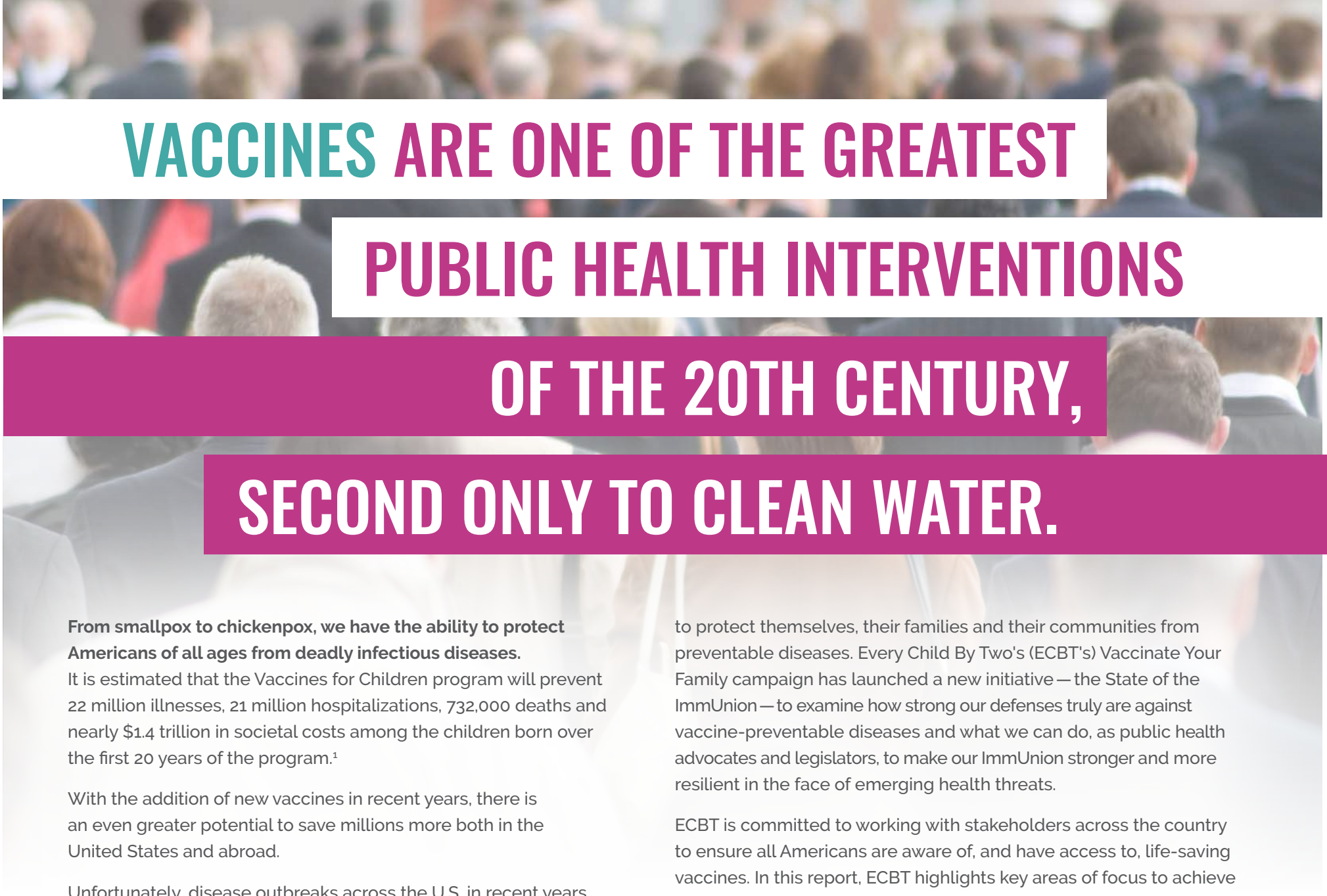
VACCINATE YOUR FAMILY

A PROGRAM OF EVERY CHILD BY TWO

2017 STATE OF THE IMMUNION

A REPORT ON VACCINE-PREVENTABLE DISEASES IN THE U.S.



VACCINES ARE ONE OF THE GREATEST PUBLIC HEALTH INTERVENTIONS OF THE 20TH CENTURY, SECOND ONLY TO CLEAN WATER.

From smallpox to chickenpox, we have the ability to protect Americans of all ages from deadly infectious diseases. It is estimated that the Vaccines for Children program will prevent 22 million illnesses, 21 million hospitalizations, 732,000 deaths and nearly $1.4 trillion in societal costs among the children born over the first 20 years of the program.[1]

With the addition of new vaccines in recent years, there is an even greater potential to save millions more both in the United States and abroad.

