Communicable Diseases

The Epidemiology Program at the Chattanooga-Hamilton County Health Department collects and analyzes information on certain communicable diseases for the purposes of determining disease impact, assessing trends in disease occurrence, characterizing affected populations, prioritizing control efforts, and evaluating prevention strategies. In Tennessee, four designated categories of communicable diseases are reported to local health departments by all hospitals, physicians, laboratories, and other persons knowing of or suspecting a case in accordance to the regulations of the Tennessee Department of Health. The list of Notifiable Diseases in Tennessee was last revised in 2015 and is included in the appendix to this report. Notable changes to the list in 2014 and 2015 include the following:

- Middle East Respiratory Syndrome (MERS) is newly reportable (2014)
- Reporting and submission of isolates which are non-susceptible to one or more carbapenems (includes intermediate and resistant to any carbapenem) is required for Escherichia coli, Klebsiella species, and Enterobacter species (2014)
- MRSA is no longer reportable statewide to local health departments; it is reportable in the National Healthcare Safety Network (2014)
- Chikungunya virus was made reportable in June 2014
- Diagnostic specimens for Viral Hemorrhagic Fevers (including Ebola Virus Disease) are required to be submitted to the state laboratory (2015)
- Carbapenem-resistant *Pseudomonas* species are newly reportable (for sentinel labs in Davidson County only (2015)

Reportable Diseases

Tennessee state law requires that categories of communicable diseases are reported to the health department. All hospitals, physicians, laboratories, and other persons knowing of or suspecting a case of these diseases are required to report. For many of these notifiable diseases, a disease-specific investigation is conducted and the information collected is reported to the state. A complete list of reportable diseases and events is located in the appendix to this report.

Below is a list of selected reportable diseases and the corresponding Hamilton County and Tennessee disease burden for the Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report (MMWR) year 2013. Preliminary reports for 2014 show an increase in Shigella, from six cases in 2013 to 93 cases in 2014.

Table 35. Summary of 2013 Reportable Diseases in Hamilton County

	Hamilton County		Tennessee
Reported Disease	**Cases**	**Rate/100,000**	**Rate/100,000**
Campylobacteriosis	29	8.317	6.204
Cryptosporidiosis	3	0.860	1.247
Ehrlichiosis/Anaplasmosis	3	0.860	1.478
Enterobacteriaciae, Carbapenem-resistant*	9	2.581	3.140
Group A Streptococcus, invasive	20	5.736	2.509
Group B Streptococcus, invasive	29	8.317	6.158
Guillain-Barre syndrome	3	0.860	0.292
Haemophilus influenzae, invasive	6	1.721	1.601
Hemolytic uremic syndrome	0	0.000	0.262
Hepatitis A, acute	1	0.287	0.323
Hepatitis B, acute	8	2.294	4.249
Hepatitis C, acute	4	1.147	1.663
Legionellosis	5	1.434	1.201
Listeriosis	0	0.000	0.200
Lyme disease	2	0.574	0.354
Malaria	2	0.574	0.308
Mumps	3	0.860	0.108
Neisseria meningitis, invasive	0	0.000	0.108
Pertussis	8	2.294	3.464
Salmonellosis	30	8.604	13.131
Shigellosis	6	1.721	10.499
Spotted Fever Rickettsiosis	11	3.155	8.313
Shiga toxin-producing Escherichia coli (STEC)	3	0.860	2.109
Streptococcus pneumoniae, invasive (IPD)	3	0.860	12.439
Tuberculosis	6	1.721	2.201
Vibriosis	3	0.860	0.185
VRE (Vancomycin-Resistant Enterococcus), invasive	9	2.581	2.786

Source: Tennessee Department of Health, Communicable and Environmental Disease Services http://health.state.tn.us/Ceds/WebAim/

Sexually Transmitted Diseases

Sexually Transmitted Diseases (STDs) refer to more than 25 infectious organisms transmitted primarily through sexual activity. STDs can cause reproductive health problems, fetal and perinatal health problems, and cancer. STD prevention as an essential primary care strategy is integral to improving reproductive health.

