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Challenges to generating evidence-informed policy and the role of systematic reviews and (perceived) conflicts of interest

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Abstract

Background: Multiple efforts to generate evidence-informed policy have attempted to teach policymakers how to understand and apply scientific research findings in their decision-making. These efforts have had limited success, because policymakers generally do not understand scientific methods.

Objective: We piloted efforts to teach policy intermediaries – specifically consumer advocacy groups – how to understand and apply health research, anticipating that they might offer such evidence to policymakers in more accessible forms.

Design: Four workshops focusing on research design and methods were conducted with consumer advocacy groups in 2010. We coded and analyzed participant responses regarding their confidence in interpreting research findings and assessments of research credibility, and the extent to which their knowledge about research findings changed after completing the workshops.

Results: Our findings suggest that although participants expressed strong interest in understanding scientific research, their ability to develop confidence about scientific research methods was limited. However, like policymakers, consumer advocacy group members intuited that financial conflicts of interest could compromise scientific findings, although they initially underestimated their effects on research results. After training, consumer advocates also saw the value of using systematic reviews rather than individual studies.

Discussion and Conclusions: Our findings suggest that although advocates may not feel confident in their understanding of scientific research, they found it easier to understand the value of systematic reviews and the risks of conflicts of interest than other statistical concepts and terminology. Focusing on making these types of information

available may offer a useful way for policymakers and consumer advocates to interpret the validity of policy-relevant scientific research.

Keywords: Policy, Conflict of interest, Consumer advocacy, Evidence-based practice, Tobacco

Background

Efforts to translate scientific knowledge to policy-making are not well-developed, and have had limited success.¹⁻⁵ To date they have most often relied on communication strategies more appropriate to scientific discourse than political constraints.^{6,7} However, policymakers rely on personal communication with intermediaries rather than written reports,^{8,9} demand customized information,¹⁰⁻¹² and will rarely report the use of research findings in their decisions.¹³ Political actors are generalists with limited engagement with research,^{14,15} more interested in questions of presenter credibility than in research methodology.^{7,11} As a result, rules about how evidence is presented can be more influential than the content of evidence itself,^{6,16} and multiple studies suggest that some kinds of communication, including publicizing the results of systematic reviews rather than of single studies, are more effective than others.^{10,17,18}

Policy researchers report that scientists often approach the policymaking process with the expectation that clinical findings should override competing political concerns.^{1,2} However policymakers do not view evidence alone as justification for systemic interventions.^{12,16} Some proposed interventions appear to be evidence-proof, in that policymaker positions are extremely resistant to change; these

have included abortion laws, regulations to address climate change, Ebola quarantines, and nutrition guidelines.^{3,19–23} In the United States, for years policymakers allowed vaccine exemptions based on ‘personal beliefs’ despite the potential health consequences.²⁴ In 2015, in the wake of a measles outbreak at Disneyland, there have been new efforts to roll back such exemptions.^{24–26} In situations such as these and more generally, although policymakers see scientific evidence as having a more limited role in decision making than clinical researchers do, they are increasingly interested in enacting evidence-informed health policy.^{2,3,8,11,12,27}

Efforts to encourage research translation have traditionally focused on attempting to teach policymakers how to understand research, but these efforts have had limited impact. Multiple training workshops have been developed to explain the hierarchy of evidence to policymakers, with no apparent effect on behavior.^{1–5,12,13,16} Recent research suggests why this strategy may be misguided. A recent study of policymakers’ use of evidence in making health policy decisions explained some of the difficulties inherent in educating policymakers into behavior change.¹⁴ Even legislators and administrators who had self-selected into an intensive program to learn about research evidence, who believed that evidence was increasingly important in making health policy decisions, did not wish to engage with the details of research. Policymakers instead reported that they did not know where to find information and often relied on intermediaries, particularly advocacy groups.

In addition, the reliance on friends, family, and consumer advocacy groups was tempered by understanding that evidence could be biased by economic interests. Drug and device studies conducted by manufacturers, for example, show more favorable results than those conducted by other funders.²⁸ Unlike questions of research design and quality of evidence, policymakers reported that issues of credibility and bias were immediately comprehensible to their colleagues, even those with little interest in understanding research design themselves. In this context, we define conflicts of interest as the influence of funding and investigator financial ties on research.

