

Appendices

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Glossary

Acute health condition, according to the National Center for Health Statistics, is a departure from a state of physical or mental well-being that has lasted for less than 3 months and has involved either a physician visit or restricted activity. In general terms, acute health condition refers to a health effect that is brief, intense, or short-term.

Age-adjusted rate is a summary rate which has been mathematically standardized to some reference population to allow for comparisons between different populations that do not have the same age-distribution. To calculate age-adjusted rates, rates are calculated by age-groups then these age-specific rates are multiplied by a number (or fraction) that represents the proportion of that age-group in the standard population. The modified age-specific rates are then summed over all the age-groups to produce the summary age-adjusted rate.

Age-adjusted mortality rate is the mathematically standardized death rate. Death rates in this report were standardized to the U.S. 2000 standard million population. For more information see the definition for age-adjusted rate.

AIDS is Acquired ImmunoDeficiency Syndrome, a condition caused by HIV in which a person's defenses against infections are decreased.

Air pollution, as defined by the Metro Code of Laws, refers to the presence in the outdoor atmosphere of one or more air pollutants in such quantities, characteristics or duration as is or tends to be injurious to human health or welfare, or animal or plant life or health, or property, or would interfere with the enjoyment of life or property.

Ambient air refers to outside air.

Aquifer The American Heritage Dictionary defines an aquifer as an underground bed or layer of earth, gravel, or porous stone that yields water.

Arboviruses are a group of viruses that are maintained in nature and transmitted to humans primarily by blood-feeding arthropods such as mosquitoes (**Arthropod-borne virus**). Infection in humans occurs when the infected arthropod bites and takes a blood meal.

Assessment is the process whereby public health agencies identify health problems and health resources, evaluate their effectiveness, and present the results of these analyses to decision-makers and the public.

Average daily hospital census is the mean number of beds which are filled in a hospital on a daily basis, during a specified period of time, usually one year.

Bioterrorism is the intentional or threatened use of viruses, bacteria, fungi, or toxins from living organisms to produce fear, death, or disease in humans, animals, or plants.

Birth Rate: A summary measure of births based on the number of live births in a population during a specified time period.

Birth Rate = $\frac{\text{Number of live births in an area in a calendar year}}{\text{Average or midyear population in that area in that year}} \times 1,000$

Cancer is a family of over 100 different diseases fundamentally characterized by uncontrolled cell growth in the body.

Census tract is a U.S. Census Bureau defined area, a small, relatively permanent statistical subdivision of a county...designed to be relatively homogenous with respect to population characteristics, economic status, and living conditions. It contains a population of approximately 4,000 individuals (range 1,000 – 8,000). Its subdivision, the block group, is the smallest geographic census unit for which census socioeconomic data are tabulated. (Census block average population = 1,000).

Chronic health condition, according to the National Center for Health Statistics, is a departure from a state of physical or mental well-being that has lasted for 3 months or more or is a condition classified as chronic regardless of its time of onset (for example, diabetes, heart conditions, emphysema, and arthritis). In general terms, chronic health condition refers to a health effect that lasts a long time.

Community The Merriam-Webster Dictionary defines community as “a unified body of individuals; the people with common interests living in a particular area; an interacting population of various kinds of individuals (as species) in a common location, a group of people with a common characteristic or interest living together within a larger society.”

Comorbidity refers to the state in which a person has more than one disease or disability-causing condition.

Congenital Anomalies are abnormalities presented at birth.

Consequences of health include disability (long-term and short-term), the use of health services, the use of medication and quality of life.

Council or Councilmanic District Thirty-five (35) councilmanic districts were created by the Charter of the Metropolitan Government of Nashville and Davidson County, Tennessee. According to article 3 of the Charter, “There shall be thirty-five (35) councilmanic districts in the metropolitan government, which are hereby created and established in accordance with the detailed descriptions thereof by metes and bounds as set forth in Appendix Two hereto attached as a part of this Charter.” “The descriptions of the councilmanic districts given in this appendix were originally promulgated in Bill No. 81-701, § adopted Oct. 6, 1981. Descriptions of Districts 1 — 35 were entirely amended in the redistricting plan adopted by referendum vote on Sept. 5, 1991. “

Crude Death Rate is the proportion of the population that has died in a specific period of time (usually one year). It is calculated with the following formula

$$\frac{\text{Number of deaths during a specific period}}{\text{Number of persons at risk of dying during the period}} \times 100,000$$

The rate is considered an estimate because the denominator commonly used is an estimate of the mid-year population.

Diabetes is a chronic, metabolic disease characterized by high blood glucose levels caused by a deficiency of insulin production, an impairment of insulin action, or both.

Digital Rectal Exam is an examination of the lower rectum in which the clinician uses a lubricated, gloved finger to evaluate the prostate gland in men and check for other abnormalities or blood in both men and women.

Ecosystem is an ecological community together with its environment, functioning as a unit.

Endemic refers to the constant presence of a disease or infectious agent within a given geographic area. It may also refer to the usual prevalence of a given disease within such area.

Environment includes all those matters related to health which are external to the human body and over which the individual has little or no control. In this document, we refer to environment as (1) physical environment, including all areas of environmental health, and (2) social environment, including, demographic indicators, sociodemographic indicators, and socioeconomic indicators.

Epidemiology is the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to control of health problems. "Study" includes surveillance, observation, hypothesis testing, analytic research, and experiments.

Estimate is to determine roughly the size, extent, or nature of something, a rough or approximate calculation.

Fecal Occult Blood Test a non-invasive colon cancer screening test in which the stool is examined for hidden blood.

Fertility is defined, according to the Dictionary of Epidemiology, as the production of live offspring. Since fertility is restricted to live births, fetal deaths and stillbirths are not included.