Unfortunately, disease outbreaks across the U.S. in recent years reflect an ongoing lack of access to vaccines combined with the fact that many Americans still aren't taking advantage of opportunities to protect themselves, their families and their communities from preventable diseases. Every Child By Two's (ECBT's) Vaccinate Your Family campaign has launched a new initiative — the State of the ImmUnion — to examine how strong our defenses truly are against vaccine-preventable diseases and what we can do, as public health advocates and legislators, to make our ImmUnion stronger and more resilient in the face of emerging health threats.

ECBT is committed to working with stakeholders across the country to ensure all Americans are aware of, and have access to, life-saving vaccines. In this report, ECBT highlights key areas of focus to achieve optimal protection against vaccine-preventable diseases.

As in life, it all begins during childhood.

PROTECTING CHILDREN IS OUR FIRST DEFENSE

Young children are one of the populations at greatest risk of suffering from life-threatening diseases. Luckily, we have the ability to protect children from 14 infectious diseases in the first few years of their lives. Unfortunately, while national vaccination rates remain high overall, families often clustered in specific communities throughout the U.S. are choosing not to vaccinate their children in greater numbers, leaving children and those around them vulnerable to infectious diseases.

Vaccines protect both the individual vaccinated and those around them from deadly diseases (a concept known as "herd immunity"). That's because most vaccine-preventable diseases are transmitted from person to person. If a high proportion of the population is vaccinated and immune, then the chains of person-to-person transmission are broken. So, for example, a child can be protected against measles or whooping cough even if they have not yet reached the recommended age for vaccination, because those around them have been vaccinated and are less likely to carry or transmit the disease. It's therefore critical that we vaccinate a certain percentage of the population to prevent vaccine-preventable diseases from circulating. This percentage, known as a herd immunity threshold, varies from disease to disease and is by no means a perfect number. The necessary percentage can vary based on several factors. That is why we continually strive toward high vaccination rates. Even a small drop in vaccination rates within a community can lead to a disease outbreak.

Herd Immunity Thresholds for Common Vaccine-Preventable Diseases

A herd immunity threshold is the percentage of vaccinated individuals needed in a population to prevent a disease from spreading.[2,3]

MEASLES: 92-95%

WHOOPING COUGH: 92-94%

VARICELLA: 90%

MUMPS: 75-86%

We are seeing more examples of communities falling below these thresholds across the U.S. For example, at several private schools in East Texas, as few as 60 percent of students are appropriately vaccinated.[4] Additionally, a Midwestern kindergarten in Minnesota reported that nearly half of its students had non-medical vaccine exemptions.[5]

Learn more about the 14 vaccine-preventable diseases from which children can be protected in Every Child By Two's interactive Vaccine-Preventable Disease eBook.

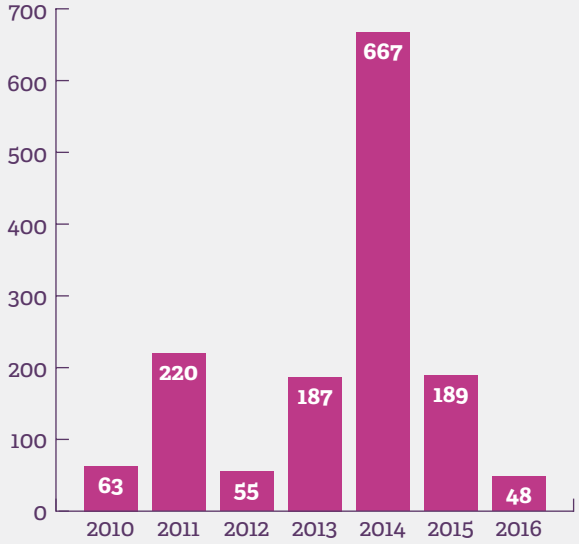
DID YOU KNOW?

Disease Elimination Versus Eradication

In September of 2016, the World Health Organization declared the Americas to have eliminated measles.[6] That does not mean that Americans are no longer at risk of contracting the contagious disease. Elimination means there are no more homegrown cases but the infection can get imported from elsewhere, which can cause outbreaks. Measles is only a plane ride away and travelers to and from the U.S. leave our unvaccinated populations at risk.

