

## Potentially Preventable Hospitalizations Among Minnesotans, 2007

### Background

Research has shown that a portion of hospitalizations could probably be avoided through timely and effective primary care, improved care coordination, and patient education. This issue has received increased attention as health care costs continue to rise and policy makers look for sources of potential savings in the system. National estimates have shown that potentially preventable hospitalizations represent roughly \$1 of every \$10 in hospital expenditures.<sup>1</sup> As a result, reducing rates of preventable hospitalizations appears to hold considerable cost saving potential.

This issue brief provides information about potentially preventable hospitalizations in Minnesota for 2007 and shows how rates for select conditions vary across the state. The analysis uses a set of indicators developed by the Agency for Healthcare Research and Quality to measure rates of hospitalizations that are considered potentially preventable (Prevention Quality Indicators or PQIs).<sup>2</sup> Although PQIs are calculated using data on hospital admissions, they are not indicators of the quality of hospital care. Instead, PQIs are measures of access to and quality of care provided in outpatient settings. For example, a high rate of preventable hospitalizations for asthma might indicate an opportunity for improving the quality, availability, or accessibility of outpatient care because this condition can normally be managed through doctor visits and medication.

### Key Findings

Overall, approximately 53,000 potentially preventable hospitalizations for adult Minnesota residents occurred in 2007. Table 1 shows preventable hospitalizations as a percentage of all adult hospitalizations for Minnesota residents by region. These hospitalizations accounted for 10.5% of all adult admissions for Minnesota residents. The share of hospitalizations that were potentially preventable varied by region, from 9.5% in the Twin Cities Metropolitan area to 12.9% in the Southwest.

Estimated costs for potentially preventable hospitalizations in Minnesota totaled about \$400 million in 2007, which represented roughly 8% of inpatient costs for Minnesota adults.<sup>3</sup> Table 2 shows preventable hospitalizations and their costs by condition. Bacterial pneumonia and congestive heart failure were the most common reasons for potentially preventable hospitalizations and together accounted for nearly half (44%) of these hospitalizations in 2007. Admissions for these conditions accounted for a similar share of the overall costs associated with potentially preventable hospitalizations (43%, Table 2). Admissions for perforated appendix and low birth weight accounted for a larger share of costs (16%) than of total admissions (8%), indicating that these hospitalizations were on average more expensive compared with other potentially preventable hospitalizations.



## Potentially Preventable Hospitalizations Among Minnesotans, 2007

Table 1  
Potentially Preventable Hospitalizations as a Percentage of All Hospitalizations for Adult Minnesotans, 2007

Region of Residence	Number of Hospitalizations		
	Total	Potentially Preventable	Potentially Preventable as % of Total
Central	71,214	8,005	11.2%
Twin Cities Metro	255,574	24,286	9.5%
Northeast	41,669	4,346	10.4%
Northwest	20,778	2,280	11.0%
South Central	28,934	3,171	11.0%
Southeast	45,681	5,407	11.8%
Southwest	24,877	3,202	12.9%
West Central	20,766	2,418	11.6%
<b>Statewide</b>	<b>509,493</b>	<b>53,115</b>	<b>10.5%</b>

Source: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Health-care Research and Quality (AHRQ) Prevention Quality Indicators

Table 2  
Potentially Preventable Hospitalizations by Condition, Minnesota Adults, 2007

	Percent of All Preventable Hospitalizations	Percent of Total Costs Associated with Preventable Hospitalizations
<b>Chronic</b>	51%	50%
Diabetes Related	10%	13%
Congestive Heart Failure	21%	22%
Hypertension	3%	2%
Angina	2%	1%
Chronic Obstructive Pulmonary Disease	10%	9%
Adult Asthma	5%	4%
<b>Acute</b>	41%	34%
Urinary Infections	10%	8%
Bacterial Pneumonia	23%	21%
Dehydration	8%	5%
<b>Other Conditions</b>	8%	16%
Perforated Appendix	2%	4%
Low Birth Weight	6%	12%
<b>Total</b>	100%	100%

Source: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.

Diabetes related hospitalizations include admissions for short and long term complications associated with diabetes, uncontrolled diabetes, and diabetes related lower extremity amputations. Low birth weight indicator measures quality of and access to prenatal care. County rates for each condition are available at <http://www.health.state.mn.us/divs/hpsc/hep/>

Tables 1 and 2 represent the total number of hospitalizations among adult Minnesota residents in 2007.<sup>4</sup> This information is useful for understanding the relative burden of potentially preventable hospitalizations on the health care system. However, to capture geographic variation that is driven by differences in quality and timely access to outpatient services, not demographic differences, it is important to adjust for variations in demographic characteristics across the state.<sup>5</sup>

Figures 1 through 8 display age and sex adjusted rates of potentially preventable hospitalizations for all Minnesota counties.<sup>6</sup> The counties are shaded from light to dark according to how each compares to the statewide rate: more than 25% below the statewide rate, within 25% (above or below) of the statewide rate, between 25% and 50% above the statewide rate, and more than 50% above the statewide rate. Figure 1 shows that four counties had *overall* rates of potentially preventable hospitalizations that were more than 50% above the statewide rate of 964 per 100,000 people (Stevens, Lac Qui Parle, Mille Lacs, and Kanabec, shown in the dark red on the map).

