



Mind the Gap

NIH Webinar Series

**Study Design and Analysis Methods for
Examining the Implementation and Impact of
Obesity and Tobacco-Related Law and Policy
on Practices, Community Environments,
and Individual Behaviors/Attitudes**

Presented by

Jamie Chriqui, Ph.D.

University of Illinois at Chicago

MEDICINE: MIND THE GAP

An NIH Office of Disease Prevention Webinar Series



STUDY DESIGN AND ANALYSIS METHODS FOR EXAMINING THE IMPLEMENTATION AND IMPACT OF OBESITY AND TOBACCO-RELATED LAW AND POLICY

JAMIE F. CHRIQUI, PH.D, MHS



@JFCHRIQUI

EMAIL: JCHRIQUI@UIC.EDU

Mind the Gap NIH Webinar Series

May 22, 2018



**Illinois Prevention
Research Center**

DISCLOSURE

- No financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters.
- This presentation will not include any discussion of the unlabeled use of a product or a product under investigational use.

PRESENTATION OBJECTIVES

- Review approaches and considerations when **“measuring” law and policy** for use in implementation and impact studies.
- Discuss the importance of **“conceptual matches” between the policy and outcome** measures.
- Highlight **study design considerations**.
- Identify **considerations when using existing or developing new policy data sources** for use in implementation and impact studies.



MEASURING LAW AND POLICY FOR USE IN EVALUATION/IMPACT STUDIES



EXAMPLES OF RESEARCH QUESTIONS



Source: "Vanderbilt Avenue, Brooklyn" by New York City Department of Transportation is licensed under CC BY 2.0.
Available:
<https://www.flickr.com/photos/nycstreets/9009276038/>



www.pedbikeimages.org/
Dan Burden



Reduced
Smoking Rates

SETTING THE CONTEXT: DEFINING POLICY EXPOSURES

- **Public Policies:** Formal policies adopted and implemented by an official governing body
 - Federal, state, local (county and/or municipal), special governments (school districts, park districts, forest preserve districts)
 - Legislation (ordinances), regulations, court decisions, executive orders, plans (e.g., master/comprehensive, transportation, bike/pedestrian, food, etc.)
- **Organizational Policies:** Informal policies adopted by non-governing organizations such as companies, associations, voluntary and membership organizations (e.g., Y-USA), community-based organizations (e.g., community recreation centers), etc.

SETTING THE CONTEXT: MEASURING POLICY EXPOSURES

■ Policy “collection”/status

■ Objective

■ Primary legal/policy research

- Westlaw/LexisNexis; local code publishers
- Government websites
- Verification/follow up with jurisdiction

■ Crowd sourcing

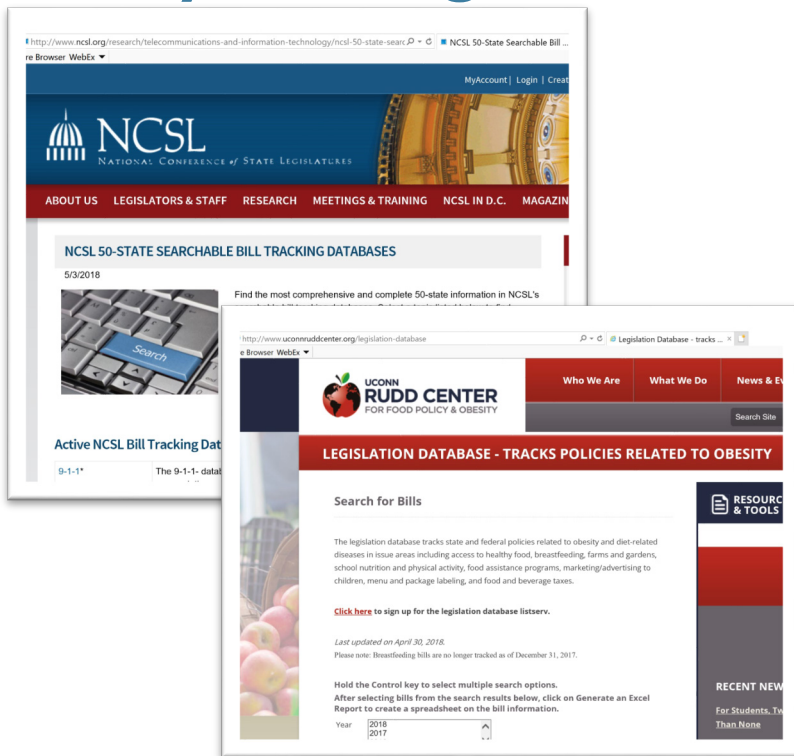
■ Perceived/Self-report

■ Surveys of officials/self-reports of policy existence

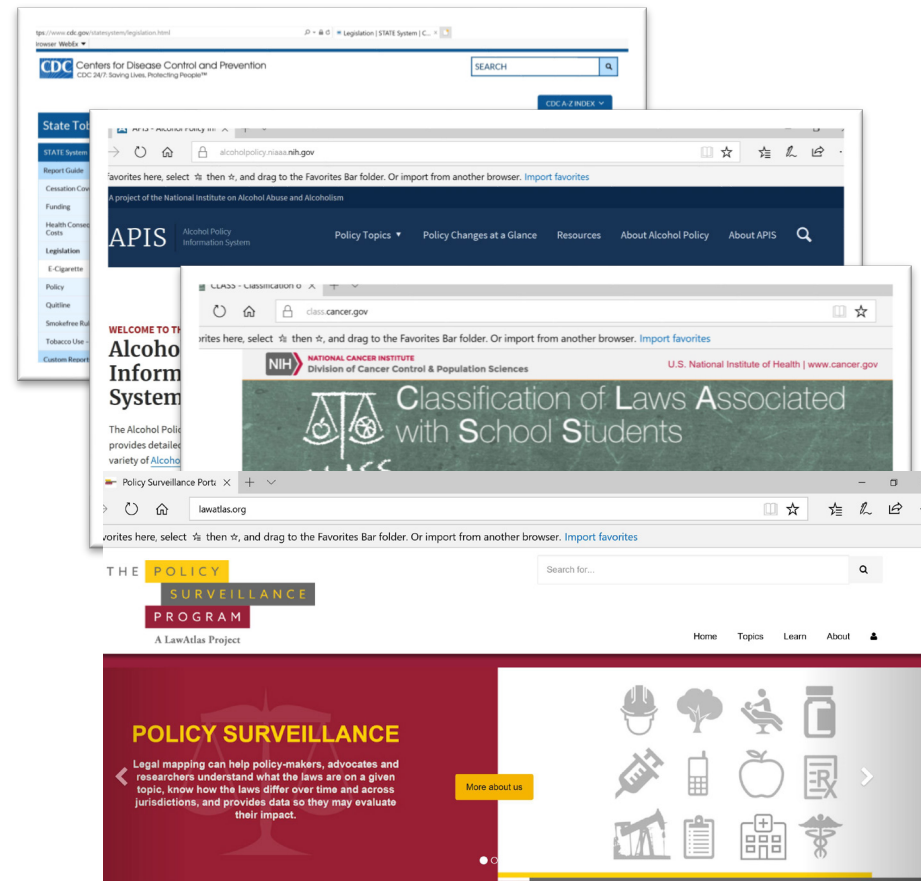
- Often aspirational/implementation-oriented rather than objective measure of “what exists”

