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Three Essays on Determinants of Policy Change at the Federal and State Levels

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Three Essays on Determinants of Policy Change at the Federal and State Levels

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An abstract of
A dissertation submitted to the Faculty of the
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Abstract

Three Essays on Determinants of Policy Change at the Federal and State Levels

By Pamela Ilene Protzel Berman

Understanding determinants of policy change provides a critical window into Federal and State-level decisionmaking. This dissertation comprises three articles examining determinants of policy change at the Federal and State levels to identify the effects of stakeholders, politics and economics on policy outcomes.

The first chapter aimed to identify barriers to influenza vaccination policy change and implementation, through interviews with 35 stakeholders from the medical, public health, educational, insurance and vaccine industry sectors. Over 97% of respondents supported the expansion of vaccination for all school-age children. Roughly 95% supported universal vaccination for all ages, but despite the level of support for this policy change, respondents raised reservations. The findings highlight the need for additional studies to examine issues related to policy implementation.

The second chapter examined the impact of political and economic determinants on state-level cancer control efforts. The shift to comprehensive cancer control represents a major policy change. Examining the variation in state spending on cancer control can provide a window into state activity and can be used as a tool to assist states in overcoming barriers to adoption, particularly related to the allocation of state investment. This study also models other state policy outcomes which have implications for cancer control. The results showed that measures of fiscal capacity appear to explain more of the variation in spending across all state outcomes examined, although political factors were also important.

The third chapter examined whether institutional factors related to women in state legislatures are predictive of policy outcomes. Results show that the incorporation of women in state legislatures is not associated with higher state appropriations for breast and cervical cancer screening. The percentage of women in state legislatures, the percentage of women in leadership roles and the percentage of women holding committee chairmanships were not significant predictors of cancer screening funding. Other political and economic factors, however, were found to be significantly associated with higher levels of state cancer screening funding. This study provides further evidence in the debate over the impact of women in legislatures on policy outcomes.

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Introduction

Understanding the determinants of policy change provides a critical window into Federal and State-level decisionmaking. This dissertation comprises three articles investigating the determinants of policy change at both the Federal and State levels to identify the effects of stakeholders, politics and economics on policy outcomes. The purpose of the three research papers was to better understand the factors involved in policymaking around different issues. This research was intended to answer important questions that have practical implications for public health – information that people working in public health at both the federal and state levels can use. These papers also provided an opportunity to look at both levels of government since there are commonalities between federal and state policymaking and potential lessons to be applied at each level.

The three essays provided a window to better understand Federal and State-level decisionmaking. Each study used different approaches and examined the role of stakeholders, politics and economics in policymaking. Across the three studies there were substantive and methodological implications that linked the research. First, the papers revealed that economic variables provided consistent findings across the research topics. Political determinants were important, but not as predictable as the fiscal capacity in states. Second, the studies confirmed the challenges of linking women's representation and policy outcomes. There was some evidence of an association between women in the legislature and policy outcomes in one paper, but not the other, indicating inconsistency in research findings on women's representation. Finally, the studies revealed a need to have regular and more consistent collection of expenditure data to be able to adequately examine policy

outcomes. The absence of comprehensive expenditure data across all 50 states made measurement challenging, though not impossible, in the studies. In addition, these papers suggested the importance of utilizing mixed methods to capture variation in policymaking that might not be easily quantifiable. While the data were suggestive of trends, using both quantitative and qualitative approaches to examine roles and relationships may provide additional explanatory power to these studies.

CHAPTER 1

Stakeholder Attitudes towards Influenza Vaccination Policy in the U.S.

Abstract

There is growing interest in simplifying influenza recommendations to include all Americans. The benefits of universal vaccination have been well documented (Jordan et al., 2006; Mair, Grow, Mair, & Radonovich, 2006). Universal vaccination might reduce the serious morbidity and mortality due to influenza in high risk persons, provide personal and societal benefits to all who are vaccinated and promote better pandemic preparedness due to expanded capacity for vaccine production and improved infrastructure for vaccine delivery. A growing body of literature supports universal vaccination of children as a way to reduce the spread of influenza in households and communities (King et al., 2006; Monto, Davenport, Napier, & Francis, 1970; Piedra et al., 2005; Reichert et al., 2001). As a result of this, the Advisory Committee on Immunization Practices (ACIP) voted to expand the recommended ages for annual vaccination of children to include all children from 6 months through 18 years of age (CDC, 2008). Increased focus on children can provide a platform for future vaccination as adults. In addition, a change in vaccination policy for children is seen as a stepwise approach to universal vaccination, allowing for steady growth in vaccine infrastructure and an opportunity to document the protection afforded others from universal childhood vaccination. Challenges remain, however, to achieving universal vaccination and to overcoming issues related to vaccination of children through age 18.

To better understand the potential barriers to policy change and implementation, interviews with 35 stakeholders from the medical, public health, educational, insurance and

vaccine industry sectors were conducted. Interviewees were asked about attitudes toward current and future influenza vaccination policy and potential barriers to policy change. Over 97% of respondents supported the expansion of vaccination for all school-age children. Roughly 95% supported universal vaccination, but despite the level of support for this policy change, respondents raised reservations. Issues related to financial and human resources are major challenges that could impede further policy change and implementation of universal vaccination. School representatives were hesitant about implementation of vaccination programs in schools given resource constraints and competing agendas. Policies which seek to address resource issues need to be identified and implemented and could serve as a model for other public health issues facing schools.

Coalition building to facilitate implementation should include more non-traditional partners in the education and insurance communities, in addition to the essential stakeholders in the healthcare and public health disciplines. This study further clarifies the policy issues ahead, particularly the need to address policies which guide the implementation of universal childhood vaccination. The findings point out the need for more in depth studies on how to overcome the barriers identified by stakeholders essential to vaccination policy implementation. Policymakers and practitioners could use the results of the study as they consider further changes to U.S. vaccination policy.

Introduction:

Despite the availability of an effective vaccine, the annual number of deaths attributed to influenza remains high in the face of vaccination coverage levels approaching 70% each year among persons ≥ 65 years of age. (CDC, 2007) Every year in the United States, on average, 5% to 20% of the population gets the flu and more than 200,000 people are hospitalized from flu complications. About 36,000 people die from flu annually (Poland, Tosh, & Jacobson, 2005; Thompson et al., 2004; Thompson et al., 2003). The focus of immunization efforts to date has been on elderly persons and those with health conditions that place them at increased risk of death associated with influenza. Current influenza vaccination recommendations are quite complex since they have both age- and risk-based recommendations which can be confusing to providers and patients and can often impede their implementation. Over time, additional risk groups have been included in the recommendations, as greater health burdens of influenza have been recognized. Attempts have been made to improve the health status of persons at high risk of complications from influenza through vaccination of their household contacts and health care workers, and through simplification of complex recommendations into age-based recommendations. Barriers to vaccination for both children and adults, however, remain. Issues related to vaccine supply, the feasibility of mass vaccination, effective strategies for vaccine delivery, financing and public acceptance have been identified as hurdles for successful implementation of universal vaccination (Briss et al., 2000; Ndiaye, Hopkins, Smith, Hinman, & Briss, 2005; Schwartz et al., 2006). Concerns about thimerosal, a preservative used in vaccines, while not currently a major barrier to vaccination, may be observed as an issue in the future.

For the 2007-2008 influenza season, 73% of the U.S. population was included in recommendations for routine vaccination, covering approximately 221 million Americans (CDC, 2007). However, coverage levels are low and the greatest number of doses used in any year is approximately 100 million. There is growing interest in simplifying recommendations to include all Americans and the benefits of universal vaccination have been well documented (Jordan et al., 2006; Mair, Grow, Mair, & Radonovich, 2006). Universal vaccination might reduce the serious morbidity and mortality due to influenza in high risk persons, provide personal and societal benefits to all who are vaccinated and promote better pandemic preparedness due to expanded capacity for vaccine production and improved infrastructure for vaccine delivery. A growing body of literature supports universal vaccination of children as a way to reduce the spread of influenza in households and communities (King et al., 2006; Monto, Davenport, Napier, & Francis, 1970; Piedra et al., 2005; Reichert et al., 2001). On February 27, 2008, the Advisory Committee on Immunization Practices (ACIP) voted to expand the recommended ages for annual vaccination of children to include all children from 6 months through 18 years of age (CDC, 2008). Increased focus on children can provide a platform for future vaccination as adults. In addition, a change in vaccination policy for children is seen as a stepwise approach to universal vaccination, allowing for steady growth in vaccine infrastructure and an opportunity to document the protection afforded others from universal childhood vaccination.

But gaps currently exist in the scientific data that may preclude a change in policy toward universal vaccination (Schwartz et al., 2006). Questions related to the effectiveness of large scale vaccination, logistic considerations and resource issues need to be explored as leaders in the influenza field consider a policy change that would both increase the numbers of

people vaccinated and substantially strengthen the current infrastructure and system of vaccinating against influenza. It is suggested that additional interdisciplinary research is needed to answer important questions about the desirability and feasibility of new policies (Coleman, Washington, Orenstein, Gazmararian, & Prill, 2006). Of particular interest is the need to better understand the circumstances under which stakeholders and groups will be supportive of a change in policy. The framework for examining these changes is adapted from the public policy literature and suggests that the influence of individuals and organizations can often have an essential impact on policy outcomes. Previous research indicates that the alliances between formal and informal actors are required to make public policy and the relationships among the actors will influence the outcome or likelihood of policy change (Kingdon, 1990; Sabatier & Jenkins-Smith, 1993).

To assess the potential for policy change and better understand the attitudes of stakeholders, we undertook a study of key opinion leaders from organizations in a variety of sectors. The study specifically asked about attitudes toward current and future influenza vaccination policy and sought to identify barriers to potential policy changes. The results of the study could be useful to policymakers and practitioners involved in influenza vaccination as they consider changes to U.S. vaccination policy.

Methods:

Study population

To assess the attitudes of key stakeholders and identify the potential barriers to policy change, the authors identified 40 key opinion leaders representing different organizations and sectors involved in influenza vaccination and policy. The stakeholder groups included; physicians, nurses, public health officials, insurance companies, school administrators and businesses. These groups and individuals were chosen to represent groups or individuals

who potentially had a role in making or influencing decisions regarding vaccination guidelines. The researchers also selected stakeholders who had been involved in vaccination issues for a long time and were considered experts by others working in the field. The list of potential persons to be interviewed was developed by the researchers with input from collaborators from CDC and Emory University. Interviewees included those with current or past representation on the ACIP, those who participated in the American Medical Association – Department of Health and Human Services National Influenza Vaccine Summits, top officials from professional associations (e.g. education, medical and business), and representatives from vaccine manufacturers. The participants were assured confidentiality and no individual attributions are made in this report. The Emory University Institutional Review Board approved the study protocol.

Data collection/analysis

The study included 35 interviews conducted between July and September 2006. Five of the identified experts were unable to participate in the study due to timing and availability. The use of a question guide with open-ended questions allowed for a semi-structured interview format. This enabled the free sharing of ideas and allowed for probing and clarification of responses. The questions used in the interviews were developed in collaboration with influenza experts at Emory University and the CDC. They were tested with individuals in the public health community for feasibility and ease of administration. Interview questions included four major thematic areas of policy related to influenza and stakeholder attitudes: attitudes toward the current influenza vaccination recommendations and major barriers to implementation of the current recommendations; support for a change in recommendations to cover the annual vaccination of all school-age children up to 18 years; the feasibility and logistics of school administration; and the feasibility of a universal

recommendation and potential barriers to its implementation. The interviews were conducted by phone and lasted approximately 45 to 90 minutes. The primary investigator used interview transcripts to write a summary report and included key themes that were highlighted by direct quotes. The major themes and summaries were reviewed by the authors for consistency of message and accuracy.

Results:

Barriers to current recommendations

When asked about the major barriers to implementation of the current recommendations, the most frequent responses across all groups were access, supply, confusing recommendations and public perceptions of the vaccine (Table 1.). The public perception category included participant comments that education was needed to convince the public of the need for vaccination and effective communication was critical to overcoming public concerns about vaccination. Cost and infrastructure issues did not figure prominently as concerns with implementation of the current recommendations, but did appear later when asked about barriers to implementing a universal recommendation. Two out of the four vaccine manufacturers mentioned supply as a barrier to the current recommendations but when asked about barriers to a universal recommendation, none of the manufacturers mentioned supply as a potential barrier. This finding suggests that a universal recommendation could stabilize and make the market more predictable.

Support for vaccination of school-age children

Respondents across all groups showed strong support for vaccination of school-age children (stronger than support for universal vaccination of the entire population) (Table 2.). Thirty-four (97%) of those interviewed were supportive although about a third expressed

some reservations about making the policy change. Concerns included cost, adequacy of supply, safety, and feasibility for healthcare providers. Of all the groups, representatives from the educational community and public health officials were most cautious about the change (3 out of 4 in schools, 4 out of 5 public health officials). Comments from these representatives reflected this caution:

> *"I can support it assuming that we have the supply and a way to pay for it."*

Looking ahead to barriers one respondent said,

> *"Theoretically, yes I can support it but if you start adding up the barriers, I think it will be difficult."*

Two-thirds of the Public health representatives mentioned resources as a reason for their hesitation –

> *"I think that implementation on a yearly basis is going to be a significant issue. I think that people are thinking that the health departments can just gear up and do school-based clinics, but where does the funding for that come from?"*

Some also expressed interest in testing the recommendation in selected areas to more clearly evaluate implementation barriers. Among those that strongly agreed that the recommendation should be changed to include all school age children, many cited a direct benefit for children, herd immunity, success in other countries and a desire to move incrementally toward universal vaccination. One respondent suggested that vaccinating children would lead to good practice as adults,

> *"It would be great for the country and public health, as kids get used to being vaccinated throughout their lives that they carry that onto adulthood. Do it for themselves and pass it along to their children as well."*

<u>Attitudes toward the best places to vaccinate children</u>

Where and how to get children vaccinated is an important logistic consideration in a change in policy to vaccinate all children under 18 years of age. The majority (63%) of those interviewed felt that schools were best in theory, but expressed reservations and concerns

about the logistics of conducting vaccination clinics in schools (Table 3.). One respondent

also commented on the potential burden on health care providers, in particular pediatricians'

offices.

> *"It is a huge logistical issue, but I don't see it working any other way than to have it administered in the school setting. That's were they are and I don't see parents taking off from work every year. I don't see Pediatricians being able to handle that kind of volume every year."*

Even within the healthcare provider group there was consensus that schools are the best

setting for vaccination of school-age children. The reservations expressed by respondents in

this group included the need for staff and resources to carry it out and the preference to

have schools as one of many options for the administration of vaccine.

