Experiences With Medical Exemptions After a Change in Vaccine Exemption Policy in California

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abstract

OBJECTIVES: In 2015, California passed Senate Bill 227 (SB277), eliminating nonmedical vaccine exemptions for school entry. Our objective for this study was to describe the experiences of health officers and immunization staff addressing medical exemption requests under SB277.

METHODS: We conducted semistructured telephone interviews between August 2017 and September 2017 with health officers and immunization staff from local health jurisdictions in California. Interviews were recorded, transcribed, and analyzed for key themes.

RESULTS: We conducted 34 interviews with 40 health officers and immunization staff representing 35 of the 61 local health jurisdictions in California. Four main themes emerged related to experiences with medical exemptions: (1) the role of stakeholders, (2) reviewing medical exemptions received by schools, (3) medical exemptions that were perceived as problematic, and (4) frustration and concern over medical exemptions. Generally, local health jurisdictions described a narrow role in providing support and technical assistance to schools. Only 5 jurisdictions actively tracked medical exemptions received by schools, with 1 jurisdiction facing a lawsuit as a result. Examples were provided of medical exemptions that listed family history of allergies and autoimmune diseases as contraindications for immunization and of physicians charging steep fees for medical exemptions. Participants also reported concerns about the increase in medical exemptions after the implementation of SB277.

CONCLUSIONS: Participants reported many challenges and concerns with medical exemptions under SB277. Without additional legal changes, including a standardized review of medical exemptions, some physicians may continue to write medical exemptions for vaccine-hesitant parents, potentially limiting the long-term impact of SB277.

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WHAT'S KNOWN ON THIS SUBJECT: The number of medical exemptions in California increased after the implementation of Senate Bill 277 (SB277). Counties with high personal belief exemption rates before SB277 had the largest increases in medical exemptions after the first year of implementation.

WHAT THIS STUDY ADDS: This study illustrates the translation of health policy into public health practice. Health officers reported substantial frustration over the lack of authority to review medical exemptions and expressed concern over the rise in medical exemptions after the implementation of SB277.

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In June 2015, Governor Jerry Brown of California signed Senate Bill 227 (SB277), eliminating nonmedical exemptions from school-entry vaccine mandates.[1] California is the first state in nearly 35 years to take this step, joining only Mississippi and West Virginia as states that do not allow nonmedical exemptions for school-entry. Professional organizations, including the American Academy of Pediatrics[2] and the American Academy of Family Physicians,[3] support the elimination of nonmedical exemptions because these types of exemptions put individuals and communities at unnecessary risk for vaccine-preventable diseases.

Medical exemptions submitted to the school by a parent or guardian must meet certain criteria to be legally acceptable under California law,[4] including the following: (1) a written statement signed by a licensed physician (MD or DO), (2) a statement that the child's physical condition and/or medical circumstance is such that immunization is not considered safe, (3) an indication of which vaccines are being exempted, and (4) an indication of whether the exemption is permanent or temporary (with an expiration date if temporary). In Mississippi and West Virginia, a central or state-level review is required for all medical exemptions submitted by physicians.[5,6] In contrast, California requires parents or guardians to submit medical exemptions directly to the schools.

In the 2 school years after the implementation of SB277, the proportion of kindergarten students reported to have received all required vaccines increased from 92.8% in 2015–2016 to 95.1% in 2017–2018, and the rates of personal belief exemptions (PBEs) have steadily declined since the 2013–2014 school year.[7] However, the rates of medical exemptions in California after the passage of SB277 increased 250% (from 0.2% in 2015–2016 to 0.7% in 2017–2018).[7] Counties that had high PBE rates before SB277 also had the largest increases in medical exemptions during the first year of SB277 implementation, leaving portions of California susceptible to vaccine-preventable outbreaks.[8,9] Potential explanations for this steep increase include underuse of medical exemptions before SB277 (when PBEs could still be obtained) and the willingness of some physicians to write medical exemptions for parents who are vaccine hesitant whose children may lack scientifically justified medical contraindications as defined by the Advisory Committee on Immunization Practices.[8,10,11] Previous studies have revealed that states that have more lenient immunization laws (permitting PBEs; easy to obtain exemptions) generally have higher nonmedical exemption and disease rates compared with states with stricter exemption laws.[12–14] Moreover, there is considerable variability in the implementation and enforcement of exemption requirements among states.[15] Importantly, easier processes for granting exemptions at the school-level is associated with the increased likelihood of a child having an exemption.[15]

As a large and diverse state that recently put into effect immunization legislation changes (Assembly Bill 2109 in January 2014[16] and SB277 in January 2016) and has experienced large-scale vaccine-preventable disease outbreaks (eg, the Disneyland measles outbreak in December 2014),[17,18] California provides an important landscape to examine how vaccine policy is translated into public health practice. The experiences of local health jurisdictions in California will be used to provide insight for other states in which exemption policies are being considered. Although other studies have revealed that there is variability among states in the implementation and enforcement of exemption requirements, our objective for this study was to describe the experiences of local health jurisdictions while addressing medical exemption requests under SB277.

