Title

Adolescent and Young Adult Health in the United States in the Past Decade: Little Improvement and Young Adults Remain Worse Off Than Adolescents

Journal

Journal of Adolescent Health, 55(1)

ISSN

1054-139X

Authors

Park, M Jane
Scott, Jazmyn T
Adams, Sally H
et al.

Publication Date

2014-07-01

DOI

10.1016/j.jadohealth.2014.04.003

Peer reviewed

Journal of Adolescent Health 55 (2014) 3–16

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Review article

Adolescent and Young Adult Health in the United States in the Past Decade: Little Improvement and Young Adults Remain Worse Off Than Adolescents

M. Jane Park, M.P.H. [a,*], Jazmyn T. Scott, M.P.H. [a], Sally H. Adams, Ph.D. [a], Claire D. Brindis, Dr.P.H. [a,b], and Charles E. Irwin Jr., M.D. [a]

[a] *Department of Pediatrics, University of California, San Francisco, San Francisco, California*
[b] *Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco, San Francisco, California*

Article history: Received February 13, 2014; Accepted April 4, 2014
Keywords: Young adults; Adolescents; Health status

A B S T R A C T

Adolescence and young adulthood are unique developmental periods that present opportunities and challenges for improving health. Health at this age can affect health throughout the lifespan. This review has two aims: (1) to examine trends in key indicators in outcomes, behaviors, and health care over the past decade for U.S. adolescents and young adults; and (2) to compare U.S. adolescents and young adults on these indicators. The review also assesses sociodemographic differences in trends and current indicators. Guided by our aims, previous reviews, and national priorities, the present review identified 21 sources of nationally representative data to examine trends in 53 areas and comparisons of adolescents and young adults in 42 areas. Most health and health care indicators have changed little over the past decade. Encouraging exceptions were found for adolescents and young adults in unintentional injury, assault, and tobacco use, and, for adolescents, in sexual/reproductive health. Trends in violence and chronic disease and related behaviors were mixed. Review of current indicators demonstrates that young adulthood continues to entail greater risk and worse outcomes than adolescence. Young adults fared worse on about two-thirds of the indicators examined. Differences among sociodemographic subgroups persisted for both trends and current indicators.

IMPLICATIONS AND CONTRIBUTION

Our review of trends and current status in adolescent and young adult health and health care identifies areas of improvement and where status has not improved. Informed by our findings, policymakers and professionals (e.g., clinicians and program managers) can effectively develop and prioritize their policies and programs and services.

This review of adolescent and young adult health indicators updates our 2009 review article, published in the *Journal of Adolescent Health* [1,2]. The prior article placed health for these ages within the life course health development framework [3]. This framework recognizes the multiple influences on health and views health as a trajectory in which early events and influences shape health throughout the life course [3]. Within this framework, transitional periods such as adolescence and young adulthood assume greater salience as times when individual trajectories are especially sensitive to contextual influences [3]. As part of normal development, adolescents may experiment with behaviors in areas such as diet, exercise, driving, substance use, and sexual activity—areas that constitute major foci for the adolescent health field [4,5]. Young adults fare worse on most traditional "adolescent" health measures [6–9].

Major differences persist among adolescent and young adult subgroups on many indicators. Special populations—such as youth with special health care needs and those who are in foster care or are homeless, among many others greater—face risk of poor health outcomes [5,10]. Certain sociodemographic subgroups also fare worse, including those with low incomes. About

* Address correspondence to: M. Jane Park, M.P.H., Division of Adolescent and Young Adult Medicine, University of California, San Francisco, Box 0503, LH 245, San Francisco, CA 94143-0503.
E-mail address: jane.park@ucsf.edu (M.J. Park).

1054-139X/$ – see front matter
http://dx.doi.org/10.1016/j.jadohealth.2014.04.003

half of the population ages 10–24 years is white non-Hispanic (NH); 6% of adolescents aged 15–17 years and 11% of young adults aged 18–24 are foreign born [11].

The transition to adulthood may involve abrupt changes as young adults navigate choices and opportunities related to college, employment, childbearing, and romantic relationships. Trends in these areas have changed over the past decades, with more young adults attending college, fewer youth dropping out of school, and more marrying later [12,13]. Choices and opportunities in these areas have implications for health and health care access in the short-term and put individuals on trajectories that shape long-term health. Many safety net programs that serve vulnerable youth change or end at age 18 years, posing challenges to successful transitions to adult roles and responsibilities [14]. Most youth transition from pediatric to adult systems of care [15], a change with major consequences for youth with special health care needs [16].

Adolescence and young adulthood bring opportunities and challenges for improving health. Given the short- and long-term public health implications of health during these periods, this review has two aims: (1) to examine trends of key indicators in outcomes, behaviors, and health care over the past decade for U.S. adolescents and young adults and (2) to compare adolescents and young adults on these indicators. This review also assesses differences among sociodemographic subgroups. Although most data sources used in this review are publicly available, the authors are unaware of any single source that both monitors trends and compares adolescents and young adults across multiple domains.

Methods and Presentation of Data

Selecting indicators and data sources for this review involved an iterative process. As shown in Figure 1, two sources guided identification of potential indicators: the 2009 review article [1] and the *Healthy People 2020* Core Health Outcome Indicators for Adolescents and Young Adults [17]. These *Healthy People* indicators span seven domains which were adapted into eight categories for this review: overall health, function, and mortality; injury; violence; mental health; substance use; sexual and reproductive health; chronic conditions and related behaviors; and health care.

To identify data sources for indicators in these categories, we reviewed the sources used in 2009 and the *Healthy People 2020* data sources and searched for online databases, articles, and reports with nationally representative measures. Searches were conducted with PubMed and Internet search engines, using terms including “adolescent” and “young adult,” and health domains (e.g., violence, injury). Table 1 presents potential sources of nationally representative data. These sources include indicators the same as or similar to measures used in 2009 and/or the *Healthy People* Core indicators. We defined adolescents and young adults as ages 10–25 years, a slight adaptation of the *Healthy People* definition of ages 10–24 years. Except for brief mention of ages 10–14 years (“younger adolescents”) in presenting mortality findings in the text, comparisons of adolescents and young adults use only two age groups. Inconsistent age definitions for adolescents and young adults (e.g., ages 15–19 and 20–24 vs. 12–17 and 18–25 years) continue to make it challenging to monitor health and well-being.

Two criteria, consistent with our study aims, guided selection of data sources. These included sources with (1) trend data (spanning about 10 years) and (2) current data (2010 or later in most cases) for both adolescents and young adults. Using these criteria for substance use, for example, the National Survey on Drug Use and Health was selected over other national data sources, because it met both criteria. In cases where we did not locate a data source meeting both criteria, we prioritized sources allowing current comparisons for adolescents and young adults; thus, National Survey of Family Growth, which has adolescent and young adult data, was selected for some sexual and reproductive health indicators, rather than Youth Risk Behavior Surveillance System, which only covers high school students. When that was not possible, data sources providing a trend for one age group were used (e.g., Youth Risk Behavior Surveillance System). Although we aimed for data points spanning about 10 years, we included sources with at least 6 years (Table 2 notes the few exceptions).

Findings are presented for each of the eight categories (i.e., overall health, function, and mortality; injury; violence; mental health; substance use; sexual and reproductive health; chronic conditions and related behaviors; and health care). Each category begins with an overview of trends, including notable subgroup differences in trends. Table 2 presents findings for trends. Arrows denote each trend as a healthy change, an unhealthy change, or “little or no change.” This is followed by a comparison of current health indicators between adolescents and young adults (Table 3) and a brief overview of subgroups faring worse on current measures.

In addition to assessing change over time (i.e., the trend) and differences in current indicators between adolescents and young adults, this review summarizes (1) subgroup differences in trends (i.e., whether a sociodemographic subgroup’s changes over time differ from the overall trend) and (2) differences in current health indicators among subgroups. Most findings were gathered from sources that did not provide evaluation of statistically significant differences. Consistent with the overall goal of highlighting implications for public health, this review generally considers differences of $>4\%$ or more than 7/100,000 to be noteworthy. The sequence of data presentation described here is modified occasionally to allow for the most logical presentation of findings within space limitations. Because of space limitations, subgroup data are not included in the tables. All data are available on the National Adolescent and Young Adult Health Information Center Web site [18].

Findings

Overall health, function, and mortality

General measures of overall health and function changed little. The vast majority of adolescents and young adults continued to be endorsed as being in excellent, very good, or good health, overall and among subgroups. Similarly, rates of limitations in activity (e.g., daily physical and social tasks, including household chores or visiting friends) remained stable and low, with adolescents having higher rates than young adults and no notable subgroup differences in trends or current measures. For both measures, adolescent data were based on parent report and young adult data were self-reported [19].