Fertility rate is a measure of fertility in a population. It is a more refined measure than the birth rate. It is calculated as follows:

$$\frac{\text{Number of live births in an area during a year}}{\text{Midyear female population age 15-44 in same area in same year}} \times 1,000$$

Fetal Death, or stillbirth, is defined by the World Health Organization (WHO) as "death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation, the fetus does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles." The state of Tennessee requires all fetal deaths 500 grams or greater to be recorded. If birth weight is unknown, then the fetal death must be at least 22 weeks of gestation.

Fetal Death Rate is a measure of fetal deaths within a population. It is calculated as follows:

$$\frac{\text{Number of fetal deaths in a year}}{\text{Number of fetal deaths plus live births in the same year}} \times 1,000$$

GIS (Geographic information system) is an organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, update, manipulate, analyze, and display all forms of geographically referenced information.

Groundwater The American Heritage Dictionary defines groundwater as water beneath the earth's surface, often between saturated soil and rock, that supplies wells and springs.

Health is a state of complete physical, mental, and social well being and not merely the absence of disease or infirmity.

Health care system consists of the quantity, quality, arrangement, nature, and relationship of people and resources in the provision of health care.

Health status is related to a more medical view of health. It is generally accepted that there are two components to health status, (1) a subjective one based on an individual, personal reading of health status, and (2) a so-called objective one based on a normative, professional assessment. Subjective health status is defined as a person's own assessment of his or her health. Objective health status refers to an assessment by a health professional. It is recognized that a professional assessment remains a judgement, though based on criteria that are more specific and on which some consensus has been reached. Objective health includes mortality, morbidity (hospital morbidity, non-hospital morbidity, physician visit and non-physician visit).

Heart Disease refers to a group of heart diseases, including coronary or ischemic heart disease, hypertensive heart disease, and rheumatic heart disease.

Hepatitis C as defined by the CDC in "Case Definitions for Infectious Conditions Under Public Health Surveillance" is an acute illness with a) discrete onset of symptoms and b) jaundice or elevated serum aminotransferase levels. The laboratory criteria that are necessary for diagnosis are:

1. Serum aminotransferase levels greater than 2.5 times the upper limit of normal, and
2. IgM anti-HAV negative, and
3. IgM anti-HBc negative (if done) or HbsAg negative, and
4. Antibody to hepatitis C virus (anti-HCV) positive, verified by a supplemental test.

HIV is Human Immunodeficiency Virus, the virus causes acquired immunodeficiency syndrome (AIDS).

Homicide is a death caused by injuries inflicted by one person with intent to injure or kill another by any means. Homicide can be classified as criminal or noncriminal, which includes death caused by negligence and those committed in self-defense.

Hospital occupancy is defined as the average daily census divided by the number of staffed hospital beds during a reporting period, usually one year.

Human biology includes all those aspects of health which are developed within the human body as a consequence of the basic biology of man and the make-up of the individual. There is no feasible population-based human biology indicator available now.

Incidence or Incidence Rate is the rate at which new cases of a disease or condition occur in a population, during a specific period of time. It is calculated using the following formula:

$$\frac{\text{Number of new cases in specific period}}{\text{Number of persons at risk of becoming cases in a specific period}} \times 1,000$$

The denominator often used is the mid-year population. Incidence measures rate of a disease/condition.

Infant Mortality is defined as the death of a child before its first birthday. Infant mortality is divided into two categories:

Neonatal Mortality refers to the death of a child aged 0-27 days.

Postneonatal Mortality refers to the death of a child aged 28-364 days.

Infant Mortality Rate is the measure used to evaluate infant mortality in a population. The infant mortality rate is calculated as follows:

$$\frac{\text{Number of infant deaths in specified time period}}{\text{Number of live births in that same specified time period}} \times 1,000$$

Intersection refers to the topological integration of two layers that preserves features common to both layers in GIS.

Intersection areas are areas exhibiting features common to two or more different layers in GIS.

Layer is a collection of similar geographic features – such as rivers, lakes, counties, or cities – of a particular area or place for display on a map. Layers are the basic components of overlay operations in GIS.

Licensed hospital beds represent the total number of inpatient beds in a hospital or group of hospitals on the day of certification inspection.

Lifestyle and behavior consists of the aggregation of decisions by individuals that affect their health. The behavioral risk factors domain in the MAPP Community Health Status Assessment list can be considered to belong to the lifestyle and behavior element.

Mammogram or Mammography refers to an X-ray technique for the breast with the purpose of early detection of breast problems, including cancer.

Maternal Mortality, according to the CDC, is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Maternal Mortality Ratio is the statistic used to measure maternal mortality in the population. It is calculated as follows:

$$\frac{\text{Number of maternal deaths in a specified time period}}{\text{Number of live births in that same time period}} \times 100,000$$

Mortality is death, the irreversible cessation of all of the following: (1) total cerebral function, (2) spontaneous function of respiratory system, and (3) spontaneous function of the circulatory system.

Neighborhood In this document, MHD considers Davidson County, TN as a community. Any geographical subdivision within Davidson County will be treated as a neighborhood.

Nosocomial infection relates to an infection acquired during a stay in a hospital or other health care facility. Nosocomial infections may also be called hospital-acquired infections. These infections were not present or incubating at the time of the admission to the hospital and were not the reason for hospitalization. Nosocomial infections also include infections that were acquired during hospitalization but did not appear until after discharge.

Overlaying refers to the process of stacking data layers on top of each other so that features in one layer can be analyzed in relation to features in other layers at the same geographical position in GIS.

