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Prekindergarten participation rates in West Virginia

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This REL Appalachia Technical Brief updates the 2009 REL Appalachia report *West Virginia's progress toward universal prekindergarten* (Cavalluzzo et al. 2009), which covered school years 2002/03–2006/07. This brief updates the findings through 2010/11.

April 2012

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Summary

In 2009, in response to concerns of state policymakers, Regional Educational Laboratory Appalachia published *West Virginia's progress toward universal prekindergarten* (Cavalluzzo et al. 2009), which covered school years 2002/03–2006/07. This follow-up brief updates that report with data for 2007/08–2010/11. It compares the shares of preK seats provided by public school systems and collaborative partners—federal or private—and analyzes participation rates based on socioeconomic and racial/ethnic subgroups and district characteristics.

This study answers five research questions:

- What is the statewide participation rate in the preK program, and how did it change between 2002/03 and 2010/11?
- What is the participation rate by collaborative partners, and how did it change between 2002/03 and 2010/11?
- How does the participation rate vary by child subgroup, including children from a low-income household, racial/ethnic minority children, and children receiving special education services?
- How does the participation rate differ between rural and nonrural districts and between high-poverty rural districts and the state as a whole?
- Do participation rates vary by child subgroup between rural and nonrural districts?

These questions are answered using West Virginia Department of Education data on public school enrollments (West Virginia Department of Education 2011; West Virginia Department of Education, Office of School Readiness 2010); the U.S. Department of Education's (2011) Common Core of Data on student family incomes and levels of district urbanization; and U.S. Census Bureau (2008) geographical data.

Key findings include:

On statewide participation rates:

- The statewide participation rate in the preK program has more than doubled, from 26 percent in 2002/03 to 63 percent in 2010/11.
- PreK enrollment has grown since 2007/08, though annual growth slowed from 7 percentage points a year from 2005/06 to 2007/08 to 4 percentage points a year from 2008/09 to 2010/11.
- Variation in participation rates between districts has shrunk since 2006/07. Most participation growth has been in districts where the participation rate was below the statewide median.

On collaborative partners:

- Seating capacity provided by collaborative partners has grown. By 2010/11, 53 of West Virginia's 55 districts had preK programs funded through contracts between local education agencies and collaborative partners, and 74 percent of the state's seating capacity was funded through collaborative partners.

On preK participation by child subgroup:

- Since 2006/07, the participation rate of children from a low-income household, which at the time was lower than the statewide rate, has grown faster than (and now exceeds) the statewide participation rate.
- The participation rates of racial/ethnic minority children is higher than the statewide average and has mirrored statewide growth in preK participation.
- The participation rate of children receiving special education services exceeded the statewide average through 2006/07, but since 2007/08, has been lower than the statewide participation rate.

On participation rates in rural and nonrural districts:

- Since 2002/03, rural districts have had the highest preK participation rates, but nonrural districts have had the fastest growth in participation rates.

On participation rates by subgroup in rural and nonrural districts:

- The participation rate of children from a low-income household was at least 5 percentage points higher in rural districts than in nonrural districts every school year except 2008/09.
- The participation rate of racial/ethnic minority children in rural and nonrural districts has not followed a consistent pattern, though it has usually been higher in nonrural districts since 2004/05.
- The participation rate of special education students was on average 8 percentage points higher in rural districts than in nonrural districts over 2002/03–2010/11.

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Technical brief

Why this brief?

In 2002, West Virginia established a universal, voluntary, publicly funded prekindergarten (preK) program. The legislation creating the program, Code Section 18-5-44, *Early childhood education programs,* has three key features:

- PreK programs may be of two types: local education agency–only programs funded solely by the agencies or collaborative partnerships funded by at least two sources, including a local education agency and one or more federal or private partners operating under contracts with the agencies (box 1). Potential partners include Head Start and private preschools or childcare programs, which can provide resources not always available from local education agencies.
- Student participation is voluntary, but districts will be required to offer publicly funded preK programs to every four-year-old during school year 2012/13.
- At least half of preK programs must be funded through collaborative partners by 2012/13.

Regional need

The 2009 Regional Educational Laboratory (REL) Appalachia report, *West Virginia's progress toward universal prekindergarten* (Cavalluzzo et al. 2009), documented growth in statewide preK participation, examined variations in participation among districts and population subgroups, and highlighted the increasing importance of collaborative partners between 2002/03 and 2006/07. The report found that the annual participation rate grew on average 4.2 percentage points a year during the study period and that rural districts had a higher preK participation rate than did nonrural ones. Also, by 2006/07 nearly a third of preK seats were provided by collaborative partners. To assess progress toward the 2012/13 goal of achieving universal access to preK, the West Virginia Department of Education's Office of School Readiness asked REL Appalachia to update the original analysis, with a focus on population subgroups and high-poverty rural districts.

PreK programs have attracted considerable interest across the United States because studies have shown that preK participation helps students succeed later in school. Children who participate in early childhood education programs such as preK develop better language skills, score higher on school readiness tests, and have better social skills and fewer behavioral problems than do children who do not participate (Karoly et al. 1998; Sadowski 2006). Children with high-quality early learning experiences are also 40 percent less likely to need special education services or to be held back a grade (Reynolds et al. 2001). Kindergarten teachers in Georgia, the first state with voluntary, universal preK for four-year-olds, report that children who participated in preK were better prepared for kindergarten, especially in prereading, premath, and social skills (Vecchiotti 2001). (See appendix A for details on the relationship between preK programs and school readiness.)

West Virginia's publicly funded preK program differs from programs in most other states because it is universal rather than targeted at specific child subgroups. (Florida, Georgia, and Oklahoma also have universal preK programs.) But because West Virginia's program is voluntary, the West Virginia Department of Education's Office of School Readiness wants to know if subgroups are participating at similar rates or if there are gaps in participation.

Research questions

Five questions drive this study:

- What is the statewide participation rate in the preK program, and how did it change between 2002/03 and 2010/11?

BOX 1

Key terms

Children from a low-income household. Children eligible for free or reduced price lunch.

Children receiving special education services. Children with an individualized education program.

Collaborative partner program. Defined under West Virginia law as a preK program funded by at least two sources. Potential partners include Head Start and private preschools or childcare programs operating under contracts with local education agencies.

District. West Virginia's county-based public school system has 55 school districts.

Eligible population. West Virginia law (Code 18-5-44) defines children eligible for publicly funded, universal preK as those who are age four by September 1 of the year when they are to enroll. Because no data are available on the number of eligible four-year-olds, averages of annual statewide enrollments in each of grades K–2 at the end of the second month of school were used as proxies for eligible preK populations.

High-poverty rural district. A rural district where half or more of K–12 students were eligible for free or reduced-price lunch in 2006/07 under the federally subsidized meal program.

Local education agency–only program. A preK program funded solely by a local education agency.

Nonrural district. A school district (county) classified by the U.S. Census Bureau as a city, suburb, or town.

Participants. Children enrolled in and attending a preK program at the end of the second month of the school year, based on head counts, not full-time equivalents.

Participation rate. The ratio of participants to the estimated eligible population or the ratio of participants in a given subgroup to the estimated eligible subgroup population. For this study, it is the ratio of four-year-olds enrolled in and attending publicly funded preK programs at the end of the second month of the school year to all eligible four-year-olds. All participation rates are based on the proxies used for *eligible populations.*

PreK program. A preschool program for four-year-olds with a curriculum designed to increase school readiness. West Virginia guidelines call for preK to provide cognitive experiences using a state-approved curriculum for at least 12 hours a week.

Racial/ethnic minority child. A child who is identified as a member of one of the following racial/ethnic groups: Black, Hispanic, Asian, and American Indian/Alaska Native.

Rural, not high-poverty district. A rural school district where less than half of K–12 students were eligible for free or reduced-price lunch in 2006/07.

Rural district. A school district (county) classified by the U.S. Census Bureau as a rural territory (Common Core of Data new geography codes 41, 42, and 43; U.S. Department of Education 2011).

Seating capacity. The number of classroom spaces provided by a preK provider.

Targeted preK program. A state- or federally funded preK program—such as Head Start—that limits participation to children meeting certain eligibility criteria (such as having special needs or coming from a low-income household).

Universal preK program. A preK program open without cost to all children of a specified age regardless of income or other need-based criteria. States with such programs include Florida, Georgia, Oklahoma, and West Virginia.

- What is the participation rate by collaborative partners, and how did it change between 2002/03 and 2010/11?
- How does the participation rate vary by child subgroup, including children from a low-income household, racial/ethnic minority children, and children receiving special education services?
- How does the participation rate vary between rural and nonrural districts and between high-poverty rural districts and the state as a whole?
- Does the participation rate vary by child subgroup between rural and nonrural districts?

The study examines statewide preK participation by all four-year-olds and by child subgroups. The participation rate is defined as the share of West Virginia's eligible four-year-olds who are enrolled in and attending publicly funded preK programs at the end of the second month of the school year. Because there are no data on the number of eligible four-year-olds, averages of annual statewide enrollments in each of grades K–2 were used as proxies for eligible preK populations.

All children who are age four by September 1 of the year when they are to enroll are eligible for preK. In addition, three-year-olds with special needs—those with individualized education programs—are also eligible. But because the universal program is for four-year-olds, this study examines participation only for that group (box 2; see appendix B for an alternative estimate of the eligible population.)

Study findings

Between 2002/03—the first full year of West Virginia's universal preK program—and 2010/11, the statewide participation rate in preK among four-year-olds rose from 26 percent to 63 percent. The highest growth occurred from 2005/06 to 2007/08, when participation rose 7 percentage points a year. From 2008/09 to 2010/11, the participation rate rose 4 percentage points a year. In 2010/11, 70 percent of preK programs and 74 percent of the state's seating capacity were funded through collaborative partners, up from 61 percent and 65 percent in 2008/09.

Over the past decade, differences in preK participation rates have narrowed among subgroups and districts. Participation rates of racial/ethnic minority children and children from a low-income household have increased in line with the statewide average. The participation rate in rural and nonrural districts has also equalized in recent years. The participation rate was initially higher in rural districts, but in 2010/11 it was 63 percent in both types of districts. The participation rate was highest in high-poverty rural districts. Statewide, districts with the lowest initial participation rate had the highest growth. Over 2002/03–2010/11, a quarter of West Virginia districts had a preK participation rate below 60 percent, while a quarter had a rate above 72 percent.

These results suggest that West Virginia is increasingly realizing the goal of equal participation in its public preK program among subgroups and throughout the state. Children from a low-income household, racial/ethnic minority children, and children who live in rural areas participate in preK at rates similar to those of the other child subgroups and districts examined.

