



# Research Does Not Identify an Optimal Teacher-Child Ratio That Improves Child Outcomes, Though More Stringent Ratios May Increase Per Child Spending

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## KEY POINTS

- Child care and early childhood education licensing regulations are set by states and identify minimum standards that programs must meet to be licensed to operate.
  - When covered by both federal rules and state licensing systems, Head Start programs are required to follow the more stringent requirement.
- Most research identifies mixed, weak, or no relationship between teacher-child ratios and outcomes in child care.
  - Rigorous systematic reviews and meta-analyses examining the pathway from structural quality (e.g., teacher-child ratios) to process quality (e.g., interactions between teachers and children) have found that while lower ratios can support better teacher-child interaction, especially for young children, evidence on direct child outcomes is inconsistent.
  - Research has also identified Head Start to be similarly associated with kindergarten readiness outcomes as other public pre-K or center-based settings even though Head Start sometimes has more stringent ratios.
- In general, the level of alignment between the state licensing standards and Head Start standards varies by child age.
  - Across both Head Start and state licensing standards, ratio requirements are smaller for younger children than for older children.
  - Head Start standards are more aligned with the state ratio standard for the youngest children (under one year old) and the oldest children (ages four to five).
  - For all age groups, when state ratio requirements are not aligned with Head Start standards, the state standard is most commonly larger than the Head Start standards.
- No single ratio or group size is uniformly viewed as necessary for quality care.
- Head Start has already permitted less stringent staff-child ratios and group sizes for thousands of funded slots through locally designed program option waivers and there is no evidence of poorer quality outcomes.
- Ratio choices carry direct cost implications: lower ratios may increase spending per child because the same staffing costs are spread across fewer children.

## BACKGROUND

States play a central coordinating role in the early childhood mixed-delivery system. Head Start, child care (for example, child care subsidies and state licensing), and state pre-K increasingly operate as parts of this state-coordinated system. Funding and accountability remain distributed across federal, state, and local authorities.

Child care and early childhood education licensing regulations are set by states and identify minimum standards that programs must meet to be licensed to operate.<sup>1</sup> Most Head Start programs operate within existing state licensing infrastructure. Recent administrative data from the Office of Head Start indicates that about 74 percent of Head Start programs report having a state license to operate. About 89 percent of Head Start Preschool programs report that at least some of their centers are required to have a license to operate.<sup>2</sup> About three-quarters of Head Start Preschool programs operate in states where all centers are required to have a license to operate.<sup>3</sup>

Even though the vast majority of Head Start programs are covered by state licensing systems, federal regulations also apply. Current federal Head Start regulations, the Head Start Program Performance Standards (HSPPS), set age-based staff-child ratios and group-size maximums, determined by the age of the majority of children present in a center-based setting.<sup>4</sup> Classrooms that serve children under 36 months must have two teachers with no more than eight children (a 1:4 staff-child ratio) or three teachers with no more than nine children (a 1:3 ratio).<sup>5</sup> Classrooms that serve a majority of children who are three years old must have no more than 17 children with two adults (two teachers or a teacher and a teaching assistant), or a 2:17 ratio.<sup>6</sup> Classrooms that serve primarily four- and five-year-olds must have no more than 20 children with two adults (a 1:10 ratio).<sup>7</sup> When a Head Start program is covered by both federal rules and state licensing systems, it is required to follow whichever requirement is more stringent.

This brief first reviews the literature on the relationship between teacher-child ratios and child outcomes, then describes how Head Start ratio standards compare with existing state licensing standards.<sup>i</sup>

## MOST RESEARCH IDENTIFIES MIXED, WEAK, OR NO RELATIONSHIP BETWEEN TEACHER-CHILD RATIOS AND OUTCOMES

A seminal 2002 study conducted by the National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network explored a hypothesized pathway from teacher-child ratios (i.e., structural quality) to child outcomes via process quality (i.e., teacher-child interactions).<sup>ii,8</sup> Using data from the NICHD Study of Early Child Care, this study provided the first empirical evidence in support of the conceptual pathway from structural quality to child outcomes, mediated by process quality. Specifically, this analysis found a direct effect between teacher-child ratios and an indicator of process quality (non-maternal caregiving) and a direct effect from process quality to child cognitive outcomes and child social competence, but stopped short of recommending a specific ratio. This study also found an indirect effect from teacher-child ratios to child cognitive outcomes and child social competence, mediated by process quality.

