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Examining Child Deprivation Across California and How It Could Be Addressed with Early Childhood Education

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Abstract

Socioeconomic deprivation can create adverse conditions with direct impacts on the development of children. The Early Childhood Deprivation Index (ECDI) shows that there are significant differences in the extent of deprivation of young children (aged 0 to 5 years) among the counties in California. Our research shows that the cost of childcare forms a significant proportion of family income among low- and middle-income families. It indicates that families can pay for a high proportion of such costs if they could access the available federal and state government entitlements. A universal high-quality early childhood education system brings about an efficient way of providing the childcare without the unnecessary cost of employing a means-tested entitlement mechanism. However, even with universal early childhood education, families need support to be able to take advantage of the program, since pre-schooling will be on a voluntary basis. It is therefore important that in addition to providing education universally-communities, and the state make every effort to increase the ability of California families to benefit from this important opportunity.

Key Words

Early Childhood Education, Poverty, Socioeconomic Condition, Deprivation, Government, Eligibility.

Introduction

The first element of having the chance of living a good life is to enjoy a healthy and balanced childhood. Children living in poverty or from low-income families face more challenges being successful in school. They are more likely to have poor health, engage in crime, and suffer from behavioral problems later in life. While it is crucial to reduce and eventually eliminate poverty, it is also essential to take the necessary steps to address the issues that impact children from low-income families in order for them to have a good start from birth to age five. Barriers to children's educational achievement start early and continue to grow without intervention.

Adverse early childhood experiences can have lifelong effects, not just on cognitive and emotional development, but also on long-term physical health. Universal high-quality early

childhood education addresses many of the disparities that children of low-income families face. Ideally, California would have an early education system in which all children aged three and four years old would have access to such education.

The gap between high- and low-income families in California is among the largest in the nation. Income inequality has increased over time. California's income distribution reflects high rates of poverty. According to Public Policy Institute of California (PPIC) families in the bottom third of the income distribution are at risk of poverty absent major safety net programs. (Bohn et al. 2022) Wealth is more unevenly distributed than income. In California, 20% of all net worth is concentrated in the 30 wealthiest zip codes, home to just 2% of Californians . (Legislative Analyst's Office 2019) However, the important question remains on how significant these differences are and how precisely they differ across the state's diverse counties. The other equally important question is what it would take to address these disparities.

This paper aims at providing information concerning the extent of some of the differences across all 58 countries within the State of California. It also goes further and provides some insight on what it may take to address some of these problems through creation of an early childhood education program across the state.

Socioeconomic Factors Impact the Ability of Young Children to Succeed

We begin our study by briefly reviewing the existing literature on the impact of socioeconomic challenges that children may face in the early years of their lives with possible negative consequences on their economic, social, and emotional growth as they age. We used a collection of relevant socioeconomic indicators for structuring and calculating a meaningful index to estimate and rank the level of socioeconomic deprivation of children in various counties across California.

It is important to state that we may not always have a clear socioeconomic indicator which can be used to measure a specific challenge. It is also clear that for some of the challenges, we have more than one indicator. Looking into a statistical method that can establish a quantitative relationship between the value of the index and each indicator is almost impossible, and this has not been used in similar studies such as Global Social Mobility Index 2020, Sustainable Development Report 2019 & 2021 and Global Hunger Index 2021. (World Economic Forum 2020, Sachs, Jeffrey D. et al. 2021, Von Grebmer et al. 2021)

The Harvard Center on the Developing Child provides a clear researched-based assessment on the vital importance of early childhood education. In the first few years of life, more than 1 million new neural connections are formed every second. These connections build brain architecture, the foundation upon which all later learning, behavior, and health depend. Studies show that 80% of core brain development occurs by the time a child reaches age 3, and by 5 years of age, 90% of brain development is complete.

Significant social and economic adversity impairs this development in the first three years of life while the child experiences the highest rate of his/her brain development. The greater the adversity a child faces, the greater are the odds of a developmental delay. Poverty, caregiver

mental illness risk, child maltreatment, having single parents, and low educational attainment of parents expose children to additional risks. These risk factors lead to a 90 to 100% likelihood of one or more delays in their cognitive, language, or emotional development. (Center on the Developing Child at Harvard University 2014)

Providing young children with a healthy environment in which to learn and grow is not only good for their development, but high-quality early childhood programs bring impressive returns on investment to the public. Three of the most rigorous long-term studies found a range of returns between $4 and $9 for every single dollar invested in early learning programs for low-income children. (Masse et al. 2002, Karoly et al. 2005 Heckman et al. 2002)

The study of intergenerational income differences found a new momentum in recent years (Chetty, Hendren, and Katz, 2016) They relate higher social mobility to the ability of children to be exposed to the living environments of better neighborhoods. Their study provides convincing evidence that children of poverty-stricken families by moving to higher-income neighborhood can experience positive impact on their economic status as they grow up. This is the essence of Move to Opportunity (MTO) through providing housing vouchers for low income families with young children.(Chetty 2016)

Poverty is the main driver for creating adverse socioeconomic conditions with direct impacts on the development of children. There are, however, a number of other factors or conditions which are mostly but not entirely correlated to poverty. They impact the chance of children to grow and become successful adults. This study looks through such factors and brings them together to form an index aimed at depicting the level of early childhood deprivation across various areas. This index can help form a better understanding of the prevailing socioeconomic conditions across all 58 counties within the State of California.

The cost of poverty is an important issue in this study for assessing the economic impact of disinvesting in our young children. Disinvestment can be defined as the inability to take advantage of the existing potential for investing in children and, as a result, losing the opportunity through the creation of a loss. This is a loss which is likely to occur because of allowing the opportunity to slip away. It is important to understand the true meaning of the cost of poverty. Often, it is looked at as how much a state spends on protecting people against poverty, rather than the cost in terms of the full spectrum of the inability of an economy to take full advantage of its available resources. Expenditure on poverty alleviation is only a cost in terms of mitigation, which at best is short-term, and with an objective of supporting those impacted with dire needs such as food, shelter, and medical necessities.