A 2013 CDC analysis found over 20 million new sexually transmitted infections were reported annually, costing the health care system approximately $16 billion in direct medical costs. The analysis included eight common sexually transmitted infections: chlamydia, gonorrhea, hepatitis B virus (HBV), herpes simplex virus type 2 (HSV-2), human immunodeficiency virus (HIV), human papillomavirus (HPV), syphilis, and trichomoniasis.[lxviii]

Data used on STDs is derived from the nationally notifiable diseases Chlamydia, gonorrhea, and syphilis. When compared to the four largest metropolitan areas in Tennessee, Hamilton County has the 3rd highest STD rate in 2013 (Table 36).

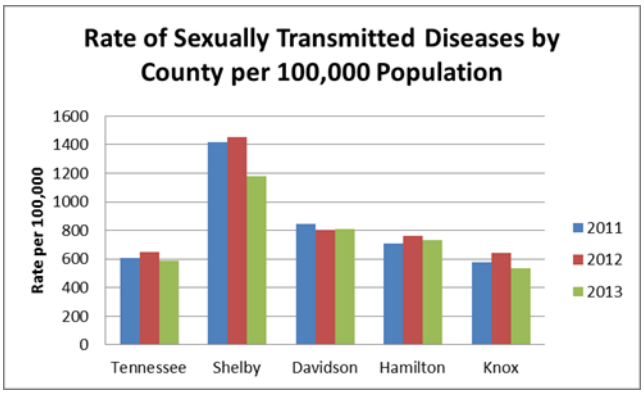


Table 36: Sexually Transmitted Diseases[i] per 100,000 Population

	2011	2012	2013
U.S.	561.2	569.2	558.2
Tennessee	609.5	649.9	586.7
Shelby	1,420.7	1,456.5	1,182.2
Davidson	844.3	802.6	810.4
Hamilton	709.4	760.0	734.2
Knox	575.6	642.1	536.0

[i]STDS include chlamydia, gonorrhea, and primary and secondary syphilis.

Figure 58 Source: Tennessee Department of Health, Communicable and Environmental Disease Services and Centers for Disease Control

Chlamydia

Chlamydia trachomatis infections are the most commonly reported notifiable disease in the United States. From 2002 through 2013, the rate of Chlamydia infection in the U.S. increased from 289.4 to 446.6 cases per 100,000 population.[lxix]

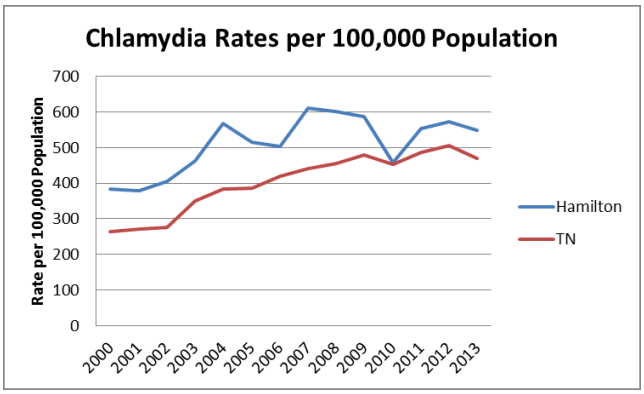
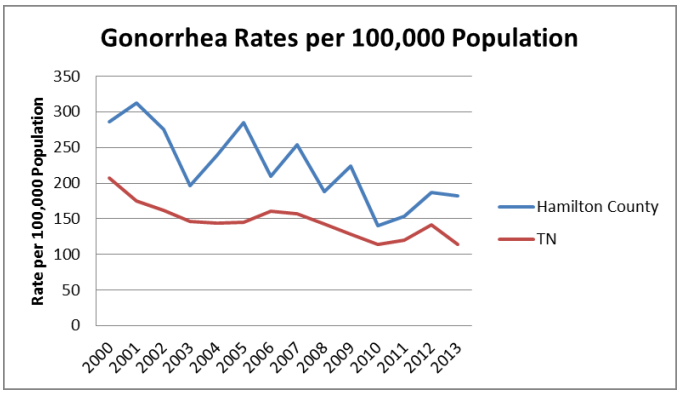


Figure 59 Source: Tennessee Department of Health, Communicable and Environmental Disease Services

- Overall, chlamydia rates in Hamilton County increased by 59.2% from 2000 through 2007 (from 383.6 to 611 cases per 100,000) and started trending down in 2008.
- In 2013, 1,913 individuals in Hamilton County were diagnosed with chlamydia, or 548.7 new diagnoses per 100,000 residents.