Overall mortality trends were mixed. Mortality decreased for ages 15–19 years, compared with little change for ages 20–24 years. Among ages 15–19 years, decreases were quite large among males, especially black-NH males. Among young adults,

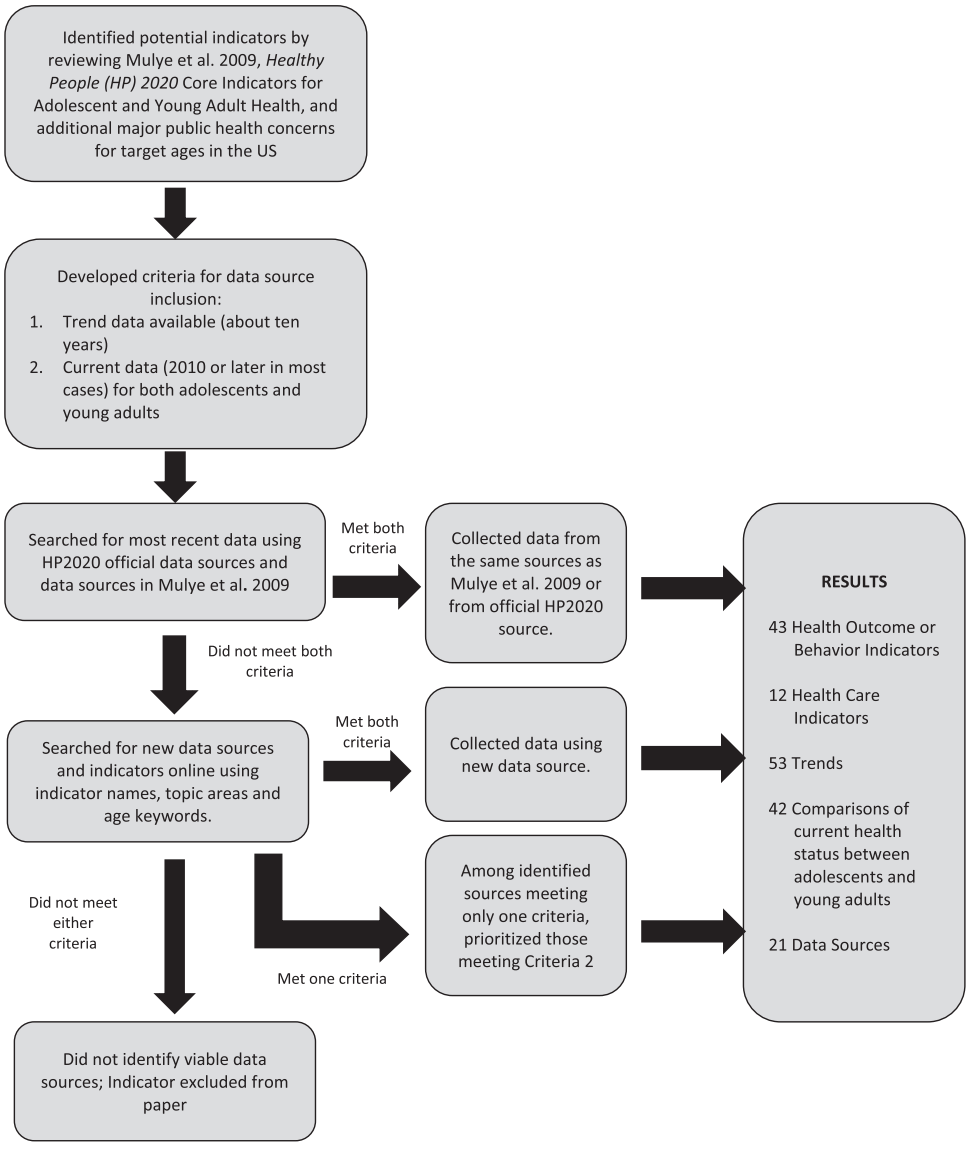

Figure 1. Methods.

larger decreases occurred among black-NH and Hispanic males, whereas rates for white-NH males increased slightly [20].

Current mortality rates (per 100,000) increase with age, from 14.9 among younger adolescents to 51.2 among older adolescents and 90.9 among young adults [20]. Mortality in this period is largely preventable. In 2010, 70% of deaths for ages 15–24 years were due to motor vehicle crashes, other unintentional injury, homicide, and suicide [21]. Overall mortality rates are two to three times higher for males than females and highest among American Indian/Alaskan Native-NH and black-NH males [20].

Injury

Injury mortality trends were encouraging for adolescents and young adults. The rate of fatal motor vehicle crashes—the leading cause of death for ages 10–24 years—decreased for all age groups. The rate also decreased for all subgroups, with American Indian/Alaskan Native-NH and white-NH males experiencing the largest decreases [22]. All other causes of unintentional injury, grouped together, are also among the top four leading "causes" of death for these age groups [21].

Other trends in injury improved, except for flat rates in two areas: seat belt use among young adults and, for both age groups, the percentage of crashes with fatalities involving young drivers in which the driver was alcohol impaired [23,24]. The other two measures related to alcohol and driving improved: drinking and driving (past year) decreased for both age groups [25] and the adolescent rate of riding with a driver who has been drinking also decreased [26]. Seat belt use increased for adolescents [26]. Subgroup differences in trends were small for these behaviors, except for drinking and driving. Compared with the overall decrease among young adults, American Indian/Alaskan Native-NHs had a larger decrease, Hispanics had smaller decrease, and black-NH females reported no change [25].

Table 1
National data sources for monitoring adolescent and young adult health by health area

Name and Web site	Source and/or method	Periodicity
Overall health, function, and mortality		
WONDER http://wonder.cdc.gov/ucd-icd10.html	Death certificates	Data released every 1–2 years on online database, timing varies; detailed mortality data 2010 current; since 1999
National Health Interview Survey (NHIS) http://www.cdc.gov/nchs/nhis.htm	Household interview survey	Annual data and reports; usually out in September; 2006 current (out September 2007); current survey model since 1995
Injury		
Youth Risk Behavior Surveillance System (YRBSS) http://www.cdc.gov/healthyyouth/yrbs/index.htm	Surveys in high schools	Data and reports released in June every 2 years; 2007 current (out June 2008); since 1991
National Highway Traffic Safety Administration/FARS/NCSA http://www.nhtsa.dot.gov/	Police reports, fatal crash records	Annual traffic safety facts reports released in Fall every year; 2007 current (out November 2008); since 1993
WISQARS http://www.cdc.gov/ncipc/wisqars/default.htm	Death certificates	Data released every 1–2 years on online database, timing varies; 2005 current (out January 2008); since 1981
National Survey on Drug Use and Health (NSDUH) http://oas.samhsa.gov/nsduh.htm	Household interview survey	Annual reports and tables released in November or December; 2007 current (out November 2008); since 1994
BRFSS http://www.cdc.gov/brfss/	Telephone survey, national	Data released every year in online database; timing varies; 2007 current; since 1990
Violence		
Bureau of Justice Statistics—National Crime Victimization Survey: http://www.ojp.usdoj.gov/bjs/	FBI crime reports	Annual reports released in November or December every 2–3 years; 2005 current (out December 2006); since 1996
YRBSS http://www.cdc.gov/healthyyouth/yrbs/index.htm	Surveys in high schools	Data and reports released in June every 2 years; 2007 current (out June 2008); since 1991
WISQARS http://www.cdc.gov/ncipc/wisqars/default.htm	Death certificates	Data released every 1–2 years on online database, timing varies; 2005 current (out January 2008); since 1981
Mental health		
WONDER http://wonder.cdc.gov/ucd-icd10.html	Death certificates	Data released every 1–2 years on online database, timing varies; detailed mortality data 2010 current; since 1999
YRBSS http://www.cdc.gov/healthyyouth/yrbs/index.htm	Surveys in high schools	Data and reports released in June every 2 years; 2007 current (out June 2008); since 1991
NHIS http://www.cdc.gov/nchs/nhis.htm	Household interview survey	Annual data and reports; usually out in September; 2006 current (out September 2007); current survey model since 1995
Monitoring the Future http://monitoringthefuture.org/	Surveys in schools	Annual reports; usually out in June; 2007 current (out September 2008); since 1975
WISQARS http://www.cdc.gov/ncipc/wisqars/default.htm	Death certificates	Data released every 1–2 years on online database, timing varies; 2005 current (out January 2008); since 1981
NSDUH http://oas.samhsa.gov/nsduh.htm	Household interview survey	Annual reports and tables released in November or December; 2007 current (out November 2008); since 1994
Substance use		
NSDUH http://oas.samhsa.gov/nsduh.htm	Household interview survey	Annual reports and tables released in November or December; 2007 current (out November 2008); since 1994
Monitoring the Future http://monitoringthefuture.org/	Surveys in schools	Annual reports; usually out in June; 2007 current (out September 2008); since 1975
YRBSS http://www.cdc.gov/healthyyouth/yrbs/index.htm	Surveys in high schools	Data and reports released in June every 2 years; 2007 current (out June 2008); since 1991
Sexual and reproductive health		
Birth data—NVSS http://www.cdc.gov/nchs/births.htm	Birth certificates	Annual reports released in November or December every year (online database now available); 2006 current (out January 2009); since 1968
Pregnancy data—National Vital Statistics http://www.cdc.gov/nchs/births.htm and Guttmacher Institute http://www.guttmacher.org/sections/pregnancy.php	Vital Statistics calculations	Vital Statistics: Data released every 2 years; timing varies; 2004 current (out April 2008); since 1976 Guttmacher: Data and/or reports released every 2–3 years; timing varies; 2002 current (out September 2006); since 1986
National Survey of Family Growth http://www.cdc.gov/nchs/nsfg.htm	Interviews	Data and/or reports from 2002 (out July 2005); conducting 2007 survey now; since 1973
HIV/AIDS and STDs Surveillance Statistics http://www.cdc.gov/hiv/topics/surveillance/basic.htm http://www.cdc.gov/nchstp/dstd/Stats_Trends/Stats_and_Trends.htm	Cases from states and/or areas; confidential reporting system	Annual reports released in November and/or December every 1–2 years; 2007 current (out November 2008); since 1981 (STDs) and 1982 (HIV/AIDS)
YRBSS http://www.cdc.gov/healthyyouth/yrbs/index.htm	Surveys in high schools	Data and reports released in June every 2 years; 2007 current (out June 2008); since 1991
Chronic conditions and related behaviors		
National Health and Nutrition Examination Survey (NHANES) http://www.cdc.gov/nchs/nhanes.htm	Interviews, physical examinations, clinical measurements or tests	Data and reports released in April every 2 years; 2003–2006 current (out February 2009); since 1976
BRFSS http://www.cdc.gov/brfss/	Telephone survey, national	Data released every year in online database; timing varies; 2007 current; since 1990
YRBSS http://www.cdc.gov/healthyyouth/yrbs/index.htm	Surveys in high schools	Data and reports released in June every 2 years; 2007 current (out June 2008); since 1991

