

Emergency Planning

to Address Chronic Health Conditions in Missouri



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Report Information

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Description: Predisaster rates of selected chronic diseases and estimates of the population affected are provided for the state and seven regions utilizing information from the 2005 Missouri Behavioral Risk Factor Surveillance System. This information is provided to assist in planning and preparing for the control of chronic diseases should a natural disaster occur.

Audience: A wide range of professionals, including state and local emergency planners, health providers, public health professionals, and others involved in disaster planning may use this information to inform planning efforts.

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EXECUTIVE SUMMARY

Natural disasters pose major public health challenges. Although emergency planning must include evacuation procedures; transportation plans; meet the universal basic needs for shelter, food and water; and prevent infectious disease outbreaks, lessons learned from recent natural disasters indicated that addressing chronic disease in disaster planning is also of vital importance.

The purposes of this report are to identify the chronic diseases that most frequently require attention following a natural disaster, estimate the numbers of Missouri residents with these conditions using the most current 2005 population estimates, and provide an overview of the essential types of treatment and medical supplies necessary to meet the need posed by these conditions should a natural disaster occur in Missouri.

This report uses the 2005 Behavioral Risk Factor Surveillance System (BRFSS) to estimate the prevalence of chronic diseases in Missouri and the literature to identify medical services that would be needed to manage chronic diseases following a natural disaster. The geographic location of Missouri hospitals and long-term care facilities are also included because it is crucial to know the location of these facilities for evacuation planning, as well as the ability of these facilities to serve as resources and manage infectious and chronic diseases during and following an emergency.

Findings indicate a substantial number of people in Missouri have a chronic illness, particularly arthritis, hypertension, asthma, diabetes and cancer, that will require access to adequate medication, supplies and treatment during and following a natural disaster. Of highest priority are the identification, appropriate treatment, and management of potential life-threatening conditions including diabetes, cardiovascular disease, asthma, individuals receiving dialysis for kidney failure and those requiring oxygen for chronic respiratory diseases.

The prevalence of many chronic diseases (i.e., coronary heart disease, myocardial infarction, stroke, hypertension, diabetes and cancer) were significantly higher among Missourians with less than a high school education and household incomes under \$15,000. Adults in the Southeast Region of



Lessons learned from recent natural disasters indicate that addressing chronic disease in disaster planning is of vital importance.

Missouri reported significantly more physician-diagnosed arthritis; activity limitations due to physical, mental or emotional problems; and having a health problem that required the use of special equipment.

Recommendations to strengthen disaster and communication plans include:

- Develop a list of essential medications consistent with the burden of chronic diseases, include a disaster prescription plan to accommodate emergency prescribing and dispensing by shelter physicians, and identify alternatives for increasing supplies of medications or replacement medications.
- Have standing arrangements with nearby facilities or other states to evacuate the most critically ill, particularly individuals requiring ventilator support and those who are not ambulatory, as well as to safely house evacuees with chronic conditions.
- Encourage individuals to include their medical history information and an insurance card as a part of their emergency supplies.
- Conduct an initial chronic disease needs assessment with the ability to connect to needed resources, use all modes of communication to educate people who may be affected by the disaster, and provide information to ensure chronic diseases remain stable and on measures to be taken for reducing infectious disease transmission and prevent disease complications such as good hand washing, wound care, drinking water safety, etc.

Only through advanced planning, networking, and continuous surveillance can chronic care needs be met and adverse health outcomes minimized during and after a disaster.



A substantial number of people in Missouri has a chronic illness, particularly arthritis, hypertension, asthma, diabetes and cancer, that will require access to adequate medication, supplies and treatment during and following a natural disaster.

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In the aftermath of hurricanes, earthquakes, floods, tsunamis and other natural disasters, the treatment of chronic diseases following such events has emerged as a critical public health issue.^{1,2,3} Inadequately controlled chronic diseases may cause exacerbation of the disease or worse yet, become life threatening.

In situations where there has been large-scale displacement of residents and the medical infrastructure severely disrupted, the challenges of transporting and treating the most critical and chronically ill exceeded the best made plans.

In addition, a large proportion of the population is aging. Older adults, those who are disabled, as well as anyone with a chronic condition, often has more than one chronic disease, which adds to the complexity of evacuation and treatment. Considering these factors and the magnitude of recent catastrophic events, advanced planning is challenging but crucial.

The purposes of this report are to identify the chronic diseases that most frequently require attention following a natural disaster, estimate the numbers of Missouri residents with these conditions and provide an overview of the essential types of treatment and medical equipment necessary to meet the need posed by these conditions should a natural disaster occur in Missouri.

This report uses the Behavioral Risk Factor Surveillance System (BRFSS) to estimate the prevalence of chronic diseases in Missouri and the literature to identify medical services that would be needed to manage chronic diseases following a natural disaster.



The purposes of this report are to identify the chronic diseases that most frequently require attention following a natural disaster and provide an overview of the essential types of treatment and medical equipment necessary.

Based on a limited needs assessment, the Centers for Disease Control and Prevention (CDC) found that following Hurricane Katrina, with the exception of injuries, the majority of medical and health visits were related to medication refills, oral health issues and chronic diseases.² The top 10 conditions among persons staying in an evacuation center, between September 10-12, 2005, are shown in Table 1.

In addition to the leading chronic conditions found among persons staying in an evacuation center, there are a number of other chronic diseases such as cancer, HIV and kidney disease that can become life threatening and should be assessed in the population affected following a natural disaster. There are other chronic conditions that may not be immediately life-threatening if treatment is discontinued for an extended period, but would severely affect functioning and quality of life such as arthritis and epilepsy.

In Florida, following the five hurricanes that occurred in 2004, there were many individuals arriving at the

special-needs shelters with a number of chronic conditions including diabetes, heart disease, kidney disease, cancer, COPD, arthritis, asthma, emphysema, Alzheimer’s disease, anxiety disorders, Crohn’s disease, cystic fibrosis, depression, epilepsy, multiple sclerosis, Parkinson’s disease, or a combination of these conditions.⁵ The needs assessment and emergency response plan should include as many of these conditions as possible.

Additional issues encountered in Florida that should be considered in emergency response planning for individuals with chronic diseases included that many people needed oxygen and special diets (e.g., heart-healthy, low-sodium, low-fat food); were obese or unable to sleep flat; and arrived without vital medications and personal, medical and insurance information. The ability for critical information to follow patients displaced by disasters (e.g., portable medical records such as *Keep It With You* (Attachment 1)⁶ or electronic transfer of medical information) is central for continuity of care. Advanced planning to address these issues would be of benefit.

Table 1. The 10 Leading Health Conditions Among Persons Staying in Evacuation Center following Hurricane Katrina, September 10-12, 2005⁴

Condition	Incidence/1,000 Residents
Hypertension/cardiovascular disease	108.2
Diabetes	65.3
New psychiatric condition	59.0
Preexisting psychiatric condition	50.0
Rash	27.6
Asthma/Chronic Obstructive Pulmonary Disease (COPD)	27.5
Flu-like illness or pneumonia	26.3
Toxic exposure	16.0
Other infections*	15.6
Diarrhea	12.8

*Pertussis, varicella, rubella, hepatitis, tuberculosis and other communicable illness of outbreak concern

There is also the need to address reproductive health issues such as birth control, pregnancy testing, acute pregnancy management, and preterm infant conditions; and individuals who are immobile or with physical disabilities; and those that reside in nursing homes, assisted living or are hospitalized. Women in the early stages of pregnancy may be particularly at risk for adverse outcomes during a disaster due to exposure to toxins or infectious agents at a time when the fetus' organs are forming. In addition, it should be kept in mind that vaccines for varicella and for measles, mumps, and rubella (MMR) are not recommended for pregnant women. The Initial Medical Screening and Ongoing Public Health Surveillance tools (Attachment 2) provided by CDC are designed to assess and monitor many of these health problems.⁷

Disaster preparedness must ensure the availability of necessary medication, supplies and accessibility to essential health services. Some of the medication, supplies and services needed include:¹⁻⁴ myocardial infarction – clot-preventing medications; ischemic stroke – anticoagulants; diabetes – oral hypoglycemic agents, multiple-dose insulin vials, fingerstick devices, urine ketone testing strips, glucose tablets, syringes, needles, and supplies (e.g., alcohol, cotton balls, etc.); asthma – rescue inhalers, controllers, nebulizers and epinephrine pens; chronic pulmonary disease – oxygen therapy; kidney failure – access to hemodialysis; cancer – common chemotherapy medications and access to radiation therapy; and pregnancy – prenatal testing and risk assessment for diabetes and hypertension. In addition, there needs to be ready to feed, single serving infant formula bottles and diapers available; recliners to support

It is essential to know the pre-disaster prevalence of chronic diseases and geographic locations of all hospitals and long-term care facilities and their surge capacity as well as the ability of the regions to respond, restore and rebuild the infrastructure for care.

obese individuals and those needing head elevation to sleep; and alternative energy sources (e.g., generator, battery, other fuel) to operate equipment. The alternative energy source equipment must be well maintained, installed and properly vented to prevent carbon monoxide poisoning.

Preparation for responding to natural disasters requires knowledge and coordination with many key health and medical organizations (e.g., Emergency Medical Services, laboratories, home health care agencies, psychiatric facilities). However it is essential to know the pre-disaster prevalence of chronic diseases and geographic location of all hospitals and long-term care facilities and their surge capacity, as well as the ability of the regions to respond, restore and rebuild the infrastructure for care. Although there are many chronic diseases and other health issues that require emergency preparedness, this report will focus on those chronic diseases for which there are data for planning available from the Missouri 2005 BRFSS.

