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The negative relationship between immunization rates and outbreaks: an argument for improving awareness and provider recommendations, advocating for, and developing intervention strategies to increase immunization rates across California.

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B.S., Arizona State University, 2011

Thesis

Submitted in fulfillment of requirements for the Degree of Master of Public Health in the School of Nursing and Health Professions at the University of San Francisco

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Abstract

Prevention is the key to public health and immunizations is one of the most effective and efficient means of protection against infectious diseases. The California Immunization Coalition (CIC) is a public-private partnership whose mission is dedicated to achieving and maintaining full immunization protection for all Californians to promote health and prevent serious illness. In order to improve immunization rates, analysis of needs is a primary focus of CIC; immunization rates for both children and adults remain low, due to compounding factors such as rising personal belief exemptions, mistrust of government and doctors, and lack of strong provider recommendations. To address these needs, a culmination of five main goals were developed: familiarization with the CIC; support California Medical Association on a HPV vaccine campaign; develop partnerships with colleges and nurseries; provide awareness and resources for colleges and nurseries; and raise awareness and education through social media outlets. The collaborative nature of CIC with local and state health departments, community organizations, and other key stakeholders help promote local and statewide involvement and community building. The following paper is a broad summary of a 300-hour fieldwork experience at CIC specific to improving awareness, advocating for, and developing innovative methods for increasing rates of immunizations across California.

The negative relationship between immunization rates and outbreaks: an argument for improving awareness and provider recommendations, advocating for, and developing intervention strategies to increase immunization rates across California.

Background

California Immunization Coalition (CIC) is a public-private partnership whose focuses are on policy change, advocacy, coordination of care, and improving provider recommendations all with the overarching pursuit of improving immunization rates across California. Additionally, CIC provides resources and materials in support of state and local health departments for both the public and provider communities; in collaboration with various organizations and departments, CIC promotes community engagement, provider support, informational materials and resources, and advocacy. Common infectious diseases that were once a major cause of morbidity and mortality in the United States, and worldwide, are now preventable with vaccines; though, vaccine-preventable diseases are still a public health concern.

Over the past hundred years, strides have been made to improve population health, of which vaccinations is the cornerstone of public health achievement. Vaccines dramatically reduced morbidity and mortality from infectious diseases (Centers for Disease Control and Prevention [CDC], 1999). Public health has been shaped by an array of different individuals and has had tremendous impacts on today's society, and they simply prevent morbidity and mortality, as well as having a direct economic benefit and cost-effectiveness to society. Because of their success, many healthcare providers and parents are not familiar with vaccine-preventable diseases, a seemingly double-edged sword for healthcare professionals and the public. Recently, new challenges present themselves as well as opportunities for improvement. Continued success of immunization depends on a concerted effort from government, public health professionals,

providers, researchers, and the public. So why is this such a highly debated and sensitive topic for parents and the public health field? There are a number of different reasons and confounding factors in this sensitive topic.

One is the growing number of concern over adverse reactions to vaccinations, contributing to the increasing number of philosophical or personal belief exemptions, parent's request. Freed and colleagues (2010) surveyed parents on their vaccine-related attitudes and found that over 11% of parents refused at least one vaccine for their child, and half were concerned about serious adverse effects of vaccines. Further, there is evidence supporting that parents of children with exemptions and parents of non-exempt children have different vaccine knowledge, attitudes, and beliefs (Salmon et al., 2006 & Mergler et al., 2013).

Within parental concern of the safety and efficacy of vaccines, lies the anti-vaccine movement and hesitancy. Vaccine hesitancy is a depolarization of a two-sided vaccine debate. These individuals are a heterogeneous group in the middle of the spectrum ranging from those accepting to refusing; they may accept some vaccines, refuse others, delay vaccines, alternate schedules or accept unsurely (Larson et al., 2014). Larson and colleagues (2014) also developed a "model of determinants of vaccine hesitancy" organized around three key domains: contextual influences; individual and group influences; and vaccine and vaccination specific issues (Figure 1). In the developed world, and especially evidenced in the United States, over the past decade there has been a strong paradigm shift from efforts to improve access to immunizations to improving uptake (Sadaf et al., 2013). The growing number of parents following specialized vaccine schedules and a 'natural' way of life has created tension in the health community, as well as those concerned with these effects on herd immunity. The anti-vaccination movement has flourished over the past century, pointing to the importance of communication and skills

healthcare professionals and providers need when addressing these concerns and misconceptions (Tafari et al., 2014).

