

A Review of State Regulations to Promote Physical Activity and Safety on Playgrounds in Child Care Centers and Family Child Care Homes

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Background: As interventions increasingly emphasize early child care settings, it is necessary to understand the state regulatory context that provides guidelines for outdoor physical activity and safety and sets standards for child care environments. **Methods:** Researchers reviewed regulations for child care facilities for 50 states, the District of Columbia and the Virgin Islands. We compared state regulations with national standards for 17 physical activity- and safety-related items for outdoor playground settings outlined in *Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs (CFOC)*. State regulations were coded as fully, partially or not addressing the CFOC standard and state-level summary scores were calculated. **Results:** On average, state regulations fully addressed one-third of 17 CFOC standards in regulations for centers (34%) and family child care homes (27%). Data suggest insufficient attention to outdoor play area proximity and size, equipment height, surfacing, and inspections. **Conclusions:** Considerable variation exists among state regulations related to physical activity promotion and injury prevention within outdoor play areas. Many states' regulations do not comply with published national health and safety standards. Enhancing regulations is one component of a policy approach to promoting safe, physically active child care settings.

Keywords: outdoor environment, preschool, injury prevention

In the United States, 11 million children under 5 years of age are in some type of nonparental child care arrangement¹ and 42% of children whose mothers are employed spend at least 35 hours in child care each week.² In many cases, child care arrangements include enrollment in a family or center-based child care setting. In 2005, 57% of children aged 3 to 5 years were enrolled in center-based child care.³ Therefore, these settings are important venues shaping the activities and development of young children.⁴

The major source of federal funding provided to the states for early child care is the Child Care and Development Block Grant. To be eligible for these funds, states must have in place policies applicable to child care providers that protect the health and safety of children.¹⁰ In

each state, child care facilities are licensed or governed by a state agency that promulgates regulations and monitors compliance. While there are some 335,000 licensed child care facilities in the United States,⁵ the regulations that govern these settings vary considerably by state.⁶⁻⁹ Recent research demonstrates heightened interest in both identifying both the regulatory content that may support healthier physical activity levels and nutrition behaviors⁶⁻⁸ and the standards for oversight and enforcement of regulations in child care settings.¹⁰ These studies highlight the importance of research that can identify and characterize potentially influential regulatory standards and assess whether these regulatory standards influence environments and practices that promote safe, physically active play in child care settings. Enhancing regulation is one component of a policy approach to promoting safe, physically active child care settings.

Many young children are physically inactive during most of their time in child care.^{11,12} The characteristics of a child care center can influence the level of physical activity young children achieve¹³⁻¹⁵ and physical activity levels vary across preschool settings.^{12,13,15} Recent reviews suggest that very few states have requirements for child care settings that specify the time children are to be given for physical activity.^{6,8} Certain physical environmental characteristics such as play space and equipment,^{15,16} as well as practices including time outdoors at preschool

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have been suggested as potential correlates of physical activity levels of young children.^{15,17,18} As interventions increasingly emphasize early child care settings,^{19,20} it will be important to understand the state regulatory context that provides guidelines and sets standards for the outdoor play spaces of child care environments.

Between 1996 and 2005, 2.1 million playground injuries occurred among children under age 18 years, with 27% of these among children under 5 years.²¹ Nationally, school settings are a primary location for playground injuries²² with commercial child care locations noted as the site of some 56% of playground equipment-related injuries treated in hospital emergency rooms among children aged 0 to 4 years.²³ Falls are the leading cause of all playground equipment-related injuries to children in the United States.²¹ Nonfatal injuries among children under 5 are predominantly head and face injuries (49%) followed by injuries to the arm or hand (30%). Among fatal injuries, primary hazards include strangulation from entanglement or entrapment, falls and tip over or collapse of the equipment, and entrapment.²³ Despite these significant health impacts, prior studies suggest that compliance to national standards for play area equipment height and safety surfacing injury in child care centers is variable.²⁴⁻²⁶ Therefore, enhancing state regulations for playground areas in child care settings may be an effective strategy in improving the quality of play settings and contribute to reductions in injury.²⁷

