misstates the record and his testimony.
THE WITNESS: It is based on my clinical expertise and experience over 25 years.
BY MR. LITZENBURG:
Q. You didn't do -- lift a finger, turn a page to find out what the incidence of immunosuppressive therapy was to Central Valley --
MR. JOHNSTON: Objection.
BY MR. LITZENBURG:
Q. -- Of California.

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Is that correct or incorrect?
A. There were --
MR. JOHNSTON: Objection. Compound and argumentative. Go ahead.
THE WITNESS: Could you unpack that question, please?
BY MR. LITZENBURG:
Q. What is the incidence of autoimmune disease in the central post of -- I'm sorry -- Central Valley of California as opposed to the rest of the country?
A. I do not know the answer to that.
Q. What did you do to look into that?
A. I did not look into it.
Q. Okay. What did you do to look into the use of other pesticides in the Central Valley of California?
A. They wouldn't be relative to the data, the illustrative data I'm showing you, unless those pesticides actually inhibited the development of NHL.
Q. So there are not --
A. I --
Q. There are not any pesticides that are associated with an increased risk of

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non-Hodgkin lymphoma?
A. Decreased risk.
Q. Wait. You hold the opinion that certain pesticides are cancer protective?
A. No, that's a conclusion from your previous question.
Q. Okay. How did you control for the use or the distribution of other pesticides in making this little map?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: This is glyphosate data only.
BY MR. LITZENBURG:
Q. All right. Let's use your anecdotal approach in clinic.
How many of your patients that came in with non-Hodgkin lymphoma have used Roundup in their life?
A. I have no idea.
Q. Okay. Will you begin keeping track of that today as you think that this is anecdotal evidence is an important way of determining causality?
MR. JOHNSTON: Are you asking him

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to? Are you asking him if he intends to? Because you have no right to ask him to do anything, counsel.
MR. LITZENBURG: Take it however you want.
THE WITNESS: I --
MR. JOHNSTON: That's argumentative and inappropriate.
THE WITNESS: I am not using anecdotal evidence to determine causality --
BY MR. LITZENBURG:
Q. Okay.
A. -- and have not done so in this report.
Q. Okay. So, again, how did you compute or allow for variations in immunosuppressive therapy in these hot spots as you call them?
A. Immunosuppressive therapy is relatively rare. I would say it's exceedingly rare based on the entire population of the United States. I do not believe it is likely to affect the regional outcomes in NHL, but I'm also not aware of any data that speaks to that question.

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Q. Okay. Did you look to see if there was any data that spoke to that question?
A. No, I did not.
Q. Okay. And what's your estimate anecdotally of the number of new NHL patients that you have that have used Roundup in the past?
A. I have no knowledge of my patients' use of Roundup.
Q. What other probable human carcinogens designated by IARC do you believe are incapable of causing cancer?
MR. JOHNSTON: Objection. Misstates his opinion. Misstates his testimony. Hypothetical.
THE WITNESS: Right. Again, I was charged with looking at glyphosate and NHL and not general cancer causation.
BY MR. LITZENBURG:
Q. Okay. Dr. Fleming, would you be comfortable presenting to your peers in the oncology department that they should tell patients to continue using Roundup or glyphosate products that they are treating for non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Beyond

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the scope of his report. Argumentative.
THE WITNESS: Right. I would have no reason to comment to my colleagues on this -- on this issue or advise them one way or another.
BY MR. LITZENBURG:
Q. Well, you've probably done more research on it than any -- any NHL expert in America; right? How long have you spent doing this?
A. I would have no idea what other individuals have -- time other individuals have spent on this question.
Q. Well, that was going to be one of my questions.
Did you recommend that Hollingsworth contact anybody with expertise in this area?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I did not -- I was not asked that question and I did not offer that information.
BY MR. LITZENBURG:
Q. Okay. Anecdotally, how many of your NHL patients have used pesticide in the past?
A. I have not asked them that question.

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Q. Okay. This recordkeeping of glyphosate use in the US, where does it come from?
MR. JOHNSTON: Objection. Vague. What recordkeeping?
BY MR. LITZENBURG:
Q. The map. Where do you get the data from?
A. The website is actually included here in my report. It's USGS National Water-Quality Assessment Project.
Q. But how is the data calculated?
A. How is the data calculated?
Q. Yeah. I mean, is it a poll?
A. There are agricultural districts that report on their use of chemicals and other variables, and this group collates this data and provides usage maps, including this one for glyphosate -- glyphosate.
Q. Dr. Fleming, isn't it true you have no absolutely no idea where they came up with the data that's in this map?
MR. JOHNSTON: Objection. Argumentative. You just answered your question.

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THE WITNESS: Yeah. They -- they -- they came up with it using -- using this agricultural district data that is widely used in the agricultural industry to -- to keep track of -- of compounds and other issues.
BY MR. LITZENBURG:
Q. What is this widely -- how else can you characterize this widely used agricultural data? What type of data are you talking about? How is it measured?
A. Using the best techniques available, the group in the federal government charged with coming up with these estimates receives reports and solicits information and puts it together. The details of which I am not aware.
Q. What are the best techniques available?
A. I was simply assuming that the government was using their best statistics to generate information which is disseminated public on the use of a variety of chemicals in agriculture, including glyphosate.
Q. You have no idea how they calculated glyphosate usage, do you, Dr. Fleming?

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MR. JOHNSTON: Objection. Argumentative.
THE WITNESS: I have no idea how the NCI calculated NHL incidence either.
BY MR. LITZENBURG:
Q. So we can set all this aside; right?
MR. JOHNSTON: Objection.
THE WITNESS: No.
BY MR. LITZENBURG:
Q. Okay. Well, how long was -- let's see.
Do you know when they started keeping data on glyphosate usage geographically?
MR. JOHNSTON: Objection. Vague as to who.
THE WITNESS: This is all available on a -- this is all present on a publicly available website.
I recall going back and looking at it certainly back into the '90s and through the 2000s. You can click each year and it repopulates it with the updated data.
BY MR. LITZENBURG:
Q. Okay.

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A. But I can't -- I can't tell you for how long, but my purpose here was to look at the year 2000. Because, as I describe in my report, in the year 2000, almost 100 million tons were used in the United States and 10 years later, eight to 12 years later, I should say, this is the incidence of NHL.
And so that's basically the two data sets I wish to present to -- to look for any associations.
Q. Okay. Do you know if -- is it based on sales figures, the agricultural use of glyphosate?
A. I do know that there is different regional ways in which agricultural activity is monitored.
Q. Name two.
A. Well, I know the state of California has a different definition than some of the other states, but I'm not -- I'm not an expert on the mechanistics of the Water-Quality Assessment Project.
Q. Do you see a variance between the state of California here and then the use of glyphosate among other states?

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A. There is no way --
MR. JOHNSTON: Objection. Calls for speculation.
THE WITNESS: Yeah.
MR. JOHNSTON: Hypothetical.
THE WITNESS: There is no way to interrogate that data with the data available in the --
BY MR. LITZENBURG:
Q. There's nothing remarkable about California's glyphosate usage?
MR. JOHNSTON: Objection. Calls for speculation. Incomplete hypothetical.
THE WITNESS: I -- I am not aware of anything different. I am aware that different states have different reporting requirements on the use of chemicals.
BY MR. LITZENBURG:
Q. Okay. What are California's reporting requirements on the use of chemicals?
A. You would have to ask the regulators.
Q. How does this map control for the different, you know, all -- is it 50 different methods of recordkeeping?

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A. I wouldn't know how many.
Q. Do you know if they use biomarkers?
A. I'm sorry?
Q. Do they use biomarkers in the calculation?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: The measurement here is the agricultural use, as indicated, in pounds per square mile.
BY MR. LITZENBURG:
Q. Okay.
A. That does not sound like a biomarker to me.
Q. Is it sale figures?
A. Records are used. Which ones I'm not sure.
Q. Don't we need to know that? Don't you need to know that? Don't you need to have spent three minutes determining that before you signed this report, Dr. Fleming?
A. I think there's a 20 -- a minimum 20-fold difference between different regional areas on this map, and I think that is a very, very wide range and will not be accounted for by -- likely to be accounted for by

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administrative differences in how this data is collected.
Q. You just -- when you were stammering about how you don't know how this data is collected, you said that all the states keep it differently; right?
MR. JOHNSTON: Objection --
THE WITNESS: No.
MR. JOHNSTON: -- to stammering.
BY MR. LITZENBURG:
Q. Oh, okay.
MR. JOHNSTON: Can you please treat the witness respectfully, counsel? Counsel.
MR. LITZENBURG: Okay. Yeah.
MR. JOHNSTON: Please treat the witness respectfully. It is not appropriate for you to be disrespectful to the witness.
BY MR. LITZENBURG:
Q. What are the differences among states in collecting or aggregating the data on glyphosate usage that you described?
MR. JOHNSTON: Asked and answered. Objection.

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THE WITNESS: I cannot give you specific details on a state-by-state basis as to the differences. That's something you'd have to contact the USGS folks about.
BY MR. LITZENBURG:
Q. Okay. So they're not kept in a standardized way amongst states; is that what you're saying?
A. I have no -- I have no firsthand knowledge on how this data is actually collected, processed or analyzed. I am aware of how it's disseminated. I have used the disseminated data to plot a graph based on criteria that the folks who put this data together felt was -- felt were reasonable parameters.
Q. You felt that was the best way of looking at this?
A. This is the only nationwide data I was able to easily find that could be converted to a map to show the pattern of glyphosate use in the United States.
Q. And it was important for you to convert it to a map because that's what you're charged with doing?

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A. They converted. No, the map is there. You click an icon that says "map." A map of the United States drops down. It asks you a couple of questions and that you can -- variables you can put in there.

And then you push a button indicating what years you're interested in looking at, and you can look at each year individually, and I chose the year 2000.

Q. All right.

A. And those are the -- those are the only choices I used.

Q. Can you name one way of gathering this data that one state might have used?

A. I did not investigate the method of data collection from which this data set is derived.

Q. Did you look behind the data or the methodology of any of the science that you looked at today, Dr. Fleming?

MR. JOHNSTON: Objection. Vague and --

THE WITNESS: Absolutely.

BY MR. LITZENBURG:

Q. How would you explain that failure

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to a first year medical student or a colleague that you have no idea how this data was collected and you'd have no idea because you have never looked into it?

MR. JOHNSTON: Objection. Argumentative and disrespectful, counsel. You can ask questions, but you cannot be disrespectful of the witness.

THE WITNESS: In my opinion, this was the best available public data demonstrating glyphosate usage in the year 2000 across the continental United States.

BY MR. LITZENBURG:

Q. Okay. What --

A. These are the keepers of this data set. I cannot speak to the details of -- of how it was collected. I can only show you the data that -- the output of that data.

Q. Who are the keepers?

A. US government reg -- it's US government. US Geological Survey and within the US Geological Survey is USGS National Water-Quality Assessment Project, NAWQA. So this is a government agency that provides annual pesticide maps -- use maps for the United States.

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And I see now in looking at my report they have done this since 1992.

Q. So we have no data about the regional usage of glyphosate, regional variations, before 1992; is that correct?

A. I didn't say that.

Q. Do you have any data used in this -- in this map model of any glyphosate usage before 1992?

A. The USGS National Water-Quality Assessment Project provides data in map form going back to 1982. That does not address whether data is available somewhere in some archive in the government. This is the publicly available data.

Q. Where is the '82 to '92 data? You just said --

A. I'm sorry. 19 -- I meant -- if I did, I misspoke. I meant 1992 through 2014.

Q. And then you told us you don't know if there's any data before 1992?

A. I am not aware of any publicly available data that can be used to generate a map.

Q. Did you look for it?

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A. Yes.

Q. Where?

A. I just -- I just looked for agricultural pesticide use maps, and this -- this is what -- what came up. There are --

Q. Well, you said --

A. There are no, that I'm aware of, competing government agencies that provide the same publicly available information on this -- on this issue.

Q. Name the government agencies that you inquired into whether they kept such data.

A. I did it the other way. I searched -- I searched for pesticide use in the United States maps.

Q. Do Google?

A. Google search. Google Scholar.

Q. Pesticide use in the United States maps?

A. US maps. Looked at that. Would have looked at that in Google Scholar. Would have looked at that in probably a PubMed search with those terms. Yeah.

Q. Okay. Is that a good way of determining etiology?

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A. It's a good way --
Q. Creating Google for maps?
A. It's a good way of collecting data.
Q. Okay.
A. It's a modern way of collecting data.
Q. All right. What did you use to determine whether or not there was data available for this geographical variance before 1992?
A. I did not identify any other publicly available, readily accessible source of data and chose to go with the USGS assessment project --
Q. Okay.
A. -- which has been in place now for a quarter century.
Q. And you told me --
A. This is -- this is the go-to place for glyphosate usage data, much as the National Cancer Institute is the go-to place -- one of the main go-to places for cancer data in the United States.
Q. Does National Cancer Institute have a position on glyphosate?
A. I did not review the positions of

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any regulatory body or any position taken in a review article or a formal position taken. I would not have reviewed a formal position taken by the NCI.

I have reviewed the Agricultural Health Study from 2005, and this was funded by the National Institutes of Health and it was funded -- it was basically done by epidemiologists from the National Cancer Institute, which is an institute within the National Institutes of Health.

Q. Was that a no?

What -- you said a minute ago that the NCI was the go-to for? What do you call them the go-to for?

A. Clinical -- clinical cancer incidence in the United States.

Q. Okay. Do you know if they have a position on the causality of glyphosate and any cancer?

A. I did not review opinions on that to come to my conclusion.

Q. Have you ever Google searched it, make Google search the maps?

A. It would -- it would -- it would not

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have -- it would not have been relevant one way or another.

My job was to look at the primary available data and to draw a conclusion. I was not asked to review the opinions of regulatory agencies or think tanks or the federal government. I was asked to review the scientific literature on this question.

Q. You didn't look at any EPA reports?
A. If they're on my MCL, I looked at them.
Q. All right. Let's look at this MCL because there seems to be a lot of confusion, Doc.

MR. JOHNSTON: Objection. Argumentative.

BY MR. LITZENBURG:

Q. Materials Considered List. Now, first of all, what is the difference between the Materials Considered List and the Supplemental Materials Considered List that I was subsequently given?
A. I don't know.
Q. Okay. You want to look at them together?

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A. Happy to.

MR. LITZENBURG: Okay. You've got one there, which is within that Exhibit 1. I'm going to give you this. We'll call this Exhibit 3.

