Vaccine Timeline

Historic Dates and Events Related to Vaccines and Immunization

It was not too many years ago when we celebrated the 200th anniversary of Edward Jenner's first smallpox vaccination in 1796. The development of vaccines continued at a fairly slow rate until the last several decades when new scientific discoveries and technologies led to rapid advances in virology, molecular biology, and vaccinology. The chart which follows displays many of the vaccine- and immunization-related events that have occurred since Jenner's critical discovery. This list is by no means exhaustive. If you know of an event that you would like us to add, contact us at admin@immunize.org.

Date	Event and related notes
March 2, 2021	CDC published ACIP interim recommendations for the use of Janssen (Johnson and Johnson) COVID-19 vaccine.
February 27, 2021	FDA issues Emergency Use Authorization (EUA) for Janssen (Johnson and Johnson) COVID-19 vaccine.
February 12, 2021	CDC released the 2021 recommended immunization schedules for children and adolescents, as well as for adults on its website.
January 8, 2021	CDC published ACIP recommendation on the use of Ebola vaccine.
December 20, 2020	CDC published ACIP interim recommendations for the use of Moderna COVID-19 vaccine.
December 18, 2020	FDA issues Emergency Use Authorization (EUA) for Moderna COVID-19 vaccine.
December 13, 2020	CDC published ACIP interim recommendations for the use of Pfizer-BioNTech COVID-19 vaccine.
December 11, 2020	FDA issues Emergency Use Authorization (EUA) for Pfizer-BioNTech COVID-19 vaccine.
September 25, 2020	CDC published ACIP recommendations on the use meningococcal vaccines.
August 21, 2020	CDC released ACIP recommendations on the use of influenza vaccines for the 2020-2021 influenza season.

July 3, 2020	CDC published updated ACIP recommendations on the use of hepatitis A vaccine.
June 24, 2020	FDA expands license for Gardasil 9 to include preventing oropharyngeal and other head-and-neck cancers caused by relevant HPV types.
April 23, 2020	FDA approves MenQuadfi (MenACWY) conjugate vaccine for prevention of invasive meningococcal disease caused by serogroups A, C, W, and Y in individuals 2 years of age and older.
February 21, 2020	FDA approved Fluad Quadrivalent (influenza vaccine, adjuvanted; Seqirus) for adults 65 years and older.
February 3, 2020	CDC released the 2020 recommended immunization schedules for children and adolescents, as well as for adults on its website.
February 1, 2020	CDC (January 30, 2020) and WHO (February 1, 2020) declared public health emergencies regarding 2019 novel coronavirus.
January 24, 2020	CDC published updated ACIP recommendations on the use of Td and Tdap vaccines.
December 19, 2019	FDA approved Ervebo (Ebola Zaire vaccine, live; Merck) first U.S.-licensed vaccine for prevention of Ebola virus disease.
December 13, 2019	CDC published ACIP recommendations on the use of BioThrax (anthrax vaccine, adsorbed; Emergent BioSolutions).
November 22, 2019	CDC published updated ACIP recommendations for the use of PCV13 and PPSV23 pneumococcal vaccines for adults age 65 and older.
November 4, 2019	FDA approved Fluzone High-Dose Quadrivalent (Sanofi Pasteur) for adults 65+ years of age—will be available for 2020–21 flu season.
August 28, 2019	CDC released ACIP recommendations on the use of influenza vaccines for the 2019–20 influenza season.
August 16, 2019	CDC published updated ACIP recommendations for human papillomavirus vaccination of adults.
August 1, 2019	AAFP, AAP, ACHA, ACOG, APhA, SAHM, and IAC released "Dear Colleague" letter stressing importance of 16-year-old immunization visit.
July 19, 2019	CDC published ACIP recommendations on use of Japanese encephalitis vaccine.
February 15, 2019	CDC published ACIP recommendations for use of hepatitis A vaccine for persons experiencing homelessness.
February 5, 2019	CDC released the 2019 U.S. recommended immunization schedules for children/adolescents as well as for adults on its website.
January 23, 2019	FDA approved use of the 0.5 mL dose of Sanofi's Fluzone Quadrivalent influenza vaccine to include children age 6 through 35 months.

January 14, 2019	FDA approved expanded use of Sanofi's Adacel Tdap vaccine for a second dose in people ages 10 through 64 years of age.
December 21, 2018	FDA approved Vaxelis (MCM Vaccine Co), a new combination DTaP-IPV-Hib-HepB vaccine for use in children 6 wks–4 yrs of age.
November 7, 2018	ACIP published updated recommendations on use of hepatitis A vaccine for pre- and post-exposure prophylaxis for international travel.
October 25, 2018	The American Dental Association adopted a policy to support the use and administration of HPV vaccine for the prevention of oral HPV infection.
October 8, 2018	FDA approved expanded age indication for Seqirus's Afluria influenza vaccine to include children age 6 months through 59 months.
October 5, 2018	FDA announced approval of expanded use of Merck's Gardasil 9 (HPV9, Human papillomavirus) vaccine to include adults 27 through 45 years old.
August 24, 2018	CDC published ACIP's 2018–19 influenza vaccination recommendations.
June 8, 2018	CDC published ACIP's recommendations for the use of quadrivalent live attenuated influenza vaccine (LAIV4) in the 2018–19 influenza season.
June 2018	The American College of Obstetricians and Gynecologists issued a committee opinion on maternal immunization.
May 16, 2018	CDC released information about a new rapid rabies test that could save lives and lead to fewer unnecessary rabies shots.
April 27, 2018	CDC published a comprehensive summary of previously published ACIP recommendations for prevention of tetanus, diphtheria, and pertussis in the U.S.
April 20, 2018	CDC published ACIP recommendations for use of hepatitis B vaccine with a novel adjuvant [Heplisav-B].
April 2018	The American College of Obstetricians and Gynecologists released a committee opinion on influenza vaccination in pregnancy.
February 6, 2018	CDC published the 2018 U.S. recommended immunization schedule for 0 through 18 years.
February 6, 2018	CDC published the 2018 U.S. recommended adult immunization schedule.
January 26, 2018	CDC published ACIP recommendations for use of herpes zoster vaccines.
January 12, 2018	CDC published updated ACIP recommendations for prevention of hepatitis B virus infection.
January 12, 2018	CDC published ACIP recommendations on use of a third dose of MMR during a mumps outbreak.
January 11, 2018	FDA approved expanded pediatric age indication for Fluarix Quadrivalent influenza vaccine.