Another is the lack of strong recommendations from healthcare providers, especially with respect to the HPV vaccine. Provider recommendations influence parental and adult acceptance of preventative care, and therefore play an important role in successful immunization strategies and campaigns (Davis et al., 2004; Dempsey et al., 2006; Olshen et al., 2005). Glanz and colleagues (2013) found that five themes emerge when evaluating vaccine decision-making and the provider-parent relationship: parents make vaccine decisions during pregnancy, or while making birth plans; decision-making is an evolving process; parents seek out various sources for vaccine information; distinction between overall trust in a pediatrician and trust in advice on vaccines; and how providers present vaccine information. Glanz et al. (2013) also examined the odds ratio for parent responses to questions related to vaccine decision-making and confidence in provider's advice, and found a correlation between vaccine refusals and disagreeing with trust of pediatrician's advice on vaccine recommendations (Figure 2).

Further, Opel and colleagues (2013) addressed the gap between provider communication behaviors in increasing parental acceptance of recommended childhood vaccines. Their findings indicate the need for shared decision-making and discussions related to vaccine recommendations (Figure 3). Wallace et al. (2014) compared healthcare providers attitudes and practices versus parental attitudes towards administration of multiple injectable childhood vaccines during a single immunization visit from 1970 – 2014. Their findings were portrayed in tables concluding that the Advisory Committee on Immunization Practices (ACIP) guidelines began requiring more immunizations in a single visit, reluctance and following of recommended guidelines varied among providers and was even more apparent among parents (Figures 4 & 5).

Parental decision-making weighs various factors concerning multiple injections including fear of adverse reactions, immune system impact, pain, distress, confidence in vaccine, and risk of acquiring disease following administration (Wallace et al., 2014 & Ackerson et al., 2014).

Ackerson et al. (2014) found that after adjusting for provider, parent and facility characteristics, increased measles, mumps, rubella and varicella (MMRV) vaccine administration was significantly associated with decreased patient-vaccine compliance status by one year of age.

Providers recommendations are a significant predictor of vaccine uptake, and the medical community, along with supportive resources play a strategic role in educating both patients and providers about vaccinations (Caskey et al., 2009; Conroy et al., 2009; Do et al., 2009; Gamble et al., 2010; Bynum et al, 2011). Interestingly, Bynum and colleagues (2011) found that providers often obtain HPV vaccine information from professional organizations, a third seek out information from ACIP, fewer from state and local immunization programs, and surprisingly, a larger number than expected sought out information from the internet. Professional organizations, ACIP, and statewide programs provide the most up-to-date information and evidence-based vaccine information for providers and the public. Further, Bynum and colleagues (2011) found that OBGYNs and Pediatricians compared to GPs were more likely to obtain vaccine information, specifically HPV, from the internet, and from professional organizations. Younger physicians were associated with a higher usage of the internet as a source of information, and they noted this as an important recognition and dynamic change in information-seeking behaviors for not only providers, but among the population as a whole (Bynum et al, 2011).

The backbone of this fieldwork experience relied heavily on collaborations and partnerships with local, county and state health departments, and was pivotal in maintaining the

mission and direction of CIC in preventing disease, disability and death. CIC has become a leader in community and provider resource building and capacity, as well as strategically coordinating resources and materials around achieving and maintaining full immunization protection. This support and work has led to the creation of shotbyshot.org, the Virtual Immunization Communication Network (VICNetwork), Voices for Vaccines, Pre-Teen Vaccine Week, and other collaborative campaigns and services. Shotbyshot.org is a collection of stories from people who have been touched by vaccine-preventable diseases. This website portrays real-life stories, told by survivors, family members, friends, and health care providers, through touching, educating depictions of the value of prevention. CIC in collaboration with the National Public Health Information Coalition created the VICNetwork in order to strengthen, connect and coordinate public health communication and education programs with immunization coalitions; the goal is the help health professionals customize immunization messaging, media, and other communication avenues to share information with the public and their patients.