(Document marked for identification purposes as Fleming Exhibit 20-3.)

BY MR. LITZENBURG:

Q. All right. I've just given you Exhibit 3, which says it's "Supplemental Materials Considered List"?
A. Yes.
Q. Okay. And how many items are on it?
A. 74.
Q. Okay. And how many items are on the initial Materials Considered List?
A. 71.
Q. Okay. Is there -- would they overlap by 71?
A. I --
Q. Or are they different lists?
A. We can go through them one at a time.
Q. Who made them?

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A. Why don't we?
Q. Who made them?
A. I made them.
MR. JOHNSTON: Objection. That clearly is in violation of rule -- the Rule 26 on about the drafts, etc., of expert reports.
BY MR. LITZENBURG:
Q. Have you ever seen these before?
A. Yes.
Q. When?
A. When I generated it.
Q. Oh, you -- you wrote these lists?
MR. JOHNSTON: Counsel, objection. You're not supposed to ask about the drafting of expert reports.
MR. LITZENBURG: He offered it. I didn't ask. He said he seen it when he drafted it.
THE WITNESS: I did not.
BY MR. LITZENBURG:
Q. Is that your under oath testimony?
A. No, it is not.
Q. Okay. What --
A. I provided --

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Q. Okay. What are --
A. I provided a list of materials I considered to Hollingsworth. They put it in alphabetical order using the reference format that you see in front of you.
Q. Did they provide any of these to you?
A. Certainly.
Q. Okay. How do we tell which ones?
A. Well, we'd have to go through them one at a time. I'm happy to.
Q. Okay. Well, let's go through this with this idea.
How many of these are regulatory documents? You said it didn't matter to you what regulators thought; right?
A. I didn't say it didn't matter. I said --
Q. What did you say about regulators -- regulatory documents?
MR. JOHNSTON: It's on the transcript, counsel. Asked and answered. You're being abusive.
THE WITNESS: I said I did not take review articles, think tank reports

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or regulatory decisions into consideration when I prepared my scientifically data-based driven report of the scientific literature evaluating the role of glyphosate and NHL, period.
BY MR. LITZENBURG:
Q. Okay. So of these 74 things on this list, tell me, what is the supplemental part of it? What needed to be add -- what were the three things that needed to be added?
A. To be sure, we would need to go over both lists one at a time to see where -- to see if there's any differences before reference or before number 72.
Q. You don't know if there's any differences?
MR. JOHNSTON: Objection. He just testified to that. He suggested that the way to do this would be to go through it one at a time. If you would like to do that, I'm sure he's willing to do that.
THE WITNESS: Absolutely.
(Reviewing document).
BY MR. LITZENBURG:
Q. I don't want to use your time like

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that.
MR. JOHNSTON: It's your time actually, counsel.
BY MR. LITZENBURG:
Q. All right. So give me -- give me a more concise statement about what you relied on in forming your opinion today.
A. I relied on studies addressing potential links between glyphosate and NHL in humans.
Q. What did you do to identify -- you said this was the best way of showing the prevalence of glyphosate use geographically over the US.
What did -- what is the second best?
MR. JOHNSTON: Objection. Assumes. It's a hypothetical question.
THE WITNESS: I am not aware of additional databases that are publicly available and could be queried.
BY MR. LITZENBURG:
Q. And what did you do to make yourself aware of them?
A. I searched the topic to begin with, and the current government-funded database that

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began 25 years ago was right at the top of the search list.
Q. When was glyphosate first marketed?
A. Give me a moment.
Q. Do you know offhand what decade it is?
A. I believe the year 1974.
Q. Okay. And where do we find the data for the geospatial usage of glyphosate from 1974 to 1992?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: The GeoViewer data is a relatively new adaptation to the SEER database and has only been relatively recently available. It is not possible to use geo version for historical purposes.
BY MR. LITZENBURG:
Q. Okay.
A. I used the most up-to-date data which goes to 2014 and begins at 2008. There may be a time period or two behind that, but -- but I wanted to use the most up-to-date data and to look at how that fit with the glyphosate usage 10 years before.

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Q. You only -- you only looked at the data from 2008 to 2014 did you just say?
A. Yes. It's the most recent and relevant data and, as shown in my report from NCI SEER database statistics, the incidence has changed over time. So, you know, you want to take what's the most current time frame and ask -- and ask your question.
So it's a current -- it's as current a database as I could use.
Q. So you're jumping. You're talking about SEER now; is that right?
MR. JOHNSTON: Well, objection. The whole line of questioning is vague because of this.
THE WITNESS: Right. I mean --
BY MR. LITZENBURG:
Q. What is the best database? The superlative that you just used?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Yeah. I'm not -- I don't understand your question.
BY MR. LITZENBURG:
Q. It's the most recent and relevant data. As shown in my report, from NCI SEER

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database statistics, the incidence has changed over time. So you want to take what's the most current time frame and ask your question so it's as current a database as I could use.
What database are you talking about there?
A. I am talking about the SEER incident rate database cancer by site, all races, both sexes, and I used the initial studies I could going back to 1975 through 2014. This is shown in Figure 3 of my report.
However, that -- that tells you that over time the incidence of -- the increasing incidence of NHL in the United States has declined, plateaued and begun, you know, and actually begun to truly decline. Okay?
During this same time period, the use of glyphosate has gone from about 1.4 million to a hundred million tons per year. So --
Q. I think -- I think we need to slow down.
A. Okay.
Q. Yeah. I was asking you about the metrics for the estimated agricultural use for glyphosate, and now you're telling me you've got

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Figure 3 and SEER data; is that right?
A. The glyphosate data is not SEER. It is not NCI.
Q. Oh.
A. It is, as we discussed a moment ago --
Q. Okay.
A. -- part of the USGS National Water-Quality Assessment Project.
Q. When did we start talking about cancer statistics? I hadn't gotten there yet. When did we start talking about that? Because I noticed a transition --
MR. JOHNSTON: Apparently your questions --
BY MR. LITZENBURG:
Q. -- in the answers.
MR. JOHNSTON: Objection. Apparently your questions were vague, counsel. So perhaps you should try it again.
BY MR. LITZENBURG:
Q. Okay. When you keep saying these are the best databases, which were you referring to? Are you talking about cancer or pesticide

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uses?
A. I believe that both of them are the most relevant to the scientific question at hand.
Q. These are --
A. Both -- both of those databases.
Q. These are the two most relevant data points to the question of causality for you?
A. I didn't say data points. I said databases. That would include more than one data point.
Q. What was the other important data points to that question?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: You'll have to be more specific.
BY MR. LITZENBURG:
Q. What are other variables that are important to this causality question?
MR. JOHNSTON: Objection. Vague and --
THE WITNESS: Other -- other variations or I'm -- I'm --
MR. JOHNSTON: Asked and answered.
THE WITNESS: What causality

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question are we -- we have to talk about a very defined definite data set and --
BY MR. LITZENBURG:
Q. Okay.
A. -- and hone in on it.
Q. Okay. So we're talking about glyphosate and non-Hodgkin lymphoma.
A. Uh-huh.
Q. Are we clear on that?
A. Yeah.
Q. Okay. What other variables are important to that question of association?
MR. JOHNSTON: Objection. Asked and answered. You asked that answer earlier.
THE WITNESS: I believe I've answered that question previously.
BY MR. LITZENBURG:
Q. What was it, the answer?
A. We've discussed it in the context of a variety of different questions.
Q. Okay. Name one. Name the third most important variable.
Are you telling me --
MR. JOHNSTON: Objection. Calls

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for hypothesis.
BY MR. LITZENBURG:
Q. -- the geographical distribution, it might be sale or it might be your analysis -- we don't know -- of glyphosate use in the US --
A. Okay.
Q. -- and SEER --
A. I can -- I can --
Q. -- incidence by county are the two most important data points?
MR. JOHNSTON: Objection. Your whole line of questioning is vague because now you're mixing apples and oranges now.
THE WITNESS: Right. I -- yeah, I need you to restate your question if you would.
BY MR. LITZENBURG:
Q. Okay. You just said these are the most important databases and the most important data points.
To what?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: With regard to the county level incidence of NHL, these are the most recent data points available to

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analyze.
This makes the conclusions drawn from them, you know, recent, not -- not historical from 20 to 30 years ago, and this is important because I was interested in focusing on the current incidence of NHL.
BY MR. LITZENBURG:
Q. Why?
A. The most recent one.
Because it doesn't really matter to me the -- the -- I was not able to generate -- Data that I could not put into a map format because it was not available to be done in a map format was of no interest to me because I wanted to demonstrate a nationwide association between these two.
Q. You wanted to demonstrate a nationwide association?
A. I wanted to look if there was one. Absolutely.
Q. Okay. What -- you were starting to say it was not important to you, which historical data; is that what you're saying?
How old --

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A. I said --
Q. How old is data before it becomes unimportant to you?
A. It depends entirely on the context, but if I was rendering an opinion on NHL today, I would not be particularly interested in county-specific data that preceded 1974 as glyphosate was not in use whatsoever. So that historical data would be of no interest to me in this matter.
Q. Okay. So how --
A. It could -- it could be of interest in answering another scientific question. It could be of interest in many other capacities, but it would not be of interest to me in this setting.
Q. Okay. Tell me two things -- tell me one thing that you did to determine the county level usage of glyphosate from 1974 to 1992.
MR. JOHNSTON: Objection.
THE WITNESS: This --
MR. JOHNSTON: Misstates the -- misstates the testimony and not encompassed within the expert report.
THE WITNESS: The SEER

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database --
BY MR. LITZENBURG:
Q. Now we're jumping from --
A. The SEER --
Q. -- from county usage to cancer incidents; right?
Because I want to make clear that transition for the record when we do that.
I just asked you a question about that top chart, which is glyphosate usage, right? Has nothing to do with cancer, or am I wrong?
MR. JOHNSTON: Objection. Compound and argumentative.
THE WITNESS: I thought you were referring to the bottom chart. So your question is now about the top chart?
BY MR. LITZENBURG:
Q. It always has been. I mean, maybe we need to demarcate the question a little bit.
A. Sure.
MR. JOHNSTON: Yes, that would help.
BY MR. LITZENBURG:
Q. We're looking at the top.
A. Uh-huh.

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Q. All right. You said this is about the geographic distribution or usage of glyphosate; right?
A. Uh-huh.
Q. And NCI doesn't -- doesn't --
A. No.
Q. -- keep such statistics?
A. No, not at all.
Q. So what did you do to look at the -- at the geographical distribution of glyphosate from 1974 to 1992?
A. From 1974 to 1992?
Q. Yes.
A. I did -- I did not look at that in detail.
Q. Okay. What -- at what level did you look at that data?
A. For interest sake, I scanned the glyphosate data in the database from some point in the '90s through to the most recent date, probably the last couple of years, and decided that if I was going to correlate this with NHL incidence, I would need to pick a year.
Q. What year did you pick?
A. I picked the year 2000 because the

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year 2000 to me seemed important because we'd had over a 70-fold increase in the amount of glyphosate since its registration in 1974. So there was a tremendous amount of glyphosate in the -- in the community.
Q. Yeah.
A. And this also, that was the latest time point I could choose and still look at incidence by county with a 10-year latency period, and that's what drove the decision of -- of looking at these two data sets.
And I would like to continue to add that the top glyphosate data set interestingly defined, by my recollection, the agriculturally intense areas of the United States pretty much since its inception, and it was really only the areas that the intensity of the use that changed over time rather than the areas for the most part.
So it was actually a very stable representation of where the high levels were used.
Q. Okay. You were answering, I believe, the question of how you calculated or where you pulled the data, the geographical

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distribution of glyphosate from 1974 to 1992. Could you answer that for me now?

MR. JOHNSTON: Objection. Vague. Misstates his testimony.

THE WITNESS: I --

MR. JOHNSTON: Misstates the question he was answering.

THE WITNESS: Yeah. I -- I did not specifically use the years you just mentioned as part of my report.

BY MR. LITZENBURG:

Q. Do you know anything about the geographical use of glyphosate between '74 and '92?

MR. JOHNSTON: Objection. Asked and answered. He just answered that about five minutes ago.

BY MR. LITZENBURG:

Q. Okay. You told me that there was -- well, do you have an answer to that question?

MR. JOHNSTON: Yeah. Asked and answered, but you can answer it if you have the -- if you want to repeat your answer.

THE WITNESS: I looked at that,

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some of that data, but not all briefly, and then did not include it in my report because I didn't think it was material.

BY MR. LITZENBURG:

Q. Where can I find that data? Where would I go to to find geographical agricultural use for glyphosate from 1980?

A. I would direct you to the USGS National Water Safety Assessment Project. They will have a web page, and I suspect they will have a button that says something along the lines of "Contact Us" and you can ask them that question.

Q. That's the only way I get the data? So did you ask them for it? Did you ask them for raw data?

A. I was not interested in those in that time frame.

Q. So you have no idea what the data is from that time frame?

A. I did not find that time frame material in any way to my report.

Q. The time frame from 1974 to 1992 is not material in any way to whether glyphosate has an association with -- with NHL?

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A. What I did in Figure 1 of this report was to show the incidence of NHL changing over time from 1975 to 2014, and I mentioned in the text of the report the concomitant increase in the use of glyphosate over that period of time.

Q. Okay. You said --

A. And I chose the most recent time frame to evaluate further using this -- these -- these maps because that was most representative of the current state of the art for current incidence of -- of NHL in the United States at the -- at the county level.

And I backed that off by 10 years to look at the glyphosate pattern. It wouldn't have mattered if I backed off four years or six years, the pattern was essentially the same. I chose 2000 because it accounted for a potential 10-year latency period.

Q. It wouldn't have mattered if you had chosen -- well --

A. The pattern would be the same. The pattern would be the same.

Q. These maps look the same going back --

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A. They look -- what I was struck by when looking at these maps was how similar they looked over time, and there was a gradient from, you know, very light yellow to very dark brown. You can see those four groups less than 4.5 pounds all the way up to more than 88 pounds per acre.

The patterns at the earliest maps I looked at basically identified the Central Valley of California. They identified the Northwest. They developed -- they identified the central portion of -- of Florida.

What was different somewhat was the intensity of it and over time the areas that had the highest use increased somewhat, but from a pure pattern point of view, pattern recognition point of view, these agricultural areas were definable by glyphosate usage from the earliest time points I recall available in the data set.

Q. So you're telling me when you looked at maps -- this is for 2000, But when you looked at the same map for 1990, it looked about the same?

