WASHINGTON STATE
OFFICE OF FINANCIAL MANAGEMENT

STRATEGIC HEALTH PLANNING: A PROGRESS REPORT

FORECASTING DIVISION
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EXECUTIVE SUMMARY

INTRODUCTION

RCW 43.370.030 directs the Office of Financial Management to develop a statewide health resources strategy. The law was enacted in 2007 as an addition to Senate Bill 5930, the legislation reflecting the recommendations of the Blue Ribbon Commission on Health Care Costs and Access.

We found that data are insufficient to fully meet the statutory requirements, and the resources provided did not allow us to supplement the data. This problem was compounded by reductions in the budget necessitated by the recession. Accordingly, this report is not the health resources strategy specified in statute, and will not be used as such.

The law provides that the strategy be submitted to the Department of Health to direct its activities related to the state's Certificate of Need program. This will be accomplished when all information and analysis intended by the Legislature can be included.

The fact that this is a progress report, instead of a final strategy, should not diminish its significance. Although based on the limited available data available and compiled within existing resources, it illustrates the potential of information to improve our health care delivery system and in doing so, reduce costs and allocate funds appropriately. It also describes the gaps in data systems and identifies steps to fully meet statutory requirements.

SUMMARY OF THE CONTENTS

Chapter 1 summarizes the key concepts and conclusions in the report, including data needed to construct a health resources strategy as described in the legislation. Analysis of health care resources requires data to answer key questions: What facilities exist in what locations and with what capacity to provide which services? Which health services professionals of various types and specialties are available in various geographic regions? Are there areas where people have difficulty obtaining health services because of travel time and/or cost? What is the health status of the population and how does it vary geographically?

Chapter 2 examines inpatient hospital utilization in Washington. Staff calculated historical usage rates using inpatient hospitalization data from the Washington State Department of Health's (DOH) Comprehensive Hospital Abstract Reporting System. Those rates were combined with state population projections through 2030 to develop a projection of inpatient usage based on the assumption that statewide occupancy would remain near where it is today, at 65 percent. If these utilization rates continue, the new bed construction needed would bring to an end a 20-year period of sufficiency. (This is not a recommendation that a 65 percent occupancy rate be accepted as a policy goal.)

The analyses of population trends in Chapter 2 indicate that at the current level of provider services utilization, Washington is approaching an untenable situation. The aging population will make illness more common, and the lack of growth in the working age population suggests that working providers will be scarcer.

The analysis of variation in utilization discussed in **Chapter 3** suggests that new bed construction might be avoided by reducing utilization in high-use areas to conform to practices in lower-use areas. This change may be possible to the extent that some utilization in high-use areas is unnecessary, ineffective or results from poor health practices that can be remedied or avoided. Chapter 2 suggests concrete steps that could be taken to reduce the level of utilization without placing additional restrictions on hospital bed construction.

The utilization data used for analyses in Chapters 2 and 3 exist only for inpatient hospital services. However, outpatient care has increasingly played a larger role beyond primary care. Many traditionally inpatient-only procedures are now commonly performed in outpatient settings. Yet data on outpatient utilization is not accessible for analysis, making it impossible to assess the system as a whole. The report recommends exploring an ***all-payer claims database*** for Washington.

Chapter 4 focuses on hospital admissions for ambulatory care-sensitive conditions. These admissions occur less frequently where a strong system of prevention and primary care is in place. Analysis of the variation in these admissions helps to identify areas where improvements in primary care and public health could reduce inpatient utilization.

In **Chapter 5**, small-area analyses conducted by applying epidemiological-based disease cluster identification tools to hospital discharge data are discussed. Regions identified as having higher or lower than expected hospitalization rates are profiled using data from the Behavioral Risk Factor Surveillance System. Through these analyses, behavioral risk factors, such as smoking, and economic risk factors, such as insurance status, were generally found to be correlated with outcome data.

Additionally, the analyses identified treatment patterns that do not appear to be correlated with need. These findings raise serious questions about the appropriateness or necessity of certain treatment practices. Further study to determine whether prevalent treatment practices in certain areas are related to need, or to other factors, is essential to an effective health resources strategy. Such research also would provide opportunities to target specific interventions to specific communities.

Chapter 6 discusses regional variation in Washington's health care work force. Using counts of health care professional licenses from DOH, availability of health care workers statewide and regionally is assessed for selected professions. Rural regions have been associated with more and greater health risk factors, and yet the health care work force in those regions is usually smaller. Analysis of inpatient data shows that many people in rural regions seek inpatient care in adjacent urban regions. Closing the gap between rural and other regions may require a multi-front approach that aims at reducing risk factors as well as increasing and retaining the health care work force in rural areas.

Chapter 7 describes the process used by the Strategic Health Planning Office (SHPO) staff to inventory health care facilities in Washington. The inventory was created by combining lists from several sources and through direct telephone contact. The chapter includes a description of what was learned in this process. One conclusion is that a census of facilities be regularly conducted. The results are available in a Web-based query system.

CONCLUSIONS AND NEXT STEPS

The report confirms the existence of substantial variation in the use of inpatient services among regions in Washington. It would be inappropriate to declare the observed variation unwarranted without additional research. It would be equally inappropriate to accept regional variations as proper. This variation should be analyzed more thoroughly to identify improvements that lead to a high-performance health system. Although data does not support accurate forecasting of future health resource needs, the report identifies concrete steps in that direction.

In addition, research conducted by SHPO staff required evaluation and analyses of many databases. Based on the work completed for Chapters 2–7, this report recommends the development of additional databases to capture missing elements essential for further analysis of health care utilization and resources in Washington. These data resources are essential to a future health services resources strategy.

The following databases should be developed when budget conditions permit:

1. A census of active health care professionals. Key elements are age, gender, license type, practice status, location(s) of practice, FTE in practice, specialty and subspecialties.
2. A census of health services facilities conducted on a routine periodic basis. Data are location, service types and service capacities.
3. An all-payer claims database. Key elements are patient age, gender, place of treatment, ZIP code of patient address, diagnosis codes, procedure codes, service dates, charges and payments. This would extend data on utilization well beyond the current restriction to inpatient services.
4. A comprehensive population-based, socio-economic and health database similar to that of the California Health Interview Survey or an expanded Behavioral Risk Factors Surveillance System for Washington.

Following this report, SHPO staff will shift focus to state-run programs for two reasons. First, the development of a complete set of databases required for analysis beyond inpatient services will take some time, due to fiscal and logistical constraints. Second, the current budget situation calls for more attention to the issue of variation within state-run programs, which are under pressure to reduce expenditures while maintaining, or even improving, quality.

CHAPTER 1

INTRODUCTION AND SUMMARY

In May 2007, the Washington State Legislature passed Engrossed Second Substitute Senate Bill 5930 (E2SSB 5930), which was signed by Governor Gregoire and enacted as chapter 259, Laws of 2007. The bill included a provision for the creation of a new Strategic Health Planning Office (SHPO) within the Office of Financial Management (OFM) to establish health planning policies and goals that relate to the regional availability of health care facilities and services, quality of care, and cost of care. It also directed the SHPO to serve as a coordinating body for public and private efforts to improve quality in health care, promote cost-effectiveness in health care, and plan health facility and health service availability.

This progress report documents the SHPO work to-date towards producing a "State Health Resources Strategy," which is required under RCW 43.370.030. The report describes the gaps in existing data systems and identifies the steps that would need to be accomplished in order to produce a complete health resources strategy as described in the statute. Until the required data become available, it will not be possible to provide any specific direction vis-à-vis health services resource needs forecasts to the Certificate of Need (CON) Program at the Department of Health (DOH), as is required in RCW 43.370.040. This report must be characterized as a progress report rather than the required health resources strategy. Nevertheless, the report does provide insight into the current state of the healthcare system in Washington State based on data that are currently available.

BACKGROUND

Legislative direction for strategic health planning in Washington goes back many years. The last complete Washington State Health Plan was produced in December 1980, although there were several addenda in 1982 and 1987. No further updates have occurred since May 1987, when two volumes were added:

- Volume 1: a review of the health status of state residents and health principles, goals, objectives and strategies; and
- Volume 2: health service performance standards as a basis for "health system monitoring" and "capital expenditure review regulation," including methods for forecasting the need for beds in select types of health care facilities.

More recently, attention to health planning has generally focused on two areas. First, in 2005 Engrossed Second Substitute House Bill 1688 (E2SHB 1688) was enacted. This bill established a task force to make recommendations for improving and updating the CON program.[1] Recommendations from the task force were published in November 2006.
Second, in its 2005-07 Supplemental Operating Budget Engrossed Substitute Senate Bill 6383 (ESSB 6383), the 2006 Legislature formed the Blue Ribbon Commission on Health Care Costs

[1] A certificate of need from the Department of Health is required prior to the construction, renovation, sale, or expansion of specific health care facilities. Details are available at http://www.doh.wa.gov/hsqa/fsl/CertNeed/. The CON program is intended to help ensure that new services proposed by health care providers are needed for quality patient care.

and Access (BRC) to find ways to provide accessible, affordable, quality care for all Washingtonians. The BRC was charged with recommending a "sustainable five-year plan for substantially improving access to affordable health care for all Washington residents."[2]

The CON task force and BRC recommendations came together in 2007 when Engrossed Second Substitute Senate Bill 5930 (E2SSB 5930) was enacted. This work has been the foundation for current efforts related to developing a high performance health system in Washington, described in Section II. The CON task force recommended that CON should be conducted:

> "*…in the context of a **comprehensive, strategic state health plan** built on the **foundation of adequate data**, and arising from a **transparent decision-making process**. … the state health plan must include mechanisms for monitoring and evaluation, be funded at a level that allows participating agencies to adequately respond, and be regularly reviewed and updated. …CON regulations flowing from this strategic health plan should apply equally to similar services delivered in different settings."*

Mindful of this vision, E2SSB 5930 created the office of Strategic Health Planning. With a view to improving the quality, cost-effectiveness, and regional availability of health facilities and services, the statute directed three key functions to shape Washington's path to a high performance health system:

- Co-ordination of related public and private efforts;
- Research and planning tasks that would culminate in the development of an ongoing plan – the "statewide health resources strategy;" and
- Development of an accessible system of data to support ongoing health system planning at the state and community levels.

THE STATEWIDE HEALTH RESOURCES STRATEGY IN CONTEXT

E2SSB 5930 directed a scope of functionality for the SHPO that is extremely broad. Taken at face value, it could be viewed as the hub of health system planning for Washington State. However, E2SSB 5930 also directed an array of on-going public and private initiatives related to improving the performance of Washington's health care system through re-engineering public program delivery systems. While the SHPO's activities were anticipated to be complementary, its research, analysis and subsequent Statewide Health Resources Strategy were statutorily designed to occur *after* the key health system improvement initiatives were already in development. These initiatives focus mostly on near-term[3] planning activities assigned to Washington's health-related agencies and various task forces, or promoted by other organizations. Geared toward more long-term planning for a future high performance health system, the SHPO has needed to remain attentive to the implications of current planning and development to minimize conflict and duplicative work.

The current fiscal crisis has produced a health system in which difficult policy and budget decisions have been necessary to reduce the growth in spending on public programs through

[2] The proceedings and final report from the BRC are available at: http://www1.leg.wa.gov/Joint/Committees/HCCA/.
[3] "Near-term" for purposes of this analysis tends to focus on the biennial budget.

eligibility limitations, increased cost sharing, and benefit cuts. In addition, subsequent to passage of E2SSB 5930, Governor Gregoire and the Legislature have continued to pay attention to health care delivery system reform, recognizing that efficiency improvements in health care delivery are critical to the future sustainability of coverage expansion efforts. With a challenging economy and increasingly complex health care system, public programs will lose even more ground if they continue to operate in a "business as usual" mode. Via Second Substitute Senate Bill 5945 (2SSB 5945), the 2009 Washington State Legislature confirmed principles to guide planning of a broad health care reform effort geared toward a high-performance, seamless array of coverage options for Washington's low-income population. This overarching effort is about health care delivery and purchasing redesign that supports an efficient, effective, and science-based health care system.

The context for the work of the SHPO is therefore complex. Although not a comprehensive list, the following examples give perspective to the wealth of activity that is currently occurring in Washington, to which the SHPO efforts are directly or indirectly connected.

Figure 1: Overview of SHPO Connections with Ongoing Work

Current Activity	Organization	Link with SHPO
Shared decision-making Patient Decision Aids	HCA/Group Health/ University of Washington pilot	Variation analyses that suggest "misuse"[4] of preference-sensitive care
Measurement of variation in standard protocols	Puget Sound Health Alliance	Complementary work that highlights opportunities for continuous improvement in the I-5 corridor
Medical homes demonstration (Quality Improvement Institute)	DSHS/HCA/DOH	Expansion of individual provider and practice data collection to measure medical home progress
Development of coverage options to improve access to health insurance (e.g., Health Insurance Partnership, Medicaid Waiver, Federal Reform estimates)	Public and private organizations	Ongoing analysis of Washington's uninsured population and employer-based sources of coverage
Development of a revised acute care bed need projection.	DOH and stakeholders	Was intended to be supported by the SHPO.
Development of a rural health plan.[5]	Rural Health Plan Steering Committee	The legislation establishing the SHPO required consideration of rural health needs.

[4] There is unwarranted variation in the practice of medicine and the use of health care system resources. The landmark work of the Dartmouth Atlas which describes misuse of preference-sensitive care, underuse of effective care, and overuse of supply-sensitive care is described in Section II.

[5] The Rural Health Plan Steering Committee report can be found at: http://www.wsha.org/files/1st%20Edition%20-%20Rural%20Health%20Plan%20-%20WA.pdf

Current Activity	Organization	Link with SHPO
Prevention and health promotion	DOH	Coordination with ongoing population health research; health professionals', inpatient hospital services, and financial data collection; and variation analyses that suggest "underuse" of effective care
Certificate of Need process	DOH	Analysis of resource use, availability, capacity, and other system efficiencies that assist in understanding potential "need"
Public program purchasing refinements	HCA/DSHS, Health insurers (Group Health in particular)	Variation analyses that suggest "overuse" of supply-sensitive care
Health technology assessment	HCA	Variation analyses that suggest "overuse" of supply-sensitive care
Health information technology expansion	HCA	Variation analyses that suggest ineffective use of the primary care system and/or lacking access to adequate clinical /health information
Analysis of health care workforce	DOH, WWAMI, Health Care Personnel Shortage Task Force	Health professions workforce analysis and data collection
Strategic planning for health care workforce shortage	Health Care Personnel Shortage Task Force	Initiatives in education, training, and retaining of health workforce and on-going monitoring of program outcomes.
Administrative simplification	OIC	Potential for enhanced (comprehensive and up-to-date) provider data collection

DEVELOPMENT OF THE 2010 STATEWIDE HEALTH RESOURCES STRATEGY

INITIAL CHALLENGE

An early challenge of the strategic health planning project was defining and developing an operational measure of need. Need has been a central concept in health planning but has never been adequately defined. Utilization has been used as a proxy for need, but there is now a well-established body of research that suggests a substantial portion of utilization is not needed under any definition. Utilization does not define need. This important insight shaped the direction of the effort to define a health care resources strategy. This direction was based on prior research (OFM Forecasting Division, 2007)[6] and a review of the literature on practice variation conducted

[6] OFM Forecasting Division. (2007). *Washington Inpatient Atlas Project (WIAP)* . Retrieved November 2009, from Washington State Office of Financial Management: http://www.ofm.wa.gov/researchbriefs/2007/brief044/default.asp

by OFM Forecasting Division staff. The primary source on the topic of practice variation is the body of research produced by Dr. John Wennberg and his associates at Dartmouth University, generally referred to as "The Dartmouth Atlas Project" (DAP). The following sums up the results of this research.

> *Much of the variation among areas in per capita resource inputs and utilization has proven to be unwarranted; it cannot be adequately explained on the basis of differences among regions in illness rates, patient preferences or the dictates of evidence-based medicine. Much of the variation relates to provider quality defects. In addition to variations in medical errors such as mortality following surgery, the DAP documents unwarranted variation in three categories of service: (1) systematic underuse of effective care such as beta-blockers after heart attack, or diabetic eye care; (2) misuse of preference-sensitive care such as discretionary surgery (as documented by striking variations among neighboring communities in rates of surgery); and (3) overuse of supply-sensitive care such as physician visits and hospitalization rates among chronically ill patients.* (The Dartmouth Institute, 2009)[7]

In accepting the premise that utilization does not necessarily reflect need, the research and analysis in this report have focused on describing variations in utilization and on raising important questions about the underlying need – or other factors – that may account for the observed variations.

Organization of this Report

This report focuses on describing Washington's health care system in terms of the current availability of its health care resources and the variations observed in the way those resources are used. It assumes that a solid foundation of data on which the performance of the current system can be adequately measured is essential to establishing and monitoring Washington's path to a high performance health system. It provides an array of measures through which variation in patterns of current and historical health care delivery can be compared against variation in health outcomes, personal behaviors, and socioeconomic characteristics of regions of the state.

DATA

Strategic analysis of health care resources requires data to answer several key questions. What facilities exist in what locations and with what capacity to provide which services? What is the availability of health services professionals of various types and specialties in different areas of the state? Are there areas where people have difficulty obtaining health services because of travel time and/or cost? What is the health status of the population and how does it vary geographically?

The state of Washington does have a significant body of data that was used in this report and is enumerated below. However there are gaps that leave many relevant questions unanswerable.

[7]The Dartmouth Institute.(2009). *Research Agenda and Findings*. Retrieved November 19, 2009, from Dartmouth Atlas of Healthcare: http://www.dartmouthatlas.org/agenda.shtm

Data Used in the Report

1. **Forecasting Population Estimates and Forecasts, Washington State Office of Financial Management (OFM).** OFM's state population estimates and forecasts are developed annually using standard methods. The most recent federal census findings or, where known, more recent actual figures, provide base figures. For example, natural increase (projected births minus projected deaths) and net migration (people moving into and out of the state) drive population growth. Projected population numbers are derived by subtracting projected deaths from projected births, and adding projected net migration. Projections are based in specific assumptions. More information regarding methods can be found on OFM's webpage at http://www.ofm.wa.gov/pop/stfc/default.asp for the State Population Forecast and at http://www.ofm.wa.gov/pop/april1/default.asp for the State Population Estimates.

2. **Facility License Database, Office of Health Professions and Facilities, Washington State Department of Health (DOH).** DOH collects basic information about facilities regulated by the agency's Office of Health Professions and Facilities. Basic information includes, although not limited to: facility type, name, and address; owner name; and license number and expiration date. DOH Geographic Information System (GIS) staff combine information from the facility license database with data from other sources to produce and update lists of facilities by type. Data related to selected types of health facilities is available for download at the DOH GIS data page, at http://ww4.doh.wa.gov/gis/gisdata.htm .

3. **Health Professional License Information, Office of Health Professions and Facilities, Washington State Department of Health.** DOH regulates professionals in more than 70 different health professions. The agency maintains a continuous database of provider information collected during license application and renewal processes. For preparation of this report, OFM staff relied on data provided by DOH for all individuals that agency had ever licensed in selected professions, as of November 2008. Specific data included: birth date, sex, profession type, license dates, ZIP code of a self-reported address, and indication of licenses held in other states.

4. **Employer Industrial Insurance Accounts Database, Washington State Department of Labor and Industries (L&I).** In Washington State, a business with one or more employees generally must open an industrial insurance account with L&I. During the registration process, a North American Industry Classification System (NAICS) code is assigned to each account based on the primary business activity. OFM staff worked with data extracted from L&I's Employer Industrial Insurance database that included active employers as of March 2008, using NAICS codes to identify health facilities (businesses) of selected types.

5. **Behavioral Risk Factor Surveillance System (BRFSS),** Center for Health Statistics, **Washington State Department of Health.** BRFSS provides information related to specific indicators of health-related behaviors, knowledge and attitudes, prevalence of selected diseases, and health care use and access. Researchers survey a randomly selected sample of adults ages 18 and older living in Washington households with landline telephones. Since 2003, BRFSS has been administered in English and Spanish. BRFSS data are available from 1987 to the present. Additional information is available at the Washington State BRFSS website: http://www.doh.wa.gov/BRFSS and in the DOH publication *The Health of Washington State 2007* at http://www.doh.wa.gov/HWS/doc/AppendixB2007.pdf .

6. **Comprehensive Hospital Abstract Reporting System (CHARS), Center for Health Statistics, Washington State Department of Health.** The CHARS database consists of public information such as the age, sex, ZIP code, length of stay and billed charges of patients in Washington State community hospitals, as well as diagnoses and procedures. Hospitals summarize information from the uniform billing form, code diagnoses and procedures, and submit it to DOH. CHARS data covers state-licensed acute care facilities providing continuous, 24-hour accommodations and services. Information from nursing homes, birthing centers, U.S. military or Veterans Health Administration (VA) hospitals, no-fee hospitals, private alcoholism hospitals, and state psychiatric hospitals is not included. More detailed information appears in *The Health of Washington State 2007*, in the "Hospitalization Data" section. DOH's Hospital Data webpage can be accessed at http://www.doh.wa.gov/EHSPHL/hospdata/Chars.htm .

7. **Extended Comprehensive Hospital Abstract Reporting System (Extended CHARS), Center for Health Statistics, Washington State Department of Health.** Extended CHARS data includes Washington State resident discharge records from all Washington and Oregon community hospitals, as well as all military hospitals in Washington and any Veterans Administration hospital during the three year period 2003-2005. Center for Health Statistics staff created this extension of CHARS through data sharing agreements with these jurisdictions, as Washington State does not routinely keep records of residents admitted to inpatient facilities outside of the state or to hospitals operated by the federal government.

8. **Death Data, Center for Health Statistics, Washington State Department of Health.** Washington's Death Certificate System contains records on all deaths that occurred in the state and all deaths of state residents that occurred in other states or countries; it is estimated to be 99 percent complete. The Death Data webpage, including a link to data tables, can be found at http://www.doh.wa.gov/EHSPHL/CHS/CHS-data/death/deatmain.htm.

9. **Hospital Financial System, Fiscal Year End Financial Reports by Hospital, Center for Health Statistics, Washington State Department of Health.** The year-end financial reports by hospitals provide complete hospital fiscal year end data that reflect hospital reported utilization and audited financial reports. These data include admissions, patient days, payer type, billed charges, net revenue, operating expense, net income, and other cost center specific financial data. Data currently available online include reports for 2002 through 2009 at http://www.doh.wa.gov/EHSPHL/hospdata/YearEnd/Default.htm .

Gaps in the Data

Accurate and detailed data describing the active professional healthcare workforce is not available. The SHPO staff reviewed and considered several potential data sources and concluded that the best available data on workforce was in the DOH licensing system. The analysis in Chapter 6 is based on these licensing records. Unfortunately, there is no ability to identify those who are actively practicing in the state. Many of the licenses may be held by people who have retired, left the state, or are not actively practicing for some other reason. In addition, there is no information available on practice specialization.

The information on health services facilities is limited. Chapter 7 describes the process the SHPO staff used to compile an inventory of health services facilities from multiple sources of incomplete data. The end result is a list of facilities with street addresses but no real information on capacity, volume or specific utilization.

The largest gap in the data is the lack of utilization data for anything but inpatient hospital services. As surgical procedures become less invasive, they are less likely to require inpatient hospitalization and more likely to occur in outpatient facilities or even doctors' offices. Because of this movement, inpatient hospital records are not an adequate data source for understanding the health care system of the state. The detailed analyses in Chapter 2 and Chapter 3 are restricted to inpatient utilization.

Data on population health is available only for adults. The BRFSS, used in Chapter 5, does not contain data on children or teenagers.

Finally, the Governor's Council on Health Disparities has noted an insufficiency of racial/ethnic health data that seriously limits the ability to adequately evaluate racial/ethnic disparities in access, utilization, quality and cost of health care. This project has arrived at the same conclusion with regard to state agency administrative data related to health care. In these state data sources, racial/ethnic data are either non-existing or have limited usage due to data coverage or quality issues. For example, the DOH started to report race/ethnicity data in 2007 on hospital discharge records in CHARS. In the 2008 release of CHARS, less than 30 percent of the 650,000 discharge records contained useable race/ethnicity data.

RESEARCH AND FINDINGS

Each of the remaining six chapters in the report focuses on a different aspect of health care resource research or data addressed by SHPO staff.

Chapter 2 examines inpatient hospital utilization in Washington State. Using inpatient hospitalization data from the DOH CHARS, staff calculated historical usage rates. Those rates were combined with state population projections through 2030 to develop a population-based projection of inpatient usage based on the assumption that the statewide occupancy would remain near where it is today, at 65 percent. If current inpatient utilization continues, the new bed construction needed to maintain the current occupancy rate would bring to an end a 20-year period of sufficiency. Of course using a 65 percent occupancy rate in this analysis is not intended to be taken as a recommended or ideal rate; instead it was chosen because that rate represents

Washington's current experience, and hence, provides a good referential guide against which to gauge future need.

The analyses of population trends in Chapter 2 indicate that at the current level of provider services utilization, Washington State is approaching an untenable situation. The aging population will make illness more common and the lack of growth in the working age population suggests that working providers will be scarcer.

The analysis of variation in utilization throughout the state discussed in Chapter 3 suggests that the new bed construction might be avoided by actively reducing utilization in high use areas to conform to practices in lower use areas of the state. This change may be possible to the extent that some utilization in high use areas is determined to be unnecessary, ineffective, or resulting from poor health practices that can be remedied or avoided. Chapter 2 suggests some concrete steps that could be taken to reduce the level of utilization of inpatient services without placing any additional restrictions on hospital bed construction.

The detailed utilization data used for analyses in Chapters 2 and 3 exist only for inpatient hospital services. However, outpatient care has increasingly played a larger role beyond primary care. Many traditionally inpatient-only procedures are now commonly performed in outpatient settings. Yet, data on outpatient utilization is not accessible for analysis, making it impossible to assess the system as a whole. The report recommends exploring an ***all-payer claims database*** for Washington.

Chapter 4 focuses on hospital admissions for ambulatory care sensitive conditions (ACSC). These admissions occur less frequently where a strong system of prevention and primary care is in place. Analysis of the variation in these admissions throughout the state helps to identify areas where improvements in primary care and public health could reduce inpatient utilization by improving the health of the population.

In Chapter 5, small-area analyses conducted by applying epidemiological-based disease cluster identification tools to hospital discharge data are discussed. Regions identified as having higher or lower than expected hospitalization rates through that analysis are then profiled using existing data from the Behavioral Risk Factor Surveillance System (BRFSS). Through these analyses, behavioral risk factors, such as smoking, and economic risk factors, such as insurance status, were generally found to be correlated with outcome data.

Additionally, the analyses identified treatment patterns that do not appear to be correlated with need. These findings raise serious questions about the appropriateness or necessity of certain treatment practices. Further study to determine whether prevalent treatment practices in certain areas are related to need, or to other factors, is essential to an effective health resources strategy. Such research would provide opportunities to target specific interventions to specific communities.

Chapter 6 discusses regional variation in Washington's health care workforce. Using counts of health care professional licenses from DOH, availability of health care workers statewide and in regions is assessed for selected professions. Rural regions have been associated with more and

greater health risk factors, and yet the health care workforce in those regions is usually smaller. Analysis of inpatient data shows that many people in rural regions seek inpatient care in adjacent urban regions. Closing the gap between rural and other regions may require a multi-front approach that aims at reducing risk factors as well as increasing and retaining healthcare workforce in rural regions.

Finally Chapter 7 describes the process used by SHPO staff to inventory health care facilities in Washington. The inventory was created by combining lists from several sources and through direct telephone contact. The chapter includes a description of lessons learned in this process. One of the conclusions is that an accurate census of facilities be conducted on a regular basis. The results have been made available in a web-based query system.

CONCLUSIONS AND NEXT STEPS

The results presented in the body of this report confirm the existence of substantial variation in the use of inpatient services among the regions of the state of Washington. To declare the observed variation unwarranted without additional research would not be appropriate. However, to accept the current regional variation as proper would be equally inappropriate. This variation should be analyzed more thoroughly with the view that it represents a learning opportunity and might lead to improvement in the direction of a high performance health system. Although data currently do not support accurate forecasting of specific future health resource needs, the report identifies concrete steps in that direction.

In addition, the varied research conducted by SHPO staff required evaluation and analyses of many types of databases. Based on the work completed for Chapters 2-7, this report recommends the development of four databases to capture missing elements that are essential for analysis of health care utilization and resources in Washington.

The following four databases should be developed when budgetary conditions permit.

1. A census of active health care professionals – key elements include age, gender, license type, practice status, location(s) of practice, number of employees in practice, specialty, and subspecialties.
2. A census of health services facilities conducted on a routine periodic basis. These data would include location, service types, and service capacities.
3. An all-payer claims database – key elements include patient age, gender, place of treatment, ZIP code of patient address, diagnosis codes, procedure codes, service dates, charges and payments. This type of database would extend data on utilization well beyond the current restriction to inpatient services.
4. A comprehensive population-based socio-economic and health database similar to that of the California Health Interview Survey or an expanded Behavioral Risk Factors Surveillance System for Washington.

These data resources constitute an essential basis for a future health services resources strategy.

Following this initial report, the SHPO staff will shift focus to state run programs. This change will occur for two reasons. First, the development of the complete set of databases required for analysis beyond the inpatient area for the entire population will take some time due to fiscal and logistical constraints. Second, the current budgetary situation also calls for more attention to the issue of variation within state run programs, which are under pressure to reduce expenditures.

CHAPTER 2

INPATIENT HOSPITAL UTILIZATION IN WASHINGTON STATE: 1990-2030

INTRODUCTION

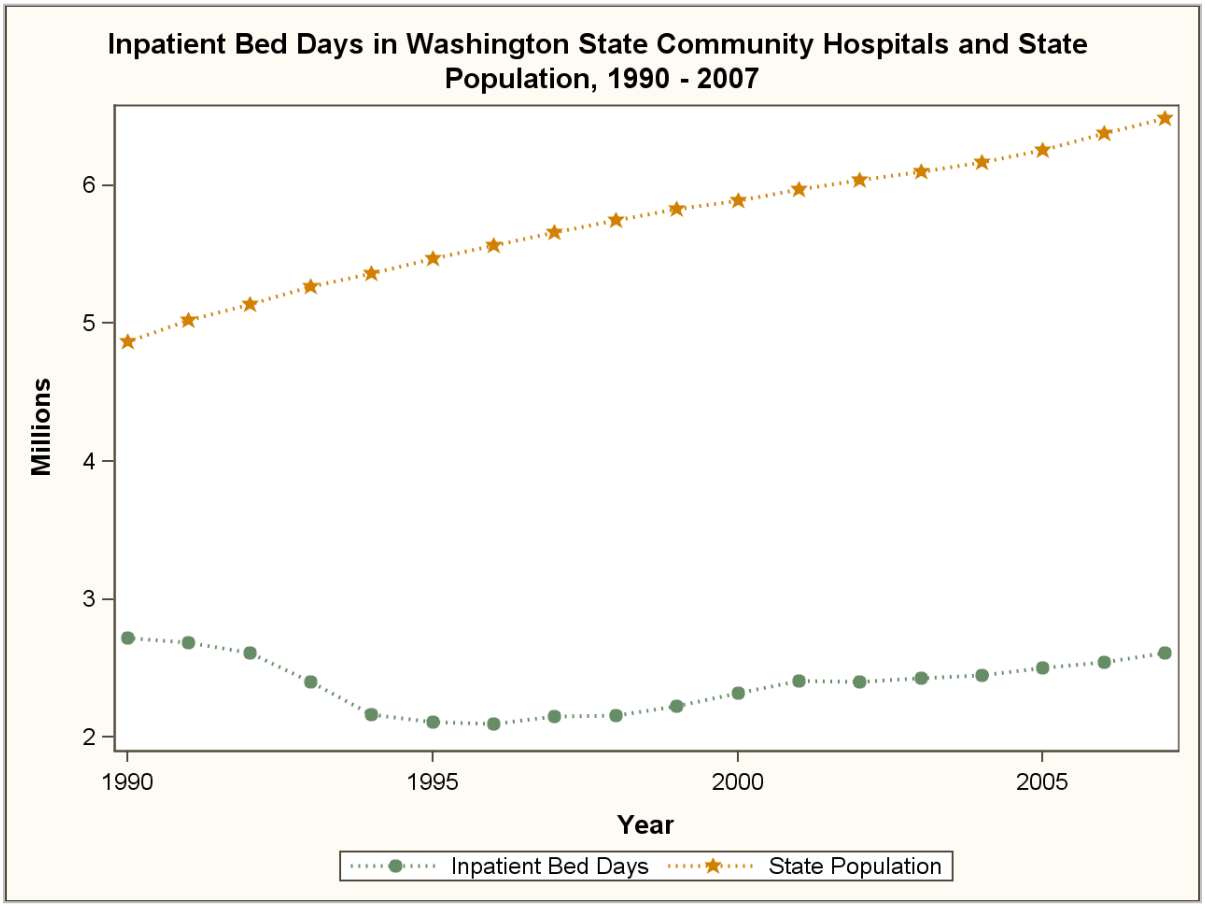
Health care has changed dramatically over the last 20 years, and the next 20 years will likely bring even more change. Understanding the history and evolution of health care provides us with critical information for predicting and shaping the future. This chapter examines Washington's use of hospitals over the last 20 years including a period of decreased usage during the early 1990s and differences in usage by gender and age. The historical information provides a hint of changes that the next 20 years may hold as our population ages and grows in size. Finally, the chapter examines how much new hospital space may be required to serve the state's population unless we take steps to reduce utilization. Some possibilities for reducing utilization will be discussed later in this chapter.

FINDINGS

As of this writing, historical data on inpatient utilization is available from the Washington State Department of Health's Comprehensive Hospital Abstract Reporting System (CHARS) for the years 1990 through 2007. Figure 2.1 displays the history of total inpatient usage in Washington State community hospitals[1] during these years. Data displayed includes days spent in Washington State hospitals by Washington residents and residents of other states and foreign countries. The state population appears in the same graph for comparison. State population grew during the entire period, however, inpatient usage declined between 1990 and 1996. This period of decline in inpatient usage is followed by a period of rapid growth between 1996 and 2000, and then a period of slightly slower growth between 2001 and 2007.

