An Analysis of Pennsylvania's Children

By: Rhoda C. Joseph Ph.D., The Pennsylvania State University Harrisburg

Abstract

This study used secondary data from multiple sources to present a short analysis of Pennsylvania children (ages 0-17) over the 10-year period of 2010-2019. It analyzed trends pertaining to children along seven different dimensions, including location, demographics, economic circumstances, education, health care, health, and behaviors. The results indicate that both rural and urban children have seen some improvements in economic circumstances, healthcare, and health from 2010 to 2019. However, there are opportunities to improve outcomes for children overall.

Keywords: Pennsylvania, children, economic circumstances, education, healthcare

This project was sponsored by a grant from the Center for Rural Pennsylvania, a legislative agency of the Pennsylvania General Assembly. The Center for Rural Pennsylvania is a bipartisan, bicameral legislative agency that serves as a resource for rural policy within the Pennsylvania General Assembly. It was created in 1987 under Act 16, the Rural Revitalization Act, to promote and sustain the vitality of Pennsylvania's rural and small communities. Information contained in this report does not necessarily reflect the views of individual board members or the Center for Rural Pennsylvania. For more information, contact the Center for Rural Pennsylvania, 625 Forster St., Room 902, Harrisburg, PA 17120, (717) 787-9555, www.rural.pa.gov.

Executive Summary

This study used secondary data from multiple sources to present an analysis of Pennsylvania children (ages 0-17) for the 10-year period of 2010-2019.

Methods Used

This study used data from the U.S. Census, including the American Community Survey, American Housing Survey, and the Survey of Income and Program Participation, the Pennsylvania Youth Survey (PAYS) from the Pennsylvania Commission on Crime and Delinquency, Kids Count Data from the Annie E. Casey Foundation, and data from the Pennsylvania Department of Education. The data included the 10-year period of 2010 to 2019, where available, to show trends across the state.

Results

- The percent of children statewide fluctuated over study period.
- There was a slight increase in diversity of Pennsylvania children, but gender differences remained constant.
- Economic conditions for rural and urban Pennsylvania children improved over the 10-year study period.
- There was a decline in math and reading proficiency among both urban and rural children over the study period.
- There was increased health insurance coverage among Pennsylvania children, and an increase in the rate of vaccinations among kindergarteners.

Conclusions

This study highlights the importance of continuing to examine available data to better understand the specific needs of Pennsylvania children.

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Introduction

This study used secondary data from multiple sources to present an analysis of Pennsylvania children (ages 0-17) over the 10-year period of 2010-2019. It also analyzed trends pertaining to children.

From 1980 to 2020, the percent of the population of children, who were between the ages of 0-17, in the U.S. declined from 30 percent to 20 percent (The Annie Casey Foundation, 2021). In 2020, Pennsylvania's population of people under age 18 was 20.6 percent (U.S. Census Bureau, 2020).

Data about Pennsylvania children are dispersed over multiple sources, and there is a lack of a single comprehensive view of children in the state. A more comprehensive view of Pennsylvania children could provide an invaluable resource for policymakers, decision makers, and stakeholders who are invested in the well-being of children.

Goal and Objectives

The goal of this study was to present a brief analysis of Pennsylvania children and show trends over a 10-year period. This study had two main objectives:

1. Present a multi-dimensional view of Pennsylvania children, and
2. Compare and contrast the profiles of rural and urban Pennsylvania children over the 10-year period of 2010 to 2019.

For Objective 1, the research included seven different dimensions as follows: 1. spatial, 2. demographics, 3. economic circumstances, 4. education, 5. healthcare, 6. health, and 7. behaviors. These are further explained in the methodology section.

For Objective 2, the similarities and differences across rural and urban children were examined. The data analyzed also show trends over time. Part of this analysis identified patterns that exist among the seven dimensions included in the study, showing both similarities and differences across rural and urban Pennsylvania children.

Related Literature

Children represent a nation's future, and it is critical to detail the issues that impact them. Developing a comprehensive repository and telling the 10-year story of Pennsylvania children is relevant to the social, economic, geographical, and political fabric of the state.

Children that are exposed to various environmental, social, and economic challenges can have lifelong challenges into adulthood. These challenges can impact: their physical and emotional health; employment opportunities; educational achievements; crime and incarceration rates; social skills; life expectancy; and more.

There are multiple recent reports published by the Center for Rural Pennsylvania that have focused on different topics related to children. For example, a 2020 report focused on child sexual abuse in the state (Font, Miyamoto, & Pinto, 2020); a 2019 report focused on obesity rates in children (Gajanan & Fiorentino, 2019); and a 2018 report focused on violence and drug use among Pennsylvania youth (Murphy, 2018). All of these reports

highlight significant issues related to children in the Pennsylvania. However, to develop a more comprehensive analysis of the state's rural and urban children, a multi-dimensional approach is needed.

To provide contextual support and justification for this study, there are additional scholarly works that focus on understanding the similarities and differences between rural and urban children. For example, childhood mortality is on the decline in the U.S., but some disturbing trends still exist. Data from 1999 to 2017 show that disparities exist across racial and ethnic groups, with American Indian/Alaska Native (AI/AN) and non-Hispanic black children having higher death rates, and rural children having higher death rates per capita than urban children (Probst, Zahnd, & Breneman, 2019). The study further explains that rural children have less access to healthcare providers, and less access to trauma centers, and are more likely to be the victim of a fatal vehicular accident than their urban counterparts.

Pennsylvania ranked 20th in a 2020 state ranking of the overall wellbeing of children nationwide (KIDS COUNT, 2020b). This position, though above the median, suggests that there are notable deficiencies and opportunities to improve outcomes for children in the state. Pennsylvania children are exposed to higher levels of drug overdoses and gun violence, on average, than children in the U.S. Also, rural Pennsylvania children have higher tobacco use and urban Pennsylvania children have higher marijuana use when compared to each other (Murphy, 2018).

One of the underlying factors affecting the wellbeing of children in Pennsylvania is poverty. The U.S. Census Bureau sets poverty thresholds based on the minimum income requirements to cover basic needs of individuals and families. In 2019, Pennsylvania was one of 10 states with increasing numbers of children living in concentrated poverty, which is defined as a community with 30 percent or more of its residents living in poverty. In Pennsylvania, 23 percent of urban children and 11 percent of rural children live in concentrated poverty (Pennsylvania Partnership for Children, 2019). The impact of childhood poverty can be lifelong and follow a child into adulthood with adverse consequences. Poverty is an underlying barrier to a child's well-being, growth, and development.

Methodology

This project encompasses three distinct phases. Phase 1 is the *dimension definition* phase. The word "dimension" in this study is used to define a group of variables that can be clustered together. For example, information such as age and gender are grouped together under the "demographics" dimension. The dimension definition required a synthesis of all the disparate dimensions identified in the literature across different agencies and stakeholders. A preliminary synthesis of dimensions created from combining information from different sources (discussed in more detail below) resulted in seven distinct categories for this study. The final set of dimensions used in this study for the

analysis of Pennsylvania children are: 1. spatial; 2. demographics, 3. economic circumstances, 4. education, 5. healthcare, 6. health, and 7. behaviors.

The dimensions for this study were informed by contexts presented by different agencies and stakeholders that collect and disseminate data about children. The Center for Rural Pennsylvania identified four primary dimensions for analyzing Pennsylvania's children: 1. demographic, 2. economic, 3. health, and 4. education. The National Center for Children in Poverty (NCCP, 2020) used the following dimensions for early childhood data: 1. health and development, 2. early care and education, and 3. parenting and supports. The KIDS COUNT (KIDS COUNT, 2020a) databook uses the following dimensions: 1. demographics, 2. economic well-being, 3. education, 4. family and community, 5. health, and 6. safety and risk behaviors. A more comprehensive list of dimensions, as defined by ChildStats (ChildStats.gov, 2020) consists of the following: 1. demographic background, 2. economic circumstances, 3. health care, 4. physical environment and safety, 5. behavior, 6. education, and 7. health.

The U.S. Census Bureau has an extensive collection of data on children. The Census, along with its American Community Survey (ACS), American Housing Survey (AHS), and the Survey of Income and Program Participation (SIPP) provided a rich inventory of data about children in the U.S. These data include too many dimensions to list here, however, they encompass many of the dimensions identified above along with others such as 1. extracurricular activities, 2. childcare, and 3. health insurance (U.S. Census Bureau, 2020). The Pennsylvania Youth Survey (PAYS) from the Pennsylvania Commission on Crime and Delinquency is a state-level repository of valuable data related to this topic. Overall, there are rich and voluminous amounts of data related to children in the U.S., with some specific sources focused on Pennsylvania children. All of these disparate sources provided the foundation and justification to include a total of seven dimensions in this study.