November 9, 2017	FDA licensed Heplisav-B, the new hepatitis B vaccine from Dynavax, for use in adults age 18 and older.
October 20, 2017	FDA licensed Shingrix, the new shingles vaccine from GlaxoSmithKline, for use in adults age 50 and older.
September 15, 2017	CDC published updated dosing instructions for hepatitis A prophylaxis with immune globulin.
August 31, 2017	FDA expanded licensure of Afluria quadrivalent (Seqirus) to include people age 5 years and older.
August 25, 2017	CDC published ACIP 2017–18 influenza vaccination recommendations.
August 2017	AAP issued policy stating that newborns should routinely receive hepatitis B vaccine within 24 hours of birth.
July 6, 2017	CDC published a Vaccine Information Statement for cholera.
June 30, 2017	CDC and FDA announced new Vaccine Adverse Event Reporting website and reporting form.
May 19, 2017	CDC published ACIP's updated recommendations on use of Trumenba meningococcal serogroup B vaccine.
May 12, 2017	CDC published ACIP recommendations for use of cholera vaccine.
April 20, 2017	CDC published ACIP recommendations titled "General Best Practice Guidelines for Immunization" to replace the 2011 "General Recommendations on Immunization."
February 7, 2017	CDC published the 2017 U.S. recommended immunization schedules for 0 through 18 years; includes new “16-year-old vaccination" column.
February 7, 2017	CDC published the 2017 U.S. recommended adult immunization schedule.
December 16, 2016	CDC published ACIP's recommendations on 2-dose HPV vaccine series for younger adolescents.
November 18, 2016	FDA approved extending the age range for use of FluLaval Quadrivalent to include children 6 to 35 months of age.
November 4, 2016	CDC published ACIP recommendations for use of meningococcal conjugate vaccines in HIV-infected persons.
September 27, 2016	PAHO/WHO announced measles elimination in the Americas.
August 26, 2016	CDC published 2016–17 influenza vaccination recommendations.
August 2016	AAP released new policy statement that urges states to eliminate all non-medical exemptions to vaccine requirements.
July 11, 2016	FDA extended the age indication for PCV13 (Prevnar 13) to include adults age 18 through 49 years.

June 22, 2016	ACIP voted that live attenuated influenza vaccine (LAIV) should not be used during the 2016–2017 flu season.
June 15, 2016	FDA approved revisions in the package insert for YF-Vax to reflect changes to International Health Regulations and WHO/ACIP recommendations.
June 10, 2016	FDA approved Vaxchora for the prevention of cholera.
April 14, 2016	FDA approved changes to vaccine administration schedule for Trumenba vaccine.
February 5, 2016	National Vaccine Program Office released an National Adult Immunization Plan.
February 1, 2016	2016 U.S. recommended immunization schedules for 0 through 18 years and "catch up" published in *MMWR*.
January 14, 2016	FDA approved Hiberix for full Hib vaccine series.
December 14, 2015	FDA expanded Gardasil 9 licensure to include males age 16–26 years.
November 24, 2015	FDA approved new injectable influenza vaccine, Fluad, for use in people age 65 years and older
October 23, 2015	ACIP published recommendations for the use of serogroup B meningococcal vaccines in adolescents and young adults.
September 4, 2015	CDC published updated ACIP recommendations regarding the intervals between PCV13 and PPSV23 vaccines for use in immunocompetent adults age 65 years and older
August 14, 2015	WHO published "Recommendations on Vaccine Hesitancy" in special issue of the journal *Vaccine*.
June 19, 2015	ACIP published recommendations for yellow fever booster doses.
June 12, 2015	ACIP published recommendations for use of serogroup B meningococcal vaccines in people age ten years and older at increased risk for serogroup B meningococcal disease.
June 8, 2015	American Medical Association adopted a new policy that supports ending non-medical vaccine exemptions, including those for healthcare professionals.
April 29, 2015	The Pan American Health Organization declared rubella eliminated in the Americas.
March 27, 2015	CDC published ACIP recommendations for use of 9-valent HPV vaccine.
March 27, 2015	CDC published new ACIP recommendations for typhoid vaccination.
March 24, 2015	FDA approved Quadracel, a new combination DTaP+IPV vaccine for use in children age 4–6 years.
January 23, 2015	CDC's Health Alert Network issued a health advisory about a multi-state outbreak of measles linked to Disneyland.

January 23, 2015	FDA approved the use of Bexsero, the second vaccine licensed in the U.S. to prevent serogroup B meningococcal disease.
December 19, 2014	FDA approved Rapivab to treat influenza infection.
December 11, 2014	FDA approved quadrivalent formulation of Fluzone Intradermal inactivated influenza vaccine.
December 10, 2014	FDA approved the use of Gardasil 9 (Merck) 9-valent HPV vaccine in the U.S.
October 29, 2014	FDA approved the use of Trumenba in the U.S. to prevent serogroup B meningococcal disease.
September 19, 2014	CDC published ACIP recommendations for use of PCV13 and PPSV23 vaccines in adults age 65 and older.
June 20, 2014	CDC published ACIP's recommendations for use of MenACWY-CRM vaccine in children age 2–23 months at increased risk for meningococcal disease.
May 5, 2014	WHO Director-General declared the international spread of wild poliovirus in 2014 a Public Health Emergency of International Concern.
April 25, 2014	CDC report showed 20-year U.S. immunization program spares millions of children from diseases.
March 24, 2014	FDA lowered age of licensure for Adacel vaccine administration from age 11 years to 10 years.
February 28, 2014	CDC published ACIP recommendations for prevention and control of Haemophilus influenzae type b (Hib) disease.
December 20, 2013	CDC published guidance for HBV protection and postexposure management of healthcare personnel.
November 15, 2013	CDC published new recommendations for use of Japanese encephalitisvaccine in children.
September 10, 2013	National Vaccine Advisory Committee released revised "Standards for Adult Immunization Practice."
August 16, 2013	FDA extended FluLaval IIV (GlaxoSmithKline) age range to include children and teens age 3–17 years; licenses quadrivalent FluLaval product.
August 1, 2013	FDA expanded age indication for Menveo (Novartis) to include infants and toddlers age 2 through 23 months.
July 19, 2013	CDC issued updated recommendations for use of VariZIG immune globulin for varicella postexposure prophylaxis.
June 28, 2013	CDC issued recommendations for PCV and PPSV vaccination of children with immunocompromising conditions.
June 20, 2013	ACIP voted to recommend FluBlok influenza vaccine for people age 18 through 49 with egg allergy.

June 14, 2013	CDC published recommendations for preventing measles, rubella, congenital rubella syndrome, and mumps.
June 7, 2013	FDA approved Fluzone (Sanofi Pasteur) as the third quadrivalent influenza vaccine licensed for U.S. use.
May 17, 2013	Booster dose of yellow fever vaccine not needed, according to WHO. A single dose of vaccine is effective in providing long-term protection from yellow fever.
February 22, 2013	ACIP recommended a dose of Tdap vaccine during each pregnancy.
February 8, 2013	UNICEF and WHO condemned attacks on polio vaccination workers in Nigeria.
January 25, 2013	FDA approved use of Prevnar 13 vaccine in older children and teens (6-17 years).
December 18, 2012	Institute for Safe Medication Practices (ISMP) launched new Vaccine Error Reporting Program.
December 12, 2012	FDA approved quadrivalent formulation of Fluarix (inactivated influenza vaccine; GlaxoSmithKline).
November 20, 2012	FDA approved first seasonal influenza vaccine manufactured using cell culture technology (Flucelvax, Novartis).
October 24, 2012	ACIP voted to recommend use of HibMenCY (Menhibrix, GlaxoSmithKline), a new combination (meningococcal and Hib) vaccine, in infants at increased risk for meningococcal disease.
October 24, 2012	ACIP voted to recommend that pregnant women receive a dose of Tdap during each pregnancy irrespective of the patient's prior history of receiving Tdap.
June 24, 2012	FDA approved HibMenCY (Menhibrix, GlaxoSmithKline), a new combination (meningococcal and Hib) vaccine for infants.
June 7, 2012	FDA expanded licensure of PCV13 to include adults ages 50 years and older.
June 5, 2012	U.S. Department of Health and Human Services (HHS) Office of the Inspector General (OIG) released a report titled "Vaccines for Children (VFC) Program: Vulnerabilities in Vaccine Management."
April 1, 2012	United Nations Foundation launched Shot@Life campaign.
December 30, 2011	FDA expanded use of Prevnar 13 (PCV13, Pfizer) vaccine to include people ages 50 and older.
October 25, 2011	ACIP recommended all 11 to 12 year-old males get vaccinated against HPV.
October 21, 2011	Addition of history of intussusception as a contraindication for rotavirus vaccination.
August 25, 2011	National survey indicated HPV vaccine rates trail other teen vaccines.

