

# CPE466

## Lab2

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### Abstract

Given some need for information, information retrieval systems are used to find a relevant subset of documents in a large collection of documents. To demonstrate and solidify our understanding, we implemented a simple IR system to query for utterances from the VACCINATION-DISCUSSION dataset. We implemented two matching algorithms, cosine similarity and okapi, to build a result set of relevant documents for a given query.

## 1 Introduction

We built a basic IR system to retrieve relevant documents for a given query. The system includes a component for building vector-space models for word occurrences in documents, and a matching component to digest these models and ultimately determine the most relevant documents to a given query.

## 2 System Design and Implementation

The system consists of two primary components: parsing and query matching. The parsing component prepares a database of document vectors and document collection meta data. The query matching component uses the prepared database for finding the most relevant documents to the given query.

The parsing component reads in and parses words from the provided JSON document which serves as the raw document collection. The parsing phase also does stopword removal and stemming on the document text. A vector of inner-document word occurrences is appended to each document and the whole collection is saved to a file. Meta-information about the collection as a whole, for instance the number of documents and the document word frequency, is also saved to a file.

The query matching component of the system uses the databases built by the parsing component to more efficiently find relevant documents to a given query. It returns the top ten relevant documents, by default. The query matching component also has command-line flags to switch between the two implemented matching algorithms, cosine similarity and okapi.

### 3 Query Answering

We executed the queries provided using both the cosine similarity and okapi matching algorithms. For each query, both algorithms were evaluated on their ability to produce relevant documents in the top ten results (excluding Q4, for which we only examined the first result). The results are displayed in Table 1 on the following page. The full query responses are provided in appendix A on page 5.

To determine how well the queries produced relevant documents, we defined an explicit yes/no question per query. The questions we asked are paired below with each query.

- Q1: *Disneyland incident measles people sick*  
Is the document about a Disneyland measles incident?
- Q2: *Centers for Disease Control chance of a serious allergic reaction*  
Is the document relevant to both the Centers for Disease Control and allergic reactions?
- Q3: *requiring parents to jump through hoops*  
Is the document about jumping through hoops?
- Q4: *Nearly everyone, from my father's generation and generations older than him, when I'd go and speak to groups, talk about the stories that they have both from their own childhood, from friends, personal stories of near-death experiences, friends they had who were maimed by communicable diseases.*  
Does the first result contain the exact match searched for?
- Q5: *parents' right to make healthcare decisions for their child*  
Is the document about parents' rights to make decisions for their children?
- Q6: *disabled kids children exceptional needs right to education*  
Is the document about disabled children or children with exceptional needs having a right to education?
- Q7: *can a licensed physician in the state of California provide an exemption from immunization?*  
Is the document about licensed physicians providing immunization exemptions?
- Q8: *association oppose bill*  
Is the document about an association which opposes the bill?
- Q9: *mercury in vaccines*  
Is the document about mercury in vaccines?
- Q10: *disease exposure sustained transmission opt-out personal belief exemption preventable*  
Is the document about how sustained transmission after disease exposure would be preventable without the personal belief exemption?

| Query | Cosine Similarity | Okapi |
|-------|-------------------|-------|
| 1     | 0                 | 10    |
| 2     | 1                 | 2     |
| 3     | 2                 | 2     |
| 4     | y                 | y     |
| 5     | 5                 | 8     |
| 6     | 2                 | 7     |
| 7     | 4                 | 8     |
| 8     | 4                 | 2     |
| 9     | 6                 | 8     |
| 10    | 1                 | 0     |

Table 1: Relevant documents in top ten results

When running the queries through the system, we observed patterns in the documents that were irrelevant to the queries. One prevailing observed pattern is that the cosine similarity algorithm tended to produce many large irrelevant documents in the top ten results. For many of the queries, the same large documents were listed in the results. On the other hand, the okapi algorithm produced half way relevant documents. For instance, the results for Q2 returned many documents about the Centers for Disease Control or allergic reaction, but had only two documents relevant to both things.

It also seems worth noting that it is difficult to tell what the user is trying to find with Q10. The question given was a guess at the intended goal. In reality, the results are often related to parts of the query but not the stated question for Q10.

## 4 Information Need Matching

We developed a query for each information need and executed each query using only the okapi matching algorithm. The information needs are shown in section 4.1 with their respective queries. We then counted the number of results for each query which answered the information need requested. Table 2 on the next page summarizes the precision of the results. The full lists of results for each query are available in appendix B on page 20.

### 4.1 Information Needs and Associated Queries

- I1: I would like to know who among the legislators have been strongly opposed to the vaccination bill, and specifically, I would like to see what their arguments were  
*<PersonType:Legislator> freedom choice against oppose*
- I2: I would like to find out the chief arguments of the proponents of the legislation.

| Query | Okapi |
|-------|-------|
| 1     | 3     |
| 2     | 6     |
| 3     | 9     |
| 4     | 2     |
| 5     | 2     |

Table 2: Relevant documents in top ten results

Why did they think it was important to require the vaccination of every child attending school in the state?

*reason sick danger disease*

- I3: The need for vaccination, as well as the opposition to it is often gauged in terms of medical necessity and/or medical needs of children. I am interested in finding the instances of such justifications, both for and against the vaccination.

*need against support oppose sick death danger vulnerable children*

- I4: The SB 277 bill has gone through a series of modifications and amendments during the timeframe of the dataset (the committee hearings took place on different dates). I am interested in finding out more about any specific changes the bill, amendments that the authors wound up including, or any amendments that might have been discussed regardless of whether or not they made it into the future versions of the bill.

*amend change previous last before bill*

- I5: The proponents of the SB277 bill often cite scientific evidence to back their case for the bill. I am interested in finding utterances in which the speaker expressed doubt in the science supporting vaccination.

