The Center for Disease Control and Prevention (CDC) has cited “Ten Great Public Health Achievements” of 20th-century America which the medical monthly Consultant described, loosely, as the CDC’s “top ten” pick of “medical triumphs.” Consultant is distributed to more than 160,000 physicians, physician assistants, and nurse practitioners. Its descriptions of the public health advances are similar to the CDC's summaries. I asked all ACSH advisors to offer comments on both the Consultant article and the CDC's list and to propose additions and replacement items. According to the CDC, the items on this list were among the "many notable public health achievements" of the 20th century and were "not ranked in order of importance":

**Vaccination**
Vaccination programs have resulted in the eradication of smallpox; the elimination of polio in the Americas; and the control of diphtheria, measles, rubella, tetanus, and other infectious diseases in the United States and other regions.

**Motor vehicle safety** Improvements in motor-vehicle safety are attributable both to the engineering-based evolution of motor vehicles and highways and to campaigns to change driving-related behavior (e.g., to habitualize seat-belt use).

**Safer workplaces** Policies and programs to improve occupational hygiene have contributed to a decrease in fatal job-related injuries of approximately 40 percent since 1980.

**Control of infectious diseases** Decreases in water contamination, improvements in waste disposal, and antibiotic therapy have contributed to the control of infectious diseases such as cholera and typhoid.

**Decline in deaths from coronary heart disease and stroke** Risk-factor modification, increases in the accessibility of early screening, and progress in treatment have resulted in a 51-percent decrease in CHD mortality since 1972.

**Safer and healthier foods** Decreases in microbial contamination of food, the identification of essential nutrients, and the establishment of food-fortification programs have vastly improved the American food supply. The major deficiency diseases (e.g., goiter, pellagra, and rickets) have been almost eliminated in the United States.

**Healthier mothers and babies** Nutritional and other improvements in hygiene, increases in the availability of antibiotics and healthcare services, and technological progress in maternal and neonatal medicine have contributed since 1900 to a decrease of 90 percent in infant mortality and to a decrease of 99 percent in maternal mortality.
Family planning
Increases in the accessibility of family planning and related services have contributed, for example, to a decrease in infant, child, and maternal deaths and to an increase in the use of condoms and other "barrier contraceptives" to prevent pregnancy and the spread of sexually transmitted diseases.
Fluoridation of drinking water

Community water fluoridation safely, inexpensively, conveniently, and importantly contributes to the prevention of tooth decay in children and adults and to the prevention of tooth loss in adults.

Recognition of tobacco use as a health hazard

The U.S. Surgeon General's 1964 report on the risks of tobacco use prompted antismoking campaigns that have resulted in a decrease in the prevalence of smoking among adults and in the prevention of millions of smoking-related deaths.

Below, listed alphabetically according to name, are advisors' comments.

Thomas G. Baumgartner, Pharm.D., M.Ed. (Clinical Professor, University of Florida): "Although one could argue that several of the achievements might encompass environmental issues (e.g., emissions from motor vehicles or industrial workplaces), environmental advances seem to have been sidestepped. Environmental policies since 1900 have been rather dramatic and should have found a place in this top 10 summary dealing with public health."

Bernard L. Cohen, D.Sc. (Professor Emeritus of Physics, University of Pittsburgh): "I believe one of the top public health achievements in this century is improvement in all aspects of safety. . . . In 1906, when the U.S. population was 86 million, [non-motor-vehicle] accidents killed 80,000, whereas toward the end of the century, when the population is 260 million, they are killing only about 45,000 per year. This is more than a fivefold reduction in per capita death rate."

Ernst M. Davis, Ph.D. (Professor of Environmental Science, The University of Texas at Houston): "Why limit this to only 10? . . . Suggestion for an additional subject: advances in waste treatment technology and application. . . . Another addition: advances in medical treatment (advances in knowledge of the human body and subsequent [advances in] the treatment of diseases).

