

Ten Great Public Health Achievements In the 20th Century

Maryland Department of Health and Mental Hygiene

Community and Public Health Administration

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April 3, 2000

Dear Public Health Colleague:

I am pleased to send you a copy of the **“Ten Great Public Health Achievements in the 20th Century”**. This very informative and educational booklet is based on a list of ten public health achievements identified by the U.S. Centers for Disease Control and Prevention for 1999. Many of these advances in public health happened here in Maryland.

It is important to remember that basic public health measures such as clean water, sanitation and proper food handling are crucial to disease prevention and have contributed to extending our life span. As we enter the new century, we must continue to maintain quality public health services and utilize new technologies to educate and encourage everyone about healthy lifestyle choices.

Please join me in saluting Maryland's public health achievements during Public Health Week 2000.

Sincerely,

Georges C. Benjamin, M.D.
Secretary



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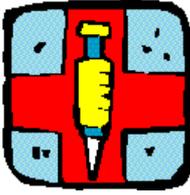
Acknowledgments

This booklet was put together to commemorate **Public Health Week**, April 3-9, 2000. The idea to document Maryland's public health history came from the **Public Health Week 2000 Committee** at the Maryland Department of Health and Mental Hygiene (DHMH). The U.S. Centers for Disease Control and Prevention published a series of articles in the Morbidity and Mortality Weekly Report in 1999 entitled "Achievements in Public Health, 1900-1999." The articles outlined the 10 greatest public health achievements of the 20th century. This provided us with a framework for our booklet.

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Vaccinations for Children

At the beginning of the 20th century, infectious diseases were widely prevalent in the U.S. and had an enormous impact on morbidity and mortality. During this past century, great progress has been made in the control of many vaccine-preventable diseases, especially in children.

- 1900** Although a **vaccine for smallpox** had been established, 48,164 cases were reported in the U.S., and 1,528 people died from the disease.
- 1955** The use of **Salk vaccine** to combat polio began in the State of Maryland. The average number of people attacked by poliomyelitis in Maryland each year dropped 75%.
- 1955** National, state and local efforts began to promote vaccine use.
- 1962** In anticipation of a polio epidemic in the area, **Baltimore City, Baltimore County and Harford County** launched a massive campaign to administer the oral (Sabin) vaccination.
- 1963** **Measles vaccine** licensed.
- 1977** Last known case of **smallpox** worldwide.
- 1991** Last known case of **wild-virus polio** in the Western Hemisphere (in Peru).

- 1994** **The Maryland Vaccines for Children (VFC) Program** was established. The program allows physicians to provide vaccines to the needy free of cost.
- 1997** Four counties on the mid-Eastern Shore introduced the **TRAC (To Reach All Children) program** designed to help track completion of immunization schedules and other screening tests for ALL mid-shore children under two years of age.
- 1998** 14 cases of **Haemophilus Influenzae Type B Meningitis** were reported in Maryland, resulting in one death. Introduction of conjugate Hib vaccine in 1987 led to a 99% decline in the incidence of this disabling and often deadly disease.
- 1999** **Reported measles cases in Maryland: 0!**

Challenges for the Future:

Keeping Maryland physicians up-to-date on new vaccines and changes in the immunization schedule is a continuing challenge. The coming century will see the development of an immunization registry. The electronic registry will allow providers to access information on childhood immunizations and check a child's immunization status instantaneously.



Improvements in Motor Vehicle Safety

In the 20th century, Americans became more mobile with the technological advance of the automobile. During the century, engineering efforts made vehicles and highways safer. Public health education campaigns contributed to large reductions in motor vehicle related deaths.

- 1899** First auto accident **fatality** recorded.
- 1903** Model A, **Ford's first car**, started into mass production.
- 1913** Toledo, Ohio was the first city to use police-operated semaphores (system for making **red and green signals**) at intersections.
- 1923** More than 175 patents were granted for **inventions** related to autos, traffic signals, and turn indicators.
- 1932** **Safety padding** on front seat backs and **directional signals** were introduced.
- 1962** **Safety belts** were required to be installed in cars.
- 1966** Highway Safety Act created the **National Highway Safety Bureau** which authorized the government to set standards for motor vehicles and highways.
- 1979** The first law requiring **child passenger safety seats** to restrain children was passed in Tennessee.