The use of immunization registries is key in the future of coordination of care, and tracking immunization rates for surveillance and control of potential outbreaks. This system accurately and efficiently stores information on those immunized, as well as information on the coverage levels in a specific population, or regions; these levels give insight into the herd immunity, level of protection against specific vaccine-preventable diseases, and at risk populations. Most states, counties and local areas have some form of an immunization registry; however, California Immunization Registry (CAIR) is a rigorous effort to coordinate information on immunizations. Having an interconnected network of complete, compatible and easily accessible immunization information across counties and districts makes tracking records feasible for both healthcare providers and patients. This information network also effectively

monitors uptake of vaccines providing efficient surveillance throughout California, and the ability to evaluate immunization campaigns and programs.

To progress the goals and mission of CIC, and its partnerships, this fieldwork experience targeted the development and maintenance of relationships, developing novel methods of communication and outreach, and improving awareness through innovative outlets. In the following sections, descriptions of the avenues of addressing these five predominant goals and objectives are discussed.

Statement of purpose

The work, projects and activities pursued and achieved in working for CIC sought to achieve higher immunization rates for children, adolescents, and adults throughout California.

Methods and Future Steps

Familiarization with CIC

CIC is a non-profit, public-private partnership, whose mission is dedicated to achieving and maintaining full immunization protection for all Californians to promote health and prevent serious illness. These goals, and the various roles of CIC staff members and board members, were delineated through both direct and indirect contact and informational interviews.

To understand the funding repertoire of CIC, websites and materials were reviewed, and organizations such as the California Department of Public Health (CDPH), California Medical Association (CMA), American Academy of Obstetrics and Gynecology (ACOG), California State Nurses Organization (CSNO), among others were addressed as active partners and collaborators on a variety of projects.

In addition, knowing what measures in developing education and communication to the public, providers, partner organizations, local health departments, and schools was examined and

researched as fieldwork began. Some activities included becoming a member of partner and collaborative organizations, including subscribing to newsletters and webinars hosted by these organizations; expanding knowledge of public health related topics, including vaccinations, infectious disease and maternal/child health was recommended and provided by an array of outputs. Familiarization of both federal and state immunization programs and policies was also helpful for supporting activities described by the project, and prospective activities at CIC. Further, since CIC is able to lobby for activists and advocacy groups on the importance and uptake of vaccines across California, having strong legislative and political stances is imperative to the success of CIC.

Support California Medical Association on a HPV vaccine campaign

CIC became a sub-contractor on a “Letter of Inquiry” examining and improving immunization rates for HPV in Latino and African-American adolescent males; CIC will provide support in recommending ACIP vaccination schedules, to both patients and providers. CIC will also be available to serve as a liaison for patients to reach out to with further questions. In writing and submitting a “Letter of Inquiry”, data and statistics were obtained on improving provider recommendations and the importance of vaccinating adolescent vulnerable male populations. Another aspect of this goal was in conjunction with the California Department of Public Health (CDPH), where CIC will collaborate in promoting materials accompanying HPV campaigns, as well as with Pre-Teen Vaccine Week.

Develop partnerships with colleges and childcare

The goal of developing partnerships with colleges is to promote and improve immunization rates among incoming students. Workshops and/or tutorial development with information on vaccinations available for website, or through health classes is a main objective

in developing partnerships as well. Providing tutorials for incoming students was also a main objective in developing partnerships and improving awareness across college campuses. There are tutorials required for incoming students at the Cal State System related to sexual violence and drinking; CIC thought it would be beneficial and cost-effective to also include in the importance and necessity for vaccines among that population. CIC is also involved in screening Invisible Threat, a documentary produced by California high school kids. Screening this documentary across the school systems, as well as having a coordination of raising awareness through the documentary on immunizations would be ideal for targeting the adolescent and young adult age group.

CIC also aims to raise awareness of the immunization registry, CAIR, to track vaccination rates of incoming students. Some methods are through connecting with college health centers on improving registry use, raising awareness on the availability, ease-of-use, and coordination of services CAIR offers, as well as improving upon current methods of tracking the immunization status of incoming students.

Provide awareness and resources for colleges and childcare

In collaborating with colleges and child-care organizations, CIC is able to develop a connected and interdisciplinary opportunity to provide resources for parents, providers and other organizations on the importance and recommendations regarding immunizations.

Targeting vulnerable populations through collaborations with the UC school system and Cal State school system in California. One method of raising awareness to these populations was working with school newspapers on developing opinion and commentary articles for the school papers. We were able to write two unique pieces that were generalizable to both the UC school system and Cal State school system. Again, by using the Invisible Threat documentary to

improve awareness to those students and young adults who may know the recommendations and allow for conversations on the topic of vaccines is tantamount to immunization success within this age group.

