Do Recessions Rein in Your Teen?

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I.	Introduction

In a series of papers related to adult mortality and behavior over the business cycle, Ruhm (1995, 2000, 2003, 2005, 2008, and with Gerdtham, 2006) found that, in general, recessions were associated with better health.   Specifically, he found that mortality declined and health behavior improved when the economy, as measured by state-specific unemployment rates, temporarily declined. Part of the improvement in health outcomes was related to reductions in tobacco use and heavy drinking, as well as an increased level of exercise among those who were previously inactive. In this work and others, unanticipated health benefits of an economic downturn have been documented for adults, but the question remains as to whether healthier behaviors by adults translate into improvements in health behaviors by their children.

Economic and social science researchers have long been concerned with unhealthy and risky behavior by adolescents (See Gruber, 2000 for an early summary of work in this area), and a number of recent papers have focused on the impact of monetary and opportunity costs on a variety of adolescent outcomes such as cigarette smoking, use of alcohol, and drugs. Though smoking and alcohol use among teens has declined in recent years, the incidence of such unhealthy behaviors remains high among US adolescents. In 2011, nearly 40% of high school students reported using any alcohol, 22% reported binge drinking in the past 30 days (CDC 2013b) and 18% report smoking cigarettes (CDC, 2013c).

Researchers have also examined factors associated with early sexual activity and risky sexual behaviors among adolescents (Gruber, 2000; Averett et al,2011; 2013, Sabia and Rees, 2012; Rashad and Kaestner, 2004; Chatterji et al, 2004);) and the potentially negative consequences of early sexual initiation and teen pregnancy have been well-documented. The Centers for Disease Control report that nearly half of all high school students have initiated sexual activity and one-third report having been sexually active in

the past 30 days (CDC, 2013a). Finally, policy makers have increasingly turned their attention to understanding factors associated with childhood obesity. A number of externally-funded programs seek to shape child and adolescent behavior with regard to nutrition and exercise.

This research explores whether improved health behavior during economic downturns carries over to the younger crowd, specifically to high-school-aged teens. The analyses are conducted using state-level mortality data from the CDC as well as data from the Youth Risk Behavior Surveillance System (YRBSS), which is the youth version of the behavioral data used in the research performed by Ruhm.

II.   Previous Literature

In a hallmark paper, Ruhm (2000) examines the health impact of short run changes in economic conditions. Using aggregate state-level data on death rates by age and cause for the years 1972 - 1991, Ruhm finds that, with the exception of suicide, eight of the ten causes of death that he examines decline as economic activity declines over the business cycle.

Additional analyses of micro data from the Behavior Risk Factor Surveillance Survey between 1987 and 1995 allows the analyses of health-related behaviors. His findings suggest that while cigarette smoking decreases when economic conditions are poor; the results for alcohol consumption is mixed, with most research suggesting that alcohol use was pro-cyclical (Ruhm, 1995, 2002). Economic downturns were found to be associated with other improvements in health such as reduction in BMI and a measure of obesity and increases in the frequency of exercise.

These improvements in healthy behaviors during times of economic decline do not extend to increases in preventive care and medical treatment. There is no increase in the prevalence of regular doctor visits, mammography and other diagnostic and preventive physician visits (Ruhm 2000).

In more recent work, Stevens (2011) replicates the work of Ruhm by looking at overall mortality rates across different age groups. That research supports the work by Ruhm that mortality is generally pro-cyclical. However, there is little support for own-age group specific unemployment rate as the mechanism. This suggests that it is not the individual's own employment experience driving the pro-cyclical relationship.

III.   Economic Conditions as a Determinant of Health

Researchers examining the effect of macroeconomic conditions on health, suggest that economic downturns may influence health and mortality through a number of channels. Studies that compare macroeconomic fluctuations across developing countries often point to long-term changes in expenditures on public health. Studies that examine this relationship within the US often posit that the primary links between macroeconomic activity in general, and unemployment in particular, and health are the resulting changes in income and the opportunity cost of time.

Time use is altered during an economic downturn. In his analysis of mortality rates, Ruhm (2000) discusses the incidence of work related exertion, stress and injury that may adversely affect health during an economic expansion. Results from his analyses also indicate an increase in mortality from automobile accidents is linked to increased economic activity (Ruhm, 1995). These increases could be due to increased commuting and work-related driving when work activity is high or to the observed increases in drinking and driving that accompanies economic upturns (Evans and Graham, 1988; Ruhm, 1995). This link between economic changes and mortality are less likely to be at play in our analyses of health behaviors of teens.

Economic fluctuations affect time use in other ways that are more relevant to decisions regarding health behaviors. In particular, the cost of time declines during a recession as labor market opportunities dwindle. In contrast, the time needed to access preventive medical care and treatment are substantially higher when joblessness is low. In addition to

these expected changes in medical care, we might also expect to see countercyclical changes in time intensive activities such as exercise.

Finally, medical care, and other health-promoting investments may require significant out-of-pocket expenditures that may be difficult in times of financial hardship during economic downturn. Reductions in medical care during recessions may also be related to the loss of health care coverage during periods of joblessness. Similarly, nutritionally appropriate meal options are often more costly than their less healthy counterparts. This is supported by Stevens 2011, who finds that nursing home deaths are pro-cyclical and a major driver of the pro-cyclicality of overall mortality.

Models of decision-making regarding health behaviors by adolescents differ somewhat from those used to explain adult behavior. This difference is particularly salient when considering changes in the opportunity cost of time associated with economic downturns. The decline in the opportunity cost of time may impact healthy behaviors (exercise) and risky behavior of teens through two possible mechanisms. First, during a downturn, teens have more time at hand to exercise. As a result, exercise and regular physical activity are expected to increase during recessions. Ruhm (2000, 2005) show that, for adults, weight often declines during recessions due to increases in the time devoted to physical activity. However, at the same time, the decline in opportunity cost of time will also allow for additional time to participate in risky behavior, such as sexual activity and substance abuse.

An economic downturn also alters the cost and availability of parental time. An increase in economy-wide joblessness leads to a decline in the opportunity cost of time among parents (or adults) as well. This is likely to translate into increased parental monitoring and supervision of children. There is evidence which shows that parental supervision significantly decreases the risky behavior of teens (Miller 2006; Averett, Argys and Rees 2011). Therefore in the times of increased joblessness, the risky behavior of teens may fall as a result of increased parental supervision. The high correlation between teen and adult unemployment, however, makes disentangling the potentially offsetting effects of increased availability of time by both teens and parents empirically challenging.

IV.   Data and Sample

The policy variables of interests in this analysis are the state level unemployment rates for teens and for the state as a whole. These data were obtained from the Bureau of Labor Statistics via Haver Analytics. As shown in Figure 1, the data used in these analyses cover the 1991 recession, the extended economic expansion during the 1990s, fluctuations in unemployment throughout the 2000s, and the Great Recession. Models include the teen (age 16-19) unemployment rate and total (adult) unemployment rates in various combinations. Though teen unemployment is substantially higher than that of adults, the two rates trend together.

In the spirit of Ruhm's work, the analyses in this paper provide preliminary estimates of the link between economic activity and both teen mortality and individually-reported health behaviors by teens. The state level mortality data by gender for 15-19 year olds was obtained from CDC Wonder. The mortality data by cause of death was matched to Ruhm (2006) whenever a sufficient number of teen deaths occurred to provide reliable data. In addition, selection of causes is made to make its categorization consistent across the time span of 1990 to 2010, which is the latest year available. These criteria result in mortality rates for the final analysis that are limited to behavioral causes of death, including 1)Total Mortality 2)Unintentional injuries (includes deaths from transport accidents and non-transport accidents); 3) Motor vehicle accidents (a sub-category of transport accidents; 4) Suicide; 5)Homicide; and 6) External Causes (any cause other than physical illness). For privacy reasons, states do not report mortality statistics when there are fewer than 10 deaths in a category in a state in a year. For the

purpose of this analysis states with fewer than 10 deaths are assigned the midpoint of 5 deaths in these categories. [1]

Average state mortality rates are presented in Table 1, and changes in mortality over time are captured in Figures 2 and 3. Mortality rates for males are much higher than those for females; for deaths related to behavior the rates are 2 to 3 times larger. However, that difference is declining over time as there is a clear, large downward trend in deaths due to external causes for males, with a much smaller decline occurring for females. It does appear that, as found in earlier work, there is an acceleration of the decline in times of recession, which is highly correlated with increases in the unemployment rate, as shown in Figure 1.