". . . Dr. Leslie A. Chambers (deceased) [told me of two developments] that he believed were the greatest contributions to improving public health in [the 20th] century: . . . the development of mass production capability for fabric production (clothes) and the mass production of soap. . . . Before these came about, people wore the same thing until it . . . rotted off their bodies, and rarely ever bathed."

Thomas R. DeGregori, Ph.D. (Professor of Economics, University of Houston): "The [Consultant] piece on medical triumphs was interesting in that it touched the major triumphs but . . . avoided the controversial aspects of them. For example, it mentions sanitation and the spread of water-borne diseases (cholera) and also the fluoridation of water but no mention of chlorine. Fluoridation of water is as controversial as the article gets. Afraid to offend Greenpeace?"

"No mention of the use of DDT and other pesticides in the control of insect-borne diseases or for the protection of crops as part of improved food production for improved nutrition. Not mentioned also are fungicides for safer foods. Nor does it mention the importance of synthesizing urea for agricultural production, or the continuing advances in plant genetics."

John E. Dodes, D.D.S. (President, New York Chapter, The National Council Against Health Fraud): "I cannot think of any other major public health measures, although I do believe that modern agriculture has saved many people from starvation."

Michael P. Elston, M.D., M.S. (faculty member, Family Practice Residency Program, Rapid City Regional Hospital): "[The Consultant article] serves as a reminder of the reliability attained when..."
the scientific method is applied to problems facing mankind. Only through careful scientific study of natural events have we been able to understand, reliably and reproducibly, the underlying principles of these events. Application of this knowledge allows the subsequent theoretical developments enabling mankind to introduce successful technological solutions to the many uncertainties facing us. This technological approach to problem solving, coupled with our opposable thumbs, has enabled mankind to become the dominant intellectual species on this planet.

"I am pleased that recognition is given to technological advances other than improved medical diagnostic and treatment modalities for their contribution to the improved lifestyles of modern-day Americans. The efforts of improved sanitation, food and water safety, and vastly improved transportation measures have all impacted our daily lives and are given due recognition in this listing. This is not meant to belittle the advances in medicine, [but is] rather to endorse the other technologies that have inherently bettered our existence. It is a puzzle to me, however, that in light of these astounding successes the anti-science and anti-technology movements have garnered increasing public support in their efforts to abandon these advancements.

"Perhaps the deliberate dismantling of technological advance is, in and of itself, an 'all natural' event the final proof that all systems decay over time and that eventually entropy wins!"

Charles O. Gallina, Ph.D. (former Senior Nuclear Scientist, State of Illinois): "Nine of the ten save lives; the remainder destroys lives and is actually destroying entire countries. . . .

"'Family planning' . . . is a misnomer in most of the world. Some families actually practice family planning in order to control the size of their families. Natural family planning (not the old Papal Roulette) is 98% effective and depends on a woman's analyzing her vaginal secretions, which undergo marked changes just before she becomes fertile. A couple can then refrain from intercourse for 3-5 days. Remember: 98% effective.

"The Guttmacher Institute (a special affiliate of Planned Parenthood) states that 47 percent of all women who have had abortions were on some form of contraceptive when they became pregnant. 47% failure rate?

"This is not even the insidious part. Planned Parenthood and International Planned Parenthood were founded by Margaret Sanger, who was a devout and dedicated eugenicist 'More children from the fit, less from the unfit.' And aside from the humongous profits made by Planned Parenthood, their forced family planning in Europe, Asia, and Third World countries is devastating entire populations. It takes a birth rate of at least about 2.1 to maintain a population. And when this type of family planning (birth control) is practiced in Third World countries, where mortality rates are very high, Planned Parenthood is only accelerating the process.

"So 'family planning' is a way for the 'Fit' to eliminate the 'Unfit.' In the United States it is called 'abortion on demand' and now we have proof that parts of aborted babies are being 'sold' for fetal research."