Children receiving special education services are a possible exception to the pattern of narrowing differences in the preK participation rate. Initially, the participation rate of special education children was higher than their share of the population, but it has not increased since 2006/07. Understanding the reasons for this trend might be a useful focus of further research.

Growth in the statewide participation rate, 2002/03–2010/11

West Virginia's preK program has expanded steadily since 2002/03. Though the number of four-year-olds remained relatively stable, the

BOX 2

Study methodology and data sources

This brief provides data on participation rates in West Virginia's preK program between 2002/03 and 2010/11, including categorizations based on child subgroups and districts (rural, nonrural, and high-poverty rural; see box 1 for definitions). The analysis was conducted in two stages: first, statewide trends in participation among the eligible populations (defined in box 1 in the main text) were identified; second, trends in participation among specific child subgroups and district types (rural, nonrural, and high-poverty rural) were examined.

The participation rate is defined as the ratio of four-year-olds enrolled in and attending publicly funded preK programs at the end of the second month of the school year to all eligible four-year-olds. In other words, it is the ratio of the number of participants to the number who are eligible. Because data were not available on the number of eligible four-year-olds, the study used as a proxy the average of reported enrollment totals in each of grades K–2 at the end of the second month of the school year. Percentages reported in all figures except for figures 3 and 4 are participation rates.

Figures 3 and 4 and tables C1–C3 refer to the percentage of statewide participants who are in a subgroup. This percentage is defined as the ratio of the number of preK participants who are members of the subgroup to the total number of statewide preK participants.

Four data sources were used in the study:

- The West Virginia Education Information System, on public school enrollment by district, grade level (preK–12), student age as of September 1, and subgroup for each school year between 2002/03 and 2010/11 (West Virginia Department of Education 2011).
- The West Virginia Department of Education's Office of School Readiness, on the number of preK programs and seating capacity provided by collaborative partners between 2008/09 and 2010/11 (West Virginia Department of Education, Office of School Readiness 2010).
- The Common Core of Data's urban-centric locale code associated with each district, and the percentage of students who qualified for free or reduced-price lunch in 2006/07 (U.S. Department of Education 2011).
- Shapefile data for the maps are from U.S. Census Bureau (2008).

The brief's data sources and methodology are discussed in greater detail in appendix B.

number participating in the program increased from 8,992 in 2006/07 to 13,108 in 2010/11 (table 1).

The preK participation rate more than doubled between 2002/03 and 2010/11, from 26 percent of eligible children to 63 percent (see table 1). The 17 percentage point increase in the participation rate between 2002/03 and 2006/07 was followed by a 20 percentage point increase between 2006/07 and 2010/11. As noted, annual growth peaked at 7 percentage points from 2005/06 to 2007/08, then fell to 4 percentage points from 2008/09 and 2010/11.

The median participation rate among districts rose from 29 percent in 2002/03 to 48 percent in 2006/07—and to 67 percent in 2010/11 (figure 1). But the participation rate varied considerably by district. In addition, the nature of participation growth has changed. Between 2002/03 and 2004/05, participation growth involved an expansion of the district-level distribution, meaning that variation in participation increased among districts. This change occurred because participation increased mainly in districts that had high initial participation. But more recently, participation growth has reflected a compression of the district-level distribution. Since 2006/07, most increases in participation have occurred in districts with low initial participation, and

TABLE 1

Statewide eligibility among four-year-olds and participation rate in West Virginia's prekindergarten program, 2002/03–2010/11

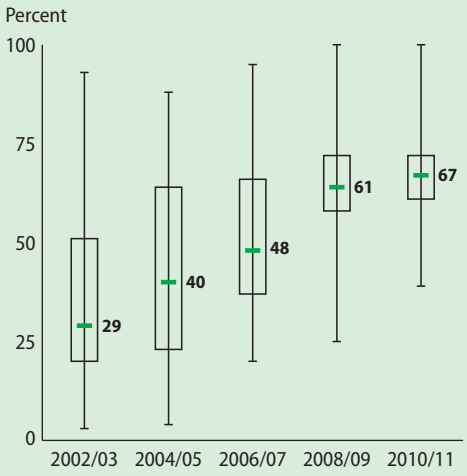
School year	Number eligible	Number participating	Participation rate (percent)
2002/03	20,478	5,293	26
2003/04	20,398	5,758	28
2004/05	20,540	6,678	33
2005/06	20,782	7,449	36
2006/07	20,831	8,992	43
2007/08	20,990	10,565	50
2008/09	20,891	11,591	55
2009/10	21,018	12,326	59
2010/11	20,806	13,108	63

Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2 at the end of the second month of school.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

FIGURE 1

Distribution of district participation in West Virginia's prekindergarten program, 2002/03–2010/11



Note: Vertical lines show the range in participation rates among districts. Green horizontal lines indicate the median participation rate for all districts. Boxes represent the interquartile range—the range of district participation rates between the 25th and 75th percentiles. For 2002/03, the West Virginia Department of Education received participation data from 53 of 55 districts. In subsequent years, all districts reported these data. See table C7 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

variation in participation across districts has narrowed.

Between 2006/07 and 2010/11, the increase in participation varied inversely with districts' initial participation rate.[1] The average increase during this period was 25 percentage points for districts that began in the bottom quartile in 2006/07 but only 1 percentage point for districts that began in the top quartile. Further, the four districts with the highest participation rates in 2006/07 saw an average decline of 18 percentage points (20 percent), with declines of 5–33 percentage points. The reason for the decline is unclear. In these four districts, preK enrollment fell on average 4 percent a year between 2006/07 and 2010/11, while the estimated number of children eligible for preK grew on average 1.5 percent a year.

Growth in collaborative partner programs, 2008/09–2010/11

West Virginia law stipulates that by 2012/13 at least half of statewide preK programs be funded through collaborative partners, such as Head Start or private preschools and child-care programs, working with local education

agencies. In 2002/03, local education agency–only programs were the only providers of publicly funded preK seats. But by 2006/07, 44 of the state's 55 districts had at least one preK program run by a collaborative partner—and by 2010/11, 53 districts did. In 2010/11, 70 percent of preK programs (682 of 979) and 74 percent of the state's seating capacity (12,490 of 16,991) were funded through an approved collaborative partner program (table 2).

Cavalluzzo et al.'s (2009) report on West Virginia's preK system found that the number of seats in programs run by collaborative partners was increasing faster than the number of seats in programs run solely by local education agencies. This trend continued through 2009/10 but halted in 2010/11, when the percentage of seats provided by collaborative providers fell 5.7 percentage points, from 79.2 percent to 73.5 percent. The 2009 report suggested that growth in preK participation might slow after most of West Virginia's pre-existing early education programs became approved collaborating partners; however, between 2009/10 and 2010/11 the number of collaborative partner programs decreased by 58. Watching the trend and understanding the decrease may be an area for future research.

Trends in participation over 2002/03–2010/11 by child subgroup

PreK programs have the potential to reduce gaps in school readiness among children from a low-income household, racial/ethnic minority children, and other child subgroups. (See appendix A for a discussion of the literature on this topic.) But reducing these gaps requires that children in subgroups who most need preK programs participate in them. In West Virginia, preK participation grew overall and for children from a low-income household, racial/ethnic minority children, and children receiving special education services between 2002/03 and 2010/11 (figure 2).

Children from a low-income household. The participation rate of children from a low-income household in West Virginia preK programs averaged nearly 4 percentage points lower than the statewide average each year between 2002/03 and 2006/07. But between 2008/09 and 2010/11, their participation rate was 1–2 percentage points higher than the statewide average (see figure 2).

Racial/ethnic minority children. PreK participation by children identified as a member of a racial/ethnic minority (Black, Hispanic, Asian, and American Indian/Alaska Native) grew from 24 percent in 2002/03 to 67 percent in 2010/11 and was similar to the statewide rate for much of the period—though in 2009/10 and 2010/11 participation was 4 percentage points higher than the statewide average.

Special education children. Children receiving special education services exceeded the

TABLE 2

Statewide and collaborative partner programs and seating capacity in West Virginia's prekindergarten program, 2008/09–2010/11

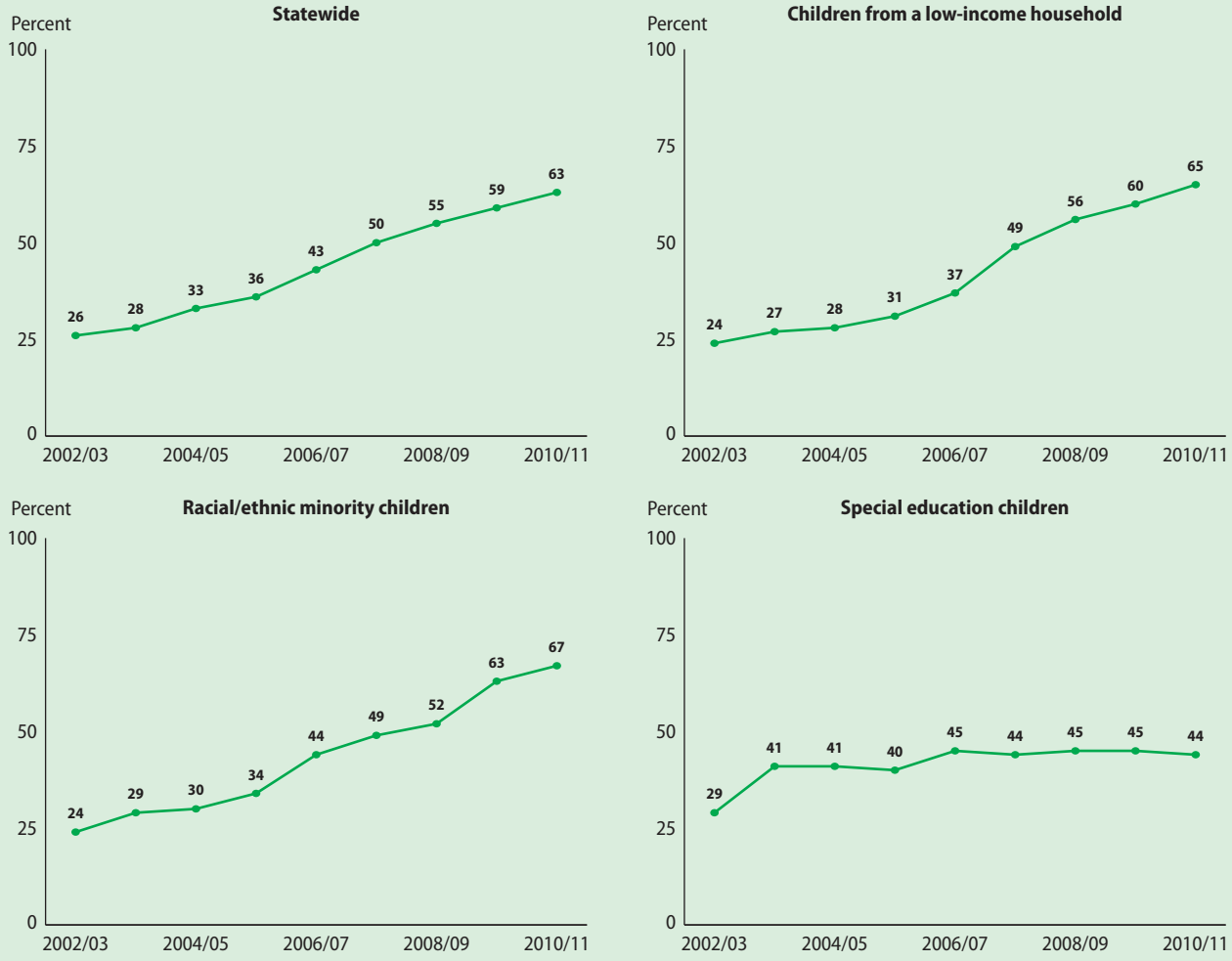
School year	Statewide		Collaborative partners		Percentage provided by collaborative partners	
	Number of programs	Number of seats	Number of programs	Number of seats	Programs	Seats
2008/09	908	15,240	550	9,864	61	65
2009/10	943	16,134	740	12,772	78	79
2010/11	979	16,991	682	12,490	70	74

Note: These data were not collected until 2008/09.

