Lawmakers' Use of Evidence in Making Reproductive and Maternal Health Policy in U.S. States

By

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ABSTRACT

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Background

Health practitioners, researchers, and advocates alike call for policies that influence health outcomes to be grounded in the best possible evidence. However, political scientists assert that evidence is only one of many important drivers of policy; political considerations, habit, anecdotes, stereotypes, and "gut instincts" may be equally or even more important to policymakers. This research explores the question of how policymakers use scientific evidence in making state-level policy decisions on two contested maternal and reproductive health issues in the U.S.: abortion, and the use of alcohol during pregnancy. Both these issues are current dynamic policy issues at the state level, affecting important aspects of maternal and reproductive health, with large numbers of restrictive or punitive state laws being passed in apparent contravention of current evidence. The aim of the work is to shed light on why state policies in these areas do not appear to reflect current best evidence on these issues, and explore implications for reproductive and maternal health practitioners and researchers.

Methods

Data for the study are drawn from semi-structured interviews with 29 state lawmakers and their aides in Maryland, North Carolina, and Virginia. These neighboring states share

many socio-political similarities yet have different mixes of policies on the two health areas of interest. Participants were recruited from the primary health-related committees of the General Assembly in all three states, as well as from among sponsors and co-sponsors of 2017 bills on abortion or substance use in pregnancy, and members of committees that voted on 2017 bills on abortion or substance use in pregnancy. Interviews were conducted between March and July 2017. Interviews were audio-recorded, transcribed, and uploaded into Dedoose, qualitative data analysis software, for coding and analysis by inductive and deductive methods.

Findings

Papers One and Two present findings from the inductive analysis regarding use of evidence in abortion policy (Paper One) and substance use in pregnancy policy (Paper Two). We find that evidence does not instrumentally shape state legislators' views on these issues. Legislators appear to trust anecdotes more than evidence; they feel that the knowledge they get from specific personal anecdotes is more "real" than scientific evidence. We find that despite evidence pointing to the harms of alcohol use in pregnancy, most lawmakers were not concerned about this topic; instead they prioritize the issue of opioid use in pregnancy over that of alcohol in pregnancy. However, evidence does appear to inform legislators' high-level understanding of some issues, particularly regarding the safety of abortion.

Paper Three presents the results of a deductive analysis, applying a conceptual framework on policy use of evidence from political science literature to data from the current study. This paper reinforces prior political science literature that state lawmakers may use evidence more to substantiate and support existing policy preferences than for any other use, even "citing" "evidence" that doesn't actually exist. However, legislators widely refer to and use evidence symbolically in a way that may help reinforce the value of evidence in policy deliberations.

Conclusions

While our study finds that evidence does not directly inform policy decisions, we also find that evidence plays an important role in policy making. Even if it is not instrumental to decision making, research is still important to motivate, inform, and even provide persuasive "ammunition" to those lawmakers who are predisposed to support a given position. This work has important implications for the fields of reproductive and maternal health. If practitioners and researchers grapple with the political reality of use of evidence, this may help them target their research dissemination efforts more strategically and effectively. Such a pragmatic approach to policy use of evidence may provide the best hope for good research to be applied in improving reproductive and maternal health.

DEDICATION

This study shines a spotlight on state legislators. But the work is dedicated, with respect, to the millions of people in the shadows, whose reproductive lives are forever shaped by the decisions those legislators make.

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ACKNOWLEDGMENTS

This study almost didn't happen. In the planning and fundraising stage, a number of my advisors and reviewers were doubtful that I could actually get busy state lawmakers to sit down for an interview with a graduate student. Their concerns gave me many anxious nights, and I almost gave up on the project. So I must start out my acknowledgments with boundless gratitude to every legislator and staffer who agreed to talk to me. These respondents were indeed overwhelmingly busy, yet representatives from both sides of the aisle gave their time and ideas generously to this effort. I deeply appreciated their willingness as well as their candor.

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Guess what, babe: I finished it.

INTRODUCTION

"Overall, research findings have not had as much influence on legislative or bureaucratic policy decisions as social scientists originally expected. Scholars in the mid-1970s, when empirical study of the situation got under way, were perplexed and disappointed… They thought of decision making as a rational enterprise and expected information to have direct influence. Many of them believed the old adage that knowledge is power, not realizing that in politics, it is more apt to work the other way: power is knowledge – or at least gives access and control over knowledge."

- Carol Weiss, *Social Sciences and Modern States*, 1991

"I can't believe I'm protesting for reality."

–- Sign spotted at the March for Science, Washington D.C., April 22 2017

These days, the United States can be a troubling place for those who want to see health policy based in solid scientific evidence. From Donald Trump calling global warming "a big scam" (Kormann 2016), to his administration ignoring evidence in order to overturn Obamacare's contraception coverage requirements (Alonso-Zaldivar 2017), to the FDA limiting the types of evidence that can be considered when setting food safety policy (Davenport 2018), the federal government appears to be marginalizing the role of science in shaping health policy.

However, this trend is not new, nor is it limited to the federal government. Starting in 2011, a surge of state-level abortion restrictions began to erode practical access to abortion care in states across the country (Boonstra and Nash 2014). In news coverage, proponents of these bills claimed that amendments to abortion facilities and restrictions on providers were needed in order to protect women from the alleged dangers and harms of abortion (Dannenfelser 2016). However, these claims were not backed by evidence. Abortion is one of the safest medical procedures available; only 0.3% of abortion patients experience a complication that requires hospitalization. In fact, abortion is 14 times safer than childbirth (Raymond and Grimes 2012) (which is, notably, the only other option for a pregnant woman).

Concern over these restrictive policies based in spurious health claims is shared by many in reproductive health. Advocates and researchers alike point to the vital role of public health in translating and conveying accurate research findings to the public and policy-

makers, especially in contested areas like reproductive health. Much policy-relevant research is conducted in the field, with an implicit assumption that policymakers will be a ready and receptive audience for that research, and that the research will make a difference in policy outcomes.

However, this assumption may not be correct. Cognitive science literature finds that when facts conflict with people's core values, people tend to discard the facts, not their beliefs (Kahan 2013). In fact, some research shows that countering ideologically-motivated perspectives with authoritative facts may actually serve to solidify those inaccurate views (Bedford 2014). Further, political science literature consistently finds that evidence is only one of many factors that influence policy. Beliefs, personal values, political considerations, stories, and other factors may be equally or even more influential in policy decisions (Stone 2001, Prewitt, Schwandt, and Straf 2012). In controversial issue areas, policymakers often appear to use evidence symbolically, to substantiate for predetermined policy preferences, rather than instrumentally, to inform their understanding of problems and policy solutions (Boswell 2009). These findings from political science and cognitive psychology, however, do not seem to reshape the commitment in public health to generating and disseminating policy-relevant research.

In the area of reproductive health, the issue of policy use of evidence is more than a theoretical question. Millions of people's reproductive lives are shaped by policies that are being passed on scant evidence or even in contravention of scientific and medical consensus (Gold and Nash 2017). This dissertation explores this issue with regards to abortion policy, but we also sought a comparison case study, in case the ways evidence was or was not used in a very partisan issue like abortion policy might not apply to other health issue areas.

State policies related to alcohol use in pregnancy provided a compelling comparison case for this topic. It is known that prenatal exposure to alcohol, especially heavier alcohol use in pregnancy, can be associated with a range of permanent physical birth defects and neurodevelopmental disorders in the fetus; these disorders have been come to be known collectively as Fetal Alcohol Spectrum Disorders (FASD). (C.M. O'Leary et al. 2010, Williams and Smith 2015). The current prevalence of some form of FASD among school children in the U.S. is estimated to be as high as 2%-5% (May et al. 2009, May et al. 2018). In recent years, U.S. states have passed an increasing number of laws aimed at addressing alcohol use during pregnancy (Drabble et al. 2014). Despite the fact that there has been insufficient research on whether policies targeting alcohol use in pregnancy reduce harms, states continue to implement such laws (Sarah C. M. Roberts et al. 2017). The extent to which evidence influences policy decision-making on alcohol use in pregnancy is unclear.

These two reproductive and maternal health issues – abortion and alcohol use in pregnancy – share some important and exciting elements. Both are current dynamic policy issues at the state level, and reflect some of the most heated social and moral controversies in American culture. Both issues involve judgments about what makes a "good mother;" both include attempts to control women's behavior, potentially infringing on women's bodily autonomy to some degree. They both involve important issues around the rights of the pregnant person versus those of the fetus; indeed, conservative social movements driving punitive responses to use of alcohol during pregnancy may be motivated by a desire to expand acceptance of fetal "personhood" (Linder 2005).

However, despite these similarities, there are important differences, notably in the different bodies of evidence on the two issues. As noted previously, there is wide consensus that legal abortion is safe, while there is less consensus in the mainstream scientific community on how to interpret the data on the risks associated with different levels of alcohol use during pregnancy. This has significant implications for the role of evidence in shaping policy on these two issues, and thus it is reasonable to expect that lawmakers' perspectives on the use of evidence may be quite different between the two issues.

This study explores questions of evidence use in policy decision making through in-depth interviews with state legislators in states with a mix of policies on these two health issue areas. I conducted interviews with state legislators and aides in Maryland, North Carolina, and Virginia between March and July 2017. Semi-structured interviews have the benefit of allowing exploration of the respondent's unique perspectives and views, with the flexibility necessary to adjust on the spot, while generating abundant quantities of rich qualitative data (Rubin and Rubin 2011).

The key research questions for the study were:

- What role does scientific evidence play in shaping U.S. state-level policy on these two contested reproductive and maternal health issues?

- How do state lawmakers and their aides assess the credibility of evidence?

- How do state lawmakers manage the potentially competing demands of evidence and politics when making policy decisions on these two issues?

- What factors are associated with use of evidence in policy decision-making? In particular, how does lawmakers' use of evidence vary with their political party (Democrat, Republican, or other), their political orientation (moderate, conservative, liberal, etc.), the level of analytical sophistication

of their staff, whether their party is the dominant party in their state legislature or not, and their gender?

- What is the role of issue controversy in making legislators more or less receptive to evidence on these issues? Is this different for abortion vs. alcohol use in pregnancy?

Three papers explore these questions in different ways. Papers One and Two present inductive analyses of the data – exploring themes that emerged from the data, including several findings that were completely unexpected in advance. Paper One focuses on how respondents in our study appear to use evidence in making abortion policy decisions. This paper finds that evidence does not instrumentally shape state legislators' views on abortion policy. Legislators appear to trust anecdotes more than evidence; they feel that the knowledge they get from specific personal anecdotes is more "real" than scientific evidence. However, evidence does appear to inform legislators' high-level understanding of the issue, particularly regarding the safety of abortion. This study suggests that evidence is rarely used in an instrumental way to shape state-level abortion policy; rather, legislators use selected evidence to substantiate preferred policy positions on abortion.

Paper Two explores policymaking on substance use in pregnancy policy. (I began this study intending to explore alcohol use in pregnancy in particular, but found that alcohol and drug use were addressed together in many bills, so I expanded my interview guide to reflect this.) This paper finds that despite widely publicized evidence on the harms of alcohol use in pregnancy, most lawmakers in our sample are not concerned about this topic, instead prioritizing the issue of opioid use in pregnancy over that of alcohol in pregnancy. As with abortion policy, personal anecdotes and known contacts are more influential in shaping legislators' views on substance use in pregnancy than evidence is. Lastly, we find that the intermediaries legislators typically rely on to analyze evidence and bring policy solutions to them are not raising the issue of substance use in pregnancy on legislators' agenda; this represents an opportunity to increase policymakers' understanding of these issues.

Paper Three reviews the literature on policy use of evidence to examine what prior research and theory suggests about how we might expect evidence to be used in health policy, including presenting a potentially useful conceptual framework on policy use of evidence. The paper then applies this framework to data from the current study, using deductive analysis to highlight themes, challenges, omissions, and implications for future political science theory and research on use of evidence in health policymaking. This paper reinforces prior political science literature that state lawmakers may use evidence more to substantiate and support existing policy preferences than for any other use, even "citing" "evidence" that doesn't actually exist. However, legislators

widely refer to and use evidence symbolically in a way that may help reinforce the value of evidence in policy deliberation.

This work will be relevant to those concerned about the use of evidence in policymaking on these health issues, and may help contribute to policies that are better supported by high-quality evidence. I had hoped that this work would help researchers and practitioners more successfully translate evidence into reproductive and maternal health policy. Given the findings, it may be that its contribution will instead be to help reproductive and maternal health researchers, practitioners, and advocates develop more realistic expectations for how data plays into the policy development process, and better understand the political and interpersonal factors that truly drive reproductive and maternal health policy.

PAPER ONE
"My good friends on the other side of the aisle aren't bothered by those facts": U.S. state legislators' use of evidence in making policy on abortion

Background

Increasingly, the field of public health emphasizes the importance of basing health policies on the best available evidence (Prewitt, Schwandt, and Straf 2012). Researchers and public health practitioners alike call on political decision-making to be informed by solid science (Otten et al. 2015, Chapman et al. 2014).

A large body of literature explores how scientific evidence has been used in policymaking in the U.S. (Prewitt, Schwandt, and Straf 2012, Contandriopoulos et al. 2010) in a range of policy areas including education (Weiss 1991), immigration (Boswell 2009), environmental policy (Keller 2009), and elder care (Feldman, Nadash, and Gursen 2001). This literature consistently finds that evidence is only one of many factors that influence policy. Beliefs, personal values, political considerations, stories, and other factors come into play as policymakers weigh their options and make decisions (Stone 2001, Prewitt, Schwandt, and Straf 2012). Studies have found that evidence can sometimes play a key role in policy outcomes, if it is presented in a timely, easy-to-use format, and if other barriers to use are addressed (Feldman, Nadash, and Gursen 2001, Oliver et al. 2014, Dodson, Geary, and Brownson 2015). However, especially in controversial issue areas, policymakers often appear to use evidence symbolically to confer legitimacy or provide substantiation for predetermined policy preferences, rather than instrumentally, that is, to understand particular problems and make policy decisions in order to improve policy outcomes (Boswell 2009).

To our knowledge, no study has examined the use of scientific evidence in making abortion policy. This is important because in recent years, many U.S. states have passed large numbers of abortion restrictions (Boonstra and Nash 2014, Nash et al. 2018). These include laws requiring abortion clinics to meet the facility standards of ambulatory surgical centers; mandating that abortion providers have admitting privileges at local hospitals; banning or limiting public and insurance funding for abortion; prohibiting some types of skilled clinicians from providing abortion care; limiting abortion after certain gestational stages; limiting provision of medication abortion, including via telemedicine; mandating parental notification and/or consent for abortions sought by minors; mandating waiting periods of 24-72 hours; mandating counseling content; and requiring ultrasound provision and viewing. Many of these state policies to regulate abortion have been passed with the rationale that such measures

are needed to protect women's health and safety (Siegel 2007, Americans United for Life 2017).

However, evidence does not support these claims; in fact, the scientific consensus is clear on abortion's safety. In a recent comprehensive survey of the published evidence on the safety and quality of abortion care in the U.S., the National Academies of Sciences concluded that legal abortions in the U.S. are safe and effective (National Academies of Sciences 2018). Based on extensive research, the report notes that state abortion restrictions may "limit the number of available providers, misinform women of the risks of the procedures they are considering, overrule women's and clinician's medical decision making, or require medically unnecessary services and delays in care" (National Academies of Sciences 2018). The report concludes that in many states, such abortion restrictions have created barriers to the availability, timeliness, and quality of abortion care. By pushing abortions later in pregnancy, these laws appear to increase risks (Raymond and Grimes 2012) as well as logistical barriers and financial burdens for women seeking to obtain an abortion (S. C. M. Roberts et al. 2015).