- 1980** **Mothers Against Drunk Driving (MADD)** was founded in California after a 13 year old girl was killed in a hit-and-run accident by a repeat offender.
- 1980** **Project KISS (Kids In Safety Seats)**, a carseat loaner and education project, was created in Maryland.
- 1983** Maryland passes **Child Passenger Safety Law**.
- 1987** Federal government begins five-star **crash test** system.
- 1996** Annual motor vehicle related deaths: 1.7 per 100 million vehicle miles traveled (VMT), a **90% decrease from 1925**.
- 1997** **Primary Seat Belt Law** went into effect in Maryland requiring the driver and an adult passenger to wear a safety belt.
- 1998** All new passenger cars must have **dual air bags**.
- 1999** System for **child seat tethers and latches** are required for new vehicles.

Challenges for the Future

The challenges for the future are to assure that children, in the 40 to 80 pound category, are properly restrained, and to improve vehicle restraint systems and carseats to make them safer and easier to use.



Improvements in Workplace Safety

At the beginning of the 20th century, Americans faced serious health and safety risks in the workplace. Scientific research, advocacy and the establishment of government agencies led to changes in standards. These changes led to a substantial decline in death and injury rates from job-related injuries and greatly improved the workplace environment.

- 1907** Coal mine **explosion** in Monongah, WV killed more than 350 men and boys.
- 1911** Passage of the **first workers' compensation act** in New York State. Each state developed its own workers' compensation insurance program, a no-fault system established to minimize litigation against employers and provide workers with needed financial protection in the event of on-the-job injury.
- 1913** In the U.S., there were **61 workplace related deaths** per 1000 workers.
- 1914** Maryland established the **State Industrial Accident Commission**, which evolved into the current agency, the State Workers Compensation Commission.
- 1914** The U.S. Public Health Service established an **Office of Industrial Hygiene and Sanitation**, which evolved into the National Institute for Occupational Safety and Health (NIOSH), the branch of the Centers for Disease Control and Prevention responsible for research in the field of occupational health.
- 1920** Marylander **Anna Baetjer** starts her sixty-year career at the Johns Hopkins University in the **field of industrial hygiene**. She studied the effects of high temperature

and humidity on workers, and was best known for her research in the relationship of cancer and chromium. She was a popular teacher and the recipient of many honors and awards.

- 1933** Workplace-related deaths dropped to **37 deaths** per 1000 workers nationwide.
- 1940** **Baltimore City** adopted its first occupational disease regulations.
- 1969** The U.S. Occupational Safety and Health Administration (**OSHA**) and National Institute of Occupational Safety and Health (**NIOSH**) established.
- 1973** Maryland Occupational Safety and Health (**MOSH**) law enacted.
- 1977** Workplace related deaths reached a low of **4 workplace related deaths** per 1000 workers nationwide.
- 1980's** Model policies on **workplace smoking** restrictions developed.
- 1989** The **Hazard Communication Standard**, which ensures all employees have the “right to know” about hazards in the workplace, became fully effective for all industries after several modifications following its initiation by OSHA, in 1974.
- 1996** Maryland job-related injury and illness rate dropped 36% since the inception of MOSH.

Challenges for the Future:

Mining remains the most *dangerous* occupation. New issues, such as homicide in the workplace, have emerged.



Control of Infectious Diseases

Improvements in sanitation and hygiene, the discovery of antibiotics, and the implementation of universal childhood vaccination programs contributed to the control of infectious disease during the 20th century.