Measles Cases by Year, 2010 to 2016

CASES BY YEAR



SIGNIFICANT OUTBREAKS

Hennepin County, Minnesota
February 15, 2011 – April 24, 2011
21 cases

Brooklyn, New York
March 13, 2013 – June 9, 2013
58 cases

Knox County, Ohio and surrounding communities
May 2014 – June 2014
383 cases

Disneyland, Anaheim, California
December 20, 2014 – April 17, 2015
149 cases

The U.S. is experiencing more outbreaks of vaccine-preventable diseases in recent years than we have in several decades.[7]

These diseases impact more than a child's health. When a child gets sick, there are hard costs, including missed days of school and of work, which can add up quickly during a disease outbreak. Beyond the days during which symptoms of the disease are visible, every vaccine-preventable disease has a "contagious period" — the amount of time during which a person can transmit the disease to others. Ill children in particular should not attend school in order to avoid further spreading the disease. In early January 2017 Auburn, WA experienced an outbreak of mumps in an elementary school, requiring at least 44 children to get up-to-date on their vaccine or be faced with a 25-day exclusion period following each new case.[8] During this time, parents will likely miss work to remain home with their children, and risk missing twice as many days if they or their family members contract the disease as well.

And it's not just small children who are affected. Pre-teens and teens are also susceptible to vaccine-preventable diseases. ■

Looking for more on the impact of vaccine-preventable diseases in your state? You can find more information on local vaccination rates on the American Academy of Pediatrics' map and through CDC's VaxView.

DID YOU KNOW?

The Costs of Vaccine-Preventable Disease

When you or a loved one contracts a preventable disease, the associated costs can range from money spent on treating the disease and its symptoms, to days of school or work lost while waiting out the disease's incubation period.[9]

INCUBATION PERIODS BY DISEASE

Chickenpox 10-21 days	**Measles** 8-12 days	**Rubella** 14-21 days
Diphtheria 2-5 days	**Influenza** 1-6 days	**Whooping Cough** 7-10 days
Hepatitis A 14-50 days	**Mumps** 12-25 days	**Meningitis (bacterial)** 2-10 days

KEEPING PRE-TEENS AND TEENS SAFE

As children transition to adolescence, they tend to shoulder more responsibilities. Whether they are helping their parents by watching younger siblings or earning money at jobs after school, teens play a key role in their schools, families and communities.

While adolescents embrace their independence by making their own decisions, they still need guidance in a number of areas—specifically around their personal health. Vaccines are just as important to them now as they were when they were infants.

The Tdap (tetanus-diphtheria-whooping cough) vaccine is a critical part of building adolescents' immunity, and protecting those around them from whooping cough. Pre-teens and teens with younger siblings also play an important role in protecting infants from infectious diseases.

In fact studies show that when a source of infection was located, family members were the source 85% of the time, with siblings being the most common source. Tdap vaccine is recommended for all 11-12 year olds.

DID YOU KNOW?

Pre-teens and teens with younger siblings can help protect infants from infectious diseases.[10]

In fact, in one recent study of infants who contracted whooping cough, **approximately 85% got it from a member of their immediate or extended family** when a source of the infection could be identified.

Many people, including family members who spread whooping cough, may not even know they have the disease—and this is one reason why it is important to learn more about whooping cough vaccination.

Yet for some illnesses, the importance of the vaccines received as an adolescent may not be revealed until later in life. Consider the human papillomavirus (HPV) vaccine, a two-dose immunization recommended by the CDC that can prevent several forms of cancer in adulthood.

Nine in 10 sexually active people will get HPV in their lifetime.[11] Of these infections, over 30,000 lead to HPV-related cancer diagnoses, which require costly treatments.[12] The HPV vaccine is vital to ensuring the health of adolescents as they grow to adulthood, and will result in substantial cost (and life)-savings for years to come.

Despite the incredible benefits of this vaccine, many parents are still failing to get their pre-teens vaccinated. We must increase HPV vaccination rates to protect tomorrow's adults from serious forms of cancer.

Other vital vaccines for adolescents include two meningococcal vaccines, which together cover serogroups A, B, C, Y and W135. Due to common social behaviors, teens are at an increased risk of contracting the disease, which will kill nearly 15 percent of those infected, and leave nearly 20 percent of survivors permanently disabled.[13] Most kids receive a MenACWY vaccine, but in recent years, meningococcal serogroup B has been responsible for several outbreaks on college campuses and now accounts for half of all meningococcal cases among 17-23 year olds in the U.S.[14] Fortunately, new MenB vaccines provide parents with more ways to protect their children than ever before, and when receiving both MenACWY and MenB vaccines, today's teens can be fully protected against the five preventable types of meningococcal disease.

Adolescent vaccines have empowered parents to protect their children in ways that were unimaginable just 10 years ago. Thanks to innovations in adult vaccines as well, parents, grandparents and others now have more opportunities than ever to keep themselves healthy. ■

DID YOU KNOW?