The relationship between state abortion laws and scientific evidence was a focus of an important U.S. Supreme Court case in 2016. In its June 2016 ruling in *Whole Woman's Health v. Hellerstedt*, the Supreme Court struck down a set of Texas abortion regulations based in claims of protecting women's health. Justice Breyer wrote, "We have found nothing in Texas' record evidence that shows that…the new law advanced Texas' legitimate interest in protecting women's health." In this case, the Supreme Court set an important precedent: the ruling explicitly requires courts to weigh the benefits and burdens of any contested abortion regulation, and to use credible evidence to do so (Whole Woman's Health v. Hellerstedt 2016). This makes the issue of use of evidence in abortion policy particularly timely.

In short, there is no evidence-based reason for concern about the health effects of abortion, and the Supreme Court agrees that many abortion restrictions are medically unnecessary and pose undue burdens on a woman's right to abortion. Yet state laws that regulate abortion in the name of patient safety continue to be introduced and to pass. This raises questions of whether and how state lawmakers use evidence when making policy decisions on abortion. This study aims to address that question, including how lawmakers assess the credibility of evidence, and how they balance evidence with other factors such as personal stories, values, and political pressures, through a qualitative study of state legislators in three U.S. states.

Methods

In this study, we define "evidence" as defined by the National Research Council's Committee on the Use of Social Science Knowledge in Public Policy: "knowledge based

in science… broadly taken to mean data, information, concepts, research findings, and theories that are generally accepted by the relevant scientific discipline" (Prewitt, Schwandt, and Straf 2012). To investigate how state lawmakers use evidence in making abortion policy, we conducted in-depth semi-structured interviews with state legislators and their aides in Maryland, North Carolina, and Virginia.[1] These three states were chosen because they neighbor each other and share some socio-cultural similarities, yet have a range of different policies on regulation of abortion (see Table 1.1). Semi-structured interviews were our method of choice because their flexible nature allows for richer and more meaningful insights into policy decision-making, including how evidence does or does not play a role(Boaz et al. 2008).

Sample and recruitment: To recruit our sample, we targeted members of the primary health-related committees of the General Assembly in all three states, as well as sponsors and co-sponsors of 2017 bills addressing abortion, and members of committees that considered abortion bills in 2017. We also asked respondents to suggest colleagues who might be interested in discussing this topic with us. We conducted initial outreach via email to 132 legislators. The outreach email described our research as a study of state legislators' decision-making around maternal and reproductive health policies, including abortion regulation, and requested their participation in the form of a 30-minute interview with the legislator or one of their staffers. The initial email was followed by outreach telephone calls, and then, as needed, in-person requests for appointments when in each state. We made additional outreach attempts with Republican legislators when it became apparent that more Democrats than Republicans were agreeing to be interviewed.

Data collection and analysis: We conducted semi-structured interviews with 29 legislators and aides in March through July 2017. Twenty-six interviews were with elected officials themselves and three were with legislative aides. Twenty-three were conducted in person (in a location of the subject's choosing, usually their office); six were conducted over the phone. Interviews ranged in length from 12 to 53 minutes, with a mean of 34 minutes.

[1] The protocol for this research was reviewed and approved by the Committee for the Protection of Human Subjects at the University of California, Berkeley.

Table 1.1. State policies on abortion

State	Abortion policies in place pre-2017	Major abortion bills introduced in 2017 legislative session (with legislative outcome)
MD	• All abortions, regardless of method, must be performed by a licensed physician	None
NC	• All abortions, regardless of method, must be performed in a facility that meets the standards of ambulatory surgical centers • No abortions may be performed after 20 weeks' gestation (unless the woman's life is endangered) • A patient must wait 72 hours after state-mandated counseling before an abortion • Mandated counseling includes information on risks to future fertility and mental health (both scientifically unproven) • Telemedicine may not be used to provide medication abortion • Ultrasound is required before all abortions • Public funding of abortions is limited to cases of rape, incest or life endangerment • A parent must consent before an abortion is provided to a minor • All abortions, regardless of method, must be performed by a licensed physician	• "Ashley's Law": Revises mandated counseling to include information on potential reversibility of medication abortion. (Failed to pass) • "Unborn Child Protection from Dismemberment Act": Bans abortion by dilation and evacuation unless necessary to prevent serious health risk to the woman. (Failed to pass) • "Whole Woman's Health Act": Repeals abortion restrictions that are in conflict with U.S. Supreme Court's decision in *Hellerstedt v Whole Woman's Health.* (Failed to pass)
VA	• Each abortion facility must have an agreement with a local hospital to transfer patients in case of complications • Ultrasound is required at least 24 hours before an abortion; the provider must offer the patient the option to view the image • An in-person counseling appointment is required at least 24 hours before abortion • No abortions may be performed after 24 weeks' gestation (unless the woman's life is endangered) • Public funding of abortions is limited to cases of rape, incest, fetal anomaly or when the woman's life is endangered • A parent must be notified and consent before an abortion is provided to a minor • All abortions, regardless of method, must be performed by a licensed physician	• Amends mandated counseling to include scientifically unproven information on abortion's risks to future fertility and other health risks; levies a $5000 penalty on physicians who do not comply. (Failed to pass) • "Pain-Capable Unborn Child Protection Act": Bans abortions after 20 weeks' gestation. (Failed to pass) • "Whole Woman's Health Act": Affirms right to abortion, repeals abortion facility restrictions, repeals mandated counseling on scientifically unproven risks of abortion, mandates insurance coverage of abortion. (Failed to pass) • Provides that a woman seeking abortion may waive waiting period requirements or informed written consent requirements. (Failed to pass)

Sources: Gold and Nash 2017, National Academies of Sciences 2018, General Assembly websites

Our interview guide was designed to allow for a scalable interview, covering one specific piece of legislation or a broader set of policy questions, as appropriate for the participant's legislative experience and the time constraints of the interview. In general, we asked participants to describe their decision-making on a specific recent abortion bill. (We also asked questions regarding policies on substance use in pregnancy; findings on that topic are reported elsewhere (Woodruff 2018a).) Follow-up questions probed for factors that were particularly influential in the participant's decision making process, such as studies/research evidence, testimony, personal experiences, constituent concerns, etc.). We also explored how participants assess the credibility of any evidence they use and how they balance evidence with other factors.

All interviews were audio-recorded and transcribed. Transcripts were uploaded to the Dedoose qualitative data analysis software (version 7.0.23, 2017) for coding and analysis. Thematic analysis (Smith and Osborn 2008, Braun and Clarke 2012) was performed via a two-stage process: first, coding to identify common concepts in the data, and then coding to synthesize the range of concepts into broader themes, yielding fewer and more meaningful units of analysis (Saldaña 2015). Representative quotations from interviews were extracted to illustrate key themes. The author consulted with advisors to resolve any areas of uncertainty, such as outlier themes, to help ensure dependability of results (Ulin, Robinson, and Tolley 2004). Results were also checked by referring to field memos written immediately after most interviews, which contained reflections on the interview, including notes on non-verbal cues and any open questions.

Results

Table 1.2 provides an overview of the sample. Participants came from all three states, with about 38% of the sample from Virginia, 34% from Maryland, and 28% from North Carolina. Approximately 40% of respondents were female and 60% were male. Democrats outnumbered Republicans in the sample by roughly two to one.

In our sample, the issue of abortion was highly polarized along partisan lines, with all Democrats supporting abortion rights and all Republicans supporting restrictions on abortion. Analysis of interview data revealed several themes.

Table 1.2. Characteristics of Study Participants, by State

	MD	NC	VA	TOTAL
N	**10**	**8**	**11**	**29**
Gender				
Female	4	3	5	12
Male	6	5	6	17
Political Party				
Democrat	6	7	7	20
Republican	4	1	4	9
Legislative Body				
House of Delegates	3	4	6	13
Senate	7	4	5	16
Office Held				
Legislator	8	8	10	26
Legislative Aide	2	0	1	3
Years in Office *(median, range)*	6.5 (1-22)	5.5 (2-15)	13.5 (2-37)	8 (1-37)

Partisan differences in views on bias in evidence

Many legislators reported not taking evidence at face value. Participants expressed the view that the scientific enterprise is guided by priorities that are inherently biased or politicized. Republicans were more likely than Democrats to suggest that researchers' priorities skewed their of research questions and interpretation of findings. As a senior aide to a Republican put it:

> *He'll look at any [study] that's brought to him. But he realizes that everything out there is written with some, you know -- maybe not an agenda, but… everyone has their own biases and angles they're trying to get at with any research they do, obviously. (Aide to Republican)*

A few Republicans expressed that research is suspect not just because its findings may be biased, but because even in choosing a specific question to be investigated, researchers deliberately ignore other important aspects of an issue.

> *Studies can be geared towards what you want it to be. And one of the problems that I have seen, and I have been in this for 16 years, is higher education*

> *institutions and so forth gather the numbers that they want to gather, but they don't look at the whole picture. (Republican)*

Some Democrats also suggested that evidence can be malleable and potentially suspect. However, they were more likely than Republicans to see this as a problem not of the research process itself but of the way politicians may select and use evidence that suits their ends. "It's all part of the art of politics," as one Democrat put it.

> *Can data be used, twisted, to support any point? Sure, I mean, that's just a fact. Data can support anything. It's how we present the data and how we contextualize it that's important. (Democrat)*

> *Well, you know, I am a politician; I understand half-truths and I understand how you can use statistics to make a case*. [Emphasis theirs] *(Democrat)*

In sum, many respondents suggested that evidence is suspect in a policy context because of possible bias, but Republicans were more likely to see this potential bias as inherent in the *production* of evidence, while Democrats saw bias chiefly in the *selection and use* of evidence in policy debate.

Evidence used to substantiate policy positions

Despite often viewing the production and use of evidence as biased and politicized, most legislators we spoke to did make use of evidence to support their policy agenda on abortion. This use of evidence took a very simplified form; legislators were not able to name specific research studies or describe methods, but they did refer to the high-level conclusions of published research as they explained their stances on abortion.

> *I can't recall the studies that I've seen. But I know that a woman who is younger age or of low income, that is allowed to have an abortion, I think she is much more likely to increase her income over a longer period of time as opposed to, you know, having a baby at an earlier age. (Democrat)*

> *Abortions are one of the safest procedures done, and in fact, in the first trimester it's safer than pregnancy. Well, that sounds a little weird when it comes out of my mouth, but – I do know it's a safe procedure. (Democrat)*

While neither of these respondents cited particular studies, these two quotes seem likely references to major studies on abortion, one showing that women denied a wanted abortion are more likely to be in poverty years later than those who received the abortion they sought (Foster et al. 2018), and one finding that morbidity and mortality from abortion are significantly lower than from childbirth (Raymond and Grimes 2012).

Using evidence in this broad-strokes way to support their policy decisions on abortion was more common among Democrats, but Republicans too called on evidence to support their policy initiatives.

> *There's lots of studies that have been done that point to unborn babies, at least by 20 weeks – and significant evidence even before then – that they are capable of feeling pain. Obviously, that's the scientific basis for this legislation. (Aide to Republican)*

In this and similar instances, respondents appeared to use selected evidence in an attempt to provide legitimacy to their abortion policy positions.

Trusted sources influence trust in evidence

When we explored how legislators and their aides appraise the quality of the research evidence they use, none referenced any assessment of study design or methodology. They did sometimes mention research published in a "prominent journal," or referred to a given research institution as being "highly respected." More often, rather than conducting their own assessment of a study's quality, they decided that a given piece of evidence was trustworthy because they got that information from a person or organization they trust. And politics is a primary lens through which they determine whom to trust.

> *Rightly or wrongly, I do trust the information I get from NARAL or Planned Parenthood. That's just sort of where my politics lead me… You know, government interference in [personal decision making] is one of the things that I feel very strongly is wrong. Planned Parenthood and I agree on that... So why wouldn't I use them as a resource? (Democrat)*

> *I've got a few people I can call and say, hey, is this a real problem out here? You know, I do that quite a bit. …If I'm not sure about some [evidence], the Family Foundation, or some doctors I know – I know them, they give me a reality check on it. (Republican)*

Drawing broad conclusions from specific anecdotes

When asked about influential evidence that shaped their policy decision-making, legislators often cited anecdotes and personal stories, rather than scientific evidence. Many would note that the story was "only anecdotal" or "just one data point," acknowledging the limitations of an individual story, but nevertheless appeared to draw broader conclusions based on that anecdote. Individual stories seemed to constitute an alternate form of "evidence" that legislators accepted as representing a wider trend. For

example, one Virginia Republican described how he came to support a ban on abortion after 20 weeks' gestation. He shared a story that supported his conviction that abortion is not a necessary option, even to respond to fetal anomalies discovered in mid-pregnancy:

> *A lot of times what we've found is there is a huge amount of misdiagnosis of these fetal abnormalities… Now, I haven't seen any real research on that. But, we had one lady who lives nearby here, she just posted on her Facebook about her son, who's one of those situations: She was recommended to terminate the pregnancy. He was born. He now is perfectly fine. So, she had posted that on her Facebook. And within a couple hours, she had ten other people saying, "Hey, same thing happened to me. They told me to terminate [because the] baby had problems. Born perfectly fine." ...So, it is very widespread. Like I said, I haven't altogether seen the actual studies on it, but, you know, it's very widespread. (Republican)*

In fact, not only do anecdotes and personal stories serve as an acceptable form of evidence, many legislators seem to find them more convincing than evidence from science.

> *I've got some friends that are doctors and they, you know, tell you anecdotes about what's going on. That's where you get – you know, you get some <u>real</u> evidence, to back up the statistics*. [Emphasis theirs] *(Democrat)*

Seeing the other side's views on abortion as shaped by ideology, not evidence

Both Republicans and Democrats described cases where their political opponents claimed to make policy decisions based on evidence but which the respondents felt were really rooted in ideology. This was particularly expressed by those in the minority party in each state, who were frustrated by the majority party's abortion policies that they saw as furthering ideological party-line goals while ignoring "common-sense facts." Republicans in Maryland (where Democrats held a majority of seats in the General Assembly in 2017) felt that Democrats put their fervor for abortion rights above even the most basic health or safety considerations. As one Maryland Republican put it:

> *The protection of abortion in this state is just about close to the unhinged level of support… We actually had a woman die from complications due to a late-term abortion, because the quality of care simply is non-existent. I mean, truthfully, a dentist is more regulated than an abortion. …But my good friends on the other side of the aisle aren't bothered by those facts. They're pretty committed to [abortion], and so they make absolutely certain that there is no change. (Republican)*

For their part, Democrats in Virginia and North Carolina (where Republicans constituted the majority of the General Assemblies in 2017) felt that abortion regulations passed in the name of protecting women's health were "sham bills" that were part of, as one Democrat put it, "a clear agenda to curtail a woman's rights."