Source: Authors' calculations based on West Virginia Department of Education, Office of School Readiness (2010).

FIGURE 2

Participation rates in West Virginia's prekindergarten program statewide and by child subgroup, 2002/03–2010/11



Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2 at the end of the second month of school. See tables C1, C2, and C3 in appendix C for more information.

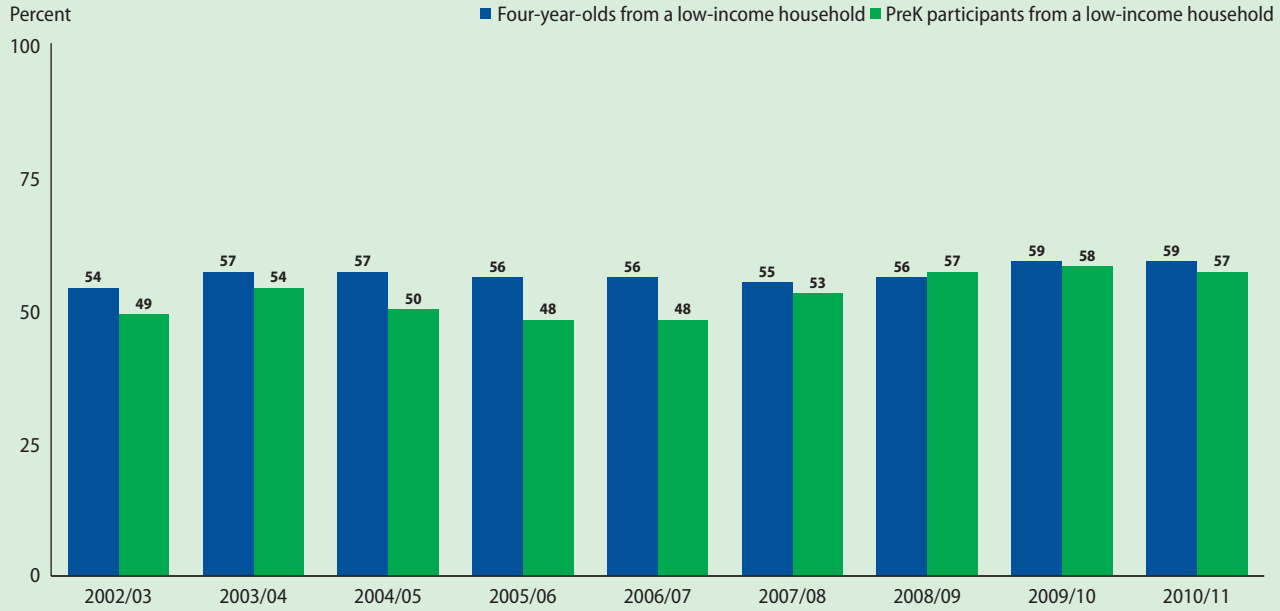
Source: Authors' calculations based on data from West Virginia Department of Education (2011).

average statewide preK participation rate through 2006/07. But since then, their participation has stagnated while the statewide rate has continued to grow. By 2010/11, special education children were participating in preK at a rate 19 percentage points below the state average.[2]

In contrast with figure 2, which shows participation rates by subgroup, figures 3 and 4 compare the percentage of all four-year-olds statewide who are in the given subgroup (blue bar) with the percentage of preK participants who are in the given subgroup (green bar). As before, the average number of students in each of grades K–2 for the corresponding subgroup is used as a proxy for the number of four-year-olds from a low-income household and four-year-olds receiving special education services. If children participated in preK proportional to their representation in the child subgroups, pairs of bars in figures 3 and 4 would be identical. The difference between each pair shows the over- and under-representation of the subgroups.

FIGURE 3

West Virginia's percentages of four-year-olds and prekindergarten participants from a low-income household, 2002/03–2010/11

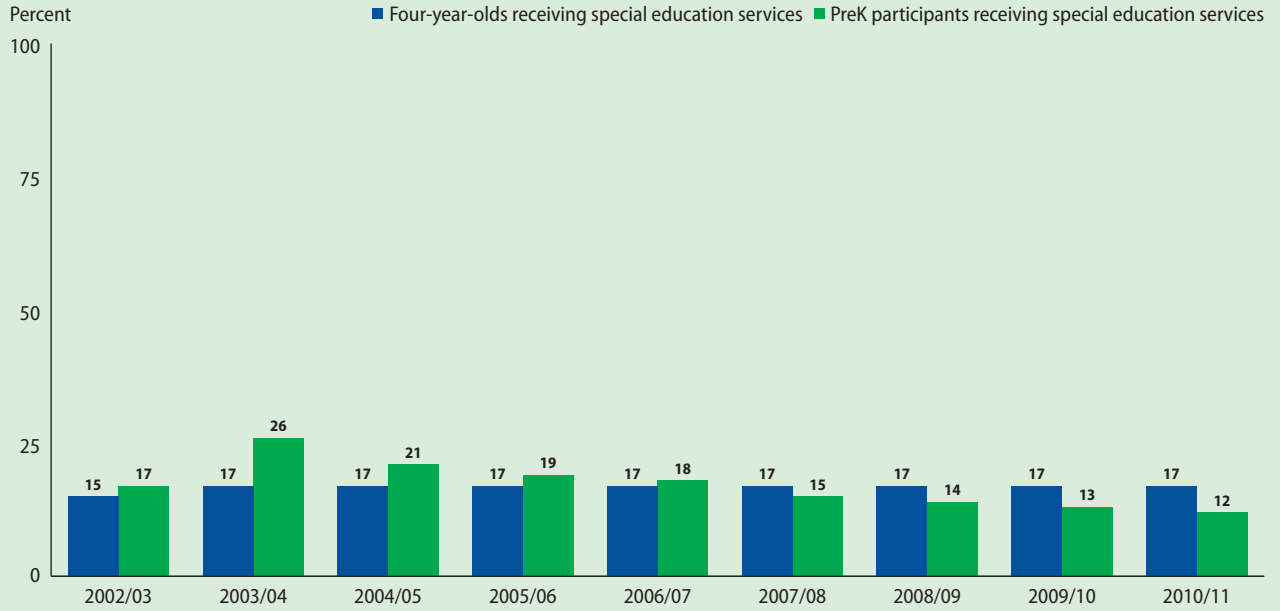


Note: The proxy for the eligible population in a given year is the average of that year's enrollments of children from a low-income household in each of grades K–2 at the end of the second month of school. See table C1 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

FIGURE 4

West Virginia's percentages of four-year-olds and prekindergarten participants receiving special education services, 2002/03–2010/11



Note: The proxy for the eligible population in a given year is the average of that year's enrollments of students receiving special education services in each of grades K–2 at the end of the second month of school. See table C3 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

Over 2002/03–2010/11, the percentage of eligible four-year-olds from a low-income household fluctuated between 54 percent and 59 percent. Through 2007/08, children from a low-income household were underrepresented in the program: the percentage of participants from a low-income household was lower than the percentage of four-year-olds from a low-income household in the general population. This pattern was especially apparent between 2004/05 and 2006/07, when most growth in preK participation came from children outside the low-income subgroup. Since 2006/07, by contrast, preK participation growth has come more from children from a low-income household than from children not from a low-income household. More than half of preK participants have been from a low-income household, and the percentage of preK participants from a low-income household has been roughly equivalent to the estimated percentage of four-year-olds from a low-income household (see figure 3).

Over 2003/04–2010/11, the estimated percentage of four-year-olds receiving special education services stayed at 17 percent (see appendix B for an alternate estimate of children receiving special education services in the four-year-old population). In the early years of the preK program, special education children were overrepresented among participants: the percentage of participants receiving special education services was higher than the estimated percentage of special education children in the four-year-old population. In 2003/04, the percentage of preK participants receiving special education services was more than 50 percent higher than the estimated percentage of four-year-olds eligible to receive such services (see figure 4). That year, 26 percent of four-year-olds participated in preK, and most of the program's participation growth came from special education students (see table C3 in appendix C). Staff of the West Virginia Department of Education said that in the early years of the preK program the state worked hard to make special education preschool programs available to children identified with special needs (Cavalluzzo et al. 2009), but by 2007/08, special education students were underrepresented among preK participants. The percentage of preK participants receiving special education services fell below the estimated percentage of special education children in the four-year-old population. Since 2003/04, growth in West Virginia preK participation has come disproportionately from children outside the special education subgroup (see figures 2 and 3).