Ozone is a colorless gas that can be found in the air we breathe. Ozone exists naturally in the earth's upper atmosphere, known as the stratosphere, where it shields the earth from the sun's ultraviolet rays. However, ozone is also found close to the earth's surface. This ground-level ozone is a harmful air pollutant. Ground level ozone forms through a complex chemical reaction involving volatile organic compounds, oxides of nitrogen, and sunlight. High ozone levels occur most frequently on hot summer afternoons when the air is stagnant. The ozone season in Middle Tennessee runs from May 1 until the end of September.

Pap Smear/Pap Test is a screening test for cervical cancer in which cells scraped from a woman's cervix are examined microscopically.

Particulate matter is any airborne finely divided solid or liquid material other than uncombined water.

Planning District: For public health planning purposes, Nashville has been divided into sixteen planning districts (PDs). Originally, there were fourteen planning districts. They were geographical subdivisions of the county adopted by the Metropolitan Planning Commission. Each planning district consists of one to sixteen 1990 census tracts. Due to noticeable changes in demographic factors in planning districts 7 and 10, it was decided in 1998 to divide planning districts 7 and 10 each into two subdivisions, i.e., PD 7 north (7a), PD 7 south (7b), PD 10 north (10a), and PD 10 south (10b).

Prevalence refers to the number of existing cases of a condition or disease in a population during a specific period of time. Prevalence measures the burden of a disease/condition.

Risk is the probability that an event will occur, e.g. that an individual will become ill or die within a stated period of time or age. Also, a non technical term encompassing a variety of measures of the probability of a generally unfavorable outcome.

SIDS is Sudden Infant Death Syndrome. The sudden death of a baby caused by unknown factors that have no specific symptoms.

Sigmoidoscopy is a test used for colon cancer screening in which the rectum, colon, and large bowel are examined with a flexible scope.

Sliver area (sliver polygon) is a small overlap area, or gap, along the borders of an area, which results from errors in overlaying or edge-matching several layers of maps in GIS.

Staffed hospital beds represent the number of inpatient beds in a hospital or group of hospitals for which there is adequate medical staff to provide care for patients in those beds.

Stroke is an interruption of the flow of blood to the brain. Stroke includes a group of diseases that affect the arteries of the central nervous system. Stroke results when an artery in the brain is either ruptured or clogged by a blood clot (thrombus), a wandering clot (embolus), or atherosclerotic plaque. Nerve cells in the affected part of brain die within minutes, often resulting in neurologic impairment.

Suicide is death as a result of violence directed against self.

Unintentional Injuries is another name for accidents and adverse effects. Refers to any unintentional damage to the body resulting from acute exposure to thermal, mechanical, electrical, or chemical energy or from the absence of such essentials as heat or oxygen.

Vaccine is a product that consists of weakened or killed microorganisms (bacterium or virus) given for the prevention or treatment of infectious diseases. Vaccines may be administered by injection or by mouth. In the future, vaccines may be given by nasal spray, an aerosol that is received simply by breathing, or by a needle-less injection system.

Vaccine schedule is a plan of vaccinations that are recommended for specific ages and/or circumstances.

Vector-borne disease refers to a disease or infection that may be transmitted to humans by an invertebrate, animal without a spinal column. These invertebrates include ticks, mites, mosquitoes, and flies. Transmission may occur through a bite or through an area of trauma caused by scratching or rubbing.

Volatile Organic Compounds (VOC) are any compounds of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participate in atmospheric photochemical reactions. Several other carbon compounds have been excluded due to their negligible photochemical reactivity.

Watershed The American Heritage Dictionary defines watershed as the region draining into a river, river system, or other body of water.

YPLL is Years of Potential Life Lost. The number of years of life lost as the result of a death, before the age of 75.

Zipcodes are administrative units established by the United States Postal Service for the most efficient delivery of mail, and therefore, generally do not respect political or census statistical boundaries.

Technical Notes

Data Sources:

1. 2000 census population data were obtained from the U.S. Bureau of the Census, mainly from its website: <http://www.census.gov> during 2001 and 2002.
2. 1991-1998 population estimates were obtained from Tennessee Department of Health (TDH), Office of Health Statistics and Information.
3. Population data for public health planning districts were derived from 2000 census data (see “Health Planning District Population Estimation” in this Technical Note for detailed information).
4. Population data for Metro council districts were obtained from Metropolitan Planning Commission June 2002.
5. Social environment related population data were mainly obtained from the U.S. Bureau of the Census and Nashville Chamber of Commerce.
6. Physical environment related data were obtained from the Bureau of Environmental Health, Metropolitan Public Health Department of Nashville and Davidson County (MPHD).
7. Lifestyle and behavioral risk factor data were mainly from the Behavior Risk Factor Surveillance Survey (BRFSS) conducted by Division of Research and Evaluation of MPHD. Tennessee and U.S. BRFSS data were obtained from the CDC website: <http://www.cdc.gov/brfss/>
8. Drug abuse violation data were obtained from Metro Nashville Police Department and from the U.S. Department of Justice Uniform Crime Reports.
9. Health care systems related data were mainly from TDH.
10. Health status and quality of life data were obtained from the BRFSS conducted by MPHD.
11. Maternal and infant health related data were produced from natality and mortality datasets provided by TDH.
12. U. S. mortality data were obtained from U.S. Department of Health and Human Services, CDC, and National Center for Health Statistics (NCHS).
13. National objectives for 2010 were obtained from the U.S. Department of Health and Human Service’s publication, *Healthy People 2010*.
14. Mortality and natality data for Nashville, Tennessee, Shelby County, TN, Knox County, TN, and Hamilton County, TN were obtained from TDH, Office of Health Statistics and Information.
15. Nashville’s mortality data was compiled mainly from the original death certificates collected by the Vital Records Division of the Metropolitan Public Health Department of Nashville and Davidson County. Copies of death certificates occurring to Nashville/Davidson County residents in other counties and states are forwarded to the Tennessee Department of Health and included in the Davidson County residents’ mortality data set.
16. The morbidity data contained in this report for Nashville/Davidson, Hamilton, Knox, and Shelby Counties and Tennessee were obtained from the Tennessee Department of Health and from records kept at the Metropolitan Public Health Department.
17. Cancer incidence data were obtained from Tennessee Cancer Registry of TDH.