The Value of the HPV Vaccine

2 doses
of the HPV vaccine at 11 years old

99%
of cancers resulting from HPV infections **can be prevented**[15]

and

+$1 billion
in costs for HPV screenings and cancer treatments **can be saved**[16]

EXTENDING PROTECTION TO ADULTS

America's economy depends on the health of its workforce. Because workplace productivity is directly linked to employee wellness, illness can have a staggering impact on both worker earnings and company output.

Optimal health is the key to employee success, yet many adult workers fail to take advantage of some of the most effective means of wellness and immunity: vaccines. Immunization coverage for adults remains low, even at 20 percent for some diseases.[17]

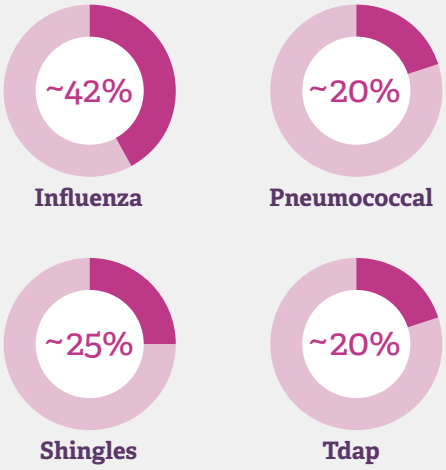
This fact has dire economic consequences. The United States spends nearly $27 billion annually treating four vaccine-preventable diseases in adults over the age of 50, including influenza, pertussis, pneumococcal disease, and shingles.[10] These costs only include medical visits, hospitalizations and prescription coverage. They do not cover the astronomical costs of absenteeism and short term disability from work to companies. Low vaccine rates contribute to substantial, yet preventable, national healthcare expenses and productivity losses.

As the American populace ages, we can expect that by 2020, one of every four workers will be over the age of 55.[18] The costs for addressing the health challenges within this segment of the workforce are massive, as treatments for conditions like diabetes and heart disease number in the hundred billions of dollars annually.[19] Many current vaccines, as well as those in development pipelines, prevent diseases that can cause dangerous complications in individuals with chronic conditions. Vaccines are a proven means of preventing and reducing

Adult Vaccination Rates for Common Vaccine-Preventable Diseases

Vaccination rates among U.S. adults are well below the targets established in the Healthy People 2020 report.[18]

Real vaccination rate among U.S. adults



DID YOU KNOW?

The Costs of Vaccine-Preventable Disease

Even if work days are not missed, productivity still suffers and costs the U.S. economy billions of dollars:[20]

Each year, poor health costs the U.S. economy an estimated **$576 billion**

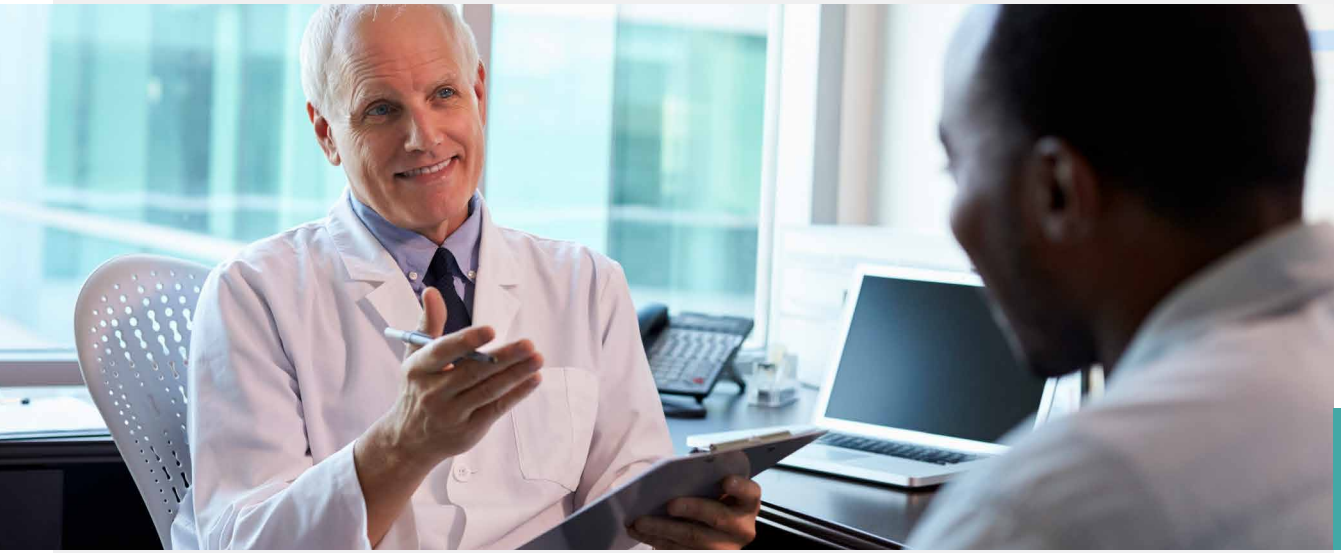
$227 billion of this amount is in productivity losses from employees who are absent due to illness, and from employees who are present, but too ill to perform at their best.