POLICY SYSTEMS: TRACKING VS. SURVEILLANCE

Policy Tracking



Policy Surveillance



BILLS VS. STATUTES: WHY IT MATTERS FOR UNDERSTANDING

Bill Text

Section 13. Subsection (4) of section 1003.4282, Florida Statutes, is amended to read:

1003.4282 Requirements for a standard high school diploma.—

(4) **ONLINE COURSE REQUIREMENT.**—At least one course within the 24 credits required under this section must be completed through online learning. ~~A school district may not require a student to take the online course outside the school day or in addition to a student's courses for a given semester.~~

(a) An online course taken in grade 6, grade 7, or grade 8 fulfills the requirements of this subsection requirement. ~~The~~**This** requirement is met through an online course offered by the Florida Virtual School, a virtual education provider approved by the State Board of Education, a high school, or an online dual enrollment course. A student who is enrolled in a full-time or part-time virtual instruction program under s. 1002.45 meets ~~the~~**this** requirement.

(b) A district school board or a charter school governing board, as applicable, may offer students the following options to satisfy the online course requirements of this subsection:

1. Completion of a course in which a student earns a nationally recognized industry certification in information technology that is identified on the CAPE Industry Certification Funding List pursuant to s. 1008.44 or passage of the information technology certification examination without enrollment in or completion of the corresponding course or courses, as applicable.
2. Passage of an online content assessment, without enrollment in or completion of the corresponding course or courses, as applicable, by which the student demonstrates skills and competency in locating information and applying technology for instructional purposes.

For purposes of this subsection, a school district may not require a student to take the online course outside the school day or in addition to a student's courses for a given semester. ~~This subsection requirement~~ does not apply to a student who has an individual education plan under s. 1003.57 which indicates that an online course would be inappropriate or to an out-of-state transfer student who is enrolled in a Florida high school and has 1 academic year or less remaining in high school.

Statute Text

§ 1003.4282. Requirements for a standard high school diploma. [Effective until July 1, 2017]

(1) **Twenty-four credits required.**

(a) Beginning with students entering grade 9 in the 2013-2014 school year, receipt of a standard high school diploma requires successful completion of 24 credits, an International Baccalaureate curriculum, or an Advanced International Certificate of Education curriculum.

(b) The required credits may be earned through equivalent, applied, or integrated courses or career education courses as defined in s. 1003.01(4), including work-related internships approved by the State Board of Education and identified in the course code directory. However, any must-pass assessment requirements must be met. An equivalent course is one or more courses identified by content-area experts as being a match to the core curricular content of another course, based upon review of the Next Generation Sunshine State Standards for that subject. An applied course aligns with Next Generation Sunshine State Standards and includes real-world applications of a career and technical education standard used in business or industry. An integrated course includes content from several courses within a content area or across content areas.

(2) **Notification requirements.**—The school district must notify students and parents, in writing, of the requirements for a standard high school diploma, available designations, and the eligibility requirements for state scholarship programs and postsecondary admissions. The Department of Education shall directly and through the school districts notify registered private schools of public high school course credit and assessment requirements. Each private school must make this information available to students and their parents so they are aware of public high school graduation requirements.

(3) **Standard high school diploma: course and assessment requirements.**

(a) **Four credits in English Language Arts (ELA).**— The four credits must be in ELA I, II, III, and IV. A student must pass the statewide, standardized grade 10 Reading assessment or, when implemented, the grade 10 ELA assessment, or earn a concordant score, in order to earn a standard high school diploma.

(b) **Four credits in mathematics.**— A student must earn one credit in Algebra I and one credit in Geometry. A student's performance on the statewide, standardized Algebra I end-of-course (EOC) assessment constitutes 30 percent of the student's final course grade. A student must pass the

Page 2 of 10

Fla. Stat. § 1003.4282

statewide, standardized Algebra I EOC assessment, or earn a comparative score, in order to earn a standard high school diploma. A student's performance on the statewide, standardized Geometry EOC

SELECTED FACTORS THAT DIFFERENTIATE POLICY TRACKING SYSTEMS FROM LONGITUDINAL POLICY SURVEILLANCE SYSTEMS

Policy Tracking/Reporting/Scans System	Longitudinal Policy Surveillance System
Reports on individual policy measures without linking to prior policy action -e.g., Bill level reporting of pending legislation	Examines changes in policies over time
Often text-based reporting of policy actions or yes/no type reporting	Can be quantitative or qualitative -Policy impact studies often rely on quantitative measures -Indicator/benchmarks often require “coded data”
New measures reported with certain frequency -e.g., Newly introduced or enacted legislation occurring during Q1 of yr	Policy data tied to specific reference date -e.g., Policies in effect as of January 1 of each year
Difficult to measure details of policy change over time, particularly if includes introduced and enacted measures	Easily enables monitoring of changes in policy over time
More advocacy/reporting oriented	More evaluation-oriented



NOT ALL POLICIES ARE CREATED EQUAL! ON THE
NEED FOR SYSTEMATIC MEASUREMENT OF LAW
AND POLICY



EXAMPLES OF “DATA” AVAILABLE FROM DIFFERENT POLICY ANALYSIS AND EVALUATION APPROACHES

Question	Approach 1: Text-based System	Approach 2: Does Law Exist ? (Yes/No)	Approach 3: Does Law Exist? (Detailed Coding Distinctions)	Difference in Understanding of Policy Status
Is there a state law governing availability of sugar-sweetened beverages in schools?	Only 100% juice, water, and skim/nonfat milk may be sold during the day EXCEPT at the HS level where....	1=Yes, law exists 0=No law	3-SSBs are banned in schools 2-SSBs are prohibited at certain times/ locations 1-SSB restrictions are encouraged 0-No law	Approach 1 provides the language of the law but requires the researcher to recode the information. Approach 2 simply tells whether a law exists or not but does not provide the nuances.
Is there a law restricting smoking in public places?	Smoking of tobacco products is restricted to employee break rooms that are separately ventilated and enclosed.	1=Yes, law exists 0=No law	4=Ban in all locations 3=Ban with exceptions for employee breakrooms 2=Smoking restricted to separately ventilated, separately enclosed areas 1=Smoking restricted to designated smoking areas 0=No law	Approach 3 tells both whether a law exists and how detailed the law is without recoding.

