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Ready or not? School preparedness for California's new personal beliefs exemption law

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ABSTRACT

Objective: This paper describes elementary school officials' awareness of and preparedness for the implementation of California's new exemption law that went into effect on January 1, 2014. The new law prescribes stricter requirements for claiming a personal beliefs exemption from mandated school-entry immunizations.
Method: We used cross-sectional data collected from a stratified random sample of 315 schools with low, middle, and high rates of personal beliefs exemptions. We described schools' awareness and specific knowledge of the new legislation and tested for differences across school types. We additionally tested for associations between outcome variables and school and respondent characteristics using ordered logit and negative binomial regression. Finally, we described schools' plans and needs for implementing the new legislation.
Results: Elementary school staff reported an overall low level of awareness and knowledge about the new legislation and could identify few of its features. We observed, however, that across the exemption-level strata, respondents from high-PBE schools reported significantly higher awareness, knowledge and feature identification compared to respondents from low-PBE schools. Multivariate analyses revealed only one significant association with awareness, knowledge and identification: respondent role. Support staff roles were associated with lower odds of having high self-rated awareness or knowledge compared to health workers, as well as with a reduced log count of features identified. Though most school officials were able to identify a communication plan, schools were still in need of resources and support for successful implementation, in particular, the need for information on the new law.
Conclusion: Schools need additional information and support from state and local agencies in order to successfully implement and enforce California's new school immunization law. In particular, our results suggest the need to ensure information on the new law reaches all levels of school staff.

1. Introduction

Nonmedical exemptions from mandated school-entry immunization requirements have risen in recent years, with faster increases in states that allow personal beliefs exemptions (PBEs) [1–4]. Voluntarily choosing to not vaccinate is associated with negative beliefs about vaccine safety, side effects, and efficacy, as well as with the perception of low risk and severity of vaccine-preventable childhood diseases (VPCDs) [5–8]. While most states offer nonmedical exemptions as a mechanism for balancing the public's health with parental rights and parental choice [9,10], exemptions are ethically and epidemiologically problematic. Exemptors present a free-rider problem by taking advantage of herd immunity without assuming any of the risk of vaccination [11]. Intentionally unvaccinated individuals are at increased risk for contracting and transmitting VPCDs, in particular pertussis and measles [12,13]. Disease risk is further increased in the presence of clusters of intentionally unvaccinated individuals [13,14]. Both the ease of obtaining an exemption [2] and the clustering of intentionally unvaccinated individuals [15,16] have been implicated in recent disease outbreaks.

In response to these concerns, some states that offer nonmedical exemptions have considered or enacted stricter requirements for filing an exemption. This shift is motivated by states' desire to use the exemption process as an opportunity to educate parents on

Abbreviations: PBE, personal beliefs exemption; VPCD, vaccine preventable childhood disease; AB, assembly bill; CDPH, California Department of Public Health; LHD, local health department.

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vaccine benefits and risks [17]. Increasing the administrative burden of obtaining an exemption also ensures that exemptions are filed out of conviction rather than convenience [18].

California is one of several states that have recently passed or are considering a law related to nonmedical exemptions. Assembly bill (AB) 2109 prescribes more stringent requirements for claiming a PBE. Those wishing to exempt from one or more required vaccines must file a letter of affidavit, signed by both a health care practitioner and the parent or guardian no more than 6 months prior to when the student becomes subject to the immunization requirement. In signing the affidavit, the health care practitioner confirms that the parent has received information on the risks and benefits of immunizations, and the parent/guardian confirms receipt of the information. The new law differs from the prior law in requiring a signed attestation from a health care practitioner; previously only the parent/guardian was required to sign an affidavit stating that one or more vaccines were contrary to the parent's beliefs [19]. Health care practitioners eligible under the new law to sign the form include physicians, surgeons, nurse practitioners, physician assistants, osteopathic physicians or surgeons, naturopathic doctors and credentialed school nurses. The credentialed school nurse was added to the original bill to address concerns about access to medical care. The law additionally stipulates that the parent must provide documentation of any immunizations the child has received, a requirement that was also stipulated in the existing health and safety code [20,21] but inconsistently enforced. In his signing message, California Governor Jerry Brown added an additional directive to the California Department of Public Health (CDPH) that a separate religious exemption option be provided; the religious exemption does not require a health care practitioner's signature [22].