Another outlet used to raise awareness at the college level was determining the differences in resources and information provided to incoming college students on immunizations. A table was formulated exposing the need for increased awareness and information provided to incoming students for both UC and Cal State school systems (Figure 6). These tables will be useful when developing a vaccine awareness campaign for college campuses, and in providing an argument for the need to understand the importance of vaccines. For example, CIC aims to use these tables in arguing for an easily disseminated pamphlet and informational leaflet.

First 5 and the California Child Care Resources and Referral Network were two organizations that CIC reached out to in providing awareness and resources for child care providers, parents, and the general public. Because First 5 is funded through taxes to fund agencies and refer out, CIC imagined working with the statewide partnership to promote immunization awareness, resources and information would be beneficial.

Raise awareness and education through social media outlets

A major role CIC plays is providing information and updates on immunization recommendations, vaccines in the news, outbreak information and resources for dispersing to the public. Social media and crowdsourcing are indispensable methods of outreach and promotion in today's society, and especially important when broadening across populations. The use of Twitter and Facebook are the main avenues that CIC utilizes when reaching targeted populations and expanding existing populations. The use of VICNetwork, Voices for Vaccines,

ShotbyShot.org are also areas in which CIC supports through comments and posting of influential, current articles, as well as informational data related to vaccines. These methods are extremely powerful and impactful when targeting parents and individuals who rely heavily on “circles of friendship”, particularly anecdotal information.

Competencies Addressed

This culminating fieldwork experience has allowed for development of academic coursework and the application of classroom knowledge to real-world public health problems and scenarios. The implications of the projects and major takeaways include innovative ways to improve awareness on public health issues, policy change, and suggestions on informing policymakers, key stakeholders, providers, and the public on a relevant public health policy issue. Explicitly, this fieldwork experience has provided opportunities to assess community and state-wide needs, utilization of qualitative methods, evidence-based practices, and development of strategic public health interventions demonstrating cultural and social values of at risk and in need communities.

Throughout this experience, leadership abilities and skills were strengthened, as well as the application of ethical and moral principles to practice. Core knowledge and cross-cutting values were achieved and built upon related to epidemiology, health policy, data evaluation and dissemination, and program planning and implementation. The principles of epidemiology were applied to the evaluation and usage of data analysis, evaluation and dissemination via literature searches and supporting documents. As a whole, this project falls into the social and behavioral science core knowledge area, as the many dynamics affecting vaccine uptake are both individual and community wide social, behavioral and cultural factors. Environmental science core knowledge can be applied broadly as an analysis of community and social structure.

In addition, systems thinking and analytical approaches to this experience were utilized and supportive in the overall project. In conjunction with systems thinking, both communication and relationship building were key values throughout this experience. These values were established in fostering leadership and professionalism skills and competencies. As an introduction to working for a non-profit organization, representing and acting as a liaison to communities and specific populations and targeted groups was rewarding and a learning experience. The experience also demonstrated both accountability and professionalism included in this caveat, comprising both personal and organizational integrity.

Strategic and program planning were also integral parts of development and management in ranking importance of projects, and negotiating to determine this ranking was difficult. However, the use of leadership skills, emotional intelligence and behavioral skills were instrumental in these strategies. This experience was extremely collaborative and relied heavily on developing strong relationships and partnerships with various organizations and key stakeholders. Teams were essential in this process, as well as problem solving and decision-making when disseminating information on vaccines. The leadership skills learned from the classroom training and exposure was invaluable in applications in this fieldwork experience.

Conclusions

Generally, this fieldwork experience suitably represented a culmination to the University of San Francisco's Master of Public Health program. It was useful in developing skills concerning building relationships with key stakeholders, networking with organizations and key community members, and progressive public health knowledge. Personally, the lack of oversight and open workspace seemed to induce a dearth of structure, and these became barriers in developing a strategy, plan, and timeline; further, difficulties presented themselves and proved to

be challenging in addressing and overcoming. However, in all, it was a great experience in time-management, timeline, strategic planning, developing connections and networking.

The public health significance of this project was profound and personally fulfilling, and both have been met after completion. The projects are useful both professionally and personally, and for the organizational and collaborative development and support. Catherine, CIC's director, was supportive and cooperative in completing and implementing feasible, effective methods of the projects and activities. The knowledge and skills gained from this experience are invaluable and were not possible without Catherine's help and guidance. As a final point, working at the California Immunization Coalition was a beneficial, constructive learning and practical experience in public health practice.