- 1900** The leading causes of death in the U.S. were **pneumonia, tuberculosis (TB), and diarrhea and enteritis**, which (together with diphtheria) caused one third of all deaths.
- 1918** **Influenza pandemic** caused a half-million deaths in the U.S. and 20 million worldwide.
- 1920s** **Worcester County** started public health activities. Health Officer, Dr. Riley, oversaw public health from a private medical office from the 1920's through the 1950's. **Public health services** included immunizations, syphilis treatment, sanitation to prevent typhoid during the summer, TB monitoring, and midwives to assist with birthing.
- 1928** Scottish bacteriologist Sir Alexander Fleming discovered **penicillin**.
- 1930s** Montgomery County Board of Health starts a **TB education campaign** in black churches.
- 1934** Maryland stands first in the nation for percentage of population served by **treated water and sewerage systems**.

- 1952** **Jonas Salk** tests killed polio virus **vaccine**.
- 1954** Maryland becomes the first state in the nation to have a **local health department in each jurisdiction** consisting of at least a health officer and a nurse.
- 1962** U.S. Congress passes the Vaccination Assistance Act -- landmark legislation that established a **federally coordinated vaccination program**.
- 1976** The Prince George's County Health Department responded to the **swine flu** by providing over 7,000 immunizations in one day.
- 1977** **Eradication of smallpox**.
- 1981** **Acquired Immune Deficiency Syndrome (AIDS)** was first recognized; Baltimore had two cases.
- 1991** **19 persons died of tuberculosis** in the State of Maryland, as compared to 2,912 deaths in 1904.
- 1999** The first "**drive-thru**" **flu shot clinic** was held in Howard County. Flu vaccine was recommended for health care workers, persons with chronic diseases and persons over 55.
- 1999** **Only 4.5% of all U.S. deaths** were attributable to infectious diseases.

Challenges for the Future

The emergence of drug resistance in many microbial organisms, and the evolution of new diseases present significant challenges for the future.



Declines in Deaths from Heart Disease and Stroke

Heart disease and stroke have remained leading causes of death throughout the second half of the 20th century.

- 1925** **First annual meeting** of medical and scientific professionals concerned with discovering and advancing knowledge related to causes and treatment of heart disease.
- 1930s** Development of **professional newsletters and specialty councils** to study specific areas such as rheumatic fever, high blood pressure, and circulation.
- 1940s** U.S. Congress passed the **National Heart Act**, resulting in the formation of the National Heart Institute, forerunner of the National Heart, Lung and Blood Institute.
- 1944** First “Blue Baby” operation done at Johns Hopkins Hospital by Maryland pediatrician Dr. Helen Taussig. **Dr. Taussig surgically repaired heart birth defects**, increasing the supply of oxygen to the blood. Her work set the foundation for modern heart surgery.
- 1950s** First **statement on smoking and heart disease** issued; **dietary fat** first linked with cholesterol and determination that high blood pressure could be reduced with certain **medications**, taken alone or in combination. First **open heart operation** made possible by invention of **heart-lung machine**. The first use of externally powered **pacemaker** by team that included Maryland’s **Dr. Vincent Gott**.

1960's CPR first taught to the public; first successful **mitral valve replacement**; **implantable pacemaker** first inserted; first official statement issued on **diet and coronary heart disease**; **cholesterol lowering drug** first used; first **World Conference on Smoking** held; and American Heart Association convenes first national **Stroke Congress**.

1970's First public education campaign on early **warning signs of heart attack**; first evidence of relationship of **kidneys** and regulation of high blood pressure; and update of statement on effect of **smoking** on individuals with heart disease.

1980's Mass **screenings for high blood pressure**, mass **training in CPR**; model policies on **workplace smoking** developed; first **smoking bans** imposed on short domestic airline flights; and **tobacco labeling** laws passed.

1990's FDA **food labeling** guidelines implemented; **women and heart disease** initiatives launched; statement on harmful effects of **environmental tobacco smoke** published; **physical inactivity and obesity** elevated to cardiovascular disease risk factors and research on **gene therapy**, with promise of new possibilities for treatment in the 21st century.

Challenges for the Future:

The questions of how to further motivate behavior change in individuals, and how to motivate providers to routinely recommend risk reduction strategies (lifestyle changes) remain as challenges for the coming century.