18. HIV and AIDS data were obtained from the HIV/AIDS Reporting System (HARS) at MPHD on March 19, 2002 and represent all cases reported to MPHD as of that date. HARS subsets used to prepare this report include the following:
AIDS by date of report – %arptdate %aidscae and rcounty="DAVIDSON CO." and aidscae='1' and arptdate=%y[2000]
AIDS by date of diagnosis – %aidscae and rcounty="DAVIDSON CO." and aidscae='1' and dxmoyr=%y[2000]
HIV by date of report – %repcat and hcounty="DAVIDSON CO." and (repcat='1' and '3') and hposdate=%y[2000]
HIV by date of diagnosis – %repcat and hcounty="DAVIDSON CO." and (repcat='1' and '3') hivpmoyr=%y[2000]
19. STD case data for Nashville was obtained from the MPHD National Electronic Surveillance System (NETSS) as of 10/18/2001 for 1995—2000 data, and as of 02/14/2002 for 2001 data. STD cases for Tennessee were obtained from the TDH as of 06/13/2002.
20. Data for leading health indicators relevant to adolescents was obtained from Nashville's 1999 Youth Behavior Risk Factor Survey. The survey was conducted on a representative sample of public school students in grades 9 through 12. To estimate vigorous physical activity, we used responses to the question regarding sweat-inducing exercise on three or more days of the past seven days. This is only a proxy measure of vigorous physical activity, which is defined in the Healthy People 2010 objective as activity that promotes cardiorespiratory fitness carried out on three or more days per week for 20 minutes or more per occasion.
21. The Healthy People 2010 target is for children 19-35 months old, however Nashville numbers are only available for children 24 months of age. We consider this an acceptable proxy as the immunizations required are the same for the national target and for Nashville's 24-month children surveyed. Healthy People objective 14-24 states that 80% of children between 19 and 35 months should be fully immunized by 2010.

Data Processing/Analysis:

1. For the purpose of mortality statistics, every death is attributed to one underlying condition, based on information reported on the death certificate. Death certificates are completed by the attending physicians, medical examiners, or coroners. The accuracy of data depends on the thoroughness of the individuals who complete the death certificates. In the case of sudden death without autopsy, the physician must make an educated guess as to the cause of death. Another cause of inaccuracy is the determination of which disease to be considered the underlying cause of death. Only the underlying death is coded according to the International Classification of Diseases, Ninth Revision (ICD-9). Secondary causes that may have significantly contributed to death are not recorded. With increased life expectancy, people are more likely to die of multiple causes; therefore, a conservative approach should be taken when interpreting mortality information.
2. Causes of death are ranked according to the number of deaths (not rates) assigned to classifications in the 113 Select Causes of Death and 130 Select Causes of Infant Death. Leading causes of death are determined by this cause-of-death ranking.

3. Years of potential life lost (YPLL) is a measure of premature death. YPLL is presented in this report for the death of persons under 75 years of age because the average life expectancy in the United States is over 75 years. YPLL-75 is calculated using the following eight groups: under 1 year, 1-4 years, 15-24 years, 25-34 years, 35-44 years, 45-54 years, 55-64 years, and 65-74 years. The number of deaths for each age group is multiplied by the years of life lost, calculated as the difference between age 75 years and the midpoint of the age group. For the eight age groups, the midpoints are 0.5, 7.5, 19.5, 29.5, 39.5, 49.5, 59.5, and 69.5. For example, the death of a person 15-24 years of age counts as 55.5 years of life lost. Years of potential life lost is derived by summing years of life lost over all age groups.
4. In some instances, analysis of age, race, and gender information in morbidity data was limited or forgone in this report due to the high percentage of reported cases whose age, race, and/or gender was unknown.
5. Notifiable disease data includes only reported cases. Because the notifiable disease reporting system is primarily a passive system, it is possible that only a portion of all notifiable diseases are actually reported. The percentage of reported notifiable diseases may vary from disease to disease. Diseases which cause the most severe clinical symptoms/illness are most likely to be reported. Reporting may also be influenced by the degree of testing required for diagnosis, the availability of laboratory facilities, and the cost of testing. Increased media coverage and subsequent increased public awareness pertaining to communicable diseases may increase reporting. Finally, the initiation of active surveillance techniques by health officials may lead to improved and more accurate reporting patterns. The Centers for Disease Control and Prevention case definitions were used to determine which reported diseases constituted a case and were reported to the Tennessee Department of Health. These definitions are used to standardize reporting nationally so that disease incidence may be compared among different geographic locations.
6. Race Groupings: Only white, black, and other races groupings could be done for most of the data analyzed in this report. Either numbers were too small or racial classification data was unreliable for other racial groups such as Hispanics, Asians, and Native Americans, and ethnicity data such as Hispanic status. Since the racial category "other" includes many different racial groups that may have different risks and behaviors, the results may be underestimates.
7. Nashville BRFSS: The data from each survey year were weighted so that the gender-race-age distribution of the respondents to the BRFSS would match the gender-race-age distribution of Nashville, TN in those years. Stratified analysis was done for covariates that are available not only in the BRFSS, but also in mortality and natality data for consistency across chapters of the *Health Nashville* report – these are gender, race, age, education, and marital status. Persons with unknown age were put in the 65 years and older group. Persons with unknown race were put in the other races group. Persons with unknown education were put in the less than high school diploma group. For marital status stratified information, persons with unknown marital status were excluded. The Nashville BRFSS sampling frame was designed to obtain approximately equal numbers of respondents from each health planning district. The Tennessee and U.S. BRFSS samples were obtained using a different sampling technique – the Mitofsky-Waksberg design – and were weighted to correct for geographic sampling bias, non-telephone coverage areas, and to match the age-by-sex or age-by-race/ethnicity-by-sex distribution of each state or region. For more information on the Tennessee and U.S. BRFSS sampling design, please go to their website at: <http://www.cdc.gov/brfss>. Because the Nashville survey uses a different sampling design than the state and national surveys, comparisons of Nashville to state and national data should be made carefully and not over-interpreted.