References

- Ackerson, B. K., Li, B. H., Sy, L. S., Cheetham, T. C., & Jacobsen, S. J. (2014). Association of the use of MMRV in infants by pediatric infectious disease specialists with that of other affiliated providers. *Vaccine*, *32*, 1863 – 1868.
- Bynum, S. A., Malo, T. L., Lee, J.-H., Guiliano, A. R., & Vadaparampil, S. T. (2011). HPV Vaccine Information-Seeking Behaviors among US Physicians: Government, Media, or Colleagues? *Vaccine*, *29*(32) 5090–5095.
- Caskey, R., Lindau, S. T., & Alexander, G. C. (2009). Knowledge and early adoption of the HPV vaccine among girls and young women: results of a national survey. *Journal of Adolescent Health*, *45*(5) 453–462.
- Centers for Disease Control and Prevention (CDC). Impact of vaccines universally recommended for children – United State, 1990-1998. *MMWR* 1999, *48*(12) 243 – 248.
- Conroy, K., Rosenthal, S. L., Zimet, G.D., Jin, Y., Bernstein, D. I., & Kahn, J. A. (2009). Human papillomavirus vaccine uptake, predictors of vaccination, and self-reported barriers to vaccination. *Journal of Women's Health*, *18*(10) 1679–1686.
- Davis, K., Dickman, E. D., Ferris, D., & Dias, J. K. (2004). Human papillomavirus vaccine acceptability among parents of 10- to 15- year old adolescents. *J Low Genit. Tract Dis.*, *8*(3) 188 – 194.
- Dempsey, A. F., Zimet, G. D., Davis, R. L., & Koutsky, L. (2006). Factors that are associated with parental acceptance of human papillomavirus vaccines: a randomized intervention study of written information about HPV. *Pediatrics*, *117*(5) 1486 – 1493.
- Do, H., Seng, P., Talbot, J., Acorda, E., Coronado, G. D., & Taylor, V. M. (2009). HPV vaccine knowledge and beliefs among Cambodian American parents and community leaders. *Asian Pac J Cancer Prevention*, *10*(3) 339–344.

- Freed, G. L., Clark, S. J., Butchart, A. T., Singer, D. C., & Davis, M. M. (2010). Parental vaccine safety concerns in 2009. *Pediatrics*, *125*(4) 654 – 659.
- Gamble, H.L., Klosky, J.L., Parra, G.R., & Randolph, M.E. (2010). Factors influencing familial decision-making regarding human papillomavirus vaccination. *Journal of Pediatric Psychology*, *35*(7) 704–715.
- Glanz, J. M., Wagner, N. M., Narwaney, K. J., Shoup, J. A., McClure, D. L., McCormick, E. V., & Daley, M. F. (2013). A Mixed Methods Study of Parental Vaccine Decision Making and Parent–Provider Trust. *Academic Pediatrics*, *13*(5) 481 – 488.
- Larson, H. J., Jarrett, C., Eckersberger, E., Smith, D. M. D., & Paterson, P. (2014). Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007–2012. *Vaccine*, *32*, 2150–2159.
- Mergler, M. J., Omer, S. B., Pan, W. K. Y., Navar-Boggana, A., Orenstein, W., Marcuse, E. K., ... Salmon, D. A. (2013). Association of vaccine-related attitudes and beliefs between parents and health care providers. *Vaccine*, *31*, 4591–4595.
- Olshen, E., Woods, E. R., Austin, S. B., Luskin, M., & Bauchner, H. (2005). Parental acceptance of the human papillomavirus vaccine. *J Adolesc Health*, *3*(37) 248–51.
- Opel, D. J., Heritage, J., Taylor, J. A., Mangione-Smith, R., Salas, H. S., DeVere, V., Zhou, C., & Robinson, J. D. (2013). *Pediatrics*, *132*(6) 1037 – 1046. doi:10.1542/peds.2013-2037
- Sadaf A., Richards, J. L., Glanz, J., Salmond, D. A., & Omer, S. B. (2013). A systematic review of interventions for reducing parental vaccine refusal and vaccine hesitancy. *Vaccine*, *31*, 4293–4304.

Salmon, D. A., Moulton, L. H., Omer, S. B., deHart, M. P., Stokley, S., & Halsey, N. A. (2005).

