Are Minnesota School Policies and Practices Effective?

The title of this presentation is Are Minnesota School Policies and Practices Effective? These are the findings from the School Obesity-related Policy Evaluation Study or ScOPE Study.

Hello, my name is Susie Nanney. I am a member of faculty in the Department of Family Medicine and Community Health at the University of Minnesota. I am the Principal Investigator of ScOPE study. I’d also like to acknowledge the other members of the research team, representing multiple disciplines across the University of Minnesota and MN Department of Health. To contact the ScOPE study investigators or for more information about our research, please visit our website.

The ScOPE study is a 5 year NIH funded study with the purpose of evaluating whether school policies and practices are effective.

In the Scope Study we use 3 primary data sets uniquely using existing surveillance instruments to conduct our school policy evaluations. The school-level policy data comes from the Minnesota School Health Profiles. The Minnesota School Health Profiles, hereafter called profiles is a conducting among principle and help educators conducted every two years in the state of Minnesota. It consists of random of simple of secondary schools.

The student-level behavior data comes from the Minnesota Student Survey. The Minnesota Student Survey is a self reported survey conducted among students every three years we called it a state wide census survey given to all 6, 9, and 12th graders although is voluntary. While there are challenges to using existing state surveillance data over time (like additions and deletions of questions over the years and changes in administration of the surveys) – the use of existing surveillance data still offers a cost effective approach to evaluating policies. And we also thirdly use the National Center for Educational Statistics for general school-level demographic characteristics like geographic location, free/reduced priced meal eligibly status of schools.

The outline for this short presentation includes first, highlighting the literature related to school policy evaluations. Next, I’ll describe our study approach to measuring effectiveness. For the ScOPE study we created timeline of relevant initiatives and policies to establish a context. We then reviewed the literature for evidence supported policies to evaluate --I’ll refer to them as “Key” policies. Then I’ll describe 2 evaluation studies.
Study 1 uses data following 37 schools from 2002 to 2006 representing over 18,000 students. Study 2 is more recent using data following 52 schools from 2008 to 2012 and representing over 14,000 9th graders.

First, let’s take a look at the literature. Schools have been the target of many local, state and national efforts to address childhood obesity. What is the evidence that those efforts have improved students weight status? Reviews from both 2005 and more recently in 2012 both say inconclusive – findings are weak and insufficient to make strong, causal claims about school policy effectiveness.

What we do see in the literature is a lot of descriptive rather than evaluation studies. For example, Descriptive studies looking at prevalence of vending machines and evaluating the language of policy statements or documents. To lesser extent, are studies examining the relationships between policies and student behaviors? For example, Evaluation studies looking at the associations between sugary drinks available in school vending machines and student pop intake. The literature reveals a positive relationship between less healthy foods and drinks being available (like soda and candy) and the association with student eating and drinking behaviors. The majority of these studies are cross-sectional (or one point in time) which limits the conclusions that can be made from these type of studies; although, a consistent evidence base is being built. What’s needed is Evaluations across multiple time points. Even fewer studies have examined the relationships between the school food and activity environments and student overweight status. While a handful are available, some do show an inverse relationship between food related policies and student overweight. Many are also cross sectional studies and evaluations across multiple time points are still needed. So, to advance the policy evaluation literature in the school arena, more rigorous studies are needed and there for what we are working on in the SCOOE study.

For the SCOPE study, we developed a timeline of events relevant to obesity-related school policies and practices. Here we see a nearly 15 year time line of both Minnesota State and National and Federal physical activity and food and nutrition related initiatives and laws that lay the context for school policy evaluations.

For study 1, the evaluation plan uses the School policy data from 2002 and 2006 and the student behavioral data from 2004 and 2007. Remember the Profiles survey is administered every 2 years and the MN Student Survey is administered every 3 years. A question asking students to report their height and weight was not added until 2007. For this study we evaluated the changes in school policies and practices from 2002 to 2006 and the effects upon students in those schools from 2004 to 2007.

How did we identify key policies? We went back to the literature to identify what policies we should examine and of course that were also available on the survey. We looked at the evidence presented by professional associations like the MN School Nutrition Association the National Association for Sports and Physical Education and the
American Academy of Pediatrics. We also examined the recommended policies from the Centers for Disease Control and the Institute of Medicine. Finally, the Cochrane Collaboration summarizes the intervention studies and identifies the policies best supported by the evidence.

Key school policies identified in the literature and available from the school health profiles survey include these 8 policies.

1. Is PE Required in any grade 6-12?
2. Is intramural activities or physical activity clubs offered to students? Yes or no?
3. Can students purchase the following in vending machines or school stores? Less healthy food and drinks like Salty snacks, Chocolate, Candy, Soda pop or sports drinks. And the more healthy foods like Fruits or vegetables or a 100% fruit juice

When examining whether school policies are influencing student behaviors, first one must examine if there were changes in student behaviors that might be just due to time (called secular trends). As indicated by the asterisks on this slide, there were significant increases in student fruit and vegetable servings by a small .1 serving and a significant increase in days of vigorous physical activity from 2004 to 2007. There were no changes either (good or bad) in soda or sports drink consumption that is (2.3 versus 2.2 glasses) from 2004 to 2007. by these students or hours of sedentary behaviors. So, we see that there was some improvement in student behavior over time —why is this? Is it secular trends and/or is it due to school policies? The strength of our evaluation approach with a cohort of schools is to separate out secular trend versus the effect of policy. This slide shows that we need to adjust for changes due to secular trends in order to tease out what might be attributable to school policy changes.