A. I don't know if I went back as far as 1990. I went back a couple years and I went

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forward several years, and I was -- I was struck by the similarity in pattern and the fact that there was a slight progression in the amount total used, which fits, of course, with the amount of glyphosate -- increasing amounts of glyphosate used over time.

Q. How many years did you use to compare it to find this year to be emblematic? You said you went forward a few years, back a few years and found this fairly representative. Can you give us a number?

A. That was not the --

MR. JOHNSTON: Objection. Misstates his testimony.

THE WITNESS: Yeah. That -- that was not the description I gave to you earlier. It is not the description in my report.

BY MR. LITZENBURG:

Q. Okay.

A. If you like me to restate what I did, I would be happy to.

Q. How did glyphosate usage patterns change from 1990 to 2000?

A. They would have significantly

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increased, and if you'll give me a moment here, I'll see how close my report brackets the years that you're questioning.

(Reviewing document).

Okay. By 1990, the annual usage of glyphosate in the United States had increased from 1.4 million pounds in 1974 to 15 million pounds. This increased to 40 million pounds by 1995 and to 98 million pounds by the year 2000.

In 2014, maximum 2014, a range of 2008 to 2014, up to 14 years after the annual usage of glyphosate reached 98 million pounds, the annual incidence of NHL continued to slowly decline.

Q. Did you just tell me anything about geography?

A. This para -- this data does not take into account any regional differences in either glyphosate usage or incidence. These are important variables that will be considered in the next section.

Q. Okay. I'm going to --

A. The next section is entitled "Regional differences in glyphosate use and the incidence of NHL."

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Q. And I'm asking you --

A. I'm happy to read this for you.

Q. I'm asking you for -- no, it was a quick read.

I'm asking for the 10th or 11th time: How did this agricultural usage across the country and its distribution, how did that change from 1990 to 2000?

Do you understand what I'm asking, first of all?

MR. JOHNSTON: Objection. He can now answer for the 10th or 11th time to the question that you've asked 10 or 11 times.

Do you know what he's asking you? You can give the same answer you gave before.

THE WITNESS: By 1990, the estimate was 15 million pounds. By the year 2000, the estimate was 98 million pounds.

BY MR. LITZENBURG:

Q. How are those 15 million pounds distributed across -- well, let me take a step back.

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You think the geographic distribution of the glyphosate is important to this causality question.

You chose that as one factor in doing this analysis; right?

A. I chose two large available data sets to test the hypothesis of whether there was any association with glyphosate and NHL, and I have compared them in two figures in my report labeled Figure 5.

Q. Was geographical distribution one of those?

MR. JOHNSTON: Objection. Vague.

THE WITNESS: Geographical distribution is a key component of both the glyphosate data set and the NHL incidence by county. They are -- these are -- this is demographic data -- I mean, regional data.

BY MR. LITZENBURG:

Q. Okay.

MR. JOHNSTON: It's about lunchtime, so wrap up soon?

MR. LITZENBURG: Yeah. We'll quit in a couple minutes.

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THE VIDEOGRAPHER: 15 minutes left on the tape.
MR. LITZENBURG: Okay. Sounds perfect.
BY MR. LITZENBURG:
Q. Geographical distribution is a key component of both the glyphosate data set and the NHL incidence by county. This is demographic data -- I mean --
A. Right.
Q. -- regional data.
You stand by that answer at least?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: Could you repeat the question?
BY MR. LITZENBURG:
Q. Yeah. Dr. Fleming, I'll go back to my original question, which is: How did the distribution patterns --
A. Uh-huh.
Q. -- of glyphosate differ between 1990 and 2000?
MR. JOHNSTON: Objection. Asked and answered.

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THE WITNESS: I did not review the distribution pattern for the dates you have inquired about.
BY MR. LITZENBURG:
Q. Okay. Why not?
MR. JOHNSTON: Objection. Also asked and answered.
THE WITNESS: I wanted to take the most geographically regionally defined data on NHL incidence in the United States. This is from 2008 to 2012.
I wanted to back off at least 10 years to account for certain estimates of latency that have been proposed to allow sufficient time for any relationship between glyphosate exposure and NHL incidence to be evident.
Consequently, I didn't go back past 2000 because I did not wish to compare 1990 with 2004. I wanted to compare current up-to-date glyphosate data.
And I would also tell you that the incidence by county is not available historically for very long. This is --

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this is -- I'm not -- I'm not sure how many other time periods were available to analyze.
I chose the most recent one and I worked backwards to say, all right, what was the glyphosate usage in this country approximately 10 years before or 10, you know, at least 10 years before.
BY MR. LITZENBURG:
Q. Okay.
A. Eight to 12.
Q. I still haven't stopped talking about that first map and you're talking about the second one; right?
A. I'm talking about both of them because either one in isolation doesn't address the question in any way about any potential correlation between glyphosate use and -- and NHL incidence.
Q. You told me --
A. You can't look at either of them in isolation and draw any conclusions.
Q. Did you tell me that the 70-fold increase in glyphosate usage from 1974 to 2000 was important to you in forming your opinion in

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doing this?
MR. JOHNSTON: Objection. Misstates his testimony.
THE WITNESS: The numbers you have quoted represent in my mind a significant increase in glyphosate usage during that time period. That is not to say it was not also significant in 2001, in 1999. You know, it's all in the sort of eye, you know, eye of the beholder. That was not my -- my point.
My point was to illustrate with nationwide data sets any relationship that could be discerned between glyphosate usage and NHL incidence by county.
This is, in my opinion, the best data sets available to provide this information in graphic form, and basically anyone can look at this and draw their conclusions as to whether there seems to be overlap between high levels of glyphosate and high levels of NHL.
It does not take any particular epidemiologic expertise to do this, medical expertise to do this. A nonexpert

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can actually sit down and look at this relationship themselves.
BY MR. LITZENBURG:
Q. Okay.
A. I was asked to prepare this report for a Daubert hearing, and I was asked to make this report to imagine I was a judge and to make this information as accessible as I could to people who did not have a strong background in lymphoma genesis, lymphoma etiology, NHL incidence, glyphosate.
So I used whatever tools I had at hand to -- to provide that. This is nothing more than a simple demonstration of what turns out to be, when looking at it, an absence of correlation between these two variables.
Q. Dr. Fleming, I'm going to try and get an answer out of this to this question before you go have lunch with your counsel and come back and we'll see what you say afterwards.
You've told me from 1974 to 2000 that the usage of glyphosate changed by a 70-fold increase; right?
A. Approximately, yes.
Q. Okay. How did the geospatial

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distribution of glyphosate -- not cancer -- change between 1974 and 2000?
MR. JOHNSTON: Objection. Asked and answered. He's already answered that question three times.
BY MR. LITZENBURG:
Q. Do you know?
A. I looked at the available data that I could in the map format and was immediately struck by the fact that the patterns of glyphosate, which is what you're looking at in that top figure, remain essentially constant throughout time. The color code changed as the amount of glyphosate use increased.
To put it another way, the Central Valley of California was present as an area of high glyphosate use as early on as I looked. It remained that way through 2002, and it remained that way for subsequent years.
Q. How early did you look?
A. I looked as early as the -- as the mapping program had data for.
Q. How far did you go back?
A. I don't recall that because, again, I focused on NHL and the approximately 10-year

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latency period and so I don't -- I don't recall the exact date that this data set goes back for being able to draw maps.
Q. Well, ballpark it.
MR. JOHNSTON: Objection. He doesn't know. Asked and answered.
THE WITNESS: I don't know.
BY MR. LITZENBURG:
Q. Okay.
A. It was not material --
Q. And --
A. It was not material to my report.
Q. The distribution -- the changes in distribution geographically between 1974 and 2000 are not important to your opinion or your report; correct?
MR. JOHNSTON: Objection. Misstates his testimony.
THE WITNESS: They are not relevant to the data I present in Figure 5 of my report and only that.
BY MR. LITZENBURG:
Q. And Figure 5 is only relevant if there is an eight to 12-year latency period for non-Hodgkin lymphoma.

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Do you agree with me there?
A. Figure 5 is relevant for a -- it is actually -- it is not known whether that is the case. I do not know for sure.
MR. LITZENBURG: Break on that.
THE VIDEOGRAPHER: Time now is 12:03. We are going off the record. This is the end of Disk No. 2.
(Whereupon, at 12:03 p.m., a luncheon recess was taken.)

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AFTERNOON SESSION
(12:53 p.m.)
WILLIAM H. FLEMING, MD, PHD
called for continued examination and, having been previously duly sworn, was examined and testified further as follows:
EXAMINATION (CONTINUED)
THE VIDEOGRAPHER: The time now is 12:53. We are back on the record. This is the beginning of Disk No. 3.
BY MR. LITZENBURG:
Q. Did you get a chance to get lunch, Dr. Fleming?
A. Yes, I did.
Q. Are you ready to go?
A. Absolutely.
Q. Okay. You've never done -- have you ever done expert work before for litigation?
A. I have provided expert reports in the past, yes.
Q. Okay. What was the matter?
A. It was a -- it related to bisphosphonates and multiple myeloma.
Q. Is somebody sued somebody? It was a court case?

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A. No. No. I just provided expert medical report, reviewing the history of the, you know, up-to-date at the time treatment of multiple myeloma. I talked about the individual case in some detail and then basically gave my opinion on the utility of bisphosphonates and the treatment.
Q. But, I mean, who was it done for? Who asked you to do it? It wasn't a court case is what I'm saying. It wasn't in litigation?
A. This was with Hollingsworth in 2010.
Q. Okay. Did you give a deposition --
A. No.
Q. -- in that case?
A. This is the first deposition I've ever given.
Q. Have you ever served as an expert -- have you ever been sued before for malpractice?
A. No, not that I'm aware of.
Q. You gave me an answer about AIDS earlier that I was surprised I didn't understand. Do you agree with me that AIDS increases the risk of non-Hodgkin lymphoma?
A. That was historically true. It is no longer true.

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Q. Okay. Why is that?
A. Because the HIV virus does not get into lymphocytes and cause a clonal expansion of lymphocytes resulting in lymphoma as EBD does. It gets into cells and reduces their number and their efficacy, and this results in virally-induced immunosuppression. It is in that setting of virally-induced immunosuppression specific to the HIV that lymphoma developed.
In the late 1800s or late 1980s through about 1993, patients who presented with full-blown AIDS often developed lymphoma. And from 1993 on, when HIV viral load could be easily controlled, it turned out that the incidence of lymphoma in those patients dropped off absolutely dramatically.
We actually had a program at our cancer center that was developed in the '90s, the early '90s to evaluate HIV lymphoma. It was a research group, and we closed that research group a number of years ago because HIV lymphoma basically ceased to exist as a clinical entity.
Q. And, in fact, if you look at Figure 3 in your report on page 4.
It's page 4.

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A. Sure. Yes.
Q. That tracks that dip. That's exactly what you're saying; right?
It's rising -- in the second chart on the right, it's rising up till about --
A. The second --
Q. -- 1993 and then there's -- then there's a dip; right?
A. The chart panel B on Figure 3 shows the SEER data for NHL, all races, all sexes, in the age group of 20 to 49.
Q. Do you agree with me that that dip has to do with AIDS just the mechanism that you just explained?
MR. JOHNSTON: Age or AIDS?
MR. LITZENBURG: AIDS.
MR. JOHNSTON: You mean HIV?
MR. LITZENBURG: Uh-huh.
THE WITNESS: This data does not, you know, give -- this data set we're looking at here does not give any indication as to what the cause of that is.
BY MR. LITZENBURG:
Q. Dr. Fleming, neither does any of the

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charts that you've referred to today.
I mean, what does Figure 4 and 5 give us as to the cause of non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Argumentative.
THE WITNESS: Figures 4 and 5 are illustrative of the conclusion I drew from the Agricultural Health Study that there was no positive correlation between glyphosate and NHL.
BY MR. LITZENBURG:
Q. I thought we were actually finding some common ground here.
Does this chart, Figure 3 on the right, does that not describe precisely the trend that you just told us about the AIDS virus and doesn't it, in fact, look at young people as opposed to all people?
This is the 20 to 49. That's typically the age range in which you get new cases of AIDS, isn't it, Dr. Fleming?
MR. JOHNSTON: Objection. Compound question and narrative, and I'm guessing it's going to be difficult to find common ground given how far out you

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are on the playing field.
But go ahead if you can answer his question.
THE WITNESS: There are a great many factors that are represented here in Panel B and I --
BY MR. LITZENBURG:
Q. What?
A. -- don't know -- I'm sorry?
Q. What factors?
MR. JOHNSTON: Can you let him answer his question? You're talking over him, counsel.
THE WITNESS: Okay. It's not -- it's not possible to tell, looking at this, what is responsible for -- for that drop.
What you're saying is that the successful treatment of the AIDS epidemic could follow a similar pattern, but that's a hypothetical to which I cannot give you an answer.
BY MR. LITZENBURG:
Q. You don't know how that -- you just gave me a very learned answer about AIDS

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epidemic --
A. Uh-huh.
Q. -- and the specific years affected --
A. Yeah.
Q. -- the incidence of lymphoma, didn't you?
MR. JOHNSTON: No. Objection. Misstates his testimony.
MR. LITZENBURG: Bob, you can't answer yes or no when I ask a question.
MR. JOHNSTON: You can't ask unfair questions.
MR. LITZENBURG: Bob, you can't answer no when I ask him a question.
MR. JOHNSTON: I'm saying no, you can't answer that question. It's improper. You're -- argumentative.
MR. LITZENBURG: You said -- you think that's how you object to form is to say no?
MR. JOHNSTON: Well, I object to form.
THE WITNESS: The extent to which therapy for HIV plays into this fall in

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Figure 3B is not a question I have looked into in any detail to provide you with any meaningful statistical answer.
BY MR. LITZENBURG:
Q. But it follows the years you gave me; right? The trend in the years '80 to '93 and then drop off, right, or does it?
A. This --
Q. Tell us if it does or it doesn't.
MR. JOHNSTON: Objection. Compound. How many questions do you want to ask him at once, counsel? It's a compound question.
THE WITNESS: Could you repeat the question, please?
BY MR. LITZENBURG:
Q. Is the shape of this line described by the trend that you just told me about AIDS between 1980 and 1993?
A. I gave --
MR. JOHNSTON: Objection. Asked and answered. Go ahead.
THE WITNESS: I gave you a generalization. These are hard numbers. Two different things.