*evidence research science doubt not false actually proof claim faulty poor adequate contrary belief oppose against*

## 5 Analysis and Conclusions

We initially implemented the basic cosine similarity matching, but we discovered that it gave too much weight to large documents with many words. We then implemented okapi and noticed that our results tended to be much more relevant.

For both algorithms, we hypothesized that word proximity may also help in computing more relevant results. For instance, in Q3, having proximity may give more weight to the words in the phrase “jump through hoops” occurring close together and in the correct order.

Ultimately, we learned some details about IR systems that might have been much more difficult to learn without the hands-on experience. For instance, we had no idea that iterating over four thousand documents per query would take more than a second, as it did. Using an inverted index would help dramatically with this performance issue.

## A Query Results

### A.1 Query 1 Results

Pan, Richard (Legislators) Senate (12.548)

And I would also point out that this is not the first time measles have shown up in Disneyland. Disneyland is an international destination. People come from all over the world. There is still measles out in the world.

Jensen, Jena (GeneralPublic) Senate (11.648)

So I wanted to let you know, for those of you who don't already know, being located in Orange County near Disneyland, we did have eight cases of Measles come into our emergency department, children with Measles come into our ED this winter. Five out of the eight were so sick that they needed to be hospitalized.

Pan, Richard (Legislators) Assembly (10.310)

And what we're seeing there is, you're seeing schools with immunization rates as low as 50% or below and in fact when people have analyzed the measles outbreak that happened to begin in Disneyland.

Pan, Richard (Legislators) Senate (10.182)

So when you have a high enough immunization rate, basically, when an exposer shows up, someone shows up with the disease, it doesn't go anywhere. In fact, let's just take Disneyland, for example. This is clearly not the first time someone has shown up to Disneyland with measles. Disneyland is an internationally renowned park. People come from all over the world.

Pan, Richard (Legislators) Senate (9.884)

And, this year the Disneyland Measles outbreak infected 134 Californians, as well as other people across the United States, and in Canada, and Mexico. And, it also included 15 infants who were too young to be immunized, here in California. It hospitalized at least 20 people.

Pan, Richard (Legislators) Senate (9.343)

That's what we saw with the Disneyland outbreak, the measles outbreak that started in Disneyland, that's what we saw with the pertussis outbreak, that's why we're doing this bill.

Pan, Richard (Legislator) Senate (9.255)

over 9,000 people, hospitalized 809, killed 10 infants, and the Disneyland measles outbreak, which infected 134 Californians including 15 infants too young to be immunized, and hospitalized at least 20 people, have both been linked to communities with low vaccination rates and high use of the personal belief exemption.

Pan, Richard (Legislator) Assembly (9.161)

And the Disneyland measles outbreak infected 134 Californians, including 15 infants too young to be immunized, hospitalized at least 20 people, and both have been linked to communities with low vaccination rates, and high use of the personal belief exemptions.

Pan, Richard (Legislator) Senate (9.144)

But what is different this time, is that the measles didn't just stay in Disneyland and maybe affect a couple of other people who were there. It spread and spread and spread across our state, across our country, even into Canada and a couple of cases in Mexico.

Pan, Richard (Legislator) Senate (8.860)

And you had hundreds of hospitalizations from that pertussis outbreak. So, pertussis clearly triggered legislative action. Measles, of course we had the Disneyland outbreak. But don't forget that the year before, in 2013, before the Disneyland outbreak, we had a record 644 cases of measles in the country.

## A.2 Query 2 Results

Monning, Bill (Legislator) Senate (36.430)

According to the CDC, the Centers for Disease Control, the chance of a serious allergic reaction due to DTap, MMR or varicella vaccines is less than four in one million doses.

Monning, Bill (Legislator) Senate (18.392)

Thank you. Well, these are helpful insights. I would ask, you referenced the CDC, Centers for Disease Control. Do you question their data as to the difference between adverse reactions versus fatalities for nonvaccinated who contract certain diseases?

Bergen, Randy (GeneralPublic) Senate (15.677)

Thank you, Senator. I would just like to respond by quoting the Centers for Disease Control website, and their question that is posed about unvaccinated children spreading the disease.

Pan, Richard (Legislator) Assembly (13.216)

The Centers for Disease Control list immunizations as one of the ten great public health achievements, that resulted in adding 25 years, 25 years of life expectancy for Americans. The World Health Organization describes vaccination as second only to clean water in reducing the burden of infectious disease.

Bergen, Randy (GeneralPublic) Senate (13.085)

So again, we can never be completely assured that we are providing no risk, but if you look at the AAP guidelines and the guidelines for the Centers for Disease Control and the Committee on Immunization Practices, it is recommended that it be given to those children.

Pan, Richard (Legislator) Senate (12.740)

You would have conditions where, if there was uncertainty about so the child who may be perhaps allergic to something that may be a component of vaccine or they've developed allergic reaction

Pan, Richard (Legislator) Assembly (12.630)

These findings are also supported by the World Health Organization, the European Union, the Centers for Disease Control, the American Medical Association and other leading medical scientific and public health organizations in the United States and across the world.

Pan, Richard (Legislator) Senate (12.542)

The findings are also supported by the World Health Organization, the European Union, the Centers for Disease Control, the American Medical Association, and many other leading medical scientific and public health organizations in the United States and across the world.

Pan, Richard (Legislator) Senate (12.433)

And, these findings, they're also supported by the World Health Organization, the European Union, Centers for Disease Control, the American Medical Association, and other leading medical, scientific, and public health organizations in the United States and across the world.

Blumberg, Dean (GeneralPublic) Senate (11.481)

such as thrombocytopenia, that's important for clotting factors it could be an allergic reaction, it may be caused by the vaccine, it may be associated, there's that temporal association or possibly it's coincidental.