The long-term impact of child abuse and child neglect is an important element of impeding the path of childhood toward becoming a productive and balanced adult. Over the past 10 years, more than 20,000 American children are believed to have been killed in their own homes by family members. (American SPCC 2020)

Three-quarters (74.8%) of child fatalities in FFY 2015 involved children younger than three years old, and children younger than one year old accounted for 49.4% of all fatalities

(Administration for Children & Families 2017) Many researchers and practitioners believe that child fatalities due to abuse and neglect are underreported. (Schnitzer, Gulino, & Yuan 2013)

Children have experienced extreme emotional, psychological, social, behavioral, and developmental consequences because of household violence. Several studies have brought attention to the experiences of children affected by violence and an urgent call has been issued to improve policies and practices to protect and support children and victimized caregivers. (The Benevolent Society 2011)

We have experienced large and increasing numbers of incarcerated parents, and unfortunately, their children have emerged as a forgotten population with their own special needs. (Wright et. al. 2015) explain that parental arrest and incarceration exposes the child to additional risks. The condition may bring separation from the parent and possibly siblings, the inability to find care arrangements, and a great deal of uncertainty about their future. This situation is further aggravated by secrecy and deception regarding the incarceration, stigma, and difficulties with visitation.(The Benevolent Society 2011)

The issue of having children raised away from their parents and, in a more likely case, of being raised by single parents (most likely by mothers) brings the question of whether being raised by single parents may impact children adversely. However, this is a very difficult question since it is more likely that being raised by single parents may bring forth the existence of a lower possibility of family income. Separating the economic impact from other possible impacts (at least theoretically) is a difficult task. We should add to this discussion the added economic burden of growing up in single-family homes headed by mothers. The gender wage gap and other prevailing adversarial economic conditions, known as the feminization of poverty, bring additional negative economic conditions to such households. (Christensen 2019)

Research shows that positive educational experiences early in a child's life can affect his or her future health and well-being. The United States ranks 25th out of 29 industrialized nations in early childhood education investments. Schools, states, and countries can invest in positive interventions to improve life outcomes for children. (Robert Wood Johnson Foundation 2016)

The U.S. Census Bureau projects the number of dual-language learners will continue to rise in the coming decades. The existing estimates suggest that the number may be even higher for children under age 5, as nearly 1 in 3 Head Start participants speak another language. On average, children who are dual-language learners and come from families of low socioeconomic status, enter kindergarten behind their peers in language, literacy, and math; in addition, they experience a higher dropout rate.

Early childhood is also a critical period for the continued development and maturation of several biological systems such as the brain, lungs, and immune system; air toxins can impair lung function and neurodevelopment, or exacerbate existing conditions, such as asthma. Infants who were born premature or growth-stunted may be particularly vulnerable to additional environmental insults, for example, due to immaturity of the lungs at birth. (RabbitAir, 2013)

Rigorous, long-term evaluation studies have found that children who participate in high-quality preschool programs are 40 percent less likely to drop out of school and 50 percent less likely to be placed in special education. (Brown et al. 2013)

The importance of developing and maintaining effective school leadership for positive and systemic change in the areas of improving the lives of families and children has been taken up in current literature. It is recognized that effective school leadership is vital to the success of education and care settings. Without skilled and committed leaders to help shape teaching and learning, the opportunity to create and sustain high-quality learning environments is minimal. Research also shows that leadership is second only to teaching as an influence on learning, and that the quality and practice of leadership are linked in a consistent and demonstrable way to improved student outcomes and educational equity. (Leithwood et al. 2006, The Wallace Foundation 2012)

Early Childhood Deprivation Index (ECDI) for the State of California

A review of the literature brought up a number of issues which explain the challenge families face in supporting their children in the early and later years of their lives. As indicated before, it is impossible to include, or find reliable statistical information for, all the counties across the State of California. Therefore, we selected the following themes and subsequently chose ten indicators which can be employed for the calculation of the Early Childhood Deprivation Index (ECDI).

Thematic Concept Used in Selection of Indicators:

Our survey of literature allowed us to look into a number of studies with a focus on how adverse socioeconomic conditions are likely to reduce the likelihood of children growing up in a positive family and social environment. These themes are as follows:

- Inability to receive the attention they need in the early years of their lives from their parents.
- Economic challenges caused by low-income levels of families and working conditions of parents. This factor includes a significant number of indicators which have their relevance in multiple and interrelated manners.
- Educational attainment of their parents, and in particular, their mothers. We should bear in mind that a significant proportion of children are likely to grow up in a single-parent family. During a child's early ages, it is more likely that the child will be living in a household headed by mothers. Educational attainment is not a mere measure of family income level. It also relates to the ability of parents and caretakers to look for, receive, and use information, which may impact the well-being of their family.
- Ability to have access to health care services (health insurance coverage).
- Social and economic isolation caused by an inability to speak, read, and write in English. Also, this affects the ability to have access to information through a digital device (computer and smartphone and high-speed internet connection).

It is important to depict the socioeconomic conditions of children across different geographic locations within the State of California. Delivery of assistance through direct intervention needs to be geographically contemplated and planned. This is the reason for developing an index, which is called the Early Childhood Deprivation Index, or ECDI.

Aggregate, County Level Socioeconomic Indicators for Composing the ECDI

1. Percentage of Children 0-5 Years Old Living Below 100% FPL The federal poverty level (FPL) is an economic measure used to decide whether the income level of an individual or family qualifies them for certain federal benefits and programs. The Department of Health and Human Services (HHS) updates its poverty guidelines once a year and adjust it for inflation.
2. Percentages of Mothers Who Gave Birth in the Last 12 Months with Less Than a High School Diploma
3. Unemployment Rate of Females with Children 0-5 Years Old
4. Percentages of People Who Speak a Language Other than English and Speak English Less than "Very Well"
5. Percentages of Children 0-5 Years Old Without Health Insurance Coverage
6. Percentages of Children 0-5 Years Old Living with Only their Mother
7. Percentage of Families Receiving Supplemental Nutrition Assistance
8. Percentages of Households with Gross Rent as 50% Percent or More of Household Income
9. Percentages of Grandparent Householders Responsible for Their Own Grandchildren Under 18 Years Old.
10. Percentages of Households without a Computer and/or Internet Connection

We collected the information from published sources for all 58 counties within the State of California. The information has its own units of measurement as percentages indicating the prevailing conditions. The direction of change can be in either of the two sides: high value, which is showing resilience, or the very opposite, which is indicated as the lower value. For example, a lower poverty rate means less austerity, whereas a higher burden of affordability means greater austerity. In addition, the range of numerical values may have unclear impacts on the way we measure vulnerability. We normalized the data and arranged all indicators within a 0 to 100 range. We then adjusted for outliers by manually replacing values more than 100 with 100 and less than 0 with 0. We adjusted the direction of change and brought the direction of indicators to the same side, which is where the high value is indicative of better socioeconomic conditions and the lower value shows the opposite. Details of the indexation can be found in Appendix B.