To ensure that associated regulatory agencies and organizations providing child care have comprehensive guidance on best practices for providing a healthy environment for children, *Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs* (CFOC) was created through a collaborative effort of the American Academy of Pediatrics, the American Public Health Association and the National Resource Center for Health and Safety in Childcare and Early Education.²⁸ CFOC provides standards on many relevant topics including specifications regarding appropriate outdoor play settings and playground equipment based on guidelines from the Consumer Product Safety Commission (CPSC) concerning hazards most commonly associated with injury.²⁹ The following analysis updates⁹ and expands the work of prior studies^{6,8,9} with an assessment of state child care licensing regulations pertinent to outdoor play spaces. We describe state regulations related to physical activity promotion and injury prevention within outdoor play areas of child care centers and family child care homes and make recommendations for future policy change initiatives.

Methods

Data Sources

Between May and June 2007, researchers collected the licensing regulations for the 50 states, the District of Columbia, and the Virgin Islands (hereafter referred to as “states”) from the National Resource Center for Health and Safety in Child Care.²⁸ This agency collects

and maintains a national database for current state child care regulations.

Most states regulate 2 classes of child care facilities: child care centers and family child care homes. States frequently have differing regulations for each facility class. As described in detail in prior regulation reviews, researchers considered and coded regulations separately for child care centers and family child care homes due to functional and regulatory differences.^{7,8} Briefly, child care centers generally serve larger numbers of children and therefore have more staff and potentially greater physical infrastructure. Family child care homes are often located in the residence of the owner and operator of the child care program, provide care for fewer children and frequently have no additional staff.

Standard Selection

Researchers selected several standards that were 1) outlined in CFOC²⁹ and 2) supported by evidence in the research literature as factors associated with physical activity promotion and playground injury prevention in outdoor settings. Major categories of selected standards included: 1) characteristics of play area settings that may promote physical activity including appropriate and sufficient equipment,^{15,16,30} proximity, size and capacity of setting,³⁰⁻³³ and supervision;^{16,30,31} 2) injury prevention from hazards in and around play areas including fencing and enclosure, adjacent hazards including water, and sun exposure;³² and 3) equipment hazards and maintenance including equipment height, surfacing characteristics, sharp edges, flaws, toxic material content, and regularly documented inspections.³⁴ Researchers also assessed regulations requiring play equipment and surfacing appropriate for children with disabilities in compliance with the Americans with Disabilities Act (ADA). All CFOC standards except play area proximity, size and capacity apply to both center and family child care homes.

Operational Definitions and Coding Strategy for Review of Regulations

Researchers considered regulatory standards that included clear, specific language with guidance that could be quantified thus enabling its use as a basis for compliance monitoring and enforcement as preferable to standards without detailed language or specification. Investigators operationalized definitions for standards with coding options defined as a 3-category response (ie, CFOC standard fully addressed in regulation, using clear and specific language consistent with standard = 2, CFOC standard partially addressed or mentioned in standard but lacking in clear and specific language or with specific language not consistent with standard = 1, and CFOC standard not addressed in regulation = 0) or in the case of 2 standards (reference to sunlit and/or shaded areas in outdoor spaces and stated restriction on use of toxic materials on play equipment), items were coded as either fully addressed or not addressed (Table 1).

Table 1 Caring for Our Children (CFOC) Standards and Coding Criteria for Child Care Regulations