> *"We need to think more broadly and outside the pediatrician's office. Schools seem like the simple answer but if we're encouraging vaccination for many risk groups and many ages, to have places where a whole family could go together would also facilitate vaccination."*

Vaccine manufacturers were the only group to unanimously prefer that influenza vaccine be

given in physicians' offices. While they preferred administration in providers' offices, they

were also open to consideration of schools as an alternative.

> *"You'd prefer that they go into their own providers but I think that in order to get children immunized you have to take the vaccine to them."*

Reservations related to the school setting included concerns about infrastructure and

financing.

> *"Schools would probably be a great venue but the sad part about that is that the infrastructure has disappeared." "The challenge is who's going to pay for the vaccine – it's a bigger issue than whether or not it's given at the school or in a private setting."*

Public health officials were generally supportive of administration in the schools (4

out of 5) but identified the need for multiple settings and cited resource concerns.

"I think if we are really looking at school-age children being vaccinated, we need to explore alternatives, and it is also the same with adults. There's nothing wrong with community influenza vaccination. The only issue we've ever had about it is information sharing."

Several public health representatives also mentioned a key role for them in this scenario and the longer-term benefit of involvement in schools.

"I think that public health would be very good at doing school-based immunization. It would be excellent for public health to have the capacity to go into schools on a routine basis. It would be good for planning for pandemic influenza."

There were mixed opinions from the school administrators interviewed about this issue. Several mentioned remembering receiving polio vaccine in schools, but only one expressed outright support for vaccination in schools. The others felt schools could be an option, but only if there was no disruption, no cost and pediatrician approval. Two of the four interviewees preferred a setting that provided family-oriented delivery.

"The best setting might seem to be schools but we don't have the parents here and I think you can make an argument for giving the whole family the vaccine and having the parents onsite getting their own vaccine and filling out the paperwork."

<u>Financing vaccination in the school setting</u>

There were mixed opinions on how to pay for school-based influenza vaccination. Equal numbers of respondents suggested government supported vaccination or a mix of public and private funding (Table 4.). This finding, however, was not the same among all groups. For school-based vaccination, almost all public health respondents favored government coverage although some recommended tapping private insurance.

"If you want to accomplish widespread immunization, it's going to have to be picked up by the federal government."

Healthcare providers had more mixed views and roughly 80% of them preferred either government or a mix of financing strategies.

> *"Flu vaccine is beneficial and should be provided to everyone. VFC will provide vaccine for those who are eligible and insurance companies would pay for influenza vaccine for those children whose parents have health coverage."*

Two-thirds of the insurers and business representatives supported government coverage, while all the vaccine manufacturers favored a mix of public and private coverage.

> *"There should be a full partnership of both government and private insurers in paying for vaccination of school-age kids."*

3 of 4 school administrators favored private health insurance coverage, citing the resource pressures on schools.

> *"There's no money to pay for it and since there is inequitable school financing systems in this country, some schools are very stretched for every dollar. This is not a priority."*

The school administrator's comments reflected their concern that the only way funding would be available for vaccination is if it would be taken from existing resources, not new ones.

Safety issues

Across the groups, safety concerns were mentioned by 52% of those interviewed as a potential issue in the expansion of the recommendations. In responses to potential barriers to universal vaccination, the need for education and communication both to alleviate safety concerns and convince the public of the need for vaccination was the third most commonly mentioned factor.

> *"Safety concerns are different when you are talking about adults and children. Adults aren't afraid they are getting an unsafe product. With children, concerns about thimerosal are important to some."*

There was a stronger perception of safety as an issue among the insurers/business group. Roughly 84% of the respondents felt that safety was an issue, and would be a barrier to policy change.

> *"The perception is that influenza vaccine is not safe for kids and teenagers. If you expand the recommendation to all school aged kids, thimerosal could be a big problem."*

Concern about the use of thimerosal in vaccines was mentioned across all groups. When asked about the feasibility of a thimerosal-free supply of influenza vaccine, all manufacturers of the trivalent inactivated influenza vaccine (TIV) indicated that it was possible to remove thimerosal from influenza vaccine within a 2-3 year time period.

Attitudes toward universal influenza vaccination

Roughly 95% of the individuals interviewed in this study indicated support for a universal influenza vaccination policy (Table 2). Despite significant support for this policy change, respondents raised concerns. Of those that support universal vaccination, almost half (46%) said that the U.S. is not yet ready for such a policy, that they would prefer to have a stepwise, incremental approach, or that they would support it only if supply was not an issue. Respondents mentioned the need to be scientifically based in decision-making and suggested that the logical next incremental step toward eventual vaccination of the total U.S. population should be aimed at school-age children.

> *"I think we need an incremental approach to adding others to be immunized. It should be epidemiologically sound. If children are the next best place to go, I would like to think that we have enough knowledge of how to do that in a manner that doesn't break the bank."*

For those that responded positively to a change to a universal recommendation with no reservations, the reasons identified included ease of vaccination, the importance of seasonal influenza experience for pandemic planning and the simplification of recommendations.

"I think one of the most important reasons to have a universal recommendation is that it is a component of our pandemic flu preparedness."

Others noted the simplification and easing of confusion regarding the recommendations, one of the major barriers to the current recommendations identified by the respondents.

"The reason for a universal recommendation is to simplify. I think only influenza vaccine experts really know what the recommendations are."

<u>Barriers to universal vaccination</u>

Issues posed as important barriers to the current recommendations were not the primary focus of barriers to universal vaccination. The most commonly mentioned factors were lack of infrastructure (including logistics, expansion of sites for vaccination, personnel), cost, the need for education, and vaccine supply (Table 1). Cost and infrastructure issues were raised as new barriers, although both education and supply remained a major concern related to vaccination both now and with any future change.

"We need to have a commitment by vaccine manufacturers to stay in the business, healthcare providers need to be convinced that they should vaccinate everyone, and we need to have time to get over the delay and shortage years and bring back confidence in flu access."

Some made a distinction between barriers for children and adults.

"Outside the pediatric population, the lack of infrastructure and resources are the biggest barriers to implementation."

Others in the public health community commented on the potential impact on other public health functions.

"I think there is concern in public health systems about how long and what impact this increased demand would have on their ability to provide other services."

For many respondents, for the policy change to succeed (i.e. reduction in deaths, improvement in coverage rates), there must be multiple and new administration sites for vaccination,

> *"You'd have to utilize non-physician places like pharmacies, or have clinics in churches since there are a fair number of people who never see a physician."*

Discussion:

Interviews with key vaccine stakeholders revealed strong support for vaccination for all school-age children and support for a change in policy to a universal influenza recommendation. While this support was broad, it was accompanied by a series of reservations that reflect barriers to change. Our finding of broad stakeholder support for routine influenza vaccination of school-age children through 18 years of age was consistent with the recent change in ACIP policy and was also confirmed by a coalition of organizations urging the ACIP to move ahead with a change in policy ("Letter to Advisory Committee on Immunization Practices", 2007). This reveals that barriers exist that may not preclude policy change, but will create challenges for implementation. For example, when asked about the best place to administer influenza vaccine under an expanded childhood recommendation, a majority of those interviewed felt schools were best, but expressed concern about the logistics of vaccinating in schools which included financing, infrastructure and education about the need for vaccination. This finding is reflected in previous work on school health policy. It highlights the challenges of education and health, particularly when there are differing agendas and resource limitations (Collins, 2007). Relatively few U.S. schools provide prevention or specialized health services and only 4.5% of schools nationwide provided influenza vaccine in 2006 (Brener, Wheeler, Wolfe, Vernon-Smiley, & Caldart-Olson, 2007). Schools may be perceived as a good setting for vaccination, but many respondents emphasized the need to have alternative delivery options reflecting a challenge

to our current infrastructure for vaccine administration. Given the importance of the potential role for the education community and schools in the implementation of a policy to include all school-age children, further research should be aimed at assessing the willingness and capacity of schools to undertake this major role in vaccination efforts.

Financing and resource issues were important barriers. Most of those interviewed representing schools felt that school influenza vaccination clinics could be financed through private insurance and clearly expressed a preference that resources necessary for vaccination not come from within the education budget. Representatives of several other groups – public health and third party payers – felt that it was primarily a governmental role to finance influenza vaccination in schools. Others preferred a mix of both private and governmental sources. Of interest, none of the respondents who favored both a school-based vaccination program and a private sector role in financing offered a mechanism for collecting private sector funds since normally public sector mass clinics use public purchased vaccines. This indicates the need for further analysis of potential options to pay for influenza vaccine administration in schools.

The major reservations related to implementing a universal recommendation mentioned across all groups included cost, adequacy of supply, safety, and feasibility for healthcare providers. Of all the groups, representatives from the educational community and public health officials were most cautious about the change. Finally, because safety concerns appeared as a potential barrier to implementation of universal vaccination, and the issue of thimerosal was mentioned across all groups, assuring adequate supply of thimerosal-free influenza vaccine will be important to successful implementation of the expansion of the recommendations to include all school aged children.

Limitations of the study:

Several factors need to be considered regarding the findings from this study. First, the findings are qualitative and were collected through interviews, potentially allowing for interviewer bias and interpretation error. Feedback from Emory University faculty and CDC staff helped to validate the findings and conclusions and provide inter-rater reliability. Second, the sample was small and could have benefited from additional participants to ensure wider representation but time and financial limitations precluded expansion. Most of the respondents, however, were active in vaccination issues as defined by their longevity in the field and involvement with the federal government in vaccine policy. Finally, the healthcare provider interview group was the largest sampled in the study (n=13), but given the broad involvement of those in the healthcare in vaccination, it was necessary to include additional experts in the group. Included were representatives from the health care community, including medical, nursing and allied health care groups, all with important, but different, interests in influenza vaccination.

Conclusion:

This study identified support among a range of stakeholders for a change in influenza vaccination policy and potential barriers to policy change. There is support for vaccination of school-age children and support for universal vaccination. Issues related to financial and human resources are major challenges that could impede further policy change and implementation of universal vaccination. School representatives were hesitant about implementation of vaccination programs in schools given resource constraints and competing agendas. Policies which seek to address resource issues need to be identified and implemented and could serve as a model for other public health issues facing schools.

Coalition building to facilitate implementation should include more non-traditional partners in the education and insurance communities, in addition to the essential stakeholders in the healthcare and public health disciplines. A universal vaccination recommendation could lead to a more assured supply of vaccine, but implementation would be complex and would require overcoming barriers of infrastructure, cost and education. This study further clarifies the policy issues ahead, particularly the need to address policies which guide the implementation of universal childhood vaccination. The findings point out the need for more in depth studies on how to overcome the barriers identified by stakeholders essential to vaccination policy implementation.

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Table 1. Stakeholder Perceptions of Barriers to Current Influenza Recommendations versus Universal Vaccination (N=35)[*]

	HEALTHCARE PROVIDERS (N=13)	PUBLIC HEALTH REPRESENTATIVES (N=5)	SCHOOL ADMINISTRATORS (N=4)	3RD PARTY PAYERS/BUSINESS (N=6)	COMMUNITY VACCINATORS (N=3)	VACCINE MANUFACTURERS (N=4)	TOTAL/ PERCENTAGE
Perceived Barriers to Current Recommendations							
Access to Vaccine	9 (69%)	5 (100%)	2 (50%)	6 (100%)	2 (67%)	0	24 (69%)
Supply	6 (46%)	5 (100%)	2 (50%)	4 (67%)	3 (100%)	2 (50%)	22 (63%)
Confusing Recommendations	5 (38%)	3 (60%)	1 (25%)	2 (33%)	2 (67%)	3 (75%)	16 (46%)
Public Perception /Education	3 (23%)	1 (20%)	1 (25%)	1 (17%)	1 (33%)	4 (100%)	11 (31%)
Cost	4 (31%)	0	1 (25%)	1 (17%)	0	1 (25%)	7 (20%)
Convenience	0	0	1 (25%)	2 (33%)	0	0	3 (9%)
Reimbursement	2 (15%)	0	0	0	0	0	2 (6%)
Vaccination of Healthcare Workers	0	1 (20%)	0	0	0	0	1 (3%)

	HEALTHCARE PROVIDERS (N=13)	PUBLIC HEALTH REPRESENTATIVES (N=5)	SCHOOL ADMINISTRATORS (N=4)	3RD PARTY PAYERS/BUSINESS (N=6)	COMMUNITY VACCINATORS (N=3)	VACCINE MANUFACTURERS (N=4)	TOTAL/ PERCENTAGE
Perceived Barriers to Universal Vaccination							
Infrastructure	11 (85%)	2 (40%)	1 (25%)	1 (17%)	1 (33%)	4 (100%)	20 (57%)
Cost	9 (69%)	4 (80%)	1 (25%)	2 (33%)	1 (33%)	1 (25%)	18 (51%)
Education	3 (23%)	3 (60%)	2 (50%)	2 (33%)	1 (33%)	4 (100%)	15 (43%)
Supply	4 (31%)	3 (60%)	0	3 (50%)	1 (33%)	0	11 (32%)
Access	4 (31%)	0	0	1 (17%)	1 (33%)	1 (25%)	7 (20%)
Convenience	1 (8%)	0	2 (50%)	1 (17%)	0	0	4 (11%)
Safety	1 (8%)	0	1 (25%)	0	1 (33%)	1 (25%)	4 (11%)
Physician Support	0	1 (20%)	0	1 (17%)	1 (33%)	0	3 (9%)
Vaccination of Healthcare Workers	0	0	0	0	0	1 (25%)	1 (3%)

*Note: Numbers of respondents who mentioned a barrier at least once, multiple responses allowed

Table 2. Stakeholder Attitudes towards Expansion of Current Influenza Vaccination Recommendations

	HEALTHCARE PROVIDERS (N=13)	PUBLIC HEALTH REPRESENTATIVES (N=5)	SCHOOL ADMINISTRATORS (N=4)	3RD PARTY PAYERS/BUSINESS (N=6)	COMMUNITY VACCINATORS (N=3)	VACCINE MANUFACTURERS (N=4)	TOTAL/ PERCENTAGE
Support for Vaccination of School Age Children*							
Full Support	9 (70%)	1 (20%)	1 (25%)	5 (83%)	2 (67%)	4 (100%)	22 (63%)
Support with reservations	3 (23%)	4 (80%)	3 (75%)	1 (17%)	1 (33%)	0	12 (34%)
Support for Universal Vaccination*							
Full Support	7 (54%)	2 (40%)	2 (50%)	2 (33%)	0	4 (100%)	17 (49%)
Support with reservations	5 (38%)	2 (40%)	2 (50%)	4 (67%)	3 (100%)	0	16 (46%)

Table 3. Best Setting for the Administration of Influenza Vaccine for School-Age Children