One challenge with data on Pennsylvania children is that the data exist in different locations and in different formats. A further challenge is that the data are not all collected with the same level of granularity. For example, some data sets only look at data for large urban areas, such as Philadelphia and Pittsburgh. Many data sets do not present any county or local level data, but instead aggregate at the state level. This aggregated data created a challenge to compare rural and urban children along all dimensions. Additionally, data are in multiple file formats including flat files, such as text, spreadsheets, and proprietary databases. Bringing these data into a single project reduces the challenges associated with having data as disparate as they currently are.

Phase 1 of this study, *dimension definition,* required a detailed examination of the seven dimensions, and identification of the specific parameters under each of the dimensions. Table 1 presents a list of items relevant to each of the dimensions. The justification for the selected items in Table 1 (as discussed above) were derived from data already used by different organizations and agencies to understand the well-being of children.

Table 1: Dimensions for Analysis of Pennsylvania's Children

Dimension Name	*Description*	*Relevant Items*
1. Spatial	Location of children	1. Location
2. Demographics	Specific characteristics of the population	2. Age 3. Gender 4. Race and ethnicity
3. Economic Circumstances	Level of poverty and/or wealth	5. Children in poverty 6. Parental employment 7. Foster care rates
4. Education	Educational profile	8. 4th grade math proficiency 9. 4th grade reading proficiency 10. School enrollment 11. Early intervention
5. Healthcare	Access to healthcare coverage	12. Health insurance coverage 13. Medicaid participation 14. CHIP enrollment
6. Health	State of health	15. Births 16. Infant mortality
7. Behaviors	Social activities	17. Use of tobacco, alcohol, illicit drugs

Phase 2 of this study was the *data acquisition* phase. This phase focused on collecting granular data about Pennsylvania children. Some data sets were aggregated by state, not the county level data that were needed for this study. This phase focused on collecting data from a variety of sources including but not limited to: Center for Rural Pennsylvania; U.S. Census Bureau; ChildStats; KIDS COUNT; NCCP; ACS; AHS; and PAYS. In cases where data were absent, published articles on the subject provided additional information.

Formatting of the data was also a significant part of the second phase of the project. The data for this study existed in many different formats. For example, one format used by the Census is Comma Separated Value (CSV). CSV files are directly transferable into Excel and thus easy to use. Data stored in pdf files were converted to Excel using Adobe Acrobat DC. Data pulled from websites needed additional formatting for analysis. (See Appendix A for more information on data formatting).

Phase 3 of this study was the *data analysis* phase. The primary tools used for the data analysis were Microsoft Excel, Tableau, and SPSS. These are all analytical tools that support descriptive statistics, reporting, visualizations (including maps) and interpretation of the data. Data were analyzed and presented in visual methods such as histogram, line charts, state maps, and tables. The data were analyzed in the following ways: 1. for Pennsylvania over different time periods; and 2. by county, comparing children across rural and urban areas. Data show trends over the 10-year period of 2010-2019. As part of the analysis, some of the data that were available at the county level were also analyzed via statistical correlation analysis.

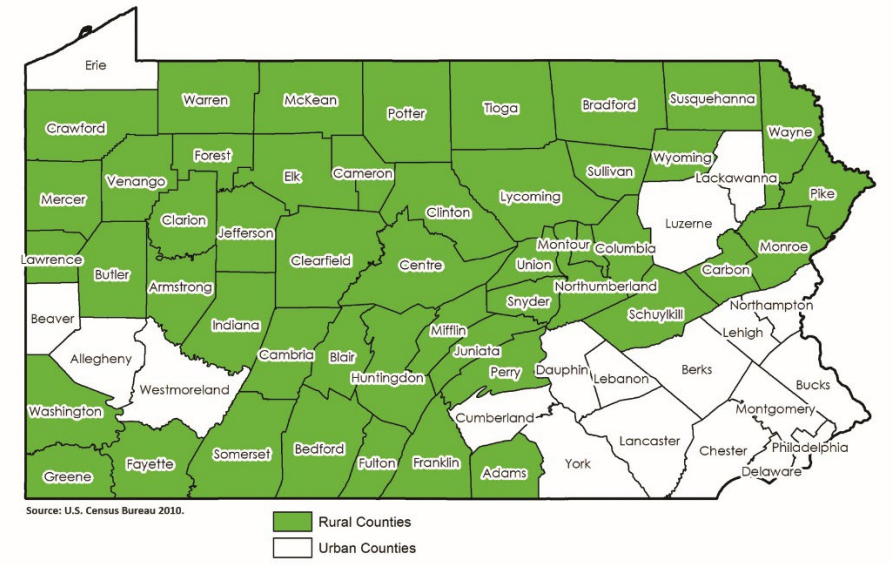
Results

The results are classified into seven categories: 1. Spatial, 2. Demographics, 3. Economic Circumstances, 4. Education, 5. Healthcare, 6. Health, and 7. Behaviors.

Spatial

The first dimension identifies the location of Pennsylvania children. This dimension examines the population change of children over the 2010-2019 period. This dimension is the only dimension with a single variable: location. Location also shows the population change of children in the state and compares rural and urban areas.

Figure 1: Rural and Urban Pennsylvania Counties



Source: Center for Rural Pennsylvania.

Figure 2: Percent Change in Population of Children Under Age 5 (2010-2019)

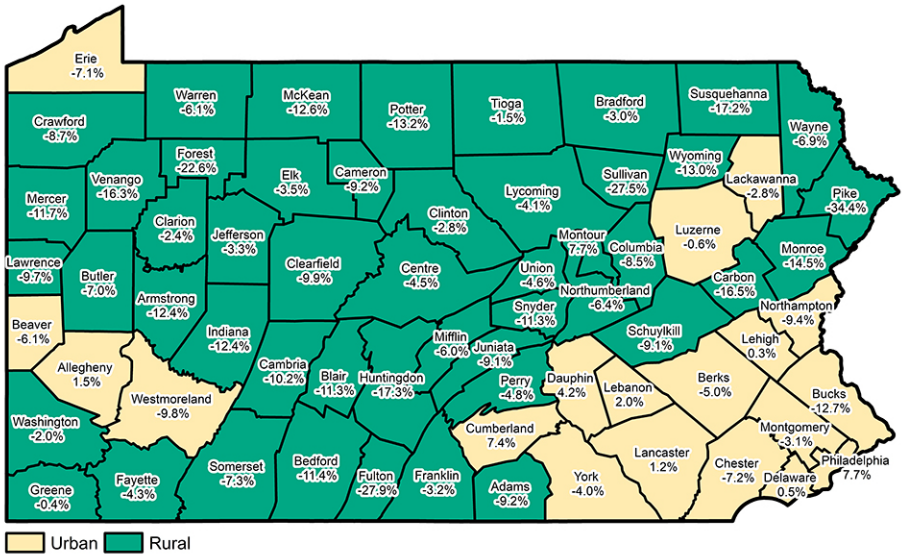
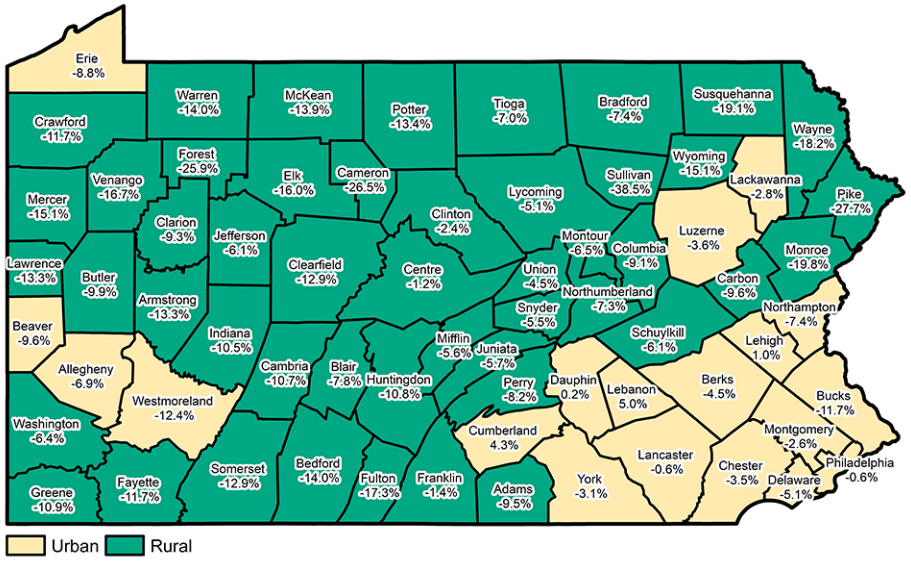


Figure 3: Percent Change in Population of Children Under 18 Years Old (2010–2019)



From the data analysis, the five counties with the largest decreases in the under 18 population were Sullivan (-38.5 percent); Pike (-27.7 percent); Cameron (-26.5 percent); Forest (-25.9 percent); and Monroe (-19.8 percent). Of these five counties, three are in the northeastern region of the state.