Research on governmental decision making routinely reveals that consumer advocacy groups provide various kinds of information to policymakers.^{15,29,30} One of the most critical types of information provided by interest groups to legislators and executives is evidence about the extent to which citizens in their districts support or oppose policy changes.^{16,31–35} Researchers studying the role of

interest groups in policymaking also report that establishing the ability to provide policy-relevant information and maintaining a reputation for accuracy are the most important assets that groups can possess.^{16,33,36,37} Advocacy groups specifically seek to become providers of specialized technical information,^{33,37–42} and when they do so successfully, become entrenched as ‘information service bureaus’ for policymakers that serve as an extension of governmental research staff; a familiarity with scientific research improves their credibility.^{31,39,41,43–46} In many cases, the distribution of workload within legislatures means that advocacy groups have little choice about which legislators to work with if they wish to be effective⁴⁷; this concentration of power demands that advocacy groups make an effort to appear credible to policymakers they might not otherwise choose to address. As a result, advocacy groups, particularly those who do not appear to have conflicts of interest, operate as critical conduits for information regarding the effects of proposed public health interventions to policymakers.

The means by which these groups gather the information they communicate to policymakers are poorly understood, particularly with respect to scientific and health findings. Some studies suggest that advocacy groups can provide biased information, whether intentionally or inadvertently.^{34,48–52} Nonetheless, some recent efforts to introduce evidence-based training to these groups have shown that advocacy groups are receptive to training in how to critically appraise research evidence.⁵³

Data and methods

In this study, we discuss the results from workshops intended to identify and improve the research resources used by consumer advocacy groups. Given that these intermediaries provide the information policymakers use to make decisions, we investigated whether training could help them understand and communicate scientific research findings. This effort seemed particularly promising given that preliminary evidence suggests that consumer advocates, unlike policymakers, are interested in such training.^{53–56}

Our educational intervention consisted of a training workshop offered to members of four consumer advocacy groups in 2010. These workshops consisted of didactic and participatory modules, and ranged in length from three to seven hours.⁵⁷ Participant groups chose the topic area, and the workshops were organized around explaining

different steps in the research process, including framing of a research question, methods, publication, and dissemination.⁵⁷ In total, these workshops enrolled 99 attendees; two workshops were offered in partnership with a large advocacy organization for retired workers and the other two were issue-oriented consumer advocacy groups focusing on breast cancer and disability. Participants consisted of members of senior and community groups, retired workers, patients, consumers, parents of disabled children, staff, and interns. Two-thirds of the participants reported having a college degree, however over half of participants reported having no prior research training.

Workshops were developed using community engagement strategies that suggested the value of a one-day learning session focused on critical appraisal of scientific research, and teaching strategies were drawn from prior research done with similar groups.^{58,59} Participants were surveyed using clickers on the day of the workshops about their knowledge of research before and after each topic covered, and completed short online evaluations and knowledge tests (10–20 minutes) immediately after the workshops. Details of the workshop planning, organization, and conduct are provided in prior research reports.^{57,60} Final results were analyzed by three members of the research team using Excel and Stata. The research was certified as exempt by the institutional review board of the University of California, San Francisco (#10-02507).

The questions asked of participants in the workshops covered a range of topics, including participants past experience with research and specifics relevant to the review of individual studies presented in each workshop. As our interest was in confidence and skills acquired with respect to appraisal, our research focuses on a subset of questions that address respondents' confidence with scientific research before and after each workshop, as well as specific assessments of knowledge about particular research designs. These include answers to questions assessing participants understanding of research findings, including, for example, which of two hypothetical drugs would provide the greatest reduction in the risk of death, relative and absolute risk reduction, the extent to which conflict of interest can influence research outcomes, and the validity of systematic reviews relative to individual studies.

Results

Our findings from these workshops suggest that an evidence-based training program increased

participant confidence in their ability to understand and communicate research. However these gains in knowledge were not uniform, as shown in Table 1.

The workshops seemed particularly successful in communicating the value of systematic reviews. Previous studies have suggested that scientific researchers should emphasize evidence summaries like systematic reviews and meta-analyses, if they are available, rather than reporting the results of individual studies. Although less than half of participants in the workshops (41%) felt that systematic reviews were usually more reliable than individual studies before the workshops, 91% believed that systematic reviews were more reliable after training. Our findings suggest that the value of systematic reviews is relatively easy to communicate.

When asked about identifying ways that bias could affect the results of studies, although less than half of participants felt confident or very confident before the workshop (44%), an overwhelming majority of participants, 74%, felt they understood bias after the workshop.

Confidence did not increase uniformly. Overall, participants felt little to moderate confidence in their ability to understand scientific research before participating in the educational intervention. Only 35% of participants felt confident or very confident that they could understand the results of a scientific study before the workshop; although confidence increased to 45% after the workshop, over half of participants remained uncertain.

These findings were consistent with independent validations of participants' knowledge. In addition to asking about confidence in understanding studies, workshop participants were also asked to interpret research studies they had read, including calculating percentages of studies showing harm from industry-sponsored studies versus non-industry sponsored studies (tobacco and pharmaceutical study examples, defining statistical significance, and identifying the difference between a risk ratio and an odds ratio (see Table 1). Participants not only felt more confident about identifying the risk of bias, they were significantly more likely to correctly calculate the extent of bias. By contrast, even after training, less than half of consumer advocates felt comfortable with research methods, remaining unable to identify absolute versus relative risk reduction, the definition of a randomized controlled trial or cohort study, or the difference between a risk ratio and an odds ratio. And although more participants could correctly identify statistical significance after the workshops than before (43% increased to 56%), the difference in their knowledge was not itself significant.