	HEALTHCARE PROVIDERS (N=13)	PUBLIC HEALTH REPRESENTATIVES (N=5)	SCHOOL ADMINISTRATORS (N=4)	3RD PARTY PAYERS/BUSINESS (N=6)	COMMUNITY VACCINATORS (N=3)	VACCINE MANUFACTURERS (N=4)	TOTAL/ PERCENTAGE
School	10 (80%)	4 (80%)	2 (50%)	3 (50%)	3 (100%)	0	22 (63%)
Pediatrician /Physician's Office	1 (8%)	0	0	1 (17%)	0	4 (100%)	6 (17%)
Multiple Settings	2 (15%)	1 (20%)	2 (50%)	2 (33%)	0	0	7 (20%)

Table 4. Financing School Administered Vaccination

	HEALTHCARE PROVIDERS (N=13)	PUBLIC HEALTH REPRESENTATIVES (N=5)	SCHOOL ADMINISTRATORS (N=4)	3RD PARTY PAYERS/BUSINESS (N=6)	COMMUNITY VACCINATORS (N=3)	VACCINE MANUFACTURERS (N=4)	TOTAL/ PERCENTAGE
Government, Federal or State	6 (46%)	4 (80%)	0	4 (67%)	1 (33%)	0	14 (40%)
Health Insurance	1 (8%)	1 (20%)	3 (75%)	2 (33%)	0	0	7 (20%)
Mix of different types of financing	5 (38%)	0	1 (25%)	0	2 (67%)	4 (100%)	13 (37%)
N/A	1 (8%)	0	0	0	0	0	1 (3%)

CHAPTER 2

The Impact of Political and Economic Determinants on State Policy Outputs: Support for State-level Cancer Control Efforts

Abstract

This study examined the impact of political and economic determinants on state policy outputs, particularly examining support for state-level cancer control efforts. The shift to approaching cancer control from a more systematic and broad way represents a major policy change. Much progress has been made to support comprehensive cancer control since federal support has been in place, but there has been limited assessment of whether or not this approach is working. One way to measure the adoption of this policy change is to examine resource allocation at the state level. No previous quantitative examination of cancer control commitments at the state level and examining the variation in state spending on cancer control can provide a window into state activity and can be used as a tool to assist states in overcoming barriers to adoption, particularly related to the allocation of state investment. This study also models other state policy outcomes which have implications for cancer control. The results showed that measures of fiscal capacity appear to explain more of the variation in spending across all state outcomes examined. States with high rate of uninsured individuals and high per capita tax revenue may be more likely to allocate expenditures for cancer control. Variation in expenditures for Medicaid, public health programs and tobacco are influenced by the political environment in the state.

Introduction:

In the war on cancer that began decades ago, it is clear that much progress has been made. Rates of new diagnoses and rates of death from all cancers combined declined significantly in the most recent time period for men and women overall and for most racial and ethnic populations in the U.S. The drops are driven largely by declines in rates of new cases and rates of death for the three most common cancers in men (lung, prostate, and colorectal cancers) and for two of the three leading cancers in women (breast and colorectal cancer). New diagnoses for all types of cancer combined in the United States decreased, on average, almost 1 percent per year from 1999 to 2007. Cancer deaths decreased 1.6 percent per year from 2001 to 2007 (Kohler et al. 2011) The significant decline in death rates and modest reductions in cancer incidence demonstrates progress made in the fight against cancer that has been attributed to effective tobacco control, early detection and screening, and appropriate treatment.

The number and quality of cancer prevention and control activities at the federal, state and local levels have played an important role in helping to reduce incidence and death rates from cancer. In recent years these programs have succeeded in creating new infrastructure and organizations to address cancer, expand expertise and identify the challenges with implementing community-based prevention programs (Abed et al., 2000). While there has been significant progress, cancer remains the second leading cause of death in the United States, exceeded only by heart disease. Each year, cancer claims the lives of more than half a million Americans. It is estimated that in 2012, over 575,000 people will die of cancer in this country, according to the American Cancer Society (ACS, 2012). In the same year, over 1.5 million people will be diagnosed with cancer in the U.S. More needs to be done to improve the treatment of cancer patients, advance the use of prevention and early detection strategies, address the needs of long-term survivors of cancer, and implement methods to appropriately address end of life issues.

Rethinking the Approach -- Comprehensive Cancer Control

In the intervening years since President Nixon gave his State of the Union speech in 1971 proclaiming the war on cancer, strong constituencies have developed around individual cancers. Most notably, efforts have been strongest around breast and cervical cancer, but colorectal, pancreatic, prostate and skin cancers have benefited from increased awareness and advocacy. All brought attention and resources to bear on their particular cancer and raised the specter of their cause in the public eye. There is much to be learned from these individual approaches and also from the advances in cancer diagnosis and treatment across all cancers. On the other hand, common risk factors, similar methods of outreach to at-risk populations, and the opportunity to broaden the scope of early detection efforts allow for a shift in the paradigm from individual cancers to a more comprehensive approach. New ideas would allow looking across cancers and applying common knowledge and approaches to the spectrum of cancers. But would it work? Could this approach be adopted and implemented? How would it be received?

Beginning in 1994, federal agencies, led by the Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI), and private-sector advocacy organizations such as the American Cancer Society began supporting what soon became known as "Comprehensive Cancer Control" activities at the state and local level. Comprehensive Cancer Control is defined as "an integrated and coordinated approach to reducing cancer incidence, morbidity, and mortality through prevention, early detection, treatment, rehabilitation, and palliation" (Given, Black, Lowry, Huang, & Kerner, 2005). The conceptual development of such an approach, however, was initiated globally in 1985 with the idea that shared resources and coordinated efforts would benefit countries with limited means to combat cancer (Stjernsward, 1985). The CDC began to make a case for a comprehensive approach and provided states with start-up funds to develop cancer plans and establish a coalition of organizations outside government to

further expand this effort. Federal and private partners recognized the importance of addressing cancer in an integrated way across the continuum from prevention to palliative care. Driving this effort was a recognition that further growth of cancer prevention and control programs within state health agencies and elsewhere would require coordination and integration of cancer efforts to leverage resources and achieve better outcomes (Abed et al., 2000). To do this, states would be encouraged to develop comprehensive cancer plans that identified priorities and promoted strategies to achieve their outcomes. The development of state-level cancer plans would assist cancer prevention and control practitioners with priority setting and long-term strategic planning. Since 1998, state health departments and local cancer partners have made impressive progress in developing cancer plans and implementing activities. The National Comprehensive Cancer Control Program currently supports 65 Comprehensive Cancer Control Programs (NCCCPs) in 50 states, the District of Columbia, 7 tribes, and 7 territories and Pacific Island Jurisdictions. The goal of these programs is to establish cancer coalitions and define cancer control plans in each state/tribe/Pacific Island Jurisdiction to define high impact interventions to reduce the burden of cancer through risk reduction, early detection, better treatment, and enhanced survivorship. The development and implementation of a focused policy agenda for NCCCPs, with the goal of implementing 3-5 policy activities within the program period, will advance NCCCP cancer control efforts through decreased tobacco use, increased physical activity, healthier diets, increased access to screening tests, improved screening for cancer survivors to reduce the risk of recurrent or new cancers, and improved delivery of high quality cancer care services.

Federal grant support for the comprehensive cancer control program has varied over time and is limited in comparison with other disease-related programs such as funding for childhood immunization, sexually transmitted diseases, and hospital acquired infections

(CDC, 2010). The federal contribution, however, was intended to be just one factor in a broader approach to addressing the prevention and control of cancer. Non-profit and state contributions would provide shared resources and emphasis to create momentum in local cancer control efforts. Factors influencing a state's ability to take a more comprehensive approach included resource limitations and the unpredictability of resource allocation both necessary to reduce cancer morbidity and mortality and to achieve a more comprehensive approach to cancer prevention and control (Abed et al., 2000).

State-level Policy Determinants

The move toward comprehensive cancer control represents a major policy shift at the state and community level. State health department cancer programs and state-wide cancer coalitions have made strides in implementing comprehensive cancer control including developing state plans, obtaining federal funding and making progress towards increased collaboration. Since 1998, the number of states, territories and tribal organizations participating in CDC's Comprehensive Cancer Control program has grown from six to 65. Successful implementation over the long term will include greater fiscal support and commitment on the state and local level. The shift in policy would represent integrated, comprehensive planning and execution rather than the current limited, categorical approach. While some progress has been made toward achieving this policy shift, a comprehensive approach to cancer control will take time to be fully integrated. The process of public policy making is often a long process which includes softening up the system to be ready when a policy window opens up to address a problem (Kingdon, 1995).

One way to measure how well states are supporting a more comprehensive approach to cancer prevention and control is to examine state budgets to identify resources allocated to

cancer programs. These dollars would be used to support activities in a state to assist in implementing their cancer control plans and would show state support for cancer-specific activities. Other ways to measure the growth in comprehensive cancer control can include growth in partnerships across cancer areas, the implementation of state comprehensive cancer control plans, and a shift in state priorities focusing on the broader spectrum of cancer control from prevention to palliative care.

A broad framework for examining the adoption and diffusion of comprehensive cancer control can be adapted from research in the field of public policy and political science. The innovation and diffusion framework has been developed from early scholarship on organizations, and over time has served as a way to explain why governments adopt or fail to adopt innovations and how diffusion of innovations occurs (Berry, F.S., 1994). The framework has been improved and expanded to a wide variety of disciplines and topics. The literature spans many academic disciplines including anthropology, economics, education, marketing and management, public health, sociology, history, political science and law. Consistent with classic diffusion theory, Rogers describes diffusion as the way change or an innovation is disseminated across groups over time (Rogers, 1995). Political scientists Walker and Gray in their examination of the spread of policy innovation in states adopted this theory. The early work of researchers focused on the characteristics of early and late adopters to better understand what leads to innovation. In order to evaluate the importance of structural and political factors as determinants of policy, it was important to examine policy formulation and whether or not to initiate a program in the first place (Walker, 1969). The major study questions concerned why some states adopt new programs more readily than others and, once adopted, how the new policies spread to other states. The present

study explores the likelihood of adoption, but cannot address cross-state diffusion due to the absence of additional years of data.

In an analysis of state lottery adoption, successful adoption in nearby states increased the likelihood of acceptance (Berry & Berry, 1990). Berry and Berry defined three types of adoption models – national interaction models that focus on the role of national groups, regional diffusion models that emphasize the importance of the influence of neighboring states, and vertical influence models that recognize the influence of national government on policy adoption. An additional way to conceptualize this study is not only to examine the policy adoption literature, but also to explore the dynamics between politics and economics to explain policy outcomes. A debate that began early in political science scholarship still holds great interest today. What is more important in determining state policy outputs, the socioeconomic factors in a state, or the political drivers in a state? It could be argued that this is an oversimplification of factors that are complex and often interrelated. Early research revealed that economic resources were more influential in shaping state policies than any of the political variables that were thought to determine public policy (Dye, 1979). Peterson's influential study of cities in the early 80's showed that governments are constricted more by their place within the larger political and social order than by internal political struggles. Cities will be more motivated by their economic interests (Peterson, 1981). This in fact created a firestorm of research in the field of political science aimed at expanding knowledge in this arena and disproving a commonly adopted notion by economists that politics didn't matter (Dye, 1979). Dye and others encouraged the testing of the assumption that politics should matter in public policy, and many subsequent studies continued to fuel the debate (Lewis-Beck, 1977; Baughman and Milyo 2009; Jackson, 1992; Hwang and Gray, 1991).

Research conducted on political and economic determinants of policy include a recent examination of the allocation of funds from the Master Tobacco Settlement. Sloan looked at the effects of political parties, interest groups, prior spending on tobacco control, and state fiscal health on the per capita settlement funds allocated to tobacco control, health, and other programs (Sloan, Carlisle, Rattliff, & Trogdon, 2005). The researchers found that tobacco producing states and those with a high proportion of conservative Democrats or elderly African-American, Hispanic, or wealthy people tended to spend less on tobacco control. Education and medical lobbies had strong positive influences on per capita allocations for tobacco control and health-related programs. State fiscal crises affected amounts spent by states from settlement funds as well as the probability of securitizing future cash flows from the settlement. Previous work examining policy adoption in different disciplines can serve as a model for explaining why there has been variation across states in the adoption of comprehensive cancer control. In particular, this literature can identify important state characteristics that help to explain the adoption of outcomes such as funding for cancer control.

In the field of public health finance, knowledge of the sources and uses of public health funding is generally difficult to obtain. Although the demands on the public health system have grown over time, there is little data on state-level spending of state and federal public health dollars (Levi, Juliano, & Richardson, 2007). There is wide variation in per capita public health spending across the states. The input of state dollars to public health efforts is critical, being 2.5 times greater than the federal contribution and accounting for 70 percent of public health expenditures (Frist, 2002). Quantifying the amount of money allocated for public health activities has been a long-standing challenge for the public health community. Some argue that public health finance has been neglected as a studied field (Honoré et al.,

2007) and should be included as Healthy People goals. Financial management is a mix of finance, accounting and management concepts used to assess, predict, and minimize economic loss to achieve stated goals in an organization (Honoré, Amy, 2007). Public health finance is grounded in public finance theories and focused on the provision of resources for the delivery of public health functions. "Public health finance is a field of study that examines the acquisition, utilization, and management of resources for the delivery of public health functions and the impact of these resources on population health and the public health system" (Honoré, Amy, 2007).

Objective

The objective of this study is to examine one aspect of policy adoption, the commitment of a state to cancer control, by measuring state financial support for cancer control activities. While there has been progress made toward developing cancer plans and bringing cancer coalitions together, little has been written about factors influencing resource allocation decisions at the state level. Research has shown that the political environment in a state is an important predictor of long-term state welfare and Medicaid spending (Garfield, 2008). In addition, the involvement of interest groups and the economic situation of the state have been shown to account for variation in the adoption of policies at the state level (F.S. Berry & Berry, 1990). Political and economic factors were found to play a role in influencing the allocation of resources from the tobacco settlement in states, and have been identified as major determinants in non-health arenas such as adoption of state lotteries and tax policy.

Building on research from the fields of political science, economics, and public policy, this paper examines the influence of political and economic factors in the support for cancer control activities at the state level. There has been no prior quantitative, predictive modeling

on cancer control commitment at the state level. This research can help to inform the current discussions about resource allocation and state investment for comprehensive cancer control. Examining the variation in state spending on cancer prevention and control activities can provide a window into state activity and can be used as a tool to assist states in overcoming barriers to adoption, particularly related to allocation of state investment.

