The 2017 YMCA-Duke University Child and Youth Well-Being Index (CWI) Report, Including:

- Values of the CWI for the Years 1975–2015,
- An Initial Estimate of the Index for 2016, and
- A Special Emphasis on Trends in Well-Being for Male and Female Children and Youth

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Kenneth C. Land, CWI Project Coordinator
Duke University
Durham, North Carolina
Executive Summary

Overview

Each year, the Child and Youth Well-Being Index Project at Duke University publishes a report on a comprehensive measure of how children are faring in the United States. This year’s report is published in partnership with the YMCA of the USA, Chicago, Illinois.

The National Child and Youth Well-Being Index (CWI) is based on a composite of 28 Key Indicators of Well-Being, grouped into seven Quality-of-Life/Well-Being Domains. These Domains are: Family Economic Well-Being, Safe/Risky Behavior, Social Relationships, Emotional/Spiritual Well-Being, Community Engagement, Educational Attainment, and Health.

This year’s report includes:

- calculated values of the CWI for each of the years from 1975, the base year of the Index, to an updated estimate of the CWI for 2015, based on observed values of Key Indicators that have become available since last year’s report;

- an initial estimate of the CWI for 2016 based on those observed values of the Key Indicators for 2016 that are currently available, along with projections of the other Key Indicators;

and highlights:

- trends in well-being for male and female children and youth.
Major Findings

For the Overall, Composite National Child and Youth Well-Being Index (CWI):

- Both the updated estimate of the CWI for 2015 and the preliminary estimate for 2016 are substantially above the 2012 low point of the Index in the aftermath of the impact of the Great Recession.

- And, since the Great Recession and its aftermath (2008 to 2012) – the short-term trend, our preliminary estimates for 2015 and 2016 have exceeded the CWI levels of 2006, 2007, and 2008 which were the previous highs for the Index.

- The long-term trend in the CWI is indicative of a small, but continued, overall improvement in the 40 years since the 1975 base year of the Index.

- By comparison, medium-term changes in the CWI over the past 20 years since 1997 show substantial improvements.

- And short-term changes in the CWI over the past four years, 2013, 2014, 2015, and 2016, based on updated estimates of Key Indicators for 2015 and initial estimates for 2016, suggest that there were substantial and statistically significant improvements in overall child and youth well-being from 2015 to 2016.

Special Emphasis Report—Trends in Well-Being for Male and Female Children and Youth:

- The medium-term trend (last 20 years, from 1997 to 2016) in the composite gender-specific CWIs show larger improvements in well-being from their 1985 base year values for female, compared to male, children and youth.

- These medium-term trends also show larger negative impacts of the Great Recession on the well-being of males than females from 2009 to 2012.

- Since 2012, the short-term trend in the overall CWI for males has increased and converged closer to that of females.

- The negative impact of the Great Recession on the CWI for male children and youth was due to declines in a number of the Community Engagement Key Indicators. The trend of the female Community Engagement Domain did not show the same effect.

- The greatest domain improvement from 1997 to 2016 has been for Safe/Risky Behavior for both male and female children and youth. In the early 1990s the values for this domain was below the 1985 levels, due, in part, to the juvenile crime wave
that was occurring during that time period. Since the early 1990s, this domain has steadily increased to be the most improved compared with the 1985 values for both males and females.

- As with the overall trend in CWI domains, the trends for gender-specific Health and Emotional/Spiritual Well-Being Domains continue to be below 1985 values for both male and female children and youth. In the 2016 Annual Report, a Special Emphasis Report focused on the causes for the recent downturns in the Emotional/Spiritual Well-Being domain. These are particularly due to increases in suicide rates since 2007, a trend that ethnographic research has linked to the widespread diffusion and use of electronic/social media in this most recent 10-year period.
The National Child and Youth Well-Being Index (CWI), 1975–2016

I. A Brief Overview

The Child and Youth Well-Being Index (CWI) is an evidence-based composite measure of trends over time in the quality of life of America’s children from birth up to the 18th birthday. The CWI tracks changes in the well-being of children annually compared to 1975 base-year values.

The CWI is designed to address the following questions:

- On average, how did child and youth well-being in the U.S. change since 1975?
- Did child well-being improve or deteriorate?
- By approximately how much?
- In which Domains of Well-Being?