The BRFSS is a cross-sectional telephone survey that generates U.S. and state-specific information about health risk behaviors, clinical preventive services, disease prevalence, health care access and other health related issues. BRFSS data are collected through random-digit-dialed (RDD) monthly telephone interviews with non-institutionalized, civilian, adults (18 years of age and older) using standardized protocols and interviewing techniques.

BRFSS is the world's largest, on-going telephone health survey system that is conducted annually by all 50 state health departments as well as those in the District of Columbia, Puerto Rico, Guam and the U.S. Virgin Islands with support and technical assistance from the Centers for Disease Control and Prevention (CDC).⁸ All states use the same standard core questionnaire, but states may include optional modules and add state-specific questions to the survey to address their needs.

Data for this report are from the Missouri BRFSS conducted in 2005 and the response rate was 57.8% for this survey. The questionnaire included information about the following chronic diseases: diabetes; cardiovascular disease (i.e., myocardial infarction or "heart attack", angina or coronary heart disease, and stroke); hypertension; asthma; cancer; and epilepsy or seizure disorder.

In addition, information on the 2005 Missouri BRFSS pertaining to arthritis and disabilities and geographic information systems (GIS) mapping of hospitals and long-term care facilities are included in this report. Although there may be several questions pertaining to

Survey questions

- Has a doctor, nurse or other health professional ever told you that you had any of the following: heart attack, angina or coronary heart disease or stroke? Have you ever been told by a doctor, nurse or other health professional that you have high blood pressure?
- Have you ever been told by a doctor that you have diabetes?
- Have you ever been told by a doctor, nurse or other health professional that you had asthma? Do you still have asthma?"
- Have you ever been told by a doctor, nurse, or other health professional that you had cancer?
- Have you ever been told by a doctor that you have a seizure disorder or epilepsy?
- Have you ever been told by a doctor or other health professional that you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?
- Are you limited in any way in any activities because of physical, mental, or emotional problems? Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?

each chronic disease, only the questions used to generate data for this report are discussed.

Cardiovascular Disease and Hypertension

Respondents were asked, “Has a doctor, nurse, or other health professional ever told you that you had any of the following?” Heart attack or also called a myocardial infarction (MI), angina or coronary heart disease (CHD), or stroke. Responses included 1) yes, 2) no, 3) don’t know/not sure or 4) refused.

Respondents who answered yes to the any of the three were considered to have the condition.

Respondents were also asked, “Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?” Respondents who answered yes were considered to have hypertension and were then asked if they were taking medicine for their hypertension.

Diabetes

Respondents were asked, “Have you ever been told by a doctor that you have diabetes?” If yes and the respondent was female, she was asked, “Was this only when you were pregnant?” The responses included 1) yes; 2) yes, but female told only during pregnancy; 3) no; and 4) no, pre-diabetes or borderline diabetes.

Respondents who answered “yes” were considered to have diabetes.

Respondents who answered 2 – 4, were not considered to currently have diabetes. Respondents, who answered “yes”, were then asked whether they used oral hypoglycemic medications or insulin and how often they checked their blood for glucose or sugar.

The BRFSS is a cross-sectional telephone survey that generates U.S. and state-specific information about health risk behaviors, clinical preventive services, disease prevalence, health care access and other health related issues.

Asthma

Respondents who answered yes to both of the following questions were considered to have current asthma: (1) “Have you ever been told by a doctor, nurse or other health professional that you had asthma?” and (2) “Do you still have asthma?” Respondents who answered no to the first question were categorized as never having asthma.

Those who answered yes to the first question but no to the second question were considered to have former asthma or sometimes called “*lifetime asthma*” meaning the person has had asthma at some time in their life but not a current health issue.

Respondents reporting an episode of asthma or an asthma attack during the past 12 months were then asked, (1) During the past 30 days, how many days did you take a prescription asthma medication to prevent an asthma attack from occurring?” and “During the past 30 days, how often did you use a prescription asthma inhaler during an asthma attack to stop it?”

Cancer

Respondents were asked, “Have you ever been told by a doctor, nurse, or other health professional that you had cancer?” If the answer was yes, the respondent was then asked, “What type of cancer was it?”

Epilepsy or Seizure Disorder

Respondents were asked, “Have you ever been told by a doctor that you have a seizure disorder or epilepsy?” Respondents answering yes were considered to be at risk for seizures.

Those responding yes were then asked if they were currently taking medication to control their seizure disorder or epilepsy and how many seizures of any type they had in the last three months.

Arthritis

Self-reported doctor-diagnosed arthritis was defined as a “yes” response to the question, “Have you ever been told by a doctor or other health professional that you have some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia?”

Respondents answering yes to self-reported doctor-diagnosed arthritis were also asked, “Are you now limited in any way in any of your usual activities because of arthritis or joint symptoms?” Those responding “yes” were considered to have arthritis-attributable activity limitation.

Disability

Persons who had a disability were defined based on answering “yes” to either of the following two questions: “Are you limited in any way in any activities because of physical, mental, or emotional problems?” or “Do you now have any health problem that requires you to use special equipment, such as a cane, a wheelchair, a special bed, or a special telephone?”

Prior to data analysis, data were weighted to adjust for the unequal probability of selection, differential non-response, and possible deficiencies in the sampling frame. SAS 9.1 (SAS Institute Inc., Cary, NC, USA) was used in data analysis. Surveymeans and Surveyfreq procedures were used to account for the complex sampling design.

The prevalence (with 95% CI) and the number of the Missouri population aged 18 and over with chronic conditions were estimated. The prevalence was further stratified by gender, race, education level and household income, and BRFSS regions— Kansas City Metro, St. Louis Metro, Central, Southwestern, Southeastern, Northwestern and Northeastern Regions (Attachment 3), when the sample size was large enough to permit regional analysis. For respondents with the chronic condition, the prevalence (with 95% CIs) and the estimated numbers who reported receiving treatment for their condition were estimated.

To calculate the prevalence of specific chronic diseases, respondents with “do not know”, refused or missing responses were excluded. To estimate disease-specific indicators such as medication usage, the weighted number of adults aged 18 and older with the self-reported chronic disease was used as the denominator.

Missouri population estimates used to estimate the number of adults with selected chronic conditions were from different sources based on availability and vary slightly. The Missouri state prevalence, gender and regional estimated numbers of adults were calculated based on population estimates from CDC.⁹ The estimated numbers of adults by racial group were calculated based on the U.S. Census Bureau estimates of Missouri’s population¹⁰ and population estimates from the 2005 American Community Survey, U.S. Census Bureau were used for educational attainment.¹¹ Population estimates were unavailable for the income categories.

Since coordination of health facilities is so important in meeting the needs of vulnerable populations following a natural disaster, maps and listings of hospitals and number of long-term care facilities by county and Missouri BRFSS regions are included (Attachments 4 and 5).

There were a total of 5,164 respondents representing 4,352,989 adults 18 years of age and older in the Missouri 2005 BRFSS. Respondents ranged in age from 18 to 99 years and, using the weighted percentages, 48.0% were men and 52.0% were women. The weighted sample majority was white, non-Hispanic (88.0%) followed by black, non-Hispanic (7.3%); Asian/Pacific Islander (0.6%); American Indian/Alaska Native (1.2%); and Hispanic (2.9%). The weighted sample was well distributed across income levels with 9.4% having a household income less than \$15,000 and 11.4% did not have a high school diploma or general equivalency diploma (GED).

Cardiovascular Disease and Hypertension

About 4.8% (representing an estimated 210,249 people) of Missouri's adult population reported that they had angina or coronary heart disease (Table 2). Those with a high school education or less and household incomes less than \$35,000 were significantly more likely to have CHD compared to those with more than a high school education and those with greater household incomes, respectively. Adults in the Southeast Region reported a significantly higher prevalence (9.4%; representing 39,904 people) of CHD compared to the state.

About 5.2% respondents reported that they had had a heart attack or MI, representing an estimated 226,791 people (Table 2). Males compared to females (6.4% versus 4.1%), Whites compared to Blacks (5.3% versus 2.7%), those with less than a high school education (10.7%) and those reporting household incomes less than \$15,000 (10.2%) were significantly

Survey results

- About 4.8% of respondents reported angina or coronary heart disease. About 5.2% of respondents reported that they had had a heart attack. About 3.4% of respondents reported that they had had a stroke. About 27.3% of respondents reported having hypertension .
- About 7.7% of respondents reported that they had physician-diagnosed diabetes.
- About 14.2% of respondents reported ever having asthma.
- About 7.7% of respondents reported having ever been told by a doctor that they had cancer.
- About 1.8% of respondents reported having ever been told by a doctor that they have a seizure disorder or epilepsy.
- About 32.1% of respondents reported that they had been told by a doctor that they had some form of arthritis.
- About 20.9% of respondents are limited in their activities because of physical, mental or emotional problems. About 6.9% of respondents reported having a health problem that required the use of special equipment, such as a cane, a wheelchair, a special bed, or a special telephone .

more likely to have experienced a heart attack or MI.

About 3.4% of Missouri respondents reported that they had had a stroke, representing an estimated 147,131 adults (Table 2). Individuals with less than a high school education (8.5%) compared to those with a high school or greater education and those with household incomes less than \$15,000 compared to those with household incomes of \$25,000 or greater, were more likely to report having had a stroke.

About 27.3% of respondents reported having hypertension (representing 1,188,366 adults) in Missouri (Table 3). No significant difference was noted between the state and the regions. However, those having lower education attainment and lower household incomes were significantly more likely to report hypertension than those with higher education attainment and household incomes of \$35,000 or more. Of those with hypertension, approximately 78.2% (or an estimated 929,421) reported using antihypertensive medications (Table 3). No additional information was collected regarding current treatments of cardiovascular disease on this survey.