Table 1
Continued

Name and Web site	Source and/or method	Periodicity
NHIS http://www.cdc.gov/nchs/nhis.htm	Household interview survey	Annual data and reports; usually out in September 2006 current (out September 2007); current survey model since 1995
Health care access and utilization		
National Survey of Children's Health http://www.nschdata.org/	Interviews	Online database; timing varies; 2003 current (out September 2005); since 2003
National Survey of Children with Special Health Care Needs; http://www.cshcndata.org/	Interviews	Online database; timing varies; 2005 or 2006 current (out October 2007); since 2001
National Hospital Ambulatory Medical Care Survey : http://www.cdc.gov/nchs/about/major/ahcd/ahcd1.htm	Patient records	Reports; timing varies; 2005 current (out June 2007); since 1992
NHIS http://www.cdc.gov/nchs/nhis.htm	Household interview survey	Annual data and reports; usually out in September; 2006 current (out September 2007); current survey model since 1995
Medical Expenditure Panel Survey http://www.meps.ahrq.gov/mepsweb/data_stats/quick_tables.jsp	Household interviews	Reports and/or tables released every year; timing varies; 2005 current; since 1996
Population and education		
U.S. Census Bureau—Population, Poverty http://www.census.gov/	Surveys	Data and reports released in summer every year; 2006 current (out September 2007); since 1970
National Center for Education Statistics http://www.nces.ed.gov/	Surveys	Annual Digest of Education Statistics released in summer every year; 2006 current (out June 2008); since 1995
Online data analysis		
University of Michigan Inter-university Consortium for Political and Social Research http://www.icpsr.umich.edu/icpsrweb/landing.jsp	Surveys, interviews, and so forth	Online Data Analysis tool providing access to different data series including NSDUH, NHANES, NHIS, and more. All years or the most recent data may not be available.
Health Data Interactive http://www.cdc.gov/nchs/hdi.htm		Online Data Analysis tool providing access to different data series including NHIS, NHANES, NVSS, and more. All years or the most recent data may not be available.

BRFSS = Behavior Risk Factor Surveillance System; FARS = Fatality and Analysis Reporting System; NCSA = National Center for Statistics and Analysis; NVSS = National Vital Statistics System; STD = sexually transmitted diseases; WISQARS = Web-based Injury Statistics Query and Reporting System; WONDER = Wide-Ranging Online Data for Epidemiologic Research.

Young adults fare worse than adolescents on most current injury indicators, including motor vehicle crash mortality and the percentage of drivers involved in fatal car crashes who were alcohol impaired [22,24]. Young adults report drinking and driving at nearly four times the rate of adolescents [25]. By contrast, both groups have similar seat belt use rates. (Table 2 notes the difference between adolescent and young adult seat belt measures [23,26].)

A few subgroup differences exist for current injury indicators. Male motor vehicle crash mortality rates are more than twice female rates [22]. For both age groups, American Indian/Alaskan Native-NHs fare worse on many measures, with higher motor vehicle crash mortality rates, especially among males, and lower rates of seat belt use. This group reports a higher rate of riding with a driver who had been drinking (adolescents). White-NH young adults have a higher rate of drinking and driving, compared with the overall rate [25,26].

Violence

Violence findings included little change and encouraging trends. The overall homicide rate changed little for both age groups. However, there were striking declines among black-NH and Hispanic males for both age groups—from three to nearly nine times the overall decline. The rate increased among young adult American Indian/Alaskan Native-NH males [22]. Victimization trends were encouraging with decreased simple and aggravated assault rates for both age groups [27]. Trends were flat for past-year physical fighting and past-month weapon carrying among adolescents [26].

This review identified other subgroup differences in trends. Compared with the overall decrease in adolescent simple assault rates, white NHs had a larger decrease and black NHs had a smaller decrease; the rate changed little for Hispanics [27]. Among young adults, Hispanics had a smaller decrease than the overall decrease [27]. For adolescents, declines in past-year physical fighting and past-month weapon carrying among American Indian/Alaskan Native-NH and white-NH males stand in contrast to flat trends overall [26].

Current homicide and simple assault rates are similar for adolescents and young adults overall, although young adult males have a higher homicide rate than adolescent males [22,27]. Aggravated assault rates are higher among young adults than adolescents [27]. Findings show several subgroup differences in current indicators. Males have homicide rates about six times higher than female rates (both age groups), and higher rates of physical fighting and weapon carrying (adolescents) [22,26]. Despite having the largest decreases in homicide, black-NH males have a current homicide rate six to seven times the overall rate [22]. American Indian/Alaskan Native-NH and Hispanic males also have higher homicide rates (both age groups) [22]. Past-year fighting and weapon carrying are higher among black-NH, American Indian/Alaskan Native-NH and Hispanic males (adolescents) [26]. Current simple assault rates are higher for females and Hispanic adolescents, compared with the overall rate. Compared with young adults overall, white NHs have a higher rate [27].

Mental health

Mental health indicators changed little, except for a decrease in unhealthy methods of weight loss (i.e., used diet pills, power and liquids, or vomiting or laxatives) [26]. Suicide rates changed little for adolescents and young adults overall and for most

Table 2
Summary of trends in adolescent and young adult health, 2000–2012

Outcome	Adolescents					Young adults				
	Ages	Years[a]	Time 1	Time 2	Change	Ages	Years	Time 1	Time 2	Change
Overall health, function, and mortality										
Health is excellent, very good, or good[b]	10–17	2000–2012	98.1%	97.3%	→	18–25	2000–2012	96.5%	95.4%	→
Limitation of activity[b]	10–17	2000–2012	8.5%	10.7%	→	18–25	2000–2012	4.3%	5.8%	→
Mortality (rate per 100,000)	15–19	2000–2010	66.8	51.2	↓	20–24	2000–2010	93.1	90.9	→
Injury										
Motor vehicle crash mortality (rate per 100,000)	15–19	2000–2010	25.3	13.6	↓	20–24	2000–2010	27.3	19.7	↓
Percent alcohol impaired among drivers involved in fatal crashes (BAC ≥.08)	16–20	2002–2012	18%	18%	→	21–24	2002–2012	33%	32%	→
Drove under the influence of alcohol (past year)	12–17	2002–2012	10.6%	6.3%	↓	18–25	2002–2012	33.2%	22.5%	↓
Rode with drinking driver (past month)	9–12 grade	2001–2011	30.7%	24.1%	↓	ND				
Sometimes, most of the time, or always wore a seat belt[c]	9–12 grade	2001–2011	85.9%	92.3%	↑	18–24	2006–2010	94.3%	95.5%	→
Violence										
Homicide deaths (rate per 100,000)	15–19	2000–2010	9.4	8.3	→	20–24	2000–2010	15.8	13.2	→
Simple assault[d] (rate per 1,000)	15–17	2002–2012	44.6	28.0	↓	18–20	2002–2012	46.2	26.4	↓
Aggravated assault[e] (rate per 1,000)	15–17	2002–2012	12	3.5	↓	18–20	2002–2012	15	9.8	↓
Physical fighting (past year)	9–12 grade	2001–2011	33.2%	32.8%	→	ND				
Weapon carrying (past month)	9–12 grade	2001–2011	17.4%	16.6%	→	ND				
Mental health										
Suicide deaths (rate per 100,000)	15–19	2000–2010	8.0	7.5	→	20–24	2000–2010	12.5	13.6	→
Major depressive episode (past year)	12–17	2005–2012	8.6%	9.3%	→	18–25	2005–2012	8.7%	9.0%	→
Suicide attempt (past year)	9–12 grade	2001–2011	8.8%	7.8%	→	ND				
Used diet pills, powders and liquids, vomiting, or laxatives to lose weight (past month)	9–12 grade	2001–2011	9.2%	5.1%	↓	ND				
ADHD	10–17	(2001–2003)–(2010–2012)	8.8%	11.8%	→	ND				
Substance use										
Cigarette use (past month)	12–17	2002–2012	13.0%	6.7%	↓	18–25	2002–2012	40.8%	31.9%	↓
Alcohol use (past month)	12–17	2002–2012	17.6%	12.9%	↓	18–25	2002–2012	60.5%	60.2%	→
Binge alcohol use (past month)	12–17	2002–2012	10.8%	7.1%	→	18–25	2002–2012	41.0%	39.5%	→
Heavy drinking: five or more binge episodes (past month)	12–17	2002–2012	2.6%	1.3%	→	18–25	2002–2012	15.0%	12.9%	→
Marijuana use (past month)	12–17	2002–2012	8.2%	7.3%	→	18–25	2002–2012	17.3%	18.5%	→
Sexual and reproductive health										
Never had vaginal intercourse: females[f]	15–19	2002–(2007–2010)	47.0%	52.6%	↑	20–24	2002–(2007–2010)	12.7%	12.9%	→
Never had vaginal intercourse: males[f]	15–19	2002–(2007–2010)	51.1%	56.3%	↑	20–24	2002–(2007–2010)	12.5%	15.5%	→
Never had same-sex sexual contact: females[f]	15–19	2002–(2006–2008)	89.4%	89.0%	→	20–24	2002–(2006–2008)	85.8%	84.2%	→
Never had same-sex sexual contact: males[f]	15–19	2002–(2006–2008)	95.5%	97.5%	→	20–24	2002–(2006–2008)	94.5%	94.4%	→
Contraceptive use by women at risk of unintended pregnancy[g]	15–19	2002–(2006–2010)	82.0%	82.0%	→	20–24	2002–(2006–2010)	87.9%	87.0%	→
Condom use at last intercourse	9–12 grade	2001–2011	57.9%	60.2%	→	ND				
Pregnancy[f] (rate per 1,000)	15–19	2001–2009	80.8	65.6	↓	20–24	2001–2009	173.7	153.8	↓
Births[f] (rate per 1,000)	15–19	2000–2012	47.7	29.4	↓	20–24	2000–2012	109.7	83.1	↓
Unintended births	15–19	2002–(2006–2010)	78.4%	77.2%	→	20–24	2002–(2006–2010)	44.0%	50.1%	↑