August 25, 2011	Institute of Medicine issued the report titled "Review of Adverse Effects of Vaccines." Overall, the committee concludes that few health problems are caused by or clearly associated with vaccines.
July 8, 2011	FDA approved Boostrix (Tdap, GlaxoSmithKline) to prevent tetanus, diphtheria, and pertussis in older people.
May 19, 2011	CDC hailed vaccinations as one of 10 public health achievements of first decade of 21st century in Morbidity and Mortality Weekly Report (MMWR).
April 22, 2011	FDA approved the first vaccine (Menactra, meningococcal conjugate vaccine, Sanofi Pasteur) to prevent meningococcal disease in infants and toddlers.
February 15, 2011	HHS releases U.S. National Vaccine Plan, covers activities, goals, and priorities for 2010-2015.
December 22, 2010	FDA approved Gardasil HPV vaccine to include the indication for the prevention of anal cancer.
August 11, 2010	WHO declared end to 2009 H1N1 influenza pandemic.
July 10, 2010	First smallpox vaccine for certain immune-compromised populations delivered under Project BioShield.
March 19, 2010	ACIP recommended use of a reduced (4-dose) vaccine schedule for PEP to prevent human rabies.
February 24, 2010	FDA approved licensure of Pneumococcal 13-valent conjugate vaccine (PCV13), which offers broader protections against *Steptococcus pneumoniae* infections.
February 19, 2010	FDA approved licensure of Menveo (Novartis), meningococcal conjugate vaccine for people ages 11 through 55 years.
January 29, 2010	WHO hailed new Gates Foundation support ($10 billion) as the "Decade of Vaccines."
February 24, 2010	ACIP recommended universal Influenza vaccination for those 6 months of age and older.
February 24, 2010	FDA approved pneumococcal 13-valent conjugate vaccine (Prevnar 13), which offers broader protection against Streptococcus pneumoniae.
December 23, 2009	FDA approved high-dose inactivated influenza vaccine (Fluzone High-Dose) for people ages 65 years and older.
November 16, 2009	CDC issued Health Advisory 2009 H1N1 Pandemic Update: Pneumococcal vaccination recommended to help prevent secondary infections.
October 21, 2009	Merck issued announcement that the company will not resume production of monovalent measles, mumps, and rubella vaccines.
October 16, 2009	FDA approved new vaccine (Cervarix, GlaxoSmithKline) for the prevention of cervical cancer.

October 16, 2009	FDA approved new indication for gardasil to prevent genital warts in men and boys.
September 15, 2009	FDA approved four vaccines against the 2009 H1N1 influenza virus.
July 1, 2009	WHO and ACIP issued recommendations on the use of H1N1 influenza vaccines.
June 23, 2009	HHS announced advanced development contract for new way to make flu vaccine.
June 11, 2009	Dr Margaret Chan, Director-General WHO, declared world now at the start of 2009 influenza pandemic.
May 22, 2009	HHS directed $1 billion toward development of vaccine for novel influenza A (H1N1).
March 16, 2009	ACIP voted to recommend hepatitis A vaccination for close contacts of international adoptees from countries with high and intermediate endemicity.
February 12, 2009	Vaccine Court ruled that MMR vaccine, when administered with thimerosal-containing vaccines, does not cause autism.
January 15, 2009	HHS awarded a $487 million contract to Novartis Vaccines and Diagnostics, Inc to build a facility to manufacture cell-based influenza vaccine.
December 11, 2008	FDA approved changes in the schedule for administering anthrax vaccine (BioThrax, manufactured by Emergent BioSolutions) and in the route of administration.
December 4, 2008	FDA approved expanded indication for use of Boostrix Tdap vaccine in people ages 10-64 years.
October 27, 2008	National Quality Forum included the hepatitis B birth dose among its consensus standards for improving health care for mothers and newborns.
June 24, 2008	FDA approved new DTaP-IPV vaccine (Kinrix) for use in children ages 4-6 years.
June 20, 2008	FDA approved Pentacel (Sanofi Pasteur), a new combination DTaP-IPV-Hib vaccine for use in children 6 wks–4 yrs of age.
June 5, 2008	FDA approved the use of Sanofi Pasteur's Tenivac tetanus and diphtheria toxoids adsorbed for adults age 60 years and older. In the original licensure, the age indication was for persons ages 7-59 years.
April 3, 2008	FDA approved new rotavirus vaccine (Rotarix) for use in U.S. Rotarix is a liquid and given in a two-dose series to infants from 6 to 24 weeks of age.
April 2, 2008	CDC issued Health Advisory in response to widespread measles outbreaks in U.S.
March 14, 2008	CDC updated its recommendations for administering combination MMRV vaccine.

February 29, 2008	CDC announced it had begun distribution of a new-generation smallpox vaccine, ACAM2000 (Acambis, Inc., Cambridge, Massachusetts), to civilian laboratory personnel, the military, and state public health preparedness programs.
February 27, 2008	ACIP voted to expand influenza recommendation to include vaccination for children ages 6 months-18 years.
December 7, 2007	CDC published updated recommendation for meningococcal vaccination of at-risk children age 2-10 years in MMWR.
October 26, 2007	ACIP voted to recommend the use of FluMist, the live attenuated influenza vaccine (LAIV; nasal-spray formulation) to include children age 2-5 years.
October 19, 2007	CDC published updated recommendations for prevention of hepatitis A virus infection after exposure and before international travel in MMWR.
October 18, 2007	FDA approved use of Menactra, a bacterial meningitis vaccine, in children age 2-10 years.
September 28, 2007	FDA approved Afluria, a new inactivated influenza vaccine for use in people age 18 years and older.
September 19, 2007	FDA approved use of FluMist nasal-spray influenza vaccine in children age 2-5 years.
August 10, 2007	CDC notified MMWR readers of revised recommendations to vaccinate all persons ages 11-18 with MCV4 at earliest opportunity.
July 20, 2007	MMWR notified readers that revised International Health Regulations have gone into effect for the United States.
July 17, 2007	HHS announced a plan to provide $175 million to assist states in pandemic influenza preparedness efforts.
June 27-28, 2007	ACIP voted to recommend routine use of meningococcal conjugate vaccine in adolescents ages 11-18 years.
June 15, 2007	HHS awarded $132.5 million to Sanofi Pasteur and MedImmune over five years to retrofit existing domestic vaccine manufacturing facilities on a cost-sharing basis and to provide warm-base operations for manufacturing pandemic influenza vaccines.
March 28, 2007	FDA approved an accelerated dosing schedule for Twinrix (hepatitis A and B vaccine). The schedule consists of three doses given within three weeks followed by a booster dose at 12 months (0, 7, 21–30 days, 12 months).
April 17, 2007	FDA approves first U.S. vaccine for humans against the avian influenza virus H5N1.
January 7, 2007	FDA licensed the refrigerator formulation of FluMist.
June 29, 2006	ACIP recommends second dose of varicella vaccine for children.