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1 The geographical focus of the CWI in this Report is the U.S., that is, the nation as a whole. The conceptual framework and methodology of the CWI also has been applied at the level of the 50 U.S. states (see O’Hare, William P., Mark Mather, Genevieve Dupuis, Kenneth C. Land, Vicki L. Lamb, and Qiang Fu 2013 “Analyzing Differences in Child Well-Being Among U.S. States.” Child Indicators Research 6(June):401–413) and to regions within the states (see Lee, Joonkoo, Vicki L. Lamb, and Kenneth C. Land 2009 “Composite Indices of Changes in Child and Youth Well-Being in the San Francisco Bay Area and the State of California, 1995-2005.” Child Indicators Research 2(December):353-374).

2 In previous years, the Foundation for Child Development, which has funded the development and research of the CWI, also managed the release of the Annual CWI Reports. Accordingly, the CWI previously was known as the Foundation for Child Development Child and Youth Well-Being Index (FCD-CWI). Beginning with the 2014 Annual CWI Report, the release of the CWI is managed by the Center for Child and Family Policy at Duke University. Thus, for consistency with the previous branding of the Index, it now can be termed the Duke Center for Child and Family Policy Child and Youth Well-Being Index (DCCFP-CWI). Since this label is too long, for simplicity we term it the Duke CWI for short.

3 The CWI is evidence-based in two senses. First, the Index is based on statistical time series of empirical data on the Key Indicators. Second, the Domains of Well-Being and the choices of the Key Indicators within each Domain are based on decades of studies of well-being, including both quantitative and qualitative research on the well-being of children, adolescents, teenagers, and young adults (see Land, Kenneth C., Vicki L. Lamb, and Sarah Meadows 2012 “Conceptual and Methodological Foundations of the Child and Youth Well-Being Index.” Pp. 13-28 in Land, Kenneth C. (ed.) 2012 The Well-Being of America’s Children: Developing and Improving the Child and Youth Well-Being Index. New York: Springer).

4 Or, as stated using Census/demographic notation, ages 0 to 17 at last birthday. Some of the Key Indicators in the CWI use slightly higher or slightly lower upper bounds, because of the age intervals in which the Indicators are reported. Our analyses, however, have found that the main focus of the CWI—the measurement of trends over time—is not greatly affected by these small differences in upper-age boundaries.
The CWI, a composite index based on data from 28 Key Indicators, is computed and updated annually. Observed data on 26 of the 28 Key Indicators are currently available through the year 2015, and observations are available on 16 of the 28 Key Indicators for 2016. The remaining Indicators are projected for 2015 and 2016 by use of statistical time series and demographic projection models. Accordingly, this report includes the calculated values of the CWI for the years 1975–2015, and an initial estimate of the CWI for 2016.

The objective of the CWI is to give a view of changes over time in the overall well-being of children and youth in the United States. The composite Index, an equally-weighted average of its seven Quality-of-Life/Well-Being Domains, provides a sense of the direction of change in overall well-being, as compared to the 1975 base year of the indicators. For this reason, the focus of the Index is not primarily on specific Indicators, but rather on the way in which they interact and change over time.

As a composite index of changes over time, the most important information to be found in the CWI is in the direction of change in Key Indicators and Well-Being Domains: Are the indices up, and thus indicative of overall improvements? Down, and thus indicative of deterioration? Flat, and thus indicative of little or no change?

Children and youth live unique lives; each experiences a range of social conditions at different points. The Index comprises Key Indicators associated with different stages of the first two decades of life. Different Indicators capture children and youth at different stages of life. During the early childhood years, for example, PreKindergarten enrollment is an Indicator of early schooling participation, while the violent crime victimization rate is indicative for ages 12–17.

The overall CWI includes the following 28 Key Indicators, organized into seven Quality-of-Life/Well-Being Domains that have been found in many social science studies to be related to an

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5 For a description of the autoregressive integrated moving average (ARIMA) models used to project each individual Key Indicator time series, see pp. 70–71 in Land, Kenneth C. (ed.) 2012 The Well-Being of America’s Children: Developing and Improving the Child and Youth Well-Being Index. New York: Springer.