Individual-level data used for this study comes from the Youth Risk Behavior Surveillance System (YRBSS). The YRBSS includes a survey administered to adolescents and young adults in odd-numbered years by the Centers for Disease Control and Prevention on behalf of states and local municipalities to gain an understanding of risky behaviors among teens. The national high school-based sample is selected from students in grades 9-12. The sample analyzed in this research includes both the national sample and the state level samples available between 1991 and 2011. The national sample is administered by the CDC for some states and some years. The data on the remaining states and years is collected by the states themselves and this state level sample is a restricted dataset. For our analyses, we obtained this dataset from individual states and then combined this state level sample

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[1] We also estimated the models with zero rather than five deaths as the default with no significant impact on the results.

with the national sample collected by the CDC. See appendix 1 for a table for information on the data availability by state and year.

 The final data used in our analyses are extracted from surveys conducted between 1991 and 2011 and include observations from 508,975 males and 490,858 females between the ages of 14 and 18. These data include information on health-related behaviors that are the focus of this study: sexual activity, drinking, binge drinking, smoking, diet and exercise. The policy variables of interest, teen and total unemployment rates, are appended to the micro data by state and year. It should be noted that the timing of the YRBSS interview is identified only by year, due to confidentiality concerns, so there is no information on month, quarter, or season of the interview provided in the data. Thus annual unemployment rates are utilized. This will likely reduce some of the precision of this potential relationship. In the YRBSS sample, the correlation between teen and adult unemployment is .844, thus limiting the ability to distinguish the differential impact of the two different unemployment rates.   Data over this period provide a valuable opportunity to examine the effect of economic fluctuations on teen health. It should also be noted that there are large differences in the sample size by question. Not all teens answered every question, which leads to some concerns about selection in the data. The means for the YRBSS sample are reported in Tables 2 and 3 and are presented for the whole sample, by age groups, and by racial/ethnic categories.

Although not in itself an unhealthy behavior, policy makers are concerned about the consequences of teen sexual activity. Unintended pregnancy and increased risk of sexually transmitted infections can have long-term adverse consequences that shape an adolescent's future. Over one-third of the high school students interviewed as part of the YRBSS report having been sexually active in the past three months, with that level increasing from approximately 20 percent for 14 and 15 year olds to over half of 18-year olds.

The YRBSS includes a number of questions related to substance use; smoking cigarettes, drinking alcohol, and using marijuana and a number of other illicit drugs. For each of these substances, respondents indicate whether they have ever used, and if so, the date of first use, and measures of recency and quantity. We use three measures of substance use in our analyses: alcohol consumption in the past 30 days, binge drinking (defined as 5 or more drinks in a row for at least one day) in the past 30 days, and smoking in the past 30 days. Approximately 45 percent of both males and females have consumed alcohol in the thirty days prior to their survey date and over 25 percent have smoked cigarettes in the same time period. Almost one-third of males engaged in binge drinking in the last 30 days, while just one-fourth of females did so.

Our analyses also include a measure of healthy activity. The YRBSS queries respondents about their physical activity. Using data from questions about the frequency of vigorous exercise, a variable that indicates vigorous exercise more than three times per week suggests that a majority of teens are physically active. Nearly two-thirds of the males in the sample reported vigorous exercise more than three times per week, while just under half of the girls. The share of teens engaging in risky behaviors as well as exercise over the years of the survey is shown in Figures 3 and 4[2]. The gray bars in the charts represent periods in which our country was in a recession. It should be noted, however, that recession is not perfectly correlated with rising unemployment rates, as evidenced by the fact that the unemployment rate remained elevated well after the NBER determined that the Great Recession was over. The figures in the charts do not suggest an obvious relationship, positive or negative, between recessions and behavior, with the possible exception of exercise which appears to increase in recessionary times. However, there is a clear pattern of declining risky behavior over a large part of the survey years.

As indicated in Table 2 and Figures 3a and 3b, there are systematic variations in the patterns of health behaviors by age and gender. In keeping with what is known from other

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[2] There is change in response to the exercise variable occurring in 2007 resulting in a substantial increase in the share participating in vigorous exercise (almost o a 50% increase from one survey to the next) . Thus, analysis is limited to before 2007 for that analysis.

studies, the incidence of substance use and sexual activity for teen females are similar to those for males. A notable exception is that females are less likely to report frequent vigorous exercise. Sexual behavior and substance use increase with age, while frequent vigorous exercise decreased with age. The age distribution of the sample is shown in Table 3b, and all empirical models that follow control for age.

Health-related activities vary only slightly across racial and ethnic groups as shown in Table 2b. As has been reported elsewhere (Gruber, 2000) non-white teens are more likely to be sexually active, but less likely to be engaged in substance use. That pattern is repeated in the YRBSS data for African- Americans, however Hispanic teens appear to behave similar to white teens. In part in response to these differences in behavior, some models are estimated separately by age, racial, and ethnic group.

V. Estimation Strategy and Results

Mortality Rates

The goal of this analysis is to understand the impact of macroeconomic fluctuation on teen health, and we begin our investigation with an analysis of mortality rates. To this end, we largely follow Ruhm's (2006) analytical strategy and estimate the following equation using OLS:

$$MR_{jst}{}^* = \alpha + \beta_0{}' X_{st} + \beta_1\, UNEMP_{st} + T_t + S_s + \varepsilon_{jst} \qquad (1),$$

Where MR is the mortality rate for 15-19 year olds by cause j in state s and year t. Unemp is the unemployment rate of interest, teen (16-19) unemployment or total unemployment in state s in year t. The vector X includes state-level controls for the racial distribution of the 15-19 year old population in state s at time t, as well as median income of the state and the percent of the state population with college degree or higher by year.

The simple estimation of the mortality rates shown in Table 4 suggest, similar to the work of Ruhm (2000) and Stevens et al. (2011) on adult mortality, that teen mortality is pro-

cyclical especially for males. There is evidence that unintentional injuries due to motor vehicle or transport as well as suicide and homicide are pro-cyclical, although the latter two are not significant at conventional levels, likely due to the high level of states with less than 10 deaths per year in these categories.   All causes of death appear to be procyclical regardless of the unemployment rate measure utilized, however, external causes, suicides, and homicides are positively, but not significantly, related to the overall unemployment rate for males.

The magnitude of these effects may seem small, a one-percentage point increase in the teen unemployment rate results in a decrease in motor vehicle fatalities of .17 girls per 100,000. However, given the low mortality rates for teen, decreasing motor vehicle mortality rates by .17 represents a nearly 1% decrease in motor vehicle deaths from the overall mean of 19 per 100,000. During recession, it is typical for the teen unemployment rate to rise by as much as 10 percentage point. An increase of that magnitude could lower female motor vehicle deaths by as much as 8%. These pro-cyclical effects support the notion of drinking and driving as normal goods, which decrease during time of economic downturn.

Health-related Behaviors.

The analysis of individual-health-related behavior using data from the YRBs are estimated in similar fashion:

$$B_{ist}^* = \alpha + \beta_0{}' X_{it} + \beta_1\ UNEMP_{st} + \beta_2\ CIGPRICE_{st} + \beta_3\ BEERTAX_{st} + T_t + S_s + \varepsilon_{ist}\ (2)$$

where B^*_{ist} represents the underlying probability that individual i engages in each of the health-related behaviors discussed above in state s at time t. X is a vector of personal characteristics that include age, race and ethnicity. UNEMP is the teen unemployment rate in state s in year t. We estimate alternative models that replace the teen unemployment rate with the overall unemployment rate. The models include the average state price of a pack of cigarettes as well as the state-level beer tax to proxy for the price of alcohol. The baseline models also include year fixed effects (T_t) and state fixed effects (S_s). The inclusion

of state-specific fixed effects means that we are estimating the effect of changes in teen unemployment within a state on changes in teen behaviors.