### A.3 Query 3 Results

Huff, Bob (Legislator) Senate (20.041)

We don't say, "Have you got your 27 vaccines," or whatever it is, before they come and go to Disneyland, or any other place. And so, you're requiring our own parents to jump through hoops to do all these things in the interest of public health; and yet, we're still exposed.

Huff, Bob (Legislator) Senate (15.250)

If I was a parent and I had a child in that category, from what I'm hearing, I wouldn't trust the public school anyway, and yet it seems like you'd want to create a safe cocoon around them as much as you can; and yet, we're jumping through a lot of hoops to force a lot of other people out when we still don't have a safe situation in school.

Bonta, Rob (LegStaff) Assembly (7.782)

Wait a second, wait a second, let me jump in here

Bonta, Rob (Legislator) Assembly (7.782)

Wait a second, wait a second, let me jump in here

Bonta, Rob (LegStaff) Assembly (7.661)

All right. Let me just jump in here. We talked about narrow tailoring earlier, and I want to ask you to narrowly tailor your responses to the questions of the members. Answer their question. And then stop and see if they have another question. And we'll move through the member questions and get on to public comment. Dr. Wood, do you have any more questions?

Bonta, Rob (Legislator) Assembly (7.661)

All right. Let me just jump in here. We talked about narrow tailoring earlier, and I want to ask you to narrowly tailor your responses to the questions of the members. Answer their question. And then stop and see if they have another question. And we'll move through the member questions and get on to public comment. Dr. Wood, do you have any more questions?

Reiss, Dorit (GeneralPublic) Senate (7.032)



We don't change the curriculum to prevent parents from having to choose between a curriculum they don't like and homeschooling. It's problematic to say we need to do away with a reasonable health and safety requirement, vaccination to prevent parents from having to choose between following the requirement and choosing another educational option, again, home schooling or independent study.

Reiss, Dorit (GeneralPublic) Senate (6.847)

The second point is the courts don't require a religious exemption. Again emphasized that parental rights and religious rights don't allow the parents to expose the community to ill health and to disease and every court since have followed that precedent.

Anderson, Joel (Legislator) Senate (6.548)

And when you're facing a parent who has gone through that turmoil and they say gosh, we don't agree with you. At that point, do you continue on and say I know better and I don't care what risk it is to your family? We have some folks who said they had two children who went through it. So, how many children do you have to punish my family before enough is enough?

Huff, Bob (Legislator) Senate (6.445)

We have other immunizations that we require that don't have as much reliability as we'd like, so they're able to spread their disease. And yet, we're trying to keep a safe place at school for those that are compromised, their immune system is compromised through chemotherapy or lupus or whatever it is.

#### A.4 Query 4 Results

Allen, Benjamin (Legislator) Senate (124.541)

Nearly everyone, from my father's generation and generations older than him, when I'd go and speak to groups, talk about the stories that they have both from their own childhood, from friends, personal stories of near-death experiences, friends they had who were maimed by communicable diseases.

Allen, Benjamin (Legislator) Senate (34.297)

He got polio when he was a little kid. He got it right before the vaccine became widely available. He doesn't even have the arm strength in his arms to be able to break his fall. When I go down to my district, and I talk to folks from his generation and older, I hear a story every single time about the horror stories of communicable diseases from measles to polio,

Pan, Richard (Legislator) Senate (26.054)

We need to restore that balance so that people, we've had witnesses here who talked about how they are afraid of now bringing their infant into public places. To pick up their older sibling in school, or go to other public places.

Loop, Ariel (GeneralPublic) Senate (25.088)

It was stressful, terrifying, and we had to go through it by ourselves at home. The days prior to the rash appearing while Mobius was contagious, we were all over town. The Public Health Department had to follow up individually for nearly a month with the 12 friends and family members who had direct contact with him during his contagious period.

Allen, Benjamin (Legislator) Senate (24.776)

I also come to this story as the son of a Polio survivor who got Polio as a child and was nursed to health by his very determined mother but who is from a generation that I think is amazed that we have allowed these communicable diseases back into American society when we have the tools to prevent that sort of human suffering and that sort of, of human suffering I suppose.

Allen, Benjamin (Legislator) Assembly (22.987)

If you did, you know that what brought me to this story was the fact that my father had polio as a kid, and got it before the vaccine became widely available. Folks from his generation can't believe that we've allowed these communicable diseases back into American society.

Allen, Ben (StateAgencyRep) Senate (21.418)

I think that's something that we're going to have to work on with the Education Committee to try to craft a good solution with our friends from the school boards that will both addresses our financial concerns for parents that you're talking about.

Pan, Richard (Legislator) Assembly (21.358)

I think that your question strikes to the heart of the issue. In fact, I have right next to me, expert infectious disease as well as pediatric infectious disease, as well as my own expertise as a pediatrician with a background in public health diseases like chicken pox. And I relayed the story of the child who had the heart transplant. They are deadly to children who are immunosuppressed. They are not worried about catching the cold, right?

Pan, Richard (Legislator) Assembly (20.626)

They want to be in fear that their child or their loved one is gonna be exposed to a deadly disease when they walk into a store, when they drop their kids off at school, when they go ride on public transit, go to other public places, go visit Disneyland. That is not what we want to have happen.

Pan, Richard (Legislator) Assembly (20.507)

There is no limitation on a physician from doing that, other than their own professional judgment, their own knowledge and expertise about what they believe is safe for the patient. I think that when we craft our laws, it's best that we try not to direct, unless we have strong scientific evidence. And the direct position that they now must do something that they have the ability to already do.

## A.5 Query 5 Results

Bonta, Rob (LegStaff) Assembly (22.431)

Every child deserves to be able to go to school in a safe and healthy environment. The parents' right to make healthcare decisions for their child is not entirely boundless, and without limitation. It must take into consideration the effect those decisions have on our neighbors, and others in the community.