6 The basic CWI that is the subject of this report is focused on the population of all American children and youth. As part of our research on child well-being, however, we also have studied time trends in the CWI for children classified by race/ethnicity, family income levels, and immigrant status (see pp. 29–76 and 77–120 of Land, Kenneth C. (ed.) 2012 The Well-Being of America’s Children: Developing and Improving the Child and Youth Well-Being Index. New York: Springer). These studies generally show that, when the overall CWI changes (increases, decreases) by 1 unit, the CWI for children from African American and Hispanic families and from families in the lowest quintile of the income distribution correspondingly changes (increases, decreases) by 1.5 to 2 units. That is, children from African American and Hispanic families and from families in the lowest quintile of the income distribution, on average, benefit more than the total child and youth population when the CWI increases and are negatively affected more than the total child and youth population when the CWI decreases. Part of the reason for these multipliers being larger than 1 is that children from white and Asian families and from families in the upper parts of the income distribution generally fare better on the well-being outcomes measured by the CWI and have less to gain during periods of overall increasing child well-being than those from other race/ethnic groups and at lower levels of the family income distribution.

7 On equal-weighted averages for well-being indices as statistical estimators, see Appendix A.
overall sense of subjective well-being or satisfaction with life. Each Domain represents an important area that affects quality of life:

**Family Economic Well-Being Domain**
1. Poverty Rate (All Families with Children Ages 0–17)
2. Secure Parental Employment Rate (All Families with Children Ages 0–17)
3. Median Annual Income (All Families with Children Ages 0–17)
4. Rate of Children with Health Insurance (All Families with Children Ages 0–17)

**Safe/Risky Behavior Domain**
1. Teenage Birth Rate (Ages 10–17)
2. Rate of Violent Crime Victimization (Ages 12–19)
3. Rate of Violent Crime Offenders (Ages 12–17)
4. Rate of Cigarette Smoking (Grade 12)
5. Rate of Binge Alcohol Drinking (Grade 12)
6. Rate of Illicit Drug Use (Grade 12)

**Social Relationships Domain**
1. Rate of Children in Families Headed by a Single Parent (All Families with Children Ages 0–17)
2. Rate of Children Who Have Moved Within the Last Year (Ages 1–17)

**Emotional/Spiritual Well-Being Domain**
1. Suicide Rate (Ages 10–19)
2. Rate of Weekly Religious Attendance (Grade 12)
3. Percent Who Report Religion as Being Very Important (Grade 12)

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8 See footnote 2. Some Key Indicators can be assigned to more than one Well-Being Domain, but, for purposes of Domain-Specific and Overall Index construction, each is included in only one Domain.

9 The label “Material Well-Being” has also been used for this Domain.

10 The label “Safety/Behavioral Concerns” has also been used for this Domain.

11 The upper age limit of 19 is used for this indicator, as the data series for this Key Indicator are not available for ages 12–18 separately.

12 The Monitoring the Future (MTF) Project is the source of time series data for five of the Key Indicators (Rates of Cigarette Smoking, Binge Alcohol Drinking, and Illicit Drug Use in this Domain, as well as Rate of Weekly Religious Attendance and Percent Who Report Religion as Being Very Important in the Emotional/Spiritual Well-Being Domain). The MTF Project originally began as the High School Senior Survey in 1975, with surveys of national samples of seniors (modal age 18) in U.S. high schools taken in the spring of the academic school year. Samples of 8th graders (modal age 14) and 10th graders (modal age 16) were added in 1991. In studies of time series of MTF data on these five Key Indicators, we have found substantial covariation over time among the 8th, 10th, and 12th grade responses. For this reason, and because the 12th grade data extend back to the principal base year of the CWI Project, 1975, we use the 12th grade time series as data for these five Key Indicators.

13 The upper age limit of 19 is used for Suicide Rate (Emotional/Spiritual Domain) as well as Mortality Rate and Rate of Obese Children and Adolescents (Health Domain), as these data series are not available for an upper age limit of 18.
Community Engagement Domain

1. Rate of Persons Who Have Received a High School Diploma (Ages 18–24)
2. Institutionally Disconnected Youth Rate (Ages 16–19)
3. Rate of PreKindergarten Enrollment (Ages 3–4)
4. Rate of Persons Who Have Received a Bachelor’s Degree (Ages 25–29)
5. Rate of Voting in Presidential Elections (Ages 18–24)

Educational Attainment Domain

1. Reading Test Scores (Averages of Ages 9, 13, and 17)
2. Mathematics Test Scores (Average of Ages 9, 13, and 17)

Health Domain

1. Infant Mortality Rate
2. Low Birth Weight Rate
3. Mortality Rate (Ages 1–19)
4. Rate of Children with Very Good or Excellent Health (Ages 0–17, as reported by parents)
5. Rate of Children with Activity Limitations due to Health Problems (Ages 0–17, as reported by parents)
6. Rate of Obese Children and Adolescents (Ages 6–19)

Appendix A briefly describes the Methods of Index Construction for the CWI. Sources for time series data on the Key Indicators are presented in Appendix B.