8. Safety Belt Use: The data was coded to combine the separate questions (#76 and 77) from 1996 to match the combined question regarding child restraints (#14) used in 1998. These questions ask how often the respondent or children under age 16 in his/her household wear safety belts or use child safety seats when driving or riding in a car. Possible answers were 1) always, 2) nearly always, 3) sometimes, 4) seldom, and 5) never. For simplicity these answers have been reduced to 1) always and 2) not always. Many publications use this method of dichotomizing the data.¹
9. Bicycle Helmet Use: The data for the bicycle helmet use section were obtained from the 1996 BRFSS question on how often the children in the household have worn bicycle helmets when riding a bicycle in the last year. The responses were classified into two groups – 1) always and 2) not always.
10. Substance Abuse: The category “drug-induced” mortality is defined by the National Center for Health Statistics to include deaths from mental and behavioral disorders due to psychoactive substance abuse; accidental poisoning by and exposure to drugs, medicaments, and biological substances; intentional self-poisonings (suicide) by and exposure to drugs, medicaments, and biological substances; assault (homicide) by drugs, medicaments, and biological substances; and poisoning of undetermined intent by and exposure to drugs, medicaments, and biological substances. This does not include accidents, homicides, or other causes that are indirectly related to drug use, or fetal or infant deaths due to mother’s drug use.
11. Adult Immunizations: The self-report data that we obtain from surveys such as the BRFSS can be biased in several ways. Misunderstood questions, words, or language, the desire to please the interviewee, memory difficulties, or variations in the way interviewers probe respondents all contribute to the potential for inaccurate data. Medicare data also contains inherent inaccuracies. Vaccination rates obtained from Medicare data are estimated based on claims that are filed. In some cases, physicians or others who administer influenza and pneumococcal vaccines may not file a claim with Medicare, perhaps because they do not know how to file claims, or the cost of filing the claim exceeds the compensation that they would receive from Medicare. In addition, adults less than 65 years old are not covered by Medicare in most cases, therefore vaccination estimates of the under 65 age group are not available using Medicare data. The following groups are at increased risk of complications from influenza, and are recommended to receive the influenza vaccine annually¹: persons aged 65 and older; residents of nursing homes and other chronic care facilities; adults and children (aged 6 months to 64 years) with chronic pulmonary or cardiovascular disorders, including asthma; adults and children who have required medical care in the previous year because of chronic metabolic diseases (diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression; children and adolescents receiving long term aspirin therapy and therefore at risk for Reye syndrome; and women who are or will be in the second or third trimester of pregnancy during the influenza season. Influenza vaccination is also recommended for adults aged 50-64 years old because of the increased prevalence of high-risk conditions, and for those who can transmit influenza to those at high risk (e.g. health care workers, nursing home employees, home health aids and household members of those at high risk). The following groups are recommended to receive the pneumococcal vaccine²: persons aged 65 and older should receive a one-time dose of pneumococcal vaccine (If the person was vaccinated before the age of 65 and it has been 5 or more years since the last vaccination, an additional dose should be administered.); adults and children (aged 2—64 years) with chronic pulmonary or cardiovascular disorders (**not**

including asthma), diabetes mellitus, immunocompromising conditions (including those on chemotherapy or corticosteroids), alcoholism, chronic liver disease, functional or anatomic asplenia (e.g. sickle-cell disease), or cerebrospinal fluid (CSF) leaks; residents of nursing homes or other chronic care facilities; and immunocompromised persons aged 2–10 should receive a single revaccination if more than three years have elapsed since receipt of the first dose.

Immunocompromised persons older than ten should receive a single revaccination if more than 5 years have elapsed since the first dose. Vaccination rates estimated from BRFSS data may be underestimates or overestimates of the true influenza and pneumococcal vaccination rates in Nashville in 1998 because they are based on self-reported vaccination status by survey respondents. The Medicare billing data rates are consistently lower than the rates obtained by self-report from the BRFSS. It is likely that the Medicare billing data underestimates the true influenza and pneumococcal vaccination rates in Nashville in 2000 because, in some cases, doctors may fail to bill Medicare for vaccines they administer resulting in the misclassification of that beneficiary as unvaccinated when they in fact did receive a vaccination. The disparity in the findings from the two different data sources could be a result of many factors. The populations being measured in the two different data sources may be very different and therefore it would be expected that the data would show different results. It is also possible that Nashville saw a large increase in pneumococcal vaccinations in 2000 compared to other areas, or that physicians in Nashville are more vigilant about billing Medicare for the vaccines they administer, than are doctors in other parts of the state and in the U.S.