Annual cancer control expenditure data for the 50 states collected under uniform conditions would be of great interest, but was inaccessible for the purposes of this study. Also, state spending on cancer prevention and control is not defined consistently across state budgets nor monitored nationally. Since data from all 50 states are not accessible and are prohibitively difficult to collect de novo state by state, this study looks at several proxy measures of state commitment to examine the relationship between the political and economic environment and cancer control. The first model examines political and economic determinants of overall public health funding in a state. The second model uses Medicaid spending per individual in poverty as an outcome to examine the association between Medicaid expenditures and political and economic factors in a state. A third model examining predictors of state tobacco control was included in the study to provide comparison of a similar discretionary public health program with our primary outcome of focus, state-level spending on cancer control programs. While tobacco is a primary risk factor for certain cancers, support for control programs at the state level has both unique and differing characteristics from cancer programs and was felt to provide a relevant case comparison in this analysis. The non-federal funding for cancer control identified by state cancer programs provided the fourth, and most direct, outcome to explore determinants of state funding and better explain adoption of cancer programs at the state level.

Conceptual framework

This study modeled each of the four outcomes as a function of political, economic and health status within a state. Hence, independent variables in the analyses are divided into three categories: political, economic, and indicators of state health status. Individually and sometimes in combination, these factors have been shown in the literature to influence state policy adoption. For example, a number of state characteristics may influence policy adoption, including fiscal capacity of states, party competition, public opinion, interest groups, and the influence of neighboring or regional states (Allen, Pettus, & Haider-Markel, 2004). Other authors have characterized what accounted for differences in the extent to which governments allocate their scarce agenda space to policies that go beyond basic state needs, such as taxes and transportation, and include matters of the environment, health and civil rights. The adoption of these policies depend on the strength of the state economy, the ideological and demographic differences among citizens, the role of organized interests, and patterns of political control (Fellowes, Gray, & Lowery, 2006). In this study, several indicators of the political environment were included in an attempt to account for the ideological leanings and policy mood of each state's public and governmental institutions.

Political Determinants

Studies point to the impact of parties on policy outcomes and suggest that political parties matter in the states (Alt & Lowry, 2000; Erikson, Wright, & McIver, 1993). Elling (1979) found that state parties are more likely to fulfill their legislative mandates in the absence of competition from the other party. This suggests that a legislature with a higher proportion of Democrats or Republicans will be more successful in adopting their agendas. It is expected that states with a high proportion of Democrats in their statehouses would have more post-materialist issues such as health or cancer control on their agendas (Fellowes et al., 2006). Democratic-controlled

legislatures may be expected to provide greater funding for social programs, particularly ones that are redistributive (Kousser, 2002) in nature. In this study, support for cancer control programs at the state-level could be considered redistributive in nature. The focus of the efforts provide support for low-income women and families across the cancer continuum.

In addition to including party control of the legislature, this study added a measure of party of the Governor to the analysis. The central figure in each state's political and governmental hierarchy is the governor. How much power they have to drive policy may vary by the political orientation of the legislature and the economic situation in the state. A governor also has a large number of competing issues to contend with and is often unable to address them all due to limited time and policy development resources (Cobb and Elder 1983, 85-89; Light 1999, 53-55) But, whatever the orientation of the legislature, it can be argued that the governor plays an important role in the policymaking process in the state (Beyle 2001, Hedge 1998). "The governor sets the agenda for public debate; frames the issues, decides on the timing; and can blanket the state with good ideas by using his access to the mass media. The governor is the most potent political power in the state." (Sanford, 1967). Governors can affect public policy in a substantial and systematic way (Barrileaux, Berkman 2003).

The importance of public or citizen preferences is widely acknowledged in the political science literature. Public preferences may influence policy change, (Kingdon 1989, Verba and Nie 1972), and Kingdon suggests that "it is likely that the constituency imposes some meaningful constraints on Congressman's voting behavior." (Kingdon, 1989, p. 68) Berry, Ringquist, Fording and Hanson (1998) developed two measures of ideology in the American States that can be used to understand the likelihood of greater state support for cancer control. Their assessment of citizen ideology measures the average location of the active

electorate in each state on a liberal-conservative continuum (Berry et al. 1998). Their

government ideology measure identifies the liberal or conservative nature of elected officials

in a particular state. These measures have been useful in analyzing the impact of public

opinion or the policy preferences of elected officials in state policy outputs, including

welfare reform (Soss et al. 2001) and anti-smoking legislation (Shipan and Volden 2006). The

citizen ideology measure is derived from a measure of the voters' perception of a

congressional representative's position on a policy continuum ranging from conservative to

liberal. The Berry, Ringquist, Fording and Hanson measure uses interest group ratings of

members of Congress, supplemented by two other sources of information, election returns

for congressional races, and data on the party composition of state legislatures and party

affiliation of governors. (Berry et al. 1998). The citizen ideology measure developed by

Berry et al. provides a method to understand the actions of state legislators by assessing the

liberal or conservative nature of their constituents. If legislators care, and act on things that

matter to the voters, then a measure of ideology will help explain state level commitment to

public health and cancer control. By using interest group scores for members of Congress,

the measure assumes that the ideological leanings of the members will be consistent with the

voters that elected them to office. Citizens will most likely vote for candidates who have

views most similar to themselves (Berry et al. 1998).

According to Elazar (1984), states can be divided into traditionalistic, individualistic, and

moralistic cultures. Political culture is the set of perceptions related to the legitimacy of political

participation and the role of government. Various cultures can move forward or impede the

translation of citizen preferences into policy (Jackson, 1992). States oriented toward an

individualist culture will emphasize the marketplace and a limited role for government.

Moralistic culture is more oriented toward the public good and expects government to advance

the interests of the public. In states with traditionalistic culture (primarily in the South), the role of government is viewed as limited, and focused primarily on defending traditional values. Parties count for less than in the other cultures and the bureaucracy is underdeveloped and distrusted (Elazar, 1984, chap. 5). In the examination of determinants of state policy outputs, it would be expected that traditionalistic and individualistic states would have lower spending than moralistic states. Studies have examined the impact of women in state legislatures over the last several decades. Female legislators are more likely than male legislators to take liberal positions on issues such as social welfare, gun control, and public health and safety (Barrett 1995, Carey, Niemi and Powell 1998), and states that have more female representatives introduce and pass more priority bills dealing with issues of women, children and families than men in their states (Thomas, 1991). Women legislators were found to co-sponsor more managed care legislation (Balla and Nemacheck, 2000). Although cancer is not predominantly a women's issue, early advocacy for breast cancer research and screening is credited to women's organizations like the Susan B. Komen Foundation and the National Breast Cancer Coalition. Given this, it would be expected that funding for cancer control programs at the state level will be positively associated with the percentage of women in state legislatures.

Economic Determinants

The economic condition in a state is an important factor to consider in policy adoption. As a state's economy grows and citizens become wealthier, the state will tend to spend more agenda time on post-materialist, or issues other than taxes, transportation and general infrastructure issues (Fellowes, Gray, & Lowery, 2006). Studies have shown that the strength and vitality of a state's economy influences its policies toward redistribution. Tweedie (1994) finds that states with more resources will provide more generous benefits than less wealthy states. Although public health programs such as tobacco control and cancer control programs are not

traditionally defined as redistribution programs, it could be argued that the primary beneficiaries of prevention and screening programs in states are low-income and uninsured citizens. Hence, it is expected that the funding for state cancer programs would increase as the state economy gets larger and citizens become more prosperous. It would be expected that wealthier states would have more generous Medicaid programs as indicated by greater state spending on Medicaid.

Several economic measures were included in the models as predictors of state spending outcomes: per capita tax revenue of the state, percentage uninsured, and state unemployment rate. Each of these variables is an indicator of the fiscal situation in states and may indicate a state's fiscal capacity and ability to spend in a state. In addition, since much of the decision making related to state spending on the outcomes of interest (public health, Medicaid, tobacco and cancer control) is in the hands of the legislature, a measure of fiscal constraint was added by including the presence of budget rules in the state. State government budgeting systems in the United States operate under a variety of budgetary institutions. The most prominent state government budgetary institutions include balanced budget rules (BBRs), tax and expenditure limits (TELs), and supermajority voting requirements for tax increases. Most states are required to balance their budgets and these rules provide the context for which legislatures and the chief executives work. Across all states, TEL's vary widely in what they limit, how they limit spending, how they are enforced, how they treat surpluses, and how they can be changed. A TEL can limit either the spending or the revenue side of a state's budget. A spending-based TEL is considered more restrictive and harder for a state to get around. Some characteristics, including the type of TEL, have been shown to have an impact on state spending (Mitchell, 2010).

From a policy development and public health perspective, it is important to understand whether adoption of new programs or support for increased funding is driven by evidence indicating there is a problem or need for a solution. To examine whether decisionmaking was

associated with a measure of state health status, measures of cancer incidence, cancer mortality, and all-cause mortality were included in the study.

Methods

Data for this study came from the following sources:

Dependent variables

1. State public health funding per capita – Data on overall public health spending for all 50 states for 2004, 2006 and 2008 were obtained through the Trust for America's Health's (TFAH) report on state investment in public health ("Shortchanging America's Health 2008: A State-By-State Look at How Federal Public Health Dollars Are Spent", 2008). TFAH used publicly available budget documents from state government websites that were verified by state public health officials. Public health was defined broadly to include all health spending with the exception of Medicaid, SCHIP, or comparable health coverage programs for low-income residents (Levi, Juliano, & Richardson, 2007). Population data were obtained from the U.S. Census Bureau to create a measure of per capita funding.

2. State Medicaid expenditures per individual in poverty -- State Medicaid data for the years 2004, 2006 and 2008 was obtained from reports from the National Association of State Budget Officers' State Expenditure Report (National Association of State Budget Officers, 2009). Data on the number of individuals in a state below the poverty level was obtained from the Kaiser Family Foundation.

3. State tobacco control funding per capita –Data on state-level funding for tobacco control programs was obtained from CDC's Office on Smoking and Health from an annual survey of grantees for the years 2004, 2006 and 2008.

4. Non-federal funding for cancer control per capita -- Outcomes related to non-federal funding for cancer control at the state level was obtained from the Performance Measures Survey conducted by CDC for the National Comprehensive Cancer Control Program. Program directors were surveyed annually to collect data on program performance and outcomes. In addition to assessing the grantees use of data, implementation of their cancer control plans, and use of evidence-based interventions, CDC asks grantees to identify non-CDC funding to support and sustain work in cancer control. These data provide a snapshot, although not necessarily a complete one, of a state's expenditures on cancer programs. Data for the years 2007, 2008 and 2009 were included in this study.

Independent Variables

Independent variables in the analyses are divided into three categories: political, economic, and indicators of state health status.

Political Variables

To measure the political control of houses in the state, data from the National Conference of State Legislatures (NCSL) were obtained. The measure of party control was defined as unified Republican control of both upper and lower legislative bodies, split party control of the legislature, or unified Democratic control of both houses. The use of a measure that distinguishes unified versus split control recognizes that there may be differences in policy outcomes between bodies controlled by different political parties. The exception is the state of Nebraska, which has a unicameral legislature and was excluded from the analysis. Nebraska's legislature is unique among all state legislatures in the nation because it has a single-house system, and is nonpartisan. In addition to including party control of the legislature, this study added a measure of party of the Governor to the

analysis. Data was collected from the National Governor's Association and party was defined as Republican or Democrat.

To gauge public attitudes, Berry's measure of state-level citizen ideology was used in each of the models. Berry's measure ranges from zero (most conservative), to 100 (most liberal) (Berry et al. 1998, updated in 2007). Data on the percentage of women legislators was obtained from the National Conference on State Legislatures. Political culture was included in each of the models (Elazar, 1984) using a 9-point linear scale to describe moralistic, individualistic and traditionalistic cultures. The mean score was 5.0 and a higher score indicated a traditionalistic culture, while a lower score indicates a more moralistic culture.

Economic Variables

Per capita tax revenue and percentage uninsured by state were obtained from the U.S. Census Bureau. Unemployment data from the same time period was accessed from the Bureau of Labor Statistics. To examine the budget rules in a state, a measure of the presence of a tax and expenditure limitation (TEL) was included. This variable is defined as no TEL, the presence of a TEL that only places limits on new revenue, or states with TELs that requires spending limits or has both revenue and spending limitations. States with spending limits or both revenue and spending limits are considered more restrictive and would expect to be associated with lower levels of state spending. Data on state budget rules were accessed from the Mercatus Center at George Mason University (Mitchell, 2010).

Indicators of State Health Status

U.S. all-cause and cancer mortality rates were obtained from the National Center for Health Statistics, National Vital Statistics System. Several variables were included as controls in the models. In the model examining spending on tobacco control, the percentage of current smokers and whether or not the state was tobacco producing were included to

account for need and economic considerations in a state driven by revenue from the

production of tobacco. Data on the percentage of current smokers was obtained from

CDC's *Behavioral Risk Factor Surveillance System Survey Data,* and tobacco producing states were

defined as those with a significant tobacco manufacturing presence and included GA, KY,

NC, OH, SC and VA (Marlow, 2008).

Other variables

All models also controlled for year and state population. The inclusion of a

population variable allowed for potential scale economies in the delivery of public health

programs, including tobacco and cancer control programs. Data were obtained from the

U.S. Census Bureau.

Multivariable Analysis

The study research design is observational. Multivariable linear regression was used to

determine the independent predictors of the following continuous variables using data from

2004, 2006, and 2008: state public health funding per capita, state Medicaid spending per

individual in poverty, and state tobacco control funding per capita. All independent variables

except for the mortality rate were lagged 1 year since budget decisions are made by state

policymakers 12-18 months in advance. The mortality rate was lagged 4 years since there is

generally a 2-3 year reporting delay with mortality data. Regression diagnostics were examined

to check modeling assumptions. The assumption of normal errors was assessed with the

Shapiro Wilk test and Q-Q plots which plot quantiles of the residuals against quantiles of a

normal distribution. Plots of residuals against the fitted values were examined to assess the

assumption of constant variances. Cook's D and DFFITS were calculated to check for

influential observations. Transformations of the dependent variable were examined when

regression assumptions were violated. Robust regression with M-Estimation using the Huber method was used when a suitable transformation was not found to satisfy the regression assumptions. Variation inflation factors and condition numbers were used to check for multicollinearity. Restricted cubic spline functions were used to assess the linearity assumption for continuous independent predictors. Plots depicting the cubic spline relationship were examined to help identify appropriate transformations. Variables found to violate the linearity assumption were transformed in the final model using restricted cubic spline functions or simpler transformations, such as linear splines or quadratic terms, if they provided a similar fit to the data. Huber-White robust standard error estimates were used to correct for heteroscedasticity across states and correlated responses within states. Results are presented as beta coefficients and standard errors. The same approach was used to create a linear regression model predicting non-federal comprehensive cancer control (CCC) funding per capita using 2007-2009 data. Recognizing that this study includes a small number of observations (n=150) for each model, and a large number of independent variables to explain spending for public health programs and Medicaid, bootstrap validation (b=150 bootstrap samples) was conducted to assess the amount of overfitting in the models. Result were similar to the full models.