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14 This Domain includes participation in educational, economic, and political institutions. The labels “place in community” and “community connectedness” also have been used for this Domain in previous CWI Reports.
15 Since some youth are delayed in completing the requirements for high school diplomas or General Education Equivalent (GED) degrees, a higher upper age limit is used for this Key Indicator series.
16 The rate of those ages 16 to 19 who are not working and not in school. The upper age limit of 19 is used for this Indicator, as the data series is not available for an upper age limit of 18.
17 Similarly to the use of a higher age limit for the high school diploma Key Indicator, a higher age limit is used for this series, in order to index trends in commitment to, and participation in, higher education institutions.
18 Since the legal voting age for presidential elections is 18, ages 18–24 are used to represent trends in youth voting behavior.
19 Those Key Indicators that do not directly measure outcomes for children and youth are proxy Indicators of the same. For instance, data are not available on direct measure of the poverty status of children, only on the poverty status of families that have children up to age 18. However, it is not strained to infer that a child living in a family whose income falls below the poverty line has a poverty-level economic well-being. Thus, the poverty status of the family is used as a proxy Indicator for the poverty status of the child.
II. Annual Update of the Overall National Child and Youth Well-Being Index (CWI) and Its Seven Domain-Specific Component Indices

Each year, we report the updated values of the overall CWI through the most recent year. Figure 1 charts annual percentage changes since 1975 in the overall composite CWI, with the value of the CWI in the base year 1975 set equal to 100.\textsuperscript{20} For all Key Indicators and Domain Indices of the CWI, a numerical value above 100 indicates an improvement in overall child and youth well-being, as compared to 1975 base-year values. For example, an Index value of 102 would indicate, on average across all Key Indicators and Domains, a two percent improvement in well-being compared to the values of the Indicators and Domains in 1975, whereas an Index value of 97 would indicate a deterioration of three percent compared to 1975 values.

\textsuperscript{20} The specific annual numerical values of the overall CWI, from which Figure 1 is constructed, are provided in Appendix C.
As stated in the Overview of the CWI in Section I, the overall, composite CWI has seven Well-Being Domain Indices: Family Economic Well-Being, Safe/Risky Behavior, Social Relationships, Emotional/Spiritual Well-Being, Community Engagement, Educational Attainment, and Health. To help interpret the changes in the overall CWI in Figure 1, Figure 2 charts annual percentage changes since 1975 in these seven domain-specific indices, with their values in the base year 1975 set equal to 100.

Trends in the overall, composite CWI (Figure 1) and in its domain-specific indices (Figure 2) give a sense of changes in child and youth well-being in the long-term (since the base year 1975), in the medium-term (the past couple of decades), and in the short-term (the last few years). The long-term and medium-term time frames yield a historical perspective, as values of the Index for the 1980s and early 1990s pertain to individuals who were children at that time but are part of today’s parental cohorts.

Over the long-term of 40 years (1975–2016), Figure 1 shows that the CWI has had periods of both deterioration and improvement. Through the late-1970s, the CWI oscillated at levels near the 1975 base year value of 100; it then showed a decline beginning in 1980 and ending in 1994 with a value of 91.60. Previous annual CWI reports have shown the roots of this decline in the economic recession of the early 1980s (which negatively affected the Family Economic Well-Being Domain Index; see Figure 2); in changing family structures (toward more single-parenting; see the Social Relationships Domain Index in Figure 2); in an upturn in risky behavior (especially increases in teenage childbearing, illicit drug use, and violent crime victimization and
offending; see the Safe/Risky Behavior Domain Index in Figure 2); and the beginnings of the trend towards an increasing prevalence of obese children (which negatively impacted the Health Domain Index; see Figure 2).

**In the medium-term of the past 20 years from 1997 to 2016, the CWI initially increased through the late-1990s, reaching a peak of 102.87 in 2002.** Previous annual CWI reports have shown that this period of increase was associated with the rapidly expanding economy of the late-1990s (see the Family Economic Well-Being Index in Figure 2), the stabilization of family structures (see the Social Relationships Domain Index in Figure 2), and lower levels of risky adolescent/teenage behavior (see the Safe/Risky Domain Index of Figure 2).

