2011 AMCHP and Family Voices National Conference: Merging Data and Policy for Children's Health: Influencing Change at the State Level Using the National Surveys of Children's Health and CSHCN

02/14/2011 Omni Shoreham, Washington, D.C.

DR. ASHLEY SCHEMPF: Okay, so I'm just here to provide kind of an applied example of evaluating a policy and just for this example I'm working on a project looking at smoking related policies and child asthma. I just want to acknowledge some collaborators on this work and asthma expert Laura Ockenbaumie and an economist Sandy Decker both at the National Center for Health Statistic.

So first some background, asthma is the most common, among the most common chronic childhood conditions. In 2009, there was a 9.6% prevalence rate effecting 7 million children, and it's also a significant source of disability and activity limitation in children. It contributed to 10.5 million missed school days in 2008. The prevalence's remained at a plateau since about 1997 after a long period of increase in the 90s. And there are persistent social economic and racial ethnic disparities in asthma. The underline causes are not known but there are triggers that include tobacco smoke, air pollutions, allergens, respiratory infections, stress and exercise.

So some of the state smoking related policies that we can examine are cigarette taxes that's been connected to reductions in the prevalence of smoking. Clean air laws in a variety of venues like bars, restaurants, and workplaces; that has also been connected to reductions in environmental tobacco smoke exposure. There's inconsistent evidence that it actually reduces the prevalence of smoking as well as insurance coverage for sensation therapies. Medicaid coverage for sensation services like medication and counseling have been linked to prenatal sensation.

So of the studies that have been conducted looking at smoking related polices and asthma, there are only three that I could find and they all examine the impact of clean air legislation and there were two studies; one in a single county of Kentucky and the other in the country of Scotland that used a pre-post design to examine public smoking ban impact on emergency department visits and hospitalizations for asthma. And both of these studies showed reductions but they lacked a contemporary **** control groups so you don't know if there were other time trends observed in other areas as well that could be explaining that effect. And then there was another cross-sectional study that examined county level smoke free legislation and child asthma prevalence and severity and that was associated with lower symptoms but not prevalence of asthma. And there were no studies of taxes or insurance coverage.

So kind of for a reminder, I know all of you are aware of these aspects of why policy evaluation is important but policies do have a population level impact. They're implemented at a broad level; it's not an individual risk reduction approach, and as such it constitutes a key tool for public health. It fits in with the three core functions of public health: assessment, policy and program development and then assurance. So are these policies and programs having the impact that we expected. And these evaluations can be used to compare the effectiveness of alternative strategies to improve health. And they can be used to advocate for further improvement in policies to promote health.

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So our objective was to evaluate and compare the impact of state specific changes in smoking related policies and child asthma prevalence and severity. And for the data we used the National Survey of Children's Health with the two waves that have been conducted so far, 2003 and 2007, and the outcomes were where a parent reported current asthma. These were all parent report; severity of current asthma so whether it was mild versus moderate or severe, and persistent or chronic ear infection defined as three or more ear infections in the past year. Upper respiratory infections including ear infection are related or exacerbated by tobacco smoke. And for all the control factors that Christy was pointing out, I did control for all these individual level factors, child age, sex, race, ethnicity, language, family structure, insurance, poverty and education.

And so we linked kids in the states with the state policy data and so there's longitudal database of tobacco policies that's available from the CDC and it's the state tobacco activities tracking evaluation system. So we were able to get cigarette taxes, clean air legislation, and a variety of venues including worksites, **** housing, malls, grocery stores, hospitals, public transit and daycare centers. And we also looked at Medicaid coverage whether the Medicaid comprehensively covered for all those enrolled, not just pregnant women. Medication counseling or both of those sensation therapies.

So the methods it's using a state panel analysis which is drawing inference within states so each state is serving as its own control.

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So you're answering the question what impact of making changes in policy has on outcomes within a given state. And this is in contrast to a cross-sectional analysis where you're drawing inference between different states. So there's no control of state differences that are associated with policy implementation and doing kind of a cross-sectional analysis can sometimes lead to over/under estimation of effect. So states that have policies or that implement policies may be more progressive or health conscious and you might see a positive association between the policy and outcome but that might be due to the characteristics of the state itself and not the policy.

Conversely, states may tend to implement a policy if they have a particular problem and in this case you might actually see a negative association between policy and outcome. And that would definitely underestimate or even give you a reverse association from what you might anticipate.

So this state panel approach is kind of the extension of a single state, kind of pre-post design so before you implement a policy what's the level of your outcome and then after what is the level. And this requires a control for temporal changes normally when you're comparing within a given state. So you want to look for comparable states that didn't implement policy. So you're using data on policies and outcomes for all 50 states and DC and contrasting differences over time within states that did enact or strengthen policies to differences within states that did not. And for that reason this is sometimes called a difference in difference

approach or a state fixed effect approach. So you're controlling for all of the state factors and looking only within states.

So just for some I'm going to show you a series of maps that depict a state variation in the outcomes and policies and the changes that have occurred over time because that's what we're looking at through these models are changes in policy and changes in outcomes.