It is also helpful to look separately at potentially preventable hospitalizations for chronic and acute conditions, which accounted for 51% and 41% of potentially preventable hospitalizations, respectively, in 2007 (Table 2). Potentially preventable hospitalization rates for chronic conditions overall are provided in Figure 2; rates for select chronic conditions are presented in Figures 3 to 5. These figures show that there are a number of counties that exhibit consistently higher rates (primarily in north central Minnesota) and others with higher rates of preventable hospitalizations for only one of the conditions (e.g., congestive heart failure hospitalizations in Rice and Martin counties; asthma hospitalization rates in Lake and Goodhue counties; and diabetes hospitalizations in Wilkin, Traverse, Lyon, Pipestone and Mower counties).

Rates of potentially preventable hospitalizations for acute conditions are provided in Figure 6; rates for select acute conditions are presented in Figures 7 and 8. Counties with the highest rates of hospitalization are generally located in north central Minnesota and in counties near the South Dakota border. Although, as with chronic conditions, not all counties exhibit consistently high or low rates of hospitalization for all acute conditions.

### Discussion

Minnesota's 2008 health reform law recognized that health care quality in Minnesota is unevenly distributed, that our payment system rewards volume instead of value, and that health care costs have been rising at unsustainable rates. The analysis in this issue brief provides one example of the size and geographic variability of some of these health system inefficiencies.

In 2007 alone, deficits in timely access to high quality care in primary care settings, patient education and/or compliance with provider recommendations resulted in roughly 53,000 potentially avoidable hospitalizations in Minnesota at a cost of about \$400 million or 8% of inpatient cost for Minnesota adults. These hospitalizations were not evenly distributed across the state, indicating potential areas for improvement overall and for specific conditions.

Many of Minnesota's 2008 reforms were designed to reduce health system inefficiencies such as preventable hospitalizations.<sup>7</sup> For example, the health care home initiative strengthens the focus on primary care so that providers, families and patients work jointly on improving health outcomes and quality of life for people with chronic health conditions. These efforts are targeted at improving patient education; creating connections between patients, their families and providers beyond the clinic visit; and better coordinating care for patients with chronic illnesses and disabilities. Similarly, the prevalence of preventable hospitalizations will likely be affected by the implementation of health reform initiatives focused on decreasing obesity and tobacco use and providing transparent cost and quality information to encourage the use of innovative, high-quality, low-cost health care providers.

## Limitations

This analysis has some important limitations. Not all of the hospitalizations represented in this analysis were preventable. Thus, these results should be considered a ceiling of hospitalizations that could have potentially been prevented. For example, someone with severe congestive heart failure could receive excellent outpatient care and management and still require a hospitalization. Also, rates of preventable hospitalizations may be driven by factors other than the quality of and access to outpatient care, such as patient preferences, health literacy, education and life-style choices. As a result, this analysis should serve as a springboard for more in depth investigation of the need for outreach and quality improvement across Minnesota. Future research will analyze how the prevalence of preventable hospitalizations and the costs associated with these hospital stays in Minnesota have changed over time.

## Endnotes

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<sup>1</sup> U.S. Agency for Healthcare Research and Quality, "Nationwide Frequency and Costs of Potentially Preventable Hospitalizations, 2006," April 2009.

<sup>2</sup> The Prevention Quality Indicators were developed by the Agency for Healthcare Research and Quality and are designed to be used with state hospital discharge data. More detailed information on the PQIs is available at [http://www.qualityindicators.ahrq.gov/pqi\\_overview.htm](http://www.qualityindicators.ahrq.gov/pqi_overview.htm).

<sup>3</sup> Costs were estimated by multiplying total charges times hospital specific cost to charge ratios.

<sup>4</sup> The calculation of area-specific rates in this issue brief is based on a patient's area of residence, not the location of the hospital that provided the services. Included in the analysis are hospitalizations for Minnesota residents that occurred in Minnesota and three neighboring states: North Dakota, South Dakota, and Iowa. Data for Wisconsin was unavailable at the time the analysis was conducted.

<sup>5</sup> This recognizes the fact that some conditions leading to potentially preventable hospitalizations are more common in certain age groups, for example the elderly make up a smaller share of the population in the metropolitan counties than they do in some of the more rural areas of Minnesota, and those differences affect the overall rate of hospitalizations.

<sup>6</sup> Calculation of the overall rate of preventable hospitalizations excludes hospitalizations for low birth weight births and perforated appendix.

<sup>7</sup> Updated information about the implementation of Minnesota's health care reform initiative can be found online: <http://health.state.mn.us/healthreform/index.html>.