June 8, 2006	FDA licensed the first vaccine developed to prevent cervical cancer (Gardasil by Merck & Co., Inc.), precancerous genital lesions, and genital warts due to human papillomavirus (HPV) types 6, 11, 16, and 18.
May 25, 2006	FDA licensed a new vaccine to reduce the risk of shingles (herpes zoster) in the elderly. The vaccine (Zostavax by Merck & Co., Inc.) is approved for use in people aged 60 years of age and older.
Feb 24, 2006	VariZIG, a new immune globulin product for postexposure prophylaxis of varicella, is available under an Investigational New Drug Application Expanded Access Protocol.
Feb 3, 2006	Rotavirus vaccine, live, oral, pentavalent (RotaTeq by Merck) was licensed for use in infants ages 6 to 32 weeks.
Dec 19, 2005	A final order on the anthrax vaccine was issued by FDA, stating that the licensed anthrax vaccine is safe and effective for the prevention of anthrax disease, regardless of the route of exposure.
Oct 18, 2005	FDA approved lowering the age limit to 12 mos for the remaining U.S.-licensed hepatitis A vaccine in the U.S. (Havrix by GlaxoSmithKline).
Oct 7, 2005	A new Federal Medicare rule became effective that required all long-term care facilities to offer annual vaccination for influenza and one-time vaccination for pneumococcal disease to all residents as a condition of participation in Medicare.
Sept 6, 2005	A vaccine that combined the measles, mumps, rubella, and varicella antigens (Proquad by Merck) was licensed. The vaccine was indicated for use in children 12 months to 12 years.
Aug 31, 2005	An inactivated, injectable influenza vaccine (Fluarix by GlaxoSmithKline) was licensed. The vaccine was indicated for adults 18 years of age and older.
Aug 11, 2005	FDA approved lowering the age limit to 12 mos for one of the two licensed hepatitis A vaccine (Vaqta by Merck).
June 10, 2005	FDA licensed a 2nd Tdap vaccine (Adacel by Sanofi Pasteur) for use in persons ages 11-64 years.
May 3, 2005	An acellular pertussis vaccine combined with the adult formulation of tetanus and diphtheria (Tdap: Boostrix by GSK) was licensed for use as an active booster in persons 10-18 years of age. This product became the first licensed acellular pertussis-containing vaccine with an indication for adolescents.
April 3, 2005	DHHS awarded a contract for $97 million to Sanofi Pasteur to develop cell culture-based influenza vaccines for the U.S.
March 21, 2005	CDC announced that rubella was no longer endemic in the U.S.
Jan 14, 2005	The first meningococcal polysaccharide (Serogroups A, C, Y and W-135) diphtheria toxoid conjugate vaccine (Menactra by Sanofi Pasteur) was licensed. This marked the first meningococcal vaccine that was immunogenic and indicated for children younger than 2 years of age.

Aug - Oct, 2004	A significant shortage of influenza vaccine occurred in the U.S. (History: On August 25, 2004, as a result of routine testing required by FDA, Chiron Corporation, located in the U.K. and one of two suppliers of inactivated influenza vaccine for the U.S., identified bacterial contamination in a limited number of lots (approx 4.5 million doses) of its influenza vaccine. Chiron was expected to produce between 46 and 48 million doses of vaccine for the U.S. as part of a total vaccine supply of about 100 million doses. On Oct 4, 2004, authorities in the U.K. suspended the company's license for 3 months. On Oct 16, 2004, FDA announced that none of the influenza vaccine manufactured by Chiron for the U.S. market was safe for use. U.S. authorities recommended allocation of vaccine to those at highest risk of complications from influenza.)
May 4, 2004	The National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institute of Health (NIH), awarded a new license agreement for RotaShield, an oral rotavirus vaccine, created by NIAID scientists in the 1980s. The licensed was awarded to BIOVIRx, Inc., of Minneapolis, MN, which planned global commercialization of RotaShield.
May 2004	Contracts were awarded to Aventis Pasteur and to Chiron to develop vaccine against the H5N1 avian influenza virus.
2004	The 8th and final report of the Immunization Safety Review Committee was issued by the Institute of Medicine. The report concluded that the body of epidemiological evidence favors rejection of a causal relationship between the MMR vaccine (and thimerosal-containing vaccines) and autism.
March 24, 2004	Tetanus and diphtheria toxoids adsorbed for adult use (Decavac by Aventis Pasteur), preservative-free, was licensed.
Oct. 15, 2003	ACIP voted to recommend that children 6 to 23 months of age be vaccinated annually against influenza, with implementation scheduled for the fall of 2004.
2003	$81 million was awarded by NIAID through four new contracts to support development of candidate HIV vaccines. The awards were part of NIAID's HIV Vaccine Design and Development Teams program, a public-private partnership that seeks to accelerate HIV vaccine development. The contract recipients were AlphaVAx Human Vaccines, Inc. (Durham, NC), Epimmune, Inc. (San Diego, CA), Novavax, Inc. (Columbia , MD), and Progenics Pharmaceuticals (Tarrytown, NY).
2003	Project Bioshield Act of 2003 was enacted. It authorized more than $5 billion over 10 years to pay for development of vaccines, drugs, and other biomedical countermeasures for biological, chemical, nuclear, and radiological weapons. The Act also empowered the Secretary of Health and Human Services to authorize the use of drugs and vaccines not licensed by the FDA in the event of an act of bioterrorism or other public health emergencies.
June 17, 2003	The first nasally administered influenza vaccine (FluMist by MedImmune) was licensed. This live influenza A and B virus vaccine was indicated for healthy, non-pregnant persons ages 5-49 years.
Dec 13, 2002	A vaccine that combined the diphtheria, tetanus, acellular pertussis, inactivated polio, and hepatitis B antigens (Pediarix by GlaxoSmithKline) was licensed.

June 21, 2002	The European Region of the world was certified as polio-free.
May 14, 2002	Diphtheria and tetanus toxoids and acellular pertussis vaccine (Daptacel by Aventis Pasteur) was licensed.
Feb 25, 2002	GlaxoSmithKline announced that the company would no longer manufacture or distribute its Lyme disease vaccine, LYMErix, because of insufficient sales of the vaccine.
Dec 13, 2002	President Bush announced a major smallpox vaccination program to protect the nation against the threat of potential biological warfare. The first phase of the program was targeted to 450,000 public health and healthcare personnel, however, the program stalled, with fewer than 40,000 health care workers and emergency responders vaccinated.
2001	The Bill and Melinda Gates Foundation earmarked $70 million to develop and produce meningitis vaccines tailored for children and adults living in Africa.
2001	Following the events of September 11, 2001, IOM again called for creation of a national vaccine authority ""to advance the development, production, and procurement of new and improved vaccines of limited commercial potential but of global public health need.""
May 11, 2001	A combined hepatitis A inactivated and hepatitis B (recombinant) vaccine (Twinrix by SmithKline Beecham) was licensed.
Feb 17, 2000	A 7-valent pneumococcal conjugate vaccine (Prevnar by Wyeth Pharmaceuticals) was licensed for use in infants at 2, 4, 6 and 12-15 months of age to prevent invasive pneumococcal disease
2000	Measles was declared no longer endemic in the U.S. following eradication campaigns that began in 1967.
2000	The Western Pacific Region of the world was certified as polio-free.
Dec 9, 1999	Diphtheria and tetanus toxoids and acellular pertussis vaccine (Tripedia by Connaught) was licensed.
Oct 22, 1999	ACIP voted to withdraw their recommendation for rotavirus vaccine after investigating reports of intussusception (a type of bowel obstruction that occurs when one part of the intestine folds into an immediately adjoining part) in infants within the first two weeks of receipt of the vaccine. Intussusception was found to occur at a rate of approximately 1 case for every 5,000 children vaccinated.
Oct 16, 1999	Wyeth Lederle Vaccines voluntarily withdrew Rotashield from the market.
Fall 1999	A meningococcal group C conjugate vaccine was introduced into the routine schedule in the U.K. for infants, adolescents (15-17 yrs), and college entrants. A second phase was planned to begin in January 2000, subject to availability of vaccine.
Sept 1999	FDA approved a 2-dose schedule of hepatitis B vaccination for adolescents 11-15 years of age using Recombivax HB (Merck) with the 10 µg (adult) dose at 0 and 4-6 months later.