[1] CHARS data covers state-licensed acute care facilities providing continuous, 24-hour accommodations and services. Information from nursing homes, birthing centers, U.S. military or Veterans Health Administration (VA) hospitals, no-fee hospitals, private alcoholism hospitals and state psychiatric hospitals is not included. See the "Hospitalization Data" section of *The Health of Washington State 2007* (http://www.doh.wa.gov/HWS/doc/AppendixB2007.pdf ; Washington State Department of Health) and RCW 70.41.020 (http://apps.leg.wa.gov/RCW/default.aspx?cite=70.41.020) for more detailed information and definitions.

Figure 2.1

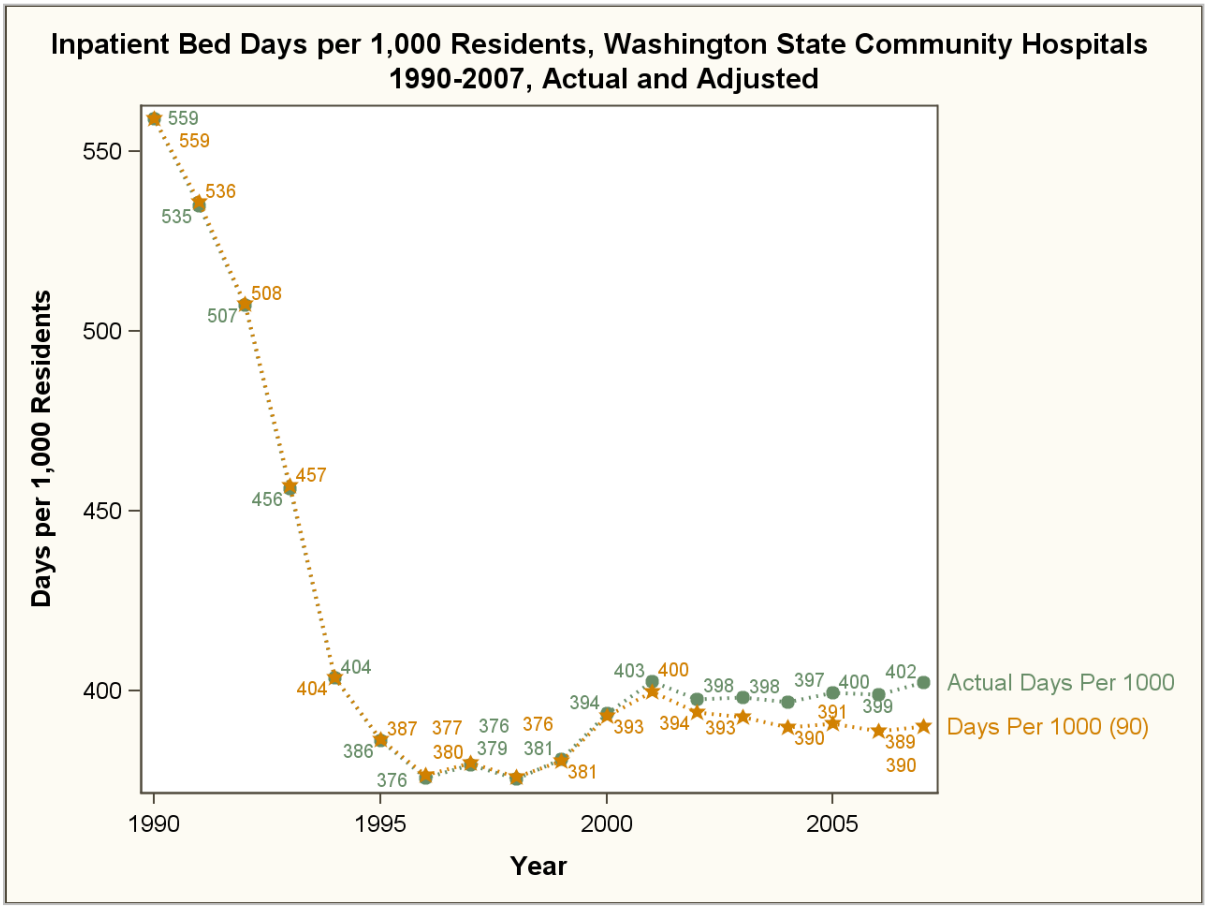


OFM Forecasting Division, November 2009. Data Source: Washington State Department of Health CHARS files 1990-2007.

Two factors combine to produce total inpatient hospital usage: the size of the population and the rate at which the population uses inpatient services.

Figure 2.2 shows the usage rate, expressed as days per 1,000 residents changing over time. Since the rate of usage varies depending on both age and sex (see Figure 2.6), two series are graphed in Figure 2.2. One depicts the actual usage rate and the other shows the theoretical usage rate if the population age-sex structure had remained as it was in 1990. The theoretical rate is calculated by applying annual usage by age and sex to the 1990 population base. Both of these curves show a period of decline from slightly more than 550 days per 1,000 residents in 1990 to approximately 400 days per 1,000 residents in 1996-2007. The fact that these two curves are almost identical demonstrates that changes in age-sex structure have not played a major role in influencing fluctuations in the utilization rate between 1990 and 2007. There is a slight increase in the actual usage above the adjusted rate after 2000. This increase indicates that the current population has an age-sex structure slightly more prone to inpatient usage.

Figure 2.2



OFM Forecasting Division, November 2009. Data Sources: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

The rate at which a population uses bed days is determined by two factors. The first is the admission rate, the rate at which members of the population are admitted to hospitals. The second is the length of stay, the average time that a member of the population remains in inpatient status once admitted. The following fundamental equation can be applied to either an entire population or any subset, such as one of the 36 age-sex cells available in CHARS and the OFM population data:

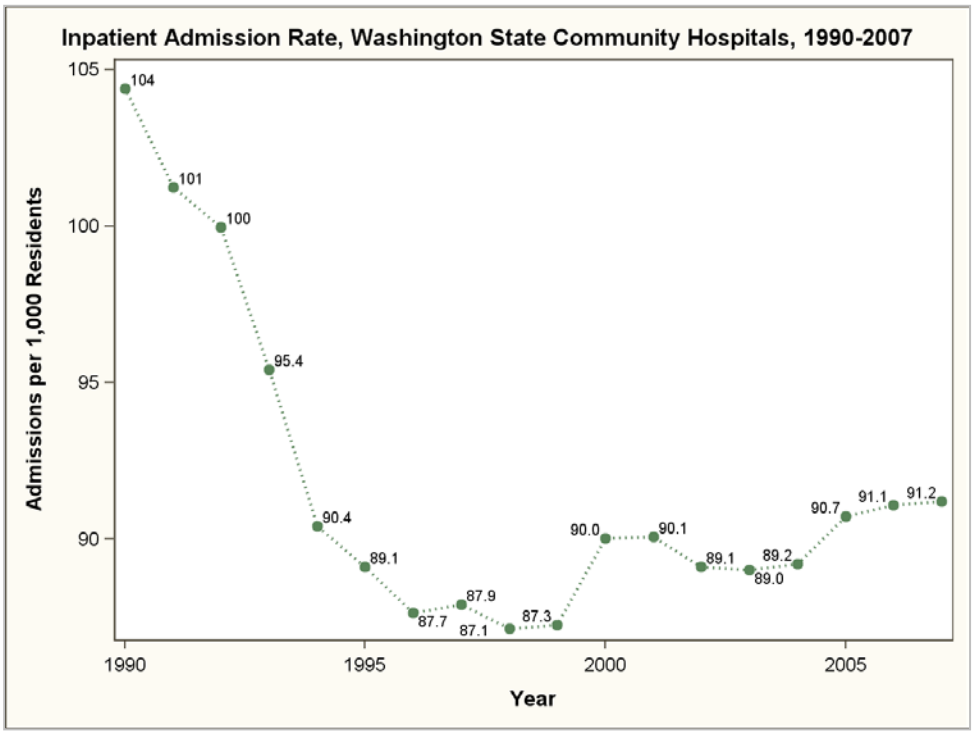
$$Usage = Population \times Admission\ Rate \times Length\ of\ Stay$$

The fact that admission rates and lengths of stay declined almost in parallel and leveled out at the same time is somewhat surprising. Figures 2.3 and 2.4 demonstrate that the two factors dropped simultaneously and that both ended their declines in 1995. There were probably several causes for the declines. Prospective payment systems in both Medicare and Medicaid, as well as the movement to managed care certainly played a role. The ongoing development of less invasive surgical procedures is also likely to have been a driving force. This historical experience is not driven by forced reductions in the supply of hospital beds.

Figure 2.3 shows the admission rate per 1,000 residents dropping from 104 in 1990 to fluctuate between 87 and 88 during the years from 1996 to 1999, and then rising to 91.2 in 2007. Figure 2.4 shows the average length of stay in days falling from 4.94 1n 1990 to a low of 3.96 in 1996.

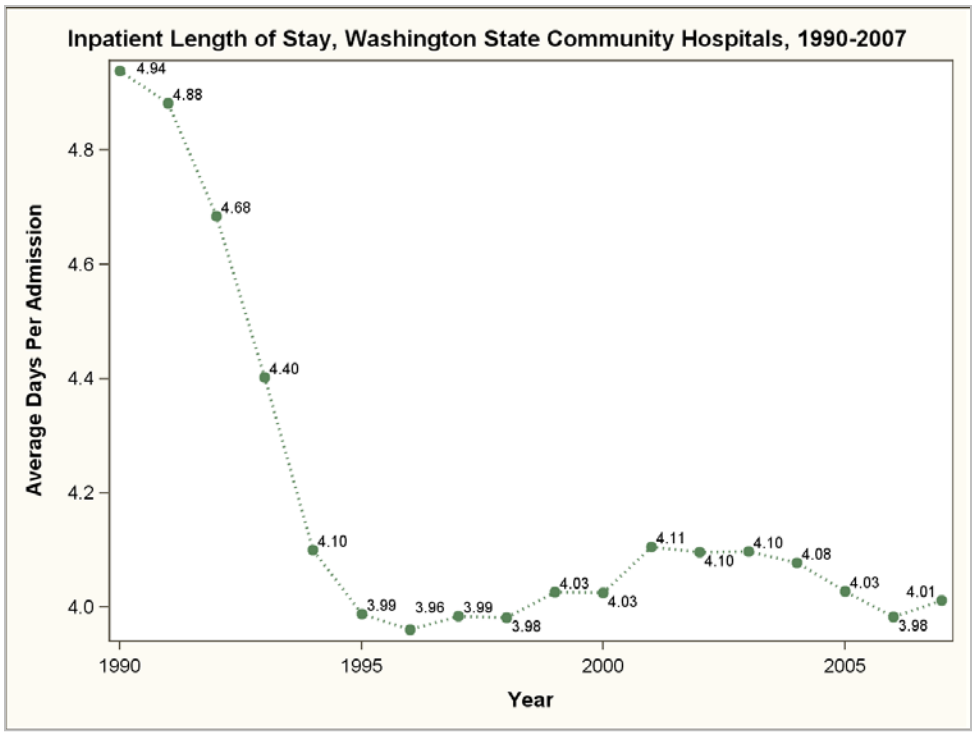
This is followed by a rise to 4.11 in 2001 and a subsequent decline back to roughly 4.0. As of 2007, both measures seem to be stable at approximately 100 admissions per 1,000 residents, with an average length of stay of about four days.

Figure 2.3



OFM Forecasting Division, November 2009. Data Sources: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

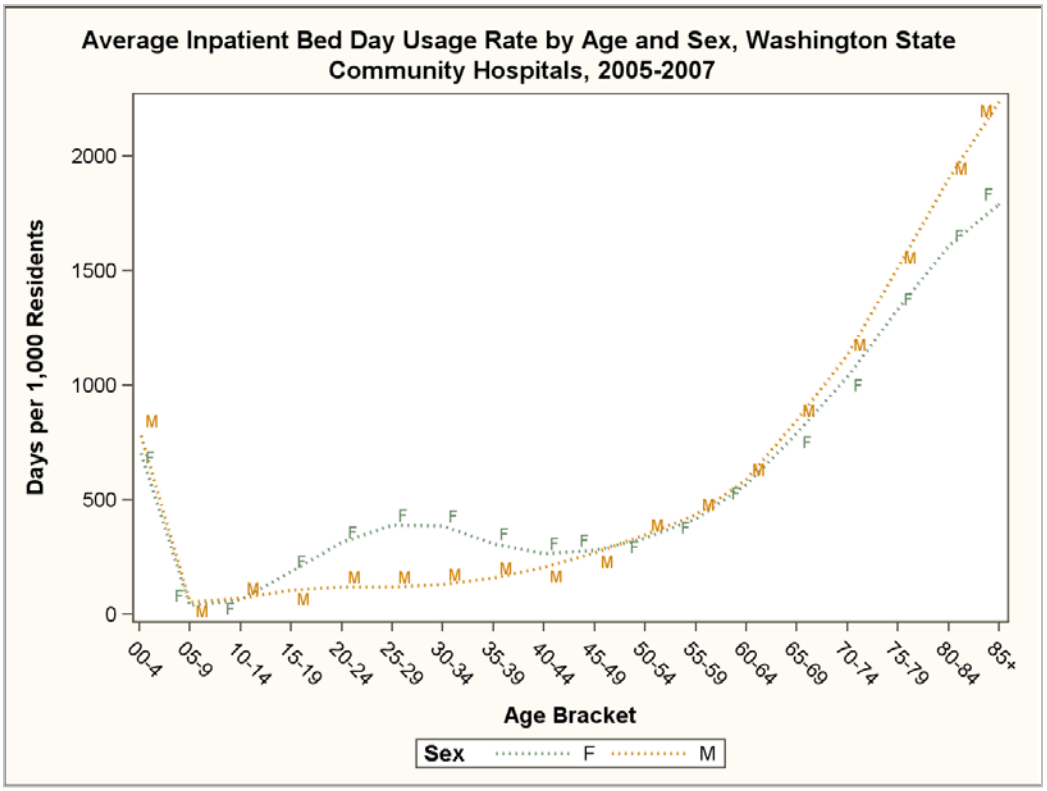
Figure 2.4



OFM Forecasting Division, November 2009. Data Sources: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

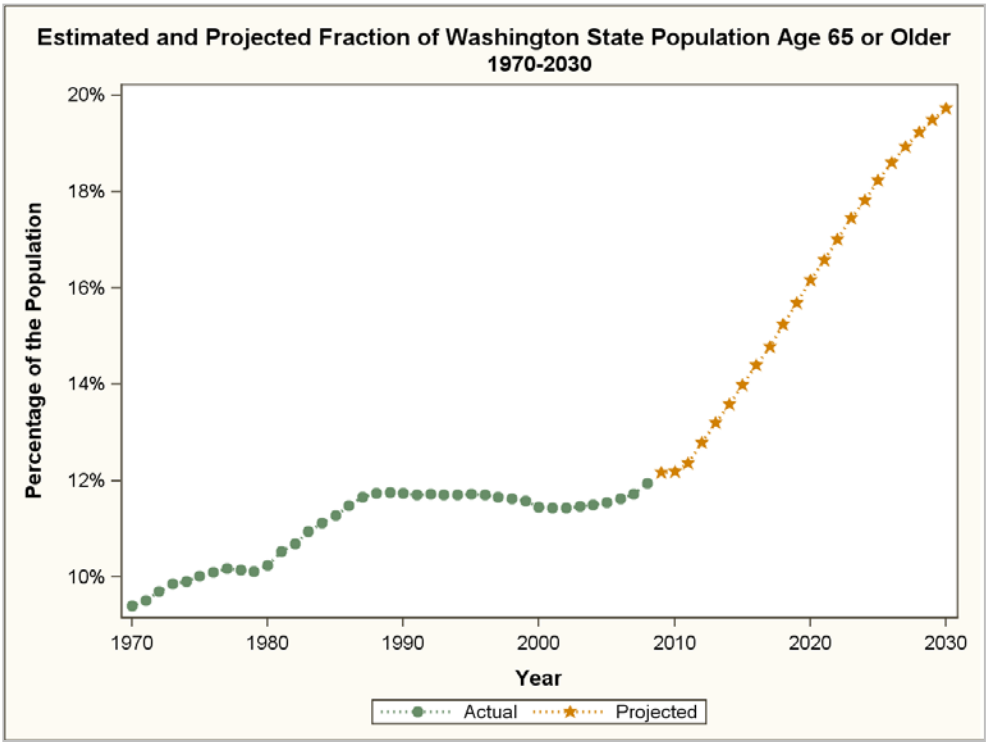
Although changes in population age-sex structure were not significant in driving inpatient utilization between 1990 and 2007, as noted above, this will change during the years between 2010 and 2030. The leading edge of the population born during the Baby Boom years of higher than normal birth rates (1946 to 1964) will reach age 65 in 2011. Figure 2.5 indicates changes in the fraction of the population 65 or older since 1970, and expected growth in this number during the next 20 years. There is a rise from below 10 percent in 1970 to about 12 percent in 1990. Then there is a very slight decline from 1990 until 2010. Beginning in 2011, the impact of the Baby Boom cohort is clear. The fraction of the population age 65 or greater will be approximately 20 percent in 2030. This is roughly a doubling compared to 1970. Illness and inpatient usage increase significantly as people age past 65, as shown in Figure 2.6.

Figure 2.5



OFM Forecasting Division, November 2009. Data Source: OFM Forecasting, Population Estimates and Forecasts.

Figure 2.6

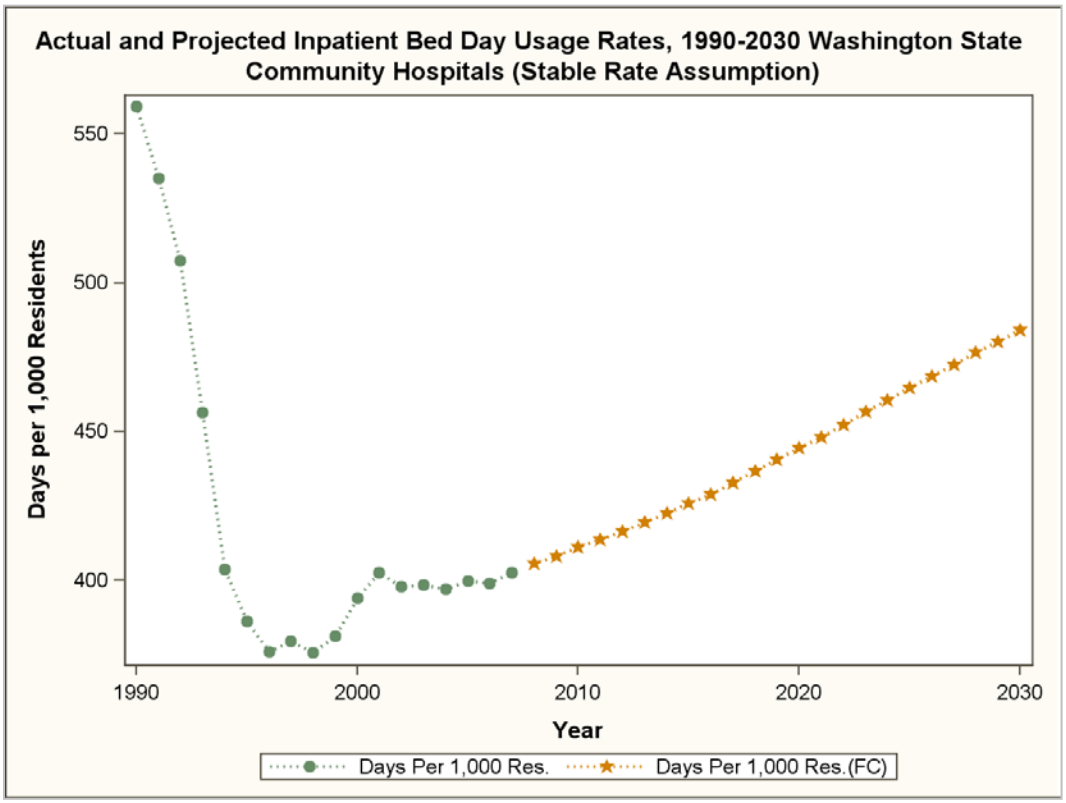


OFM Forecasting Division, November 2009. Data Sources: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

Figure 2.6 demonstrates that inpatient usage increases significantly as people age past 65. The figure shows inpatient utilization in days per 1,000 residents by age bracket and sex, for 2005-2007. Children of both sexes in the 0-4 age bracket used between 500 and 1,000 bed days per 1,000 residents. Children in the 5-9 age bracket utilized almost no bed days. Male and female usage was almost identical until the child-bearing years, between 15 and 45. For these age brackets, the female usage was distinctly higher. The chart shows usage for the two sexes as nearly identical again between 45 and 65. After age 65, a gap grows between male and female usage per 1,000 residents. After age 85, in particular, males have a usage in excess of 2,100 days per 1,000 residents. Females in this age bracket use between 1,500 and 2,000 days per 1,000 residents. In contrast, the usage rates for both sexes are below 500 days per 1,000 residents in the 55-59 age bracket. Again, Figure 2.6 emphasizes the key role age-sex structure plays in determining inpatient usage by a population.

What will happen to inpatient utilization in the future? A simple forecast of future inpatient utilization rates can be based on the assumption that the usage rates within five-year age-sex cells, which have remained fairly constant since 2000, will continue in this fashion for the next 20 years. This scenario is not likely, since expected changes in medical technology and other factors will almost certainly affect utilization rates. However, a stable-rate scenario, displayed in Figure 2.7, provides insight into the magnitude of the changes to the state population represented by the Baby Boom effect. As shown, age-sex structure changes would increase the usage rate from the current level of 400 to approximately 480 days per 1,000 residents in 2030. This represents a projected return to the utilization level of 1993-94.

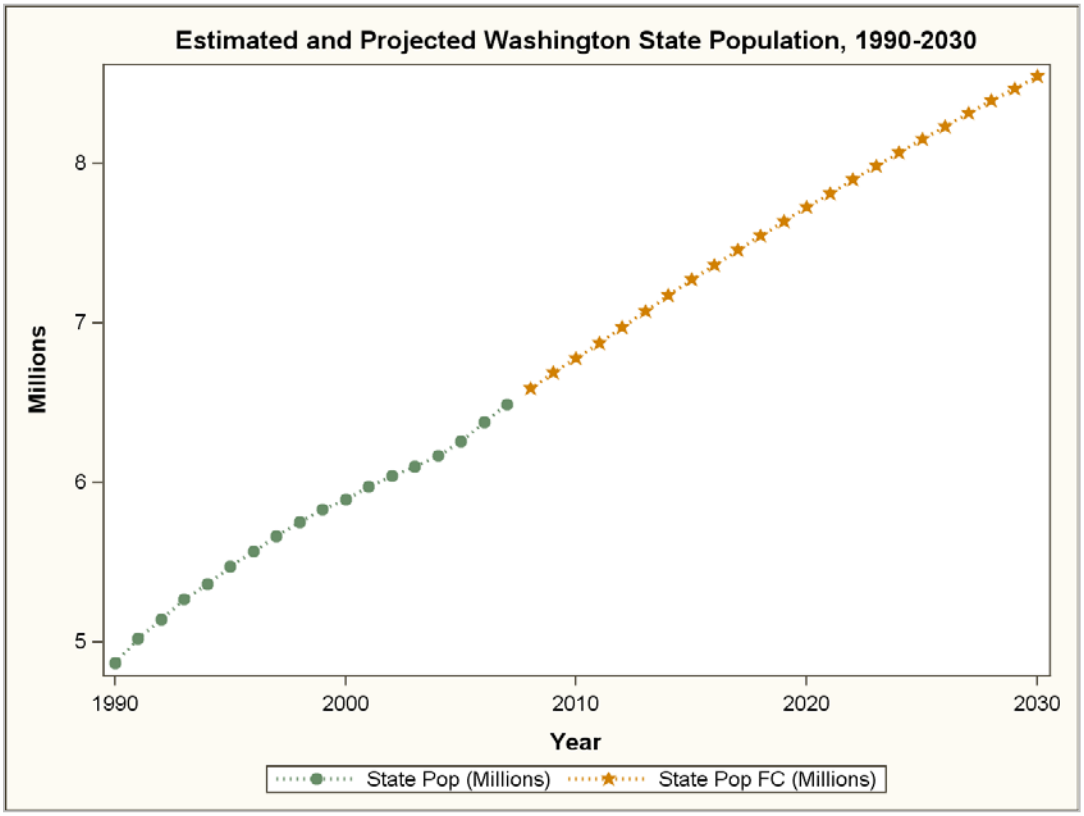
Figure 2.7



OFM Forecasting Division, November 2009. Data Sources: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

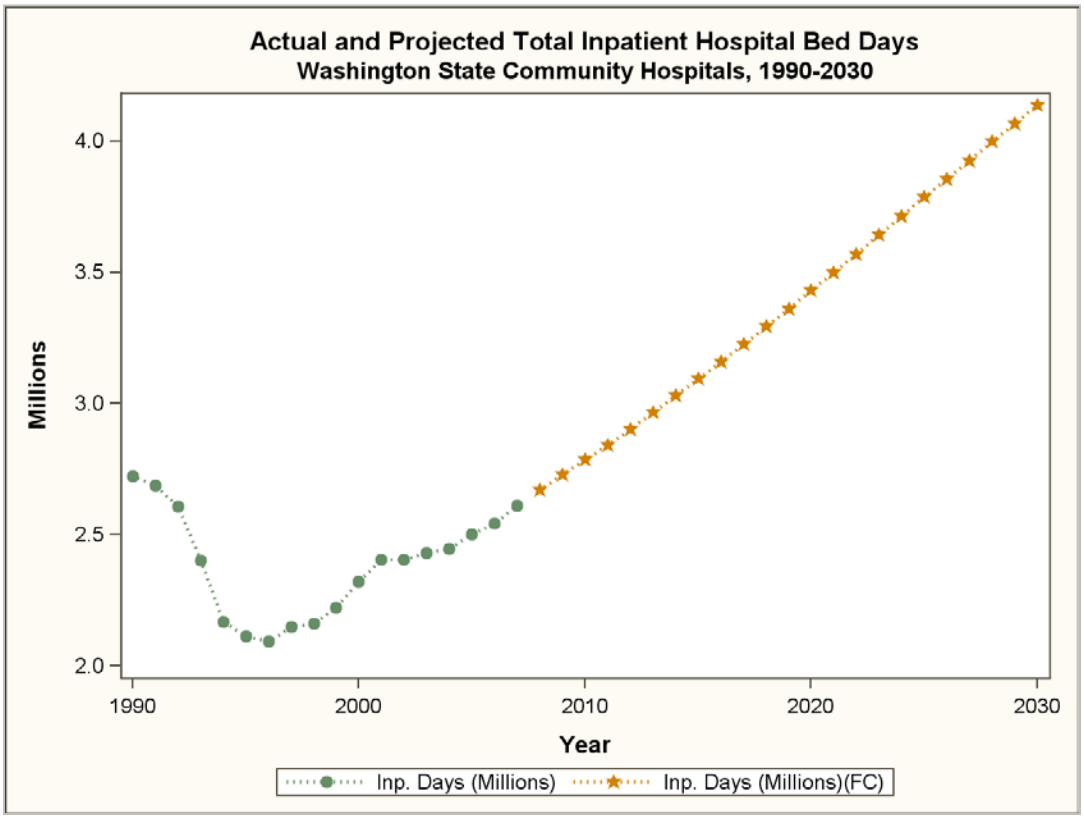
A forecast of future utilization must go beyond the projection of days used per 1,000 residents. The absolute size of the population is also a factor. Growth in Washington State's population explains the fact that total inpatient bed usage is higher now than in 1994 (as seen in Figure 2.1). Figure 2.8 shows the history of the state's population and the forecast out to 2030. In 1990, there were fewer than 5 million state residents. By 2030, the figure is expected to be over 8.5 million. Figure 2.9 depicts the implications of this expected population growth for inpatient usage. The increase in the absolute size of the population will drive bed day consumption to more than 4 million per year by 2030, again assuming fixed utilization rates by age and sex.

Figure 2.8



OFM Forecasting Division, November 2009. Data Source: OFM Forecasting, Population Estimates and Forecasts.

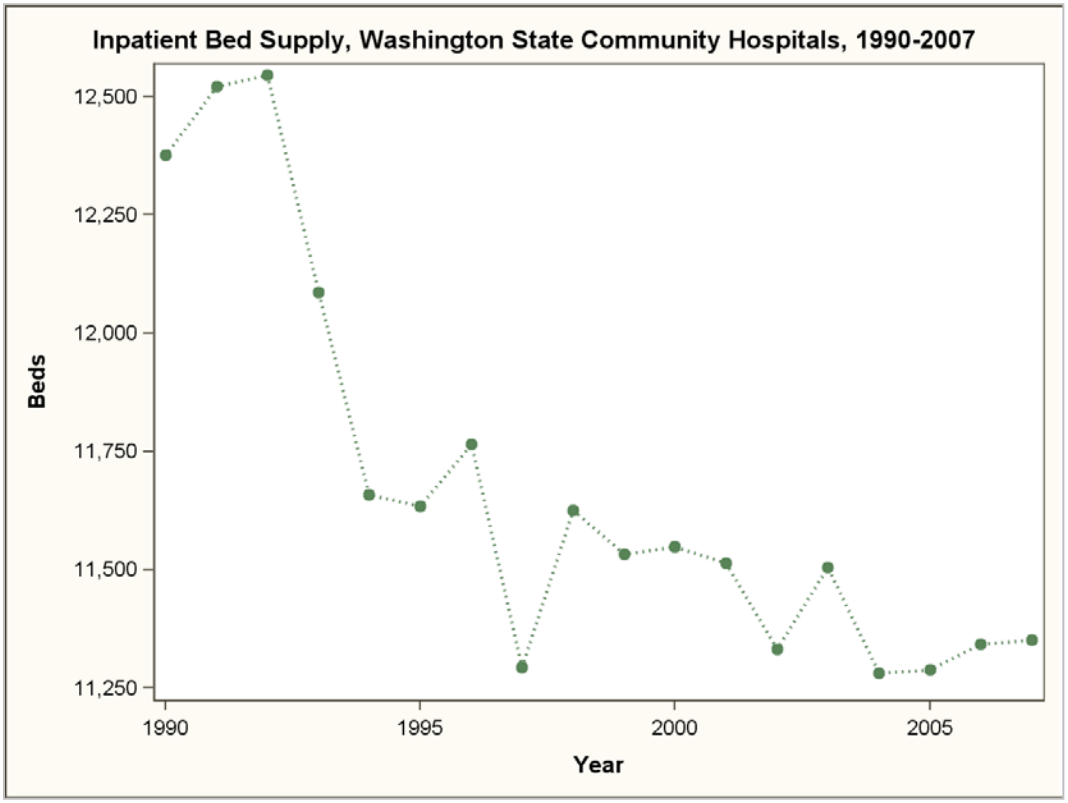
Figure 2.9



OFM Forecasting Division, November 2009. Data Sources: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

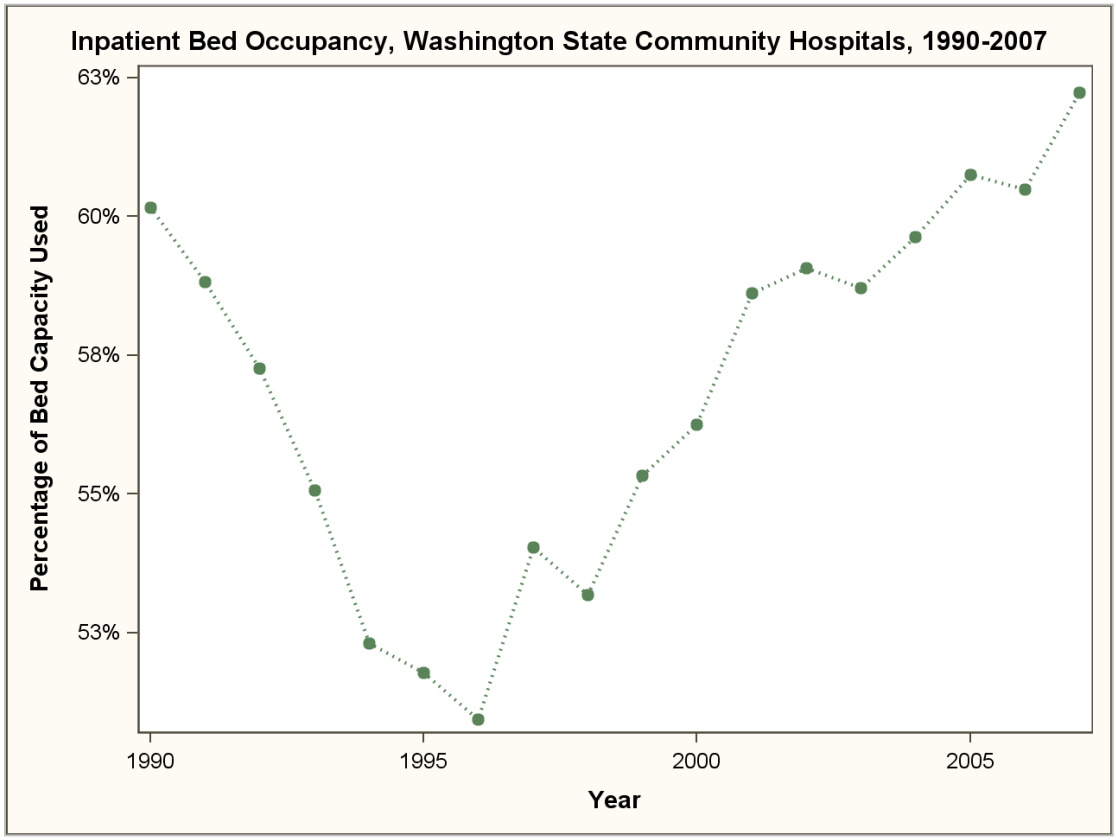
Hospitals and hospital systems responded to the decreased utilization by reducing capacity by about 1,000 beds through mergers, acquisition, and closures, mostly between 1992 and 1996. As of 2007, there were more than 3,000 licensed beds that were not available. Figure 2.10 traces the history of bed supply in Washington State based on available beds. Figure 2.11 shows the drop in the occupancy of the remaining capacity. ("Capacity" is defined as the percentage of available bed-days that are actually used.) The ratio dropped from slightly above 60 percent in 1990 to a low point of about 52 percent in 1996. Since that time, increases in utilization have not resulted in a major upturn in the number of beds available. The occupancy ratio is now at 62 percent, slightly above the 1990 level.