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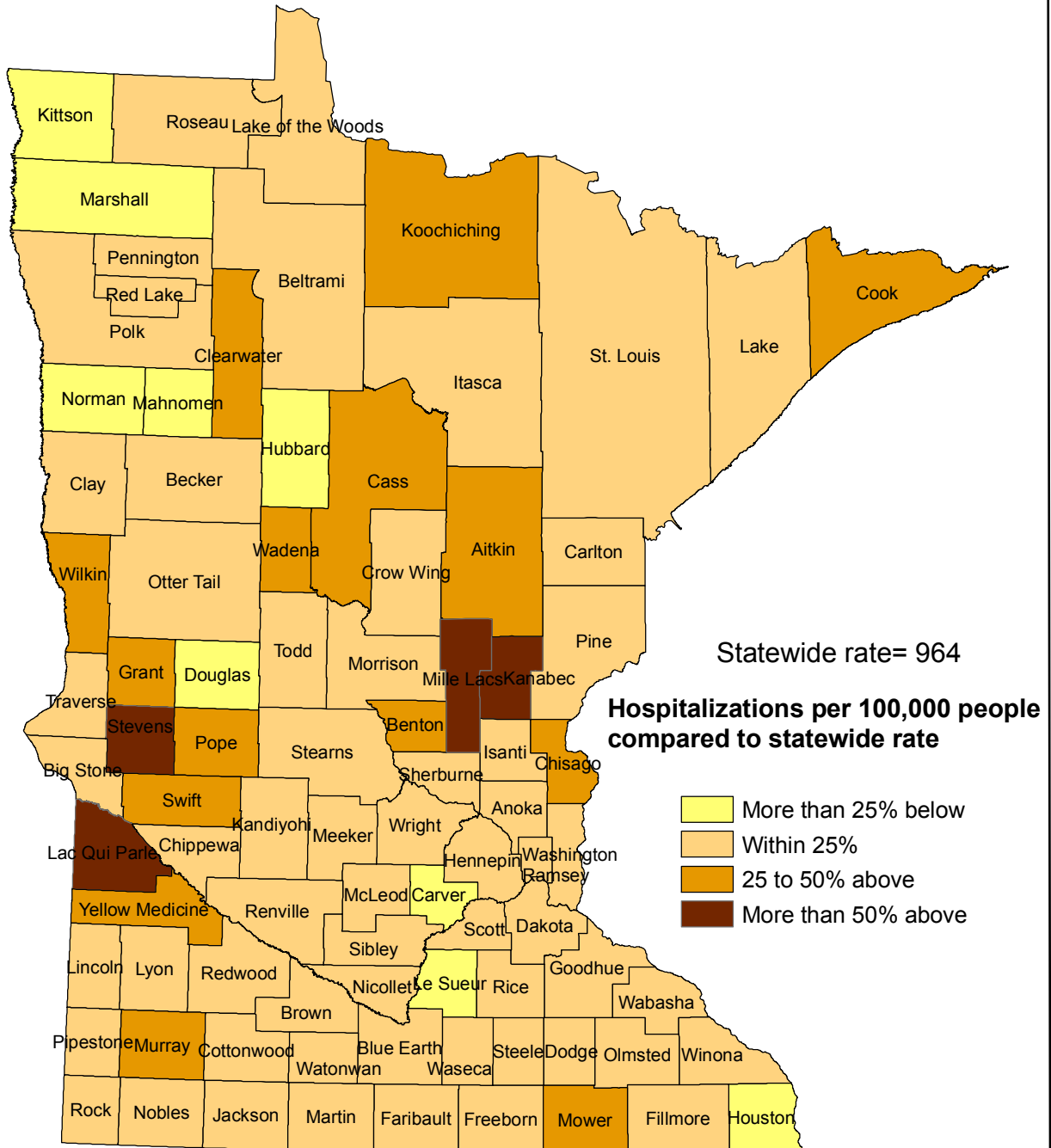
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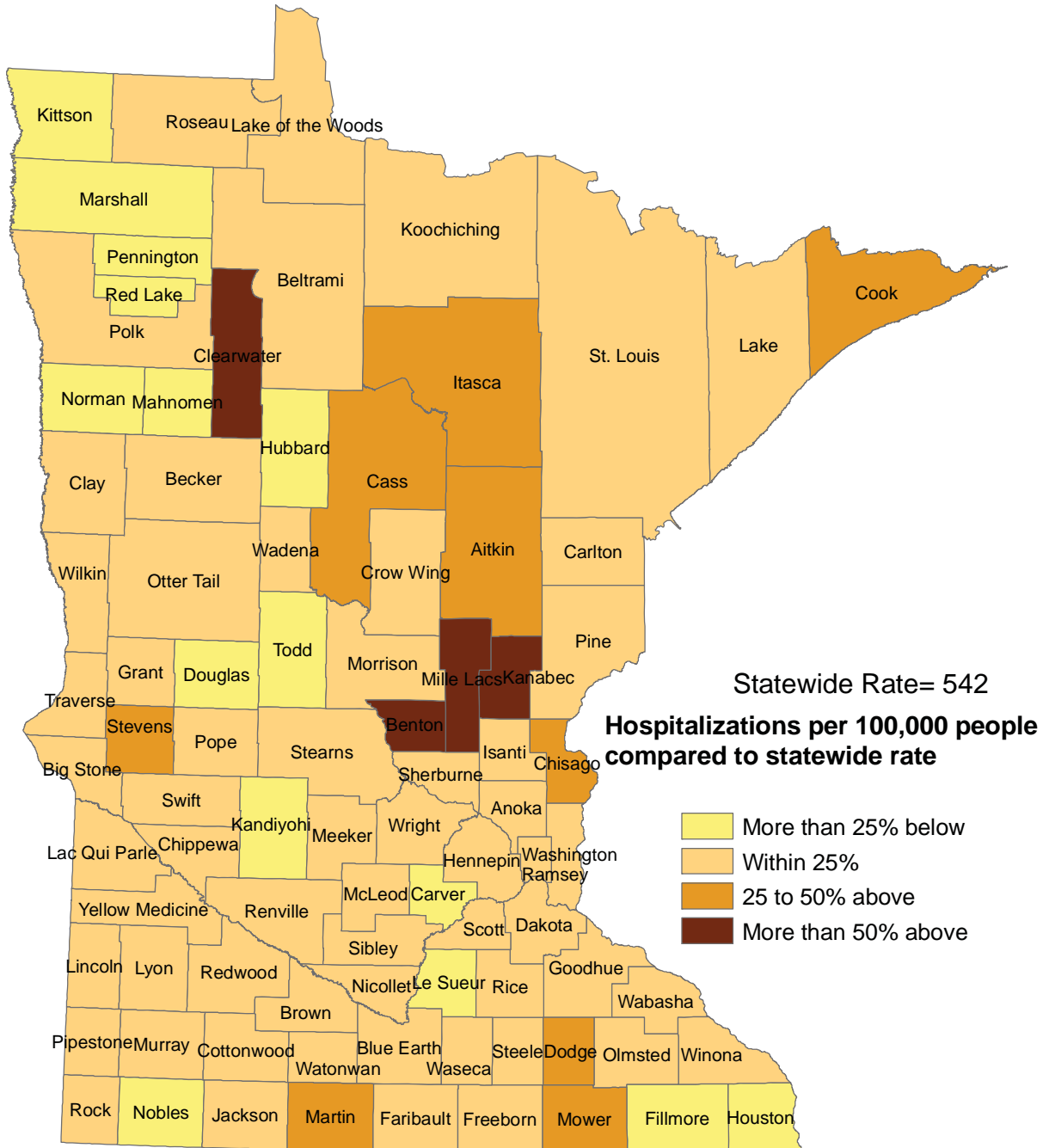
**Figure 1**  
**Potentially Preventable Hospitalizations for**  
**Minnesota Residents, 2007**