CFOC standard number and components	Description	Fully addressed (Score=2)	Partially addressed (Score=1)	Not addressed (Score=0)	
5.085	Equipment height Appropriate equipment	One foot per year of age of the intended users. Or, in some states, 48 inches for preschoolers (30 months to 5 years of age). Play equipment and materials shall be deemed appropriate to the developmental needs, individual interests, and ages of the children, by a person with at least a master's degree in early childhood education or psychology, or a doctoral degree in psychiatry, or identified as age-appropriate by a manufacturer's label on the product package.	Specific height limits in line with standards. Equipment and materials deemed appropriate by qualified person or manufacturer's label. Reference to development, age, size.	Reference to height not in line with standard. Or, general statements about height and safety. Reference to appropriateness of equipment and materials but not by qualified person or manufacturer's label.	Height not mentioned. Appropriateness not mentioned.
	Sufficient equipment	Enough play equipment and materials available to avoid excessive competition and long waits.	Enough play equipment and materials shall be available to avoid excessive competition and long waits. Or, reference to sufficient equipment to allow for individual or small group involvement of children/avoiding conflict.	Reference to sufficient quantity of equipment.	Sufficient equipment/materials not mentioned.
	Supervision in play area	Children shall always be supervised when playing on playground equipment.	Children always supervised when playing on playground equipment. If supervision referred to "at all times," mark fully addressed.	Reference to general supervision.	Supervision not mentioned.
5.162	Play area proximity*	The facility shall be equipped with an outdoor play area that directly adjoins the indoor facilities or that can be reached by a route that is free of hazards and is no farther than one-eighth mile from the facility.	Outdoor play area at/adjoined/adjacent to indoor facility. If not at facility, via hazard-free route within one-eighth miles.	Reference to proximity of outdoor play area but not required at/adjoined to facility. Reference to within walking distance, accessible, convenient and safe. Or, statement that if it is not possible to have play area at center, must be within safe distance, walkable, etc.	Proximity of outdoor play area not mentioned.

(continued)

Table 1 (continued)

CFOC standard number and components	Description	Fully addressed (Score-2)	Partially addressed (Score-1)	Not addressed (Score-0)
Play area size*	Minimum of 75 square feet for each child using the playground at any one time (except infants—33 square feet; and children 18–24 months—50 square feet).	Minimum 75 square feet per child using playground.	Reference to size of outdoor play area not in line with standard.	Size of play area not mentioned.
5.164				
Play area capacity*	Accommodate at least 33% of the licensed capacity at one time.	Accommodate at least 33% (one-third) of the licensed capacity, including 100% capacity with slight caveat.	Reference to capacity of outdoor area other than that in standard or without specification.	Capacity of outdoor area not mentioned.
5.169				
Hazards in play area	Playground free of hazards and more than 30 feet from hazards (see list in standard).	Playground free of hazards and more than 30 feet from hazards.	Playground free of hazards but no reference to distance from hazards.	Playground hazards not mentioned.
Fencing and enclosure	Fencing or another form of barrier such as a hedge or other plants (at least 4 feet high) that restrain the children, and that they cannot climb, must be provided around the play area and around hazards.	Fencing or barrier at least 4 feet high present around play area and any hazards.	Presence of fencing or barrier around play area and hazards but no reference to height.	Fencing/barriers not mentioned.
5.176				
Water	Outside play areas shall be free from the following bodies of water: unprotected swimming and wading pools, ditches, quarries, canals, excavations, fish ponds, etc.	The following 3 criteria are met: 1) Outdoor play areas free from unprotected bodies of water 2) Discuss pools/permanent wading pools with fence or 'protection' 3) Discuss emptied moveable wading pool.	Some of the 3 criteria are met.	None of the 3 criteria are mentioned.
5.177				
Sun and shade	Sunlit areas and shaded areas shall be provided by means of open space and tree plantings or other cover in outdoor spaces.	Reference to sunlit and/or shaded areas.		Exposure to sun and shade not mentioned.
5.183				

(continued)

Table 1 (continued)