While the CDPH is responsible for overseeing the rollout of the new policy [22,23] and tracking immunization compliance across the state, and is specifically tasked with designing new exemption forms, direct implementation of AB-2109 falls to local school districts and school officials. Implementation and enforcement of the new law will ultimately depend on district and school procedures as well as individual actions; previous research has documented school-level variability in the interpretation and implementation of immunization laws [24]. The goal of this paper is to describe awareness and knowledge of AB-2109 and preparedness for implementing the new law among California elementary school officials and staff.

2. Methods

2.1. Data

We used survey data collected by the CDPH Immunization Branch in the 2013 Special Kindergarten Assessment survey. The survey assessed school officials' awareness of and preparedness for California's new personal beliefs exemption law. Interviews took place in the spring 2013, 7–9 months prior to the January 2014 effective date for AB-2109. As many schools begin kindergarten registration in February or March, the interviews took place approximately one year before schools would need new forms and procedures in place to comply with the new legislation.

The survey was conducted with a stratified random sample of 315 schools. Following the sampling protocol established by the CDPH Immunization Branch for a similar survey in 2009 [25], the sampling frame of 8226 public and private schools in the state enrolling kindergarteners was first stratified based on PBE prevalence in order to compare knowledge and awareness of AB-2109 across schools with different exemption rates. Following our earlier work on PBE rates in California [26], we defined the high-PBE stratum ($N = 469$) as having a Fall 2012 PBE rate of at least 20% or having at least 20 PBEs. The low-PBE stratum ($N = 1381$) was defined as having no PBEs filed in the past 5 years. The remaining schools ($N = 6376$) were placed in the middle stratum. After excluding schools with fewer than 10 kindergarteners ($N = 1028$) and schools with enrollment or PBE data errors ($N = 6$), schools were randomly sampled from each strata. The final sample selected for interview consisted of 96 high-PBE schools, 117 low-PBE schools, and 102 middle-PBE schools. Sampling weights were calculated for each school as the inverse of the school's selection probability. The sample size of 315 was based on the CDPH's capacity to interview 300 schools, power calculations for similar previous surveys used to estimate kindergarten cohort immunization coverage, and a small allowance for lack of response. Following CDPH's usual survey protocol, local (county) health department (LHD) representatives conducted a phone survey with representatives from sampled schools. The respondent at each school was identified as the staff member responsible for maintaining immunization records. The questionnaire was based on the CDPH's standard Selective Review instrument (used every 3–5 years to validate annual mandatory school reporting of kindergarten immunization status and exemptions) and adapted to include AB-2109-specific questions. The survey included 19 questions that were a combination of close-ended, open-ended, partial open-ended and scaled questions; approximately 60% of the survey items focused on the new legislation. The final question on the survey solicited comments, questions, or concerns about the implementation of the new legislation for school personnel and parents. Surveys lasted approximately 5–15 min. 17 of the sampled schools were not able to provide sufficient data, leaving 298 schools in the analytic sample.

2.2. Measures

We examined three main outcomes: self-rated awareness, self-rated knowledge and specific knowledge of the new legislation (see Appendix 1 for survey question wording). Self-rated awareness and self-rated knowledge of the new legislation were each measured according to a 5-point scale from not at all aware/knowledgeable [1] to very aware/knowledgeable [5]. Specific knowledge of key provisions of the new legislation was measured by asking respondents to describe the legislation. Following a script in the interview guide, the interviewer said, "Tell me about the key components of the legislation as you understand them." Interviewers were instructed not to read the list of components or prompt the respondent. As respondents enumerated components of the legislation (for example, the implementation date or the requirement for a health care provider signature), interviewers compared responses to a list of the 7 key provisions of the legislation identified by the research team prior to data collection. For each provision, interviewers then coded awareness via a three-category variable: whether the respondents had identified it correctly and fully; partially/incorrectly; or not at all. This protocol was pilot tested prior to the survey and interviewers reported that they were able to capture and code respondents' unprompted answers. Responses were only coded by a single interviewer (the LHD representative for the county in which the school was located) as interviews were not recorded or transcribed. We present results for these awareness items as separate dichotomous variables, where 1 represents fully and correctly identified and 0 represents all other responses. In addition, we created a summary measure for total number of components identified (possible range 0–7) for use in regression analysis.