12. Communicable diseases in this report are a selected group of notifiable diseases that are reported to the Metropolitan Public Health Department of Nashville and Davidson County (MPHD) regularly (other than AIDS/HIV, STDs, and TB). Other communicable diseases not listed in this report may be added as needed. Communicable diseases make up the largest portion of notifiable diseases, which are diseases that are required by law to be reported to the health department. Diseases that can be prevented by immunization include influenza, measles, mumps, polio, rubella (German measles), pertussis, diphtheria, tetanus, *Haemophilus influenzae* type b, hepatitis B, varicella (chickenpox), and others. Influenza, measles, diphtheria, mumps, pertussis, and tetanus are the six vaccine-preventable diseases listed regularly in this report, although others may be included as needed.
13. For MCH data, the calculation of statistics with small numbers often produces unstable results that demonstrate great fluctuation from year to year. Percentages are only calculated if the number of births is greater than 10. Groupings with less than 10 events are excluded from the analysis.
14. HIV and AIDS cases are tabulated two different ways: 1) by date of diagnosis and 2) by date of report to MHD. HIV cases had no AIDS defining conditions at the time of diagnosis. If HIV and AIDS were diagnosed simultaneously, the individual was counted only as an AIDS case.
15. HIV and AIDS cases include only individuals who were residents of Nashville at the time of diagnosis. For HIV cases, this means residence at first positive HIV-antibody test, and for AIDS cases, this means residence at diagnosis of the first AIDS indicator condition(s). Nonresidents were not included in this report, even if they became ill, were diagnosed, or received treatment in Nashville.
16. HIV and AIDS data presented in this report may not agree with data previously published by TDH or MPHD due to a number of factors. The number of cases will differ depending on whether date of diagnosis or date of report is used as the reference date. The number of cases by date of diagnosis will differ depending on the year the report is produced because of the time delay between when cases are diagnosed and when they are reported, sometimes several years. Specifically, rates

of disease based on date of diagnosis among Nashville residents differ from numbers previously published in the report “Sexually Transmitted Diseases in the 1990’s in Davidson County, Tennessee” because additional cases diagnosed in past years have since been reported. In addition, some reports may include individuals who are living with HIV/AIDS in Nashville and/or are receiving treatment and services in Nashville, even if they were diagnosed elsewhere, for the allocation of public health resources. Those individuals were excluded in this report.

17. According to the CDC, in Nashville there were 230 AIDS cases reported in 1999 and 340 AIDS cases reported in 2000, however, these numbers reflect reports from counties contained within the Nashville metropolitan statistical area (MSA). In addition to Davidson County, counties included in the Nashville MSA are: Cheatham, Dickson, Montgomery, Robertson, Rutherford, Sumner, Wilson, and Williamson Counties.
18. HIV and AIDS rates reported here are incidence rates per 100,000 population. The year 2000 population data used to calculate year 2000 rates was obtained from the U.S. Census Bureau. Population estimates for previous years used to calculate rates of disease from 1995—1999 were obtained from the TDH and are based on data provided by the University of Tennessee, Department of Sociology. Incidence rates are calculated as follows:

$$\text{Incidence Rate} = \frac{\text{Number of new cases (reported or diagnosed) in year}}{\text{Number of people at risk during the year}} \times 100,000$$

19. The HIV/AIDS dataset does not allow for a separate ethnic identity, separate from race, therefore, for the purposes of analysis, race was reported as black, white or other, with the “other” group including identified Hispanics.
20. HIV information for the entire U.S. includes only cases reported from the 34 areas with laws or regulations requiring confidential reporting by name of individuals with confirmed HIV infection.
21. The number of STD cases reported here may differ from numbers previously published by Tennessee or by the U.S. government because of differences in data collection and reporting practices. Many of the race group differences are attributable to the manner in which ethnicity and race are reported by different entities, for example, the state of Tennessee includes all those of Hispanic origin in the “Other” race category, whereas CDC and MPHD include Hispanics as a unique race/ethnicity category.
22. STD rates for Nashville published in this document may differ from rates previously published by Tennessee or by the U.S. government because of differences in the denominator used to calculate rates for reasons detailed previously, and because of differences in the population data used to calculate disease rates.
23. STD rates reported here are incidence rates per 100,000 population. The population data used to calculate year 2000 STD rates for Nashville and Tennessee was obtained from the U.S. Census Bureau. Year 2001 rates were also calculated using year 2000 census data because estimates for 2001 were not available at the time of analysis. Population data used to calculate STD rates for 1995—1999 are estimates based on the 1990 census obtained from the TDH and provided by the University of Tennessee, Department of Sociology. Incidence rates are calculated as follows:

$$\text{Incidence Rate} = \frac{\text{Number of new cases (reported or diagnosed) in year}}{\text{Number of people at risk during year}} \times 100,000$$

24. Published STD rates reported from CDC are calculated using intercensal population estimates provided by the U.S. Census Bureau for 1995—1999 rates, and for year 2000 rates because year 2000 census data had not been released at the time of analysis. See individual publications for detailed information on the calculation of national STD rates.

Health Planning District Population Estimation:

1. **Background:** The population numbers for MPHD Health Planning Districts were obtained by performing an overlay analysis with a geographic information system (GIS). A GIS is a computer-based tool used to analyze information that can be associated with a known location on the earth, or in our case, in Nashville. Within a GIS, information that describes the location of geographic features such as streets, fire stations, census tracts, or zip code areas, is grouped into categories based on the particular type of feature it is. For instance, all fire stations would be in the same “fire station” category. These categories are called layers. Additional information about the geographic features can also be stored in each layer. In the fire station example, additional information might be the number of staff at each station, or the number of trucks.

Using a GIS, you can add layers to a map of the city to show the exact location of the features (e.g. fire station) in the city. In the fire station example, by displaying the number of fire trucks at each fire station on the map, one can identify which areas of the city have the most fire trucks available. By adding two or more layers to a single map, you can see different types of features at the same time and learn how they are related to each other. If a fire station layer was displayed with a layer containing information about schools, and a layer of streets and highways, it would be possible to determine the number of fire stations and fire trucks near each school, as well as the streets that would need to be taken to get from each fire station to a particular school. This process is called overlay analysis.