METHODS

Study Design

The study was conducted among members of the Health Officers Association of California (HOAC), an organization that represents health officers in California's local health jurisdictions, including 58 counties and 3 cities (Berkeley, Long Beach, and Pasadena).[19] In July 2017, members of the HOAC were invited via e-mail to participate in an interview regarding SB277. Multiple e-mail reminders were sent to encourage participation. The interview guide was designed to uncover respondents' perspectives about SB277 (including the rollout of the law in their jurisdiction), experiences with tracking (collecting copies of medical exemptions from the schools), verifying (reviewing medical exemptions for compliance according to the criteria established by the law), and overall challenges with the law. This study was approved by the Institutional Review Board at Emory University.

Data Collection

Data were collected through semistructured telephone interviews between August 2017 and September 2017. Health officers were given the option to invite or suggest other staff whom they believed may be better suited to discuss SB277. Verbal informed consent was obtained before the start of the interview and audio recordings of every interview were transcribed verbatim by a third-party transcription firm. Participants were thanked for their time with a signed copy of a public health book.

Analysis

Thematic codes were developed by using a priori codes informed by the interview guide and literature and through line-by-line reading of a subsample of interview transcripts. Three investigators (S.M., C.M.J., A.M.B.) independently read and coded 3 interview transcripts to identify major themes and content codes. After the independent coding, the categories were discussed until consensus was reached, and a preliminary codebook was generated. Each code was given an explicit definition to ensure coding accuracy and agreement among coders. Using the preliminary codebook, investigators (S.M., C.M.J., A.M.B.) coded 2 additional transcripts to identify any additional discrepancies, and the coding scheme was modified. By using the final codebook, all interview transcripts were coded by using NVivo 11 (QSR International Pty Ltd, Victoria, Australia).

RESULTS

We conducted 34 phone interviews with 40 health officers and immunization staff who represented 35 of the 61 local health jurisdictions in California (1 participant represented 2 jurisdictions). Participants included 18 (45%) health officers and 22 (55%) immunization staff (immunization coordinators or directors, communicable disease directors, and public health nurses). Among the 34 interviews, 14 were conducted with a health officer, 14 were conducted with an immunization staff member, 4 were completed jointly with a health officer and an immunization staff member, and 2 were conducted with multiple immunization staff members. On average, interviews lasted 31 minutes (range of 15–57 minutes).

To provide context for the participating jurisdictions, we included descriptive characteristics, including the following: (1) the average kindergarten PBE rate in the 3 school years (2013–2014, 2014–2015, and 2015–2016) before SB277 implementation[20] (low: <3%; medium: 3%–10%; high: >10%), (2) the geographic distribution of urban and rural populations[21] (based on where ≥50% of the population lives), and (3) the median household income[22] (low: <$50 000; medium: $50 000–$69 999; high: >$70 000). Among the participating jurisdictions, 20% had high average PBE rates before SB277 implementation, 20% were categorized as rural, and 34% had median household incomes of >$70 000 (Table 1). In comparison, among nonparticipating jurisdictions, 27% had high average PBE rates before SB277 implementation, 27% were categorized as rural, and 12% had median household incomes of >$70 000.

TABLE 1 Characteristics of Participants and Local Health Jurisdictions

Characteristics	*n* (%)
Participant Role	
Health officer	18 (45)
Communicable disease coordinator	7 (17)
Immunization coordinator and/or director	9 (23)
Public health nurse	6 (15)
Local health jurisdiction	
Average PBE rate before SB277	
Low (<3%)	16 (46)
Medium (3%–10%)	12 (34)
High (>10%)	7 (20)
Geographic distribution of population	
Urban	28 (80)
Rural	7 (20)
Median household income	
Low (<$50 000)	9 (26)
Medium ($50 000–$69 999)	14 (40)
High ($70 000)	12 (34)

When examining experiences with medical exemptions under SB277, we identified 4 major themes: (1) the role of stakeholders, (2) reviewing medical exemptions received by schools, (3) medical exemptions that were perceived as problematic, and (4) frustrations and concerns over medical exemptions. Each of the 4 themes have associated subthemes, which are described in detail below.