NOT ALL POLICIES ARE CREATED EQUAL: NEED FOR SYSTEMATIC RESEARCH

NCI Code Reform Project: Policy Coding Instructions

A. Community Identification Information

FIPSIS: _____

Summary Level Code: _____

Place Name: _____

County Name: _____

State Name: _____

Keep Level: _____

B. Coder and Zoning Code Information

Code ID Number: 1 0 _____

Coding Date: ____ / ____ / ____ 2 0 ____

Community Type	
County	1
Place	2

Zoning Code Status	
Zoning code exists	1
No zoning code (verified)	0
Missing zoning code (non-responder)	9

If "Zoning code exists" is selected, continue to next column

B. Coder and Zoning Code Information (Cont.)

Policies Coded	
County	1
Place	2
Place and County	3

Zoning Code Adoption Date	
____ / ____ / ____	
Zoning Code Most Recent Amendment Date	
____ / ____ / ____	

Zoning Code Source(s)	Y	N
Online code publisher	1	0
Other code publisher	1	0
Community website	1	0
Planning/Zoning Office website	1	0
Community mail/email	1	0
Other (specify):	1	0

Zoning Code Type(s)	Y	N
Traditional/Euclidean	1	0
Code Reform	1	0
Unified Development Code (UDC)	1	0

If "Code Reform" is selected, provide dates below

Code Reform Adoption Date	
____ / ____ / ____	
Code Reform Most Recent Amendment Date	
____ / ____ / ____	

If "Code Reform" is selected, continue to next column

SmartCode*

Full Form-Based

Code Reform I

Code Reform II

Form-Based Design

Transsect-Based

New Urbanist

Pedestrian-Oriented

Transit-Oriented

Traditional Ne

Other Code Re

Code Reform -

Commercial -

Mixed Use -

Park, Rec, Open

Planned Unit G

Public, Civic, G

Residential -

General Zoning

Req (Required)

Enc (Encouraged)

No = strongest

Allow (Allowed)

None-use not

[Prohib (Prohibited)]

[Mixed - both]

C. Zoning District Category Coding

ZONING DISTRICT CATEGORIES PRESENT		Yes	No	Community Districts Coded	
1. CODE REFORM CATEGORY		1	0		
2. COMMERCIAL DISTRICTS CATEGORY		1	0		
3. MIXED USE DISTRICTS CATEGORY		1	0		
4. PARK, REC, OPEN SPACE DISTRICTS CATEGORY		1	0		
5. PLANNED UNIT DEVELOPMENT (PUD) CATEGORY*		1	0		
6. PUBLIC, CIVIC, GOV'T DISTRICTS CATEGORY		1	0		
7. RESIDENTIAL DISTRICTS CATEGORY		1	0		
8. GENERAL ZONING PROVISIONS		1	0		

*PUD Type(s)	Y	N
Primarily Commercial	1	0
Primarily Residential	1	0

Category Present?	Y	N	1. Code Reform Category	Addressed?	Yes	No	Req
			A. Sidewalks		1	0	2
			B. Crosswalks		1	0	2
			C. Bike-Pedestrian Connectivity		1	0	2
			D. Street Connectivity		1	0	2
			E. Bike Lanes		1	0	2
			F. Bike Parking		1	0	2
			G. Bike-Pedestrian Trails-Paths		1	0	2
			H. Other Walkability		1	0	2
			I. Mixed Use		1	0	2
			J. Active Recreation		1	0	2
			K. Passive Recreation		1	0	2

Y	N	2. Commercial Districts Category	Addressed?	Yes	No	Req
		A. Sidewalks		1	0	2
		B. Crosswalks		1	0	2
		C. Bike-Pedestrian Connectivity		1	0	2
		D. Street Connectivity		1	0	2
		E. Bike Lanes		1	0	2
		F. Bike Parking		1	0	2
		G. Bike-Pedestrian Trails-Paths		1	0	2
		H. Other Walkability		1	0	2
		I. Mixed Use		1	0	2
		J. Active Recreation		1	0	2
		K. Passive Recreation		1	0	2

Y	N	3. Mixed Use Districts Category	Addressed?	Yes	No	Req
		A. Sidewalks		1	0	2
		B. Crosswalks		1	0	2
		C. Bike-Pedestrian Connectivity		1	0	2
		D. Street Connectivity		1	0	2
		E. Bike Lanes		1	0	2
		F. Bike Parking		1	0	2
		G. Bike-Pedestrian Trails-Paths		1	0	2
		H. Other Walkability		1	0	2
		I. Mixed Use		1	0	2
		J. Active Recreation		1	0	2
		K. Passive Recreation		1	0	2

3.0 GENERAL CODING GUIDELINES

3.1 STRENGTH OF PROVISION

If a topic is addressed, you must select one of the three options provided for the strength of the provision. Please choose the strength that is the most appropriate according to the following guidelines:

- Required:** Select this option if the strongest provision (or "marker") found for the topic in the district category is required. Required language includes words such as will, shall, has been done, must be done, is mandatory, etc. This strength should also be selected for markers where establishments, such as parks or trails, are clearly in existence.
- Encouraged:** Select this option if the strongest marker found for the topic in the district category is encouraged. Encouraged language may include terminology such as encouraged, should be done, may be required, could be done, is recommended, is suggested, etc. Encouraged markers can often be found in purpose/objective sections or in design regulations.
- No:** If markers are found that have no strength, could not be considered required or encouraged, or which the strength is not discernible, please select this option. If a marker is simply found in a use chart or list of uses, select No for strength and Allowed for type of use. Also, if a marker is simply asked to be shown (if it happens to be present) on a site plan/plot, then it gets coded as No strength.

Other Notes: Be sure to code the strength of markers based on contextual clues, such as section titles, language surrounding the marker, definitions, or any other relevant information that might shed some light on the marker in question. When in doubt, consult another coder to get their opinion or to brainstorm other places to search for clues.

