Winning the Vaccination War in California

By Raymond Barglow and Margret Schaefer
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Over the past half century vaccinations have nearly eradicated a number of infectious diseases, including polio, diphtheria, and measles in developed countries. But in the past decade some of these diseases have reappeared, particularly pertussis (whooping cough) and measles. In 2014 there were nearly 10,000 pertussis cases reported in California, more than had occurred in any year since 1947, and over 200 of the hospitalized patients were infants under four months of age. In December 2014 an outbreak of measles occurred at Disneyland in Southern California that spread across the state and nationally. The measles virus is extremely contagious and can lead to severe brain disease, seizures, ear or chest infections, and even death.

These outbreaks of disease have occurred primarily in regions of California where vaccination rates have fallen below the herd immunity level (the level of inoculation required to protect a population against a disease). In California and many other states as well, there has been an increase in the number of families that obtain a "personal belief" exemption permitting them to withhold their children from vaccination programs. The high number of these exemptions accounts for a rising incidence of diseases that strike children disproportionately and that are often severely injuring or even fatal. In the case of the Disneyland measles outbreak, for example, scientists from M.I.T. and the Boston Children's Hospital who analyzed the data reported that vaccination rates for the exposed population had fallen to between 50 and 86 percent, far below the inoculation level of 95 to 99 percent that is needed for herd immunity.

Alarmed by this upsurge of vaccine-preventable diseases, a group of parents contacted state legislators about tightening up California's vaccination requirements. State Senators Richard Pan and Ben Allen drafted SB 277, a bill that eliminates the personal belief exemption that allowed unvaccinated children to attend school. Since it is in a school environment that infectious illnesses are most commonly transmitted from one child to another, private as well as public schools fall within the scope of the bill. SB 277 still allows exemption from vaccination for a medical reason—
a child's allergy to a vaccine, for example—
but exemption is no longer granted to families that object to vaccination on religious or philosophical grounds or because they believe it is unsafe.

From the moment that SB 277 was placed on the legislative calendar in February 2015, it encountered a storm of libertarian, religious, and legal objections. The debate lasted for over four months and received more media coverage than any other legislative conflict in recent history. Activists traveled to the state capitol in Sacramento in order to hold rallies, attend hearings, and meet with their representatives to discuss the alleged dangers of vaccination. Democrat Marc Levine, a member of the State Assembly, reported that his office was deluged by constituents wanting to weigh in on the issue. A single vote by Senator Hannah-Beth Jackson in favor of SB 277 elicited thousands of Twitter comments.

The grassroots organizing done on both sides of this issue was extraordinary. Advocates for SB

277, no less than opponents of the bill, understood that they had to build a broad community of support if they were to carry the day. Framing the case for vaccination in an emotionally engaging as well as scientifically convincing way, they built an effective campaign to win hearts and minds. Their efforts were successful: Following dozens of hours of public hearings and impassioned public debate in which thousands of advocates and opponents participated, SB2 277 was passed in both the state Assembly and the Senate and then signed into law by Governor Brown on the last day of June.

Future pro-vaccination campaigns in the 47 states where vaccination is still left to the discretion of parents are likely to find the strategy and tactics useful that have proved so effective in California. But even in California, the debate is by no means over. Following passage of SB 277, the opposition claimed to have gathered over 200,000 signatures on a petition seeking to repeal the bill. Community activists have also brought to their local school boards the request that they not enforce SB 277. And Dr. Bob Sears, a pediatrician from Southern California and author of a best-selling critique of vaccination, ***The Vaccine Book***, has assured parents that they will be able to find a physician who will help them obtain a vaccination exemption for their child without proof of any medical condition. (Sears, like most of the critics of SB 277, insists he is not opposed to all vaccinations. But the magnification in his book of alleged "side effects and problems with vaccines" is apt to convince uninformed readers to forego them altogether.)

Triumph or Travesty of Democracy?