It should be added that the numerical value of the index is not a rigorous determinant of the level of deprivation in early childhood, as it would be driven through multivariate regression or other quantitative methods. The factors used in the calculation of the index are not unidimensional. The ECDI is built on the assumption that socioeconomic challenges may deprive young children from a good start in their lives.

The methodology used for the calculation of the ECDI is widely used in a number of references, which employ the exact same methodology used in this study. (World Economic Forum 2020, Sachs et al. 2021, Save the Children, 2021, Hollanders 2021, Von Grebmer et al. 2021)

Finally, there is no sound criteria for the weighting of these factors for the formation of the index. Avoiding the criteria for giving weights to the formation of such an index came out in the process of developing the Sustainable Development Goals Index, which is published annually through the well-known Sustainable Development Report, an important and highly recognized international report.

Figure 1: Early Childhood Deprivation Index (ECDI) Across State of California Across Its 58 Counties

	Early Childhood Deprivation Index	Population of Children 0-5 Years Old	Percentage of Children 0-5 Years Old Living Below 100% FPL	Mothers who gave birth in the last 12 months with less than a high school degree	Unemployment Rate of Females with Children 0-5 Years Old	People who have language other than English and speak English less than "very well"	Kids 0-5 Years Old without health insurance coverage	Kids 0-5 Years Old living with only mother	Food Stamps	Gross Rent as 50 Percent or More of Household Income	Grandparents Householders Responsible for Their Own Grandchildren Under 18 Years Old	Households without computer and/or internet connection
Placer County	80.2	25,671	90.9	85.9	89.9	62.7	61.4	98.3	91.4	52.0	78.5	90.9
San Francisco County	77.8	46,762	88.1	74.2	84.2	16.0	84.3	84.0	87.8	92.4	85.2	81.9
San Mateo County	77.8	53,170	89.5	72.6	78.0	38.4	78.7	89.1	95.9	48.8	90.8	96.3
Santa Clara County	77.4	139,011	89.8	69.0	71.2	37.8	80.3	85.3	90.4	64.4	85.7	100.0
Marin County	75.7	14,854	82.2	56.6	82.0	31.5	92.6	89.1	100.0	46.2	79.9	97.5
Inyo County	74.0	1,210	71.8	95.2	84.2	63.8	56.4	100.0	72.6	100.0	45.4	50.7
Sierra County	72.1	123	100.0	100.0	100.0	100.0	100.0	71.1	34.0	4.6	81.1	30.4
El Dorado County	71.0	10,787	85.1	77.8	94.4	62.4	16.9	84.3	83.8	42.4	81.3	81.4
Alameda County	70.1	116,803	79.3	64.9	72.9	38.9	68.5	78.7	80.7	52.3	77.7	87.5
Contra Costa County	69.5	78,532	78.2	58.7	81.4	38.6	68.5	69.4	81.2	43.9	76.7	98.9
San Luis Obispo County	68.5	15,414	84.0	69.6	82.5	50.9	28.5	85.4	89.3	35.6	74.3	84.5
Yolo County	67.6	14,374	68.6	63.1	75.8	48.4	92.2	89.5	62.9	14.6	75.6	85.1
Sonoma County	66.9	30,574	81.1	59.0	84.2	22.0	59.3	70.2	81.2	43.7	78.9	89.8
Nevada County	65.6	4,943	77.0	76.6	100.0	79.9	20.2	75.2	82.2	14.6	56.4	74.3
Plumas County	65.6	871	75.3	60.6	100.0	83.6	100.0	73.4	74.1	44.4	0.0	44.4
Orange County	64.7	223,802	72.9	52.6	78.6	25.8	58.8	73.3	82.2	29.2	77.4	95.8
Mono County	63.6	704	0.0	10.8	100.0	67.5	0.0	99.4	88.3	100.0	100.0	69.9
San Benito County	63.5	4,548	78.5	88.4	58.8	27.2	43.9	47.2	68.5	81.3	49.6	91.8
San Diego County	63.5	248,328	71.2	62.6	66.7	42.1	55.7	71.6	76.6	26.7	68.9	92.6
Napa County	63.3	8,361	90.1	29.1	87.0	20.3	25.9	69.8	91.9	54.1	78.3	86.9
Ventura County	62.4	60,875	77.7	50.5	78.6	35.5	53.8	61.3	76.6	32.7	74.0	83.7
Tuolumne County	62.2	3,146	64.2	90.8	92.1	80.1	0.0	53.1	65.5	53.2	62.9	60.1
Amador County	59.3	1,894	80.1	85.1	45.9	75.3	13.9	56.9	76.1	50.4	38.4	70.8
Lassen County	59.1	1,691	67.5	60.7	67.9	42.4	31.6	67.2	73.1	66.6	68.6	45.8
Trinity County	58.7	662	17.5	100.0	100.0	76.4	22.9	69.6	51.8	57.7	91.4	0.0
Solano County	58.7	31,982	70.9	62.9	42.5	35.5	64.6	48.8	69.5	41.1	57.2	93.5
Alpine County	57.7	48	3.0	100.0	100.0	40.4	100.0	0.0	57.4	100.0	0.0	76.1