3.2 TYPE OF USE RELATIVE TO PROVISION

Choose the appropriate type of use related to the provision (select one of the responses):

- Allowed:** If the provision is classified as a permitted, conditional, or accessory use, select this option. The type of use will usually be found in a use chart/table or list of uses that covers all districts or in a list of permitted uses within the regulations for each district.
Note: We will very rarely see uses listed for the PUD and General Zoning Provisions categories. Also, be careful to only count uses as allowed that are accessible to the general public.
- None:** If a type of use is not indicated, please select this option. In other words, this is the default answer unless the marker is found in some type of use chart/table or list of uses.

The following two types of uses only apply to the Mixed Use topic for each of the district categories:

- (Prohibited):** If mixed uses are prohibited in all of the districts within a category, please select this option. They must be explicitly not allowed, either through a use chart/table or list of uses or elsewhere in the regulations, in order to select this option ("Prohibited") as the type of use.
- (Mixed):** If mixed uses are prohibited in at least one district and allowed in at least one other district within the same district category, choose this option. In other words, if "residential uses above retail stores" (or something similar) is listed as permitted in the C-1 district, but prohibited in the C-3 district (and no other mixed use development-related uses are listed), choose this type of use option ("Mixed") under the mixed use topic for the commercial districts category. This option will most likely only appear when a use chart is provided that specifically allows and prohibits mixed use development in certain districts.

SCIENTIFICALLY INFORMED POLICY MEASUREMENT: C.L.A.S.S. NUTRITION AND PHYSICAL ACTIVITY

Author's personal copy

Development of a Physical Education–Related State Policy Classification System (PERSPCS)

Louise C. Masse, PhD, Jamie F. Chiqui, PhD, Mary F. Igoe, MA, Audie A. Atienza, PhD, Judy Kruger, PhD, Harold W. Kohl III, PhD, Mary M. Frosh, JD, Amy L. Yaroch, PhD

Background: As policy-based approaches are increasingly proposed to address childhood obesity, this paper seeks to: (1) present the development of a system to systematically and reliably assess the nature and extent of state physical education (PE) and recess-related policies; (2) determine the inter-rater agreement in using the system; and (3) report on the variability in state policies using a December 31, 2003 baseline.

Methods: The PE and Recess State Policy Classification System (PERSPCS) was developed from a conceptual framework and was informed by reviewing the scientific and gray literatures and through consultations with an expert panel and key experts. Statutes and regulations enacted as of December 31, 2003 were retrieved from Westlaw (data retrieved and analyzed in 2004–2005).

Results: PERSPCS addresses five areas: PE time requirements, staffing requirements for PE, curriculum standards for PE, assessment of health-related fitness, and recess time (elementary schools only). The inter-rater agreement ranged from 0.879 (PE staffing requirements) to perfect agreement (recess time). Staffing requirements had more restrictive policies, followed in decreasing order by time requirements, curriculum standards, assessment, and recess time. Overall, state policies met minimal requirements across area and grade levels as of December 2003.

Conclusions: Extending PERSPCS to address other aspects of childhood obesity is a critical first step in understanding the range of state policy approaches in this area and their impact. PERSPCS should be examined in conjunction with school district-level policies to determine the overall effects of policies on school environmental and behavioral outcomes. PERSPCS is not designed to set policy guidelines.

(Am J Prev Med 2007;35(4S):S264–S270) © 2007 American Journal of Preventive Medicine

Introduction

In many industrialized nations, the prevalence of childhood obesity is increasing at an alarming rate.^{1–3} Currently, there is a strong consensus that policy-based approaches targeting the school environment may have the greatest population-level impact on childhood obesity. This is due primarily to the fact that such approaches can reach most children and because children consume one third of their daily caloric intake and spend 50% of their energy expenditure in schools.^{4,5} As many public health exper-

imentalists (e.g., reduction of motor vehicle and firearm injury; lowering of dental caries through water supply fluoridation; tobacco control) have been attributed to policy change,^{6,7} a broad spectrum of school-based policies already have been proposed to address childhood obesity (e.g., eliminating vending machines in schools, increasing time spent in physical education [PE]). Both nutrition and physical activity policies have been proposed, as it is recognized that obesity, for the majority of children, results from an imbalance in caloric consumption and/or lack of physical activity.⁸ Currently, there is a need to develop a system to systematically and reliably classify the breadth and depth of these policies across states to facilitate environmental and systems-level evaluations that relate to childhood obesity.

Increasing physical activity opportunities during school hours is one area that has been targeted by policy-based approaches. Such strategies may target the PE program and/or recess time (for children in elementary school only). Results from a recent systematic review suggest that having adequate instruction time

From the Centre for Community Child Health Research (Masse), University of British Columbia, Vancouver, British Columbia; Centre for Health Policy and Legislation, Anshoo Chitambar, Esq., Inc., The MayTech Corporation, Silver Spring, Maryland; Health Promotion Research Branch, National Cancer Institute, Bethesda, Maryland; Division of Nutrition and Physical Activity (Rogers, Kohl), Centers for Disease Control and Prevention, Atlanta, Georgia; Address correspondence and reprint requests to: Louise C. Masse, PhD, University of British Columbia, Department of Pediatrics, CCHR—Centre for Community Child Health Research, 1400–1480 Oak Street, Vancouver, BC V6T 1P6, Canada. E-mail: lmasse@chc.ubc.ca.

S264 Am J Prev Med 2007;35(4S) 0748-9797/07/\$—see front matter doi:10.1016/j.amepre.2007.07.019 © 2007 American Journal of Preventive Medicine • Published by Elsevier Inc.

Author's personal copy

Development of a School Nutrition–Environment State Policy Classification System (SNESPCS)

Louise C. Masse, PhD, Mary M. Frosh, JD, Jamie F. Chiqui, PhD, Amy L. Yaroch, PhD, Tanya Agurs-Collins, PhD, RD, Heidi M. Blanck, PhD, Audie A. Atienza, PhD, Mary L. McKenna, PhD, RD, James F. Igoe, MA

Background: As policy strategies are rapidly being developed to address childhood overweight, a system was developed to systematically and reliably classify state policies related to the school nutrition environment. This study describes the development process, the inter-rater reliability to code state policies enacted as of December 2003, and the variability in state policies related to the school nutrition environment.

Methods: The development of the School Nutrition–Environment State Policy Classification System (SNESPCS) included a comprehensive review of published literature, reports from government and nongovernmental sources, input from an expert panel, and select experts. Baseline statutes and regulations for each of the 50 states and the District of Columbia were retrieved from Westlaw (data retrieved in 2005–2006 and analyzed in 2006) and pilot testing of the system was conducted.

