

# **Regulatory Factors in Early Childhood Services**

## **Executive Summary**

A review of the research and best practices literatures on regulatory factors in early childhood services that influence the health, safety, mental health, and school readiness of young children converges on the following recommendations and conclusions, some of which are supported directly by research and others of which are supported indirectly by inference.

Regulatory factors are circumstances that can potentially be regulated by legislation or policy and incorporated into licensing, credentialing, or registration requirements. Typically, they include child-staff ratio, group size, and age mix plus director and staff education and training. In terms of outcomes, health refers primarily to infectious disease rates; safety includes accidents and physical harm; mental health pertains to positive early social and emotional development that predicts later mental health and social competence; and school readiness includes general and specific mental development that predicts later school performance.

## **Conclusions**

### **Group Size**

Group size should be limited (e.g., 6 or fewer infants, 12 or fewer toddlers, and 18 or fewer preschoolers), because smaller group size increases the individualized attention that children receive from caregivers, which, in turn, improves children's physical health, safety, mental health, and cognitive development.

### **Child-Staff Ratios**

Child-staff ratios should be low; lower ratios are associated with better health and safety and more advanced social and cognitive competence, because caregivers more are able to interact with children individually and engage in less restrictive (i.e., commands, reprimands) behavior when they are in charge of fewer children.

### **Age Mix of Children**

Children should be separated into homogeneous age groups, because such groups have fewer diseases, possibly fewer injuries, and better mental health.

## Staff Qualifications

Caregivers should be encouraged or required to have as much general education and/or specific training in child development, health, and safety as possible, because educated and trained caregivers are more likely to promote the physical and mental health, safety, and cognitive development of the children in their care.

## Staff In-Service Training

Staff should be trained in health and safety procedures as well as in behaviors that promote social and cognitive development, because staff training, when monitored, leads to improved physical and mental health, safety, and cognitive development.

## Recommended In-Service Training

- The American Public Health Association and American Academy of Pediatrics (1) suggest that child care directors and caregivers should have at least 30 hours per year of continuing education in their first year of employment (16 hours in child development and 14 in safety, child health, and staff health). Each year thereafter, directors and staff should obtain 24 hours of training (16 in child development and 8 in health).
- Expert opinion suggests that caregivers should receive training in the need for sanitary procedures, the early assessment of certain illnesses, child development and developmental disabilities (2), general first aid, rescue breathing, and first aid for choking (3).
- Training programs should be practical and cumulative in nature (4) and should be structured to promote the acquisition and retention of information.

A summary of conclusions is given in Table 1.

## Recommendations

- Smaller group size, lower child-staff ratios, and homogeneous age groups should be encouraged, because they increase the individualized attention children receive from caregivers which then improves children's health, safety, social, and cognitive development.
- Child care directors and staff should be required to have as much general education and/or specific training in child development, health, and safety as possible, because better educated and/or trained staff provide more sensitive and responsive care to children, which promotes children's health, safety, and social and cognitive development.

**Table 1. Summary of Conclusions**

Child-Staff Ratio	Group Size	Age Mix	Staff Qualifications
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<b>Health</b>	Lower child-staff ratios may reduce the transmission of infectious disease.	Smaller group size is associated with less risk of infection and illness.	Homogeneous age grouping reduces the spread of infectious disease.	A college education improves caregiver behavior, which then improves children's health.
<b>Safety</b>	Having more than one adult in a group decreases the risk of child abuse; higher ratios relate to more situations involving potential danger.	Caregivers spend less time actively involved with children in larger groups, which may place the children at greater risk for injury.	Homogeneous age grouping decreases injury rates.	Child care centers that have caregivers with more formal education have lower ratings of potential danger.
<b>Mental Health</b>	Children in lower child-staff ratio classrooms are more likely to experience good caregiving and thus may be more likely to develop social competence.	Smaller group size enables caregivers to play a larger role in children's day-to-day activities, which may improve the mental health of children.	Homogeneous age grouping improves social competence.	College-educated caregivers tend to have children who are more compliant and more socially competent.
<b>School Readiness</b>	Children in lower child-staff ratio classrooms engage in more verbal communication with caregivers, which appears to foster language development.	Smaller group size is associated with greater gains in tests of language ability.	Heterogeneous age grouping improves cognitive development of younger children.	College-educated caregivers promote the development of verbal skills, which foster language and intellectual ability.