Figure 2.10



OFM Forecasting Division, November 2009. Data Source: Washington State Department of Health CHARS files 1990-2007.

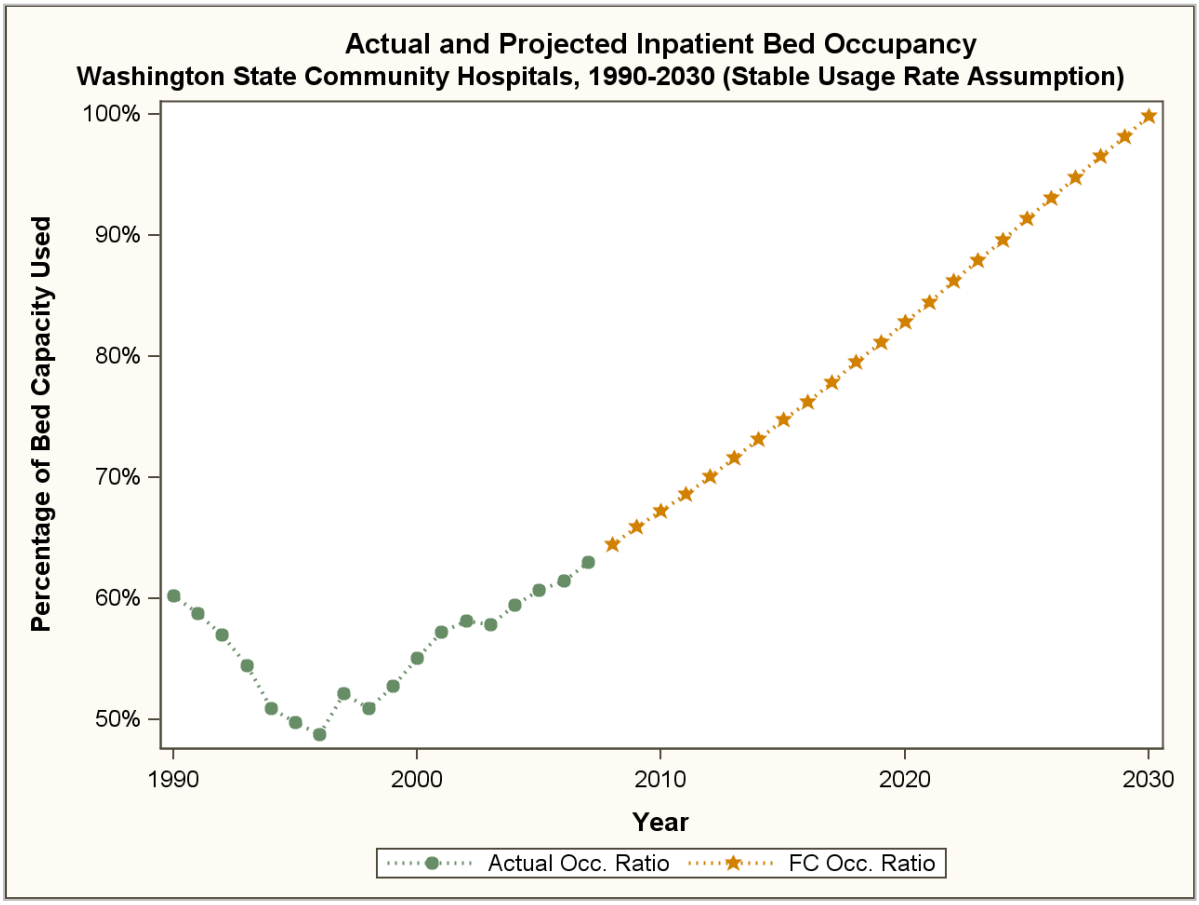
Figure 2.11



OFM Forecasting Division, November 2009. Data Source: Washington State Department of Health CHARS files 1990-2007.

In coming years, the expected increase in bed days and the occupancy ratio implied by that increase will exert upward pressure on bed supply. Figure 2.12 shows a projection of the occupancy ratio based on the current-usage-rate projection of bed usage and the assumption that no new beds are made available. The occupancy ratio would rise to 100 percent by 2030 using these assumptions.

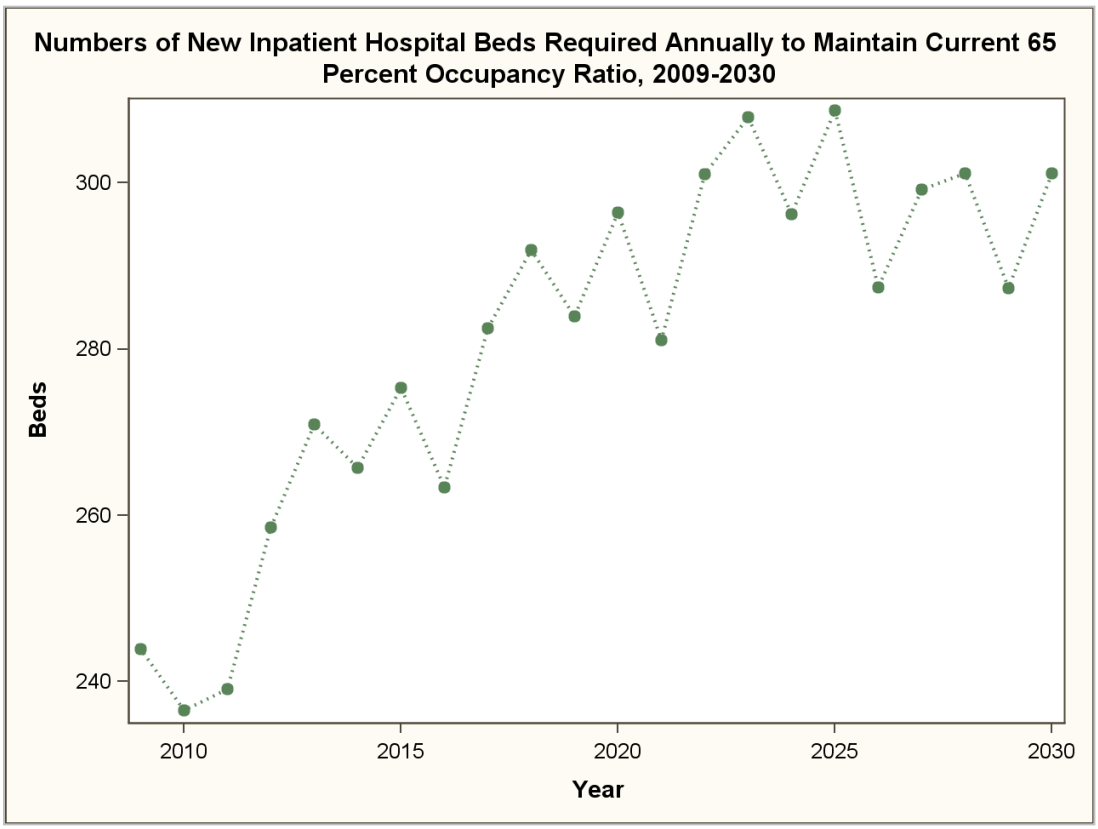
Figure 2.12



OFM Forecasting Division, November 2009. Data Sources: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

What does this imply about the need for new available beds? The utilization history provided earlier in this chapter demonstrates that utilization rates fluctuate over time. In addition, the desired occupancy ratio and the continuation (or not) of current utilization rates can be influenced by policy choices. Later chapters of this report will show that improvements in other parts of the health care system, including primary care and public health, could reduce the utilization of inpatient services in some parts of the state. However, it is useful to consider how many new available beds would be needed to maintain a given statewide occupancy ratio with the assumption that current utilization rates continue. Figure 2.13 shows the number of new beds required to maintain a 65 percent occupancy ratio. This ratio is used purely for illustrative purposes. It is slightly above the value for 2007. This scenario calls for approximately 260-300 new beds each year. Many of these beds might be currently licensed beds that cannot be brought on-line quickly and cheaply.

Figure 2.13



OFM Forecasting Division, November 2009. Data Source: Washington State Department of Health CHARS files 1990-2007 and OFM Forecasting Population Estimates and Forecasts.

What steps might be taken to reduce future inpatient utilization and avoid the construction of new bed capacity? There are many different approaches to this that do not rely on restrictions in the supply of beds. Most of them have in common the fact that they reduce the demand for inpatient services. The future demand for inpatient services in the state of Washington depends on the extent to which these and similar approaches are adopted. This list is not intended to be exhaustive, but to serve as a set of concrete examples of possibilities.

REDUCING OBESITY/DIABETES

There is little debate that obesity, which is a growing problem in the state of Washington, leads to diabetes, which in turn leads to an increased risk of hospitalization. For example, recent research conducted by the Lewin Group found that persons with a diagnosis of type II diabetes used on average more than six times as many inpatient hospital days per year as a person with no diagnosis of diabetes. (Dall, Zhang, Chen, Quick, & Wang, 2010)

TOBACCO CESSATION

According to the 2004 Surgeon General's Report—The Health Consequences of Smoking, "smoking harms nearly every organ of the body, causing many diseases and reducing the health of smokers in general." Specific conditions recognized as being caused by smoking, according

to that report, include bladder, esophageal, laryngeal, lung, oral, and throat cancers, chronic lung diseases, coronary heart and cardiovascular diseases, as well as reproductive effects and sudden infant death syndrome. In addition, the report notes that abdominal aortic aneurysm, acute myeloid leukemia, cataract, cervical cancer, kidney cancer, pancreatic cancer, pneumonia, periodontitis, and stomach cancer are also associated with tobacco use. Quitting smoking, the report further states, has "immediate as well as long-term benefits, reducing risks for diseases caused by smoking and improving health in general." Given this broad array of conditions and diseases, it is not surprising that the Centers for Disease Control and Prevention estimate that within Washington State the smoking-attributable health care expenditures in 2004 equaled $1.954 billion, including over a billion dollars in hospital care services alone. (Department of Health and Human Services)

INFORMED PATIENT DECISION MAKING

One approach to dealing with the observed variation in surgical practice is to empower patients with information and support them in taking on more responsibility in decision making. The same bill which created the SHPO directed the Health Care Authority to begin taking concrete steps in this direction.

RCW 41.05.033 reads in part as follows:

> (1) The legislature finds that there is growing evidence that, for preference-sensitive care involving elective surgery, patient-practitioner communication is improved through the use of high-quality decision aids that detail the benefits, harms, and uncertainty of available treatment options. Improved communication leads to more fully informed patient decisions. The legislature intends to increase the extent to which patients make genuinely informed, preference-based treatment decisions, by promoting public/private collaborative efforts to broaden the development, certification, use, and evaluation of effective decision aids and by recognition of shared decision making and patient decision aids in the state's laws on informed consent.
>
> (2) The health care authority shall implement a shared decision-making demonstration project. The demonstration project shall be conducted at one or more multispecialty group practice sites providing state purchased health care in the state of Washington, and may include other practice sites providing state purchased health care. The demonstration project shall include the following elements:
>
> (a) Incorporation into clinical practice of one or more decision aids for one or more identified preference-sensitive care areas combined with ongoing training and support of involved practitioners and practice teams, preferably at sites with necessary supportive health information technology;

The following chapter points out some of the possibilities for reduction of utilization rates to numbers below current levels by examining current geographical variations in usage.

CHAPTER 3

VARIATION IN INPATIENT USAGE

INTRODUCTION

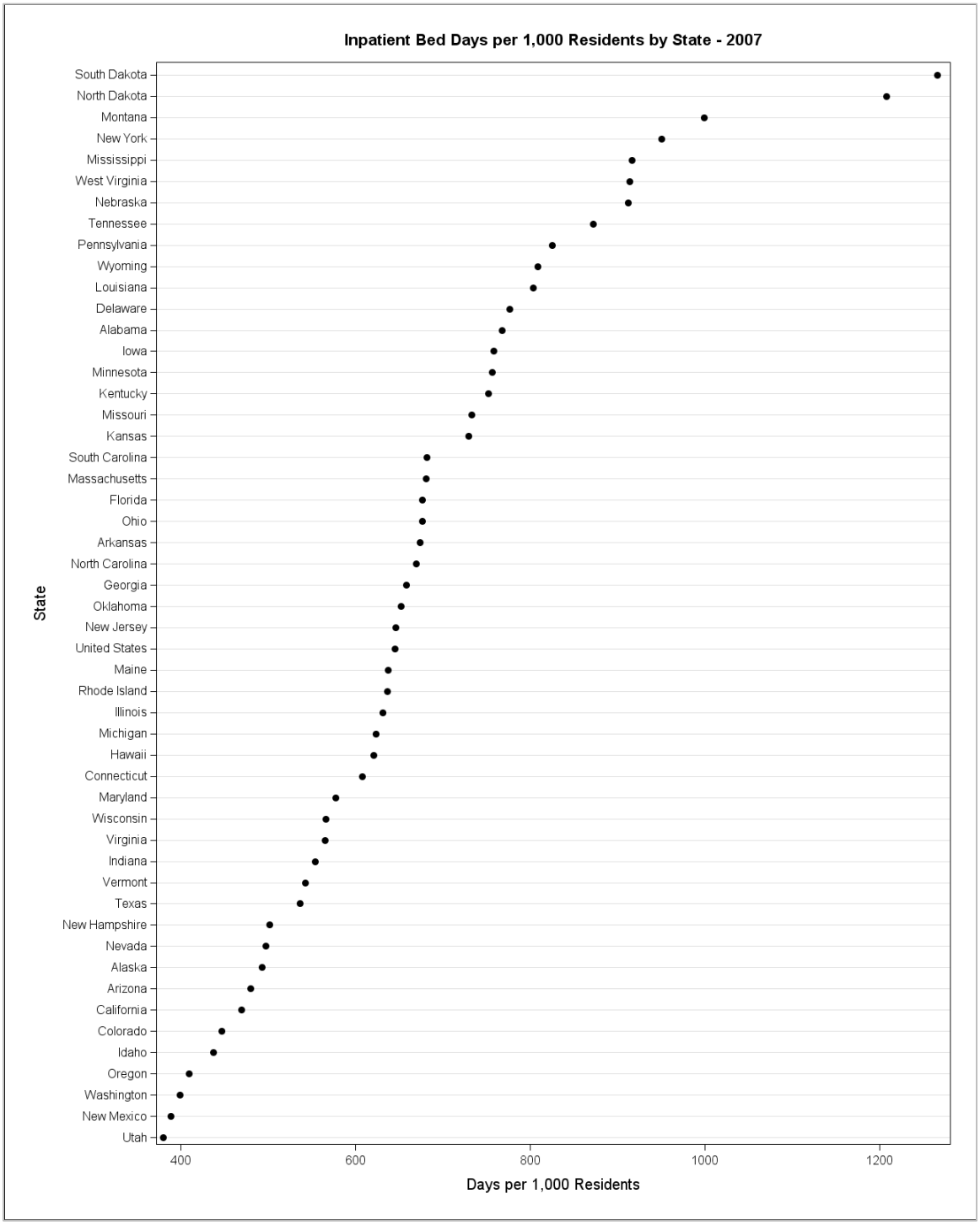
Many people think that their chances of spending time in a hospital are the same no matter where they live in the United States. In fact, there are large geographical differences, and significant differences even exist depending on where one lives in the state of Washington. This chapter examines how much hospitalization rates vary depending on location. Identifying the causes of this variation is important, because there are many possible sources – such as underlying demographic differences, practice patterns, availability of primary care, or treatment alternatives. In some cases, the analysis following in Chapter 4 will show that the higher utilization is due to underlying problems in the health of the population. In these cases, there are opportunities to improve the health of the population and thereby reduce inpatient utilization.

FINDINGS

Usage of hospital inpatient services can vary markedly. The previous chapter discussed historical changes in Washington State since 1990. Figure 3.1 below puts current rates in a different perspective, indicating how Washington's rate of 399 inpatient days per 1,000 people compared with the rest of the U.S. in 2007.

Only two states, New Mexico and Utah, posted 2007 inpatient usage rates lower than that of Washington. South Dakota ranked highest in use of inpatient services (1,266 days per 1,000 residents), a rate more than three times higher than Washington's rate. Washington's relatively low rate would suggest that little room for improvement remains. However, usage variations within the state suggest that there may be opportunities for dropping the rate even lower.

Figure 3.1

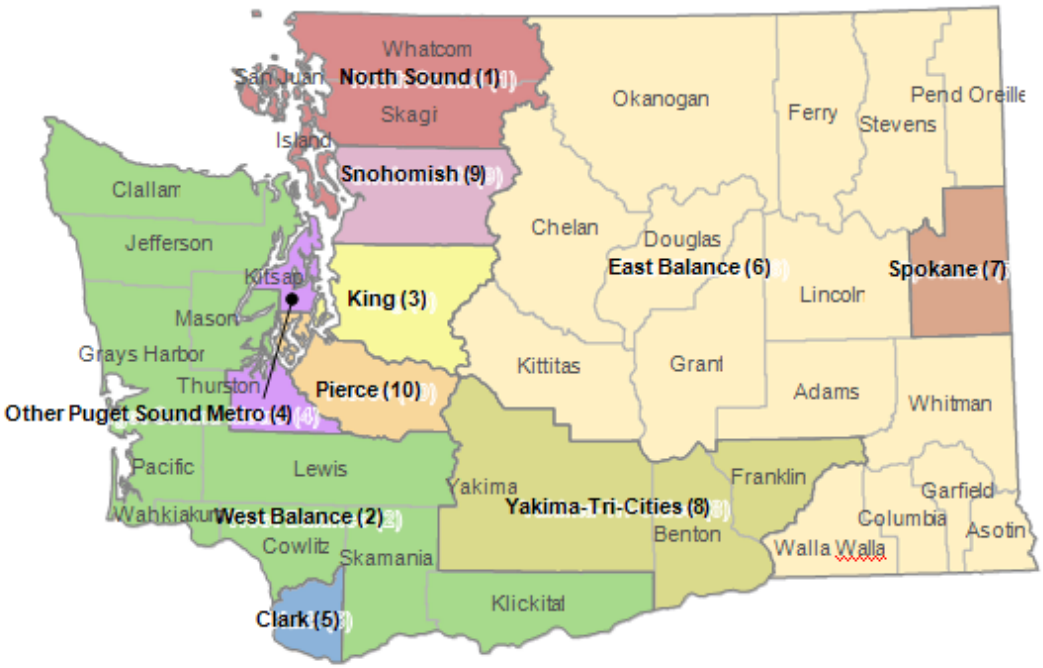


OFM Forecasting Division, November 2009. Data Source**:** Kaiser State Health Facts, Kaiser Family Foundation. (Data from American Hospital Association).*

* http://statehealthfacts.org/comparetable.jsp?ind=402&cat=8

Figure 3.2 and Table 3.1 show the geographic regions referred to in the remainder of this chapter. OFM staff use this regional breakdown when conducting the State Population Survey (SPS).

Figure 3.2
Washington State Geographic Regions



OFM Forecasting Division, November 2009. Data Source: Washington State Office of Financial Management.*

* http://www.ofm.wa.gov/sps/2008/spsmap.asp

Table 3.1
Washington State Geographic Regions, State Population Survey

Region	Counties
North Sound (1)	Island, San Juan, Skagit, Whatcom
West Balance (2)	Clallam, Cowlitz, Grays Harbor, Jefferson, Klickitat, Lewis, Mason, Pacific, Skamania, Wahkiakum
King (3)	King
Other Puget Sound Metro (4)	Kitsap, Thurston (prior to 2008 Snohomish and Pierce counties were included)
Clark (5)	Clark
East Balance (6)	Adams, Asotin, Chelan, Columbia, Douglas, Ferry, Garfield, Grant, Kittitas, Lincoln, Okanogan, Pend Oreille, Stevens, Walla Walla, Whitman
Spokane (7)	Spokane
Yakima-Tri-Cities (8)	Benton, Franklin, Yakima
Snohomish (9)	Snohomish (not available prior to 2008)
Pierce (10)	Pierce (not available prior to 2008)

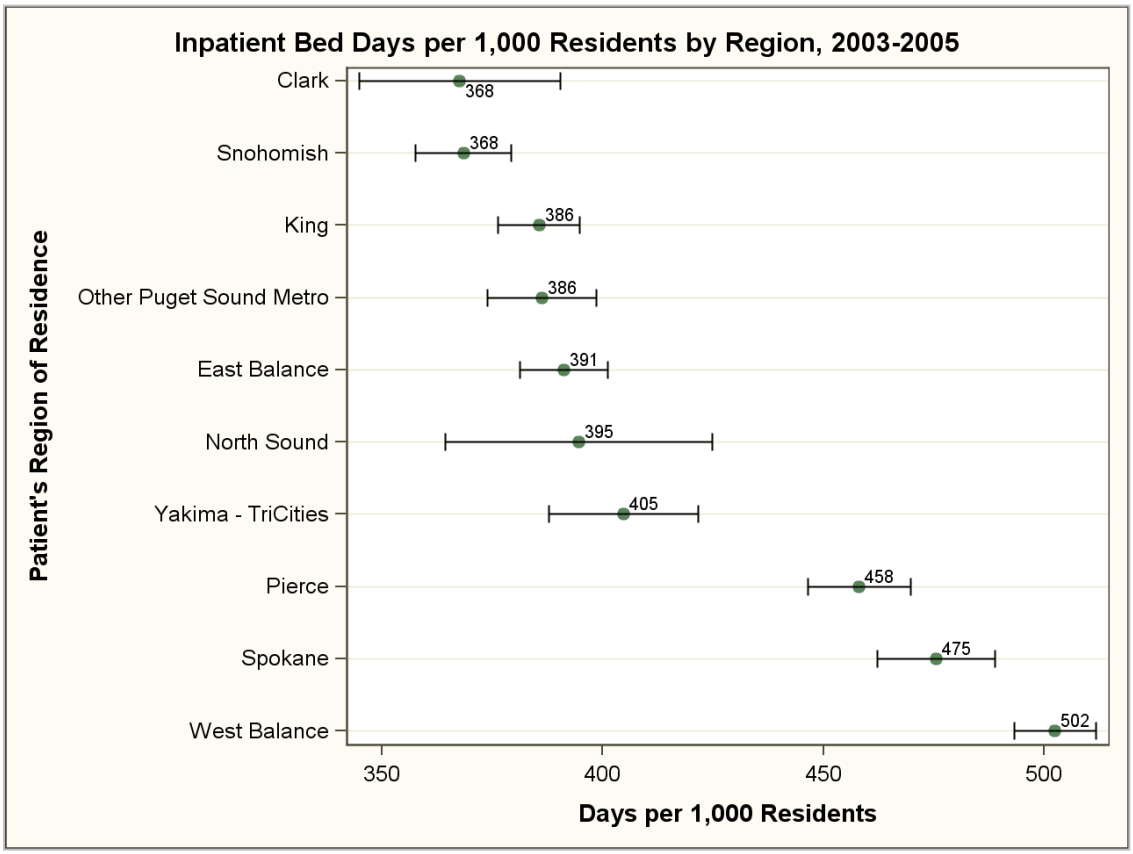
OFM Forecasting Division, November 2009. Data Source: Washington State Office of Financial Management.*†

Analysis in this chapter is based on data from an extended version of CHARS, for the years 2003 through 2005. Washington State currently does not keep records of residents admitted to inpatient facilities outside of the state or to hospitals operated by the federal government. Hence, CHARS data generally does not include hospital stays in adjacent states by residents of border cities such as Vancouver, or admissions to military and U.S. Department of Veterans Affairs (VA) hospitals (in or out of Washington State). The Center for Health Statistics at Washington's Department of Health created an extension of CHARS which contains 2003-2005 records of Washington resident admissions in Oregon as well as the military and VA hospitals located here.

Washington residents vary widely by geographical location in their use of inpatient services, as displayed in Figure 3.3. These data exclude non-resident usage and all skilled nursing (swing bed) usage. Residents of three regions, Spokane County, Pierce County, and West Balance, stand out as particularly heavy users of inpatient-bed days relative to people living elsewhere in the state. The analysis in this chapter always uses patient residence as the basis of geographical classification. This information is recorded by hospitals in the form of ZIP codes. The remainder of this chapter examines inpatient usage by these three groups in greater detail.

* http://www.ofm.wa.gov/sps/2008/spsmap.asp

Figure 3.3



Note: Bracketed horizontal lines indicate 95 percent confidence intervals (CIs) around the average numbers of inpatient bed days per 1,000 residents for each region. Averages are identified by dots and associated numbers. A confidence interval is a numerical range that is expected, with a specified level of certainty, to include the value of an estimate. For a given level of certainty, the narrower the confidence interval, the more precise the estimate is. In other words, a confidence interval describes the precision associated with an estimate.

OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal and Oregon Hospitals).

Each of the following three sections is devoted to examining one of the high-use regions in comparison to the state as a whole. The first, addressing data from Spokane County residents, contains detailed explanations with the intent of aiding data interpretation.

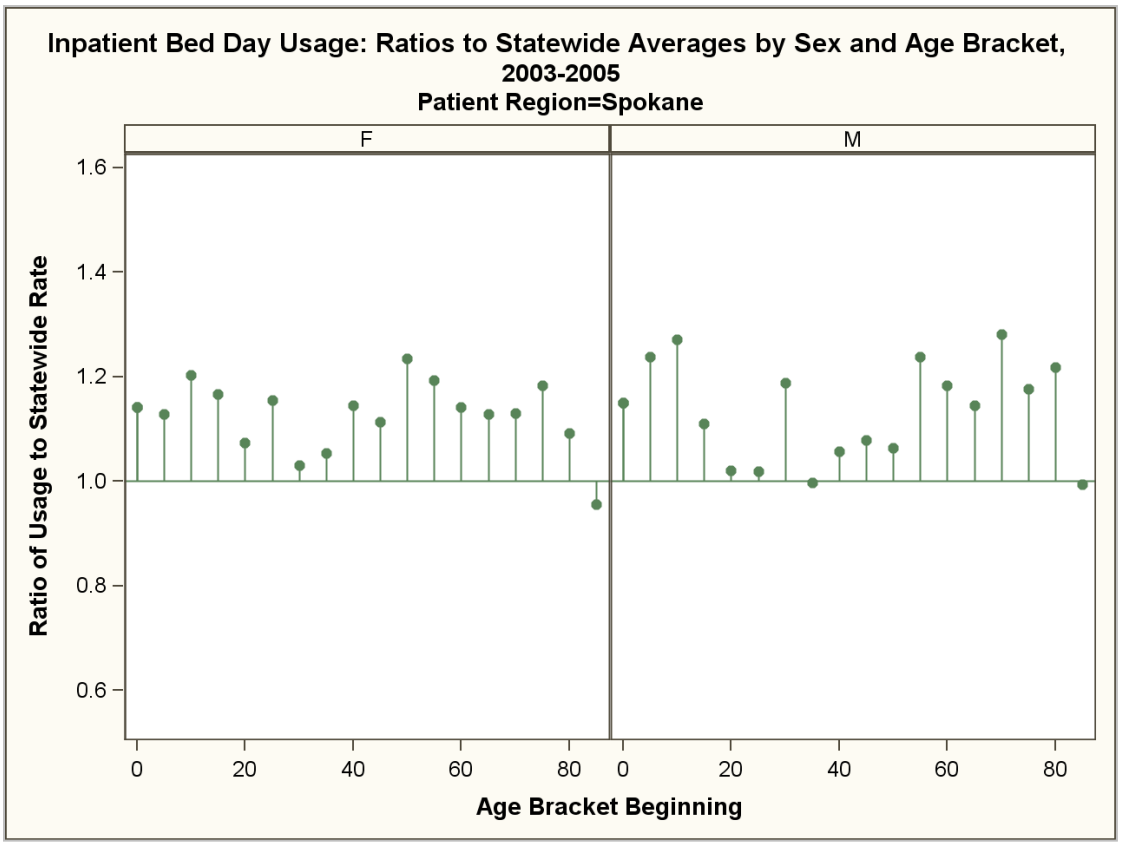
SPOKANE COUNTY

One question to ask in determining the importance of specific usage data is whether differences are concentrated in particular age-sex cells. In other words, is Spokane's inpatient bed usage, which is high in relation to the statewide average (Figure 3.3), due to exceptionally high rates in particular age-sex population groups but not in others?

Figure 3.4 reveals the answer. Graphs in the remainder of this chapter are each divided into two sections, with the left-hand half providing data for females and the right-hand half for males. Within each half, there is a vertical needle for each of the 18 age cells. The needle expresses the

usage in the cell as a ratio to the statewide average for that cell. For example, in Figure 3.4 below, the vertical needle for 10-14 year old females extends slightly above 1.2. This indicates that the usage of bed days by 10-14 year old females residing in Spokane County is approximately 1.2 times what would be expected from the statewide average for 10-14 year old females. Needles reaching below the horizontal line (set at 1.0) indicate usage below the statewide average for that cell. In this graph, only females 85 and older have a usage rate below the statewide average. Although values vary from cell to cell, the high usage in Spokane County as a whole is not concentrated in any particular age-sex cells, and high usage figures for one set of cells are not deemphasized or hidden by balancing low usage figures in another set.

Figure 3.4



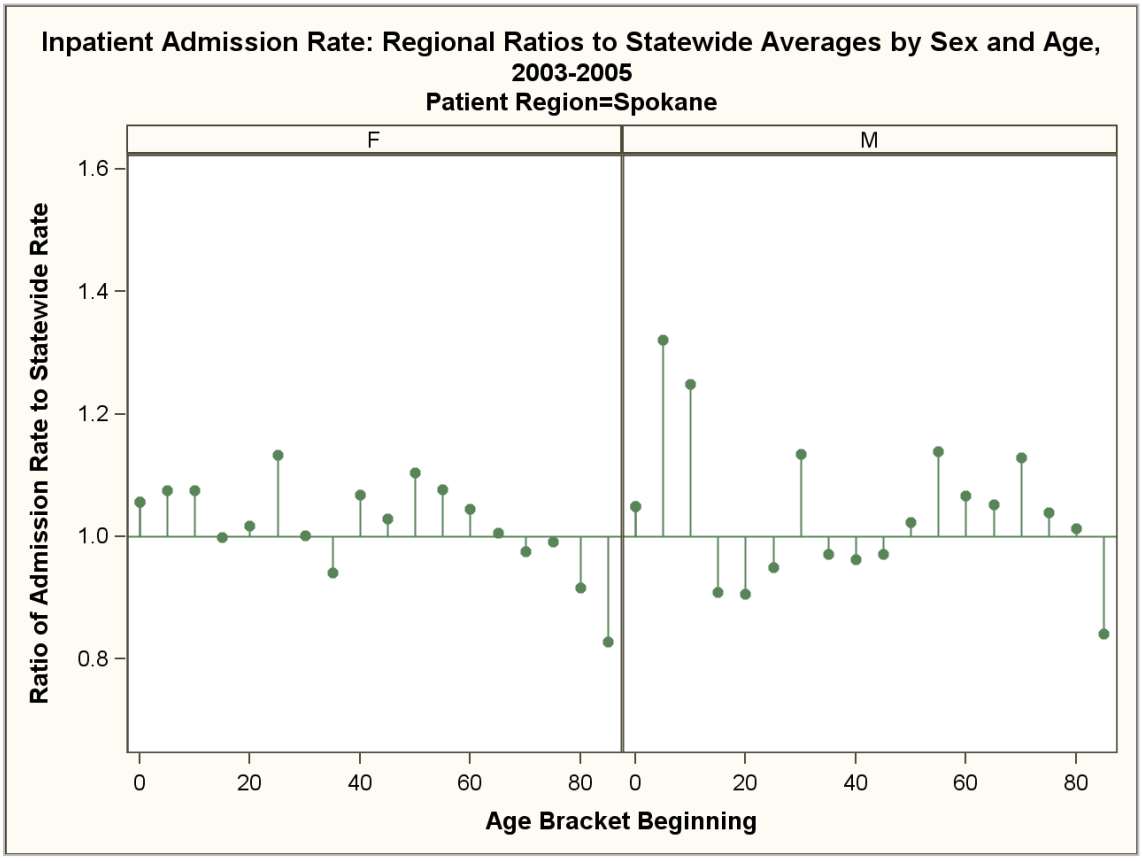
OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

Usage of inpatient services as expressed in days depends on two independent factors: the rate of admission and the length of stay. Figure 3.5 examines admission rates for Spokane County in comparison to statewide averages, using the same type of age-sex ratio graph as displayed in Figure 3.4.

Admission rates for Spokane County residents show some variation in comparison to their statewide counterparts. There are more positive (i.e., higher usage) than negative (lower usage) variations overall. Inpatient day usage by males between 5 and 14 years of age shows the

strongest positive (higher usage of bed days) difference from the statewide average. Both men and women aged 85 and older show the strongest negative (lower usage of bed days) variation.