Chlamydia (rate per 100,000)	15–19	2001–2011	1408.0	2076.1	↑	20–24	2001–2011	1434.5	2,508.5	↑
Gonorrhea (rate per 100,000)	15–19	2001–2011	494.3	398.6	↓	20–24	2001–2011	584.6	516.0	↓
HIV diagnoses (rate per 100,000)	15–19	2008–2011	10.4	10.4	→	20–24	2008–2011	31.4	36.4	↑
Chronic conditions and related behaviors										
Special health care needs Prevalence	12–17	(2005–2006)–(2009–2010)	16.8%	18.4%	→	ND				
Hearing loss (≥15 dB)	16–17	(1988–1994)–(2005–2006)	14.9%	21.5%	↑	18–19	(1988–1994)–(2005–2006)	15.2%	20.1%	↑
Current asthma prevalence	10–17	(2003–2005)–(2009–2011)	9.9%	11.1%	→	18–24	(2003–2005)–(2009–2011)	7.5%	8.7%	→
Lifetime asthma diagnosis prevalence	10–17	(2003–2005)–(2009–2011)	14.9%	17.5%	→	18–24	(2003–2005)–(2009–2011)	12.7%	16.5%	→
Obese	12–19	(2001–2002)–(2009–2010)	16.7%	18.4%	→	20–24	(2001–2002)–(2007–2008)	24.1%	28.7%	↑
Physical activity										
Adolescents: exercised for at least 60 minutes on ≥5 days	9–12 grade	2005–2011	35.8%	49.5%	↑	ND				
Young adults: met guidelines for physical activity (150 minutes/week)	ND					18–24	(2001–2003)–(2010–2012)	53.1%	59.3%	↑
Television viewing (≥3 hours/day)	9–12 grade	2001–2011	38.3%	32.4%	↓	ND				
Games/Internet (≥3 hours/day)	9–12 grade	2003–2011	22.1%	31.1%	↑	ND				

Summary of trends in health care access and utilization

Outcome	Adolescents (10–17)			Young adults (18–25)		
	2000 (%)	2012 (%)	Change	2000 (%)	2012 (%)	Change
Full-year insured	84.8	88.9	↑	63.9	69.3	↑
Full-year uninsured	7.7	5.2	→	18.7	17.7	→
Partial-year uninsured	7.5	6.0	→	17.4	13.0	↓
Usual place when sick	91.6	94.8	→	74.8	73.1	→
Had doctor visit besides hospital, ER, and surgery (past year)	83.3	88.1	↑	73.3	70.7	→
Had well checkup (past year)	62.7	73.8	↑	ND	ND	
Had one or more ER visit (past year)	18.0	14.5	→	25.8	22.5	→
Dentist visit (past year)	81.4	87.2	↑	52.3	61.0	↑
Delay in care (past year)	7.2	8.7	→	9.3	10.5	→
Unmet need for dental care (past year)	7.3	7.1	→	11.7	13.4	→
Unmet need for prescriptions (past year)	2.4	2.6	→	7.6	7.3	→
Youth with special health care needs who received transition care	(2005–2006) 41.2	(2009–2010) 40.0	→	ND	ND	

↑ = Up; ↓ = Down; → = little or no change; Green = healthy change; Red = unhealthy change.
ADHD = attention deficit hyperactivity disorder; BAC = blood alcohol content; ER = emergency room; ND = no data.

[a] Although we aimed for data points spanning about 10 years, sources with at least 6 years are included. Two exceptions are for HIV incidence and young adult seat belt use, for which only 3 and 4 years of data, respectively, could be located. Trend data for HIV incidence are limited because of a change in data collection methodology in 2008. Another exception is the 17-year span for the trend in hearing loss, a Healthy People 2020 core indicator.

[b] The measures "health is excellent, very good, or good" and "limitation of activity" are measures obtained from the National Health Interview Survey. Adolescent data were collected via parent report, whereas the data for young adults were self-reported.

[c] The adolescent and young adult seat belt data were collected from different sources, and the wording differs slightly. The adolescent measure, retrieved from Youth Risk Behavior Surveillance System, shows the percentage who "Sometimes, Most of the Time, or Always Wore a Seatbelt," and the question specifically asks the respondent to report on instances in which they are in the car while someone else is driving. The young adult measure, retrieved from Behavior Risk Factor Surveillance System, is shows the percentage that "Sometimes, Nearly Always, or Always Wore Seatbelts."

[d] An attack or attempted attack without a weapon that results in no injury, minor injury (e.g., bruises, black eyes, cuts, scratches, or swelling), or an undetermined injury requiring <2 days of hospitalization.

[e] An attack or attempted attack with a weapon, regardless of whether the victim is injured, or an attack without a weapon when serious injury results.

[f] This review does not assess whether young adult trends in sexual experience, pregnancy, and childbirth are healthy or unhealthy; therefore, arrows are not color coded as healthy or unhealthy.

[g] "Women at risk of unintended pregnancy" refers to women who have a chance of becoming pregnant at the date of interview but do not want to become pregnant now: they are either (1) using a contraceptive method or (2) they are not using contraception, but they have had intercourse in the 3 months before the interview and are not pregnant or trying to become pregnant.

Table 3
Current health status of adolescents and young adults

Measure	Year	Adolescents[a]	Young adults	Healthier
Overall health, function, and mortality				
Health is excellent, very good, or good[b]	2012	97.3%	95.4%	≈[c]
Limitation of activity[b]	2012	10.7%	5.8%	YA
Mortality (rate per 100,000)	2010	51.2	90.9	Adol
Injury				
Motor vehicle crash mortality (rate per 100,000)	2010	13.6	19.7	Adol
Percent alcohol impaired among drivers involved in fatal crashes (BAC ≥.08)	2012	18%	32%	Adol
Drove under the influence of alcohol (past year)	2012	6.3%	22.5%	Adol
Sometimes, most of the time, or always wore a seat belt[d]	2011	92.3%	95.5% (2010)[e]	≈
Violence				
Homicide deaths (rate per 100,000)	2010	8.3	13.2	≈
Simple assault[f] (rate per 1,000)	2012	28.0	26.4	≈
Aggravated assault[f] (rate per 1,000)	2012	3.5	9.8	Adol
Mental health				
Suicide deaths (rate per 100,000)	2010	7.5	13.6	Adol
Major depressive episode (past year)	2012	9.3%	9.0%	≈
Substance use				
Cigarette use (past month)	2012	6.7%	31.9%	Adol
Alcohol use (past month)	2012	12.9%	60.2%	Adol
Binge alcohol use (past month)	2012	7.1%	39.5%	Adol
Heavy drinking: five or more binge episodes (past month)	2012	1.3%	12.9%	Adol
Marijuana use (past month)	2012	7.3%	18.5%	Adol
Sexual and reproductive health				
Never had vaginal intercourse: females	2007–2010	52.6%	12.9%	[g]
Never had vaginal intercourse: males	2007–2010	56.3%	15.5%	[g]
Never had same-sex sexual contact: females	2006–2008	89.0%	84.2%	[g]
Never had same-sex sexual contact: males	2006–2008	97.5%	94.4%	[g]
More than five opposite sex sexual partners (past year): females[h]	2006–2010	3.5%	3.2%	≈
More than five opposite sex sexual partners (past year): Males	2006–2010	3.6%	6.8%	≈
Contraceptive use by women at risk of unintended pregnancy[i]	2006–2010	82.0%	87.0%	Adol
Pregnancy (rate per 1,000)	2009	65.6	153.8	[g]
Births (rate per 1,000)	2012	29.4	83.1	[g]
Unintended births	2006–2010	77.2%	50.1%	YA
Chlamydia (rate per 100,000)	2011	2076.1	2508.5	Adol
Gonorrhea (rate per 100,000)	2011	398.6	516.0	Adol
HIV diagnoses (rate per 100,000)	2011	10.4	36.4	Adol
Chronic conditions and related behaviors				
Dental decay present[j]	2007–2008	15.3%	27.9%	Adol
Hearing loss (≥15 dB)	2005–2006	21.5%	20.1%	≈
Current asthma prevalence	2009–2011	11.1%	8.7%	≈
Lifetime asthma diagnosis prevalence	2009–2011	17.5%	16.5%	≈
Obese	2009–2010	18.4%	28.7% (2007–2008)[e]	Adol
Healthcare access and utilization (past year)				
Full-year insured	2012	88.9%	69.3%	Adol
Full-year uninsured	2012	5.2%	17.7%	Adol
Partial-year uninsured	2012	6.0%	13.0%	Adol
Usual place when sick	2012	94.8%	73.1%	Adol
Had doctor visit besides hospital, ER, and surgery (past year)	2012	88.1%	70.7%	Adol
Had one or more ER visit (past year)	2012	14.5%	22.5%	Adol
Dentist visit (past year)	2012	87.2%	61.0%	Adol
Delay in care (past year)	2012	8.7%	10.5%	≈
Unmet need for dental care (past year)	2012	7.1%	13.4%	Adol
Unmet need for prescriptions (past year)	2012	2.6%	7.3%	Adol

Adol = adolescents; BAC = blood alcohol content; ER = emergency room; YA = young adults.