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I told you that after 1993 with the advent of triple therapy, the entity of AIDS lymphoma declined in the -- in the ensuing years.

I did not mean to suggest that it dropped as much as it did or as quickly as it did in Figure 5B. I do not know, you know, what other contributing factors are involved.

BY MR. LITZENBURG:

Q. Has anybody done a study on that?

A. Again, beyond the scope of my expert report here today.

Q. Do you think if we stuck two maps side by side it would answer the question for us?

MR. JOHNSTON: Objection.

Geez, counsel, you don't think that's argumentative and disrespectful?

Objection to the conduct of this deposition.

THE WITNESS: Again, beyond the scope of my report.

BY MR. LITZENBURG:

Q. You agree with me that those two maps that we were looking at before only is true

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if the latency for non-Hodgkin lymphoma is between eight and 12 years; right?

A. Which two maps?

Q. Page 8.

A. No, I do not agree with that statement.

Q. Okay. So if the average latency of non-Hodgkin lymphoma is six months, you're telling me these maps are useful in determining whether glyphosate caused it or not?

MR. JOHNSTON: Objection. Misstates the testimony about what these maps show.

THE WITNESS: These maps show, as it's titled, the incidence on a county-wide basis from 2008 to 2012.

BY MR. LITZENBURG:

Q. But you made an assumption that latency is between eight and 12 years in making those two maps; right?

MR. JOHNSTON: Objection. Vague. Misstates his testimony.

THE WITNESS: I believe eight to 12 years is a reasonable time to begin to look at this question. I do not mean to

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suggest this covers the entire waterfront in terms of possible latency.

BY MR. LITZENBURG:

Q. What is your profession or your industry view as a reasonable latency for non-Hodgkin lymphoma?

MR. JOHNSTON: Objection. Speculative.

THE WITNESS: As noted in my report, outside of the context of chemo and radiation therapy for Hodgkin's disease and outside of the context of developing lymphoma in organ transplantation, very little direct evidence is out there for the latency of NHL.

In the vast majority of cases, the latency in a given individual is simply unknown.

BY MR. LITZENBURG:

Q. Well, how did you pick eight to 12 to do this?

MR. JOHNSTON: Objection. Asked and answered. We spent a significant amount of time on that this morning,

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counsel.

BY MR. LITZENBURG:

Q. Because it's not unreasonable? Is that how you practice medicine or science?

MR. JOHNSTON: Objection. Argumentative. And misstates the testimony that you spent a significant amount of time on this morning.

THE WITNESS: As I discussed earlier today, the chemotherapy and radiation therapy data, in combination with data in patients that are immunosuppressed, suggests that this is a very reasonable time, and I believe that there are hints in the case literature studies suggesting 10 years is not unreasonable.

BY MR. LITZENBURG:

Q. I'm asking is that how you practice medicine to do things that are not unreasonable?

MR. JOHNSTON: Objection. Vague.

THE WITNESS: We practice medicine based on the best available data at the moment we draw conclusions and make decisions about treatment.

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BY MR. LITZENBURG:
Q. But words are important here in litigation at least, and you keep telling me that a latency period of eight to 12 years is not unreasonable.
That's different from telling me that you have an opinion that the latency period of non-Hodgkin lymphoma is approximately eight to 12 years; right?
MR. JOHNSTON: Objection. Vague. Compound.
THE WITNESS: My opinion, based on the evidence available to me, is that this time frame should be sufficient to detect NHL.
BY MR. LITZENBURG:
Q. And what if the latency is three years? The relationship of these two maps to each other doesn't tell us anything about etiology, would it? You're comparing 2000 to -- 2008 to 2012; right?
MR. JOHNSTON: Objection. Compound. Two questions there, counsel. Choose one.
THE WITNESS: If it were limited

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to three years, that would be true. In the case of organ transplantation, there are circumstances where the lymphoma can develop earlier.
There is a subset of patients, for whom we do not understand the reasons, develop lymphoma within a year of beginning immunosuppressive therapy. The risk for developing it persists until about year 10.
Most patients don't develop it in the first year. Most patients do it later. It sort of peaks. It tends to peak at year 10. That's not to say there isn't a patient out at year 17 or 18. I just -- I'm just coming up with a reasonable time window to -- to look at this data in.
BY MR. LITZENBURG:
Q. So then one year is not unreasonable either?
A. There are subsets of patients in whom we have data that suggests NHL can develop within one year, but that would not be generalizable to the NHL population as a whole.

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The data -- the data in Figure 5 is basically that generalization.
Q. Would you agree with me that a latency of one year is not unreasonable in the context of non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I do not believe a latency of one year is in any way typical of the average latency for NHL based on the data we have. It would be -- it would be an outlier, and I have no doubt you could find patients in whom that was true, but that would not be the general trend.
BY MR. LITZENBURG:
Q. No. Is it reasonable or not reasonable to use that for a data?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: I took the best available data from the -- on NHL incidence by county, the most recent data, and correlated it with an average of approximately 10 years exposure to glyphosate and have presented that data.
I have not looked at any other

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time frames, and I'm not prepared to discuss that.
MR. LITZENBURG: Okay.
(Document marked for identification purposes as Fleming Exhibit 20-4.)
BY MR. LITZENBURG:
Q. I handed you Exhibit 4. It's a document from, I believe, the 9.11 commission. The heading is "9.11 Monitoring and Treatment Minimum Latency & Types or Categories of Cancer."
Do you see that?
A. If you'll give me a moment to read it, counselor.
Yes, I see this.
Q. Okay. And in those five categories below, which category would non-Hodgkin lymphoma fit into?
A. Well, it says that lymphoproliferative and hematologic cancers, including all types of leukemia and lymphoma. Point three.
Q. Okay. And what does it list as a minimum latency?
A. 0.4 years which they say is

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equivalent to 146 days.
Q. Is that unreasonable or not unreasonable?
A. It's based on low estimate use for lifetime risk of low level ionizing radiation studies, and this represents a change from lymphoproliferative cancers from the October 17, 2012, 9.11 version.
Q. What was the 2012 version?
A. Don't know.
Q. Okay. Do you know if it's gone up or down?
A. Don't know.
Q. Okay. Is .4 years as a low end estimate of latency, is that reasonable, not reasonable, or a third?
A. This is a conclusion drawn by an administrative group headed apparently by Dr. John Howard. It's a white paper. It's an opinion paper, and for the purposes of 9.11, they are considering this to be the minimal latency.
I am not aware of the primary data supporting this -- this allegation but -- per this conclusion I should say, but at the same time, I would not have searched out and reviewed

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this as this is a, you know, an opinion of a -- of a think tank, if you will.
Q. Right. In Figure 5 here, NHL Incidence by County, how is that data reported? Is it -- well, what does it mean by "county"?
A. What does it mean?
Q. Yes.
A. This would be the incident rate per hundred thousand people in that particular county.
Q. Is it where a person -- so if a person is living -- does it count where a person is living at the time of diagnosis? Does it count the actual site they were diagnosed at, the site of exposure? Where does that count?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: How those variables are addressed in the data set I cannot tell you.
BY MR. LITZENBURG:
Q. You have no idea if the SEER data collects where the person was diagnosed or where they lived or where they lived at the time of exposure? You have no idea what location that's using to collect that data?

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A. I have confidence that the National Institutes of Health and the SEER database that they oversee through the National Cancer Institute has carefully thought through these issues and worked to present data that they feel is -- is reliable based upon, you know, based upon all of these variables.
Q. Well, nobody is saying that NCI is unreliable.
I'm just asking you if you know -- if you work, say, in the Central Valley of California?
A. Uh-huh.
Q. And you get diagnosed in San Francisco, where is it going to count that diagnosis for NHL in the SEER data?
A. I have not reviewed the specifics of that question.
Q. Wouldn't that be crucially important to our understanding here?
MR. JOHNSTON: Objection. Calls for speculation and hypothetical.
THE WITNESS: I see patients from Washington State on a routine basis. They receive their diagnosis at my institution

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in Oregon. They drive five miles across a bridge to another state.
I would think it very unlikely that they would be included in an Oregon statistic because they are logged into the system as a state of Washington resident, and the county that they're residing in is also included because all that address information is there.
They're basically all reported cases of cancer in the United States or all diagnosed cases of cancer in the United States are supposed to be reported and collated to facilitate our understanding of the burden of disease, and there is a, you know, well-organized group of people who focus on this problem.
And how they addressed your question, how they addressed your question with granular detail, I don't know.
BY MR. LITZENBURG:
Q. So is your answer that this represents the county in which the patient is living at the time of diagnosis?
A. I do not know for certain whether

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that is correct.
Q. Okay. So how can you make this comparison or draw any conclusions from it if you don't know whether this is showing the places where people get non-Hodgkin lymphoma, the places where they get diagnosed with non-Hodgkin lymphoma, or the place where they were living at the time the latency period begins?
A. The people who constructed the SEER database would have a clear set of rules because the situation is actually more complex than you make it out to be. A person could have moved to a county within six months, get diagnosed in another county, and then returned to that second county. And where -- where are you going to include that?
Q. That's what I'm asking.
A. They'll -- they'll -- they'll have a standardized approach to answer your question, and that will basically be a wash for all the individuals who are recorded in the database.
Q. No, that's the question that I'm asking.
A. They're certainly not going to report the incidence of diagnosis at major

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teaching hospitals throughout America because it would then appear that essentially all cancer diagnosis in America were made in a few hundred centers.
As you can see here, there's very small counties throughout this map that are in states with low populations and states with no medical schools.
Q. Yeah.
A. So it's not going to be based on where the diagnosis is made.
Q. Yeah. In fact --
A. How long -- how long one needs to reside in the county before they're considered a county resident for purposes of the statistic I do not know.
Q. And, in fact, how many sites does SEER collect this data from?
A. The actual number of sites cannot be ascertained from the information that SEER provides in this.
Q. Did you do --
A. Because -- because the gray boxes in here indicate one of two possibilities. The data is not available or the data, in the words of the

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NCI, has been suppressed. And the reason it is suppressed is that there are some counties in this country that have a thousand residences or a thousand residents, and there are counties like LA County that have 10 million residents.
So if you've got a thousand people in your county, there's -- you're not going to be able to say too much about the annual incident rate of lymphoma because the population base is too small.
So much of the data here is because I think they have to have at least, I think I recall, 12 to 16 cases per county. Otherwise the information is censored or suppressed.
Q. Dr. Fleming, do you know how many sites SEER draws this data from?
A. The actual number of physical sites? No, I do not.
Q. Do you know if it's less than 20?
A. I do not know.
Q. You don't know if it's more than a hundred?
A. I don't know the reporting system for cancer diagnosis in the United States at a granular detail.

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Q. What is your estimate of the number of sites that SEER draws this data from?
A. I have no estimate to give you.
Q. Okay. If you're a migrant worker moving up and down the Central Valley harvesting vegetables and you get diagnosed in San Francisco with non-Hodgkin lymphoma, where are you recorded as getting non-Hodgkin lymphoma?
A. We would have to check with the rules and regulations that -- and guidelines that SEER uses to construct the database. I can't -- I'm not going to speculate on that.
Q. What proportion of agricultural workers in the Central Valley are migratory?
A. Again, beyond the scope of my report.
Q. Do you think that the etiology of non-Hodgkin lymphoma varies by subtype?
A. Let me think for a minute. That's a complex question.
HTLV, particularly in people of a Japanese background, tends to result in T-cell malignancies. So that is a subtype of -- of NHL. Okay?
EBV-driven lymphomas tend to be

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B-cell lymphomas. EBV-driven lymphomas tend not to be follicular low-grade lymphomas.

So the answer to your question is, there is some data associating some etiologies with some subtypes of NHL, but our data set and knowledge is incomplete.

Q. Does -- do either of your maps account for that?

A. It accounts for the overall instance, which would include the common types of NHL and the rare types.

Q. Could we adjust to see if it -- do the same thing for T-cell lymphoma versus B-cell lymphoma?

A. It cannot be done with the publicly available NCI database, to the best of my knowledge. Whether someone else at the NCI has that data on a -- on an NCI server, you'd have to ask them.

Q. Did you look into it?

MR. JOHNSTON: Objection. Vague.

THE WITNESS: This question looked at the overall NHL diagnosis, as do the great majority of epidemiologic studies.

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Subsequent subset analysis is appropriate when patient populations are large enough. That was not the goal of the NCI in generating this county-by-county data set.

BY MR. LITZENBURG:

Q. So you agree with me when you look at causality, you look at NHL overall and not on just individual subtype?

A. I don't think you're going to get a low-grade lymphoma arising as a cause of immunosuppression in an adult treated with an organ transplant. You will not get a follicular small cleave cell lymphoma, no.

So there is an example that I would -- I would be suspicious if someone provided those, you know, put those two together. But in many other cases, in fact in most cases, we don't know.

Q. I move to strike that answer, and I'm going to read it to you again.

Do you agree with me that when you look at causality, you look at NHL overall and not just by individual subtype?

A. I think it's reasonable to look at

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both.

Q. Okay. You don't account for subtypes in this?

A. Subtype? I can only go with the data I have. Subtype analysis was not available on this.

Q. Are you certain?

A. It was not easily publicly available. If I petition the NCI to release this, I could go through a review process where they would release any data to me because I'm a, you know, a physician scientist at a US university.

I could go through a process to -- to -- to get my hands on any data, but it would probably be in a format that I would not be able to, you know, readily -- readily work with.

Q. What format?

A. It would -- the format --

MR. JOHNSTON: Objection. Calls for speculation.

THE WITNESS: Yeah. This -- this geo version -- this GeoViewer type of data permits this county-by-county assessment.

Again, anybody, regardless of

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their background and statistics or epidemiology, can go in there and click and get a statistically valid representation of the incidence by county in those counties for which data is available.

BY MR. LITZENBURG:

Q. And you --

A. You don't have to make any decisions. The decisions have been made for you. You can choose from a modest menu, and that's basically the limitation of it.

I, again, cannot query this data set and ask how many people with NHL -- how many people with blue eyes got NHL in Florida. That is not something I could query and present to you today because that is not on the menu. Age and sex and other variables are.

Q. And you have no idea, again, what "NHL Instance by County" means? You don't know if that means the county of residence, the county of residence of diagnosis, the county of exposure? You have no idea, and it makes no difference to your opinion, does it?

MR. JOHNSTON: Objection.