> *All of this is under the guise of, because we want to keep abortion safe, or we want to keep the woman safe, blah, blah, blah, blah, blah. …But the proponents of these bills know exactly what they're trying to do -- because there is no medical evidence that suggests you need these kinds of things. I don't think their proposals are evidence-based at all. I think they're just trying to put up barriers that won't sound too offensive to the average person, but in effect [are] devastating to low-income women who don't have access. (Democrat)*

> *My belief is that most of those claims [about protecting women] are obfuscations to try and give some scientific and health-related legitimacy to something that is truly an ideological perspective. The restrictions that we've had in place, like the 72-hour waiting period on abortion and the ultrasound requirement, I don't believe that there's any medical evidence that shows that those create a safer environment for the mother. I think that those are both intended to reduce the total number of abortions and that they're intrusive in a mother's decision-making process. And so, to me, I haven't seen a claim on the restriction bills around safety that I thought had significant research-based backing to make me believe that it was worth supporting. (Democrat)*

A (male) representative in Virginia forcefully argued that abortion restrictions passed in the name of health are actually part of a broader misogynistic agenda by Republicans:

> *They claim they want to protect women's health? That's just pure crap. They may as well have said, you can only have an abortion every 5th Sunday in March, and only if there's a full moon… Those laws, waiting periods, ultrasound, they're all designed to do everything they can to discourage women from having an abortion. Let me tell you something, if men could have kids, there would be more abortion clinics than Starbucks. And everybody knows it. (Democrat)*

Beliefs drive evidence claims, not the reverse

Despite respondents from both political parties suggesting that their own policies on abortion were evidence-based while the other side was ideologically driven, we found several instances where respondents' comments revealed that their own claims and priorities were dictated by previously held policy preferences, rather than by evidence. For instance, one Democrat said:

> *No, I don't have any concern about the safety of abortion. I think the way it is, it's pretty safe. In fact, I know it is. And, you know, one of your questions was: do I have any statistics or any numbers? No, I don't. It's just how I feel. (Democrat)*

An aide for a Republican reported,

> *He has read the studies that [show] negative long-term effects and short-term effects of abortion on women… Obviously he appreciates the academic research and studies, he uses all that. But really, this is something he believes personally, from his own life experiences and learning. He's been pro-life for a long time... You know, it's something he does because he thinks it's the right thing to do. (Aide to Republican)*

Discussion

To our knowledge, this study is the first to explore how state lawmakers weigh and use evidence in their legislative decision-making on abortion. Our research has three key findings. First, evidence does not instrumentally shape state legislators' views on abortion policy. Notably, we did not find any instance of a legislator forming or changing their mind about an abortion policy because of any particular research evidence. Rather, lawmakers' decisions on the regulation of abortion seem largely shaped by party ideology. Members of both major political parties believe that their opponents' positions are predetermined along party lines while claiming that their own are informed by evidence. Yet in their own discussion of the issue, members of both parties also reveal their own priorities to be dictated more by values than evidence.

Second, legislators appear to trust anecdotes more than scientific evidence. It is not a novel finding that stories pack more communication power than evidence (Gamson 2002, Zak 2014, Kahneman 2011). However, our research suggests not just that legislators use stories because they find them more compelling or persuasive than facts; they actually see evidence from science as less trustworthy, less *real*, than personal experience or anecdotes. This may be because stories are seen as being beyond researchers' "agendas" and therefore purer than scientific evidence. While researchers sometimes explicitly refer to a hierarchy of evidence that deems rigorous randomized control trials the most valuable type of evidence ("U.S. Preventive Services Taskforce Procedure Manual" 2008, Leigh 2009), legislators' own implicit hierarchy of evidence appears to place personal stories from trusted sources above research evidence in terms of utility and value.

Finally, while legislators may view evidence from research with some suspicion or cynicism, they do appear to make use of scientific evidence to endorse their positions. They do so by citing research findings in their simplest form, as long as they have

received the evidence from a trusted source, and – importantly – as long as it supports their preexisting policy preferences. This study suggests that evidence is rarely used in an instrumental way to shape state-level abortion policy; rather, legislators use selected evidence to substantiate preferred policy positions on abortion.

Rather than finding unique uses of evidence in the abortion policy context, the findings of this study are unsurprising from a political science perspective. That policymakers use research mostly to affirm pre-existing beliefs echoes much prior work on evidence use in policy (Boswell 2009, Prewitt, Schwandt, and Straf 2012, Contandriopoulos et al. 2010). The extent to which policymakers view evidence on abortion as suspect or biased may surprise some, but this research affirms prior studies finding that, especially on controversial issues, evidence is not persuasive to anyone who is not already inclined to agree with a given position (Nyhan et al. 2014, Stone 2001). We find that some Republicans mistrust production of evidence itself; this echoes opinion among Republicans more broadly, as U.S. conservatives' trust in universities as public institutions has never been lower (Johnson and Peifer 2017). Finally, our finding that under-staffed state legislators accept evidence from trusted sources, rather than assessing the quality of research for themselves, echoes observations that people come to believe expert and scientific claims not by reading or understanding the research itself, but by hearing about it from trusted others (Shapin 1995).

Limitations and Strengths

Although our data were rich, several limitations of this work should be noted. The pool of legislators who agreed to be interviewed is not representative of the overall sampling frame. Despite our attempts to oversample Republicans, our sample is more Democratic, as well as more female, than the overall representation in the General Assemblies of all three states.[2] This may influence the results in ways we cannot assess. Secondly, because we worked within subjects' time constraints, we were not able to ask exactly the same questions of each participant. This may limit our ability to draw conclusions across our sample, as well as our ability to transfer findings to other contexts (Miles and Huberman 1994). Thirdly, the states where we conducted this research have very different track records on abortion: the Guttmacher Institute has rated Maryland "Supportive" while Virginia and North Carolina are both rated "Extremely Hostile" to abortion rights (Nash et al. 2018). While we deliberately sought out states with a range of abortion policies, we acknowledge that this contrast may limit the generalizability of our findings. On the other hand, 29 U.S. states are rated hostile or

[2] The percentage of women lawmakers in these state legislatures in 2017 ranged from 19% in VA to 31% in MD. The percentage of Republicans was 34% in MD and 64% in NC and VA. See National Conference of State Legislators: http://www.ncsl.org/legislators-staff/legislators/womens-legislative-network/women-in-state-legislatures-for-2017.aspx
and
http://www.ncsl.org/research/about-state-legislatures/partisan-composition.aspx#2017

extremely hostile to abortion rights, while only 12 are supportive, so our sample states may approximate the degree and direction of abortion policy polarization across U.S. states as a whole. A final limitation is that one author conducted all interviews and coded all the data. However, collaboration among advisors as well as validation of themes with respondents helped confirm the thematic findings.

This study also has several unique strengths. As the first study to explore state policymakers' use of evidence in making abortion policy, it sheds light on one aspect of the dramatic increase in state abortion restrictions, an active policy trend in U.S. states that has implications for millions. It also adds to the critical discussion over how evidence is (or is not) used in making public health policy. Our flexible, in-person interview process allowed us to probe legislators' views in depth. Indeed, it was crucial to gaining access to legislators at all, as several expressed that they do not respond to requests for participation in research via surveys or questionnaires but are "always glad to have a conversation." While legislators may dominate public discourse in settings such as news media, their perspectives are rarely represented in social science, so public health practitioners and researchers do not have adequate opportunity to apprehend their values and views. As such, this study contributes an important understanding of the outlook of individuals whose decision-making has broad public impact (Nader 1972).

Implications

We believe this work has several important implications for those who wish to see more evidence-informed lawmaking on reproductive health issues. The work suggests that further research about the safety of abortion or the harms of not having access to abortion care will not stop the flood of state level restrictive abortion policies being passed. However, several notable court decisions in recent years highlight the critical role of evidence in informing judicial interpretation of and possible limits on restrictive abortion laws (Yang and Kozhimannil 2016, Whole Woman's Health v. Hellerstedt 2016). This suggests that researchers should consider the evidence needs of the judicial branch, including litigators and expert witnesses, in addition to those of the legislative branch, when planning their dissemination efforts.

This work highlights the importance of intermediaries in influencing legislators' policy agendas and providing them with useful evidence. To increase the utility of research, reproductive health researchers should consider working with established intermediaries to get their research findings into the hand of state lawmakers. These intermediaries include lobbyists, local experts, organizational partners and colleagues with whom lawmakers already have trusting relationships. Our data suggest that it is at this "upstream" point where evidence is assessed, selected, simplified and packaged to make it useful to policymakers. As this work affirms the persuasive power of stories and anecdotes, these intermediaries may consider providing policymakers with stories of "authentic voices," people who have direct experience with the issues being addressed

by policy, to help bring to life key points from the research evidence (Wallack et al. 1999).

This study is a first step in exploring why abortion policy in the states does not appear to be based in evidence. As such it raises several questions for future research on the use of evidence in abortion policy. Are there any sources of evidence or any institutions that could be accepted as an authority by both sides? For example, in many other health issues, we might expect that an independent nonpartisan research body's comprehensive review of evidence, such as the National Academies of Sciences' recent review on the safety and quality of abortion care in the U.S. (National Academies of Sciences 2018), would be accepted as definitive. When it comes to abortion, however, initial responses to the NAS study suggest that those inclined to oppose abortion rights will continue to challenge the science (Kann 2018).

This raises the question of whether it is realistic for those in the field of reproductive health to expect to increase all legislators' trust in the scientific evidence on abortion. Public health researchers and practitioners must grapple with the fact that knowledge and evidence are passed along within interpersonal networks, and given partisanship, those networks are increasingly mutually exclusive (Ringe, Victor, and Tam Cho 2017). One implication is that to increase the chance that abortion policy will reflect the best current evidence, reproductive health researchers may consider prioritizing building relationships with and presenting their evidence to legislators who are open to supporting abortion rights, rather than trying to convince anti-choice legislators to accept their research findings.

Given this study's findings and the partisan ideological nature of the abortion issue, future research should examine how the degree of partisanship within a state legislature affects use of evidence, how partisan knowledge networks function to endorse some evidence for policymakers while suppressing other research, and how evidence claims interact with value claims in decision-making on this issue. Research into these questions may ultimately help bring abortion policy in the U.S. more in line with scientific consensus on its safety and efficacy.

PAPER TWO
"Alcohol during pregnancy? Nobody does that any more": State legislators' use of evidence in making policy on substance use in pregnancy

Background

Alcohol use in pregnancy is an issue of significant public health concern, with implications both for birth outcomes and for the health and social services systems in the U.S. Overall, an estimated 15% of women in the U.S. report any use of alcohol in pregnancy, with about 21% of those reporting heavy episodic (binge) drinking (Lange et al. 2017). Use of alcohol varies by stage of pregnancy; in a study of month-by-month drinking, approximately 42% of women in the first month of pregnancy reported any drinking in the last 30 days, dropping to about 17% of those two months pregnant and about 8% of those three months pregnant (Alshaarawy, Breslau, and Anthony 2016). It is clear that many pregnancies are exposed to alcohol before the pregnancy is detected (Tough et al. 2006), and for some the level of exposure is high (Floyd, Decouflé, and Hungerford 1999).

Prenatal exposure to alcohol is associated with adverse birth outcomes such as low birth weight and pre-term birth (Patra et al. 2011). Drinking in pregnancy, in particular drinking that is heavy and/or early in pregnancy, is also linked to a range of permanent physical birth defects and neurodevelopmental disorders in the fetus known collectively as Fetal Alcohol Spectrum Disorders (FASD) (C.M. O'Leary et al. 2010, Williams and Smith 2015). As many as 2%-5% of school children in the U.S. may be affected by some form of FASD (May et al. 2009, May et al. 2018).

There is considerable debate over what level of alcohol use during pregnancy causes harm. No conclusive research evidence shows that low levels of prenatal alcohol exposure cause fetal harm (Henderson, Gray, and Brocklehurst 2007, O'Leary and Bower 2012, Abel 2006). However, most studies find that regular heavy drinking or binge drinking in pregnancy can lead to adverse outcomes, including lasting neurodevelopmental harms in the future child (Sayal et al. 2009, Jacobson and Jacobson 1999,Patra et al. 2011, Flak et al. 2014).

In recent years, U.S. states have passed an increasing number of policies addressing alcohol use in pregnancy (Drabble et al. 2014). These policies have been categorized by researchers into two main categories: *supportive*, providing information, treatment, and services to pregnant women, or *punitive*, seeking directly to control pregnant

individuals' behavior (Thomas, Rickert, and Cannon 2006). Supportive laws include measures prioritizing access to public or private alcohol treatment for pregnant and postpartum women, or mandating signage at sites serving or selling alcohol to warn patrons of the risks of drinking during pregnancy. Punitive laws include measures requiring physicians to report patients who abuse alcohol during pregnancy to either Child Protective Services or a health authority, or mandating civil commitment of pregnant alcohol abusers to involuntary treatment or placement into protective custody of the State for the protection of the fetus. Policy environments around alcohol and pregnancy are becoming increasingly punitive, as many states with supportive laws have added punitive laws in recent years (Sarah C. M. Roberts et al. 2017).

Yet the evidence on the impact of these policies addressing alcohol in pregnancy remains limited. Mandatory alcohol label warnings have been shown to increase awareness of the risks of alcohol's harms, including from use during pregnancy, but studies have not found that they change drinking behavior during pregnancy (Wilkinson and Room 2009). In contrast, one recent study found that laws mandating point-of-sale signs warning of the risks of drinking alcohol in pregnancy have been associated with decreases in some adverse birth outcomes, such as very low birth weight and pre-term birth (Cil 2017). Another study found that reducing the waiting time for entry into treatment was associated with higher completion rates for the treatment program (Albrecht, Lindsay, and Terplan 2011), suggesting that laws giving pregnant women priority entry into treatment may help improve outcomes. There is concern that punitive policies on alcohol use in pregnancy may have unintended adverse effects. A few qualitative studies have suggested that policies requiring physicians to report patients using illicit drugs during pregnancy to child welfare agencies may deter women from seeking prenatal care (Roberts and Pies 2011, Schempf and Strobino 2009). It is plausible that this also applies to women using alcohol in pregnancy, though more research is needed on this question.

Policies intended to reduce general alcohol consumption across populations may also affect birth outcomes. In one study, a minimum legal drinking age (MLDA) of 18 years (vs. the MLDA of 21 now standard across the U.S.) was associated with lower birth weight and higher rates of pre-term birth, particularly among children born to black women (Fertig and Watson 2009). A more recent study found little association between MLDA and infant health, but did find an association between lower MLDA and higher fetal death rates (Barreca and Page 2015). Another study found that increasing beer taxes is associated with significant reductions in low birth weight and in binge drinking for pregnant women (Zhang 2010). This small body of evidence raises the question of whether policies addressing general alcohol consumption may be more effective at reducing pregnancy-related alcohol harms than policies specifically targeting alcohol use in pregnancy. More research is needed to investigate this question.

Despite the fact that there has been insufficient research on whether policies targeting alcohol use in pregnancy reduce harms, states continue to implement such laws (Sarah C. M. Roberts et al. 2017). Medical experts and practitioners have called for policies on alcohol use in pregnancy to be guided by the best available scientific evidence (Krans and Patrick 2016, Terplan 2017, Chasnoff and Gardner 2015). However, the extent to which evidence influences policy decision-making on alcohol use in pregnancy is unclear. To our knowledge, no study has examined state policymakers' decision-making about such laws, in particular assessing how they use research evidence when making their decisions. To bridge this gap, we conducted a qualitative study of state lawmakers in three neighboring U.S. states with varying policy environments on alcohol use in pregnancy.

Methods

For purposes of this study, we use the definition of "evidence" established by the National Research Council's Committee on the Use of Social Science Knowledge in Public Policy: "knowledge based in science… broadly taken to mean data, information, concepts, research findings, and theories that are generally accepted by the relevant scientific discipline" (Prewitt, Schwandt, and Straf 2012). Our study focused on interviews with state legislators to explore their use of such evidence in making policy on alcohol and pregnancy in the states of Maryland, North Carolina, and Virginia.[3] These states were chosen because they share some socio-cultural similarities, being in the same region; however, they have different policies on alcohol and other substance use in pregnancy (see Table 2.1).

We began this study intending to focus only on policies related to alcohol use in pregnancy. However, many policies considered in these states in 2017 covered both alcohol and drugs in a single bill. For example, Maryland's SB27, rejected by the Senate Judicial Proceedings committee, would have required health care professionals to report to child welfare agencies any newborns displaying "the effects of controlled drug use or symptoms of withdrawal resulting from prenatal controlled drug exposure as determined by medical personnel; or the effects of a fetal alcohol spectrum disorder," with no exceptions for circumstances involving prescribed drugs. As a result, we amended our interview guide in order to include exploration of legislative decision-making on a broader range of substance use in pregnancy policies.

[3] The protocol for this research was reviewed and approved by the Committee for the Protection of Human Subjects at the University of California, Berkeley.