For each of the models, independent variables included party control of the state legislature, party of the governor, percentage of women in the state legislature, citizen ideology score, political culture measure, percentage uninsured, per capita tax revenue, state tax and expenditure limitation, unemployment rate, the state cancer or overall mortality rate, and year. In addition, percentage of current smokers and an indicator for tobacco-producing state were included in the tobacco control funding model while total population was included as an independent variable in all models except the Medicaid spending model.

In these analyses, discrete variables are expressed as frequencies and percentages, and continuous variables as means $\pm$ standard deviations and medians with 25th and 75th percentiles. Bivariate relationships among continuous variables are presented as Spearman correlation coefficients. Statistical testing for differences in discrete variables was performed using the likelihood ratio chi-square test. The Kruskal-Wallis rank sum test was used to test for differences in continuous variables across discrete groups. P-values <.10 were considered statistically significant. All analyses were performed using the R Package for Statistical Computing and SAS version 9.2 (SAS Institute, Inc., Cary, NC).

Results

Descriptive statistics are found in Tables 1-3. The results from the various models examining the effects of political and economic variables on state spending for public health, Medicaid, tobacco, and cancer control are found in Tables 4-7. The beta coefficients, standard errors, and p-values are reported for each explanatory variable. In general, average public health spending per capita in states was $38 per person and ranged widely across states (Table 1). State tobacco funding, in contrast, was on average $3.03 per capita (Table 1). Spending on cancer control activities in states also varied widely with the average per capita spending in states less than $1.00 (Table 2). Bivariate correlations for the political variables revealed significant relationships between party control of the legislature and public health funding; citizen ideology with Medicaid spending and tobacco control; percentage of women in state legislatures with Medicaid and tobacco spending; and party of the Governor with tobacco and cancer control spending. Economic variables with significant correlations included per capita tax revenue with all four outcomes. Strict budget rules in a state was correlated with public health funding, Medicaid and tobacco control funding. The

percentage of uninsured individuals in a state was negatively correlated with Medicaid

spending and positively correlated with spending on cancer control (Table 3).

Political characteristics across the models

Party Control of the Legislature

The results were varied related to the effect of political variables on each of the

outcomes. There was a significant relationship (p=.001) between party control of the

legislature and funding for public health (Table 4). States with either split control or unified

Democratic control spent more on public health, relative to a unified Republican controlled

legislature. For example, a state with split party control of the legislature spent roughly $11

more per capita than those with unified Republican control of the legislature. Similarly, states

with unified Democratic control of the legislature spent approximately $13 more per capita

than those with unified Republican control (p=.003). Party control of the legislature was not

significant in the Medicaid or tobacco control funding models. However, there was a

significant relationship between with spending on cancer control and party control of the

legislature, with the opposite effect as found in the public health model. Split control or

unified Democratic control was associated, with a $.20 and $.31 reduction in non-federal

cancer control spending per capita, respectively (Table 7).

Women in State Legislatures

The study revealed an association between the percentage of women in state legislatures

and the various policy outputs. A higher percentage of women in state legislatures was

associated with higher spending on Medicaid per individual in poverty. A 1% increase in the

number of women in the legislature was associated with an increase of $29.59 in Medicaid

spending per individual in poverty (Table 5). A non-linear relationship was observed

between the percentage of women in state legislatures and public health funding. An increasing percentage of women in state legislatures was associated with a decline in public health funding up to around 0.20 – 0.25 percent. Above this level, public health funding tended to increase with higher percentage of women in state legislatures, but was not statistically significant.

Party of the Governor

The only outcome in which the party of Governor was found be significantly associated with spending was tobacco control funding. The party of the Governor had a significant association with tobacco control funding (p=.018), having a Democratic Governor was associated with an increase of $1.35 in state tobacco control funding per capita (Table 6).

Citizen Ideology and Political Culture

Citizen ideology had a significant non-linear relationship with public health funding. Increasing citizen ideology scores were associated with lower public health funding up to 45-50. For ideology scores above 60, more liberal ideology was associated with a significant increase in public health funding. The citizen ideology variable was significantly associated with Medicaid spending (p<.001) and indicated that for each 1-unit increase in the ideology score of a state, there was an $32 increase in Medicaid spending per individual in poverty.

The political culture variable was only significant (p=.025) in the public health funding model, suggesting that those states identified as more Traditionalist were associated with increased public health funding per capita. Specifically, a one point increase in the political culture scale (more Traditionalist) was associated with an increase of $4.09 in public health funding per capita.

Economic characteristics across the models

Per capita tax revenue

Measures of a state's fiscal condition was associated with increased spending in all models. Higher per capita tax revenue was associated with higher Medicaid spending per individual in poverty. For example, a $1 increase in state per capita tax revenue was associated with a $885 increase in Medicaid spending per individual in poverty. States with higher per capita tax revenue spent more on public health funding (p<.001), tobacco control programs (p=.03) and cancer control activities (p=.03), with a $9.59, $1.79 and $.14 increase per capita, respectively.

Insurance status and unemployment

Several differences were noted for the percentage of uninsured in a state. There was an inverse relationship between the percentage of uninsured individuals in the state and Medicaid spending. A one percent increase in the uninsurance rate in the state was associated with a decrease in Medicaid spending by $188 per individual in poverty (p<.001). But there was a significant relationship between the uninsurance rate and funding for cancer control. A one percent increase in the uninsurance rate in a state was associated with a $.04 increase in non-federal cancer control spending per capita (p<.001). The state unemployment rate was significantly associated with a decline in public health funding, with a one percent increase in the unemployment rate associated with a decrease of $6.51 in public health funding per capita.

Budget rules

The measure of state economic constraint, the Tax and Expenditure Limit (TEL) was not found to be significantly associated with public health funding, Medicaid spending, or non-federal cancer control funding. However, the presence of a tax and expenditure

limitation was negatively associated with spending on tobacco. A revenue-based TEL was associated with $1.47 lower spending per capita as compared to states without a TEL. Having only a spending-based TEL or both revenue and spending was not associated with lower spending. Significant bivariate relationships were observed between the TEL and public health funding (p=.03) and Medicaid (p=.006), but were not significant in the final models.

Health status and other variables across the models

Health status in a state, measured by mortality rates, was only significant in the public health model. However, the association between mortality and public health funding was an unexpected non-linear relationship. A 10-unit increase in the mortality rate was associated with a decline of $1.11 in public health funding per capita for mortality rates below 1000. However, there was an increase of $2.16 in public health funding per capita at levels of mortality above 1000. Cancer mortality rates were not significantly associated with tobacco control programs or cancer control funding. In addition, being a tobacco producing state or having a high percentage of current smokers was not associated with tobacco control funding levels. Additionally, it was found that in 2008, public health spending per capita was lower than in the reference year, 2004.

Discussion:

The analyses presented show an interesting range of relationships between selected predictor variables and the outcomes of interest. As expected, increased funding for public health programs in states was associated with both unified Democratic and split control of the state legislature, compared to states with Republican control, consistent with other

studies (Kousser, 2002, Fellowes et al., 2006). However, in the cancer control model, the variable for unified Democratic or split party control was associated with lower spending. Similarly, Sloan (2005) found that none of the measures of partisanship, political ideology, or political party control had statistically significant effects on total tobacco settlement spending. Also as expected, in the public health spending model, one measure of economic conditions in states (unemployment rate) was a significant predictor of lower spending for public health. This suggests that states may have competing priorities during economic downturns and are less willing to spend on discretionary programs. Funding for Medicaid and other mandatory spending programs may take priority for state policymakers. Per capita tax revenue was significant; an expected finding given that wealthier states, with greater capacity would have been expected to spend more on discretionary public health programs. The finding that a higher percentage of uninsured individuals in a state was associated with lower spending for Medicaid was an interesting finding and potentially explained by factors related to changes in the Medicaid program. This finding reflects a downward spending trend in Medicaid spending from 2001 to 2006. Medicaid spending growth hit a record low of 1.3% in FY2006 (Kaiser Commission on Medicaid and the Uninsured, 2007). States attribute the decline in spending to slowed enrollment growth, cost containment and the transfer of prescription drug costs for beneficiaries from the Medicaid roles to Medicare (Kaiser, 2007). In addition, as the numbers of uninsured in a state rise, the potential dollars available for Medicaid may not be rising as fast as the need, thereby creating a gap in funding.

The finding that there is an unusual relationship between public health funding and mortality rates raises an important issue about the use of evidence in decision-making by state legislatures. It would be expected that higher death rates in a state would encourage

action and support for public health programs. It might be possible to argue that states with overall lower mortality rates were doing better since they spent money on public health activities to improve health. But the context in which legislators work may be an important factor not considered in this analysis. State legislators experience institutional constraints that impact their ability to use evidence in policy making such as working within a part-time legislature, the length of the legislative session, limited number of professional staff, and the number of bills to be considered over a short period of time. The expectations of members to have knowledge about a broad range of issues poses challenges for legislators, and often requires a reliance on others for information as part of their decisionmaking process. In the arena of health care and public health, the issues are often so complex that if members are not directly on the committees dealing with health, they follow the advice of peers on issues (Jewell & Bero, 2008). Given the results here, it may be important to examine in more depth how institutional factors are associated with increased support for public health and cancer control programs at the state level. In addition, previous studies examining tobacco settlement expenditures (Gross 2002, Sloan et al., 2005) found that smoking-related health needs had little impact of states' anti-smoking funding. States with higher smoking rates tended to invest less per capita on tobacco control programs.

The presence of women in state legislatures was significantly associated with increases in spending on Medicaid, but an interesting relationship was seen in the public health model. With the presence of a small percentage of women in state legislatures, an increase in the percentage of women is associated with a reduction in public health spending. For example, an increase in the percentage of women from 0.15 percent to 0.20 percent was associated with decreased public health funding. This effect was not found when the percentage of women in state legislatures was at higher levels (>0.25%). The presence of the opposite

effect of women in state legislatures in the public health and Medicaid models raises questions about the ability of this variable to explain policy outcomes. This study reflects the variation occurring in the literature and continues to raise issues over the impact of women's substantive representation in legislatures. Previous research has shown that there is little or no relationship between the numbers of women in state legislatures and overall policy outcome (Thomas 1991, Tolbert and Steuernagel 2001), and others point to the impact of women on passage of women's health bills (Reingold and Schneider 2001). The proportion of women in state legislatures did not play a big role in policy outcomes related to cancer control or tobacco spending. Examining the impact of numbers alone does not provide enough explanation, and outcomes may also depend on the incorporation of women into dominant coalitions and leadership structures in a state (Reingold and Smith 2012).

In the Medicaid model, higher spending in states with more liberal ideologies was consistent with expectations and previous literature finding that more liberal states will have greater Medicaid spending per capita (Garfield, 2008). In the public health funding model, the relationship between citizen ideology and funding was non-linear and not expected. In this model, a shift from more conservative ideology to a more moderate ideology was associated with lower spending, while a shift from more moderate to liberal ideology was associated with higher public health spending. The political culture variable appeared to be significant only in the public health model, with a more traditionalist culture associated with an increase in public health spending per capita. This finding is inconsistent with the literature that suggests a more limited government role in traditionalist states (Elazar, 1984; Conway, 1989).

In the model examining cancer control funding, political variables played a limited role in explaining support. Unified Democratic control of the legislature was associated with lower

cancer control funding relative to unified Republican control of the legislature. This finding was in the opposite direction from the public health funding model in which unified Democratic control was associated with increased funding. This could be a reflection of Democrats' willingness to spend on other key public health concerns (for example, maternal and child health programs or infectious disease programs such as influenza vaccination and pandemic planning), but not on cancer control efforts. Based on the social construction of the population with cancer, it would have been expected that both Democrats and Republicans, alike would support higher spending on cancer control. Governmental priorities are thought to be influenced by the perceptions of the population affected by a given problem, as well as how serious it is and by its cause. Schneider and Ingram stress the importance of "cultural characterizations or popular images of the persons or groups whose behavior and well-being are affected by public policy" (Schneider and Ingram, 2001). They theorize that the social construction of target populations shapes both the policy agenda and the actual design of policy. Target populations are classified as advantaged, dependents, contenders, or deviants according to the combination of their public image, positive or negative, and their political power, high or low. This theory suggests that the positively constructed population affected by cancer could affect support for cancer control and increases for funding both among legislatures with unified republican and unified democratic control. But an association with lower spending may ultimately be driven by other factors, regardless of how the public or policymakers view people with cancer.

The measure of fiscal capacity, per capita tax revenue, was significantly associated with higher spending for cancer control. The only other significant factor in determining higher spending on cancer control was the percentage of uninsured in a state. This may be due to the legislature's need to support screening and cancer control services for those who lack

health insurance. The finding that a greater percentage of uninsured in a state is associated with higher spending may reflect a lack of understanding of cancer control programs and the use of state allocated funding. In contrast to state funding directly for screening services, comprehensive cancer control was initiated to provide support for health promotion activities, implement activities in a state-wide cancer control plan and provide support to cancer survivors. In this case, support may be narrowly interpreted as for those in need of screening, versus the needs of a broader population across the cancer control spectrum. But it may also reflect the inability of the chosen variables to capture the range of influences on policy decisions, particularly ones related to support for cancer control.

Limitations:

Several factors need to be considered regarding the findings from this study. First, since it was impractical to obtain a measure of all cancer control spending in all 50 states, the findings from examining relationships of the proxies provide some insight, if not a complete picture of how important political and economic factors are in state policymaking. Second, the study could also have benefitted from a larger sample, incorporating additional years of outcome data for public health funding, tobacco control funding, and cancer control funding. Time and data access limitations precluded expansion.

There are several potential limitations to use of the Comprehensive Cancer Control survey data, including the accuracy of self-reported data, potential confusion by the states regarding the intent of the questions included in the study, and missing data. However, these issues were addressed by reviewing the funding data with the individual states to clarify discrepancies, and appropriate adjustments were made. Feedback from CDC staff helped to validate the findings and reliability.

An additional limitation to this study was the absence of a measure reflecting the presence of organized interests in the state policymaking process. While other studies have used numbers of AMA members (Sloan 2005), or effective hospital/nursing home groups within a state (Garfield 2008) as a measure of interest group strength in models for Medicaid expenditures and tobacco settlement spending, information on cancer-related groups at the state level was not easily accessible. It is a major challenge to understand the role, influence and impact of interest groups. However, even if publicly available measures were incorporated in the analysis, it still may not have adequately predicted cancer outcomes in this study.

Despite these limitations, this study has several strengths and unique features. It looked at measures of spending across different health programs at the state level. There has been limited research examining the political and economic determinants of state Medicaid and tobacco spending and no literature examining determinants of state cancer control funding. It provides some insight into the dynamics of policymaking and sheds light on the challenges with identifying factors that drive decisionmaking at the state level. This work provides a starting point for further analysis and practical information for advocates and those in the cancer community to continue efforts to adopt an agenda to address cancer prevention and control.