The active participation of citizens in political life is a hallmark of authentic democracy. But there is a challenge that such grassroots participation encounters in a modern society: the thoughtful resolution of complex issues calls not only for critical thinking skills but also for a degree of scientific knowledge that many people do not possess. One such issue has been the vaccination of school children, which became the subject in California of a prolonged and bitter debate. Did democracy work to resolve this dispute? Could it possibly have worked?

If our only criterion for grassroots democracy is the massive involvement of citizens in government, then the California vaccination debate certainly qualifies. But if we join to that criterion the additional requirement that citizens' involvement be well-informed – or at least not deeply misinformed -- then what occurred in California looks less democratic. The dissemination of falsehoods about the risks of vaccination through social media, the dismissal of scientific evidence, and an extreme polarization that even led to threats of violence undermined the democratic intent of the deliberations.

The strongest opposition to SB 277 came from anti-government Republicans who see mandatory vaccination as "government overreach" leading to a police state. But resistance has also been substantial in some progressive cities with presumably well-educated populations—in the San Francisco Bay Area and Orange County, for example—where rates of personal belief exemption to vaccination are among the highest in the state.

Those who opposed SB 277 have been very effective in raising fears about the safety of vaccination and about loss of "parental rights." They combined rallies, marches, petitions, and

visits to political representatives with the use of social media such as anti-vaccine websites, Facebook, and especially Twitter to weave together a well-funded, grassroots network that has cooperated with similar communities in other states to defeat pro-vaccination legislation. This nationwide community has recruited celebrities such as Jim Carrey, Charlie Sheen, Jenny McCarthy, Robert F. Kennedy Jr., Bill Maher, and Donald Trump to speak on its behalf and has created a veritable industry for anti-vaccination books, posters, and films. One widely viewed anti-vaccination documentary, ***The Greater Good***, won several film festival awards, and another, ***Trace Amounts: Autism, Mercury, and the Hidden Truth***, was screened at anti-vaccination community meetings across the country and at the United Nations 2015 NGO Conference.

Science does not always compete successfully against a fear-driven campaign of this magnitude. Scientific authority today faces a "credibility gap" that is both general, deriving from a history of harmful scientific applications, and specific to the domain of human health. At a general level, scientific authority has been discredited by destructive consequences (e.g., modern warfare, pollution of the planet) wrought by science-based technologies over the past century. And the authority of scientists, public health officials, and physicians has been further eroded in recent years because citizens have felt empowered by the wealth of "information" now easily available on the Internet to decide medical issues for themselves. The problem is that many Internet sources are driven by commercial or political interests rather than by an unbiased consideration of scientific evidence. Compounding this problem is the fact that science doesn't always speak in a single voice; almost always there are researchers and health experts, however few, who don't agree with the mainstream view. The scientific studies themselves are often difficult to interpret and evaluate, especially for people who lack scientific training and statistical literacy. This places the public and its political representatives in a quandary: how are they to reconcile conflicting authorities and claims?

In principle, the "democratic" dissemination of information on the Internet can help the public understand medical issues. But the link between Internet presentations of medical matters and authentic scientific findings is often weak or nonexistent. Although the most common Google search on the Internet is the search for medical information, Google does not return to the user a list of sites ranked in the order of their scientific credibility. Websites posing as "scientific," including those that aim to defeat pro-vaccination legislation, are popular sources of misinformation. Even when the consensus among scientists is almost unanimous—as in the cases of global warming, biological evolution, and the safety of vaccination—a very few dissenting scientists may be touted by widely viewed Internet sites as courageous renegades who "speak truth to power." Just about any improbable research hypothesis, groundless fear, or profit-seeking health remedy can find a home on the Web that will vouch for its validity. (Wikipedia, which has become the world's most popular source of information about health matters, is today monitored by page editors who make an effort to hold in check the posting of false statements, but this attempted gate-keeping frequently fails; the page editors are volunteers who are often not expert in the subject areas they oversee.) A network of websites echoing one another and promoting a concept like "vaccine-injured child" to the public can create a discourse that pulls many thousands of believers permanently into its orbit.