CFOC standard number and components	Description	Fully addressed (Score=2)	Partially addressed (Score=1)	Not addressed (Score=0)
Safety surfacing	Equipment used for climbing shall not be placed over, or immediately next to, hard surfaces such as asphalt, concrete, dirt, grass, or flooring covered by carpet or gym mats not intended for use as surfacing for climbing equipment.	Playground equipment to be surrounded by shock-absorbing surface as per CPSC, ASTM and HIC standards. Or, reference to type and depth of surfacing or critical height requirements.	Climbing equipment shall be surrounded by appropriate surfacing.	Surfacing for climbing equipment not mentioned.
Safety surfacing fall zone	Surfacing shall extend at least 6 feet beyond stationary equipment (fall zone).	Surfacing shall extend at least 6 feet beyond stationary equipment (fall zone). Or, reference to CPSC/ASTM.	Surfacing shall extend distance other than that in standard or not specified.	Distance of surfacing not mentioned.
5.185				
Equipment flaws	Play equipment shall be free of sharp edges, protruding parts, weaknesses, and flaws. Sharp edges shall be rounded to 1 half-inch radius and wood materials sanded smooth and inspected regularly.	Equipment of safe design and good repair with reference to specific criteria (ie, sharp edges, protruding parts, weaknesses, and flaws).	Equipment of safe design or good repair (without specific criteria).	Safe design and good repair not mentioned.
5.187				
ADA	Play equipment and play surfaces shall be provided for children with disabilities and shall conform to ADA.	Play equipment and play surfaces shall be provided for children with disabilities and shall conform to ADA.	Reference to any equipment or general facilities for children with disabilities.	Equipment for children with disabilities not mentioned.
5.195				
Toxic materials	Equipment shall not be coated or treated with nor contain toxic materials in hazardous amounts that are accessible to children.	Equipment shall not be coated or treated with nor contain toxic materials in hazardous amounts that are accessible to children (paint or materials).		Toxins in equipment not mentioned.
5.196				
Regular documented inspections	Inspection of play area and equipment shall take place at regular intervals and observations documented (see checklist in standard).	Inspection of play area and equipment shall be documented, using checklist in standard, or with specific criteria/components.	Reference specific inspection criteria (but not documented).	Inspection criteria not mentioned.

* Standard applies to child care center facilities only.

One researcher (EO) reviewed all state regulations in their entirety and performed selected key word searches for each standard, assigning initial coding scores based on these document reviews. Researchers then calculated summary scores for comprehensiveness and strength of regulations.³⁵ The comprehensiveness summary score was defined as the proportion of total standards addressed in state child care regulations. The strength summary score was defined as the proportion of the standards assessed that were coded as “CFOC standard fully met” by state regulation. Researchers also calculated summary scores by topic areas including physical activity, injury prevention, and equipment hazards.

While this study did not involve human subjects, the study protocol was reviewed by the Institutional Review Board of the Harvard School of Public Health.

Results

Overall Summary Scores

On average, state-level overall comprehensiveness summary scores indicate that around two-thirds of the 17 CFOC standards were partially or fully addressed in the regulations for centers (69%) and in regulations for child care homes (62%) (Table 2). However according to overall strength summary scores, on average just 34% of these 17 standards were assessed as fully in compliance with CFOC standards among regulations for child care centers, and 27% were assessed as fully in compliance with CFOC standards in state regulations for child care homes.

CFOC Standards Promoting Physical Activity

State-level physical activity comprehensiveness summary scores suggest that states’ regulations partially or fully addressed 76% of the 6 CFOC standards for the promotion of physical activity in child care centers and 68% of the standards in regulations for child care homes, on average (Table 3). Of the 6 key CFOC standards related to physical activity promotion in outdoor playgrounds

areas, 40% were fully addressed among regulations for centers and 35% were addressed in regulations for child care homes according to the calculated state-level physical activity strength summary scores.