Implications:

This study examines the extent to which political and economic factors may influence spending on public health programs and Medicaid at the state level. The outcomes examined were proxies of a state's commitment to spending on public health and cancer control. This study revealed that states were more likely to spend on cancer control if there

was a high uninsured population in the state and if there was high per capita tax revenue. Other important findings include confirmation that more liberal states and those controlled by Democratic legislatures are likely to spend on Medicaid, while more discretionary spending on public health and tobacco are influenced by having a Democratic legislature and a Democratic Governor, respectively. But it is important to note that while some political characteristics matter, it was the economic conditions in states which have important implications for resource allocation at the state level across all relationships.

The findings of this study can provide insight to better understand how cancer coalitions and public health professionals can influence the political process, and how the economic conditions in a state will affect their ability to adopt change. A purely quantitative approach to defining interest group influence may not be the best predictor of policy outcomes in this study since it cannot adequately explain the relationships/interactions between lobbyists and group leaders and between lobbyists and policymakers, both elected and appointed. Quantitative methods need to be combined with qualitative approach: "soaking and poking" as Richard Fenno would say – interviewing, observing and associating with lobbyists, group leaders, legislators and bureaucrats. Another strategy for capturing the impact of interest groups on these outcomes would be to examine the composition and actions of specific comprehensive cancer control coalition members to create an index or "power" score to assess strength. There are clearly interesting factors outside the scope of this study that may account for the variation in funding for cancer control and other public health programs. Public health and the cancer community would benefit from future research to further understand these relationships.

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Descriptive Statistics
Table 1. Distribution of state political, economic, and funding characteristics, 2004, 2006 and 2008. [Model 1 – 3: Public Health Funding, Medicaid Spending, Tobacco Control]

Characteristic	N	
Public Health Funding per Capita ($)	148	16.6 / 30.2 / 50.7
		37.7 ± 28.5
State Medicaid Spending per Individual in Poverty ($)	150	2014 / 2742 / 4668
		3567 ± 2356
State Tobacco Control Funding per Capita ($)	150	0.77 / 2.09 / 4.21
		3.03 ± 3.03
Party of Governor	150	
Democrat		73 (48.7%)
Republican		77 (51.3%)
Party Control of State Legislature	147	
Unified Republican		55 (37.4%)
Split control		35 (23.8%)
Unified Democrat		57 (38.8%)
Percentage of Women in State Legislatures	150	17.1 / 22.7 / 28.5
		22.7 ± 7.1
All-Cause Mortality Rate (per 100,000)	150	777.1 / 869.3 / 940.5
		855.7 ± 129.5
Cancer Mortality Rate (per 100,000)	150	179.8 / 199.9 / 215.2
		196.0 ± 30.9
Percentage Uninsured	150	10.8 / 13.4 / 16.9
		13.9 ± 3.8
Per Capita Income ($)	150	29807 / 32875 / 37011
		33726 ± 5724
Citizen Ideology Score	150	44.0 / 52.8 / 64.2
		53.8 ± 15.2

Table 1. Distribution of state political, economic, and funding characteristics, 2004, 2006 and 2008, *continued*

Characteristic	N	
Unemployment Rate	150	4.1 / 4.9 / 5.6
		4.9 ± 1.1
Percentage of Current Smokers*	150	19.3 / 20.9 / 23.4
		21.2 ± 3.4
Per Capita Tax Revenue	150	1.82 / 2.17 / 2.49
		2.26 ± 0.63
Political Culture Score	147	2.5 / 4.3 / 7.7
		5.0 ± 2.6

* Estimated from Behavioral Risk Factor Surveillance System (BRSS) survey.

Continuous variables presented as lower quartile / median / upper quartile and means ± standard deviations. Categorical variables presented as frequency and percentage.

Note: Funding data (public health, state Medicaid, and state tobacco control) are for the current year. Mortality data have 4-year data lag due to delay in availability of data. All other independent variables have a 1-year data lag.

Descriptive Statistics

Table 2. Distribution of state political, economic, and funding characteristics, 2007-2009. [Model 4: Non-federal contribution to CCC program]

Characteristic	N	
Non-federal funding to comprehensive cancer control programs ($ per capita)	139	0.01 / 0.05 / 0.43 0.93 ± 2.95
Party of Governor	150	
Democrat		79 (52.7%)
Republican		71 (47.3%)
Party Control of State Legislature	147	
Unified Republican		49 (33.3%)
Split control		31 (21.1%)
Unified Democrat		67 (45.6%)
Percentage of women in state legislatures	150	17.3 / 22.7 / 30.1 23.2 ± 7.3
Cancer mortality rate (per 100,000)	150	179.2 / 198.8 / 213.4 194.5 ± 30.2
Percentage uninsured	150	11.3 / 13.6 / 17.0 14.1 ± 4.0
Per capita income ($)	150	32774 / 36177 / 40257 37118 ± 5767
Citizen Ideology Score	150	46.8 / 57.0 / 70.3 57.6 ± 16.8
Unemployment Rate	150	3.8 / 4.6 / 5.3 4.7 ± 1.2
Tax and Expenditure Limitation (TEL)	150	
No State Law		65 (43.3%)
State has revenue TEL		21 (14.0%)
State has spending or both TEL		64 (42.7%)

Table 2. Distribution of state political, economic, and funding characteristics, 2007-2009, *continued*

Characteristic	N	
Per Capita Tax Revenue	150	2.16 / 2.40 / 2.79
		2.63 $\pm$ 1.07
Political Culture Score	147	2.5 / 4.3 / 7.7
		5.0 $\pm$ 2.6

Continuous variables presented as lower quartile / median / upper quartile and means $\pm$ standard deviations.

Table 3. Bivariate Relationships with Dependent Variables

	State Public Health Funding Per Capita[0]	Medicaid Spending Per Individual in Poverty[0]	State Tobacco Control Funding Per Capita[0]	Cancer Control Funding Per Capita[0+]
Political				
Party Control of Legislature**[**][++]	p=.001	p=.135	p=.119	p=.142
Unified Republican	14.8 / 21.0 / 37.3 28.4 $\pm$ 19.8	2018 / 2553 / 3476 3108 $\pm$ 1710	0.37 / 1.73 / 3.75 2.57 $\pm$ 2.88	0.01 / 0.12 / 1.01 1.24 $\pm$ 2.69
Split Control	13.9 / 27.3 / 48.2 33.4 $\pm$ 22.5	1972 / 2595 / 4457 3110 $\pm$ 1400	0.88 / 2.07 / 4.13 3.26 $\pm$ 3.33	0.02 / 0.06 / 0.41 1.55 $\pm$ 4.91
Unified Democrat	24.1 / 40.0 / 64.6 49.1 $\pm$ 35.3	2039 / 3338 / 5851 4314 $\pm$ 3137	1.27 / 2.53 / 4.83 3.42 $\pm$ 3.00	<0.01 / 0.04 / 0.21 0.50 $\pm$ 1.91
Party of Governor**[**][++]	p=.291	p=.5	p=.075	p=.029
Democrat	16.2 / 25.8 / 46.6 33.9 $\pm$ 22.1	2154 / 2792 / 4599 3423 $\pm$ 1866	1.16 / 2.36 / 4.24 3.48 $\pm$ 3.37	0.02 / 0.098 / 0.46 1.48 $\pm$ 3.97
Republican	18.5 / 35.3 / 51.9 41.4 $\pm$ 33.4	1900 / 2562 / 4784 3704 $\pm$ 2747	0.44 / 1.84 / 4.11 2.60 $\pm$ 2.61	<0.01 / 0.02 / 0.35 0.32 $\pm$ 0.59
Percentage of Women in the State Legislature**[*][+]	-.022, p=.787	.323, p<.001	.201, p=.014	-.073, p=.39
Citizen Ideology**[*][+]	.062, p=.451	.539, p<.001	.245, p=.003	-.085, p=.317
Political Culture**[*][+]	.108, p=.195	-.366, p<.001	-.164, p=.047	.020, p=.817
Economic				
Per Capita Tax Revenue**[*][+]	.299, p<.001	.525, p<.001	.415, p<.001	-.144, p=.09
Percentage Uninsured**[*][+]	.097, p=.243	-.586, p<.001	-.027, p=.739	.21, p=.013
Unemployment**[*][+]	-.23, p=.005	-.158, p=.05	-.226, p=.005	-.107, p=.210
Tax & Expenditure Limitations**[**][++]	p=.03	p=.006	p=.394	P=.192

	State Public Health Funding Per Capita[0]	Medicaid Spending Per Individual in Poverty[0]	State Tobacco Control Funding Per Capita[0]	Cancer Control Funding Per Capita[0+]
Revenue TEL	19.6 / 25.8 / 48.9 34.6 $\pm$ 22.7	2792 / 2996 / 4671 4415 $\pm$ 2887	0.36 / 0.89 / 2.12 1.33 $\pm$ 1.21	<0.01 / 0.03 / 0.15 0.14 $\pm$ 0.25
Spending and Revenue TEL	13.7 / 24.8 / 42.4 34.6 $\pm$ 32.9	1837 / 2390 / 3421 3262 $\pm$ 2629	0.90 / 1.89 / 3.95 2.93 $\pm$ 2.87	.01/0.03 / 0.29 0.65 $\pm$ 2.20
Other				
All-Cause Mortality*[+]	-.161, p=.05	.525, p<.001	n/a	n/a
Cancer Mortality*[+]	n/a	n/a	-.097. p=.239	
Tobacco-Producing State**	n/a	n/a	p=.015	n/a
Yes			0.47 / 1.07 / 2.22 1.47 $\pm$ 1.32	
No			0.89 / 2.30 / 4.40 3.24 $\pm$ 3.13	
Percentage of Current Smokers*[+]	n/a	n/a	-.10, p=.221	n/a
Year**[++]	p=.854	p=.05	p=.394	p=.967
2004	15.2 / 32.3 / 53.5 36.3 $\pm$ 25.8	1814 / 2498 / 3835 3071 $\pm$ 1925	0.67 / 1.87 / 3.88 2.71 $\pm$ 2.78	0.01 / 0.06 / 0.32 1.13 $\pm$ 3.62
2006	16.5 / 30.0 / 47.9 38.0 $\pm$ 30.9	1982 / 2657 / 4950 3623 $\pm$ 2453	0.69 / 1.87 / 4.23 2.91 $\pm$ 3.01	0.01 / 0.05 / 0.44 0.81 $\pm$ 2.79
2008	19.8 / 28.7 / 51.3 38.7 $\pm$ 29.1	2227 / 3090 / 4943 4008 $\pm$ 2590	0.93 / 2.60 / 4.35 3.45 $\pm$ 3.28	0.01 / 0.03 / 0.65 0.85 $\pm$ 2.39

Table 4.

Model 1: Multivariable linear regression model predicting state public health funding per capita, 2004, 2006, and 2008.

Characteristic	Beta Coefficient (S.E.*)	P-value
Party Control of Legislature		0.006[†]
Unified Republican	Reference	
Split Control	11.21 (5.29)	0.036
Unified Democrat	13.00 (4.33)	0.003
All-Cause Mortality Rate[‡] (per 10,000)		<0.001[‡]
<1000	-1.11 (0.32)	0.001
>1000	2.16 (0.57)	<0.001
Percentage of Women in State Legislatures[§]	-4.96 (1.59)	0.004[§]
Percentage of Women Squared	0.10 (0.04)	0.007
Citizen Ideology Score[§]	-4.08 (0.92)	<0.001[§]
Citizen Ideology Score Squared	0.04 (0.01)	<0.001
Political Culture Score	4.09 (1.80)	0.025
Party of Governor		
Republican	Reference	
Democrat	4.76 (4.22)	0.261
Percentage Uninsured	-0.90 (1.11)	0.417
Per Capita Tax Revenue	9.59 (4.50)	0.035
Unemployment Rate	-6.51 (2.22)	0.004
Year		<0.001[†]
2004	Reference	
2006	-5.40 (3.11)	0.085
2008	-18.54 (4.27)	<0.001
Tax and Expenditure Limitation (TEL)		0.425[†]
No State Law	Reference	

State has Revenue TEL	7.90 (6.12)	0.199
State has Spending TEL or both Revenue & Spending TEL	1.55 (6.21)	0.803
Population[||] (per 100,000)	-0.36 (0.17)	0.021[||]
Nonlinear	0.57 (0.23)	0.016

* Huber-White robust standard error estimates

† P-value is from the simultaneous test that the coefficients for all associated indicator variables are equal to 0.

‡ Transformed with linear spline function due to non-linearity. The p-value is from the simultaneous test that both linear coefficients are equal to 0.

§ Quadratic term included due to non-linearity. The p-value is from the simultaneous test that the linear and quadratic coefficients are equal to 0.

|| Transformed with 3-knot restricted cubic spline function due to non-linearity. The p-value is from the simultaneous test that the linear and nonlinear coefficients are equal to 0.

Model R-Square = 0.645

Validated R-Square = 0.526

Table 5.

Model 2: Multivariable linear regression model* predicting Medicaid spending per individual in poverty, 2004, 2006, and 2008.

Characteristic	Beta Coefficient (S.E.)	P-value
Party Control of Legislature		0.269[†]
Unified Republican	Reference	
Split Control	-385.10 (270.41)	0.154
Unified Democrat	-51.41 (267.85)	0.848
All-Cause Mortality Rate (per 10,000)	-8.84 (11.02)	0.423
Percentage of Women in State Legislatures	29.59 (18.06)	0.101
Citizen Ideology Score	32.44 (8.97)	<0.001
Political Culture Score	62.99 (47.80)	0.188
Party of Governor		
Republican		
Democrat	-66.00 (198.28)	0.739
Percentage Uninsured	-188.58 (32.71)	<0.001
Per Capita Tax Revenue	885.96 (230.45)	<0.001
Unemployment Rate	74.80 (109.06)	0.493
Year		0.959[†]
2004		
2006	49.28 (243.18)	0.839
2008	-13.23 (286.34)	0.963
Tax and Expenditure Limitation (TEL)		0.663[†]
No State Law		
State has Revenue TEL	242.09 (296.95)	0.415
State has Spending TEL or both Revenue & Spending TEL	-18.63 (214.93)	0.931

* Robust regression (M-Estimation using the Huber method) was used due to non-normal errors.

† P-value is from the simultaneous test that the coefficients for all associated indicator variables are equal to 0.

Model R-Square = 0.412

Table 6.

Model 3: Multivariable linear regression model predicting state tobacco control funding per capita, 2004, 2006, and 2008.

