

# COMMUNICABLE DISEASE PREVENTION AND CONTROL

**Note to readers and users of the *Healthiest Wisconsin 2020* Profiles:** This *Healthiest Wisconsin 2020* Profile is designed to provide background information leading to collective action and results. This profile is a product of the discussions of the Focus Area Strategic Team that was convened by the Wisconsin Department of Health Services during September 2009 through November 2010. The objectives from this Focus Area have been recognized as objectives of *Healthiest Wisconsin 2020*. (Refer to Section 5 of the *Healthiest Wisconsin 2020* plan.) A complete list of *Healthiest Wisconsin 2020* Focus Area Strategic Team Members can be found in Appendix A of the plan.

## Definition

Communicable diseases (infectious diseases) are illnesses caused by bacteria, viruses, fungi or parasites. Organisms that are communicable may be transmitted from one infected person to another or from an animal to a human, directly or by modes such as airborne, waterborne, foodborne, or vectorborne transmission, or by contact with an inanimate object, such as a contaminated doorknob.

*Communicable disease prevention and control* involves the surveillance for and protection from communicable diseases that may result from changes in or evolution of infectious agents (bacteria, viruses, fungi or parasites), spread of infectious agents to new geographic areas or among new populations, persistence of infectious agents in geographic areas and populations, newly emerging infectious agents, or acts of bioterrorism. Communicable disease prevention and control involves isolation and quarantine, immunization, prophylactic (preventive) measures, early interventions including antimicrobial treatment, public health education and other measures.

## Importance of the Focus Area

Communicable disease prevention and control is the cornerstone of public health. Waves of severe illness and death due to communicable diseases have occurred throughout history, including smallpox prior to its eradication, the bubonic plague in 14<sup>th</sup> century Europe, the influenza pandemic of 1918 and, close to home, the massive waterborne outbreak of cryptosporidiosis in Milwaukee in 1993. Advancements in clean water and refrigeration and the development of safe, effective vaccines have greatly decreased such threats; however, common diseases still cause outbreaks and new communicable diseases emerge. The worldwide AIDS epidemic, multidrug-resistant tuberculosis, West Nile virus, severe acute respiratory syndrome (SARS), avian influenza and drug-resistant staphylococcus infections are all reminders of our continued vulnerability to communicable diseases.

Successful efforts to prevent and control communicable diseases depend on understanding the disease-causing agent in the population and its characteristics, its reservoirs, the mode of exit of

the agent from these reservoirs or sources, the mode of transmission of the agent to its next host, the mode of entry of the agent into the host and the susceptibility of the host to the agent.

Wisconsin public health law requires the state health department and all local health departments to monitor and respond to 73 distinct communicable diseases and any disease outbreak. Each year approximately 35,000 cases of communicable disease are reported to public health departments in Wisconsin. Effective surveillance and early intervention are critical to prevent more people from becoming infected. Control measures include quarantine or isolation of infected people, promoting personal hygiene, administering vaccines to heighten immunity, or prophylaxis for short-term protection. Other control measures include sanitation and sanitary measures for food and waterborne infectious agents, procedures to prevent health care-associated infections, or repellants for mosquito- and tick-borne diseases.

Vaccines protect more than the individual immunized; they prevent the spread of disease within the population. This is the principle of herd immunity. The development of vaccines and their safe and effective use are considered to be among the greatest medical and public health achievements of the 20th century. Many diseases that were widely associated with severe or fatal outcomes are now rare in the U.S. because of sound policies promoting widespread use and application of vaccines, particularly routine use of vaccines to prevent serious diseases among children. The Student Immunization Law has also contributed to the reduction of diseases among children. Maintaining high immunization rates is critical to this success as only one vaccine-preventable disease, smallpox, has been globally eradicated and resurgence of these diseases can occur if immunization levels decrease. Numerous challenges remain. According to the U.S. Department of Health and Human Services, most cases of vaccine-preventable disease in the U.S. now occur among adults. With the aging population and persistently low adult immunization rates, new efforts are needed to encourage vaccination across the life span. Prioritizing best practice, evidence-based strategies to improve the effectiveness of immunization delivery systems is a critical public health priority. It must include increasing immunization access in all communities to eliminate racial, ethnic and other disparities, so all Wisconsin citizens will benefit from safe, effective vaccines.