County												
Sacramento County	57.7	118,748	55.5	66.9	63.9	31.8	72.4	54.3	55.3	32.2	60.5	83.7
Yuba County	56.9	7,318	59.8	50.1	36.9	49.5	63.5	73.5	41.1	56.8	74.5	63.0
Santa Cruz County	56.4	16,473	71.2	28.4	72.9	33.8	76.2	58.4	67.5	6.9	69.1	79.6
Siskiyou County	56.4	2,971	51.5	52.8	87.0	40.9	75.4	70.3	52.3	54.5	26.3	52.9
Calaveras County	54.7	2,286	64.5	49.0	37.4	82.7	100.0	38.8	73.1	31.6	5.8	64.1
Riverside County	53.5	188,468	60.7	50.2	57.7	41.5	47.9	51.1	65.5	19.9	64.1	76.4
Santa Barbara County	53.3	33,105	71.8	10.3	73.5	21.8	52.5	56.9	72.1	27.4	63.4	83.4
Stanislaus County	52.1	46,769	54.7	55.2	37.4	36.6	69.4	44.0	43.7	41.1	69.6	69.1
Monterey County	51.2	37,802	60.5	0.0	70.7	5.2	61.1	44.3	76.1	48.5	79.0	66.5
Lake County	51.1	4,491	53.1	44.2	100.0	28.6	85.2	26.8	51.8	58.0	27.1	35.9
Modoc County	50.8	534	58.5	85.6	51.0	18.3	0.0	89.9	62.9	63.7	73.6	4.2
Butte County	50.3	15,328	54.0	60.8	55.5	45.2	43.5	54.8	52.3	12.1	51.9	73.1
Los Angeles County	50.2	726,107	57.1	39.8	65.0	27.2	53.2	44.5	68.5	17.5	61.8	67.3
Shasta County	49.9	12,863	42.1	58.0	69.0	68.4	46.6	50.9	55.8	27.4	28.4	52.5
Colusa County	49.7	1,903	54.1	35.9	39.7	31.5	46.4	31.8	32.5	93.0	77.1	55.6
San Joaquin County	49.6	63,029	54.9	37.9	51.5	30.1	69.0	44.0	39.6	38.9	67.7	62.0
Kings County	49.2	13,497	45.7	42.9	58.3	3.7	72.8	36.5	31.0	78.0	71.4	51.5
Humboldt County	47.0	8,816	56.4	75.1	68.4	62.7	4.4	45.9	47.7	0.0	44.8	64.2
Sutter County	46.4	8,007	53.8	9.7	52.6	16.3	43.1	50.9	43.1	82.6	50.8	60.6
Mendocino County	46.3	5,747	21.3	60.7	55.5	34.6	63.6	23.8	61.4	31.6	54.9	55.2
San Bernardino County	43.9	183,975	48.8	41.1	50.4	45.5	51.5	37.1	38.1	25.8	33.6	67.7
Tehama County	43.5	4,463	24.7	67.7	29.5	45.5	78.7	62.5	43.7	29.1	23.0	30.6
Del Norte County	42.6	1,969	56.7	51.7	94.9	58.1	0.0	35.5	18.8	53.2	8.0	48.9
Glenn County	42.1	2,267	45.7	56.5	24.5	36.1	1.7	57.2	47.2	47.4	88.7	16.3
Mariposa County	41.4	927	32.3	70.5	9.8	77.6	100.0	19.6	50.8	17.1	0.0	36.2
Merced County	38.9	25,421	29.4	10.1	48.7	24.6	48.6	24.6	16.2	58.8	63.1	64.9
Madera County	38.5	14,089	31.8	26.5	61.1	25.2	48.4	34.4	25.4	63.8	19.0	49.0
Kern County	37.3	83,745	32.2	17.0	31.8	28.1	61.7	38.4	27.4	39.3	49.5	47.6
Fresno County	34.8	92,439	21.6	28.1	48.7	27.2	61.5	25.0	15.2	21.4	50.5	49.1
Tulare County	32.9	46,529	28.7	7.9	40.8	0.0	69.3	44.5	0.0	35.4	67.2	35.5
Imperial County	22.4	17,884	27.5	16.5	0.0	19.7	65.8	13.0	4.6	38.3	0.0	39.0

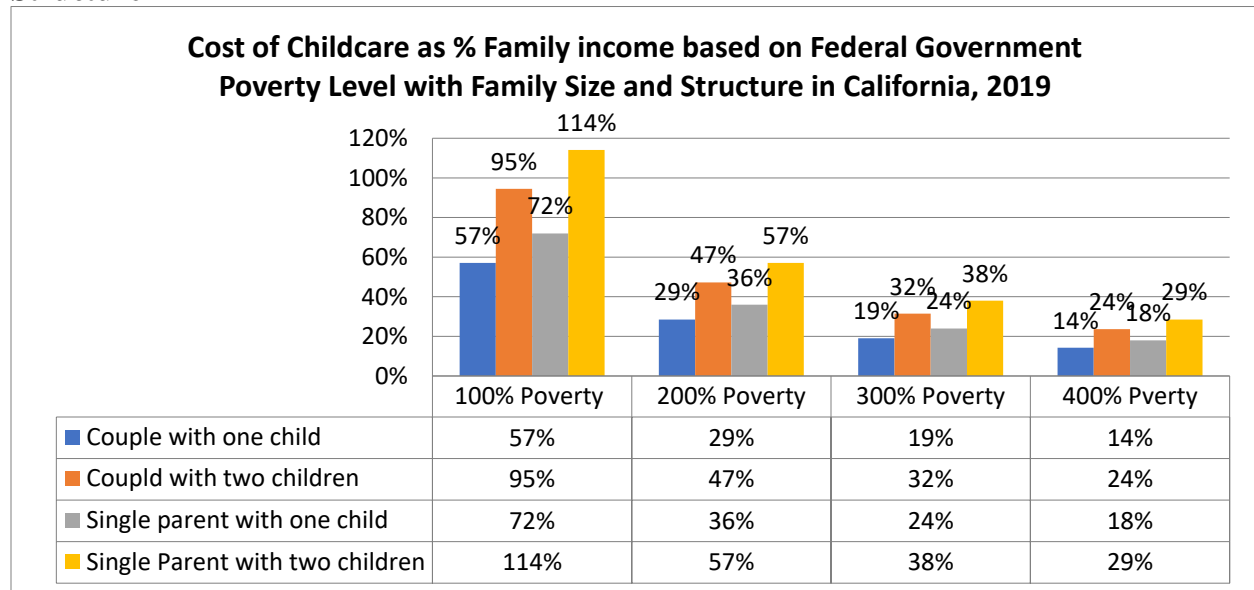**Source:** U.S. Census 2020 and authors' calculations.

The ECDI is not a rigorous measure of the extent of the level of early childhood deprivation in every county. There could be other possible known, or unknown but compelling, socioeconomic factors which may create good reasons for a disproportionate level of unmet needs in a county. One of the limitations on our ability to include other factors is a lack of quantifiable information at the county level for all other factors which may influence ECDI. Furthermore, the level of investment in a geographic area depends on many other conditions, which are not factored into this study. For example, the digital divide is not merely determined by the lack of affordability of households in an area. It can be a function of the lack of infrastructure to provide such services. Providing the needed infrastructure is not a linear function. There are many other complexities in providing the needed assistance which are not factored into this study.