Trends in participation over 2002/03–2010/11 by district type

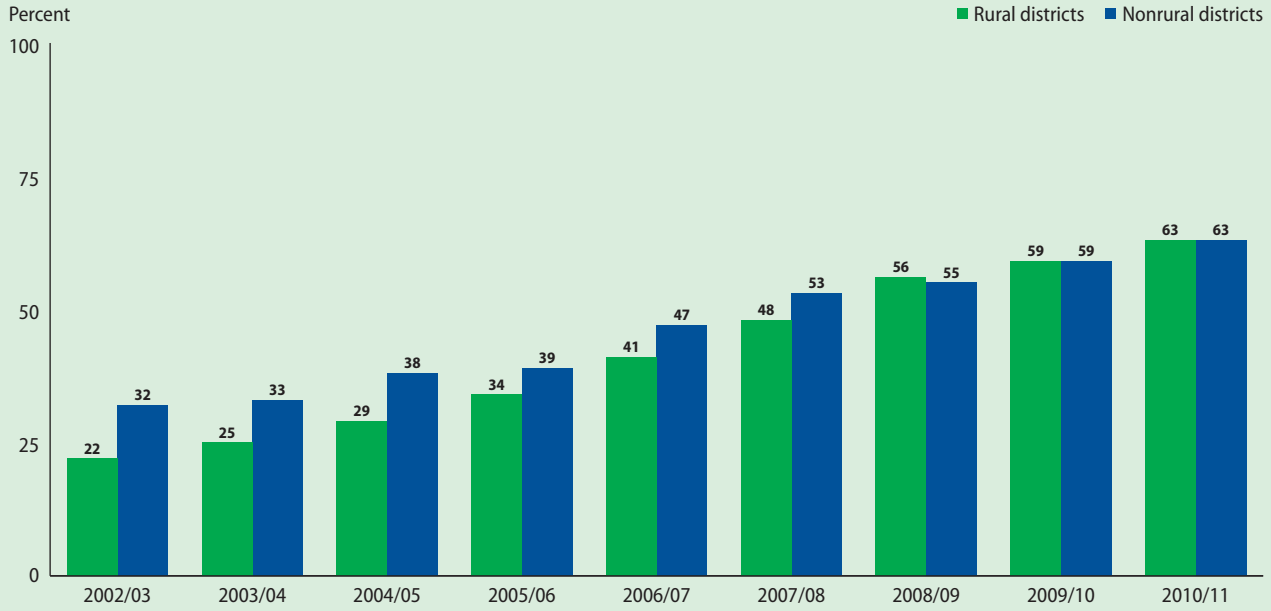
Education systems in rural areas can face very different challenges than those in nonrural areas (cities, suburbs, and towns). Geographic isolation and high transportation costs may restrict rural children's access to education resources. In addition, poverty may limit rural parents' ability to augment their children's education with home resources (Miller 1995; Howley and Maynard 1997; Johnson and Strange 2009). This brief used U.S. Census Bureau locale codes, as reported in the 2006/07 Common Core of Data (U.S. Department of Education 2011), to classify districts as rural or nonrural. This section compares the preK participation rate of rural and nonrural districts.

Rural and nonrural districts. In West Virginia, 30 of 55 districts—about 55 percent—are classified as rural. Rural districts serve fewer students than do nonrural districts—over 2002/03–2010/11, about 60 percent of the state's four-year-olds lived in nonrural districts, and 40 percent lived in rural districts (see tables C4 and C5 in appendix C for more detail). For example, in 2010/11, there were 12,601 children eligible for preK in nonrural counties, compared with 8,299 in rural counties.

Over 2002/03–2007/08, the preK participation rate was higher in rural districts than

FIGURE 5

Participation rates in West Virginia's prekindergarten program in rural and nonrural districts, 2002/03–2010/11

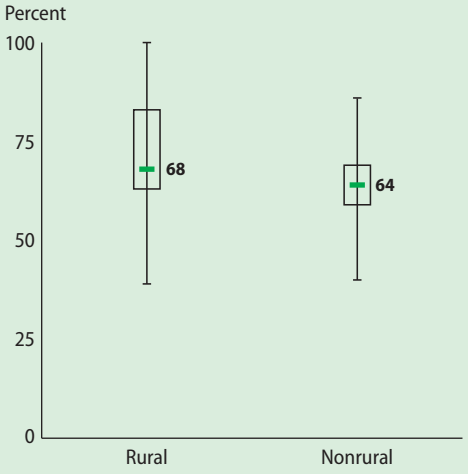


Note: The proxy for the eligible population in a given year is the average of that year's enrollments in rural or nonrural districts in each of grades K–2 at the end of the second month of school. See tables C4 and C5 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011). Data on district rural status are from U.S. Department of Education, National Center for Education Statistics (2011).

FIGURE 6

Distribution of participation in West Virginia's prekindergarten program by rural and nonrural districts, 2010/11



Note: Vertical lines show the range in participation rates among districts. Green horizontal lines indicate the median participation rate for all districts. Boxes represent the interquartile range—the range of district participation rates between the 25th and 75th percentiles. $N = 30$ rural districts and 25 nonrural districts. See table C8 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

in nonrural districts (figure 5). In 2002/03, the participation rate in rural districts (32 percent) exceeded that in nonrural districts by 10 percentage points. But since 2008/09, faster enrollment growth in nonrural districts has resulted in an average participation rate roughly equal to that in rural districts. Between 2002/03 and 2010/11, the preK participation rate in rural districts grew by an annual average of 3.9 percentage points, compared with 5.1 percentage points in nonrural ones. The average preK participation rate in rural and nonrural districts was the same in 2009/10 (59 percent) and in 2010/11 (63 percent).

Still, in 2010/11, there was less variation in preK participation rates in nonrural than in rural districts (figure 6). Most nonrural districts had preK participation rates of 60–70 percent, while in most rural districts this variation was 62–82 percent.

High-poverty rural districts. Some rural districts in West Virginia suffer from high rates of poverty. This brief defines a high-poverty rural district as one where half or more of students are eligible for free or reduced-price lunch (see box 1). To qualify for subsidized meals, students must have a reported household income below 200 percent of the federal poverty line.

Research consistently identifies poverty as a serious barrier to students' education achievement (Berliner 2009). Poverty can undermine education attainments even more when poor students are in classes with other poor students (Bickel and Howley 2000; Johnson 2007). Thus the concentration of high-poverty rural school districts in the Appalachia Region is of particular interest to regional education stakeholders.

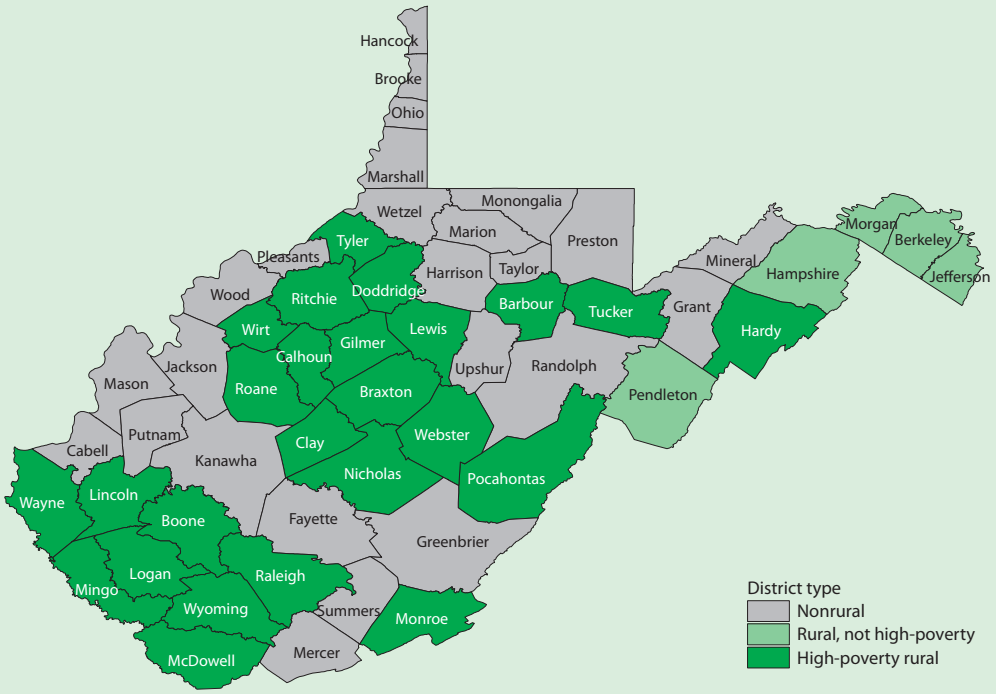
Map 1 classifies districts in West Virginia as nonrural; rural, not high-poverty; or high-poverty rural. Of the state's 55 districts, 30 are rural, 25 of which (83 percent) are high-poverty rural.

Between 2002/03 and 2010/11, the preK participation rate was higher for high-poverty rural districts than for rural and nonrural districts or statewide. In 2002/03, preK participation in high-poverty rural districts (37 percent) was 11 percentage points higher than the statewide average of 26 percent (figure 7). Though the rural and nonrural preK participation rate converged in 2008/09 (see figure 5), participation in high-poverty rural districts was at least 5 percentage points higher than the statewide rate through 2010/11.

The geographic distribution of preK participation rates by district in 2010/11 is shown in map 2. Of the 11 districts where the participation rate exceeded 80 percent, 10 are

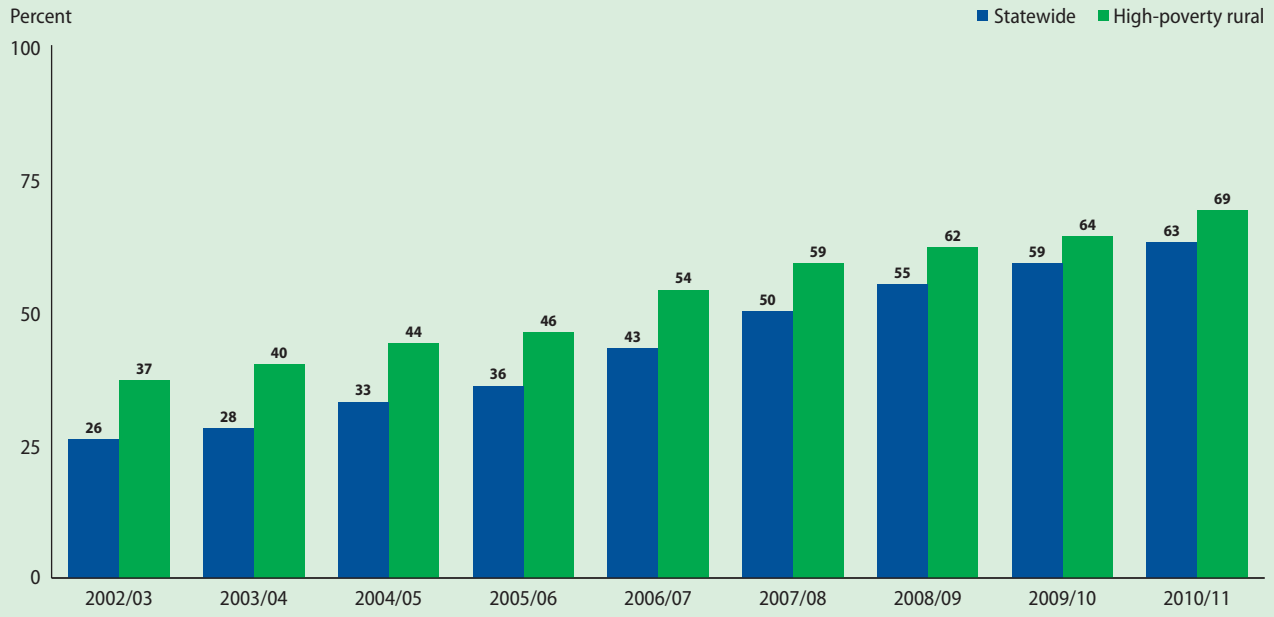
MAP 1

Categorization of West Virginia districts as nonrural; rural, not high-poverty; or high-poverty rural



Source: U.S. Department of Education, National Center for Education Statistics 2011; U.S. Census Bureau 2008.