So this is just the asthma prevalence in 2007 and you can see that it's concentrated in the Northeast and South ranging from 5.2% in South Dakota to 14.4% in DC. And some of these inferences are related to demographic characteristics but these patterns remain similar after adjustment. And so this map is showing state changes in asthma prevalence between the two surveys, and you can see that these changes occurred throughout the country and the location is not actually important, it's just that change has occurred. So we need to have observed the changes in order to connect that to changes in policy. On average there was a range of changes between a drop to an increase of 3.1% and so with the overall prevalence it was 9% of asthma so this corresponds to about a 30% change over time within states. And this is of the other outcome we looked at chronic ear infection and the highest prevalence is in the south and central parts of the country ranging from 2.9% in Minnesota to 8.7% in Alabama. And again for the state changes over time, they're dispersed. A range of changes and they're wide relevant to the overall prevalence of 5% so these are

about 50% relative changes with ranging from a drop of 2.6% in Pennsylvania to an increase of 2.7% in Louisiana.

And so for those policies that were examining, here's a map of cigarette taxes and you can see they're definitely stronger in more northern states relative to the strong tobacco growing states in the south. The state average is about $1 and it ranges from 7 cents in South Carolina to $2.58 in New Jersey.

So the changes that occurred between 2003 and 2007 also occurred throughout the country. There's no real pattern. They declined actually 10% in Oregon and don't really know what happened there. Christy, maybe you can comment on that. And they remain stable in 23 states and increased in 26 states and DC. There were six states that had an increase of a dollar per pack.

For clean air laws, I just used one venue just as example, restaurants. In 2007, 9 had no law, 21 had separate designated or ventilated areas, and 21 had a full ban. And for the changes over time there was variation, 17 states implemented a full ban between the two surveys.

And the last policy variable Medicaid coverage for sensation therapy, 14 states had no coverage, 25 covered medications only and 12 covered both the medication and form of counseling group or individual. And for state changes over time there were only seven states that increased their coverage. I'm showing a two year lag from the surveys so 2001 and is lagged two years from the

2003 survey and 2005 is like two years from the 2007 survey just because that's what I found to be significant later on. So sometimes it takes a while for the policies to fully be implemented.

One state Pennsylvania implemented coverage for both medications and counseling during this timeframe. Rhode Island added medication. They had previously only covered counseling. South Carolina started covering medication and then Arkansas, New York, North Dakota and Utah added counseling from previously covering medication. So six of the seven changes were to extending comprehensive coverage of both forms of therapies.

So the results we found that for cigarette taxes, the asthma prevalence declined 16% per dollar increase and that was a marginally statistically significant effect and had a greater effect actually on the severity of asthma. So this is consistent with a previous study, kind of showing that tobacco may not initiate asthma but may exacerbate the severity of the condition.

For clean air legislation, didn't find significant effects on any venue or even a summary index. The literature is less consistent about whether clean air laws actually reduce household exposure. It's very clear that they reduce exposure in those venues themselves, but whether people are less likely to quit inside their homes is maybe another matter and household exposure may be the predominant source of exposure for kids. Another reason why we might not have observed an effect is that there's also sub-state variation in clean air laws, so the county, there's lots of different

county laws as well and so the state may not be the best unit for analysis of this policy.

Medicaid coverage for sensation therapy, we did find a large effect on chronic ear infections; it dropped 60% with expansion. But this is, there are only seven states; I'm still kind of exploring this further but it was interesting.

So the limitations and future directions, there were only two time points so we're really looking forward to this new round coming out so we have more data to be pooling for changes because with only two you can't control for state specific trends that may have occurred irrespective of the policy. And it ultimately is an observational association but it is improved by connecting changes in the policy issues and outcomes. We're going to look further at examining mediation by household smoking to see if these effects are from reductions in household exposure versus environmental exposure outside the home, and we can examine sensitivities or different **** in effects according to age, race, ethnicity, and poverty and I did explore some of this and we have seen that young kids are more effected. They may have developmentally more vulnerable lungs and also may be more captive to household exposures then older kids. And we're also planning to supplement this with an examination of emergency department visits and hospitalizations through other surveys; hospital level data.

So the implications are, you know, that we've observed some positive effects that increasing cigarette taxes and Medicaid

coverage for tobacco sensation appear to be effective in reducing the burden of child asthma and ear infection. And this information can be used to advocate for further policy expansions and improvements. Healthy people actually can contain many objectives for tobacco control, and as of the last quarter in 2010 there were 20 states that still didn't meet the objective for the cigarette tax. The objective is at least $2 of combined federal and state excise taxes. So this could be really powerful in urging, you know, some states to really get on that.

And insurance coverage for sensation, there were 13 states that don't mandate Medicaid coverage for medication and 23 that don't cover counseling. And there's only a handful that are fully compliant in covering all the US preventive service task force recommended services for tobacco dependence treatments.

And so I just wanted to, Christy mentioned, you know, finding where we can look for these policy data to be evaluating and the CDC actually monitors school health policies and practices and it tracks state, district and school policies for nutrition, physical activity, tobacco use, violence prevention, health and sexual education, health services and these policies can be connected to the National Survey of Children's Health. And I also just wanted to, you know, have you think more broadly of about economic policy influencing health and using social determinants blends. There is a lot of state variability in the generosity of the earned income tax credit, for example, that could be examined in relation to family and child health.

And so that’s kind of it.