

## Dr. Raymond Pearl's Famous 1938 Death Rates Data

Smokers are killed, prematurely **killed**, dying commonly years before nonsmokers. Male smokers lost an average of 13.2 years of life. Female smokers lose 14.5 years of life.—NVSR 49, No. 3, [U.S. Centers for Disease Control \(6-26-2001\)](#). See also the book by the National Research Council (US) Panel on Understanding Divergent Trends in Longevity in High-Income Countries; Edited by Eileen M Crimmins, Samuel H Preston, and Barney Cohen (Washington (DC): [National Academies Press](#), 2011), [Explaining Divergent Levels of Longevity in High-Income Countries](#), especially Chapter 5, "[The Role of Smoking](#)."

"About 25% of all deaths in the US are related to tobacco. That's more than murders, car accidents, and HIV/AIDs combined. And 10% of all deaths worldwide are the result of tobacco-related diseases," says [Action on Smoking or Health](#) (retrieved 29 November 2013).

You may (or **may not**) have heard of the famous 1938 data on death rates from smoking vs. nonsmokers typically living longer, i.e., not dying prematurely. Here, using the normal chart form of death rates per 100,000 people, is data from that material:

**How Many Smokers and Nonsmokers  
Are Still Alive At Each Age  
(Starting With 100,000 Each and Dying Down Each 5-yr Period)**

AGE	Nonsmokers	Light Smokers	Heavy Smokers
30	100,000	100,000	100,000
35	95,883	95,804	90,943
40	91,546	90,883	81,191
45	86,730	85,129	71,665
50	81,160	78,436	62,699
55	74,538	70,712	54,277
60	66,564	61,911	46,226
65	57,018	52,082	38,328
70	45,919	41,431	30,393
75	33,767	30,455	22,338
80	21,737	19,945	14,494
85	11,597	10,987	7,865
90	4,753	4,686	3,292
95	1,320	1,366	938

It is evident that at each age division, more nonsmokers remain alive. Fewer smokers are alive. Smokers essentially consistently die off earlier. This earlier death rate continues until the last age range, when few are left in each category alive (age 95), and the death rate approaches the expected 100% rate. To get to that last point, don't smoke.

For those interested in the details of each period, here is a second aspect of the 1938 data:

**Smoker Premature Death Rates  
(Per 100,000 at Various Ages)**

AGE	Nonsmokers	Light Smokers	Heavy Smokers
30	8.18	7.86	16.89
35	8.78	9.63	21.27
40	10.01	11.89	23.91
45	12.04	14.9	25.69
50	15.16	18.61	27.49
55	19.82	23.67	30.09
60	26.72	30.49	34.29
65	36.88	39.83	41.2
70	51.69	52.84	52.72
75	73.02	71.28	72.33
80	103.22	97.95	100.44
85	142.78	136.50	139.48
90	197.49	190.23	193.68
95	273.2	265.1	268.9

Source:

Prof. Raymond Pearl, Dep't of Biology,  
School of Hygiene and Public Health,  
[Johns Hopkins Univ](#), Baltimore, MD,  
"Tobacco Smoking and Longevity,"  
87 *Science* (#2253) 216-217 (4 March 1938)

**Why Tobacco Typically  
Kills Prematurely**

[Cigarettes' Deleterious  
Ingredients and Emissions](#)

[100% Lung Cancer Rate](#)

[The Post-War Formula Change  
to Add Coumarin, for Rat Poison](#)

As the [quantities of toxic chemicals](#) involved are [so extensive](#), so [massive](#), so [poisonous](#), injury is immediate. "Even brief exposure to tobacco smoke causes immediate harm to the body, damaging cells and inflaming tissue in ways that can lead to serious illness and death," says "[Just one cigarette can harm DNA, Surgeon General says](#)" (USATODAY, 09 December 2010).

Premature tobacco-caused deaths are therefore noted as long ago as 1833: "Five thousand deaths in these United States every year, from the use of tobacco!"--Orin S. Fowler, *Disquisition on the Evils of Using Tobacco, and the Necessity of Immediate and Entire*

*Reformation* (Providence: S. R. Weedon, 1833), [p 21](#).