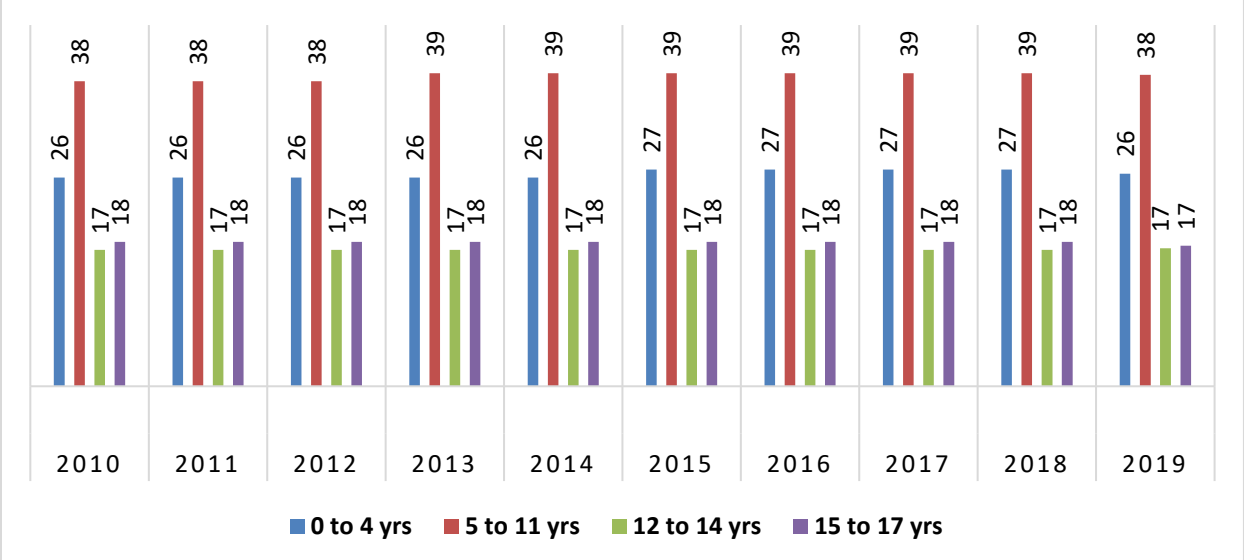
The Northeast region of the U.S. saw a -5.1 percent decrease in the population that was under 18 years old from 2010 to 2020, which was the highest rate of decline in the country (Ogunwole, Rabe, Roberts, & Capla, 2021). The Midwest (-4.1 percent) and the West (-2.1 percent) also saw declines. Only the South (+2.1 percent) saw a population increase in children over the last decade.

Overall, there was a -5.6 percent change in the number of children under age 18 in Pennsylvania. Rural counties had a -10.3 percent change and urban counties had a -4 percent change in children under 18 years old.

Demographics

The demographic data focused on age, gender, race, and place of birth of Pennsylvania children. From the previous spatial dimension, the data showed a decline in the percent of children in both urban and rural Pennsylvania counties. Even though the population of children decreased over the 10-year period, the age distribution of children remained constant. As shown in Figure 4, the percent of children in the 15-17 age group showed a small decline in that period. However, the other age groups remained flat, even though there was a slight increase in children aged 0-4 between 2015–2018. The gender distribution also remained flat, with boys consistently accounting for 51 percent of the population, and girls at 49 percent of the population.

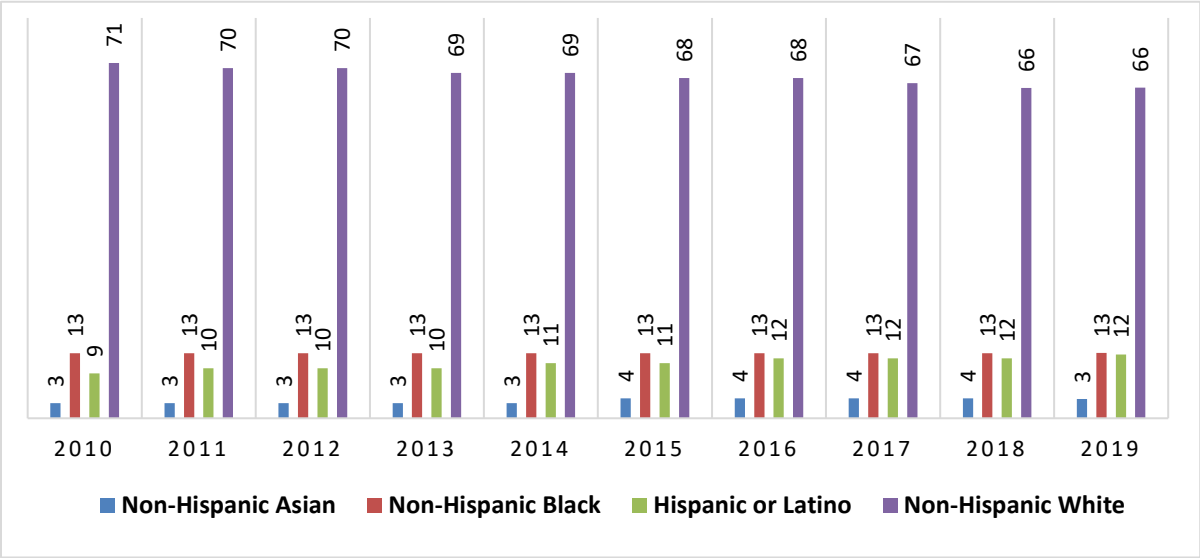
Figure 4: Percent of Pennsylvania Children Distributed by Age Group (2010–2019)



Note: Totals may not add to 100 due to rounding errors.

With respect to the race/ethnicity of Pennsylvania children, the data indicated an increase of Hispanic children from 9 percent to 12.77 percent. There was also a small increase in the non-Hispanic Asian population from 3 percent to 3.86 percent. The percent of non-Hispanic black children remained constant at 13 percent. The non-Hispanic white population saw an almost 5 percent population decline, from 71 percent to approximately 66 percent of the total population of children in Pennsylvania (See Figure 5).

Figure 5: Percent of Pennsylvania Children by Race/Ethnicity (2010–2019)



Note: Totals may not add to 100 due to rounding errors.

Economic Circumstances

The economic circumstances dimension examined children living in poverty, parental employment, and foster care rates.

Overall, poverty rates for children decreased over the 10-year study period. Poverty rates for the 0-5 age group and the 6-17 age group were the same in 2019.

Parent unemployment rates over the 10-year period also decreased from 10 percent to under 5 percent for children across the different age groups.

Figure 6: Poverty Rates for Pennsylvania Children by Age Group (2010–2019)