Nonetheless, having ECDI is an important index to rank counties based on the socioeconomic challenges that children and their families face. It can be used as a useful index for basic resource allocation. It is also through the ECDI that any concrete planning at the county level should include a number of other regional designs authenticated for the specific conditions of the region.

Cost of Childcare and the Role of Federal and State Eligibility in Helping Low- and Middle-Income Families in California

The cost of childcare is one of the most pressing economic burdens on many young families. The following exhibits present the picture vividly.

Figure 2: Cost of Childcare As a Percentage of Family Income Within Its Different Structure

Cost of Childcare as % Family income based on Federal Government Poverty Level with Family Size and Structure in California, 2019

	100% Poverty	200% Poverty	300% Poverty	400% Pverty
Couple with one child	57%	29%	19%	14%
Coupld with two children	95%	47%	32%	24%
Single parent with one child	72%	36%	24%	18%
Single Parent with two children	114%	57%	38%	29%

Sources: Authors' calculation based on data provided by the Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services 2019; and, the cost of childcare in the State of California provided by California Child Care Resource & Referral Network 2019

The above chart shows that the cost of childcare is a significant proportion of family income under a wide range of income levels and family structures. This makes it clear that families have the need and are dependent on the eligibility supposedly provided by the federal and state governments, but do get the opportunity to actually receive it.

There are also state subsidies for low- and middle-income families in California. We used the information and calculated the range of family income, which allows California families to potentially benefit from their childcare entitlements.

Figure 3: Range of Family Income Based On Family Size for the State Preschool Eligibility

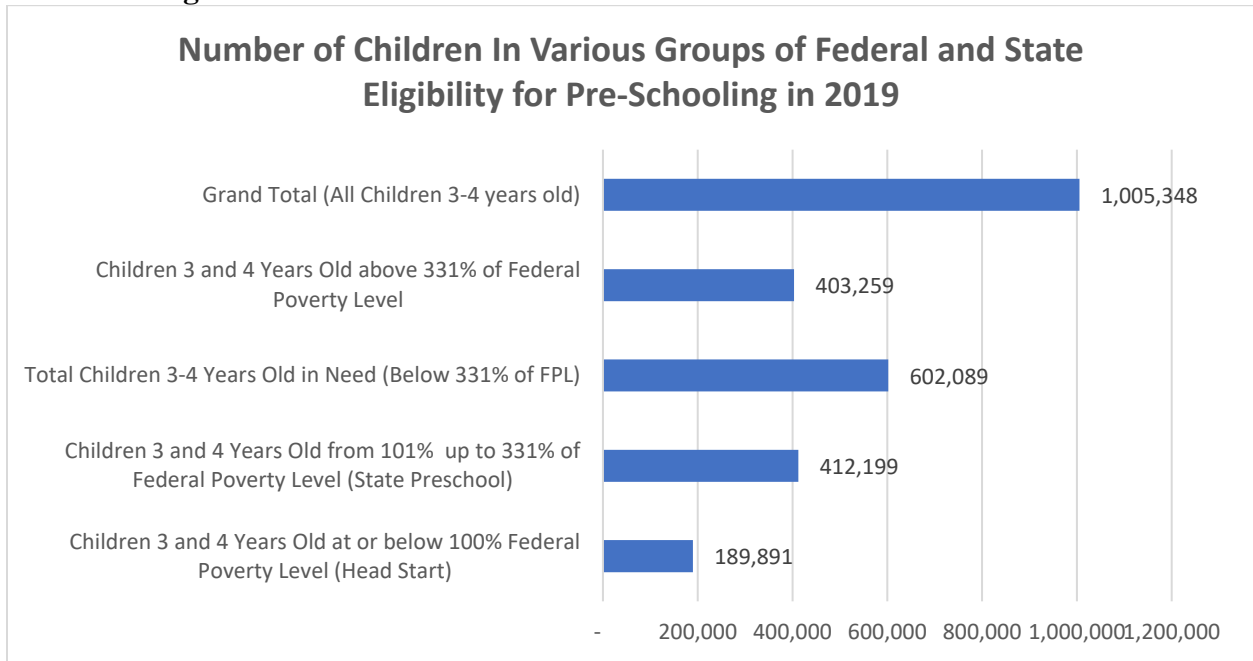| Family Size	Family Monthly Income	Family Yearly Income	Poverty Guideline	Ratio of Income Required for Enrollment in the Program to Poverty Guideline (Percentage Below Poverty)	Poverty Thresholds	Eligibility Criteria
1 – 2	$5,343	$64,120	$12,490	513%		
1 – 2	$5,343	$64,120	$16,910	379%	$16,265	394%
3	$5,802	$69,620	$21,330	326%	$19,992	348%
4	$6,719	$80,623	$25,750	313%	$25,707	314%
5	$7,794	$93,522	$30,170	310%	$30,440	307%
6	$8,869	$106,422	$34,590	308%	$34,439	309%
7	$9,070	$108,841	$39,010	279%	$39,105	278%
8	$9,272	$111,259	$43,430	256%	$43,727	254%

Sources: Office of the Assistant Secretary for Planning and Evaluation, U.S. Department of Health and Human Services 2019, California Department of Education, Early Education and Support Division 2019, and Census Poverty Thresholds 2019

We took the average family size in California to reach a size indicator of 3.54, as can be seen in the table. We should remember that poverty thresholds are reported by family size, not household size. The family size in California is bigger than the average household size. Based on our estimation, income eligibility for state preschool, on average, is about 331% of the Federal Poverty Level. This can be used to estimate the total number of children eligible for state assistance. It is important to know that in 2019 the State of California changed its state eligibility for pre-schooling from 70% of California Median income to 85%. This change made a much bigger number of children become eligible for state pre-schooling assistance.