Results: SNESPCS included 11 policy areas that relate to a range of environmental and surveillance domains. At baseline, states had no (underlying/promotional and preferential pricing) or modest (school meal environment, reimbursable school meals, coordinating or advisory councils, body mass index screening) activities in many of the policy areas. At 2003, 60% of the states had policies related to the sale of foods in school that compete with the school meal program.

Conclusions: Evaluation of policies that affect the school-nutrition environment is in its earliest stage. SNESPCS provides a mechanism for assessing variation in state policies that can be incorporated in an evaluation framework aimed at elucidating the impact of state policies on the school environment, social norms, and children's dietary behaviors in schools.

(Am J Prev Med 2007;35(4S):S271–S281) © 2007 American Journal of Preventive Medicine

Do an on the prevalence of overweight among children have triggered an interest in environmental and policy changes in the school setting. The rationale for developing and implementing school policies is emerging.⁹ However, in recent years, much policy activity affecting the school nutrition environment has occurred at the federal, state, and local levels. As legislatures have had success in developing public health policies in other areas (automobile safety, and tobacco),¹⁰ such strategies are increasingly

being considered as an incentive to structure the school environment to support healthy behaviors. As children consume a significant proportion of their daily food intake in schools, the school environment is a prime target for nutrition-related policy initiatives.¹¹ To date, recommendations for policy changes in schools have been made based on “best-available” evidence and their effectiveness as it relates to school practices is just beginning to be evaluated.

The use of policy strategies to regulate the school nutrition environment is not new. For example, the nutritional contents of meals sold as part of the National School Lunch Program (NSLP) and School Breakfast Program (SBP) is regulated at the federal level to conform to the United States Dietary Guidelines.¹²

However, federal regulations are limited for foods and beverages sold outside the NSLP and SBP (termed competitive foods).¹³ Only a portion of the competitive foods, those defined as Foods of Minimal Nutritional Value (FMNV) cannot be sold in school cafeterias or other food service areas during meal times.¹⁴ However, it is well documented that students have easy access to

From the Centre for Community Child Health Research, University of British Columbia (Masse), Vancouver, British Columbia; Centre for Health Policy and Legislation, Anshoo Chitambar, Esq., Inc., The MayTech Corporation, Silver Spring, Maryland; Health Promotion Research Branch, National Cancer Institute, Bethesda, Maryland; Division of Nutrition and Physical Activity (Rogers, Kohl), Centers for Disease Control and Prevention, Atlanta, Georgia; Address correspondence and reprint requests to: Louise C. Masse, PhD, University of British Columbia, Department of Pediatrics, CCHR—Centre for Community Child Health Research, 1400–1480 Oak Street, Vancouver, BC V6T 1P6, Canada. E-mail: lmasse@chc.ubc.ca.

S271 Am J Prev Med 2007;35(4S) 0748-9797/07/\$—see front matter doi:10.1016/j.amepre.2007.07.017 © 2007 American Journal of Preventive Medicine • Published by Elsevier Inc.

RESEARCH AND PRACTICE

Change in School Nutrition–Related Laws From 2003 to 2008: Evidence From the School Nutrition–Environment State Policy Classification System

Louise C. Masse, PhD, Fern Perna, PhD, Tanya Agurs-Collins, PhD, and Jamie F. Chiqui, PhD

Childhood obesity is on the rise in many industrialized nations, and prevalence in the United States has reached alarming proportions.¹ Obesity is a complex and multifactorial problem that requires population-based preventive solutions.^{2,3} Focusing on the school nutrition environment is considered to be an important starting point because almost all students attend school, and they consume about one third of their caloric requirements there.⁴ In the past decade, laws about school nutrition policies to optimize the nutritional environment of schools have undergone a drastic shift.

In the intervention literature, modification of the school nutrition environment has been associated with student eating behaviors, but its influence on obesity is unclear.^{5–7} Evidence suggests that food and beverage availability,^{8–12} quality of the food offered in schools,^{13,14} length of the lunch period,¹⁵ and pricing and marketing practices^{16–18} in schools have had an impact on student eating behaviors (total intake, fat consumption, and food preference). In cross-sectional studies, the school nutrition environment has been linked with children's eating behaviors and body mass index (BMI) 2003 to 1995 in light of this evidence, it is not surprising that policy-makers are resorting to strategies to modify the school nutrition environment to ultimately affect childhood obesity.

As school nutrition policies are increasingly being used to curb the rise in childhood obesity, support for such policies in the scientific literature is emerging.^{22–25} State laws and district policies have been found to influence the school nutrition environment; studies reveal an inverse association between school nutrition policies and the availability of less healthy foods and beverages at school.^{22–25} For example, Mendonça et al noted significant

Objectives. We examined state laws affecting the school food environment and changes in these laws between 2003 to 2008.

Methods. We used the Westlaw legal database to identify state-enacted laws, with scoring derived from the updated School Nutrition–Environment State Policy Classification System, obtained from the Classification of Laws Associated With School Students Web site.

Results. States significantly changed their school nutrition laws from 2003 to 2008, and many increased the stringency of the laws targeting competitive foods (snacks and entrees sold in competition with the school meal) and beverages sold in school and for in-school fundraising. Many states enacted laws that mandated the establishment of a coordinating or advisory wellness team or council. Stronger laws were enacted for elementary grades. We found tremendous variability in the strength of the laws and plenty of room for improvement. **Conclusions.** State law governing school nutrition policies significantly changed from 2003 to 2008, primarily affecting the competitive food environment in schools. The extent to which changes in school nutrition laws will lead to desired health outcomes is an area for additional research. (Am J Public Health. Published online ahead of print January 17, 2013; e1–e7. doi:10.2195/AJPH.2012.300808)

foods and beverages consumed at lunchtime among sixth and eighth graders after the Texas nutrition policy was implemented.²⁶ In addition, school nutrition policies have been favorably associated with the prevalence of overweight and obesity in children; some studies report that the increase in prevalence has been halted as a result of these policies.^{26–28} When researchers have evaluated the influence of both state and district school nutrition policies, state laws have been found to be more important in influencing behaviors and BMI.²³ Because state laws and policies will likely have wider influence on the school environment, it is essential to monitor the enactment of laws and the strength of these laws across states.