By 1836, it is already known "that thousands and tens of thousands die of [diseases of the lungs](#) generally brought on by tobacco smoking. . . . How is it possible to be otherwise? Tobacco is a poison. A man will die of an infusion of tobacco as of a shot through the head." —Samuel Green, *New England Almanack and Farmer's Friend* (1836).

In 1845, it is known that ". . . German physiologists compute, that of twenty deaths between eighteen and thirty-five years, ten originate in the waste of the constitution by smoking.' Look at that! Ten out of twenty deaths caused by smoking! The number seems incredible. But the physicians of Germany who have examined the subject ought to be informed. It is the opinion of some of the best physicians in our country, that *more than twenty thousand* die annually in the United States by reason of the use of tobacco!"--Benjamin I. Lane (1797-1875), *The Mysteries of Tobacco* (New York: Wiley and Putnam, 1845), [pp 131-132](#).

In 1876, Dr. Hippolyte A. Depierris (1810-1889) wrote in depth on the subject, in [Physiologie Sociale: Le Tabac, Qui Contient Le Plus Violent des Poisons, La Nicotine Abrège-t-il l'Existence? Est-il Cause de la Dégénérescence Physique et Morale des Sociétés Modernes?](#) (Paris: Dentu, 1876, reprinted and edited, E. Flammarion, 1898). Note the Pearl-like [death-data chart, p 399](#), and [similar conclusion, reduced numbers of elderly, p 402](#).

In 1882, "it is estimated by many medical men that the victims of this weed, on an average, cut short their life about one quarter. Thus, from an average life of forty-five to fifty, about ten or twelve are sacrificed to this evil-doer."--Meta Lander (1813-1901), [The Tobacco Problem](#) (Boston: Lee and



Shepard, 1882), [p 55](#). And, "multitudes are carried to the grave every year by tobacco alone," [p. 67](#).

This enormous death-rate constitutes "one of the greatest offenses against humanity," says Prof. Bruce Fink (1861-1927), in *Tobacco* (Cincinnati: The Abingdon Press, 1915), [p 30](#).

In 1922, there was reference to "the decreasing number of persons who attain great age. Centenarians are becoming extinct. The proportion of centenarians to the general population differs greatly in various countries and agrees very well with the amount of tobacco consumed, but in inverse ratio."--John H. Kellogg, M.D., LL.D., F.A.C.S. (1852-1943), [Tobaccoism, or, How Tobacco Kills](#) (Battle Creek, Michigan: The Modern Medicine Publishing Co, 1922), [p 118](#).

### For More Historical Data

<a href="#">Tobacco Amblyopia Known in 1792</a>
<a href="#">Cigarette-Cancer Link Known in 1880's - 1925 Era</a>
<a href="#">Michigan House of Representatives Cigarette Report - 1889</a>
<a href="#">Tennessee's 1897 Cigarette Ban</a>
<a href="#">Michigan's Smokers' Rights Law - 1909</a>
<a href="#">Edison's 1914 Warning of A Cigarette Hazard</a>

### Tobacco Ingredients' Effects Sites

<a href="#">Abortion</a>	<a href="#">Addiction</a>	<a href="#">AIDS</a>	<a href="#">Alcoholism</a>
<a href="#">Alzheimer's</a>	<a href="#">Birth Defects</a>	<a href="#">Brain Damage</a>	<a href="#">Breast Cancer</a>
<a href="#">Crime</a>	<a href="#">Divorce</a>	<a href="#">Drugs</a>	<a href="#">Fires</a>
<a href="#">Hearing Loss</a>	<a href="#">Heart Disease</a>	<a href="#">Lung Cancer</a>	<a href="#">Macular Degeneration</a>
<a href="#">Mental Disorder</a>	<a href="#">Seat Belt Disuse</a>	<a href="#">SIDS</a>	<a href="#">Suicide</a>

### Related Law Sites

<a href="#">Legal Term Definitions</a>
<a href="#">Michigan Law</a>
<a href="#">Common Law</a>
<a href="#">International Law</a>

[U.S. Supreme Court Cases](#)

[Federal Circuit Court Tobacco Cases](#)

[Dangerous Tobacco Cases](#)

[Tobacco Company Behavior Cases](#)

[Illegality of Death-Causing Words](#)