Wisconsin is a leader in the surveillance and early detection of and response to communicable diseases. This is in part due to excellent laboratory surveillance. For example, the Wisconsin State Laboratory of Hygiene and other laboratory partners, working closely with the Wisconsin Division of Public Health and public health partners, have the highest success rate in the nation (greater than 90 percent) in identifying pathogens causing reported foodborne outbreaks.

## **Wisconsin Data Highlights**

### ***Influenza***

- Each year 5 percent to 20 percent of the population gets sick from influenza. In Wisconsin this annually results in thousands of hospitalizations and several hundred deaths. Young children, pregnant women, people with underlying medical conditions and the elderly are at greatest risk for influenza-related complications.
- Promoting annual influenza vaccination remains the most effective means of reducing the occurrence of influenza in Wisconsin.

### ***Foodborne diseases***

- The Centers for Disease Control and Prevention estimates that 76 million cases of foodborne disease occur each year in the United States, resulting in 325,000 hospitalizations and 5,000 deaths.
- During 1998 to 2007, Wisconsin reported 260 foodborne disease outbreaks, and each year the Wisconsin Division of Public Health receives reports of thousands of individual cases of infection from reportable foodborne pathogens including *Salmonella*, *Campylobacter*, shigatoxin-producing *E. coli*, and *Listeria*.
- Advances in laboratory testing methods have increased capacity to detect foodborne illnesses and outbreaks.

### ***Immunization***

- Wisconsin coverage rates for completion of the recommended vaccine series among children 19 to 35 months of age increased from 67.5 percent in 2002 to 79.6 percent in 2008, based on the Centers for Disease Control and Prevention's National Immunization Survey.
- The percent of parents claiming personal conviction waivers for certain required vaccines at kindergarten entrance increased from 1.9 percent in 2000 to 2.9 percent in 2007. The most common reason for declining vaccination was concern over vaccine safety.
- In 2009, the Wisconsin Immunization Program distributed vaccines valued at \$39.4 million (federally funded) to public and private health care providers enrolled in the Vaccines for Children Program.
- The consistent use of vaccines has greatly reduced vaccine-preventable disease-related morbidity. For example, the quick adoption of rotavirus vaccines among Wisconsin infants has reduced rotavirus-related hospitalizations statewide by 84 percent during the first two rotavirus seasons following the initial licensure of one of these vaccines.

### ***Tuberculosis***

- In Wisconsin the number of cases of active tuberculosis disease has declined from an average of 111 per year during the 1990s to 71 per year during the period 2000 to 2009.
- The occurrence of multidrug-resistant (MDR) tuberculosis is on the rise, from a single reported case during 2000 to 2004, to 12 cases during 2005 to 2009.
- The proportion of active disease cases occurring in people who were foreign-born has also increased in Wisconsin.
- Active tuberculosis disease, whether multidrug-resistant or not, occurs predominantly among minority populations. Of the 68 cases of tuberculosis reported in Wisconsin during 2008, the race/ethnicity among the patients was Asian, 35 percent; White non-Hispanic, 26 percent; Blacks/African American, 19 percent; Hispanics/Latinos, 19 percent; and American Indian, 1 percent.

### ***Lyme disease/tickborne infections***

- Lyme disease is the most common vectorborne disease in the United States. In Wisconsin the incidence of Lyme disease has tripled from an average of 8 cases per 100,000 during 1991 to 1995, to 27 cases per 100,000 during 2004 to 2008. This increase follows a

steady expansion in the geographic range of the deer tick (*Ixodes scapularis*) which transmits *Borrelia burgdorferi*, the bacteria that cause Lyme disease.

- Deer ticks are now found in most areas of Wisconsin and, in addition to *B.burgdorferi*, can transmit bacteria that cause other serious infections including anaplasmosis, ehrlichiosis, and babesiosis.