Because we do not observe B*, but rather a dichotomous indicator of whether or not individual i engages in behavior B, we estimate equation (1) as a linear probability model. All standard errors are adjusted for clustering at the state level.

Estimates of the parameters in equation (2) are reported in Table 5. Columns 1 and 2 report the estimates of β_1 for males and females respectively. Each row in Table 5 represents a regression with a different dependent variable.[4] For example, the coefficient reported in the first row of column 1 represents the effect of a one percent change in the teen unemployment rate on the probability that a male high school student engaged in sexual activity in the past three months. This significant estimate suggests that as teen unemployment increases by one percentage point the probability that a high school boy is sexually active declines by .15 percentage points. This result is somewhat surprising since the theoretical framework does not predict a negative relationship between teen unemployment and sexual activity by teens. An increase in teen unemployment should lower the opportunity cost of time and increase the likelihood of a teen being sexually active, but this estimate is likely confounded by the strong correlation between changes in teen unemployment and changes in adult unemployment. Column 3 presents estimates of the same model, but replaces the teen unemployment rate with the overall adult unemployment rate. This estimate suggests a larger effect of a one percent increase in the adult unemployment rate on teen sexual activity and is consistent with the hypothesis that as adults, and parents in particular, have additional non-market time, teens may face increased supervision that deters risky behavior. Similar, and slightly larger, effects are estimated for females.

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[4] . Estimates of the coefficients for the control variables are reported in appendix table 1. The effects of age, race and ethnicity on health behaviors are as expected.

In an attempt to disentangle the contributions of teen unemployment and adult unemployment to changes in adolescent health behaviors we estimate a third model that includes both unemployment rates as independent variables. The estimates in columns 5 and 6 indicate negative impacts of both teen and adult unemployment, but larger and more precise estimates (for males) of the impact of adult unemployment on teen sexual activity. This pattern provides support for the conjecture that parental supervision is the mechanism through which unemployment affects teen sexual activity.

The remaining results in Table 6 indicate many significant and positive relationships between unemployment and substance use in the form of alcohol, both any drinking and binge drinking, suggesting that teen alcohol consumption is counter-cyclical. Increases in the teen unemployment rate are associated with a .16 percentage point increase in binge drinking for males and a .12 percentage point increase for females. The analysis of the adult unemployment rate produces larger and precisely estimated positive correlations as well. When both unemployment rates are included, the overall unemployment rate dominates the teen-specific rate. There is a similar pattern for recent drinking, although the coefficients are not as precisely estimated. There does not appear to be much discernible effect of the unemployment rate on smoking behavior, except for the youth unemployment rate, which is significantly and positively correlated with smoking for males.

Reductions in the opportunity cost of time, as reflected in higher teen unemployment, does seem to encourage time-intensive health-promoting activities. Specifically, as the teen unemployment rate rises by one percentage point, the probability that a male teen engages in regular vigorous exercise, rises by .2 percentage point. Though this effect sounds small, teen unemployment climbed ten percentage points during the onset of the Great Recession. In response, teens were two percentage points more likely to engage in vigorous exercise. The effect was larger for females, with a 0.3 percentage point increase in exercise for a one percentage point increase in the unemployment rate.

An alternative strategy to disentangle the relative contributions of parental or adult unemployment from teen unemployment is to estimate these models separately for teens by smaller age subgroups. In particular, one would expect parental unemployment to have a larger impact on younger teens and own unemployment would be more salient to the oldest teens. Tables 7, 8, and 9 report estimates from identical models by age group. Table 7 reports estimates for 14 and 15 year olds, Table 8 for 16 and 17 year olds, and Table 9 reports estimates for 18 year olds. In contrast to what we might have expected, the results are somewhat similar across age groups. The lone exception is that unlike healthy behavior by younger teens, unemployment has little impact on exercise among 18 year old male high school students.

We also investigate whether responses to unemployment vary by race and ethnicity. Not surprisingly the results for white respondents suggest that their behavior drives the overall results, although the smaller sample sizes contribute to somewhat more imprecise estimates. Despite the smaller sample sizes there are a number of statistically significant estimates for African-American (Table 11) and Hispanic respondents (Table 12). The most consistent results across racial and ethnic subgroups are that greater unemployment is associated with increased exercise and increased binge drinking. In addition, own unemployment is negatively and significantly related to drinking for African-American males while the overall unemployment rate is positively correlated, when both are included in the model. The impact of unemployment on health behaviors is weakest for Hispanic teens.

When longitudinal data are used to estimate responses to changes in policy variables that vary over time, there is often concern that state-level time-varying unobservables may bias estimates. One solution to this potential problem is to include state-year indicators and identify the model from within-state and -year variation in unemployment rates. Though unemployment is measured monthly by the Bureau of Labor Statistics, the YRBSS data provide only year indicators of the interview date. This prevents the researcher both from precisely matching the timing of behavior to the appropriate unemployment rate at the monthly level and from including state by year interactions. As a partial solution the

models in Tables 4 and 6 are expanded to include state specific time trends as indicated in equations (3) and (4). Equation (3) is for the analysis of mortality rates:

$$MR_{jst}^* = \alpha + \beta_0' X_{st} + \beta_1 \, UNEMP_{st} + T_t + S_s + Trend_{st} + \varepsilon_{jst} \quad (3),$$

while equation (4) is for the analysis of the behavioral data:

$$B_{ist}^* = \alpha + \beta_0' X_{it} + \beta_1 \, UNEMP_{st} + \beta_2 \, ALCPRICE_{st} + \beta_3 \, CIGTAX_{st} + T_t + S_s + Trend_{st} + \varepsilon_{ist} \quad (3)$$

Table 5 reports the estimates for the mortality statistics and Table 13 reports the estimates from this equation for the entire sample. The mortality statistics for the males continue to be robust for the unintended injuries for the overall unemployment rate, however, when both are included deaths are only significantly related to the total unemployment rates. Motor vehicle accidents are robust for own and total unemployment rate for females. The lack of significant effects for the behavioral analysis may indicate that, after controlling for time-varying unobservables that might affect teen risky behaviors in each state over time, teen health behaviors are largely unresponsive to macroeconomic fluctuations. It may also be that the inclusion of state-specific linear trends leaves little meaningful variation in unemployment to enable precise estimation (Ruhm 2006).

Conclusion

The results in this paper suggest that there is a mixed impact of economic downturns on the behavior of teens. Important positive effects are that recessions tend to reduce sexual activity and increase the level of physical activity among teens. Overall, the decrease in the level of sexual activity is consistently significant across all age groups and gender. However, increase in the exercise level is more consistently significant for younger and white students. The observed pro-cyclicality in the teen sexual activity supports the theory that the impact of the increase in parental supervision outweighs the impact of the decline in the opportunity cost of time of teens. This suggests that increased parental supervision is a positive externality of recessions and that such supervision does lead to a net reduction in the sexual risky behavior among teens. The procyclical response of drinking and binge

drinking, however, casts doubt on the parental supervision argument. One theory is that it is easier to monitor sexual activity than drinking behavior.

In addition to these behavioral trends during recessions, we report some interesting findings related to death rates. Death rates from unintentional injuries and motor vehicle accidents exhibit a pro-cyclical behavior. This finding supports the fact that driving is a normal good for teens as well. We also find evidence of reduction in deaths from suicide and homicide among males, which does not have a straightforward economic intuition, similar to the work of Ruhm (1995).

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Table 1
Average State Mortality Rates per 100,000 for Ages 15-19
Mean
(std. dev.)