Includes potentially preventable hospitalizations for 14 separate conditions.  
 Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.

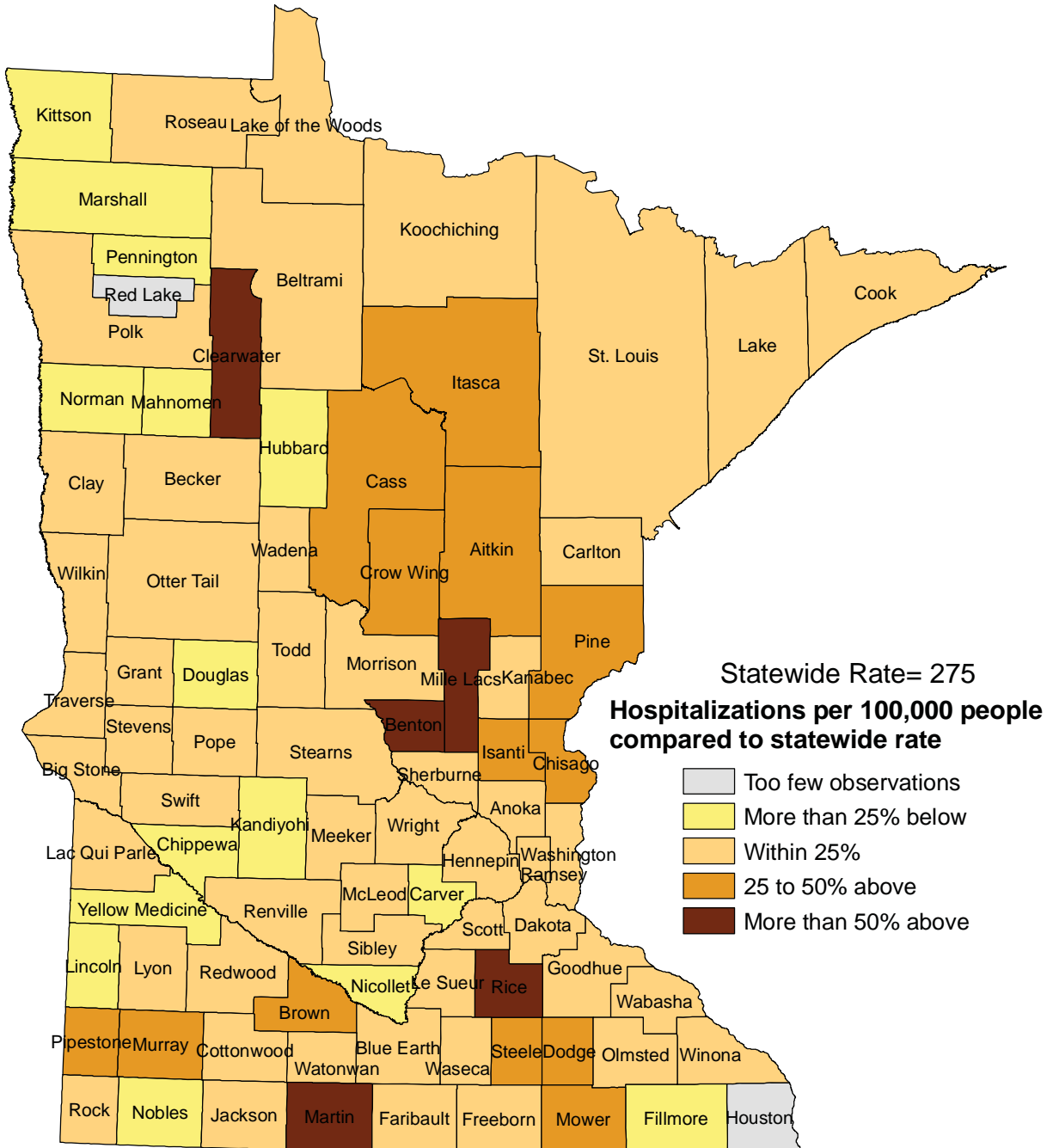
**Figure 2**  
**Potentially Preventable Hospitalizations for**  
**Chronic Conditions, 2007**



Includes preventable hospitalizations related to diabetes, cardiovascular disease, and respiratory problems. Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.