Dr. Pearl (1879-1940) was also an educator of laymen. Note his "The Search for Longevity," 46 *The Scientific Monthly* 462-483 (May 1938), "[p]resented as one of the Third Series of 'Lectures to the Laity' of the New York Academy of Medicine on February 24, 1939." That much longer paper has a number of references tracking concern on the subject and data back some decades, noting that length of life compared to about fifty years earlier, had actually deteriorated, was "not quite as good" (p 466). In that February 1938 lecture, he offered a comparison to 1890 with an example: "At that time six hundred out of every 10,000 white males alive at age 70 lived on to 90 or more. Now . . . only 563 manage this feat." "The *span* of human life has *not* been lengthened, and there is no present prospect that it soon will be. The *average duration* of life is all that has been altered." "In 1890 only 72 per cent. of the boy babies starting got a foothold on . . . 10-year [age]; now 91 per cent. do."

He thus refuted the mythology too often fed to laymen. He correctly identified that in truth, the fact was really that merely "more babies" were being enabled to survive, but actual length of average lifespan had not only not increased, but was actually "not quite as good." Of course, due to the [unlawfully-caused tobacco-induced deaths](#) constituting the [tobacco holocaust](#).

Pearl knew the averaging data, e.g., that "Death rates began their sustained declines by the 1870's" (see "Population of the United States, 1790-1920," by Michael R. Haines, *The Cambridge Economic History of the United States*, Vol 2, Stanley Engerman & Robert Geallmon, eds). The real issue is of course, not "average," but "span." And, it had long been reported "that one half the deaths of men in that country [[Germany](#)] between eighteen and thirty-five years of age, are attributed, by their physicians, to smoking."—Wm. A. Alcott, M.D., *The Use of Tobacco: Its Physical, Intellectual, and Moral Effects on The Human System*(New York: Fowler and Wells, 1836), [p 76](#).

"The [sedative](#) effect of [tobacco](#) upon the [brain](#) is so great that it often requires an act of the will to stimulate the involuntary muscles to action, so that when sleep arrests this [will-power](#) these muscles cease to act, the breathing stops, and the person is found dead in his bed—'from [heart-disease](#)' say his friends, but in reality from tobacco-paralysis of the heart and muscles of inspiration."—John B. Wight, *Tobacco: Its Use and Abuse* (Columbia: L. L. Pickett Pub Co, 1889), [p 56](#).

Death-Cause Comparison Chart (1995)

Cocaine	Opiates	Alcohol	Tobacco
2,000	4,000	125,000	419,000





Dr. Pearl was a veteran analyst of life span data. He was editor of *Human Biology*, a six-times-a year journal published by [Wayne State University](#), Detroit, MI, and printed in Baltimore by Warwick & York, beginning with Volume 1, January 1929. Writings by Dr. Pearl on the subject pertinent to the above cited tobacco-related material include the following:

- *Studies in Human Longevity* (Baltimore: Williams and Wilkins, 1924)
- *The Rate of Living, Being an Account of Some Experimental Studies on The Biology of Life Duration* (New York: A. A. Knopf, 1928)
- "Studies on Human Longevity. IV. The Inheritance of Longevity," 3 *Human Biology* 245-269 (1931)
- "Studies in Human Longevity. V. Constitutional Factors in Mortality at Advanced Ages," 4 *Human Biology* (#1) 80-118 (Baltimore, Md.: Johns Hopkins Press, Feb 1932) (with T. Raenkham)
- "Prolonging Life," 48 *Annals of Biology* 575-599 (1934) (with Gould, S. A, Edwards, T. I., and Miner, J. R.)
- *Ancestry of the Long-Lived* in series *Aging and Old Age* (Baltimore and London: Johns Hopkins and Oxford University Presses, 1934, reprinted, New York: Arno Press, 1979) (with Ruth D. Pearl)

### Other Significant Writings by Dr. Pearl

"A Notable Advance in the Theory of Correlation," XXI *Science*(#523) 32-35 (1905)

*Modes of Research in Genetics* (New York, The Macmillan Co, 1915)

"Biology and War," VIII *Journal of the Washington Academy of Sciences* (#11) 341-360 (4 June 1918)

United States Food Administration, Statistical Division, *Reference Handbook of Food Statistics in Relation to the War*(Washington, [Govt. Printing Office](#), 1918) (With Esther Pearl Matchett)

"Influenza Studies. I. On Certain General

**Statistical Aspects of the 1918 Epidemic in American Cities," *Public Health Reports* 1743-1783 (Washington DC: Govt Printing Office, 8 Aug 1919). Reprint No. 548**