The majority of state regulations for child care centers fully met national standards for supervision in outdoor play areas (90%). Thirty states (58%) fully addressed the standard for provision of adequate play size per child and 31% fully addressed standards for play area capacity. However, only 7 states’ regulations (13%) fully addressed national standards for availability of an outdoor play area adjoining or in close proximity of the center in their regulations for centers (Table 3). Alternatively, the majority of states’ regulations for child care homes fully addressed provision of supervision (94%). Some states’ regulations for centers and homes, respectively, did not address the provision of equipment that was appropriate to developmental needs, interests and age(s) of children (8% centers, 13% homes) or available in sufficient quantities to avoid competition or excessive waits (19% centers, 27% homes). Forty-seven states addressed play area size in regulations. Among these, 45 states included specifications in their regulations for an amount of play space per child in child care centers or the information necessary for its calculation (ie, total play area size and enrollment). The specified amount of outdoor play space per child ranged from 20 to 100 square feet per child and averaged 67.2 square feet/child (standard deviation, 14.7), or below the CFOC recommendation for 75 square feet/child. Although specific CFOC space requirement standards are not suggested for family child care homes, averages for those 40 states with regulations for provision of outdoor space per child for child care homes were comparable to those for child care centers (mean 65.9 square feet/child, standard deviation 13.9, range 37.5 to 100 square feet/child).

CFOC Standards Regarding Injury Prevention

On average, injury prevention comprehensiveness summary scores for centers (54%) and family child care homes (44%) indicate that approximately half of the 4

Table 2 Average Overall State-Level Summary Scores of Regulatory Adherence to National Caring for Our Children (CFOC) Standards for Child Care Centers and Family Child Care Homes (n = 52)

State-level Summary Score	Centers				Homes			
	Mean	Median	SD	Range	Mean	Median	SD	Range
State-level overall								
Comprehensiveness Summary Score ^a	69%	71%	16%	6%–100%	62%	65%	16%	6%–94%
State-level overall								
Strength Summary Score ^b	34%	35%	15%	0%–88%	27%	24%	15%	0%–88%

Abbreviations: SD, Standard Deviation.

^a Overall Comprehensiveness Summary Score calculated as the proportion of total items for each state coded as either 1–Partially Addressing CFOC Standard, or 2–Fully Addressing CFOC Standard.

^b Overall Strength Summary Score calculated as the proportion of total items for each state coded as 2–Fully Addressing CFOC Standard.

Table 3 Number and Proportion of States by Level of Regulatory Adherence to National Caring for Our Children (CFOC) Standard for Physical Activity-related Items for Child Care Centers and Family Child Care Homes (n = 52)

CFOC Item standard for physical activity	CFOC Item Standard Score					
	Centers			Homes		
	Score	N	%	Score	N	%
Appropriate equipment	0	4	8	0	7	13
	1	47	90	1	44	85
	2	1	2	2	1	2
Sufficient equipment	0	10	19	0	14	27
	1	19	37	1	20	38
	2	23	44	2	18	35
Supervision in play area	0	2	4	0	1	2
	1	3	6	1	2	4
	2	47	90	2	49	94
Play area proximity	0	23	44	0	25	48
	1	22	42	1	19	37
	2	7	13	2	8	15
Play area size	0	5	10	0	10	19
	1	17	33	1	19	37
	2	30	58	2	23	44
Play area capacity	0	30	58	0	42	81
	1	6	12	1	1	2
	2	16	31	2	9	17

	State-Level Summary Score							
	Centers				Homes			
	Mean	Median	SD	Range	Mean	Median	SD	Range
State-Level Physical Activity Comprehensiveness Summary Score ^a (% items scored 1 or 2)	76%	83%	22%	0%–100%	68%	67%	22%	0%–100%
State-Level Physical Activity Strength Summary Score ^b (% items scored 2)	40%	33%	20%	0%–83%	35%	33%	19%	0%–83%

Abbreviations: SD, Standard Deviation.

^a State-Level Physical Activity (PA) Comprehensiveness Summary Score calculated as the proportion of a state's total PA items coded as either 1–Partially Addressing CFOC Standard, or 2–Fully Addressing CFOC Standard.

^b State-Level PA Strength Summary Score calculated as the proportion of a state's total PA items coded as 2–Fully Addressing CFOC Standard.

items concerning injury prevention were partially or fully in compliance with CFOC standards in state regulations. Injury prevention strength summary scores indicating the proportion of the 4 items coded as fully addressing CFOC standards were 37% for child care centers and 25% for family child care homes (Table 4).