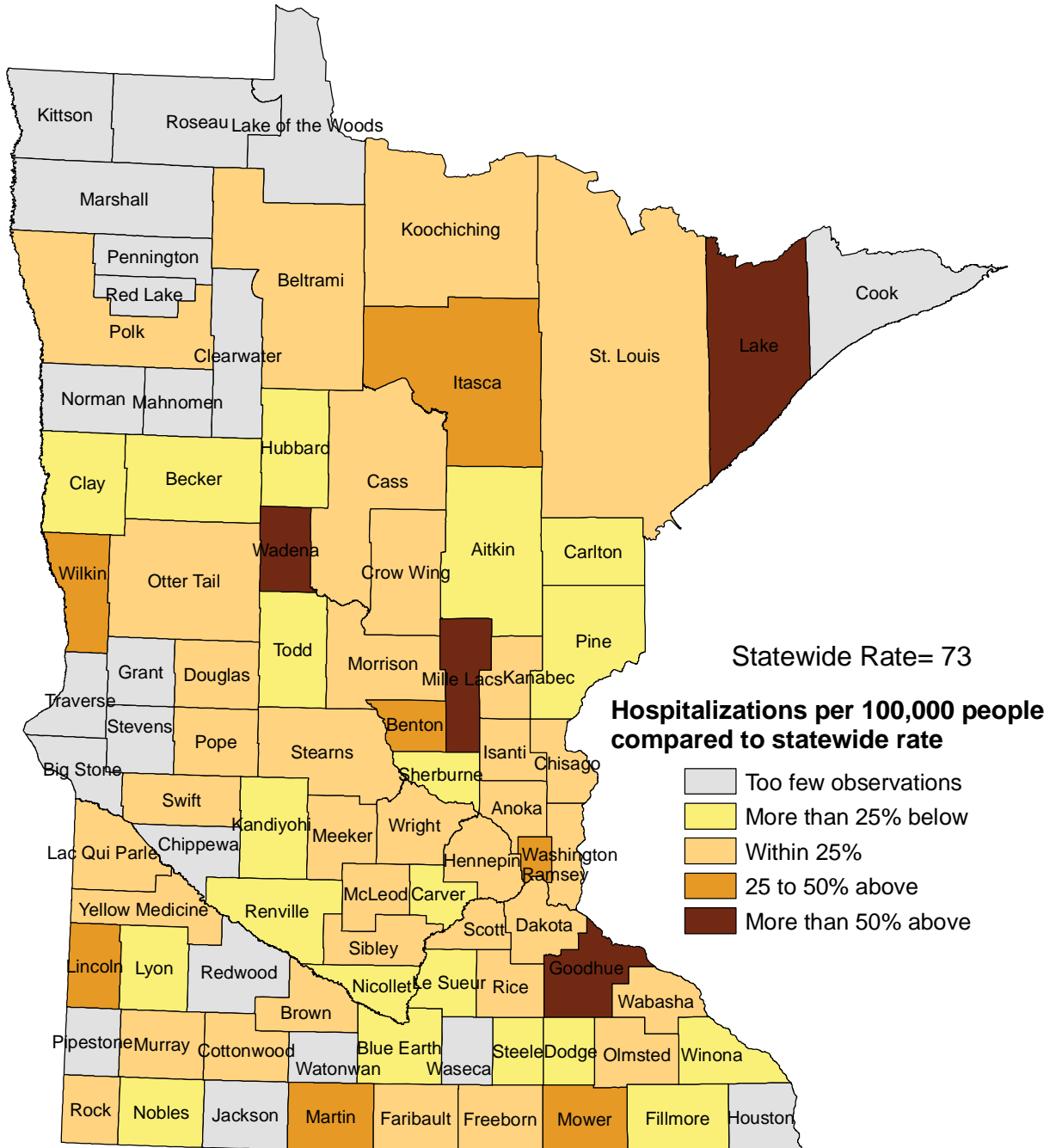
**Figure 3**  
**Potentially Preventable Hospitalizations**  
**for Congestive Heart Failure, 2007**



Rates were not reported for counties with fewer than five relevant hospitalizations (shown in gray on map). Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.