Table 2.1: State Policies on Alcohol and/or Substance Use in Pregnancy, as of 2017 legislative session

State	Alcohol and/or Substance Use in Pregnancy Policies in place pre-2017*	Alcohol and/or Substance Use in Pregnancy Policies considered in 2017 (with legislative outcome)
MD	• Mandatory reporting of substance-exposed newborns (those showing effects of substance abuse, or withdrawal resulting from prenatal exposure to a controlled substance, or effects of a FASD) to child welfare agencies, with exemption for substances prescribed by a physician	• Mandatory reporting of substance-exposed newborns to child welfare agencies – whether or not the substance was prescribed by a physician (rejected)
NC	• Mandatory point-of-sale warning signs for alcohol sales (off-premises consumption only)	• Mandatory point-of-sale warning signs for on- and off-premises sales of alcohol (passed) • Mandatory reporting of substance-exposed newborns to child welfare agencies (rejected)
VA	• Mandatory reporting of substance-exposed/FASD-affected newborns to child welfare • Prenatal alcohol exposure may be used as evidence in child welfare proceedings regarding child abuse/neglect • Medical test/screening results may be used as evidence in criminal prosecution of women who may have caused harm to a fetus	• Funded study to explore barriers to treatment for substance-exposed infants (passed) • Required local social services to investigate whether the mother of a infant exposed *in utero* to a controlled substance sought substance abuse counseling or treatment during pregnancy – whether or not the substance was prescribed by a physician (passed) • Board of Health to adopt Neonatal Abstinence Syndrome as a reportable disease (passed) • Designated the first week of July as Substance-Exposed Infant Awareness Week (passed)

* Data from NIAAA's Alcohol Policy Information System and General Assembly websites of MD, NC & VA

Outreach and recruitment: We recruited legislators from the primary health-related committees of the General Assembly in all three states, as well as sponsors and co-sponsors of 2017 bills on alcohol and/or drug use in pregnancy, and members of committees that voted on 2017 bills on alcohol and/or drug use in pregnancy. We also asked respondents to suggest colleagues who might be interested in discussing these issues with us. We conducted outreach via email to 132 legislators. The outreach email described our research as a study of state legislators' decision-making around maternal

and reproductive health policies, and requested their participation in the form of a 30-minute interview with the legislator or one of their staffers. We followed up with telephone calls, and then, as needed, stopped by their office to make in-person requests for appointments when in each state. We made additional outreach attempts with Republican legislators when it became apparent that more Democrats than Republicans were agreeing to be interviewed.

Data collection and analysis: We conducted open-ended interviews with 29 legislators and aides in March through July, 2017. Twenty-six interviews were with elected officials themselves and three were with legislative aides. Twenty-three were conducted in person (in a location of the participant's choosing, usually their office); six were conducted over the phone. Interviews ranged in length from 12 to 53 minutes, with a mean of 34 minutes.

Our interview guide was designed to allow for a scalable interview to allow for the participant's legislative experience and the time constraints of the interview; thus we could cover one specific piece of legislation or a broader set of policy questions. In general, we asked participants to describe their decision-making on a recent bill related to substance use in pregnancy. Follow-up questions probed for factors that were particularly influential in their decision-making process (studies/research evidence, stories, testimony, personal experiences, etc.). We also explored how participants assessed the credibility of any evidence they used and how they balanced evidence with other factors. If time allowed, we also asked about how concerned they were about alcohol and opioid use during pregnancy, and explored their perceptions of the relative scope of these two problems in their state. Our interviews also covered other reproductive health subjects; those data are analyzed in other work (Woodruff 2018a, Woodruff 2018b).

All interviews were audio-recorded and transcribed. Transcripts were uploaded to the Dedoose qualitative data analysis software (version 7.0.23, 2017) for further coding and analysis. We analyzed the data using a two-stage process of thematic analysis (Smith and Osborn 2008, Braun and Clarke 2012): preliminary coding to identify concepts arising from the transcripts, and second-cycle coding to consolidate the range of concepts into broader themes. This multi-stage process yields fewer and more meaningful units of analysis than a single-stage coding process (Saldaña 2015). Quotations that illustrate key themes were extracted. The first author consulted with other authors about how to resolve any areas of uncertainty, such as themes that seemed compelling yet were rare, to help ensure dependability of results (Ulin, Robinson, and Tolley 2004). Results were also checked by referring to field memos written immediately after most interviews, which contained reflections on the interview, including notes on non-verbal cues and any open questions.

Results

Table 2.2 provides an overview of the sample. Participants came from all three states, with about 38% of the sample from Virginia, 34% from Maryland, and 28% from North Carolina. Approximately 40% of respondents were female and 60% were male. Democrats outnumbered Republicans in the sample by roughly two to one.

Table 2.2. Characteristics of Study Participants, by State

	MD	NC	VA	TOTAL
N	**10**	**8**	**11**	**29**
Gender				
Female	4	3	5	12
Male	6	5	6	17
Political Party				
Democrat	6	7	7	20
Republican	4	1	4	9
Legislative Body				
House of Delegates	3	4	6	13
Senate	7	4	5	16
Office Held				
Legislator	8	8	10	26
Legislative Aide	2	0	1	3
Years in Office *(median, range)*	6.5 (1-22)	5.5 (2-15)	13.5 (2-37)	8 (1-37)

In our analysis of interview transcripts, several themes emerged. In general, alcohol use in pregnancy was not seen as salient, unless respondents had personal direct experience with the issue. Rather, respondents reported that opioid use, including in pregnancy, was of greater concern to them than alcohol use in pregnancy. On the opioid issue, anecdotes and known personal contacts were more important in shaping their views than evidence. Finally, many noted that the professional intermediaries they rely on to bring health policy issues to them are not raising the issue of substance use in pregnancy with them. We explore each of these themes below.

Alcohol use in pregnancy is not salient

For most participants, alcohol use in pregnancy was not a salient issue. Most expressed that they do not believe drinking during pregnancy to be a major public health problem. This is largely due to the perception, expressed by many, that prominent government efforts to educate the public about the risks have been effective.

> *"I don't see a big problem with [drinking in pregnancy]... I think that the public-service announcements and the whole campaign to make sure that people know that it's a bad thing to do has been helpful." (Democrat)*

> *"I really do think we've done such a good job on educating the public [on] don't drink when you're pregnant." (Republican)*

> *"Alcohol during pregnancy? Do I think that's a problem? You know, everybody I know, that's how you know they're pregnant, when they're not drinking. So – yeah, nobody does that anymore." (Democrat)*

Personal experience sets the agenda on alcohol use during pregnancy

The only participants who expressed concern about alcohol use in pregnancy in particular were those who disclosed a direct personal familial connection to the issue. In one case, a participant believed that he and his siblings had themselves been harmed by in-utero alcohol exposure:

> *"My mom and dad were heavy drinkers... And I am sure that we kids are in some manner affected by fetal alcohol, all of us. Not terribly, but to a degree – I do see it. I don't think you can avoid it, when you're drinking at that level… So I am ultra-sensitive to the issue because of my personal background." (Republican)*

Others had experience from the parental side; three participants shared that they were foster or adoptive parents of children who had been born exposed to alcohol or drugs. As one Democrat said, "My oldest child is adopted, and she was put into foster care because of chronic substance abuse in her biological family. So, I have kind of that personal connection to it."

Many female legislators who were parents reported that they had eliminated their own drinking during pregnancy, and therefore assumed that others should or would as well. Some legislators reported that they had noticed changing norms toward greater acceptability of drinking during pregnancy, but they still believed that virtually everyone felt pressure to minimize their drinking when pregnant, and would do so.

"This one girl the other day had a glass of champagne and then she proceeded to tell me she was pregnant. She said, you know I've done a lot of research and, she said, one little glass of champagne is not going to hurt me… So, she felt pretty confident with that. But I wouldn't. When I got pregnant, it was just, you can't drink coffee, you can't drink alcohol, you can't smoke… And if I were pregnant now I wouldn't drink anything." (Democrat)

Opioid use during pregnancy is higher priority than alcohol

Many participants expressed that the opioid crisis is a higher priority than alcohol use, even specifically during pregnancy. This appeared to be due to two perceptions, reported by a number of participants: 1) the belief that opioid use is more prevalent overall than (heavy) alcohol consumption is; and 2) the belief that, used during pregnancy, opioids pose more threat of harm to the fetus than alcohol does.

"I think opiate use [during pregnancy] has probably got a bigger impact [than alcohol use], to be honest with you. I mean, opioid use is pretty rampant, way more than alcohol." (Democrat)

One participant summed up a common perception, that opioids are much more powerful and hazardous than alcohol, specifically in terms of potential harm to the fetus.

"Alcohol vs. drugs… It's comparing apples and oranges, to see the effects on the child when it's born. Whether it be what they call crack babies, meth babies, opioid-addicted babies – I don't think that the effect of alcohol on that child when it's born is as great as it is whenever it's one of those drugs. I mean, an opioid – that's just such a powerful drug." (Republican)

Even many of those who did understand that alcohol poses a serious risk of harm during pregnancy, and believed it to be a concern, still placed a higher priority on the opioid issue.

"Alcohol use in pregnancy? I'm sure it's there. I'm sure that it's just as -- it would be just as relevant to study as opioids, because you know it's happening... I mean, that's just as bad on the child, just as bad on development, things of that nature. So, something we need to address. But it's not the focus of what we're doing now." (Democrat)

In Maryland and North Carolina, many legislators were aware of 2017 bills in their state to require mandatory reporting of substance-exposed newborns to child welfare agencies, but many of those participants assumed that the relevant substances were opioids and other drugs; they were not aware that the bills' definition of "substance-

exposed newborn" included infants displaying effects of a Fetal Alcohol Spectrum Disorder. This included some legislators who had personally voted on these measures.

On opioids, anecdotes drive sense of urgency more than evidence

Regarding opioid use, anecdotes appear more influential than evidence in prioritizing the issue on the policy agenda. Several participants reported being impacted by the stories of friends or colleagues who had used prescription painkillers and had conveyed the addictive potential of these drugs. One participant who had briefly used opioids after surgery said:

> *"While I was still in the hospital, I had a friend come in telling me, you've got to get off of this stuff fast. Because he'd been in a motorcycle accident and he was taking pills, and a year later he woke up and realized he was addicted. And you don't want to be that guy. So I tried to get off those things as quick as I could. And my family, you know, has a problem with addictions. So, you know, I had some real interest in trying to get off of it." (Republican)*

Several respondents noted that there seemed to be a convergence of opinion in the General Assembly about the need to address the opioid crisis, driven largely by stories and anecdotes circulating among their colleagues.

> *"It really is remarkable the number of personal stories [about opioid addiction] that legislators have that they'll share privately and say, well, my brother, my friend, my kids... And so it didn't take a lot to convince people that it's time to do something about this. The governor put together a taskforce for a year, and while that was happening, all of these stories were coming out of the woodwork and everyone just knows, okay, it's time, we've got to do this." (Republican)*

Media coverage also provided compelling stories and anecdotes that fueled respondents' sense of urgency on the opioid issue, even in the absence of evidence to help them understand the scope of the problem.

> *"It [opioid addiction] has been a significant and increasing problem. Though honestly -- I've been in the legislature for three years -- I don't know if there's been this huge increase or if it's always been kind of there. But the press has just glommed onto this… You read these stories, someone, a couple people dying every week. So it's definitely getting more attention, and lawmakers are definitely more aware." (Democrat)*

It is worth noting that respondents shared these anecdotes and observations about the urgency of opioid addiction in response to questions about substance use in *pregnancy*, even though their anecdotes did not relate to use in pregnancy.

Known contacts more trusted than evidence

In shaping policy approaches to substance use (in pregnancy and in general), people known to the legislators appear to be more trusted and influential than evidence. One Republican described how he came to reject punitive approaches to opioid use in pregnancy:

> *"I went to the same two doctors that help me on all my pro-life stuff… I asked them [about civil commitment or mandatory reporting] and they said, totally misguided. They said the only way to get the kids born healthy, and the mother to come out of it, is to treat it purely medical. And so that's what we do. I kept the people at bay that wanted to lock them up or report them and I just – I explained to them. It was not any original research on my part, or any data. It was where I was trusting the people that were in the field doing it." (Republican)*

Others noted that they were attuned to issues related to opioid use because affected constituents were asking them for help or they had seen the impact in their district first hand.

> *"I think the legislators who know about this issue are the ones who have a personal connection through their district, the ones who are seeing and hearing about this problem on a regular basis. I happen to have a personal connection 'cause I [come from] a post-industrial town [with a high incidence of opioid use]. That's where I got like 90 percent of my knowledge on this problem. Otherwise, I don't think I'd know squat." (Democrat)*

Intermediaries are not raising this issue with lawmakers

While constituents had raised concerns related to opioid use with many of our respondents, we found that the issue of substance use in pregnancy wasn't "professionalized": that is, with few exceptions, respondents reported that no one in the bureaucracy or the lobbyist community had brought the issue to them.

> *"I'm not saying the data is not influential, but it's just not present. I haven't had anybody come and talk to me about the opioid epidemic ever. Ever. I'm sure there are lots of groups working on it – couldn't name one. This is the only conversation I've ever had about it in this office." (Democrat)*

> *"I certainly would support anything that would help us, you know, limit or restrict or stop completely a mother's use of alcohol during her pregnancy. But again, I don't hear calls of, you know, it's a crisis or that we need to address it*

immediately or anything like that. So, again I'm sure it's a problem but you know, just nothing's – nothing specific has come across my desk." (Democrat)

Discussion

This study of state legislators' policy use of evidence related to alcohol in pregnancy has four key findings. First, most lawmakers in our sample were not concerned about alcohol use in pregnancy. They believed that past efforts to educate the public about the harms of drinking during pregnancy have worked, and that, effectively, "nobody does that anymore." Second, legislators prioritized the issue of opioid use in pregnancy over that of alcohol in pregnancy. When asked, most believed that opioid use is more prevalent and poses a far greater threat to fetal development than alcohol use in pregnancy does. Third, personal experiences, anecdotes, and known contacts are more influential in shaping legislators' views on substance use in pregnancy than evidence is. Lastly, we find that the intermediaries legislators typically rely on to analyze and bring evidence about problems and suggested solutions to them are not raising the issue of alcohol use in pregnancy on legislators' agenda.

Our respondents' relative lack of concern over alcohol use in pregnancy is a surprising finding, given high-profile efforts by the Centers for Disease Control and Prevention to highlight the dangers of drinking in pregnancy and the persistence of the problem. The CDC invested significant resources in a 2016 report and educational campaign to recommend that (hetero)sexually active women who are not using birth control should abstain from drinking alcohol, in order to prevent harms from the use of alcohol before pregnancy recognition (CDC 2016). This campaign generated significant news coverage and controversy (Victor 2016a, Szabo 2016), as many observers criticized what they saw as the "condescending" tone of the recommendations (Petri 2016, Victor 2016b). It is possible that state policymakers were not aware of the CDC's education effort or the resulting media coverage. However, an alternative explanation of these findings is that if legislators were aware of the campaign, they may have taken it as more proof that the public has been adequately educated about the risks of alcohol in pregnancy. Prior critiques of public education campaigns on alcohol consumption have pointed out that such campaigns may do more harm than good, in that the campaign's visibility can make policymakers believe that the issue is being addressed, and may therefore reduce political will for other interventions or policies that may be more effective (DeJong, Atkin, and Wallack 1992, DeJong and Wallack 1992). This study cannot answer the question of how state legislators came to believe that alcohol in pregnancy is no longer a pressing public health issue; more research is needed to explore this.