Characteristic	Beta Coefficient (S.E.*)	P-value
Party Control of Legislature		0.944[†]
Unified Republican	Reference	
Split Control	0.04 (0.63)	0.947
Unified Democrat	-0.23 (0.75)	0.761
Cancer Mortality Rate (per 10,000)	-0.004 (0.181)	0.984
Percentage of Women in State Legislatures	0.03 (0.05)	0.553
Citizen Ideology Score	0.01 (0.03)	0.672
Political Culture Score	0.12 (0.18)	0.527
Party of Governor		
Republican		
Democrat	1.35 (0.56)	0.018
Percentage Uninsured	-0.03 (0.11)	0.787
Per Capita Tax Revenue	1.79 (0.81)	0.030
Unemployment Rate	-0.04 (0.33)	0.896
Tobacco-Producing State	-0.10 (0.86)	0.908
Percentage of Current Smokers	0.05 (0.16)	0.741
Year		0.558[†]
2004		
2006	-0.43 (0.44)	0.330
2008	-0.68 (0.63)	0.281
Tax and Expenditure Limitation (TEL)		0.053[†]
No State Law		
State has Revenue TEL	-1.47 (0.60)	0.016
State has Spending TEL or both Revenue & Spending TEL	-0.17 (0.69)	0.802

Population (per 100,000)[‡]	-0.09 (0.03)	0.001
Nonlinear Term	0.12 (0.04)	0.001

* Huber-White robust standard error estimates

† P-value is from the simultaneous test that the coefficients for all associated indicator variables are equal to 0.

‡ Variable transformed using 3-knot restricted cubic spline functions due to non-linearity. The p-value is from the simultaneous test that the linear and nonlinear coefficients are equal to 0.

Model R-Square = 0.496

Validated R-Square = 0.355

Table 7.

Model 4: Multivariable linear regression model* predicting non-federal funding contribution (per capita) to comprehensive cancer control programs, 2007-2009.

Characteristic	Beta Coefficient (S.E.)	P-value
Party Control of Legislature		0.003[†]
Unified Republican	Reference	
Split Control	-0.20 (0.10)	0.044
Unified Democrat	-0.31 (0.09)	0.001
Cancer Mortality Rate (per 10,000)	-0.01 (0.02)	0.647
Percentage of Women in State Legislatures	-0.004 (0.007)	0.556
Citizen Ideology Score	0.002 (0.003)	0.579
Political Culture Score	-0.01 (0.02)	0.579
Party of Governor		
Republican		
Democrat	0.11 (0.07)	0.126
Percentage Uninsured	0.04 (0.01)	<0.001
Per Capita Tax Revenue	0.14 (0.06)	0.031
Unemployment Rate	0.0004 (0.0381)	0.992
Tax and Expenditure Limitation (TEL)		0.302[†]
No State Law		
State has Revenue TEL	-0.04 (0.11)	0.734
State has Spending TEL or both Revenue & Spending TEL	-0.11 (0.07)	0.127
Year		0.591[†]
2007		
2008	0.08 (0.08)	0.352
2009	0.07 (0.09)	0.424
Population (per 100,000)	-0.001 (0.001)	0.016

* Robust regression (M-Estimation using the Huber method) was used due to non-normal errors.

† P-value is from the simultaneous test that the coefficients for all associated indicator variables are equal to 0.

Model R-Square = 0.034

CHAPTER 3

Impact of Women's Legislative Incorporation on Support for State Breast and Cervical Cancer Screening

Abstract

Funding for breast and cervical cancer screening programs varies widely across states. Getting on the agenda of policymakers requires demonstration of the problem, feasible solutions and efforts by political actors. Women legislators can play an important role as policy entrepreneurs to support state screening efforts. The research linking women's representation and policy outcomes has been mixed at best. Few studies have looked at predictors of state funding for breast and cervical cancer screening. The purpose of this study goes beyond the simple measure of number of women in legislatures and examines whether institutional factors are predictive of policy outcomes. Three years of state appropriations for screening for breast and cervical cancer were examined to test the hypothesis that women in leadership roles within state legislatures will result in higher spending for cancer screening for low-income women.

This study finds that the incorporation of women in state legislatures is not associated with higher state appropriations for breast and cervical cancer screening. The percentage of women in state legislatures, the percentage of women in leadership roles and the percentage of women holding committee chairmanships were not significant predictors of cancer screening funding. Other political factors, however, were found to be significantly associated with higher levels of state cancer screening funding. Unified Democratic control of the legislature and a more professional legislature was associated with higher spending for breast and cervical cancer screening. In addition, state fiscal capacity was associated with funding

outcomes. State budget rules were associated with decreased funding and higher per capita tax revenue in states was found to be associated with increased funding.

The main findings of the study do not support the hypothesis that the incorporation of women in the legislature, in particular women in committee and leadership positions, has an impact on funding support for breast and cervical cancer screening. This study provides further evidence in the debate over the impact of women in legislatures on policy outcomes. In addition, the study also highlights other important economic and political factors likely to impact a state's level of funding for breast and cervical cancer screening.

Background

Breast and cervical cancer screening is an important, if at times controversial, women's health issue. Deaths from breast and cervical cancers could be avoided if cancer screening rates increased among women at risk (Farley et al., 2010). Deaths from these diseases occur disproportionately among women who are uninsured or underinsured. Mammography and Pap tests are underused by women who have no source or no regular source of health care, women without health insurance, and women who immigrated to the United States within the past 10 years (CDC, 2012). To address these issues, in 1990, Congress passed the Breast and Cervical Cancer Mortality Prevention Act, creating a program to provide breast and cervical cancer screening services to underserved women (PL 101-354).

Through the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), the Centers for Disease Control and Prevention (CDC) provides low-income, uninsured, and underserved women access to timely breast and cervical cancer screening and diagnostic services. Since 1991, NBCCEDP-funded programs have served approximately 4 million women – providing breast and cervical cancer screening exams and diagnosing cancers. Although this program has existed for over 20 years, it serves only a small proportion of women who are eligible to receive screening services (CDC, 2012).

In the early 1990s when the program began, it was a historic time for attention to women's health issues. A 1990 General Accounting Office report found that HHS had made little progress since the mid-1980s in including women and minorities in clinical research trials funded by the U.S. government. The GAO report, presented at Congressional hearings in 1990, found than only 13.5% of the NIH budget supported research on women's health issues and noted egregious examples of large, publicly funded studies entirely excluding women as subjects (Carnes et al. 2008). Not only was there a wave of outspoken

concern about the lack of attention to women's health and the inequities in clinical studies which did not include a strong enough focus on women, studies at the time revealed that screening rates for breast and cervical cancer were alarmingly low for such an important preventive health measure. The public outrage resulting from the hearings led to more than 20 separate bills introduced in Congress to improve women's health (Carnes 2008). In addition, these bills were combined into an omnibus package and introduced as the Women's Health Equity Act of 1990 by the Congressional Caucus on Women's Issues. The timing was right for a greater focus on women's issues, and there was a substantive increase in women's representation at the national level. There was a greater emphasis on domestic issues, particularly ones that were traditionally associated with women including family security, education and health care (Hawkesworth, 2001).

Since that time, cancer screening programs have played an important role in providing services to women in need. Programs receive varying levels of funding from CDC, which directly influences the number of women that can be served. Clinical costs also vary by state, tribe, and territory. Each of the funded programs adopts operational models suitable to their state, territory, or tribal public health infrastructure and is often augmented by state programs and funding to reach more women. Many programs blend funds to extend services or use additional funds to provide services to a broader population, such as screening younger women for breast cancer. Each program implements strategies to reach women in underserved communities. Priority populations include older women for breast cancer screening, women rarely or never screened for cervical cancer, and racial and ethnic minority women.

States play a significant role in partnership with the NBCCEDP. Almost all states provide additional funding for cancer screening programs, including mammography and pap

testing for low-income or underserved populations, operation of referral services, and information about diagnostic and treatment issues. For example, in 2008 and 2009, the South Carolina State Legislature appropriated $2 million to expand the Best Chance Network. The state funds allow the program to expand age eligibility and to screen more women throughout the state. In Kentucky, the State Health Department contracted with local health departments to conduct screening and follow-up services for uninsured women with funds provided by the state legislature (CDC, 2012). Although many states provide additional funding for screening women, not all do. It is for this reason that this study aims to identify the key determinants of this state policy outcome and disseminate the findings to the public health community for further action.

Agenda Setting and Public Policy

In public health, people often ask the question, how do we get support for our programs in the field? How do we get support from policymakers to initiate, develop and expand activities to promote health and wellness? This is a longstanding question and the answers often vary depending on the issue, the context in which it is placed, and the environment at the time.   To effectively get on a policymaker's agenda, it is critical to demonstrate that there is a problem and a solution to drive the policy process (Kingdon, 2003). Kingdon suggests that events be quantifiable and visible to policymakers, pointing out that it is often more persuasive and real for policymakers if they can see the impact of their decisionmaking. Consequently, building roads and supporting transportation infrastructure is the classic problem readily attended to by policymakers. It is also argued that getting on the agenda is often more successful for those issues with a focusing event to call attention to the problem,

and that crises and disasters get on the agenda more frequently than every day, more routine issues (Kingdon, p.95).

Political actors are essential in public policymaking (Kingdon, 1984; Polsby, 1984). The priority accorded competing problems is often driven by policy entrepreneurs who invest their resources to achieve policy change, including state legislators who are involved in the process. Legislators can be identified as policy entrepreneurs when they serve as experts in an area and work to "soften" the system so that when the policy window opens, they are positioned to prevail (Weissert 1991, Carter 2004). The notion of women as legislative policy entrepreneurs is supported by the literature, which acknowledges that leadership on policy issues is continuous and comprehensive during the entire legislative process. Women legislators are not only introducing legislation but influencing the process through their committee and leadership roles (Swers 2003; Hawkesworth et al. 2001)

Studies have shown a link between women's actions within the legislature and support for traditional women's issues. Female legislators are more likely than male legislators to take liberal positions on issues such as social welfare, gun control, and public health and safety (Barrett 1995, Carey, Niemi and Powell 1998), and states that have greater numbers of female representatives versus male representatives introduce and pass more priority bills dealing with issues of women, children and families than men in their states (Thomas, 1991). Research focused on Arizona and California revealed that female legislators viewed themselves as representative of women and women's issues (Reingold 1992); and even in legislatures with a small number of women, those women are more likely than men to sponsor legislation with a focus on women's interests (Bratton 2005). Support for women's issues cuts across party lines, as Swers (2002) found that Democratic and moderate

Republican congresswomen are more likely to pursue women's interests, including childcare and domestic violence.

Gaps in the literature

The research linking women's representation and policy outcomes has been varied and inconclusive. In a previous study examining variation in state spending on public health programs and Medicaid, there was some evidence that the proportion of women in state legislatures was a predictor of higher funding for Medicaid, but not for other public health programs (Protzel Berman, 2012). Studies have examined the impact of women in legislatures over the last several decades. Women legislators were found to co-sponsor more managed care legislation (Balla and Nemacheck, 2000), and women who were elected to office previously held by a male representative were shown to sponsor more legislation that pertains to women's issues (Gerrity et al., 2007). Beyond initiating and sponsoring legislation, few studies have made a convincing link between substantive policy outcomes and female representation. There is evidence that female legislators have an impact on some women's issues, but not others. Female legislators can make a difference on issues such as abortion and child support (Berkman and O'Connor 1993; Crowley 2004; Keiser 1997), but not necessarily on domestic violence and women's health (Tolbert and Steurnagel 2001; Weldon 2004, 2006a).

It is also important to consider the institutional factors and broader context for policy outcomes. Skocpol (1992) suggests political activity carried out by politicians or other social groups is conditioned by the institutional structures of party systems and governments. The rules and norms within legislative institutions may restrict how or whether women's issues are translated into policy and are often limited by the lack of women representatives in

positions of power within the institution (Heath et. al, 2005; Swers 2000). Because of this, it is important to consider the role of women within the legislature and examine how leadership is associated with policy outcomes. Women state legislators are more likely to serve on committees with jurisdiction over traditional concerns like health and welfare issues (Carroll, 2008). Other studies found that Committees provide women legislators with greater opportunity to influence welfare policy and concluded that women's participation in state legislatures does influence policy (Poggione 2004). Poggione found that women state legislators hold more liberal preferences on welfare policy than men, even when controlling for constituency preferences and party ideology. Scholars have suggested that more research is needed on women's access to party leadership, arguing that the absence of women in legislative leadership may impact the ability to further women's issues within the legislature (Baer 2003, Rosenthal 1998).

This study goes beyond the simple measure of the number of women in legislatures and examines whether institutional factors are predictive of policy outcomes. Few studies have looked at predictors of state funding for breast and cervical cancer screening. This study tests the hypothesis that increasing numbers of women in leadership roles within state legislatures will result in higher spending for cancer screening for low-income women. This study is particularly relevant since public health programs in states have been seeing declining support over time. At the state and local levels, public health budgets have been cut at dramatic rates in recent years. According to a Trust for America's Health (TFAH) analysis, 33 states and the District of Columbia cut funding for public health from fiscal year 2008-2009 to 2009-2010, and 15 of these states cut funding for a second year in a row (TFAH 2011). According to the Center on Budget and Policy Priorities, states have experienced overall budgetary shortfalls of $425 billion since FY 2009 (Center on Budget

and Policy Priorities 2012). In January 2010, 53 percent of local health departments reported

that their core funding had been cut from the previous year, and 47 percent anticipate cuts

again in the coming year (TFAH, 2011). Many public health programs are not funded at

optimal levels, including tobacco and bioterrorism efforts (Campaign for Tobacco-Free

Kids, 2011; TFAH, 2011). With the impact of the recession and declines in public health

spending, many public health programs would benefit from a better understanding of key

determinants of policy and the role of women legislators in support for breast and cervical

cancer screenings programs in our current environment.

Methods

Dependent Variables

Data from the American Cancer Society from 2008-2010 are used to identify the amount

of state funding appropriated for breast and cervical cancer screening. These funds are used

to provide screenings to low-income women who are unable to afford cancer screenings.

State appropriated money for cancer screenings complement federal support through the

National Breast and Cervical Cancer Early Detection Program. The data were reported by

state NBCCEDP programs in all 50 states. The dependent variable was reported as spending

per woman aged 18-64 at or below 250% of the federal poverty level, thus capturing the

baseline number of women in the population who are eligible for recommended screenings

(USPSTF guidelines).

Independent and Control Variables

To test the hypothesis that funding is related to the role of women in state legislatures,

or their legislative incorporation, several measures are included in the analysis. The first

variable is the percentage of legislative seats occupied by women in both the upper and

lower houses. The second variable utilizes the percentage of women in leadership positions (including senate presidents and presidents pro tempore; house speakers and speakers pro tempore; majority and minority leaders of the house and senate) and the third variable is the percentage of chairs and co-chairs of all senate, house and joint standing committees who are women.