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## Group Size

*Group size should be limited (e.g., 6 or fewer infants, 12 or fewer toddlers, and 18 or fewer preschoolers), because smaller group size increases the individualized attention that children receive from caregivers, which, in turn, improves children's physical health, safety, mental health, and cognitive development.*

### Health

- **Smaller group size is associated with less risk of infection in child care.** The risk of illness in children between the ages of one and three years of age increases as the group size increases to four or more, whereas children in groups of three or fewer have no more risk of illness than children cared for at home (5; 6; 7). The risk of repeated ear infections increases in one- to six-year-old children who attend child care in groups of more than six children (8).

The risk of hemophilus influenzas increases for children one year of age or older in a child care setting with four or more children, and the risk of infection peaks in settings with 21 or more children (7).

- **Experts suggest that the group size be limited to twice the maximum number of children allowed per adult (i.e., twice the maximum child-staff ratio; 9).**
- **Smaller child care centers, not just those with smaller class sizes, have lower rates of disease.** Outbreaks of Hepatitis A occur at the rate of 3% in centers that enroll less than 20 children but 53% in those that enroll 51 or more children (10).

Children in small child care centers (10-20 children) in France had two to three times the risk of repeated infections (e.g., upper respiratory tract infections, otitis media, conjunctivitis) than children in family child care settings with no more than three children (11).

### ***Safety***

- **Smaller group size improves the caregiving behaviors and the safety of children.** The North Carolina Office of Child Care Licensing found that the severity and frequency of complaints (i.e., reports of abuse and neglect) were worse in child care centers serving 30 or more children (12).

Caregivers in small groups spend substantially more time interacting (e.g., praising, responding, comforting, questioning, and instructing) and are more actively involved with the children in their care (9). One might speculate that such caregivers are better able to protect children from unhealthy and unsafe experiences.

### ***Mental Health***

- **Smaller group size appears to promote prosocial and creative behavior in children.** Research suggests that children in groups of 12-14 with two caregivers are more cooperative, compliant, and exhibit more reflection/innovation than children in groups of 24-28 with four caregivers (9). Children in smaller groups also exhibit more social competence than children in larger groups (13; 14).
- **Smaller group size enables caregivers to play a larger role in children's day-to-day activities, which may improve the mental health of children in child care.** Children become securely attached to individuals whom they trust to care for them in a responsive and sensitive manner (15). Caregivers in small groups spend more time interacting and are more actively involved with children (9), and they are more responsive, more socially stimulating, and less restrictive than caregivers in larger groups (16; 17). These behaviors correspond to those found in caregivers of securely attached children (e.g., 18; 19). Securely attached children tend to be more advanced in their play, less aggressive and withdrawn, and more socially competent than children who are insecurely attached (18; 20).

Children receive less attention, affection, responsiveness, and stimulation from caregivers each time a single child is added to a group (14). It appears that caregivers have more positive, nurturant interactions with children and provide children with more individualized attention when they are in charge of smaller groups of children with smaller child-staff ratios (21). Children who have highly involved caregivers tend to exhibit behaviors suggestive of secure attachment (e.g., they explore unfamiliar surroundings more, have more contact with the caregiver, and orient more to the caregiver than to a stranger) more than children with less involved caregivers (22).

*School Readiness*

- **Children in smaller groups show greater gains on the Preschool Inventory and the Peabody Picture Vocabulary Test (PPVT, a measure of receptive vocabulary; 9).** Children who are members of larger groups and receive less individual attention show lower gains in PSI scores than children who are members of smaller groups and receive more individual attention (23).

Children with higher language development scores have caregivers who are more responsive, more sensitive, and less detached (19).

- **Smaller group size is associated with more developmentally appropriate classroom activities than larger group size.** Groups of 6 or fewer infants, 12 or fewer toddlers, and 18 or fewer preschoolers are more likely to engage in developmentally appropriate activities than children in groups that exceed these numbers (18). When children are expected to perform at unattainable levels (i.e., above their capabilities), they may feel overwhelmed (24) and thus be less motivated towards academic pursuits.