[a] Specific age ranges vary. Age ranges for most indicators are presented in Table 2. For Table 3 indicators not in Table 2, age ranges are presented in the notes below.

[b] The measures "health is excellent, very good, or good" and "limitation of activity" are measures obtained from the National Health Interview Survey. Adolescent data were collected via parent report, whereas the data for young adults were self-reported.

[c] The symbol (≈) denotes that rates are similar.

[d] The adolescent and young adult seat belt data were collected from different sources, and the wording differs slightly. The adolescent measure, retrieved from Youth Risk Behavior Surveillance System, shows the percentage who "Sometimes, Most of the Time, or Always Wore a Seatbelt," and the question specifically asks the respondent to report on instances in which they are in the car while someone else is driving. The young adult measure, retrieved from Behavior Risk Factor Surveillance System, is shows the percentage that "Sometimes, Nearly Always, or Always Wore Seatbelts."

[e] Indicates young adult assessment year different than year of adolescent assessment.

[f] Simple assault: an attack or attempted attack without a weapon that results in no injury, minor injury (e.g., bruises, black eyes, cuts, scratches, or swelling), or an undetermined injury requiring <2 days of hospitalization. Aggravated assault: an attack or attempted attack with a weapon, regardless of whether the victim is injured, or an attack without a weapon when serious injury results.

[g] This review does not assess whether young adult trends in sexual experience, pregnancy, and childbirth are healthy or unhealthy; therefore, they cannot be compared with adolescents.

[h] For the multiple partners indicator, adolescents are ages 15–19 years and young adults are ages 20–24 years for both males and females.

[i] "Women at risk of unintended pregnancy" refers to women who have a chance of becoming pregnant at the date of interview but do not want to become pregnant now: they are either (1) using a contraceptive method or (2) they are not using contraception, but they have had intercourse in the 3 months before the interview and are not pregnant or trying to become pregnant.

[j] For the dental decay indicator, adolescents are ages 12–17 years and young adults are ages 18–25 years.

subgroups, except for increases among American Indian/Alaskan Native-NH males in both age groups [20]. Rates of past-year major depressive episodes were also flat overall and for most subgroups. Exceptions mostly involved Native American/Alaskan Native-NHs: the rate decreased among males (both age groups) and increased among young adult females. The rate for Native Hawaiian/other Pacific Islander–NH young adults also decreased [25].

Among adolescents, rates of suicide attempts and attention deficit hyperactivity disorder also remained stable overall and among subgroups [26,28]. The decrease in unhealthy weight loss was similar across subgroups [26].

Current suicide rates are nearly twice as high among young adults compared with adolescents [20]. Past-year major depressive episode rates are similar for both age groups. The review identified subgroup differences in current measures. Males have higher rates of suicide and attention deficit hyperactivity disorder than females [19,28], and females have higher rates of past-year major depressive episode and suicide attempts [25,26]. American Indian/Alaskan Native-NHs fare worse on most mental health indicators, having the highest rates of suicide [20], past-year major depressive episode (young adult females) [25], and suicide attempts (adolescents females) [26]. Suicide attempt rates are also higher for Asian-NH and Hispanic females [26]. Among adolescents, Hispanic females have the highest major depressive episode rate [25].

Substance use

Most measures of substance use among adolescents and young adults changed little. A major exception is the decrease in cigarette use for both age groups. This trend was similar across subgroups, with the decrease among Native American/Alaskan Native-NH adolescents more than twice the overall decrease. Exceptions included smaller changes among groups with low rates, including black-NH and Asian-NH adolescents, and among young adults, black NHs and Hispanic females. The rate increased among Native American/Alaskan Native-NH males [25].

Trends in all three measures of past-month alcohol use (any use, binge drinking, and heavy drinking) changed little among adolescents and young adults overall, with the exception of a decrease among adolescents in any use. Subgroup differences in trends were mostly small. Compared with the overall adolescent decrease in any alcohol use, Native American/Alaskan Native-NHs had a larger decrease and Asian-NH females reported no change. In contrast to the flat trend in any alcohol use among young adults, the rate decreased for Native American/Alaskan Native-NH males and increased for black-NH and Hispanic females [25].

In contrast to little overall change in binge drinking (five or more drinks on the same occasion), rates decreased among adolescent Native American/Alaskan Native-NHs, young adult Native Hawaiian/Other Pacific Islander-NHs, and young adult Native American/Alaskan Native-NH males. Rates increased among young adult black-NH and Hispanic females. The main exception to the flat trend for heavy drinking (five or more binge drinking episodes) was an increase among Native Hawaiian/Other Pacific Islander-NH young adults [25].

Trends in past-month marijuana use were also flat for both age groups and most subgroups. Exceptions included decreases among Native American/Alaskan Native-NH adolescents and young adults. In addition, rates increased among young adult black NHs and male Hispanics [25].

Most current measures of past-month substance use increase dramatically between adolescence and young adulthood. Rates of cigarette use and any alcohol use increase fourfold between adolescence and young adulthood [25]. Rates of binge drinking increase fivefold; heavy alcohol use increases tenfold and marijuana use more than doubles [25].

Large subgroup differences persist among young adults in current measures of past-month substance use. For most measures, males report higher rates than females. Native American/Alaskan Native-NHs and white NHs fare worse on several measures. Smoking rates are highest for these two groups. Rates of any alcohol use are higher among white NHs. Binge drinking rates are higher among all white NHs and Native American/Alaskan Native-NH females. Marijuana use rates are higher among white-NH and black-NH males [25]. Among adolescents, differences are small except for higher rates of cigarette use among Native American/Alaskan Native-NHs [25].

Sexual and reproductive health

Trends in sexual and reproductive health were a mix of encouraging, discouraging, and flat changes, with several notable subgroup differences for both age groups. Among adolescents, most trends were encouraging or flat. This review does not assess whether young adult trends in sexual experience, pregnancy, and childbirth are healthy or unhealthy. Young adult trends for the remaining indicators were mostly flat or unhealthy.

The percentage reporting never having vaginal intercourse increased among adolescents but remained stable among young adults. There was little change in the percentage reporting any same-sex sexual contact and contraception use (both age groups) and condom use (adolescents) [26,29,30]. There were no notable subgroup differences in trends across these behaviors, except for a decrease in condom use among black-NH females [26].

Pregnancy and birth rates decreased for both adolescents and young adults. Black-NH and Hispanic females in both age groups experienced larger decreases than the overall decrease for both indicators [31,32]. The percentage of pregnancies ending in unintended births remained stable for adolescents but increased for young adults [33].

Trends in sexually transmitted infections (STIs) were mixed. For both age groups, chlamydia rates increased and gonorrhea rates decreased [34]. HIV incidence did not change among adolescents but increased among young adults [35]. The increase in chlamydia likely reflects systemic improvement in screening and use of more sensitive tests and reporting and may partly represent a true increase in prevalence [36].

Findings for all subgroups differed notably from the overall chlamydia increase and gonorrhea decrease. For chlamydia, females had a larger increase than males in both age groups. Among females in both age groups, black NHs had about two times the overall increase and white NHs and Hispanics had smaller increases. The increases among American Indian/Alaskan Native-NH females were smaller than the overall adolescent increase but larger than the overall young adult increase. Young adult Asian/Pacific Islander-NH females had a smaller increase than the overall trend. The rate decreased among adolescent Asian/Pacific Islander-NH females [34].

The decrease in the adolescent gonorrhea rates was larger among females than males. Compared with overall decreases among females, the decrease among black NHs was larger and the decrease among Asian/Pacific Islander-NHs was smaller for

both age groups, and decreases among adolescent white NHs and Hispanics were smaller. Rates increased for the following groups of females: American Indian/Alaskan Native-NHs in both age groups and young adult white NHs and Hispanics. For both chlamydia and gonorrhea, males had patterns similar to females, with smaller racial or ethnic differences [34].

Current data show that adolescents report less sexual experience than young adults, except for similar rates of same-sex contact among males [29]. Both age groups have similar rates of multiple sexual partners (past year) [29]. Compared with adolescents, young adults have higher rates of contraceptive use, pregnancy, birth, chlamydia, gonorrhea, and HIV [30,32,34,35]. Disparities in current measures persist and are similar for both age groups. Pregnancy and birth rates are higher among black NHs and Hispanics [31,32]. Chlamydia and gonorrhea remain higher for females than males. Black-NH females have three times the overall rate for both STIs. American Indian/Alaskan Native-NH females also have higher rates for these STIs [34].

Chronic conditions and related behaviors

Findings for chronic conditions and related behaviors included healthy, unhealthy, and flat trends for both age groups. The prevalence of youth with special health care needs changed little among adolescents [37]. Hearing loss increased for both age groups [38]. The prevalence of asthma, both current and lifetime, changed little for either age group. Subgroup differences in asthma trends include increases for the following groups: adolescent black-NH females from lower-income families and Asians (lifetime prevalence) and, among young adults, black-NH females (current and lifetime prevalence) [28].

Obesity rates changed little for adolescents and increased for young adults, with several notable subgroup differences. Rates increased among adolescent black-NH and Mexican-American males. Differences from the overall increase among young adults include a larger increase among Mexican-Americans, especially females, and male "other Hispanics"; little change for white-NH males; and a decrease for "other Hispanic" females [28,39].