Factors Associated With Refusal of Childhood Vaccines Among Parents of School-aged Children: A Case-Control Study. *Arch Pediatr Adolesc Med.*, 159, 470-476.

Tafari, S., Gallonea, M. S., Cappelli, M.G., Martinelli, D., Prato, R., & Germinario, C. (2014).

Addressing the anti-vaccination movement and the role of HCWs. *Vaccine*, 32, 4860–4865.

Wallace, A. S., Mantel, C., Mayers, G., Mansoor, O., Gindler, J. S., & Hyde, T. B. (2014).

Experiences with provider and parental attitudes and practices regarding the administration of multiple injections during infant vaccination visits: Lessons for vaccine introduction. *Vaccine*, 32, 5301 – 5310.

Appendix

Figure 1.



Fig. 1. The SAGE Working Group [WG] "Model of determinants of vaccine hesitancy".

Figure 2.

Table 4. Odds Ratio Estimates for Parent Responses on Questions Related to Vaccine Decision Making and Trust/Confidence in Provider's Advice, by Vaccine Group†

Question/Statement	Parents Who Refused Versus Accepted Vaccines			Parents Who Delayed Versus Accepted Vaccines		
	Adjusted OR	95% CI	P Value	Adjusted OR	95% CI	P Value
First began thinking of vaccinations before the child was born	3.2	1.3–8.0	.01	2.3	1.4–4.0	.002*
Constantly or occasionally reevaluate vaccination decision for their child	8.1	3.8–17.4	<.0001	9.2	5.4–15.7	<.0001*
Absolutely or very confident about having necessary information to make vaccine decisions for their child	0.7	0.3–1.4	.3	0.5	0.3–0.8	.007*
Strongly disagree or disagree to trust their child's pediatrician's advice on vaccinations	35.7	10.7–119.3	<.0001	8.4	2.5–28.0	.0006*

*Statistically significant.

†OR, odds ratio; CI, confidence interval. Adjusted ORs are adjusted for demographic characteristics (age of parent, gender, race/ethnicity, education, income, and marital status).

Figure 3.

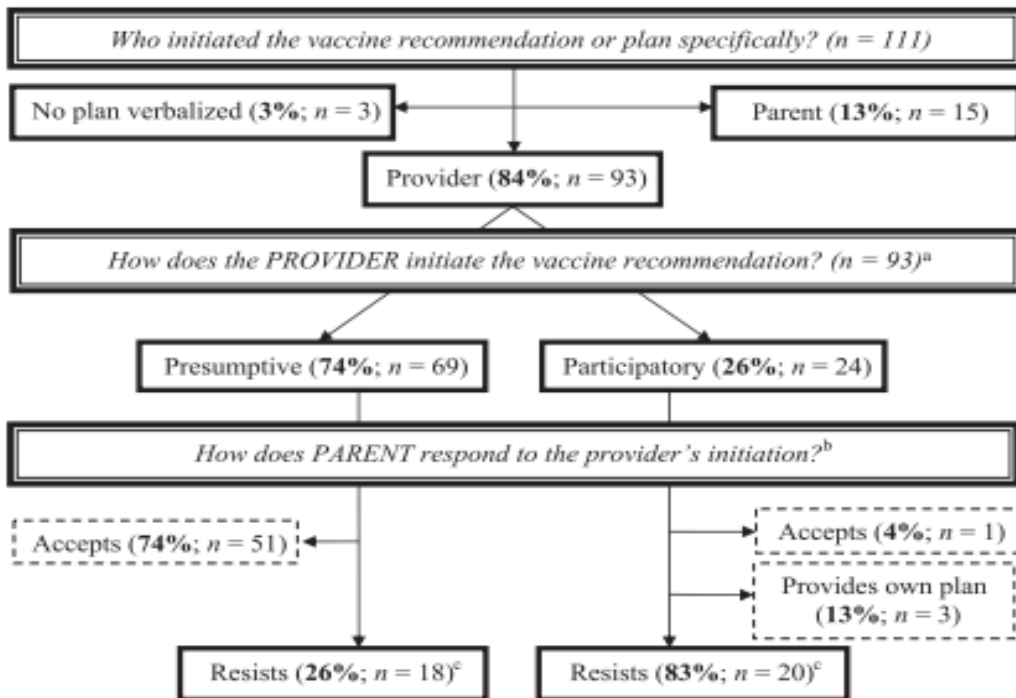


FIGURE 1

How providers initiated the visit vaccine recommendation and how parents respond. ^aProvider use of participatory initiation formats with VHPs and NVHPs was 41% vs 11%, respectively ($P = .001, \chi^2$ test). ^bParent resistance to provider initiation among VHPs and NVHPs was 54% vs 28%, respectively ($P = .009, \chi^2$ test). ^c $P < .001$ (Fisher's exact test).