Safer and Healthier Foods

New sanitation and manufacturing processes decreased the high prevalence of food contamination present at the beginning of the century. Foodborne illnesses were identified and the public was educated about the importance of proper food handling. Essential vitamins and minerals necessary to prevent diseases caused by dietary deficiencies were identified.

- 1900** Consumers kept food fresh by placing it on a **block of ice** or in the **cool air**.
- 1906** Upton Sinclair's novel *The Jungle*, which described deplorable working environment and unsanitary food production conditions in the Chicago meat-packing industry, led to passage of the **Pure Food and Drug Act** by the U.S. Congress.
- 1916** The newly formed **U.S. Department of Agriculture** produced a guide which divided foods into **five categories**: Milk, Meat, Cereals, Vegetables and Fruits, and Sugars.
- 1920's** **Refrigerators** with freezer compartments became available for residential use.
- 1921** **Rickets** was considered the most common nutritional disease in children. Milk fortification with **Vitamin D** nearly eliminated the incidence of rickets.
- 1924** U.S. Public Health Service created the **Grade A Pasteurized Milk Ordinance**, a voluntary agreement that established uniform sanitation standards for interstate shipment of milk.

- 1930** Federal government began to develop **school nutritional education** programs.
- 1941** **Recommended Daily Allowance** (RDA) for nutrients and vitamins was developed.
- 1950's** **Four basic food groups** were promoted.
- 1970's** Newly formed **Environmental Protection Agency** (EPA) removed **DDT** and several other pesticides from the market.
- 1970's** Food and nutrition labeling encouraged the development of products **low in fat, saturated fat, and cholesterol**.
- 1980** The now familiar **Food Pyramid** was developed.
- 1980's** Outbreaks of foodborne illness from contaminated eggs, undercooked beef, and certain fruits and vegetables led to **changes in food handling** and manufacturing practices.
- 1990's** Electronic communication between federal and state agencies allowed rapid exchange of information to **improve detection, investigation, and control** of outbreaks.
- 1996** Food Quality Protection Act set **stricter food safety standards**.
- 1999** Federal and state laws concerning **pesticide use** were strengthened.

Challenges for the Future

Research and development of “super foods” that are manufactured using genetic engineering will create controversy. Increased demand for organic foods and soybean products will fill the market. Improved food outbreak investigation and control measures will continue.



Healthier Mothers and Babies

Improvements in the safety of drinking water and milk, better nutrition, access to health care, declining fertility, advances in clinical medicine, as well as increases in education levels have contributed to significant declines in maternal and infant deaths over the past 100 years.

- 1900** **One out of every 10 infants die** before their first birthday. One out of every three infants die in urban areas.
- 1905** Baltimore City Health Department began medical inspections of school children by the **first public health nurse**.
- 1934** The Dorchester County Health Department began providing regular **prenatal clinics** on the first and third Thursdays of every month.
- 1938** Hopkins scientist **Emanuel Kaplan**, Sc.D. launched a free diagnosis program to assess blood lead levels. Dr. Kaplan's work led to a **pioneering lead paint poison prevention** program in Baltimore city.
- 1965** Maryland became one of two states to institute statewide **screening** of newborns to **detect hereditary disorders** that are treatable.
- 1969** Hopkins physician **Dr. David Paige**, began working to address nutrition deficiencies in Baltimore City children. This project served as the model for **the federal WIC Program**, a supplemental food program for pregnant women and children.

- 1970's** Establishment of **neonatal intensive care units**; improvement in **neonatal transport**; **regionalization** of perinatal services.
- 1989** Artificial pulmonary **surfactant** introduced to prevent and treat respiratory distress syndrome in premature infants.
- 1991** Baltimore City was awarded funding from the **federal Healthy Start** program. Over a six year period, the intensive community enrichment program achieved a **30% reduction in infant mortality** and a 60% reduction in very low birth weight babies in the project areas.
- 1996** Maryland legislature is the first to pass "**the 48 hour bill**" to ensure that mothers and newborn babies receive adequate medical care in the first few days after delivery. Maryland's State Hereditary Disorders chief, **Dr. Susan Panny**, provided data to the U.S. Congress and assisted in crafting the national legislation which passed in 1997.
- 1997** Maryland's newborn screening and comprehensive case management for children with **sickle cell disease** becomes a national model.
- 1999** U.S. infant mortality rate **dropped 93%** since the beginning of the century.