Legislators appear to apply their sense of urgency and concern about opioid use in general to the issue of drug and alcohol use in pregnancy. This is suggested by the ways

in which they generalize from what they know of addiction to judge the scope of harms from use in pregnancy. Opioid use in pregnancy *is* on the rise; the prevalence of opioid abuse or dependence among pregnant women has increased from 1.7 per 1000 hospital births in 1998 to 3.9 per 1000 in 2011 (Maeda et al. 2014). The number of infants born with Neonatal Abstinence Syndrome (NAS), a set of clinical symptoms and issues associated with postnatal drug withdrawal among some infants exposed to opioids *in utero*, has risen from 1.2 per 1000 hospital births in 2000 to 5.8 per 1000 in 2012 (Ko et al. 2016). However, despite legitimate concerns about increasing opioid use in pregnancy, state legislators' prioritization of opioid use over alcohol in pregnancy does not reflect current evidence of the relative impacts of these substances on a fetus. While *in utero* opioid exposure can cause symptoms of physical withdrawal that can be distressing to witness and difficult to manage, NAS is usually treatable with existing practices, and any lasting effects do not appear to be major (Grossman, Seashore, and Holmes 2017). Fetal alcohol spectrum disorder, on the other hand, can cause permanent physical and neurodevelopmental damages that have been estimated to affect up to 5% of US school children (May et al. 2009, May et al. 2018). By the most recent estimates, the number of U.S. children affected by FAS/FASD is about 10 times the number of infants with NAS (May et al. 2018, Ko et al. 2016).

Legislators' relative focus on opioid use in pregnancy over alcohol in pregnancy may reflect the influence of recent changes in federal child welfare laws. Since 2003, the federal Child Abuse Prevention and Treatment Act (CAPTA) has required states to make and implement a "Plan of Safe Care" for each substance-exposed newborn. In 2010, the CAPTA Reauthorization Act clarified the definition of "substance-exposed newborn" to explicitly include those showing effects of a Fetal Alcohol Spectrum Disorder, as well as those affected by illegal substance use and withdrawal symptoms. In 2016, the Comprehensive Addiction and Recovery Act, passed in response to the increase in prescription opioid abuse, specifically removed the word "illegal" from the definition of substance-exposed infants and thus included prescription opioids within CAPTA's purview for the first time. Thus it is possible that some state policies on substance use in pregnancy which include alcohol use in pregnancy may have been passed in response to changes in federal child welfare laws, rather than out of a sense of urgency about the harms of alcohol use in pregnancy. Our respondents' lack of clarity over whether the mandatory reporting bills proposed in their states included alcohol-exposed pregnancies supports this interpretation.

Thus, some increase in the number of mandatory reporting laws may be due to CAPTA changes; however this still does not explain the increase in other types alcohol in pregnancy policies. If state lawmakers truly believe alcohol use in pregnancy is no longer a problem, and find prenatal opioid use to be a greater threat, why do states continue to pass laws on alcohol in pregnancy? Future research should explore this question.

Finally, our analysis suggests that personal experience and anecdotes from trusted sources set the filter through which legislators understand the issue of substance use in pregnancy, and may have more influence than any scientific evidence. This reflects the fact that that most U.S. states, including those where we conducted our research, have part-time legislatures, made up of lawmakers from a wide variety of professions who come together for a brief and busy legislative session. (For example, the General Assembly of Maryland decided on more than 2800 bills in the 90-day 2017 legislative session.[4]) The legislators we spoke with typically had only one legislative aide, who assisted with everything from scheduling and constituent relations to limited policy analysis. In this context, legislators rely on trusted intermediaries such as lobbyists, public health practitioners, and professional organizations to assess the quality of evidence on an issue and package and present policy solutions to them (Feldman, Nadash, and Gursen 2001).

This finding concurs with a seminal political science study that explains legislative oversight of bureaucratic functions of government as functioning more like fire alarms than police patrols. That is, legislators do not go out proactively looking for problems to solve; rather, they respond to the "alarms" raised by interest groups who bring concerns to them (McCubbins and Schwartz 1984). In the absence of such proactive efforts by intermediaries on the issue of alcohol use in pregnancy, the issue is not seen as urgent.

Our findings must be considered in the light of several limitations. The pool of legislators who agreed to be interviewed is not representative of the overall sampling frame. Despite our attempts to oversample Republicans, our sample is more Democratic, as well as more female, than the overall representation in the General Assemblies of all three states.[5] Secondly, because we worked within subjects' time constraints, we were not able to ask exactly the same questions of each participant. This limits our ability to draw conclusions across our sample, as well as the transferability of conclusions from this study to other contexts (Miles and Huberman 1994). Third, the states where we conducted the interviews are experiencing high levels of opioid use and overdose, and are adjacent to states with the highest levels of NAS in the country (Ko et al. 2016). This may mean that legislators' perceptions about the urgency of opioid use in pregnancy may not generalize to other states where opioid use and NAS rates are lower.

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[4] http://msa.maryland.gov/msa/mdmanual/07leg/html/sessions/2017.html

[5] In 2017, women lawmakers made up from 19% (VA) to 31% (MD) of these states' General Assemblies. The percentage of Republicans was 34% in MD and 64% in NC and VA. See National Conference of State Legislators: http://www.ncsl.org/legislators-staff/legislators/womens-legislative-network/women-in-state-legislatures-for-2017.aspx and http://www.ncsl.org/research/about-state-legislatures/partisan-composition.aspx#2017

This study also has several unique strengths. As the first study to explore how state policymakers understand substance use in pregnancy and use evidence in making decisions, it sheds light on the motivations behind an active policy trend in U.S. states that has implications for millions, as well as adding to the critical discussion over how evidence is (or is not) used in making public health policy. Our open-ended, in-person interview process allowed us to uncover unexpected findings; indeed, it was crucial to our getting access to legislators at all, as several expressed that they do not respond to requests for participation in research via surveys or questionnaires but are "always glad to have a conversation." While legislators may dominate public discourse in settings such as news media, their perspectives are rarely represented in social science. As such, this study contributes an important understanding of the views of individuals whose decision-making has broad public impact (Nader 1972).

This research has some important potential implications. Basic evidence on the prevalence and harms of alcohol use in pregnancy does not appear to influence state lawmakers' policy priorities. While alcohol use in pregnancy is not a concern for state lawmakers, the opioid crisis *is*, and this may provide a window of opportunity to educate policymakers on the relative scope and harms of both alcohol and opioid use in pregnancy. The fact that legislators' trusted sources of information are not currently raising this issue with them suggests that researchers concerned about substance use in pregnancy may be able to work with existing intermediaries to translate research on these issues for policymakers. However, our findings also suggest that scientific evidence has limited influence on policymaking on this issue, and may not outweigh anecdotes and personal stories in legislative decision-making. More research is needed to explore how state lawmakers form their understanding of substance use in pregnancy and what policies they think will make a difference on this issue.

PAPER THREE
"I don't know that, but I'm certain of it": Controversy, consensus, and conjecture in U.S. state legislators' use of evidence in reproductive and maternal health policymaking

OVERVIEW

Public health practitioners increasingly call for health policies to be based on the best available scientific evidence (Tabak et al. 2015, Aldrich et al. 2015). Indeed, the desire to inform political decision making is often the explicit motivation driving health and social science research (Otten et al. 2015, Chapman et al. 2014). Yet cases where evidence definitively shapes health policy outcomes are hard to identify (Hartsfield, Moulton, and McKie 2007).

As one example, consider the use of evidence in informing sexuality education policy in the United States. Beginning in 1996, Title V of the U.S. Welfare Reform Act offered federal funds to match states' investment in sexuality education for children in public schools – if the states agreed to teach abstinence-only sex ed.[6] California was the only state to refuse; all other states accepted the federal funds and adopted abstinence-only sexuality education.

In 1998, Congress mandated a rigorous evaluation of abstinence-only sexuality education programs, commissioned by the Dept. of Health and Human Services. This long-term multisite trial involved more than 2000 teens randomly assigned to one of four federally approved abstinence-only programs, or to a control group. The study found that abstinence-only education not only showed no benefits in age of first sex, rates of sexual activity, or levels of unprotected sex, but actually decreased teens' knowledge of condoms' role in preventing sexually transmitted infections (Trenholm et al. 2007).

Rather than being convinced by these findings, the federal government announced it had no intention of changing its funding priorities, and continued to support abstinence-only sex ed programs (Stepp 2007). However, many states made a different policy

[6] This was defined as a sexuality education program which teaches that abstinence from sexual activity outside marriage is "the expected standard of human sexual activity" and that sexual activity outside of marriage is likely to have "harmful psychological and physical effects," and which prohibits any positive discussion of contraception (in order to avoid an apparent mixed message). (Elliott 2012)

decision: by the end of 2009, half of U.S. states had rejected Title V abstinence-only funds (Doan and R. McFarlane 2012).

For many in public health, this case stands as an example of the victory of evidence over ideology in shaping reproductive health policy. When an ideologically driven program was proven to be a failure, states responded by changing their educational directions. However, others question this interpretation, noting that half of U.S. states still continued providing a failed program. There is also some indication that states that rejected the federal funding may have been reacting against increasingly stringent federal restrictions on block grants, rather than to the evidence of the failure of this type of sex ed programming (Doan and R. McFarlane 2012).

In many health areas, and in policy related to reproductive and maternal health in particular, recent years have evinced a boom in policies that do not appear rooted in evidence. For example, since the early 2000s many U.S. states have passed laws to regulate abortion, often with the rationale that such measures are needed to protect women's health and safety (Siegel 2007, Americans United for Life 2017). These claims are not supported by available evidence, as abortion in the U.S. is among the safest medical procedures performed (National Academies of Sciences 2018). Similarly, states have passed a growing number of laws responding to alcohol use in pregnancy (Roberts et al. 2017); the extent to which evidence influences the passage or implementation of these laws is unclear. To our knowledge, no study has examined the use of evidence in shaping policies in these reproductive and maternal health areas; we do not know whether the role of evidence in policymaking differs between these two issues, or is different than in other health policy issues that have been examined by political science and social science scholars. Prior political science studies suggest that issue controversy and the level of scientific consensus may play a role in policy use of evidence (Prewitt, Schwandt, and Straf 2012), yet little of that research has been done at the state level, where the majority of reproductive health policies are now being passed (Guttmacher Institute 2017, Center for Reproductive Rights 2017). Because our two health issues are the focus of significant state-level legislative activity yet have different levels of controversy and are based in different bodies of evidence, they may be fruitful cases for investigating how lawmakers use evidence in making their policy decisions.

This paper aims to apply existing frameworks on policy use of evidence to a qualitative study of state policymakers' decision-making on maternal and reproductive health policy issues. The purpose of this paper is twofold: first, to examine what prior research and theory suggests about how we might expect evidence to be used in health policy; and second, to compare those expectations with how evidence appears to be used in state policymaking on two currently active maternal and reproductive health policy issues: regulation of abortion, and the use of alcohol in pregnancy. Data come from a qualitative study of state policymakers in Maryland, North Carolina, and Virginia; study details are discussed below.

The paper proceeds in three sections. First, we summarize prior research and key frameworks on policy use of evidence, including the different models of policymaking on which these differing views of evidence rely. Next, we present findings of an application of these frameworks to data from the current study. Finally, we discuss the implications and limitations of this work and make recommendations for public health researchers and policy professionals.

1. PRIOR RESEARCH AND THEORY ON POLICY USE OF EVIDENCE

Even a cursory review of the literature on use of evidence in policymaking reveals that the term *evidence* has a wide variety of meanings in different disciplines. Here we use the definition established by the National Research Council's Committee on the Use of Social Science Knowledge in Public Policy: "knowledge based in science… broadly taken to mean data, information, concepts, research findings, and theories that are generally accepted by the relevant scientific discipline" (Prewitt, Schwandt, and Straf 2012, p. 8).

Though calls for health policy to be rooted in evidence go back decades, the drive for "evidence-based policy" has intensified in mainstream public health since the turn of the 21st century (Brownson, Chriqui, and Stamatakis 2009). Some scholars observe that this trend is related to the health care field's drive for "evidence-based medicine" in the same time period. Evidence-based medicine is "the conscientious, explicit, judicious and reasonable use of modern, best evidence in making decisions about the care of individual patients" (Masic, Miokovic, and Muhamedagic 2008). Proponents of evidence-based medicine call for the use of evidence to define standards of medical practice that can be widely applied; they argue this can improve health care efficiency and effectiveness while potentially reducing costs. In this effort it is generally accepted that relationships between health care interventions and health outcomes can be observed, measured, and interpreted in an objective way. This positivist orientation of medical research has been challenged, as in evaluations of patient-centered outcomes research in the U.S. (Keller et al. 2018), but the *goal* of applying research findings to widespread medical standards is not generally questioned. Prominent recent criticism of clinical practice guidelines as insufficiently driven by evidence (LeFevre 2017) suggests that the use of evidence to shape medical practice is still seen as a worthy and largely achievable goal.

The role of evidence in shaping *policy* is rarely so direct. "Evidence-based policy" suggests too direct and causal a link, not often borne out by reality. Indeed, while some evidence is regularly taken into account in policy decision making – for example, economic data driving interest rate policy (Weiss 1991) – and other notable examples are cited such as public health evidence leading to fluoridation of community water supplies (Fielding and Briss 2006) or provision of childhood vaccinations (Hinman,

Orenstein, and Schuchat 2011), these few clear cases only highlight the absence of others. At best, many suggest that aiming for "evidence-*informed*" policy might be a more realistic goal (Black 2001).

Models of Policymaking

Perspectives on whether and how evidence might be expected to inform health policy depend on what model of policymaking one subscribes to. Summarized by Hanney and colleagues, policymaking models can be conceptualized along a spectrum, including:

- Rational models: In the 1960s and 70s, the classic model of policy decision-making was a rational, linear one, suggesting that policymakers define a problem, seek information to understand that problem and its possible solutions, and then select the policy option that best meets their goals (Hanney et al. 2003). Many scholars consider this type of model simplistic and unrealistic. (It should also be noted that other models are not necessarily "irrational," just less linear.)

- Incrementalist models: These models recognize that policymaking is a complex process involving many factors, rarely proceeding in a line from problem to solution. Policymaking does not move towards predetermined goals but rather is a process of "muddling through" (Lindblom 1959), characterized by many small changes (Hanney et al. 2003). Sometimes this takes the form of punctuated equilibrium (Baumgartner and Jones 1993), in which the slow muddling process is occasionally interrupted quickly and decisively by changing events or new evidence, as in some states' response to the abstinence-only sexuality education study cited earlier.

- Network models: Network models of policymaking acknowledge that a variety of interests influence policy development. Overlapping networks of government officials, interest groups, and sometimes health professionals and/or researchers can interact with policymakers to set agendas and shape outcomes in an incremental policy process. The relationships among these networks is seen as a paramount factor in shaping policy decisions (Weiss 1979).

- Garbage Can model: A classic model of how "organized anarchies" (such as universities) make decisions (Cohen, March, and Olsen 1972), this model recognizes policymaking as a "most untidy process" in which "solutions that might have been disregarded nevertheless remain in the policy-making system, and occasionally there are problems to which they become attached" (Hanney, p. 6). Kingdon's Multiple Streams Approach is an application of a Garbage Can Model that has had enduring impact on the study of public policy (Kingdon 2010, Cairney and Jones 2016). The model asserts that policy decision-making

> happens through the intersection of three independent streams: problems, policies, and politics. When these three streams converge on a given issue, windows of opportunity for policy action are opened. These windows for action remain open only briefly, after which they may remain closed for an extended time; hence policy entrepreneurs aim to recognize open windows and be prepared to spring into action.

Implied within each of these models of policymaking are differing roles for evidence to play in the process. In the technocratic, rationalist view of policymaking, evidence is used as pure data to inform decisions. In more humanistic and socially influenced models such as networks and garbage can models, evidence may contribute to how people understand problems and solutions via a more diffuse, "enlightenment" manner (Weiss 1991).

Prior Research on Policy Use of Evidence

A large body of literature explores how scientific evidence has been used in policymaking in the U.S. and elsewhere; in fact a bewildering range of related theories and frameworks exists across many disciplines. Particularly useful reviews and analysis of the current scholarship on policy use of evidence have been produced by The National Research Council Committee on the Use of Social Science Knowledge in Public Policy, and by Boaz and colleagues (Boaz et al. 2008) and Makkar and colleagues (Makkar et al. 2016), among others. While a full review of this literature is outside the scope of this paper, a few common themes are noteworthy here.