The Role of Stakeholders

Participants described the roles of stakeholders, including physicians, schools, local health departments, the state health department, and the California Medical Board (Table 2). The physicians' role was described as writing the medical exemption and having the authority and discretion to decide the reason for the medical exemption. Parents submitted the medical exemption directly to the school, where the school staff reviewed the exemption on the basis of the criteria established by SB277. If the school staff noticed a discrepancy on the medical exemption (ie, missing elements of the medical exemption), different methods were employed to address the discrepancy, including reaching out to the local health department for guidance, reaching out to the parent, or, in rare cases, reaching out to the physician who wrote the medial exemption.

The local and state health department provided support and technical assistance to the schools. Local health departments in counties with larger populations described spending more time providing support to schools, whereas those in smaller jurisdictions stated that it had not impacted their workload. A few jurisdictions discussed

TABLE 2 Role of Stakeholders

Subtheme	Quote(s)
Physicians	"The way that the law is written, the physician is the one who makes the decision." Health officer, urban jurisdiction, medium PBE rate, medium household income; "I'm not the doctor. I see some really lame reasons [for medical exemptions]. But I'm not the physician, and it's not in my capacity to be able to say, 'Well, that's not a valid medical exemption,'…I may think it, but if the doctor gives these reasons and they're writing the medical exemption, then it's accepted as long as it meets the requirements…. It's not my patient, and I'm not a physician." Immunization coordinator, urban jurisdiction, high PBE rate, high household income.
Schools	"It's not a school's expectation or role or responsibility to determine whether the medical reason is valid…. The school's role is just to make sure everything that's listed out in the law is met and that they file it away." Immunization coordinator, urban jurisdiction, low PBE rate, high household income.
Local health departments	"I don't think you'll find most local health officials feel like it is their job to enforce the law. It is to encourage compliance with the law and education about the law." Health officer, urban jurisdiction, medium PBE rate, low household income; "As a health department, I do not have any authority to decide…whether this is fraudulent or a legitimate medical exemption or not. There's no way that I have the ability or the authority to do that." Health officer, rural jurisdiction, low PBE rate, medium household income.
State health department	"The state immunization branch, the California Department of Public Health, had a great Web site called Shot for School, and it had an SB277 FAQ, and it had an entire section about medical exemptions; what it needs to contain, who can provide one. So, we frequently sent that link as well as copied and pasted content relevant to that question and said, 'Please share this with the family and the provider.' So, it was a very helpful resource for everyone." Communicable disease director, urban jurisdiction, low PBE rate, high household income.
California Medical Board	"The California Medical Board is kind of like the judicial system of medicine…. If the California Medical Board disciplines a physician for issuing a medical exemption because an aunt had asthma, and they say no, no an aunt having asthma is not a reason for issuing a medical exemption, then that would be essentially setting case law. That would be saying okay, so physicians who do this are outside of the standard of practice and are vulnerable to having their license disciplined by the California Medical Board." Health officer, urban jurisdiction, medium PBE rate, medium household income.

FAQ, frequently asked questions.

conducting trainings with physicians about SB277, but most stated that they did not interact with physicians in their jurisdiction about SB277. The state health department has a Web site called Shots for School, which features a Frequently Asked Questions page that was widely used and praised among participants as a helpful resource.[5] Although some participants reported that they may not agree with listed contraindications for immunization on the medical exemptions, they did agree that the local health department has no authority to question the scientific validity of the medical exemptions according to California law. Many participants wanted the California Medical Board to take a more active role in disciplining physicians who were writing medical exemptions that they perceived to be problematic.

Reviewing Medical Exemptions

Four subthemes were identified when participants described reviewing medical exemptions: reasons for actively tracking medical exemptions, legal repercussions for actively tracking medical exemptions, reasons for not actively tracking medical exemptions, and verifying medical exemptions (Table 3).

Five health jurisdictions in this sample tracked all medical exemptions filed at the schools, whereas all other jurisdictions reported only reviewing them when schools wanted to discuss specific cases. Among the jurisdictions that tracked medical exemptions, all agreed that schools were cooperative. The main reason for tracking was to examine patterns within the medical exemptions, including types of conditions listed as contraindications and names of physicians granting medical exemptions.