It is also important to realize that having existing entitlements does not mean that those who qualify for them can always receive them. Social and economic isolations such as digital divide, English Language Isolation and educational attainments of parents may play a role. According to the Rice et al. (2019), a majority of the federal funding for child care and all funding for rental assistance programs is subject to the annual congressional appropriations process. While the programs enjoy bipartisan support, funding is not high enough to serve all eligible families. This partly reflects the overall limits (or caps) on annual funding for appropriated programs that have been in place in recent years, which have made it hard for policymakers to provide enough funding to serve more eligible families. (Rice et al. 2019).

Using the available information, we calculated the number of children in various groups of federal and state eligibility for government supported pre-schooling.

Figure 4: Estimated Number of Children Based on Their State and Federal Eligibility for Pre-Schooling

Number of Children In Various Groups of Federal and State Eligibility for Pre-Schooling in 2019

Category	Value
Grand Total (All Children 3-4 years old)	1,005,348
Children 3 and 4 Years Old above 331% of Federal Poverty Level	403,259
Total Children 3-4 Years Old in Need (Below 331% of FPL)	602,089
Children 3 and 4 Years Old from 101% up to 331% of Federal Poverty Level (State Preschool)	412,199
Children 3 and 4 Years Old at or below 100% Federal Poverty Level (Head Start)	189,891

Source: Authors' calculation, U.S. Census 2020

Figure 5: Eligibility of Children 3 and 4 Years Old for Preschool in the State of California and Its Counties

Eligibility of Children 3 and 4 Years Old for Preschool in the State of California and Its Counties, 2019
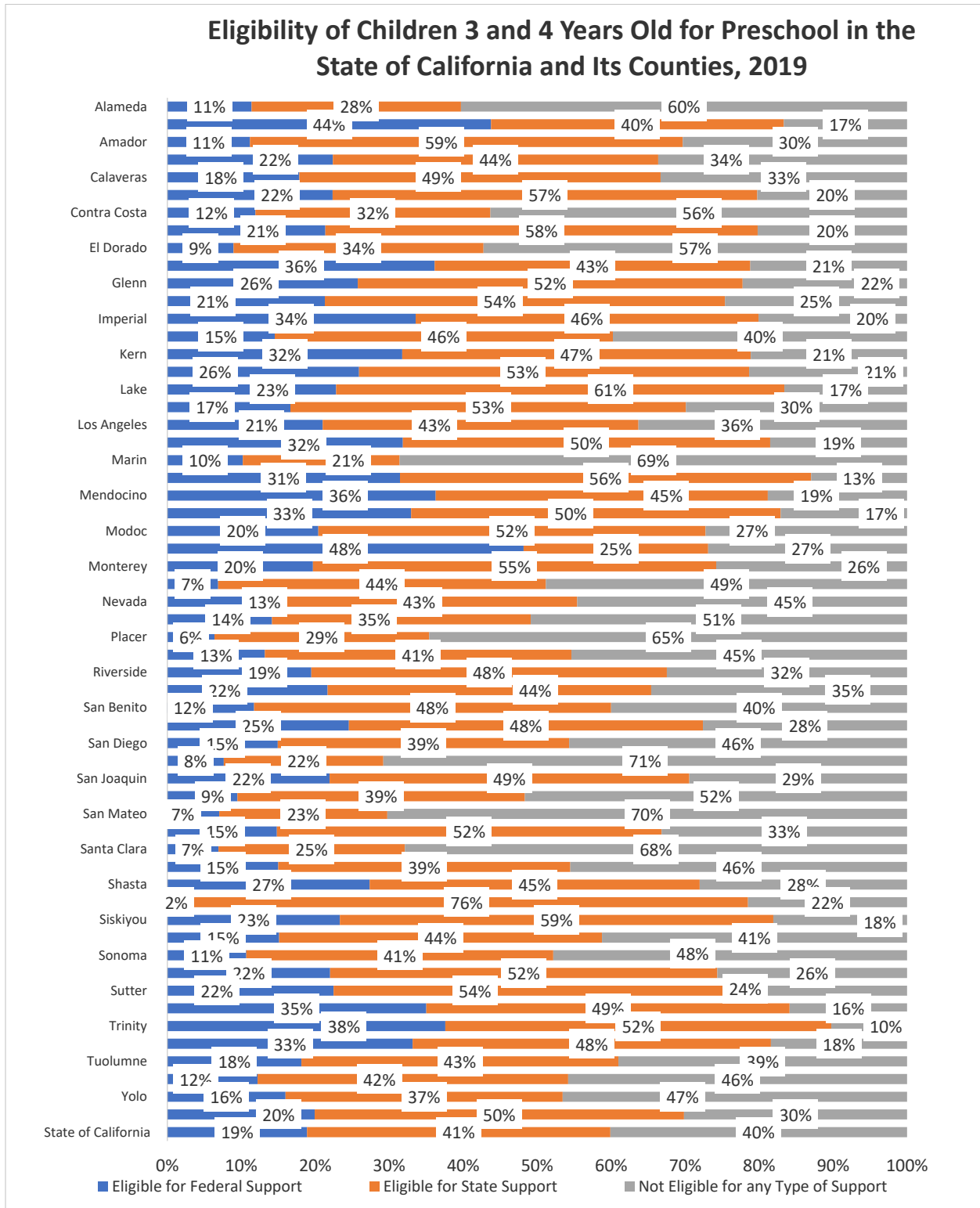
Source: U.S. Census 2020 and authors' calculations.

The above chart shows that 60% of families and their children potentially enjoy either federal or state preschool assistance. This can reach as high as 90% in some counties, and as low as 30% in others. This suggests that a significant proportion of the cost of preschool is already included in the federal or state government entitlement program. The problem is the ability of parents to receive the assistance to which they are entitled. Having a universal early childhood education brings an efficient way of providing such assistance without the often-unnecessary costs of a means-tested system. However, it should not be forgotten that even with universal early childhood education in the state, it is not certain that all families in need will access the service since it is on an optional basis.

Conclusion and Possible Policy Implications

The study creates a composite index, which can explain the range of challenges and their severity in each of the 58 counties within the state. While the value of the index is not a precise quantitative measure of the level of deprivation, it provides a useful map of the challenges captured by ten different socioeconomic indicators separately, and by the overall value of the index. There are compelling arguments in support of efforts in responding to the needs of around one million young children aged three and four years within the State of California. One of the most important takeaways from this study is that the highest proportion of the cost of supporting the annual expenditure per child is already available through federal and state government entitlements.