Diabetes

Of the adult population in Missouri, 7.7% (representing an estimated 335,180 people) reported that they had physician-diagnosed diabetes (Table 4). A statistically significantly higher proportion of blacks reported diabetes than whites (12.9% versus 7.4%). Individuals with less than a high school education and with household incomes less than \$25,000 also reported significantly more physician-diagnosed diabetes than those with greater educational attainment and higher household

incomes, respectively. Among those with diabetes, 68.7% (or an estimated 230,403 adults) reported using oral glucose-lowering medications, and 30.4% (or an estimated 101,995 adults) reported using insulin (Table 4). In addition, of those who check their blood glucose, about 72.3% or an estimated 242,168 people do so one or more times per day (Table 4).

Asthma

Approximately 14.2% (or an estimated 618,995 adults) reported ever having asthma and 65.5% (405,442) of these individuals reported currently having asthma (Table 5). Among adults with asthma and reporting an episode or asthma attack in the past 12 months, about 63.4% (or an estimated 233,105 adults) reported taking a prescription medication during the previous 30 days to prevent an asthma attack from occurring and 52.7% (or an estimated 191,553 adults) reported using a prescription asthma inhaler during an asthma attack to stop it. In addition, 25.6% (or an estimated 103,834 adults) of those with current asthma reported having one or more days in the past 12 months that they were unable to carry out their usual activities due to asthma (Table 5). Females were significantly more likely than males to report asthma-attributable activity limitation (31.6% versus 14.7%).

Cancer

About 7.7% of respondents (representing 333,439 adults) reported having ever been told by a doctor that they had cancer (Table 5). A significantly larger proportion of females than males (9.5% versus 5.7%) and those with less than a high school education compared to those with education beyond high school (11.0% versus 6.3%) reported a previous

diagnosis of cancer. Individuals with household incomes below \$15,000 (14.4%) compared to those with incomes of \$25,000 or greater also were significantly more likely to report a cancer diagnosis. Comparing types of cancer, non-Hodgkin lymphoma, kidney or other cancers combined (2.6%); and breast cancer (1.4%) had the highest reported prevalence. No information on cancer treatment was collected on the 2005 Missouri BRFSS.

Epilepsy or Seizure Disorder

About 1.8% of respondents (representing 77,048 adults) reported having ever been told by a doctor that they have a seizure disorder or epilepsy (Table 6). Individuals with household incomes less than \$15,000 were significantly more likely to report a seizure disorder or epilepsy (6.1%) compared to individuals reporting a household income at or above \$35,000. Of those reporting being diagnosed with a seizure disorder or epilepsy, 37.7% (or an estimated 38,376 adults) were taking medication to control their seizures, 4.7% (or an estimated 3,583 adults) reported one seizure in the last 3 months, and 17.9% (or an estimated 13,822 adults) reported two or more seizures in the last 3 months.

Arthritis

About 32.1% of respondents (or an estimated 1,399,051 adults) reported they had been told by a doctor or other health professional that they had some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia (Table 6). Females (35.9%) and respondents with lower education and income levels were significantly more likely to have some form of arthritis when compared to males (28.0%), those with a high school education or higher, and individuals

with household incomes exceeding \$25,000. About 28.9% of respondents (or an estimated 498,582 adults) were limited in their usual activities because of arthritis or joint symptoms (Table 6). The Southeast Region had significantly more individuals reporting some form of arthritis (38.8%) and limitation in usual activity (40.0%) as a result when compared to the state prevalence.

Disability

Approximately 20.9% of respondents (or an estimated 908,034 adults) are limited in their activities because of physical, mental or emotional problems (Table 7). Respondents in the Southeast Region (28.9%), those with lower educational attainment and incomes were also significantly more likely to report being limited in their activity when compared to the state and respondents with higher education levels and incomes.

Overall, 6.9% of respondents (or an estimated 298,615 adults) reported having a health problem that required the use of special equipment, such as a cane, a wheelchair, a special bed, or a special telephone (Table 7). Respondents in the Northeast (10.5%) and Southeast (10.4%) regions were more likely to report the need for special equipment compared to the state prevalence. In addition, respondents with less than a high school education and those with household incomes less than \$15,000 were also significantly more likely to report the need for special equipment for a health problem.

Table 2. Unadjusted Prevalence with 95% Confidence Intervals and Estimated Numbers with Cardiovascular Disease Among Adults Aged 18 and Older in Missouri by Selected Population Characteristics and Regions, Behavioral Risk Factor Surveillance System, 2005

State, Population Characteristics and Regions	Coronary Heart Disease		Myocardial Infarction		Stroke	
	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number
Missouri ^a	4.8 (4.1-5.5)	210,249	5.2 (4.5-5.9)	226,791	3.4 (2.8-4.0)	147,131
Gender^a						
Male	5.6 (4.5-6.8)	117,443	6.4 * (5.2-7.5)	133,116	3.2 (2.3-4.0)	65,827
Female	4.1 (3.3-4.9)	92,793	4.1 (3.3-5.0)	93,699	3.6 (2.8-4.4)	81,251
Race^b						
Black	3.3 (0.7-6.0)	15,768	2.7 (0.9-4.5)	12,700	2.0 (0.9-3.2)	9,631
White	4.9 (4.1-5.6)	187,991	5.3 * (4.5-6.1)	204,590	3.4 (2.7-4.0)	130,861
Other	5.5 (2.7-8.3)	4,947	6.1 (3.6-8.6)	5,441	4.6 (2.4-6.8)	4,112
Education^c						
Less than HS	8.5 * (5.9-11.1)	55,772	10.7 * (7.9-13.5)	70,307	8.5 * (5.6-11.5)	56,167
High School	5.1 (3.9-6.4)	73,380	5.8 (4.6-7.0)	83,269	3.8 (2.8-4.8)	54,462
Greater than HS	3.8 (3.0-4.7)	83,323	3.7 (2.9-4.5)	80,068	2.1 (1.5-2.7)	44,699
Income						
Less than 15K	9.6 * (6.9-12.4)	**	10.2 * (7.7-12.8)	**	9.4 * (6.6-12.2)	**
15-25K	6.5 (4.3-8.7)	**	5.8 (4.0-7.5)	**	6.4 (4.1-8.8)	**
25-35K	5.4 (3.7-7.1)	**	7.0 (4.8-9.2)	**	2.8 (1.5-4.2)	**
35-50K	3.6 (2.2-4.9)	**	3.0 (1.7-4.3)	**	1.6 (0.7-2.5)	**
50-75K	3.9 (2.1-5.7)	**	3.4 (1.8-5.0)	**	1.0 (0.3-1.6)	**
75+K	2.4 (1.1-3.6)	**	2.5 (1.2-3.9)	**	1.4 (0.4-2.5)	**
Region^a						
Kansas City Metro	3.6 (2.6-4.7)	30,310	4.1 (2.9-5.4)	34,234	2.5 (1.6-3.4)	20,457
St. Louis Metro	3.7 (2.4-5.1)	57,419	4.0 (2.7-5.3)	61,258	3.2 (2.0-4.5)	49,743
Central	5.3 (3.6-6.9)	27,497	6.8 (4.8-8.9)	35,825	3.9 (2.4-5.4)	20,427
Southwest	5.5 (3.4-7.7)	36,252	5.6 (3.8-7.4)	36,645	3.4 (2.1-4.6)	22,118
Southeast	9.4 * (7.0-11.7)	39,904	7.7 (5.4-9.9)	32,672	4.6 (2.8-6.3)	19,484
Northwest	3.8 (2.3-5.3)	6,890	5.4 (3.5-7.3)	9,850	2.9 (1.5-4.3)	5,318
Northeast	6.1 (4.3-8.0)	12,041	7.9 (5.2-10.7)	15,596	5.3 (3.6-7.0)	10,430

^aPopulation estimates from Centers for Disease Control and Prevention.

^bPopulation estimates from the U.S. Census Bureau.

^cPopulation estimates from the 2005 American Community Survey, U.S. Census Bureau.

*Statistically significant difference compared to one or more groups; regions compared to the state.

**Population estimates unavailable or insufficient data.

Table 3. Unadjusted Prevalence with 95% Confidence Intervals and Estimated Numbers with Hypertension and Taking Hypertension Medication Among Adults Aged 18 and Older in Missouri by Selected Population Characteristics and Regions, Behavioral Risk Factor Surveillance System, 2005

State, Population Characteristics and Regions	Hypertension		Taking Hypertension Medication	
	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number
Missouri ^a	27.3 (25.9-29.0)	1,188,366	78.2 (75.1-81.4)	929,421
Gender^a				
Male	28.0 (25.3-30.7)	585,127	71.8 (66.8-76.8)	420,121
Female	26.6 (24.5-28.7)	602,025	84.5 * (80.6-88.3)	508,531
Race^b				
Black	31.6 (25.2-38.0)	149,186	81.7 (73.0-90.4)	121,885
White	27.0 (25.2-28.9)	1,042,252	78.4 (75.1-81.8)	817,542
Other	26.3 (16.5-36.1)	23,612	70.6 (54.0-87.2)	16,670
Education^c				
Less than HS	40.4 * (34.9-45.9)	265,708	83.7 (77.2-90.2)	222,451
High School	30.1 (27.1-33.1)	431,393	80.2 (75.7-84.6)	345,761
Greater than HS	22.9 (20.7-25.1)	496,901	74.6 (69.4-79.9)	370,837
Income				
Less than 15K	41.0 * (35.2-46.8)	**	78.3 (67.8-88.9)	**
15-25K	33.2 (28.8-37.6)	**	79.8 (73.6-85.9)	**
25-35K	30.4 (25.4-35.3)	**	77.3 (69.1-85.6)	**
35-50K	24.0 (20.1-27.9)	**	78.8 (70.5-87.2)	**
50-75K	24.5 (20.2-28.7)	**	76.6 (68.1-85.0)	**
75+K	16.5 (13.0-20.1)	**	80.9 (72.0-89.8)	**
Region^a				
Kansas City Metro	25.8 (22.7-28.9)	215,426	76.0 (69.1-82.9)	163,681
St. Louis Metro	23.6 (20.0-27.2)	362,326	82.3 (75.2-89.4)	298,049
Central	28.5 (24.6-32.5)	149,272	72.2 (64.0-80.4)	107,774
Southwest	31.4 (27.0-35.8)	205,474	76.2 (68.1-84.2)	156,489
Southeast	33.1 (28.9-37.3)	140,812	82.8 (77.0-88.6)	116,550
Northwest	28.6 (24.6-32.6)	52,266	72.9 (65.6-80.3)	38,123
Northeast	32.0 (27.5-36.6)	62,856	77.8 (70.3-85.3)	48,921

^aPopulation estimates from Centers for Disease Control and Prevention.

