

TRENDS IN YOUTH SMOKING

IS THERE REALLY A CRISIS?

by Peter VanDoren

GOVERNMENTAL AGENCIES, such as the Federal Trade Commission and Food and Drug Administration, that wish to regulate the production, distribution, and advertising of cigarettes often use youth smoking trends as a rationale for their regulations. For example, the press release from the Department of Health and Human Services announcing the release of the final FDA rules regulating the sale of cigarettes to minors cited dramatic increases in tobacco use by young people. "Between 1991 and 1995, the percentage of eighth and tenth graders who smoke increased 34 percent." But what are the trends in teenage smoking behavior across time, and do they support the contentions of those who advocate increased regulation of smoking?

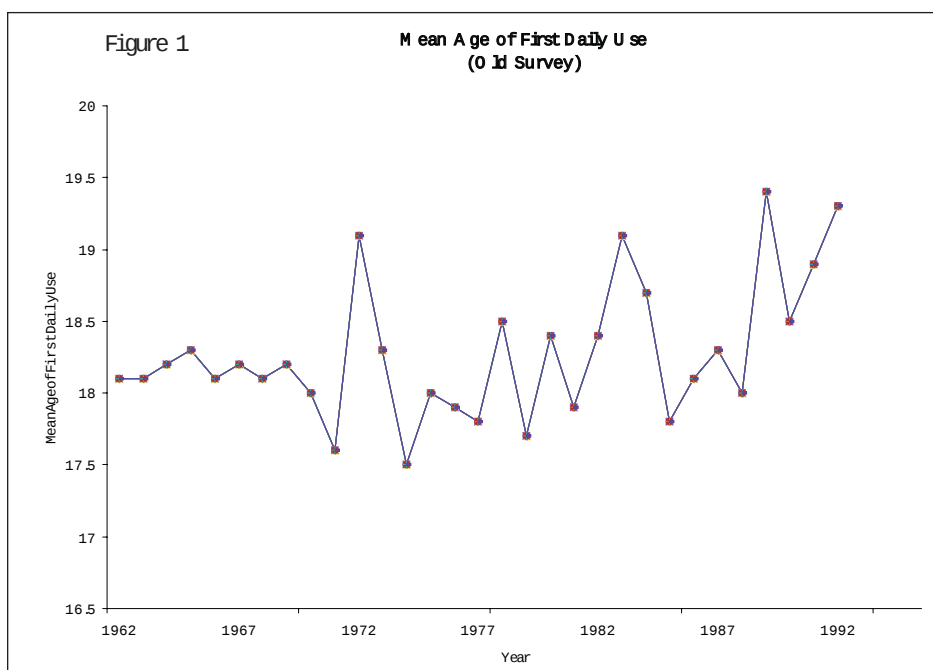
As the old saying goes, figures never lie but liars use figures. That is certainly true in the case of youth smoking data. Time series data vary for random reasons in the short run. Trends are defined only over the long run. Long term data about youth smoking behavior can be contrasted with the short trends used by smoking regulation advocates. That contrast shows that the actual trends are not those touted by the advocates.

One source of statistical information on cigarette smoking among minors is the National Household Survey on Drug Abuse (NHSDA) administered annually since 1971 by the Substance Abuse and Mental Health Services Administration (SAMHSA). The survey is a random sample of the American population, excluding the homeless, active military personnel, and residents of jails and hospitals. The survey is the source of three different types of information about smoking behavior: the number of individuals who became daily users of cigarettes each year, the mean age of the new daily smokers, and the rate at which individuals of different age groups become daily smokers.