> The U.S. spends **nearly $27 billion annually treating four vaccine-preventable diseases in adults** over the age of 50: influenza, pertussis, pneumococcal disease, and shingles.[10]

the inevitably huge cost of maintaining the health of our aging workforce.

Barriers to preventive care pose a huge obstacle to both vaccination rates and the benefit of immunizations to the workforce.[21] First dollar coverage of vaccines greatly improves the likelihood that an adult will be immunized.[22] Health insurance has been a proven catalyst for adult vaccine coverage — it is imperative that we continue to promote programs that have given medically-marginalized communities preventive care through vaccination and other treatments. The cost savings for our economy, coupled with increased workplace productivity, are well worth the investment. In addition to coverage, access to immunization providers in a wide array of community settings, such as a provider office, health clinic, pharmacy, employer-sponsored clinic or other health site is also essential to improving adult immunization rates. Incentivizing a robust network of community providers who support and carry out adult immunization standards in their practices are also a strong driver of improved adult immunization rates.

While equality in vaccination rates across communities is desired, racial disparities in vaccine coverage continue to exist among adult populations as whites are consistently better vaccinated than minority groups. People of color have traditionally been underinsured, lacking access to quality treatment and preventive care through medical coverage. ■



DID YOU KNOW?

Disparities in Adult Vaccination Rates

Adult vaccination rates for shingles, as seen in the following statistics from 2014, varied greatly among racial/ethnic groups:[23]

White	Blacks & Hispanics	Asian
23%	<9%	17%

> First dollar coverage of vaccines **greatly improves the likelihood that an adult will be immunized.**[22]

PROTECTING EXPECTING MOMS AND THEIR BABIES

The next generation of American innovation, achievement and imagination has yet to take their first breath. The better tomorrow we all hope for will be created by the infants of today and beyond. In order to provide them with a foundation for success, we must work to ensure that they have a healthy start — even before they are born.

Maternal vaccines are a critical part of this goal. These immunizations protect both the pregnant mother and her newborn during the first few months of life, when they are most susceptible to infections. Most vaccines for infants start at 2 months of age, so the only protection for very young infants is through vaccination of their mothers who transfer protective proteins, called antibodies, to their babies across the placenta. These antibodies protect the baby until the baby can develop their own antibody through vaccination.

The stakes are high: infants and pregnant women have a greater risk of influenza complications than the general population and children and infants comprise the largest share of pertussis-related deaths. Infant-health depends on maternal vaccines, which offer protection to newborns until they can themselves be fully vaccinated.

While currently only influenza, pertussis and tetanus are preventable through maternal vaccination, researchers are working to discover scientific breakthroughs for many other infant conditions. Maternal vaccines may soon be used to protect infants from Respiratory Syncytial Virus (RSV), Cytomegalovirus (CMV), and Group B streptococcus. The development of these vaccines will result in immense economic cost savings and better health outcomes for infants who are heavily impacted by these diseases.

Vaccinating During Pregnancy

It's recommended that expectant mothers receive two vaccines during pregnancy:[24]

Tdap: Expectant mothers should get the Tdap vaccine during the 3rd trimester, between the 27th and 36th week of pregnancy.

Influenza: The flu shot is recommended for expectant mothers at any stage of pregnancy.

Pregnant Women and the H1N1 Influenza Epidemic

The 2009 H1N1 Influenza epidemic serves as a stark reminder of just how vital vaccines are to maternal health. With low flu immunization rates that year and a particularly virulent strain — due in part to a delay in the availability of the vaccine — during the outbreak, pregnant women:

- Were more likely to suffer from complications of the flu[25] such as pneumonia and subsequent acute respiratory distress syndrome (32% of pregnant women versus 7% of the general population); and

- Had the highest rate of hospital admissions that flu season.[26]

From April 2009 to August 2010, nearly 350 severely ill pregnant women were reported — of that number, 75 died from complications of H1N1.[27] While expectant mothers make up just 1 percent of the population, they accounted for 5 percent of total U.S. H1N1 deaths in initial reports.[28]

America's future rests in the hands of our young. Here in the U.S. we have the technology to prevent suffering among our most vulnerable citizens, our newborns. By working together to ensure access to and delivery of vaccines to pregnant women we can eliminate the suffering of so many families who have lost their precious newborns to vaccine-preventable diseases. ■

DID YOU KNOW?