In the years following 2002, the Index declined from its 2002 peak of 102.87 and then increased to 103.18 in 2006 and 103.61 in 2007. After 2007, the CWI shows the imprint of the Great Recession of 2008–2009 and its aftermath, for which the lowest value of the CWI, 102.80, was recorded for 2012. In the most recent years, the Index values are 103.01 in 2013, 103.32 in 2014, an updated estimate of 103.72 for 2015, and an initial estimate of 104.82 for 2016. The difference in the CWI from 2015 to 2016 thus is 1.10. The domain-specific summary indices shown in Figure 2 suggest that this year-to-year improvement was associated with a substantial increase in the Family Economic Well-Being Index from 2015 to 2016.

**In summary, the long-term trend in the CWI, taking into account the improvements in some Well-Being Domains and Key Indicators and deteriorations in others, yields values of the Index in the most recent years (2013, 2014, 2015, and 2016) well above the 100 base year value of 1975. In other words, the predominant long-term trend in the CWI over the past 40 years is indicative of a small, but increasing, improvement in overall child and youth well-being.**

By comparison, **medium-term changes in the CWI over the past 20 years show substantial improvements, from 94.33 in 1997 to an estimated 104.82 in 2016, largely due to recovery from the declines of the late-1980s/early-1990s and, most recently, from the downturn associated with the Great Recession and its aftermath.**

And **short-term changes in the CWI over the past four years, 2013, 2014, 2015, and 2016, based on updated estimates of Key Indicators for 2015 and initial estimates for 2016, suggest that there were substantial and statistically significant improvements in overall child and youth well-being from 2015 to 2016.**

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21 As noted in Appendix C, a year-to-year change in the CWI of 1.0 or greater is statistically significant relative to the estimated time series standard errors of year-to-year variation in the CWI. Accordingly, it can be stated that the CWI series plotted in Figure 1 is indicative of a statistically significant improvement in overall child and youth well-being from 2015 to 2016. However, this statement must be accompanied with the caution that the updated 2015 value of the CWI shown in Figure 1 is based on time series projections of two of its 28 Key Indicators, and the initial value estimated for 2015 is based on 12 projected Key Indicators.
III. Special Emphasis Report: Trends in Well-Being for Male and Female Children and Youth

The 2016 Duke CWI Report included special emphasis analyses of 1) recent trends in well-being disparities among white, African American, and Hispanic children and youth, and 2) the recent downturn in emotional/spiritual well-being.

This year we update a report on gender differences from our 2005 Social Indicators Research article, in which we reported that:

The results are mixed – they show that for both boys and girls, some of the seven domains of well-being have improved since 1985, while others have deteriorated. Since 1995, overall well-being indices for boys and girls have shown significant improvement and 2001 levels were well above 1985 baseline figures. A direct comparison of male and female well-being reveals that the absolute level of gender differences in the summary well-being index decreased in the late 1980s, increased through the mid-1990s, peaked in 1997, and declined thereafter. It is concluded that gender differences in well-being, when they do exist, are very slight and that overall, both boys and girls in the United States currently enjoy a higher quality of life than they did in 1985 (p. 1).

With the passage of over a decade and the additional time series information on the Key Indicators of the CWI and its Domain and Overall Indices, we now ask: How have things changed?

To address this question, Figure 3 updates the gender-specific CWI series. Data on most of the Key Indicators used in the construction of the CWI have had sufficient gender identifiers since the mid-1980s to allow computation of the CWI for male and female children and youth. Accordingly, 1985 is the base year for the gender trends in child and youth well-being displayed in Figure 3, using the 28 Key Indicators from the CWI.

The trends of the gender-specific CWIs in Figure 3 show, first of all, that the fluctuations in overall improvement and decline in the Child-Well-Being Index in Figure 1 have historically applied for both male and female children and youth. In other words, when overall child and youth well-being improves, the improvements benefit male and female children, and, when overall child well-being declines, the declines affect both groups. This was particularly evident in our 2005 publication which showed the overall male and female CWI tracking very closely together.

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23 Key Indicators by gender for Family Economic Well-Being indicators are not available. We assume, however, that boys and girls experience similar rates of family poverty, secure parental income, median family income, and access to health insurance.
However, our updated trends also show that the CWI for males is more negatively affected by economic downturns than that of females. This is particularly evident during the Great Recession of 2008-2009 and its aftermath. The male CWI values for the years 2009 to 2013 were 3.95 to 5.09 points below those of females.

![Figure 3. Gender-Specific Summary Indices of Child and Youth Well Being, 1985 - 2016](image)

Figures 4 and 5 present the domain-specific indices of the CWI for males and females, respectively.