Since that time, more research has assessed the relationship between teacher-child ratios and outcomes, generally reaching a more nuanced conclusion than the 2002 study: lower ratios can support better teacher-

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<sup>i</sup> State and territory child care licensing regulations define age bands inconsistently, both in the specific age (by month) ranges used and in how many distinct bands are reported. To enable comparison across jurisdictions and against Head Start Program Performance Standards, each jurisdiction's reported age bands were mapped onto five standardized one-year target bands: Under 1 year (0-11 months), 1-2 years (12-23 months), 2-3 years (24-35 months), 3-4 years (36-47 months), and 4-5 years (48-59 months).

<sup>ii</sup> Structural quality refers to regulable aspects of the educational setting, such as group size and teacher-child ratio. Process quality refers to factors that reflect the child's experience in ECE, such as positive interactions between staff and children.

child interaction, especially for young children, but evidence on direct child outcomes is inconsistent. Four systematic reviews and meta-analyses published between 2017 and 2026 are described in more detail below. A meta-regression of ECE program evaluations conducted between 1960 and 2007 examined the relationship between teacher-child ratio, class sizes, and child outcomes.<sup>9</sup> Among center-based preschool programs, there was not a significant linear relationship between teacher-child ratios and cognitive or achievement outcomes. Ratios at the lower end of the scale (at or below 1 adult to 7.5 children, or 1:7.5) were associated with higher cognitive and achievement outcomes, but not with socioemotional outcomes. There was no relationship between larger ratios and child outcomes. These findings suggest that teacher-child ratios for preschoolers may need to be quite low in order to influence child outcomes, and that the most common ratios used by states may not be associated with outcomes.

A systematic review of studies conducted prior to 2015 examined the relationship between teacher-child ratios in preschool ECE settings and child outcomes.<sup>10</sup> Of the 29 studies reviewed, the vast majority did not identify a relationship between teacher-child ratios and child outcomes. Some studies reported small associations between ratios and outcomes for cognitive, math, language, and positive behaviors, with most of the statistically significant associations appearing between lower ratios and better outcomes. Some studies analyzing problem behaviors and some math and language outcomes found the opposite: that higher ratios were associated with better outcomes. A meta-analysis of a small subset of these studies found no significant relationship between teacher-child ratios and child outcomes. Overall, these findings suggest that lower ratios are not strongly or consistently associated with better outcomes.

A 2022 systematic review extended the earlier analysis by exploring causal effects, including process quality measures as outcomes, and including studies of young children.<sup>11</sup> This review looked at studies from 1968 to 2019 that met certain methodological requirements, and it examined the relationship between teacher-child ratios in ECE settings for children ages zero to five and child outcomes. It found one significant effect of reducing the teacher-child ratio on process quality outcomes, though this effect was very small. Overall, the authors found that the quality of the available research was low and precluded strong interpretations of the relationship between ratios and outcomes, particularly for younger children.

A 2026 meta-analysis of 49 studies published between 2000 and 2024 examined the relationship between teacher-child ratios and indicators of process quality (e.g., the Classroom Assessment Scoring System, Early Childhood Environment Rating Scale-Revised).<sup>12</sup> This analysis found that the teacher-child ratio was significantly associated with process quality, such that more children per staff in a classroom was associated with slightly lower levels of process quality. When looking at this pattern by child age, higher teacher-child ratios were associated with lower levels of process quality for younger children and in mixed-age classrooms, but not in classrooms with children three years of age or older. Importantly, the teacher-child ratio was associated only with global process quality outcomes, rather than specific elements of process quality such as interaction quality. These findings suggest that ratio requirements might be particularly important for younger children or in classrooms with a range of developmental needs.