We aimed to (1) update the status of state laws for school nutrition-related policies with the revised School Nutrition–Environment State Policy Classification System (SNESPCS), which was previously published in 2007,²⁴ and (2) examine whether state laws focused on school nutrition-related policies changed from

2003 to 2008. Improvements were expected during the period because the US Congress mandated significant improvement in the school environment as part of the Child Nutrition and Wicam, Inflation, and Children Reauthorization Act of 2004.²⁹ Specifically, Congress required all school districts that participate in the National School Lunch Program and other federal child nutrition programs to develop and implement a local school wellness policy by the 2006/2007 school year that includes, but is not limited to:

1. goals for nutrition education;
2. guidelines for food and beverage availability at school;
3. assurance that federal regulations for the reimbursable school meal are followed;
4. a plan for assessing implementation of the policy as well as designation of staff responsible for the implementation of the policy; and
5. involvement of the school community in the development of the policy.

Although the wellness policy was required at the district level, many states enacted laws

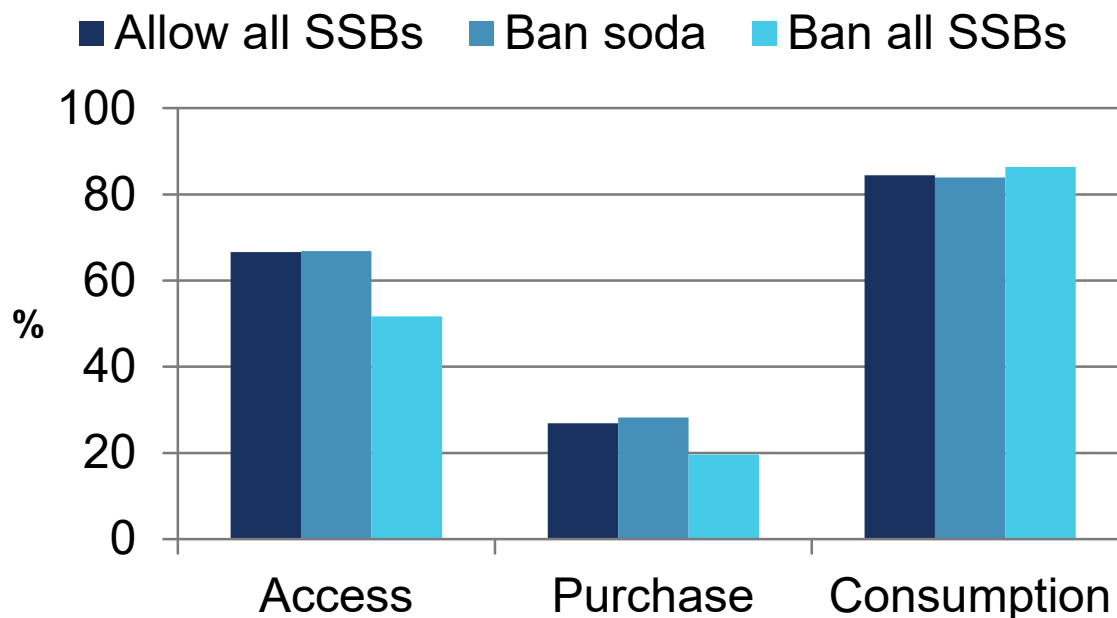
Published online ahead of print January 17, 2013 | American Journal of Public Health

Masse et al. | Peer Reviewed | Research and Practice | e1

NOT ALL POLICIES ARE THE SAME...

For example, banning soda alone is not sufficient to reduce sugar-sweetened beverage (SSB) access or purchasing; **must apply to all SSBs.**

State laws that prohibit all SSBs reduce the prevalence of middle school student in-school SSB **access** and **purchasing**, but do not reduce overall **consumption**



ADOLESCENTS CONSUME MORE SSBS IF THE STATE LAW ONLY BANS SODA

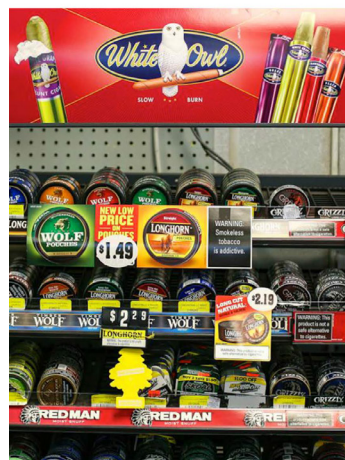
- If state law ONLY bans soda, then HS still sell SSBs in vending machines, and students consumed more sports drinks, energy drinks, and coffee/tea

SSB	RR*	95% CI	p
Sports drink	1.25	1.03, 1.45	.001
Energy drink	1.33	1.03, 1.71	.03
Coffee/tea	1.27	1.03, 1.56	.02
Other SSB	1.12	0.94, 1.33	.19

* Ratio of the number of servings per week, relative to students in states that did not ban soda, adjusted for race, sex, grade, state median income, region, and home food access

Taber et al., *IJBNPA* 2015

UNDERSTANDING POLICY CONTEXT



State Regulation of Tribal Tobacco Sales:

A Historical State-by-State Analysis, 2005-2015

DeLong HR, Leider J, Chriqui JF, Chaloupka FJ
University of Illinois at Chicago

October 2016

Tobacco Product Taxation:

*An Analysis of State Tax Schemes Nationwide,
Selected Years, 2005-2014*

Camille K. Gourdet, JD, MA | Jamie F. Chriqui, PhD, MHS | Julien Leider, MS
Hillary DeLong, J.D. | Colin Goodman, J.D. | Frank J. Chaloupka, PhD.

August 2015

Tobacco Product Pricing Laws:

A State-by-State Analysis, 2015

DeLong HR, Chriqui JF, Gourdet CG, Leider J, Chaloupka FJ
University of Illinois at Chicago