The largest improvements in the CWI for both genders has been in the Safe/Risky Behavior Domains. As we indicated in our 2005 publication, during the early 1990s this domain decreased markedly for males and females. This was in part due to the juvenile crime wave that was occurring in the U.S. during this period. Since 1994, the Safe/Risky Behavior Domain has steadily increased to become the most improved domain compared to the 1985 base year levels for males and females.

As with the trends in Figure 1, both male and female children and youth have domain index values for Health and Emotional/Spiritual Well-Being below the 1985 baselines. Health is primarily impacted by obesity rates, and the Emotional/Spiritual domain values reflect declines in religious participation, and the importance of religion. In addition, suicide rates have been on the increase since 2007 for both genders.
Figure 4. Domain-Specific Indices of Child and Youth Well-Being for Males, 1985 - 2016.

Figure 5. Domain-Specific Indices of Child and Youth Well-Being for Females, 1985 - 2016.
An examination of the Figures 4 and 5 highlights the impact of the Great Recession on the Community Engagement Domain, for males compared with females, starting in 2009. The trend for females continues to rise for the years 2009-2012, whereas the trend for males declines in 2009 and 2010 and does not exceed its 2008 value until 2015. The factors contributing to this increased difference were greater declines in education completion rates of males (both high school diploma and bachelor’s degrees) and to increases in institutional disengagement (percent ages 16 to 19 not working and not in school). Figure 6 contains graphs showing the percentage points by which female high school diploma and college degree attainments exceed those of males for each of the years 2007 to 2014. It can be seen that the female advantage for receipt of high school diplomas especially increased in 2009 to 2011 and that for receipt of bachelor’s degrees increased for 2008 to 2011.

In summary, the principle conclusions from this update of the gender-specific CWIs in Figure 3 are:

- The medium-term (last 20 years, from 1997 to 2016) trends in the composite gender-specific CWIs of Figure 3 show larger improvements in well-being from their 1985 base year values for female, compared to male, children and youth.
• These medium-term trends also show a greater negative impact of the Great Recession on the well-being of male from 2009 to 2012.

• Since 2012, the overall CWI for males has increased to become closer to that of the females.

In summary, the principle conclusions from the comparison of the male and female domain-specific trends in Figures 4, 5, and 6 are:

• The negative impact of the Great Recession on males was due to declines in a number of the Community Engagement Key Indicators. The trend of the female Community Engagement Domain did not show the same effect.

• The greatest domain improvement has been for Safe/Risky Behavior for both male and female children and youth. In the early 1990s the values for this domain was below the 1985 levels, due, in part, to the juvenile crime wave that was occurring during that time period. Since the early 1990s, this domain has steadily increased to be the most improved compared with the 1985 values for both males and females.

• As with the overall trend in CWI domains, the gender-specific trends for Health and Emotional/Spiritual Well-Being continue to be below 1985 values for both male and female children and youth. In the 2016 Annual Report, a Special Emphasis was on the causes for the recent downturns in the Emotional/Spiritual Well-Being domain, which is particularly due to increases in suicide rates. This increase has been linked by ethnographic research to widespread diffusion and use of electronic/social media in the 2007 to 2016 decade. This trend continues to be a concern that merits continued monitoring.
Acknowledgements and Contact Information

The **Child and Youth Well-Being Index Project** at Duke University is coordinated by Kenneth C. Land, Ph.D., Department of Sociology and Center for Child and Family Policy, Duke Box 90088, Duke University, Durham, NC 27708-0088 (e-mail: kland@soc.duk.edu). The Project is supported by a grant from the Foundation for Child Development ([http://www.fcd-us.org/](http://www.fcd-us.org/)).

Dr. Land is a Faculty Fellow in the Center for Child and Family Policy, Research Professor in the Social Science Research Institute, and John Franklin Crowell Professor of Sociology and Demography Emeritus at Duke University. He has conducted extensive research on contemporary social trends and quality-of-life measurement, social problems, demography, criminology, organizations, and mathematical and statistical models and methods for the study of social and demographic processes. He is the co-author or co-editor of eight books, more than 200 research articles and book chapters. Dr. Land has been elected a Fellow of the American Statistical Association, the Sociological Research Association, the American Association for the Advancement of Science, the International Society for Quality-of-Life Studies, and the American Society of Criminology.

Other researchers involved in the Project include Vicki L. Lamb, Ph.D. (Professor, North Carolina Central University and Duke University), and Emma Zang, M.A. (Doctoral Student, Public Policy and Sociology, Duke University).