2. **Methods:** Population demographics for health planning districts were estimated by overlaying U.S. Census Bureau census tract areas and population numbers, with the major assumption that populations are equally distributed within each census tract.

For the 2000 Census the U.S. Census Bureau divided Davidson County, Tennessee into 144 contiguous areas called census tracts. As designed by the U.S. Census Bureau these 144 census tracts cover all of Davidson County and do not include any areas that are not Davidson County. Similarly, the MPHD divides Davidson County into 16 contiguous health planning districts, while the Metro Council divides Davidson County into 35 contiguous council districts. The criteria used to establish boundaries for census tracts are different than the criteria used to establish boundaries for health planning districts or council districts. Both health planning districts and council districts are larger geographic entities than census tracts.

Therefore, a single health planning district or a single council district tends to cover the same geographic area as multiple census tracts, and can contain entire census tracts and/or portions of several different census tracts. The methodology was used in this analysis, with a health planning district layer.

3. **Health Planning District Population Estimation:** To estimate the population of the health planning districts (Figure TN1), the Davidson County census tracts layer

(Figure TN2) was overlaid with the health planning districts layer (Figure TN3). Using a GIS, a new “intersection” layer was generated based on the overlay, containing the geographic information of both the census tracts layer and the health planning districts layer (Figure TN4). Each area in the new intersect layer represented a census tract, or portion of a census tract, which overlapped with a portion of a health planning district. The proportion of each census tract falling within different health planning districts was calculated by dividing the total area of the census tract by the area of each census tract part falling within a different health planning district (Figure TN5). If the entire census tract fell within the boundary of the health planning district, then the proportion of the census tract falling within the health planning district was 100%. If the census tract was divided among several health planning districts, then the proportion of the entire census tract falling within each of the different health planning districts summed to 100%. In geographic terms, following the intersect overlay of the census tract layer and the health planning district layer, each census tract or census tract portion is called an “intersect area”.

To obtain population and demographic data for each of the health planning districts, the population of each intersect area was first calculated. This was done by multiplying the intersect area’s census tract proportion by the entire census tract population (Table TN1). Finally, the population estimates of the intersect areas contained within each of the health planning districts were summed to obtain total population estimates for each of the health planning districts (Table TN2).

4. **Limitations:** One limitation of this methodology is that a uniform population density is assumed throughout each census tract and health planning district. In other words, it is assumed that the people represented by the demographic data are just as likely to reside in one portion of a census tract or health planning district as they are in another portion of the same geographic feature. Water bodies or other regions where it is known people do not live were not taken into account. In addition, rounding error and “sliver areas” resulted in the total population estimates for all of the health planning districts summed together (i.e. total Davidson County population based on the sum of health planning districts) to be slightly different from the total population of all census tracts summed together.

Rounding error is introduced when an intersect area’s census tract proportion is applied to a population count for a census tract. If the intersect area is equal to an entire census tract (the intersect area’s census tract proportion is 100%) then the entire population of that census tract will be assigned to the same health planning district. However, if an intersect area represents only a portion of the census tract, then the population for that intersect area is a decimal value rather than a whole number, resulting from the multiplication of the intersect area’s census tract proportion with the entire census tract population. When the population of all of the intersect areas within each health planning district are added together, fractions of individuals are summed together to represent new whole individuals. The end-result of the summation is also a decimal value, which must be rounded to the nearest whole number to represent population counts.

Sliver areas are introduced when the boundaries for census tracts and health planning districts happen to coincide, generally along street centerlines or the county boundary. Because the GIS data (map) for census tracts and health planning districts are from different sources, the boundaries do not overlay precisely and extremely small intersect areas result. For this analysis, sliver areas smaller than 0.05% of the total census tract area were discarded from the intersection layer.

To correct some of the errors caused by rounding and sliver polygons, health planning district population numbers were rescaled to equal the total population of Davidson County when summed, using the following formula:

$$\frac{\text{Sum of all Health Planning District Populations}}{\text{Health Planning District Total Population}} \times \text{Davidson County Census Population}$$

As a result of rescaling, underestimates of the total population would result in the addition of population to each health planning district, proportional to the population of each health planning district. Similarly, overestimates of the population would result in proportional subtraction of population counts from each health planning district.

It is important to remember that these numbers are estimates and may not be representative of the true population distribution in any of these areas. U.S. Census Bureau data should be referenced when using the total Davidson County population.

Planning District:

For public health planning purposes, Nashville has been divided into sixteen planning districts (PDs). Originally, there were fourteen planning districts. They were geographical subdivisions of the county adopted many years ago by the Metropolitan Planning Commission. Each planning district consists of one to sixteen 1990 census tracts. Due to noticeable changes in demographic factors in planning districts 7 and 10, it was decided in 1998 to divide planning districts 7 and 10 each into two subdivisions, i.e., PD 7 south (7b), PD 7 north (7a), PD 10 south (10b), and PD 10 north (10a).