Future Maternal Vaccines May Help Prevent:

Group B streptococcus (GBS):

- Fever, difficulty feeding, irritability or lethargy, difficulty breathing, blue-ish color to skin[29]
- Meningitis

1 in 4
pregnant women carry GBS bacteria.[30]

About 1,000
babies get early-onset GBS each year in the U.S.

Respiratory Syncytial Virus (RSV):

- Runny nose, decrease in appetite, coughing, sneezing, fever, wheezing, irritability, decreased activity, and breathing difficulties[31]

33.8 million cases
of acute lower respiratory infections (e.g. pneumonia, bronchitis, lung abcesses)[32]

36,000–199,000
RSV-associated ALRI deaths[13]

Cytomegalovirus (CMV):

- While usually a mild infection for people, babies born with CMV can have brain, liver, spleen, lung, and growth problems
- Hearing loss is the most common health problem[33]

38,000 cases
of congenital CMV infections in the U.S. and Europe[34]

400 deaths
estimated[35]

THE STATE OF OUR IMMUNION IS STRONG.

But it's not guaranteed. Vaccination rates can and must be improved.

Legislators can play an important role in ensuring that public health staff are prepared to face the threats of disease outbreaks and that their constituents are protected from dangerous infectious diseases. You can help by:

- **Appropriating annual funding to the CDC, states and territories** so that they are prepared to: respond to existing and potential emerging vaccine-preventable disease outbreaks, conduct community outreach, educate providers and the public, maintain immunization registries and offer vaccine services to the community. Federal vaccine appropriations have not met the levels requested in annual justification reports from CDC and state appropriations are nearly non-existent. This has resulted in a loss of personnel and the disbanding of several highly effective statewide coalitions which supported immunization efforts for decades;
- **Understanding the science behind vaccines and supporting the CDC-recommended immunization schedule.** The public must be reassured that the timing of vaccines is carefully considered prior to CDC-recommendation and that prior to and following licensure, vaccine safety is heavily monitored. There are many disproven myths about the safety of vaccines. You can be a champion and advocate simply by knowing how to respond to your constituents' concerns and offering evidence-based responses;
- **Reaching out to your local immunization advocates,** including hospitals, leading health care providers, colleges and universities, and immunization coalitions; and
- **Connecting with your fellow legislators to support** federal, state and local efforts.

RESOURCES AND USEFUL LINKS

Commonly Requested Information for Constituents

- **Vaccine Safety (Monitoring & Licensure Systems; Safety Studies; Federal Advisory Committees & Immunization Recommendations)** www.ecbt.org/index.php/facts_and_issues/article/vaccine_safety
- **Every Child By Two:** www.ecbt.org
- **Vaccinate Your Family:** www.vaccinateyourfamily.org

Policy Resources

- Trust for American's Health: Ready or Not? examines the nation's ability to respond to public health emergencies, tracks progress and vulnerabilities, and includes a review of state and federal public health preparedness policies and a state-by-state map rating of preparedness.
- 317 Coalition is solely focused on advocating for increased 317 funding, and as such will focus on implementing the policies of the Advisory Committee on Immunization Practices and other relevant policy making bodies.
- Adult Vaccine Access Coalition is fostering an inclusive partnership of organizations to inform and engage federal policymakers in working towards common legislative and regulatory solutions that will strengthen and enhance access to and utilization of adult immunization services across the health care system.
- Association of Immunization Managers enables immunization managers to work together to effectively prevent and control vaccine-preventable diseases and improve immunization coverage in the United States and its territories.
- Association of State and Territorial Health Officers is the national nonprofit organization representing public health agencies in the United States, the U.S. Territories, and the District of Columbia, and over 100,000 public health professionals these agencies employ.
- Immunization Coalitions Network of the Immunization Action Coalition offers a searchable database to locate state and local immunization coalitions and a host of state policy resources.
- National Association of County & City Health Officials is comprised of over 2,800 Local Health Departments across the United States.
- American Academy of Pediatrics offers an overview of recent disease outbreaks and vaccination rates.