Timothy N. Gorski, M.D. (President, Dallas/Fort Worth Council Against Health Fraud): "Although it has always been fashionable to complain about how much worse the world is . . . getting, we
ought to be *pinching* ourselves at the close of the 20th century over how much has been accomplished towards giving more people the opportunity to live longer and healthier lives.

"If there is anything to be unhappy about, it is merely . . . not having done more conquered cancer, cured genetic diseases, and solved the problem(s) of cardiovascular disease. Perhaps our descendants of 2099 will be able to boast that they eliminated these remaining health problems and made a good start on others."

Alfred E. Harper, Ph.D. (Professor Emeritus of Nutrition Sciences and Biochemistry, University of Wisconsin-Madison): "The first sentence of the [Consultant] article 'Americans live on average more than 30 years longer than they did in 1900' is deceptive. It carries the implication that the average American now lives 30 years longer than he would have if he had lived in 1900. A more accurate statement would be: 'The life expectancy of Americans is 30 years greater than it was in 1900, because mortality among infants and young children has declined sharply." [It is not] because people who have reached maturity are living much longer [that the increase in life expectancy] has . . . occurred. The life expectancy of a man who survived to age 65 in 1900 was 11.5 years, giving an average length of life of 76.5 years; that of a 65-year-old man today is 15.6 years, for an average length of life of 80.6 years. Thus, the average increase in life expectancy of a male who survives to age 65 is just 4 years greater than that of one who reached this age in the early part of the century. The difference for women is about 7 years. Similar differences are observed throughout most of the world. The major achievement of this century has been in reducing mortality among the very young, not so much in prolonging the lives of mature individuals. Thus, infants born in 1900 had about a 40 percent chance of surviving to age 65, whereas infants born today have a 75-80 percent chance of reaching this age.

"The self-congratulatory tone of the authors of this article in discussing increased life expectancy in the United States during this century might have been tempered somewhat if they had acknowledged that the U.S. ranked 23 for male life expectancy (below Costa Rica and Cuba) and 19 for female life expectancy. . . .

"[Under] 'Safer and more healthful foods,' the emphasis, I think, should be on improved nutritional or dietary guidance, not on 'healthier foods.' There may be quite a few better foods today, but there are also many less healthful foods . . . ."

". . . [The] development of insecticides that are effective against human, animal, and plant pests has made it possible to . . . [control] insect-borne diseases and to increase the food supply by preventing losses of crops due to infestations of insects. . . . [The] development of high-yielding varieties of major food crops has made it possible to increase food production at a rate that matches the increased consumption due to the steadily rising population. . . ."
"... I believe the self-congratulatory tenor of the statement [under "Recognition of the hazards of tobacco use"] is not justifiable. Minors were prohibited from purchasing tobacco products in many places 70 or more years ago because the hazards of tobacco products were recognized, although they were not then well documented. Throughout much of the century the restrictions were not enforced, the hazards were discussed little, and the problem received only limited attention from health officials.

"Highway engineering has improved greatly, but this benefits mainly the thruways; the mass of roads in areas that cannot support thruway-like construction are still hazardous . . . ."

Dade W. Moeller, Ph.D. (Professor Emeritus, Harvard University): "Under 'Control of infectious diseases' [in the Consultant article], I would have said: 'The chlorination of drinking water and improved sanitation in handling foodstuffs have halted the spread of typhoid and cholera [in- stead of "Improved sanitation has halted the spread of typhoid and cholera by contaminated water"]. . . ."

"To me, the chlorination of drinking water was probably one of the most important advances of the past 100 years. . . . [T]his is 'hidden' in [the CDC] list, while 'Fluoridation of drinking water' is given prominence. Of the two, chlorination has had, in my opinion, far more impact. Tooth decay is bad, but is nothing compared to cholera and typhoid and the wide range of other intestinal diseases that can be transmitted by drinking water."