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Absolutely compound and asked and answered.
Choose a question. Which one do you want him to answer?
BY MR. LITZENBURG:
Q. You have no idea what "NHL Instance by County" means do you?
A. It means that residents of the United States have been assigned a county following the diagnosis of NHL.
Q. How is that defined?
A. The details of that are determined by the NCI and the SEER database.
Q. Would that affect your --
A. I can only speculate on this.
Q. Would that affect your opinion?
A. No, not at all.
Q. It wouldn't affect your opinion if this county is the place where the person was exposed, the place where they lived at the time of diagnosis, or the place where the site of diagnosis is? That wouldn't make any difference to your opinion?
MR. JOHNSTON: Objection. Compound and calls for speculation.

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THE WITNESS: Figure 5 -- my opinion in this case is not dependent on Figure 4 and Figure 5 at all.
Figure 4 and Figure 5, as I said earlier, are illustrative of the data that we have in the epidemiology literature looking at a large cohort-based study.
I simply said, are there other data sets that would illustrate to us whether that was a, you know, you know, a reasonable conclusion. Would they have a different finding? Who knows?
So I went and plotted up the data. You got it in front of you. It is not epidemiologic data. It is not the data I based my opinion.
If I did not have any of the data in Figures 1 through 5, this would not change my opinion.
BY MR. LITZENBURG:
Q. Is this an accepted method of epidemiology?
A. No. It's not epidemiology at all.
Q. Okay. And what does -- well, are you aware of published epidemiology on this

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subject that shows a dose-response?
A. I am not aware of any dose-response in the literature that I have seen that I would consider to be scientifically credible because it has not been adjusted for the use of other pesticides or it simply does not meet statistical significance after multivaried analysis that only includes a relatively short list of variables.
Q. What paper finds a dose-response but then fails one of the criteria that you just mentioned?
MR. JOHNSTON: Objection.
THE WITNESS: Again, I did not -- I did not memorize the content of -- of these case studies reports. If there's one you'd like to discuss, please provide it and I'll be happy to point out my thinking.
BY MR. LITZENBURG:
Q. Has any study concluded there's a dose-response or not between glyphosate and NHL?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: There are -- I recall abstracts of papers that have suggested that that's what they conclude.

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I have looked at their primary data, and I do not agree that it provides -- that it provides convincing evidence of a relationship between glyphosate and NHL in a dose-dependent or non-dose-dependent manner.
BY MR. LITZENBURG:
Q. You looked at the primary data for all these papers?
A. I looked at -- I looked in the case-control studies at some primary data.
Q. Where did you get your answer?
A. Primary data -- if you put numbers in a table and those are the numbers and they, you know, they haven't been adjusted, that's primary data. If you take it a step further and say we did multivaried analysis on these things, that's still primary data.
Q. So for each of these papers, you read the abstract and then you went and looked at the primary data; is that --
A. I looked at -- I looked at the primary data. There was -- there was a paper or two that said there was potentially a dose-response, and I looked at it. And I was

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underwhelmed by the number of patients in the study, I was underwhelmed by the dose-response differences and, most importantly, I didn't rely on them because they didn't adjust for other pesticides.

Q. What papers?

MR. JOHNSTON: Objection. Asked and answered.

BY MR. LITZENBURG:

Q. Were you underwhelmed? I mean, you just told me that you were underwhelmed by patient numbers of one of papers that showed a dose-response. Which one?

A. We could --

MR. JOHNSTON: Objection. Misstates his testimony. That's highly --

THE WITNESS: Let's go to my MCL. I'll point them out for you. That's fine. It's not a problem.

BY MR. LITZENBURG:

Q. Do you remember the question pending is: Which of these shows a dose-response for which you don't like the patient population numbers?

MR. JOHNSTON: I'm going to

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object on the grounds that that's compound and also argumentative and also disrespectful.

THE WITNESS: (Reviewing document).

The Eriksson 2008 paper, to the best of my recollection, mentions a potential dose-response.

BY MR. LITZENBURG:

Q. Any others?

A. To discuss this any further, I suggest we just take it out and look at it to refresh both our memories and we can -- I will be happy to tell you what concerns me about their analysis.

Q. Well, you must have weighed two lists. Tell me if there's anything that meets that criteria.

MR. JOHNSTON: Objection to the extent he recalls.

THE WITNESS: Yeah.

MR. JOHNSTON: Because this is not a memory test, counsel.

THE WITNESS: Yeah. There was at least one other case-control study that

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mentions dose-response in this regard.

BY MR. LITZENBURG:

Q. Is dose-response one of the Bradford Hill criteria?

A. Yes.

Q. Do you believe that latency varies by subtype?

A. Latency varies by a number of different factors, and subtype would be one of them.

Q. Okay. Do you disagree with IARC that this is a probable human carcinogen?

MR. JOHNSTON: Objection. Beyond the scope of his report.

THE WITNESS: I did not consider IARC's opinion in detail. I considered the IARC monograph exactly as I would any other review article as a review of published data with which I used to double-check that. There was no studies I had excluded from my analysis.

BY MR. LITZENBURG:

Q. What other disagreements do you have with IARC in terms of carcinogens?

MR. JOHNSTON: Objection. No

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foundation. Misstates the record.

THE WITNESS: Yeah. I -- I am not here to give an opinion today on IARC's decision of the classification of glyphosate. That's beyond the scope of my report.

I am looking at the primary scientific data.

BY MR. LITZENBURG:

Q. Is there a more authoritative source than IARC on what causes cancer and what doesn't?

A. Yes.

Q. What?

A. The primary data in the world's literature is the authoritative source on the scientific significance of correlating any exposure with -- with any disease.

IARC is an international organization that reviews potential carcinogens, and it is also an organization that brings together, you know, large data sets from around the world for investigators to query.

So they have a panel of epidemiologists who sort of continually review compounds that they may think are potentially

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carcinogens, yes.
Q. Do you agree with the EPA's classification of glyphosate or Roundup?
A. Again, I did not take the EPA's classification into consideration when I wrote this report.
Q. Why did you put it in your Materials Considered List?
A. I -- pardon me.
Q. You just said you didn't consider it, but it's on your Materials Considered List?
A. I misspoke. I did not rely upon it. Again, because it is -- IARC is also on my list. I did not rely on IARC. I did not rely on any review articles. I did not rely on any opinion pieces. I did not rely on any -- the results for any regulatory agencies.
Q. Was it all peer reviewed, everything you relied on?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Yes, at some juncture all the -- all the data that -- that -- all the data I really relied on, truly relied on, yes, was peer reviewed. There was other aspects of it that were

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sort of updates of peer-reviewed data. So while the final followup on certain patients from AHS studies had not yet been published, it was collected in the same peer-reviewed format as the other studies had, so...
BY MR. LITZENBURG:
Q. So you relied on unpublished data?
A. I didn't rely on it. It was congruent with the opinion of the De Roos 2005 article, of which it was a longitudinal follow-up. It strengthened the conclusions of the 2005 article, but did not -- but did not materially contribute to my opinion.
Q. Do you know what the North American Pooled Project is?
A. Yes, I've heard of it.
Q. Did you look at that unpublished data?
A. No, I did not.
Q. Do you know if it's favorable to Monsanto's case or unfavorable?
A. I do not.
MR. JOHNSTON: Objection. Calls for speculation and vague as to

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"favorable" and that he knows what Monsanto's case is.
THE WITNESS: And I do not -- I do not know of any unpublished data from this project.
BY MR. LITZENBURG:
Q. So you were only given one set of unpublished data?
A. I was given the 2013 draft manuscript by Alavanja, et al. updating glyphosate in the AHS data set through 2008.
Q. Do you think that this methodology in Figures 4 and 5 is better than that of Eriksson?
A. Apples and oranges. My -- I think Figure 4 and 5 are illustrative of the relationship described in the AHS study. They are completely congruent with it and do not show the expected changes one would see if that hypothesis or if that -- if that result was different in fact.
Q. Do you think that working in agriculture places you at increased risk of non-Hodgkin lymphoma?
A. I think there's a very long,

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well-established set of data indicating that farmers have a small but real increase in NHL compared to the general population, yes.
Q. Well, did you account for that in Figures 4 and 5?
A. The very highest levels of glyphosate in Figure 4 essentially define the major agricultural areas in the United States. So they are accounted for very, very clearly in Figure 4.
Q. What are you measuring that by?
A. I'm measuring that by -- It's the use on a per square mile basis essentially highlights the major agricultural areas of the United States.
Q. What are you --
A. From the Central Valley from eastern Oregon and eastern Washington to the Central Valley of California to Northwest Texas to Florida and all up the Southeastern seaboard and into the West Coast. These are -- these are all highlighted.
I would -- I do not see what I would consider a major agricultural area that -- that has no estimate of usage.

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Q. What have you done to study measures of major agricultural areas? I mean, what are you comparing this to to say that they match up?
It's circular logic, isn't it?
MR. JOHNSTON: Objection. Compound.
BY MR. LITZENBURG:
Q. You're telling me that because they use glyphosate, it's an agricultural area; is that right?
A. Uses of glyphosate certainly in the range, the higher range, which I would say is of greater than 88 pounds per square mile as compared to less than 4 pounds -- so we're seeing 20-fold differences, round numbers -- aggregate as expected within the major agricultural areas of the United States.
Q. Have --
A. Full -- full stop. I don't need -- I don't need any additional data to convince me that the Central Valley of California has a high glyphosate usage, and this is also true of, you know, of the Midwest and Florida.
As I pointed out, it's -- it's very clear. We're not drawing fine lines and borders.

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We're looking at with -- we're looking at broad areas of known agricultural activity that have high uses of glyphosate.
That's -- they're essentially -- you're right. They're essentially defined by glyphosate use themselves.
Q. So you would define a major agricultural area by the amount of glyphosate it uses?
A. I think there would be a very strong correlation, but I'd be happy to entertain any data you have to the -- in the contrary.
Q. Do you know how the AHS study controlled for the elevated risk of agricultural workers?
A. Controlled for it?
Q. Yeah.
A. Yeah. I'm not sure I understand your question.
Q. Did it?
A. What they did was, they did what was not possible in the case-control study where you take a population of patients with a disease or an outcome and then look down that list to find affected individuals.

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They focused on pesticide applicators. They went where the assumed problem was. There was a lot of preliminary evidence suggesting that might be a fruitful place to look for the increased incidence of NHL in farmers.
And they said, all right, let's get a cohort, a large cohort. 57,000 pesticide users. 75 percent of whom had glyphosate exposure. So the tyranny of small numbers that you get in case reports disappears when you have a robust prospective cohort study.
Q. You put in here that children are at 50 percent increased risk of non-Hodgkin lymphoma if they grew up on a farm; is that right?
A. Not as children. That's not what it says.
Q. People who grew up on a farm through 18 years of age?
A. Which is a very different statement.
Q. Okay.
A. That means if you grew up on a farm through 18 years of life, your risk of developing NHL subsequently was higher. It does not say you develop NHL as a child.
Q. What is that excess risk from?

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A. We do not know.
Q. Okay. You just know it can't be glyphosate?
MR. JOHNSTON: Objection. Misstates his opinion.
THE WITNESS: What I do know is that the Agricultural Health Study enrollees in 1993 were median age of 47, and this means that all of them, I mean, the median in that group would have been older than 18 years of age in about 1961, a full -- a full 13 years before glyphosate became available.
So those individuals who were, you know, in this study who have higher incidences if, in fact, they were raised on a farm, it had to be -- I have no idea what the exposure was, but I know with confidence that the vast majority of them absolutely would not have been young enough to have had any glyphosate exposure in the first 18 years of their life.
BY MR. LITZENBURG:
Q. Well, which is it? You have no idea what the exposure is or you have absolute

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confidence?
MR. JOHNSTON: Objection. Argumentative.
THE WITNESS: I have absolute confidence that the -- when you subtract the median age of enrollees in 1993 and then ask when they turned 18 years of age, this would be approximately a decade before glyphosate was ever used in the United States. Therefore, the -- one cannot correlate.
One can conclusively, I think, state that glyphosate in those individuals who turned 18 before 1974, they simply cannot have their disease, their NHL or anything else, attributed to glyphosate in childhood.
BY MR. LITZENBURG:
Q. So the fact that NHL existed before Roundup pushes you toward the conclusion that Roundup can't cause NHL?
MR. JOHNSTON: Objection. Misstates his testimony.
THE WITNESS: No. In this very well-defined group of patients who became

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adults long before glyphosate was approved, we cannot attribute their NHL to glyphosate, period.
BY MR. LITZENBURG:
Q. Okay. Did the incidence of non-Hodgkin lymphoma increase, decrease, or stay the same from '74 to present?
MR. JOHNSTON: Objection. Compound.
THE WITNESS: That data is in Figure 1 or -- pard me -- Figure 3 of my report.
Individuals over 50 years of age are shown in Panel A on the left. Individuals between 20 and 49 years of age are shown on the right.
BY MR. LITZENBURG:
Q. And overall did it increase, decrease, or stay the same?
MR. JOHNSTON: Objection. Vague as to time frame.
THE WITNESS: It exactly depends on the time frame, and I will run through that with you.
It's -- it increased quite

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substantively between 1975 and about 1990. At that point, the curve began to flatten out until 2004, and from 2004 on it has actually begun to decrease.
So the pattern is an increase for the first 10 or so years, a decrease in the rate, followed by a fall.
BY MR. LITZENBURG:
Q. The truth is from '74 to 2009, the incidence of NHL has gone up in every single subgroup that SEER measures; right?
MR. JOHNSTON: Objection. Vague.
BY MR. LITZENBURG:
Q. Every race, every age group?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Every single subgroup? The subgroups that SEER looked at are actually, this is, you know, this is SEER data. It's there in the figure.
And this Panel A is adults age 50, all races, both sexes, 1975 to 2014, and you can, you know, look at any -- any time interval you wish there to -- to talk about rate.
And the rate initially increased

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for unknown reasons, began to decrease, plateaued, and fell. In other words, the more glyphosate was used over time in the United States, the lower the incidence and rate of incidence of NHL became until it began to actually fully decline.
BY MR. LITZENBURG:
Q. I'm sorry. Do you know of a single subgroup for which the rate -- the incidence of NHL is lower today than it was in 1974, Dr. Fleming?
A. I did not do subset analysis in conjunction with the SEER data I presented in Figure 3.
Q. Is that a no?
A. I can't answer that off the top of my head. It's beyond the scope of my expert report.
Q. Do you know -- do you know if -- what was the long -- well, let's talk about AHS unpublished data.
What's the loss to follow up there approximately?
A. I would have to refresh my memory.
Q. You have no idea? Was there a loss

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to follow up?
A. I can't -- there's a loss to follow up in every study. And, in fact, a well-designed study will take into account the expected loss over time in order to have sufficient numbers.
Q. How do you do that? How do you make up for the loss over time?
A. You talk to well-qualified statisticians and epidemiologists before setting up a comprehensive cohort study, as the AHS is, and you say what would we anticipate, you know, loss to follow up be over time and how should we -- how many people should we enroll in the study to compensate for this difference.
Q. Uh-huh. And how did they compensate for the loss to follow up? Did they make that?
A. You can't compensate for the loss to follow up. Most --
Q. What did they do to adjust it?
MR. JOHNSTON: Objection. Quit interrupting him and let him answer your question before you ask another one, which renders your question a compound question.
THE WITNESS: Could you repeat your question, please?