So, the results that I’ll present next do include several adjustments for change over time, differences by income status of schools and other time constant factors like geography or location of the schools

The first column on this slide identifies the student behaviors and weight represented as body mass and percentile there we are interested in. The second and third columns represent the average student drinking, eating and activity behaviors at two time points 2002 and 2006. With adjusting for secular trends those we identify from previous slide, the 4th column shows the Estimated Difference in student outcome with a 1 key policy increase. The red asterisk identifies the 2 behaviors that appear to be effected by school policies. As a school in the cohort adopts a key policy, daily glasses of sugary drinks is reduced by .1 serving. Similarly, as a school in the cohort adopts a key policy, daily servings of fruits and vegetables increase .1 servings a day. Increases in school policies don’t appear to be influencing sedentary activities (although going in the right direction) or days a week of vigorous physical activity (also going in the desired direction).

So, from this evaluation study, we find that key policies were associated with improved intakes of sugary drinks and fruits and vegetables among students attending those
schools, this is above and beyond what we’d expect to see from secular trends or (changes due to time).

Study 1 has been peer reviewed and is available from the following link.

This next study is similar, except that we incorporate data from more recent years. The same approach is used. Note that we can evaluate behaviors and weight at two time points. One limitation of this study however, and use of state surveillance data in general, is that changes occurred in the questionnaires and administration method—this is normal, as states respond to changing evaluation needs. Note that findings from Study 2 are preliminary.

Here we see the same policy questions—with some differences – mainly the separation of soda pop and sports drinks AND fruits and vegetables where before they were combined. Similarly, PE required by grade is available by individual grade. This continues to highlight some of the challenges (and solutions) to using existing state surveillance data.

Once again, we use a cohort evaluation approach this time 52 schools are both available at 2 time points 2006 and 2012. So, Are there Any changes in school policies over time? We first examine changes due to secular trends. We see that in both 2006 and 2012 about half of the schools in this cohort had fruits and vegetables available in vending machines and school stores – no significant changes over time. We see that the availability of less healthy foods and drinks (like salty snacks, candy, chocolate candy, soda pop, and sport drinks) did decline by about 1 food or drink item from 2006 to 2012. No changes in schools requiring PE in 9th grade and no changes in schools providing intramural opportunities during this time period. When we sum up all the policies to create a “policy environment” score, we see an improvement that is (increased score from 2.5 to 3.8) from 2006 to 2012 are on average ----likely driven by the food availability polices.

Any changes in student behaviors over time? There were no changes in the average BMI Percentile (ranking) over time among 9th graders. Similarly, no significant changes in obesity during these time periods (this is the top range of BMI percentile). We do see a decrease in daily glasses of soda pop (0.2 fewer glasses a day). No change in daily glasses of sports drinks. We also see an improvement of about 1 serving of fruits and vegetables from 2006 to 2012. Unfortunately, due to changes in the survey question over this time period we cannot evaluate changes in student physical activity behavior.

Like before, because we saw changes in some school policies and practices and student behaviors over time—the analysis needs to adjust for those so that we can better attribute changes in student outcomes to possible school effects.
This slides identifies that among all students, as fruits and vegetables are available in schools, daily intake of fruit and vegetable servings increases by .15 serving significantly. Also, as less healthy foods/drinks are available in schools during this time period, there is an increase in student BMI Percentile (ranking of student weight for height by sex and age). While we don’t see a direct effect of school policies that require a PE course in 9th grade and 9th grader BMI Percentile or Obesity (or with school Intramural Options and student weight)—we do see that the summary of all combined policies is significantly associated with a decline in obesity among 9th graders in those schools by 1%. Note that a limitation of this work is that we cannot compare the PE policies with student activity behaviors.

The previous slide was examining the relationships among all students. This slide highlights any significant effects upon boys only. We see that as fruits and vegetables are available in schools, daily intake of fruit and vegetable increases significantly by a quarter of servings among boys (note: among all students was an increase of an 8th of servings). Also, as less healthy foods and drinks are available in schools during this time period, there is an increase in BMI Percentile among boys Oddly, we see that school offerings of intramural options is associated with a 4% INCREASE in BMI percentile among boys. One explanation might be that the leaner boys may be playing competitive sports while the boys with a higher BMI percentile might be playing intramurals. Although, this is just one hypothesis.

Among girls, as less healthy foods and drinks are available in schools during this time period, there is an increase in girl obesity by 2% (versus 1% increase among all students). Also, when combining the policy environment all together—the effect appears to be most beneficial for girls with a decrease in 2% of Obesity for them (compared to 1% among all students).

In summary of these 2 policy evaluation studies:

- Evidence of effectiveness of school policies upon student behaviors and weight appears small, but significant from a public health perspective, impactful.
- Fruits & Vegetables being available appears to result in student consumption by 1/8 to ¼ daily servings.
- As less healthy snacks and drinks were available=increase in obesity, especially among girls.
- And the sum of all policies together appears to have the greatest impact upon decreasing obesity among all students by 1% and girls by 2%.

This concludes the research presentation, “Are Minnesota School Policies and Practices Effective?”. Please visit our study website to watch for additional research.