Bonta, Rob (Legislator) Assembly (22.431)

Every child deserves to be able to go to school in a safe and healthy environment. The parents' right to make healthcare decisions for their child is not entirely boundless, and without limitation. It must take into consideration the effect those decisions have on our neighbors, and others in the community.

Monning, Bill (Legislator) Senate (20.616)

But, where we have a balance here with this bill, that is a tough one for us, is on the one hand, many people voiced their strong belief that they have a right to make the decision for their child. If it were just a decision about their child, I think you would find no quarrel with having a right to make that decision.

Pan, Richard (Legislator) Assembly (15.941)

So remember, this bill is about enrolling children in school. The decision whether to immunize or not is something the parent makes with their doctors or other healthcare providers providing the immunization. That is separate from school entry. When they then bring their child to school, the school will say, please present your immunization record and your school form, and they would say, okay your child may not.

Loop, Ariel (GeneralPublic) Senate (15.605)

There are numerous personal decisions parents make for their children. Disposable vs. cloth diapers, formula vs. breast milk, etc. Vaccination is not a comparable decision. The choice not to vaccinate your children is a threat to public health. Choosing not to vaccinate your child is like, making a choice to risk the health of everyone around you.

Pan, Richard (Legislator) Assembly (15.036)

She asks, why is my child's school made unsafe because of a decision of another parent? What about my child's right to an education? And what of this mother's need to make a living to support her child and family?

Gordon, Jay (GeneralPublic) Assembly (14.528)

And may actually adversely effect children's health. A no vote means you support your constituents rights to make informed medical decisions with their own doctors without coercion. And without the right to free and equal educational access for their children.

Russin, Leah (GeneralPublic) Senate (14.143)

There are parents who disagree with me. I know they want to prevent their children from getting sick. I know some of them personally and I know them to be loving and kind. I respect they are doing what they believe is the best for their child, and if those decisions only affected their own child that might be okay, but their decision not only jeopardizes the health and safety of their children, it puts my child at risk and that is unfair.

Anderson, Joel (Legislator) Senate (12.773)

That here you are not having to take care of that child for the rest of their life, making decisions for them when we know it's a very slim risk but a risk all the same. And you know, I have...I'm not shifting gears because I think that doctor, you've been very insightful.

Gordon, Jay (GeneralPublic) Assembly (12.361)

So that they can intelligently participate in decisions about their baby's healthcare. I believe that SB 277 might have the opposite effect on these discussions. Homeschooling is a viable option for very, very few families.

## A.6 Query 6 Results

Fatheree, George (GeneralPublic) Assembly (24.121)

In California we say, kids with exceptional needs. The kids with disabilities must be educated in the least restrictive environment and what that means is to the maximum extent possible, they have a right to receive an education with non-disabled peers and the only exception for that is if the child's disability prevents it. That's the only exception.

Fatheree, George (GeneralPublic) Assembly (15.144)

So there's serious Constitutional problems and under the Federal law, under the Individual with Disabilities Educational Act. One of the pillars of that law, which protects the rights of students with disabilities, is that kids with disabilities have a right to learn with their non-disabled peers.

Pan, Richard (Legislator) Assembly (14.434)

Both protection of the public and children from death and disability due to preventable communicable diseases, and ensuring children with special needs their right to an education, are compelling interests to require all students be vaccinated unless granted a medical exemption.

Pan, Richard (Legislator) Senate (13.881)

Both protection of the public and children from death and disability due to preventable communicable diseases and assuring that children with special needs, their right to an education, are compelling interests to require all students be vaccinated unless they are granted a medical exemption. Thank you.

Fatheree, George (GeneralPublic) Assembly (13.082)

The second part of the test is the law has to be narrowly tailored to limit rights, the right to education as little as possible, which I think this bill is the opposite. It's very broad. That's just the constitutional analysis under California's constitution. In addition, we've got the Individuals with Disabilities Educational Improvement Act, the IDEA, which is a federal law. California mirrors federal law in this respect, that requires that kids with special needs.

Holland, Mary (GeneralPublic) Senate (12.772)

I also want to touch briefly on the legal problems that would arise in taking away education from special needs children under the Individuals with Disability Education Act. Under federal law, special

needs children are entitled to a free and public education that includes annual individualized educational plan reviews and a host of special services, including occupational therapy, physical therapy, and speech therapy.

Bonta, Rob (LegStaff) Assembly (11.436)

Thank you. The next is with respect to individualized education plans and special education. That is, jumping down now to section H. And as discussed in the analysis under Federal and state law, disabled children are guaranteed the right to a free appropriate public education, including necessary services for a child to benefit from his or her education.

Bonta, Rob (Legislator) Assembly (11.436)

Thank you. The next is with respect to individualized education plans and special education. That is, jumping down now to section H. And as discussed in the analysis under Federal and state law, disabled children are guaranteed the right to a free appropriate public education, including necessary services for a child to benefit from his or her education.

Amador Nava, Shelby (GeneralPublic) Senate (10.609)

Shelby Amador Nava, I'm an educator, child care provider for special needs kids and a single mother and I strongly oppose this bill.

Hertzberg, Robert (Legislator) Senate (10.584)

Right, that's what I thought. I don't want to make a mistake, 10, so, the issue here is that what really is going on in this bill is that with respect except with regard to those 10 vaccinations that people are getting now, kids are getting now if they go to school.

## A.7 Query 7 Results

Pan, Richard (Legislator) Senate (22.399)

So the exemption that is in statute basically says that any licensed physician, any licensed physician in the state of California can grant a medical exemption.

Pan, Richard (Legislator) Assembly (21.592)

The law clearly states that any licensed physician in the state of California can provide a medical exemption. Mainly what they have to do is document the reason. They document the duration, which there's no limitation. That can be indefinite. And they have to sign it, of course, saying that they are a licensed physician. And you get a medical exemption.