Encouraging trends in obesity-related behavior included more exercise among both age groups [23,26] and less time spent watching television among adolescents [26]. However, adolescents also reported more "screen time" (>3 hours/day on games and/or the internet) [26]. Several adolescent subgroup differences exist. Compared with the overall increase in physical activity, black-NH and Hispanic males had larger increases, and Hispanic females reported a smaller increase. Compared with the overall decrease in television viewing, Hispanics, black NHs, American Indian/Alaskan Native-NHs, and native Hawaiian, or other Pacific Islander NHs had larger decreases. For "screen time," increases were larger for black-NH and Hispanic/Latino females and all Asian NHs than the overall increase, and there was no change for American Indian/Alaskan Native-NHs [26].

Current measures of dental decay are higher among young adults [40]. Rates of hearing loss and asthma prevalence (both current and lifetime) are similar for adolescents and young adults. Adolescent subgroup differences include higher asthma prevalence (both current and lifetime) among black NHs. Among young adults, asthma prevalence (current and lifetime) is higher among black NHs [28].

Young adults have higher obesity rates than adolescents. Subgroup differences for adolescent obesity include higher rates for Mexican-American males and all black NHs. Among young adults, females have higher rates than males, with black-NH and Mexican-American females having the highest rates. Females in both age groups are less likely to report exercise, with adolescent black-NH and Hispanic females reporting the lowest rates [23,26].

Health care access

Most trends in health care access and utilization changed little for both age groups with a few encouraging exceptions. For adolescents and young adults, rates of insurance and past-year dental visits increased. Among adolescents, there was also an increase in rates of past-year well checkups and doctor visits. For all measures, adolescent data are based on parent report and young adult data are based on self-report [19]. All measures refer to past-year experience.

Several notable subgroup differences in trends were identified. Hispanics, black NHs, and those with lower incomes generally experienced more encouraging trends, and those without insurance for a full year generally experienced worse trends. For both age groups, those in the lower-income categories had greater increases in insurance coverage, compared with the overall increases. Among adolescents, black NHs and Hispanics had greater increases in insurance coverage compared with the overall rise [19]. Having a usual source of care increased for Hispanic adolescents and those from the lowest-income group, compared with little change overall. This review found greater increases in having a doctor visit among those in the lowest-income families and black-NH and Hispanic adolescents, compared with a smaller overall increase. However, rates of having a doctor visit or well visit did not improve for adolescents who were uninsured for a full year. Similarly, young adults who were uninsured for a full year had a decrease in doctor visits, compared with no change among young adults overall. The increase in dental visits among adolescents was even greater among the lower-income groups and black NHs and Hispanics. The increase in dental visits among young adults was greater for the middle-income group, black NHs, and Hispanics than the overall improvement. Finally, the percentage with unmet need for dental care worsened among young adults lacking insurance for a year, compared with no change overall [19]. Among youth with special health care needs (ages 12–17 years), the percentage receiving transition services necessary to transition to adult care has changed little, overall and among subgroups [37]. Current measures show that adolescents fare better on measures of access and utilization than young adults [19]. The uninsured in both age groups generally fare worse on most current measures of access. Young adult males and Hispanics in both age groups also fare worse on most of these measures.

Discussion

This review shows little or no progress on most key measures of adolescent and young adult health. Exceptions include encouraging trends in unintentional injury for both age groups and sexual and reproductive health for adolescents. Decreased tobacco use and assault rates and increases in exercise are also encouraging. Most other areas showed little change or unhealthy trends. The review also showed that young adulthood continues to entail greater risk than adolescence, with young adults faring worse on about two-thirds of the indicators examined.

Health is shaped by a complex interaction among multiple biopsychosocial factors [41]. Although establishing causality between these factors and our findings is beyond the scope of this review, some observations about policies are warranted. Three areas with promising trends—injury, adolescent sexual and reproductive health, and tobacco use—have received significant state and/or federal policy attention.

In the area of injury, all states and the District of Columbia have established graduated drivers licensing programs, which delay full licensure [42] and are linked to reductions in adolescent fatal motor vehicle crashes, especially where states require at least a 6-month learner's permit period [43]. Improved seat belt use among adolescents, which reduces risk of motor vehicle crash fatalities [44], may be partly due to increased primary enforcement of seat belt laws [45]. Economic conditions, which have contributed to a general decrease in adolescent driving, may also explain the decrease [46]. Research is limited on policies related to young adult motor vehicle crash rates.

Adolescent sexual behavior and childbearing have been the focus of major federal and state programs [47–49], including significant attention to pregnancy prevention messages [50]. Evidence points to the importance of improved contraception in decreasing adolescent birth and pregnancy rates, with declines in contraceptive use coincident to a brief rise in births in 2006 and 2007 [51]. Furthermore, data indicate increased use of more effective contraception, despite flat overall rates of contraception [52,53]. However, greater focus on sexual minorities is warranted. Lesbian, gay, bisexual, and transgender youth face multiple challenges, including higher rates of mental health problems and suicidality, among other risks [54]. Young men who have sex with men account for an increasing portion of new HIV cases [55].

Numerous policies focus on tobacco use, which remains a leading cause of premature death [56,57]. Policies over the past decade include a greater focus in states on prohibiting the sale and distribution of tobacco products to minors, an increase in the federal cigarette tax, and tax increases in several states [58]. However, the recent increase in e-cigarettes use may threaten these gains. Emerging research suggests that adolescent e-cigarette use is associated with "regular" smoking [59]. Decreases in assault rates, another encouraging trend, may be due in part to more effective policing responses to crime and use of effective primary prevention interventions [60].

Mental health measures are among those that changed little. The 2010 Affordable Care Act (ACA) may make it easier for adolescents and young adults to receive mental health services. The law's provisions include expansion of mental health parity laws and required coverage of mental health services in certain plans [61,62]. Most major mental health provisions are due to take effect in 2014.

Except for tobacco, most measures of substance use changed little, in contrast to major declines after the mid-1990s [63,64]. In this review, the small decreases in most measures of alcohol use were characterized as "little change." A federal study suggests that adolescents were exposed to fewer prevention messages over the past decade [65]. Although existing research does not support causality between such exposure and substance use, research has identified effective programs to prevent substance use [66], which may merit continued investment.

Indicators of hearing loss and obesity worsened. Emerging research suggests that hearing loss may be linked to increased exposure to loud music (e.g., through mobile phones) [67]. Young adult obesity rates increased. Although the adolescent rate held steady after decades of increases, the continuing high rates portend serious health consequences in adulthood, including higher rates of diabetes, heart disease, and certain cancers [68,69]. The causes of obesity are complex, but evidence suggests that addressing environmental factors—such as opportunity for exercise, financial incentives and disincentives related to food choices, and decreased exposure to marketing of unhealthy foods—may help reduce obesity [70].

Improved insurance rates for adolescents and young adults are likely partly due to public policy. For young adults, increases in insurance after the ACA's passage are well documented [71]. ACA provisions and expansions of Medicaid and the Children's Health Insurance Program before the ACA have likely contributed to increases in insurance for adolescents [72,73]. Improved rates of past-year doctor, dental, and well visits may reflect better access because of higher insurance rates. The increase in well visits may also reflect additional immunization recommendations for adolescents in the past decade and greater adherence to professional recommendations related to well visits [74,75].

Major differences persist by gender for most current indicators. Considerable racial or ethnic disparities also remain, with black-NH and American Indian/Alaskan Native-NH adolescents and young adults faring worse in many areas.

Summary and Implications

This review revealed improvements in monitoring data compared with 2009, including increased access through online databases and data specific to young adults. Many limitations remain, however, notably disparate age groupings across data sets [76]. The relative lack of easily accessible data for young adults remains a challenge. Despite the similarity in health issues, monitoring systems for adolescents and young adults remain fairly separate, making direct comparisons difficult. Available data allow for examination of differences by race or ethnicity and gender but rarely include socioeconomic status and contextual measures (e.g., family and community influences) known to influence health outcomes [15,41,77,78]. National data remain sparse for special populations, including rural youth, homeless youth, and those in the foster care and justice systems. National measures of positive development are similarly limited. The inclusion of a measure of positive adult connections in *Healthy People 2020* is a promising step forward [17].

The finding of some encouraging trends suggests that sustained policy and societal commitment can improve health. However, the findings of mixed, flat, or discouraging trends in most areas suggest a case for strengthening research, programs, and policy to improve health for these pivotal age groups. Research on effective programs has expanded over the past several years, with numerous collections of effective programs [61,79–83]. Additional research is needed to take these programs to scale so that their use is standard practice [83]. Although the literature about "what works" for young adults is also growing, it is largely limited to college-based interventions, especially in alcohol use [15]. Other young adult populations warrant increased focus. Beyond directing efforts to specific issues, health officials and researchers are increasingly approaching adolescent health using the social determinants of health framework [81]. This framework holds that health is shaped by distal factors and more traditional proximal factors, such as family, community

contexts, as well as health policies and programs. A growing body of research suggests that employment and education status during adolescence and young adulthood are associated with health in the short and long term [81,82,84]. Ecologic approaches have also examined cultural changes in industrialized countries that reduce social cohesion and increase uncertainty and insecurity—factors which may contribute to increases in risky behaviors, unhealthy habits, and poor mental health [85]. Research and policies addressing these broader areas are critical. Efforts to improve adolescent and young adult health need to be responsive to emerging issues that may affect the health of youth, such as the ACA [86,87], legalization of marijuana [88], e-cigarettes [59], widely reported increases in heroin-related deaths [89], and greater use of social media [90], as well as new research, such as the growing understanding of brain development during these years [91].

Acknowledgments

The authors gratefully acknowledge Elizabeth Ozer for her review of an earlier manuscript and Linda Ha for her assistance in preparing the manuscript for publication.

Funding Sources

This research was supported by grants awarded to Dr. Irwin from the Maternal and Child Health Bureau, Health Resources and Services Administration, U.S. Department of Health and Human Services (U45MC 00002 and U45MC 00023).

