



## **American Cancer Society / U.S. Centers for Disease Control study confirms the value of tobacco harm reduction: Switching from smoking to smokeless tobacco is almost as good as quitting entirely**

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Good news for tobacco harm reduction came from an unexpected source last month. Researchers working for the two leading anti-harm-reduction advocacy organizations, the American Cancer Society and the United States government (specifically the Centers for Disease Control), published a study that provides further evidence that switching from smoking to smokeless tobacco is almost as good as quitting entirely. (Study reference: Henley SJ, Connell CJ, Richter P, Husten C, Pechacek T, Calle EE, Thun MJ, "Tobacco-related disease mortality among men who switched from cigarettes to spit tobacco" *Tobacco Control* 2007;16:22-28.)

The study confirms the main message of TobaccoHarmReduction.org: For those smokers who are unwilling or unable to quit using nicotine, switching to smokeless tobacco provides most of the benefits of quitting nicotine entirely. The study used the

same data that the U.S. government uses to estimate the health effects of smoking. It found that Americans who had switched from smoking to smokeless tobacco before 1982 had only slightly higher risk of death than former smokers who had quit tobacco entirely; if there was any risk from using smokeless tobacco at all, it was much lower than from continuing to smoke. Furthermore, the difference in outcomes between the "switchers" and the "quitters" seemed to result from the fact that switchers smoked more when they did smoke and other differences between the two groups, and thus was not caused by the use of smokeless tobacco.

(Switching, in this context, usually refers to a smoker choosing to quit smoking and, rather than give up nicotine, switches to smokeless tobacco. It should be noted that the study defined "switcher" somewhat unusually, by including anyone who smoked previously and used smokeless tobacco at the time of the 1982 survey, even though

there was often a substantial time gap between the smoking and smokeless tobacco use.)

The study found that for a simple comparison of switchers to quitters, switchers are more likely to die sooner. However, it turns out that the switchers had various characteristics that made them generally less healthy than the quitters. When the effects of those factors are partially removed, much of the difference between the groups goes away. Keep in mind that these people switched long before there was much knowledge about harm reduction, and probably believed (mistakenly) that smokeless tobacco causes substantial health risks, comparable to those from smoking. Thus subjects who were most concerned about improving their health would have been more likely to quit rather than switch, and would also have been more likely to eat better, maintain healthy body weight, etc. More important, before they stopped smoking, the switchers had smoked longer and more intensely than did the quitters. When the effect of greater past smoking is partially corrected for, most of the remaining difference in risk disappears.

In addition, switchers were also probably more likely to start smoking again, in part because anti-smokeless-tobacco advocates were telling them that using smokeless tobacco was just as bad as smoking, so they might as well smoke. The health effects of starting to smoke again would explain some or all of the remaining difference. (There is data in the study that suggests that this speculation is correct; unfortunately the nature of the study, which collects data at one point in time rather than following the subjects to see how their behavior changes, makes it difficult to correct for this, and the authors did not even attempt to do so.)

Most telling, after partially correcting for intensity of smoking and other health factors, the remaining difference in death rates between switchers and quitters -- the result reported in the study -- is almost

entirely due to lung diseases. These diseases are overwhelmingly caused by smoking. This suggests that most or all of the remaining difference is due to the differences in past and future smoking patterns between the switchers and the quitters, and that the attempt to statistically remove all of that effect was not successful. Some of the lung disease disparity may have resulted from smokers who already had lung symptoms switching to smokeless tobacco in order to breathe easier (though few people in 1982 knew that smokeless tobacco caused only about 1/100<sup>th</sup> the risk from smoking, most probably understood that it did not hurt their lungs).

These challenges in determining which differences are caused by an exposure and which are caused by other things are common in epidemiology research. We try to "control for" the effects of variables that obscure the true relationship we want to measure, but we cannot do so completely, and so some of the error remains. (Technically this problem is known as "confounding", and when we cannot correct for all of it, it is called "residual confounding".) Similarly, we try to correct for cases where a disease might cause a behavior, like lung symptoms causing a smoker to switch, rather than the other way around, but in a study like this that is close to impossible.

Since it is usually not possible to completely eliminate these problems statistically, it is necessary to use our knowledge of the world. When researchers see a difference in lung disease rates between two groups, they generally conclude that the difference was caused by different levels of smoking between the groups, and that the data was just not good enough to control for that difference. In the case of this new study, this would explain the small difference between switchers and quitters.

In short, the new study found that, at worst, switchers have only slightly poorer outcomes than quitters, and that most of that

difference does not appear to be attributable to the use of smokeless tobacco. This does not mean that switching to smokeless tobacco or another source of nicotine has 100% of the physical health benefits of quitting nicotine entirely (which no one seriously claims). But it confirms that switching is much, much better than continuing to smoke, or than trying to quit and failing. The main harm reduction message remains clearly true: Smokers who are unwilling or unable to quit nicotine can choose a much less harmful alternative by switching to smokeless tobacco.

The news from the study was not all good, though the bad news was mostly about politics rather than health. Sadly, the authors of the study proved unwilling or unable to admit that their results contradicted the anti-harm-reduction views of their employers. Instead of honestly reporting their scientific findings, they let politics and spin carry the day, trying to explain away their results and claim that switching to smokeless tobacco is a bad idea. Instead of interpreting the lung disease differences as being caused by the switchers smoking more, as would be the standard analysis in epidemiology, they claimed that smokeless tobacco use was causing lung disease (despite decades of previous evidence that fails to support such a claim). Instead of recognizing that the remaining difference between switchers and quitters was probably caused by confounding they could not fully control for, they implicitly claimed that the very small remaining difference was the true causal relationship despite the substantial uncertainty that actually exists.

Worst of all, the authors, who work for the two organizations that are the source of most estimates of the health effects of smoking, carefully avoided comparing the health of switchers and those who continued to smoke. Had they done so, it would have been obvious to readers that any difference between switching and quitting is extremely small compared to the risks from continuing

to smoke. This is the most important comparison for purposes of evaluating harm reduction, but they hid this from their readers even as they drew conclusions about harm reduction. The importance of this omission should not be underestimated or judged to be a minor oversight. This comparison would have clearly demonstrated that the anti-harm-reduction message the authors included in the text of their article and emphasized in their press release was contrary to what their study results showed.

It appears that the authors' efforts to confuse people about their study results were successful. News and advocacy organizations blindly copied the press release and reported that switching to smokeless tobacco was not a good alternative to smoking. (While it seems astonishing that anyone would blindly report claims made by the U.S. government as truth anymore, it remains a common practice.) Readers of reports about the study are unlikely to learn that no matter how one interprets the results, they show that switching is very much better than continuing to smoke. Some writers were so confused by the anti-harm-reduction spin that they actually reported that switching is even worse than continuing to smoke.

The one possible bit of scientific bad news is that this study suggests, as did a previous analysis of part of the same dataset, that there might be a small risk of stroke from smokeless tobacco use. Switchers had a higher stroke risk than quitters, and it did not substantially diminish when other variables were controlled for, unlike the risks for other reported diseases. This difference could be completely due to the residual confounding described above, and the result needs to be confirmed by other studies before it is considered more than suggestive. But it is biologically plausible that there is an effect since nicotine (in any form) is a mild stimulant which temporarily increases heart rate and blood pressure, factors that can trigger a stroke in someone

with a predisposing condition. Other mild stimulants have been linked to small increases in stroke risk. But it should be noted that even if there is some stroke risk, it is very small compared to the risks from smoking (which would have this effect in addition to its many other negative health effects), and so smokeless tobacco would remain a viable and potentially invaluable harm reducing alternative for those who smoke.