Pan, Richard (Legislator) Senate (19.281)

So, actually, existing law for the medical exemption allows a licensed physician in the State of California to exempt a child with a medical exemption for vaccination. And so, if the licensed physician believes that that child is at risk for injury from the vaccine, they can simply give a medical exemption. In many ways the law has no restrictions on a licensed physician in being able to do that.

Pan, Richard (Legislator) Senate (18.572)

that their licensed physician would not write a medical exemption, again any licensed physician can write that medical exemption.

Pan, Richard (Legislator) Assembly (17.786)

That is, it's the professional challenge of the physician in terms of what they believe, that if the risk of the immunization is gonna be such that it's going to put that child at certain or, near, basically increased harm. Then they can provide that exemption. And so, that's to the judgment of actually any licensed physician in the state of California. There's no requirement that you even have to go to a physician that you've seen multiple times in the past.

Pan, Richard (Legislator) Senate (15.941)

They certainly are, any licensed physician in the state of California.

Reiss, Dorit (GeneralPublic) Senate (15.542)

In the past, California was extremely generous in providing exemptions from immunization requirements. Before AB 2109 it was even easier than it is now. It still is reasonably easy to get an exemption, but again this balance is something states can and do consider as things change.

Pan, Richard (Legislator) Senate (14.422)

So if you're under the care of one, 2 specialists, primary care there's no restriction any licensed physician can write a medical exemption per the law.

Pan, Richard (Legislator) Senate (13.500)

There is a definition in statute. We did not touch that in the bill which is why you don't see it in the bill language. But it basically says that a licensed physician in the state of California and their professional judgement can grant the medical exception.

Pan, Richard (Legislator) Senate (13.033)

There is no other restriction on the judgement of a licensed physician, so anyone who said that they have a licensed physician who told them they couldn't get immunized, should be able to get a medical exemption, and then those children, because they're not immunized, require protection. When you talk about do you have children who may be partially immunized, they may have certain vaccines, they may not take other vaccines.

## A.8 Query 8 Results

McDaid Ting, Farrah (GeneralPublic) Senate (4.922)

Farrah McDaid Ting representing the California State Association of Counties as well as the County Health Executives Association of California in support.

McDaid Ting, Farrah (Lobbyist) Senate (4.922)

Farrah McDaid Ting representing the California State Association of Counties as well as the County Health Executives Association of California in support.

Bautista, Phillip (Lobbyist) Senate (4.903)

Phillip Bautista, elected director to the American Nurses Association California, and as a board of directors on behalf of the association we strongly support this bill.

Bautista, Phillip (GeneralPublic) Senate (4.903)

Phillip Bautista, elected director to the American Nurses Association California, and as a board of directors on behalf of the association we strongly support this bill.

Pearce, Julianna (GeneralPublic) Assembly (4.812)

Julianna Pearce, President of National Autism Association. We strongly oppose.

Reid, Lee Angela (Lobbyist) Senate (4.792)

Lee Angela Reid on behalf of the San Francisco Unified School District, the Small School Districts Association and the School Employers Association of California in support.

Stenzler, Brian (GeneralPublic) Senate (4.719)

Dr. Brian Stenzler, President of the California Chiropractic Association. We oppose this bill.

Imitel, Michael (Lobbyist) Assembly (4.663)



Michael Imitel with the California Transit Association in support.

Warren, Brian (GeneralPublic) Assembly (4.638)

Brian Warren with the California Pharmacists Association in support.

Warren, Brian (Lobbyist) Assembly (4.638)

Brian Warren with the California Pharmacists Association in support.

## A.9 Query 9 Results

Gordon, Jay (GeneralPublic) Assembly (10.530)

Mercury has been eliminated from virtually every single vaccine. However, multiple dose vials of the influenza shot given to children can still contain I believe 25 micrograms of mercury. Unusual vaccines, I believe Japanese encephalitis vaccines contain mercury. And also I believe that the tetanus shot can contain mercury.

Thurmond, Tony (Legislator) Assembly (9.275)

One, on the issue of Thimerosal and mercury. We've been presented with all kinds of conflicting reports about mercury being in vaccinations that could cause various illness, but we've also been provided with very definitive science that says there is no mercury. I want the presenter to address it, and I want the witnesses for the opposition to address it.

Thurmond, Tony (LegStaff) Assembly (9.275)

One, on the issue of Thimerosal and mercury. We've been presented with all kinds of conflicting reports about mercury being in vaccinations that could cause various illness, but we've also been provided with very definitive science that says there is no mercury. I want the presenter to address it, and I want the witnesses for the opposition to address it.

Gordon, Jay (GeneralPublic) Assembly (8.845)

But the vast majority of childhood vaccines have no Thimerosal at all and trace amounts of mercury at best.

Pan, Richard (Legislator) Assembly (7.142)

And that childhood vaccines contain mercury that causes autism. Opponents have made statements comparing vaccination to forced labor and rape. And falsely insinuated that children will be forcibly vaccinated and non-vaccinating parents would be thrown into prison.

Fatheree, George (GeneralPublic) Assembly (7.031)

Yeah, so my understanding is that there are trace amounts of not only mercury, but also other toxins and metals, I believe I have a list here, that are still permitted in vaccines that are administered within the state. Okay, so trace amounts, and then, yes sir?

Mercury Ray, Lisa (GeneralPublic) Assembly (7.019)

Hi, my name's Lisa Mercury Ray. I'm from San Leandro, California. Mother of two, a chiropractor, and strongly oppose.

Thurmond, Tony (Legislator) Assembly (6.689)

That there is no longer any mercury in the immunization is the information that we've been provided. If you believe that's different, please tell us and what science you are basing that on.

Thurmond, Tony (LegStaff) Assembly (6.689)

That there is no longer any mercury in the immunization is the information that we've been provided. If you believe that's different, please tell us and what science you are basing that on.