**Child-Staff Ratios**

*Child-staff ratios should be low; lower ratios are associated with better health and safety and more advanced social and cognitive competence, because caregivers more are able to interact with children individually and engage in less restrictive behavior (i.e., commands, reprimands) when they are in charge of fewer children.*

*Health*

- **Lower child-staff ratios reduce the transmission of disease.** Although there is little research available that examines relations between particular child-staff ratios and children’s health, most experts agree that fewer children per adult reduces the transmission of disease because caregivers are better able to monitor and promote healthy practices and behaviors. Expert opinion (25; 26; 9) suggests the following specific guidelines for group size and staff-child ratios.

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**Suggested Group Size and Child-Staff Ratios**

Age of Children	Group Size										
	6	8	10	12	14	16	18	20	22	24	28

Age of Children	Group Size										
	Birth-12 months	3:1	4:1								
1-3 years	3:1	4:1	5:1	4:1							
3-6 years					7:1	8:1	9:1	10:1			
6-8 years								10:1	11:1	12:1	
9-12 years										12:1	14:1

NOTE: These numbers reflect a combination of suggestions from a variety of sources (i.e., 25; 26; 9) and may not correspond to any one source.

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### *Safety*

- **Lower child-staff ratios are associated with fewer situations involving potential danger (e.g., children climbing on furniture; 26) and child abuse (27).** Having a second adult in a child care facility (which is usually the case in child care centers but not necessarily in home-based care) reduces the chances for child abuse (27). When centers and family child care homes have insufficient staff, caregivers are often burdened with the care of more children than they can manage, which increases their stress and makes it more likely that they will abuse the children (28). Additional staff enable workers to leave stressful situations until they are ready to cope with and respond to the children in a manner that does not inflict harm.

### *Mental Health*

- **Lower child-staff ratios are associated with less distress in infants and toddlers, less apathy and distress in infants (26), and more social competence (14).** Children in classrooms with lower child-staff ratios engage in more talk and play (29) and display more gestural and vocal imitation (30) than children in classrooms with higher child-staff ratios, and children who engage more frequently in conversations with caregivers tend to be better developed socially (31).
- **Lower child-staff ratios promote positive caregiver interaction with children, which, in turn, improves children's social and emotional development.** Children in

classrooms having lower child-staff ratios (i.e., 3:1 or less for infants, 4:1 or less for toddlers, 9:1 or less for preschoolers) are more likely to have positive interactions with staff members, be properly supervised, and be engaged in activities rated as good or very good (18; 17). Lower child-staff ratios relate to more developmentally appropriate caregiving and sensitivity (32; 19); more contact (e.g., talking, playing, touching, and laughing) with children (16; 29; 33); more responsive and stimulating behavior (17); and less restriction of children's behavior (e.g., less commanding, correcting; 16; 29; 9; 33).

Additional caregivers reduce the amount of irritability and restrictiveness that caregivers express to the children in their care (34; 35). Lower child-staff ratios are associated with higher rates of secure attachments between toddlers and their caregivers (36).

### *School Readiness*

- **Lower child-staff ratios are associated with more verbal communication between caregivers and children, which appears to foster language development in children.** Adults and children talk to one another more when there is a lower child-staff ratio (37; as cited in 38), and caregivers engage in more dialogues (i.e., verbal communications between a caregiver and child that involve an exchange of at least three turns) and fewer monologues (i.e., verbal communications between a caregiver and child that contain only one or two sentences and involve only one or two turns; 38). More adult-child verbal interactions predict better scores on language inventories, whereas more peer verbal interactions predict lower scores on these measures (23).
- **Lower child-staff ratios allow caregivers to engage in more educational activities (e.g., teaching, promoting problem-solving) with children (39).**

### **Age Mix of Children**

*Children should be separated into homogeneous age groups, because such groups have fewer diseases, possibly fewer injuries, and better mental health.*

### *Health*

- **The separation of children into groups based on their chronological age and developmental level may reduce the spread of disease in child care.** When pre-toilet trained and toilet-trained children are grouped together, the toilet-trained group is at increased risk of developing an infectious disease (40). Conversely, infants are more likely to contract respiratory-tract infections when they have contact with older toddlers and preschoolers who may be carrying the disease (41).