FIGURE 7
Participation rates in West Virginia's prekindergarten program statewide and in high-poverty rural districts, 2002/03–2010/11



Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2 at the end of the second month of school. See table C6 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

high-poverty rural districts. Of these, 9 are in the north-central part of West Virginia. The other, Monroe County, is in the southern part of the state.

Trends in the participation rate over 2002/03–2010/11 by child subgroup and district type

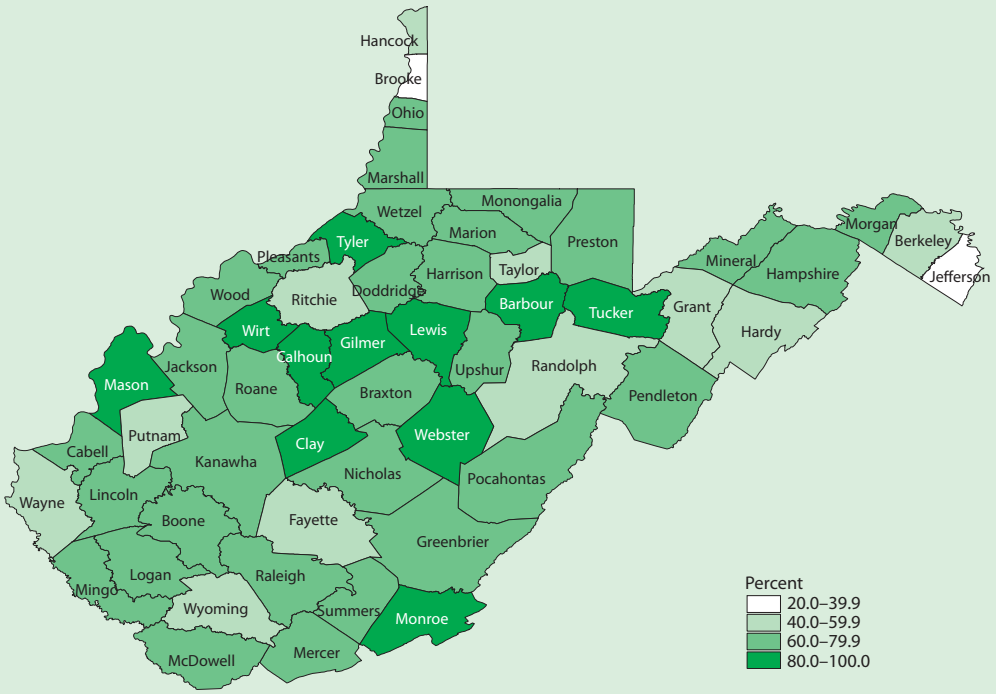
The preceding sections analyzed preK participation rates for children from a low-income household, racial/ethnic minority children, and special education children and compared those participation rates between rural and nonrural districts. This section examines whether participation rates vary by those population subgroups in rural and nonrural districts.

Children from a low-income household. Although the overall gap in the participation rate between rural and nonrural districts was closed in 2008/09 (see figure 5), for children from a low-income household a gap remained between rural and nonrural districts (figure 8). In every year except 2008/09, the participation rate of children from a low-income household was at least 5 percentage points higher in rural than in nonrural districts.

Racial/ethnic minority children. The preK participation rate of racial/ethnic minority children has not followed a consistent pattern in rural and nonrural districts. In 2002/03, the participation rate was higher in rural districts, but in 2003/04 it was the same in both types of districts (figure 9). Between 2004/05 and 2010/11, the preK participation rate of racial/ethnic minority children was higher in nonrural districts in five of the seven years.

Special education children. A gap between the preK participation rate of special education

MAP 2
Participation rates in West Virginia's prekindergarten program by district, 2010/11



Source: Authors' calculations based on data from West Virginia Department of Education (2011) and U.S. Census Bureau (2008).

children in rural and nonrural districts persisted for the entire period studied (figure 10). The participation rate of special education students was, on average, 8 percentage points higher in rural districts between 2002/03 and 2010/11.

Study limitations

Several limitations of the data used in this study mean that the findings must be interpreted with caution.

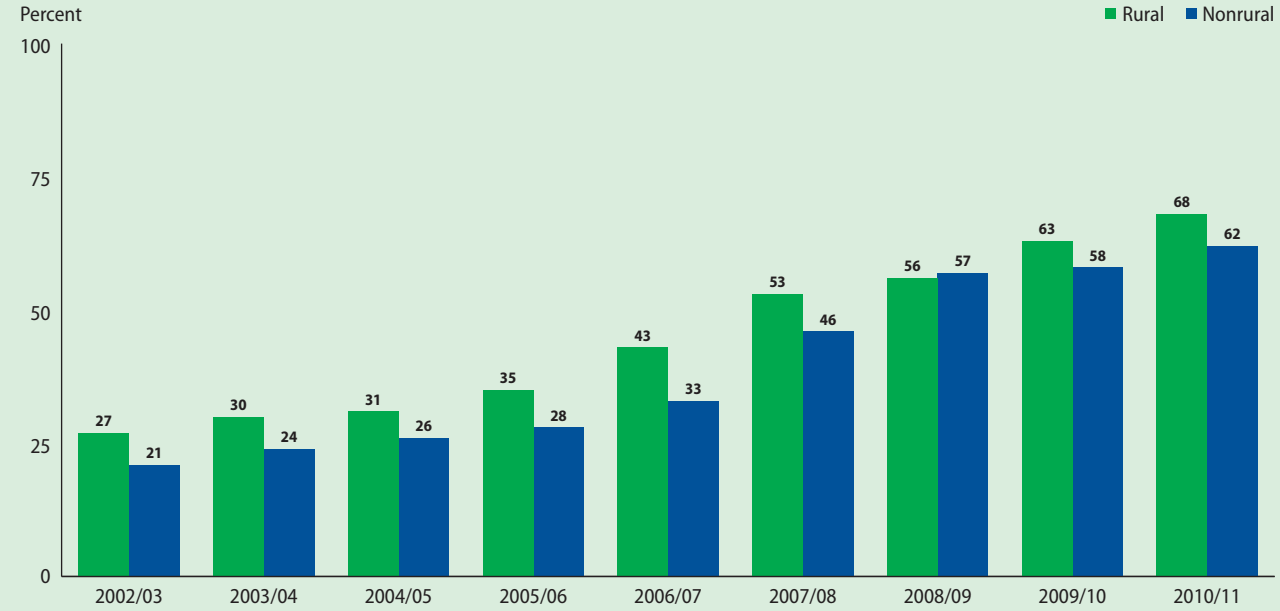
First, West Virginia lacks a direct measure of the number of children eligible for preK each year. So this study estimated the eligible population of children in a given school year as the average of that year's enrollments in each of grades K–2 at the end of the second month of school. The same proxy was used in the preceding report on the state's prekindergarten program (Cavalluzzo et al. 2009). For special education students, the proxy may overestimate the number eligible, resulting in underestimates of participation by that subgroup. But this limitation does not appear to affect conclusions about trends in preK participation by these students (see appendix B for more details).

Second, West Virginia lacks enrollment data by type of preK provider—local education agency only or collaborative partner programs. So the analysis used data on preK programs from the West Virginia Department of Education's Office of School Readiness (2010). These data are not available for school years before 2008/09; therefore, the trend covers only 2008/09 and after, not the entire period (2003/04–2010/11).

Third, the state does not collect data on participation in private preK or other early learning programs not provided by collaborative partners. Accordingly, this study does not

FIGURE 8

Participation rates in West Virginia's prekindergarten program by children from a low-income household in rural and nonrural districts, 2002/03–2010/11

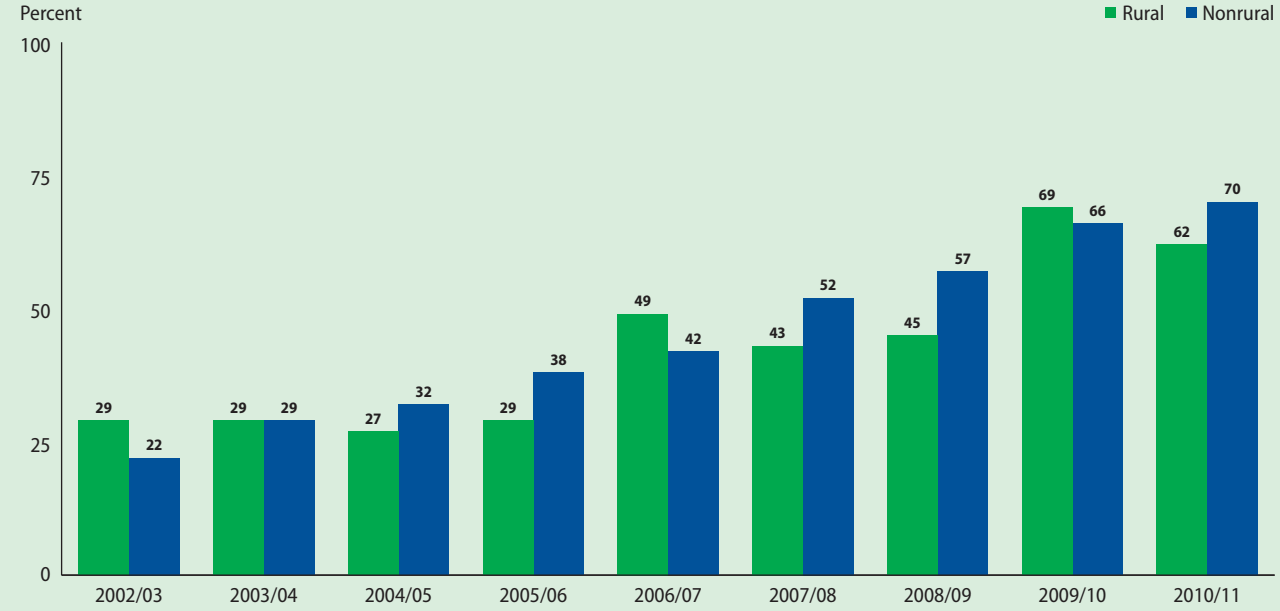


Note: The proxy for the eligible population in a given year is the average of that year's enrollments in rural or nonrural districts in each of grades K–2 at the end of the second month of school. See tables C1, C4, and C5 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