^bPopulation estimates from the U.S. Census Bureau.

^cPopulation estimates from the 2005 American Community Survey, U.S. Census Bureau.

*Statistically significant difference compared to one or more groups; regions compared to the state.

**Population estimates unavailable or insufficient data.

Table 4. Unadjusted Prevalence with 95% Confidence Intervals and Estimated Numbers with Diabetes, Taking Medication, and Self-Monitoring Glucose Among Adults Aged 18 and Older in Missouri by Selected Population Characteristics and Regions, Behavioral Risk Factor Surveillance System, 2005

State, Population Characteristics and Regions	Diabetes		Taking Oral Medication		Taking Insulin		Blood Glucose Check (one or more times daily)	
	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number
Missouri^a	7.7 (6.8-8.7)	335,180	68.7 (62.7-74.8)	230,403	30.4 (24.8-36.1)	101,995	72.3 (66.6-77.9)	242,168
Gender^a								
Male	7.8 (6.3-9.2)	163,000	59.7 (49.7-69.7)	97,246	31.2 (21.9-40.6)	50,889	68.4 (59.4-77.4)	111,557
Female	7.7 (6.6-8.8)	174,270	77.1 * (71.1-83.1)	134,345	29.7 (23.1-36.3)	51,741	76.1 (69.3-82.8)	132,619
Race^b								
Black	12.9 * (8.5-17.4)	60,902	62.7 (44.2-81.2)	36,173	40.1 (22.2-58.1)	24,446	72.3 (55.5-89.2)	44,032
White	7.4 (6.4-8.3)	285,654	69.4 (62.7-76.1)	198,244	29.3 (23.0-35.5)	83,554	72.2 (66.1-78.3)	206,242
Other	7.4 (4.4-10.4)	6,644	**	**	**	**	**	**
Education^c								
Less than HS	16.0 * (11.8-20.2)	105,231	64.9 (49.8-80.0)	68,295	43.4 (28.6-58.2)	45,639	75.2 (61.8-88.5)	79,102
High School	8.4 * (6.9-9.8)	120,389	75.7 (67.1-84.3)	91,110	29.8 (21.7-37.9)	35,876	72.3 (64.6-79.9)	87,005
Greater than HS	5.7 (4.6-6.7)	123,683	64.7 (55.5-73.9)	79,973	23.4 (16.4-30.4)	28,979	70.7 (61.4-79.9)	87,444
Income								
Less than 15K	16.2 * (12.1-20.3)	**	68.0 (53.5-82.5)	**	45.7 (31.9-59.5)	**	73.1 (59.0-87.2)	**
15-25K	12.5 * (9.3-15.7)	**	63.9 (49.4-78.4)	**	35.1 (21.7-48.5)	**	74.6 (61.4-87.8)	**
25-35K	7.4 (5.3-9.6)	**	86.1 (76.8-95.5)	**	25.5 (12.6-38.4)	**	65.4 (51.5-79.4)	**
35-50K	5.1 (3.6-6.6)	**	64.4 (50.1-78.8)	**	26.2 (12.9-39.4)	**	68.2 (54.3-82.2)	**
50-75K	6.2 (4.1-8.3)	**	78.8 (66.1-91.5)	**	20.9 (7.7-34.1)	**	74.0 (60.1-87.9)	**
75+K	3.9 (2.2-5.6)	**	**	**	**	**	**	**
Region^a								
Kansas City Metro	7.7 (5.7-9.7)	64,294	68.5 (54.3-82.8)	44,041	35.8 (21.7-49.9)	23,017	79.9 (70.6-89.2)	51,371
St. Louis Metro	6.2 (4.5-8.0)	95,494	64.3 (49.9-78.7)	61,403	36.8 (23.2-50.4)	35,142	74.0 (60.5-87.6)	70,666
Central	8.2 (5.8-10.5)	42,948	67.6% (51.4-83.7)	29,011	17.9 (8.5-27.4)	7,696	62.1 (47.8-76.3)	26,658
Southwest	9.1 (6.6-11.5)	59,548	71.5 (58.1-84.9)	42,571	24.8 (13.6-36.0)	14,780	64.4 (50.3-78.5)	38,331
Southeast	9.8 (7.4-12.1)	41,690	75.8 (65.2-86.5)	31,601	30.7 (18.3-43.1)	12,799	73.9 (62.9-85.0)	30,809
Northwest	7.7 (5.5-9.8)	14,072	62.2 (47.3-77.1)	8,753	26.8 (14.1-39.4)	3,771	78.7 (66.9-90.4)	11,075
Northeast	9.6 (6.7-12.5)	18,857	74.7 (61.2-88.2)	14,077	28.0 (14.1-41.8)	5,272	76.6 (65.4-87.8)	14,439

^aPopulation estimates from Centers for Disease Control and Prevention.

^bPopulation estimates from the U.S. Census Bureau.

^cPopulation estimates from the 2005 American Community Survey, U.S. Census Bureau.

*Statistically significant difference compared to one or more groups; regions compared to the state.

**Population estimates unavailable or insufficient data.

Table 5. Unadjusted Prevalence with 95% Confidence Intervals and Estimated Numbers with Asthma, Asthma Limitation and Cancer Among Adults Aged 18 and Older in Missouri by Selected Population Characteristics and Regions, Behavioral Risk Factor Surveillance System, 2005

State, Population Characteristics and Regions	Ever told had Asthma		Current Asthma		Activity Limitation due to Asthma (one or more days during past 12 months)		Cancer	
	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number
Missouri^a	14.2 (12.6-15.9)	618,995	65.5 (58.6-72.4)	405,442	25.6 (19.9-31.4)	103,834	7.7 (6.7-8.6)	333,439
Gender^a								
Male	12.0 (9.7-14.2)	250,142	58.7 (48.1-69.3)	146,908	14.7 (8.0-21.4)	21,595	5.7 (4.6-6.8)	119,115
Female	16.3 (13.9-18.6)	368,683	70.0 (60.9-79.2)	258,078	31.6 * (24.0-39.2)	81,578	9.5 * (7.9-11.0)	214,103
Race^b								
Black	16.6 (10.1-23.1)	78,417	66.7 (41.3-92.2)	52,328	**	**	4.0 (0.8-7.2)	18,884
White	13.2 (11.6-14.7)	507,615	68.1 (61.3-75.0)	345,889	26.2 (19.8-32.7)	90,761	7.7 (6.8-8.7)	298,779
Other	23.4 (13.8-33.0)	20,999	48.0 (22.0-73.9)	10,071	**	**	10.5 (4.5-16.6)	9,463
Education^c								
Less than HS	20.3 * (15.6-25.1)	133,775	76.9 (65.5-88.3)	102,860	33.1 (18.8-47.5)	34,088	11.0 * (8.2-13.8)	72,215
High School	11.8 (9.7-13.9)	168,688	67.4 (57.9-77.0)	113,729	31.6 (19.5-43.8)	35,972	8.9 (7.2-10.5)	127,125
Greater than HS	14.4 (12.0-16.9)	312,896	61.1 (50.6-71.6)	191,117	20.2 (13.3-27.1)	38,567	6.3 (5.0-7.6)	136,268
Income								
Less than 15K	19.9 (14.3-25.5)	**	92.1 * (87.0-97.2)	**	39.9 (24.6-55.2)	**	14.4 * (9.5-19.2)	**
15-25K	14.9 (11.6-18.1)	**	77.4 (68.0-86.9)	**	33.9 (20.4-47.5)	**	8.8 (6.5-11.1)	**
25-35K	13.1 (9.6-16.7)	**	72.6 (60.5-84.7)	**	18.6 (6.8-30.5)	**	7.3 (5.2-9.4)	**
35-50K	12.1 (8.8-15.4)	**	76.7 (65.5-87.9)	**	22.6 (6.7-38.4)	**	7.1 (4.9-9.4)	**
50-75K	12.6 (9.2-16.0)	**	56.5 (41.9-71.1)	**	**	**	4.7 (2.9-6.4)	**
75+K	12.8 (8.0-17.5)	**	40.5 (22.1-58.8)	**	**	**	5.0 (2.8-7.2)	**
Region^a								
Kansas City Metro	15.0 (12.2-17.7)	125,081	73.2 (64.2-82.3)	91,609	22.3 (12.3-32.4)	20,465	8.0 (6.3-9.7)	66,548
St. Louis Metro	15.5 (11.6-19.4)	237,968	55.9 (41.0-70.9)	133,119	27.5 (13.9-41.0)	36,554	6.2 (4.0-8.3)	94,727
Central	12.9 (9.9-15.8)	67,460	68.1 (56.2-80.0)	45,920	33.3 (19.7-46.8)	15,282	8.0 (6.0-10.0)	41,953
Southwest	10.1 (7.3-13.0)	66,288	71.0 (55.6-86.4)	47,038	**	**	9.5 (7.2-11.7)	61,904
Southeast	17.4 (13.6-21.3)	74,149	75.4 (64.8-85.9)	55,886	27.2 (12.6-41.7)	15,184	9.8 (7.3-12.2)	41,605
Northwest	11.3 (8.3-14.3)	20,559	63.7 (49.6-77.8)	13,098	**	**	6.8 (4.9-8.7)	12,463
Northeast	15.0 (9.8-20.1)	29,385	70.1 (54.1-86.0)	20,587	**	**	9.0 (6.6-11.5)	17,678

^aPopulation estimates from Centers for Disease Control and Prevention.