The problem here is not just that people are ***un***informed, but that they are ***mis***informed and apt to

resist facts that go against their firmly held beliefs. Scientific evidence is readily discounted if one accepts, for example, the premise promoted on anti-vaccination websites that scientists who speak out on behalf of vaccination have been bought off by the pharmaceutical industry.

The Pro-Vaccination Campaign Community

The anti-vaccination movement might have defeated SB 277—as it had defeated similar pro-vaccination proposals in Oregon, Washington, and other states—if California's vaccination advocates had not organized a passionate campaign community of their own. Their cause drew support from doctors, nurses, and other health care professionals; from school boards and PTAs; from Democratic Party organizations, newspapers, unions, and civic associations. But at the core of the pro-vaccination community were parents who wanted to protect their children from infectious diseases and who were able to dispute the testimony given by parents on the other side.

SB 277 hearing in Sacramento. Vaccination advocates wore blue buttons, opponents red tee-shirts. ***Credit: Pauline Bartolone/Capital Public Radio***.

This pro-vaccination community understood from the beginning that it had to be as visible and media-savvy as the opposition and that presentation of scientific evidence would not by itself ensure success. No less than the vaccination critics, pro-vaccination families aimed to convey to the public their empathy with children's vulnerability and need for protection and love. They waged their campaign to convince legislators and the public on three fronts: the marshaling of statistical evidence, the presentation of images and anecdotes, and the use of catchwords and slogans.

Pro-vaccination campaign button
Credit: Vaccinate California

The Battle of Statistics

The first line of advocacy for a science-dependent issue such as vaccination is of course the presentation of empirical evidence. Researchers and public health advocates cited statistics showing that vaccine-preventable diseases of childhood such as whooping cough and measles have been reappearing in California, and that low rates of vaccination are responsible for this phenomenon. The situation in California, vaccination advocates pointed out, is by no means unique. The vaccination rate has fallen in many other states as well, accounting for a nationwide increase in the incidence of diseases that had previously been almost eradicated. As Mark Fischetti, a senior editor of ***Scientific American***, has pointed out, "many states are dropping below safety thresholds. That is because parents are opting out of state vaccination requirements for kids entering public school, despite a dearth of evidence that vaccines are harmful or unnecessary."

Pro-vaccination advocates also addressed the opposition's claim that vaccination could lead to diseases such as autism. The alleged vaccination-autism link, which is a widely circulating cultural "meme" today, dates back to the notorious "scientific study" published in 1998 by Andrew Wakefield, an English physician, in the respected British medical journal ***Lancet***. Wakefield, on the basis of only 12 patients, claimed that the administration of the measles, mumps, and rubella (MMR) vaccine was linked to the onset of severe illnesses. One of them, he announced to the press, was autism, and he called for a suspension of MMR vaccination until "more research could be done." His vaccination-leads-to-autism hypothesis was widely reported in the media and taken up by many parents of autistic children who were looking for an explanation of the disease. Following the publication of Wakefield's article, however, other researchers rigorously tested his hypothesis and found no evidence for it. Their negative finding has been confirmed many times.

In 2006, it was discovered that Wakefield's research was not only faulty but unethical and fraudulent: he had subjected already developmentally compromised children to unnecessary colonoscopies and spinal taps, and had made up the data he claimed to observe. It also turned out that Wakefield had been paid £400,000 by lawyers trying to prove in court that the standard MMR vaccine had caused autism in the children of their clients, and had tried to patent a purported alternative to the standard MMR vaccine. In 2010 ***Lancet*** retracted Wakefield's study, and in the same year his medical license was revoked. A study covering 95,000 children and published in the ***Journal of the American Medical Association*** in 2015 confirmed once again that there is no correlation between vaccination and autism.