	Full Sample	
VARIABLES	Males	Females
Total	106.1042	42.0385
	(48.7359)	(13.6995)
Unintentional Injuries	49.2661	22.3468
	(19.0763)	(8.7882)
Motor Vehicle Accidents	35.5401	19.5680
	(14.7246)	(7.9128)
External Causes	88.6875	29.4624
	(46.1432)	(11.3824)
Suicide	17.4778	7.4151
	(9.0605)	(6.9069)
Homicide	22.5478	7.8157
	(40.3658)	(6.7649)

Table 2a
Sample Means – Health Related Behaviors by Age and Gender – YRBSS 1991-2011

	Full Sample		Ages 14 and 15		Ages 16 and 17		Age 18	
VARIABLES	Males	Females	Males	Females	Males	Females	Males	Females
Had sex in the past 3 months	0.3421	0.3542	0.2139	0.2124	0.3763	0.4133	0.5195	0.5463
	(0.4744)	(0.4783)	(0.4101)	(0.4090)	(0.4845)	(0.4924)	(0.4996)	(0.4979)
Sample Size	*383,143*	*415,108*	*135,535*	*161,778*	*193,469*	*207,142*	*57,154*	*49,773*
Drank alcohol in the past 30 days	0.4782	0.4451	0.3789	0.3935	0.5109	0.4695	0.5948	0.5030
	(0.4995)	(0.4970)	(0.4851)	(0.4885)	(0.4999)	(0.4991)	(0.4909)	(0.5000)
Sample Size	*440,372*	*468,435*	*158,008*	*183,892*	*221,496*	*233,416*	*64,575*	*55,438*
Binge drinking in the Past 30 days	0.3250	0.2530	0.2214	0.2085	0.3588	0.2751	0.4476	0.2994
	(0.4684)	(0.4348)	(0.4152)	(0.4063)	(0.4797)	(0.4466)	(0.4973)	(0.4580)
Sample Size	*459,395*	*484,598*	*164,731*	*190,461*	*231,066*	*241,207*	*67,441*	*57,345*
Smoked cigarettes in past 30 days	0.2758	0.2662	0.2073	0.2301	0.2953	0.2843	0.3665	0.3027
	(0.4469)	(0.4420)	(0.4054)	(0.4209)	(0.4562)	(0.4511)	(0.4819)	(0.4594)
Sample Size	*447,246*	*474,064*	*160,761*	*186,388*	*224,806*	*236,050*	*65,441*	*55,993*
Vigorous exercise > 3 times in last 7 days*	0.6766	0.4863	0.7275	0.5742	0.6654	0.4485	0.5973	0.3665
	(0.4678)	(0.4998)	(0.4452)	(0.4945)	(0.4718)	(0.4973)	(0.4905)	(0.4819)
Sample Size	*440,493*	*256,941*	*89,649*	*99,618*	*127,456*	*127,736*	*38,873*	*31,986*

* 1991- 2005 only

Table 2b

Sample Means – Health-related Behaviors by Race and Ethnicity – YRBSS 1991-2011

	White		African-American		Hispanic	
VARIABLES	Males	Females	Males	Females	Males	Females
Had sex in the past 3 months	0.2931	0.3333	0.5492	0.4666	0.3844	0.3466
	(0.4552)	(0.4714)	(0.4976)	(0.4989)	(0.4865)	(0.4759)
Sample Size	*234,283*	*248,775*	*55,530*	*66,071*	*40,069*	*44,487*
Drank alcohol in the past 30 days	0.4998	0.4770	0.3799	0.3353	0.5094	0.4649
	(0.5000)	(0.4995)	(0.4854)	(0.4721)	(0.4999)	(0.4988)
Sample Size	*273,070*	*285,915*	*64,786*	*75,279*	*42,595*	*46,306*
Binge drinking in the Past 30 days	0.3569	0.2955	0.1829	0.1049	0.3480	0.2598
	(0.4791)	(0.4563)	(0.3866)	(0.3064)	(0.4763)	(0.4385)
Sample Size	*280,791*	*292,326*	*69,928*	*79,906*	*44,982*	*48,466*
Smoked cigarettes daily in past 30 days	0.2936	0.3091	0.1831	0.1260	0.2720	0.2245
	(0.4554)	(0.4621)	(0.3868)	(0.3319)	(0.4450)	(0.4173)
Sample Size	*275,160*	*287,658*	*66,777*	*76,846*	*43,557*	*47,016*
Vigorous exercise > 3 times in last 7 days*	0.6999	0.5279	0.6254	0.3706	0.6463	0.4348
	(0.4583)	(0.4992)	(0.4840)	(0.4830)	(0.4781)	(0.4957)
Sample Size	*160,932*	*159,615*	*41,990*	*46,983*	*26,090*	*26,936*

*1991- 2005 only

Table 3a
Sample Means – Mortality Analysis
Means
(std. dev.)

VARIABLES	
State unemployment rate Ages 16-19	16.7832
	(5.5651)
State unemployment rate	5.4453
	(1.8415)
State percent of population white	70.1995
	(17.7379)
State percent of population black	13.1392
	(13.2508)
State percent of population Hispanic	9.8219
	(10.8669)
State median household income	42088.2
	(9357.8495)
State percent of population with BA & higher	22.7440
	(5.4641)

Table 3b
Sample Means – YRBSS 1991 - 2011

VARIABLES	Full Sample	
	Males	Females
State unemployment rate	17.8358	17.9049
Ages 16-19	(5.7646)	(5.8042)
State unemployment rate	5.8930	5.9020
	(2.0819)	(2.0783)
State beer tax	0.2794	0.2817
($/gallon)	(0.2425)	(0.2453)
Average cigarette price	3.6908	3.6965
($/pack)	(1.7058)	(1.7142)
Age=14	0.1015	0.1231
	(0.3020)	(0.3285)
Age=15	0.2460	0.2583
	(0.4307)	(0.4377)
Age=16	0.2636	0.2628
	(0.4406)	(0.4402)
Age=17	0.2336	0.2288
	(0.4231)	(0.4200)
Age=18	0.1459	0.1168
	(0.3530)	(0.3212)
African-American	0.1544	0.1648
	(0.3613)	(0.3710)
Hispanic	0.0983	0.1000
	(0.2977)	(0.3000)
Asian	0.0300	0.0272
	(0.1705)	(0.1628)
Native American	0.0248	0.0202
	(0.1555)	(0.1408)

Table 4
Mortality Rates Regression
(std. error)

	Model 1		Model 2		Model 3	
	Males	Females	Males	Females	Males	Females
Total						
Teen Unemployment Rate	-0.9248*	-0.2367**			-1.5519	-0.1973*
	(0.4905)	(0.1020)			(0.9405)	(0.1157)
Adult Unemployment Rate			0.3132	-0.6874	3.8291	-0.2403
			(1.3391)	(0.4703)	(3.2351)	(0.5571)
External Causes						
Teen Unemployment Rate	-0.8285*	-0.1737*			-1.4019	-0.0734
	(0.4872)	(0.0871)			(0.9327)	(0.0924)
Adult Unemployment Rate			0.3250	-0.7790**	3.5010	-0.6128
			(1.2788)	(0.3648)	(3.1615)	(0.4134)
Unintentional Injuries						
Teen Unemployment rate	-0.0741	-0.1577**			0.0728	-0.0902
	(0.1082)	(0.0660)			(0.1195)	(0.0645)
Total Unemployment. Rate			-0.7317*	-0.6165*	-0.8965**	-0.4123
			(0.3838)	(0.3194)	(0.4426)	(0.3585)
Motor Vehicle Accidents						
Teen Unemployment. Rate	-0.1044	-0.1743***			-0.0900	-0.1044*
	(0.0928)	(0.0548)			(0.1059)	(0.0605)
Adult Unemployment Rate			-0.2918	-0.6631**	-0.0879	-0.4266
			(0.2844)	(0.2535)	(0.3088)	(0.3002)
Suicide						
Teen Unemployment Rate	-0.0935	-0.0131			-0.1084	-0.0135
	(0.0764)	(0.0193)			(0.0722)	(0.0287)
Adult Unemployment Rate			-0.1545	-0.0282	0.0910	0.0025
			(0.3422)	(0.0718)	(0.3644)	(0.1068)
Homicide						
Teen Unemployment Rate	-0.7048	-0.0163			-1.3648	-0.0148
	(0.5046)	(0.0211)			(0.9171)	(0.0241)
Adult Unemployment Rate			0.9378	-0.0428	4.0299	-0.0092
			(0.9960)	(0.0985)	(2.8792)	(0.1175)