Gordon, Jay (GeneralPublic) Assembly (3.094)

So that I could be appropriately vaccinated. I, in fact, received a hepatitis A vaccination and a typhoid vaccine. SB 277 is not about whether vaccines are right or wrong, I wanna make that very clear. As a pediatrician, I give vaccines in my office every day. I receive vaccines.

## A.10 Query 10 Results

Blumberg, Dean (GeneralPublic) Senate (26.319)

Opting out tends to cluster. Although the overall opting-out rate is less than 3% in California, some schools have opt-out rates of 10 or 20%, some 50% or greater. This leaves pockets of children susceptible to preventable diseases. When disease exposure occurs, sustained transmission is the result.

Blumberg, Dean (GeneralPublic) Assembly (17.519)

And resulting disease exposure leads to sustained transmission. The consequences are disease among those who choose not to be vaccinated, but also in those who are vaccinated, because, remember vaccines don't work 100% of the time. And in addition, there are those who are too young to be vaccinated, and they may be infected.

Obukhanych, Tetyana (GeneralPublic) Senate (12.957)

Neither IPV, the Polio vaccine, nor the acellular pertussis, the whooping cough vaccine, nor the diphtheria toxoid vaccines are capable of preventing transmission of infection. They are intended to prevent disease symptoms only.

Moxley, Robert (GeneralPublic) Senate (12.288)

and the vaccination rates are increasing. Since the restrictions have been put on personal belief exemptions in California, personal belief exemptions have been dropping. I'm here to advocate for the fact that religious exemptions are a necessary religious exemptions, legitimate religious exemptions

Reiss, Dorit (GeneralPublic) Senate (12.209)

It's simply hard to police. You can't limit it to organized religions. You can't prevent it from someone whose religion, but their personal belief does not. It's really hard to prevent giving the exemption to people who are claiming religious opposition even though their main reason is different.

Moxley, Robert (GeneralPublic) Senate (11.937)

of the certain orthodoxy, not to give them. So, personal belief exemptions are necessary. Religious belief exemptions are necessary, simply as a matter of American freedom. Thank you.

Liu, Carol (Legislator) Senate (11.827)

And you believe the culprit for that, is that the personal belief exemption, is the cause of that?

Loe Fisher, Barbara (GeneralPublic) Assembly (11.562)

Only 2.5% of children entering kindergarten in 2014 had a personal belief exemption and many of these children are vaccinated, but use a modified vaccine schedule. SB 277 eliminates the personal belief vaccine exemption, while federal health officials tell doctors to deny medical exemptions to 99.99% of children.

Henry, Hannah (GeneralPublic) Assembly (11.541)

But you can change policy and make it harder for people to fall victim to the traps of bogus claims. In considering SB 277 please remember personal belief exemptions do not save lives. Vaccines save lives. Personal belief exemptions do not protect our children and communities.

Obukhanych, Tetyana (GeneralPublic) Senate (11.255)

Furthermore, Low-Responders outnumber those who currently hold personal belief exemptions in California. The rate of personal belief exemptions is currently 2.54% in California. The proportion of Low-Responders was estimated to be 4.7% based on the antibody titre analysis following the second MMR.

## B Info Needs Query Results

### B.1 Info Need 1 Results

Huff, Bob (Legislator) Senate (8.934)

It certainly has saved us from a lot of childhood deaths and other things. But not everything in life is easily accomplished with advancements without trade-offs on the other side. And so, where I am leaning right now and I'll probably vote is against your bill, because I think the trade-off of giving up personal freedoms, even if your child gets sick because of that personal freedom or personal choice, I think that that's a threshold that should be very carefully evaluated before we hand it over to a government mandate.

Steinorth, Marc (Legislator) Assembly (8.197)

Now, I want to be clear, I support vaccinations. I support the idea of vaccinating to make California safer. But I also think that law makers have to really weigh that against the individual's freedoms and parental rights.

Waldron, Marie (Legislator) Assembly (7.276)

And we've forgotten about that, but informed consent is a human right. It's been stated that there is a responsibility in the freedom of choice, and therefore, those choosing to limit vaccines face the consequence of not being able to send their child to school,

Pan, Richard (Legislator) Assembly (6.269)

Thank you. I'm disappointed that there's some people who don't believe in freedom here, but SB 277 is about freedom. Freedom from deadly, crippling contagions that are now preventable through the science of vaccination. Vaccines are one of the greatest health achievements of mankind.

Chavez, Rocky (Legislator) Assembly (5.841)

Well thank you very much. I'll just close at this time. Truly this discussion we're having here is not about vaccinations, I think it's about freedom. I think somebody used that in the beginning, it's about freedom. I'm looking at this and trying to figure out, before

I impact upon people's freedom, what is the problem? What's the problem we're trying to solve?

Pan, Richard (Legislator) Assembly (5.727)

I wanna thank the chair and committee staff for your hard work on the bill and we are accepting the proposed committee amendments as described in the analysis. Thank you. SB 277 is about freedom, freedom from deadly crippling contagions.

Allen, Benjamin (Legislator) Senate (5.483)

that Dr. Pan's described it is the fact, if that is not the fact we want to hear from doctors and we would be very interested in changing the language to make sure to provide doctors with the preached freedom they need to exercise their professional judgment with freedom.

Monning, Bill (Legislator) Senate (5.292)

I'm one of those who feel strongly that the public health interest of all Californians is are in charge and as I said in an earlier hearing striking the balance between individual choice about your own child if that choice can affect the health of somebody else's child then it goes beyond the per view of personal choice and becomes a personal choice with community consequences.

Monning, Bill (Legislator) Senate (5.060)

My concern, and my trouble with that opposition, is that you're making a choice not just for your child, not just for your family. But a choice that potentially affects another person's child.