Most states' regulations (96%) for child care centers and child care homes only partially addressed injury prevention in play area standards for requiring playgrounds to be free from hazards and located at least 30 feet from

major hazards. The majority of state regulations for child care centers (54%) and child care homes (71%) did not mention provision of sunlit and/or shaded areas in outdoor play areas (Table 4).

CFOC Standards Regarding Play Equipment Hazards

Six key standards were used to assess regulations for playground equipment standards (Table 5). Summary

Table 4 Number and Proportion of States by Level of Regulatory Adherence to National Standards for Injury Prevention Items for Child Care Centers and Family Child Care Homes (n = 52)

CFOC Item standard for play area injury prevention	CFOC Item Standard Score					
	Centers			Homes		
	Score	N	%	Score	N	%
Hazards in play area	0	1	2	0	1	2
	1	50	96	1	50	96
	2	1	2	2	1	2
Fencing and enclosure	0	6	12	0	5	10
	1	21	40	1	28	54
	2	25	48	2	19	37
Water	0	8	15	0	4	8
	1	37	71	1	36	69
	2	7	13	2	12	23
Sun and shade	0	28	54	0	37	71
	1	N/A	N/A	1	N/A	N/A
	2	24	46	2	15	29

	State-Level Summary Score							
	Centers				Homes			
	Mean	Median	SD	Range	Mean	Median	SD	Range
State-Level Injury Prevention Comprehensiveness Summary Score ^a (% items scored 1 or 2)	54%	50%	22%	0%–100%	44%	50%	20%	0%–100%
State-Level Injury Prevention Strength Summary Score ^b (% items scored 2)	37%	33%	21%	0%–83%	25%	33%	18%	0%–83%

Abbreviations: SD, Standard Deviation; N/A, not available.

^a State-level Injury Prevention (IP) Comprehensiveness Summary Score calculated as the proportion of a state's total IP items coded as either 1–Partially Addressing CFOC Standard, or 2–Fully Addressing CFOC Standard.

^b State-level IP Strength Summary Score calculated as the proportion of a state's total IP items coded as 2–Fully Addressing CFOC Standard.

play equipment hazard comprehensiveness scores indicate that state regulations for child care centers, on average, either partially or fully addressed 79% of these items. Data were similar for play equipment hazard comprehensiveness scores for child care homes with 77% of the CFOC standards for playground hazards being addressed (either partially or fully) in states' regulations. Summary equipment hazard strength scores indicate that approximately one quarter of the key items pertaining to national standards for playground equipment were fully addressed with clear and strong language in the regulations for centers (27%) or homes (23%). Few states fully addressed the standard for providing regular inspection and documentation of specific criteria for playground equipment in their regulations for child care centers (5 states) or homes (2 states).

CFOC Standards Regarding ADA Compliance

Five states (10%) required child care centers to provide play equipment and surfacing appropriate for children with disabilities. Just 3 states (6%) required the same from providers in family child care homes.

Discussion

Regulations that are evidence-based, clearly written and with detail sufficient to allow for compliance monitoring and enforcement can be an important step in a policy strategy to improve child health and safety in child care settings. This study describes one method that may be used to document and characterize state-level regula-

Table 5 Number and Proportion of States by Level of Regulatory Adherence to National Standard for Playground Equipment Hazard Items for Child Care Centers and Family Child Care Homes (n = 52)

CFOC Item standard for playground equipment hazards	CFOC Item Standard Score					
	Centers			Homes		
	Score	N	%	Score	N	%
Equipment height	0	34	65	0	39	75
	1	18	35	1	13	25
	2	0	0	2	0	0
Safety surfacing	0	12	23	0	19	37
	1	16	31	1	23	44
	2	24	46	2	10	19
Safety surfacing fall zone	0	39	75	0	47	90
	1	2	4	1	1	2
	2	11	21	2	4	8
Equipment flaws	0	2	4	0	2	4
	1	14	27	1	19	37
	2	36	69	2	31	60
Toxic materials	0	12	23	0	20	38
	1	N/A	N/A	1	N/A	N/A
	2	40	77	2	32	62
Regular documented inspection	0	46	88	0	48	92
	1	1	2	1	2	4
	2	5	10	2	2	4