Table 1 Knowledge among consumer advocates of the value of systematic reviews and the risks of bias increased after evidence training

	Before training (%)	After training (%)	(Percentage-change)
Systematic reviews usually provide stronger evidence than individual studies do (5-point Likert scale, includes 'strongly agree' and 'somewhat agree')	41	91	(124%)
87% of the studies that are NOT funded by the tobacco industry show that second hand smoke is harmful. What percentage of studies that ARE funded by the tobacco industry show that second hand smoke is harmful? (percentage answering correctly, multiple choice)	41	76	(85%)
How confident are you that you can identify several ways that bias can affect the results of a study (5-point Likert scale, includes 'confident' and 'very confident')	44	74	(68%)
Independent research found that studies funded by pharmaceutical companies were about ___ times more likely to conclude that their drug was better than a competitor's drug. (percentage answering correctly, multiple choice)	32	57	(78%)
If a study's results are STATISTICALLY SIGNIFICANT, they ... (percentage answering correctly, multiple choice)	43	56	(30%)
How confident are you that you can understand the results of a scientific study? (5-point Likert scale, includes 'confident' and 'very confident')	35	45	(29%)
How confident are you that you can explain the term COHORT STUDY to someone else? (5-point Likert scale, includes 'confident' and 'very confident')	18	45	(150%)
How confident are you that you can explain the term RANDOMIZED CONTROLLED TRIAL to someone else? (5-point Likert scale, includes 'confident' and 'very confident')	29	44	(52%)
How confident are you that you can explain the term ABSOLUTE RISK REDUCTION to someone else? (5-point Likert scale, includes 'confident' and 'very confident')	10	37	(270%)
How confident are you that you can explain the term RELATIVE RISK REDUCTION to someone else? (5-point Likert scale, includes 'confident' and 'very confident')	12	32	(167%)
RISK RATIO and ODDS RATIO ... (percentage answering correctly, multiple choice)	17	30	(76%)

Discussion and conclusions

Consistent with research on policymakers,⁸⁻¹³ our findings suggest caution about attempting to train consumer advocates to understand and use scientific evidence. Such educational interventions have been popular for policymakers, but evidence on their effectiveness is mixed. One study found that one to three years after training, policymakers found it of little value, with the exception of their continuing interest in conflicts of interest.¹⁴ Our assessment of the knowledge gained by consumer advocates is consistent with these findings. By both self-assessment and objective measures, consumer advocates were far more comfortable interpreting the extent of bias created by conflicts of interest than they were in determining the quality of studies.

The bias in research generated by perceived conflicts of interest was evident to participants once explained, and they were able to apply it interpreting other kinds of research. Similarly, the idea that combining multiple studies is more reliable than relying on a single study was easy to understand even for those without extensive training in the conduct of research. Although understanding other statistical concepts is important for interpreting research, developing this expertise may require longer-term interventions.

Although this research is preliminary and based on a limited sample, our findings suggest that it may not be possible to train consumer advocates to understand research design, despite their expressed interest in scientific research. As policymakers noted in a previous study, people who are attracted to research get

'Masters and Ph.D.s' while those involved in policy tend to think that 'evidence is boring.'¹⁴ The continuing efforts to communicate an understanding of scientific research to people who may be uninterested reflect the habits of researchers and educators rather than the perceived needs of advocates and policy-makers. However, consumer advocates express consistent interest in using scientific evidence in their work, although this study is limited in that we were unable to determine if advocates actually changed their communications to policymakers. Nonetheless, our research suggests that they have a better understanding of research. Historically in the United States, federal and state governments recruited staff members with research training to help interpret scientific research; these positions have been cut in recent years, but training consumer advocates them could provide a partial replacement through their new expertise.

Our research suggests recommendations that further hone those developed in prior research on the role of evidence in policymaking.⁸⁻¹⁴ Researchers may find it most effective to focus on easily-understandable concerns about scientific evidence when addressing advocacy groups and policy-makers, which will help them make sense of competing research findings and identify potential conflicts of interest. While existing research suggests the value of personal communications and targeted recommendations in communicating evidence, our results suggest that these strategies may be even more effective if discussions with advocacy groups and policy-makers specifically emphasize the value of systematic reviews and the problems inherent in research when funders support research in the hope or expectation that it will lead to a desired conclusion.

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Conflicts of interest No conflicts of interest have been declared.

Ethics approval Ethical approval was not required. The research was certified as exempt by the institutional review board of the University of California, San Francisco.

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