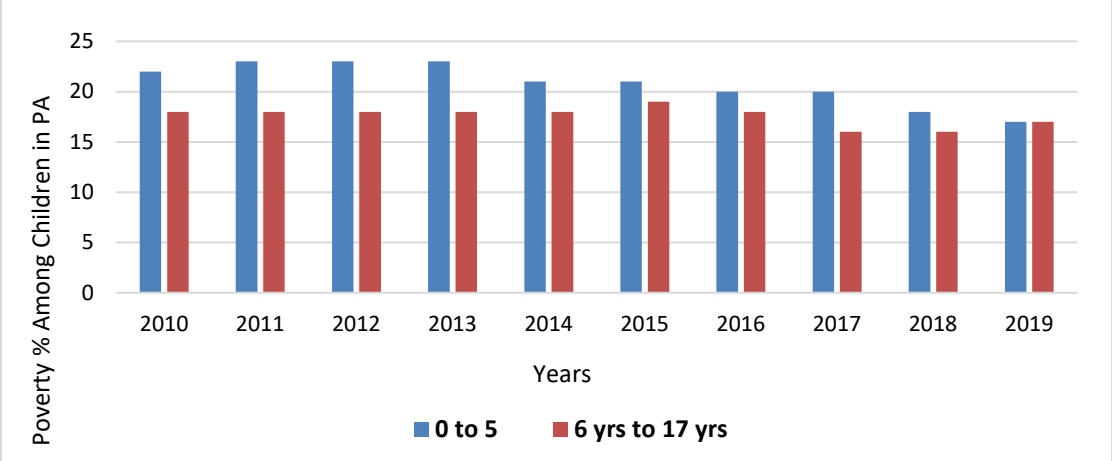
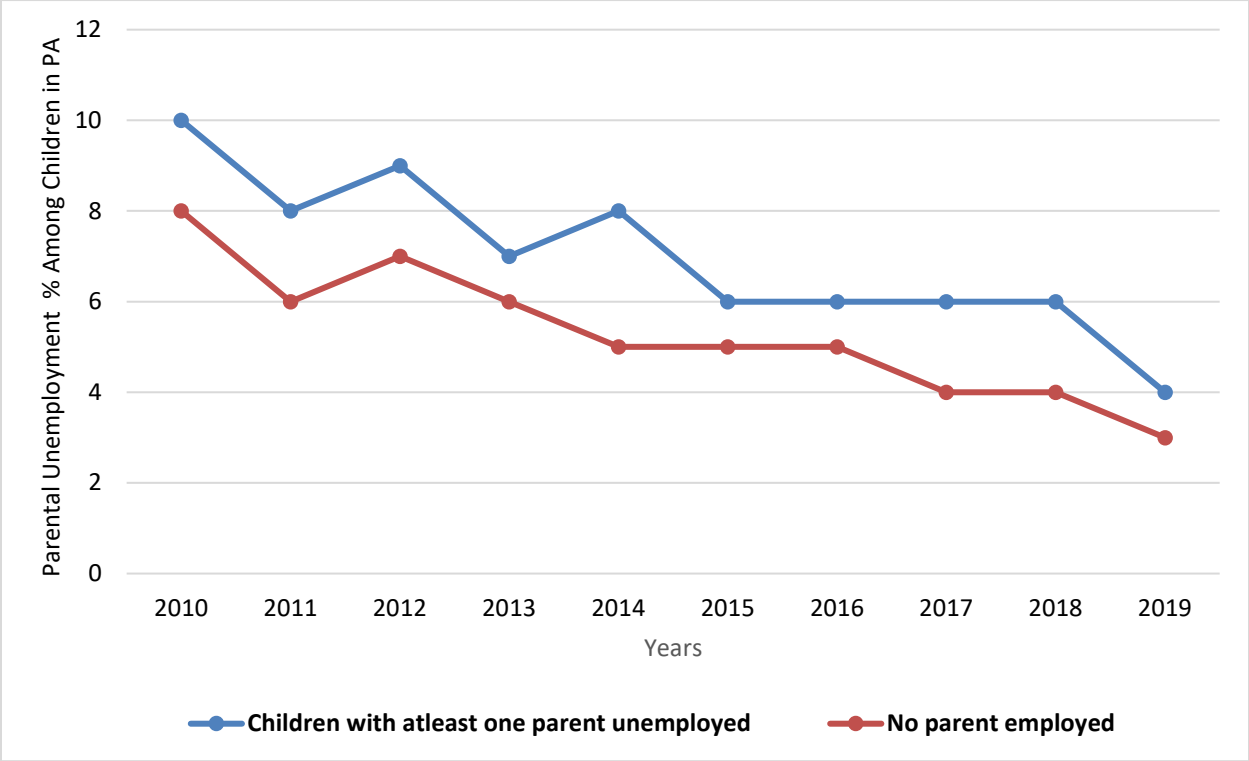
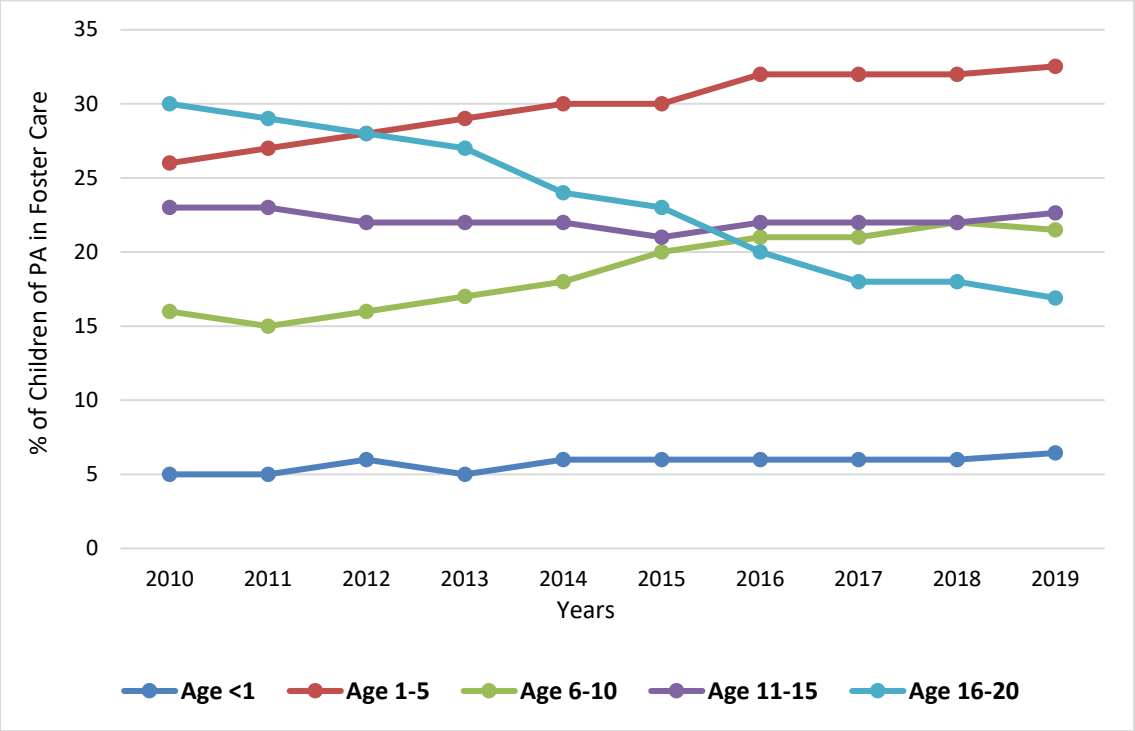


Figure 7: Percent of Parental Unemployment in Pennsylvania (2010–2019)



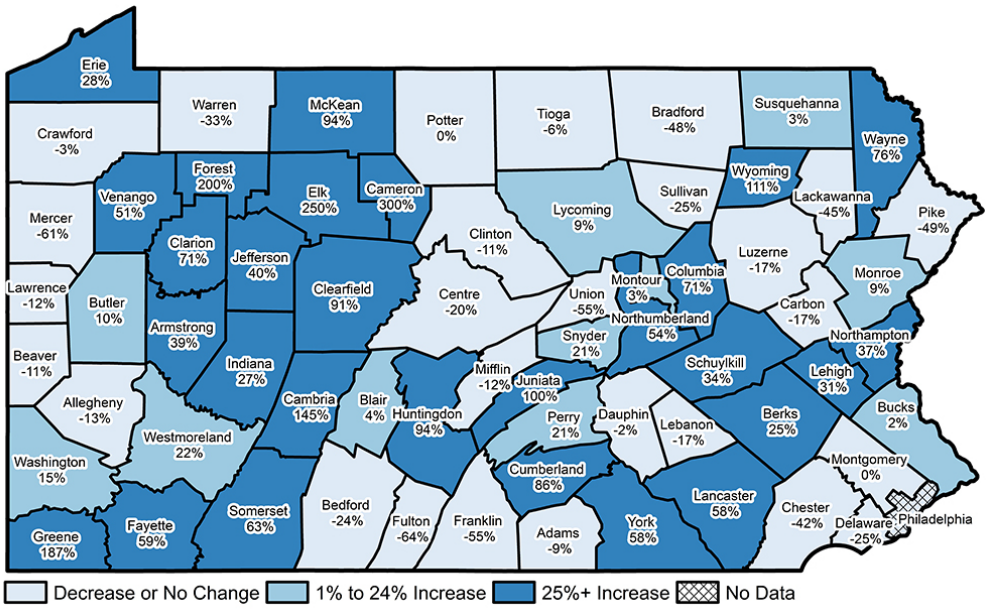
One of the biggest shifts under the economic circumstances dimension pertains to children in foster care. The data used for foster care participation was from the Annie E. Casey Foundation, Kids Count (The Annie Casey Foundation, 2019). The percent of Pennsylvania children aged 16-20 in foster care decreased by almost 50 percent from 30 percent to 16 percent during the study period. However, for children under age 10, there was an overall increase in the percent placed in foster care. Recent data indicate that the number one reason for foster care placements in Pennsylvania is parental drug abuse (Pennsylvania Partnerships For Children, 2018). This trend correlated with the macro country level data from 2017, where approximately 60 percent of children under the age 5 entered foster care as a result of parental drug use (Meinhofer & Anglero-Diaz, 2019). Future data for the decade of 2020 to 2030 should be examined to learn the impact of the COVID-19 pandemic on foster care rates.

Figure 8: Percent of Children in Foster Care by Age Group (2010–2019)



Based on the data analyzed in this study, Pennsylvania saw an 8 percent increase in the number of children in foster care from 2010 to 2018. The absolute numbers were 14,831 children in 2010 and 16,022 children in 2018. In 2010, 21 percent of all children in foster care lived in rural Pennsylvania counties and 79 percent were in urban counties. In 2018, the rural share of children in foster care increased to 23 percent, and the urban share decreased to 77 percent. Seven rural counties had foster care rate increases of 100 percent or greater: Juniata, Wyoming, Cambria, Greene, Forest, Elk, and Cameron. These seven counties represent the counties with the largest increase of children in foster care. The growth of children in foster care is concentrated in western rural counties, with lower rates in central and eastern counties (see Figure 9).