September 2016

Structure of Tobacco Pricing Formulas

Minimum Markup

Base Cost

Manuf.
List
Price

Taxes

Cartage

Trade
Discounts

Other Costs & Fees

Wholesaler Statutory Markup

Wholesaler Minimum Price

Retailer Statutory Markup

Retailer Minimum Price

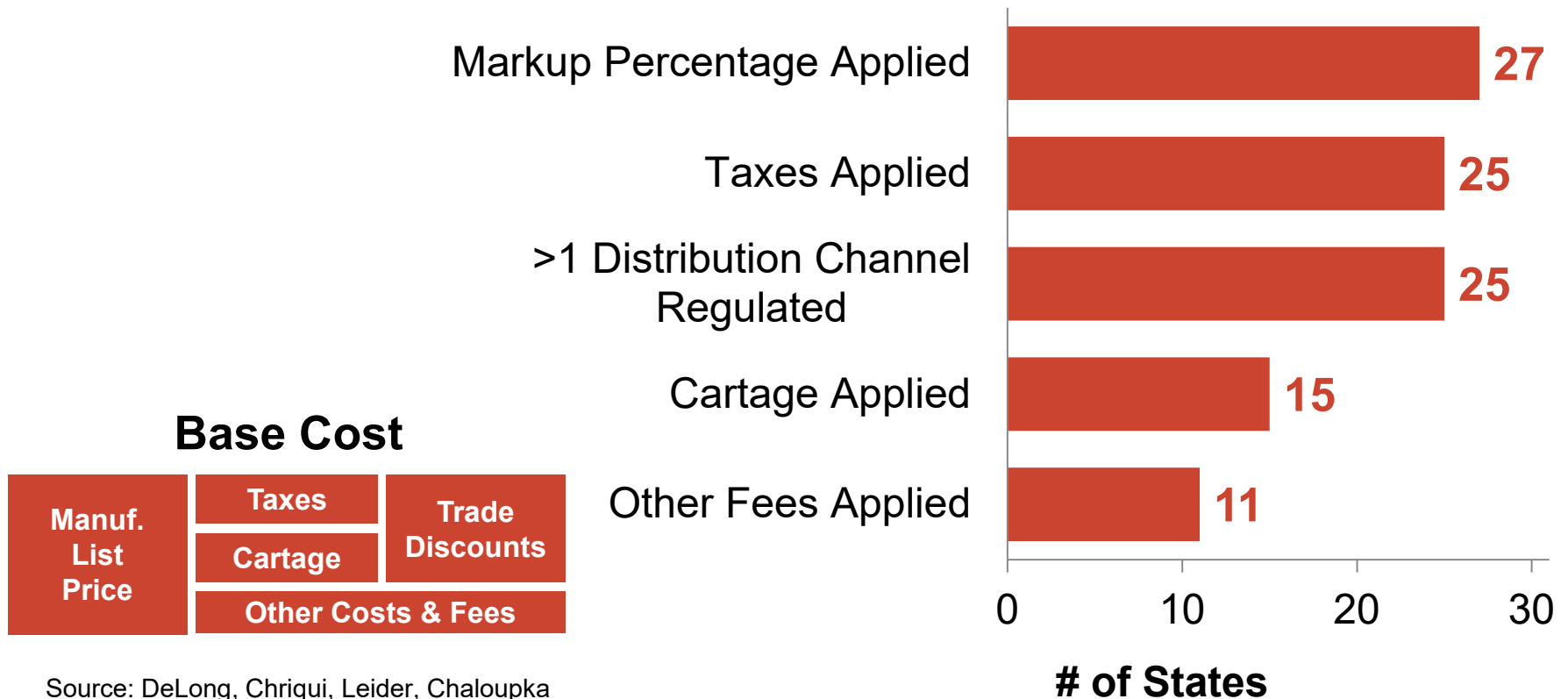
Examples of minimum markup states include Iowa, New York, and Wisconsin.

Minimum Pricing

**Cost of
Product to
Purchasing
Party**

Examples of minimum pricing states include Colorado and Washington.

Frequency of Factors That Increase the Base Cost of Cigarettes (2015)



Source: DeLong, Chriqui, Leider, Chaloupka (2015). Tobacco Product Pricing Laws: A State-by-State Analysis, 2015. Available: www.tobacconomics.org

*N=31 states with Minimum Pricing Laws
(Data are not mutually exclusive)*

How States Utilize Regulatory Mechanisms That Increase and Decrease Base Cost of Cigarettes (2015)

Factors That Increase Price:

1. # of Parties Regulated
2. Markup *
3. Cartage
4. Taxes
5. Other Fees

Factors That Decrease Price:

1. Below-Cost Coupons Allowed
2. Consumers Can Receive Below-Cost Coupons
3. Combination Sales Below Cost Allowed
4. Restrictions on Below-Cost Combination Sales
5. Trade Discounts Used to Reduce Base Price
6. Trade Discount Defined to Include Discount Programs
7. Competitor Price-Matching Allowed
8. Restrictions on Competitor Price-Matching

* All factors were scored using a dichotomous scale except for "Markup," which was scored using an ordinal grouping based on continuous scale:

Markup Rate Scale	
No Markup	0
Markup > 0-6%	1
Markup > 6-12%	2
Markup > 12-18%	3
Markup > 18-24%	4
Markup > 24%	5

Regulatory Strength: Factors That Increase and Decrease Base Cost of Cigarettes By State

Increase Max Score: 9		Decrease Max Score: 8	
4	AK	3	
4	AR	4	
2	CA	5	
1	CO	4	
7	CT	4	
3	DE	4	
4	DC	4	
4	HI	3	
0	ID	4	
6	IN	5	
5	IA	5	
6	LA	5	
5	ME	5	
6	MD	5	
8	MA	5	
7	MN	2	
5	MS	3	
6	MT	2	
6	NE	5	
1	NV	3	
6	NJ	3	
5	NY	3	
5	OH	5	
5	OK	6	
5	PA	4	
6	RI	5	
6	SD	3	
4	TN	4	
1	WA	4	
5	WV	5	
6	WI	6	





UNDERSTAND THE NEED FOR CONCEPTUAL MATCHES BETWEEN POLICY AND EXPOSURE/OUTCOME



NEED TO ENSURE “CONCEPTUAL MATCHES” BETWEEN POLICY, EXPOSURE, AND OUTCOMES



Source:
<https://phil.cdc.gov/Details.aspx?pid=13653>
Amanda Mills



Source: <https://phil.cdc.gov/Details.aspx?pid=14403>
Deborah Cartagena

And NOT



Source:
<https://phil.cdc.gov/Details.aspx?pid=13622>
Amanda Mills

*See Ding & Gebel, Health & Place, 2012

CONCEPTUAL “MIS”MATCH AND MATCH EXAMPLES

Zoning for Passive Recreation → Activity Outcomes



Pedbikeimages.com/Dan Burden

- % Workers taking active travel to work (Coeff=0.50, 95% CI: -0.41, 1.42) **versus**
- Reduced rates of adult inactivity (Coeff=-0.12, 95% CI: -0.15, -0.08)

Zoning for Bike Lanes → Built Env. Measures



Center for Active Design/Queens Plaza, New York City

- Google Street View (GSV) data on playgrounds/active recreation spaces (AOR: 1.01, 95% CI: 0.73, 1.39) **versus**
- GSV data on bike lanes (AOR=2.22, 95% CI: 1.74, 2.84)

District Wellness Policy Restrictions on **Calories** in A la Carte Snacks → Food Purchasing Standards