**"The Effect of The War on the Chief Factors of Population Change," *LI Science* (#1327) 553-556 (4 June 1920)**

***The Nation's Food: A Statistical Study of a Physiological and Social Problem* (Philadelphia: W. B. Saunders, 1920)**

**"Influenza Studies. II. Further Data on the Correlation of Explosiveness of Outbreak of the 1918 Epidemic. III. On the Correlation of Destructiveness of the 1918 Epidemic. IV. On the Correlation Between Explosiveness and Total Destructiveness of the Epidemic Mortality," *Public Health Reports* 273-298 (Washington DC: Govt Printing Office, 18 Feb 1921). Reprint No. 642**

**"The Biology of Death," *Scientific Monthly* (NY: March-Sept 1921)**

***Experimental Studies on the Duration of Life. I-XII,* 2 vols, (Baltimore: 1921 and 1929)**

**"The Vitality of The Peoples of America," 1 *The American Journal of Hygiene* (#5-6) 592-674 (Sep - Nov 1921)**

***The Biology of Death; Being a Series of Lectures Delivered at the Lowell Institute in Boston in December 1920.* In series: *Monographs on Experimental Biology* (Philadelphia, London: J.B. Lippincott Co, 1922)**

***Biometrical Studies in Pathology* (Baltimore, Johns Hopkins Press, 1922, 1924) From 21 *Johns Hopkins Hospital Reports* (#3, 5) and 33 *Johns Hopkins Hospital Bulletin* (Nov 1922)**

***Introduction to Medical Biometry and Statistics* (Philadelphia, London: W.B. Saunders Co, 1923)**

***The Action of Alcohol on Man* (London, New York: Longmans, Green, 1923) (With Ernest Henry Starling (1866-1927), Robert Hutchison (1871-),**

and Sir Frederick Walker Mott (1854-)

*Alcohol & Mortality* (Plymouth, England: The Mayflower Press, 1924)

*Alcohol and Longevity*. In series: *Addiction in America* (New York: Knopf, 1926 and reprinted, Arno Press, 1981)

*The Biology of Population Growth* (New York: A. A. Knopf, 1925)

*To Begin With: Being Prophylaxis Against Pedantry*. Suggestions about Reading Based on "The Reading of Graduate Students" 21 *Scientific Monthly* 33-44 [July 1925]. (New York and London: A. A. Knopf, 1930)

*The Biology of Population Growth* (New York: A. A. Knopf, 1930)

"Quotations: Tobias Venner and His *Via Recta*," 4 *Human Biology* (#4) 558-583 (Baltimore: J. Hopkins Press, Dec 1932) (Dr. Venner was a pioneer researcher, cited for example with respect to [tobacco amblyopia](#) and [other tobacco effects](#)).

*Constitution and Health*. In series: *Psyche Miniatures General Series*, no. 60 (London: K. Paul, Trench, Trubner & Co., Ltd., 1933)

"Biology and Human Trends," 25 *Journal of the Washington Academy of Sciences* (#6) June 15, 1935, reprinted in *Smithsonian Institution Annual Report, 1935*, pp 327-344 (Washington, 1936)

"Multiplying Man," *Yale Review*, pp 584-602 (New Haven: March 1936)

*The Natural History of Population*. In series: University of London. Heath Clark Lectures, 1937, at the London School of Hygiene and Tropical Medicine (New York: Oxford University Press, 1939)

Dr. Pearl knew that smokers' disproportionate premature deaths do not occur in a vacuum. Data on smokers' disproportionate sickness rate was also then known. For example, note data from this 1890 study of 5,000 students on smoker sickness rates, already at an elevated level in all listed categories (type, combination, frequency):

**Illness Rates**



DISEASE	Smokers	Nonsmokers
Respiratory	16.09%	10.69%
Digestive	11.88%	9.92%
Both of Above	8.77%	3.22%
All Types	36.74%	23.83%
Frequency	45.83%	32.71%

Source:

Dr. Mendelson's "The Influence of Tobacco Smoking Upon the Health"

2 *British Med J* 923 (2 Oct 1897)

and *Vratch*, No 14 (Russ, 1897)

Insurance companies of the era also reported the tobacco-premature death connection.