Caregivers spend less time with older children when infants are present (42). One might speculate that less time with older children may result in more transmission of infectious disease, because caregivers will be less likely to monitor the unsanitary practices of older children or toys that have been mouthed by younger children.

### *Safety*

- **The separation of children into groups based on their chronological ages may decrease injury rates.** Caregivers spend less time with older children when they are also responsible for infants (42); thus, caregivers may spend less time with ambulatory children making them less able to protect those children from harmful situations.

### *Mental Health*

- **The separation of children into groups based on their chronological ages improves children's social competence (e.g., how children interact with peers and adults, children's knowledge of others).** Children in age-mixed classrooms tend to have lower social knowledge and less social competence with adults and peers but less negative behavior towards peers (13; 42).

Infants receive more responsive, stimulating, and positive caregiving in mixed age groups than in infant-only or infant and toddler-only groups (17). Although this may be beneficial for infants, it suggests that caregivers may be providing less positive care to the other children in the group.

### *School Readiness*

- **The separation of children into groups based on their chronological ages may be less beneficial for children’s cognitive development than for other areas of development.** When older children are present, the cognitive development of toddlers and infants is enhanced. As the number of preschoolers in a group increases, caregivers spend more time in developmental and language activities and children engage in more language interactions (42). Children also score higher on measures of intelligence when older children are present (14).

## Staff Qualifications

*Caregivers should be encouraged or required to have as much general education and/or specific training in child development, health, and safety as possible, because educated and trained caregivers are more likely to promote the physical and mental health, safety, and cognitive development of the children in their care.*

### *Health*

- **Child care directors who have more experience and education may be more likely to monitor staff, which promotes children’s health.** Higher rates of diarrhea have been found in child care centers in which the directors had less than eight years of experience (43).

Caregivers may be more likely to exhibit behaviors that protect children’s health and safety if their behavior is monitored (see 44). Staff surveillance requires knowledge of behaviors that reduce the transmission of disease, which suggests that child care directors should have more education in child development and health than the direct caregivers they supervise.

- **Caregivers with more education engage in more sensitive and positive interactions with children, which are thought to lead to lower disease rates.** Caregivers with a bachelor’s degree with or without specialized training or with no bachelor’s degree but with specialized training at the college level behave more sensitively and less harshly, engage in more positive interactions (more warmth, more enthusiasm, and more developmentally appropriate communication with children), and display less detachment (i.e., are more involved with and interested in the children) and less punitiveness (i.e., are less hostile, threatening, and harshly critical of children; 45; 9; 42; 19).

One might speculate that such caregivers are more attentive and responsive to children, more aware of unhealthy and unsafe behaviors and conditions (e.g., toys that have been mouthed, children who have not properly washed their hands), and thus more likely to correct such circumstances, more likely to be obeyed by the children, and thereby more likely to reduce the transmission of bacteria and viruses and the rate of accidents.

### *Safety*

- **Child care centers that have caregivers with more formal education have lower ratings of potential danger (e.g., children climbing on furniture; 9).**
- **Child care directors with more experience and education may be more likely to monitor staff, which promotes children's safety.**
- **Caregivers with more education interact more sensitively and positively with children (9; 42; 19), which may reduce the number of injuries in child care.**

### *Mental Health*

- **Caregivers with more education have children who are more compliant and socially competent (14).** College-educated caregivers encourage children more, exhibit more teacher direction (i.e., behaviors that indicate goals for children without pressuring the children to accept them), and engage in less restrictive behavior with children than do high-school-educated caregivers (46).

Caregivers who complete at least two child-related courses at the community college level hold less authoritarian attitudes (i.e., strict rules, little give-and-take about those rules, assertive discipline strategies, emphasis on conformity) than those who have no training at all (45). Such attitudes toward caregiving appear to influence the behavior exhibited by caregivers (see 47). The promotion of independence contributes to the development of social competence and school readiness.

- **Caregivers with more education are more likely to continue in child care employment (46), which promotes attachment and social development.** Caregivers who plan to continue in child care employment are less restrictive, place a greater emphasis on the development of children's verbal skills, and have better child-oriented attitudes than those who do not plan to continue working in child care. Children who have stable caregivers are more likely to engage in social activities, spend less time aimlessly wandering around the center (19), and are more likely to display secure attachment (26), which is a major component of later healthy personal/social development.