Figure 9: Percent Change of Pennsylvania Children in Foster Care (2010–2018)



Education

The education dimension focused on math and reading proficiency, school enrollments, and early intervention. Reading proficiency in 4th grade English is a critical element to determine a child's readiness for success in middle school and beyond. Schools track Annual Yearly Progress (AYP) to determine success outcomes for children. If most of the student population of a school is at the "basic" and "below basic" reading levels and not achieving AYP, it will be difficult for students to progress academically in the long-term. The data show an overall decline in reading proficiency for 4th grade students across the state during the 10-year period. There was also a stark shift downward with the number of students across the state that are advanced in 4th grade math. Panel data from three states, North Carolina, Massachusetts, and Washington, showed that 3rd grade standardized test scores were highly correlated to dropout rates, and high school success (Goldhaber, Wolff, & Daly, 2021). In this research, the 4th grade data were used, following the model that significant information is learned about the path to success for children during their academic life in elementary school.

This study used reading and math proficiency data from the Annie E. Casey Foundation, Kids Count Data Center. The results of this analysis are shown in Figures 10 and 11. One point of note is that the data were missing for the 2014 calendar year. Fortunately, even with the missing data points, it was still possible to observe the data trends. The trends indicated a decline in advanced reading proficiency, with a more pronounced decline in math proficiency for children. It should be noted that there were changes to the reading, writing and math PSSAs in 2014-15 to align with the Pennsylvania Common Core Standards. According to PA Partnerships for Children, the initial drop in test scores was not unexpected.

The data here were not decomposed at the county or ZIP Code levels to determine if there were any differences across rural and urban children.

Figure 10:Fourth Grade English Reading Proficiency (2010-2019)

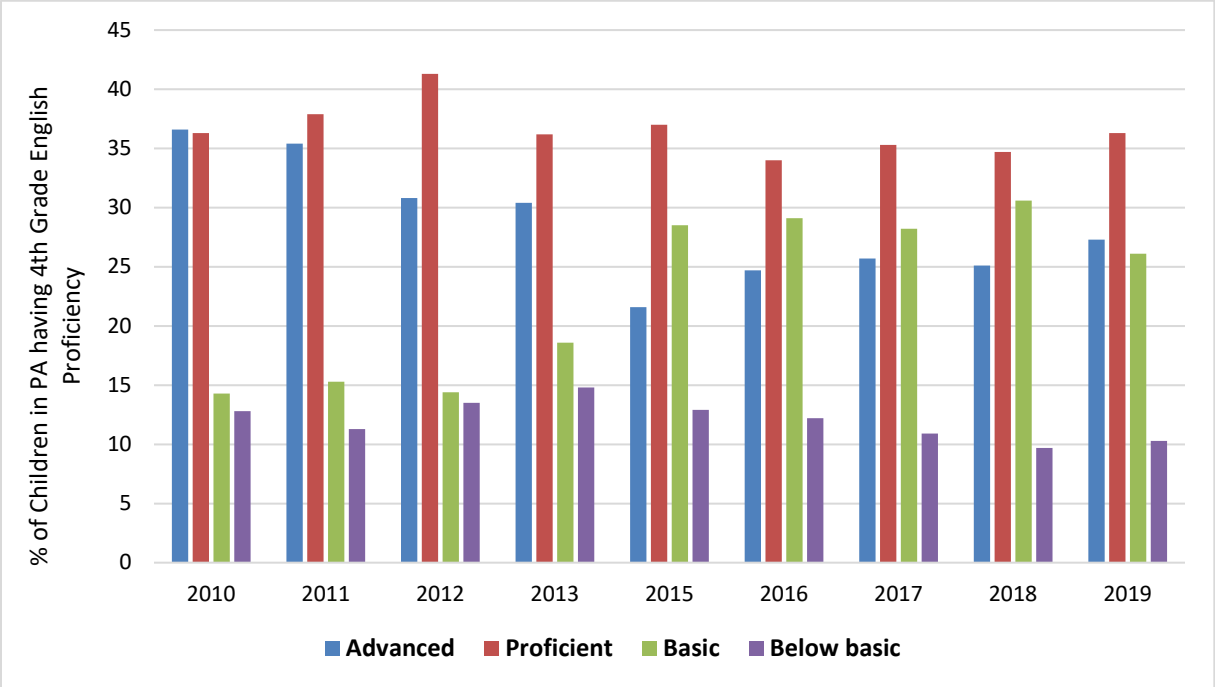
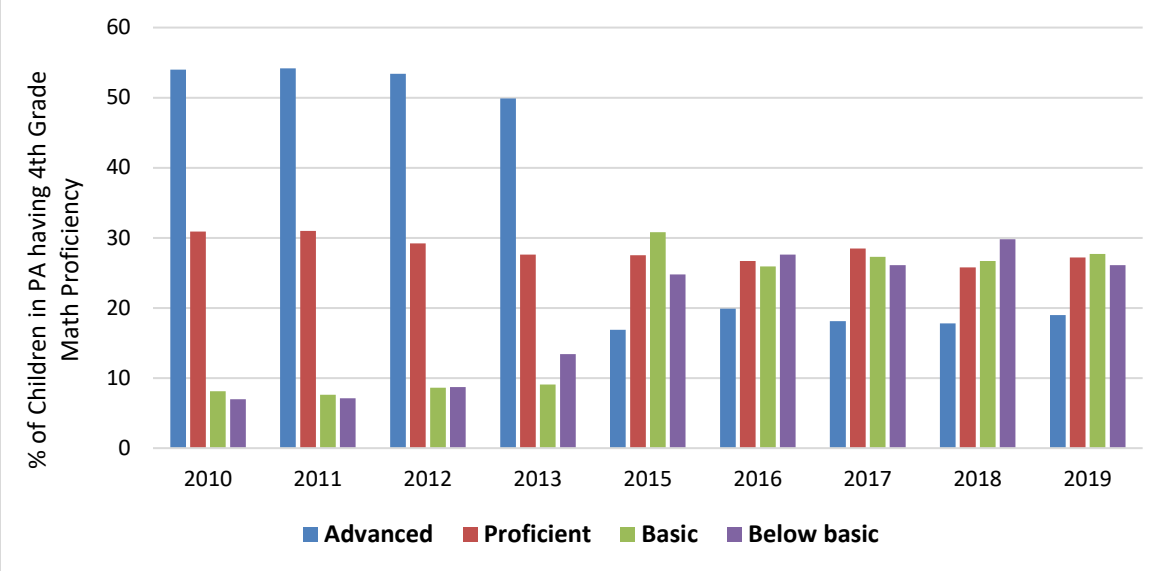


Figure 11: Fourth Grade Math Proficiency (2010-2019)



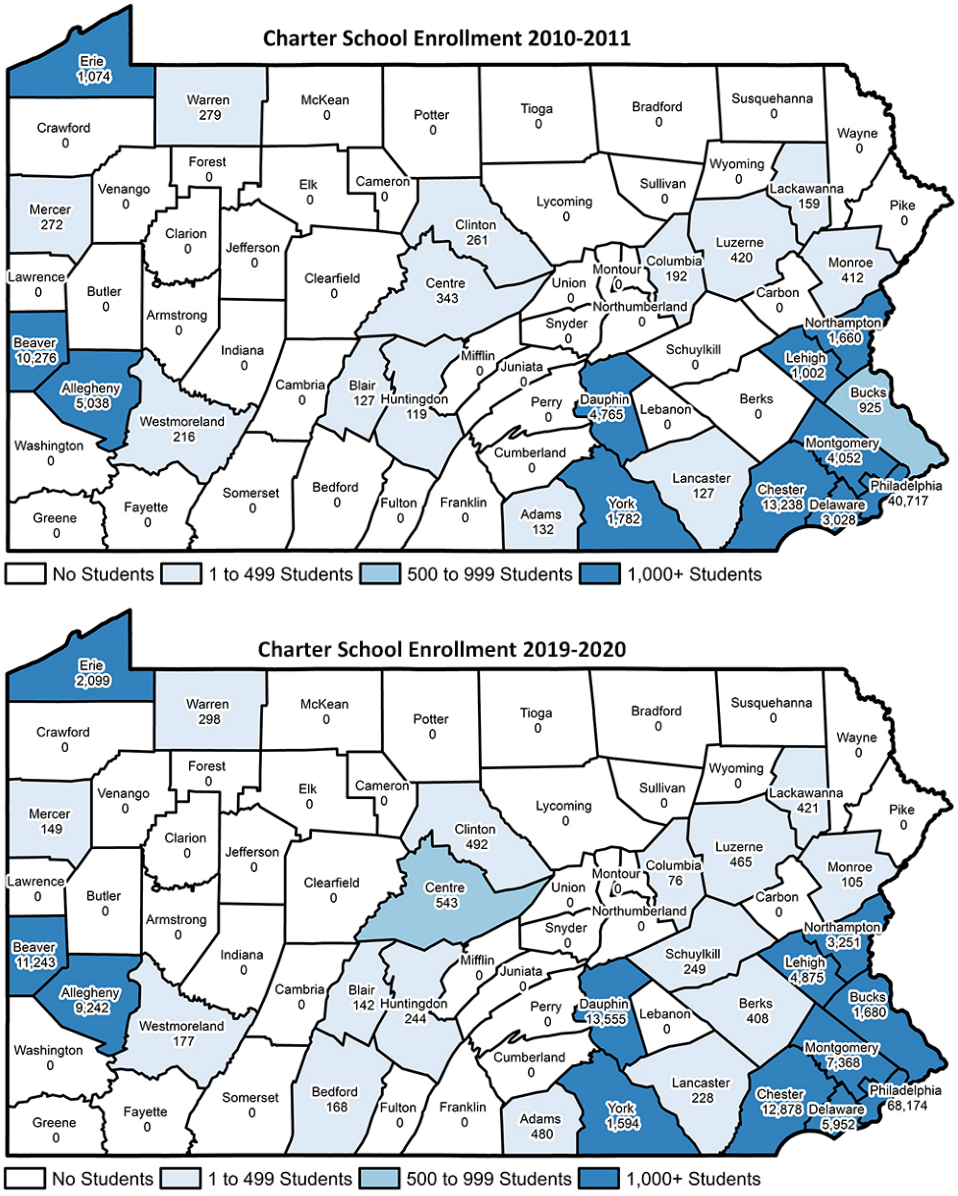
The second variable analyzed in the education dimension was school enrollments. Results from earlier dimensions have demonstrated a decline in the number of children in Pennsylvania. This decline has not impacted the number of school districts in the state, which has remained constant at 500. One area that has seen a change in school enrollments is charter schools. All data for the analysis of charter schools were obtained from the Pennsylvania Department of Education (Pennsylvania Department of Education, 2022b).