	State-Level Summary Score							
	Centers				Homes			
	Mean	Median	SD	Range	Mean	Median	SD	Range
State-Level Playground Equipment Comprehensiveness Summary Score ^a (% items scored 1 or 2)	79%	75%	20%	25%–100%	77%	75%	18%	25%–100%
State-Level Playground Equipment Strength Summary Score ^b (% items scored 2)	27%	25%	24%	0%–100%	23%	25%	24%	0%–100%

Abbreviations: SD, Standard Deviation; N/A, not available.

^a State-Level Playground Equipment (PE) Comprehensiveness Summary Score calculated as the proportion of a state's total PE items coded as either 1–Partially Addressing CFOC Standard, or 2–Fully Addressing CFOC Standard.

^b State-Level PE Strength Summary Score calculated as the proportion of total PE items coded as 2–Fully Addressing CFOC Standard.

tions for child care settings. This is an important step in promoting further study of the role of regulations in promoting a healthy environment. Using this method, we note that while considerable variation exists among state regulations regarding physical activity promotion and injury prevention within outdoor play areas of child care settings, many states' regulations do not fully address published national health and safety standards.

On average, state regulations fully addressed (with clear and specific language consistent with the standard) one-third of 17 CFOC standards in regulations for centers (34%) and one quarter for family child care homes (27%). There were notable exceptions among states, however. One state had regulations for child care centers that fully addressed national standards for 88% of the 17 CFOC standards while other states' regulations are considerably

less consistent with national guidelines. One state, for example, addressed only a small fraction (6%) of these standards in its regulations for child care centers. The strength and specificity of regulatory language for each of the coded items also varied. Given their potential role in promoting physical activity and preventing injury, our data suggest insufficient detail in regulatory standards related to outdoor play area proximity and size, equipment height, surfacing, and inspections.

Physical activity guidelines suggest that toddlers and preschool children should participate in at least 60 minutes of unstructured physical activity daily in addition to 30 to 60 minutes of structured physical activity depending on age.³⁶ However, the collection of reliable and valid measures of unstructured physical activity levels among young children is particularly difficult due to intermittent activity patterns, and only recently have more detailed recommendations for suggested best practice for physical activity assessment been developed.¹¹ Perhaps due in part to these measurement difficulties, research is still evolving regarding several of the environmental and policy factors within preschool settings that promote physical activity.

Data from our state-by-state review suggest potentially insufficient detail in regulatory guidance related to key standards that may influence physical activity levels among young children, including provision of sufficient and appropriate play equipment. The importance of play equipment in promoting physically active play has been examined in studies using either objective or observational measures of physical activity in various settings. Structured observations in outdoor areas of preschools indicate that children are more likely engaged in moderate and vigorous physical activity when playing with equipment (balls, objects, fixed equipment) and playing in open spaces.¹⁶ However, presence of toys was not significantly related to objective measures of physical activity during recess in another study,³¹ though the authors suggest that this may have been due to waiting time for equipment or a lack of desirable equipment choices. Portable play equipment (but not fixed equipment) has shown direct associations with the proportion of daily time observed in moderate and vigorous physical activity.¹⁵

While further research may be needed to optimize recommendations for policy related to equipment specifications, the literature supports the importance of providing opportunity for active play¹⁵ and the space provided for that play out-of-doors.³¹ Forty states are reported to require that children in child care have time outdoors each day (weather permitting).⁴ As noted, CFOC play area size, capacity and proximity standards apply only to child care centers, though their importance in promoting physical activity in family child care home environments is also defensible. Our review of regulations suggests that only 30 states' regulations (58%) for child care centers meet CFOC minimal play area size requirement standards (75 sq ft/child), and just 29 states (55%) include language related to—or specifying that—outdoor play areas be adjoining or within a “walkable” distance. This gap is

significant given that studies among both adolescents^{30,33} and preschool age children³¹ have found direct associations between outdoor environments, including the available play space (or the space per child) and physical activity levels. Spacious outdoor child care environments large enough to accommodate trees, shrubbery and other sun protection features may also limit sun exposure, a potential issue for child care providers in warm climates or seasons.³² In our review of regulations, the majority of states' regulations for child care centers (54%) and child care homes (71%) did not address the provision of shaded or sunlit areas by means of open spaces, trees and other greenery in outdoor spaces.