Nutrition Facts	
8 servings per container	
Serving size	2/3 cup (55g)
Amount per serving	
Calories	230
% Daily Value*	
Total Fat 8g	10%
Saturated Fat 1g	5%

- District-level food purchasing standards governing **total fats** (AOR=1.71, 95% CI: 0.42, 7.00) **versus**
- District-level food purchasing standards governing **total calories** (AOR=4.48, 95% CI: 1.08, 18.64)



STUDY DESIGN CONSIDERATIONS



EXAMPLES OF STUDY DESIGNS USED WHEN STUDYING NATURAL EXPERIMENTS

- Pre/post with comparison jurisdictions
 - Helps to have multiple comparisons
 - Replication across jurisdictions with policy change
- Time series
- **Difference-in-difference**
- Regression discontinuity

OTHER DESIGN CONSIDERATIONS WHEN STUDYING THE IMPLEMENTATION/IMPACT OF LAW AND POLICY

- Time lag for implementation
 - Need to understand likely implementation timeline
 - E.g., Taxes vs. infrastructure change
- Understand the effective date of the policy change
 - For policy surveillance studies, need to identify a standard reference date
- Whether outcomes will likely vary over time
- Need for consistent measurement of outcomes over time (at the same time points)
 - E.g., beverage purchasing is seasonal so may not need to do weekly but definitely monthly or by season to account for seasonal effects



DATA CONSIDERATIONS



PRIMARY REASONS WHY DIFFERENT POLICY SYSTEMS REPORT DIFFERENT INFORMATION

- Underlying system purpose
- Policy analysis and reporting methodology(ies)
- “Sources” of policy information
- Level of experience/expertise with legal/policy research and analysis and subject matter
- Primary intended “aim”/use of the system
- Resources

CHALLENGES WITH MEASURING POLICY AND ON-THE-GROUND OUTCOMES

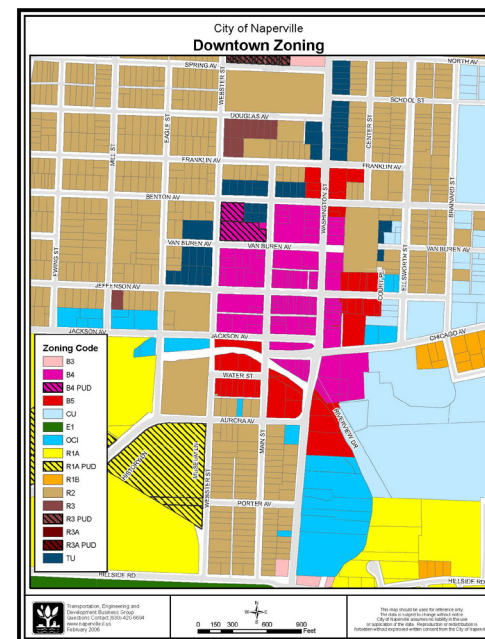
- Beyond the complexity of how and what to “measure”
- Validity and reliability of measurement
 - Content validity
 - Inter-rater/coder reliability/validity
- Developing scores from “big” and/or complex data sets
- Comparability (or lack thereof) of measures across studies to allow for meaningful comparisons

CHALLENGES: GEOCODES FOR LINKING TO OUTCOME DATA

- Geocodes in large, national data sets
- Often county level or larger geographies
 - Data may be individual level but for linking to policy and environmental exposures, often restricted to linking on county level geocodes which makes the conceptual match difficult
 - Example with zoning study
 - Zoning data for all jurisdictions located in largest 496 US counties. BRFSS geocode was restricted to county-level identifiers in the public use files up to and including 2012; starting in 2013, identifiers removed from public use files

OTHER CONSIDERATIONS

- **Do it right!**
 - Policy data take time to compile correctly; build that into your study timeline and design
 - Historical policies hard to obtain depending on jurisdiction and type of policy
 - Requires expertise in both methods and content
- **Exposure**
 - How do we know whether people are actually exposed to the law/policy?
- **Endogeneity**
 - Need for longitudinal data on exposures and persons
 - Need to account for self-selection
- **Implementation/Impact Lags**
 - Need to allow time for policy implementation
 - Lag varies by policy type and infrastructure changes required “on the ground”
 - Lag from policy to environment to behavioral change/outcomes





SELECTED REFERENCES FOR CONSIDERATION



SELECTED RELEVANT REFERENCES AND READINGS FOR MORE INFORMATION

- Burris S., Ashe M., Levin D., Penn M., & Larkin M. (2016). A transdisciplinary approach to public health law: The emerging practice of legal epidemiology. *Ann. Rev. Pub. Health*, 37(135): 135-148.
- Centers for Disease Control and Prevention, Public Health Law Program. The Legal Epidemiology Competency Model Version 1.0. Available: <https://www.cdc.gov/phlp/publications/topic/resources/legalepimodel/index.html>
- ChangeLab Solutions. Public Health Law Academy (for legal epidemiology training). Available: <http://changelabsolutions.org/public-health-law-academy>
- Chriqui, J. F., O'Connor, J. C., & Chaloupka, F. J. (2011). What gets measured, gets changed: evaluating law and policy for maximum impact. *J. Law Med. Ethics*, 39 Suppl 1, 21-26.
- Ding, D., & Gebel, K. (2012). Built environment, physical activity, and obesity: what have we learned from reviewing the literature? *Health Place*, 18(1), 100-105. doi:10.1016/j.healthplace.2011.08.021

SELECTED RELEVANT REFERENCES AND READINGS FOR MORE INFORMATION

- Mâsse L.C., Frosh M.M., Chriqui J.F., et al. (2007). Development of a school nutrition environment state policy classification system (SNESPCS). *AJPM* 33(4S):S277-S291.
- Mâsse L.C., Chriqui J.F., Igoe J.F., et al. (2007). Development of a physical education-related state policy classification system (PERSPCS). *AJPM* 33(4S):S264-S276.
- *Public Health Law Research: Theory and Methods*, edited by A.C. Wageneaar and S.C. Burris, John Wiley & Sons, Incorporated, 2013.
- Schwartz, M. B., Lund, A. E., Grow, H. M., McDonnell, E., Probart, C., Samuelson, A., & Lytle, L. (2009). A comprehensive coding system to measure the quality of school wellness policies. *J. Am. Diet. Assoc.*, 109(7), 1256-1262.
- Wagenaar A & Komro K. Natural experiments: Research design elements for optimal causal inference without randomization. In: *Public Health Law Research :Theory and Methods*, edited by A.C. Wageneaar and S.C. Burris, John Wiley & Sons, Incorporated, 2013.



QUESTIONS?