We also looked for associations between each outcome variable and 4 school and respondent characteristics. School-level variables were school type (public, private or charter), kindergarten enrollment and 2012 PBE rate per 100 kindergarteners. Enrollment

and PBE rate were logged for the regression analyses; the large number of zero values for 2012 PBE rates required the following transformation: $log(X+1)$. Respondent's role was a 3-category variable created based on position title: health worker (all nurses and health support staff), administrator (principals, directors, managers and coordinators) and support staff/other (all administrative and clerical support roles, information technology, student services, teaching staff and volunteers).

2.3. Analysis

We first described the current level of awareness of and knowledge about the new legislation for all schools officials and by PBE strata. We tested for differences in means between the high- and low-exemption groups and between the middle- and low-exemption groups using the Wald test. For distributions of categorical variables we tested for significance using the adjusted χ^2 test. We next examined associations between each of our main outcome variables and school and respondent characteristics using ordered logistic regression (self-rated outcomes) and negative binomial regression (count outcome), respectively. We then described the range of responses regarding plans to notify parents about the legislative change and information and support resources needed. All quantitative analyses were weighted using survey sampling probability weights to account for the sampling design. Analyses were conducted in Stata 12.0 using the survey data commands.

3. Results

3.1. Sample characteristics

Table 1 displays summary descriptive statistics in panel A and outcome variables in panel B for the overall sample and by PBE stratum. We found statistically significant associations for school type and school nurse with PBE exemption level and statistically significant differences in kindergarten enrollment and convenience use of the PBE for the high-PBE sample compared to the low-PBE sample. For example, about twice as many school officials in the high-PBE sample reported that their school offers PBE to parents who cannot provide documentation of up-to-date immunizations compared to the low-PBE sample. Overall, 11% of the sample reported this type of convenience use of the PBE.

A remarkable result of our analysis was the overall low level of awareness and knowledge: only 1 out of 10 respondents was able to correctly identify even one element of the new legislation, and, on average, respondents correctly identified fewer than 1 out of 7 elements of the legislation. Respondents were least aware of the religious exemption option added by Governor Brown in his signing statement and of the 6-month window for parent and provider signatures.

However, we still observed significant differences across PBE strata in awareness and knowledge of California's new PBE legislation (see Table 2). School officials at high-PBE schools reported higher self-rated awareness and knowledge compared to school officials in the low-PBE sample; a higher proportion of school officials in the high-PBE sample were also able to identify more features of the new legislation compared to those in the low-PBE sample. The elements of the new law most often enumerated were the requirement for signatures from parents and health-care providers and the effective date of the new legislation.

3.2. Regression analyses

Bivariate analyses revealed associations between school type, kindergarten enrollment and respondent role and the awareness and knowledge outcome variables. In multivariate analyses, only the association with respondent role remained; this was true for all three outcome variables. A support staff role was associated with 70% lower odds of being in a higher level of self-rated awareness or self-rated knowledge compared to health workers (see Table 2, panels A and B, respectively) while the log count of features identified was 1.3 units lower for support staff compared to health workers (Table 2, panel C).

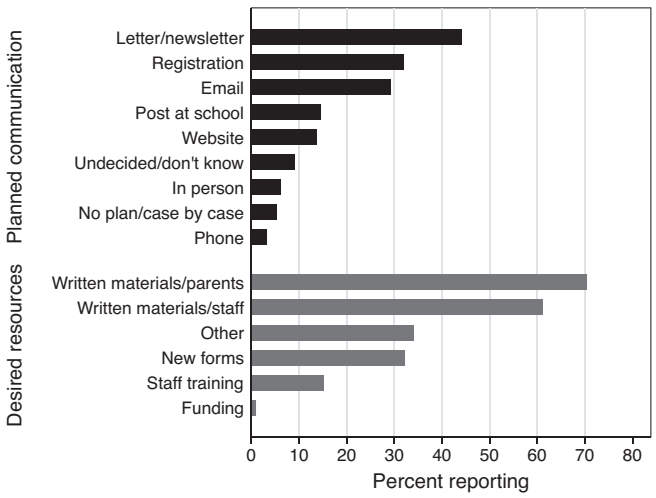

Fig. 1. Reported plans for communicating the new legislation to parents and desired resources for implementing the new legislation.