June 17, 1999	ACIP recommended exclusive use of inactivated poliovirus vaccine (IPV) for infants and children
1999	The Dale and Betty Bumpers Vaccine Research Center (VRC) was established at the National Institutes of Health to facilitate research in vaccine development. The primary focus of VRC research was to be the development of vaccines for AIDS.
1998	ACIP recommended DTaP vaccines for all five doses in the vaccination schedule, because local reactions, fever, and other systemic events were found to occur substantially less often after DTaP administration than after administration of whole cell DTP.
Aug 26, 1998	The Children's Vaccine Program was established at WHO's Program for Appropriate Technology in Health (PATH) with a $125 million gift from the Bill and Melinda Gates Foundation. The program's goal was to provide vaccines to children in the developing world and to accelerate research and development of new vaccines. The first vaccines purchased were Hib, hepatitis B, rotavirus, and pneumococcal, which were not commonly used in the developing world.
Dec 21, 1998	Lyme Disease Vaccine (Recombinant OspA), (LYMErix by SmithKline Beecham) was licensed for use in persons ages 15 to 70 years. ACIP recommended that decisions on the use of the vaccine be made on the basis of assessment of individual risk, which included the extent of both person-tick contact and geographic risk. Just 3+ years later, on February 25, 2002, GlaxoSmithKline announced that the company would no longer manufacture or distribute LYMErix because of insufficient sales of the vaccine.
Aug 31, 1998	Rotavirus vaccine, live, oral, tetravalent (RotaShield by Wyeth) was licensed for use in infants at 2, 4, and 6 months of age.
July 29, 1998	Diphtheria and tetanus toxoids and acellular pertussis vaccine adsorbed (Certiva by North American Vaccine) was licensed for primary and booster immunization of infants and children (except as a 5th dose in children who have previously received 4 doses of DTaP).
1998	The first vaccine for the prevention of HIV/AIDS (Aidsvax) entered Phase III trial, the first large-scale human trial of an HIV vaccine. The trial involved more than 5,400 volunteers from the U.S., Canada, and the Netherlands, the majority of whom were men who have sex with men. Preliminary results from the trial AIDS VAX (VaxGen) vaccine were reported in early 2003. The HIV vaccine appeared to show a protective effect among non-Caucasian populations, especially African Americans, although sample sizes were small. However, for the majority of the participants, who were Caucasians, the effect of the vaccine was minimal.
Nov 21, 1997	The FDA Modernization Act (FDAMA) was signed into law, amending the Food, Drug and Cosmetic Act and the Public Health Service Act to modernize the regulation of food, medical products, and cosmetics. FDAMA initiatives included measures to modernize the regulation of biological products. Specifically, changes included eliminating the need for establishment license applications, streamlining the approval processes for manufacturing changes, and reducing the need for environmental assessment as part of a product application.
1997	ACIP recommended booster doses of pneumococcal polysaccharide vaccine after 5 years for persons at highest risk of disease.

Oct 20, 1997	Rabies vaccine (RabAvert by Chiron Behring) was licensed.
Jan 29, 1997	Diphtheria and tetanus toxoids and acellular pertussis vaccine adsorbed (Infanrix by SmithKline Beecham) was licensed for the first four doses of the series.
Jan 1997	ACIP recommended adoption of a sequential series of two doses of IPV followed by two doses of OPV for all infants and children to decrease the rare occurrences of Vaccine Associated Paralytic Polio (VAPP) that were noted following the administration of live oral poliovirus vaccine.
Dec 30, 1996	Diphtheria and tetanus toxoids and acellular pertussis vaccine (Acel-Imune by Lederle) was licensed for use as the first through fifth doses in the series.
Sept 27, 1996	Combination DTaP and Hib vaccine (TriHIBit by Aventis Pasteur) was licensed for the fourth dose in the DTaP and Hib series.
July 31, 1996	Diphtheria and tetanus toxoids and acellular pertussis vaccine adsorbed (Tripedia by Aventis Pasteur) was licensed for primary and booster immunization of infants.
1996	The Interational AIDS Vaccine Initiative (IAVI) was launched, calling for the speedy development of a human immunodeficiency virus (HIV) vaccine for use worldwide. The Initiative created the Scientific Blueprint for AIDS Vaccine Development. Since 1996, IAVI invested nearly $20 million in the research and development of HIV vaccines by companies and research institutes worldwide. IAVI received major financial support from the Bill and Melinda Gates Foundation; the World Bank; the Rockefeller, Sloan and Starr foundations; Becton, Dickinson & Co.; and eight national governments, among other donors. IAVI is a Collaborating Centre of the Joint United Nations Programme on HIV/AIDS (UNAIDS).
Oct 2, 1996	A combined *Haemophilus influenzae* type b conjugate and hepatitis B vaccine (Comvax by Merck) was licensed.
Mar 29, 1996	A second inactivated hepatitis A vaccine (Vaqta by Merck) was licensed.
Feb 22, 1995	The first inactivated hepatitis A vaccine (Havrix by SmithKline Beecham) was licensed.
Mar 17, 1995	Varicella virus vaccine, live (Varivax by Merck) was licensed for the active immunization of persons 12 months of age and older.
1995	The ACIP, American Academy of Pediatrics, and the American Association of Family Physicians issued the first "harmonized" childhood immunization schedule, combining recommendations of all three national groups.
Nov 28, 1994	Typhoid Vi polysaccharide inactivated injectable polysaccharide vaccine (Typhim Vi by Aventis Pasteur) was licensed.
1994	The Global Programme for Vaccines and Immunization was created, merging two WHO programs -- the Expanded Programme for Immunization and the former Programme for Vaccine Development, and adding a new unit for Vaccine Supply and Quality.