However, this well-documented history of fraud and deception didn't halt the dissemination of

Wakefield's views by the mass media and the Internet. Lionized as a founder and leader for the anti-vaccination movement, Wakefield continues today to assert that vaccination is a cause of autism. A charismatic speaker who travels the world, he played a significant role in the vaccination debate in California, as we note below.

The Battle of Images

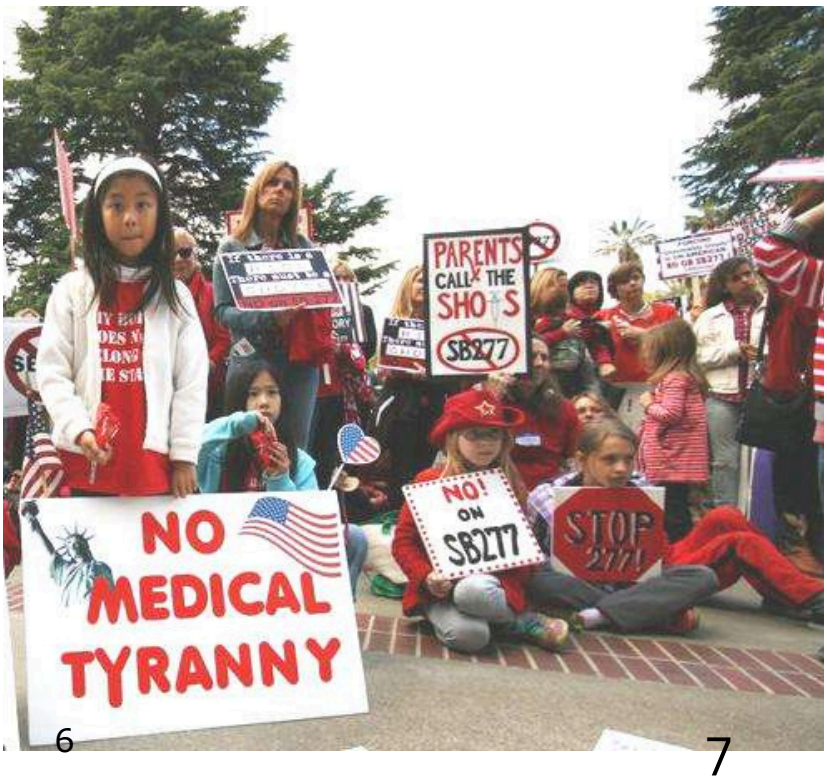
The anti-vaccination campaign in California used vivid imagery and tragic personal stories to fuel fear about the safety of vaccination and to warn about loss of parental authority.

Times Square Billboard
NVIC.org is an anti-vaccination website.
Credit: Business Wire

Vaccination critics invoked the fantasy
of a monstrously coercive state.
Credit: David Dees

The attention of the mass media was captured by the campaign's eye-catching videos, photographs, buttons, marches and rallies. Andrew Wakefield came to California and became a spokesman for the anti-vaccination movement, reaffirming his claim about a vaccination-autism link and also encouraging resistance to vaccination: "Your rights are being ripped from you. Parents are no longer going to be in charge of their own children. This is the fight that has to be taken to Sacramento."

Credit: Pauline Bartolone
Capital Public Radio



In response to this effort to discredit vaccination, public health advocates created visual representations that linked high vaccination levels to health. When parents opposed to SB 277 came to Sacramento with their children, casting an image of themselves as families concerned for their children's welfare, pro-vaccination mothers and fathers also brought their children to Sacramento, affording equally persuasive photo-ops.

For example, one of the sponsors for SB 277, Dr. Richard Pan, who is a pediatrician and professor at the UC Davis Children's Hospital, was often photographed during the campaign in the company of healthy children, establishing a visual link between the proposed vaccination legislation and children's health and safety.