3.3. School implementation plans

We next reported school readiness for implementing the new exemption requirements. As there were no significant differences across strata in these responses, we presented results for the full sample only (see Fig. 1). School representatives identified a variety of planned communication modalities. Fifteen percent of respondents reported that the school did not yet have a plan because they were waiting for more information from the district or because the respondent was not aware of the new law. An additional 6% reported that the school would not make a specific communication plan or would deal with requests for information on a case-by-case basis. Respondents cited the rarity of exemption requests at the school, not wanting to advertise the exemption option, and feeling that word of mouth communication among parents would be sufficient as reasons for not having a communication plan or communicating on a case-by-case basis.

To inform CDPH and LHD initiatives, we also asked school representatives about resources needed to implement the new law. Respondents overwhelmingly expressed a desire for written communication materials to distribute to parents (71%) and to educate and inform staff (61%). One third of respondents also identified other resource and support needs, including bilingual materials, a template letter to send to parents, vaccine clinic information for uninsured families, official communication to the school, public service announcements, electronic versions of materials to distribute to parents, posters, a state contact person and the presence and endorsement of the state and local officials.

Of the 182 schools with a full-time or part-time credentialed school nurse, most (66%) expected that the school nurse would provide immunization risk and benefit education and sign PBE forms if asked. For the 10% of respondents who did not believe the school nurse would provide counseling or sign exemption forms if asked, this was attributed to not wanting to encourage PBEs, lack of

Table 1
Summary school characteristics and outcome variables for total sample and by exemption-level strata (%, [95%CI]).

	Total	Low PBE	Middle PBE	High PBE
Panel A: Descriptive				
School type†††				
Public	68.0 [60.6, 75.4]	68.9 [60.1, 77.7]	69.7 [60.6, 78.8]	22.6 [14.1, 31.1]
Charter	7.6 [3.5, 11.6]	1.9 [−0.7, 4.5]	7.1 [2.0, 12.1]	47.3 [37.1, 57.5]
Private	24.5 [17.7, 31.3]	29.2 [20.6, 37.9]	23.2 [14.9, 31.6]	30.1 [20.8, 39.5]
School nurse†				
Full-time	22.6 [16.0, 29.2]	31.1 [22.3, 40.0]	21.2 [13.1, 29.3]	11.8 [5.2, 18.4]
Part-time/district	46.4 [38.4, 54.5]	34.9 [25.8, 44.0]	49.5 [39.6, 59.4]	32.3 [22.7, 41.8]
None	31.0 [23.6, 38.3]	34.0 [24.9, 43.0]	29.3 [20.3, 38.3]	55.9 [45.8, 66.0]
K Enrollment (mean)	72.3 [65.4, 79.2]	67.2 [58.2, 76.2]	74.4 [66.9, 82.9]	48.2 [37.5, 58.8]**
Exemption rate (mean)	2.9 [2.4, 3.5]	0.0 [0.0, 0.0]	2.2 [1.5, 2.8]	36.0 [32.7, 39.4]
School informs parent of PBE exclusion[a]	91.3 [86.9, 95.7]	88.7 [82.6, 94.7]	91.9 [86.5, 97.3]	90.3 [84.3, 96.3]
School offers PBE to not-up-to-date parents[b]	10.9 [5.9, 16.0]	8.5 [3.2, 13.8]	11.1 [4.9, 17.3]	19.4 [11.3, 27.4]*
Respondent role				
Health worker	45.7 [37.7, 53.7]	51.9 [42.4, 61.4]	45.5 [35.6, 55.3]	21.5 [13.1, 29.9]
Administrator	19.1 [12.7, 25.4]	15.1 [8.3, 21.9]	19.2 [11.4, 27.0]	35.5 [25.7, 45.2]
Support staff/other	35.2 [27.5, 42.9]	33.0 [24.1, 42.0]	35.4 [25.9, 44.8]	43.0 [32.9, 53.1]
Panel B: Outcomes				
Self-rated awareness (mean)	1.8 [1.6, 2.1]	1.6 [1.4, 1.9]	1.9 [1.6, 2.1]	2.6 [2.2, 2.9]***
Self-rated knowledge (mean)	1.7 [1.5, 1.9]	1.5 [1.3, 1.7]	1.7 [1.5, 1.9]	2.1 [1.9, 2.4]***
Features identified (mean)	0.4 [0.2, 0.6]	0.3 [0.1, 0.4]	0.4 [0.2, 0.7]	0.9 [0.6, 1.2]***
Features identified unprompted				
Required signatures	9.9 [5.0, 14.7]	6.6 [1.9, 11.3]	10.1 [4.2, 16.1]	20.4 [12.2, 28.6]**
Date effective	8.6 [4.0, 13.2]	3.8 [0.1, 7.4]	9.1 [3.4, 14.8]	20.4 [12.2, 28.6]***
School nurse can sign	8.3 [3.7, 12.9]	3.8 [0.1, 7.4]	9.1 [3.4, 14.8]	11.8 [5.2, 18.4]*
Accepted HCPs	7.9 [3.6, 12.3]	5.7 [1.3, 10.1]	8.1 [2.7, 13.5]	16.1 [8.6, 23.6]*
Immunization history required	6.1 [2.2, 9.9]	4.7 [0.7, 8.8]	6.1 [1.3, 10.8]	12.9 [6.1, 19.7]*
6-month signature window	1.2 [−0.4, 2.8]	0.9 [−0.9, 2.8]	1.0 [−1.0, 3.0]	7.5 [2.1, 12.9]*
Religious exemption added	1.1 [−0.5, 2.7]	0.9 [−0.9, 2.8]	1 [−1.0, 3.0]	3.2 [−0.4, 6.8]
Observations[c]	298	106	99	93