Pan, Richard (Legislator) Senate (4.629)

Who are concerned about going to school, not because of their own choices, because of someone else's choices. And that, so what about the right to those families? To bring their children to school without being at risk of potentially catching a serious disease.

## **B.2 Info Need 2 Results**

Allen, Benjamin (Legislator) Senate (9.126)

I think this is about being able to tell, look parents in the eye and tell them that their government has taken the reasonable steps necessary for protecting their children from dangerous communicable disease. So that's why we're here today. We're happy to have a discussion about all the legal and rights issues involved.

Allen, Travis (Legislator) Senate (8.330)

Ultimately, our goal is trying to protect public health, increase vaccination rates, prevent the likelihood of an outbreak, protect kids, make sure the parents know that the government is taking reasonable steps to ensure that when they send their kids to school, they will not be exposed to dangerous communicable diseases that we have the tools to stop. That's what this is about.

Loe Fisher, Barbara (GeneralPublic) Assembly (8.248)

We nurture them throughout childhood, so they can grow up to be productive members of society. We are personally responsible for their health and we are the ones who care for them when they become sick and unable to care for themselves for any reason.

Russin, Leah (GeneralPublic) Senate (7.733)

A dad shared his concern about whether to take his child into the pediatrician. He worried his son had an ear infection, but he was more worried about what dangerous disease his son might catch.

Pan, Richard (Legislator) Assembly (7.508)

Keep them free from disease. That's freedom. Not to be sick. And we need to be sure that that is what we strive for. I respectfully ask for an aye vote. And thanks again. I want to thank the committee and members for your thoughtful discussion.

Allen, Benjamin (Legislator) Assembly (7.478)

I used to work for the United Nations in East Africa, and I was so grateful of the fact that I was able to go to the doctor, get vaccinated, and get the shots to protect me from the dangerous diseases that existed there. I continue to be grateful that I grew up fully vaccinated, that I grew up in a society that actually took the steps necessary to protect our young people, our children, from dangerous communicable diseases that continue to impact people all over the world today.

Russin, Leah (GeneralPublic) Senate (7.461)

Pertussis, Whooping Cough, and other deadly childhood diseases at epidemic levels again. And a study in Pediatrics points again, to low vaccination rates. No vaccine is 100% effective. So even though we followed our pediatrician's advice and vaccinated our kids, if exposed to an highly infectious disease, they may still get sick.

Reiss, Dorit (GeneralPublic) Senate (7.267)

The last statement on this was in the 1944 case of Prince versus Massachusetts which was about a different issue but where the courts said the parent's rights and the parent's religious rights don't trump the freedom of the child from a dangerous disease or the freedom of the community from diseases as well.

Pan, Richard (Legislator) Senate (6.680)

Varicella is a very dangerous infection, particularly with people who have been treated with chemotherapy. So the FDA does not, the recommendation I would perhaps defer to our infectious disease expert, since you have two general pediatricians who disagree, perhaps with the Chair's permission, we can let our infectious disease expert tell us what the recommendation is.

Hall, Isadore (Legislator) Senate (6.553)

So if someone is in my district and they're sick, they have some type of condition where they cannot be, autoimmune disease of some sort. And they're exposed to someone who perhaps is ill, who chooses not to be vaccinated, if you will, would that person put in harm's way, would that person put my constituent in harm's way?

### B.3 Info Need 3 Results

Pan, Richard (Legislator) Assembly (12.399)

This is the proof of why SB 277 is needed to protect the public from vaccine preventable contagions. SB 277 is also needed to protect our most vulnerable citizens. Vaccine preventable infections are particularly dangerous to people with cancer, transplants, and other immune disorders.

Loe Fisher, Barbara (GeneralPublic) Assembly (11.715)

It fails to value the health and educational needs of vulnerable children, for whom the risk of vaccination have been or will turn out to be 100%. No doctor in California or public health official at the CDC in Atlanta can accurately predict whether or not a child will suffer brain inflammation, injury or death after vaccination.

Blumberg, Dean (GeneralPublic) Assembly (10.651)

And thank goodness that there were no deaths due to measles, but make no mistake, measles can be deadly, with one death out of every thousand cases. In fact, more children have died from measles than any other disease. That's why SB 277 is needed.

Henry, Hannah (GeneralPublic) Assembly (10.277)

The personal belief exemption is an artifact of a time when we collectively understood the need and value of vaccination. But as more and more parents have chosen their own schedule, their own version of the truth about vaccines, and as those people have clustered in like-minded circles, dangerous pockets of vulnerability have developed.

Pan, Richard (Legislator) Assembly (9.180)

Both protection of the public and children from death and disability due to preventable communicable diseases, and ensuring children with special needs their right to an education, are compelling interests to require all students be vaccinated unless granted a medical exemption.

Pan, Richard (Legislator) Senate (9.136)

That is proof of why SB 277 is necessary to protect the public from vaccine preventable contagions. In addition, vaccine preventable infections are particularly dangerous to children who have cancer, may have transplants, or immune diseases. These children are particularly vulnerable to infection and they depend on community immunity to prevent the contagion from actually reaching them.

Pan, Richard (Legislator) Senate (8.831)

Both protection of the public and children from death and disability due to preventable communicable diseases and assuring that children with special needs, their right to an education, are compelling interests to require all students be vaccinated unless they are granted a medical exemption. Thank you.

Jensen, Jena (GeneralPublic) Senate (8.672)

So I wanted to let you know, for those of you who don't already know, being located in Orange County near Disneyland, we did have eight cases of Measles come into our emergency department, children with Measles come into our ED this winter. Five out of the eight were so sick that they needed to be hospitalized.