Senator Richard Pan, accompanied by pro-vaccination families, supports SB 277 at a press conference. ***Credit: Office of Richard Pan***

Countering the opposition's presentation of heart-wrenching personal stories in which vaccination was followed by severe illness, pro-vaccination advocates presented equally compelling anecdotes about children who fell seriously ill, or who were especially vulnerable to falling ill, from diseases that vaccination protects against. In this contest of narratives, the mass media focused their attention on two boys, Otto Coleman and Rhett Krawitt, who personified the arguments made by the opposing sides. Otto, beset by transverse myelitis following vaccination, carried the banner for the view that vaccination is dangerous. Rhett, in remission from leukemia and very susceptible to contagious diseases that vaccination prevents, represented the view that vaccination is essential to public health.

Otto Coleman,age6,preparestodelivera stack ofpetitionswiththousandsofanti-SB 277 signaturestoGovernorBrown.His father attributesOtto'sparalysistoaroundof vaccinationsandbelievesthat"Vaccineinjury is indeedreal,itisnotrare,andparentswant to be theonestochoosewhatriskstotake with theirownchildren."
Credit:Jeff Gros

LeukemiasurvivorRhettKrawitt,age7, is on his way toGovernorBrown'sofficewherehewill deliver a boxofpetitionswiththousandsofpro-SB 277 signatures.Hisparentsbelievethatthehealth of childrenlikeRhett,withcompromisedimmune systems,willbeendangeredbyunvaccinated schoolmates.MarinCounty,whereRhett lives, has the highestrateofpersonalbeliefexemptions in California.***Credit:Marc Levine***

Thesetwoboysandtheirfamiliesbecameinspiringsymbolsforthepro-andanti-vaccination causes.Theparentsineachfamilywereearnestandwell-spoken,andthemassmediaconveyed theirheart-rendingstoriestothepublicthroughcompellingimagesandvideosaswellas words. OttoColeman'sfatherJoshuaisavideographer,andrecordingshemadeabouthisson's illness werepostedtoYouTube.AvideosegmentofthefatherandsonappearingbeforeaCalifornia SenateHealthCommitteehearingonvaccinationwasalsowidelyviewedontheInternet. On the otherside,NPRproducedashortfilmaboutRhettKrawittinwhichhisparents,Jodiand Carl, explainthattheirimmune-compromisedsoncannotbevaccinatedandthereforedepends on herd immunityintheschooland communitywherethe familylives.

Anecdotal evidence thus played a major role in advancing both the pro-vaccination and anti-vaccination causes. Within the anti-vaccination movement, personal histories of vaccine injury

became especially important. Even though vaccination has severe negative consequences only very rarely (the probability of a serious reaction to the measles vaccine, for example, is less than one in a million), a single personal story about those consequences, movingly recounted by a parent, may lead another parent to worry that vaccination will affect his or her child very negatively too. We human beings are designed to respond more strongly to a gripping story than to a reassuring but abstract statistic; according to evolutionary biologist Stephen Jay Gould, "Humans are storytelling creatures preeminently." Stories have always been with us, statistics only recently.

The vaccination debate sometimes devolved into a contest of narratives, with each side seeking to paint the more frightening scenarios. One reason that the anti-vaccination movement has continued to associate autism with vaccination, long after it has been proven that there is no causal link between the two, is that autism is a more permanent and disabling disease than, for example, typical cases of measles (which most young families today have never even encountered). And since the causes of autism are currently not well understood by medical science, many parents of affected children have seized upon the idea that autism is caused by vaccination, despite the lack of evidence for this link.

The Battle of Words

Each side in the vaccination debate enlisted catchwords and slogans in its effort to convince legislators and the public. The most emotionally powerful words in the anti-vaccination lexicon were "vaccine-injured child." The association of a vaccine with a debilitating injury, repeated again and again by those testifying at the 2015 vaccination hearings in Sacramento, embedded in the minds of susceptible listeners the suspicion of a causal link between vaccination and injury. So although there is no scientific evidence for a link between vaccination and autism, its continued mention fixes it in the imagination. Even when such a link is explicitly ***denied***, that very denial may, paradoxically, arouse or deepen belief in its existence. If the word "vaccine" and the word "autism" are spoken in the same sentence enough times, as in "There is no evidence for a causal link between vaccination and autism," a listener cannot help but entertain the idea that there might in fact be such an association.