Notes: K, kindergarten; HCP, health care practitioner.
[a] Unvaccinated children may be excluded from school if there is an outbreak of a disease that the child has not been vaccinated against.
[b] As a short-term alternative to completing required immunizations or obtaining complete immunization records so that the child can enroll in school on-time.
[c] Unweighted *N* for each strata, all percentages and means are weighted for sampling proportions.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$ (Wald test for significance comparing high and middle exemption strata to the low exemption strata).
† $p < 0.05$.
††† $p < 0.001$ (adjusted χ^2 test for independence of categorical variables).

time, not being present during kindergarten registration, and lack of knowledge or confidence in providing the information.

At the end of the phone survey, school representatives were asked for any other comments or concerns about the new exemption law. Open-ended responses reveal the need for more information about the new law and about district plans for implementation. Respondents had specific questions about whether the new legislation applied to currently exempted students or whether these students would be grandfathered in. They also expressed worries about the new legislation creating an increased burden for the school and in particular for the school nurse, with one suggestion for additional training for school nurses.

Table 2
Association of respondent awareness and knowledge of the new legislation with school and respondent characteristics.

	Bivariate		Multivariate	
	OR	CI	OR	CI
Panel A: Self-rated awareness (ordered logit)				
School type				
Public	Ref	–	Ref	–
Private	0.4*	[0.2, 0.8]	0.2	[0.0, 1.2]
Charter	1.8	[0.4, 7.0]	1.9	[0.4, 9.0]
K enrollment (log)	1.4	[0.9, 2.1]	0.9	[0.4, 1.9]
PBE rate per 100 (log)	1.0	[0.8, 1.4]	0.9	[0.6, 1.4]
Respondent role				
Health worker	Ref	–	Ref	–
Administrator	0.9	[0.4, 2.2]	1.9	[0.5, 7.0]
Support staff	0.2***	[0.1, 0.5]	0.3**	[0.1, 0.7]
Observations	298		298	
	Bivariate		Multivariate	
	OR	CI	OR	CI
Panel B: Self-rated knowledge (ordered logit)				
School type				
Public	Ref	–	Ref	–
Private	0.3*	[0.1, 0.8]	0.3	[0.0, 1.7]
Charter	1.3	[0.4, 3.9]	1.5	[0.5, 5.3]
K enrollment (log)	1.5*	[1.0, 2.3]	1.0	[0.5, 2.3]
PBE rate per 100 (log)	1.0	[0.7, 1.3]	0.8	[0.6, 1.3]
Respondent role				
Health worker	Ref	–	Ref	–
Administrator	0.7	[0.3, 1.9]	1.7	[0.4, 7.2]
Support staff	0.2**	[0.1, 0.6]	0.3**	[0.1, 0.7]
Observations	298		298	
	Bivariate		Multivariate	
	Coef.	CI	Coef.	CI
Panel C: Features of legislation fully/correctly identified (negative binomial)				
School type				
Public	Ref	–	Ref	–
Private	−1.4	[−3.0, 0.3]	−0.5	[−3.0, 2.0]
Charter	0.7	[−0.2, 1.6]	0.9	[−0.2, 1.9]
K enrollment (log)	0.6*	[0.1, 1.2]	0.5	[−0.5, 1.5]
PBE rate per 100 (log)	0.1	[−0.2, 0.5]	0.3	[−0.1, 0.7]
Respondent role				
Health worker	Ref	–	Ref	–
Administrator	0.1	[−0.9, 1.1]	0.4	[−0.7, 1.4]
Support staff	−1.6*	[−3.0, −0.3]	−1.3*	[−2.6, −0.1]
Observations	298		298	