One of the 5 jurisdictions that tracked medical exemptions was mentioned in a federal civil lawsuit against SB277 that was filed by a group of parents and nonprofit organizations. The lawsuit, which mentioned the Department of Public Health, the Department of Education, the local health jurisdiction, and health officials from the local jurisdiction, created some concern among other jurisdictions that they could be targeted next. This lawsuit was ultimately withdrawn, but this case was frequently cited as a reason for not tracking medical exemptions among other participants. The participant from the jurisdiction that was mentioned in the lawsuit described receiving "hate mail and death threats across all social media" as a result of the decision to track medical exemptions; however, this jurisdiction continued to track medical exemptions during the first year of SB277 implementation. Other reasons that jurisdictions did not track exemptions included the following: not being required by law to do so, not having the perceived legal authority to track, not having the staffing or resources, wanting to see how the law worked before deciding to track, having low rates of medical exemptions and PBEs before SB277, and trusting doctors'

TABLE 3 Reviewing Medical Exemptions

Subtheme	Quote(s)
Reasons for actively tracking	"From a purely public health perspective, we also wanted to see what the trend was going to be–what was going to be on the medical exemptions, were we going to see a spike in permanent medical exemptions from all vaccines? Which schools were going to be involved? So, where would our pockets of vulnerability be? I realized that we should probably be looking at these medical exemptions so that we could help the schools determine which ones did and did not meet the law." Health officer, urban jurisdiction, medium PBE rate, medium household income.
Legal repercussions for actively tracking	"When they named me and my boss and our county [in a federal civil lawsuit], it was really a way to try and scare us away from doing our job and to signal to other local health officers that this is what they have coming to them if they continue to do their job. We carried on with looking at all the medical exemptions throughout the year…. I do continue to get harassing messages, e-mails on social media, and I ignore them." Health officer, urban jurisdiction, medium PBE rate, medium household income.
Reason for not actively tracking	"Pretty early on, there was another California county that ran into problems with that [actively tracking medical exemptions], which we were all aware of. And we decided to just kind of wait to see how it would roll out on its own and see how the state reports came out. And if we felt that there was a problem or if we'd heard that there was a specific problem at a specific school, we would deal with it then, but we kind of wanted to see what would happen on its own." Health officer, rural jurisdiction, high PBE rate, medium household income.
Verifying	"We're not the auditors of the physicians. If a licensed physician in California says this child has a medical exemption, we're not going to go do investigative work to say oh no, that's not valid. That would be an entirely different role for the health department that I don't really think we should be in. So, we trust their judgement that there's a medical exemption…." Health officer, urban jurisdiction, low PBE rate, high household income; "We usually reach out to that physician and/or the parent to try to understand what–there is 1 doctor that will write allergies but nothing more specific. So, if they write that, then we do reach out and say, 'What do you mean exactly to allergies?'" Public health nurse, urban jurisdiction, medium PBE rate, medium household income.

judgements about the reasons for medical exemptions.

The majority of participants reported that they did not verify medical exemptions because the law does not require them to do so. Participants also discussed that California law permits a broad range of conditions to be listed as contraindications to immunization. Some jurisdictions described verifying elements of medical exemptions if a school noticed a large volume of medical exemptions coming from the same provider. To address this, jurisdictions reported a variety of methods they used, including using a state database to confirm that the signing physician is a licensed MD or DO, reaching out to the physician who wrote the medical exemption, guiding schools to reach out to the parent who submitted the medical exemption, or reporting the physician to the California Medical Board.

Medical Exemptions That Were Perceived as Problematic

Participants described the medical exemptions that their jurisdiction had received and perceived as problematic. These medical exemptions were described as problematic in terms of (1) conditions listed as contraindications for immunization, (2) medical exemptions coming from physicians who were charging fees, and (3) types of physicians and health care providers signing medical exemptions (Table 4). Most participants reported seeing few or no medical exemptions that they believed were problematic. The most commonly reported conditions that participants described as suspicious were family history of allergies and family history of autoimmune disorders because these are not medical contraindications to immunization according to the Advisory Committee on Immunization Practices.[10] However, participants did acknowledge that although they might not agree that these are scientifically valid contraindication to immunization, the regulatory language of SB277 does state that it is legally acceptable for a family medical history to be taken into consideration.[4] Of greater concern were reports of physicians who advertised medical exemptions online for a fee. Examples that participants had encountered included a physician who charged a fee for watching a video on vaccines in exchange for a medical exemption and a physician who required and charged for medical tests of the child and family members to establish a family medical history. Participants also described receiving medical exemptions signed by physicians who do not typically treat children (cardiologists, dermatologists, surgeons, and physicians at medical marijuana dispensaries) and by unauthorized nonphysician providers, including nurse practitioners.