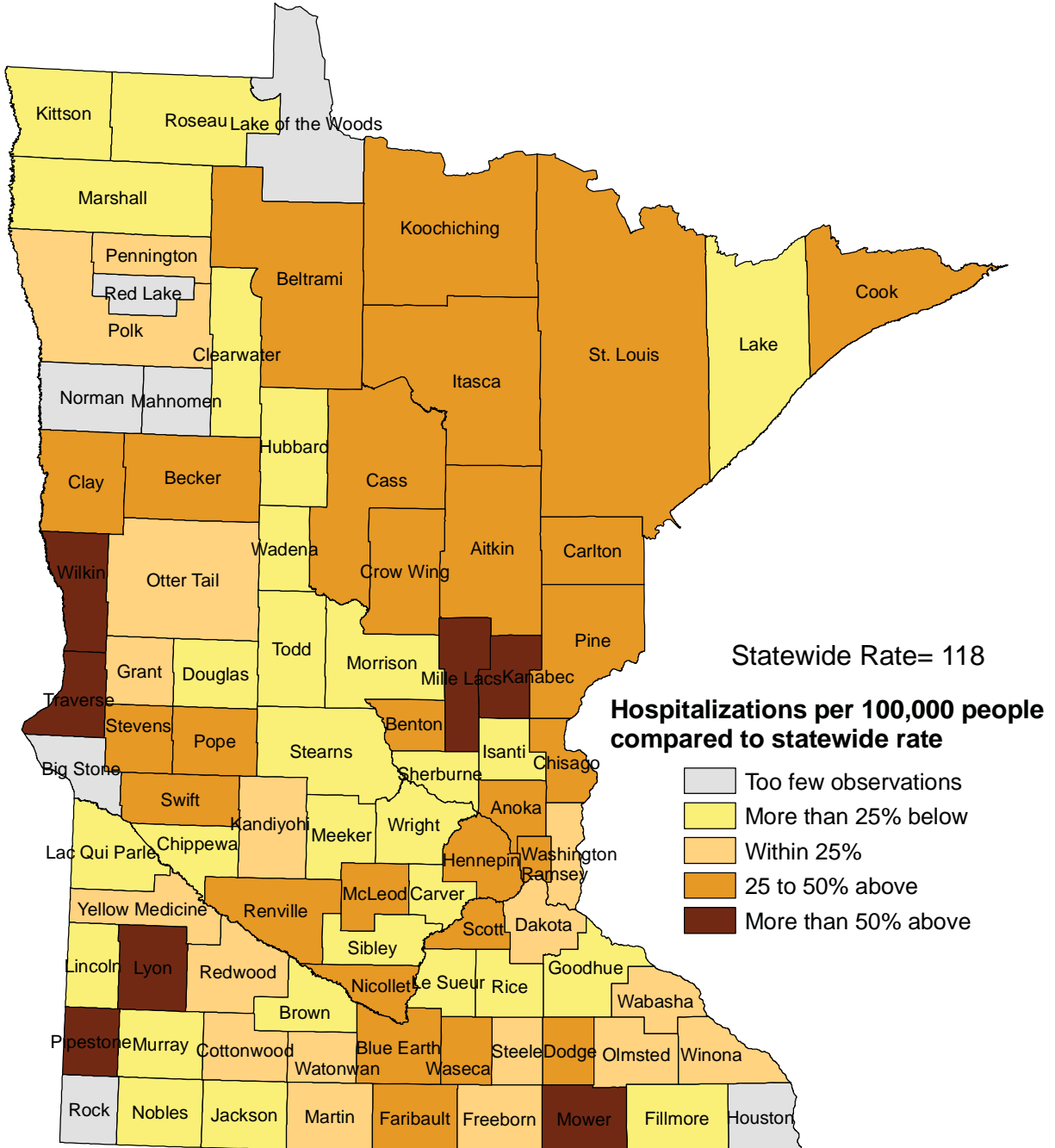
**Figure 4**  
**Potentially Preventable Hospitalizations**  
**for Adult Asthma, 2007**



Rates were not reported for counties with fewer than five relevant hospitalizations (shown in gray on map). Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.

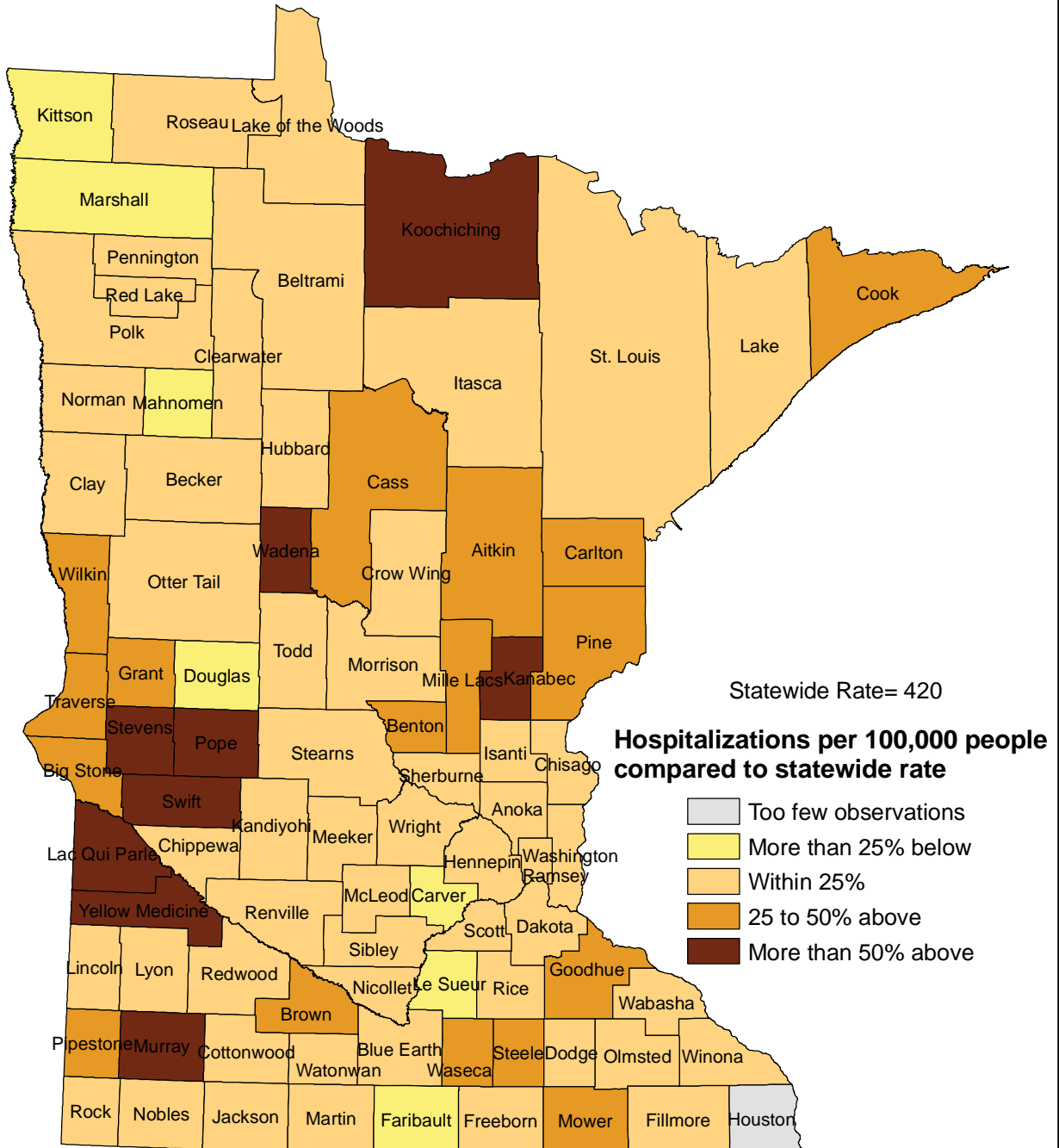
**Figure 5**  
**Potentially Preventable Hospitalizations**  
**for Diabetes, 2007**