### *School Readiness*

- **Caregivers with college educations tend to engage children in interactions that expand upon and extend children's ongoing activities and promote the development of verbal skills (46), which may improve children's readiness for school.** College-educated caregivers are almost three times as likely to display behaviors that promote the development of verbal skills (i.e., encouraging children to express themselves verbally, explaining the meaning of words, giving factual information) than caregivers with only a high school diploma (46). Children who have caregivers who answer their questions, engage them in more informative talk (48), talk to them more (49; 9; 19), and give

information to and request information from them (23) have higher language competence and intelligence test scores.

Caregivers with more years of education tend to have children who make higher gains on the Preschool Inventory (PSI; a measure of children's knowledge of shapes, sizes, parts of the body, spatial relationships, etc.; 9) and other measures of intellectual ability (i.e., language comprehension, verbal fluency, memory, object recognition, and knowledge of concepts; 13).

- **Caregivers with more education are more likely to continue in child care employment, and the children in their care have higher Peabody Picture Vocabulary Test scores than children in centers with less stable caregivers (19).**

### **Staff In-Service Training**

*Staff should be trained in health and safety procedures as well as in behaviors that promote social and cognitive development, because staff training, when monitored, leads to improved physical and mental health, safety, and cognitive development.*

#### **Health**

- **Staff training programs, particularly those involving hand washing procedures, reduce disease rates.** Staff training in procedures to reduce the transmission of infectious disease reduces the number of pathogens present in children (50), the number of intestinal illnesses (51), the number of cases of diarrhea (43; 52), the number of upper respiratory infections (53), and the frequency of illness symptoms (54; 55).

After receiving training in hand washing, those who earned the best scores for handwashing had children with lower rates of diarrhea. Further, implementing a health education program reduced the incidence of diarrhea (from 72.7 to 20.4 cases per 100 child-years) and colds (from 208.7 to 94.5 cases; 43).

- **The benefits of staff training in health procedures is more likely to benefit children when staff behavior is monitored by supervisors following the training.** After participating in training to reduce the transmission of infectious diarrhea, 41 of 44 caregivers passed an examination of the procedures they had just been taught. Eight months later, 28 of the 44 originally trained workers and 14 subsequently trained workers were given the same examination. None of the caregivers passed the examination (50). One might infer that caregivers did not practice the behaviors they initially learned. Conversely, instituting a hand washing program for caregivers and following it up with continuous monitoring of caregivers' hand washing practices was associated with a 50% decrease in the incidence of diarrhea in two child care centers (56). Monitoring appears to remind staff of their training and promotes implementation of healthy practices.

### *Safety*

- **Staff training programs reduce the number of accidental injuries in child care centers** (54). Significant decreases in the number of accidental injuries occur after child care staff have been trained in identifying signs and symptoms of childhood illnesses and infection control, preventing child and staff injuries, and providing basic first aid for children (54). Staff training programs may be more effective when accompanied by staff monitoring. Two years after receiving an intervention that showed child care directors the specific hazards found on their playgrounds, explained why these problems were dangerous, and distributed educational materials about child safety, inspectors returned to the centers and found that the intervention playgrounds were no less hazardous than centers that did not receive the intervention (57). Perhaps the intervention would have been more effective if it had been accompanied by monitoring.

### *Mental Health*

- **Staff training improves caregiving behavior and children's social competence.** Caregivers who receive specialized training are better able to facilitate a positive learning and socialization environment (58) and tend to have children who are more compliant, more cooperative, less aggressive, and who exhibit fewer negative (i.e., uncooperative, unpleasant, and avoidant) behaviors with an unfamiliar peer in a laboratory playroom (14; 59; 9).

### *School Readiness*

- **Staff training improves caregiving stimulating behaviors, which enhance cognitive development in children.** Caregivers with more training tend to stimulate children's cognitive and language development more (16; 9; 42) and have children with more cognitive competence (13; 9) and who display more complex cognitive play than caregivers with less training (59). When caregivers receive specialized training in facilitating language interactions, such interactions increase in frequency, which result in children's accelerated language acquisition (60).