Frustrations and Concerns Over Medical Exemptions

Frustrations and concerns were commonly discussed when describing medical exemptions. Four subthemes revealed the feelings of frustration and concern: (1) frustration over the lack of authority for local health departments, (2) concern over the burden on school staff to review medical exemptions, (3) frustration with physicians who are writing problematic medical exemptions, and (4) concern about

TABLE 4 Medical Exemptions That Were Perceived as Problematic

Subtheme	Quote(s)
Suspicious conditions listed as contraindications for immunization	"Let me read one off the top. This is today's pack. "To Whom It May Concern…In my opinion, this patient meets the criteria described in SB277 for a temporary exemption for vaccinations including…" – he enumerates them all, through July 2030, so that's one hell of a temporary exemption – '…for the following reasons: family history of adverse effects include autoimmune disorders, inflammatory bowel disease, allergic disorders, neurologic problems, neurodevelopmental disorders, psychiatric disorders. I agree that due to this patient's physical condition and medical circumstances, there could be a severe reaction.'" Health officer, urban jurisdiction, low PBE rate, medium household income.
Charging a monetary fee for a medical exemption	"I'm getting a very high volume of medical exemptions from one provider, and from what I understand, for all intents and purposes, she's selling these medical exemptions. They're not charged for the office visit; they're charged to view a video. So, they watch a video on vaccine safety, and then they have an office visit, and they leave with a medical exemption. She used to just give permanent medical exemptions, and now she's giving temporary for 3 months. So, now families have to go back every 3 months and pay $300 to get their temporary medical exemption updated…. So, these kids have medical exemptions that are expired, and they can't get into school because they can't get an appointment with her…. So, the parents are being basically duped. They're being told you have to renew this every 3 months. Well, that's not true it all. It's just her decision. It's a business decision on her part." Immunization coordinator, urban jurisdiction, high PBE rate, high household income; "We're seeing specialists that aren't supposed to see kids signing these. And they're not pediatricians, they're not generalists, they're not family docs…and when we talk to the parents, come to find out they never actually were examined by this physician. They just made a phone call and got this letter for $100." Communicable disease director, urban jurisdiction, low PBE rate, high household income.
Types of physicians and health care providers signing medical exemptions	"There's one who's like a medical marijuana dispensary. And I'm like, really? He's a primary care physician for these kids? My suspicions are just always like, I don't believe that this is where this child is going for primary care." Immunization coordinator, urban jurisdiction, low PBE rate, high household income; "But by the doctor's signature line, a nurse practitioner had signed it. So, I told the school staff…they needed to go back and tell the parent to go back to the office and have the physician sign it." Immunization coordinator, urban jurisdiction, medium PBE rate, high household income.

TABLE 5 Frustrations and Concerns

Subtheme	Quote(s)
Lack of authority for local health department	"I don't get to approve or disapprove the medical exemptions. The law didn't give the health officer any role, and I'll tell you how ridiculous this is. In comparison with the fact that I have to review dog rabies vaccine exemption requests and I get to see medical records of dogs and I have the authority to disapprove requests for exemptions for rabies vaccines…and for people, we don't have that authority." Health officer, urban jurisdiction, medium PBE rate, high household income.
Burden on school staff	"One of the weaknesses at the school level is the person who's making these decisions is the clerk in the office, and given the paucity of school nurses, the school nurses really don't have the time, or even the presence many times, to participate much in this process…. I think there needs to be an increased role of the school nurse in that process, but they just don't have the time or the staff to go ahead and do that." Health officer, urban jurisdiction, high PBE rate, medium household income; "I think it was an issue because all of our schools are so small, and there is an impact when kids don't enroll or if they aren't able to go to school because of that. Then it does impact their average daily attendance too. It's just, I think, upsetting to them when they have to turn kids away because their population is so small." Immunization coordinator, rural jurisdiction, low PBE rate, low household income.
Physicians writing problematic medical exemptions	"My frustration is dealing with these doctors that would write what is thought to be maybe not completely valid medical exemptions for the students whose parents just don't want them to get any. That's my personal frustration, and that is shared by a lot of school nurses." Immunization coordinator, urban jurisdiction, low PBE rate, medium household income; "Some of them go into great detail. In fact, almost a startling level of detail considering what they're actually alleging as contraindications…like I say, I've got very little sympathy…the physicians know better. And this is where I start to get a little bit annoyed with my own profession." Health officer, urban jurisdiction, low PBE rate, medium household income.
Increase in medical exemption post-SB277	"My concern, my worry is that–I think we saw a fourfold increase in medical exemptions. My concern is that if that continues to occur, we may just be in the same position as before with parents pursuing medical exemptions when they're really personal belief exemptions." Immunization coordinator, urban jurisdiction, medium PBE rate, high household income; "The whole point is to eliminate PBEs and eliminate the pockets of susceptibility and potential transmission. And my fear is that the cottage industry bogus medical exemptions will erode that safety net that the bill was intended to create." Immunization coordinator, urban jurisdiction, high PBE rate, high household income.