Gonorrhea

Gonorrhea is the second most commonly reported notifiable disease in the U.S. Infections from *Neisseria gonorrhoeae* are a major cause of Pelvic Inflammatory Disease, which can lead to serious outcomes in women such as tubal infertility, ectopic pregnancy, and chronic pelvic pain. From 2002 through 2013, the rate of gonorrhea in the U.S. decreased from 122.0 to 106.1 cases per 100,000 population.[lxx]



- Although gonorrhea rates in Hamilton County swing widely from year to year, the overall trend shows an overall decline from 2000 to 2013 (from 285.8 to 181.5 per 100,000).
- In 2013, 633 individuals in Hamilton County were diagnosed with gonorrhea, or 181.5 new diagnoses per 100,000 residents.

Figure 60 Source: Tennessee Department of Health, Communicable and Environmental Disease Services

Syphilis

Syphilis, caused by the bacterium *Treponema pallidum,* can cause significant complications if untreated and can facilitate the transmission of HIV. Untreated early syphilis in pregnant women results in perinatal death in up to 40% of cases, and if acquired and untreated during the four years preceding pregnancy, may lead to infection of the fetus in 80% of cases.[ii] Although the rate of primary and secondary syphilis in the U.S. decreased 90% from 1990 to 2001, the national rate has since increased annually, and more than doubled between 2002 and 2013 (from 2.4 to 5.5 per 100,000).[lxxi]

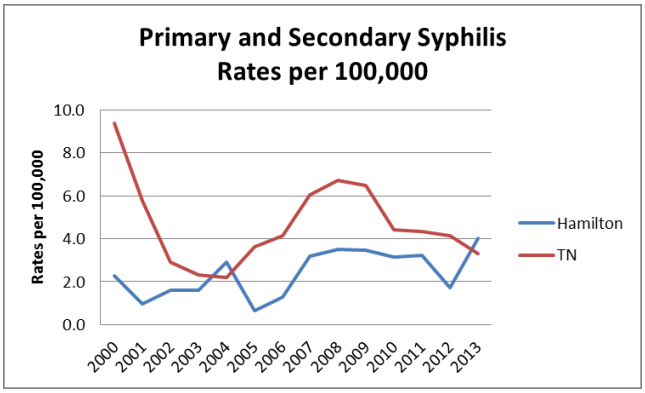


Figure 61 Tennessee Department of Health, Communicable and Environmental Disease Services

- Hamilton County's syphilis rates have been consistently lower than the overall state rates except in 2013, when the Hamilton County rate exceeded the state rate.
- After reaching a low of 0.6 cases per 100,000 residents in 2005, syphilis rates in Hamilton County increased and remained fairly stable through 2011. Infection rates fluctuated in 2012 and 2013.*
- In 2013, there were 14 new cases of primary and secondary syphilis in Hamilton County, or 4 cases per 100,000 residents.

* Rates based on fewer than 20 cases are unstable and can cause significant variations as illustrated above for 2012 (6 cases or 1.7 per 100,000) and 2013 (14 cases or 4 per 100,000).

HIV/AIDS

Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) is a spectrum of conditions caused by infection with the human immunodeficiency virus (HIV). Where it was once considered a death sentence, thanks to modern medicine and treatment adherence, patients are able to manage this virus more effectively. The Centers for Disease Control and Prevention estimates that about 1.2 million people in the United States were living with HIV at the end of 2011 and that approximately 14% do not know they are infected.[lxxii] The CDC recommends that everyone between the ages of 13 and 64 get tested at least once and that people in high-risk groups get tested more often.

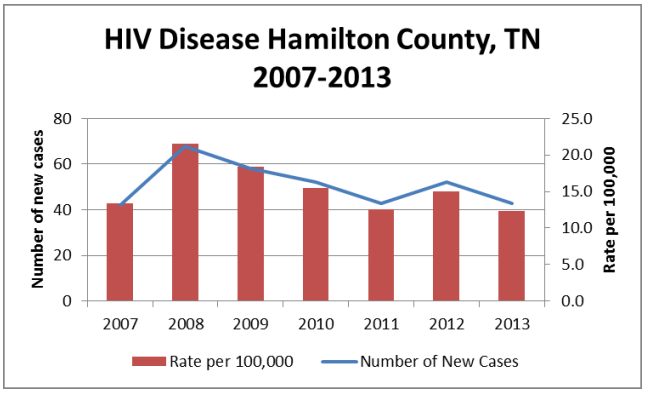


Figure 62 Source: TN Dept. of Health TN-PRISM (Patient Reporting Investigating Surveillance Manager)

- In 2013, there were 43 new HIV/AIDS infections in Hamilton County, or 12.3 per 100,000 residents.
- Cumulatively, there have been 1,616 cases of HIV/AIDs in Hamilton County through 2013.
- In 2013, there were 939 individuals living with HIV disease in Hamilton County.