1994	The entire Western Hemisphere was certified as "polio-free" by the International Commission for the Certification of Polio Eradication, WHO.
1993	The Institute of Medicine published "The Children's Vaccine Initiative: Achieving the Vision." Later, following the events of September 11, 2001, the Institute of Medicine again called for creation of a national vaccine authority ""to advance the development, production, and procurement of new and improved vaccines of limited commercial potential but of global public health need.""
1993	The National Immunization Program (NIP) was created as a separate program reporting directly to the Office of the Director at CDC. NIP was established to provide federal leadership and services to all local and state public health departments involved in immunization activities (e.g., disease surveillance for vaccine-preventable diseases, development of vaccine information management systems).
May 1, 1993	The costs of influenza vaccine and its administration became a covered benefit under Medicare Part B.
March 1993	Conjugated *Haemophilus influenzae* type b vaccines (ActHIB by Connaught/Mérieux and OmniHib by SmithKline Beecham) were licensed.
March 1993	A combined *Haemophilus influenzae* type b vaccine and whole cell DTP vaccine (Tetramune by Lederle/Praxis) was licensed.
1993	The development of immunization registries was promoted at the national level. A national health goal for 2010 was subsequently established to increase the participation in population-based immunization registries to 95%.
1993	The Vaccines for Children Program was established after passage of the Omnibus Budget Reconciliation Act of 1993. Federally-purchased vaccines under this program were made available to children from birth through 18 years of age who met one of the following requirements: Medicaid-enrolled, without health insurance, and American Indian or Alaskan native. Also, children with health insurance that did not cover the costs of immunization were eligible to receive vaccines at a federally-qualified health center or a rural health clinic. All ACIP recommended vaccines received funding, which included new vaccines, new vaccine combinations, and revised recommendations for vaccine use.
Dec 10, 1992	Japanese encephalitis (JE) virus vaccine inactivated (JE-Vax by Research Foundation for Microbial Diseases of Osaka University [BIKEN]) was licensed. JE is the leading cause of viral encephalitis in Asia. WHO acts as a facilitator for the development of new JE vaccines that are safer, require fewer doses, and are more suitable for public health use, in particular, in disease-endemic developing countries.
Sept 20, 1992	Diphtheria and tetanus toxoids and acellular pertussis vaccine (Tripedia by Connaught) was licensed for use as the fourth and fifth doses in the series.
Dec 17, 1991	Diphtheria and tetanus toxoids and acellular pertussis vaccine (Acel-Imune by Lederle) was licensed for use as the fourth and fifth doses in the series.
Nov 22, 1991	ACIP recommendations for routine hepatitis B vaccination for all infants were published in *MMWR*.

August 1991	The last case of indigenous polio in the Western Hemisphere occurred in a 5-year-old boy, Luis Fermin Tenorio, in Pichanaqui, Peru.
Jan 11, 1991	Recommendations of ACIP for routine Hib vaccination for infants beginning at 2 months of age were published in *MMWR*.
Dec 21, 1990	An enhanced-potency inactivated poliovirus vaccine (Ipol by Pasteur Méérieux Vaccins et Serums) was licensed.
April 13, 1990	ACIP recommendations for use of any of the three licensed Hib conjugate vaccines (ProHIBIT, HibTITER, and PedvaxHIB) for children as young as 15 months of age were published in *MMWR*.
Dec 20, 1989	Conjugated *Haemophilus influenzae* type b (Hib) vaccine (PedvaxHIB by Merck) was licensed.
Dec 15, 1989	A live, oral typhoid vaccine (Ty21a, *Vivotif Berna* by Swiss Serum Institute) was licensed.
Aug 28, 1989	Recombinant hepatitis B vaccine (Engerix-B by SmithKline Beecham) was licensed.
1989	Recommendations for routine 2nd doses of measles-containing vaccine were issued by both ACIP and the AAP. During the mid- to late-1980s, a high proportion of reported measles cases were in school-aged children (5-19 years) who had been appropriately vaccinated. These vaccine failures led to national recommendations for a second dose of measles-containing vaccine.
Dec 21, 1988	Conjugated *Haemophilus influenzae* type b vaccine (HibTITER by Wyeth-Lederle) was licensed.
1988	The Center for Biologics Evaluation and Research (CBER) was created within the FDA to regulate biological products, including blood, vaccines, tissue, allergenics, and biological therapeutics.
1988	The World Health Assembly (the ministers of health of all member states of the WHO) passed a resolution to eradicate polio by the year 2000.
1988	The National Vaccine Injury Compensation Program (NVICP) was established to provide compensation following a vaccine-related adverse event that resulted in injury or death. NVICP was intended to serve as an alternative to civil litigation. The law established a Vaccine Injury Table that provided a list of compensable vaccination events and, for each, an associated time period requirement.
Jan 22, 1988	ACIP recommendations to administer Hib conjugate vaccine to all children at 18 months of age were published in *MMWR*.
Dec 22, 1987	Protein-conjugated *Haemophilus influenzae* type b vaccine (PRP-D, ProHibit by Connaught) was licensed.
July 23, 1986	Recombinant hepatitis B vaccine (Recombivax HB by Merck) was licensed. Using recombinant DNA technology, Merck scientists developed a hepatitis B surface antigen subunit vaccine.

1986	Congress created the National Vaccine Program (NVP) to coordinate the vaccine research and development programs of AID, NIH, CDC, the Department of Defense, and FDA.
1986	The National Childhood Vaccine Injury Act of 1986 was enacted by Congress. The Department of Health and Human Services established the Vaccine Adverse Event Reporting System (VAERS), co-administered by FDA and CDC, to accept all reports of suspected adverse events, in all age groups, after the administration of any U.S.-licensed vaccine. The Act required healthcare providers and vaccine manufacturers to report to the Department of Health and Human Services specific adverse events following the administration of measles, mumps, rubella, polio, pertussis, diphtheria, and tetanus vaccine and any combinations thereof.
Apr 12, 1985	*Haemophilus influenzae* type b (Hib) polysaccharide vaccines (b-CAPSA 1 by Praxis Biologics, Hib-VAX by Connaught, and Hib-IMUNE by Lederle) were licensed. The vaccine was recommended routinely for children at 24 months of age and for children at 15 months of age enrolled in child care facilities. The vaccine was not consistently immunogenic in children <18 months of age.
Sept 1, 1984	The costs of hepatitis B vaccine and its administration became a covered benefit under Medicare Part B.
July 1983	Two enhanced pneumococcal polysaccharide vaccines were licensed (Pneumovax 23 by Merck on July 11 and Pnu-Imune 23 by Lederle on July 21). These vaccines included 23 purified capsular polysaccharide antigens of *Streptococcus pneumoniae* and replaced the 14-valent polysaccharide vaccine licensed in 1977.
1981	The first hepatitis B viral vaccines, developed by Merck and also by the Pasteur Institute, were licensed. Both had independently developed plasma-based hepatitis B viral vaccines.
Nov 23, 1981	Quadrivalent groups A, C, Y, and W-135 (Menomune A/C/Y/W-135 by Connaught) meningococcal vaccine was licensed. Because this and other polysaccharide meningococcal vaccines were found to induce a relatively poor immune response in children younger than two years and not able to elicit long-term immunologic memory, their use was limited to persons 2 years of age and older.
July 1, 1981	The costs of pneumococcal vaccine and its administration became a covered benefit under Medicare Part B.
May 8, 1980	The World Health Assembly certified the world free of naturally-occurring smallpox.
1980	Rabies human diploid-cell vaccine (Imovax Rabies by Mérieux and Wyvac by Wyeth) were licensed.
1979	The RA 27/3 (human diploid fibroblast) strain of rubella vaccine (Meruvax II by Merck) was licensed; all other strains were discontinued.
1979	The last cases of wild type 1 poliovirus occurred in the U.S. among unvaccinated Amish persons and members of other religious groups who did not accept vaccination. The source of the outbreak was determined to have been brought