## **Recommended In-Service Training**

### *Amount of Training*

- **The American Public Health Association and American Academy of Pediatrics (1) suggest that child care directors and caregivers should have at least 30 hours per year of continuing education in their first year of employment (16 hours in child development and 14 in safety, child health, and staff health). Each year thereafter, directors and staff should obtain 24 hours of training (16 in child development and 8 in health).** New staff should receive an orientation to the policies and procedures (including children's needs, discipline, relating to parents, emergency procedures, basic hygiene practices, and child abuse) of the center. Within the first 3 months, they should also receive training in infection control procedures and daily health assessments.

### *Content of Training*

- **Expert opinion suggests that caregivers should receive training in the need for sanitary procedures, the early assessment of certain illnesses, child development and developmental disabilities (2), general first aid, rescue breathing, and first aid for choking (3). Training should include sanitary procedures that reduce the spread of disease (e.g., staff and child hand washing, food preparation and service), which have been shown to reduce diarrheal illnesses (61; 44). Three out of four child care centers report a need for more information on infectious diseases (62).**

**First aid training should be consistent with that of the American Red Cross, the American Heart Association, or the National Safety Council.** It should be more child-focused than standard first aid courses (3).

**Child care center staff should be trained to detect developmental disabilities and to make referrals for appropriate intervention (63).**

- **Child care directors and staff should be trained to assess children's daily health (1).** Training in daily health assessments should include detection of signs and symptoms of common childhood diseases. If childhood professionals were trained to observe the signs and symptoms of various childhood diseases, they may be better able to enable infected children to seek professional medical help earlier than it may have otherwise been possible and to limit the transmission of infectious disease (64).

### *Structure of Training*

- **Training programs should be practical and cumulative in nature (4) and should be structured to promote the acquisition and retention of information.** Coherent, cumulative training programs appear to be more effective than single sessions that do not build upon one another (65). The most preferred forms of training are those that actively involve students in learning, such as small group discussions, demonstrations and modeling, role playing, games and simulation, observations of actual procedures, and video presentations (66; 4). Changes in caregivers' behavior are most often seen when the content of training is focused and meets a specific need, when handouts are disseminated for later reference, when the administration supports the training, and when a variety of training techniques are used. In contrast, caregivers may not learn much from training that consists of charts, research data, and foreign terminology. Changes in caregivers' behavior are not as likely to be seen following training that is based on worksheets, panel discussions, and homework assignments.

**Effective training conveys information in the same context in which caregivers work every day.** Trainers must speak in the same language and be able to understand the day-to-day dilemmas faced by child care providers.

- **Nurses are effective trainers of health and safety practices in child care centers** (e.g., 53; 67; 54; 55). Some professionals suggest that schools of nursing contract with child care centers to have nursing students gain clinical experience through implementing training programs for child care providers (54).
- **Preventing chronic stress and burnout in child care directors and staff is important for the health and safety of children in child care** (68). Individuals who burn out may provide negligent care and fail to enforce health and safety precautions (68), which in turn, may result in an increased risk of injury and infectious disease in their children (69).

### **Recommendations**

- Smaller group size, lower child-staff ratios, and homogeneous age groups should be encouraged, because they increase the individualized attention children receive from caregivers, which then improves children's health, safety, social and cognitive development.
- Child care directors and staff should be required to have as much general education and/or specific training in child development, health, and safety as possible, because better educated and/or trained staff provide more sensitive and responsive care to children, which promotes children's health, safety, and social and cognitive development.

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This report was prepared by Sue Kelley of the University of Pittsburgh Office of Child Development with partial financial assistance from the Frank and Theresa Caplan Fund for Early Childhood Development and Parenting Education. It is one of a continuing series of background papers written for policymakers, funders, journalists, human service professionals, scholars, and citizens that summarize research and best practices on issues of public interest that pertain to children, youth, and families. It is produced by the Universities Children's Policy Partnership (UCPP), a collaboration of the University of Pittsburgh Office of Child Development (Christina J. Groark and Robert B. McCall, Co-Directors, 412-624-5527); and the Pennsylvania State University Prevention Research Center (Mark T. Greenberg, Director, 814-865-0112). UCPP is dedicated to contributing to the health and welfare of children, youth, and families by providing nonpartisan information on public policy issues.