First, we must acknowledge that any discussion of evidence use in policy is complicated by the postmodern debate around the nature of evidence itself. In 21st century scholarship it is widely accepted that knowledge is socially constructed, and therefore dependent on the perspectives, experiences, and biases of both the knowledge producer and consumer. As Stone notes, "facts don't exist independent of interpretive lenses" (Stone 2001, p. 314). Thus the very concept of "evidence-based policy" is admittedly a construction of the historical and social contexts within which any relevant evidence is generated and interpreted (Berridge and Stanton 1999). Some have therefore questioned the relevance of evidence to policymaking, given its inherent subjectivity. Feminist scholars of standpoint epistemology walk the fine line between conceding that evidence is socially constructed yet also positing that such knowledge can be "real" and important, especially in social applications such as policy creation (Harding 1992). Some public health scholars assert that epidemiological evidence must be placed in context of political will and social organizing in order to have any impact on prevention policy (Atwood, Colditz, and Kawachi 1997). Further dissection of these distinctions is better suited to a dissertation in semiotics, but it is important to bear in mind the contested nature of evidence while considering these issues in practice.

One of the most consistent findings from past research on the use of evidence in policymaking is that many different factors shape how policy decisions are made, and evidence is at best one of them. Beliefs, personal values, political considerations, media coverage, "gut instincts," reasoning by analogy, habits, and stereotypes all come into play as policymakers weigh their options and make decisions. In fact, policy decision making is routinely characterized by interactions between values, politics, and science, with science perhaps the least compelling of the three (Waddell et al. 2005, Brownson et al. 2006, Dodson et al. 2013, Redman et al. 2015).

Given this, it is perhaps not surprising that studies of health policy decision making have generally found very little direct use of evidence to guide policy formulation and other decisions (Amara, Ouimet, and Landry 2004, Brownson, Chriqui, and Stamatakis 2009, Ritter 2009, Chagnon et al. 2010). In 1979, Weiss described any expectation of "the direct application of the results of a specific social science study to a pending [policy] decision" as "wildly optimistic" (p. 427-8). Virtually all studies since then agree that such cases are rare.

Frustrated by this absence, many scholars have attempted to identify barriers and facilitators to direct use of evidence in policymaking (Choi et al. 2005, Dodson, Geary, and Brownson 2015). Typical of findings from such studies are those summarized by Feldman et al (2001):

- **"Source matters**—Policy makers are more likely to rely on information from trusted sources, such as peers, leaders in the field, or those with first-hand knowledge of a state's circumstances, priorities, and needs.
- **Substance matters**—Policy makers are more likely to use research that is relevant to problems they are currently facing or are likely to be facing in the foreseeable future.
- **Translation matters**—Policy makers are more likely to pay attention to research if the policy implications of research findings are clearly spelled out; they welcome speculation on the policy implications of research findings.
- **Format matters**—Policy makers are more likely to report using information that is presented in a concise, visually appealing format.
- **Timeliness matters**—Policy makers prefer early, tentative results to late, definitive results.
- **Overload matters**—Policy makers are overwhelmed with information; they gravitate toward mechanisms that help them select the most important information." (p. 313)

It is important to note that these are all instrumentalist considerations, rooted in the assumption that policymakers use evidence with the goal of improving policy. There may be barriers to that use, as in issues with format or timeliness, but the basic assumption of many studies of policy use of evidence is that policymakers value science

for its ability to inform their policy decisions and lead to better policy outcomes (Oliver et al. 2014). As Berridge and Stanton point out, "Underlying all these moves are positivist models of science and rational models of policy making. …The issue is portrayed as a technical one, of securing a functioning working relationship between [research and policy]" (Berridge and Stanton 1999, p. 1133).

In other words, while theories on models of policymaking have moved beyond the simplistic rational models of the 1970s and 80s to embrace the complex, relational and messy nature of policymaking, it is notable that attempts to identify use of evidence in policy still tend to look for direct instrumental examples.

The Weiss/Boswell Conceptual Framework

A more nuanced view of the use of evidence in policymaking comes from Carol Weiss's work evaluating education policy. Weiss characterized policy use of research evidence into three main categories:

- ***instrumental use***: *research as data*, when research knowledge is directly applied to decision-making to address particular problems;

- ***conceptual use***: *research as ideas*, when research influences or informs how policymakers and practitioners think about issues, problems, or potential solutions; and

- ***tactical use***: *research as argument*, when research is used to support or challenge a specific proposal (Weiss 1991).

In the 21st century, scholars have added a fourth use of data in policy making: ***symbolic use***, when research is used to legitimate preferred predetermined positions, or even to delay action indefinitely (Boswell 2009, Prewitt, Schwandt, and Straf 2012). Boswell argues that "research is in fact highly valued by policymakers, and that it plays a crucial role in policymaking and in political argumentation. But the value of expert knowledge does not lie exclusively, or even predominantly, in its contribution to policy." (p. 6) She identifies two key symbolic uses of evidence common in policymaking:

- *Legitimizing:* "By being seen to draw on expert knowledge, an organization can enhance its legitimacy and potentially bolster its claim to resources or jurisdiction over particular policy areas." (p. 7)

- *Substantiating:* "Expert knowledge can help substantiate an organization's or political party's policy preferences, and undermine those of rival agencies or organized interests." (p. 7)

Boswell concludes, "In the cases of both legitimizing and substantiating knowledge usage, drawing on expert knowledge can be seen to have a symbolic rather than a substantive value: it enhances the credibility of agencies or policy positions, rather than improving the quality of an organization's output. It is not so much the content of knowledge that is being valued, as the signal it conveys about the credibility of an organization or its policies." (p. 8)

Weiss's typology of policy use of evidence, with the addition of Boswell's symbolic use category (see Table 3.1), frames the analysis for the data in this paper.

Table 3.1: Weiss/Boswell Typology of Policy Uses of Evidence

Category	Shorthand	Definition
Instrumental use	*research as data*	Research is directly applied to decision-making to inform problem definition or solution selection
Conceptual use	*research as ideas*	Research informs general concepts that can shape how legislators come to understand a problem or solution
Tactical use	*research as argument*	Research is used in policy debate to support or challenge a specific policy proposal
Symbolic use	*research as signal*	Research is used to enhance credibility or legitimacy, to convey uncertainty about a policy, or to delay policy action

Adapted from Weiss 1991 and Boswell 2009.

Research Gaps and Limitations

Prior research on use of evidence in policymaking has some important limitations. As might be expected given the wide range of disciplines addressing this question, there are significant variations in definition and operationalization of frameworks on policy use of evidence. In particular, despite the heuristic value of Weiss's definitions, many have noted that "conceptual use," "tactical use" and the like are abstract concepts with a good deal of definitional overlap; they have certainly been defined inconsistently in the literature (Weiss 1979, Lavis, Ross, and Hurley 2002, Sumner et al. 2011, Lemay and Sá 2014, Redman et al. 2015). Even Weiss herself changed definitions over time, early on labeling as "tactical use" such cases as using evidence to delay action, deflect criticism, or enhance prestige (Weiss 1979). In later work, she limited the term "tactical use" to using research in policy argument, with the acknowledgement that some

evidence-based arguments are used to legitimate decisions already made (Weiss 1991); others later adapted these earlier cases into the added category of "symbolic use"(Boswell 2009). Such definitional variations complicate attempts to apply these typologies and categorize case studies of policy use of evidence.

Scholars trying to study use of evidence in real-world policy settings have employed various methods to try to resolve the definitional confusion, none wholly satisfactory. As one example, Contandriopolous and colleagues limited their important review of "active knowledge exchange efforts" to include only deliberate, instrumental communications attempting to inform the policy actions of others, thus missing many passive (conceptual) and symbolic uses of evidence that may be part of a more common "enlightenment" role played by evidence in the policy process (Contandriopoulos et al. 2010). In the current study, we note where definitional overlap clouded our efforts and how we attempted to resolve this issue.

Secondly, many prior studies directly ask policymakers to report on their use of evidence. These assume that policymakers (or indeed anyone) can readily assess their own use of evidence and report on it accurately. Such assumptions are challenged by work in the field of cognitive psychology, which demonstrates how unconscious cognitive processes influence decision making, leading people to prioritize some forms of evidence while ignoring others (Kahneman 2011). In particular, motivated reasoning – the often-unconscious way in which people process information selectively in order to confirm and maintain their prior beliefs – is now well documented among the general public (Lord, Ross, and Lepper 1979, Kraft, Lodge, and Taber 2015, Gollust, Barry, and Niederdeppe 2017); however such biases have often been left out of studies of policymakers' decision making.

Cognitive psychology also suggests that how questions are framed in interviews with policymakers can trigger unconscious biases, leading to response bias (where the researcher inadvertently signals that a certain kind of response is wanted). Many studies of policy use of evidence start by asking policymakers how they use evidence or data; these tend to yield findings that data and analysis play a significant role in policymaking (Apollonio and Bero 2017, Brennan et al. 2017, Makkar et al. 2017). By contrast, studies such as ours that lead by asking policymakers more generally to describe how they make decisions or set priorities on specific policy issues may be more likely to find that evidence is given a relatively low priority compared to other factors (Dodson et al. 2013, Black 2001).

Thirdly, much research on policy use of evidence was done at the federal level and before the development of the current era of extreme partisanship in U.S. politics. For example, Weiss's framework on policy use of evidence was developed based on studies of Congress in the 1980s, well before the 1994 "Republican Revolution" which many see as the beginning of a shift toward entrenched partisanship among politicians and the

public (Pew Research Center 2014). This is significant because some research suggests that partisan political identity may affect use of evidence (Gauchat 2012, Jelen and Lockett 2014), with conservatives in particular showing less trust in science than others (Hamilton 2015). Also, in 1991 Weiss noted that using research to support policy argument is effective in policy debate only because most legislators share values on most issues: "By and large, this is not a society with violently divergent, polarized positions. The most conservative Republicans are concerned, to some degree, with the plight of the homeless and the health and education of new immigrants of color. The most liberal Democrats care about the competitiveness of American industry and reduction of the budget deficit. Political actors across the spectrum respond to many of the same values, if with different intensity, and can be prevailed upon to consider policy proposals in light of a range of criteria" (p. 328). This view of bipartisan values-sharing seems almost quaint in light of the polarized antipathy of today's politics. This is why the addition of symbolic use of evidence adds a critical dimension to understanding policy use of evidence, and is taken into account in the current study.

One factor not usually addressed in prior studies is how the degree of consensus on a scientific issue affects use of evidence in policymaking. Esterling (2004) has observed that given legislators' inherent risk-averse nature, they prefer not to implement policies that have greater levels of uncertainty. Thus one important role of evidence is to assess levels of certainty: legislators will assess how interest groups are using evidence to back their case. A high volume of evidence cited by interest groups will give legislators comfort about the likely success of a proposed program; its lack may indicate that uncertainty about a proposed initiative is unacceptably high (Esterling 2004). Makkar et al (2016) also touch on the issue of uncertainty and use of evidence, but to our knowledge, no other research has applied this theory to case studies of policy use of evidence. In the current study, we looked at how levels of scientific consensus and uncertainty may interact with use of evidence.

Finally, the topics to which the question of how evidence shapes policy has been applied are varied but far from exhaustive. Previous research has examined the role of evidence in federal alcohol policy (Greenfield, Johnson, and Giesbrecht 2004), education (Weiss 1991, Virtue 2007), tobacco control (Blackman 2005), alcohol control (Hale 2011), international development (Prewitt, Schwandt, and Straf 2012), health care (Contandriopoulos et al. 2010), environmental policy (Keller 2009), and elder care (Feldman, Nadash, and Gursen 2001). To our knowledge, no study has examined how evidence shapes the reproductive and maternal health policy issues covered here. This is important because in the politically charged arena of maternal and reproductive health policy, researchers, practitioners, and advocates need to develop a more nuanced understanding of the role of evidence in policymaking, informed by current political and cognitive science frameworks on policy decision-making, in order to help shape reproductive health policy and improve outcomes.

2. CURRENT STUDY

Goals and Expectations Driving This Research

This study sought to explore two active areas of state policymaking in maternal and reproductive health – regulation of abortion and alcohol use in pregnancy – to shed light on why state policies in these areas do not appear to reflect current best evidence on these issues. These issues were chosen because both are current dynamic policy issues at the state level, affecting important aspects of maternal and reproductive health, with large numbers of restrictive or punitive state laws being passed (Roberts et al. 2017, Nash et al. 2018) in apparent contravention of current evidence.

There are also important differences between the two health topics chosen, notably in the partisan divisions on the two issues. Abortion is notoriously one of the most polarized topics in American politics, with opinions hardened into two distinct camps (Evans 2009). Efforts to address the issue of substance use in pregnancy, on the other hand, have bipartisan support at the federal level (e.g., *Maternal Opioid Treatment, Health, Education, and Recovery Act of 2018 (H.R. 5492)*). There are also differences in the bodies of evidence on these issues. As noted previously, there is wide consensus that legal abortion is safe, and that many abortion policies harm rather than help women's health (National Academies of Sciences 2018), while there is less consensus in the mainstream scientific and medical communities on how to interpret the data on the risks of various levels of alcohol use during pregnancy (O'Connor and Whaley 2006, O'Leary and Bower 2012), and limited research on the impact of policies addressing alcohol use during pregnancy (Cil 2017, Albrecht, Lindsay, and Terplan 2011). These differences may have implications for use of evidence on these policy issues.

This was an exploratory, qualitative study, and as such was not intended to test a set hypothesis. However, based on the differences between the two health issues and the literature on policy use of evidence, we expected to find limited instrumental use of evidence on abortion policy, along with high levels of symbolic and tactical (argumentative) use – in keeping with the polarized pro-choice/pro-life abortion rhetoric dominating so much of U.S. public discourse on abortion (Hayden 2009). On substance use in pregnancy, an arguably less polarized issue with more open questions regarding impact and policy options, we anticipated more instrumental use of evidence as lawmakers sought to attempt to understand the issue and its possible solutions. Given cognitive psychology literature, we also expected to find examples of motivated reasoning and other cognitive biases on both issues.

Methods

To explore these issues, we conducted semi-structured in-depth interviews with state legislators and their aides in three states (Maryland, North Carolina, and Virginia), and

attempted to apply the expanded Weiss-Boswell typology above to analyze and interpret the data. Details about study participants and methods have been reported previously (Woodruff 2018a, Woodruff 2018b). Briefly, we selected Maryland, North Carolina, and Virginia for our research because they are neighboring states that share many socio-political similarities yet have different mixes of policies on the two health areas of interest. In all three states, we recruited legislators from the primary health-related committees of the General Assembly, as well as sponsors and co-sponsors of 2017 bills on abortion or substance use in pregnancy, and members of committees that voted on 2017 bills on abortion or substance use in pregnancy. We sent outreach emails to 132 legislators, following up by telephone and, sometimes, in person (when in each state capitol). We made additional outreach attempts with Republican legislators when it became apparent that more Democrats than Republicans were agreeing to be interviewed. (See Table 3.2.) The protocol for this research was reviewed and approved by the Committee for the Protection of Human Subjects at the University of California, Berkeley.

We conducted open-ended interviews with 29 legislators and aides in March through July 2017. Twenty-six interviews were with elected officials themselves and three were with legislative aides. Twenty-three were conducted in person (in a location of the participant's choosing, usually their office); six were conducted over the phone. Interviews ranged in length from 12 to 53 minutes, with a mean of 34 minutes.

Our interview guide was designed to allow for a scalable interview, covering one specific piece of legislation or a broader set of policy questions, as appropriate for the participant's legislative experience and the time constraints of the interview. In general, we asked participants to describe their decision-making on recent bills related to abortion and/or substance use in pregnancy. (Because many bills considered in these three states in 2017 covered both alcohol and drug use during pregnancy in a single bill, our interview guide covered policies related to a range of substances used in pregnancy, rather than focusing only on alcohol use in pregnancy.) Follow-up questions probed for factors that were particularly influential in legislators' decision-making process (studies/research evidence, stories, testimony, personal experiences, etc.). We also explored how participants assessed the credibility of any evidence they used and how they balanced evidence with other factors.