^bPopulation estimates from the U.S. Census Bureau.

^cPopulation estimates from the 2005 American Community Survey, U.S. Census Bureau.

*Statistically significant difference compared to one or more groups; regions compared to the state.

**Population estimates unavailable or insufficient data.

Table 6. Unadjusted Prevalence with 95% Confidence Intervals and Estimated Numbers with Epilepsy or Seizure Disorder, Arthritis and Arthritis-Attributable Activity Limitation Among Adults Aged 18 and Older in Missouri by Selected Population Characteristics and Regions, Behavioral Risk Factor Surveillance System, 2005

State, Population Characteristics and Regions	Epilepsy / Seizure Disorder		Arthritis		Activity Limitation due to Arthritis / Joint Symptoms	
	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number
Missouri^a	1.8 (1.2-2.3)	77,048	32.1 (30.3-34.0)	1,399,051	28.9 (26.5-31.3)	498,582
Gender^a						
Male	2.1 (1.1-3.0)	42,840	28.0 (25.3-30.8)	585,754	26.6 (22.9-30.3)	218,101
Female	1.5 (0.8-2.2)	34,175	35.9 * (33.5-38.4)	813,186	31.0 (28.0-34.0)	280,764
Race^b						
Black	1.4 (0.0-3.1)	6,704	27.0 (20.5-33.6)	127,469	27.4 (19.2-35.5)	44,266
White	1.9 (1.2-2.6)	73,730	32.8 (30.8-34.8)	1,267,687	27.8 (25.3-30.4)	432,530
Other	0.8 (0.0-1.6)	673	29.0 (21.4-36.6)	26,018	38.6 (28.2-48.9)	12,806
Education^c						
Less than HS	2.4 (0.3-4.5)	15,719	45.8 * (40.1-51.6)	301,487	34.1 (27.9-40.2)	104,143
High School	2.0 (1.1-3.0)	29,237	35.0 (31.7-38.2)	501,190	32.8 (28.4-37.3)	194,059
Greater than HS	1.5 (0.7-2.3)	32,331	27.6 (25.2-30.1)	599,536	24.9 (21.8-28.1)	201,783
Income						
Less than 15K	6.1 * (2.3-9.9)	**	48.2 (42.2-54.2)	**	50.4 * (43.1-57.7)	**
15-25K	2.9 (0.9-4.9)	**	38.8 (34.2-43.5)	**	35.6 (29.9-41.2)	**
25-35K	1.6 (0.3-2.9)	**	35.9 (30.7-41.2)	**	29.6 (23.2-36.0)	**
35-50K	0.6 (0.1-1.2)	**	27.3 (23.2-31.5)	**	23.4 (18.0-28.8)	**
50-75K	1.0 (0.0-2.3)	**	27.2 (22.7-31.6)	**	22.1 (16.9-27.3)	**
75+K	0.5 (0.0-1.0)	**	24.5 (20.2-28.9)	**	18.6 (13.4-23.9)	**
Region^a						
Kansas City Metro	1.5 (0.4-2.6)	12,441	29.2 (26.0-32.4)	243,899	26.2 (22.0-30.4)	87,407
St. Louis Metro	1.1 (0.1-2.1)	17,502	29.9 (25.8-34.0)	458,281	24.9 (19.7-30.1)	140,067
Central	1.6 (0.3-2.9)	8,275	32.7 (28.5-36.8)	171,112	31.0 (25.6-36.5)	62,660
Southwest	2.8 (1.0-4.5)	17,995	35.6 (31.1-40.0)	232,631	34.0 (28.0-40.0)	96,779
Southeast	2.3 (0.8-3.8)	9,699	38.8 * (34.3-43.3)	165,060	40.0 * (34.2-45.7)	75,255
Northwest	1.9 (0.8-3.0)	3,454	34.0 (29.6-38.5)	62,189	25.6 (20.5-30.8)	18,395
Northeast	4.3 (0.0-8.9)	8,368	32.9 (28.3-37.5)	64,663	26.0 (20.6-31.4)	22,169

^aPopulation estimates from Centers for Disease Control and Prevention.

^bPopulation estimates from the U.S. Census Bureau.

^cPopulation estimates from the 2005 American Community Survey, U.S. Census Bureau.

*Statistically significant difference compared to one or more groups; regions compared to the state.

**Population estimates unavailable or insufficient data.

Table 7. Unadjusted Prevalence with 95% Confidence Intervals and Estimated Numbers with Activity Limitation due to Physical, Mental, or Emotional Problems and a Health Problem that Requires Special Equipment Among Adults Aged 18 and Older in Missouri by Selected Population Characteristics and Regions, Behavioral Risk Factor Surveillance System, 2005

State, Population Characteristics and Regions	Activity Limitation due to Physical, Mental or Emotional Problems		Health Problem Requires Special Equipment	
	% (95% CI)	Estimated Number	% (95% CI)	Estimated Number
Missouri ^a	20.9 (19.3-22.4)	908,034	6.9 (6.0-7.7)	298,615
Gender^a				
Male	19.2 (16.9-21.4)	400,394	6.4 (5.2-7.7)	134,161
Female	22.5 (20.4-24.6)	508,100	7.3 (6.2-8.4)	164,538
Race^b				
Black	17.5 (12.7-22.4)	82,760	6.8 (4.0-9.6)	32,056
White	20.9 (19.3-22.6)	807,938	6.8 (5.9-7.6)	260,949
Other	21.0 (14.6-27.5)	18,881	6.3 (3.9-8.7)	5,629
Education^c				
Less than HS	32.7 * (27.6-37.8)	215,263	13.9 * (10.5-17.3)	91,485
High School	22.8 * (20.1-25.5)	326,053	7.3 (5.9-8.7)	104,480
Greater than HS	17.2 (15.2-19.2)	373,001	5.1 (4.1-6.1)	111,314
Income				
Less than 15K	46.4 * (40.4-52.4)	**	18.8 * (14.8-22.7)	**
15-25K	28.5 (24.3-32.8)	**	9.2 (6.8-11.5)	**
25-35K	18.1 (14.4-21.8)	**	6.2 (4.3-8.2)	**
35-50K	19.3 (15.3-23.3)	**	4.5 (2.8-6.2)	**
50-75K	13.6 (10.4-16.9)	**	2.9 (1.7-4.1)	**
75+K	10.7 (8.0-13.4)	**	3.4 (1.8-4.9)	**
Region^a				
Kansas City Metro	19.3 (16.6-22.1)	161,486	6.7 (5.0-8.4)	56,027
St. Louis Metro	17.8 (14.6-21.1)	273,894	5.5 (3.8-7.2)	84,440
Central	21.3 (17.8-24.8)	111,718	5.8 (4.1-7.6)	30,535
Southwest	23.6 (19.7-27.4)	154,171	7.5 (5.5-9.6)	49,275
Southeast	28.9 * (24.7-33.0)	122,774	10.4 * (8.0-12.8)	44,115
Northwest	20.3 (16.9-23.7)	37,116	8.7 (6.4-10.9)	15,826
Northeast	25.6 (20.4-30.8)	50,304	10.5 * (7.9-13.2)	20,703

^aPopulation estimates from Centers for Disease Control and Prevention.

^bPopulation estimates from the U.S. Census Bureau.

^cPopulation estimates from the 2005 American Community Survey, U.S. Census Bureau.

*Statistically significant difference compared to one or more groups; regions compared to the state.

**Population estimates unavailable or insufficient data.

Natural disasters create major public health issues. Although the majority of emergency planning to this point has focused on infectious disease outbreaks, lessons learned from recent natural disasters indicated that addressing chronic disease in disaster planning is also of vital importance.

Public health must assess the situation and determine what public health function has been adversely impacted, the geographic area(s) impacted, the number of people affected and the critical infrastructures that have been disrupted (e.g., electricity, food, water, supplies, sanitation, telecommunications, transportation, medical and healthcare facilities, etc.).

This report provides baseline information about the numbers of people in Missouri with chronic diseases and the treatments needed to manage these conditions. This information is critical in planning to know what conditions are most prevalent in order to identify assessment and resource options in the planning stage.

The geographic location of Missouri hospitals and long-term care facilities are also included because it is crucial to know the location of these facilities for evacuation planning, as well as the ability of these facilities to serve as resources and manage infectious and chronic diseases during an emergency.

Findings indicate a substantial number of people in Missouri have a chronic illness, particularly arthritis, hypertension, asthma, diabetes and cancer, that will require access to adequate medication, supplies and

This report provides baseline information about the numbers of people in Missouri with chronic diseases and the treatments needed to manage these conditions. This information is critical in planning to know what conditions are most prevalent in order to identify assessment and resource options in the planning stage.

treatment during and following a natural disaster. Of highest priority are the identification, appropriate treatment, and management of potential life-threatening conditions such as diabetes, cardiovascular disease, asthma, individuals receiving dialysis for kidney failure and those requiring oxygen for chronic respiratory diseases. In addition, disease management is needed to prevent exacerbation or complications of these and other diseases and conditions such as uncontrolled hypertension leading to stroke or uncontrolled diabetes leading to diabetic coma.