In the 2010-2011 school year, there were 141 charter schools in Pennsylvania. That number grew to 177 charter schools in the 2019-2020 school year, representing a 27 percent increase in the total number of charter schools. The number of students enrolled in charter schools increased by 74 percent, going from 80,138 children enrolled in the 2010-2011 school year to 139,188 enrolled in the 2019-2020 school year.

For rural Pennsylvania counties, the total number of charter schools grew from 14 to 15. This change is reflected as follows: Bedford County increased its count of charter schools from zero to one; Huntingdon County increased its count from one to two; Schuylkill County increased its count from zero to one; Center County decreased its count from four to three; and Monroe County reduced its count from two to one; resulting in an overall gain of one charter school. The total number of rural children enrolled in charter schools increased by 14 percent from 2,585 to 2,946.

For urban counties, Philadelphia County had the largest increase in the number of charter schools: from 71 to 89 charter schools, and a 25 percent increase in total student enrollment. Overall, for urban counties, there was an increase of 75 percent for the number of children enrolled in charter schools from 2010 to 2020.

Figure 12: Number of Children Enrolled in Charter Schools in Pennsylvania (2010–2020)

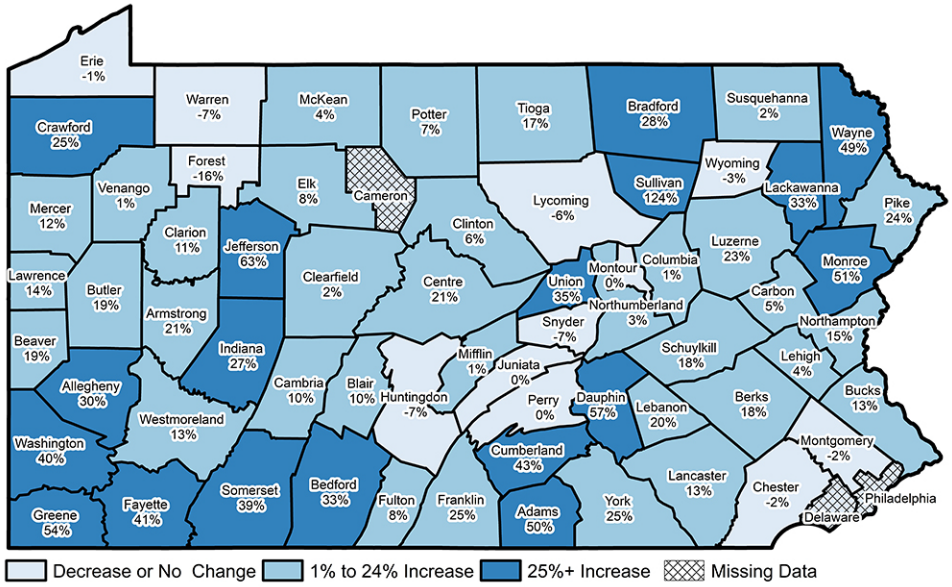


Note: data include both brick and mortar and cyber charter schools by place of enrollment.

Early intervention helps children that have developmental delays reach critical milestones. In Pennsylvania, children up to age 5 are eligible for early intervention and the range of services include support for physical, cognitive, communication, social, and adaptive development that can be provided in-home, at school, or in specialized programs (Pennsylvania Department of Education, 2022a). The data collected for this study show an increase in early intervention services throughout the state, with an average increase of 21.6 percent. The increase for rural Pennsylvania was 20.3 percent

and for urban Pennsylvania it was 24.9 percent. Figure 13 shows the 10-year change for all Pennsylvania counties.

Figure 13: Percent Change of Children Receiving Early Intervention (2010–2019)



Healthcare

The healthcare dimension focused on health insurance coverage (Figure 14), Medicaid participation (Figure 15), and CHIP enrollment (Figure 16). This dimension showed positive change for all children in the 10-year period. There were increases in healthcare coverage, CHIP enrollment, and Medicaid enrollment. One study indicated that increasing Medicaid access to parents also increases coverage and healthcare benefits for both the parents and children (Schubel, 2021). In Pennsylvania, there was also an increase in the rate of vaccinations for kindergarteners.

Figure 14: Children in Pennsylvania Without Health Insurance (2013–2019)

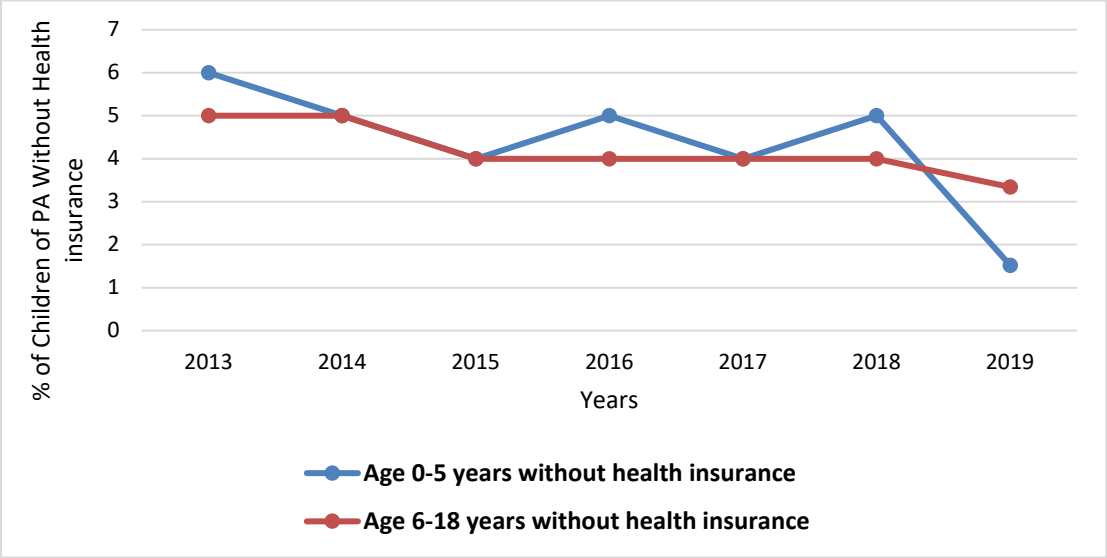


Figure 15: Medicaid Participation of Pennsylvania Children (2010–2019)