### **Research does not identify an optimal teacher-child ratio that improves child outcomes**

While much of the research evidence supports a general association between lower teacher-child ratios and better process quality (and, less consistently, some child outcomes), limited research to date has explored what an optimal ratio would be.<sup>13</sup> One study examining teacher-child ratios and peer interactions estimated optimal ratios for peer outcomes specifically, though its narrow focus on a single outcome domain limits the generalizability of this finding.<sup>14</sup> Notably, in many of the studies included in the systematic reviews and meta-analyses cited above, the ratios studied fell within existing state and federal licensing regulations<sup>15</sup> – for example, in the 2017 meta-regression, all but one ratio examined was 1:10 or lower.<sup>16</sup> This suggests that the

existing evidence base speaks mainly to a reasonable range of ratios already common in current practice and does not identify a single threshold below which quality reliably improves or above which it reliably declines.

### **Early childhood programs in states, localities, and other countries that do not have nationally mandated ratios can maintain high levels of quality**

Research has also identified Head Start to be similarly associated with kindergarten readiness outcomes as other public pre-K or center-based settings.<sup>17</sup> For example, a systematic review and meta-analysis that compared the school readiness skills of children participating in public pre-K or Head Start found no significant difference in overall school readiness outcomes or in specific language, math, or social-emotional skills.<sup>18</sup> The strongest recurring finding from this body of research is that there is not a significant difference in kindergarten readiness across state pre-K and Head Start, two high-quality center-based settings.<sup>19,20</sup> A recent analysis of state-funded pre-K programs found that 51 of 63 state pre-K programs have a staff-child ratio of 1:10 or lower,<sup>21</sup> suggesting some alignment across states in the ratios they voluntarily select for this type of setting.

International comparisons, though somewhat complicated given variation in broader policy contexts, show that ratio mandates are not universal, even among top-performing early care and education systems. For example, two of the highest-quality early childhood systems internationally on various measures – Sweden and Iceland – have no national regulation or guideline governing staff-child ratios.<sup>22</sup> Thus, even without a national regulation or guideline, programs can make design decisions that maintain high levels of quality.

### **Staff-child ratio requirements have direct implications for child care costs and program capacity**

Ratio choices carry direct cost implications: permitting fewer children per staff (a lower ratio) increase cost per child because the same staffing costs are spread across fewer children. This tradeoff is explicitly modeled in the Administration for Children and Families (ACF) Provider Cost of Quality Calculator, a tool that helps estimate the annual costs and revenue of operating a child care center.<sup>23</sup>

Some empirical studies examining the effects of child care regulations on market prices have found that more stringent staff-child ratio requirements are associated with higher prices for center-based care. For example, one study estimated that tightening staff-child ratio requirements by two children per staff would increase the expected price of center-based care by approximately 12 percent.<sup>24</sup> Consistent with this, a state-level analysis of child care prices (e.g., costs incurred by families) found that permitting one additional infant per staff member was associated with a 9 to 20 percent decrease in infant care prices.<sup>25</sup> These cost implications, particularly in an environment with workforce constraints, can impact the ability of programs to serve children. In a survey conducted during the FY25 program year, among Head Start programs with at least one classroom closed, staff vacancies were the top reason for closure.<sup>26</sup>

## **STATE STANDARDS ARE MORE ALIGNED WITH THE HSPPS RATIO STANDARDS FOR THE YOUNGEST AND OLDEST CHILDREN (UNDER ONE AND AGES FOUR TO FIVE) COMPARED TO OTHER YOUNG CHILDREN**

Across state licensing and the HSPPS standards, ratio requirements are smaller for younger children than for older children (Table 1).<sup>iii</sup> State licensing ratios range from 1:3 to 1:6 (for infants under one year) or 1:4 to 1:12 (for children ages two to three). The most common state ratio for infants under one year is 1:4 (59 percent of

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<sup>iii</sup> State and territory staff-to-child ratio requirements were collected from child care licensing regulations available through ACF's National Database of State Child Care Licensing Regulations and requirements established in the Head Start Program Performance Standards. This review included all states, the District of Columbia, and U.S. territories for which licensing data were available.

states, or 32 states). For children ages two to three, the most common state ratio is 1:8 (33 percent of states, or 18 states). For infants and toddlers under the age of three, the current HSPPS standard is a 1:4 ratio.