* Models include state and year fixed effects and all independent variables reported in Table 3a. Standard errors are adjusted for clustering by state

Table 5
Mortality Rates Regression with State Specific Time Trends
(std. error)

	Model 1a		Model 2a		Model 3a	
	Males	Females	Males	Females	Males	Females
All Causes						
Teen Unemployment Rate	0.0947	-0.1534			0.0092	-0.1183
	(0.3714)	(0.1175)			(0.2880)	(0.1314)
Adult Unemployment Rate			0.6271	-0.5159	0.6064	-0.2493
			(1.6066)	(0.5484)	(1.3668)	(0.6198)
External Causes						
Teen Unemployment Rate	0.1478	-0.1087			0.1199	-0.0035
	(0.3313)	(0.1028)			(0.2528)	(0.1090)
Adult Unemployment Rate			0.4677	-0.7542	0.1974	-0.7464
			(1.4810)	(0.4770)	(1.2805)	(0.5267)
Unintentional Injuries						
Teen Unemployment rate	-0.1478	-0.1177*			-0.0136	-0.0674
	(0.1160)	(0.0661)			(0.1174)	(0.0744)
Total Unemployment. Rate			-0.9826**	-0.5089	-0.9520*	-0.3571
			(0.4675)	(0.3811)	(0.4856)	(0.4440)
Motor Vehicle Accidents						
Teen Unemployment. Rate	-0.1003	-0.1516**			-0.1359	-0.0819
	(0.1102)	(0.0613)			(0.1140)	(0.0662)
Adult Unemployment Rate			-0.0536	-0.6788**	0.2528	-0.4942
			(0.3533)	(0.2979)	(0.3256)	(0.3340)
Suicide						
Teen Unemployment Rate	-0.1432	0.0058			-0.1214	0.0199
	(0.0940)	(0.0175)			(0.0887)	(0.0199)
Adult Unemployment Rate			-0.4284	-0.0554	-0.1548	-0.1002
			(0.4980)	(0.0788)	(0.5356)	(0.0911)
Homicide						
Teen Unemployment Rate	0.3187	-0.0165			0.1712	-0.0116
	(0.2380)	(0.0192)			(0.1511)	(0.0221)
Adult Unemployment Rate			1.4320	-0.0605	1.0462	-0.0344
			(1.0662)	(0.0756)	(0.8184)	(0.0869)

* with state and year fixed effects plus state specific time trend

Table 6
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects -- Ages 14 through 18

	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	-0.0015**	-0.0023***			-0.0005	-0.0015
	(0.001)	(0.001)			(0.001)	(0.001)
Total Unemployment. Rate			-0.0057***	-0.0071***	-0.0047*	-0.0040
			(0.002)	(0.002)	(0.002)	(0.003)
Drank alcohol past 30 days						
Teen Unemployment. Rate	0.0011*	0.0007			0.0001	0.0001
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0048**	0.0033	0.0045*	0.0030
			(0.002)	(0.002)	(0.002)	(0.002)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0016***	0.0012***			0.0007	0.0004
	(0.001)	(0.000)			(0.001)	(0.001)
Adult Unemployment Rate			0.0057***	0.0047***	0.0043**	0.0038*
			(0.002)	(0.002)	(0.002)	(0.002)
Smoked past 30 days						
Teen Unemployment Rate	0.0007*	0.0005			0.0004	0.0003
	(0.000)	(0.000)			(0.000)	(0.001)
Adult Unemployment Rate			0.0023	0.0016	0.0014	0.0011
			(0.001)	(0.002)	(0.002)	(0.002)
Recent Exercise						
Teen Unemployment Rate	0.0020	0.0031			0.0027	0.0011
	(0.002)	(0.002)			(0.002)	(0.003)
Adult Unemployment Rate			0.0107***	0.0136***	0.0040	0.0109
			(0.003)	(0.005)	(0.005)	(0.007)

Note: Models include state and year fixed effects and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Table 7
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects -- Ages 14 and 15

	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	-0.0013*	-0.0018**			-0.0008	-0.0013
	(0.001)	(0.001)			(0.001)	(0.001)
Total Unemployment. Rate			-0.0042***	-0.0049**	-0.0026	-0.0023
			(0.002)	(0.002)	(0.002)	(0.003)
Drank alcohol past 30 days						
Teen Unemployment. Rate	0.0007	0.0005			-0.0005	0.0002
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0047**	0.0021	0.0057**	0.0017
			(0.002)	(0.002)	(0.003)	(0.003)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0010	0.0011**			0.0001	0.0003
	(0.001)	(0.000)			(0.001)	(0.001)
Adult Unemployment Rate			0.0044**	0.0047***	0.0042*	0.0041**
			(0.002)	(0.002)	(0.002)	(0.002)
Smoked past 30 days						
Teen Unemployment Rate	0.0004	-0.0000			-0.0002	-0.0007
	(0.001)	(0.000)			(0.001)	(0.001)
Adult Unemployment Rate			0.0023	0.0017	0.0026	0.0031
			(0.002)	(0.001)	(0.002)	(0.002)
Exercise						
Teen Unemployment Rate	0.0039***	0.0037*			0.0021	0.0007
	(0.001)	(0.002)			(0.002)	(0.003)
Adult Unemployment Rate			0.0144***	0.0178***	0.0091	0.0161**
			(0.004)	(0.004)	(0.007)	(0.007)

Note: Models include state and year fixed effects and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Table 8
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects -- Ages 16 and 17

	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	-0.0020***	-0.0027***			-0.0012	-0.0019**
	(0.001)	(0.001)			(0.001)	(0.001)
Total Unemployment. Rate			-0.0061***	-0.0080***	-0.0035	-0.0042
			(0.002)	(0.003)	(0.003)	(0.003)
Drank alcohol past 30 days						
Teen Unemployment. Rate	0.0014**	0.0009			0.0004	-0.0001
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0058***	0.0045**	0.0050*	0.0046**
			(0.002)	(0.002)	(0.003)	(0.002)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0017***	0.0013***			0.0008	0.0002
	(0.001)	(0.000)			(0.001)	(0.001)
Adult Unemployment Rate			0.0058***	0.0058***	0.0040*	0.0053**
			(0.002)	(0.002)	(0.002)	(0.002)
Smoked past 30 days						
Teen Unemployment Rate	0.0008*	0.0009*			0.0004	0.0008
	(0.000)	(0.001)			(0.000)	(0.001)
Adult Unemployment Rate			0.0028**	0.0021	0.0019	0.0004
			(0.001)	(0.002)	(0.001)	(0.002)
Exercise						
Teen Unemployment Rate	0.0036***	0.0028			0.0031	0.0016
	(0.001)	(0.002)			(0.002)	(0.003)
Adult Unemployment Rate			0.0102***	0.0107*	0.0024	0.0066
			(0.003)	(0.005)	(0.005)	(0.008)

Note: Models include state and year fixed effects and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Table 9
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects – Age 18

	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	-0.0001	-0.0024**			0.0028**	-0.0012
	(0.001)	(0.001)			(0.001)	(0.002)
Total Unemployment. Rate			-0.0074**	-0.0080**	-0.0132***	-0.0054
			(0.003)	(0.003)	(0.005)	(0.005)
Drank alcohol past 30 days						
Teen Unemployment. Rate	0.0006	0.0015*			0.0002	0.0009
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0022	0.0047*	0.0018	0.0028
			(0.003)	(0.003)	(0.004)	(0.004)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0022**	0.0010			0.0008	0.0012
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0086***	0.0018	0.0070*	-0.0006
			(0.003)	(0.003)	(0.004)	(0.005)
Smoked past 30 days						
Teen Unemployment Rate	0.0011	0.0005			0.0016	0.0006
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0011	0.0011	-0.0022	-0.0001
			(0.003)	(0.003)	(0.004)	(0.004)
Exercise						
Teen Unemployment Rate	0.0027	0.0043*			0.0025	0.0029
	(0.002)	(0.002)			(0.002)	(0.003)
Adult Unemployment Rate			0.0072	0.0150**	0.0010	0.0076
			(0.005)	(0.006)	(0.007)	(0.009)