Challenges for the Future:

The infant mortality rate for Maryland's African American infants is two to three times greater than for whites, and the gap continues to widen.



Family Planning

The discovery of reliable methods of fertility control improved people's ability to plan when to have children and how many to have. This has had a positive effect on the health of women, infants and children, and has improved the social and economic role of women.

- 1900** Distributing information about contraceptives was **illegal**, and birth control was labeled "**obscene**" by the "Comstock Laws" passed in the 1870's.
- 1912** **Margaret Sanger**, a public health nurse who devoted her life to fighting for women's reproductive freedom, began to educate women about contraception.
- 1927** Two Hopkins physicians started the Bureau for Contraceptive Advice, **Baltimore's first birth control clinic**, across the street from Johns Hopkins Hospital. The diaphragm was the main method prescribed.
- 1928** The **timing of ovulation** was determined medically, although it was mistakenly understood that the fertile period lasted two weeks.
- 1936** A decision by U.S. Circuit Court of Appeals Judge Augustus Hand liberalized the "Comstock Laws" and **allowed contraceptives to be imported** in some states.
- 1939** Birth Control Federation of America established, later renamed **Planned Parenthood Federation of America**.
- 1960** The **birth control pill** and **intrauterine device (IUD)** became available in the U.S.
- 1962** **Alan Guttmacher, M.D.**, a Baltimore-born Hopkins physician, becomes president of Planned Parenthood Federation of America. Dr. Guttmacher's leadership helped change the attitudes of Americans toward birth control.

- 1963** Baltimore City Health **Commissioner Dr. Robert Farber** asked Planned Parenthood to set up family planning sessions in the city's prenatal/postpartum clinics. Two years later, Dr. Farber obtained city funding, and **Baltimore City became the first public health department in the nation to underwrite family planning.**
- 1965** **Supreme Court** struck down all state "Comstock Laws" in the landmark case, Griswold vs. Connecticut, and enabled **all married couples to legally use contraceptives.**
- 1970** **Maryland Senator Joseph Tydings** authored "**Title X**" of the Public Health Service Act which created the National Family Planning Program that currently funds more than 4,000 family planning clinics annually nationwide.
- 1986** Maryland Office of Maternal Health and Family Planning started the "**Three for Free**" **condom distribution program** at local health departments, colleges and universities. By 1995, five million condoms were distributed annually at over 700 sites statewide.
- 1990** Caroline County adopted the "**Dollar-A-Day**" program designed to provide incentives to teenage girls to postpone pregnancy. Teen birth rates have declined remarkably.
- 1992** **Depo-Provera**, a birth control injection, was approved by the F.D.A. and introduced in family planning clinics.
- 1999** World population hit the **six billion** mark, a 312% increase in just 100 years.

Challenges for the future:

Nearly half of all pregnancies are unintended. Helping couples plan their pregnancies through family planning services will ultimately result in less need for abortions, fewer teen pregnancies and improvement in pregnancy outcomes.



Fluoridation of Drinking Water to Prevent Tooth Decay

Fluoridation of community drinking water is a major factor responsible for the decline in dental caries (tooth decay) during the second half of the 20th century. Although other fluoride-containing products are available, water fluoridation remains the most equitable and cost-effective method of delivering fluoride.

- 1901** **Dr. Frederick S. McKay** of Colorado Springs, Colorado noted an unusual permanent stain on many of his patients' teeth. He concluded that a natural mineral in the public water supply was probably causing the stain. He also noticed that teeth with this stain were less susceptible to tooth decay.
- 1936** **Dr. H. Trendley Dean**, a dental officer of the U.S. Public Health Service, and his staff made the critical discovery that **fluoride levels** of up to 1.0 part per million (ppm) in the drinking water did not cause dental staining. He also noted a correlation between fluoride levels in drinking water and a reduced incidence of tooth decay.
- 1945** In a field study, the fluoride level of community water supplies of four cities was adjusted to 1.0-1.2 ppm. Observations over a 13-15 year period showed that **caries were reduced 50%-70%** among children in those communities.