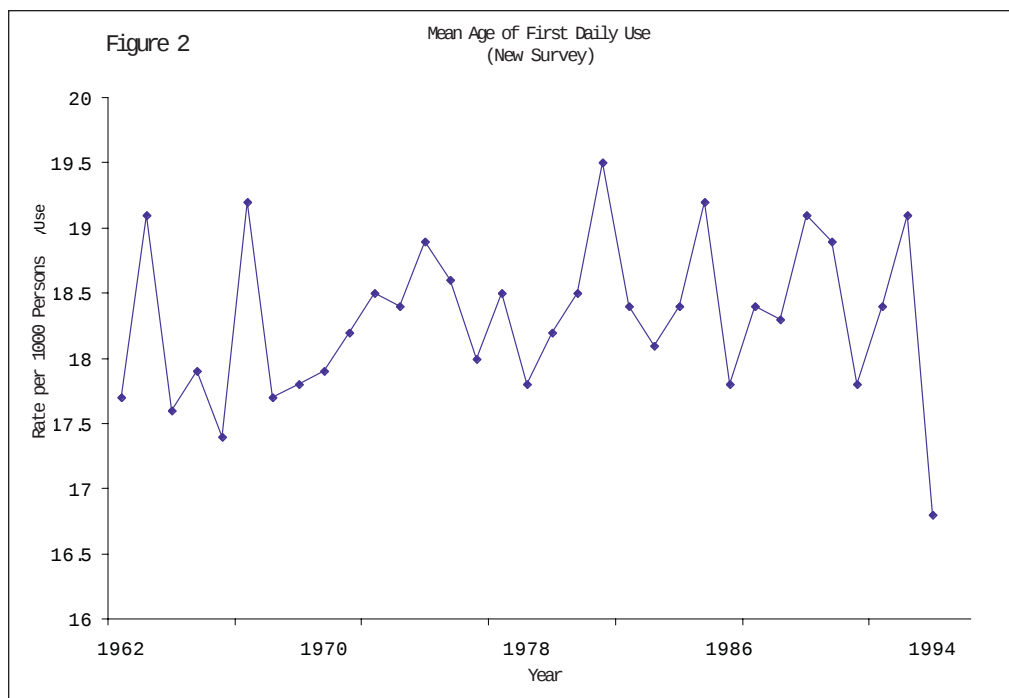
Questions in the survey about past behavior allow inferences to be made about teenage smoking behavior since 1962.

In 1994, the questions about tobacco use in the survey were changed from an oral interview format to a self-administered answer sheet format, in which the members of a household fill out questionnaires privately. The change has resulted in an increase in the estimate of smoking rates, especially for the twelve-year-old to seventeen-year-old subjects. The 1994 survey was conducted on a split sample to allow a comparison of the old and new methods. SAMHSA used the comparison to construct a revised time series for the years 1971 to 1993.

Figure 1 displays the mean age of first daily use from 1962 through 1992 using the old method. Figure 2 displays the mean age of first daily use of cigarettes from 1962 through 1994 using the reconstructed new method. I estimated regressions to determine if mean age exhibits a statistically significant trend over time. The old survey method shows the mean age of first daily use rising over time. Using the new survey



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age without using cigarettes will become a daily user of cigarettes before reaching his or her next birthday. For example, the 64.4 in 1981 under the old methodology means that for every one thousand kids who started the year 1981 as nonsmokers, 64.4 would become daily smokers by year's end.

The old time series and reconstructed time series tell dramatically different stories after 1988. The old series, based on face-to-face interviews, shows that the rate at which minors were becoming daily smokers was declining steadily while the new reconstructed series, based on written questionnaires, tells exactly the opposite story. The reconstructed time series story is used by advocates of smoking regulation as a rationale for regulatory proposals.

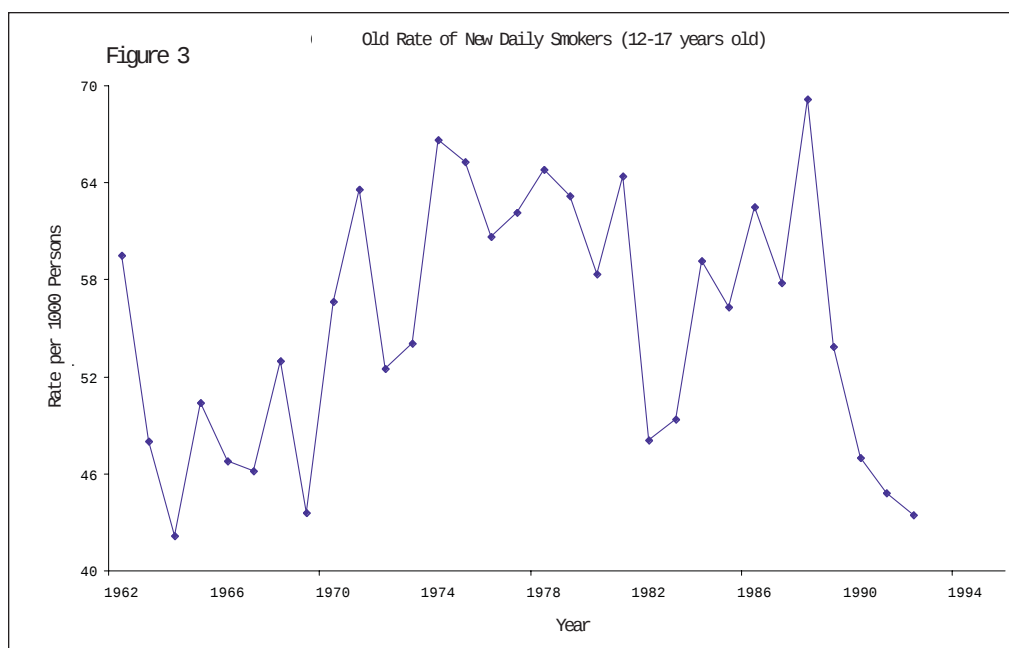
method, the mean age is constant. The dramatic drop in the age of first daily use in 1994 to 16.8 years of age from 19.1 years of age in 1993 found with the new methodology in Figure 2 is enough to change the trend from a rising age of first daily use over time to no trend.