Figure 4.

Table 3
Summary of healthcare providers' attitudes and practices toward administration of multiple injectable childhood vaccines during a single immunization visit; studies published 1970–2014.

Study year	Attitudes and practices toward given number of injections recommended in single childhood immunization visit					Country	No. of HCPs ^a	Source
	1	2	3	4	5			
1991			80% would administer 3 recommended injections	66% would administer 4 recommended injections		USA	490	[11]
1992			72–77% reported some caregiver opposition to 3 injections in a single visit			USA	448	[15]
1992		86–100% would administer all injections if >1 are due	62–100% would administer all injections if >2 are due			USA	62	[5]
1992			60% had strong concerns about administering 3 recommended injections	80% had strong concerns about administering 4 recommended injections		USA	289	[9]
1992	8–12% believed that 1–2 injections were too many for a single visit		59–76% believed that 3 injections were too many for a single visit			USA	88	[8]
1996			11% would not administer 3 injections in a single visit			USA	1241	[20]
1998			76% usually would not offer to defer any doses when 3 injections due	52% usually would not offer to defer any doses when 4 injections due		USA	274–399	[40]
2002	95–97% would administer 1 recommended injection	97% would administer 2 recommended injections	96–97% would administer 3 recommended injections	89–90% would administer 4 recommended injections	59–69% would administer 5 recommended injections	USA	232	[12]

^a Number of healthcare providers (HCPs) surveyed in study.

Figure 5.

Table 4
Summary of parents' attitudes toward administration of multiple injectable childhood vaccines during a single immunization visit; studies published 1970–2014.

Study year	Potential acceptability of given number of injections recommended in single childhood immunization visit					Country	No. of parents ^a	Source
	1	2	3	4	5			
1992			71% believed 3 injections were too many for a single visit			USA	342	[8]
1992	31% had strong concerns about a single injection		41% had strong concerns about 3 injections			USA	193	[9]
1992		91% approved of 2 injections	58% approved of 3 injections	42% approved of 4 injections		USA	281	[28]
1996		86% were comfortable with infant receiving 2 to 3 injections		26% were comfortable with 4 injections		USA	227	[10]
1996			54% approved of 3 injections			Australia	162	[19]
2001				58% were comfortable with 4 injections		USA	7810	[29]
2005	100% approved of 1 injection	82% approved of up to 2 injections	14% approved up to 3 injections	6% approved up to 4 injections	5% approved of unlimited injections	Belgium	1347	[30]
2006	34% preferred only 1 injection	91% preferred 2 or less injections	9% approved of 3 or more injections	2% approved of 4 or more		United Kingdom	796	[33]

^a Number of parents surveyed in study.

Learning Contract

Goal 1: Familiarization with California Immunization Coalition				
Objective(s)	Activities	Start/End Date	Who?	Tracking Measures
Goals of the CIC and the roles of staff members and board	-Review all websites and materials of CIC and affiliated organizations	8/25 – 9/12	Kate	-Catherine will be available to give information on organization
	-Become member of partner organizations	8/25 – 9/12		-Will subscribe to affiliated newsletters
What measures are taken in developing education and communication to the public, providers, partner organizations, local health departments, and schools	-Collaborate with CIC staff members as steps are taken to fulfil other objectives described below	9/12 – 9/26	Kate	-Catherine will include Kate in meetings and other activities related to CIC affiliations
	-Participate in meetings	9/19 – 11/26		-Kate will develop relationships and connections through Catherine
Expand knowledge of public health related topics, including vaccinations, infectious disease and maternal/child health	-Attend seminars, meetings and talks	9/5 – 11/26	Kate	-Attend relevant lectures and seminars
	-Familiarization of federal and state immunization programs and policies	9/15 – 10/3		-Research federal and state immunization programs and vaccine policy