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BY MR. LITZENBURG:
Q. Yeah. In the Agricultural Health Study, what did they do to adjust for the loss to follow?
A. I am not sure of the details of the -- in how the loss -- how the loss to follow up impacted the calculations that the epidemiologists did in their analysis. I cannot give you a granular answer on that.
I just know it's -- obviously by the fact it's published data by a well-respected group, I would -- I would expect the data to have been handled in a way that most epidemiologists would think was appropriate.
Q. What does plausibility mean to you?
A. As an English definition, I consider the word plausible as possible.
Q. Well, as a cancer doctor.
A. I guess plausible is not, you know, you know, a term that we, you know, we frequently use.
Q. It's one of the Bradford Hill criteria; right?
A. If something is implausible, it is certainly -- if the premise is implausible, then,

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you know, there -- there can't be a meaningful result derived from studying that premise.
Q. No. I asked if it was one of the Bradford Hill criteria.
A. I don't know if it's -- if it's one of the nine Bradford. I suspect it's incorporated in it, but I have, you know, not memorized all -- all nine criteria.
Q. Do you know if Roundup has been shown in some studies to cause DNA damage?
A. I'm sorry. I didn't hear your question.
Q. Do you know if Roundup has been shown in any studies to cause DNA damage?
A. Again, of -- I was -- I was retained in this matter to look at human etiology and epidemiology. I was not retained as a DNA damage expert.
Q. What are the mechanisms of action that you considered in looking at this potential association?
A. In my mind, before you have -- scientifically before you have a mechanism of action, you first have to have a, you know, a solid relationship, and I know of no credible

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scientific data that would suggest that there is an association between glyphosate and NHL. So there would be no mechanism to study.
Q. Do you know if there are any studies concluding that glyphosate exposure causes oxidative stress?
A. I have not reviewed any such -- I have not considered -- I have not relied certainly on any of them. Whether there's a paper or two on my MCL, we could certainly check.
Q. You don't know whether you looked at one or more or not; is that right?
A. If it's on my MCL, I looked at it. I certainly did not use that study in any way to arrive at my -- my opinion.
Q. Okay. A 20 percent increase in cancer risk is clinically significant to a cancer doctor, isn't it?
A. All depends.
Q. If a population that you're treating the risk of, if their incidence of lymphoma goes up by 20 percent because of exposure to something, that's important to you as a doctor, isn't it?
MR. JOHNSTON: Objection.

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Incomplete hypothetical. Calls for speculation.
THE WITNESS: Anything we can do to meaningfully reduce the cancer burden in the United States makes sense. Where you put a cutoff, many factors determine this.
BY MR. LITZENBURG:
Q. And as those efforts to reduce the cancer burden on the US, or whatever, you would not tell a current patient to stop using Roundup?
A. I would have no reason --
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: I would have no reason to because I have no credible data leading me to that conclusion.
BY MR. LITZENBURG:
Q. Do you agree that NHL can be secondary to prior cancer treatment?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: In a very narrowly defined group of patients, namely those who have been previously diagnosed with

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non-Hodgkin's lymphoma, NHL can occur. How much of that is due to the underlying NHL genetics and the chemotherapy and radiation therapy and those interactions are not well understood.
BY MR. LITZENBURG:
Q. What is the latency period for that association?
A. Again, probably in the six-year range. Six to 10-year range.
Q. You've actually studied it, haven't you? You've published on it. Do you remember?
A. I have -- I have not published anything on cancer latency.
Q. Okay. You don't remember publishing a paper saying kids that get secondary NHL after primary cancer treatment have a mean of 3.7 years between the two?
A. I'm sorry. Whose? May I see this manuscript?
Q. Do you remember participating, having your name on a paper that said that?
A. No, absolutely not.
Q. Okay. So that paper would be wrong, and this would be correct?

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MR. JOHNSTON: Objection. Calls for speculation.
You haven't shown him the paper, counsel. You're asking him to speculate about what the paper says and take your word for it, that's not proper. You're testifying.
THE WITNESS: To the best of my knowledge, I am not a coauthor on any paper where the latency of -- of NHL is -- is the primary topic at all.
BY MR. LITZENBURG:
Q. Okay. Do you agree it's not proper for scientists to develop an opinion and then work backwards to get your data methodology to fit it?
A. I disagree with your characterization.
Q. No. I asked you whether it was appropriate or not.
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Yeah. I -- your example does not fit the real scientific world in which I live and operate.
BY MR. LITZENBURG:

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Q. Do you know what our intake of glyphosate is, our biological load from just eating everyday foods?
MR. JOHNSTON: Objection. Calls for speculation and hypothetical incomplete.
THE WITNESS: Again, I was not retained to provide any opinion on the exposure of individuals to -- to glyphosate.
BY MR. LITZENBURG:
Q. Do you have an opinion on exposure of people to glyphosate?
MR. JOHNSTON: Objection. Asked and -- Objection. Misstates his testimony.
THE WITNESS: Not individuals in terms of their daily exposure and, you know, through -- through food products, crops, air, water, whatever. I was -- that's not part of my expert report.
BY MR. LITZENBURG:
Q. Did you look into it?
A. No.
Q. You don't know whether people get

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exposed to glyphosate through the diet?
A. It doesn't really matter how they're exposed to glyphosate when we have clear, compelling, reliable cohort data showing no association between glyphosate exposure and NHL, and that was the focus of my report.
Q. Is dietary glyphosate taken into account in these Figures 4 and 5?
A. That in Figure 4, that's glyphosate usage, I believe, per acre in these agricultural districts. End of story. But what --
Q. And, again, you don't know if that's based on sales figures. You don't know where that comes from; right?
A. I know it is what the US government consists -- considers the most reliable map of glyphosate usage per acre in the United States. That's all that data says.
You're inferring that it can be looked at in greater detail, and I am -- I am not aware that it can and I have not done so.
Q. Is most of food grown in the Central Valley of California consumed in the Central Valley of California?
MR. JOHNSTON: Objection. Calls

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for speculation and a hypothetical.
THE WITNESS: Right. I really don't understand the full economics of the food production in the United States. Can't comment.
BY MR. LITZENBURG:
Q. You did agree with me that correlation is not the same as causation; right?
A. Yes.
Q. Okay. And that's why we have epidemiology and controls; right?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: It's -- you don't always need to have epidemiology to demonstrate a causal relationship and it's not absolutely necessary, but epidemiologic tools are often very helpful in making these determinations.
BY MR. LITZENBURG:
Q. And the bulk of the published epidemiology in this case has a positive association?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: I am not aware of any statistically significant association

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between glyphosate and NHL in the published epidemiologic literature that accounts and is adjusted for pesticide exposure.
BY MR. LITZENBURG:
Q. Do you believe bladder cancer is associated with smoking?
A. I'm sorry. I didn't hear.
MR. JOHNSTON: Excuse me.
BY MR. LITZENBURG:
Q. Do you believe bladder cancer to be associated with smoking?
A. The --
MR. JOHNSTON: Objection. Beyond the scope of the opinion.
THE WITNESS: Again, not the -- not the subject of my expert report today here.
BY MR. LITZENBURG:
Q. Do you know?
A. I am not prepared to provide expert testimony as to that question today.
Q. You don't know if you're qualified to provide an answer?
A. I am not prepared to provide expert

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testimony outside of the question I've been asked to address here.
MR. ESFANDIARY: Doctor, where in time --
MR. JOHNSTON: Excuse me. You're not -- you're not allowed to speak on the record counsel. The deposition --
MR. ESFANDIARY: Right. I want to make clear of whether his best answer is his best answer, and he can't give us --
MR. JOHNSTON: You're not allowed to speak on the record, counsel. You're not allowed to speak.
MR. ESFANDIARY: Don't tell me what I'm not allowed to do.
MR. JOHNSTON: Oh, I will. I absolutely will tell you.
You're -- under the agreement and the order entered by Judge Chhabria, only one attorney is permitted to ask questions. You're in violation of the court order, counsel. Go ahead.
BY MR. LITZENBURG:
Q. Do you know if smoking causes lung

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cancer?
A. There is a very strong association between smoking and lung cancer, yes.
Q. Okay. And so you would -- you would say it causes it?
A. In some but not all people. The full 10 percent of lung cancer cases occur in nonsmokers.
Q. And you don't know whether it causes bladder cancer or not?
A. There is a literature that would support an increased instance of bladder cancer in certain individuals who harbor certain mutations, two minor mutations.
Q. Just two data points.
The rate of cigarette smoking in Egypt has gone up steadily in the last 30 years and the incidence or the percentage of diagnosed cancers that are bladder cancers has gone down. Those are two maps you could put up next to each other.
Would that show us -- would that disprove the theorem that smoking is associated with bladder cancer?
MR. JOHNSTON: Objection.

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Incomplete hypothetical. Calls for speculation.
THE WITNESS: Right.
MR. JOHNSTON: Misstates his testimony.
THE WITNESS: Yeah. You'd have to provide that data to me and -- and ask me to formally analyze it.
BY MR. LITZENBURG:
Q. You'd have to look at a whole lot more variables, wouldn't you?
MR. JOHNSTON: Objection. Calls for speculation.
Counsel, can you -- he can answer the question, but can we take a break in a few minutes?
MR. LITZENBURG: Yeah. Give me --
MR. JOHNSTON: I think there's a question pending. Go ahead and answer the question.
THE WITNESS: I'm sorry?
BY MR. LITZENBURG:
Q. You would need to know a lot more variables, wouldn't you?

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MR. JOHNSTON: Objection. Calls for speculation. Go ahead.
THE WITNESS: To conclusively formulate a scientific opinion, yes, you would. Absolutely.
MR. LITZENBURG: Okay. Time to break.
THE VIDEOGRAPHER: Time now is 1:59. We are going off the record.
(A brief recess was taken.)
THE VIDEOGRAPHER: Time now is 2:13. We are back on the record.
BY MR. LITZENBURG:
Q. Dr. Fleming, do you hold an opinion that any extrinsic factor is responsible -- partially responsible for the rise in lymphoma over the last 20 years?
MR. JOHNSTON: Objection. Vague. Calls for speculation.
THE WITNESS: Hepatitis C is an extrinsic factor. It affects a fair number of the world's population and, amongst other things, it increases the risk for NHL.
BY MR. LITZENBURG:

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Q. Any chemicals?
MR. JOHNSTON: Objection. Vague.
THE WITNESS: There are recent reports from the Agricultural Health Study looking at a variety of pesticides, and they are finding statistically significant associations.
I can tell you that this has been found for lindane, permethrin, diazinon, and Tribufos, in addition to DDT.
BY MR. LITZENBURG:
Q. And glyphosate; right?
A. Glyphosate is not on this list.
Q. Conveniently, but it's been found in multiple publications to have statistically significant increase; right?
A. This is the updated study focusing on NHL on the AHS cohort that does not talk about glyphosate in any way, shape, or form.
Q. So what information does it give us?
A. Your --
MR. JOHNSTON: Objection. Vague.
THE WITNESS: Your question was, did I believe anything caused NHL. My answer -- extrinsic factors. My answer

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was, yes, I do. Hepatitis C.
Your next question was, do you know of any chemicals? My answer was yes, and I have listed five of them.
BY MR. LITZENBURG:
Q. You --
A. I'm sorry. I don't understand your question.
Q. Before you -- so hepatitis C and those five pesticides are the only extrinsic factors you know of that are responsible for the rise?
MR. JOHNSTON: Objection. Misstates his testimony.
BY MR. LITZENBURG:
Q. Anything else?
A. No. Those are the only ones that -- that we've discussed so far. Those are the only ones that I've put in my report.
Q. Okay. Well, what else is there?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: Well, there's -- there's --
MR. JOHNSTON: Go ahead.

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THE WITNESS: There's other factors in the case. We discussed the manuscript. We discussed earlier looking at the incidence of NHL in patients with allergic rhinitis. This would be Hofmann, et al. 2005.
Again, this is the cohort study where they found a significant reduction in NHL in farmers and spouses with allergic rhinitis. Almost a 40 percent reduction.
The hazard ratio was 0.63 and the confidence limits were 0.51 through 0.79, and this is very interesting and shows the complexity of this problem because we typically associate inflammation and increased immunity with increased cell turnover in cancer.
And here we've got increased immune function in the setting of allergic rhinitis and a decrease risk of lymphoma.
BY MR. LITZENBURG:
Q. I just asked you to identify more extrinsic factors that increased the incidence of non-Hodgkin lymphoma, and you tell me that

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rhinitis is cancer protective essentially; is that right?
A. I'm sorry. I misunderstood your question. I thought you said that modulated NHL, that influenced NHL. I did not -- I did not -- I misunderstood your question.
Q. Before you read that one 2014 article listing those other pesticides, were you aware of any chemicals that caused non-Hodgkin lymphoma?
A. That were definitively studied in a large cohort, no.
Q. Okay. But you only need that one paper to convince you that those four pesticides cause non-Hodgkin lymphoma?
MR. JOHNSTON: Objection. Misstates his testimony.
THE WITNESS: When you have a prospective cohort study that's of sufficient size to control for a variety of different exposures, as we see in agriculture, this type of data is vastly superior to the hypothesis-generating ideas that may come out of smaller case-control studies.