Based on the information provided in this report and experts in the field, a list of essential medications consistent with the burden of chronic diseases in the state should be developed and used in planning for the provision of medications during and following disasters. States would benefit from having a disaster prescription plan to accommodate emergency

prescribing and dispensing by shelter physicians, as well as plans to identify alternatives for increasing supplies of medications or replacement medications during and following disasters. It would also benefit states to have standing arrangements with nearby facilities or other states to evacuate the most critically ill, particularly individuals requiring ventilator support and those who are non-ambulatory, as well as to safely house evacuees.

Individuals should be encouraged to maintain their medical history information and an insurance card as part of their emergency supplies. Once relocated away from the affected area, there is a need to conduct an initial chronic disease needs assessment with the ability to gather information and then connect to needed resources (e.g., hospitals, laboratories, pharmacies, etc.). There is also a need to monitor the long-term effects of a natural disaster across many chronic diseases and conditions.

All modes of communication should be used to educate people who may be affected by the disaster. These communications should inform people of steps needed to ensure that their chronic diseases remain stable and adverse health outcomes are prevented, as well as routine measures to reduce infectious disease transmission and prevent disease complications including information on good hand washing, wound care, drinking water safety, etc. These measures will help to strengthen disaster and communication plans and will assist to prevent further adverse health conditions.

Limitations of this study are that all information from the BRFSS are based on self-reports and individuals

Findings indicate a substantial number of people in Missouri have a chronic illness, particularly arthritis, hypertension, asthma, diabetes and cancer, that will require access to adequate medication, supplies and treatment during and following a natural disaster.

who reside in institutional settings are not included. In addition, only individuals with land-based telephones are included in the BRFSS, and since prevalence of the conditions is based on only one year of data, the estimates may be unstable. Although not all the diseases and conditions mentioned in this report are included in the BRFSS, this analysis suggests that the Missouri BRFSS may provide useful information for planning future relief efforts. Only through advanced planning, networking, and continuous surveillance can chronic care needs be met and adverse health outcomes minimized in the mist of and following a disaster.

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Keep It With You

PERSONAL MEDICAL INFORMATION FORM

In an emergency situation, people may not be able to get to their medical records. The “**Keep It With You**” (**KIWY**) **Personal Medical Information Form** is intended to be a voluntary and temporary record that lists medical care and other health information for people who need care during disasters and similar situations. It is important for health care workers to have a simple and reliable way to learn information about past and new health concerns for people receiving help.

Directions:

Please print out Side 1 & 2 of the KIWY Personal Medical Information Form. The KIWY form should be copied so that it is on 2 sides of one piece of paper.

Please fill out as much as you can on the form. It is okay if you don't fill out every space. You might want to use a pencil if some information will change, such as your address. Some of the information will be filled out by a health care worker, like “Active Diagnoses” and “Healthcare Encounters” information. If you have an immunization card listing the shots you have recently had, please staple it to the KIWY form.

The KIWY form can be folded and placed in a plastic bag for safe keeping.

For Health Care Workers:

The KIWY form is not intended to replace hardcopy or electronic medical records, but is an interim communication tool to assist individuals as they navigate a potentially complex system of temporary support, housing, and clinical services. Clinicians are encouraged to adapt format and content as necessary to best serve the specific situation, population, and clinical care needs. The form provided is intended to serve as a basic tool, providing a framework for more specific refinement.

It is suggested that care providers **photocopy** the document after an individual receives care, in order to maintain a record of who was seen and what treatment was provided. The original form is intended to **remain with the individual** during the time they are displaced. The form can serve as an interim summary when normal care can be resumed.

Help is available to reconstruct evacuee medical histories from known sources of data such as pharmacy information. Please go to **Katrinahealth.org** to get information on accessing these and other resources to support the health of Katrina evacuees.



Please print the following pages and **Keep It With You**.



NAME: _____

Date of Birth: ___/___/___

Male ___ Female ___

E-mail: _____

Home Address: _____

City: _____

State: ___ Zip: _____

Phone Number: _____

Temporary Address: _____

City: _____

State: ___ Zip: _____

Phone Number: _____

Previous evacuee center location(s):

Facility: _____ City: _____

Facility: _____ City: _____

Facility: _____ City: _____

ID number/case number (if available):

Parent/Guardian/Other Support Person:

Name: _____

Phone # or other contact info: _____

Relationship: _____

ACTIVE DIAGNOSES :

ALERTS :

Doctor or clinic before evacuation (if known):

Name: _____

City: _____ State: _____

ALLERGIES :

ACTIVE MEDICATIONS

Table with columns for Name of pharmacy chain (if known), Medication, and Instructions. Multiple rows for listing medications.

NOTE: Help is available to reconstruct Katrina evacuees' medical histories. Please visit Katrinahealth.org for more information.

Please note encounters on reverse side ->



Initial Medical Screening and Ongoing Public Health Surveillance in Evacuation Centers

The Centers for Disease Control and Prevention (CDC) is recommending an initial medical intake in evacuation centers housing Hurricane Katrina evacuees, to be followed by ongoing public health surveillance. This guidance is intended specifically for persons in evacuation centers and does not necessarily apply to evacuees who may be in other residential settings. This medical intake screening and surveillance are important to ensure that the evacuees receive the health care they need. This two-phase process is envisioned as follows.

First, CDC recommends an initial medical intake screening for evacuees in evacuation centers. The goals of this initial screening are to—

1. rapidly identify and triage persons who have medical conditions that require acute medical care (e.g., dehydration, serious wound infections)
2. identify persons who have chronic health problems (e.g., hypertension and diabetes) and other conditions (e.g., pregnancy or disabilities) that require referral for additional medical attention, special services, or medications
3. assess persons for communicable diseases of public health significance to prevent introduction and transmission of these conditions in the group setting

The general principles of the medical intake screening are that it should be—

1. able to be completed rapidly, by persons who may have differing levels of medical training
2. based on risk assessment
3. focused on identifying persons who require additional evaluation and treatment, rather than being a comprehensive medical assessment
4. sufficiently flexible as ongoing surveillance identifies new issues

To facilitate the intake screening, CDC has provided an interim form to be used for medical intake assessment and triage of evacuees who are entering an evacuation center. The form can be used to identify evacuees who may need additional medical evaluation and treatment. The first page contains registration information for use by facility, local, and state authorities. The remaining pages can be used for anonymous reporting of medical conditions among evacuees. These forms are available on the CDC website: <http://www.bt.cdc.gov/disasters/hurricanes/katrina/evacueeform.asp>.

After initial screening is completed, a second phase of public health surveillance for evacuation centers is ongoing monitoring for conditions of public health importance among the evacuees. This information will serve to direct the public health response by 1) determining the secondary impact of the hurricane on evacuated populations, 2) identifying disease outbreaks and other events of public health concern, and 3) helping to direct distribution of state and federal resources.

To accomplish this objective, an interim form, provided at <http://www.bt.cdc.gov/disasters/hurricanes/katrina/pdf/housingsurv.pdf>, is intended to be used for surveillance for medical conditions of public health importance among evacuees residing in evacuation centers. The form can be used on a daily basis to record numbers of evacuees with specific infectious

Initial Medical Screening and Ongoing Public Health Surveillance in Evacuation Centers
(continued from previous page)

syndromes, mental health conditions, injuries and chronic diseases who might benefit from possible public health interventions. The selected syndromes vary in clinical specificity. Syndromic surveillance categories (e.g., fever, gastrointestinal illness, respiratory illness, rash, and neurologic illness) are included for use when specific clinical information or diagnoses are unavailable. Specific conditions and illnesses (e.g., bloody diarrhea, suspected chickenpox, and acute psychosis) are listed for use when clinical information or diagnosis is available.

Categories of diseases and conditions on the intake form and the daily report form are coordinated to facilitate aggregate data reporting.

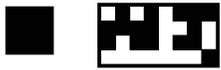
Individuals completing these forms should submit them to the appropriate state or local public health authorities. State or local public health authorities should modify CDC contact information on these forms as needed to facilitate reporting from within their jurisdiction. CDC is interested in receiving completed forms after they have been submitted to or reviewed by state or local agencies.

The information derived through both these surveillance efforts will be invaluable for identifying events of public health concern among facilities and across States and for directing interventions and other resources to areas of greatest need. For questions and additional information about the surveillance activities, please contact CDC at 770-488-7100 or at eocanalysis@cdc.gov.

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

September 9, 2005

Page 2 of 2



62134

Hurricane Evacuee Medical Intake Form (v.4)

OMB 0920-0008

ID

Complete one form for each individual. Please print in BLOCK

1. City of Departure

2. State of Departure

3. Date of Departure
Month (01-12) Day (01-31)

4. City of Arrival

5. State of Arrival

6. Date of Arrival
Month (01-12) Day (01-31)

7. Original City of Displacement (if different from departure city)

8. Original Displacement State (if different)

9. Date of Birth
Month (01-12) Day (01-31) YYYY

10. Unaccompanied Minor (check one)
 Yes No Not Applicable

11. Gender
 Male Female

12. Family Name (Last)

13. Given Name (First)

14. Middle Initial

15. Permanent Home Address

16. City

17. State/Province

18. Country

19. Postal Code

20. Permanent Home Telephone

21. Mobile Phone or Pager

22. E-mail Address

23. Do you have an intended place to go for shelter? Yes No Unknown

24. If YES, Facility Name or Hotel Name

25. Street Address (if known)

26. Telephone/Mobile Phone/Pager (if known)

27. City

28. State

29. Postal Code (if known)

Emergency contact information - to give or receive critical health information.