References

[1] Mulye TP, Park MJ, Nelson CD, et al. Trends in adolescent and young adult health in the United States. J Adolesc Health 2009;45:8–24.
[2] Berg TD, Catalano RF, Chase-Lansdale PL, et al. The health and well being of adolescents in the United States, 2009. J Adolesc Health 2009;45:6.
[3] Halfon N, Hochstein M. Life Course Health Development: An integrated framework for developing health, policy, and research. Milbank Q 2002;80:433–79.
[4] Centers for Disease Control and Prevention. Youth Risk Behavior Surveillance—United States, 2011. MMWR Surveill Summ 2012;61:1–162.
[5] Institute of Medicine. Adolescent Health Services: Missing opportunities: Committee on Adolescent Health Services and Models of Care for Treatment, Prevention, and Healthy Development. Washington, DC: National Academies Press; 2009.
[6] Park MJ, Mulye TP, Adams SH, et al. The health status of young adults in the United States. J Adolesc Health 2006;39:305–17.
[7] Irwin Jr CE. Young adults are worse off than adolescents. J Adolesc Health 2010;46:405–6.
[8] Neinstein LS, Irwin Jr CE. Young adults remain worse off than adolescents. J Adolesc Health 2013;53:559–61.
[9] Neinstein LS. The new adolescents: An analysis of health conditions, behaviors, risks, and access to services among emerging young adults. Los Angeles, CA: University of Southern California; 2012.
[10] Knopf D, Park MJ, Brindis CD, et al. What gets measured gets done: Assessing data availability for adolescent populations. Matern Child Health J 2007;11:335–45.
[11] U.S. Census Bureau, Population Division. Annual estimates of the resident population by sex, age, race, and Hispanic origin for the United States and States: April 1, 2010 to July 1, 2012. Published June 2013.
[12] Child Trends' calculations of U.S. Census Bureau. School enrollment—social and economic characteristics of students. Detailed Tables: Table 1. Available at: http://www.census.gov/hhes/school/data/cps/index.html; October 2012. Accessed November 4, 2013.
[13] U. S. Bureau of the Census. Current Population eports, Series P20–514, "Marital Status and Living Arrangements: March 1998 (Update)," and earlier reports. Available at: http://www.census.gov/population/socdemo/ms-la/tabms-2.txt. Accessed November 4, 2013.
[14] Settersten RA, Furstenburg FF, Rumbaut RG, eds. On the frontier of adulthood: Theory, research and public policy. Chicago, IL: University of Chicago Press; 2005.
[15] Institute of Medicine and National Research Council. Improving the health, safety, and well-being of young adults: Workshop summary. Washington, DC: The National Academies Press; 2013. Available at: http://www.iom.edu/Reports/2013/Improving-the-Health-Safety-and-Well-Being-of-Young-Adults-Workshop-Summary.aspx. Accessed November 4, 2013.
[16] American Academy of Pediatrics, American Academy of Family Physicians, American College of Physicians-American Society of Internal Medicine. A consensus statement on health care transitions for young adults with special health care needs. Pediatrics 2002;110:1304–6.
[17] US Department of Health and Human Services. Healthy people 2020 draft core indicators for adolescent and young adult health. Available at: http://www.healthypeople.gov/2020/learn/Draft_Core_Indicators_Web.pdf. Accessed January 29 2014.
[18] University of California, San Francisco. Department of Pediatrics, Division of Adolescent and Young Adult Medicine, National Adolescent and Young Adult Health Information Center. Available at: http://nahic.ucsf.edu. Accessed February 12, 2014.
[19] Public Policy Analysis and Education Center for Adolescent and Young Adult Health. National Health Interview Survey [private data run] 2012. Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/nchs/nhis.htm. Accessed August 12, 2013.
[20] Centers for Disease Control and Prevention. Compressed Mortality, 1999-2010 data provided by CDC WONDER Online Database, Released January 2013. Available at: http://wonder.cdc.gov/cmf-icd10.html. Accessed April 3, 2013.
[21] Centers for Disease Control and Prevention – National Center for Injury Prevention and Control: Data and Statistics. WISQARS: Leading Causes of Death [online database]. Available at: http://www.cdc.gov/ncipc/wisqars/. Accessed August 20, 2013.
[22] Centers for Disease Control and Prevention - National Center for Injury Prevention and Control: Data and Statistics. WISQARS: Fatal Injury Reports [online database]. Available at: http://www.cdc.gov/ncipc/wisqars/. Accessed August 20, 2013.
[23] Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System [online database]. Available at: http://apps.nccd.cdc.gov/BRFSS/. Accessed May 28, 2013.
[24] National Highway Traffic Safety Administration. Traffic Safety Facts 2011: A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Reporting System and the General Estimates System. Available at: http://www-nrd.nhtsa.dot.gov/Pubs/TSF2007FE.PDF. Accessed September 9, 2013.
[25] Substance Abuse and Mental Health Services Administration. Center for Behavioral Health Statistics and Quality. National Survey on Drug Use and Health. ICPSR34481–v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2012-11-28.
[26] Centers for Disease Control and Prevention. 2000-2011 Youth Risk Behavior Survey. Available at: www.cdc.gov/yrbs. Accessed May 24, 2013.
[27] Bureau of Justice Statistics. Rates of Personal Victimization by Age, Sex, and Race/Hispanic Origin by NCVS Victimization Analysis Tool. Available at: http://www.bjs.gov/index.cfm?ty=nvat. Accessed November 14, 2013.
[28] Centers for Disease Control and Prevention. National Health Interview Survey, National Center for Health Statistics: Health Data Interactive. Available at: www.cdc.gov/nchs/hdi.htm. Accessed August 6, 2013.
[29] Chandra A, Mosher WD, Copen C, Sionean C. Sexual behavior, sexual attraction, and sexual identity in the United States: Data from the 2006–2008 National Survey of Family Growth. Natl Health Stat Report 2011;3:1–36.
[30] Jones J, Mosher W, Daniels K. Current contraceptive use in the United States, 2006–2010, and changes in patterns of use since 1995. Natl Health Stat Report 2012. Hyattsville, MD: National Center for Health Statistics.
[31] Curtin SC, Abma JC, Ventura SJ, Henshaw SK. Pregnancy rates for U.S. women continue to drop. NCHS Data Brief 2013:1–8.
[32] Hamilton BE, Martin JA, Ventura SJ. Births: Preliminary data for 2012. Natl Vital Stat Rep 2013;62:1–20.
[33] Mosher WD, Jones J, Abma JC. Intended and unintended births in the United States: 1982–2010. Natl Health Stat Report 2012:1–28.
[34] Centers for Disease Control and Prevention, National Center for HIV, STD and TB Prevention, Division of STD/HIV Prevention. Sexually Transmitted Disease Morbidity for selected 1996-2011 STDs by age, race/ethnicity, and gender. CDC WONDER Online Database. Available at: http://wonder.cdc.gov/std?std?race?age.html. Accessed July 22, 2013.
[35] Centers for Disease Control and Prevention. 2011 HIV Surveillance Report; vol. 23, 2013. Available at: http://www.cdc.gov/hiv/topics/surveillance/resources/reports/. Accessed August 15, 2013.
[36] Centers for Disease Control and Prevention. Sexually Transmitted Disease Surveillance 2011. Atlanta: U.S. Department of Health and Human Services. Available at: http://www.cdc.gov/std/stats11/Surv2011.pdf; 2012.

[37] National Survey of Children with Special Health Care Needs. Online Database. Available at: http://childhealthdata.org/browse/survey?s=1. Accessed January 3, 2014.

[38] Shargorodsky J, Curhan SG, Curhan GC, Eavey R. Change in prevalence of hearing loss in US adolescents. JAMA 2010;304:772–8.

[39] Fryar CD, Carroll MD, Ogden CL. Prevalence of obesity among children and adolescent: United States, trends 1963-1965 through 2009-2010. Available at: http://www.cdc.gov/nchs/data/hestat/obesity_child_09_10/obesity_child_09_10.pdf. Accessed May 28, 2013.

[40] Centers for Disease Control and Prevention. National Center for Health Statistics. National Health and Nutrition Examination Survey, 2007-2008. ICPSR34481–v1. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]; 2013-6-17.

[41] World Health Organization. Health Impact Assessment: The Determinants of Health. Available at: http://www.who.int/hia/evidence/doh/en/. Accessed January 27 2014.

[42] Insurance Institute for Highway Safety. Effective Dates of Graduated Licensing Law Components in Every State and D.C. Available at: http://www.iihs.org/media/028244c2-87b1-4108-8122-c055877ea5da/-838545571/Laws/gdl_effective_dates.pdf. Accessed December 5 2013.

[43] Ehsani JP, Bingham CR, Shope JT. The effect of the learner license Graduated Driver Licensing components on teen drivers' crashes. Accid Anal Prev 2013;59:27–336.

[44] Centers for Disease Control and Prevention, National Center for Injury Prevention and Control, Division of Unintentional Injury prevention. Policy impact: Seat belts. Available at: http://www.cdc.gov/motorvehiclesafety/seatbeltbrief/index.html. Accessed December 5 2013.

[45] Garcia-España JF, Winston FK, Durbin DR. Safety belt laws and disparities in safety belt use among US high-school drivers. Am J Public Health 2012;102:1128–34.

[46] Centers for Disease Control and Prevention. Vital signs: Drinking and driving among high school students aged ≥ 16 years—United States, 1991-2011. MMWR Morb Mortal Wkly Rep 2012;61:796—900. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6139a5.htm?s_cid=mm6139a5_w. Accessed December 5 2013.

[47] Office of Adolescent Health. TPP Replication of Evidence-Based Programs. Available at: http://www.hhs.gov/ash/oah/oah-initiatives/teen_pregnancy/about/evidence-based.html. Accessed December 5, 2013.