Tuberculosis

Tuberculosis (TB) is caused by a bacterium called Mycobacterium tuberculosis that usually attacks the lungs. One third of the world's population is infected with TB, resulting in approximately 1.5 million TB-related deaths worldwide. In 2013, there were 9,582 TB cases (rate of 3.0 cases per 100,000 persons) reported in the U.S.

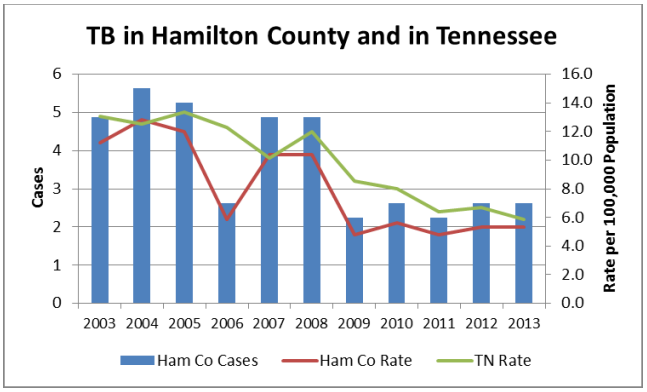
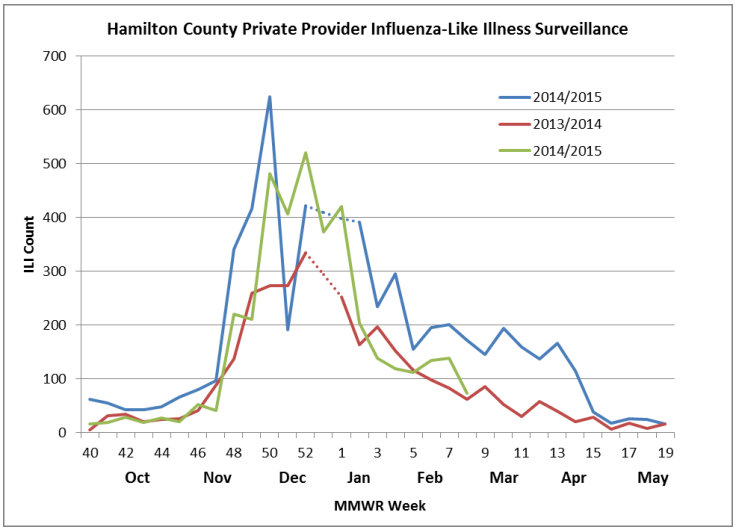


Figure 63 Source: Tennessee Department of Health, Communicable and Environmental Disease Services

- In 2013, there were seven cases of tuberculosis in Hamilton County, or 2.0 per 100,000.
- Over the past ten years, the County's tuberculosis rate has significantly decreased.

Influenza-Like Illness Activity in Hamilton County

Tennessee was ranked sixth in the nation in 2013 for influenza (flu) and pneumonia deaths.[lxxiii] In 2012, 33 deaths in Hamilton County were attributed to flu and pneumonia. In Hamilton County, 43% of adults surveyed had received the flu vaccine in 2011-2013. Out of adults ages 65 years and older, 60.4% had received the flu vaccine and 64.4% received the pneumonia vaccine.



The Health Department tracks influenza-like-illness (ILI) in the community as an indicator of the current influenza season. Sentinel providers in Hamilton County are health care providers who volunteer to provide weekly information on how many patients are visiting their practices with ILI, which is defined by the Centers for Disease Control and Prevention as having a fever with a temperature of 100˚F or greater and a cough and/or sore throat in the absence of a known cause other than influenza.

Figure 64 Chattanooga-Hamilton County Health Department

Trends in ILI vary by severity and seasons (Figure 65). The dotted lines represent weeks for which data are missing.