Example: Anonymous. Postal Life Insurance Company, New York. *Bulletin* (20 Nov 1913). Has data on the relation of the smoking to foreseeable mortality.

Of course, doctors continue to study death rates. See for example, Morabia A, and Khatchatrian N, "Major Causes of Deaths Between 1901 and 1990 in Geneva, Switzerland," 41 *Soz Praventivmed* (#5) 315-321 (1996).

#### A Death Rate Example

Death rate data shows that about 400,000 smokers in America, out of about 59,000,000, are annually killed by smoking. The pushers rant, that's too low a ratio (4/590, i.e., a .0067796 rate), so therefore, cigarettes are NOT killing!

World War II military statistical analysis found that "300,000 bullets were fired for each man killed," says Prof. Michael P. Ghiglieri, Ph.D., *The Dark Side of Man* (Reading, MA.: Perseus Books, 1999), p 185. 299,000 misses, 1 hit = only a 1/300,000 correlation!

Vietnam War military statistical analysis found that it took 40,000 shots for each one dead enemy troop. 39,999 misses, 1 hit = .000025 correlation. 1/40,000, now that's a really low correlation! :)

Of course, the underlying fact is, that the individual one hit was THE, repeat, THE, "causation" of the death.

At individual level, it's causation. On the gross statistical level, it's supposedly only "correlation": 1/40,000 (.000025).

If you were the Military Supply Officer, would you stop issuing bullets? -- would you deny they kill? -- because the correlation (1/40,000; .000025) was too low?!

You think about it: cigarettes kill at a 4/590 (.0067796) rate. Intentionally fired war bullets killed at only a 1/40,000 (.000025) hits rate.

What do YOU say; are the pushers right in denying their [killing](#)?

Or do you agree that the pushers are committing [mass premeditated murder at the holocaust level](#)? and should be prosecuted, convicted, and executed as per pertinent precedents?

Note [censorship of tobacco news](#).

#### Sudden Deaths from Tobacco

[1798](#) [1845](#) [1882](#) [1909](#) [1912](#) [1915](#) [1916](#) [1929](#)

French Examples by Dr. Depierris

[pp 78-79](#)

And see also data on deaths among the unborn ([abortion/miscarriage](#)) and youth ([SIDS](#)); and the [right to pure air](#), needed to prevent such deaths, caused by the [poisonous nature](#) of [Toxic Tobacco Smoke](#).

This data also refutes the notion that women inherently live longer than men. Studies cited by Dr. Daniel H. Kress, *Modern Use of Tobacco*, cited this issue! Conclusion: "Men drink and smoke too much." By 1910, this tobacco-caused longevity difference was becoming evident: Census data showed 1380 men over 100, vs 2175 women, says Pryn's Hopkins, Ph.D. (1885 - 1970), *Gone Up in Smoke: An Analysis of Tobaccoism* (Culver City, CA: The Highland Press, 1948), p 90.

Dr. Pearl's death rates' comparison study is repeatedly cited for its enormous value in showing tobacco dangers, in the public education book by Frank Leighton Wood, M.D. *What You Should Know About Tobacco* (Wichita, KS: The Wichita Publishing Co, 1944), pages 6, 7, 33-35, 46-47, 52, 86-92, 107, 123, 134-135, and 137. See also Prof. Arthur H. Steinhaus and Florence M. Grunderman, *Tobacco and Health: Some Facts About Smoking* (2d ed) (New York: Association Press, 1941), p 44-45.

Educated people tend disproportionately to not smoke.—E. Jacobs, "Smoking: Insidious Suicide and Personal Air Pollution," 135 *Military Med* 678-681 (Aug 1970). And see related longevity data, e.g., the study by Lawrence J Whalley (professor of mental health) and Ian J Deary (professor of differential psychology), "[Longitudinal](#)

[cohort study of childhood IQ and survival up to age 76](#)," 322 *Brit Med J* (#7290) 819 (7 April 2001) ("Childhood mental ability is a significant factor among the variables that predict age at death.")