[48] The National Campaign to Prevent Teen and Unplanned Pregnancy. Personal Responsibility Education Program. Available at: http://www.thenationalcampaign.org/federalfunding/prep.aspx. Accessed December 5 2013.

[49] Margolis AL, Roper AY. Practical experience from the office of adolescent health's large scale implementation of an evidence-based teen pregnancy prevention program. J Adolesc Health 2014;54(3 Suppl):S10–4.

[50] Hamilton BE, Mathews TJ, Ventura SJ. Declines in state teen birth rates by race and Hispanic origin. NCHS Data Brief May 2013:1–8.

[51] Santelli JS, Melnikas AJ. Teen fertility in transition: Recent and historic trends in the United States. Annu Rev Public Health 2010;31:371–83.

[52] Finer LB, Jerman J, Kavanaugh ML. Changes in use of long-acting contraceptive methods in the U.S., 2007-2009. Fertil Sterility 2012;98:893–7. Available at: http://www.guttmacher.org/pubs/journals/j.fertnstert.2012.06.027.pdf. Accessed December 5 2013.

[53] Martinez G, Copen CE, Abma JC. Teenagers in the United States: Sexual activity, contraceptive use, and childbearing, 2006–2010 National Survey of Family Growth. Vital Health Stat 23 2011:1–35.

[54] Society for Adolescent Health and Medicine. Recommendations for promoting the health and well-being of lesbian, gay, bisexual, and transgender adolescents: A position paper of the Society for Adolescent Health and Medicine. J Adolesc Health 2013;52:506–10.

[55] HIV surveillance in adolescents and young adults; Available at: www.cdc.gov/hiv/topics/surveillance/resources/slides/adolescents/index.htm. Accessed March 31, 2014.

[56] U.S. Department of Health and Human Services. Preventing tobacco use among youth and young adults: A report of the surgeon general. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2012.

[57] National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention. Tobacco Use: Targeting the Nation's Leading Killer. Available at: http://www.cdc.gov/chronicdisease/resources/publications/AAG/osh.htm#aag. Accessed December 11 2013.

[58] Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. The NSDUH Report: Trends in cigarette use among adolescents and young adults. April 12 2012. Rockville, MD. Available at: http://www.samhsa.gov/data/2k12/NSDUH047/SR047CigaretteTrends2012.htm. Accessed December 5 2013.

[59] Dutra LM, Glantz SA. Electronic cigarettes and conventional cigarette use among US adolescents: A cross-sectional study. JAMA Pediatr published online March 6, 2014; http://dx.doi.org/10.1001/jamapediatrics.2013.5488.

[60] Centers for Disease Control and Prevention. Homicide rates among persons aged 10-24 Years—United States 1981-2010. MMWR Morb Mortal Wkly Rep 2013;62:545–60. Available at: http://www.cdc.gov/mmwr/pdf/wk/mm6227.pdf. Accessed December 5 2013.

[61] National Conference of State Legislatures. Final Rules under the Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity aAct of 2008; Technical Amendment to External Review for Multi-State Plan Program. November 2013. Available at: http://www.ncsl.org/documents/statefed/health/MHParity-FRule_mwedits.pdf. Accessed December 5 2013.

[62] Barry CL, Huskamp HA. Moving beyond parity—Mental Health and Addiction Care under the ACA. N Engl J Med 2011;365:973–5.

[63] The Monitoring the Future Study, University of Michigan. Table 3: Trends in 30-day prevalence of use of various drugs in grades 8, 10, and 12. Available at: http://www.monitoringthefuture.org/data/13data/13drtbl3.pdf. Accessed January 27 2014.

[64] Serwach J. Teen smoking rates and illicit drug use continue to drop. The University Record Online for Faculty and Staff of the University of Michigan. Available at: http://www.ur.umich.edu/0506/Dec12_05/24.shtml; January 3, 2006. Accessed January 27, 2014.

[65] Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. The NSDUH Report: Trends in exposure to substance use prevention messages among adolescents. February 7 2013. Rockville, MD. Available at: http://www.samhsa.gov/data/2k13/NSDUH099b/sr099b-trends-prevention-messages.htm. Accessed December 5 2013.

[66] Substance Abuse and Mental Health Services Administration. National Registry of Evidence-Based Programs and Practices. Available at: http://www.nrepp.samhsa.gov/Index.aspx. Accessed December 11 2013.

[67] Berg AL, Serpanos YC. High frequency hearing sensitivity in adolescent females of a lower socioeconomic status over a period of 24 years (1985–2008). J Adolesc Health 2011;48:203–8.

[68] Office of the Surgeon General, U.S. Department of Health & Human Services. Overweight and obesity: Health consequences. Surgeon general calls to action. Available at: http://www.surgeongeneral.gov/library/calls/obesity/fact_consequences.html; 2001. Accessed December 5 2013.

[69] Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition, Physical Activity, and Obesity. Basics about childhood obesity. Available at: http://www.cdc.gov/obesity/childhood/basics.html. Accessed December 5 2013.

[70] Story M, Sallis JF, Orleans CT. Adolescent obesity: Towards evidence-based policy and environmental solutions. J Adolesc Health 2009;45:S1–5.

[71] Kirzinger WK, Cohen RA, Gindi RM. Trends in insurance coverage and source of private coverage among young adults aged 19–25: United States, 2008–2012. NCHS Data Brief, no 137. Hyattsville, MD: National Center for Health Statistics.

[72] Kaiser Commission on Medicaid and the Uninsured Key Facts. State adoption of coverage and enrollment options in the Children's Health Insurance Reauthorization Act of 2009. Available at: http://kaiserfamilyfoundation.files.wordpress.com/2013/01/8146.pdf. Accessed January 27 2014.

[73] Snyder L, Rudowitz R. CHIP enrollment: June 2012 data snapshot. The Henry J Kaiser Family Foundation. Available at: http://kff.org/medicaid/issue-brief/chip-enrollment-june-2012-data-snapshot/. Accessed January 27 2014.

[74] Hagan JF, Shaw J, Duncan P. Bright futures: Guidelines for health supervision of infants, children, and adolescents. Available at: http://brightfutures.aap.org/pdfs/Guidelines_PDF/18-Adolescence.pdf. Accessed January 27, 2014.

[75] Centers for Disease Control and Prevention. Vaccination coverage among adolescents aged 13-17 years—United States, 2007. MMWR Morb Mortal Wkly Rep 2008;57. Retrieved January 21, 2014 from, http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5740a2.htm.

[76] Patton GC, Coffey C, Cappa C, et al. Health of the world's adolescents: A synthesis of internationally comparable data. Lancet 2012;379:1665–75.

[77] Resnick MD, Bearman PS, Blum RW, et al. Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. JAMA 1997;278:823–32.

[78] Aufseeser D, Jekielek S, Brown BV. The family environment and adolescent well-being: Exposure to positive and negative family influences. Washington, DC: Child trends. San Francisco, CA: National Adolescent Health Information Center, University of California, San Francisco. Available at: http://nahic.ucsf.edu/wp-content/uploads/2011/02/2006-FamEnvironBrief.pdf; 2006. Accessed March 18, 2009.

[79] Child Trends. Lifetime interventions to nurture kids successfully (LINKS) Database. Available at: http://www.childtrends.org/what-works/. Accessed February 12, 2014.

[80] University of Colorado Boulder, Institute of Behavioral Science, Center for the Study and Prevention of Violence. Blueprints for healthy youth development. Available at: http://www.blueprintsprograms.com/. Accessed February 12, 2014.

[81] Viner Russell M, Ozer Elizabeth M, Denny Simon, et al. Adolescence and the social determinants of health. Lancet 2012;379:1641–52.
[82] Johnson MK, Crosnoe R, Elder Jr GH. Insights on adolescence from a life course perspective. J Res Adolesc 2011;21:273–80.
[83] Catalano RF, Fagan AA, Gavin LE, et al. Worldwide application of prevention science in adolescent health. Lancet 2012;379:1653–64.
[84] Freudenberg N, Ruglis J. Reframing school dropout as a public health issue. Prev Chronic Dis 2007;4. Available at: http://www.cdc.gov/pcd/issues/2007/oct/07_0063.htm. Accessed February 12, 2014.
[85] Eckersley R. A new narrative of young people's health and wellbeing. J Youth Stud 2011;14.
[86] English A, Scott J, Park MJ. Implementing the Affordable Care Act: How much will it help vulnerable adolescents and young adults? Chapel Hill, NC: Center for Adolescent Health & the Law; and San Francisco, CA: National Adolescent and Young Adult Health Information Center; 2014.
[87] English A, Park MJ. The Supreme Court ACA Decision: What happens now for adolescents and young adults? Chapel Hill, NC: Center for Adolescent Health & the Law; and San Francisco, CA: National Adolescent and Young Adult Health Information Center; 2012.
[88] Joffe A, Yancy WS. Legalization of marijuana: Potential impact on youth. Pediatrics 2004;113:e632–8.
[89] Paone D, Tuazon E, Nolan M, O'Brien DB. Epi Data Brief: Unintentional drug poisoning (overdose) deaths in New York City, 2000-2012. September 2013, No 33. Available at: http://www.nyc.gov/html/om/pdf/2013/edb_unintentional_drug_poisoning_overdose_deaths.pdf. Accessed March 31 2014.
[90] Giedd JN. The digital revolution and adolescent brain evolution. J Adolesc Health 2012;51:101–5.
[91] Johnson SB, Blum RW, Giedd JN. Adolescent maturity and the brain: The promise and pitfalls of neuroscience research in adolescent health policy. J Adolesc Health 2009;45:216–21.