Note: Models include state and year fixed effects and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Table 10
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects – White Respondents

	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	-0.0007	-0.0015**			-0.0003	-0.0008
	(0.001)	(0.001)			(0.001)	(0.001)
Total Unemployment. Rate			-0.0025	-0.0046**	-0.0019	-0.0030
			(0.002)	(0.002)	(0.002)	(0.003)
Drank alcohol past 30 days						
Teen Unemployment. Rate	0.0009	0.0002			0.0001	-0.0004
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0041**	0.0022	0.0039*	0.0030
			(0.002)	(0.002)	(0.002)	(0.002)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0012*	0.0007			0.0003	0.0001
	(0.001)	(0.000)			(0.001)	(0.001)
Adult Unemployment Rate			0.0048**	0.0032*	0.0042**	0.0031
			(0.002)	(0.002)	(0.002)	(0.002)
Smoked past 30 days						
Teen Unemployment Rate	0.0004	-0.0002			-0.0003	-0.0003
	(0.000)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0025*	-0.0002	0.0031	0.0003
			(0.001)	(0.001)	(0.002)	(0.003)
Recent Exercise						
Teen Unemployment Rate	0.0035***	0.0042**			0.0040**	0.0034
	(0.001)	(0.002)			(0.002)	(0.003)
Adult Unemployment Rate			0.0072**	0.0123***	-0.0028	0.0039
			(0.003)	(0.003)	(0.005)	(0.007)

Note: Models include state and year fixed effects and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Table 11
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects – African American Respondents

	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	-0.0008	-0.0015			-0.0005	-0.0027*
	(0.001)	(0.001)			(0.001)	(0.001)
Total Unemployment. Rate			-0.0028	0.0033	-0.0019	0.0083
			(0.003)	(0.004)	(0.004)	(0.006)
Drank alcohol past 30 days						
Teen Unemployment. Rate	-0.0005	0.0009			-0.0014*	0.0004
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0028	0.0040	0.0057*	0.0032
			(0.003)	(0.003)	(0.003)	(0.005)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0003	0.0014***			-0.0001	0.0006
	(0.001)	(0.000)			(0.001)	(0.001)
Adult Unemployment Rate			0.0023	0.0062***	0.0026	0.0050*
			(0.003)	(0.002)	(0.004)	(0.003)
Smoked past 30 days						
Teen Unemployment Rate	0.0014*	0.0018***			0.0013	0.0013*
	(0.001)	(0.001)			(0.001)	(0.001)
Adult Unemployment Rate			0.0034	0.0061**	0.0008	0.0036
			(0.003)	(0.003)	(0.003)	(0.004)
Recent Exercise						
Teen Unemployment Rate	0.0046**	0.0011			-0.0001	-0.0014
	(0.002)	(0.003)			(0.002)	(0.003)
Adult Unemployment Rate			0.0315**	0.0136	0.0318**	0.0171
			(0.013)	(0.013)	(0.014)	(0.016)

Note: Models include state and year fixed effects and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Table 12
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects – Hispanic Respondents

|	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	0.0007	-0.0012			0.0007	-0.0011
	(0.001)	(0.002)			(0.002)	(0.002)
Total Unemployment. Rate			0.0018	-0.0031	0.0001	-0.0005
			(0.003)	(0.006)	(0.006)	(0.007)
Drank alcohol past 30 days						
Teen Unemployment. Rate	0.0014	0.0015			0.0019	0.0016
	(0.001)	(0.001)			(0.002)	(0.002)
Adult Unemployment Rate			0.0024	0.0035	-0.0023	-0.0004
			(0.005)	(0.005)	(0.007)	(0.007)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0023*	0.0022*			0.0027*	0.0012
	(0.001)	(0.001)			(0.001)	(0.002)
Adult Unemployment Rate			0.0046	0.0077	-0.0020	0.0048
			(0.005)	(0.005)	(0.006)	(0.007)
Smoked past 30 days						
Teen Unemployment Rate	0.0006	0.0006			0.0012	0.0003
	(0.001)	(0.001)			(0.002)	(0.001)
Adult Unemployment Rate			0.0001	0.0022	-0.0028	0.0016
			(0.004)	(0.004)	(0.005)	(0.004)
Recent Exercise						
Teen Unemployment Rate	0.0008	-0.0003			0.0024	-0.0057
	(0.002)	(0.003)			(0.003)	(0.005)
Adult Unemployment Rate			-0.0022	0.0147	-0.0089	0.0308
			(0.008)	(0.016)	(0.012)	(0.024)

Note: Models include state and year fixed effects and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Table 13
Linear Probability Model of the Impact of Unemployment on Health Behaviors
State and Year Fixed Effects with State Specific Time Trends – Ages 14 - 18

	Males	Females	Males	Females	Males	Females
Sex in the past 3 months						
Teen Unemployment rate	-0.0007	-0.0006			-0.0010	-0.0011
	(0.001)	(0.001)			(0.001)	(0.001)
Total Unemployment. Rate			-0.0008	0.0011	0.0014	0.0037
			(0.002)	(0.003)	(0.003)	(0.004)
Drank alcohol past 30 days						
Teen Unemployment. Rate	0.0005	0.0009			-0.0001	0.0005
	(0.001)	(0.001)			(0.001)	(0.000)
Adult Unemployment Rate			0.0037	0.0039	0.0039*	0.0029
			(0.002)	(0.003)	(0.002)	(0.003)
Binge Drink past 30 days						
Teen Unemployment Rate	0.0008	0.0009**			0.0004	0.0006
	(0.001)	(0.000)			(0.001)	(0.000)
Adult Unemployment Rate			0.0032	0.0034*	0.0023	0.0021
			(0.002)	(0.002)	(0.003)	(0.002)
Smoked past 30 days						
Teen Unemployment Rate	0.0001	0.0004			0.0001	0.0005
	(0.000)	(0.001)			(0.000)	(0.001)
Adult Unemployment Rate			0.0001	0.0009	-0.0001	-0.0001
			(0.002)	(0.003)	(0.003)	(0.003)
Recent Exercise						
	0.0023***	-0.0001			0.0030*	0.0009
	(0.001)	(0.001)			(0.002)	(0.002)
			0.0015	-0.0056	-0.0057	-0.0077
			(0.008)	(0.012)	(0.010)	(0.017)

Note: Models include state and year fixed effects, state-specific linear time trends and all independent variables reported in Table 3. Standard errors are adjusted for clustering by state.