**On the Web**: More information about the CWI, its construction, and the scientific papers and publications on which it is based can be found online at: [http://www.soc.duke.edu/~cwi/](http://www.soc.duke.edu/~cwi/)
Appendix A
Conceptual Foundation, Methods of Construction, and Indicator List for the CWI

Conceptual Foundation

The National Child and Youth Well-Being Index (CWI) is based on more than four decades of research on social indicators and well-being/quality-of-life research on children, youth, and adults. This research has established that overall well-being/life quality is multidimensional. This research is the foundation on which the CWI is based.24

Methods of Construction

Annual time series data (from vital statistics and sample surveys) were assembled on 28 national-level Indicators in seven Quality-of-Life Domains: Family Economic Well-Being, Safe/Risky Behavior, Social Relationships, Emotional/Spiritual Well-Being, Community Engagement, Educational Attainment, and Health. These seven Domains have been well-established, having recurred time after time in more than three decades of empirical research in numerous subjective well-being studies. They also have been found, in one form or another, in studies of the well-being of children and youth.

To calculate the CWI, each of the time series of the Indicators is indexed by a base year (1975). The base-year value of the Indicator is assigned a value of 100 and subsequent values of the Indicator are taken as percentage changes in the CWI. The directions of the Indicators are oriented so that a value greater than 100 in subsequent years means the social condition measured has improved, while a value less than 100 in subsequent years means the social condition has deteriorated.

The 28 indexed Key Indicator time series then are grouped into the seven Domains of Well-Being by equal weighting to compute the Domain-Specific Index values for each year. The seven Domain-Specific Indices then are grouped into an equally-weighted CWI value for each year. The CWI Project uses an equal-weighting strategy for constructing its composite indices for two reasons. First, it is the simplest and most transparent strategy and can easily be replicated by others. Second, statistical research done in conjunction with the CWI Project has demonstrated that, in the absence of a clear ordering of the Indicators of a composite index by their relative importance to the composite index, and with a high degree of consensus in the population, an equal weighting strategy is privileged in the sense that it will achieve the greatest

level of agreement among the members of the population. In statistical terminology, the equal-weighting method is a *minimax estimator*.\(^\text{25}\)

The CWI builds on a base of subjective well-being empirical research in both identifying which Domains of Well-Being to measure and assigning Indicators to those Domains. It can therefore be viewed as an *evidence-based measure of trends in averages of the social conditions encountered by children and youth in the United States across recent decades.*

**Table A-1. Twenty-Eight Key Indicators of the National CWI.\(^a\)**

*Family Economic Well-Being Domain*

1. Poverty Rate (All Families with Children)
2. Secure Parental Employment Rate
3. Median Annual Income (All Families with Children)
4. Rate of Children with Health Insurance

*Safe/Risky Behavior Domain*

1. Teenage Birth Rate (Ages 10–17)
2. Rate of Violent Crime Victimization (Ages 12–19)\(^b\)
3. Rate of Violent Crime Offenders (Ages 12–17)\(^b\)
4. Rate of Cigarette Smoking (Grade 12)
5. Rate of Binge Alcohol Drinking (Grade 12)
6. Rate of Illicit Drug Use (Grade 12)

*Social Relationships Domain*

1. Rate of Children in Families Headed by a Single Parent
2. Rate of Children Who Have Moved Within the Last Year (Ages 1–17)

*Emotional/Spiritual Well-Being Domain:*

1. Suicide Rate (Ages 10–19)\(^b\)
2. Rate of Weekly Religious Attendance (Grade 12)\(^b\)
3. Percent Who Report Religion as Being Very Important (Grade 12)\(^b\)

*Community Engagement Domain*

1. Rate of Persons Who Have Received a High School Diploma (Ages 18–24)
2. Institutionally Disconnected Youth Rate (Ages 16–19)
3. Rate of PreKindergarten Enrollment (Ages 3–4)\(^b\)
4. Rate of Persons Who Have Received a Bachelor’s Degree (Ages 25–29)
5. Rate of Voting in Presidential Elections (Ages 18–20)

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*Educational Attainment Domain*
1. Reading Test Scores (Ages 9, 13, and 17)  
2. Mathematics Test Scores (Ages 9, 13, and 17)

*Health Domain*
1. Infant Mortality Rate  
2. Low Birth Weight Rate  
3. Mortality Rate (Ages 1–19)  
4. Rate of Children With Very Good or Excellent Health (as reported by parents)  
5. Rate of Children With Activity Limitations Due to Health Problems (as reported by parents)  
6. Rate of Obese Children and Adolescents (Ages 6-19)