All interviews were audio-recorded and transcribed. Transcripts were uploaded to Dedoose (version 7.0.23, 2017) for coding and analysis. Coding was conducted using a definition scheme based on the expanded Weiss-Boswell typology described above; representative quotations were extracted to illustrate each of the types of use of evidence as described in this framework. We also identified examples of cognitive biases in use of evidence that did not appear to fit any of the Weiss-Boswell categories; these are discussed below.

Table 3.2: Characteristics of Study Participants, by State

	MD	NC	VA	TOTAL
N	**10**	**8**	**11**	**29**
Gender				
Female	4	3	5	12
Male	6	5	6	17
Political Party				
Democrat	6	7	7	20
Republican	4	1	4	9
Legislative Body				
House of Delegates	3	4	6	13
Senate	7	4	5	16
Office Held				
Legislator	8	8	10	26
Legislative Aide	2	0	1	3
Years in Office *(median, range)*	6.5 (1-22)	5.5 (2-15)	13.5 (2-37)	8 (1-37)

Findings

Prior papers from this study have demonstrated the underuse of evidence to directly shape policy on abortion and substance use in pregnancy. For example, basic evidence on the prevalence and harms of alcohol use in pregnancy does not appear to influence state lawmakers' policy priorities on substance use in pregnancy (Woodruff 2018a). Similarly, we found no instances of evidence changing legislators' decisions on abortion policy. Rather, legislators' decisions on the regulation of abortion seem largely shaped by ideology, not evidence, and they select and use evidence mainly to substantiate preferred policy positions on abortion (Woodruff 2018c).

Other findings were that evidence is outweighed by anecdotes and personal stories in legislative decision-making. Indeed, legislators have a much broader view of what constitutes "evidence" than just scientific evidence, considering elements such as personal experience, anecdotes, constituent preferences, values, etc. to be "evidence" for or against a given position; they view it as their job to weigh scientific evidence (which they see as potentially biased) against these other factors. However, while legislators view research evidence with some suspicion or cynicism, and trust anecdotes

more than evidence, they do appear to make use of scientific evidence to substantiate their positions and argue their case to others (Woodruff 2018c).

For the current paper, we limit our findings to those related to the typology of policy use of evidence described earlier. We examine cases of instrumental use, conceptual use, tactical use, and symbolic use, as well as examples of motivated reasoning and other cognitive biases relevant to evidence use in policymaking.

Instrumental use:

Based on Weiss (1991), we defined instrumental use of evidence as the direct and purposeful application of research evidence to decision-making to inform problem definition or solution selection. Across all interviews, we only found one example that clearly meets this definition of deliberative instrumental use of evidence to shape policy. One legislator reported that he asked his state's Department of Health Services for data analysis to help decide whether to accept federal child abuse prevention dollars that were tied to mandatory reporting of women's use of prescription opioids during pregnancy. Though he found this evidence helpful in decision-making, ultimately the values around the issue were more compelling to him than the data.

> *The federal funding [for the state] was somewhere around $500,000. So when you broke it down across the whole state, and I had someone do an analysis, I asked them for that, [my] county was to receive something negligible…. And I looked at how many cases [my] county would investigate – it was a pretty decent amount... So it would cost more to investigate these cases than the money we'd be getting back as a county. So that data showed me that the fiscal piece didn't match up for me.*
>
> *But more importantly was – it was a policy call. And that call was that, do you want mothers to have to be fearful of having the government essentially come into their house to do this investigation? Which seemed to me a pretty invasive process, when they're legally prescribed and cared for and monitored to take this drug.* (Democrat)

This example represents a slightly different definition of "evidence" than that which we posited, as it refers to data analysis by a member of the state bureaucracy, rather than scientific evidence generated by researchers. Yet it is notable in that it was the only time in our interviews that a legislator reported proactively seeking *any* kind of data or evidence to help understand or decide how to vote on one of our maternal and reproductive health issues.

Conceptual use:

We defined conceptual use of evidence as when evidence informs general concepts that can shape how legislators come to understand a problem or solution. As Weiss notes, in this use of evidence, "Most of the paraphernalia of research [e.g., specifics of methodology, sample size, etc.] has been stripped away… The original research findings are reduced to a simple 'story,' qualifying statements are lost, and the conclusions are often stretched beyond the findings of the study" (Weiss 1991, pg. 311). In our study, this use of evidence was more common than instrumental use. For example, one Democrat described how impact evaluations of social policies had led him to support investments in programs for low income pregnant women, such as those giving them priority access to substance use treatment.

> *My belief is that within the realm of evidence-based policy, that the really good stuff, the peer-reviewed double-blind solid evidence, is in the area of early childhood. Which is why, from a public policy standpoint, that's my top area. Supporting investments in [early childhood] is I think is the most politically feasible, the most fiscally feasible, and the most enticing from the standpoint of long-term impact. So, it's got this nice trifecta of, political possibility, financial plausibility, and human potential. (Democrat)*

When asked, this legislator could not refer to any specific studies on the impact of early childhood investments, even in broad strokes. However he felt sure that he could trust the source of his information: a large foundation funding research on early childhood.

> *To me, it's a highly credible source when I'm talking to a major philanthropy that has already committed millions of dollars and… they're only committed to results, right? There's little to no political pressure on these major philanthropies... So, if they come to me and say, "We just spent $10 million and it worked," I'm gonna take that real serious. (Democrat)*

We also found instances of conceptual use of data when we asked legislators whether they were concerned about the safety of abortion. As one Democratic lawmaker said:

> *I think the safety issue is when you do it with a coat hanger or drink bleach or something, because you don't have access to a doctor or a clinic. Most of the safety issues are when you restrict abortion, not when you provide it. And I don't know the statistics, but I remember that was part of the debate, or the background – it was like, the risks are really miniscule. I don't remember what the number is but – safer than, like, a colonoscopy. So, no, no, no concerns about the safety aspect. (Democrat)*

Similarly, another Democrat said:

> *It's more, if we end up* not *making abortion available to women, I see lots of horrible health and safety concerns attached to that. …No, it is safe. It is safe. I've heard* [laughs]*, I've heard that it's as safe as going to the dentist. (Democrat)*

These comments appear to refer obliquely to a groundbreaking study finding a low rate of complications following abortions in the U.S. (Upadhyay et al. 2015), which received significant news coverage. Much of this news coverage reported that the complication rate for abortion is lower than that for wisdom tooth removal or colonoscopy (Doyle 2014, Haynes 2014, Oaklander 2014, Engel 2014, Moscatello 2014). It appears to be this type of reported sound bite, rather than any specifics of the primary research findings, that left a lasting impression on lawmakers; in this way the general concept informs legislators' thinking, without any details from the research. Notable in this case is that the high-level concept the legislators retained from this research is essentially accurate, which is certainly not always the case when scientific evidence is conveyed through media coverage (Huertas and Kriegsman 2014, Haber et al. 2018).

Tactical use:

In 1991, Weiss noted that in tactical use of evidence, not only has research been diluted (as in conceptual use), but something has been added: an advocacy position. Weiss concluded that this use of evidence as a tool of argumentative persuasion was the most common use of evidence in legislatures: "Because the legislature is the quintessential site for the resolution of ideological and interest-based differences, argumentation is the prevailing mode, and research that supports argumentation will be welcome" (p. 315).

However, our study did not reveal many cases of tactical use of evidence. One rare instance was when a pro-life Republican looked into his state's statistics on abortion provision in order to dispute a national research institute's report of an increase in abortion in the state. His effort seemed focused not on getting clarity on the actual abortion rate but on discrediting the opposition's argument.

> *Guttmacher did some report trying to show our actual abortion rate had actually gone up a tad in 2013, '14, but I got into the real statistics on that. It just wasn't true… So this is the crazy thing the abortionists do: they say all these restrictions just keep women from getting abortions or they're dying in back alleys for lack of abortion [services]. On the other hand they have another set of reports that said actually [abortion restrictions] have no effect on the abortion rate. Well, obviously both of those can't be true… But that's just typical for them. (Republican)*

More common than using evidence to support an argument was the tactic of using *conjectured* evidence to argue a point when the respondent did not have any actual

evidence to be used. That is, respondents more than once claimed that while they did not know of specific evidence to support their argument, they were sure that the evidence, if known, *would* back up their argument. For example, one respondent objected to laws requiring mandatory reporting of substance use during pregnancy because of her concerns about bias in reporting and disparities in resources for substance abuse treatment.

> *I am willing to venture, right now, without having any data in front of me, that there will be certain pockets of our state where there will be many more referrals of women who are addicted to substances they shouldn't be using during pregnancy, and these areas will have fewer community resources to treat the women. And I bet you they'll be high poverty. I mean, I could almost pick the zip codes... I mean, I don't know that, but I'm certain of it. (Democrat)*

While hypothesizing as to what might happen if a given policy were implemented is certainly a reasonable facet of policy debate, it was notable that several respondents felt comfortable relying on their "sense" of the facts around an issue to make a policy argument. For example, one respondent objected to a mandatory reporting bill's inclusion of legally prescribed substances used in pregnancy; he claimed this concern was supported by data, despite not actually knowing any data on the use of legal vs. illegal substances in pregnancy.

> *I remember them saying, no matter what, as long as there is a substance, it triggers the reporting requirement. So, [I asked,] what if somebody's on [a] prescription? They said it still gets triggered. Okay, that to me is a problem... I mean, the average soon-to-be mother probably is not using anything that's illegal anyway. I think that it's a small percentage… I mean, maybe the data's there, but my sense is it's not a big issue. Which, it might be increasing, but still, why penalize everybody for something they've done legally, just because there's a handful of drug users out there? I just think that's wrong. (Aide to Democrat)*

On the issue of abortion policy, we found few cases of tactical use of evidence. But we did find respondents pointing to their political opposition's *lack* of evidence, and criticizing the other side for failing to take evidence into account when making abortion policy. Members of each political party claimed that the other party had effectively gone "off the deep end" in using politics rather than evidence to decide their positions on abortion.

> *Politically, [abortion] is very important to the [conservative Republican] base. So, there's going to be an abortion bill here every single year. Just like there's gonna be a gun bill every single year, and there's gonna be a bill kickin' around gay people every single year. In general, there are four or five issues where, to demonstrate your allegiance to the Republican primary electorate, you've got to*

support those issues, and abortion is just one of them. So since I have been here, I have seen no abortion regulation bill that seemed based in evidence or common sense. It seems to me to be an area almost completely devoid of reality. I feel like Republicans have just gone completely off the deep end on this issue, but – you know, I'll listen to what they have to say. If they've got something real, that there's a real problem, I'm all ears. (Democrat)

You have to understand, we have a three to one ratio in the Senate, three Democrats to every Republican. So what the Democrats want, the Democrats get. And the Democrats have made a philosophical decision – it's just a philosophical decision here by the majority party across the board, not to address abortion no matter what the logic says. (Republican)

Of course, in our interviews, our respondents were not directly trying to convince us of their policy positions, so perhaps it is not surprising that tactical use of evidence was rare. Yet it was striking that in discussing their policy decision making, our respondents were more likely to conjecture about potential evidence and criticize the opposition's lack of evidence than to argue from actual evidence for their own policy positions.

Symbolic use:

The symbolic uses of evidence identified by Boswell and others (Hanney et al. 2003, Prewitt, Schwandt, and Straf 2012) include using evidence to substantiate a predetermined policy preference, to validate a position by cloaking it in scientific legitimacy, to introduce uncertainty into policy debate, and to delay action. Our interviews reveal instances of several of these symbolic uses of evidence.

In discussing punitive policies (those that seek to control women who use substances during pregnancy, such as mandating civil commitment of pregnant alcohol abusers), one Democrat described how she used evidence to justify her preferred position on other punitive policies:

I mean, I've got a bleeding heart, so it's my preference always to try and give somebody a hand up, just to help improve a life, certainly away from the punitive, incarceration route. And the empirical stuff, I mean – I know in [youth criminal justice issues], if you try them as a youth, support them, the recidivism rate is much lower than if you put them in an adult prison, and it ends up costing a lot less because kids don't end up with an adult criminal record, they can get jobs, they don't end up on public assistance... But I just use the economic argument to sound less like a bleeding heart liberal, you know, or when I need to convince a conservative. Really I just think it's the right thing to do. (Democrat)

On abortion policy, a conservative Republican referenced a wide array of published evidence in a clear effort to bring credibility to the medically disputed concept of "fetal pain."

> *There's lots of studies that have been done that point to unborn babies, at least by 20 weeks – and significant evidence even before then – that they are capable of feeling pain. Obviously, that's the scientific basis for this legislation… I mean, I've got a huge list of all these different studies from, you know, all kinds of prominent [journals] – British Medical Journal, Brain and Development, there's one from Fetal and Neonatal Medicine – I'm just looking at a list here of – yeah, 33 pages worth of studies. (Aide to Republican)*

Another Republican reported using a single study to try to inject uncertainty into policy discussion about the long-term impact of abortion.

> *You will hear repeated, repeated, endlessly repeated that there's no association between abortion and breast cancer. Well, one of the studies I [saw] was from Tianjin, China… and they found there is a causal association between abortion and breast cancer. I don't remember the statistics but I think if you had one abortion, 44 percent elevated risk of breast cancer, jumps to 68 percent [after 2 or more abortions] – and you know, abortionists never tell women that. They claim it's safe but maybe long-term it's not… I'm just saying we need to talk about that more, we don't know, we have to be careful. (Republican)*

We did not find clear cases of using evidence (or calls for more evidence) to delay legislative action on these policy issues.

Cognitive biases

Our study shows evidence that state policymakers are not immune from cognitive biases in decision making. For example, "false consensus bias" is the tendency to overestimate the extent to which one's own opinions, beliefs, habits and choices, or those of one's immediate social circle, are normal and typical of all people (Ross, Greene, and House 1977). Respondents demonstrated this bias when they assumed that experiences of their own social networks represented those of the public at large. For example:

> *Alcohol during pregnancy? Do I think that's a problem? You know, everybody I know, that's how you know they're pregnant, when they're not drinking. So – yeah, nobody does that anymore. (Democrat)*

Similarly, another Democrat reported:

> *In my neck of the woods, I mean, we're all very healthy, and just very highly educated. I just don't see a big problem with [substance use in pregnancy]. (Democrat)*

In an example of another type of cognitive bias, when discussing the issue of substance use in pregnancy, one conservative Republican explained how he came to his understanding of the impact of parental drug use on the fetus:

> *Well, I can't pinpoint a study. I just – I've served on the [Health] committee now for the last six years, I've heard people speak about how bad these addictions are and how much effect they have on the fetus. And the way that I recall the description is, if the mother is an addict and a routine user of the drug, then, you know, nine times out of ten, the child is going to end up with some kind of an addiction to whatever drug she's using. That's just a fact. (Republican)*

It seems important to note here that this is not, in fact, "a fact."[7] However, as a perspective that seems to confirm this legislator's views on responsibility and addiction, which he discussed elsewhere in the interview, it is a "fact" that he easily brings to mind and uses when considering these issues. This appears to be an example of confirmation bias: the tendency to search for, interpret, or recall information in a way that confirms one's pre-existing beliefs or hypotheses (Klayman 1995, Sloman and Fernbach 2017).

3. DISCUSSION

This exploratory study adds to the literature on how evidence is used in policy decision making. In agreement with prior research, this study found almost no instrumental use of evidence to directly inform policy decisions. This was true even on the issue of substance use in pregnancy, about which our participants reported being concerned and confused; despite expressing a desire to know more about the issue, they did not appear to turn to research evidence to understand the problem or possible solutions. We found that evidence was sometimes used to inform high-level conceptualizations of problems; this was most apparent among Democrats on the issue of abortion (e.g., understanding abortion as safe).