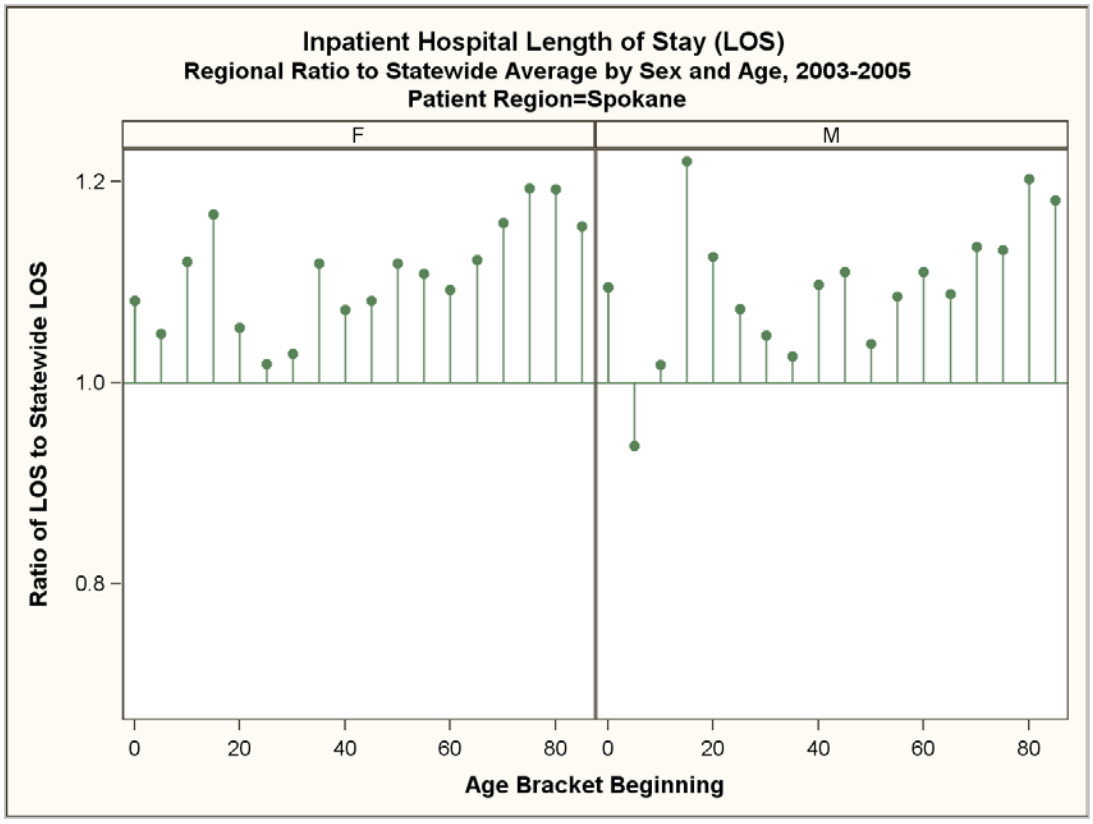
Figure 3.5



OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

The second factor determining usage rates is the number of days a person remains hospitalized following an admission (length of stay). Relying on a layout almost identical to that of the previous graph, Figure 3.6 compares this aspect of Spokane County residents' inpatient day usage to that for the state as a whole. With only one exception, males between 5 and 9 years of age, the length of stay for a Spokane County resident is greater than expected based on the statewide average. This factor is the fundamental reason for the high overall usage rate by Spokane County residents. There is always some concern that high usage in Spokane County might be an illusion driven by misclassification of patient residential locations, which would have to occur within the hospitals. If there were misclassification of patients who do not live in Spokane, the effect would be seen in admission rates, not in length of stay. While additional research would be required to determine *why* the rate is relatively high in Spokane County, the data provided here point to the fact that further investigation might be useful.

Figure 3.6



OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

The illnesses or other medical conditions leading to hospitalization are a third factor affecting inpatient usage rates. Are there particular types of admissions that play a large role in Spokane County resident usage?

Average annual usage by major diagnostic category (MDC) is displayed in Table 3.2. This table compares the usage of Spokane residents to that of the average state resident in two ways.

The column labeled "Excess" compares actual inpatient day usage and the expected usage based on the statewide average in each diagnostic category, during the three-year study period (2003-2005 combined). Numbers in the "Excess" column express bed usage above or below the statewide average. The largest figure here is in MDC 23, which is generally used to signify rehabilitation. During the period 2003-2005, Spokane County residents used about 20,000 more days than predicted on the basis of average statewide inpatient day usage for rehabilitation.

The second comparison method is in the column labeled "Ratio of Actual to Predicted Usage." According to this measure the average Spokane County resident was hospitalized 1.9 times as many days in MDC 23 as the average state resident. Overall, Spokane County residents are higher than the statewide average in their inpatient day usage in 20 of the 25 diagnostic categories.

Table 3.2
Average Annual Inpatient Day Usage by Major Diagnostic Category (MDC), 2003-2005
Region = Spokane

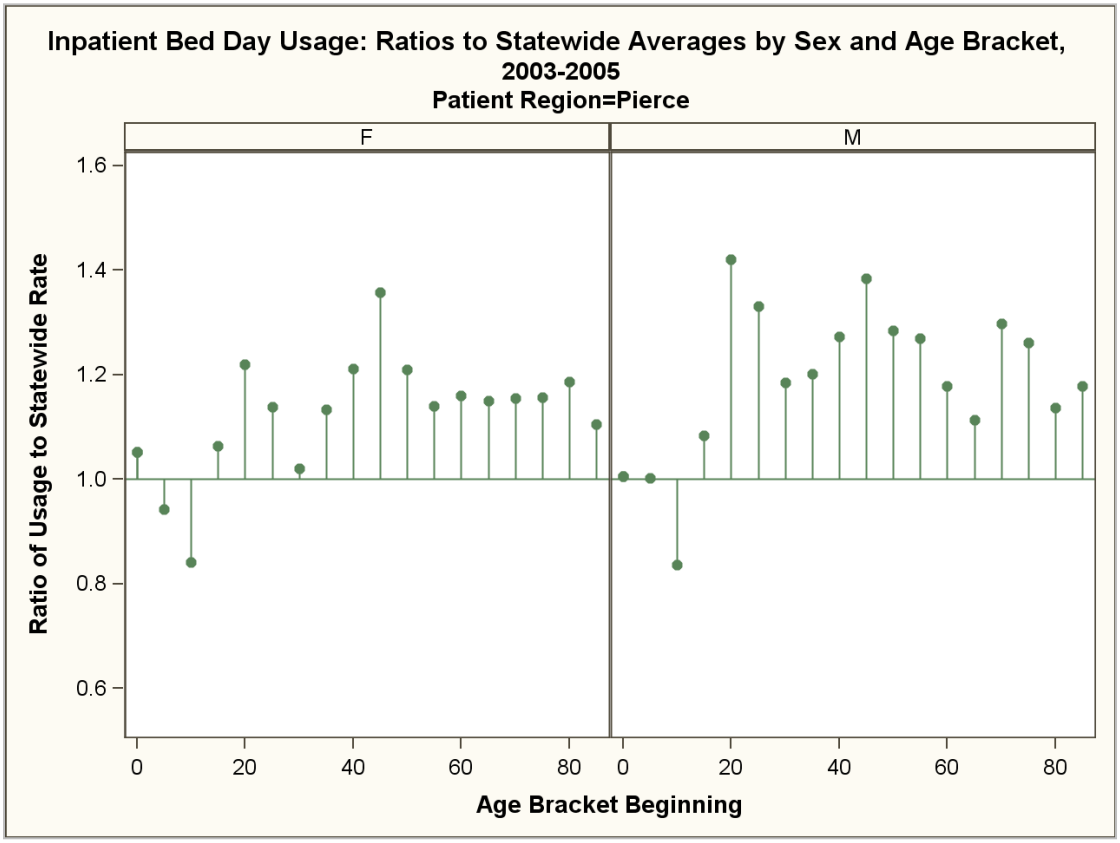
MDC	Actual Inpt. Day Usage	Expected Usage Based on Statewide Average	Excess (Usage above Statewide Average)	Ratio of Actual to Predicted Usage	Diagnostic Category Description
1	34,430	31,202	3,228	1.1	Nervous System
2	362	443	-81	0.8	Eye
3	4,259	3,936	323	1.1	Ear, Nose, Mouth And Throat
4	76,207	61,555	14,652	1.2	Respiratory System
5	71,334	67,300	4,034	1.1	Circulatory System
6	57,534	53,576	3,958	1.1	Digestive System
7	18,617	17,156	1,461	1.1	Hepatobiliary System And Pancreas
8	56,317	50,112	6,205	1.1	Musculoskeletal System And Connective Tissue
9	10,300	11,199	-899	0.9	Skin, Subcutaneous Tissue And Breast
10	13,584	12,200	1,384	1.1	Endocrine, Nutritional And Metabolic System
11	20,278	18,399	1,879	1.1	Kidney And Urinary Tract
12	3,386	2,360	1,026	1.4	Male Reproductive System
13	11,809	9,816	1,993	1.2	Female Reproductive System
14	42,792	43,173	-381	1.0	Pregnancy, Childbirth And Puerperium
15	56,304	50,821	5,483	1.1	Newborn And Other Neonates (Perinatal Period)
16	5,291	5,079	212	1.0	Blood and Blood Forming Organs and Immunological Disorders
17	10,281	9,121	1,160	1.1	Myeloproliferative DDs (Poorly Differentiated Neoplasms)
18	18,193	16,444	1,749	1.1	Infectious and Parasitic DDs
19	47,463	41,570	5,893	1.1	Mental Diseases and Disorders
20	2,794	6,881	-4,087	0.4	Alcohol/Drug Use or Induced Mental Disorders
21	6,836	6,583	253	1.0	Injuries, Poison And Toxic Effect of Drugs
22	1,456	1,102	354	1.3	Burns
23	43,109	23,111	19,998	1.9	Factors Influencing Health Status
24	2,692	2,980	-288	0.9	Multiple Significant Trauma
25	967	961	6	1.0	Human Immunodeficiency Virus Infection

OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

PIERCE COUNTY

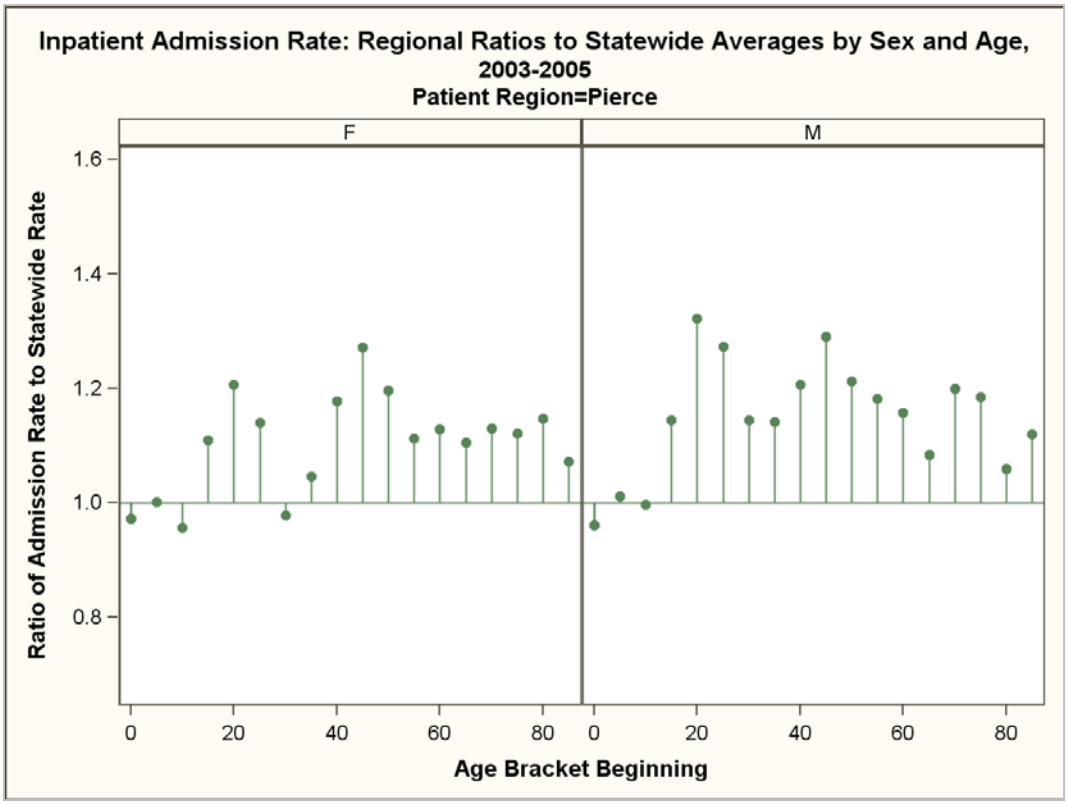
Figures 3.7, 3.8 and 3.9 and Table 3.3 compare inpatient bed day usage by Pierce County residents to that of average state residents in each age-sex grouping. Pierce County residents over 19 years of age consume more inpatient services than expected. Admission rates and lengths of stay are high for this broad age range across both sexes, although the former contribute more to deviation from average values than do the latter. Higher use than expected is also more concentrated in the male population. With one exception, females ages 25-29, lengths of stay for people older than 19 are longer than the statewide average. Overall, Pierce County residents used about 25,875 more inpatient bed days than expected (based on the statewide average) across 2003-2005 combined for hospitalizations related to circulatory system conditions (MDC 5), and about 22,355 above a similar prediction for mental diseases and disorders (MDC 19). Pierce County's greatest variation appears in MDC 16 (Blood and Blood Forming Organs and Immunological Disorders), which was 40 percent above the statewide average.

Figure 3.7



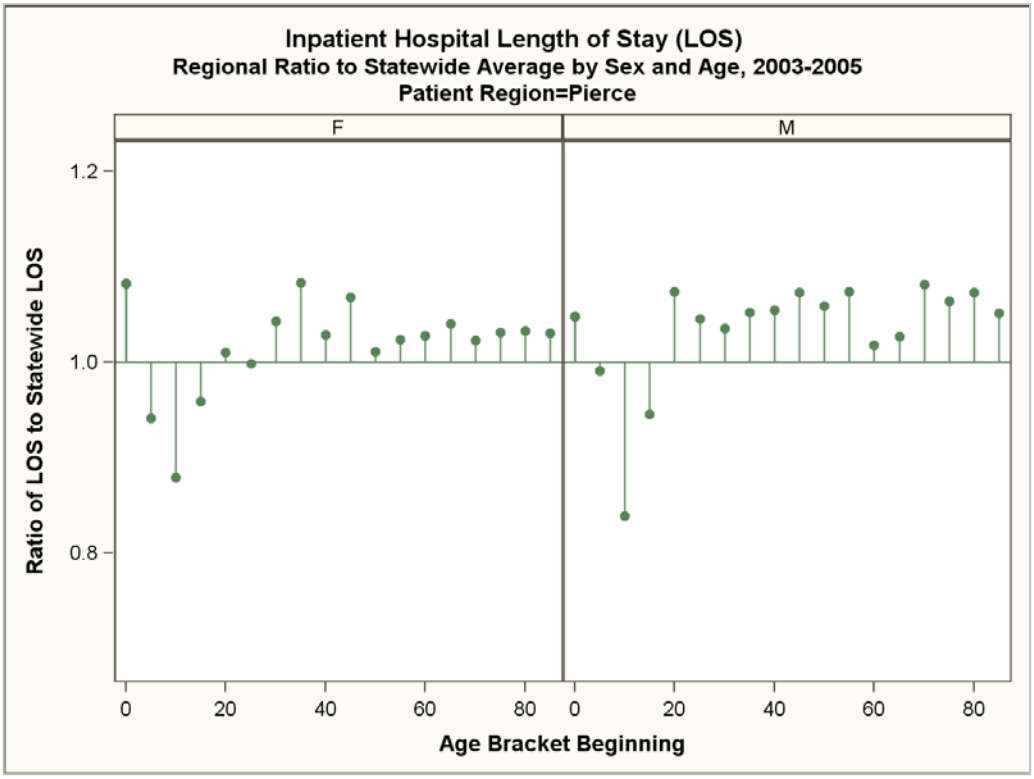
OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

Figure 3.8



OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal and Oregon Hospitals).

Figure 3.9



OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

Table 3.3

Average Annual Inpatient Day Usage by Major Diagnostic Category (MDC)
Patient Region = Pierce

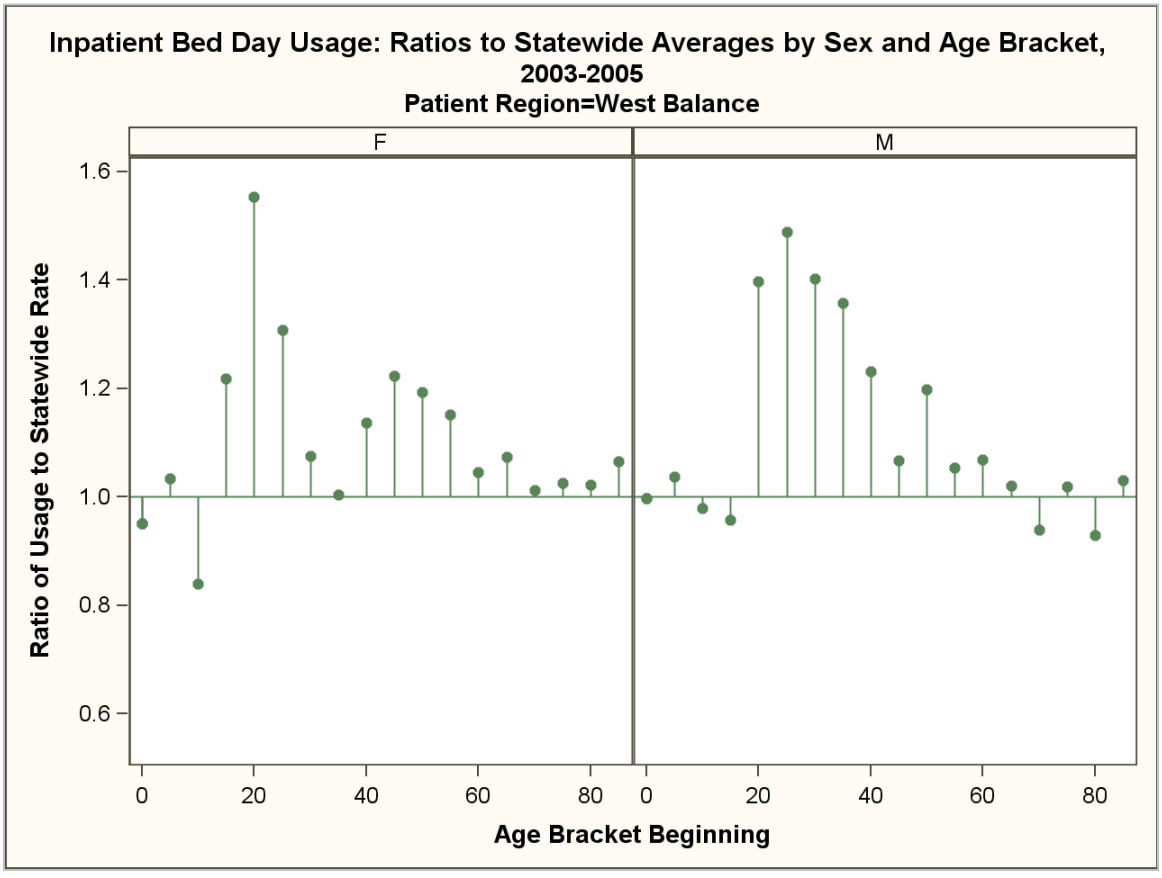
MDC	Actual Inpt. Day Usage	Expected Usage Based on Statewide Average	Excess (Usage above Statewide Average)	Ratio of Actual to Predicted Usage	Diagnostic Category Description
1	56,987	48,158	8,829	1.2	Nervous System
2	860	737	123	1.2	Eye
3	7,439	6,476	963	1.1	Ear, Nose, Mouth and Throat
4	105,954	93,788	12,166	1.1	Respiratory System
5	126,624	100,749	25,875	1.3	Circulatory System
6	97,850	83,225	14,625	1.2	Digestive System
7	32,518	27,544	4,974	1.2	Hepatobiliary System and Pancreas
8	83,196	76,324	6,872	1.1	Musculoskeletal System and Connective Tissue
9	24,380	18,092	6,288	1.3	Skin, Subcutaneous Tissue and Breast
10	23,439	19,366	4,073	1.2	Endocrine, Nutritional and Metabolic System
11	35,640	27,936	7,704	1.3	Kidney and Urinary Tract
12	4,164	3,714	450	1.1	Male Reproductive System
13	18,712	16,482	2,230	1.1	Female Reproductive System
14	79,401	76,983	2,418	1.0	Pregnancy, Childbirth and Puerperium
15	100,068	95,099	4,969	1.1	Newborn and Other Neonates (Perinatal Period)
16	11,071	8,172	2,899	1.4	Blood and Blood Forming Organs and Immunological Disorders
17	16,912	14,948	1,964	1.1	Myeloproliferative DDs (Poorly Differentiated Neoplasms)
18	30,198	25,578	4,620	1.2	Infectious and Parasitic DDs
19	92,058	69,703	22,355	1.3	Mental Diseases and Disorders
20	9,861	11,844	-1,983	0.8	Alcohol/Drug Use or Induced Mental Disorders
21	13,817	10,827	2,990	1.3	Injuries, Poison and Toxic Effect of Drugs
22	2,179	1,889	290	1.2	Burns
23	43,254	35,041	8,213	1.2	Factors Influencing Health Status
24	5,097	5,007	90	1.0	Multiple Significant Trauma
25	1,497	1,716	-219	0.9	Human Immunodeficiency Virus Infection

OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal and Oregon Hospitals).

WEST BALANCE

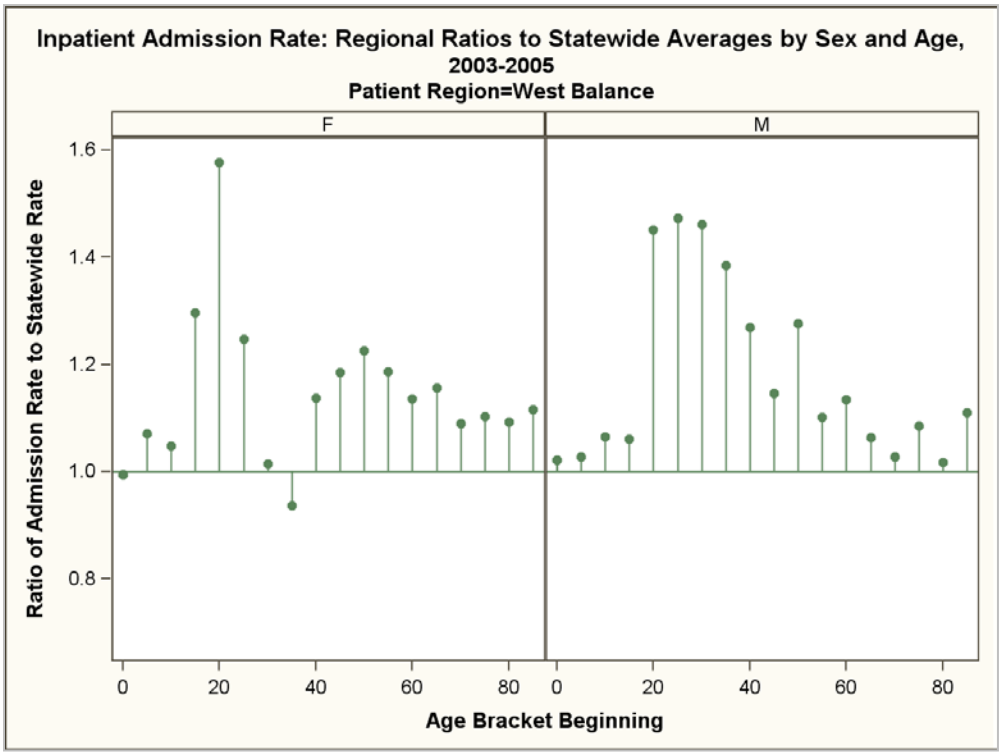
Figures 3.10, 3.11 and 3.12 and Table 3.4 compare inpatient bed day usage by residents of the West Balance region to statewide averages. High usage by female West Balance residents extends from the 15-19 age bracket and through ages 25-29. This rate is probably related to childbearing. For males, the high usage period begins slightly later, with the 20-24 year age bracket, and then declines into later middle age. High usage in West Balance is almost completely driven by high admission rates, in contrast to the findings in Spokane County; all West Balance age-sex groups except one, females age 35-39, are admitted at rates higher than expected. Lengths of stay in West Balance generally fall below statewide averages. One West Balance finding was particularly striking. MDC 20 (Alcohol/Drug Use or Induced Mental Disorders) has a ratio value of 2.1 (2.1 times as many inpatient hospital days as the statewide average for this diagnosis), which is the highest single ratio in all three of the high-use regions.

Figure 3.10



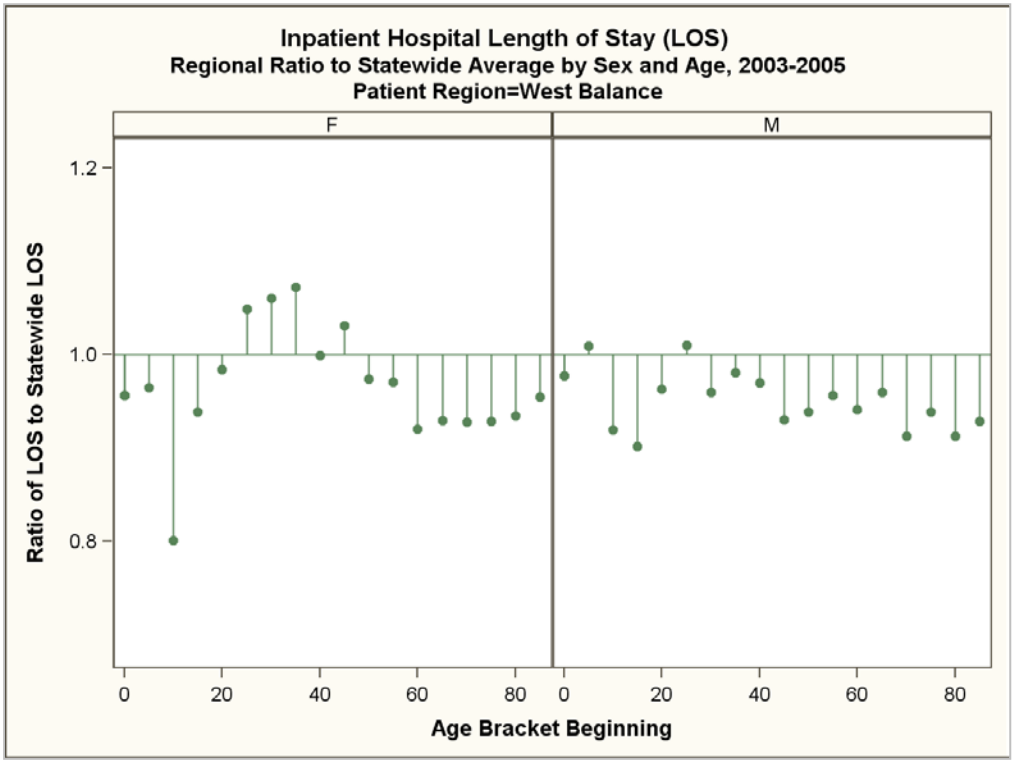
OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

Figure 3.11



OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

Figure 3.12



OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal and Oregon Hospitals).

Table 3.4

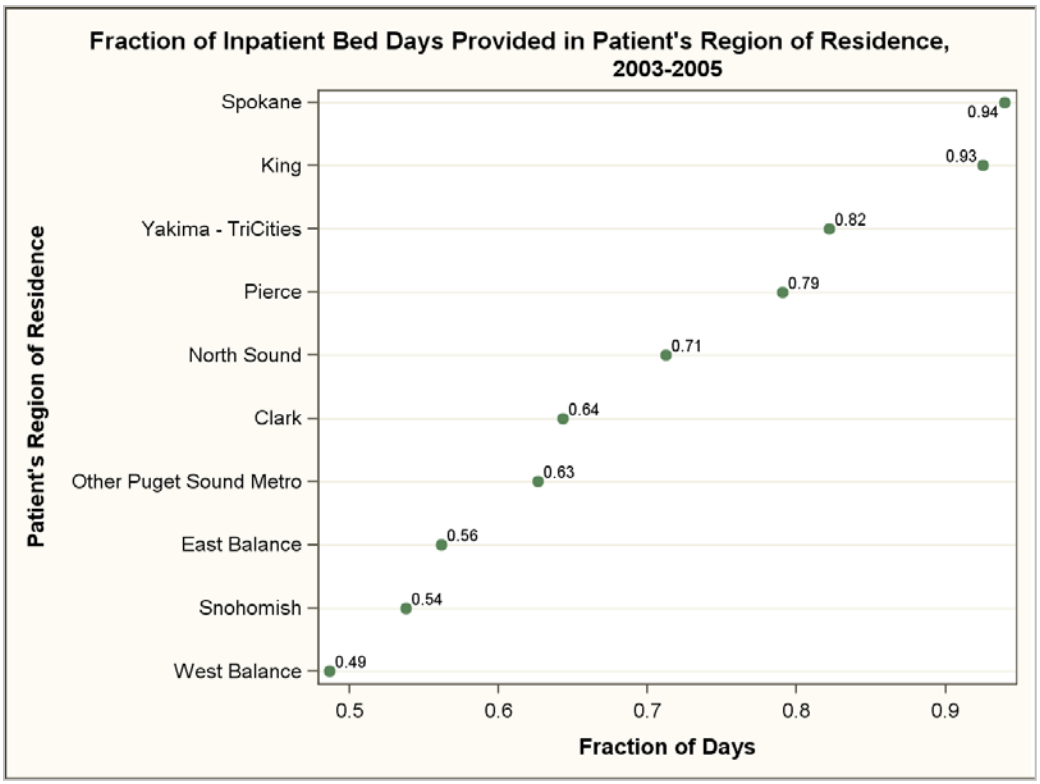
Average Annual Inpatient Day Usage by Major Diagnostic Category (MDC)
Patient Region = West Balance

MDC	Actual Inpt. Day Usage	Expected Usage Based on Statewide Average	Excess (Usage above Statewide Average)	Ratio of Actual to Predicted Usage	Diagnostic Category Description
1	37,533	36,519	1,014	1.0	Nervous System
2	508	476	32	1.1	Eye
3	4,400	4,352	48	1.0	Ear, Nose, Mouth And Throat
4	82,507	74,469	8,038	1.1	Respiratory System
5	95,813	84,582	11,231	1.1	Circulatory System
6	69,157	62,937	6,220	1.1	Digestive System
7	22,729	19,878	2,851	1.1	Hepatobiliary System And Pancreas
8	65,561	59,622	5,939	1.1	Musculoskeletal System And Connective Tissue
9	14,926	12,575	2,351	1.2	Skin, Subcutaneous Tissue And Breast
10	13,699	13,755	-56	1.0	Endocrine, Nutritional And Metabolic System
11	24,206	22,001	2,205	1.1	Kidney And Urinary Tract
12	3,205	3,186	19	1.0	Male Reproductive System
13	11,840	10,295	1,545	1.2	Female Reproductive System
14	38,158	33,743	4,415	1.1	Pregnancy, Childbirth And Puerperium
15	44,455	45,328	-873	1.0	Newborn And Other Neonates (Perinatal Period)
16	5,360	5,701	-341	0.9	Blood and Blood Forming Organs and Immunological Disorders
17	11,038	10,621	417	1.0	Myeloproliferative DDs (Poorly Differentiated Neoplasms)
18	20,866	19,499	1,367	1.1	Infectious and Parasitic DDs
19	36,644	42,557	-5,913	0.9	Mental Diseases and Disorders
20	14,847	7,027	7,820	2.1	Alcohol/Drug Use or Induced Mental Disorders
21	9,366	7,285	2,081	1.3	Injuries, Poison And Toxic Effect of Drugs
22	1,621	1,101	520	1.5	Burns
23	21,226	28,137	-6,911	0.8	Factors Influencing Health Status
24	4,023	2,980	1,043	1.3	Multiple Significant Trauma
25	392	945	-553	0.4	Human Immunodeficiency Virus Infection

OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

The geographic variation described in this chapter is based on the patient's region of residence. Geographic classification is necessary since age-sex distributions are used in determining utilization rates. Unlike a geographic region, however, a hospital does not have a natural population; patients are often treated in hospitals located within their region of residence, but this is not always the case. Figure 3.13 shows the extent to which patients were treated at hospitals within their region of residence during the years 2003 to 2005. More than 90 percent of King and Spokane County residents sought treatment within their respective counties. However, residents of the West Balance Region received less than half of their inpatient services within their own region.

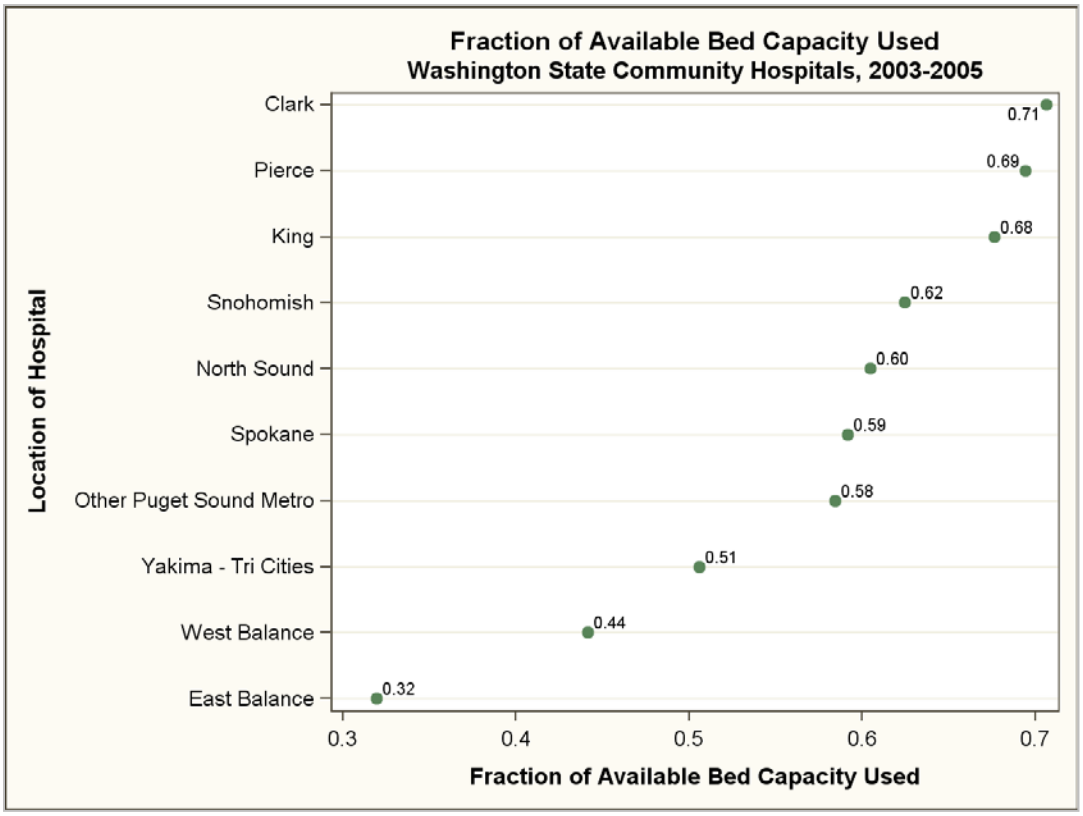
Figure 3.13



OFM Forecasting, November 2009. Data Source: Washington State Department of Health Extended CHARS (Includes Community, Federal, and Oregon Hospitals).