Notes: Exponentiated coefficients presented for ordered logit regressions; 95% confidence intervals in brackets.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.
K, kindergarten; PBE, personal beliefs exemption.

4. Discussion

The goal of this study was to gain a better understanding of elementary school officials' awareness and knowledge of AB-2109, California's new personal beliefs exemption law, and of school readiness for implementation. Because the new PBE requirements will be implemented at the school and district level, successful implementation of the provisions of the law depends critically on the support and actions of school and district staff [24].

Our main finding is that school officials reported low levels of self-rated awareness and knowledge about AB-2109 and were able to identify few elements of the new legislation. Respondents expressed a need for training and communication resources from their district and from the state to support implementation. These resources became available in Fall 2013, when the CDPH posted information on the implementation of AB-2109 on their "Shots for Schools" website, including an FAQ and the forms that parents and providers must sign to obtain an exemption [20]. However, additional concerns, such as the need for specific training for school nurses given their new role under the law or worries about the increased burden on schools may have yet to be addressed.

We also found small but significant differences in awareness and knowledge of the new legislation by school type, with school officials from high-PBE schools showing greater awareness and knowledge compared to officials from low-PBE schools. In multivariate analyses, however, the only significant association we observed is with respondent role. Given the role that support staff play at many schools in immunization and exemption tracking and

interacting with parents, this suggests a targeted area for education and training. In the context of budget cuts for public health spending, it is important to identify where resources can have the greatest impact [27].

Despite the relatively low awareness and knowledge of the new legislation, the majority of respondents were able to identify their school's communication plan. This suggests that once school staff feel adequately informed, they will be able to quickly implement a communication plan. A small percentage of respondents reported no intentions to make a communication plan, largely because they felt it was unnecessary for their school due to the rarity of PBE requests. This further reinforces the idea of concentrating implementation efforts where they are most needed.

School officials also identified a number of resources needed for implementation. Written materials for informing school staff and for distributing to parents were highest priority, with staff training, exemption forms, state presence and endorsement, electronic materials and bilingual materials also requested. The range of materials identified points to the diversity of school populations and communication systems across the state. CDPH and LHDs will need to accommodate this diversity when supporting implementation and enforcement of AB-2109. Finally, it is not clear how or whether school nurses will exercise their authority to sign PBE risk and benefit counseling affidavits, and how this will affect PBE rates after the new law goes into effect. This is an area for further investigation.

A potential limitation of our study is a possible underreporting of knowledge of the key components of the legislation. Because we solicited this information from respondents in an open-ended, unprompted format, respondents may have been less able to enumerate any existing knowledge about the legislation. Interviewer coding of these responses was more challenging than simply asking about awareness of each provision of the legislation, particularly for partially or incorrectly stated provisions; multiple independent coding of responses was also not possible. Results about awareness should therefore be interpreted as the elements of the legislation that were most salient or top-of-mind for school officials. A strength of our study comes from the stratified sample design, which was representative of all California schools across high-, middle- and low-PBE groups.

This study of California's new personal beliefs exemption law documents low levels of awareness of and knowledge about specific features of the new legislation among California elementary school officials responsible for immunization tracking less than 9 months prior to the law going into effect. Our study demonstrates a need for training and other forms of support from state and local agencies for all school officials who play a role in enforcing school-entry immunization requirements. As other states seek to reverse the trend of rising personal belief exemption rates, California's experience of implementing new exemption requirements offers important lessons on the challenges of school-level enforcement.

Conflict of interest statement

The authors have no potential conflicts of interest to disclose.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.vaccine.2014.03.051.

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