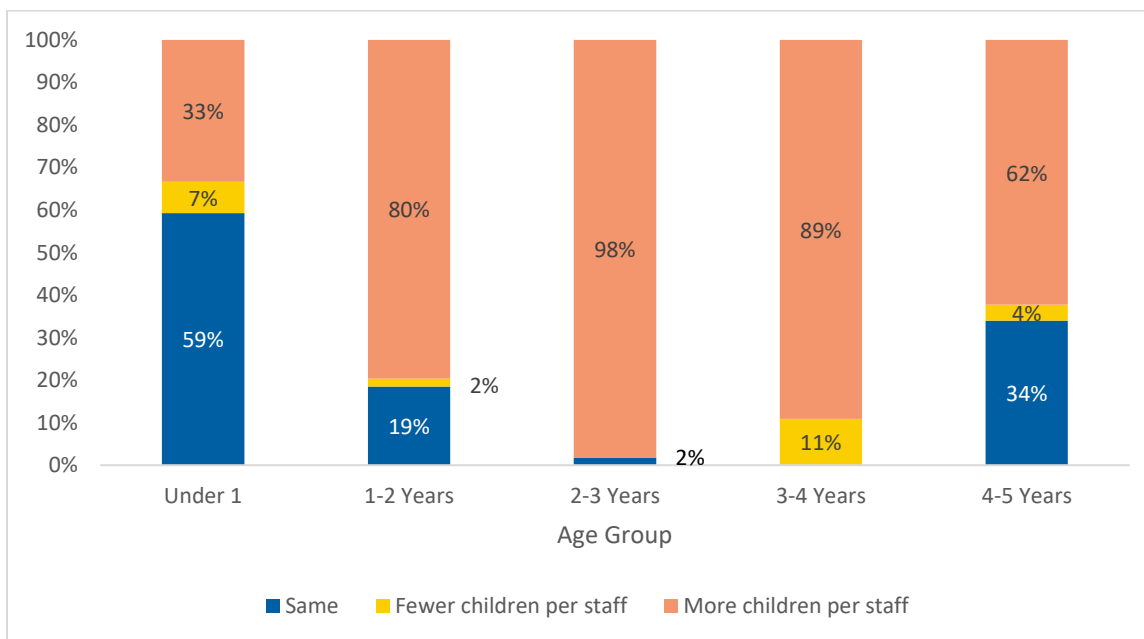
For older children ages four to five, state licensing ratios range from 1:8 to 1:20 across states. The most common state ratio is 1:10 (34 percent of states, or 18 states). The current HSPPS standard is a 1:10 ratio.

**Table 1. Ratio Requirements in the HSPPS and State Licensing Standards**

| Age Group    | Head Start Standard | Range of State Ratios | Most Frequent State Ratio |
|--------------|---------------------|-----------------------|---------------------------|
| Under 1 year | 1:4                 | 1:3 – 1:6             | 1:4 (59%)                 |
| 1 to 2 years | 1:4                 | 1:3 – 1:9             | 1:6 (37%)                 |
| 2 to 3 years | 1:4                 | 1:4 – 1:12            | 1:8 (33%)                 |
| 3 to 4 years | 1:8.5 <sup>iv</sup> | 1:7 – 1:15            | 1:10 (45%)                |
| 4 to 5 years | 1:10                | 1:8 – 1:20            | 1:10 (34%)                |

The degree of similarity between state child care licensing ratios and the HSPPS ratios varies by age group (Figure 1).<sup>v</sup> For infants under one year, nearly 60 percent of states (32 states) use the same ratio as the HSPPS. That share is smaller for other age groups: 19 percent of states (10) have the same ratio as the HSPPS for children one to two years, and two percent of states (1) have the same ratio as the HSPPS for children two to three years. No states use the same ratio as the HSPPS for children ages three to four, and about one third of states (34 percent, or 18 states) use the same ratio as the HSPPS for children ages four to five. Where state and HSPPS ratios differ, states allow larger ratios than the HSPPS standard in the majority of cases.