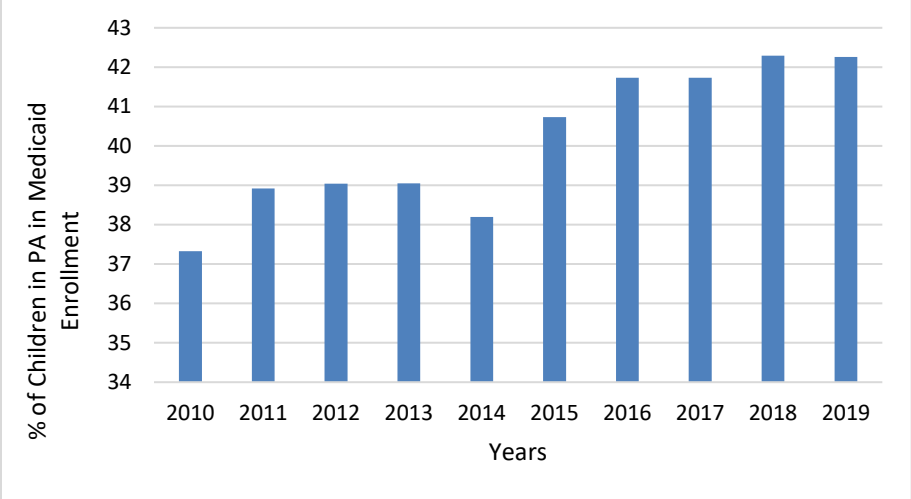
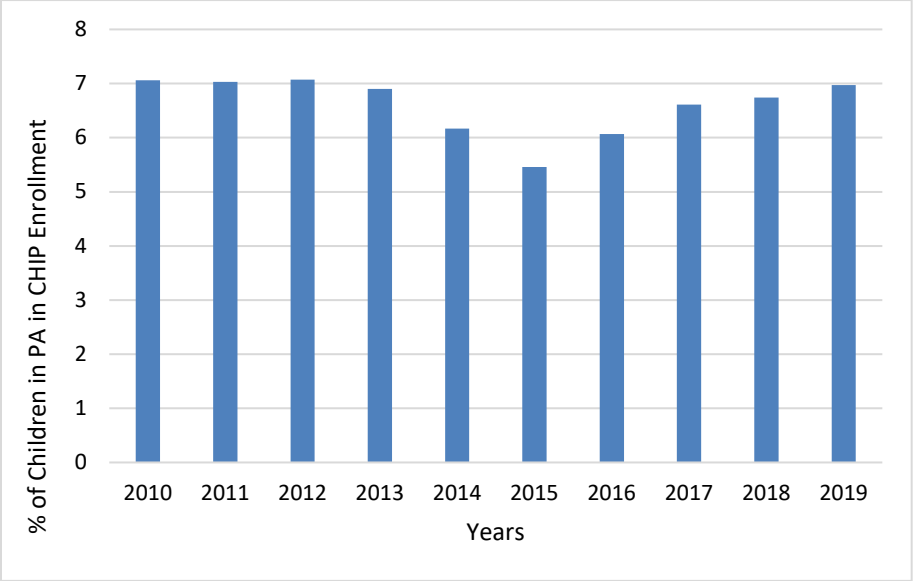


Figure 16: CHIP Enrollment Among Pennsylvania Children (2010–2019)



Health

The health dimension focused on births (Figure 17), infant mortality (Figure 18), and obesity. The rates for pre-term births and low-birth-weight babies remained constant. The main anomaly in the data was the 2014–2017 period that saw a higher than usual percentage of Pennsylvania births covered by Medicaid. During that period, Pennsylvania expanded Medicaid eligibility, which was the primary contributor to the number of births that were covered.

Even though there are gaps in the data, there is a trend showing increasing rates of obesity for Pennsylvania children. Childhood obesity in the U.S. is at an epidemic level and the rate has doubled to approximately 19 percent of children over a 30-year period (Sanyaolu, COkorie, Qi, Jennifer, & Rehman, 2019). Childhood obesity impacts childhood quality of life, as well as increases other health risk factors.

Figure 17: Number of Births in Pennsylvania (2010–2019)

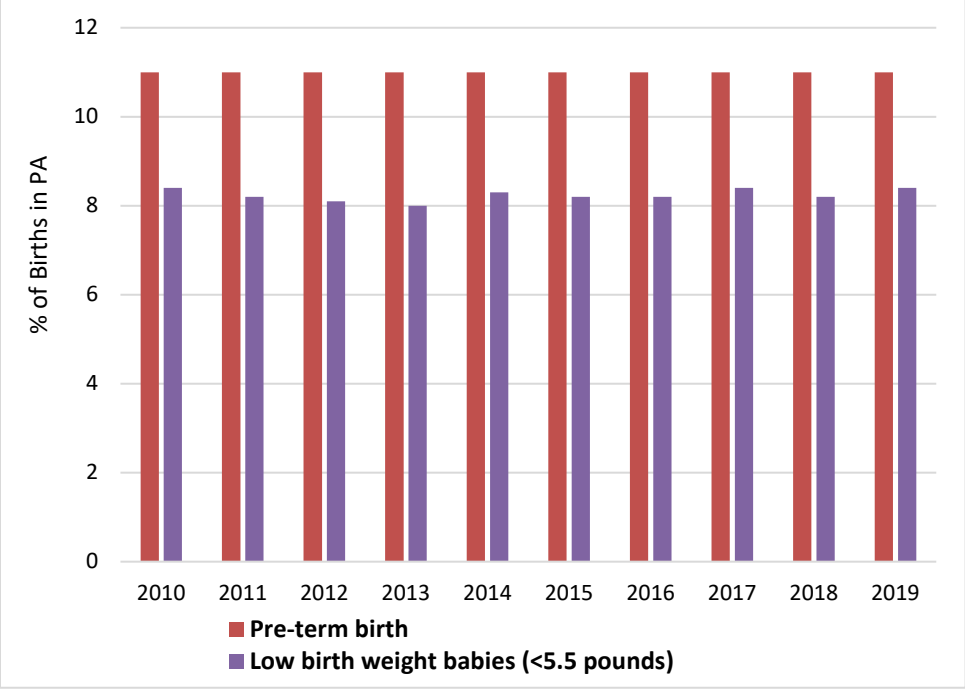
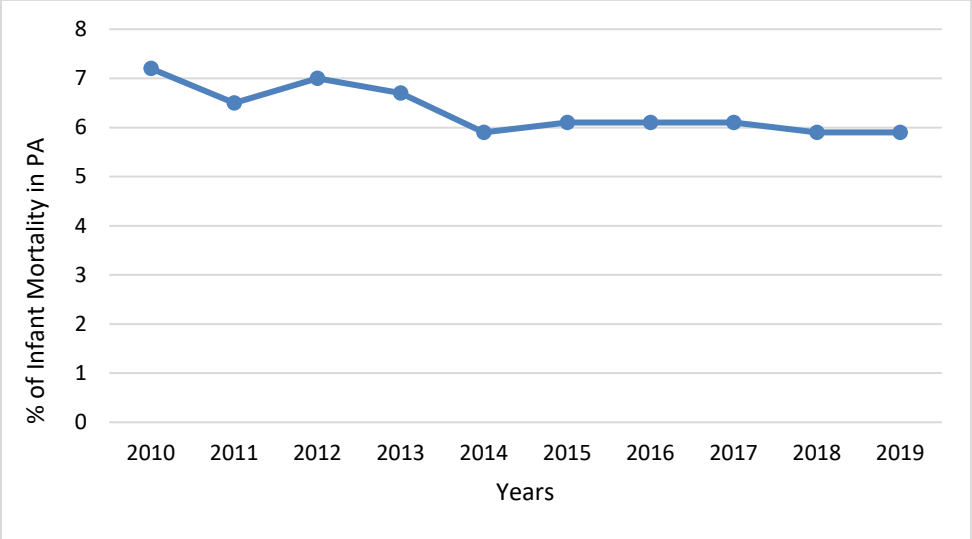


Figure 18: Infant Mortality Rate in Pennsylvania per 1,000 (2010–2019)

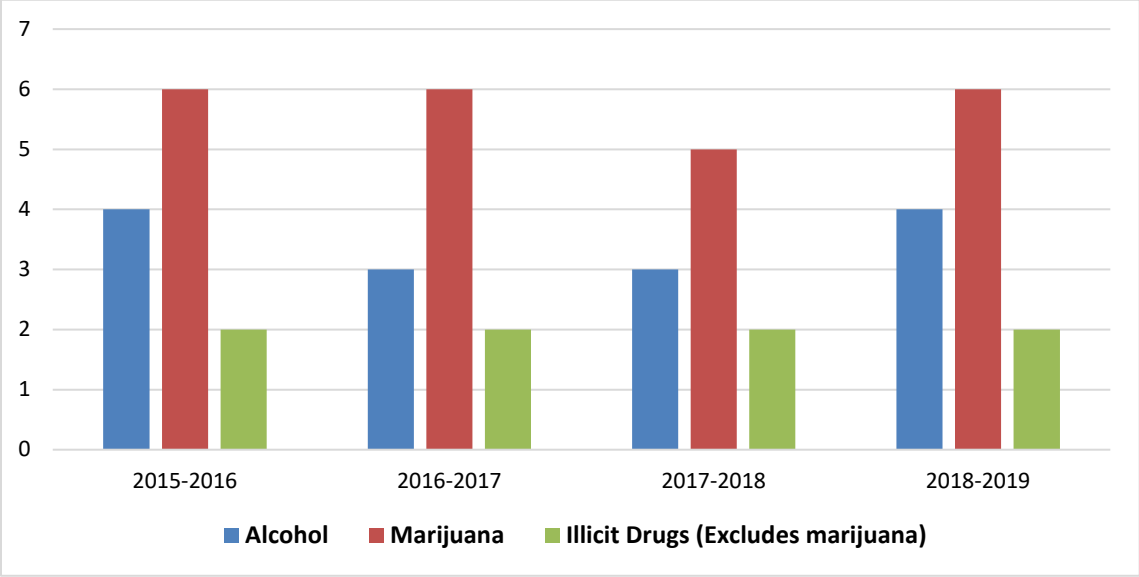


Behaviors

The behavior dimension can be complex and detailed. In this study, two primary variables were examined: 1. alcohol, marijuana, and illicit drug use, and 2. gambling. The data on alcohol, marijuana, and illicit drug use were from the Annie E. Casey Foundation, Kids Count Data Center, which asked children about their behaviors over the prior year. For the period 2015 to 2019, the rate of dependency on or abuse of alcohol by children

aged 12 to 17 was 4 percent, 3 percent, 3 percent, and 4 percent for the four consecutive years. For the period 2015 to 2019, the rate of marijuana use by children aged 12 to 17 was 6 percent, 6 percent, 5 percent, and then 6 percent again for the four consecutive years. These data also showed a consistent dependency on or abuse of illicit drugs by 2 percent of children aged 12 to 17 for the period 2015 to 2019.