Notes:
*a* Unless otherwise noted, indicators refer to children ages 0–17.  
*b* Projected for 2016.  
### Appendix B
Sources of Data for the National CWI

<table>
<thead>
<tr>
<th>Category</th>
<th>Source</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topic</td>
<td>Source</td>
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<tr>
<td>--------------------------------------------</td>
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Appendix C
National Child and Youth Well-Being Index Values, 1975-2015,\(^{26}\) with an Initial Estimate for 2016\(^{27}\)

<table>
<thead>
<tr>
<th>Year</th>
<th>CWI</th>
<th>Annual Change in CWI</th>
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<tbody>
<tr>
<td>1975</td>
<td>100.00</td>
<td>0.00</td>
</tr>
<tr>
<td>1976</td>
<td>100.75</td>
<td>0.75</td>
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<tr>
<td>1977</td>
<td>98.94</td>
<td>-1.81</td>
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<tr>
<td>1978</td>
<td>99.29</td>
<td>0.35</td>
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<tr>
<td>1979</td>
<td>100.01</td>
<td>0.72</td>
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<tr>
<td>1980</td>
<td>99.70</td>
<td>-0.31</td>
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<tr>
<td>1981</td>
<td>97.48</td>
<td>-2.22</td>
</tr>
<tr>
<td>1982</td>
<td>96.17</td>
<td>-1.30</td>
</tr>
<tr>
<td>1983</td>
<td>96.77</td>
<td>0.60</td>
</tr>
<tr>
<td>1984</td>
<td>96.64</td>
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<td>1985</td>
<td>94.11</td>
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<td>1986</td>
<td>95.36</td>
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<td>94.21</td>
<td>0.06</td>
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<td>1989</td>
<td>94.76</td>
<td>0.55</td>
</tr>
<tr>
<td>1990</td>
<td>94.33</td>
<td>-0.42</td>
</tr>
<tr>
<td>1991</td>
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<td>93.12</td>
<td>-0.09</td>
</tr>
<tr>
<td>1993</td>
<td>91.14</td>
<td>-1.98</td>
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</table>

\(^{26}\) Numerical values of the CWI for earlier years are calculated and reported in each annual CWI Report. These values may have slight numerical differences from report to report due to the following factors:

1. Updates in the numerical values of some of the Key Indicator time series. For instance, in the 2012 annual report, the childhood obesity time series is updated with newly-released CDC statistics. Similarly, each year, the median family income series is updated with the most recent inflation-adjusted data from the U.S. Census Bureau, and recent vital statistics, such as teenage birth and mortality rates, are retrieved from preliminary reports issued by the CDC. When the CDC issues final reports one year later, vital statistics are usually adjusted and our indicators are updated accordingly.

2. Changes in the time series statistics. For instance, in the 2011 annual report, we adjusted the activity limitation series so that the age intervals of respondents (0–17) are consistent from 1975 to 2009 and updated the corresponding data from 2004 to 2009.

3. Data on the Voting in Presidential Elections, (ages 18–24), Math Scores, and Reading Scores series are available only every four years. When new data become available, the projected Indicators of these series are updated accordingly.

\(^{27}\) As of release date, 2 Key Indicators were projected for 2015, and 10 Key Indicators were projected for 2016; see Table A-1 in Appendix A.
Statistical Significance of Changes in the CWI

In studying the year-to-year or period-to-period changes in the CWI time series, questions of statistical significance sometimes arise: Given that the CWI has changed by $x$ percent from one time period to another, is the change $x$ statistically significant? One approach to addressing this question is to study the time series fluctuations in the CWI from year-to-year, estimate a standard deviation or error of fluctuations in the time series, and then assess the size of a year-to-year or period-to-period change relative to the estimated standard deviation of the series. To operationalize this procedure, the expected value of the CWI for each year must be calculated. These values then can be subtracted from the observed values, squared, and divided by the length of the time series to estimate the variance. The square root of the estimated variance then can be taken as an estimate of the standard deviation of the CWI series taken as a time series.

We have applied this method using a three-point moving average of the CWI values centered on each year $t$ as the expected value of the CWI for that year. The resulting estimated standard deviation of the CWI time series, compared to expected values based on three-point centered moving averages, is 0.5. This implies that a year-to-year or period-to-period change of less than 1.0 is not a statistically significant change.