Annual Vaccination Rate Data

- **Child Rates:** www.cdc.gov/vaccines/imz-managers/coverage/childvaxview/index.html
- **School Rates:** www.cdc.gov/vaccines/imz-managers/coverage/schoolvaxview/index.html
- **Teen Rates:** www.cdc.gov/vaccines/imz-managers/coverage/teenvaxview/index.html
- **Adult Rates:** www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/data-reports/index.html
- **Flu Rates:** www.cdc.gov/flu/fluvaxview

References

1. The Economic Value of Vaccination: Why Prevention is Wealth [Special Issue]. (2015). *Journal of Market Access & Health Policy 2015, 3.* DOI: http://dx.doi.org/10.3402/jmahp.v3.29204
2. Kung, J. *Vaccines and Public Health* [PDF Document]. Retrieved from: http://sitn.hms.harvard.edu/wp-content/uploads/2010/09/Lecture_1.2.pdf
3. UNICEF (n.d.) *Data Analysis Activity: Herd Immunity* [Worksheet]. New York: UNICEF. Retrieved from: https://www.teachunicef.org/sites/default/files/Data_Analysis.pdf
4. Casey, A. (2016, November 16). "As non-medical vaccine exemptions grow, Texas parents seek transparency in schools." *Kaiser Health News.* Retrieved from: http://khn.org/news/as-non-medical-vaccine-exemptions-grow-texas-parents-seek-transparency-in-schools/
5. Sinner, C. (2016, October 27). "How common are vaccination exemptions for Minnesota's kindergartners?" *The Star Tribune.* Retrieved from: http://www.startribune.com/how-common-are-vaccination-exemptions-for-minnesota-s-kindergartners/398515841/
6. McNeil Jr., D. (2016, September 27). "Americas region declared free of endemic measles." *The New York Times.* Retrieved from https://www.nytimes.com/2016/09/28/health/measles-eradication-united-states.html?_r=2
7. American Academy of Pediatrics. (2016). *Child Vaccination Across America.* [Data file]. Retrieved from: https://immunizations.aap.org/
8. *Mumps keeps 44 unvaccinated Auburn students out of school* [Video File]. (2017, January 10). Retrieved from: http://www.king5.com/news/health/mumps-keeps-44-unvaccinated-auburn-students-out-of-school/384849959
9. Summit Medical Group. (2014). *Infections: incubation and contagious periods.* Retrieved from: http://www.summitmedicalgroup.com/library/pediatric_health/hhg_incubation/
10. Skoff, T. H., Kenyon, C., Cocoros, N., Liko, J., Miller, L., Kudish, K., Baumbach, J. (2015). Sources of Infant Pertussis Infection in the United States. Pediatrics Sep 2015, peds.2015-1120; DOI: 10.1542/peds.2015-1120.
11. Every Child By Two. (n.d.). *Prevent Cancer? Here's the Answer* [Infographic], Retrieved February 5, 2017 from: http://vaccinateyourfamily.org/files/resources/VYF_SImmunion_HPV_Infographic_Final.png
12. Centers for Disease Control. (2016). *Human Papillomavirus (HPV) and Cancer.* Retrieved from: https://www.cdc.gov/cancer/hpv/
13. Centers for Disease Control. (2016). *Meningococcal Disease: Diagnosis and Treatment.* Retrieved from: https://www.cdc.gov/meningococcal/about/diagnosis-treatment.html
14. Soeters HM, McNamara LA, Whaley M, Wang X, Alexander-Scott N, Kanadanian, KV, et al. Serogroup B Meningococcal Disease Outbreak and Carriage Evaluation at a College – Rhode Island, 2015. MMWR Morb Mortal Wkly Rep. 2015;64(22):606- 607.
15. Van Damme, P., Olsson, S., Block, S., Castellsague, X., Gray, G., Herrera, T., Huang, L... (2015). Immunogenicity and Safety of a 9-Valent HPV Vaccine. *Pediatrics, Volume 136,* Issue 1, 28-39. DOI: 10.1542/peds.2014-3745.
16. Chesson, H., Ekwueme, D., Saraiya, M., Watson, M., Lowy, D., Markowitz, L. (2012). Estimates of the annual direct medical costs of the prevention and treatment of disease associated with human papillomavirus in the United States. *Vaccine,* Sep 14;30(42):6016-9. DOI: 10.1016/j.vaccine.2012.07.056.
17. Williams, W., Lu, P., O'Halloran, A., Bridges, C., Kim, D., Pilishvili, T., Hales, C... (2015). Vaccination Coverage Among Adults, Excluding Influenza Vaccination — United States, 2015. *Morbidity & Mortality Weekly Report,* 64(04);95-102. Retrieved from: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6404a6.htm
18. United States Department of Labor, Bureau of Labor Statistics (2012). Labor force projections to 2020: a more slowly growing workforce. *Monthly Labor Review,* 43-64. Retrieved from: https://www.bls.gov/opub/mlr/2012/01/art3full.pdf
19. Centers for Disease Control. (n.d.). At A Glance 2015: Workplace Health Promotion. Retrieved from: https://www.cdc.gov/chronicdisease/resources/publications/aag/pdf/2015/aag-workplace-health.pdf