Educated people live longer. "People with 12 years of education or more have seen their life expectancy rise faster than among those with less education, and researchers say that differences in smoking rates are an important reason for the disparity," says "[Smoking Blamed for Education-Related Mortality Gap](#)" (12 March 2008). "Bottom line: as of 2000, better-educated 25-year-olds could expect to live to age 82, while less-educated adults of the same age could only expect to live to 75. Smoking-related illnesses accounted for much of the mortality gap, researchers found. Lung cancer and chronic obstructive pulmonary disorder alone accounted for 20 percent of the mortality differences between the two groups. Past studies have shown that less-educated people are also less likely to quit or abstain from smoking." See [the article](#) by David Cutler, *et al*, in the journal *Health Affairs* (March/April 2008).

Herbert H. Tidswell, M.D., *The Tobacco Habit: Its History and Pathology* (London: J. & A. Churchill, 1912), [p 238](#), showed that tobacco causes premature death among nonsmokers as well, e.g., killing the unborn, "fifty-three per cent. of . . . abortions . . . are due to tobacco." Additionally, also at [p 238](#), ". . . inhalation of [tobacco smoke](#) by pregnant mothers when sitting among smokers is sufficient to cause fatal poisoning of the foetus."

"The two co-founders of Alcoholics Anonymous (Bill Wilson and Bob Smith) both died of lung cancer at ages 75 and 71 respectively,"

says [www.cardiovision2020.org/KickTobacco.htm](http://www.cardiovision2020.org/KickTobacco.htm). Smokers, they had focused on a tobacco effect, alcoholism, not on [its typical tobacco causation process](#), nor even noted the long known [tobacco-lung cancer connection](#). For more examples, see [www.smokefreeair.org/fds.pdf](http://www.smokefreeair.org/fds.pdf).

Click [here for a list of current and past smokers](#).

#### The Top Seven Causes of Death (April 2005)

Click to learn Tobacco Role, if any

1. [tobacco](#)
2. [alcohol](#)
3. [germs](#)
4. [toxins and pollutants](#)
5. [car crashes](#)
5. [guns](#)
6. [risky sexual behavior](#)
7. [poor diet and inactivity](#)

"[41 nations top U.S. life expectancy](#)" says Stephen Ohelemacher (The Associated Press, *Seattle Times*) (12 August 2007). "A baby born in the United States in 2004 will live an average of 77.9 years. That life expectancy ranks 42nd, down from 11th two

decades earlier, according to international numbers provided by the Census Bureau and domestic numbers from the National Center for Health Statistics." "'Something's wrong here when one of the richest countries in the world, the one that spends the most on health care, is not able to keep up with other countries,' said Dr. Christopher Murray, head of the Institute for Health Metrics and Evaluation at the University of Washington."

"Four common bad habits combined — smoking, drinking too much, inactivity and poor diet — can age you by 12 years," says Lindsey Tanner, "[Bad habits can age you by 12 years, study suggests](#)" (AP, 26 April 2010). "The study appears in Monday's [Archives of Internal Medicine](#)." For details, see Elisabeth Kvaavik, PhD; G. David Batty, PhD; Giske Ursin, MD, PhD; Rachel Huxley, DPhil; Catharine R. Gale, PhD, "[Influence of Individual and Combined Health Behaviors on Total and Cause-Specific Mortality in Men and Women: The United Kingdom Health and Lifestyle Survey](#)," *Arch Intern Med.* 2010;170(8):711-718.

Jeffrey Kopman, "[The WORST States for a Long Life](#)" (1 August 2013) ("Hawaii is . . . the ideal location for people who want to live the longest, healthiest life possible. . . . Healthy life expectancy was generally lower in the South than the rest of the United States. . . . The lowest healthy life expectancy recorded was 75.8 — meaning the average resident of that state lives healthfully to age 75 — down 5.4 years from Hawaii's 81.2, the highest mark. Hawaii also had the longest overall life expectancy at 86.3 years. Nationally, the average healthy life expectancy for all states was 78.9 years, and the average total life expectancy is 84.1 years.")

See also Mo Costandi, "[Your Nose Knows Death is Imminent](#)" (*The Guardian*, 20 October 2014) citing J. M. Pinto, *et al.* (2014). Olfactory Dysfunction Predicts 5-Year Mortality in Older Adults. PLOS ONE, 9(9): e107541.

doi: [10.1371/journal.pone.0107541](https://doi.org/10.1371/journal.pone.0107541): "Losing the sense of smell predicts likelihood of death within five years." Of course, as tobacco's [toxic ingredients](#) damage both the [brain](#) and the nose thus damage the sense of smell.