Figure 1

Average State Unemployment Rates for 16-19 Year-Olds and Total

1990-2012
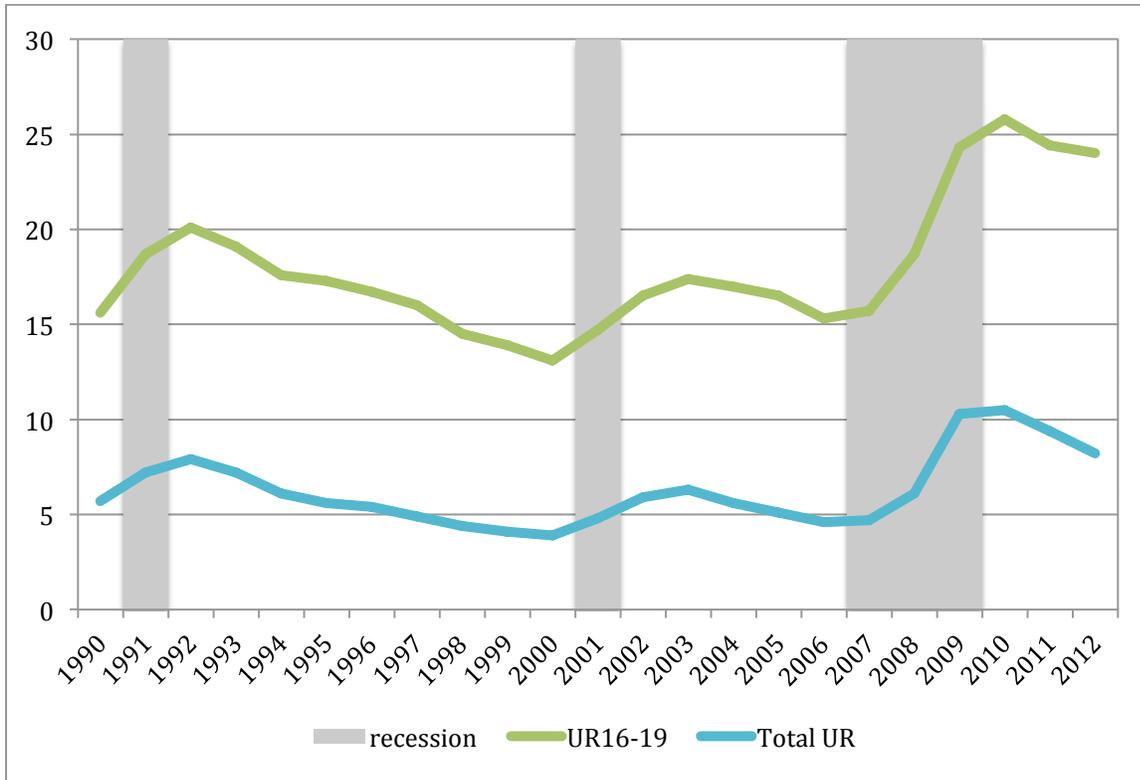
source: BLS/Haver Analytics

Figure 2a
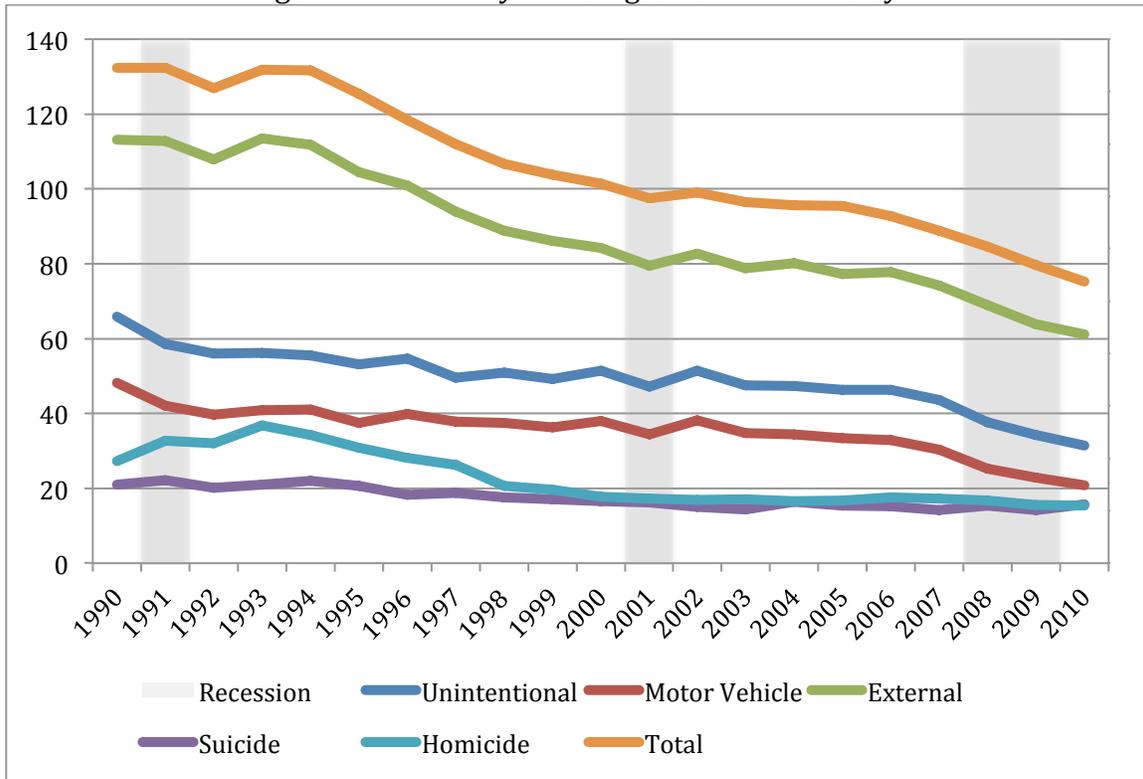Average State Mortality Rates Ages 15-19: Males by Year

Figure 2b
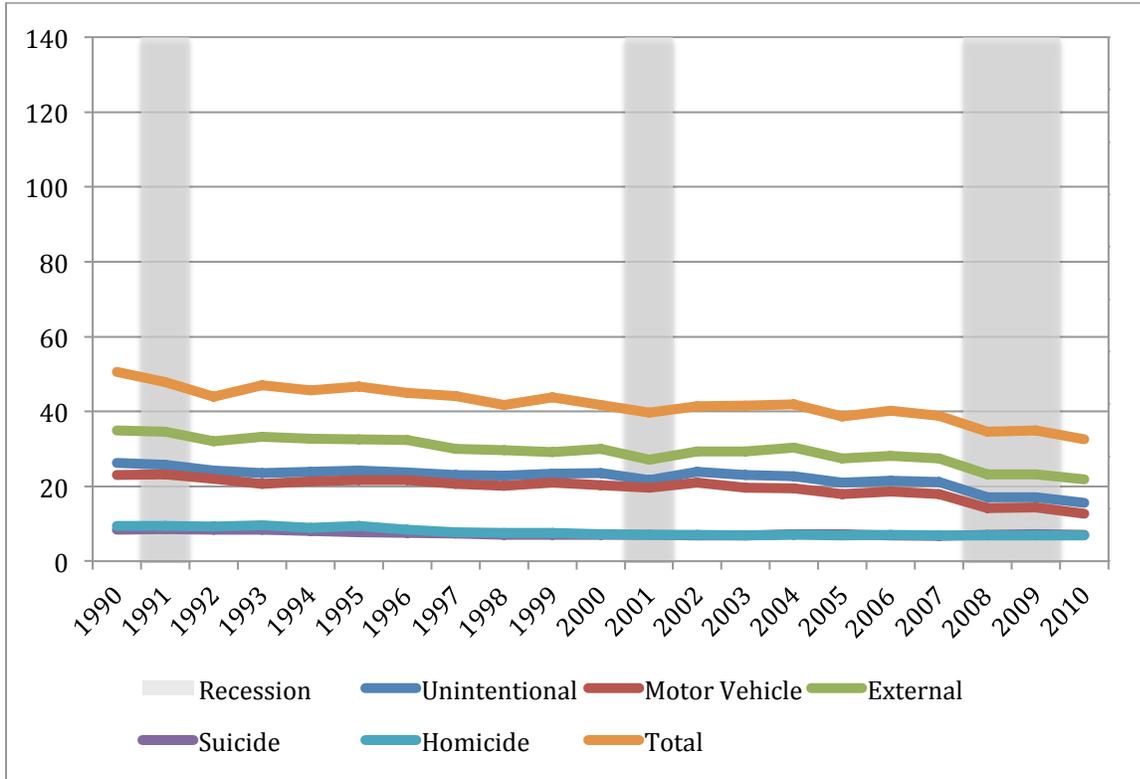Average State Mortality Rates Ages 15-19: Females by Year