FIGURE 9

Participation rates in West Virginia's prekindergarten program by racial/ethnic minority children in rural and nonrural districts, 2002/03–2010/11

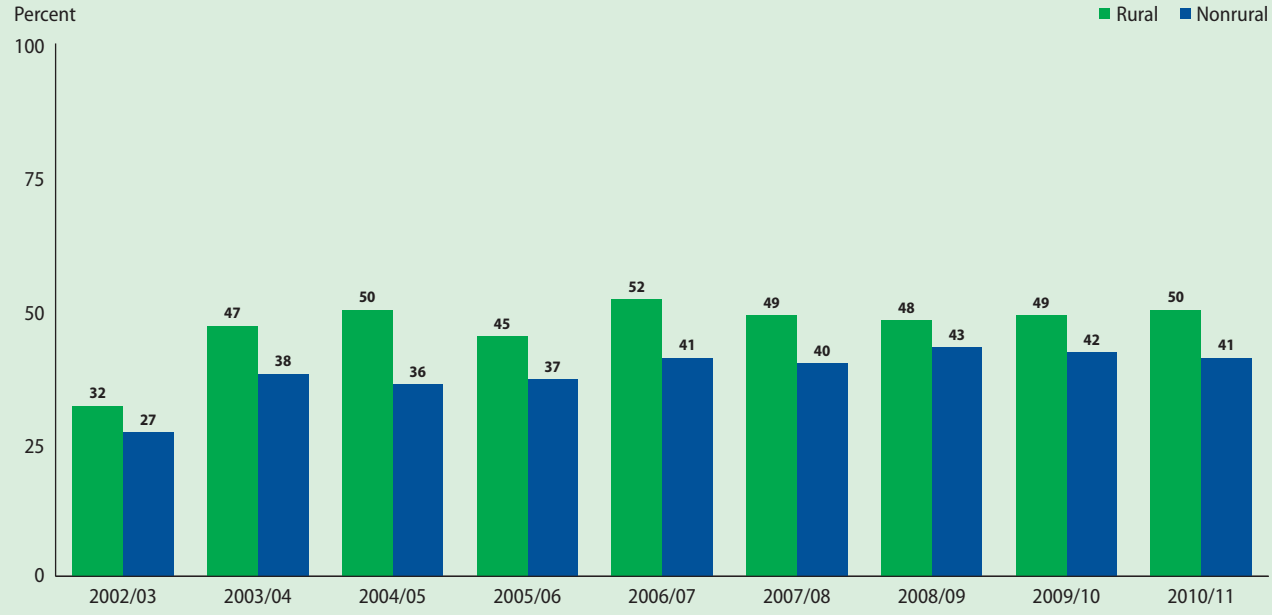


Note: The proxy for the eligible population in a given year is the average of that year's enrollments in rural or nonrural districts in each of grades K–2 at the end of the second month of school. See tables C2, C4, and C5 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

FIGURE 10

Participation rates in West Virginia's prekindergarten program by special education children in rural and nonrural districts, 2002/03–2010/11



Note: The proxy for the eligible population in a given year is the average of that year's enrollments in rural or nonrural districts in each of grades K–2 at the end of the second month of school. See tables C3, C4, and C5 in appendix C for more information.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

provide a complete measure of participation in early education programs in West Virginia. The lack of these data may help explain why districts in northeastern West Virginia have lower participation in the state's preK program than do other parts of the state. These districts tend to have higher incomes, so children there may have better access to private preK.

Finally, eligibility for free or reduced-price lunch was used to determine whether students were from a low-income household. This proxy has limitations explained in appendix B.

This brief is intended only to provide descriptive data analysis of differences in preK participation across subgroups and districts in West Virginia. No inferences about causal relationships between the characteristics of specific children, programs, or districts and the extent of participation in the state's preK program can be made from these findings. Establishing causal relationships requires further research using more rigorous methods on differences in the participation rates described in this brief.

Appendix A
Literature review

This appendix describes research on the general benefits of prekindergarten (preK), evaluations of state-funded preK, and the benefits for subgroups of children.

General benefits of prekindergarten

PreK programs have attracted considerable interest across the United States because studies have shown that preK participation helps students achieve later success in school. For example, research has shown that compared with nonparticipants, children who participate in early childhood education programs such as preK develop better language skills, score higher on school readiness tests, and have better social skills and fewer behavioral problems (Karoly et al. 1998; Sadowski 2006).

But such findings are mixed and might depend on the quality of the program model. Well designed and implemented preschool programs have shown significant short-term—and some long-term—effects on children's cognitive growth. For example, a randomized evaluation of the Abcedarian Project, an intensive early childhood education program, found that students acquired improved reading and math skills that lasted into adulthood, attained more years of education, and were more likely to attend a four-year college (Campbell et al. 2002). Similarly, a long-term, randomized evaluation of an intensive preK program, the High/Scope Perry Preschool Project, found that program participants have significantly higher earnings, home ownership rates, and schooling levels, as well as significantly fewer arrests and social service interventions, than do nonparticipants (Schweinhart et al. 1993). Research has also shown that children with high-quality early learning experiences are 40 percent less likely to need special education services or to be held back a grade, and show improvements in cognitive, emotional, and social development as late as grade 2 (Reynolds et al. 2001; Peisner-Feinberg et al. 2001).

Findings have also pointed to the potential of public programs that can be funded at lower levels and be less intensive than demonstration projects. For example, a study funded by the Institute of Education Sciences and conducted by Vanderbilt University that combined a randomized controlled trial with a regression discontinuity design found gains in literacy, language, and math skills for children participating in Tennessee's preK program (Lipsey et al. 2011). Kindergarten teachers in Georgia—the first state to introduce voluntary, universal preK for four-year-olds—reported that children who had participated in preK were better prepared for kindergarten, especially in prereading, premath, and social skills (Vecchiotti 2001). Some studies of Head Start programs have also documented positive effects on children's early learning (Currie and Thomas 1995; Garces, Thomas, and Currie 2002). But other studies suggest that the effects might fade over time (Puma et al. 2010).

State-funded prekindergarten

During the 2000s, state-funded preK expanded throughout the country. By 2009, 38 states offered some form of it, and 30 percent of four-year-olds nationwide were enrolled (Barnett et al. 2009). As the programs grew, research on them expanded. It may be especially important to understand the effects of typical state-funded preK programs because they can be less intensive or funded at lower levels than some of the programs that have been found to be effective, such as the Abcedarian Project or High/Scope Perry Preschool Project.

Effects on student achievement. Hustedt et al. (2009) used a regression discontinuity design to evaluate New Mexico's preK initiative. Across three cohorts of students, the researchers found an average positive effect from preK on premath and preliteracy scores but no mean effect on early language skills.

Wong et al. (2008) also used a regression discontinuity design to evaluate preK programs in five states, including West Virginia. Overall, they found positive mean effects on premath and preliteracy, though the premath effect was not statistically significant in the West Virginia sample. Evaluations of Oklahoma's universal preK program in Tulsa using regression discontinuity designs compared younger (relative to their kindergarten class) kindergarteners who had just completed preK to older (relative to their preK class) children just beginning preK. The evaluations found positive effects on prereading, prewriting, and premath skills for all racial/ethnic groups at all socioeconomic levels (Gormley et al. 2005; Gormley 2007; Gormley, Phillips, and Gayer 2008).

Persistence of effects. Although the evaluations of state preK programs have found some significant impacts, only a few studies have followed students to determine whether these effects persist. Two examples are evaluations of New Jersey's Abbott preK program (Frede et al. 2009) and Georgia's universal preK program (Fitzpatrick 2008). Frede's team found that the Abbott preK program has potentially positive effects on oral language and premath skills through grade 2, particularly for students who attended Abbott preK programs for two years, but no impact on other early literacy skills. Fitzpatrick used a difference-in-differences approach to estimate how Georgia's preK program affected National Assessment of Educational Progress scores in grade 4. She found a positive effect on average math and reading scores, especially among economically disadvantaged students in rural and remote areas. But the federal Head Start Impact Study found that many of the gains made by students participating in Head Start had faded by the end of grade 1 (Puma et al. 2010). The long-term persistence of preK impacts is an area that requires further study.

Benefits of prekindergarten by student subgroup

Research on kindergarten readiness and the benefits of preK for subgroups of children has generated four important findings:

- Children's readiness for kindergarten varies by subgroup, regardless of participation in preK.
- Participation in preK programs can increase kindergarten readiness across subgroups.
- The rate of participation in early childhood education programs varies with socioeconomic and demographic factors.
- Targeted preK programs raise the participation rate for children from a low-income household and racial/ethnic minority children.

Kindergarten readiness varies by subgroup. Children's readiness for kindergarten varies by income level and racial/ethnic background. Analysis of the Early Childhood Longitudinal Study–Birth Cohort, for example, found that disparities in early learning and development begin as early as age 9 months and are affected by factors such as household income, race/ethnicity, and maternal education (Halle et al. 2009). Other studies have found similar results:

- *Income and socioeconomic status.* An analysis based on data from 1998 found that children from a low-income household performed poorly on cognitive tests relative to children from middle- or high-income households. The analysis uncovered a similar pattern for social skills, which are considered important for children's success in school (Schulman and Barnett 2005). A study of cognitive assessments conducted at entry into kindergarten found that children from the highest socioeconomic status group scored 60 percent higher than children from the lowest socioeconomic status group (Lee and Burkham 2002). In

addition, a study that tracked language-use patterns by 42 families in Kansas City, Missouri, found that three-year-olds of parents receiving welfare had a vocabulary a third smaller than that of three-year-olds of working-class parents—and half the size of three-year-olds of professional-class parents (Hart and Risley 1995).

- *Race/ethnicity.* A study using the Early Childhood Longitudinal Study–Birth Cohort found that 24-month-old Black toddlers scored two-thirds of a standard deviation lower and Hispanic toddlers three-quarters lower than their White counterparts on measures of cognitive development (Halle et al. 2009). A 1998 meta-analysis attributed half the academic achievement gap between Black and White students in grade 12 to the achievement gap between Black and White students in grade 1. This result suggests that early childhood education achievement gaps can have implications for achievement gaps later in students' lives (Phillips, Crouse, and Ralph 1998).

Prekindergarten programs can increase kindergarten readiness across subgroups. Participation in preK programs can mitigate variations in kindergarten readiness across subgroups because they can increase school readiness.