Early childhood education needs its own infrastructure and we need to plan for the creation of the needed physical structures in various parts of the state in consultation with different counties. The system should become capable of hiring a relatively large number of qualified teachers, trainers, and other specialists. This calls for the creation of additional educational and training capacities in various counties, and statewide. This can be done through public and private universities and colleges. Transportation is one of the important components of the creation of the capacity to serve families and satisfy their needs. Creation of administrative systems that can run the program with the use of a centralized or decentralized structure is essential. Details need to be worked out based on similar experiences around the State of California or other states within the country.

One of the recent developments is the ongoing demographic changes within the state and in its different counties and geographic locations. This may offer some opportunities to reallocate the emerging excess capacity within the school system to pre-kindergarten education. Early childhood needs to gain the trust of families with young children. A successful system needs to educate families and enable them to participate in the process of establishing the system and earn its co-ownership. Creation of a parental support system is essential. This is one of the most crucial segments of creating a successful high-quality preschool program and should be carefully studied and given priority.

We need to enhance the capacity of the system to reach families in need and help them to receive their entitlements in absence of a universal high-quality early childhood education. The most important way of thinking about this issue is to consider the cost of reaching parents as an

investment in making the stem work efficiently. Bearing in mind that even with the establishment of a universal high-quality early childhood education, taking advantage of it will still be optional.

We need to take a number of important steps to allow families to benefit from the system without any limitations due to their socioeconomic status. This can be done through giving a number of provisions serious consideration. They include focusing on counties with higher level of English Language Isolation. They also include using existing nonprofits as well as supporting the creation of additional nonprofits with a focus on assisting families in need. Nonprofits can bring focused attention to helping families in need by reducing the burden of their social and economic isolation. We need to follow the same procedures that are set for school enrollment such as proof of residency, so all children, regardless of their residency status, can enroll in preschools. California is home to millions of undocumented immigrants, and investing in their children is very important. Furthermore, many of these families have children who were born in the United States. Much work lies ahead, but we hope this article provides a sense of the type of actions that could move us in the right direction.

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Appendix A: Real Values of Data Before Indexation

	Percentage of Children 0-5 Years Old Living Below 100% FPL	Mothers who gave birth in the last 12 months with less than a high school degree	Unemployment Rate of Females with Children 0-5 Years Old	People who have language other than English and speak English less than "very well"	Kids 0-5 Years Old without health insurance coverage	Kids 0-5 Years Old living with only mother	Food Stamps	Gross Rent as 50% Percent or More of Household Income	Grandparents Householders Responsible for Their Own	Households without computer and/or internet connection
Alameda County	11.2%	9.4%	4.8%	37.6%	1.9%	17.1%	6.3%	23.5%	2.3%	11.3%
Alpine County	43.8%	0.0%	0.0%	37.1%	0.0%	60.0%	10.9%	12.5%	10.4%	14.0%
Amador County	10.9%	4.0%	9.6%	24.9%	5.1%	24.0%	7.2%	23.8%	4.6%	15.2%
Butte County	22.0%	10.5%	7.9%	35.4%	3.3%	24.7%	11.9%	29.9%	3.8%	14.7%
Calaveras County	17.6%	13.7%	11.1%	22.3%	0.0%	29.7%	7.8%	26.8%	6.5%	16.8%
Colusa County	22.0%	17.2%	10.7%	40.2%	3.2%	31.9%	15.8%	17.0%	2.3%	18.8%
Contra Costa County	11.7%	11.1%	3.3%	37.7%	1.9%	20.0%	6.2%	24.8%	2.3%	8.6%
Del Norte County	20.9%	13.0%	0.9%	30.9%	8.0%	30.8%	18.5%	23.4%	6.3%	20.4%
El Dorado County	8.8%	6.0%	1.0%	29.4%	4.9%	15.3%	5.7%	25.1%	2.1%	12.8%
Fresno County	35.8%	19.3%	9.1%	41.7%	2.3%	34.1%	19.2%	28.4%	3.9%	20.4%
Glenn County	25.6%	11.7%	13.4%	38.6%	5.8%	23.9%	12.9%	24.3%	1.6%	28.1%
Humboldt County	21.0%	6.7%	5.6%	29.3%	5.6%	27.5%	12.8%	31.8%	4.2%	16.8%
Imperial County	33.3%	22.5%	20.7%	44.3%	2.0%	37.9%	21.3%	25.7%	7.6%	22.8%
Inyo County	14.4%	1.3%	2.8%	28.9%	2.6%	10.3%	7.9%	13.9%	4.2%	20.0%
Kern County	31.3%	22.3%	12.1%	41.4%	2.3%	29.9%	16.8%	25.6%	3.9%	20.7%
Kings County	25.6%	15.4%	7.4%	49.9%	1.6%	30.5%	16.1%	19.4%	2.6%	19.8%
Lake County	22.4%	15.0%	0.0%	41.2%	0.9%	33.5%	12.0%	22.6%	5.2%	23.5%
Lassen County	16.3%	10.6%	5.7%	36.4%	4.0%	20.7%	7.8%	21.2%	2.8%	21.2%
Los Angeles County	20.7%	16.2%	6.2%	41.7%	2.8%	27.9%	8.7%	29.0%	3.2%	16.1%
Madera County	31.5%	19.7%	6.9%	42.4%	3.0%	31.1%	17.2%	21.7%	5.7%	20.4%
Marin County	10.0%	11.7%	3.2%	40.2%	0.4%	13.8%	2.5%	24.5%	2.1%	9.0%
Mariposa County	31.3%	7.9%	16.0%	24.1%	0.0%	35.8%	12.2%	29.1%	7.6%	23.4%
Mendocino County	36.0%	10.6%	7.9%	39.1%	2.1%	34.5%	10.1%	26.8%	3.6%	18.9%
Merced County	32.5%	24.2%	9.1%	42.6%	3.0%	34.2%	19.0%	22.5%	3.1%	16.6%
Modoc County	20.1%	3.9%	8.7%	44.8%	17.4%	13.6%	9.8%	21.7%	2.5%	31.0%
Mono County	48.2%	24.0%	0.0%	27.6%	15.3%	10.5%	4.8%	10.6%	1.0%	15.5%
Monterey County	19.3%	26.9%	5.2%	49.4%	2.3%	28.0%	7.2%	24.1%	2.2%	16.3%
Napa County	6.7%	19.1%	2.3%	44.1%	4.4%	19.9%	4.1%	23.2%	2.2%	11.5%
Nevada County	12.3%	6.3%	0.0%	23.3%	4.7%	18.2%	6.0%	29.5%	3.5%	14.4%
Orange County	14.0%	12.7%	3.8%	42.2%	2.4%	18.8%	6.0%	27.2%	2.3%	9.4%
Placer County	6.3%	3.8%	1.8%	29.3%	2.3%	10.9%	4.2%	23.5%	2.2%	10.5%
Plumas County	13.0%	10.6%	0.0%	22.0%	0.0%	18.8%	7.6%	24.8%	8.0%	21.5%
Riverside County	19.2%	13.4%	7.5%	36.7%	3.1%	25.8%	9.3%	28.6%	3.1%	13.9%
Sacramento County	21.4%	8.9%	6.4%	40.1%	1.6%	24.8%	11.3%	26.7%	3.3%	12.2%
San Benito County	11.6%	3.1%	7.3%	41.7%	3.3%	27.1%	8.7%	18.9%	3.9%	10.3%
San Bernardino County	24.3%	15.8%	8.8%	35.3%	2.9%	30.3%	14.7%	27.7%	4.8%	16.0%
San Diego County	14.7%	10.0%	5.9%	36.5%	2.6%	19.3%	7.1%	27.6%	2.8%	10.1%
San Francisco County	7.5%	6.9%	2.8%	45.6%	0.9%	15.4%	4.9%	17.1%	1.8%	12.6%
San Joaquin County	21.6%	16.7%	8.6%	40.7%	1.8%	28.1%	14.4%	25.6%	2.9%	17.3%
San Luis Obispo County	9.3%	8.2%	3.1%	33.4%	4.2%	15.0%	4.6%	26.2%	2.5%	12.0%
San Mateo County	6.9%	7.4%	3.9%	37.8%	1.3%	13.8%	3.3%	24.1%	1.5%	9.2%
Santa Barbara County	14.5%	24.1%	4.7%	43.6%	2.8%	24.0%	8.0%	27.5%	3.1%	12.3%
Santa Clara County	6.8%	8.3%	5.1%	38.0%	1.2%	15.0%	4.4%	21.6%	1.8%	8.4%
Santa Cruz County	14.7%	19.2%	4.8%	39.4%	1.4%	23.5%	8.9%	30.7%	2.8%	13.2%
Shasta County	27.1%	11.3%	5.5%	27.3%	3.1%	25.9%	11.2%	27.5%	5.1%	19.6%