Goal 2: Develop a HPV vaccine promotion campaign				
Objectives (S)	Activities	Start/End Date	Who?	Tracking Measures
Developing a stronger collaboration with OB/GYNs in California for adult and adolescent vaccines - via ACOG	-provide support in recommending ACIP vaccination schedules	9/22 – 11/26	Kate	-Lisa’s connections through CMA will help develop relationship with ACOG and work with offices or hospitals in developing campaign
	-resources to reach out to CIC with further questions from patients	10/6 – 10/31	Lisa	
Collaborate with CDPH in using promotional materials to accompany campaign	-Online materials, media, e-blasts, flyers	9/29 – 11/21	Kate Catherine Tammy	-Kate will reach out to Tammy Pilisik for promotional material for HPV campaign -Catherine and Kate will evaluate materials and revise as necessary

Goal 3: Develop partnerships with colleges

NEGATIVE RELATIONSHIP

Conant, K 25

Objectives (S)	Activities	Start/End Date	Who?	Tracking Measures
<p>Goal 4: Collaborate with local school districts (nurses) to educate and empower students, faculty, staff and parents on vaccines.</p> <p>vaccinations</p>	<p>development with information on vaccinations available for website, or through health classes</p> <p>-screen Invisible Threat</p>	<p>9/29 – 11/21</p>	<p>Catherine</p>	<p>options for college health centers – UC school system collaboration</p> <p>-Coordinate with local departments or coalitions in hosting parties and workshops</p> <p>-Discuss with schools on in class times to discuss vaccines</p> <p>-Kate will help Catherine develop informational packet on Invisible Threat for colleges</p>
<p>Raise awareness of immunization registry to track vaccination rates of incoming students</p>	<p>-Connect with college health centers on improving registry use</p> <p>-Learn and improve on current methods of tracking rates of incoming students</p>	<p>9/22 – 10/3</p> <p>10/3 – 11/21</p>	<p>Kate</p>	<p>-Connect with Cal State and UC school systems</p>
<p>Partner with UC school system, and other universities and colleges in California</p>	<p>-reach out to Napolitano, president of UC system – or UC Medical Director</p> <p>-reach out to Health Center or Promotion programs at other colleges</p>	<p>9/22 – 11/26</p> <p>9/22 – 11/26</p>	<p>Kate</p>	<p>-Connections with college health centers</p>

NEGATIVE RELATIONSHIP

Conant, K 26

Objectives (S)	Activities	Start/End Date	Who?	Tracking Measures
Partner and work with CSNO	-Develop relationship with school	9/22 – 10/3	Kate	-Rapport with CSNO and DoE
Goal 5: Raise awareness and education about CIC through social media outlets.				
streamline Objectives (S)	-Screen Invisible Threat	9/29 – 11/14	Catherine	Catherine will develop promotional material
	-Promote nonbiased education of importance of vaccinations at schools	9/29 – 11/14	Healthcare professionals	-Kate will help Catherine develop informational packet on Invisible Threat for schools/districts
	-Guest speaker in classes on the importance of vaccines	9/29 – 11/21		
	-Provide materials for students to take home – flyers	9/29 – 11/14		
Reach out to PTAs in various districts, potentially those with high opt-out rates	-Promote nonbiased education of importance of vaccinations -Invisible Threat	9/29 – 11/14 9/29 – 11/14	Kate	-Catherine will provide, or help develop, Kate with promotional material for approaching nonbiased education
Promote recommended vaccinations by ACIP and boosters	-Allow for Q&A sessions -Workshops to promote awareness and education on vaccines available for both parents and students	10/6 – 11/21 10/6 – 11/21	Kate Catherine Healthcare professionals	-Kate will determine Q&A sessions (determined with DoE and districts) and provide individuals to speak -Kate will work with local districts and advocates on coordinating workshops

NEGATIVE RELATIONSHIP

Conant, K 27

Learn fundamentals and principles of social marketing campaigns	-Familiarize myself with Hootsuite platform to manage Twitter, Facebook and other social media outlets	8/25 – 9/5	Kate Catherine	Catherine and Kate will work together to raise awareness and improve social media exposure
Develop team to proactively highlight positive information online or reactively respond to bad information shared on social media platforms	-Respond to negative or misinformation posted online -Post new related to vaccine research and infectious diseases	8/25 – 11/26 8/25 – 11/26	Kate	Kate will respond to posts that are influential to CIC and other pro-vaccine outlets
Promote ShotbyShot.org project	-Respond to posts with comments -Support posted articles and posts	8/25 – 11/26 8/25 – 11/26	Kate	Kate will respond to comments and stories posted on the site to promote the project