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BY MR. LITZENBURG:
Q. And that data hasn't been published on glyphosate; right? That article that you're referencing over and over again doesn't mention glyphosate?
A. It --
Q. It may gather data on glyphosate, right, but it hasn't been published?
MR. JOHNSTON: Objection.
THE WITNESS: It --
MR. JOHNSTON: Compound and vague. Go ahead.
THE WITNESS: The original data was published. It showed no increased risk. The manuscript is De Roos 2005. Follow-up on that has not been published and -- to the best of my knowledge.
BY MR. LITZENBURG:
Q. Your testimony is De Roos 2005 did not find increased risk associated with glyphosate?
A. Correct.
Q. Okay. Well, how do you define "statistical significance"?
A. In science in general, it is defined

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typically by the 95 percent confidence limit.
Q. Okay. So one year ago you were not aware of any chemicals that could cause non-Hodgkin lymphoma. Today you're aware of four, and they all come from the same article; is that accurate?
A. They --
MR. JOHNSTON: Objection.
THE WITNESS: -- do not come from the same article. No. I mean, the glyphosate conclusions come from one article, the allergic rhinitis comes from a second article, and the pesticides come from yet a third article.
BY MR. LITZENBURG:
Q. Allergic rhinitis doesn't cause non-Hodgkin lymphoma. I thought you just told me that.
A. It modulates the risk for non-Hodgkin lymphoma.
Q. I don't know how to use the word "modulate." You think I said that? You think you're answering my question?
MR. JOHNSTON: Maybe your questions are bad, counsel.

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THE WITNESS: I'd be happy to have you restate your question.
BY MR. LITZENBURG:
Q. A year ago today you were not aware of any chemicals that caused non-Hodgkin lymphoma; is that correct?
A. I can't say with precision when I became aware of this other manuscript.
Q. Did you read that manuscript in the abstract, or did you read it as part of your work for this case?
A. I certainly reviewed it as part of my work for this case, but the first time it came to my attention, I can't put a time and date on that. So your assertion that one year ago I did not know is not something I can -- I can agree to or refute.
Q. All --
A. I simply don't know.
Q. All four chemicals that you know to cause non-Hodgkin lymphoma are in that one article; right?
A. That is a fair assessment, yes.
Q. All right. Page 4 of your report, look at the bottom paragraph, please.

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A. Sorry. Just a second here.
Yes.
Q. Okay. It says "The observed plateau in NHL instance." That's the sentence I'm concerning myself with.
Have you found that?
A. Yes, I have.
Q. Okay. Now, I'm interested in you explaining the subparts to me.
You proffer possible decrease in the presence of extrinsic factors that previously increased the risk of NHL.
A. That is one possibility, yes.
Q. Well, then we'll parse it out.
What are extrinsic factors that previously increased the risk of NHL that decreased over this period?
A. This paragraph and this hypothetical construct in this paragraph are not dependent on any specifically identified. This is -- this is a theoretical analysis for the plateau and decline in 2004, and it may be caused -- this is -- this is just looking at the possibilities in a general sense and does not refer to any particular extrinsic factor.

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Q. Do you know of any extrinsic factors that previously increased the risk of NHL that decreased over this period?
A. Prior to the publication of the AHS data looking at the pesticides, no.
Q. All right. And it postulates it's possible the introduction of new external factors in some way protect against the development of NHL.
Do you know any such examples?
A. Again, this wasn't a summary of identified external factors. This was -- this was a theoretical construct that a decrease in the presence of extrinsic factors and introduction of some new factor that in some way protects hypothetically or a combination of both because both could be happening at the same time.
Q. That wasn't my question.
Can you provide one example of external factors that protect against the development of NHL that decreased over this time period?
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: Allergic rhinitis.

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BY MR. LITZENBURG:
Q. That -- that decreased from '74 to 2014?
MR. JOHNSTON: Objection. Vague. I think you --
THE WITNESS: I miss -- sorry. I misunderstood your question.
That answer would not be applicable to the time frame you mentioned.
BY MR. LITZENBURG:
Q. Okay. Can you list any examples?
MR. JOHNSTON: Objection. Vague and misstates his testimony. He's already answered that question.
THE WITNESS: This is a hypothetic -- this is a hypothetical construct about potential explanations for why this may have occurred.
There is no data to support any of those three possibilities, and it was not meant in reference to any particular factor or factors. That's why it was posed in the hypothetical.
BY MR. LITZENBURG:

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Q. Can you list any examples?
MR. JOHNSTON: Objection. Asked and answered.
BY MR. LITZENBURG:
Q. Is that a yes or no?
A. For the years --
Q. Yeah.
A. -- that this is referring to, 1975 through 2003, where there was a significant increase, I was not aware of any data that identifies any specific extrinsic factors, as I have told you --
Q. Okay.
A. -- for the initial rise or the subsequent decline in the incidence.
Q. You can't name a single possibility?
A. It's unknown.
MR. JOHNSTON: Objection. Asked and answered.
BY MR. LITZENBURG:
Q. What about these three points? The decrease in extrinsic factors, the introduction of new external factors that protect work in combination with each other to lead to a decline in NHL?

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MR. JOHNSTON: Objection. Vague.
THE WITNESS: Yeah. You've actually -- I have -- the combination is the two together.
BY MR. LITZENBURG:
Q. Uh-huh. How would this work in combination to decrease the incidence of non-Hodgkin lymphoma?
A. Chemical Factor A hypothetically causes NHL. Chemical Factor B gets introduced and in some way mitigates the pathways responsible for lymphoma development, and lymphoma development declines. This is a hypothetical.
Another hypothetical would be that Factor A is an external factor causing NHL and Factor B comes along and the use of Factor B leads to the diminished use of Factor A and, consequently, NHL incidence fall.
The third possibility is that both of those things happen.
The fourth possibility that nothing happens would be, you know, not worth postulating because something is causing the incidence to go down.

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Q. And you can't give me one example of a cancer protective chemical in the context of NHL?
MR. JOHNSTON: Objection. Misstates his testimony. Calls for speculation.
THE WITNESS: Again, beyond the focus of my report.
BY MR. LITZENBURG:
Q. Okay. On page 5 at the bottom, it says:
"Although NHL does not run in families, if any first degree relative has any form of blood cancer, this increases overall risk of NHL by about twofold."
Can you explain that sentence to me?
A. The sentence, I think, is self-explanatory. If you have a -- if you ask the question statistically, you know, does NHL run in families? Is there a certain percent elevated risk if a parent or an aunt or an uncle has it? The answer is no if you ask that question that way in the epidemiologic literature. Okay?
However, if you ask the question,

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have you any first degree relative with any type of blood cancer? A different question. This will increase the risk of NHL by twofold.

Q. Do you believe that to demonstrate causality?

A. This merely demonstrates an association. It doesn't -- it doesn't necessarily. There could be -- it could be genetic susceptibility with multiple causes that could be different from individual to individual. This does not address any of those questions.

Q. Is there an association between glyphosate use and non-Hodgkin lymphoma?

A. To my reading of the literature, there is no credible scientific evidence that establishes a relationship between glyphosate use and NHL.

Q. Why do we -- why are meta-analysis done?

A. I can't give you an expert opinion as to the answer to that question. I suggest you speak with an epidemiologist.

Q. Do you even know what the numerical results of any of the meta-analyses in this case are?

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A. I really did not review and look at meta-analysis in any detail.

I will say that the reason historically in medicine people have done it is they've had very small numbers of patients to deal with, and they wonder if by combining the number of patients and trying to analyze it as a group, as challenging as that is statistically, whether that will shed any new light on the problem.

My own personal experience with meta-analysis in clinical medicine, not epidemiology, is that it is, you know, not typically not very useful, but if it is, it's hypothesis-generating and you need to have a prospective trial to address your question and get your data.

Q. Is it -- is a meta-analysis less useful than Figures 4 and 5?

MR. JOHNSTON: Objection. Calls for speculation.

THE WITNESS: Apples and oranges. Figures 4 and 5 are illustrative of the results and consistent with the results from the prospective study that forms the basis of my opinion. They are not epidemiologic studies, so they cannot be compared to any epidemiologic study.

BY MR. LITZENBURG:

Q. Do you know if there's a published meta risk that reaches statistical significance?

A. I --

MR. JOHNSTON: Objection. Vague.

THE WITNESS: Again, meta-analyses by definition involve analyzing retrospective studies. With the existence of a prospective study, retrospective studies are certainly still useful to generate further hypotheses, but they -- they can't really, you know, address the association question.

BY MR. LITZENBURG:

Q. Do you -- is it your opinion that two-thirds of cancers have no external contributing factor?

A. There's a very interesting article published in Nature by Tomasetti, et al., and he is an expert -- he and Burt Vogelstein, the senior author -- are experts in colon cancer and colon stem cells. They have looked at this stem

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cell question using hundreds of databases throughout the country, trying to make sense of what we actually know happens with exposures in cancer.

In other words, there's genetic factors, there's environmental factors, and then there's unknown, and the unknown we have always known in cancer medicine is the largest group.

Q. Is it your opinion that two-thirds of cancers have no external contributing factor?

That was the question. Are you able to answer it?

A. Random mutations are likely to be the main reason for the development of about two-thirds of cancers rather than well-defined genetics and exposures, yes.

Q. So --

A. That's the current state of the art.

Q. -- two-thirds of cancers you believe to be unifactorial and just be genetic bad luck?

A. I don't believe any cancers to be unifactorial.

Q. Okay. So are you telling me those two-thirds that what? The gene mutation was the primary factor, the most important factor, the

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initiator? What are -- what are you trying to tell me?
A. I am saying --
MR. JOHNSTON: Objection. Compound. Calls for speculation.
THE WITNESS: Right.
MR. JOHNSTON: Vague.
THE WITNESS: Could you unpack your question?
BY MR. LITZENBURG:
Q. Yeah. In 66 percent of cancer cases, you're saying that external factors played no role or are you saying --
A. No.
Q. You're saying --
A. No, that's not correct.
Q. -- that genetic mutation would be initiating?
A. No, that's not correct.
Q. What are you saying?
A. I am referring to a paper by Tomasetti, et al., that's in my Materials Considered List that indicates of the mutations that are involved in cancer, about two-thirds of them have nothing to do with the initial

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underlying predisposition. In other words, mutations that you were born with, mutations that you carried over from your parents. So that's the family genetics history.
The other piece is exposure, whether it be cigarette smoke or alcohol in combination with cigarette smoke or whatever you like, you know, together really only represent about a third of it.
The other mutations in cancer randomly occur and that's because stem cells continually divide to replenish our skin, replenish our gut, replenish our lung epithelial, and errors occur randomly, and as we get older, our ability to repair those errors decreases.
This random accumulation of mutations is probably what's responsible about for about two-thirds of cancer. Approximately a third is primarily due to a combination of genetics and environment.
Q. You're talking about cancer overall?
A. Yes, in the broadest sense. This is not applicable to any particular subset, but if you'll look at that -- that manuscript, you'll see they have looked at -- at registries that

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were provided to them by IARC to actually interrogate, you know, stem cell turnover data in order to -- to draw their conclusions.
Q. And you have no idea how that proportion translates to NHL?
A. No, I wouldn't be able to say in the case of NHL at all how that. That's -- that's sort of -- that's a global number.
Q. Okay. Can we agree these five factors on page 5 -- inherited genetic disorders, autoimmune disease, immunosuppressive drugs -- well, that's three factors --
A. Uh-huh.
Q. -- are not accounted for in your Figure 5 in any way?
A. They -- I disagree with that statement.
They are obviously included in this global data set because the data set is all-comers with NHL, and if there's a transplant recipient that's immunosuppressed, there's somebody with hepatitis C that gets NHL, they would all be part of that general population.
Q. What's the difference between a cohort study and a case-control?

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A. Well, in my view, the single most important aspect -- there are several differences. The most important aspect is one is a retrospective study which looks back at historical events, which bring in all sorts of limitations and biases, and the other one identifies a group of individuals who are potentially at risk for a certain outcome.
It could be heart disease. It could be cancer. It could be NHL. And, in fact, the prospective study only enrolls people who have not yet developed the disease in question so they can look at the development of disease over time in that cohort.
There are four components they analyze in a cohort study. Exposed individuals who develop the disease, exposed individuals who do not develop the disease, unexposed individuals who develop the disease, and unexposed individuals who do not develop the disease. This gives a great deal of information into the natural history of that disease and that well-defined patient population.
In contrast, case-control study is retrospective. A case-control study by one form

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or another identifies individuals with a particular disease, such as NHL, and then says we're going to get age matched, sex matched, contemporary controls, and we're going to now question them as to their exposure to a drug, their exposure to a chemical, what have you.

So they're in this situation where they need to, in the case-control for NHL, identify NHL, individuals with NHL and ask them to participate in survey. The basis of which is we're trying to collect information on what caused your cancer. What can you tell us from your memory?

In contrast, the prospective studies essentially start with everybody in the same place and say, okay, we need to keep very close track of what's happening in the future. We're going to be asking you questions realtime, you know, over -- over a period of time and ask you to, you know, update your answers as life and circumstances change.

So those are the fundamental differences.

Q. Okay. What are the biases that each are susceptible to?

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MR. JOHNSTON: Objection. Compound.

BY MR. LITZENBURG:

Q. What is the biases that case-control studies are susceptible to?

A. Case-control studies are susceptible primarily to recall bias.

Q. Anything else?

A. Meaning you're being asked to estimate an exposure to something in the past, and this is a challenging thing to do.

Q. Anything else?

A. Well, that, you know, that is -- that is one of the, you know, main important one -- that's one of the most important biases in it.

And you've also -- you've also selected people who are, you know, now have the disease and are wanting to participate in such a study, and this may be a different cross-section of the population than if you study people prospectively who didn't have the disease.

So people's motivation for being in the study, for staying in the study, for participating in it, and the same thing can be said of control participants in a study.

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Q. And --

A. But it's the retrospective nature that in my mind is the -- is the critical component. In clinical medicine, we do retrospective studies all the time to generate hypotheses, and then we test them prospectively. The FDA will never give you a drug approval without a prospective trial. It simply isn't done.

Q. Doctor, would it be ethical to do a prospective clinical trial on whether Roundup gives you cancer?

MR. JOHNSTON: Objection. Misstates his testimony.

THE WITNESS: Yes. There -- there is no need to do a prospective trial where patients are assigned various groups. You simply design a cohort in which there are different individuals with different exposures and then analyze the data.

BY MR. LITZENBURG:

Q. Would you agree a randomized clinical trial is the gold standard and that's what you're referring to when you say a new drug

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gets approved?

A. You cannot do randomized studies in a -- in a population of individuals unless there's a clear potential benefit to that study, and there would be no potential benefit to a study that looked at extrinsic factors that caused cancer. Whereas, with treatment there is.

Q. You pretty much just considered temporality when you were deciding whether there's a causality fit between this agent and this disease; is that fair?

MR. JOHNSTON: Objection. Vague.