### ***Health care associated infections***

- National estimates of annual health-care-associated infections indicate that 5 percent to 10 percent of hospital patients acquire health-care-associated infections, and such infections rank among the top 10 causes of death. Recognition of these infections as a major public health problem has resulted in federal funding for state health departments to develop health care associated infection prevention programs.
- In 2009, Wisconsin developed a statewide prevention plan that calls for improved tracking of state-specific health care associated infection incidence rates and enhanced prevention activities in Wisconsin hospitals.

## **Objective 1**

**By 2020, protect Wisconsin residents across the life span from vaccine-preventable diseases through vaccinations recommended by the U.S. Advisory Committee on Immunization Practices (ACIP).**

### **Objective 1 Indicator**

Proportion of population fully immunized according to ACIP recommendations among children aged 0-12 years, teens aged 13-17 years, and adults aged 18 years and older.

### **Objective 1 Rationale**

Routine immunization is among the most effective interventions available to safeguard public health. Maintaining high immunization rates in every Wisconsin community is essential to preventing communicable diseases and promoting health equity. As the number of recommended vaccines increases and the immunization schedule becomes more complex, new strategies for public education and vaccine delivery are needed.

## **Objective 2**

**By 2020, implement strategies focused to prevent and control reportable communicable diseases and reduce disparities among populations with higher rates.**

### **Objective 2 Indicator**

Population-specific incidence rates of reportable conditions by race and ethnicity, sexual identities and orientations, gender identities, educational or economic status, or other characteristic associated with health disparities.

### **Objective 2 Rationale**

The burden of many communicable diseases is higher among the poor, and among racial and ethnic minorities, immigrants, and other socially disenfranchised populations. Identifying populations at greatest risk and focusing prevention efforts to reach these populations are necessary to reduce disparities and improve overall health.

## Potential evidence- or science-based actions to move the focus area objectives forward over the decade

### *Vaccine Preventable Diseases*

**Increase vaccination rates among healthcare workers:** Influenza vaccination of healthcare personnel (HCP) reduces patient mortality in long-term care facilities [Potter, 1997; Carman 2000] and reduces employee absenteeism and financial costs in hospitals [Wilde 1999; Boersma 1999]. The Wisconsin Division of Public Health will continue to lead efforts to increase hospital and nursing home employee influenza vaccination rates (EIVRs) throughout the state by monitoring rates, tracking trends, providing feedback, education, and recommendations, and recognizing facilities achieving EIVRs of at least 80 percent.

**Improve monitoring of adolescent and adult vaccination rates.** The adolescent immunization platform continues to expand with the development of new vaccines. The expanded recommendations are included in the Wisconsin Immunization Registry WIR along with benchmark reports that providers can use to monitor the status of their adolescent patients. The adult recommendations and benchmark reports are also included in the WIR. **The benchmark reports can be done at the provider, local health department or state level.** Efforts will continue to recruit health care providers that provide care to adults to participate in the WIR as well as working with health insurers and the Medicaid and Medicare Programs to get pertinent immunization related data on their beneficiaries.

**Improve monitoring of adult vaccination rates.** The Wisconsin Immunization Registry is experiencing significant and steady improvements in the entry of adult vaccinations, especially in the area of seasonal influenza vaccines. While efforts are ongoing to improve this data collection, health maintenance organizations do collect this information to assess their wellness programs. Payers such as Medicare and Medicaid can provide age, sex, and zip code billing information for vaccinations. These proxy sources of data may enable the estimation of vaccination rates in adults.

### *Prevent and control reportable communicable diseases and reduce disparities among populations with higher rates*

**Improve detection of foodborne disease outbreaks:** Reducing foodborne disease is a national priority. The PulseNet database has been shown to be an effective tool for the early detection of foodborne illnesses caused by genetically-related bacteria [Buxrod, 2010; CIFOR, 2010]. Epidemiological investigations prompted by PulseNet have led to the identification and control of several recent national foodborne disease outbreaks. Wisconsin will continue to play a leadership role in this area by conducting laboratory testing to determine the genetic fingerprint of major bacterial pathogens, and the necessary epidemiologic follow-up to identify potential sources of exposure.

**Improve collection of race and ethnicity data:** Race and ethnicity data are often omitted from reports of communicable disease. Reporters will be reminded to include this information, and assessment of compliance with this request can be made yearly.

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