John P. Morgan, M.D. (Professor of Pharmacology, City University of New York Medical School): "Tobacco was recognized as a health hazard in popular culture and the media by the 1920s. School education programs linking tobacco to 'compulsive use' and warning of a link to alcohol and 'narcotics' were firmly in place in the decade of prohibition. The recent decline in use is wonderful, but it occurred for a variety of reasons not because the scales fell from our eyes in 1964. It is particularly wrong that damages have been awarded to lifelong smokers because they didn't know of the hazards.

"Workplace accidents and deaths have been declining for two decades (at least). Yet employers are still encouraged (almost forced) to test workers for the presence of illegal drugs to ensure workplace safety. This is an important misuse of the 'need' for safety, actually justifying a desire for social control.

"The decline in motor vehicle deaths [preceded the setting of the 'drinking age' at] 21, which has not in itself obviously reduced drinking among 18-21-year-olds. Many believe that [this law] 'caused' the decline in highway fatalities. This is simply not true. Intoxicated 18-21-year-olds were always a small contribution to the total pool of intoxicated drivers. There is little evidence that [this] prohibition has worked to reduce drinking in those young people. I mention this because there is little evidence that driving while drinking has significantly declined. The reduction in vehicular deaths has other causes."

Charles Polk, Ph.D. (Professor Emeritus, Department of Electrical Engineering, University of Rhode Island): The [Consultant article] . . . is excellent; the selection of the 10 public health achievements is entirely appropriate. No substitutes please!

David B. Roll, Ph.D. (Professor of Clinical Chemistry, University of Utah): "Perhaps it is too broad,
but my recommendation for addition to the list would be the advances in bioengineering. Certainly progress in this area has been critical in many aspects of medicine, but just as important, if not more so, are the advances in the development of nutritionally superior crops, which require less fertilizer and pesticides, are hardier, and have the potential to alleviate world hunger (unless the Luddites from Greenpeace and co-traveller organizations have their way).

"This technology is important in at least four of the top 10 public health achievements: control of infectious diseases, decline in coronary-disease and stroke deaths, safer and more healthful foods, and healthier mothers and infants."

**Harold H. Sandstead, M.D.** (Professor, University of Texas Medical Branch): "It is my understanding that the major increases in life expectancy occurred in industrialized countries before the advent of antibiotics and what is called 'modern medicine.' Infrastructure changes that improved sanitation and improved storage and distribution of fresh and frozen foods were critical factors."

**Varro E. Tyler, Ph.D., Sc.D.** (Dean and Distinguished Professor Emeritus, Purdue University): "Vaccination (really an 18th century achievement) and the control of infectious diseases should logically be placed in a single category use of vaccines and antibacterial (antibiotic) drugs to control infectious diseases.

"The development of new chemotherapeutic agents (vincristine, adriamycin, taxol, etc.) for the treatment of cancer would far outrank motor vehicle safety on my list. Actually, the motor-vehicle safety measures do not seem to have been very effective.

"Instead of singling out only mothers and infants as being healthier, I would emphasize that longevity has increased for members of both sexes, reflecting better and longer-lasting health for all.

"We may know more about food health and safety, but only a small number of U.S. citizens utilize that knowledge effectively.

"Family planning would seem to refer primarily to the use of 'the pill,' the development of which is certainly one of the great developments of this century. It may have brought about a reduction in family size, but it has also produced a sharp decline in morality. The pill thus remains a two-edged sword.

"Finally, I would have to include at the very top of my list the development of the American health care system (hospitals, clinics, diagnostic devices, medical and surgical treatment of all kinds . . . etc.), which has become in this century a true miracle and the envy of people in every other nation in the world. Now all we have to do is find a way to pay for it!"

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Source Notes:

Priorities Volume 11 Number 4 1999
Source URL: https://www.acsh.org/news/1999/12/01/the-ten-greatest-american-public-health-achievements-of-the-20th-century-or-are-they