BY MR. LITZENBURG:

Q. In terms of the Bradford Hill criteria, you find that it found temporality; is that fair?

A. In terms of the Bradford Hill criteria, I was able to say pretty definitively that the marked steep increase in the incidence of NHL between 1975 and 1985, the etiologic agent for this has not been identified. But I said assuming approximately a 10-year latency period and an introduction of glyphosate in 1974, it's reasonable to conclude most, if not all, of the cases in that 10-year period were not due to

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glyphosate.
Q. It all depends on that presumption of a 10-year latency period; right?
MR. JOHNSTON: Objection. Vague as to "all."
THE WITNESS: Yes. It -- it doesn't exclude the possibility of a given individual having a shorter latency period, no. But there is a general feeling, I believe, that 10 years is a -- is a reasonable time period.
There's exceptions on both ends of that, but if you're looking at the US population over a 10-year period, the bulk of the patients are not going to be exceptions. They're going to cluster at the averages.
BY MR. LITZENBURG:
Q. What are the other Bradford Hill criteria that you considered in this report?
A. The presence of, you know, a dose-response.
Q. Anything else?
A. Biological gradient. Those were the two I particularly decided to, you know, hone in

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on because those were relationships that I felt hadn't previously been fully addressed.
Q. Other than the two you particularly chose to hone in on, did you consider any of the other Bradford Hill criteria?
A. I'd like to take a look at the list to refresh my memory in order to discuss that further.
Q. Can you name two other Bradford Hill criteria?
A. I'm aware of the concepts. I'm not aware of the verbiage.
Q. Can you name one that you considered in this case in addition to what you've already told us?
A. My goal was not to consider Bradford Hill criteria. My goal was to consider the temporal aspect and the dose-response aspect, as I have in the -- in the data I showed you in this report, and I linked those two particular ones to Bradford Hill. I did not set out with a goal of trying to meet all nine Bradford Hill criteria --
Q. What's a --
A. -- as part of this.
Q. What's a confounding factor?

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A. A confounding factor is one that, if taken into consideration, would no longer -- would actually be the real explanation for a relationship between two things. So if you've got, you know, if A and B look to be closely associated, but C is a confounding factor which could give a similar result, the result may be due to C.
So as Bradford Hill himself said, the important aspect of this is to make sure that when you're comparing A to B, that some confounding factor is not responsible for any observed difference. That's basically his central tenet.
Q. How did you do that in Figure 5?
MR. JOHNSTON: Objection. Misrepresents what Figure 5 is.
THE WITNESS: Yeah. Figure 5 is not an epidemiologic study. Figure 5 is not a statistical study. Figure 5 is a snapshot over time of glyphosate usage and NHL incidence.
This was constructed to address the question of whether glyphosate usage on a regional basis was in any way

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associated with NHL incidence. Full stop. No other -- no other conclusions can be, you know, addressed from this, and this was basically, you know, demonstrated that the results of the AHS study were, in fact, correct.
I had no idea of what Figure 5 was going to look like until I plotted them and looked at them. It could have easily been the other way around.
I'm showing it to you, you know, because I chose to analyze that data and, in fact, I chose to analyze this data in this way, and you were not seeing expected patterns you would if there was a clear association of glyphosate and NHL at the county level when correlated with usage --
BY MR. LITZENBURG:
Q. Do --
A. -- in very basic ways.
And the confounding factors that may exist are certainly there, but they would be somewhat mitigated that this is a country-wide survey. So if there was a confounding factor in the Northeast in 10 percent of the patients and

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in the Southwest in 2 percent of the patients, at the end of the day, the patterns wouldn't really change very much.

Q. Confounding factors are all geographic?

MR. JOHNSTON: Objection. Misstates his testimony.

THE WITNESS: I did not make that statement.

BY MR. LITZENBURG:

Q. Okay. Did you run this model for any latency assumption other than this 10-year, eight to 12-year?

A. There is relatively little hard data on the latency of NHL, as we discussed at length earlier today. I used the best available data to look at what people seem to think is a reasonable time period. This has been suggested in the literature in many studies.

Q. That's not what I asked.

You said you didn't know what this would look like before you ran it.

Did you also run it for a five-year assumption and a 15-year assumption? Anything other than your 10-year assumption?

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A. It's not a 10-year assumption. If you look at it, you'll see it's an eight to 12-year assumption.

Q. Did you run it with any other assumption?

A. I looked at a couple of different dates, dates for glyphosate exposure. And as I told you earlier, the intensity of the pattern varied somewhat, but the distribution did not. So I looked at that quite extensively.

I don't believe there were more than perhaps one more choice of time frame in the -- in the GeoViewer data for the NCI.

Q. Okay.

A. So I chose the most up-to-date one. I was, you know, just very simple straightforward. What's our most recent data on NHL incidence by county? Assume 10-year latency. Okay. What's glyphosate look like? Fine.

I was interested to see how glyphosate, you know, changed over time, and I clicked on a great number of those years. And as I've discussed earlier, the data was essentially the same in terms of distribution, although the dose did change over time.

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So I was, therefore, you know, pretty confident that if there was going to be an association, the geographic association would not dramatically change because the glyphosate data didn't.

Q. What other years did you look at for this statement?

A. For which one now?

Q. What other years did you look at before you picked 2000?

MR. JOHNSTON: Objection. Asked and answered. Misstates his testimony.

THE WITNESS: I looked several years past 2000 and then I looked several years below 2000, including the earliest point in which the data was available. I can't recall that now.

If you'd like to bring up the web page, we can answer your question.

BY MR. LITZENBURG:

Q. Do you know if it was the '40s or the '90s? Do you have a ballpark?

MR. JOHNSTON: Objection. Asked and answered.

THE WITNESS: I would say it was

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the 1990s.

BY MR. LITZENBURG:

Q. Do you know if it went back to the use -- did you look at the decade following the introduction of Roundup to the market?

A. This mapping data that we're talking about here certainly does not go back to -- to the 1970s.

Q. Did you look for any data that did?

A. I looked at data that was in a well-organized data set that was publicly available so that anybody could independently bring up the data I'm showing you in Figure 4 and Figure 5 on these websites, create it themselves and print it out, print it out on as large a piece of paper as they liked, project it on a wall or a screen, and spend as much time as they liked looking at it in as much of a granular detail as they would like. So this data is available to you, and you can go back and have a look at that.

I represent once again -- and I hope for the final time -- that I looked at the most recent data for incidents by county. It is 2008 to 2012. I'm interested in contemporary NHL

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incidents, and then I backed off by, you know, till -- till the year 2000.
Q. Is it your opinion that glyphosate doesn't cause non-Hodgkin lymphoma?
A. My --
MR. JOHNSTON: Objection. Asked and answered.
THE WITNESS: My opinion is there is no credible scientific evidence that shows an association between glyphosate and NHL.
BY MR. LITZENBURG:
Q. So it's better characterized as you simply don't know?
A. There is --
MR. JOHNSTON: Objection. Misstates his testimony.
THE WITNESS: Yeah. There is no scientific evidence today that supports an association between glyphosate and NHL in what I consider to be a scientifically credible manner.
BY MR. LITZENBURG:
Q. Do you have an opinion as to whether it increases or decreases the risk of non-Hodgkin

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lymphoma?
MR. JOHNSTON: Objection. Vague as to "it." His opinion is stated in his report. Asked and answered. You're harassing the witness at this point.
Go ahead. You can answer it.
THE WITNESS: Would you like to rephrase the question?
BY MR. LITZENBURG:
Q. No. Do you have an opinion whether Roundup or glyphosate exposure increases the risk in a population for non-Hodgkin lymphoma?
MR. JOHNSTON: His opinion is stated in his report. Vague. Asked and answered. Argumentative and harassing. Go ahead.
THE WITNESS: Again, I'd like you to restate the question one more time because there were a couple of words in it that were different from the last time you asked it, and I want to be sure I can address every component of it.
BY MR. LITZENBURG:
Q. Would the court reporter read it?
A. Sorry?

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(The reporter read the record on page 259 lines 10-12.)
MR. JOHNSTON: Same objections.
THE WITNESS: Which population? That is a very vague statement. I can't address that.
BY MR. LITZENBURG:
Q. Do you have an opinion that glyphosate or Roundup exposure increases the risk of non-Hodgkin lymphoma in any population?
A. I am not aware of any credible scientific evidence linking glyphosate use to the development of NHL.
Q. Why did you ask me which population?
A. Your first question sound like -- sounded like you were specifying something and didn't complete it. Your second one was an overall comment on global NHL.
Q. Okay.
A. So I did not understand what the term "population" referred to. Was that a population in California? A population in Iowa? The population of the cohort study? I asked you to clarify that question. Thank you.
Q. And you agree that you would be

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comfortable at a meeting with other oncologists discussing your recommendation for parents to go ahead and continue using glyphosate around children with NHL?
MR. JOHNSTON: I'm going to object. You've asked that argumentative and abusive and disrespectful question three times today. I don't know why you need to ask it a third time, but it's very disrespectful and argumentative and demonstrates how you intend to conduct these depositions.
You can answer it again if you'd like to.
THE WITNESS: I have no opinion as to whether any individual should continue or discontinue their use of glyphosate. I have no opinion on that matter.
BY MR. LITZENBURG:
Q. The only thing you have an opinion on whether they should expose themselves or not expose themselves to are four chemicals in that one article about pesticides?
MR. JOHNSTON: Objection. Goes

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beyond the scope of his opinion in this case.

THE WITNESS: I am not in a position here to provide expert testimony on the details of insecticide exposure and when it should and shouldn't be recommended.

BY MR. LITZENBURG:

Q. There are four things that you would tell patients to modify their exposure to your NHL patients, and they are those four pesticides in that article; is that true?

MR. JOHNSTON: Objection. Misstates his testimony. Speculative. Incomplete hypothetical.

THE WITNESS: I would explain to patients that there was literature implicating five pesticides that had been recently published as part of a robust prospective cohort study, and if they were interested in more information about these, you know, compounds, I would -- I would discuss it further but...

BY MR. LITZENBURG:

Q. Have you had that discussion before?

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A. I have not actually been -- I have mentioned to people that there may be agricultural-related products. I mean, this has been known, as we discussed earlier, since at least the 1970s it increased the risk in farmers.

And so if I'm talking to a farmer and he says, hey, doc, what do you know now? I will absolutely tell him that.

If I am talking to someone who lives in an urban environment and has no questions about exposures, I am not going to list these and tell them that they must at all costs rethink their exposure to these compounds and their family must as well. Because I don't believe the association, while there, is strong enough to make that kind of recommendation.

Q. You wouldn't tell those same patients or that farmer about any of the literature on Roundup?

MR. JOHNSTON: Objection. Asked and answered.

THE WITNESS: I would tell a patient in my office the same thing I'm telling you today.

That in terms of glyphosate

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exposure and NHL, I do not believe there is any credible scientific evidence linking the two.

BY MR. LITZENBURG:

Q. What else do you do -- all right. Take a five-minute break.

THE VIDEOGRAPHER: Time now is 2:54. We are going off the record.

(A brief recess was taken.)

THE VIDEOGRAPHER: The time now is 3:06. We are back on the record.

BY MR. LITZENBURG:

Q. Dr. Fleming, one more question.

Is there anything that IARC has classified one way or another that you've told any of your patients about?

A. Absolutely. IARC classifies tobacco as a Class 1 carcinogen. It also classifies alcohol as that, and certainly I counsel my patients who both smoke and consume alcohol to the added effects of doing that.

Q. Okay. So --

A. It also -- if I may continue?

Q. Yeah.

A. There are a variety of

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chemotherapeutic agents -- cytotoxin, Vincristine, etoposide, Busulfan, just to name a few -- that are all classified as Level 1 human carcinogens by IARC. And I discuss these -- these when applicable when treating patients with great regularity.

Q. Okay. Alcohol, tobacco, chemo. Anything else?

A. Those are the ones that absolutely would be the great majority of things. Occasionally a patient will, you know, make an inquiry about something, a particular compound, and if I don't readily know the answer, I'll say I'll need to, you know, get back to you on that. But, you know, my current answer is, it's not ringing a bell, but next time we meet I'll have a better answer for you. And I'll go look it up.

Q. Have any of those things been in response to the IARC classification?

My guess is you don't tell your patients about tobacco being a carcinogen because IARC classified it as such; is that right?

That's a really poorly worded logic question.

Have you begun telling any patients

about anything you believe is carcinogenic as a result of IARC making that classification?

A. Not recently that I can recall, no.

Q. Okay. And, again, what would you need to know to determine whether glyphosate was a contributing factor to the development of somebody's non-Hodgkin lymphoma? What would you need to know about that person?

A. I wouldn't need to know anything about the person because you're asking a case-specific causality question, and the general causation question I should say the evidence is very clear that there is no credible evidence implicating glyphosate and NHL.

So discussing it in a granular form with an individual patient at any length doesn't seem to be productive.

MR. LITZENBURG: All right. That's all I got.

MR. JOHNSTON: All right. Give us a second. We may be done --

MR. LITZENBURG: Okay.

MR. JOHNSTON: -- but I want to make sure.

THE VIDEOGRAPHER: Time now is

3:09. We are going off the record.

(A brief recess was taken.)

THE VIDEOGRAPHER: Time now is 3:12. We are back on the record.

MR. JOHNSTON: We don't have any questions on behalf of Monsanto. So I assume this deposition is considered closed at this point.

MR. LITZENBURG: We agree.

THE VIDEOGRAPHER: Time now is 3:12. This deposition has concluded.

(Deposition concluded at 3:12 p.m.)

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ACKNOWLEDGMENT OF DEPONENT

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

_____

WILLIAM H. FLEMING, MD, PHD DATE

Subscribed and sworn to before me this _____ day of _____, 20____.

My commission expires:_____

_____

Notary Public

CERTIFICATE OF REPORTER

DISTRICT OF COLUMBIA)

I, DENISE D. VICKERY, CRR/RMR and Notary Public, hereby certify the witness was by me first duly sworn to testify to the truth; that the foregoing deposition was taken at the time and place stated herein; and that the said deposition was recorded stenographically by me and thereafter reduced to printing under my direction; that said deposition is a true record of the testimony given by said witness.

I certify the inspection, reading and signing of said deposition were NOT waived by counsel for the respective parties and by the witness; and that I am not a relative or employee of any of the parties, or a relative or employee of either counsel, and I am in no way interested directly or indirectly in this action.

Denise D. Vickery, CRR/RMR

My Commission expires February 14, 2018