The most stirring anti-SB 277 testimony at the hearings in Sacramento was given by parents who, unmoved by the scientific evidence presented by vaccination advocates, told a story about a son or daughter whom they said had been severely harmed by vaccination. Profoundly anguished, these parents have a powerful psychological motivation to believe that the association between their child's illness and the vaccinations he or she has received is a causal one. Attributing a child's autism, for example, to a recent vaccination is apt to be experienced as more satisfying than linking it instead to an "inborn predisposition," which seems vague and intangible. And there are many vaccine-skeptical websites and organizations that will validate that attribution and find "scientific studies" that support it.

Credit: National Vaccine Information Center

It's true that autism is typically diagnosed not long after the age when babies receive their MMR vaccination. But that sequence of events provides scant evidence that vaccination ***causes*** autism. From the fact that event X (vaccination) is followed by event Y (illness), it does not follow that X must have caused Y. The claim of such a causal link, without further evidence, is an example of the "post-hoc, ergo propter hoc" fallacy.

It is well known that there are rare instances in which a vaccination does trigger severe medical symptoms that go beyond the pain of an injection or a sore arm. A vaccination may cause a temporary fever in a child that can activate a pre-existing medical condition such as epilepsy. But this can happen following just about any medical procedure. A child who undergoes a routine eye exam or dental appointment, for example, may have an epileptic seizure thereafter. But such a rare consequence does not establish that these procedures ***cause*** epilepsy -- and does not lead anyone to stop recommending them.

The current best practices standard for vaccination is to screen children for illnesses such as epilepsy or an immunodeficiency, and then exempt from vaccination children who are in fact at risk. To be sure, this standard does not work 100% of the time. But as Wendy Bloom, a pediatric nurse at Children's Hospital Oakland Research Institute, has commented, "No medication can or ever will be 100% safe …. Let us keep our eyes on the goal of protecting our community from very preventable diseases and not be swayed by fear mongering." Advocates for SB 277 pointed out that when immunization levels fall, the toll of suffering and death is far greater than that resulting from rare adverse reactions to immunization. The best way to minimize these adverse reactions is to fund research to better understand these diseases, including their relation to the immune system, not to lower vaccination rates.

Another salvo in the war of words was the vaccination critics' claim that mandatory vaccination

violates parent's "freedom" to raise their children as they choose and to protect them against the alleged "risk" of vaccination. Vaccination advocates made use of these words too, but reversed their implications. Senator and pediatrician Richard Pan, a professor at the UC Davis Children's Hospital, stated that "SB 277 is about freedom, freedom from deadly, crippling contagions that are now preventable through the science of vaccination." Assembly member Lorena Gonzalez, a co-author of SB 277, argued that concern about "risk" favors mandatory vaccination: "While I respect that fundamental right to make medical decisions for your own family, when a parent's decision to ignore science and medical fact puts other children at risk, we can't as a state condone it."

Gonzalez was challenging the idea that people have the absolute right to make any medical choice they wish for themselves and their families, without having to consider the consequences of that choice for others. When memory of the suffering due to previously prevalent infectious diseases fades, a narrow risk-benefit calculation may disincline families from vaccinating their own children. SB 277 advocates argued that such calculation is socially irresponsible. Families that do not vaccinate are "free riders" who benefit from herd immunity without contributing to it. Abstention leads to the proverbial "tragedy of the commons," whereby a shared good is sacrificed to the perceived self-interest of a few.