	over to the U.S. from the Netherlands by members of an unvaccinated religious group.
Jan 3, 1978	Yellow fever vaccine (YF-Vax by Connaught) was licensed in the U.S.
Jan 3, 1978	Monovalent group A (Menomune-A by Connaught), group C (Menomune-C by Connaught) meningococcal vaccines, and a bivalent vaccine for both groups A and C (Menomune-A/C by Connaught) were licensed.
Nov 21, 1977	The first pneumococcal vaccine was licensed, containing 14 serotypes (of the 83 known serological groups) that comprised 80% of all bacteremic pneumococcal infections in the U.S.
Oct 26, 1977	The last case of naturally-acquired smallpox occurred in the Merca District of Somalia.
1977	Joseph A. Califano, Jr., Secretary of the Dept of Health, Education, and Welfare (later Health and Human Services) launched the National Childhood Immunization Initiative with a goal of achieving 90% vaccination levels among all children.
1976	The age for routine vaccination with MMR vaccine was changed from 12 months to 15 months.
Apr 2, 1974	The first monovalent (group C) meningococcal polysaccharide vaccine (Merck) was licensed.
1974	The Expanded Programme on Immunization was created within WHO, in response to poor immunization levels in developing countries (less than 5% of children in 1974). The following vaccines are used by the Expanded Programme on Immunization: BCG, polio, DTP, measles (often MMR), yellow fever (in endemic countries), and hepatitis B.
July 18, 1973	Measles and mumps virus vaccine, live (M-M-Vax by Merck) was licensed.
1972	The Division of Biologics Standards was transferred from NIH to FDA and renamed the Bureau of Biologics. It was responsible for the regulation of all biologics, including serums, vaccines, and blood products.
Apr 22, 1971	Combined measles, mumps, and rubella vaccine (MMR by Merck) as well as combined measles and rubella vaccine (M-R-Vax by Merck) were licensed; the vaccine was developed by Maurice Hilleman and colleagues at Merck.
1971	CDC recommended discontinuation of routine vaccination for smallpox in the U.S. following a greatly reduced risk of disease.
1969	Three rubella virus strains were licensed in the U.S.: HPV-77 strain grown in dog-kidney culture (Rubelogen by Parke-Davis); HPV-77 grown in duck-embryo culture (Meruvax by Merck); and Cendehill strain grown in rabbit-kidney culture (Cendevax by RIT-SKF, and Lirubel and Lirutrin by Dow).
1968 - 1969	The "Hong Kong" influenza pandemic, caused by an H3N2 influenza virus, resulted in roughly 34,000 deaths in the U.S.

1968	A second live, further attenuated measles virus vaccine (Attenuvax by Merck, based on the Moraten strain, derived from the Edmonston strain) was licensed.
1967	The Global Smallpox Eradication Program was launched by WHO. During the first year of the program, 44 countries, 31 of which had endemic smallpox, reported 217,218 cases.
Dec 28, 1967	Mumps virus vaccine live (MumpsVax by Merck) was licensed. The vaccine was developed by Maurice Hilleman who isolated a wild type virus from his daughter, Jeryl Lynn, who was recovering from mumps. It became known as the Jeryl Lynn strain of mumps virus.
1966	The World Health Assembly called for global smallpox eradication.
1966	CDC announced the first national measles eradication campaign. Within 2 years, measles incidence had decreased by more than 90% compared with prevaccine-era levels.
1966	The rubella virus was attenuated by Paul Parkman and Harry Meyer, Jr.
1965	Bifurcated needle for smallpox vaccine introduced
1965	Live, further attenuated measles virus vaccine (Lirugen by Pitman Moore-Dow based on the Schwarz strain, derived from the Edmonston strain) was licensed in the U.S. The recommended age for routine administration was changed from 9 to 12 months of age.
1964	A rubella epidemic swept the U.S. resulting in 12.5 million cases of rubella infection, an estimated 20,000 newborns with congenital rubella syndrome (CRS), and excess fetal and neonatal deaths in the thousands.
1964	The Immunization Practices Advisory Committee (ACIP) to the U.S. Public Health Service was formed to review the recommended childhood immunization schedule and note changes in manufacturers' vaccine formulations, revise recommendations for the use of licensed vaccines, and make recommendations for newly licensed vaccines.
June 25, 1963	Trivalent oral polio vaccine was licensed. The vaccine development began in 1957 by Albert Sabin to improve upon the killed Salk vaccine.
1963	The Federal Immunization Grant Program was established. The grants, authorized under section 317 of the Public Health Service Act, were made to states to provide funds to purchase vaccines and to support basic functions of an immunization program. The only vaccines available at the time were DTP, polio, and smallpox.
Mar 21, 1963	The first live virus measles vaccine (Rubeovax by Merck) was licensed. Other live virus measles vaccines were eventually licensed (M-Vac by Lederle, Pfizer-vax Measles-L by Pfizer, and generic vaccines by Lilly, Parke Davis, and Philips Roxane).
1963	Inactivated measles vaccine (Pfizer-vax Measles-K by Pfizer and a generic vaccine by Lilly) were licensed in the U.S. These vaccines were eventually withdrawn from the U.S. market in 1967.

1962	President John F. Kennedy signed the the Vaccination Assistance Act into law. It allowed the CDC to support mass immunization campaigns and to initiate maintenance programs.
Mar 27, 1962	Oral polio vaccine type 3 was licensed in the U.S., as well as the trivalent product.
1961	Oral polio vaccine types 1 and 2, developed by Dr. Albert Sabin and grown in monkey kidney cell culture, were licensed for use in the U.S.
1957 - 1958	The "Asian" influenza pandemic, caused by an H2N2 influenza virus, resulted in an estimated 70,000 deaths in the U.S. alone.
1955	The Polio Vaccination Assistance Act was enacted by Congress, the first federal involvement in immunization activities. It allowed Congress to appropriate funds to the Communicable Disease Center (later the Centers for Disease Control and Prevention) to help states and local communities acquire and administer vaccine.
1955	The Cutter polio vaccine incident began on April 25, 1955, when polio was reported in a vaccine recipient. One day later, five more cases were reported. All cases had received vaccine produced by Cutter Laboratories. Polio was reported in 94 vaccinees and in 166 close contacts of vaccinees. On April 27, the Laboratory of Biologics Control requested that Cutter Laboratories recall all vaccine and the company did so immediately. On May 7, the Surgeon General recommended that all polio vaccinations be suspended pending inspection of each manufacturing facility and thorough review of the procedures for testing vaccine safety. The investigation found that live polio virus had survived in two batches of vaccine produced by Cutter Laboratories. In 1955, as a result of the Cutter Incident, the Laboratory of Biologics Control was raised to division status within NIH, to strengthen and expand its biologics control function. Large-scale polio vaccinations resumed in the fall of 1955.
Apr 12, 1955	The first polio vaccine was licensed -- an inactivated poliovirus vaccine (IPV) pioneered by Dr. Jonas Salk.
1954	The Nobel Prize in Medicine was awarded to John Enders, Thomas Weller, and Fredrick Robbins for their discovery of the ability of poliomyelitis viruses to grow in tissue cultures.
1954	John Enders and Thomas Peebles isolated the measles virus in cell culture.
1953	Tetanus and diphtheria toxoids (adult formulation) was first licensed in the U.S., after the concentration of diphtheria toxoid was reduced.
May 22, 1953	Yellow fever vaccine (Merrell National Labs) was first licensed in the U.S.
July 16, 1952	Heat-phenol inactivated typhoid vaccine by Wyeth was licensed.
1952	The worst recorded polio epidemic in U.S. history occurred with 57,628 reported cases
1949	Diphtheria and tetanus toxoids and pertussis (DTP) was licensed.