Figure 3a
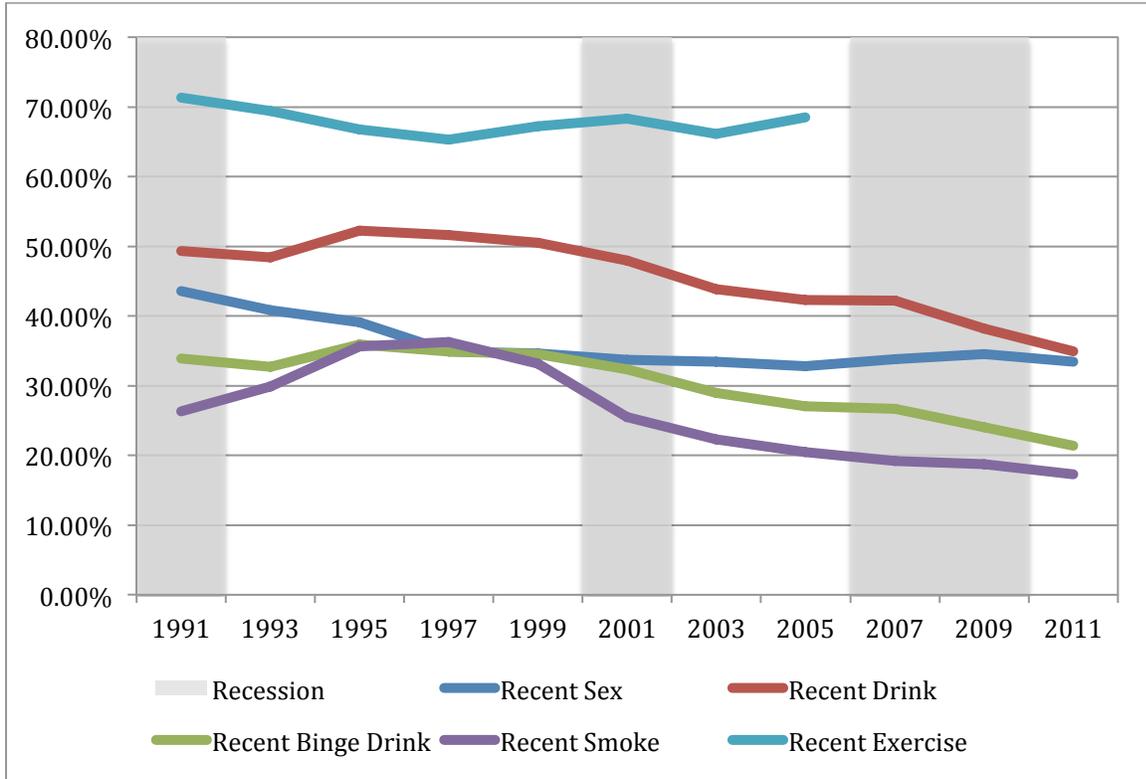Male Teen Behavior by Year- YRBSS 1991-2011

Figure 3b
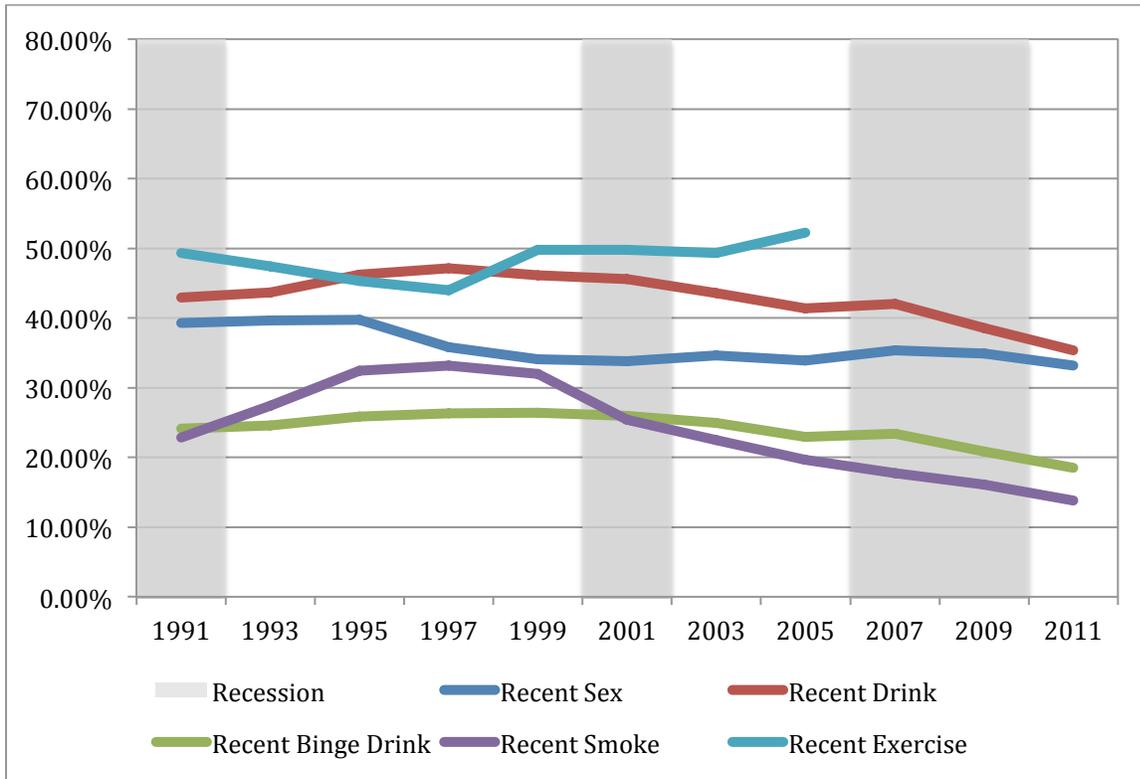Female Teen Behavior by Year- YRBSS 1991-2011

	Y1991	Y1993	Y1995	Y1997	Y1999	Y2001	Y2003	Y2005	Y2007	Y2009	Y2011
State											
AL	X	X	X	X	X	X	X	X		X	X
AK			X				X		X	X	X
AZ							X	X	X	X	X
AR			X	X	X	X		X	X	X	X
CA											
CO		X		X	X	X	X	X	X	X	X
CT				X				X	X	X	X
DE					X	X	X	X	X	X	X
DC		X		X	X		X	X	X		X
FL						X	X	X	X	X	X
GA	X	X	X	X	X	X	X	X	X	X	X
HI											
ID	X	X				X	X	X	X	X	X
IL		X	X						X	X	X
IN							X	X	X	X	X
IA				X				X	X		X
KS								X	X	X	X
KY				X			X	X	X	X	X
LA				X					X	X	X
ME			X	X		X	X	X	X	X	X
MD								X	X	X	X
MA		X	X	X	X	X	X	X	X	X	X
MI				X	X	X	X	X	X	X	X
MN											
MS		X	X	X	X	X	X		X	X	X
MO			X	X	X	X	X	X	X	X	
MT		X	X	X	X	X	X	X	X	X	X
NE	X	X					X	X			X
NV		X	X	X	X	X	X	X	X	X	
NH		X	X				X	X	X	X	X
NJ						X		X		X	X
NM	X							X	X	X	X
NY				X	X		X	X	X	X	X
NC		X	X			X	X	X	X	X	X
ND			X		X	X	X	X	X	X	X
OH		X		X	X		X	X	X		X
OK							X	X	X	X	X

OR											
	Y1991	**Y1993**	**Y1995**	**Y1997**	**Y1999**	**Y2001**	**Y2003**	**Y2005**	**Y2007**	**Y2009**	**Y2011**
PA										X	
SC	X	X	X	X	X			X	X	X	X
SD	X	X	X	X	X	X	X	X	X	X	X
TN		X					X	X	X	X	X
TX						X		X	X	X	X
UT	X	X	X	X	X	X	X	X	X	X	X
VT		X	X	X	X	X	X	X	X	X	X
VA											X
WA											
WV		X	X	X	X		X	X	X	X	X
WI		X		X	X	X	X	X	X	X	X
WY			X	X	X	X	X	X	X	X	X