Sierra County	2.4%	0.0%	0.0%	3.5%	0.0%	19.5%	15.5%	31.1%	2.1%	24.8%
Siskiyou County	23.1%	12.7%	2.3%	36.9%	1.4%	19.8%	11.9%	23.1%	5.3%	19.5%
Solano County	14.8%	10.0%	10.2%	38.8%	2.1%	26.6%	8.5%	25.3%	3.5%	9.9%
Sonoma County	10.5%	11.0%	2.8%	43.5%	2.4%	19.8%	6.2%	24.9%	2.2%	10.8%
Stanislaus County	21.7%	12.0%	11.1%	38.4%	1.8%	28.1%	13.6%	25.3%	2.7%	15.6%
Sutter County	22.1%	24.3%	8.4%	45.5%	3.3%	25.9%	13.7%	18.7%	3.8%	17.7%
Tehama County	34.5%	8.7%	12.5%	35.3%	1.3%	22.2%	13.6%	27.2%	5.5%	24.7%
Trinity County	37.6%	0.0%	0.0%	24.5%	4.5%	20.0%	12.0%	22.6%	1.5%	32.0%
Tulare County	32.8%	24.8%	10.5%	51.2%	1.8%	27.9%	22.2%	26.2%	2.9%	23.6%
Tuolumne County	17.7%	2.5%	1.4%	23.2%	6.1%	25.2%	9.3%	23.4%	3.1%	17.8%
Ventura County	11.9%	13.3%	3.8%	38.8%	2.7%	22.6%	7.1%	26.6%	2.5%	12.2%
Yolo County	15.8%	9.9%	4.3%	34.3%	0.5%	13.7%	9.8%	29.5%	2.4%	11.9%
Yuba County	19.6%	13.4%	11.2%	33.9%	2.1%	18.7%	14.1%	22.8%	2.5%	17.1%

Appendix B: Preparation of Data for Indexation

We collected the information from published sources for all 58 counties within the State of California. The information has its own units of measurement as percentages indicating the prevailing conditions. The direction of change can be in either of the two sides: high value, which is showing resilience, or the very opposite, which is indicated as the lower value. For example, a lower poverty rate means the area experiences less austerity, whereas a higher burden of affordability means greater austerity. In addition, the range of numerical values may have unclear impacts on the way we measure vulnerability.

We took the following steps to prepare our indicators for the creation of a composite index:

- **Finding Outliers:** We took a series of actions to find the outliers in our data series.
- **Normalization of Data Without Outliers:** We adjusted the outliers by manually replacing values more than 100 with 100, and less than 0 with 0. We then took the minimum and maximum of the data we had and used the following formula for normalization of each value, where each value is **x** (x-new min) / (new max-new min), multiplied by 100. By employing these steps, we arranged all indicators within the 0 to 100 range. We then adjusted for outliers by manually replacing values more than 100 with 100, and less than 0 with 0.
- **Uniformity of Values and Color Coding of the Data:** We transformed the data in a way where low values uniformly indicate higher vulnerability, and high values uniformly indicate lower vulnerability, for every ZIP code. Thus, data originally indicating the opposite were converted to (100-x), where **x** stands for the observed value showing a direct relationship with higher vulnerability. Consequently, low values consistently indicated a higher level of vulnerability and high values consistently indicated low vulnerability. We then added the following color-coding system:
  - Values between 0 and 20 are Red
  - Values between 20.1 and 40 are Orange
  - Values between 40.1 and 60 are Yellow
  - Values between 60.1 and 80 are Light Green
  - Values between 80.1 and 100 are Dark Green

Following those established color codes, we generated our index by setting it to show 100 where there is no vulnerability, and 0 where the conditions are indicative of extreme vulnerability. The results are presented in the table included in the body of this article. The raw data gathered and processed into the index values can be found in Appendix A.