Childhood Immunizations

Immunizations can prevent disability and death from infectious diseases. Immunizations can also help control the spread of disease in communities. Even though most infants and toddlers have received all recommended vaccines by age 2, many under-immunized children remain, leaving the potential for outbreaks of disease.

The Tennessee Department of Health's annual survey of immunization status of 24-month old children tracks progress towards achieving on-time immunization with each routinely recommended vaccine for that population. The goal for the Tennessee Department of Health's Immunization Program is for 90% of Tennessee children under age two have completed the immunization series for each of seven vaccines which protect against the 11 following diseases: diphtheria, tetanus and pertussis (combined as DTaP); polio (IPV); measles, mumps and rubella (combined as MMR); hepatitis B (HBV); Haemophilus influenza type B (Hib); varicella (chicken pox); and pneumococcus (PCV). The Healthy People 2020 goal is to increase the percentage of children aged 19 to 35 months who complete all the recommended doses of all of the following: DTaP, polio, MMR, Hib, hepatitis B, varicella and PCV to (80%).

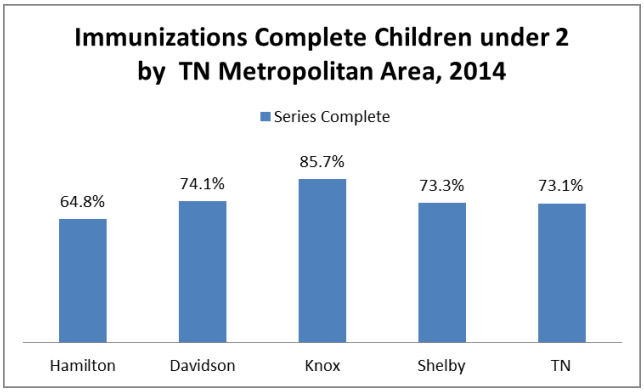


Figure 65 Source: Tennessee Department of Health, Tennessee Immunization Program

- Figure 66 shows the percentage of children with immunizations complete by the four largest metropolitan counties. Statewide, Hamilton County had the lowest immunizations complete estimate (64.8%) of the four largest metro counties; however, of the major metropolitan regions, only Knox County (85.7%) had results which were statistically significantly different than the statewide coverage level of 73.1%.

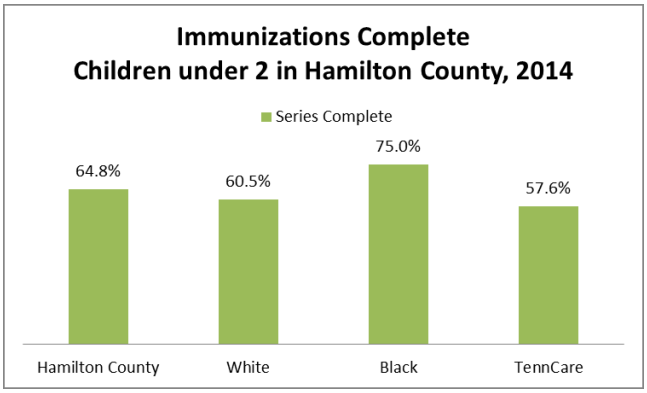


Figure 66 Source: Tennessee Department of Health, Tennessee Immunization Program

- Figure 67 shows the estimated percentages of children in Hamilton County who have completed the immunization series categorized by race and TennCare enrollment. The rate for blacks was higher than the rate for whites, although sample sizes were too small to calculate statistical significance.

- Statewide, the difference of immunizations complete between white and black children was not statistically significant; however, there is a racial disparity in flu immunization, where white children are more likely to receive the flu vaccine than their black peers (54.4% vs. 35.2%).

Vaccines required by Tennessee law for kindergarten enrollment in 2015 include:

- Diphtheria-Tetanus-Pertussis (DTaP, or DT if appropriate) – 4 or 5 doses, one of which must be given on or after the fourth birthday.
- Poliomyelitis (IPV or OPV) – 3 or 4 doses , one of which must be given on or after the 4th birthday
- Measles, Mumps, Rubella - 2 doses of each, usually given together as MMR
- Hepatitis B (HBV)- 3 doses
- Varicella - 2 doses or history of disease
- Hepatitis A –total of 2 doses, spaced at least 6 months apart