**Figure 1. State Child Care Licensing Ratios Compared with HSPPS Ratio Standards**



<sup>iv</sup> The HSPPS specifically identify a ratio of no more than 17 children with two adults (2:17).

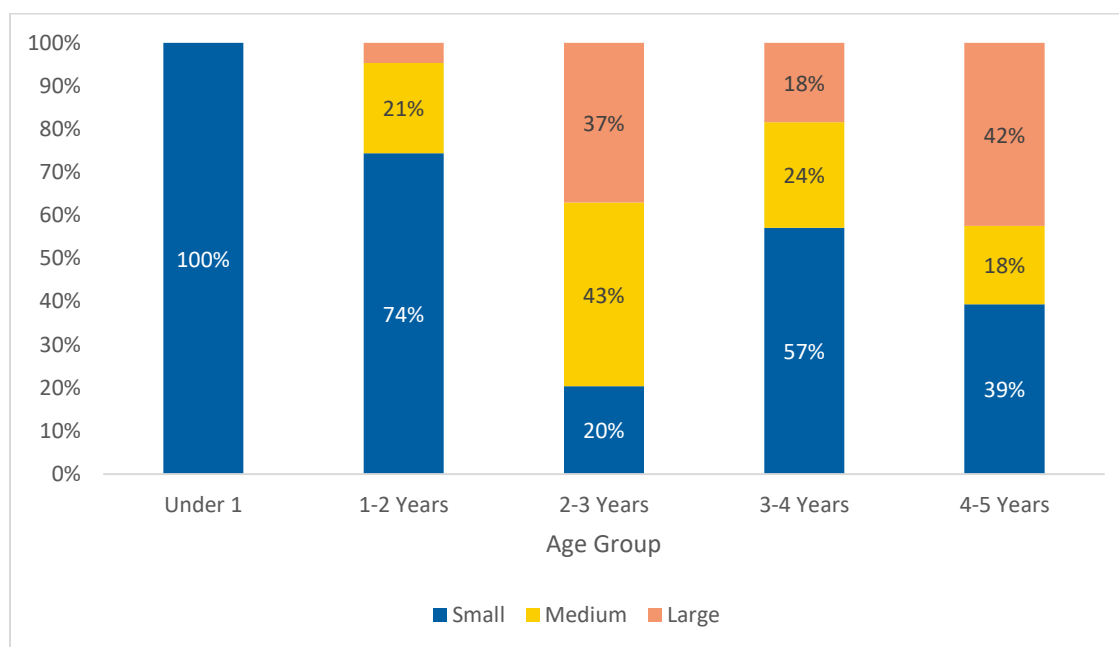
<sup>v</sup> When a jurisdiction's reported age band overlapped a target band only partially, or when multiple reported bands overlapped a single target band, the least stringent ratio (i.e., the highest number of children permitted per staff member) among all overlapping bands was used to represent that jurisdiction's ratio for the target band. For example, if a jurisdiction's ratio for 18-29 months was 1:7 and its ratio for 0-17 months was 1:5, the 1-2 year target band (12-23 months) was assigned a ratio of 1:7, since the 18-29 month band overlaps the target band and represents the less stringent of the two applicable ratios.

## The size of the difference between state licensing and the HSPPS standard varies by child age, with the smallest differences observed for infants

Among states with larger ratios than the HSPPS standard, the size of that difference also varies by age (Figure 2). We define a small difference as fewer than two additional children per staff relative to the HSPPS ratio (e.g., 1:4 vs. 1:5). We define a medium difference as two to four additional children per staff (e.g., 1:4 vs. 1:8) and a large difference as more than four additional children per staff relative to the HSPPS ratio (e.g., 1:4 vs. 1:9).