Geographic categorization of patient residence also may reveal useful information, because the decision to hospitalize is almost certainly made by the patient and the healthcare providers who oversee the patient's care in normal circumstances. The tendency of residents of some regions to seek hospital services in other regions leads to the question of bed capacity. Do some people seek treatment in other regions because nearby hospitals are full? Figure 3.14 provides a partial answer to this question by depicting the fraction of available bed capacity actually used in Washington State community hospitals from 2003 to 2005. There appears to be more than enough unused capacity in those regions with high out-of-region usage. Further research would be required to explain why residents of one region are hospitalized in another.

Figure 3.14



OFM Forecasting Division, November 2009. Data Source: DOH Hospital Financial System. The formula used to create these results was verified against the published DOH occupancy ratios for individual hospitals.

SUMMARY

This chapter has demonstrated that inpatient service utilization rates change from region to region across Washington State. Factors driving high usage rates vary. Subsequent chapters, investigating additional aspects of the health care system, will shed some light on underlying reasons. While regional fluctuations suggest that reduction may be possible in geographic areas with higher-than-average usage rates, thus providing an alternative to production of new hospital capacity as the state's population grows and ages, further investigation is necessary to determine the causes of the observed variation and whether reducing it is feasible.

CHAPTER 4

REGIONAL VARIATIONS IN POTENTIALLY AVOIDABLE HOSPITALIZATIONS

INTRODUCTION

This chapter discusses variation in hospital utilization for ambulatory care sensitive conditions (ACSCs). ACSCs are medical conditions that, under a high-quality and community-based primary care system, do not usually require hospitalization. In other words, hospitalizations for these conditions are potentially avoidable. High rates of ACSCs in a community are indications of a poorly performing primary care system.[1] In Chapter 2, the hospital capacity projection based on current utilization suggests that Washington's hospital capacity may become insufficient in the next two decades, due to overall population increase and older persons, who make more intensive use of health services, becoming an increasingly larger share of the state's population. While ultimately it may be necessary to build more hospitals to meet this challenge, reducing potentially avoidable hospitalizations offers an alternative or complementary solution that focuses on hospital conservation. This solution requires improvements to the existing primary care system. Analysis on variation in potentially avoidable hospitalizations can help formulate this solution to target areas where improvements are most wanting.

Measures of ACSCs have been incorporated into the federal Agency for Healthcare Research and Quality (AHRQ)'s Prevention Quality Indicators (PQIs). The AHRQ PQI consists of 14 individual indicators and three composite indicators.[2] The three composite indicators (Overall, Acute, and Chronic) are derived from 12 of the 14 individual indicators. Table 4.1 shows the 14 individual PQIs and their relationship to the three composite indicators.

[1] http://www.ahrq.gov/data/hcup/factbk5/factbk5.pdf
[2] http://www.qualityindicators.ahrq.gov/pqi_overview.htm

Table 4.1

Agency for Healthcare Research and Quality (AHRQ)'s Prevention Quality Indicators (PQI)

		Composite PQI Measures			
No.	Individual PQI Measures	Acute	Chronic	Overall	PQI #
1	Diabetes, short-term (ST) complications		√	√	PQI 1
2	Perforated appendicitis				PQI 2
3	Diabetes, long-term (LT) complications		√	√	PQI 3
4	Chronic obstructive pulmonary disease (COPD)		√	√	PQI 5
5	Hypertension		√	√	PQI 7
6	Congestive heart failure (CHF)		√	√	PQI 8
7	Low birth weight				PQI 9
8	Dehydration	√		√	PQI 10
9	Bacterial pneumonia	√		√	PQI 11
10	Urinary infections	√		√	PQI 12
11	Angina without procedure		√	√	PQI 13
12	Uncontrolled diabetes (Diabetes Unc)		√	√	PQI 14
13	Adult asthma		√	√	PQI 15
14	Lower extremity amputations among patients with diabetes (LEAmput)		√	√	PQI 16

OFM Forecasting Division, November 2009.

Data Source: Agency for Healthcare Research and Quality.

Note: The two shaded individual PQI measures are not included in any of three composite measures. They are not used in analysis in this chapter.

Staff applied the AHRQ's PQI methodology to hospital discharge records of adult patients in Washington State's Comprehensive Hospital Abstract Report System (CHARS). The analysis of Washington's ACSCs focused on the composite indicators to answer the following questions:

- How did Washington's primary care system fare historically as measured by ACSC data, and how did it compare with the nation?
- What were the regional ACSC trends?
- Which regions' rates were higher or lower than expected, and did patterns change over time?
- What was the cost burden of ACSC-related hospitalizations?

How Did Washington's Primary Care System Fare Historically as Measured by ACSC Data, and How Did It Compare with the Nation?

Between 1990 and 2007, Washington's overall ACSC hospitalization rates for the adult population, adjusted to the 2004 U.S. adult population by age and sex, saw a gradual decrease from 1,292 to 995 hospitalizations per 100,000 adults (Figure 4.1). This decrease was largely driven by a decrease in the chronic ACSC hospitalization rates from 874 to 583 (Figure 4.2). Although the acute ACSC hospitalization rate for 2007 roughly matched that of 1990 at about 415 per 100,000 adults, for most of the intervening years, the rate was higher (Figure 4.3).

Washington State's ACSC hospitalization rates compare favorably to national figures. In recent years, Washington's numbers in the three composite indicators have been about half of the U.S. average in 2004.

(Charts showing changes of ACSC specific conditions for the state can be found in the appendix.)

Figure 4.1

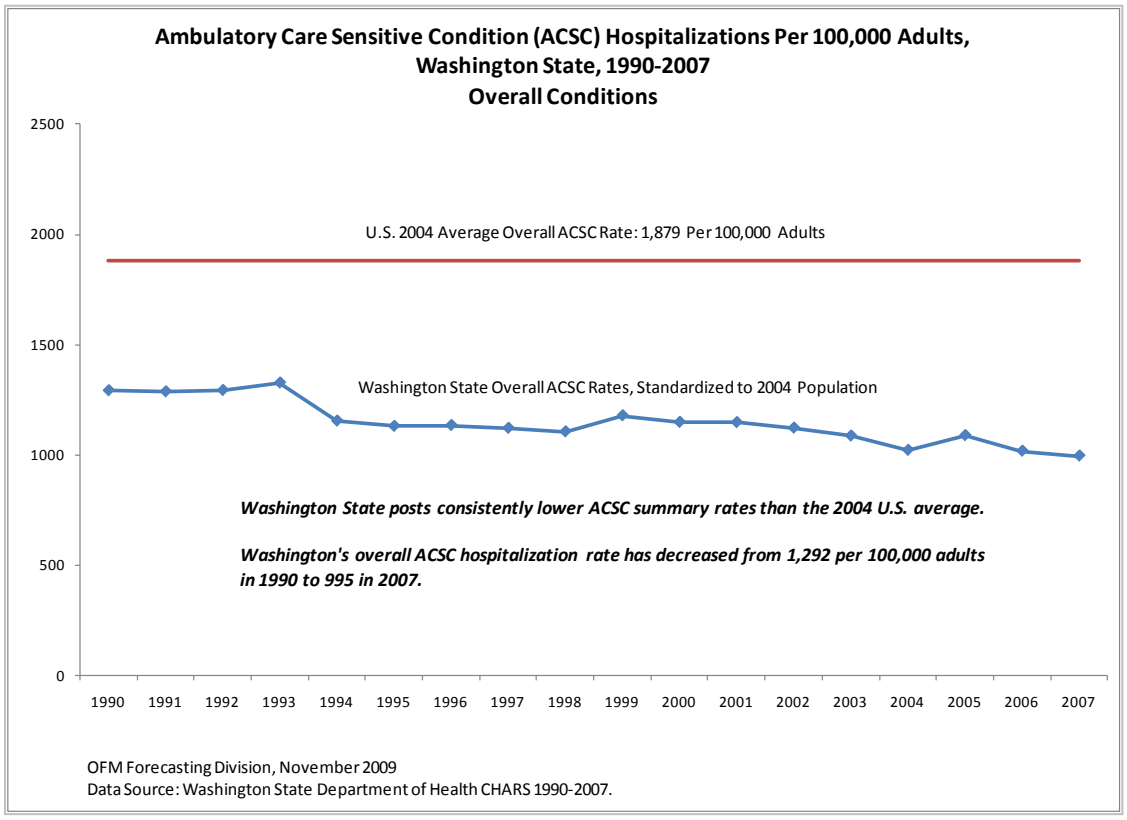


Figure 4.2

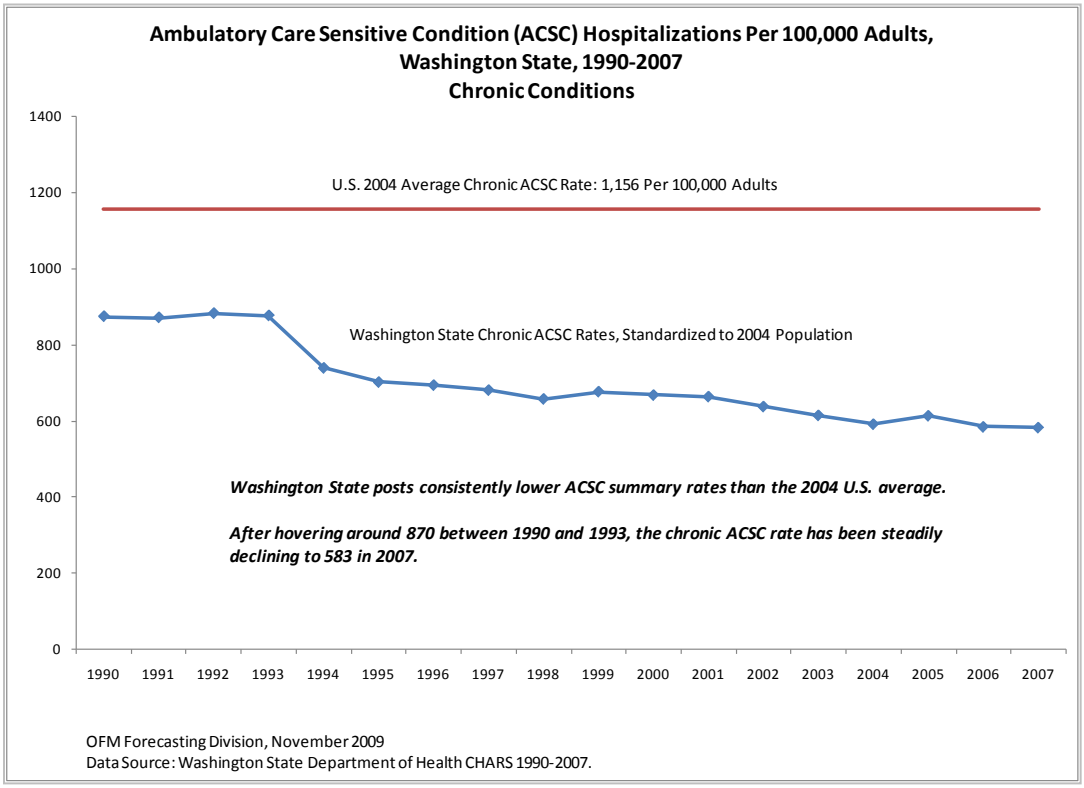
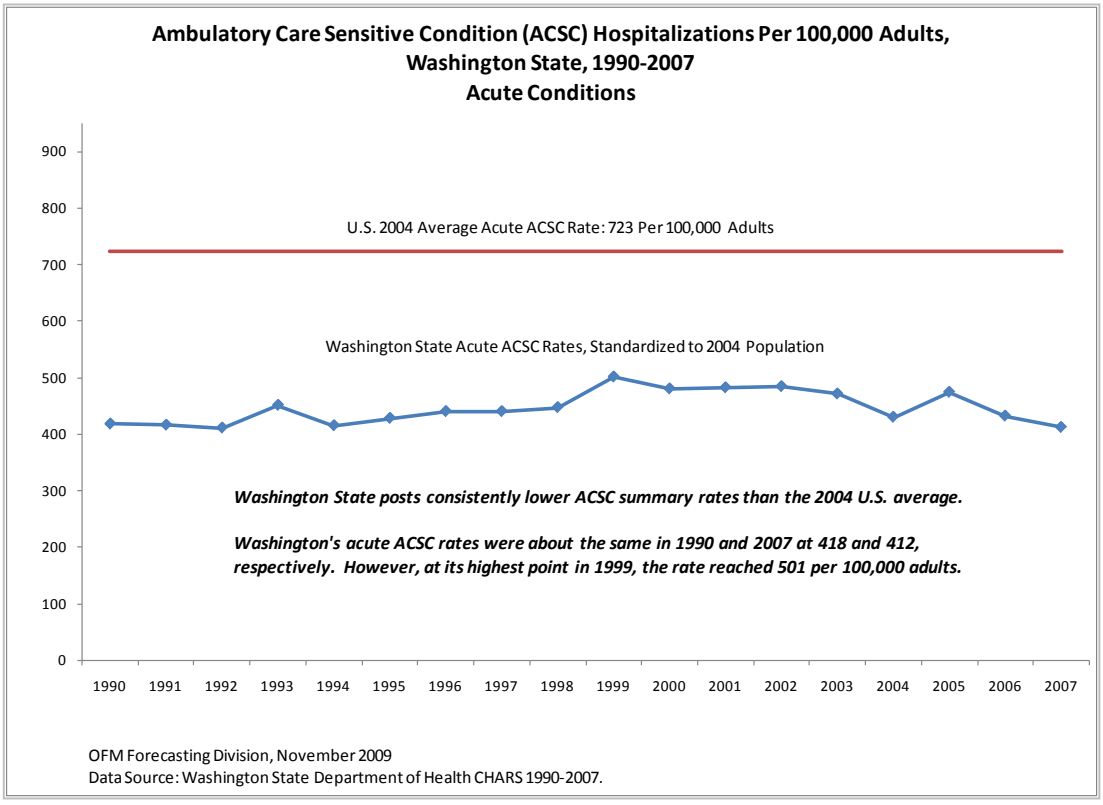


Figure 4.3



WHAT WERE THE REGIONAL ACSC TRENDS?

To learn about regional ACSC trends, staff adopted the ten-region geographical designations used by the Washington State Population Survey.[3] One of the ten regions, Clark County, was excluded from this analysis, because a significant portion of the Clark residents sought inpatient care in Oregon,[4] thus limiting project access to their hospital discharge data.

Regional ACSC hospitalization rates reveal large differences in trends. In the overall ACSC rates (Figure 4.4), all urban regions except Pierce County saw a declining trend; in contrast, Pierce experienced a slight and gradual increase beginning in 1995. The rural region of West Balance, despite a trend in the desired direction, started and finished the 18 year study period with the highest rate of all regions. Even West Balance's lowest overall ACSC rate (in 2007) was higher than the highest rate of any other regions. In another rural region, East Balance, the overall ACSC hospitalization rates also remained above the 2004 state average.

Hospitalizations of patients for chronic ACSCs (Figure 4.5) are the primary influence on the downward trend of state and regional ACSC hospitalization rates. The acute ACSC rates (Figure 4.6) told a different story. Acute ACSC patients were hospitalized at higher rates in 2007 than in 1990, in several regions.

(Charts showing changes of ACSC specific conditions for the regions can be found in the appendix.)

[3] http://www.ofm.wa.gov/sps/2008/spsmap.asp
[4] An unpublished staff analysis of 2005 records of Washington residents discharged from hospitals in Washington and Oregon shows that one-fourth of Clark County residents' hospitalizations in that year were in facilities located in Oregon.

Figure 4.4

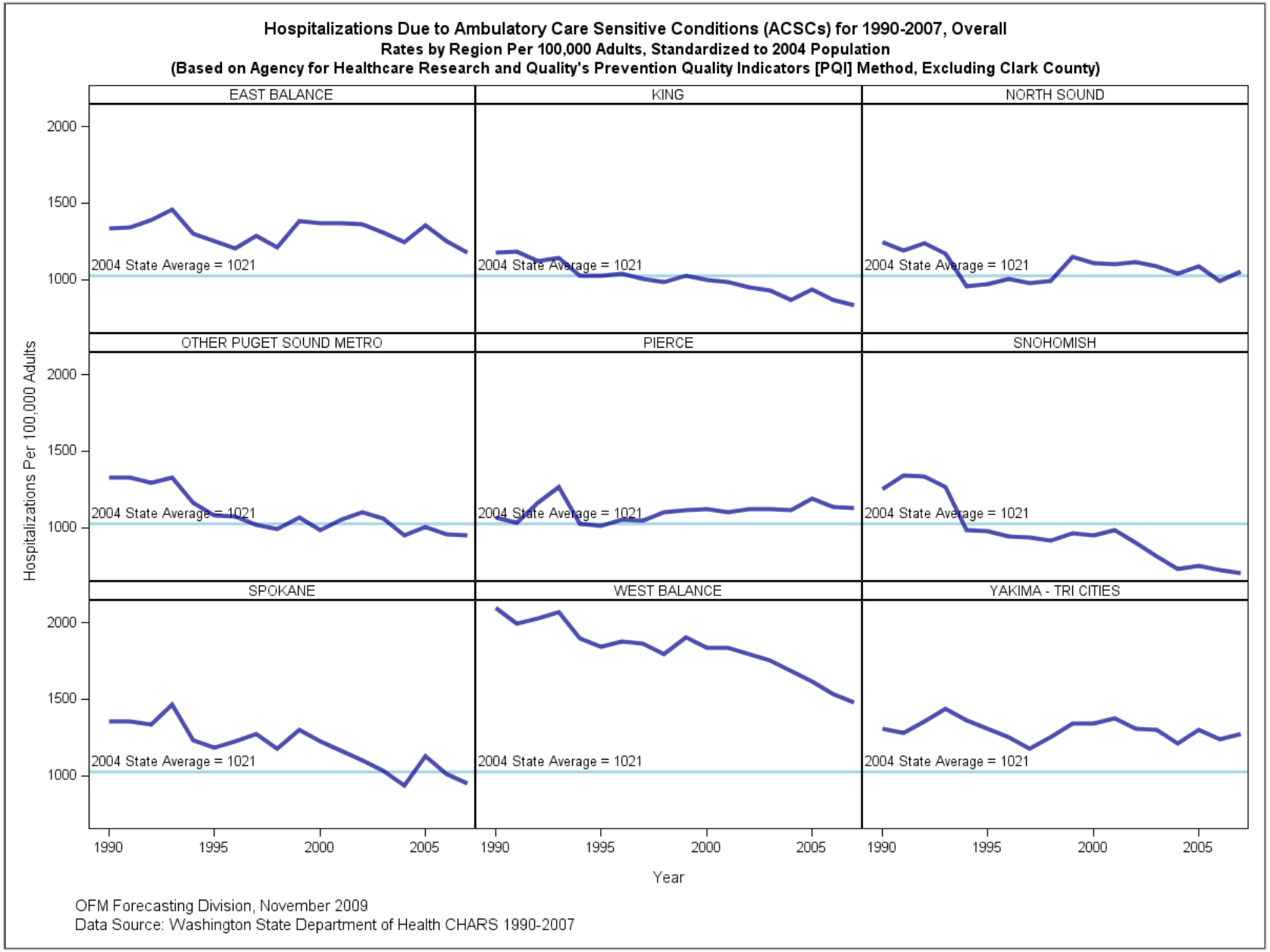

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Overall
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 1021
Hospitalizations Per 100,000 Adults
2000
1500
1000
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Figure 4.5

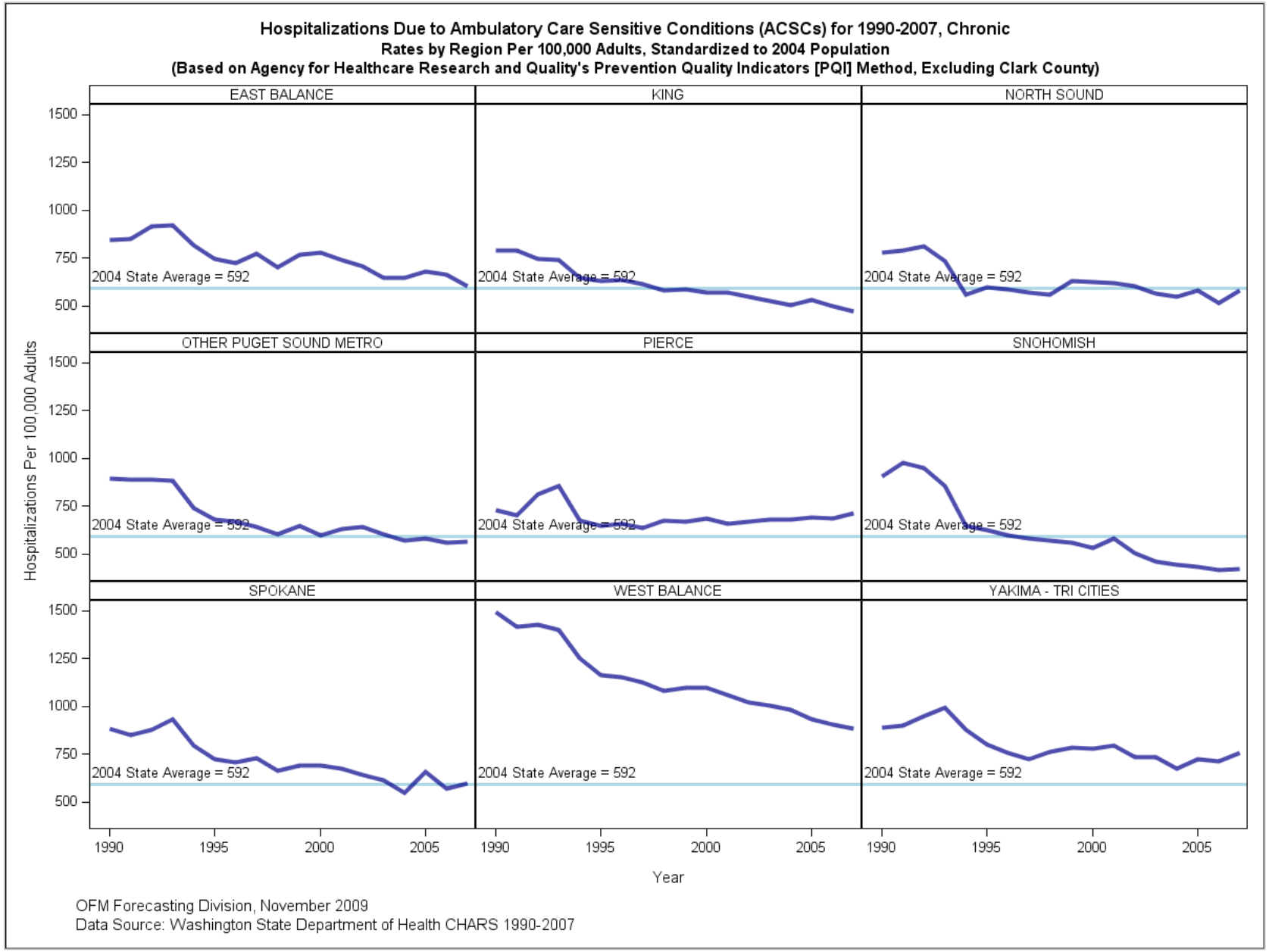
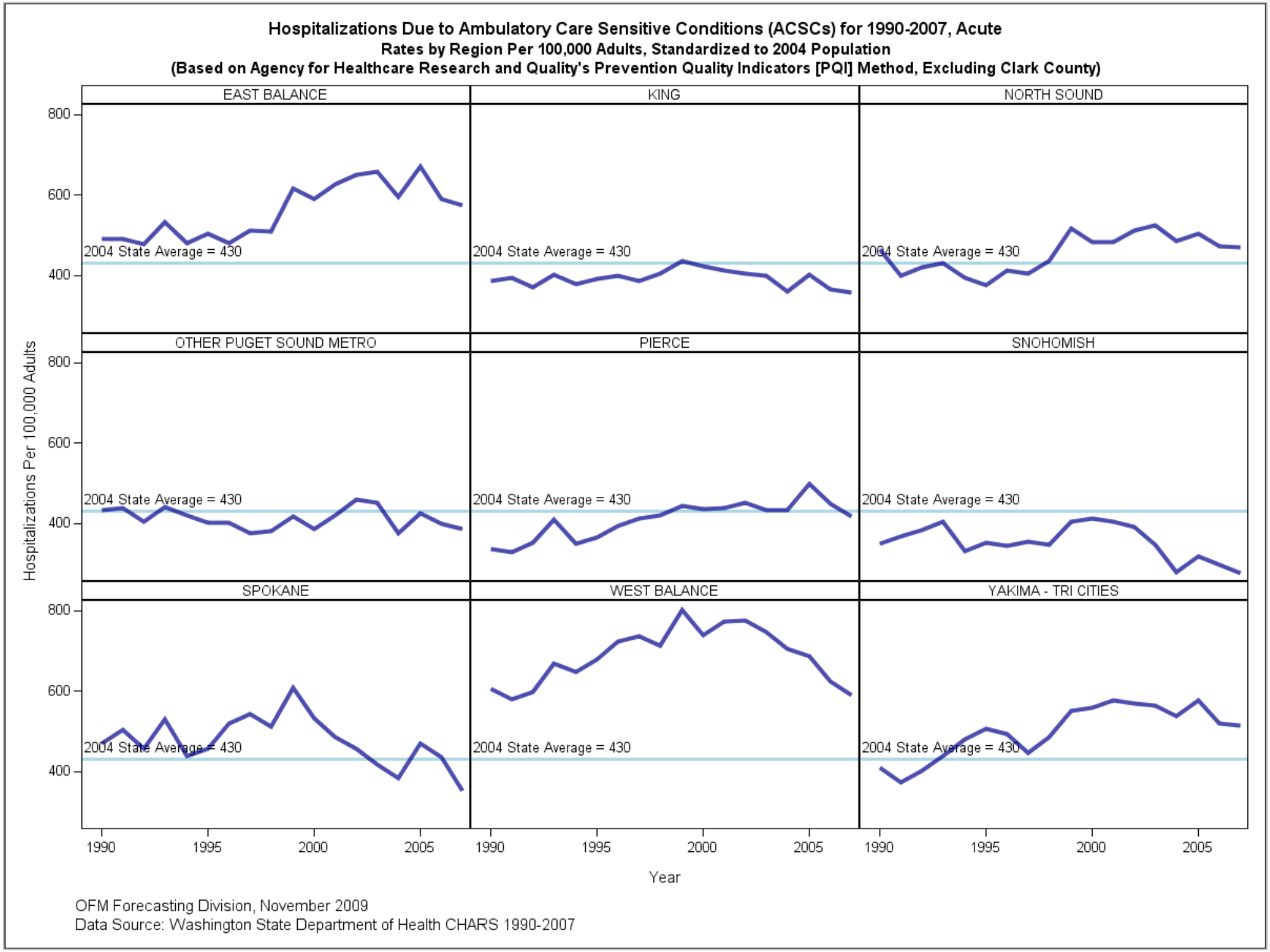

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Chronic
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 592
Hospitalizations Per 100,000 Adults
1500
1250
1000
750
500
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Figure 4.6


Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Acute
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 430
Hospitalizations Per 100,000 Adults
800
600
400
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

WHICH REGIONS' ACSC RATES WERE HIGHER OR LOWER THAN EXPECTED, AND DID PATTERNS CHANGE OVER TIME?

For each year between 1990 and 2007, a ratio of observed count over the expected count of ACSCs was calculated in nine of the ten regions. Clark County was again excluded from this analysis for the reasons mentioned above. The expected count was obtained by applying the state average rate of ACSC for each age/sex population group to the corresponding population group of a region. The ratio reveals whether a region's observed ACSC rate is above or below, and how far it is from, the state's average. Snapshots of these regional ratios for 1990, 2000 and 2007 appear below for each of 12 ACSC-specific conditions that compose the three composite indicators, as well as the three composite indicators themselves.

In 1990, King and Pierce were the only two regions with ACSC rates either near or lower than the statewide average, and West Balance alone posted ACSC rates considerably higher (Figure 4.7). The other regions had a mixture of "ups-and-downs" with rates for some ACSC indicators higher and some lower.

Ten years later in 2000, King – now joined by North Sound, Other Puget Sound Metro, and Snohomish – continued with most of its rates near or lower than expected (Figure 4.8). West Balance, Yakima-Tri-cities and East Balance logged rates higher than expected. The "ups-and-downs" rank in 2000 included Pierce and Spokane.

By 2007, Spokane had joined King, North Sound, Other Puget Sound Metro and Snohomish in posting rates near or lower than expected (Figure 4.9). Rates for Pierce, West Balance and Yakima Tri-Cities came in above the state average. East Balance was the only "ups-and-downs" region.

Of particular interest here is Pierce County. In contrast to what other urban regions experienced, Pierce County's ACSC rates changed from mostly lower than expected to the "ups-and-downs" category, and finally to mostly higher than expected.

(Charts showing the regional ACSC observed/expected [O/E] ratios for all years between 1990 and 2007 can be found in the appendix.)

Figure 4.7

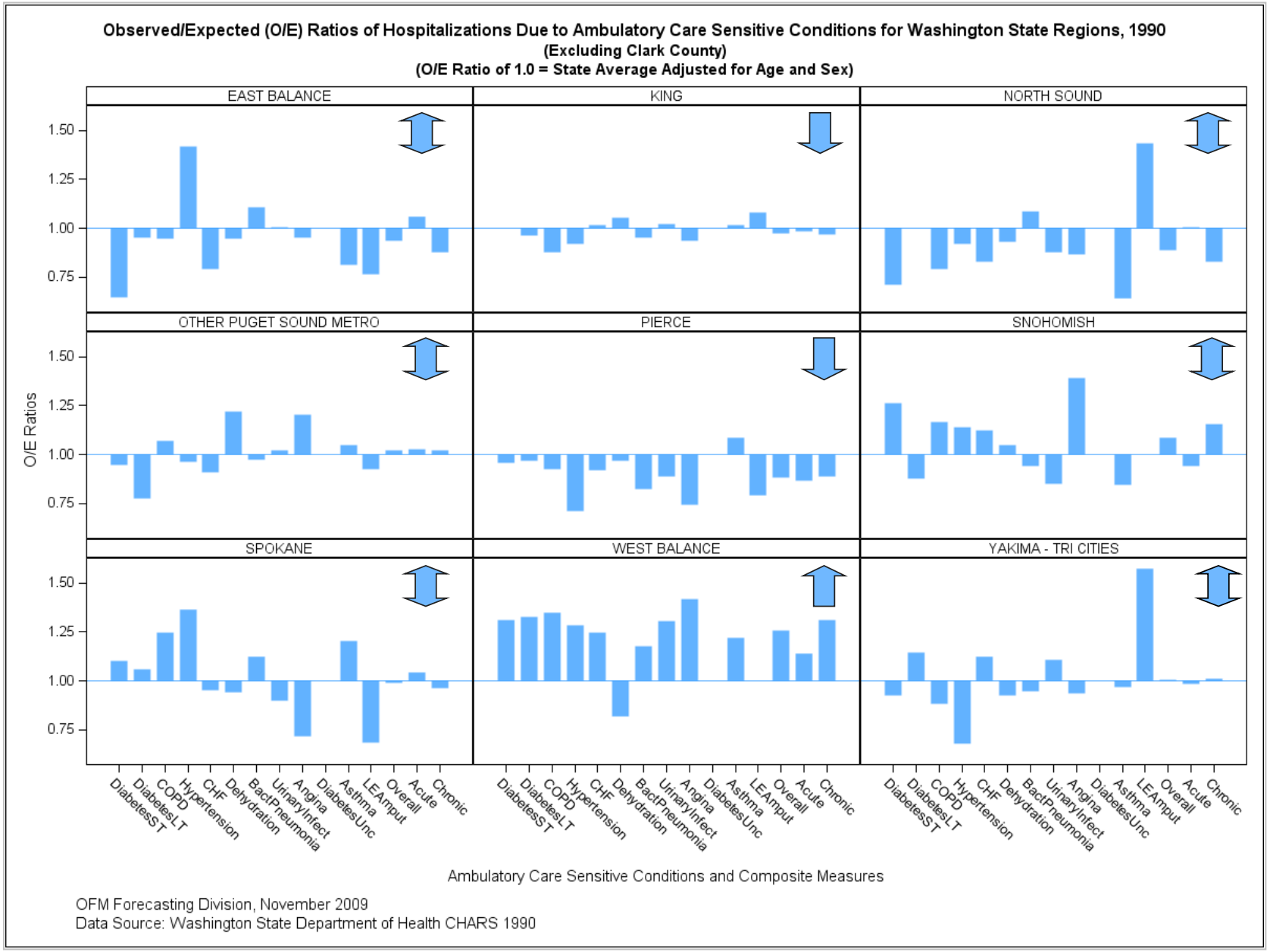

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1990
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
1.50
1.25
1.00
0.75
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990