20. Jaspen, B. (2012). "U.S. Workforce Illness Costs $576B Annually From Sick Days To Workers Compensation." *Forbes.* Retrieved from: http://www.forbes.com/sites/brucejapsen/2012/09/12/u-s-workforce-illness-costs-576b-annually-from-sick-days-to-workers-compensation/#690f90d27256
21. Ventola, C. L. (2016). Immunization in the United States: Recommendations, Barriers, and Measures to Improve Compliance: Part 2: Adult Vaccinations. *Pharmacy and Therapeutics, 41(8),* 492–506. Retrieved from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4959618/
22. National Vaccine Advisory Committee. (2014). Recommendations from the National Vaccine Advisory Committee: Standards for Adult Immunization Practice. *Public Health Reports, 129(2),* 115–123. Retrieved from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3904889/
23. Lu, P., O'Halloran, A., Williams, W., Lindley, M., Farrall, S., Bridges, C. (2015). Racial and Ethnic Disparities in Vaccination Coverage Among Adult Populations in the U.S. *American Journal of Preventive Medicine, Volume 49,* Issue 6, Supplement 4, Pages S412–S425. DOI: http://dx.doi.org/10.1016/j.amepre.2015.03.005
24. Every Child By Two. (n.d.). *Pregnancy.* Retrieved from: http://www.vaccinateyourfamily.org/pregnancy/
25. The American College of Obstetricians and Gynecologists. (2014). *Influenza Vaccination During Pregnancy.* Retrieved from: http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Influenza-Vaccination-During-Pregnancy
26. Jamieson, D., Honein, M., Rasmussen, S., Williams, J., Swerdlow, D., Biggerstaff, M., Lindstrom, S... (2009). H1N1 2009 influenza virus infection during pregnancy in the USA. *The Lancet, Volume 374,* No. 9688, p451–458. DOI: http://dx.doi.org/10.1016/S0140-6736(09)61304-0
27. Centers for Disease Control. (2010). *2009 H1N1 Flu In The News.* Retrieved from: https://www.cdc.gov/h1n1flu/in_the_news.htm
28. Maternal and Infant Outcomes Among Severely Ill Pregnant and Postpartum Women with 2009 Pandemic Influenza A (H1N1) — United States, April 2009 – August 2010. (2011). *Morbidity and Mortality Weekly Report, 60(35);*1193-1196. Retrieved from: https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6035a2.htm
29. Centers for Disease Control. (2016). *Group B Strep Symptoms and Complications.* Retrieved from: http://www.cdc.gov/groupbstrep/about/symptoms.html
30. Centers for Disease Control. (2016). *Group B Strep Fast Facts.* Retrieved from: https://www.cdc.gov/groupbstrep/about/fast-facts.html
31. Centers for Disease Control. (2014). *Respiratory Syncytial Virus Infection (RSV): Symptoms and Care.* Retrieved from: https://www.cdc.gov/rsv/about/symptoms.html
32. Nair, H., Nokes, D. J., Gessner, B., Dherani, B., Madhi, S., Singleton, R., O'Brien, K. (2010). "Global burden of acute lower respiratory infections due to respiratory syncytial virus in young children: a systematic review and meta-analysis." *The Lancet. Volume 375,* No. 9725, Pg. 1545-1555. Retrieved from: http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)60206-1/abstract
33. Centers for Disease Control. (2016). *Cytomegalovirus (CMV) and Congenital CMV Infection.* Retrieved from: http://www.cdc.gov/cmv/congenital-infection.html
34. M Schleiss. "Pediatric Cytomegalovirus Infection." *Medscape.* January 27, 2015. Available at http://emedicine.medscape.com/article/963090-overview#showall
35. American Society for Microbiology. (2013). *Clinical Microbiology Reviews, Vol. 26,* no. 1 86-102. Retrieved from: http://cmr.asm.org/content/26/1/86/F6.expansion.html

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A PROGRAM OF EVERY CHILD BY TWO

Vaccinate Your Family

Vaccinate Your Family (VYF) is an Every Child By Two initiative aimed at raising awareness of the critical importance of vaccines across the lifespan. It is the next generation of the Vaccinate Your Baby program, which focused on the importance of protecting infants against vaccine-preventable diseases. Learn more at vaccinateyourfamily.org.

Every Child By Two – Carter/Bumpers Champions for Immunization

Founded in 1991 by Former First Lady Rosalynn Carter and Former First Lady of Arkansas Betty Bumpers, Every Child By Two works to protect families and individuals from vaccine-preventable diseases by raising awareness of the critical need for timely immunizations for people of all ages, increasing the public's understanding of the benefits of vaccines, increasing confidence in the safety of vaccines, ensuring that all families have access to life-saving vaccines, and advocating for policies that support timely vaccination. Learn more at ecbt.org.