A measure of legislative professionalism is also included as it has been hypothesized to influence a wide range of behaviors, both within and outside the legislature, from the adoption of various internal rules and procedures to specific policy outputs (Squire, 2007). The professionalism index includes indicators of pay, session length, and staff resources and is reported on a scale from 0-1. State legislatures vary considerably in their design and the resources available for policymaking. The features included in the legislative professionalism index, particularly session length, compensation, professional staff, differ across the states. State constitutions often restrict some of these features and provide constraints for state legislatures (Konisky et al, 2008). The least professional legislatures, often referred to as citizen legislatures, have fewer resources to conduct research, hold hearings, and thoroughly debate issues. In contrast, professional legislatures have much greater capacity for deliberation and policy formulation.

Several variables are also included to test for a relationship between economic conditions and funding for screening services, including per capita tax revenue, the percentage of uninsured individuals in states, and tax and expenditure limitations. Relevant economic variables were included to test whether state fiscal capacity is a strong predictor of spending. Economic variables have been shown in previous studies to be associated with higher levels of funding for Medicaid and public health programs (Garfield, 2008, Protzel Berman 2012, Sloan, 2005). Several variables are included as controls for the possible confounding

influence of other state political, socioeconomic, and demographic factors which may be related to cancer funding and the election of women to the state legislatures. The study is controlling for citizen ideology (Berry et al. 1998), party control of the legislature, and party of the Governor. Party control of the legislature is associated with policy outcomes (Alt & Lowry, 2000; Erikson, Wright, & McIver, 1993). Elling (1979) found that state parties are more likely to fulfill their legislative mandates in the absence of competition from the other party. This suggests that a legislature with a higher proportion of Democrats or Republicans will be more successful in adopting their agendas. Democratic-controlled legislatures may be expected to provide greater funding for social programs (Kousser, 2002) In addition to including party control of the legislature; this study added a measure of party of the Governor to the analysis. The governor plays an important role in the policymaking process in the state (Beyle 2001, Hedge 1998). Governors can affect public policy in a substantial and systematic way (Barrileaux, Berkman 2003).

Data Analysis

In this study, multivariable linear regression was used to determine the independent predictors of state appropriations for breast and cervical cancer screening funding from the years 2008-2010. The dependent variable in this analysis is the state appropriations for breast and cervical cancer screening per woman age 18-64 at or below 250% of the Federal poverty level. Independent variables included percentage of women in the state legislature, percentage of leadership positions held by women, percentage of committee chairs held by women, party control of the state legislature, party of the governor, legislative professionalism, citizen ideology score, per capita tax revenue, and the presence of a state tax and expenditure limitation. All independent variables were lagged 1 year since budget decisions are made by state policymakers 12-18 months in advance. Regression diagnostics

were examined to check modeling assumptions. Variation inflation factors and condition

numbers were used to check for multicollinearity. Results are presented as estimated beta

coefficients and standard errors.

Sensitivity analysis

To examine the robustness of the findings, a number of alternative specifications were

examined. First, to account for the potential underlying relationships between the three

legislative incorporation of women variables, factor analysis was examined. A factor score

was created from the variables percentage of women in the legislature, percentage of

leadership positions held by women and percentage of committee chair positions held by

women. The three component variables were strongly related and loaded on the same

factor. The factor score represents the underlying relationship associated with legislative

incorporation in the model (Preuhs 2007). Second, the model was examined with the

dependent variable defined as the state appropriations for women aged 18-64 of all incomes.

The results from this analysis were the same as those found in the core model. Together,

these findings provide support for the robustness of the findings to alternative model

specifications.

In these analyses, discrete variables are expressed as frequencies and percentages, and

continuous variables as means and standard deviations. Bivariate relationships among

continuous variables are presented as Spearman correlation coefficients. Statistical testing

for differences in discrete variables was performed using the likelihood ratio chi-square test.

The Kruskal-Wallis rank sum test was used to test for differences in continuous variables

across discrete groups. Regressions were run with robust standard errors to account for non-

normal distribution of data. P-values <.10 were considered statistically significant. All

analyses were performed using Stata, Release 12.

Results

The distribution of state political, economic and funding characteristics can be found in Table 1. There was a great deal of variation in the states' commitment to breast and cervical cancer screening support, with funding per age-eligible ranging from $0.0 to $47.8 million. On average, state appropriations for breast and cervical cancer screening was $2.99 per woman between the ages of 18-64. The representation of women in state legislatures during the period of 2008-2010 ranged from 9% to 38%. Incorporation of women in legislatures also included both leadership positions and committee chairmanships. The average percentage of women in leadership positions was 16.4% and the range during this period of time was from 0% to 71%. On average, 23.4% of all committee chair positions were held by women. Women holding committee chair roles ranged from a low of 0% in Wyoming and South Carolina to a high of 78.0% in Nevada. Testing for the relationship between women's state legislative variables revealed a significant association (Table 2).

There are several significant bivariate relationships between state appropriations for breast and cervical cancer screening programs and state political and economic characteristics (Table 3, 4). A number of variables were found to be associated with increased state funding for breast and cervical cancer screening programs, including: percentage of women in the legislature (p=0.005), legislative professionalism (p=0.007), per capita tax revenue (p=0.000), citizen ideology (p=0.007), a unified Democratic legislature (p=0.004), a Democratic Governor (p=0.000) and tax and expenditure limitations (p=0.006).

Multivariable results

Results from the multivariable linear regression analysis found no statistically significant association between the variables measuring incorporation of women in the state legislature

and state breast and cervical cancer screening funding (Table 5). Specifically, the percentage of women in the legislature, the percentage of leadership positions held by women, and the percentage of committee chairs held by women were not significantly associated with cancer screening funding. There were, however, other significant political determinants of state cancer screening funding, including party control of the legislature and legislative professionalism. States with a unified Democratic legislature were associated with a $1.98 increase in cancer screening funding per eligible woman, as compared to a unified Republican legislature. A .1-unit increase in the legislative professionalism score was associated with a $1.05 increase in cancer screening funding per eligible woman (p=.001). Other variables in the model were in the expected direction. For example, higher per capita tax revenue was associated with increased funding for cancer screening, while the presence of a TEL was associated with lower funding. A revenue based TEL was associated with a decline of $3.01in screening funding per eligible woman, while a spending TEL or both a revenue and spending TEL was associated with a $1.98 decline in spending per eligible woman as compared to no state law.

Discussion

The absence of an association between the measures of women's legislative incorporation and funding for breast and cervical cancer screening funding is not surprising given previous research failing to find an association between women in the legislature and policy outcomes (Tolbert and Steurnagel 2001; Weldon 2004, 2006a, Protzel Berman 2012). This finding, while consistent with previous studies, is nonetheless interesting given the strong perceived connection between support for breast cancer screening and women policymakers. Twenty years ago, it was the significant effort of women legislators that led to

the initiation of screening programs in health departments. This policy outcome was part of an effort to draw attention across the federal government to women's health. In the 1990s, there was a resurgence of interest in woman's health resulting from several key trends in the women's health movement – the impact of women as health professionals and as policymakers, and the influence of grassroots organizing around women's health. Today, there seems to be an absence of a strong association between either the numbers of women in the legislature or the roles they play in the legislature. This could be a result of the broad acceptance of the need for this type health service which crosses gender differences in the legislature, or due to the continuous, persistent efforts of advocacy organizations at the state level to influence policy outcomes. This research highlights the need to better understand the current environment, informed by changes from the past.

Another key finding from this study is the significant role of a highly professional legislature and Democratic control of the legislature on women's cancer screening funding. The legislative professionalism measure reflects an assessment of the capacity of both individual members and the organization as a whole to generate and digest information in the policymaking process. The professionalism index has been shown to influence specific policy outputs (Squire 2007), and the association in this study suggests that it is a significant factor in funding for cancer screening. Although it was initially hypothesized that women in leadership roles would be associated with higher levels of cancer screening funding, it may be that the effect of the woman legislator as policy entrepreneur is dominated by a more professional legislature. Instead of the significant role a female legislator plays in the stewardship of legislation through committee and final passage, a highly efficient legislature with superior staff resources may be more predictive of policy outcomes. The finding that having a unified Democratic state legislature was associated with $1.98 increase in cancer

screening funding per eligible woman, as compared to a unified Republican legislature, was consistent with other studies (Alt and Lowry 2000; Erickson, Wright & McIver 1993; Fellowes 2006). This reinforces the view that party control is a significant factor in support for spending on cancer screening at the state level.

Finally, the significant association between tax revenue per capita and screening funding underscores the importance of the state's fiscal capacity and willingness to support public health programs and implement policy outcomes. Use of a state's budget rules as a predictor of funding also provides evidence that even when a policy window opens; the solution may only be successful if the fiscal conditions are conducive to change.

Limitations

This paper takes an initial look at the impact of legislative incorporation of women in state legislatures. Additional years of data would provide an opportunity to identify trends and ideally provide a comparison to previous years to determine if there was an association between women's role in the legislature and policy outcomes. The three years of funding data in the study included significant variation across years and provides an opportunity to examine predictors of outcomes. This study was also unable to capture further detail on women legislators' leadership roles within the legislature. Identification of specific committee and leadership roles could have enabled a more robust interpretation of findings. Time and data access limitations precluded expansion. There was also no available way to measure the impact of interest group advocacy on legislative decisionmaking, a factor which may be significantly related to the outcome. Despite these limitations, this study has several strengths and unique features. It adds to the body of research specifically examining women's leadership roles in legislatures and policy outcomes. The study also utilizes current

data on state-level expenditures on cancer screening to identify a baseline prior to implementation of the Affordable Care Act to identify future changes.

Conclusion

Examining how the incorporation of women in legislatures impacts cancer screening support at the state level is important for several reasons. With the impending implementation of the Affordable Care Act, this study provides a relevant and timely focus on states' support for "safety net" services. This study examines a period of time just prior to passage of the new law, and may provide some insight into the role of women legislators in choices regarding expansion of Medicaid benefits and leading state initiatives to define essential benefits for individuals under the Affordable Care Act. In addition, this paper contributes to substantial and ongoing research to examine the impact of women legislators on policy outcomes and confirms the challenges researchers face in linking women's descriptive representation and policy outcomes. Further qualitative analysis, including case studies, may be helpful to learn more about motivations and specific actions of women policymakers. Another way to measure the impact of women may require examination of specific legislative actions, and history could reveal further insight and address the motivations of women legislators acting as policy entrepreneurs on women's issues.

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Table 1. Distribution of state political, economic, and funding characteristics, 2008-2010

Characteristic	N	Mean/Frequency (SD/%)
State Appropriations for Breast and Cervical Cancer Screening Programs ($ per woman age 18-64 at or below 250% of FPL)	150	2.99 (3.38)
Party of Governor	150	
Democrat		84 (56.0%)
Republican		66 (44.0%)
Party Control of State Legislature	150	
Unified Republican		43 (29.3%)
Split control		29 (19.7%)
Unified Democrat		75 (51.0%)
Percentage of Women in State Legislatures	150	23.6 (7.2)
Percentage of Leadership Positions held by Women	150	16.4 (17.3)
Percentage of Committee Chairs held by Women	150	23.4 (13.5)
Legislative Professionalism	150	0.18 (0.11)
Citizen Ideology Score	150	60.4 (16.9)
Tax and Expenditure Limitation (TEL)	150	
No State Law		66 (44.0%)
State has Revenue TEL		21 (14.0%)
State has Spending TEL or both Revenue & Spending TEL		63 (42.0%)
Tax Revenue Per Capita	150	2.63 (1.13)

Continuous variables presented as means and standard deviations. Categorical variables presented as frequencies and percentages.

Note: Data for state appropriations for the breast and cervical cancer screening programs are for the current year. All independent variables have a 1-year data lag.

Table 2. Spearman correlation coefficients between women legislative variables

	womenleg	wlead	wcmte
Percentage of Women in State Legislatures	1.0000		
Percentage of Leadership Positions held by Women	0.4569 (0.0000)	1.0000	
Percentage of Committee Chairs held by Women	0.7173 (0.0000)	0.3993 (0.0000)	1.0000

Table 3. Spearman correlation coefficients between state appropriations for breast and cervical cancer screening programs* and state political and economic characteristics, 2008-2010.

Characteristic	Spearman Correlation Coefficient (rho)	P-value
Percentage of Women in State Legislatures	0.227	0.005
Percentage of Leadership Positions held by Women	0.089	0.279
Percentage of Committee Chairs held by Women	0.142	0.083
Legislative Professionalism	0.273	0.000
Citizen Ideology Score	0.273	0.000
Tax Revenue Per Capita	0.534	0.000

* Per woman age 18-64 at or below 250% of the Federal Poverty Level

Table 4. State appropriations for breast and cervical cancer screening programs by discrete
political characteristics, 2008-2010

Characteristic	State Appropriations for B&C Screening Programs*†	P-value‡
Party of Governor		0.000
Democrat	3.41(3.10)	
Republican	2.54(3.62)	
Party Control of Legislature		0.004
Unified Republican	1.58 (1.44)	
Split Control	2.04(2.03)	
Unified Democrat	4.22(4.13)	
Tax and Expenditure Limitation (TEL)		0.006
No State Law	3.83(3.83)	
State has Revenue TEL	2.64(3.61)	
State has Spending TEL or both Revenue and Spending TEL	2.25 (2.55)	
Year		0.542
2008	3.16 (3.61)	
2009	3.02 (3.16)	
2010	2.81(3.42)	

* Per woman at or below 250% of the Federal Poverty Level, ages 18-64.
† Data presented as means and standard deviations. SD is above in parenthesis.
‡Statistical testing performed using Kruskal-Wallis rank sum test.

Table 5. Multivariable linear regression model+ predicting state appropriations† for breast
and cervical cancer screening programs, 2008-2010

Characteristic	Beta Coefficient (S.E.)	P-value
Percentage of Women in State Legislatures	2.68 (4.51)	0.553
Percentage of Leadership Positions held by Women	0.10 (1.74)	0.954
Percentage of Committee Chairs held by Women	-2.64 (2.02)	0.195
Party Control of Legislature		0.009**
Unified Republican	Reference	
Split Control	-0.81 (0.51)	0.115
Unified Democrat	1.98 (0.68)	0.004**
Legislative Professionalism	10.47 (3.10)	0.001***
Party of Governor		
Republican	Reference	
Democrat	0.64 (0.58)	0.271
Citizen Ideology Score	-0.09 (0.02)	0.026**
Per Capita Tax Revenue	.647 (0.22)	0.005**
Year	-0.31 (0.30)	0.301
Tax and Expenditure Limitation (TEL)		<0.001***
No State Law	Reference	
State has Revenue TEL only	-3.01 (0.69)	0.000***
State has Spending TEL or both Revenue and Spending TEL	-1.98 (0.58)	0.001***

+ Robust regression (M-Estimation using the Huber method) was used due to non-normal
errors.
***   Significant at $p<0.01$.
**   Significant at $p<0.05$.
*   Significant at $p<0.10$.

† Per woman at or below the Federal Poverty Level, age 18-64.
Model R-Square = 0.4250