Figure 3 displays the data on the rate of first daily use of cigarettes for kids between the ages of twelve and seventeen per 1,000 person-years using the old survey methodology from 1962 to 1992. Figure 4 does the same for the years 1962 to 1994 using the reconstructed new survey methodology. The rates are estimates of the probability that a person who reaches a specified

When viewed over a longer time frame, however, even the reconstructed data are less alarming. Under the old methodology, in Figure 3 no trend over time exists in the rate of first daily use among twelve year olds to seventeen year olds. Under the new methodology, a graph of the data in Figure 4 appears to the eye to exhibit a small trend. But data patterns may be the result of random variation rather than an actual trend. Statistical analysis can estimate the probability that any particular pattern in data is the result of random variation rather than any underlying real trend. In this case, the pattern of first daily use data is not statistically significant at the 95 percent confidence level, the usual criterion for

acceptance of a trend as "real" rather than the result of random variation in the data. If the current trend continues, however, the rate of daily use across time will rise with the conventionally acceptable 95 percent confidence.

The FDA based its 1996 regulations on data about the smoking behavior of minors found in the Monitoring the Future Study (MFT), conducted by the Institute for Social Research at the University of Michigan for the National Institute on Drug Abuse. The annual survey has collected data from 1975 to the present from random sample of American high school seniors. Starting in 1991 the MFT study added surveys of eighth graders



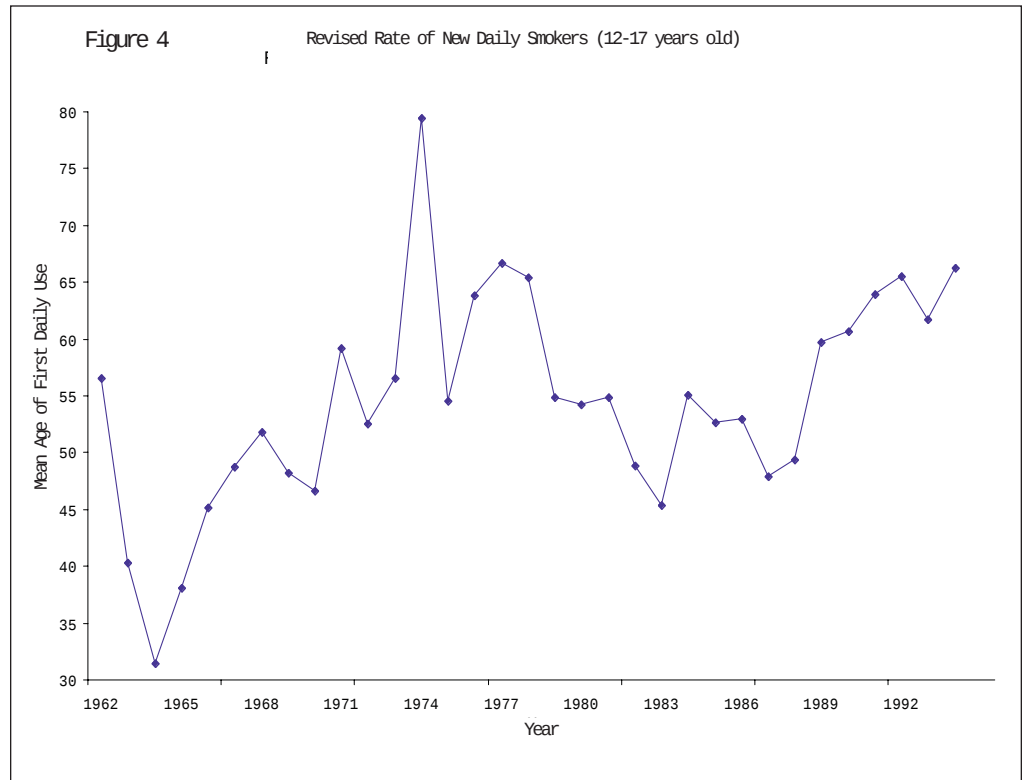
and tenth graders. It was on the results of that latter, short term data that the FDA based its regulations. For example, the MFT short term data show that since 1992, the age of first use is down, the rate of first use is up as is the percentage of seniors who smoke daily, and the quit rate among seniors is down.