Figure 4.8

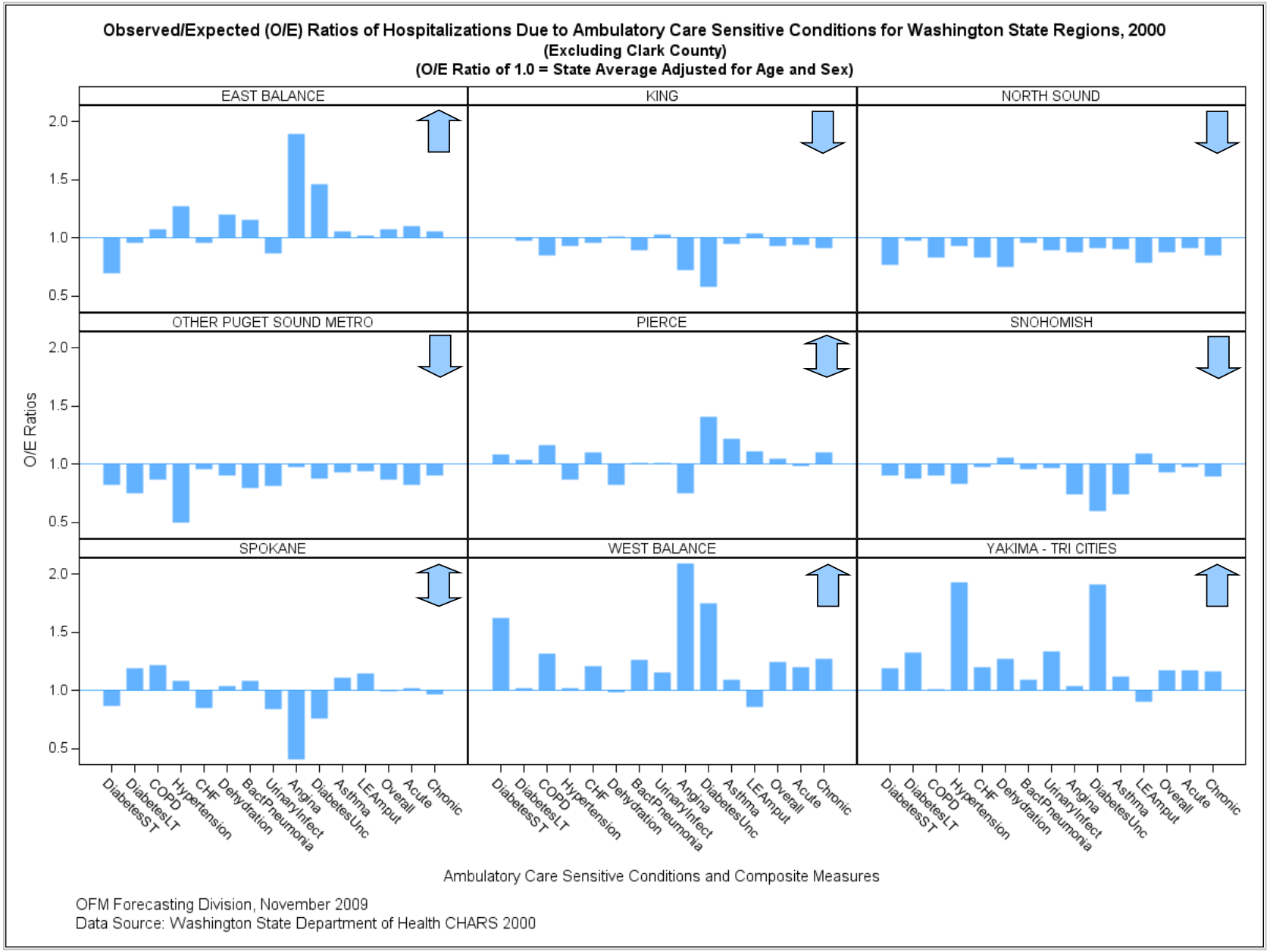
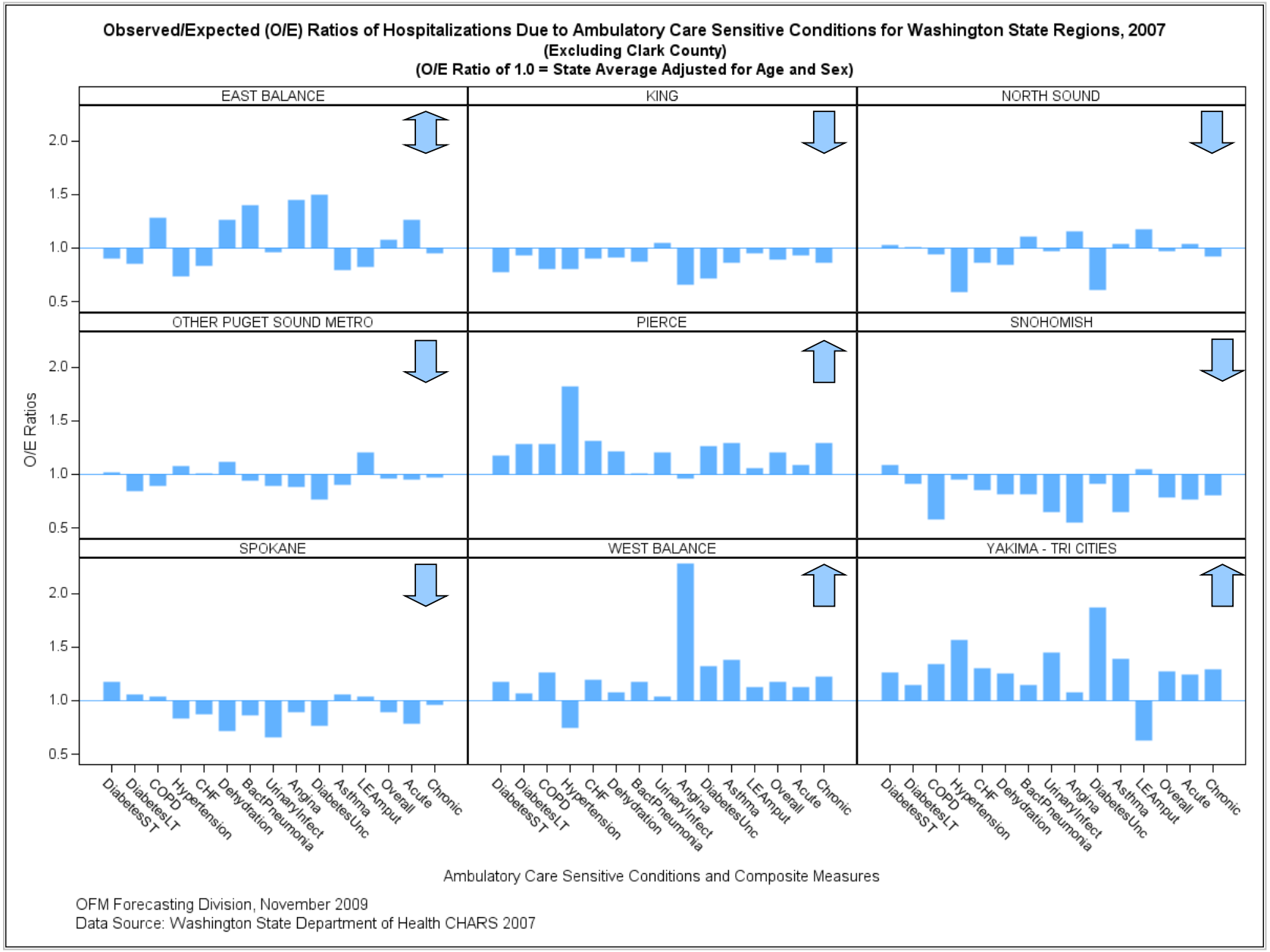

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2000
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2000

Figure 4.9


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2007
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2007

WHAT WAS THE COST BURDEN OF ACSC-RELATED HOSPITALIZATIONS?

In 2007, approximately one in every ten hospitalizations of Washington adults was ACSC-related. The number of ACSC-related hospitalizations in 2007 was estimated to be 52,200, including hospitalizations of Washington adults in U.S. Department of Veterans Affairs (VA), in military facilities located in Washington, and in Oregon hospitals.[5] Total ACSC hospital charges were $930 million.

However, hospital charge is not the same as the actual cost, since hospital charges are in general much higher than the actual price paid. Lack of access to hospital cost data at the discharge level made it impossible to quantify the true cost of ACSC-related hospitalizations. Instead, the cost burden of ACSC-related hospitalizations was estimated by applying a cost-to-charge ratio of .484 to hospital charges for ACSC hospitalizations in 2007.[6] This resulted in an estimate of Washington's total ACSC hospitalization cost in 2007 as roughly $450 million; the per-hospitalization cost as $8,615; and the average daily hospital stay cost as $2,175. The estimated $450 million cost of ACSC-related hospitalizations is approximately 7 percent of the total hospitalization cost incurred by Washington State's adult residents.

Table 4.2

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations, Charges, and Estimated Costs, Washington State, 2007

Number of ACSC Hospitalizations	52,200
Average Length of Stay (days)	4
Cost-to-charge Ratio	0.484
Total Charges ($millions)	$930
Charges Per Hospitalization	$17,806
Charges Per Day	$4,495
Total Costs ($millions)	$450
Costs Per Hospitalization	$8,615
Costs Per Day	$2,175

OFM Forecasting Division, November 2009

Source: OFM analysis of 2005 and 2007 CHARS (including Oregon, military, and Veterans Health Administration hospital discharge records for Washington residents for 2005 and estimated discharges from these hospitals in 2007).

[5] To produce this estimate, the rate of change in ACSCs from 2005 to 2007 regular CHARS (for community hospitals in Washington) was applied to the 2005 Extended CHARS that included Washington adults admitted to hospitals in Washington (including VA and military hospitals) and Oregon.

[6] This ratio was derived using files obtained from the federal Agency for Healthcare Research and Quality (AHRQ). These files contain cost-to-charge ratio estimates for groups of hospitals stratified by hospital characteristics (e.g., urban-rural location and number of beds). The 2006 AHRQ data were used (the latest available at the time of the analysis). For more information about the AHRQ cost-to-charge ratio files, see http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp.

SUMMARY AND IMPLICATIONS

Analysis of ACSC-related hospitalizations can reveal how well a community's primary care system performs. ACSCs can result in elevation of condition severity, increase in use of more costly inpatient care, and extra pressure on hospital capacity. And yet, most if not all, ACSC hospitalizations can be avoided under a high-performance primary care system.

Although the rate of ACSC-related hospitalizations in Washington is below the national average, they account for one tenth of all hospitalizations of the state's adult population. In addition, new and persistent regional differences in ACSC hospitalization prevalence suggest the possibility of improvement. Our research indicates that improvements can be made in rural regions and Pierce County. The state's hospital bed occupancy ratio is already on a trajectory to meet 100 percent of current capacity at some point during the next two decades. While building more hospitals and hospital beds may appear to be inevitable, controlling ACSC-related hospitalizations can certainly help reduce the need for new hospitals and hospital beds, in addition to improving the population's health. Controlling ACSC-related hospitalizations, in turn, requires an improved primary care system.

CHAPTER 5

SMALL AREA ANALYSIS OF HOSPITALIZATION RATES

INTRODUCTION

Location matters, and in this chapter, one of the most common units of geography, ZIP code, is used to seek out locations where rates of hospitalization are higher or lower than expected. Once identified, these regions are then profiled by the characteristics and behaviors of the people who live there. This type of analysis allows policymakers to better target and prioritize interventions that can help minimize costly hospital stays while improving the health of our state's residents.

Throughout most of this report, geographic variations are assessed using a set of pre-defined regions, typically either the State Population Survey Regions or counties. This approach is similar to that used in the Dartmouth Atlas of Health Care. However, recent developments in methods for assessing geographic variations offer alternative and complementary approaches. In this chapter, pre-defined regions are put aside, and instead the spatial scan statistic (originally developed for the National Cancer Institute to identify cancer clusters) is used to seek out regions with higher or lower than expected hospitalization rates. [1,2]

To do so, this method looks at all the possible regions that could be created using adjacent ZIP code areas as the basic building blocks. Each possible region is then assessed to determine if the people living in that area are hospitalized at a statistically significant higher or lower rate than expected.

Based upon various tests used in that assessment, one set of ZIP code areas is identified as the primary "high risk region," meaning that residents there are hospitalized more often than expected. Another set of ZIP code areas is identified as the primary "low risk region," where residents are hospitalized less often than expected. Secondary high- and low-risk regions may also be identified through this process.

The analysis in this chapter relies on extended CHARS data* for 2003-2005. Primary high- and low-risk regions are identified for four causes of hospitalization. Two of these causative conditions come from the Agency for Healthcare Research and Quality's (AHRQ) set of Prevention Quality Indicators (PQI): bacterial pneumonia, and long-term complication of diabetes. Hospitalizations for either of these can, in theory, be prevented if adequate primary care services are available and used.[3]

The remaining two conditions assessed here for possible excess hospitalizations are prostate cancer and coronary artery bypass graph (CABG) surgeries. Researchers chose prostate cancer because of the lack of medical consensus around screening and treatment; therapies for conditions lacking clear clinical guidelines may vary widely.[4,5] CABG was selected because of

* Extended CHARS data includes discharge records from all Washington and Oregon community hospitals for Washington State residents, as well as from all military hospitals in Washington. Department of Health staff also obtained similar data for Washington residents admitted to U.S. Department of Veterans Affairs (VA) hospitals.

its high costs, because this procedure addresses one of the leading causes of mortality, heart disease, and because risk factors and preventative measures are well-established.[6]

Since analyses of geographic variations are often used to assess the potential overuse, underuse, or misuse of health care services, the analysis in this chapter also attempts to determine if the people living in the high- and low-risk regions have pre-existing conditions or behaviors that may account for their high or low hospitalization rates.[7] Five years (2003-2007) of Washington State Behavioral Risk Factor Survey System (BRFSS) data representing more than 100,000 completed interviews were combined and examined for this part of the analysis. Researchers also drew from state Department of Health death data from 2003 to 2007 combined, to compute age-adjusted mortality rates for each high- and low-risk region. These rates arguably reflect the ultimate measure of need within each of the regions assessed.

The selected causes of hospitalization are assessed individually in the next four sections of this chapter. All differences discussed in these specific assessments are statistically significant unless otherwise indicated. Graphs display differences between regions, and a table of percents and rates for all measures assessed appears at the end of each section. Maps in Appendix 5.A depict primary and secondary geographic clusters for each individual year and all years combined.

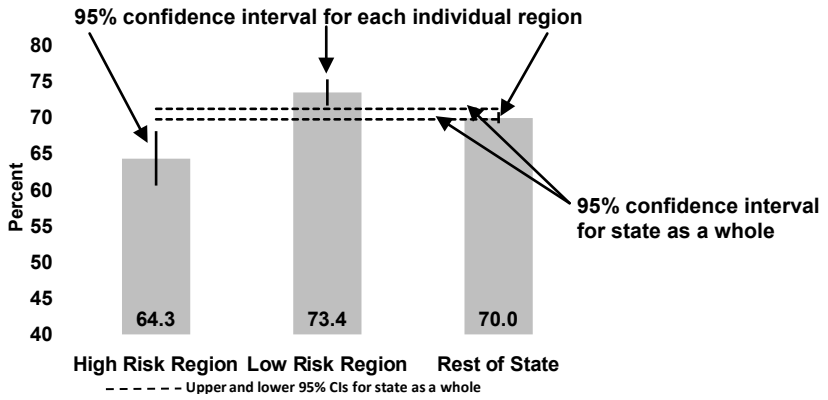
A general summarization of findings follows, accompanied by a brief description of data limitations. The chapter ends with conclusions drawn from the analysis and from this dual approach (spatial scan statistic and BRFSS) to analyzing data.

The box below provides a guide to reading the graphs in this chapter.

How to Read Chapter 5 Graphs

In this example, the differences between each region are statistically significant because their 95% confidence intervals (CIs), represented by the vertical needles, do not overlap.

The differences between the high and low risk regions and the state as a whole are also statistically significant because the 95% CIs for those regions do not overlap the state's 95% CIs (represented by the dashed horizontal lines).



However, the difference between the state as a whole and the region outside the high and low risk regions (labeled "Rest of the State") is <u>not</u> statistically significant because the 95% CI for this region overlaps the state's.

BACTERIAL PNEUMONIA HOSPITALIZATIONS

Hospital inpatient admissions for bacterial pneumonia are potentially preventable provided those who are most vulnerable to the disease, generally people ages 65 and older, receive the pneumococcal vaccination at least once in their lifetime. [8] This vaccine is widely available, and at-risk individuals should receive it as part of their routine primary care. [9]

Between 2003 and 2005, a number of regions were identified as having higher than expected admissions for bacterial pneumonia. Of these, the most persistent region was seen in the northeast corner of the state. For each individual year assessed, and for all three years combined, this general area was identified as having more hospitalizations than expected. For 2003-2005 combined, the relative risk in this region was 2.0 ($p < 0.001$), or twice the expected, equaling more than 270 excess hospitalizations per year.

Figure 5.1
Bacterial Pneumonia Hospitalizations: High and Low Risk Regions
2003-2005 Combined

Figure 5.1a: High Risk Region

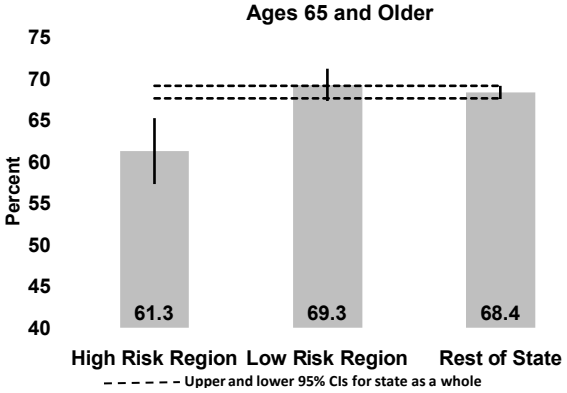
Figure 5.1b: Low Risk Region

OFM Forecasting Division, November 2009
Data Source: Washington State Health Extended CHARS Files, 2003-2005.

During this same time period, a region in the northern Seattle and Puget Sound area was found to have persistently lower than expected inpatient admissions for bacterial pneumonia. For 2003-2005 combined, the relative risk in this region was 0.6 ($p < 0.001$), equaling an average of 87 fewer than expected hospitalizations per year.

To find out *why* these differences in hospitalizations might be occurring, the ZIP

Figure 5.2
Ever Received a Pneumococcal Vaccination, Ages 65 and Older



OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

codes for the high-risk region in northeast Washington, the low-risk region in northern Seattle/Puget Sound, and the rest of the state outside either region were identified, grouped and then used in analyzing the BRFSS data for 2003-2007.

For each of the five years assessed, the BRFSS questionnaire asks respondents ages 65 and older if they had ever received a pneumococcal vaccination. The differences between the regions are telling. As can be seen in Figure 5.2, the respondents in the high-risk region were significantly less likely to have been vaccinated than those in any other region assessed including the state as a whole. About two-thirds of those hospitalized were ages 65 and older.

Bacterial pneumonia can be a complication of influenza.[10] BRFSS respondents in the high-risk region were less likely to have had an influenza vaccination compared to the other two regions and the state as a whole (Figure 5.3). This finding further indicates that the population living in this region is not adequately receiving – or perhaps not accepting – a basic component of primary care, vaccinations.

Other population characteristics also associated with access to care were assessed to see if this pattern was persistent. It was. Respondents ages 65 and older in the high-risk region were found to be twice as likely to *not* have a personal physician or health care provider compared to those living in the low-risk region. They were also more apt to *not* see a physician when needed because of costs, and they were more apt to *not* have any health care insurance coverage (Figures 5.4, 5.5 and 5.6).

Figure 5.3
Received an Influenza Vaccination in Last Year, Ages 65 and Older

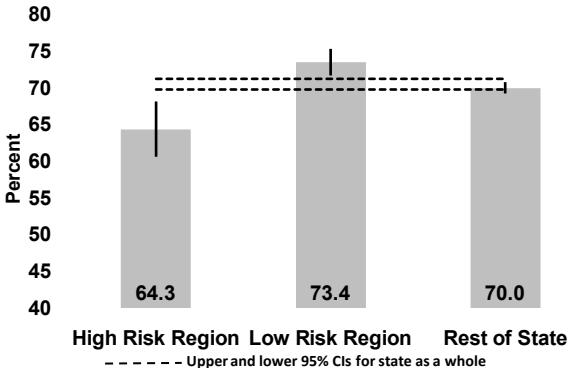


Figure 5.4
No Personal Physician or Health Care Provider, Ages 65 and Older

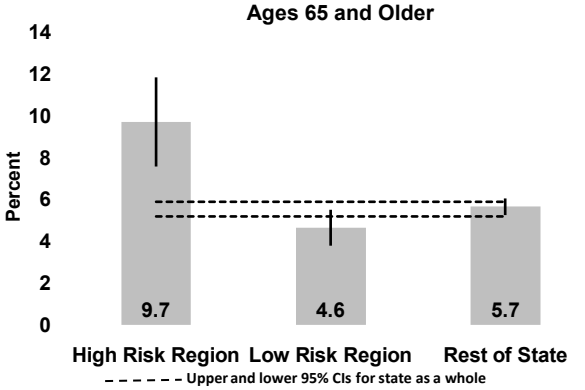


Figure 5.5
Did Not See a Physician When Needed Because of Cost

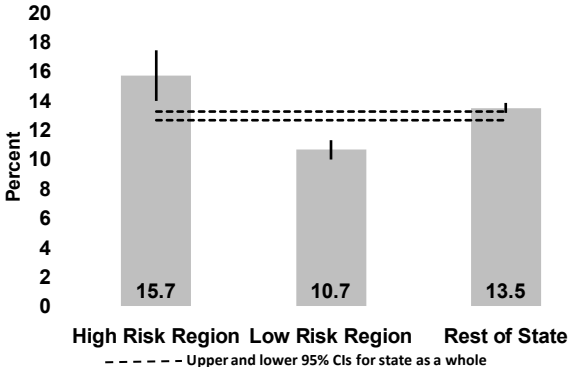
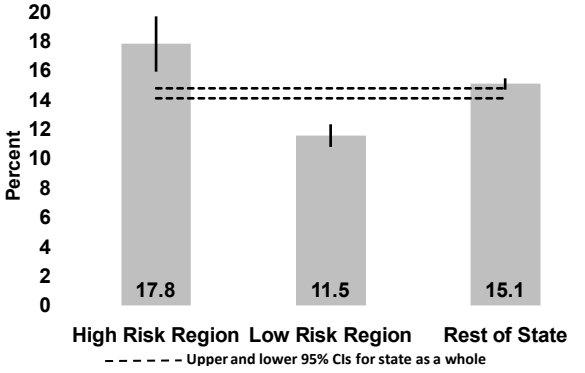


Figure 5.6
No Health Care Coverage of Any Kind



OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

Certain characteristics and behaviors of a population that may pose a risk for increased disease severity were also assessed. These, too, might help account for higher or lower hospitalization rates.

For instance, pneumonia patients with diabetes are at increased risk of complications because of diabetes' association with cardiovascular disease and renal dysfunction. [11] Such complications could lead to higher hospitalization rates. Respondents in the high-risk region had the highest rate of diabetes of the three regions assessed, while those in the low-risk region had the lowest. Both differed from the state as a whole (Figure 5.7).

Smokers tend to be at higher risk for getting pneumonia, and once they have the disease, generally appear to experience higher levels of acuity and complications.[12,13] Respondents in the high-risk region reported the highest smoking rates, while those in the low-risk region had the lowest (Figure 5.8).

Other more general characteristics of each of the regions were also assessed to better understand who lives in these areas so that any interventions could be appropriately targeted.

The education level in the high-risk region differed from that seen elsewhere: only one in five of the respondents from that region had graduated from a college or technical institute – less than half the percent seen in the low-risk region, and well below the state average (Figure 5.9).

When asked what their annual household income was, four out of ten of the respondents in the high-risk region reported that their

Figure 5.7
Told by a Physician That They Have Diabetes

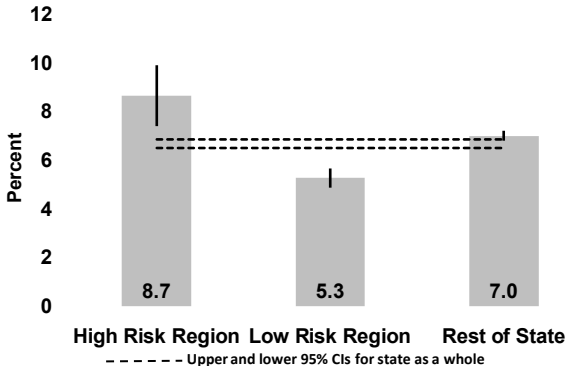


Figure 5.8
Currently Smoke Some Days or Every Day

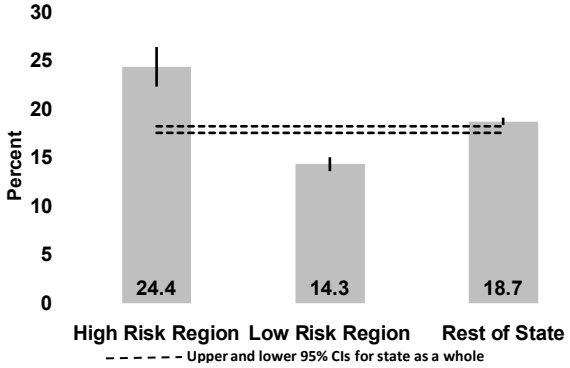


Figure 5.9
Graduated from College or Technical Institute

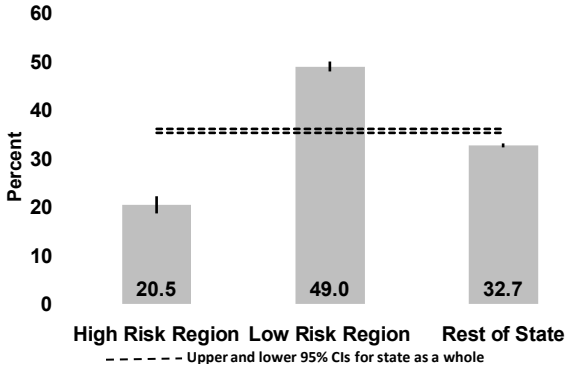
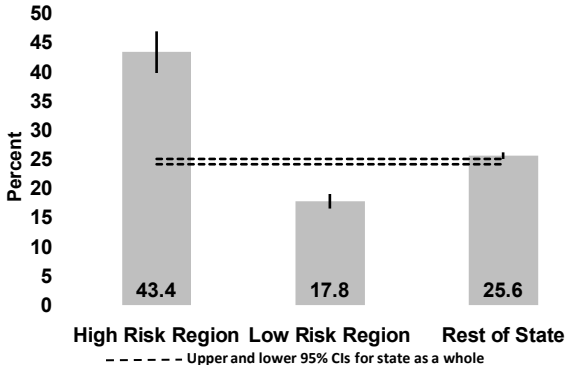


Figure 5.10
Household Incomes Less Than $25,000 Per Year



OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

household income was less than $25,000 per year – more than twice the percentage seen in the low-risk region (Figure 5.10).

Equally striking, the high-risk region included a disproportionately high percentage of American Indians and Alaska Natives – more than four times the percentage seen in the low-risk region, and more than three times the percentage seen in the rest of the state outside the high- and low-risk regions (Figure 5.11).

Finally, while mortality rates for bacterial pneumonia in Washington State are, in general, relatively low, the age-adjusted mortality rate for each region was also assessed. [14] This measure represents the most profound indication of need.

As shown in Figure 5.12, although the rates did not differ significantly, the rate in the high-risk region was elevated compared to the rate in the low-risk region, and to the rate in the rest of the state.

Figure 5.11
Self-Reported Race Category:
American Indian/Alaska Native

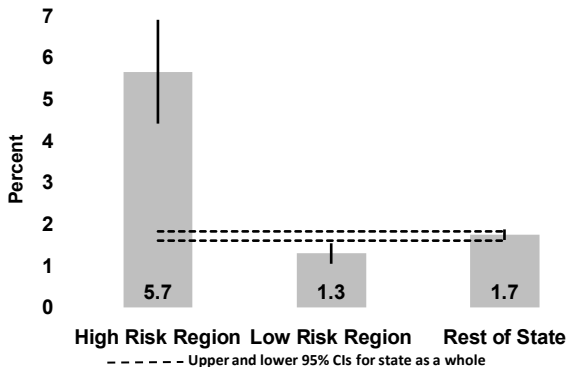
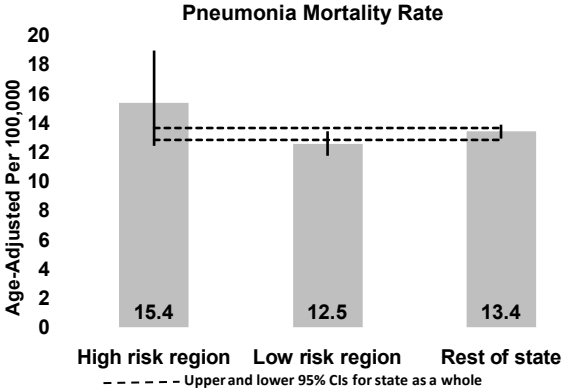


Figure 5.12
Pneumonia Mortality Rate



OFM Forecasting Division, November 2009
Data Sources: Washington State Behavioral Risk Factor Surveillance System, Washington State Center for Health Statistics Death Data, 2003-2007.

Table 5.1

Bacterial Pneumonia: Selected Behavioral Risk Factor Surveillance System Indicators and Age-Adjusted Mortality Rates by Region for 2003-2007

Percents or Rates and 95% Confidence Intervals

	High Risk Region	Low Risk Region	Rest of State	State Total
Ever received a pneumococcal vaccination, ages 65 and older	**61.3%** (57.3,65.3)	**69.3%** (67.3,71.2)	**68.4%** (67.6,69.2)	**68.4%** (67.7,69.2)
Received an influenza vaccination in last year, ages 65 and older	**64.3%** (60.6,68.1)	**73.4%** (71.6,75.2)	**70.0%** (69.2,70.7)	**70.5%** (69.8,71.2)
No personal physician or health care provider, ages 65 and older	**9.7%** (7.6,11.8)	**4.6%** (3.8,5.5)	**5.7%** (5.3,6.0)	**5.6%** (5.2,5.9)
Did not see a physician when needed because of costs	**15.7%** (14.0,17.4)	**10.7%** (10.0,11.3)	**13.5%** (13.2,13.8)	**13.0%** (12.7,13.3)
No health care coverage of any kind	**17.8%** (15.9,19.7)	**11.5%** (10.8,12.3)	**15.1%** (14.7,15.5)	**14.4%** (14.1,14.8)
Told by a physician that have diabetes	**8.7%** (7.4,9.9)	**5.3%** (4.9,5.7)	**7.0%** (6.8,7.2)	**6.7%** (6.5,6.9)
Currently smoke some days or every day	**24.4%** (22.3,26.4)	**14.3%** (13.6,15.1)	**18.7%** (18.3,19.1)	**17.9%** (17.6,18.2)
College or technical school graduate	**20.5%** (18.7,22.3)	**49.0%** (48.0,50.0)	**32.7%** (32.3,33.1)	**35.8%** (35.4,36.1)
Household income less than $25,000 per year	**43.4%** (39.8,47.0)	**17.8%** (16.6,19.0)	**25.6%** (25.0,26.1)	**24.6%** (24.1,25.1)
Self-reported race category: American Indian/Alaska Native	**5.7%** (3.9,6.5)	**1.3%** (1.1,1.5)	**1.7%** (1.6,1.9)	**1.7%** (1.6,1.8)
Age-adjusted pneumonia mortality rate per 100,000 persons	**15.4** (12.4,18.9)	**12.5** (11.7,13.4)	**13.4** (12.9,13.9)	**13.2** (12.8,13.6)

OFM Forecasting Division, November 2009
Data Sources: Washington State Behavioral Risk Factor Surveillance System, Washington State Center for Health Statistics Death Data, 2003-2007.

HOSPITALIZATIONS FOR LONG-TERM COMPLICATIONS FROM DIABETES

Long-term complications occur, in varying degrees, to all individuals with diabetes. But complications that are severe enough to require hospitalization are generally caused by poor disease management over a long period of time. [15]

One such severe long-term complication may include nerve damage to the stomach and digestive system, a condition called gastroparesis. In its most advanced stage, gastroparesis may require a surgeon to insert a feeding tube directly into the patient's small intestines to bypass the stomach, because it no longer functions properly. Circulatory conditions such as skin ulcers can also result from poor disease management over a long period of time. Left untreated, these ulcers can lead to foot or limb amputation. End-stage kidney disease and severe vision loss can also result from poor long-term disease management. [16]

When people with diabetes manage their blood sugar levels properly by maintaining a healthy diet and exercising regularly, and when they have regular access to adequate and appropriate primary care services, they can generally prevent these types of severe complications. [17]

Figure 5.13

Diabetes, Long-Term Complications Hospitalizations: High- and Low-Risk Regions
2003-2005 Combined

Figure 5.13a: High-Risk Region

Figure 5.13b: Low-Risk Region

OFM Forecasting Division, November 2009
Data Source: Washington State Health Extended CHARS Files, 2003-2005.

In the spatial analysis of hospitalizations for long-term complications from diabetes, many regions were identified as having higher than expected admission rates. Among those regions, the most persistent was in the Tacoma area. For each individual year assessed, and for all three years combined, this region was included in, or was, the primary high-risk region. For 2003-2005 combined, the relative risk in this area was 2.5 ($p < 0.001$), two and a half times the expected, equaling more than 100 excess hospitalizations per year.

The region with lower than expected hospitalizations ran from north King County to the Canadian border and eastward to Chelan County. For 2003-2005 combined, this region had

approximately 250 fewer hospitalizations than expected per year and a relative risk of 0.6 ($p < 0.001$).

Between 2003 and 2007, BRFSS asked respondents if they had been told by their physician that they had diabetes.

As Figure 5.14 shows, the percent of those in the high-risk region with diabetes was more than one and a half times the percent of those in the low-risk region. Each region, too, was higher or lower than the state as a whole.

Obesity is a major risk factor for the most common form of diabetes, Type 2.[18] In addition, lack of exercise and/or being a smoker are both well-established as behaviors that worsen this condition.[19,20,21]

As Figure 5.15 shows, the percent of obese respondents in the high-risk region was considerably higher than in the low-risk region – and higher than the state as a whole, too. The low-risk region, conversely, had the lowest rate.

Similarly, the percent of those in the high-risk region reporting no physical exercise outside of work was about 10 percentage points higher than those in the low-risk region. It was also higher than the state as a whole and the region outside the high- and low-risk areas. Again, the low-risk region was the lowest (Figure 5.16).

The number of current smokers in the high-risk region was also more than 10 percentage points higher than in the low-risk region. Here, too, the high-risk region was higher than the state and the region outside the high- and low-risk regions, while the low-risk region was lower (Figure 5.17).

OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

Figure 5.14
Told by Physician That Have Diabetes

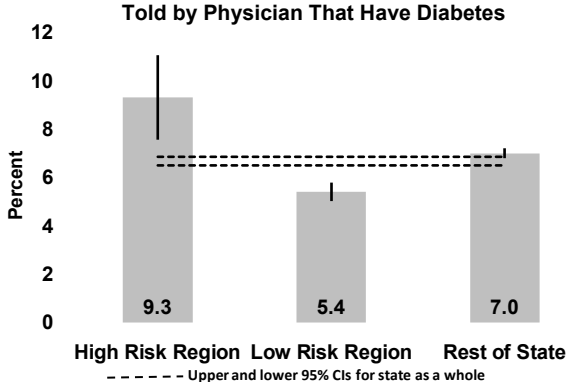


Figure 5.15
Obese (Body Mass Index≥30)

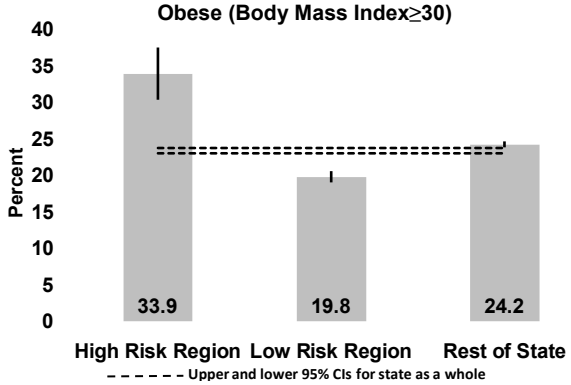


Figure 5.16
No Physical Exercise Activities Outside of Work

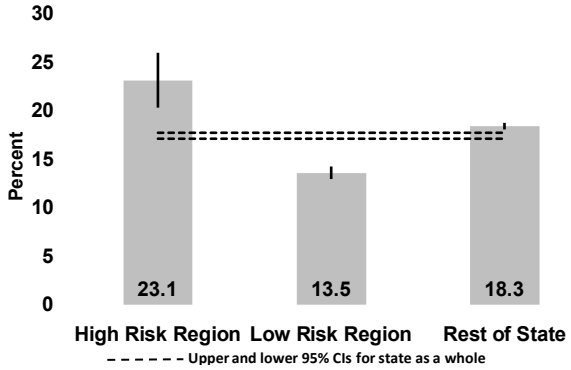
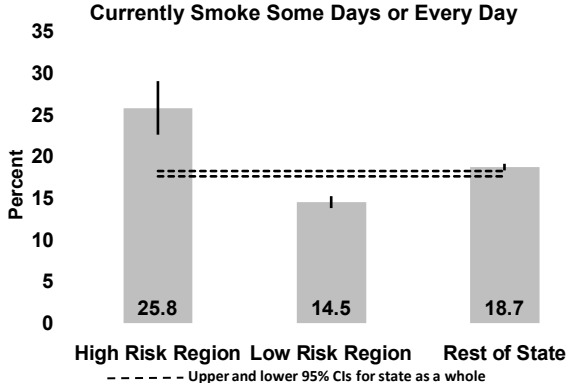


Figure 5.17
Currently Smoke Some Days or Every Day



Factors associated with access to care differed, too, with those living in the high-risk region faring the worst.

When asked if they had health care coverage of any kind, nearly a fourth of the respondents in the high-risk area answered no, they did not have any coverage. In the low-risk region, less than half as many, 12 percent, said they had no coverage (Figure 5.18).

Asked if they had a personal physician or other health care provider, almost a third of those in the high-risk region answered no. In the low-risk region, less than a fifth of the respondents said they didn't have a personal physician or other health care provider (Figure 5.19).

Respondents in the high-risk area were also almost twice as likely as those in the low-risk region to have not seen a physician when needed because of costs (Figure 5.20).

For each of these three measures of access to care, the high-risk region was also higher than the state as a whole, while the low-risk region was lower.

The socio-economic characteristics of these regions also differed. In the high-risk region, less than 20 percent of the respondents reported graduating from a college or technical institute; the percent in the low-risk region was more than two and a half times greater (Figure 5.21).

Household incomes differed also. More than a third of the respondents living in the high-risk region reported a household income of less than $25,000 per year; in the low-risk region, less than 20 percent fell into that income bracket (Figure 5.22).

OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

Figure 5.18
No Health Care Coverage of Any Kind

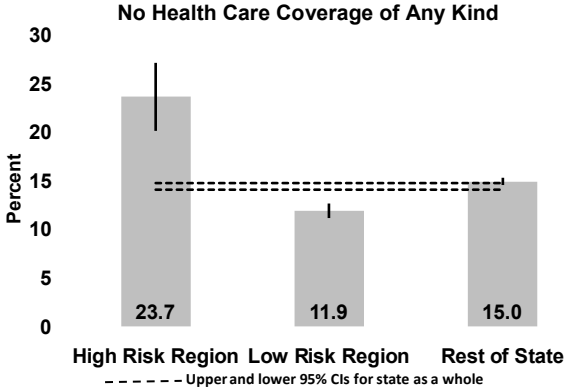


Figure 5.19
No Personal Physician or Health Care Provider

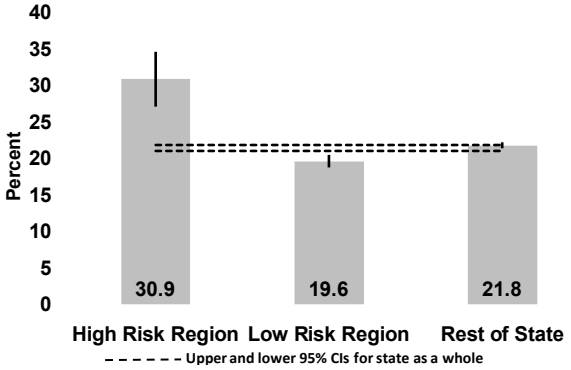


Figure 5.20
Did Not See a Physician When Needed Because of Cost

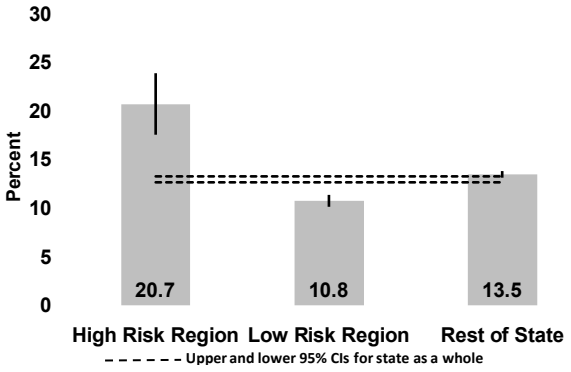
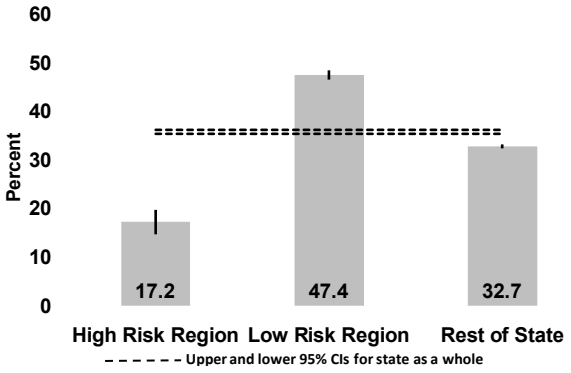


Figure 5.21
Graduated from College or Technical Institute



The two regions did *not* differ in terms of employment. Among those ages 18 to 64, 71 percent of the respondents in the high-risk region and 74 percent of those in the low-risk region indicated they were employed. This minor difference was not statistically significant (figure not shown).

Large differences between the high- and low-risk regions were seen, however, in race and ethnicity:

- The percent of African-Americans in the high-risk region was eight times that in the low-risk region (Figure 5.23).
- The percent of Hispanics in the high-risk region was more than twice that in the low-risk region (Figure 5.24).
- The percent of American Indians/Alaska Natives in the high-risk region was also more than twice that seen in the low-risk region, although it did not differ significantly from the state as a whole (figure not shown).

African-Americans, American Indians/Alaska Natives and people of Hispanic descent are, in general, at higher risk for diabetes than other racial or ethnic groups.[22]

The diabetes age-adjusted mortality rate for each region was also computed.

The rate in the high-risk region was more than twice that seen in the low-risk region. In addition to differing from each other, both also differed from the state as a whole (Figure 5.25).

Figure 5.22
Household Income Less Than $25,000 per Year

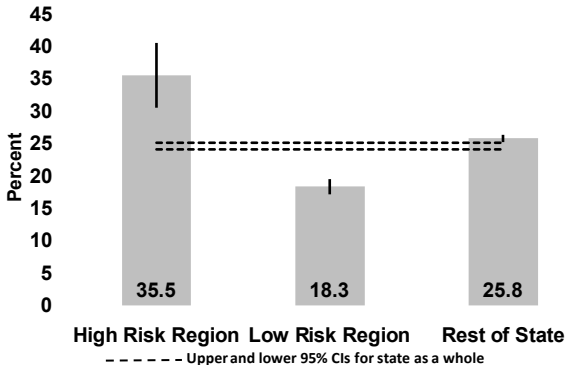


Figure 5.23
Self-Reported Category: African-American

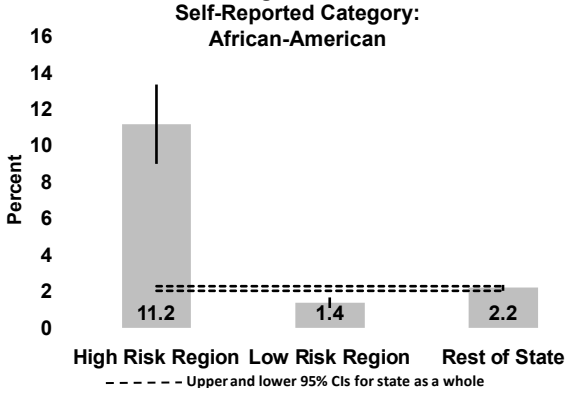


Figure 5.24
Self Reported Category: Hispanic Ethnicity

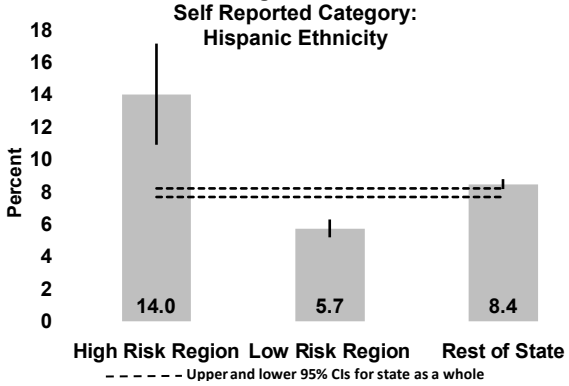
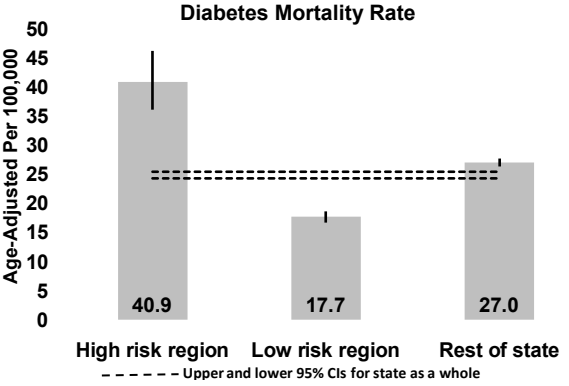


Figure 5.25
Diabetes Mortality Rate



OFM Forecasting Division, November 2009
Data Sources: Washington State Behavioral Risk Factor Survey, 2003-05

Table 5.2

Diabetes, Long-term Complications: Selected Behavioral Risk Factor Surveillance System Indicators and Age-Adjusted Mortality Rates by Region for 2003-2007

Percents or Rates and 95% Confidence Intervals

	High Risk Region	Low Risk Region	Rest of State	State Total
Told by a physician that have diabetes	**9.3%** (7.6,11.1)	**5.4%** (5.0,5.8)	**7.0%** (6.8,7.2)	**6.7%** (6.5,6.9)
Obese (Body Mass Index greater than or equal to 30)	**33.9%** (30.4,37.5)	**19.8%** (19.0,20.6)	**24.2%** (23.8,24.6)	**23.4%** (23.0,23.7)
No physical exercise activities outside of work	**23.1%** (20.2,25.9)	**13.5%** (12.9,14.2)	**18.3%** (18.0,18.7)	**17.3%** (17.0,17.7)
Currently smoke some days or every day	**25.8%** (22.6,29.0)	**14.5%** (13.8,15.3)	**18.7%** (18.3,19.1)	**17.9%** (17.6,18.2)
No health care coverage of any kind	**23.7%** (20.2,27.2)	**11.9%** (11.2,12.6)	**15.0%** (14.6,15.3)	**14.4%** (14.1,14.8)
No personal physician or health care provider	**30.9%** (27.1,34.6)	**19.6%** (18.7,20.4)	**21.8%** (21.3,22.2)	**21.4%** (21.0,21.8)
Could not see a physician when needed because of costs	**20.7%** (17.5,23.9)	**10.8%** (10.1,11.4)	**13.5%** (13.1,13.8)	**13.0%** (12.7,13.3)
College or technical school graduate	**17.2%** (14.7,19.7)	**47.4%** (46.5,48.4)	**32.7%** (32.3,33.1)	**35.8%** (35.4,36.1)
Household income less than $25,000 per year	**35.5%** (30.4,40.5)	**18.3%** (17.1,19.5)	**25.8%** (25.2,26.3)	**24.6%** (24.1,25.1)
Currently employed (ages 18 to 64)	**70.7%** (65.5,75.9)	**74.4%** (73.0,75.7)	**71.4%** (70.8,72.0)	**71.9%** (71.4,72.5)
Self-reported race category: African American	**11.2%** (9.0,13.3)	**1.4%** (1.1,1.7)	**2.2%** (2.0,2.3)	**2.2%** (2.0,2.3)
Self-reported category: Hispanic ethnicity	**14.0%** (10.9,17.1)	**5.7%** (5.2,6.3)	**8.4%** (8.1,8.8)	**7.9%** (7.7,8.2)
Self-reported race category: American Indian/Alaska Native	**3.0%** (1.7,4.4)	**1.3%** (1.0,1.5)	**1.8%** (1.7,1.9)	**1.7%** (1.6,1.8)
Age-adjusted diabetes mortality rate per 100,000 persons	**40.9** (36.1,46.1)	**17.1** (16.8,18.7)	**27.0** (26.3,27.7)	**24.9** (24.3,25.5)

OFM Forecasting Division, November 2009. Data Sources: Washington State Behavioral Risk Factor Surveillance System, Washington State Center for Health Statistics Death Data, 2003-2007.

PROSTATE CANCER HOSPITALIZATIONS

While there are no known methods for preventing prostate cancer, much attention has been focused on early detection, most notably through prostate-specific antigen (PSA) screening tests. [23,24,25] Unfortunately, PSA screening tests have been found to be wanting. The results from two large-scale randomized control trials evaluating PSA tests, one in the U.S. and the other in Europe, exemplify the problem.[26,27]

In the U.S. trial, interim results show that although annual PSA screening did detect more cancers, they did not lower prostate cancer mortality rates. In the European trial, the interim results indicate that PSA screenings did result in lower prostate cancer mortality rates, but that *overdiagnosis*, that is, finding a non-aggressive cancer that would not be clinically detectable in the patient's lifetime and, hence would not require treatment, was as high as 50 percent. In other words, it is unclear if PSA screening actually saves lives, but it does appear as though PSA tests increase the chances that a man will be treated for prostate cancer even if the therapy may be unwarranted.

Based upon these trials and other studies, no major scientific or medical organizations currently recommend PSA screening for prostate cancer. These organizations include: the American Cancer Society (ACS), American Urological Association (AUA), U.S. Preventive Services Task Force (USPSTF), American College of Physicians (ACP), National Cancer Institute (NCI), American Academy of Family Physicians (AAFP) and American College of Preventive Medicine (ACPM). [17]

This has not always been the case. Throughout the 1990's and much of the early 2000's, both the ACS and the AUA recommended routine PSA screening tests.[28]

The potential for confusion for both the public and providers over the changing recommendations on PSA screening has been further compounded by the lack of clarity in treatment options. These options run the gamut from "watchful waiting" to radical prostatectomy depending on the disease stage, the patient's age, and his willingness to risk the potential side effects of treatment versus his willingness to risk the aggressiveness of his particular cancer.[29]

Taking all these factors into consideration, the potential for variations in prostate cancer hospitalizations would seem high.

In fact, two persistent clusters of higher than expected hospitalizations for prostate cancer were identified for each year assessed and for all three years combined: one in the north Puget Sound environs, and the other in northeastern Washington. Of these two, the north Puget Sound region (primarily in Whatcom and San Juan Counties) was identified as being the primary cluster; it is shown as the high-risk region in Figure 5.26a. A persistent cluster of lower than expected hospitalizations was also identified. This low-risk region encompasses most of King, Snohomish, Island and Kitsap Counties (Figure 5.26b).

Figure 5.26

Prostate Cancer Hospitalizations: High and Low Risk Regions
2003-2005 Combined

Figure 5.26a: High-Risk Region

Figure 5.26b: Low-Risk Region

OFM Forecasting Division, November 2009
Data Source: Washington State Health Extended CHARS Files, 2003-2005.

The relative risk in the high-risk region equaled 1.9 ($p<0.001$), or approximately twice the expected, and resulted in an average of 55 excess hospitalizations per year. The relative risk in the low-risk region was 0.7 ($p<0.001$), equaling about 136 fewer than expected hospitalizations per year.

While age is the leading risk factor for prostate cancer (nationally, the median age at death from prostate cancer is 80), BRFSS data were not used to assess age differences between the high- and low-risk regions.[30,31] This is because the method used to identify these regions already uses age-specific rates to calculate the expected number of cases. Age, in other words, is already factored into the assessment.

In addition to age, race is highly correlated with the risk of developing and dying from prostate cancer. Such rates are highest among African-Americans.[32]

It was initially surprising to find that although there were approximately 1,000 completed interviews with males ages 40 and older in the high-risk region, not one of those interviewees was African-American (Figure 5.27).

OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

Figure 5.27
Self-Reported Race Category
African-American Males Ages 40 and Older

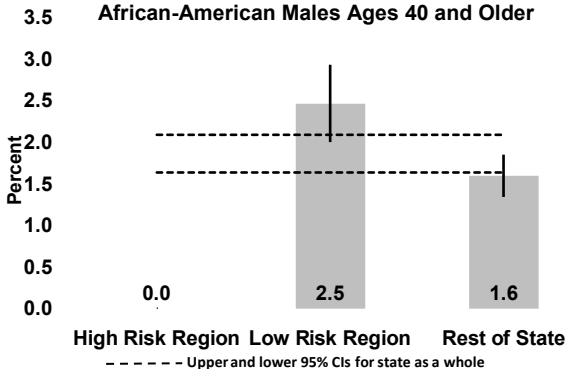
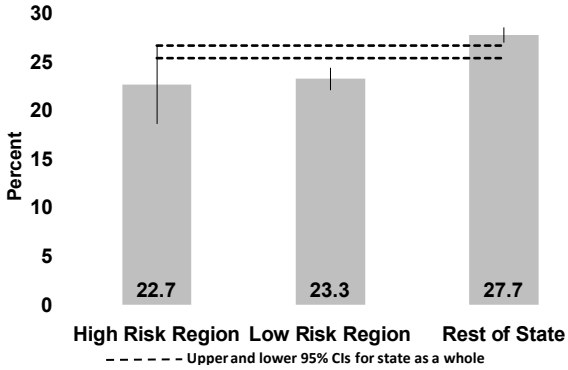


Figure 5.28
Obese, Males Ages 40 and Older (Body Mass Index≥30)



This finding does not appear to be a function of poor sampling design: According to the state population estimates, African-Americans in that region constitute less than 1 percent of the males ages 40 and older. Race, therefore, does not appear to be a factor in explaining the high hospitalization rates seen in the high-risk region.

While obesity may not be a risk factor for getting prostate cancer, the case fatality rate, or risk of dying, for obese men with prostate cancer has been found to be higher than the case fatality rate for non-obese men.[33] Physicians caring for a more obese population may therefore opt for more aggressive therapies.

Yet, as displayed in Figure 5.28, the percent of obese males ages 40 and older in the high-risk region does not differ from those in the low-risk region or from the state as a whole. Obesity, therefore, also does not appear to be a factor.

The two other major risk factors for prostate cancer, family history and hormone levels, are not included in BRFSS data and were thus not assessed.[34,35]

However, every other year the BRFSS questionnaire does include questions pertaining to cancer screening. In 2004 and 2006, men ages 40 and older were asked if they had had a PSA test within the last two years.

As can be seen in Figure 5.29, nearly 60 percent of the respondents in the high-risk region indicated that they had had the test. This percent was higher than the low-risk region, the region outside the high- and low-risk areas, and the state as a whole.

Figure 5.29
Had Prostate-Specific Antigen Test Past Two Years, Ages 40 and Older
(2004 and 2006 only)

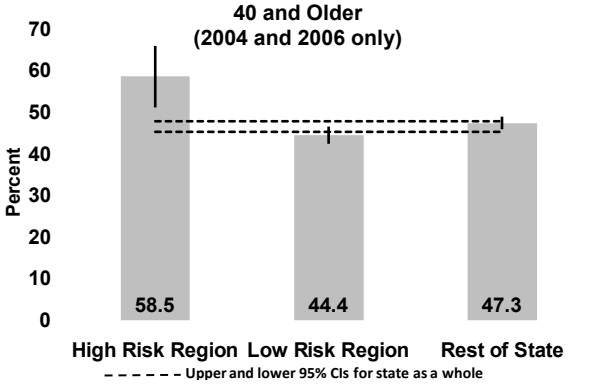


Figure 5.30
Had Prostate-Specific Antigen Test Past Two Years, Ages 40 to 49 and Ages 75 and Older Combined
(2004 and 2006 only)

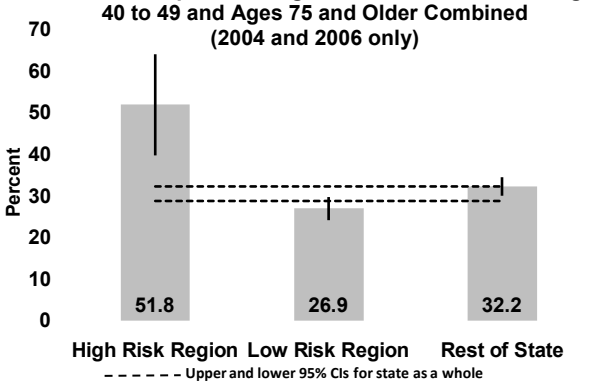


Figure 5.31
Have Any Kind of Health Care Coverage, Males Ages 40 and Older

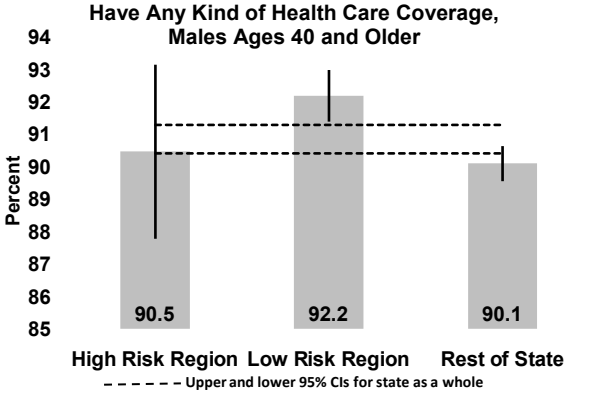
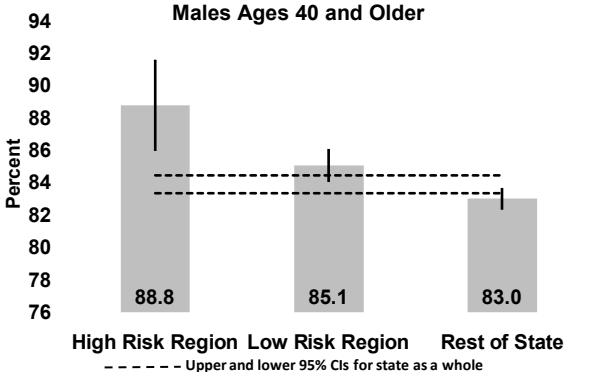


Figure 5.32
Have a Personal Physician or Health Care Provider, Males Ages 40 and Older



OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

In addition, while the USPSTF has consistently maintained that the evidence is inconclusive to recommend either for or against PSA screening in men under age 75, it has recommended *against* screening men ages 75 and older, and has also noted that the population that could most benefit from screening, once an effective test is developed, would be those ages 50 to 74. [36] Among those males who were ages 40 to 49 or 75 and older – and thus outside the target population – more than half reported having a PSA screening in the high-risk region, almost twice the rate in the low-risk region and, again, higher than any of the other areas assessed (Figure 5.30).

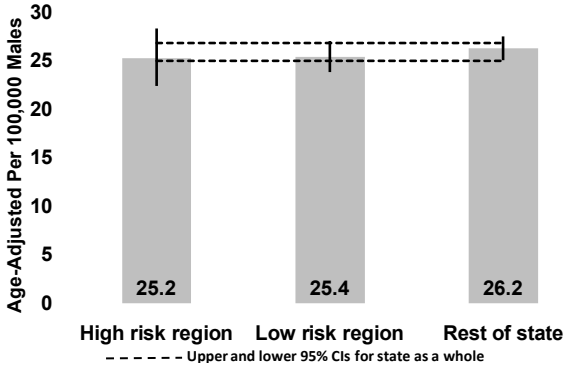
Men living in the high-risk region did not differ from those living elsewhere in terms of their health care coverage (Figure 5.31).

However, compared to the state as a whole and to the rest of the state outside the high- and low-risk areas, a higher percent reported that they had a personal physician (Figure 5.32).

Other BRFSS measures including cost barriers to accessing a physician when needed, education, income, and employment did not generally differ among the regions assessed and therefore are not included in this report.

Similarly, the age-adjusted prostate cancer mortality rates did not differ among the regions; nonetheless, these are presented in Figure 5.33.

Figure 5.33
Prostate Cancer Mortality Rate



OFM Forecasting Division, November 2009
Data Sources: Washington State Behavioral Risk Factor Survey, 2003-05
Washington State Center for Health Statistics Death Data, 2003-2007

Table 5.3

Prostate Cancer Hospitalizations: Selected Behavioral Risk Factor Surveillance System Indicators and Age-adjusted Mortality Rates by Region for 2003-2007
Percents or Rates and 95% Confidence Intervals

	High Risk Region	Low Risk Region	Rest of State	State Total
Self-reported race category: African American males ages 40 and older	**0%** (n/a)	**2.5%** (2.0,2.9)	**1.6%** (1.3,1.8)	**1.9%** (1.6,2.1)
Obese (Body Mass Index greater than or equal to 30) males ages 40 and older	**22.7%** (18.6,26.7)	**23.3%** (22.1,24.4)	**27.7%** (27.0,28.5)	**26.0%** (25.4,26.7)
Had Prostate-Specific Antigen test in past 2 years, ages 40 and older (2004 and 2006 BRFSS only)	**58.5%** (51.2,65.8)	**44.4%** (42.3,46.5)	**47.3%** (45.8,48.9)	**46.5%** (45.2,47.7)
Had Prostate-Specific Antigen test in past 2 years, age groups 40 to 49 and 75 and older combined	**51.8%** (39.7,63.9)	**26.9%** (24.1,29.6)	**32.2%** (30.0,34.4)	**30.4%** (28.7,32.2)
Have some kind of health care coverage, males ages 40 and older	**90.5%** (87.8,93.1)	**92.2%** (91.4,93.0)	**90.1%** (89.6,90.6)	**90.9%** (90.4,91.3)
Have a personal physician or health care provider, males ages 40 and older	**88.8%** (85.9,91.6)	**85.1%** (84.1,86.1)	**83.0%** (82.3,83.7)	**83.9%** (83.3,84.4)
Age-adjusted prostate cancer mortality rate per 100,000 males	**25.2** (22.4,28.3)	**25.4** (23.8,27.0)	**26.2** (25.0,27.5)	**25.8** (24.9,26.8)

OFM Forecasting Division, November 2009
Data Sources: Washington State Behavioral Risk Factor Surveillance System, Washington State Center for Health Statistics Death Data, 2003-2007.

CORONARY ARTERY BYPASS GRAPH (CABG) SURGERIES

Coronary artery bypass graph (CABG) surgeries are among the most costly and high-risk procedures performed in hospitals. Between 2003 and 2005, the average charge per stay was $74,880 and the statewide in-hospital mortality rate was 2.4 percent.[37]

CABG surgery is also a relatively common procedure. During those same three years, 11,245 Washington residents had CABG surgeries, with 10,405 of those procedures performed in Washington community hospitals. In fact, although only 18 hospitals in Washington are approved to provide CABG surgeries, they performed, in total, 11,424 CABG surgeries between 2003 and 2005, or more than 3,800 per year.[38]

Broadly, CABG surgeries are used to treat coronary heart disease (CHD). Risk factors for CHD are well established and are divided into modifiable and non-modifiable conditions. The latter category includes being elderly, male, having a family history of heart disease, and being of African-American, American Indian/Alaska Native or Hispanic descent. The former category, modifiable conditions, includes smoking, high cholesterol, high blood pressure, physical inactivity, obesity and diabetes.[39]

Figure 5.34

Coronary Artery Bypass Graph Surgery: High and Low Risk Regions
2003-2005 Combined

Figure 5.34a: High-Risk Region

Figure 5.34b: Low-Risk Region

OFM Forecasting Division, November 2009
Data Source: Washington State Health Extended CHARS Files, 2003-2005.

For each year assessed and for the three years combined, varying sized regions in the southwest corner of the state were found to have higher than expected hospitalizations for CABG surgeries. For 2003-2005 combined, the high-risk region's relative risk was 1.2 ($p<0.001$), or 20 percent more than expected, equaling about 120 excess CABG surgeries per year.

Similarly, for each year assessed and for the three years combined, a core region including Seattle and the surrounding environs was found to have fewer than expected CABG surgeries. For 2003-2005, the relative risk in this area was 0.7 ($p<0.001$), or 70 percent of the expected and equaling about 270 fewer CABG surgeries per year.

In 2005, 2006 and 2007, the BRFSS questionnaire asked respondents if they had ever had a heart attack. Respondents in the high-risk region reported the highest rates of heart attacks, while those in the low-risk region had the lowest. Both differed from the state as a whole (Figure 5.35).

This finding alone suggests that people in the high-risk region likely have a greater need for cardiac care than those in the low-risk region.

To further assess this region's needs, risk factors associated with CHD were examined.

For 2003-2007, respondents were asked their smoking status. Those living in the high-risk region reported the highest rates of smoking, while those in the low-risk region had the lowest. Each differed from the state as a whole (Figure 5.36).

In 2003, 2005 and 2007, respondents were asked if they had ever been told by a physician that they have high blood pressure. Those living in the high-risk region reported the highest rates of high blood pressure, while those in the low-risk region had the lowest. For this measure, too, each differed from the state as a whole (Figure 5.37).

For those same three years, respondents were also asked if they had been told that they had high blood cholesterol levels. For this risk factor, the high- and low-risk regions did not

Figure 5.35
Ever Had a Heart Attack, Ages 55 and Older
(2005, 2006 and 2007 BRFSS)

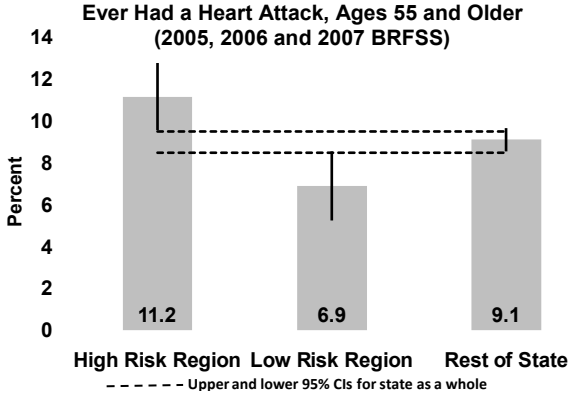


Figure 5.36
Currently Smoke Some Days or Every Day

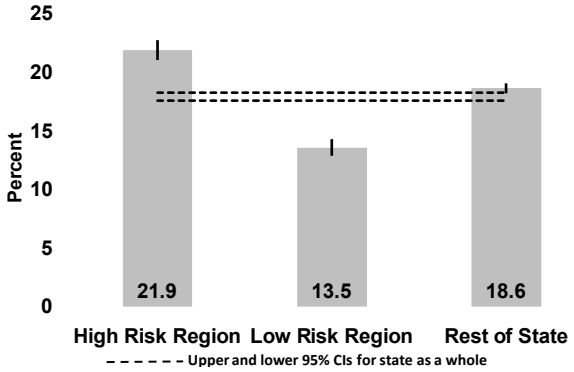


Figure 5.37
Told by Physician That They Have High Blood Pressure
(2003, 2005 and 2007 BRFSS)

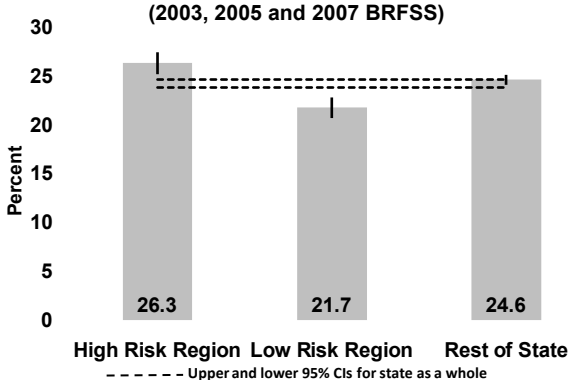
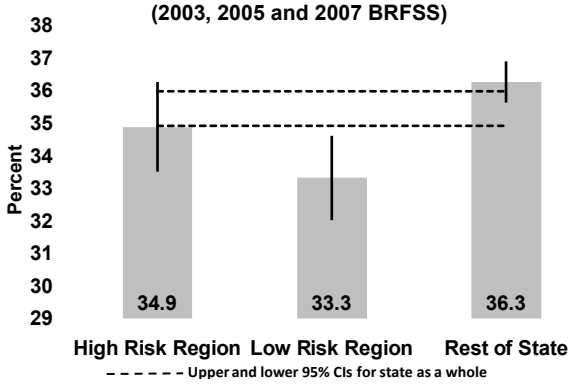


Figure 5.38
Told by Physician That They Had High Cholesterol
(2003, 2005 and 2007 BRFSS)



OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

differ from each other, although the low-risk region was lower than the state as a whole (Figure 5.38).

For all five years assessed, BRFSS asked respondents if they engaged in any physical exercise outside of work. Those living in the high-risk region and in the "rest of the state," had the highest rates of no exercise, while those in the low-risk region had the lowest. Each differed from the state as a whole (Figure 5.39).

Each year, BRFSS asked respondents their height and weight, and used those measures to calculate each respondent's Body Mass Index (BMI).