30. Telephone/Mobile Phone/Pager

31. Contact Person Name

32. City

33. State/Province

34. Country

Hurricane Katrina Evacuee Medical Intake Form

Age: _____ years months days

Facility Name: _____

Gender: Male Female

Facility City: _____

Spanish or Hispanic or Latino Ethnicity*: Yes No

Facility State: _____

Race (choose one or more)*:

Facility Phone: _____

 White Black, African American, or Negro American Indian or Alaska Native. Print name of enrolled or principal tribe _____ Asian -- Native Hawaiian -- Other Pacific Islander -- Some other race

*To be chosen by evacuee

Language spoken at home most of the time: _____ (e.g., English, French, Creole, Spanish, Chinese, Korean, Vietnamese, etc)

Does the person have a history of receiving one or more means-tested federal benefits (e.g., Medicaid, food stamps, subsidized housing, etc.):

 Yes No

Does the person have: (check all that apply)

 Gastrointestinal illness Watery Diarrhea (3 or more watery bowel movements per day) Bloody Diarrhea Vomiting (One episode or more) Other, specify _____ Respiratory illness Upper respiratory (e.g. pharyngitis) or influenza-like illness (fever and either cough or sore throat) Lower respiratory tract illness (e.g. pneumonia, bronchiolitis) Tuberculosis, suspected (cough for ≥ 3 weeks, fevers/chills, night sweats, or recent weight loss) Pertussis, suspected Other, specify _____ Neurologic illness Meningitis/encephalitis, suspected (fever, mental status change, focal neurologic deficits) Other, specify _____ Dermatologic condition Varicella, suspected (vesicular rash) Rubella/Measles, suspected (maculopapular rash) Scabies Rash, acute onset + fever Other, specify _____ Other infectious disease condition Fever $>100.4^{\circ}$ F (38° C) ALONE without localizing signs Jaundice (Viral hepatitis, suspected) Lice Wound infection, specify site _____ Conjunctivitis (red eyes, ocular discharge) Other _____

Hurricane Katrina Evacuee Medical Intake Form

Mental Health condition

- Anxiety /Depression/ Insomnia
- Substance Abuse / withdrawal
- Disorientation/Confusion
- Acute psychosis/ Suicidal or Homicidal
- Violent Behavior
- Other, specify _____

Injury

- Self-inflicted Injury - Intentional (violence)
- Assault-related injury – Intentional (violence)
- Unintentional injury (accidents)
- Heat related injury
- Other, specify _____

Dehydration

Are you or do you think you could be pregnant? Yes No Not sure

If yes, what is your due date? ___/___/___ (MM/DD/YY) OR
when was your last menstrual period? ___/___/___ (MM/DD/YY)
If unsure, when was your last menstrual period? ___/___/___ (MM/DD/YY)

Chronic Medical Conditions

- Cardiac
 - Hypertension
 - Other, specify _____

- Pulmonary
 - Chronic obstructive pulmonary disease (COPD)
 - Asthma
 - Other, specify _____

- Kidney Disease
 - Dialysis dependent
 - Other, specify _____

- Diabetes
 - Insulin
 - Oral medication
 - Other, specify _____

Immunocompromised condition (cancer, chemotherapy, high-dose or steroid use > 2 weeks, HIV/AIDS)

- Hereditary blood disorders
 - Requires blood products
 - Other, specify _____

Medications (if yes, please fill out page 4)

Known Allergies, specify _____

Hurricane Katrina Evacuee Medical Intake Form

Person with Disabilities

Physical disability

Mobility impairment (wheelchair, walker, etc.)

Other, specify _____

Sensory disability

Visually impaired (blindness, limited vision)

Hearing impaired

Other, specify _____

Cognitive disability

Mental retardation

Autism

Attention Deficit Hyperactivity Disorder

Other, specify _____

Resided in a group home, nursing home or assisted care facility

Other, specify _____

Disposition:

Referred for additional medical follow-up

STATE
LOGO

Aggregate Hurricane Morbidity Report Form

For Active Surveillance in Facilities Serving Evacuees



Form v1.0
Rev.06/13/2006

Submit completed form daily to CONTACT via email (xxx@xxx.xxx), phone (XXX/XXX-XXXX) or fax (XXX/XXX-XXXX).

Part I FACILITY INFORMATION		
LOCATION:		
STATE	ZIPCODE	NAME OF FACILITY
REPORTING PERSON/CONTACT:		
PHONE	NAME	
FAX	EMAIL	

Part III PERSONS SEEN OR TREATED	
TOTAL SEEN OR TREATED DURING CURRENT REPORTING PERIOD:	
RACE / ETHNICITY	White
	Black/African American
	Hispanic or Latino
	Asian
	Other
AGE	≤ 2 years
	≥ 65 years
	Pregnant females

Part II REPORTING PERIOD		
START:	AM	PM
END:	AM	PM
MONTH	DAY	YEAR
HOUR	(CIRCLE)	

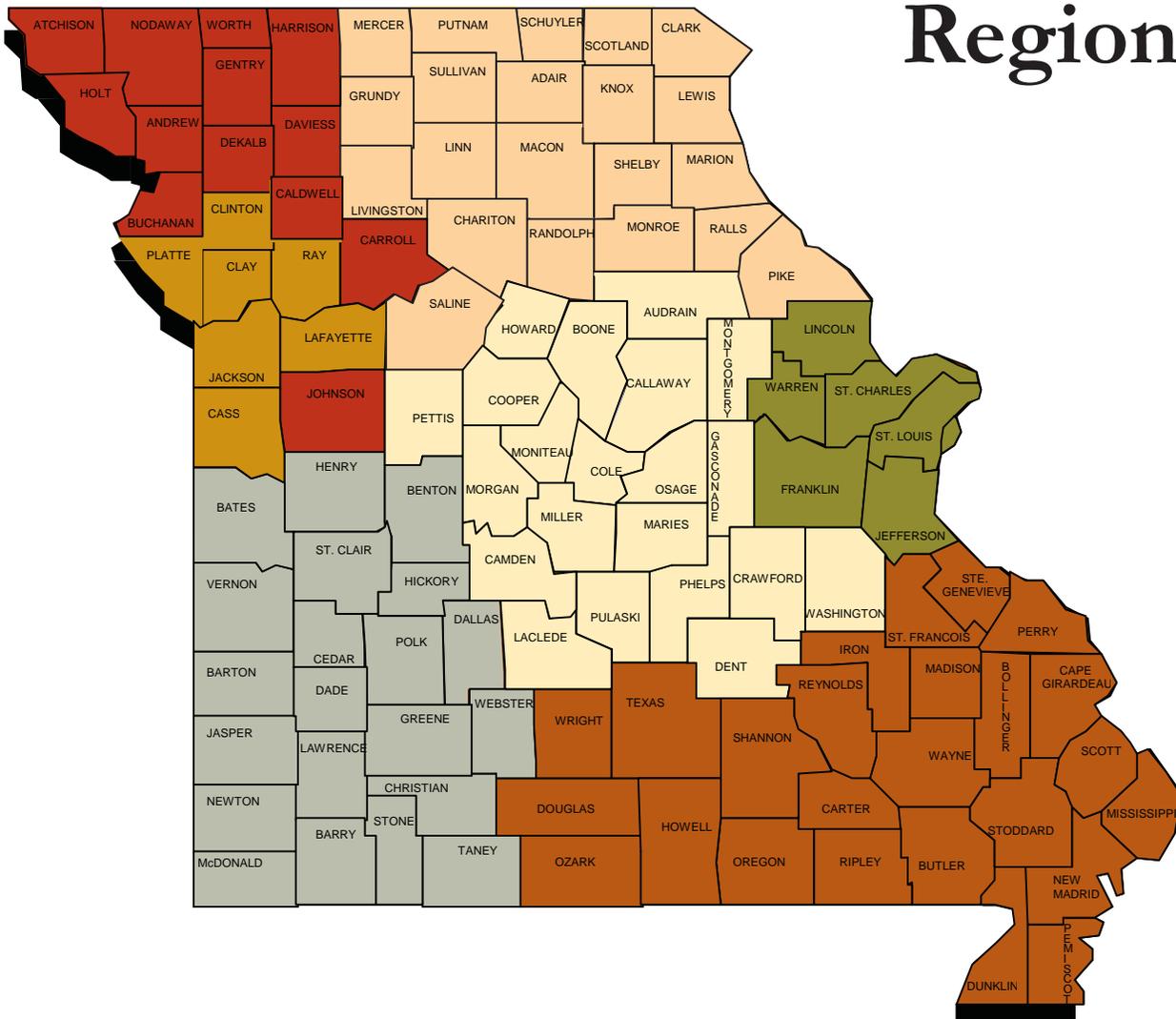
TOTAL SHELTER POPULATION AT START:	TOTAL REFERRED TO HOSPITAL:
------------------------------------	-----------------------------

Part IV TREATED PATIENTS
 Use categories that best describe patients' **current** reasons for seeking care. Complete the **Total** patient tallies for each syndrome category in the column to the right. Be as specific as possible. A single patient may be counted more than once.