The uneven quality of playground safety regulations and practice for child care centers has been recognized by prior research.^{9,24} In their 1991 study, Runyan and colleagues found that no state specified maximum heights for playground equipment, and 96% neglected to mention playground surfacing in their regulations.⁹ In 1994, among a national sample of child care centers, self-reported compliance with the recommended maximum equipment height requirement of 5.5 feet was 45%, while 38% of centers reported maintaining adequate resilient surfacing under play equipment.²⁴ Our findings suggest that regulations in many states do not fully address playground equipment standards. No state fully addresses playground equipment height, though 18 states (35%) have partially addressed the CFOC standards for playground equipment height. Twenty-four states (46%) have included regulations requiring that playground equipment be surrounded by appropriate safety rated surfacing consistent with CFOC standards. Given the prominent role that safety surfacing and equipment height play in determining the severity of injuries sustained on playgrounds,³⁷⁻³⁹ the lack of compliance with national standards on these issues could be made a public health-related policy priority. No state was found to fully address the CFOC recommended height standards in either center or home child care regulations, and standards for equipment inspection and documentation were inadequate.

State child care regulations form the minimum requirements for maintaining a license to operate a child care program within some states. The intention is to establish the basic required level of health and safety for a variety of child care programs.⁴⁰ However, other guidelines for programs also exist. Localities may establish local ordinances governing child care programs or programs may also choose to apply for and obtain accreditation through organizations such as the National Association for the Education of Young Children. In these instances, the practices regarding promoting physical activity and preventing injuries in outdoor play areas that are followed by local child care agencies may be more stringent than those evidenced by a simple review of regulations at the state level.

While these other regulatory avenues for promoting safe and physically active environments exist, strategies to enhance state regulations for child care settings, identify necessary technical assistance needs and then monitor

implementation may be effective steps in providing safe, active play spaces for young children. For example, in North Carolina, the annual rate of medically attended injuries in child care centers declined 22% coinciding with implementation of new state playground safety regulations for out-of-home child care and observed declines (from preregulation implementation levels) in playground hazards.²⁷ Such evidence suggests the role of implementing strong standards and the importance of oversight and monitoring in reducing unintentional injury. However, a recent report from the National Association of Child Care Resource and Referral Agencies (NACCRRA) showed that no state had strong standards for both health and safety and for oversight to ensure that existing standards were enforced.¹⁰ Therefore, a comprehensive approach, including communication and technical assistance strategies combined with regulatory change and enforcement may be needed to reduce injury risk while minimizing burdens on child care centers as presence of regulation and existing enforcement alone may not be sufficient.²⁶

While this regulatory review can form a baseline for future research studies, it does not address compliance or actual practice within child care settings, nor does it monitor subsequent changes to regulations. Many states' regulations are simply outdated⁸ and standards for health and safety are constantly evolving based on emerging science and practice. Therefore, national organizations might recommend standards for frequency of regulatory review as well as stronger standards for outdoor play spaces as research evolves. Then, as state agencies update regulations they can set explicit expectations for monitoring and oversight, provide opportunities for training and technical assistance, and develop self-monitoring tools to address new or updated regulatory requirements. These strategies may improve compliance and decrease burdens on child care providers. Other educational opportunities also exist. Establishing partnerships with vendors supplying outdoor play equipment to child care programs may present opportunities for education of child care providers at point of sale. As research evidence evolves, providing education and training to child care providers regarding emerging best practices is critical; early adopters could help inform or champion policy change statewide. Given the potential for significant population-level health impact on young children, these may be important policy- and practice-based strategies to promote safe, physically active child care environments.

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