Figure 19: Percent Use of Alcohol, Marijuana, Illicit Drugs by Children Aged 12 to 17 (2015-2019)



Limitations

This study presented a mix of aggregate data and data segregated by rural and urban counties. The main limitation is that all the variables are not decomposed to the county level. However, each dimension provides an overview of Pennsylvania children. The 10-year period successfully captured many of the changes that occurred with children in the state. One method to expand this study would be to collect more primary data from some of the different dimensions and expand the number of variables under each dimension. These data can be captured through qualitative surveys to address any gaps in the data encountered in this project.

Conclusions

This study examined specific variables related to Pennsylvania children over a 10-year period. The study indicated that certain dimensions, such as economic circumstances and healthcare, improved for children in Pennsylvania over the study period. Some aspects, particularly in education, have seen concerning declines.

This project also indicated changing demographics of Pennsylvania children. Rural

children have been disproportionately impacted by growth in foster care admits.

The profile of children in a state impacts the allocation of public funds at the federal, state, and local levels. Programs such as childcare, special education, foster care, housing, health services, and education are all supported by data collected about children. Like other states, Pennsylvania state funds are allocated to diverse agencies and programs that directly and indirectly support the well-being of children. One specific area where this is evident is with the allocation of public funds to support education initiatives. As the data has shown in this study, there has been a significant increase in charter schools and early intervention but a decrease in math and reading scores. These variables can impact the future of education funding available to public education options.

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Appendix A – Data Formatting Steps

- Below is a list of the steps taken to format the data in this report:
- Converting all data into CSV files. Adobe Acrobat was used to convert pdf files to CSV. Once the files were converted, some manual updates were needed ensure that all data was converted and formatted correctly.
- Adding appropriate variable names for all the different data e.g., lead exp for lead exposure.
- Documenting the names of all the newly created variables.
- Identifying consistent codes for missing values. For example, if there are counties without data on lead exposure, use a dummy variable of 909 to show that the data is missing.
- Changing some text data to numeric data types. In some instances, it was necessary to change a Yes/No value to 1 and 0 for effective analysis.

Appendix B – Data Sources

Dimension Name	*Relevant Items*	*Source*
Spatial	Location	https://www.census.gov/quickfacts/PA
Demographics	Age	https://www.census.gov/quickfacts/PA
	Gender	https://www.census.gov/quickfacts/PA
	Race and Ethnicity	https://www.census.gov/quickfacts/PA
Economic Circumstances	Children in Poverty	https://www.nccp.org/data-table/?data=num&unit=Children&age=18&inc=Low-Income&cat=age&denom=char&state=PA
	Parental Employment	https://datacenter.kidscount.org/data/tables/6519-unemployment-rate-of-parents?loc=40&loct=2#detailed/2/40/false/1729,37,871,870,573,869,36,868,867,133/any/13484,14405
	Foster Care Rates	https://datacenter.kidscount.org/data/map/8561-foster-care--september-30-snapshot-by-age-group?loc=40&loct=5#5/any/false/false/133/4572/17265/Orange/
	Childhood Caregivers	https://datacenter.kidscount.org/data/tables/111-children-living-with-neither-parent#detailed/1/any/false/1729,37,871,870,573,869,36,868,867,133/any/439,440
Education	4th Grade Math Proficiency	https://datacenter.kidscount.org/data/tables/5949-pssa--grade-4-math-test-scores-by-proficiency-level?loc=40&loct=2#detailed/2/any/false/1740,1639,1600,1536,1460,1120,1024,937,809,712/1845,1846,1847,1848/12589
	4th Grade Reading Proficiency	https://datacenter.kidscount.org/data/tables/5950-pssa--grade-4-reading-english-language-arts-test-scores-by-proficiency-level?loc=40&loct=2#detailed/2/any/false/1740,1639,1600,1536,1460,1120,1024,937,809,712/1845,1846,1847,1848/12590
	School Enrollment	https://www.education.pa.gov/DataAndReporting/Enrollment/Pages/PublicSchEnrReports.aspx
	Early Intervention	https://datacenter.kidscount.org/data/tables/2667-early-intervention--number-of-children-receiving-early-intervention-services?loc=40&loct=5#detailed/5/5379-5445/false/1771,1740,1639,1600,1536,1460,1249,1120,1024,937/any/10969

Healthcare	Health Insurance Coverage Medicaid Participation CHIP Enrollment	https://datacenter.kidscount.org/data/tables/10196-children-without-health-insurance-by-race-and-ethnicity?loc=40&loct=2#detailed/2/40/false/1729,37,871/10,11,9,12,1,185,13/19728,19729 https://datacenter.kidscount.org/data/tables/2667-early-intervention--number-of-children-receiving-early-intervention-services?loc=40&loct=5#detailed/5/5379-5445/false/1771,1740,1639,1600,1536,1460,1249,1120,1024,937/any/10969
Health	Births Infant Mortality	https://datacenter.kidscount.org/data/tables/6051-infant-mortality?loc=40&loct=2#detailed/2/40/false/1729,37,871,870,573,869,36,868,867,133/any/12718,12719 https://datacenter.kidscount.org/data/tables/6051-infant-mortality?loc=40&loct=2#detailed/2/40/false/1729,37,871,870,573,869,36,868,867,133/any/12718,12719
Behaviors	Use of Tobacco, Alcohol, Illicit Drugs	https://datacenter.kidscount.org/data/tables/10128-illicit-drug-use-other-than-marijuana-by-age-group#detailed/2/40/false/1696,1648,1603,1539/30,31/19555,19556

Appendix C – Correlation Analysis

The research included a correlation analysis of select variables. The list of variables used in correlation analysis are shown in the table below.

Variable	Dimension	Description
Var1	Spatial	This variable was set to either 1 or 0, indicating either a rural or urban county.
Var2	Education	This variable focused on early intervention and capture the percentage change by county for the academic years for children of 2010/2011 to 2019/2020.
Var3	Economic Circumstances	This variable focused on foster care rates and showed the percentage change of children admitted into foster care for the period 2010-2018.
Var4	Social Activities	This variable focused on 8th grade gambling and showed the percentage change of gambling activity from 2015 to 2019
Var5	Social Activities	This variable focused on 12th grade gambling and showed the percentage change of gambling activity from 2015 to 2019
Var6	Demographics	This variable focused on the change in population of children under the age of 5 for the period 2010-2020.
Var7	Demographics	This variable focused on the change in population of children ages 18 and younger for the period 2010-2020.
Var8	Education	This variable focused on percentage change in the population of children in charter schools for the period 2010-2011 to 2019-2020.
Var9	COVID-19	These data are from March 2022 and focused on the number of children ages 5-9 that were fully vaccinated.
Var10	COVID-19	These data are from March 2022 and focused on the number of children ages 10-14 that were fully vaccinated.
Var11	COVID-19	These data are from March 2022 and focused on the number of children ages 15-19 that were fully vaccinated.

Correlation analysis across 11 variables

	Var1	*Var2*	*Var3*	*Var4*	*Var5*	*Var6*	*Var7*	*Var8*	*Var9*	*Var 10*	*Var 11*
Var1	1										
Var2	0.0888	1									
Var3	-0.1972	-0.2609	1								
Var4	-0.2015	0.0659	0.018	1							
Var5	0.0450	0.2994	-0.052	0.2036	1						
Var6	0.0885	0.0077	0.301	-0.0678	-0.0695	1					
Var7	0.1980	-0.1360	0.138	-0.1246	-0.1985	0.5542	1				
Var8	0.3701	0.2463	-0.087	0.0332	0.1985	0.15414	0.13545	1			
Var9	0.68704	0.08464	0.2107	-0.1968	-0.0362	0.05433	0.06939	0.31340	1		
Var 10	0.7320	0.0835	0.2178	-0.2177	-0.0408	0.04414	0.06541	0.28745	0.9939	1	
Var 11	0.7575	0.0713	-0.2238	-0.2347	-0.0553	0.0368	0.05904	0.25657	0.9811	0.9952	1

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Kyle C. Kopko, Ph.D., Executive Director

Jonathan Johnson, Senior Policy Analyst

Christine Caldara Piatos, Communications Manager

Linda Hinson, Office Manager

David W. Martin, Public Policy Data Analyst

625 Forster St., Room 902, Harrisburg, PA 17120
(717) 787-9555 | www.rural.pa.gov