For infants under one year, children one to two years, and children three to four years, most states with larger ratios show only a small difference from the HSPPS. For children ages two to three, however, most with larger ratios display either a medium (43 percent) or a large difference (37 percent) from the HSPPS. For children ages four to five, 42 percent of states with larger ratios show a large difference from the HSPPS.

**Figure 2. Difference Between State and HSPPS Ratios, Among States with Larger Ratios**



## Head Start allows programs to request waivers for staff-child ratios and/or group sizes for Locally Designed Program Options

Prior to the 2016 revision to the HSPPS, ratios and class sizes for preschool-aged children were regulated partially through program-wide averages. For example, §1306.32(a)(3) in the pre-2016 HSPPS stated that for class sizes serving predominantly four- or five-year-old children, the average class size of that group of classes must be between 17 and 20 children, with no more than 20 children enrolled in any one class. The 2016 revision to the HSPPS removed the program-wide averages and more stringently regulated class sizes and staff-child ratios. In addition, the 2016 revision increased the flexibility for programs to request waivers for Locally Designed Program Options (LDOs). Specifically, LDOs were permitted to request waivers for ratio and group size requirements in center-based settings based on the needs of children and families in their communities.<sup>27</sup> Ratios and group sizes were not permitted to be waived for children younger than 24 months.

Based on available LDO waiver records dating back to 2016, of the LDO waivers for which the waiver purpose could be identified, approximately 35 to 40 percent involved staff-child ratios or group sizes.<sup>vi</sup> Across FY23 to FY26, LDO-funded slots represented about 2.5 percent of total funded enrollment in a given fiscal year.<sup>vii</sup> Taken together, this suggests that about 1 percent of total funded enrollment, or 7,000 to 8,000 funded slots per year, may be associated with ratio or group-size LDOs. There is no research available to suggest quality outcomes differ between Head Start programs meeting current requirements for ratios and those that had waivers granted for less stringent ratios.

## CONCLUSION

Research on teacher-child ratios has not identified a single optimal ratio for child outcomes; the relationship between ratios and outcomes is typically mixed, weak, or inconsistent, with somewhat more evidence on the lower end of the ratio range and for younger children. Even where associations are found, they reflect small changes in outcomes. As stated above, state and HSPPS ratio standards correspond most closely for the youngest children, where research evidence most consistently points to the importance of smaller ratios for outcomes. This suggests that for most ages, there may be a reasonable range of teacher-child ratios that can support child development in ECE settings.

Family preferences also suggest that there may be an acceptable range rather than a specific threshold. In the 2023 National Household Education Survey, parents of 39 percent of children with at least one weekly nonparental care arrangement rated the number of children in the care group as “very important” when selecting care.<sup>28</sup> This suggests that group size – a construct related to, though distinct from ratios – is a meaningful consideration for many families, but not the deciding factor for the majority.

Together, this indicates that ratio policies carry real tradeoffs between staffing feasibility, cost, and the uncertain prospect of improved outcomes. As discussed above, more stringent ratio requirements can increase per-child costs by requiring staffing costs to be spread across fewer children. In Head Start, where programs operate on fixed budgets, increased costs per child must be absorbed by the program, potentially resulting in a reduction of services or enrollment. No single ratio is uniformly viewed as necessary for quality care; instead, there may be a reasonable range of ratios that are responsive to local circumstances and balance these factors.

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<sup>vi</sup> Based on ACF internal analysis.

<sup>vii</sup> LDO funded enrollment is concentrated among a relatively small number of large grant recipients. In each year from FY23 through FY26, although about 100 to 120 Head Start grants in any given year had LDO-funded enrollment slots, the three largest LDO-funded grants accounted for approximately 35 percent of all LDO-funded slots.

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