Another catchphrase used by the opposition to discredit vaccination, "Big Pharma," seeks to attribute advocacy of vaccination to the unfettered pursuit of profit by pharmaceutical companies without regard to the health and safety of consumers. It's true that commercial interests do often shape public policy to benefit themselves. The pharmaceutical industry often resists government regulation of the safety and the cost of its products, and wariness about the influence of that industry is therefore justified. Even inside a scientific laboratory, the search for truth may be compromised by allegiance to an external interest—a corporate funding source that is paying for the clinical trials of a new drug, for example; the rules that govern clinical testing aren't always sufficient to exclude bias of this kind. Public health advocates needn't deny the fact that the pursuit of economic gain can sometimes undermine scientific objectivity.

However, a profit-seeking motivation does not invalidate ***all*** the practices and policies of the pharmaceutical industry. Yes, there should be stricter regulation of that industry, but a too sweeping condemnation fails to recognize the unmistakable advances in human health that privately funded medical research, development, and manufacture of medications have helped to achieve. Pharmaceutical research has enabled the production of effective treatments for many severe human illnesses, including cardiovascular disorders, diabetes, hypertension, HIV/AIDS, chronic pain, and some types of cancer.

In any case, "Big Pharma" was demonstrably not the driving force behind the mandatory vaccination campaign in California. The pharmaceutical industry derives relatively little profit from vaccine sales in the U.S. and has little interest in making the vaccination of schoolchildren mandatory. Less vaccination and more infectious disease might actually be in the financial interest of companies whose drugs treat disease. And while it is true that the pharmaceutical industry has contributed to the electoral campaigns of some California lawmakers, there is no evidence that this support induced them to advocate mandatory vaccination. On the contrary, the campaign for SB 277 began when parents, worried that their children could catch diseases from unvaccinated

children, contacted legislators and urged them take action on this issue. There is no reason to believe that the public health advocates, health care providers, parents and other activists who worked so hard to pass SB 277 were motivated by money rather than conviction.

Whither Democracy?

While new media technologies can advance the aim of democratic deliberation and decision making, they lend themselves as readily to the generation of misinformation and the manipulation of public opinion. The gathering of views under a Twitter hashtag, for example, enables political advocacy, but sometimes stifles deliberation and shuts out dissenting voices. Digital technologies make it easy to hear only a single point of view and tune out anything else.

The wish, shared by vaccination advocates and critics alike, to band together with others to participate in democratic decision-making is an honorable and valid one. But democracy works well only if the participants are well-informed, which requires the capacity to distinguish trustworthy from non-trustworthy sources of information. Those of us who believe in grassroots democracy thus face a challenge: what processes of public deliberation and decision-making will best enable citizens to evaluate political issues whose understanding requires a high level of scientific/technical expertise?

In California, lengthy hearings on the vaccination issue were held in both the Senate and Assembly, in an effort to base policy formation on a thoughtful public discussion. In that discussion, vaccination advocates presented the nearly universal scientific consensus that vaccination is essential to public health and is safe. But as we know from the debate about climate change, for example, an existing scientific consensus can be contested quite effectively by a well-organized, fervent opposition. Still, pro-vaccination and anti-vaccination advocates did listen to and learn from one another, and the proposed legislation was amended to address some of the concerns raised by the vaccination critics. Dialogue of this kind does have the potential to modify people's opinions and to shape policy outcomes. Upon that potential, the future of democracy depends.

About the Authors

Raymond Barglow majored in physics at Cal Tech and received a Ph.D. in philosophy at UC Berkeley. He has taught at UC Berkeley and Trinity College and writes on science, ethics, and cultural issues. He is interested in the history and prospects of participatory democracy in the United States and abroad.

Margret Schaefer received a Ph.D. in English at UC Berkeley, and has taught at UC Berkeley, San Francisco State, and the University of Illinois at Chicago. She is a cultural and literary critic, journalist, and translator, and has written on issues in psychology and medical history as well as on Oscar Wilde, Kleist, Kafka, and Arthur Schnitzler. Recently she translated and published three volumes of Schnitzler's fiction and two of his plays, which were produced in New York and in Berkeley.