Tactical use of evidence to argue policy positions was limited as well. While Weiss concluded that most use of data in legislative settings is argumentative, our findings

[7] Many factors affect the relationship between in-utero drug exposure and development of NAS, making exact links between the two difficult to assess. The current best evidence suggests that between 40 and 70% of newborns with regular prenatal exposure to opioids will manifest symptoms of physical withdrawal (Patrick et al. 2012, Tolia et al. 2015, Patrick et al. 2015).

support Boswell's more recent conclusion that most policy use of evidence is symbolic. This may be a sign that increasing partisanship has shifted legislators' use of evidence away from trying to convince their opponents, toward more symbolic uses. We found several cases of legislators using evidence to support a predetermined policy preference, to attempt to validate a position via scientific legitimacy, and to introduce uncertainty into policy debate. Even more significant, perhaps, is our finding that policymakers are comfortable making arguments using hypothetical "evidence" that they are sure would back up their case, if only they had it. Asserting by conjecture about evidence that does not exist may be the most symbolic use of evidence yet.

This study calls into question the value of applying the Weiss-Boswell typology to distinguish between different uses of evidence in policymaking. While the distinctions between categories are useful in theory, in practice their definitions do not allow for clear-cut decisions about how references to evidence are to be categorized. This makes application challenging, as noted by others in prior research (Contandriopoulos et al. 2010, Lemay and Sá 2014). Others have noted that instrumental and conceptual use are overlapping concepts (Makkar et al. 2016), but we found the biggest challenges in distinguishing between conceptual and tactical use. For example, the way that some participants talked about the safety of abortion ("safer than, like, a colonoscopy") appeared to be a case of conceptual use of data, but it could also be categorized as tactical use, using a general concept from evidence to argue a position on the issue. Without insight into our participants' inner views and motivations, we found it difficult to tell when someone was making a policy argument on an issue versus reporting on how they viewed an issue more broadly.

However, the essential contribution of this application of the typology may be not specifically to categorize the different uses of evidence but to demonstrate that on these maternal and reproductive health issues, there are many uses beyond the instrumental use long assumed to be the model. This is important because our current political climate often appears to suggest that facts don't matter at all (Nyhan and Reifler 2010, Bluemle 2018). Seeing few direct signs of evidence shaping policy instrumentally, many observers may assume evidence plays no role at all in the policy process. However, the uses of evidence we found point to a research mindset that is alive and well among legislators, though different than the instrumental approach expected in the 1970s and 80s. The practices of being informed by high-level concepts from research, arguing using evidence from science, and even using evidence to justify one's position or convey credibility, all point to the enduring value of evidence in policy decision making. As Prewitt et al note, "It is a frequent complaint among scientists that policy makers use scientific evidence as confirmation of prior beliefs. This complaint, however, overlooks the fact that, when policy makers argue on the basis of evidence, it is more difficult for their opponents to ignore that evidence, or to leave it unchallenged. 'My science versus your science' has the merit of putting science in play, and over time opens more space for policy arguments that include scientific evidence" (p. 38). Perhaps

this perspective is as absurdly Pollyannaish as the idea that evidence is irrelevant is pessimistic – a question that future research on policy decision making should aim to explore.

The role of cognitive biases such as motivated reasoning and related partisan issues seems an important factor that is entirely left out of the Weiss model. Some scholars theorize that motivated reasoning is not equally distributed across the political spectrum – conservatives are more likely than liberals to reject evidence that conflicts with their views (Gauchat 2012, Motta 2018). This may be because political considerations such as appealing to their base and appearing non-elite are leading some on the right to reject expert opinion, while those on the left may see political benefits in respecting the role of science. However, other scholars have noted that ideologically motivated cognition may help cement "belonging" and signal loyalty to key affinity groups – such as, perhaps, political party (Kraft, Lodge, and Taber 2015). This suggests that motivated reasoning may be equally likely on both sides of the political spectrum. On this question, we do not have definitive findings. Our abortion study found that Republicans were more likely to see the scientific enterprise as potentially biased, while Democrats noted that selection and highlighting of particular findings was an expected tool of the political process (Woodruff 2018c). In the current study, we did not observe clear differences in motivated reasoning or cognitive biases by political party. Further research is needed to explore this question in more depth.

In our research, we explored how different levels of scientific certainty may affect policy use of evidence (Esterling 2004, Makkar et al. 2016). We anticipated that instrumental use of evidence may be higher on issues where there is less scientific consensus on the problem or solutions, as in substance use in pregnancy, a topic our respondents expressed a good deal of uncertainty about. In our research, however, legislators do not appear to respond to uncertainty by seeking out evidence on these issues, as theorized. Rather, if they are uncertain about an issue, they are likely to refer to their own experience, or turn to trusted experts. These experts may or may not be researchers who can refer to scientific evidence; they are often doctors, social workers, or other professionals working in the field who can bring some "real expertise" to back up the statistics that may be viewed with some suspicion. In other words, in the social networks used by the state legislators in our study, comfort and certainty about a policy proposal are provided by the people they know, not the studies those people may (or may not) cite (Woodruff 2018a, Woodruff 2018b).

This has important implications for maternal and reproductive health practitioners and researchers looking to inject more evidence into policymaking. As Dodson et al note, many state legislators recognize their pragmatic limitations in terms of assessing evidence; in their study, legislators "were aware that they could not and need not know everything about every subject as long as they had an unbiased expert to whom they could turn" (Dodson, Geary, and Brownson 2015, p. 844). It is important for researchers

to realize that the benefit of communicating with legislators about their work is not that legislators will remember their findings, but that they will remember *them.* Researchers' goal in developing relationships with legislators and their staff and intermediaries should not be purely to educate but rather to become a trusted source to whom legislators can turn for a "reality check" when they need guidance on a topic related to their work.

We expected to find important differences in how policymakers use evidence when we compared a partisan issue like abortion with substance use in pregnancy, which generates bipartisan concern (Miller and Santorum 2017). However, we were surprised in this study to find few differences between the two issues. Despite the differences in controversy and level of scientific consensus on the issues, policymakers in our study mostly used evidence symbolically in relation to both topics. One difference was that conceptual use of evidence to inform general views of the issue seemed higher on abortion than on substance use in pregnancy. This may reflect the fact that scientific consensus is higher on abortion's safety than on the harms from or responses to substance use in pregnancy; such consensus may lead to a more consistent message being diffused and thus influencing policymakers' concepts about the topic. However, this explanation cannot be confirmed by the findings of this study. More research is needed to explore the relationship between scientific consensus and policy use of evidence.

Limitations

Beyond the challenge of applying the Weiss-Boswell typology to these data, this study has other limitations. It is clear that our sample was not representative, given that our respondent pool was more Democratic (and more female) than the overall makeup of the General Assemblies in all three states. If there are important differences in how Republicans and Democrats (or men and women) use evidence, or use it in the area of maternal and reproductive health in particular, our study was not able to determine these. Further, we acknowledge that the three states chosen for this study cannot represent all U.S. states. The specific context of these mid-sized Southern states, with part-time citizen legislatures and little substantive legislative staff support, may mean that these findings are most useful in states with similar contexts. However, it is worth noting that only 10 U.S. states have full-time professional legislatures, with significant numbers of policy-focused staff per representative. The legislatures of the remaining 40 states have structures similar to or even less professionalized than those where we conducted our study (Weberg 2017).

Another potential limitation of this study is related to social desirability bias; some may question whether legislators would share their true views on research with a researcher. We did carefully craft the interview guide to discuss decision-making overall, rather than leading with how participants use evidence, in order to reduce this possibility. However

in the interviews, we were surprised to find that legislators were quite willing to admit that they had little or no evidence, as we defined it, to back up their views (Woodruff 2018c). In fact many noted that it was their job to put evidence into its proper place in the hierarchy of political considerations, constituent concerns, special interest factors, anecdotes and personal experience that informed their decision making – and it was clear that evidence ranked lower than these other considerations in their hierarchy.

Finally, this study considers only the perspectives of legislators and their aides. Although these are very important policymakers to consider when assessing policy use of evidence, "policymakers" is a term that applies far more broadly. Administrators in executive branch bureaucracies, and even judges in the judicial branch, may use evidence in different ways to shape policy that impacts maternal and reproductive health just as widely as the legislative branch does (Poot et al. 2018). This study can not assess the ways these other types of policymakers may use evidence in shaping health policy.

Conclusions

This study reinforces prior political science literature finding that state lawmakers use evidence more to substantiate and support existing policy preferences than for any other use. A novel finding may be that of some policymakers relying on and even "citing" "evidence" that doesn't actually exist. Though these findings may paint a bleak picture for those hoping to increase evidence-informed policy, we find reasons for at least some hope. Our study finds that not all non-instrumental uses of evidence are necessarily the superficial, self-serving selection of evidence that has come to be understood by the term "motivated reasoning." Indeed, many legislators we spoke to – including some on both sides of the political divide – demonstrated an evidence mindset that we believe points to the enduring value of evidence in policy debate. Even if it is not instrumental to decision making, research is still important to motivate, inform, and even provide persuasive "ammunition" to those lawmakers who are predisposed to agree.

We believe the fields of reproductive and maternal health must grapple with the political reality of use of evidence. If researchers accept that evidence is used largely to inform general concepts and substantiate predetermined policy positions, it may help them target some of their dissemination efforts strategically toward policymakers who are open to policy solutions aligned with the evidence. While this focus may make some researchers uncomfortable, such a pragmatic approach to policy use of evidence may provide the best hope for good research to be applied in improving reproductive and maternal health.

CONCLUSION

In exploring use of evidence in making reproductive and maternal health policy in U.S. states, this work affirms prior literature finding that evidence does not instrumentally shape state legislators' policy decisions. Personal experience, anecdotes, and known contacts are more influential in shaping legislators' views on these issues than evidence is. On abortion, legislators use selected evidence to substantiate preferred policy positions; on substance use in pregnancy, legislators appear to generalize from what they know about addiction and substance use in general to inform their understanding of alcohol and drug use in pregnancy, without attention to whether these generalizations are supported by evidence specific to use in pregnancy.

Interestingly, both Democrats and Republicans appeared to acknowledge that evidence *should* be an important factor in shaping policymaking, as legislators on both sides criticized their opponents for not basing their abortion policy in evidence. However, both sides revealed that their own party's positions on abortion were based more in ideology than evidence. Evidence did appear to contribute to some legislators' general understanding the safety of abortion, a potentially important conceptual use of evidence. On substance use in pregnancy, our data found no noticeable differences in attitudes toward or use of evidence by political party.

Surprising findings were that state lawmakers are comfortable using their "sense" of what the evidence might show to "cite" "evidence" that doesn't actually exist. We were also surprised to find that legislators do not consider alcohol use in pregnancy to be a pressing or salient issue, despite evidence showing its harms.

Reflecting on this work and public health practice, I conclude those who want to see more evidence used in policymaking tend to make several mistaken assumptions. First, in much public health work I see a focus on increasing research *dissemination,* rather than working to increase *utilization*. In other words, we essentially mistake the *supply* for the *demand*. But if policymakers are not making use of the available research instrumentally to inform their decision making, then efforts to enhance the volume and quality of the research available, without attention to the needs and priorities of policymakers, will likely continue to disappoint. The directionality of public health dissemination efforts tends to be from researchers toward policymakers, whereas I believe we need more attention to understanding the real ways policymakers use evidence in order to be effective.

Second, public health often mistakes the *facts* for the *argument*. Some seem to hope that just presenting public health evidence will almost magically lead to action. But this work shows that no matter how compelling the evidence, in policy debate that evidence

becomes – at best – just one part of the argument. It must be placed in context of values, stories, priorities, and competing needs, to make the case for a given policy. This study suggests that given political limitations, fiscal limitations, constituent needs, and other interests, policymakers may find a variety of policy options to be sensible and acceptable, even if those options are not supported by existing evidence.

In fact, we may be mistaken in assuming a shared value for evidence at all. Even if we in public health acknowledge that evidence alone won't carry the day in policy debate, we do expect policymakers to agree that having policy reflect the best available evidence is a desirable goal. However, my research shows that some policymakers don't agree. They either outright mistrust the production of evidence, or recognize that researchers can (by definition) only deal with one slice of the problem or solution at a time. Meanwhile they view their role as one of seeing the big picture and synthesizing all the factors to make their decisions.

On the other hand, some health policy observers who have addressed this question are convinced the goal of research dissemination must be to challenge and change policymakers' beliefs (Black 2001). This too seems mistaken; cognitive psychology has demonstrated clearly that beliefs are stronger than facts, and we cannot expect evidence to change beliefs. In my interviews, there were no cases where values or beliefs were shifted by presentation of evidence; in fact I found the reverse, where evidence was considered credible if it aligned with preexisting values. I expected this on the issue of abortion but was surprised to find even on the less partisan issue of substance use in pregnancy that legislators did not seek out evidence, and in fact were quite comfortable embracing claims based on no evidence other than their own social circle ("Nobody does that anymore.").

Given these admittedly discouraging findings on the current state of evidence use in reproductive and maternal health policymaking, what are the implications for public health? If evidence isn't used instrumentally to shape policy decisions, and doesn't appear to shift lawmakers' beliefs, some might question what the utility of research is at all. But to embrace this view is to overlook the power of evidence to have some effects on policy that are meaningful and important, if different than we might expect. For example:

1) Sometimes evidence *does* make a difference in policy outcomes, in very direct ways. The field of reproductive health can point to rare but important examples when evidence has materially changed policy. For example, evidence that providing long-acting contraceptives for free reduces unintended pregnancy rates has led some states to adopt this policy (Secura et al. 2010, Lindo and Packham 2017).

2) Even if it is not instrumental in shaping decision making, research is still very important to motivate and reinforce action among lawmakers who are inclined to agree with a given position. This is a strategic orientation to providing evidence to lawmakers that may make some in public health uncomfortable, as it may appear to show inappropriate partisan orientation. But realistically, one important role of evidence is to provide political cover or even pressure for legislators to act. For example, in 2013 in California, AB154 was introduced to allow nurse practitioners, certified nurse-midwives, and physician assistants to perform aspiration abortions. Similar bills had been introduced and defeated earlier, but this year the bill was accompanied by research evidence from the University of California, San Francisco, showing that abortions provided by such practitioners are clinically as safe as those performed by physicians (Weitz et al. 2013). One legislator from a fairly liberal district in California told me at the time that while he had supported the proposal in general the prior year, the data allowed him to feel comfortable that he wouldn't get "attacked" (in the press or by pro-life constituents) for voting yes.

3) Public health practitioners should bear in mind that current lawmakers aren't the only policymakers whose views and actions may be shaped by evidence. The "enlightenment" function of evidence suggests that today's research may be educating future generations of policymakers, shaping how they understand these issues in important ways. Also, other governmental actors, such as administrators in executive branch bureaucracies, and even judges in the judicial branch, may use evidence in different ways to shape policy that impacts reproductive and maternal health just as widely as the legislative branch does (Poot et al. 2018). This perspective suggests taking a longer and broader view of how our research might ultimately affect policy.

The implications of this work leave me grappling with several questions. Can we in reproductive and maternal health make peace with our evidence being used by legislators primarily to substantiate predetermined policy positions? If we accept that, it may help us focus more strategically on policymakers who are open to our evidence and who recognize that having good evidence can advance their policy goals. Is it "OK" to accept this if it can still help "win" the goal of better health outcomes? On the other hand: does this risk making partisanship worse? If we believe evidence is important to shaping outcomes, we cannot just cede the ground of evidence-informed policy to those who are willing to agree with us. As a society we should resist a trend to make reliance on evidence the exclusive domain of the Left.

More research and discussion is needed to explore these questions. I hope that this work may provide fuel for an ongoing and evolving conversation about how health research interacts with and supports policymaking in the United States.

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