- *Income and socioeconomic status.* Many studies have found that children from a wide range of income groups can benefit from early education (Gormley et al. 2005; Larsen and Robinson 1989). One study, using a regression discontinuity design to compare outcomes among children whose birthdays fell close to cutoff dates for preK enrollments, measured the effects of public preK programs on school readiness in five states. It found that the programs had statistically significant positive effects on early language, literacy, and math skills and positive effects on print awareness skills (knowledge of letters, print symbols, and reading conventions) for programs targeted at specific subgroups (Barnett, Lamy, and Jung 2005). The analysis of Oklahoma's universal preK program in Tulsa found that the program increased school readiness across economic subgroups (Gormley et al. 2005). A study of the Chicago Child-Parent Center Project, a half-day preK program for three- and four-year-olds, selected matched pairs of poor neighborhoods to evaluate the program's effects. It found that participation in the program reduced the likelihood of students' enrolling in special education services, being held back a grade, and being arrested as juveniles and increased their likelihood of graduating from high school (Reynolds, Temple, and Ou 2003).
- *Race/ethnicity.* The analysis of Tulsa's universal preK program also found that the program increased school readiness among racial/ethnic minority students (Gormley et al. 2005).

Preschool participation varies by subgroup. According to the National Household Education Survey—which collected data on a nationally representative sample of 7,601 three- and four-year-olds in 1991 and 1999—the most important family characteristics associated with participation in early education and care are maternal employment, marital status, education, and income (National Institute for Early Education Research 2011). Several other studies have also suggested that preK and preschool participation varies with children's socioeconomic and demographic characteristics. For example, an analysis of attendance data for public and private preschool programs drawn from the National Household Education Survey found that children from a low-income household were less likely to attend preschool. The analysis also found that children were less likely to attend preschool (excluding

home-based care) if they were Hispanic or if their mothers were poorly educated. Least likely to be enrolled in preschool were children from households with modest incomes who were ineligible for government-subsidized preK programs (Barnett and Yarosz 2007).

A number of studies already cited—including the Abcedarian Project (Masse and Barnett 2002), High Scope/Perry Preschool Project (Schweinhart 2004), Chicago Child-Parent Center Project (Reynolds and Temple 1998), and Tulsa preK program (Gormley et al. 2004)—provide evidence that children from a low-income household and children at risk for school failure benefited more from those programs than did children less at risk. Together these findings imply that children in subgroups most likely to benefit from high-quality preK programs are also less likely to enroll in them.

Targeted prekindergarten programs can raise participation among subgroups. Nationally, children from a low-income household and those with poorly educated mothers have low preschool enrollment rates (U.S. Department of Education 2008). But states with targeted preK programs have been able to raise those enrollments. For example, a study of 240 preK programs in six states, conducted by the National Center for Early Development and Learning, found that children from a low-income household and racial/ethnic minority children were more likely to be enrolled in targeted preK programs than were higher income and White children (Clifford et al. 2005).

In addition, in an analysis of preK participation using data from Head Start, the 2000 U.S. Census, the Survey of Income and Program Participation, and the Current Population Survey, Magnuson and Waldfogel (2005) reported that the availability of publicly funded preschool programs such as Head Start and targeted preK was associated with higher participation by Black and Hispanic children. PreK program participation increased for all subgroups examined, though at varying rates across student and district subgroups. A descriptive data study of Tennessee's preK program found that participation increased faster for racial/ethnic minority children than for White children (Grehan et al. 2011). But it is unclear whether these results for targeted programs would carry over to a universal preK program like West Virginia's.

Appendix B
Data and methodology

This brief examines participation rates in West Virginia's universal, voluntary prekindergarten (preK) program over 2002/03–2010/11. The analysis was conducted in two stages: first, statewide trends in participation among the eligible populations (defined in box 1 in the main text) were identified; second, trends in participation among specific child subgroups and district types (rural, nonrural, and high-poverty rural) were examined.

The *participation rate* is defined as the ratio of four-year-olds enrolled in and attending publicly funded preK programs at the end of the second month of the school year to all eligible four-year-olds. In other words, it is a ratio of participants to eligible children. Percentages reported in all figures except for figures 3 and 4 are participation rates.

Figures 3 and 4 and tables C1–C3 refer to the percentage of statewide *participants who are in a subgroup*. This percentage is defined as the ratio of the number of preK participants who are members of the subgroup to the total number of statewide preK participants. In other words, it is a ratio of a subset of participants to all participants. Figures 3 and 4 also refer to the percentage of statewide *four-year-olds who are in a subgroup*. This percentage is defined as the ratio of the estimated number of four-year-olds in the state who are members of the subgroup to the total number of four-year-olds in the state.

Because data are not available on the number of eligible four-year-olds in the state, this number had to be estimated. The study used as a proxy the average of reported enrollment totals in each of grades K–2 at the end of the second month of the school year. This is the same method used in the 2009 study, *West Virginia's progress toward universal prekindergarten* (Cavalluzzo et al. 2009), which covered school years 2002/03–2006/07.

This appendix discusses the data sources used in the analysis, their limitations, and the implications of alternative methods for estimating the size of the student population eligible for preK.

Data sources

Four data sources were used to generate the study's figures, tables, and maps:

- The West Virginia Education Information System provided summary data on public school enrollment by district, grade level (preK–12), student age as of September 1, and child subgroup (such as students qualifying for free or reduced-price lunch) for each school year between 2002/03 and 2010/11. All participation rates and enrollments in this study are based on these data (West Virginia Department of Education 2011).
- The West Virginia Department of Education's Office of School Readiness provided data on the number of preK programs and seating capacity provided by collaborative partners over 2008/09–2010/11 (West Virginia Department of Education, Office of School Readiness 2010).
- The Common Core of Data provided the urban-centric locale code for each West Virginia district (classifying the district as city, suburb, town, or rural) and the percentage of enrolled K–12 students who qualified for free or reduced-price lunch in 2006/07 (U.S. Department of Education, National Center for Education Statistics 2011).
- Shapefile data for the maps came from U.S. Census Bureau (2008).

Data limitations

Three limitations of the data provided by the West Virginia Department of Education (2011) mean that this study's findings must be interpreted with caution. There is also a limitation with the Common Core of Data.

The main data limitation is the lack of a direct measure of four-year-olds eligible for

preK in the state. The number of eligible children was estimated using the average number of students in each of grades K–2 for each school year through 2010/11. This approach smooths annual fluctuations in the population and is unlikely to result in a participation rate estimate greater than 100 percent.

A second limitation involves the unavailability of preK enrollments by type of provider (local education agency only or collaborative partner). Data on seating capacity provided by the West Virginia Department of Education were used instead (West Virginia Department of Education, Office of School Readiness 2010). The actual number of students may differ from program-specific seating capacity, and program-specific capacity utilization data are not available. In addition, for 2002/03 and 2003/04, the West Virginia Department of Education suppressed preK enrollment data for two districts due to concerns about student confidentiality. But the omission of these two districts does not materially change the results. Such small numbers of participants likely have little if any effect on statewide subgroup or urban-centric locale-specific estimates of participation rates.

Finally, West Virginia does not collect data on private preK program participation or on non-preK early education programs. Thus the results presented here do not provide an overall measure of the extent of participation in early education programs in West Virginia.

For the Common Core of Data, an important limitation involves the proxy used to determine whether students come from a low-income household—defined as being eligible for free or reduced-price lunch (U.S. Department of Education 2011). This measure has well known problems. Rates are subject to conditions unrelated to socioeconomic status, including willingness to apply for subsidized meals, procedures that school officials use to secure applications for subsidized meals (some schools are more assertive or insistent than others), and the decreased tendency of secondary school students to participate (Harwell and LeBeau 2010). Nevertheless, eligibility for subsidized meals is a widely used variable in research when school districts are the unit of analysis and was the only viable measure available for use in this brief.

Alternative methods for estimating the eligible population

Two proxies were considered to estimate the number of four-year-olds eligible for preK in a given district in a given year:

- The average number of children in each of grades K–2 in the same year.
- The number of kindergarteners in the year $t + 1$.

Both approaches have benefits and drawbacks. The first—the main proxy on which the analysis in this brief is based—represents this year's average enrollment in grades K–2. It smooths annual population fluctuations and thus is less variable from year to year. It is also less likely to result in participation rate estimates greater than 100 percent. Finally, it allows all years of available data to be used when calculating participation rates.

The second proxy has the benefit of being easy to calculate. But it has a major drawback: the number of eligible children cannot be estimated for the most recent year of available enrollment data. This proxy is also sensitive to population movements into or out of a district, which affect annual enrollment patterns. For these reasons, and to maintain consistency with the previous report (Cavalluzzo et al. 2009), the first proxy was used to estimate the size of the eligible population.

Sensitivity of results to choice of proxy. The 2009 report found that the two proxies for measuring the eligible population generated very similar participation rates. Tables B1–B4 show that this earlier estimate remains consistent for this brief's updated data except for special

education students (see table B4), where the choice of proxy seems to affect the estimated percentage of participants in preK.

For all students, the difference between estimates of the number of children eligible for preK is a few hundred children in any given year out of more than 20,000 students (see table B1). This generally results in participation rate differences of only 1–2 percentage points a year. This level of participation rate differences also holds for the low-income and racial/ethnic minority subgroups (except for racial/ethnic minority children in 2009/10; see tables B2 and B3).

The main exception is the special education subgroup (see table B4). The two proxies generate differences in participation rate estimates around 5–8 percentage points a year. For this subgroup, the first proxy results in consistently lower participation rate estimates. The reason for the difference is likely that special education enrollments in a given year tend to increase between kindergarten and grade 1 and between grades 1 and 2. The first proxy thus generates higher enrollment estimates than does the second for the number of eligible children, and thus lower participation rates.