Councilmanic District:

Thirty-five (35) councilmanic districts were created by the Charter of the Metropolitan Government of Nashville and Davidson County, Tennessee. According to article 3 of the Charter, “There shall be thirty-five (35) councilmanic districts in the metropolitan government, which are hereby created and established in accordance with the detailed descriptions thereof by metes and bounds as set forth in Appendix Two hereto attached as a part of this Charter.” “The descriptions of the councilmanic districts given in this appendix were originally promulgated in Bill No. 81-701, § adopted Oct. 6, 1981. Descriptions of Districts 1 — 35 were entirely amended in the redistricting plan adopted by referendum vote on Sept. 5, 1991. ” In this report, it refers as “ Council District (1991-2002)”. Descriptions of Districts 1 — 35 were entirely amended again in the

Figure TN1. Health Planning Districts in Nashville, TN

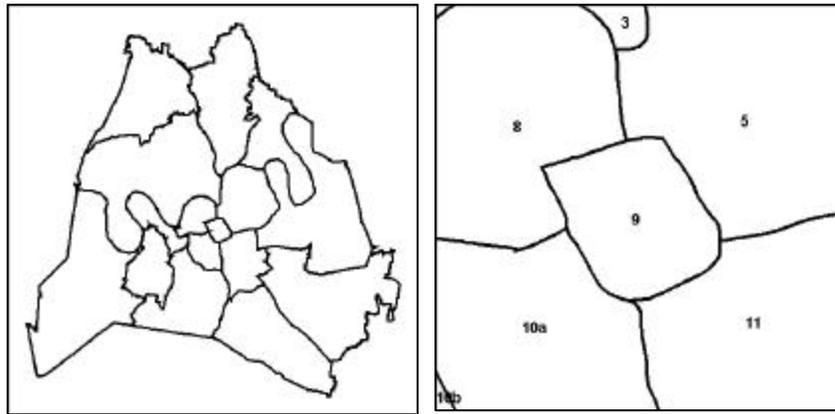


Figure TN2. Census Tracts in Nashville, TN

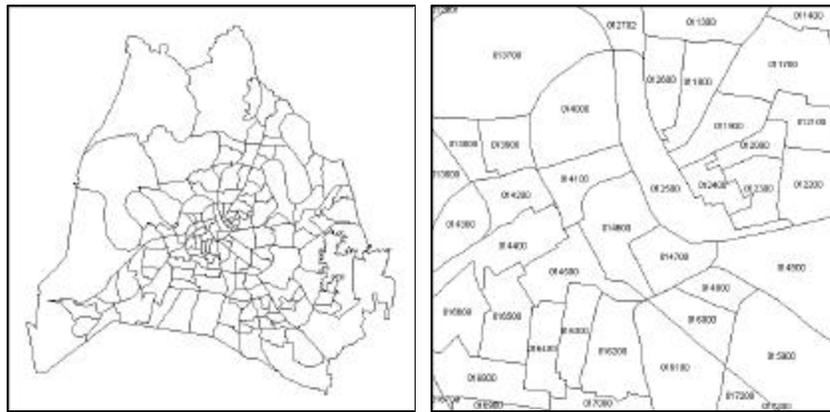
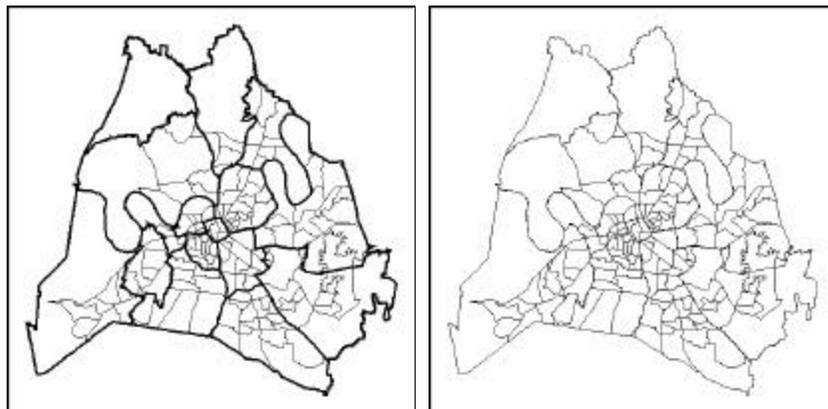


Figure TN3. Overlay of Health Planning District and Census Tract Layers



Figures TN 4, 5. Intersection of Health Planning District and Census Tract Layers and Calculation of Intersection Area Proportions



Table TN1. Calculation of Intersect Area Population Values

Intersection ID	Census Tract	Health PD	Area Percentage	Tract Population	Intersection Population
1	012500	5	31%	234	72.54
2	012500	9	54%	234	126.36
3	012500	5	15%	234	35.1
4	014100	9	100%	530	530
5	014500	10a	63%	357	224.91
6	014500	9	37%	357	132.09
7	014600	9	100%	2306	2306
8	014700	9	100%	308	308

Table TN2. Calculation of Health Planning District Population Values

Intersection ID	Census Tract	Health PD	Area Percentage	Tract Population	Intersection Population
2	012500	9	54%	234	126.36
4	014100	9	100%	530	530
6	014500	9	37%	357	132.09
7	014600	9	100%	2306	2306
8	014700	9	100%	308	308
Total Population for Health Planning District 9:					3402.45

redistricting plan based on census 2000 data and was adopted in November 12, 2001. In this report, it is referred to as “ Council District (2003)”. Council District (2003) will take effect after the 2003 metropolitan council election.

Residential Data:

Data presented in this report is for Nashville/Davidson County residents only.

Software:

Data were analyzed using Microsoft Excel 97; SAS for Windows, Version v.6.12; and SPSS v.9.0 for Windows. Maps were produced using ArcGIS v.8.2. Data presentation preparations were done in Microsoft Excel 97 and Microsoft Word 97. The layout of this report was done in Adobe PageMaker v.7.0.

Technical Notes References:

1. CDC. Prevention and control of influenza: recommendations of the Advisory Committee on Immunization Practices. Morbidity and Mortality Weekly Report 2002; 51(RR-3): 1-31.
2. CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). Morbidity and Mortality Weekly Report 1997; 46(RR-8): 1-24.