an increase in medical exemptions under SB277 (Table 5).

Some participants described frustration with their lack of authority under SB277. One health officer voiced frustration by saying, "The law didn't give the health officer any role, and I'll tell you how ridiculous this is. In comparison to the fact that I have to review dog rabies vaccine exemption requests…." Given their role in managing vaccine-preventable disease outbreaks in school settings,

some health officers reported frustration in not having a larger role in the design and implementation of SB277.

Participants also felt it was unfair to put the burden on school staff to implement SB277 because the shortage of school nurses has left secretaries, registrars, and health clerks to review medical exemptions. Many participants said that SB277 put school staff in a challenging position because they should be excluding students from attending school on the basis of their immunization records, but could lose their average daily attendance funding by excluding students. Participants were frustrated with physicians who were charging for medical exemptions, which was viewed as taking advantage of parents. Lastly, there was concern that with the increase in medical exemptions during the first year of SB277 implementation, medical exemptions could be used as a substitute for PBEs. This would limit the intended impact of SB277 in preserving and protecting herd immunity.

DISCUSSION

In the first year of SB277 implementation, health officers and immunization staff in local health jurisdictions across California described many challenges and concerns with medical exemptions. Health officers discussed frustration with the lack of authority that they were given under SB277 and the burden on schools to review medical exemptions. One jurisdiction was named in a lawsuit for tracking medical exemptions, which had an impact on other jurisdictions' decision to track. Although immunization rates increased during the first year of SB277 implementation, many participants discussed concern with the increases in medical exemptions. In this study, we provide valuable insight for other states considering similar policies because we were able to highlight consequences of SB277, including lawsuits from parents as well as physicians charging fees in exchange for medical exemptions.

Although most participants reported reviewing no or few problematic medical exemptions, we do not necessarily interpret this to mean that problematic medical exemptions are rare; instead, given that the majority of the jurisdictions were not tracking medical exemptions, it is likely that they only saw the most egregious examples. Among participants who did report seeing problematic medical exemptions, a primary concern was physicians charging fees for medical exemptions. Although financial disincentives, such as processing fees, can be used to discourage nonmedical exemptions,[23] it is not clear whether the processing fees discourage parent from seeking medical exemptions for children without scientifically valid contraindication to immunization. On the basis of a family's income, processing fees may contribute to social disparities in access to exemptions, particularly under stricter exemption regimes, such as SB277 in California. To address this knowledge gap, authors of future studies should explore the role of financial disincentives and processing fees for medical exemptions.

Adding to the increase in medical exemptions after SB277 implementation are physicians who are willing to write medical exemptions for parents who are vaccine hesitant. The Internet provides access to physicians who are willing to sign off on exemptions and to Web sites used to instruct parents on how to get physicians to approve medical exemptions. To date, the California Medical Board has received 60 complaints regarding medical exemptions since the implementation of SB277. A majority of cases have been closed because of no violations being found, insufficient evidence to pursue disciplinary action, or the inability to proceed because of a lack of supporting evidence. (K. Kirchmeyer, personal communication, 2018) Dr. Bob Sears, a pediatrician who offers an alternative immunization schedule[24] and opposes mandatory vaccine laws, is currently under a 35-month probation by the California Medical Board for gross negligence and for deviating from standards of care for a toddler for whom he issued a medical exemption.[25–27] Although Dr Sears can continue to practice medicine, the requirements of his probation are extensive, including being monitored by a fellow physician, taking education and ethics courses, giving notification of his probation to any hospitals he has privileges in, reporting to the medical board quarterly, and informing the medical board of any travel outside of California that will last >30 days.[26,27] The requirements of Dr Sears' probation may be a signal to other physicians who write medical exemptions outside the intent of the law that they may face similar consequences. Without these consequences or a standard review process, medical exemption rates may continue to increase under SB277.