TABLE B1

Effects of alternative proxies on estimates of the number of eligible children and participation rates in West Virginia's prekindergarten program: all four-year-olds, 2002/03–2009/10

School year	Number eligible		Number enrolled in preK	Participation rate (percent)	
	Average of K–2	Next year's K		Average of K–2	Next year's K
2002/03	20,478	20,922	5,293	26	25
2003/04	20,398	20,932	5,758	28	28
2004/05	20,540	21,421	6,678	33	31
2005/06	20,782	21,073	7,449	36	35
2006/07	20,831	21,296	8,992	43	42
2007/08	20,990	20,905	10,565	50	51
2008/09	20,891	21,446	11,591	55	54
2009/10	21,018	21,244	12,326	59	58

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

TABLE B2

Effects of alternative proxies on estimates of the number of eligible children and participation rates in West Virginia's prekindergarten program: children from a low-income household, 2002/03–2009/10

School year	Number eligible		Number enrolled in preK	Participation rate (percent)	
	Average of K–2	Next year's K		Average of K–2	Next year's K
2002/03	10,971	11,759	2,596	24	22
2003/04	11,579	11,910	3,114	27	26
2004/05	11,779	11,895	3,339	28	28
2005/06	11,535	11,677	3,697	32	32
2006/07	11,677	11,566	4,318	37	37
2007/08	11,565	11,826	5,644	49	48
2008/09	11,698	12,261	6,584	56	54
2009/10	12,120	12,183	7,263	60	60

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

TABLE B3

Effects of alternative proxies on estimates of the number of eligible children and participation rates in West Virginia's prekindergarten program: racial/ethnic minority children, 2002/03–2009/10

School year	Number eligible		Number enrolled in preK	Participation rate (percent)	
	Average of K–2	Next year's K		Average of K–2	Next year's K
2002/03	1,249	1,375	300	24	22
2003/04	1,310	1,407	375	29	27
2004/05	1,374	1,472	411	30	28
2005/06	1,460	1,465	503	34	34
2006/07	1,493	1,545	651	44	42
2007/08	1,545	1,488	753	49	51
2008/09	1,567	1,662	817	52	49
2009/10	1,656	1,878	1,051	63	56

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

TABLE B4

Effects of alternative proxies on estimates of the number of eligible students and participation rates in West Virginia's prekindergarten program: special education children, 2002/03–2009/10

School year	Number eligible		Number enrolled in preK	Participation rate (percent)	
	Average of K–2	Next year's K		Average of K–2	Next year's K
2002/03	3,051	3,032	893	29	29
2003/04	3,561	3,016	1,473	41	49
2004/05	3,455	3,250	1,429	41	44
2005/06	3,543	3,198	1,425	40	45
2006/07	3,574	3,119	1,622	45	52
2007/08	3,596	3,198	1,575	44	49
2008/09	3,545	3,255	1,602	45	49
2009/10	3,550	3,053	1,593	45	52

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

Appendix C
Detailed tables

TABLE C1

Participation in West Virginia's prekindergarten program by children from a low-income household, 2002/03–2010/11

School year	Number eligible	Number participating	Participation rate (percent)	Percentage of statewide participants who are low income
2002/03	10,971	2,596	24	49
2003/04	11,579	3,114	27	54
2004/05	11,779	3,339	28	50
2005/06	11,535	3,697	32	50
2006/07	11,677	4,318	37	48
2007/08	11,565	5,644	49	53
2008/09	11,698	6,584	56	57
2009/10	12,120	7,263	60	59
2010/11	11,878	7,676	65	59

Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2. The participation rate equals the number of subgroup participants divided by the number of eligible students in the subgroup. The percentage of statewide participants who are in the subgroup equals the number of subgroup participants divided by the total number of statewide participants.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

TABLE C2

Participation in West Virginia's prekindergarten program by racial/ethnic minority children, 2002/03–2010/11

School year	Number eligible	Number participating	Participation rate (percent)	Percentage of statewide participants who are racial/ethnic minorities
2002/03	1,249	300	24	6
2003/04	1,310	375	29	7
2004/05	1,374	411	30	6
2005/06	1,460	503	34	7
2006/07	1,493	651	44	7
2007/08	1,545	753	49	7
2008/09	1,567	817	52	7
2009/10	1,656	1,051	63	9
2010/11	1,757	1,180	67	9

Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2. The participation rate equals the number of subgroup participants divided by the number of eligible students in the subgroup. The percentage of statewide participants who are in the subgroup equals the number of subgroup participants divided by the total number of statewide participants.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

TABLE C3

Participation in West Virginia's prekindergarten program by special education children, 2002/03–2010/11

School year	Number eligible	Number participating	Participation rate (percent)	Percentage of statewide participants who receive special education
2002/03	3,051	893	29	17
2003/04	3,561	1,473	41	26
2004/05	3,455	1,429	41	21
2005/06	3,543	1,425	40	19
2006/07	3,574	1,622	45	18
2007/08	3,596	1,575	44	15
2008/09	3,545	1,602	45	14
2009/10	3,550	1,593	45	13
2010/11	3,537	1,571	44	12

Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2. The participation rate equals the number of subgroup participants divided by the number of eligible students in the subgroup. The percentage of statewide participants who are in the subgroup equals the number of subgroup participants divided by the total number of statewide participants.

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

TABLE C4

Participation in West Virginia's prekindergarten program in nonrural districts, total and by child subgroup, 2002/03–2010/11

School year	Eligible	Participants	Participation rate (percent)
Total			
2002/03	12,542	2,788	22
2003/04	12,457	3,109	25
2004/05	12,442	3,640	29
2005/06	12,537	4,259	34
2006/07	12,542	5,126	41
2007/08	12,585	6,093	48
2008/09	12,507	6,946	56
2009/10	12,622	7,407	59
2010/11	12,601	7,880	63
Children from a low-income household			
2002/03	6,535	1,398	21
2003/04	6,774	1,649	24
2004/05	6,897	1,817	26
2005/06	6,801	2,000	29
2006/07	6,901	2,285	33
2007/08	6,789	3,135	46
2008/09	6,860	3,887	57
2009/10	7,159	4,154	58
2010/11	7,016	4,367	62

School year	Eligible	Participants	Participation rate (percent)
Racial/ethnic minority children			
2002/03	817	177	22
2003/04	848	242	29
2004/05	890	282	32
2005/06	924	347	38
2006/07	928	427	46
2007/08	947	494	52
2008/09	965	549	57
2009/10	1,036	680	66
2010/11	1,083	761	70
Special education children			
2002/03	1,865	511	27
2003/04	2,192	825	38
2004/05	2,123	764	36
2005/06	2,155	803	37
2006/07	2,167	888	41
2007/08	2,205	888	40
2008/09	2,207	959	43
2009/10	2,230	942	42
2010/11	2,184	899	41

Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2.

Source: Authors' calculations based on data from West Virginia Department of Education (2011) and U.S. Department of Education, National Center for Education Statistics (2011).

TABLE C5

Participation rates in West Virginia's prekindergarten program in rural districts, total and by child subgroup, 2002/03–2010/11

School year	Eligible	Participants	Participation rate (percent)
Total			
2002/03	7,936	2,505	32
2003/04	7,941	2,649	33
2004/05	8,098	3,038	38
2005/06	8,245	3,190	39
2006/07	8,289	3,866	47
2007/08	8,405	4,472	53
2008/09	8,383	4,645	55
2009/10	8,395	4,919	59
2010/11	8,299	5,228	63
Children from a low-income household			
2002/03	4,436	1,198	27
2003/04	4,806	1,465	30
2004/05	4,882	1,522	31
2005/06	4,734	1,697	36
2006/07	4,776	2,033	43
2007/08	4,776	2,509	53
2008/09	4,838	2,697	56
2009/10	4,961	3,109	63
2010/11	4,862	3,309	68

School year	Eligible	Participants	Participation rate (percent)
Racial/ethnic minority children			
2002/03	431	123	29
2003/04	461	133	29
2004/05	484	129	27
2005/06	536	156	29
2006/07	565	224	40
2007/08	598	259	43
2008/09	602	268	45
2009/10	620	371	60
2010/11	675	419	62
Special education children			
2002/03	1,186	382	32
2003/04	1,369	648	47
2004/05	1,332	665	50
2005/06	1,388	622	45
2006/07	1,407	734	52
2007/08	1,391	687	49
2008/09	1,338	643	48
2009/10	1,319	651	49
2010/11	1,353	672	50

Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2.

Source: Authors' calculations based on data from West Virginia Department of Education (2011) and U.S. Department of Education, National Center for Education Statistics (2011).

TABLE C6

Participation rates in West Virginia's prekindergarten program in high-poverty rural districts, total and by child subgroup, 2002/03–2010/11

School year	Eligible	Participants	Participation rate (percent)
Total			
2002/03	5,792	2,153	37
2003/04	5,753	2,289	40
2004/05	5,806	2,573	44
2005/06	5,816	2,699	46
2006/07	5,800	3,106	54
2007/08	5,838	3,456	59
2008/09	5,816	3,628	62
2009/10	5,835	3,759	64
2010/11	5,760	3,947	69
Children from a low-income household			
2002/03	3,505	1,037	30
2003/04	3,809	1,261	33
2004/05	3,837	1,297	34
2005/06	3,679	1,375	37
2006/07	3,728	1,624	44
2007/08	3,635	1,938	53
2008/09	3,646	2,169	59
2009/10	3,705	2,752	74
2010/11	3,616	2,636	73

School year	Eligible	Participants	Participation rate (percent)
Racial/ethnic minority children			
2002/03	210	71	34
2003/04	228	69	30
2004/05	229	57	25
2005/06	236	69	29
2006/07	226	117	52
2007/08	225	87	39
2008/09	213	121	57
2009/10	239	168	70
2010/11	248	194	78
Special education children			
2002/03	910	291	32
2003/04	1,018	545	54
2004/05	985	520	53
2005/06	1,010	476	47
2006/07	1,043	574	55
2007/08	1,009	507	50
2008/09	972	457	47
2009/10	966	471	49
2010/11	984	479	49

Note: The proxy for the eligible population in a given year is the average of that year's enrollments in each of grades K–2.

Source: Authors' calculations based on data from West Virginia Department of Education (2011) and U.S. Department of Education, National Center for Education Statistics (2011).

TABLE C7

Distribution of statewide participation rates in West Virginia's prekindergarten program, 2002/03–2010/11 (percent)

Part of distribution		School year				
		2002/03	2004/05	2006/07	2008/09	2010/11
Maximum		93	88	95	95	100
Interquartile range	75th percentile	51	64	66	72	72
	Median	29	40	48	61	67
	25th percentile	20	23	37	54	61
Minimum		3	4	20	23	39

Source: Authors' calculations based on data from West Virginia Department of Education (2011).

TABLE C8

Distribution of participation rates in West Virginia's prekindergarten program by district type, 2010/11 (percent)

Part of distribution		District type	
		Nonrural	Rural
Maximum		86	100
Interquartile range	75th percentile	69	83
	Median	64	68
	25th percentile	59	63
Minimum		40	39

Source: Authors' calculations based on data from West Virginia Department of Education (2011) and U.S. Department of Education, National Center for Education Statistics (2011).

Notes

1. Cavalluzzo et al. (2009) found a similar result between 2002/03 and 2006/07.
2. This finding is sensitive to the measure used to proxy the number of preK-eligible students receiving special education services. If the number of kindergarteners is used instead of the average of K–2 students, participation rates have still stagnated for special education students since 2006/07, but the gap between this group and overall participation rates was 5 percentage points narrower in 2008/09 and 6 percentage points narrower in 2009/10 (see appendix B).

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