But short term data may exhibit random variations that do not prove a trend. The MFT data on high school seniors that give a twenty year perspective paint a different picture from the one exhibited by the FDA.

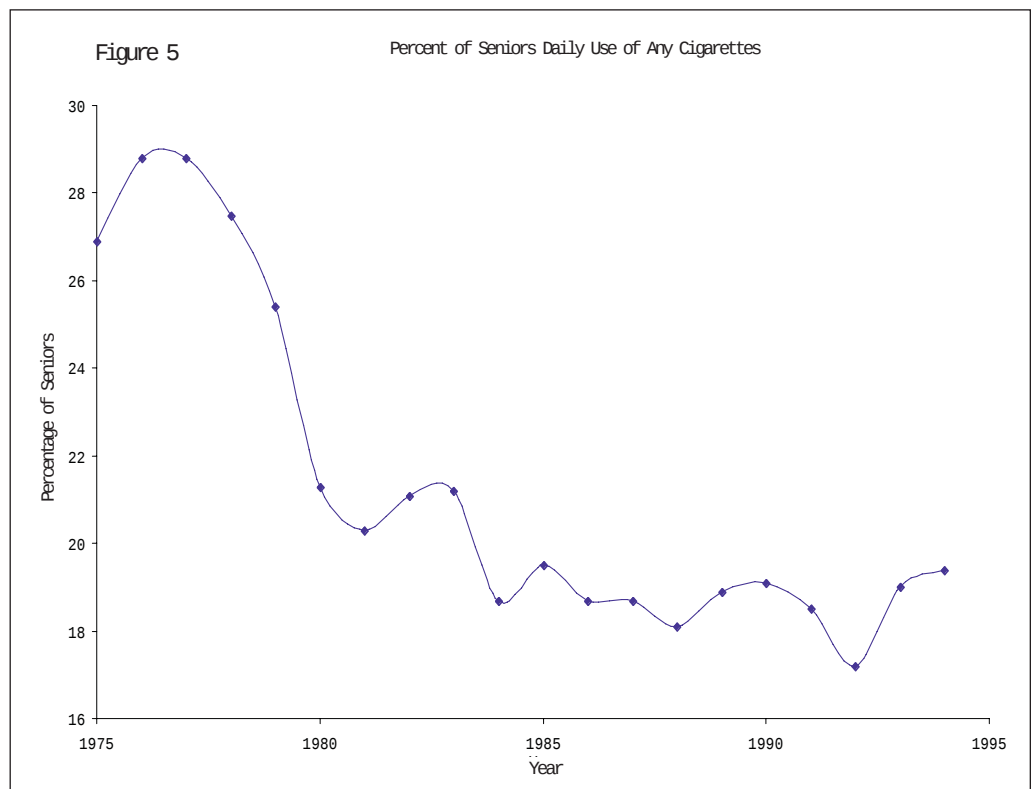
Figure 5 displays the percentage of high school seniors who smoked any cigarettes at all on a daily basis during the 30 days prior to the survey. The decline between 1975 through 1994 is obvious to the casual observer and is confirmed by regression analysis with 99 percent confidence. Over the same period of time, Figure 6 with 99.9% confidence shows that the percentage of high school seniors who smoked a half-pack or more daily during the thirty days prior to the survey declined as well. Regulation advocates ignore those declines, choosing to focus only on the increases between 1992 and 1994.

Figure 7 displays quit rates over time defined as the percentage of seniors who smoked regularly at any point in their lives but who did not smoke at all during the thirty days prior to the survey. No obvious trend is visual to the eye. Regression analysis shows that the probability there is a downward trend in the data, rather than no trend at all, is only 16 percent, well below the usual 95 percent confidence standard.

Trends in time series data provide useful insights into reality only over long periods of time. For example, if one examines the MFT data since 1992, the trends in the smoking behavior among minors are not



comforting. Mean age of first use is down, the rate of first use is up as is the percentage of seniors who smoke daily, and the quit rate among seniors is down. These data may exhibit their





short-term trends, however, only because of random variation that made 1992 data different.

When viewed over a longer time period, the data are rather

benign. In the MFT survey the percentage of young people quit rate are constant over time. The alarmist view of smoking behavior by minors is not consistent with the data over the last twenty years.