Although participants provided support and technical assistance to schools, few talked about their communication with physicians to provide education about SB277. Understanding how physicians interpret the law is important because they are writing the medical exemptions. Studies suggest that physicians often report not feeling confident or lacking familiarity with important health policy legislation,[28–31] and California physicians have experienced 2 recent immunization policy changes within a short period of time (Assembly Bill 2109 in 2014

and SB277 in 2016). An upstream approach to ensure that fewer problematic medical exemptions make it to the schools would be to provide more education and resources to physicians about SB277. Although local and state health departments as well as professional membership organizations (the American Academy of Pediatrics and the American Academy of Family Physicians)[32] have created handouts to educate physicians about SB277, further outreach through in-person or online training modules, webinars, and newsletters are needed to educate physicians on SB277 and on any future legislation that will impact how they practice medicine.

Our study has several limitations. First, data were collected ~1 year after SB277 implementation, so the results may be subject to recall bias. However, given that this is an issue that health officers continue to be actively involved in, recall bias is likely to be low. Second, although qualitative studies are not meant to be generalizable, the results are based on a voluntary sample of 35 health jurisdictions, and participants with strong opinions about SB277 may have been more likely to participate and may have biased the sample. The local health departments that participated in this study were located in jurisdictions with higher median household incomes compared with nonparticipating health departments, which may have also biased the sample. Despite these limitations, this is the first study in which the perspectives of local health jurisdictions from the first year of SB277 implementation are highlighted.

CONCLUSIONS

Our results reveal the translation of health policy into public health practice and some of the consequences of the implementation of SB277, including an increase in medical exemptions. Some physicians may continue to write medical exemptions for children without scientifically justified medical contraindications to vaccines. Without additional legal changes to SB277, including a standardized review of medical exemptions, this could potentially undermine and limit the long-term impact of SB277. Although the number of students receiving all required vaccines in California increased after the implementation of SB277 and the rates of medical exemptions are still relatively low (0.7%), counties and jurisdictions that had high PBE rates before SB277 also had the largest increases in medical exemptions during the first year of SB277 implementation. If medical exemption rates continue to rise, portions of California will remain susceptible to vaccine-preventable outbreaks. California's experience with SB277 will provide important insight for other states in which stricter vaccine exemption policies are being considered.

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ABBREVIATIONS

HOAC: Health Officers Association of California
PBE: personal belief exemption
SB277: Senate Bill 277