SYNDROME CATEGORY	TOTAL
Acute neurological symptoms (e.g., altered mental status)	----
Cold- or heat-related illness or dehydration	----
Conjunctivitis / eye irritation	----
Fever (i.e., >100.4° F or 38° C)	----
Gastrointestinal illness – Total	----
Watery diarrhea	----
Bloody diarrhea	----
Nausea / vomiting	----
Gastrointestinal illness— <i>not specified above</i>	----
Jaundice/viral hepatitis, suspected	----
Meningitis/encephalitis, suspected (e.g., fever, stiff neck, headache, altered mental status)	----
Obstetrics/gynecology – Total	----
Routine pregnancy check-up	----
Complication of pregnancy (e.g., bleeding, abdominal pain, fluid leakage)	----
GYN condition not associated with pregnancy or post-partum period	----
Respiratory illness – Total	----
Cough	----
Shortness of breath or difficulty breathing	----
Wheezing in chest	----
Lower respiratory infection, suspected	----
Skin / soft tissue – Total	----
Generalized rash (e.g., chickenpox, measles)	----
Localized rash (e.g., dermatitis, eczema)	----
Lice or scabies	----
Skin, soft tissue, or wound infection	----

SYNDROME CATEGORY	TOTAL
Routine / follow-up care – Total	----
Blood pressure check	----
Blood sugar check	----
Dressing change/wound care	----
Medication refill	----
Routine care— <i>not specified above</i>	----
Exacerbation of chronic illness – Total	----
Cardiovascular disease (e.g., hypertension, coronary heart disease, congestive heart failure)	----
Cerebrovascular disease / stroke	----
Chronic pain / arthritis	----
Diabetes	----
Chronic respiratory disease (e.g., asthma, COPD, emphysema)	----
Chronic illness— <i>not specified above</i>	----
Injury – Total	----
Violence / assault (e.g., sexual or other)	----
Suicide / self-inflicted injury	----
Unintentional injury (e.g., fall, burn, bite/sting, cut, bruise, fracture)	----
Poisoning / toxic exposure (e.g., CO)	----
Injury— <i>not specified above</i>	----
Mental Health – Total	----
Anxiety / depression	----
Disoriented to person, place, or time	----
Drug / alcohol intoxication or withdrawal	----
Violent behavior / threatening violence	----
Unable to care for self or dependents	----
OTHER REASON FOR VISIT, specify:	----

BRFSS Regions



1-Kansas City Metro

Cass
Clay
Clinton
Jackson
Lafayette
Platte
Ray

2-St. Louis Metro

Franklin
Jefferson
Lincoln
St. Charles
STL City
STL County
Warren

3-Central

Audrain
Boone
Callaway
Camden
Cole
Cooper
Crawford
Dent
Gasconade
Howard
Laclede
Moniteau
Maries
Miller
Montgomery
Morgan
Osage
Pettis
Phelps
Pulaski
Washington

4-Southwestern

Barry
Barton
Bates
Benton
Cedar
Christian
Dade
Dallas
Greene
Henry
Hickory
Jasper
Lawrence
McDonald
Newton
Polk
St. Clair
Stone
Taney
Vernon
Webster

5-Southeastern

Bollinger
Butler
Cape Girardeau
Carter
Douglas
Dunklin
Howell
Iron
Madison
Mississippi
New Madrid
Oregon
Ozark
Pemisot
Perry
Reynolds
Ripley
Scott
Shannon
St. Francois
Ste. Genevieve
Stoddard
Texas
Wayne
Wright

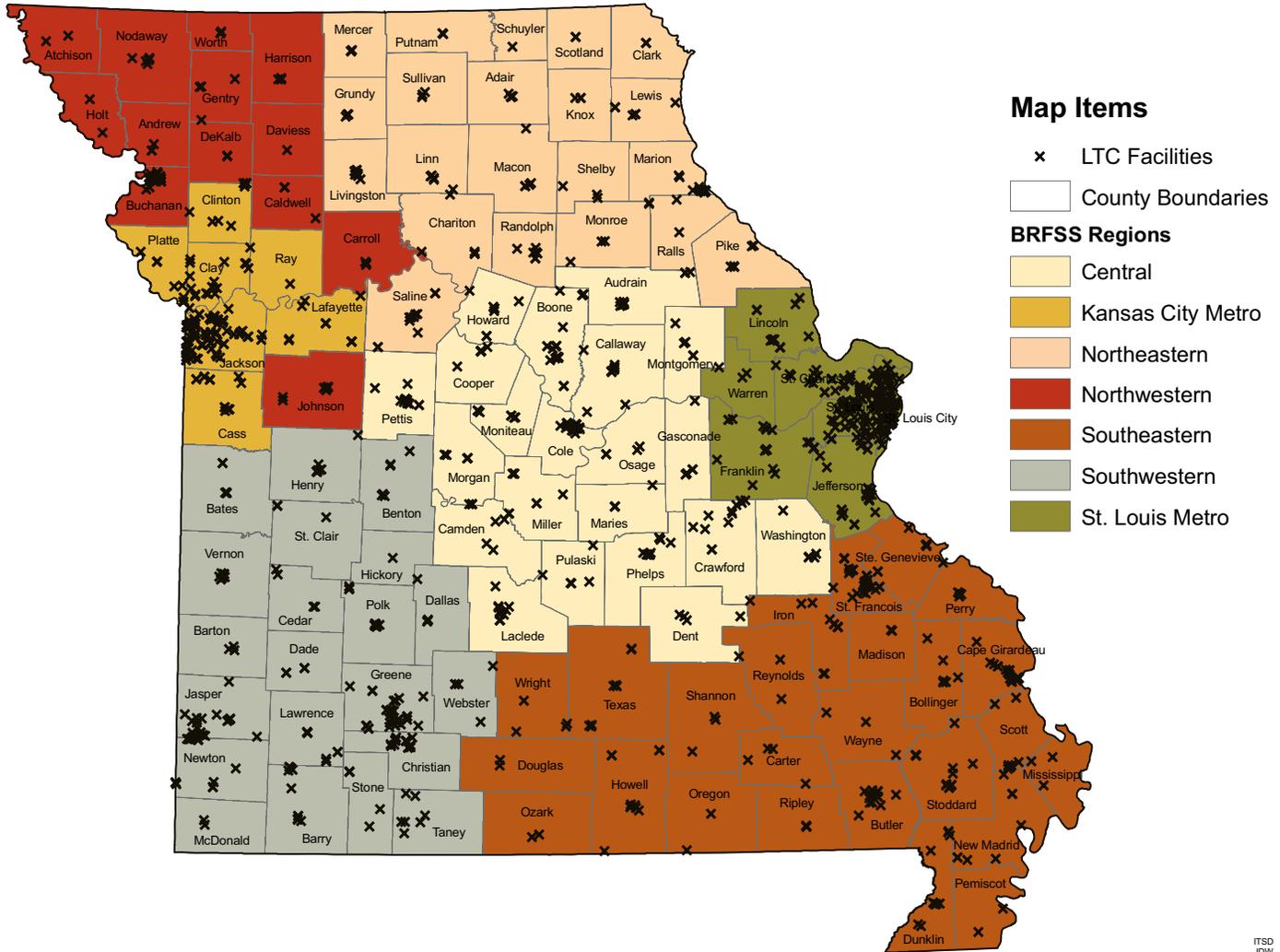
6-Northwestern

Andrew
Atchison
Buchanan
Caldwell
Carroll
Davies
DeKalb
Gentry
Harrison
Holt
Johnson
Nodaway
Worth

7-Northeastern

Adair
Chariton
Clark
Grundy
Knox
Lewis
Linn
Livingston
Macon
Marion
Mercer
Monroe
Pike
Putnam
Ralls
Randolph
Saline
Schuyler
Scotland
Shelby
Sullivan

Long Term Care (LTC) Facilities



Map Items

- × LTC Facilities
 - County Boundaries
- BRFS Regions**
- Central
 - Kansas City Metro
 - Northeastern
 - Northwestern
 - Southeastern
 - Southwestern
 - St. Louis Metro

Number of long term care facilities by county:

Adair	5	Clay	18	Iron	9	Montgomery	5	Schuyler	1
Andrew	2	Clinton	5	Jackson	81	Morgan	6	Scotland	1
Atchison	2	Cole	17	Jasper	23	New Madrid	6	Scott	9
Audrain	9	Cooper	5	Jefferson	28	Newton	9	Shannon	3
Barry	9	Crawford	9	Johnson	9	Nodaway	6	Shelby	3
Barton	3	Dade	2	Knox	2	Oregon	2	St. Charles	20
Bates	6	Dallas	4	Laclede	10	Osage	4	St. Clair	3
Benton	6	Daviess	1	Lafayette	7	Ozark	2	St. Francois	28
Bollinger	7	DeKalb	6	Lawrence	7	Pemiscot	2	St. Louis	110
Boone	19	Dent	4	Lewis	4	Perry	5	St. Louis City	51
Buchanan	22	Douglas	2	Lincoln	10	Pettis	12	Ste. Genevieve	6
Butler	16	Dunklin	11	Linn	6	Phelps	10	Stoddard	12
Caldwell	2	Franklin	18	Livingston	8	Pike	5	Stone	4
Callaway	10	Gasconade	5	Macon	4	Platte	8	Sullivan	3
Camden	4	Gentry	4	Madison	2	Polk	11	Taney	7
Cape Girardeau	20	Greene	34	Marion	16	Pulaski	5	Texas	8
Carroll	3	Grundy	4	McDonald	2	Putnam	2	Vernon	8
Carter	4	Harrison	3	Mercer	3	Ralls	2	Warren	2
Cass	10	Henry	7	Miller	6	Randolph	7	Washington	5
Cedar	4	Hickory	1	Missouri	6	Ray	2	Wayne	3
Chariton	3	Holt	2	Mississippi	3	Reynolds	3	Webster	4
Christian	12	Howard	6	Moniteau	5	Ripley	3	Worth	2
Clark	1	Howell	10	Monroe	4	Saline	10	Wright	4
								TOTAL:	1032