- 1950** **The American Dental Association** and the **US Public Health Service** began its support and endorsement of the fluoridation of community water supplies and the use of fluoride-containing products as safe and effective measures for preventing tooth decay.
- 1950** **Baltimore City** began a two-year health education campaign to inform and build public support for the fluoridation of its water supply.
- 1951** **Hagerstown, Maryland** began to fluoridate its water supply.
- 1952** **Baltimore**, a city of nearly 1 million, began to fluoridate the water supply. An additional 210,000 persons were served in the surrounding area.
- 1992** A nationwide census determines that **over 80% of community water systems** in Maryland are fluoridated.
- 1998** Maryland passes legislation establishing an **Office of Oral Health** to report on oral health issues relating to the Medicaid population.
- 1999** Three towns in Western Maryland: **Boonesboro, Keedysville** and **Middletown** approved the implementation of water fluoridation.

Challenges for the Future

In the coming century, the challenge will be to continue to assure the public that fluoridation is a safe, economically sound, and effective way to reduce oral disease.



Tobacco Use as a Health Hazard

Smoking, long considered an acceptable behavior, is a leading preventable cause of death and disability.

- 1900** Annual per capita cigarette consumption: **54**.
- 1911** **Cigarettes given to soldiers** in World War I, ensured that virtually an entire generation returned from the war addicted to smoking.
- 1927** Smoking initiation rates among **teen girls** tripled due to slick ad campaigns.
- 1929** **53% of adult males smoked**.
- 1938** Tobacco declared a protected crop as part of the WWII effort, and a tobacco shortage developed. By the end of the war, **cigarette sales were at an all-time high**.
- 1942** Landmark report finds that painting cigarette tar on the backs of mice creates **tumors**, the first definitive biological link between smoking and cancer.
- 1954** **Marlboro cowboy** created for Philip Morris. Actors playing the Marlboro Man later died of lung cancer.
- 1964** First **Surgeon General's Report** linking smoking and lung cancer released.
- 1965** Surgeon General's **warnings required on cigarette packs**.
- 1971** Cigarette **advertising banned** on radio and TV.
- 1984** FDA approves **nicotine gum** as the first quit-smoking aid.
- 1984** **Lung cancer** surpasses breast cancer as number one killer of **women**.
- 1991** Johns Hopkins University announces it will sell all of its \$5.3 million worth of **tobacco stock**.
- 1992** **Maryland tobacco tax** increased from 16 to 36 cents a pack.

- 1992** **Nicotine patch** therapy was introduced.
- 1993** Cancer Summit recommendations included creating a coalition to decrease certain types of cancer. As a result, **Smoke Free Maryland Coalition**, directed by Prince George's County health officer Dr. Martin P. Wasserman, was created.
- 1993** MOSH **Workplace smoking ban** was developed and went into effect in 1995.
- 1995** **Secret tobacco industry documents** become available on Internet despite industry attempts to suppress them. Documents showed industry cover-up of health impact of smoking.
- 1996** **Maryland** became one of eight states to **sue tobacco companies** for recovery of monies spent to treat sick smokers.
- 1996** Maryland divested state **pension fund** of tobacco money.
- 1998** Attorneys' General and tobacco companies came to **landmark settlement**, providing for unprecedented restrictions on cigarette advertising and on tobacco makers' liability in lawsuits. Maryland will receive **\$4.5 billion** for tobacco prevention.
- 1998** **Annual per capita cigarette consumption: 2,261.**
- 1999** Maryland **increased tobacco tax** on cigarettes from 36 to 66 cents a pack and extended tax to include **other tobacco products.**

Challenges for the Future

Implementation of effective tobacco education and cessation programs for youth and adults, use of settlement funds for effective programs, and reducing health and prevalence disparities among genders and races are the current challenges.

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www.dhmh.state.md.us