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REFERENCES

1. California Legislature. SB-277 public health: vaccinations. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB277. Accessed March 20, 2018
2. Committee on Practice and Ambulatory Medicine; Committee on Infectious Diseases; Committee on State Government Affairs; Council on School Health; Section on Administration and Practice Management. Medical versus nonmedical immunization exemptions for child care and school attendance. *Pediatrics*. 2016;138(3):e20162145
3. American Academy of Family Physicians. Immunization exemptions. Available at: https://www.aafp.org/about/policies/all/immunizations-exemptions.html. Accessed March 23, 2018
4. California Department of Public Health. Senate Bill 277 frequently asked questions. Available at: www.shotsforschool.org/laws/sb277faq/. Accessed April 3, 2018
5. West Virginia Department of Health and Human Resources. Medical exemptions information. Available at: https://dhhr.wv.gov/oeps/immunization/requirements/Pages/Medical-Exemption-Resource-Center.aspx. Accessed March 1, 2018
6. Mississippi State Department of Health. Medical exemption policy. Available at: https://msdh.ms.gov/msdhsite/_static/14,0,71,688.html. Accessed March 1, 2018
7. California Department of Public Health, Immunization Branch. 2017-2018 kindergarten immunization assessment – executive summary. Available at: https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Immunization/2017-2018KindergartenSummaryReport.pdf. Accessed July 3, 2018
8. Delamater PL, Leslie TF, Yang YT. Change in medical exemptions from immunization in California after elimination of personal belief exemptions. *JAMA*. 2017;318(9):863–864
9. Buttenheim AM, Jones M, Mckown C, Salmon D, Omer SB. Conditional admission, religious exemption type, and nonmedical vaccine exemptions in California before and after a state policy change. *Vaccine*. 2018;36(26):3789–3793
10. Mello MM, Studdert DM, Parmet WE. Shifting vaccination politics–the end of personal-belief exemptions in California. *N Engl J Med*. 2015;373(9):785–787
11. Centers for Disease Control and Prevention. Contraindications and precautions. Available at: https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/contraindications.html. Accessed March 22, 2018
12. Rota JS, Salmon DA, Rodewald LE, Chen RT, Hibbs BF, Gangarosa EJ. Processes for obtaining nonmedical exemptions to state immunization laws. *Am J Public Health*. 2001;91(4):645–648
13. Omer SB, Pan WK, Halsey NA, et al. Nonmedical exemptions to school immunization requirements: secular trends and association of state policies with pertussis incidence. *JAMA*. 2006;296(14):1757–1763
14. Omer SB, Richards JL, Ward M, Bednarczyk RA. Vaccination policies and rates of exemption from immunization, 2005-2011. *N Engl J Med*. 2012;367(12):1170–1171
15. Salmon DA, Omer SB, Moulton LH, et al. Exemptions to school immunization requirements: the role of school-level requirements, policies, and procedures. *Am J Public Health*. 2005;95(3):436–440
16. California Legislature. AB-2109 communicable disease: immunization exemption. Available at: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201120120AB2109. Accessed March 15, 2018
17. Zipprich J, Winter K, Hacker J, Xia D, Watt J, Harriman K; Centers for Disease Control and Prevention (CDC). Measles outbreak–California, December 2014-February 2015. *MMWR Morb Mortal Wkly Rep*. 2015;64(6):153–154
18. Clemmons NS, Gastanaduy PA, Fiebelkorn AP, Redd SB, Wallace GS; Centers for Disease Control and Prevention (CDC). Measles - United States, January 4-April 2, 2015. *MMWR Morb Mortal Wkly Rep*. 2015;64(14):373–376
19. Health Officers Association of California. Available at: www.calhealthofficers.org/. Accessed February 15, 2018
20. California Health and Human Services Agency. School immunizations in kindergarten by academic year. Available at: https://data.chhs.ca.gov/dataset/school-immunizations-in-kindergarten-by-academic-year. Accessed March 15, 2018
21. US Census Bureau; American FactFinder. Urban and rural. Universe: housing units. 2010 census summary file 1. Available at: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_SF1_H2&prodType=table. Accessed March 20, 2018
22. US Census Bureau; American FactFinder. Median household income in the past 12 months (in 2016 inflation-adjusted dollars). Universe: Households. 2012-2016 American community survey 5-year estimates. Available at: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_B19013&prodType=table. Accessed March 20, 2018
23. Billington JK, Omer SB. Use of fees to discourage nonmedical exemptions to school immunization laws in US states. *Am J Public Health*. 2016;106(2):269–270
24. Sears RW. *The Vaccine Book: Making the Right Decision for Your Child*. 2nd ed. New York, NY: Little, Brown and Company; 2011
25. *Medical Board of California v Sears*, (State of California 2016). Available at: http://www2.mbc.ca.gov/BreezePDL/document.aspx?path=%5cDIDOCS%5c20160909%5cDMRAAAFC12%5c&did=AAAFC160909210940460.DID. Accessed May 23, 2018
26. *Medical Board of California v Sears*, (State of California 2018). Available at: http://www2.mbc.ca.gov/BreezePDL/document.aspx?path=%5cDIDOCS%5c20180627%5cDMRAAAGL14%5c&did=AAAGL180627201150927.DID. Accessed July 3, 2018

27. Karlamangla S. California doctor critical of vaccines is punished for exempting 2-year-old boy from all childhood immunizations. *Los Angeles Times*. June 29, 2018. Available at: www.latimes.com/local/california/la-me-ln-sears-license-20180629-story.html. Accessed July 2, 2018

28. Ganjian S, Dowling PT, Hove J, Moreno G. What physicians from diverse specialties know and support in health care reform. *Fam Med*. 2015;47(4):283–291

29. Winkelman TN, Antiel RM, Davey CS, Tilburt JC, Song JY. Medical students and the Affordable Care Act: uninformed and undecided. *Arch Intern Med*. 2012;172(20):1603–1605

30. Rock EM, Simmons PS. Physician knowledge and attitudes of Minnesota laws concerning adolescent health care. *J Pediatr Adolesc Gynecol*. 2003;16(2):101–108

31. Rocke DJ, Thomas S, Puscas L, Lee WT. Physician knowledge of and attitudes toward the Patient Protection and Affordable Care Act. *Otolaryngol Head Neck Surg*. 2014;150(2):229–234

32. California Medical Association; American Academy of Pediatrics, California; California Academy of Family Physicians. SB 277: California's new school vaccine law. What physicians need to know. Available at: http://familydocs.org/f/SB277FAQ.PDF. Accessed March 1, 2018

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