Includes hospitalizations for long and short term diabetes complications and uncontrolled diabetes. Rates were not reported for counties with fewer than five relevant hospitalizations (shown in gray on map). Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.

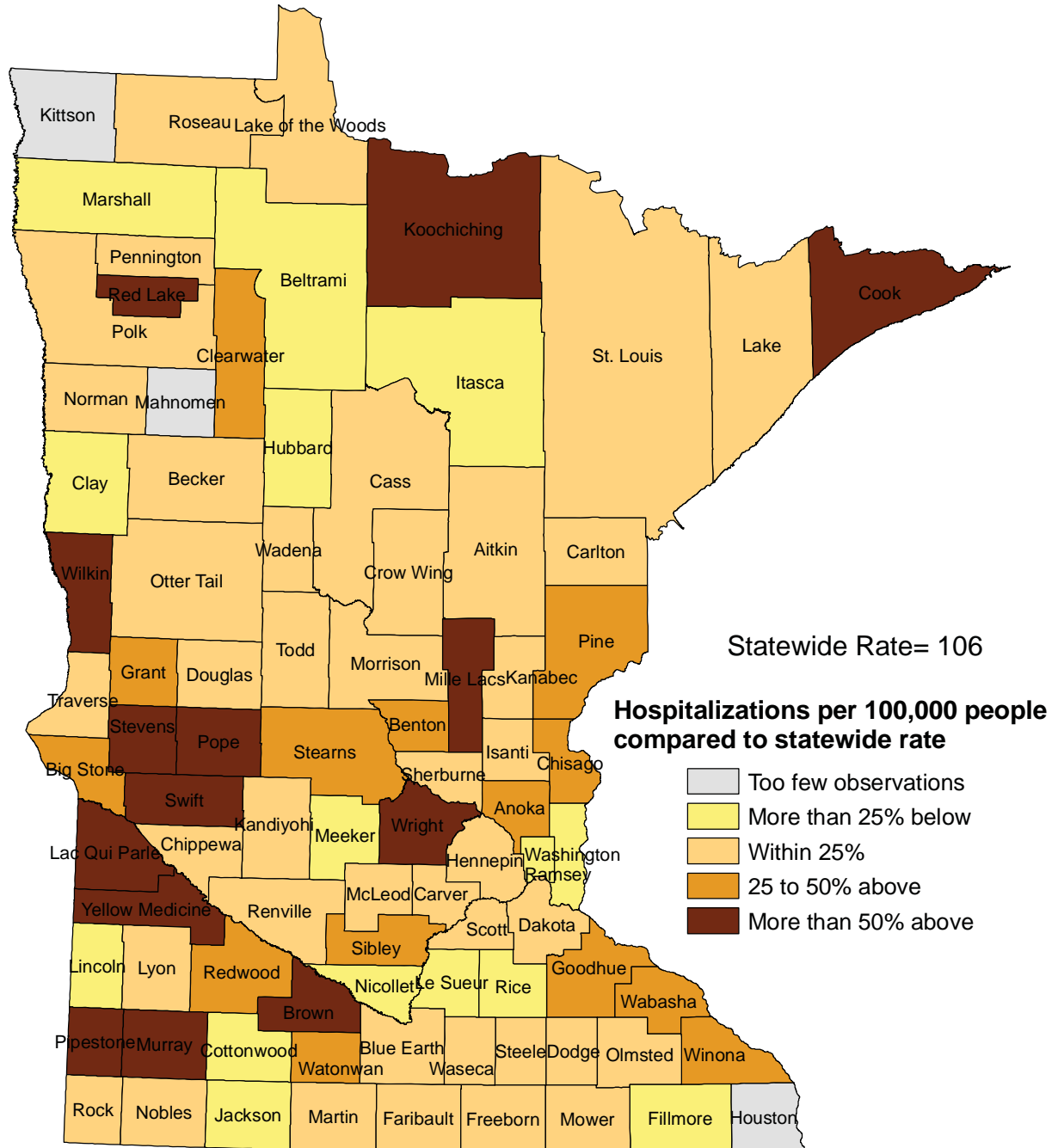
**Figure 6**  
**Potentially Preventable Hospitalizations for**  
**Acute Conditions, 2007**