1949	The last case of smallpox in the U.S. was reported; however, it took another two decades before the disease was eradicated globally.
1947	Combination diphtheria and tetanus toxoids for pediatric use was first licensed in the U.S.
1945	Inactivated influenza vaccine was first licensed in the U.S.
1945	K Habel and John Enders isolated the mumps virus.
1944	The Public Health Services Act of 1944 was enacted, consolidating all legislation affecting the functions of the Public Health Service.
1943	Penicillin first became mass-produced. This medical miracle, rediscovered by Alexander Fleming in 1928, was capable of attacking many types of disease-causing bacteria. It played a vital role in treating infected wounds during World War II.
1942	Influenza A/B vaccine was introduced to the Armed Forces Epidemiological Board. The influenza vaccine was licensed in 1945 and, following the war, was also used for civilians.
1942	Hepatitis A and B viruses were first differentiated.
1938	President Franklin D. Roosevelt, a victim of polio, founded the National Foundation for Infantile Paralysis, later known as the March of Dimes.
1937	An adsorbed form of tetanus toxoid was first licensed in the U.S.
1937	The Division of Biologics Control was formed within the National Institute of Health. Much later, in 1972, the Division was transferred to the FDA.
1935	A live yellow fever vaccine (17D) was first licensed. The development of the chorioallantoic membrane for culturing viruses had led to its development.
1930	The Hygienic Laboratory changed its name to the National Institute (singular) of Health and authorized the establishment of fellowships for biological and medical research.
1930	Cell culture was developed and shown to be able to grow virus, thus paving the way for the subsequent production of viral vaccines.
1928	The first iron lung was used to preserve breathing function in patients with acute polio.
1927	Bacille Calmette-Guerin (BCG) vaccine was first used in newborns, having been developed by Albert Calmette and Camille Guéérin in 1921. BCG (live-attenuated *Mycobacterium bovis* BCG) represented the only vaccine against tuberculosis. It has become the most widely administered of all vaccines in the WHO Expanded Programme for Immunization, but has been estimated to prevent only 5% of all potentially vaccine-preventable deaths due to tuberculosis.
1923	Diphtheria toxoid was licensed; prepared from the inactivated bacterial toxin that has lost its toxicity but retains its antitoxin producing properties. In 1924, Gaston

	Ramon discovered diphtheria toxoid. Along with the discovery of antitoxins, Ramon uncovered the role of adjuvant substances of immunity.
1918	The "Spanish flu" influenza pandemic was responsible for at least 50 million deaths worldwide, with about 675,000 deaths in the U.S. This virus was unusual because it spread so quickly, was so deadly, and exacted its worse toll among the young and healthy. About one-third of the world's population (~500 million people) were infected.
1915	Pertussis vaccine, a suspension of inactivated *Bordetella pertussis* cells, was licensed. Inactivated vaccines were prepared with a microorganism or virus that had been killed, usually with a chemical such as formaldehyde.
1914	Typhoid vaccine was first licensed in the U.S.
1914	Rabies vaccine was first licensed in the U.S.
1914	Tetanus toxoid was introduced following the development of an effective therapeutic serum against tetanus by Emil Von Behring and Shibasaburo Kitasato.
1908	The first county health departments in the U.S. were formed.
1906	The Pure Food and Drugs Act was formed, prohibiting interstate commerce in misbranded and adulterated foods, drinks, and drugs.
April 5, 1902	The Biologics Control Act was formed. It included the regulation of vaccine and antitoxin producers and required both licensing and inspections of manufacturers. The standards imposed by the 1902 Act resulted in bankruptcy for one-third of the companies manufacturing antitoxins and vaccines while benefiting the manufacturers already in compliance. Ten firms held licenses with the Laboratory of Hygiene following the 1902 Act.
1901	In St. Louis, 13 children died of tetanus-contaminated diphtheria antitoxin. In the autumn of 1901, nine children in Camden, New Jersey, died from tainted smallpox vaccine. Efforts to ensure the purity of biological treatments by government oversight followed with the Biologics Control Act of 1902.
1901	The first Nobel Prize for Physiology and Medicine was awarded to Emil von Behring for his work on the development of a diphtheria antitoxin (later known as antiserum).
1897	Plague vaccine was introduced, following the preparation of anti-plague horse serum at the Pasteur Institute by Alexandre Yersin. After demonstrating protection from disease in immunized animals, Yersin went to China with the vaccine to protect humans during a plague epidemic.
1896	Cholera and typhoid vaccines were first developed.
1893	City and state public health departments began mass production of diphtheria antitoxin, following its introduction in European laboratories.
1888	The Pasteur Institute was established as a rabies treatment center as well as an infectious diseases research and training institute.

1888	The diphtheria toxin was discovered by Emile Roux. Passive serum therapies were developed through the scientific contributions of many, including Emil Von Behring who developed the first effective therapeutic serum against diphtheria and Paul Ehrlich who developed enrichment and standardization protocol, which allowed for an exact determination of quality of the diphtheria antitoxins.
1887	Joseph Kinyoun established one of the country's first bacteriological laboratories in the Marine Health Service Hospital on Staten Island, NY. He was director of the Laboratory of Hygiene, which moved to Washington, D.C., in 1891. Kinyoun brought the latest techniques such as the procedure for preparing diphtheria antitoxin back from his visits to Europe.
1885	Louis Pasteur first used rabies vaccine in humans.
1884	The first live attenuated viral vaccine (rabies) was developed by Louis Pasteur, using dessicated brain tissue inactivated with formaldehyde.
1882	Robert Koch identified the tubercle bacillus as the cause of tuberculosis, subsequently called Koch's bacillus.
1881	Louis Pasteur and George Miller Sternberg almost simultaneously isolated and grew the pneumococcus organism.
1879	Louis Pasteur created the first live attenuated bacterial vaccine (chicken cholera)
1877	Louis Pasteur proposed The Germ Theory of Disease.
1798	Edward Jenner published his work on the development of a vaccination that would protect against smallpox. Two years earlier, in 1796, he had first speculated that protection from smallpox disease could be obtained through inoculation with a related virus, vaccinia or cowpox. He tested his theory by inoculating eight-year-old James Phipps with cowpox pustule liquid recovered from the hand of a milkmaid, Sarah Nelmes.
1798	The Marine Health Service was established in 1798 as the nation's first public health agency. It provided hospital care for merchant seamen and protected port cities against diseases such as smallpox, cholera, and yellow fever.
1721	Variolation was introduced to Great Britain.
1100s	The variolation technique was developed, involving the inoculation of children and adults with dried scab material recovered from smallpox patients. Variations of variolation have been noted in Turkey, Africa, China, and Europe.
400 BC	Hippocrates described mumps, diphtheria, epidemic jaundice, and other conditions

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