Huff, Bob (Legislator) Senate (8.588)

It certainly has saved us from a lot of childhood deaths and other things. But not everything in life is easily accomplished with advancements without trade-offs on the other side. And so, where I am leaning right now and I'll probably vote is against your bill, because I think the trade-off of giving up personal freedoms, even if your child gets sick because of that personal freedom or personal choice, I think that that's a threshold that should be very carefully evaluated before we hand it over to a government mandate.



Pan, Richard (Legislator) Assembly (8.020)

Keep them free from disease. That's freedom. Not to be sick. And we need to be sure that that is what we strive for. I respectfully ask for an aye vote. And thanks again. I want to thank the committee and members for your thoughtful discussion.

#### **B.4 Info Need 4 Results**

Bonta, Rob (LegStaff) Assembly (11.468)

We can also entertain a motion. And I'm also going to walk through what changed going forward. So everyone's clear about what's happening and where we're going. There's gonna be an additional amendment taken before the assembly floor.

Bonta, Rob (Legislator) Assembly (11.468)

We can also entertain a motion. And I'm also going to walk through what changed going forward. So everyone's clear about what's happening and where we're going. There's gonna be an additional amendment taken before the assembly floor.

Gomez, Jimmy (Legislator) Assembly (9.969)

With these amendments and the amendment that will be taken before it gets to the floor, I feel comfortable voting aye on the bill.

Blumberg, Dean (GeneralPublic) Senate (9.358)

I wanna digress just a bit about my change of heart regarding parental choice. A few years ago I was hear to testify on behalf of Dr. Pan's previous bill to increase immunization rates, AB 2109, which has successfully mildly reduced the immunization opt-out rate in California.

Pan, Richard (Legislator) Assembly (8.914)

No. The vaccine requirements have not been changed in terms of which vaccines are required at what time in this particular bill, it's based on previous actions of this legislature. Every single vaccine that's required in the state of California has been passed by this legislature and signed by a governor.

Winners, Robert (GeneralPublic) Senate (7.937)

Robert Winners, Navy Nuclear Machinist mate, previous and I do oppose this bill.

Pan, Richard (Legislator) Senate (7.849)

So again this is a professional judgment but I would say that physicians want to work actually, we actually had a previous discussion about this before you came in that physicians I think, most physicians work with the families, I mean we know the patients we work with the families and we want to help them and make things work out.

Reiss, Dorit (GeneralPublic) Senate (7.464)

In the past, California was extremely generous in providing exemptions from immunization requirements. Before AB 2109 it was even easier than it is now. It still is reasonably easy to get an exemption, but again this balance is something states can and do consider as things change.

Blumberg, Dean (GeneralPublic) Senate (7.024)

At that time, I spoke of my belief in parental rights in this regard. But times change, and my views have evolved. My father-in-law died last year, which prompted much introspection and reflection on his career. Among his other roles, Dr. Jesse Steinfeld served as Surgeon General of the US about 45 years ago.

Pan, Richard (Legislator) Assembly (7.023)

Yes. This bill is about having your child enroll in school or potentially, the existing law for day care. And it's about enrolling children in school. So a child visiting a doctor would still have to provide. The parent would still have to provide consent before we would immunize a child. That does not change under this bill.

## B.5 Info Need 5 Results

Loe Fisher, Barbara (GeneralPublic) Assembly (13.691)

The fact that science has not adequately defined, who among us is at high risk for vaccine complications, does not mean that our lives are less deserving of protection than those at high risk for the disease complications. The science is not clear, it is not settled.

Pan, Richard (Legislator) Senate (13.029)

In both of them, research studies have shown, have been linked to communities with low vaccination rates and high use of personal belief exemptions. This is the proof of why SB 277 is necessary to protect the public from vaccine-preventable contagions.

Pan, Richard (Legislator) Senate (12.130)

The Institute of Medicine which is part of the National Academy of Sciences has examined the research and data on vaccine safety and concluded that quote, no evidence of major safety concerns associated with adherence to the childhood immunization schedule, unquote.

Henry, Hannah (GeneralPublic) Assembly (11.459)

Vaccines and the policies that require them for school protect our children and our communities. Our organization is not here to debate or defend the science behind vaccines. We are here to insist that science is honored over gut feelings, fear, and baseless claims.

Henry, Hannah (GeneralPublic) Assembly (11.228)

But you can change policy and make it harder for people to fall victim to the traps of bogus claims. In considering SB 277 please remember personal belief exemptions do not save lives. Vaccines save lives. Personal belief exemptions do not protect our children and communities.

Pan, Richard (Legislator) Assembly (9.310)

Vaccinations have prevented more than 21 million hospitalizations, and 732,000 deaths among children born in the last 20 years. Vaccines are safe and vaccines work. The Institute of Medicine, which is part of the National Academy of Sciences, examined the research and data on vaccine safety and concluded that, quote, there is no evidence of major safety concerns associated with adherence to the childhood immunization schedule, unquote.

Speaker, Unidentified (Lobbyist) Senate (9.242)

I think they probably underreport both because you have to have very fair proof that a person died of a disease and very fair proof that a person died of a vaccine and sometimes the proof is a little tough.

Speaker, Unidentified (GeneralPublic) Senate (9.242)

I think they probably underreport both because you have to have very fair proof that a person died of a disease and very fair proof that a person died of a vaccine and sometimes the proof is a little tough.

Krawitt, Carl (GeneralPublic) Senate (9.212)

others, that's easy for people who claim personal choice, but we're here for the community. We believe that this is sound public health policy because it keeps our children safe. You have a duty to legislate from solid evidence. not from fear and keep our schools safe. Vaccines save lives, please vote yes on SB 277. Thank you, I now yield to Rhett.

Obukhanych, Tetyana (GeneralPublic) Senate

(9.155)

Non-vaccinating families do not pose a unique, or in most cases, any threat to the public to warrant any discrimination against them. My conclusion is that SB 277 is not needed and personal belief exemptions must be preserved. Thank you for your attention.