Includes hospitalizations for pneumonia, dehydration, and urinary infections. Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.

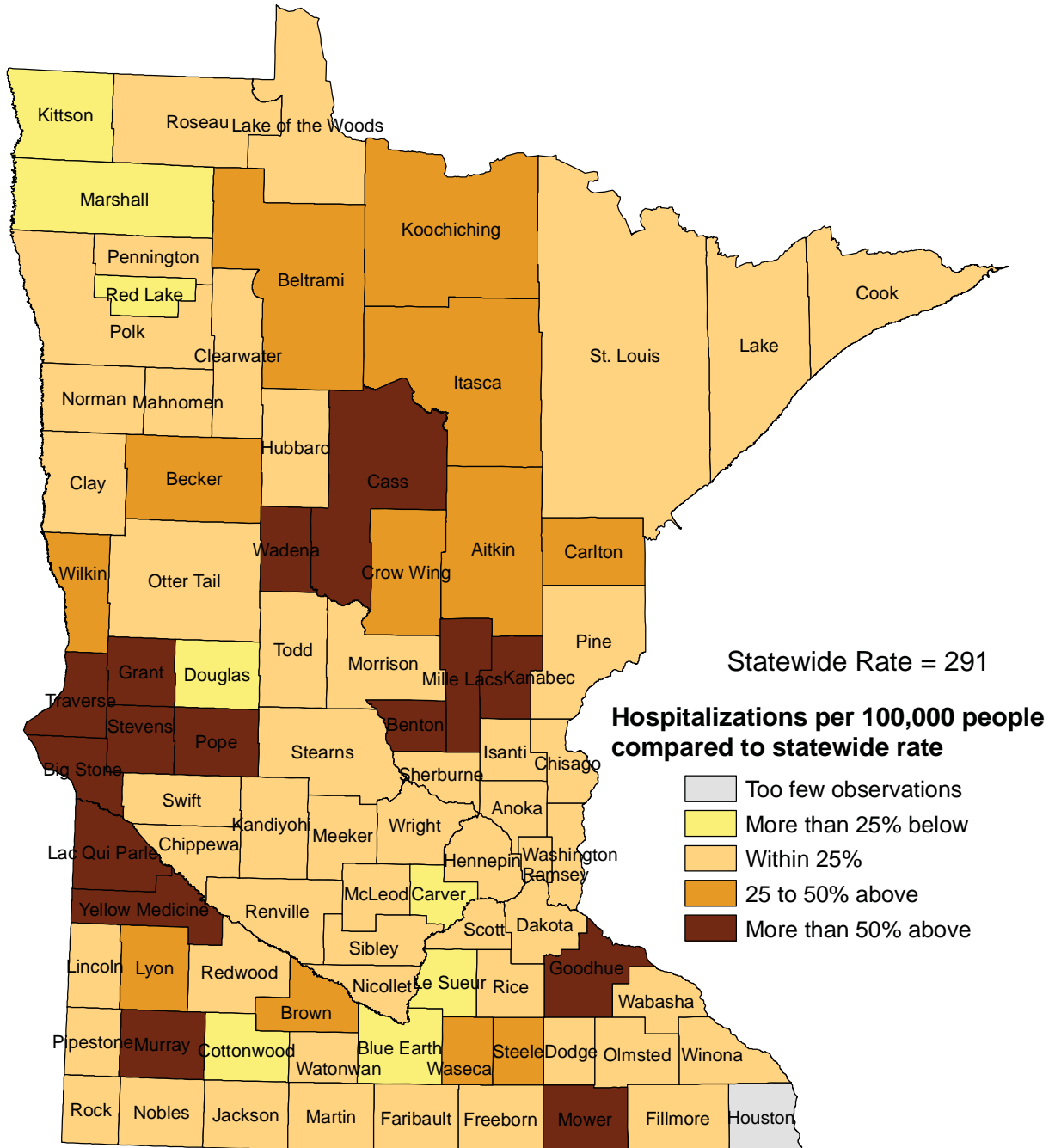
**Figure 7**  
**Potentially Preventable Hospitalizations**  
**for Dehydration, 2007**



Rates were not reported for counties with fewer than five relevant hospitalizations (shown in gray on map). Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators

**Figure 8**  
**Potentially Preventable Hospitalizations**  
**for Bacterial Pneumonia, 2007**



Rates were not reported for counties with fewer than five relevant hospitalizations (shown in gray on map). Rates were adjusted for age and sex.

Sources: MDH analysis of 2007 Minnesota Hospital Discharge Data using the Agency for Healthcare Research and Quality (AHRQ) Prevention Quality Indicators.