Based upon this calculated BMI, respondents in the high-risk region had the highest levels of obesity, while those in the low-risk region had the lowest. Each also differed from the state as a whole (Figure 5.40).

When asked if they had ever been told by their physician that they had diabetes, residents in the high-risk region reported the highest rates, while those in the low-risk region had the lowest. Again, besides differing from each other, both also differed from the state as a whole (Figure 5.41).

In short, for all but one of these modifiable risk factors for CHD, the high-risk region had the highest rates and the low-risk region had the lowest, with the sole exception being cholesterol levels.

Looking at demographic factors that are associated with non-modifiable risk factors, the high- and low-risk regions did not differ from each other in terms of African-American race or Hispanic ethnicity (Figures 5.42 and 5.43).

Figure 5.39
No Physical Exercise Activities Outside of Work

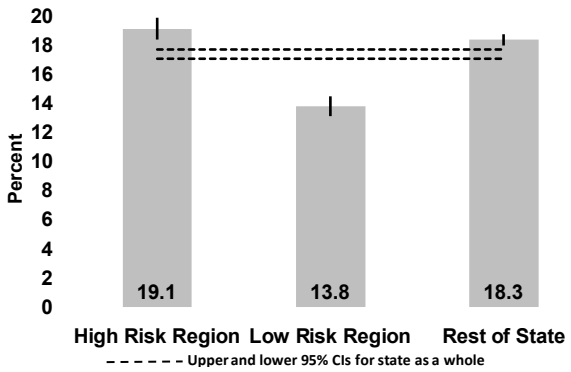


Figure 5.40
Obese (Body Mass Index≥30)

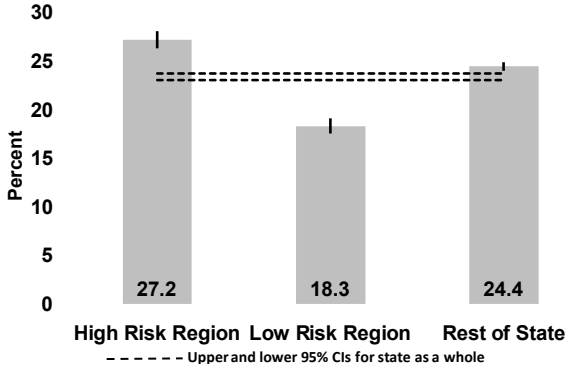


Figure 5.41
Told by a Physician That They Have Diabetes

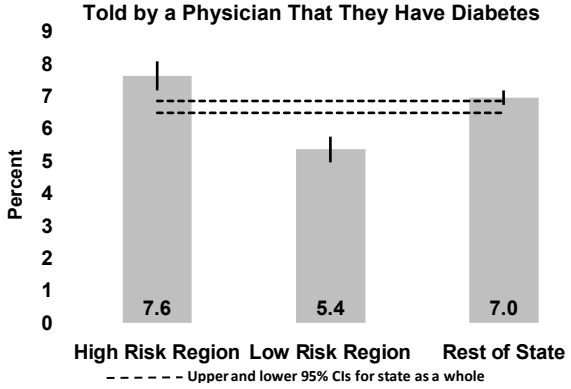
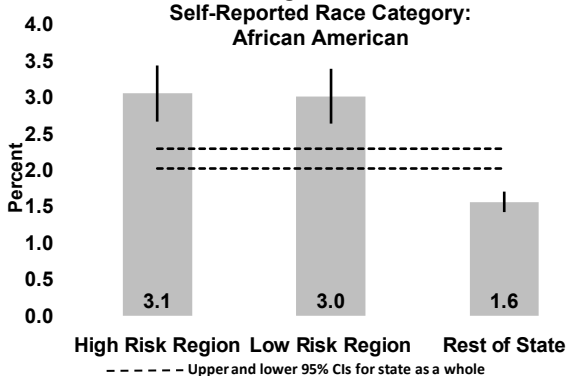


Figure 5.42
Self-Reported Race Category: African American



OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

But both regions did differ from the state as a whole; each was higher in term of African-American race, and each was lower in terms of Hispanic ethnicity.

There were, however, more American Indians and Alaska Natives in the high-risk region compared to the low-risk region. The low-risk region also differed from the state as a whole (Figure 5.44).

The high- and low-risk regions also differed in terms of access to care:

- Respondents in the high-risk region had a higher rate of no health care coverage than those in the low-risk region (Figure 5.45).
- Respondents in the high-risk region had the highest rates of no personal physician or health care provider; those in the low-risk region had the lowest (Figure 5.46).
- When asked if there was ever a time in the past year when they needed to see a doctor but did not because of cost, respondents in the high-risk region and the "rest of the state" had the highest rates of forgoing care because of costs, while the low-risk region had the lowest (Figure 5.47).

Differences in education and income were assessed, too. Respondents in the high-risk region had the lowest rate of graduation from a college or technical institution; those in the low-risk region had the highest (Figure 5.48).

Similarly, compared to the low-risk region and the state as a whole, respondents in the high-risk region reported the highest level of household incomes of $25,000 or less per year (Figure 5.49).

Figure 5.43
Self-Reported Category: Hispanic Ethnicity

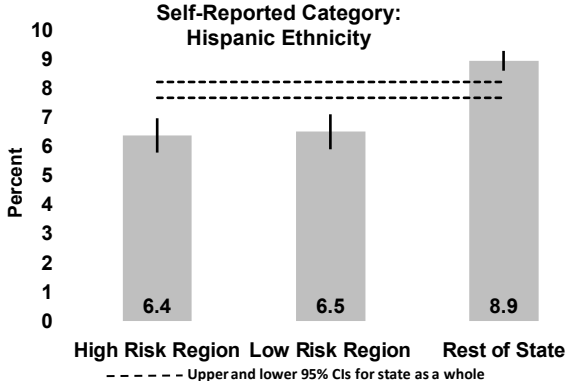


Figure 5.44
Self-Reported Race Category: American Indian/Alaska Native Race

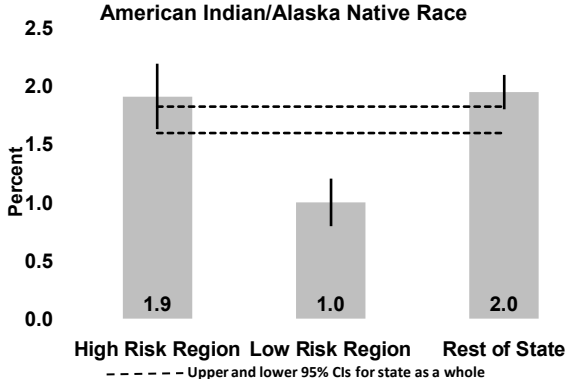


Figure 5.45
No Health Care Coverage of Any Kind

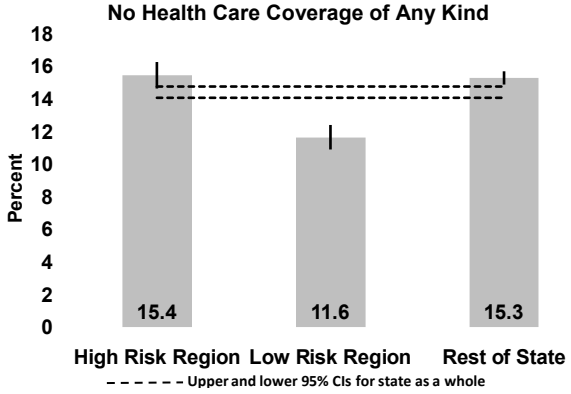
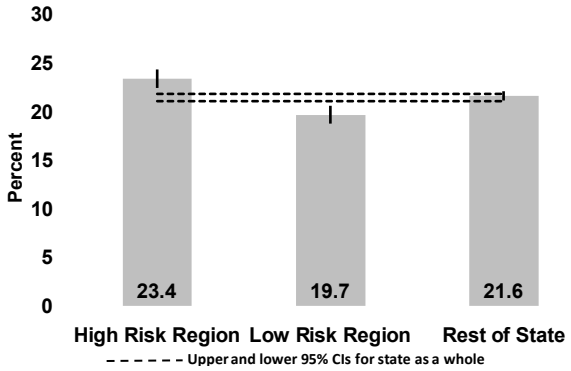


Figure 5.46
No Personal Physician or Health Care Provider



OFM Forecasting Division, November 2009
Data Source: Washington State Behavioral Risk Factor Survey, 2003-05

Finally, to assess the most important indicator of need, the age-adjusted CHD mortality rates for each region were also computed. Here, too, the high-risk region had the highest rate, while the low-risk region had the lowest (Figure 5.50).

Figure 5.47
Did Not See a Physician When Needed Because of Cost

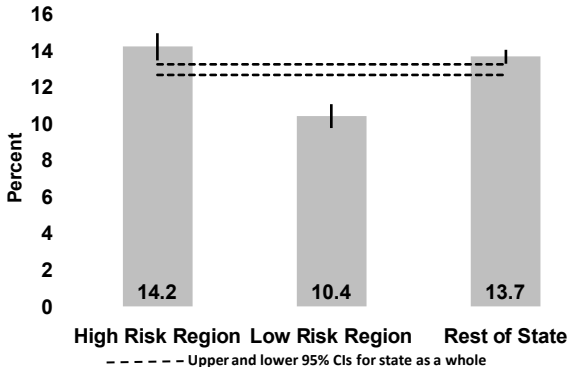


Figure 5.48
Graduated from College or Technical Institute

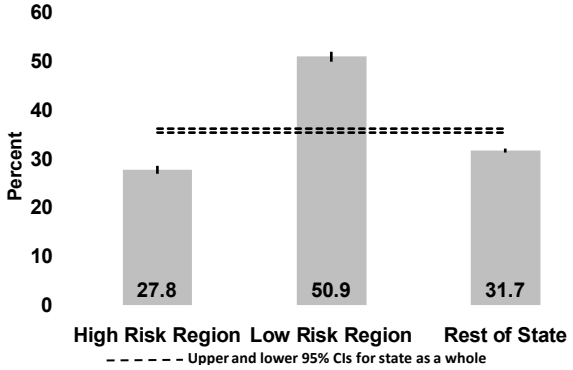


Figure 5.49
Household Income Less Than $25,000 per Year

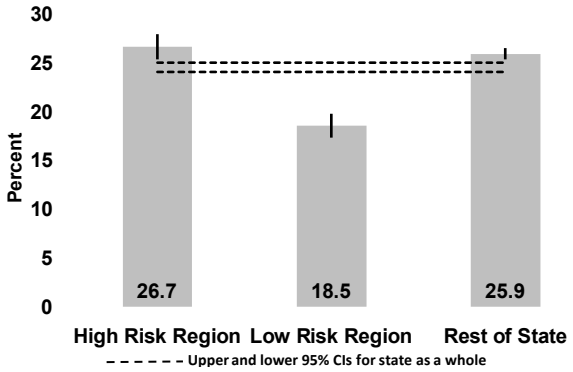
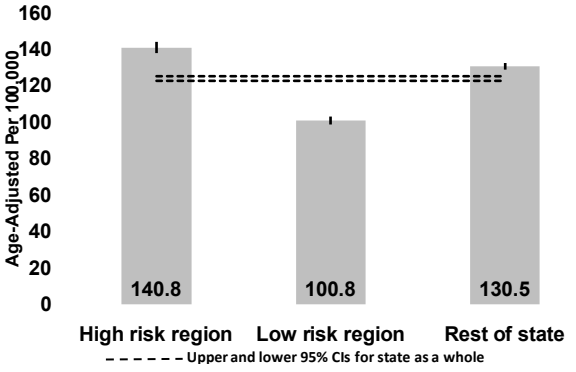


Figure 5.50
Coronary Heart Disease Mortality Rate



OFM Forecasting Division, November 2009
Data Sources: Washington State Behavioral Risk Factor Survey, 2003-05
Washington State Center for Health Statistics Death Data, 2003-2007

Table 5.4

Coronary Artery Bypass Graph Surgery Hospitalizations: Selected Behavioral Risk Factor Surveillance System Indicators and Age-adjusted Mortality Rates by Region for 2003-2007
Percents or Rates and 95% Confidence Intervals

	High Risk Region	Low Risk Region	Rest of State	State Total
Ever had a heart attack, ages 55 and older (2005-2007 BRFSS only)	**11.2%** (9.6,12.8)	**6.9%** (5.3,8.6)	**9.1%** (8.6,9.7)	**9.0%** (8.5,9.5)
Currently smoke some days or every day	**21.9%** (21.0,22.7)	**13.5%** (12.8,14.2)	**18.6%** (18.2,19.0)	**17.9%** (17.6,18.2)
Told by a physician that have high blood pressure (2003,2005 & 2007 BRFSS)	**26.3%** (25.2,27.4)	**21.7%** (20.7,22.8)	**24.6%** (24.1,25.1)	**17.3%** (17.0,17.7)
Told by a physician that have high blood cholesterol (2003,2005 & 2007 BRFSS)	**34.9%** (33.5,36.3)	**33.3%** (32.0,34.6)	**36.3%** (35.6,36.9)	**24.2%** (23.8,24.6)
No physical exercise activities outside of work	**19.1%** (18.4,19.9)	**13.8%** (13.1,14.5)	**18.3%** (18.0,18.7)	**17.3%** (17.0,17.7)
Obese (Body Mass Index greater than or equal to 30)	**27.2%** (26.3,28.1)	**18.3%** (17.5,19.1)	**24.4%** (24.0,24.9)	**23.4%** (23.0,23.7)
Told by a physician that have diabetes	**7.6%** (7.2,8.1)	**5.4%** (5.0,5.7)	**7.0%** (6.7,7.2)	**6.7%** (6.5,6.9)
Self-reported race category: African American	**3.1%** (2.7,3.4)	**3.0%** (2.6,3.4)	**1.6%** (1.4,1.7)	**2.2%** (2.0,2.3)
Self-reported Hispanic ethnicity	**6.4%** (5.8,7.0)	**6.5%** (5.9,7.1)	**8.9%** (8.6,9.3)	**7.9%** (7.7,8.2)
Self-reported race category: American Indian/Alaska Native	**1.9%** (1.6,2.2)	**1.0%** (0.8,1.2)	**2.0%** (1.8,2.1)	**1.7%** (1.6,1.8)
No health care coverage of any kind	**15.4%** (14.6,16.3)	**11.6%** (10.9,12.4)	**15.3%** (14.9,15.7)	**14.4%** (14.1,14.8)
No personal physician or health care provider	**23.4%** (22.4,24.3)	**19.7%** (18.8,20.6)	**21.6%** (21.2,22.1)	**21.4%** (21.0,21.8)
Could not see a physician when needed because of costs	**14.2%** (13.5,15.0)	**10.4%** (9.8,11.1)	**13.7%** (13.3,14.1)	**13.0%** (12.7,13.3)
College or technical school graduate	**27.8%** (27.0,28.6)	**50.9%** (50.0,51.9)	**31.7%** (31.2,32.1)	**35.8%** (35.4,36.1)

OFM Forecasting Division, November 2009
Data Sources: Washington State Behavioral Risk Factor Surveillance System, Washington State Center for Health Statistics Death Data, 2003-2007.

DISCUSSION

Clearly there is substantial geographic variation across Washington State in hospitalization rates for the four conditions assessed. With the exception of prostate cancer hospitalizations, much of this variation appears to be associated with the underlying needs of the populations living in those areas.

Residents of the high-risk region for bacterial pneumonia hospitalizations, for instance, had the lowest pneumococcal vaccination rate of any other area assessed. Not surprisingly, they also had the lowest influenza vaccination rate. Compounding this apparent lack of basic preventative care, residents of that high-risk region also engaged in behaviors (smoking) and had pre-existing conditions (diabetes) that made them more susceptible to the disease and more apt to face higher levels of acuity and complications once they acquired it.

Similarly, residents of the high-risk region for long-term complications of diabetes had the highest diabetes prevalence rate – and the highest diabetes mortality rate – of all the regions assessed. Not surprisingly, one-in-three adults living there was also found to be obese, the leading risk factor for Type 2 diabetes. Compounding this risk, residents of that region were also highest in *not* having health care coverage of any kind, in *not* having a personal physician or health care provider, and in *not* being able to see a physician when needed because of costs. This apparent lack of access to care befits the fact that severe long-term complications of diabetes are associated with poor long-term disease management.

Besides being more apt to have had a heart attack, residents in the high-risk CABG region also had higher rates of smoking, high blood pressure, physical inactivity, obesity, and diabetes compared to the low-risk CABG region and the state as a whole. With the exception of blood cholesterol levels, where there was not an apparent difference among the regions assessed, these constitute *all* of the major modifiable risk factors for CHD. Not surprisingly, this region also had the highest CHD mortality rate.

Residents in the high-risk regions for these three conditions also shared some common socio-economic and demographic characteristics: they tended to be poorer and less educated, and within the high pneumonia and high diabetes region, they were disproportionately more likely to be from communities of color.

In contrast, residents of the low risk-regions for these three conditions were, compared to the state as a whole, consistently less likely to smoke or be obese, and more likely to exercise. They were also more likely to be college or technical school graduates and to report household incomes greater than $25,000 per year. Residents of these low-risk regions were also more likely to have a personal physician, to have some kind of health care coverage, and not to forgo care when needed because of costs.

Simply put, regional variation in hospitalization rates for these three conditions appears to be explainable and likely preventable through basic public health interventions and primary care services.

The same cannot be said for prostate cancer hospitalizations. For this condition, residents in the high-risk region did not have elevated rates for either of the two risk factors included in BRFSS: race and obesity. Nor was their prostate cancer mortality rate higher – or lower – than any other region assessed.

What they did have, however, was more PSA testing. The high rates of PSA testing and prostate cancer hospitalizations together suggest that treatment may not have been related solely or primarily to need. Further research is essential in this type of situation to determine if aggressive treatments and their associated costs could be avoided.

The implications of these findings for health planning and resource development are worth noting. In the northeast region where residents were found to have higher than expected hospitalization rates for bacterial pneumonia and lower than expected pneumococcal vaccination rates, policy makers, the community, health care providers and insurers are presented a simple choice: As the population in that region grows and ages, should more hospital beds be built to accommodate pneumonia patients, or should more efforts be directed toward vaccinating the at-risk population?

Similarly, in the northwest region where residents were found to have higher than expected hospitalization rates for prostate cancer and higher than expected PSA screening rates: Should more hospital beds be built to treat men with prostate cancer or should more efforts be directed toward educating the physicians and community about the value of those screening tests and subsequent therapies?

In short, for each condition assessed, the findings in this analysis repeatedly demonstrate the simple maxim that an ounce of prevention is well worth a pound of cure.

LIMITATIONS

While the acquisition of nearly all inpatient records for Washington residents constitutes a major advance in assessing intra-state variations in hospitalization rates, the data still tell only part of the story. Much of what had been done inside hospitals in the past is now performed on an outpatient basis, and many new procedures routinely performed on outpatients have replaced older procedures that can be performed only in an inpatient setting.

Prostate cancer is a prime example: While radical prostatectomy is still largely, although not exclusively, an inpatient procedure, alternative therapies, including external beam radiation and radioactive seed implantation, are typically performed in an outpatient setting. Assessing all therapies associated with prostate cancer might generate a much different picture than seen with inpatient procedure data only.

Similarly, while CABG surgery is exclusively an inpatient procedure, percutaneous coronary intervention (PCI) therapies such as angioplasty – which are well established alternatives to CABG, particularly for patients with blockages in one or two vessels – are performed in both inpatient and outpatient settings and vary widely by region. In 2008, the Washington State Department of Health conducted a survey of all hospitals to determine PCI volumes for

Certificate of Need purposes. Of the 3,908 procedures performed in Seattle and King County hospitals in 2007, nearly a third (1,220) were performed in an outpatient setting; of the 1,118 performed in Spokane area hospitals, only 15 (1 percent) were outpatients. Assessing geographic variations in PCI rates with inpatient data alone is not currently possible.

CONCLUSIONS AND NEXT STEPS

The spatial scan statistic appears to be a useful tool in identifying geographic variations in inpatient hospitalizations. Additionally, BRFSS data can provide a deeper understanding of the risk factors present in high- and low-risk regions. Taken together, these can be used to assess the underlying causes of regional variations, identify the characteristics of the at-risk populations, inform policy decision making and assist in developing targeted interventions.

While this analysis focused on the primary at-risk regions only, future analyses could assess all the secondary risk regions as well. These results are shown in Appendix 5.A.

Similarly, while this analysis focused on statewide variations, future analyses could look at a single county or a region of the state. For instance, identifying variations within King County could bring to light problematic areas there relative to the county as a whole. Also identifying and assessing variations within the West or East Balance Regions could help pinpoint communities at highest risk.

In addition, larger at-risk regions identified through the statewide assessments could, themselves, be reanalyzed through the spatial scan statistic to see where within those larger at-risk regions there might be particularly problematic areas.

Data are essential to any future analyses. Maintaining a large sample size in BRFSS and continued acquisition of the extended CHARS data are fundamental. So are accurate small area population estimates.

Aligning the state-added questions in BRFSS to a health service analysis plan would also be helpful. In doing so, more detailed questions pertaining to primary care services, including prescription medications, could further help in understanding – and addressing – regional variations.

Finally, acquiring outpatient data would open many doors now closed by the limitations of inpatient-only data sets.

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CHAPTER 6

REGIONAL AVAILABILITY AND FUTURE DEMAND FOR HEALTH CARE WORKFORCE

INTRODUCTION

This chapter explores the current regional variation in the availability of health care workers and the state's future demand for its health care workforce. While more accurate data are needed, the current research identifies areas of potential concern and disparity in the state's workforce availability and distribution.

Accurate information on health care workforce availability is crucial in planning health services. Key data includes types of providers and numbers of *practicing* providers in each category, as well as each provider's practice location, specialty, hours worked and demographic information.

Limited evidence suggests that the proportion of license holders actively in practice in Washington State varies by licensed profession.[1] Retirements, moves or practices out of state, leaves of absence and work in teaching or administrative positions are among the reasons for discrepancies between numbers of licensed professionals and numbers of professionals actively providing medical care here.

Washington State's current licensing data collection system does not distinguish between practicing and non-practicing health care providers. The Department of Health (DOH) gathers information from all health professionals as they become licensed to practice in Washington and when they renew their licenses, but these records do not contain data related to license holders' practice activity in their professions. Despite this limitation, the DOH database can provide an outer boundary for estimates on the size of the health workforce in Washington, since all health professionals must be licensed in order to practice in the state.

In January 2009, researchers acquired from DOH a data file containing information related to health care professional licenses issued through November 2008. The dataset contained historical records on licensee age, gender, and the ZIP code portion of the address, as well as license type and various relevant dates. Next, records for licenses valid anytime between December 2007 and November 2008 were extracted. Some 351,000 individual health professionals held valid Washington State licenses during the specified 12 months, and 306,000 of these provided addresses in the state.

Workforce availability of selected types of licensed health professionals was assessed from records with Washington addresses, using the 10-region geographical designation adopted by the Washington State Population Survey (SPS).[2] Each SPS region is either a single county or a group of counties, allowing association of self-reported ZIP codes with first a county and then a region. It should be noted that the self-reported address in the DOH license database indicates the location to which a license was issued, not necessarily a practice site. Communication with DOH

[1] Recent research by the Washington, Wyoming, Alaska, Montana, Idaho Center for Health Workforce Studies shows that of the RNs, LPNs, and ARNPs licensed in Washington in 2007, 63.8 percent, 71.7 percent, and 72.3 percent, respectively, reported practicing in Washington. Source: http://depts.washington.edu/uwchws/findings.php.
[2] http://www.ofm.wa.gov/sps/default.asp.

staff suggests that the self-reported address in the DOH data may be a license holder's practice address, but it can also be a home address, business headquarters or mail box used only for mailing purposes. In other words, license holders may have provided an address that is in a region or even a state different from where they actually work. Despite this limitation, the available data can point to potential issues in health care workforce distribution, as the remainder of this chapter attempts to do. The remainder of the chapter provides an assessment of the current availability of total licensed health professionals and those in selected professional categories, statewide and for the regions. Also discussed below are analyses by staff and external researchers concerning future demands for physicians and registered nurses, two of the major professional groups in the health care world.

STATEWIDE WORKFORCE AVAILABILITY AND CHARACTERISTICS

In 2008, more than 306,000 individual health providers held valid licenses issued by the Department of Health to an address in Washington State. These licenses covered a wide range of health professions, from doctor of medicine to prosthetist. The analysis in this chapter focuses on the following professions:

- Physicians
  - Doctor of Medicine (MD)
  - Doctor of Osteopathic Medicine (DO)
- Dentists
- Pharmacists
- Radiologic Technologists
- Nurses
  - Registered Nurse (RN)
  - Licensed Practical Nurse (LPN)
  - Advanced Registered Nurse Practitioner (ARNP)

The 306,000 total health professional licenses in 2008 meant that there were 4,650 licenses per 100,000 population (Table 6.1). Of the total licenses, 19,104 (290 per 100,000 population) were physician licenses, mostly MDs.[3] Nurse licenses accounted for 78,315 (1,189), mostly RNs. Licenses for dentists, pharmacists and radiologic technologists each contributed 4,887 (74), 6,189 (94) and 4,939 (75) respectively.

The average age of all license holders was 44 years, identical to the average age of the general population aged 15 and older in 2008. [4] Average license holders in each of the selected professions, with the exception of radiologic technologists (44), tended to be in their later 40s.

[3] A 2007 report by American Association of Medical Colleges (AAMC) using the American Medical Association's (AMA's) Physician Masterfile (January 2007) shows 16,243 active physicians (254 per 100,000 population) in Washington State (http://www.aamc.org/workforce/statedatabookjan2008.pdf). However, studies have called attention to the limitations of the AMA Masterfile in accounting for practicing physicians. The concerns center around the reporting lags, especially for physicians no longer practicing (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361068/pdf/hesr_00288.pdf).
[4] Age 15 was the youngest age inclusion rule applied in selecting records from the DOH license database.

Although more than three quarters of all license holders were women, the proportion of female license holders varied widely from profession to profession. Women made up less than one-third of physician and dentist license holders, about half of pharmacist and radiologic technologist license holders, and nine in 10 nurse license holders.

For those professions in which the overall proportion of female license holders was small, the proportion became even smaller in the older age groups. Women made up approximately 40 percent in the 15-44 age group among physician and dentist license holders, but among those 65 and older, they constituted only 7 and 3 percent respectively. A similar smaller proportion of female license holders was also apparent in older pharmacist license holders. An opposite trend was observed in nurse license holders, particularly in RNs and LPNs – their proportion grew in older age groups. The female proportion of RN license holders changed from 89 percent in the age group of 15-44 to 97 percent in the age group of 65 and older. Female radiologic technologists appeared to maintain their proportion in all age groups shown.

Licenses issued in professions selected for this analysis were distributed somewhat unevenly when compared with the distribution of the total licenses, based on the self-reported Washington addresses in those licenses. In Table 6.2, King County is shown to have 30 percent of the state's total licenses for health professionals, but 50 percent of physician licenses and 42 percent of the dentist licenses. East Balance and West Balance regions each had about 4 percent of the state's share in physician licenses and dentist licenses while their shares of the state's total professional licenses were about 7 percent each. Also worth noting is Pierce County's 20 percent of the state's LPN licenses; its share of all nurse licenses (13 percent) was quite similar to its share of total health professional licenses (12 percent). The figures for selected professions in Yakima-TriCities are generally unremarkable when compared with this region's share of the state's total licenses at 6 percent, except that 12 percent of the state's DO license holders reported addresses in that region.

The geographic distribution of raw counts of health professional licenses tells only a partial story of the variation in the health workforce availability among the state's regions. The next four sections compare the availability of total licensees and selected types of licensees by using rates of licensed professionals per 100,000 population.

Table 6.1

Selected Types of Health Professional Licenses with Self-reported Addresses in Washington: Population Rates, Licensee Age and Sex, 2008

					Age Group			Percent Female in Age Group		
	Licenses	Per 100k Pop**	Average Age	Percent Female	15-44	45-64	65+	15-45	45-65	65+
Total Licenses	306,098	4,647	44	76%	156,654	131,368	18,076	78%	75%	69%
Selected Licensed Professions										
- Physician	19,104	290	49	30%	7,419	9,359	2,326	43%	26%	7%
MD	18,295	278	50	30%	7,068	8,967	2,260	44%	26%	7%
DO	809	12	48	28%	351	392	66	38%	22%	3%
- Dentist	4,887	74	49	21%	1,973	2,328	586	35%	15%	1%
- Pharmacist	6,189	94	46	53%	3,133	2,531	525	64%	45%	23%
- Radiological Technologist	4,939	75	44	63%	2,455	2,336	148	62%	65%	61%
- ARNP, LPN, or RN*	78,315	1,189	49	91%	28,061	43,102	7,152	89%	91%	97%
ARNP	3,622	55	49	87%	1,125	2,312	185	87%	87%	86%
LPN	14,527	221	47	88%	6,020	7,384	1,123	86%	89%	95%
RN	64,786	983	49	91%	22,892	35,863	6,031	89%	92%	97%

*Sums of ARNP, LPN and RN licenses will be greater than numbers of individuals because some individuals hold two or all three of these license types.

**Washington State's total population in 2008: 6,587,600.

OFM Forecasting Division, November 2009

Source: Washington State Department of Health health professional license database.

Table 6.2

Geographic Distribution of Licenses with Self-reported Washington Addresses for Selected Professions, 2008

	Total Licenees	Physicians	(MDs)	(DOs)	Dentists	Pharmacists	Radiological Technologists	ARNP, LPN, or RN*	(ARNP)	(LPN)	(RN)
State Total	306,098	19,104	18,295	809	4,887	6,189	4,939	78,315	3,622	14,527	64,786
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Clark	16,458	805	753	52	264	334	259	4,098	160	465	3,646
	5%	4%	4%	6%	5%	5%	5%	5%	4%	3%	6%
East Balance	21,789	813	764	49	248	378	371	5,572	222	1,095	4,625
	7%	4%	4%	6%	5%	6%	8%	7%	6%	8%	7%
King	92,427	9,298	9,090	208	2,037	2,284	1,327	22,028	1,306	2,863	19,325
	30%	49%	50%	26%	42%	37%	27%	28%	36%	20%	30%
North Sound	19,129	991	952	39	272	308	308	5,279	197	1,311	4,039
	6%	5%	5%	5%	6%	5%	6%	7%	5%	9%	6%
Other Puget Sound Metro	23,973	1,266	1,191	75	347	391	398	6,560	299	1,427	5,209
	8%	7%	7%	9%	7%	6%	8%	8%	8%	10%	8%
Pierce	35,537	1,812	1,700	112	471	556	542	9,810	368	2,971	6,952
	12%	9%	9%	14%	10%	9%	11%	13%	10%	20%	11%
Snohomish	29,797	1,079	1,019	60	433	619	612	7,864	259	1,230	6,716
	10%	6%	6%	7%	9%	10%	12%	10%	7%	8%	10%
Spokane	27,618	1,410	1,336	74	349	679	445	7,188	410	1,072	6,192
	9%	7%	7%	9%	7%	11%	9%	9%	11%	7%	10%
West Balance	20,946	722	676	46	218	301	305	5,351	198	1,209	4,284
	7%	4%	4%	6%	4%	5%	6%	7%	5%	8%	7%
Yakima-TriCities	18,424	908	814	94	248	339	372	4,565	203	884	3,798
	6%	5%	4%	12%	5%	5%	8%	6%	6%	6%	6%

*Sums of ARNP, LPN and RN licenses will be greater than numbers of individuals because some individuals hold two or all three of these license types.

OFM Forecasting Division, November 2009

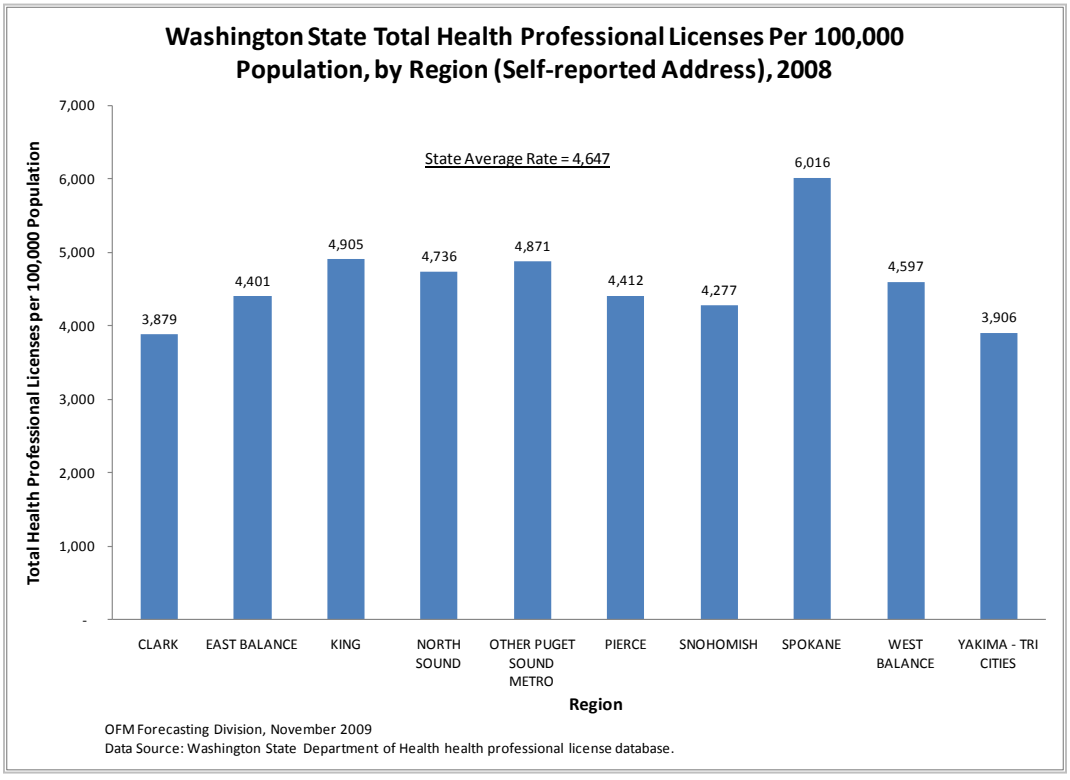
Source: Washington State Department of Health health professional license database.

REGIONAL VARIATION IN TOTAL HEALTH PROFESSIONAL LICENSES

Regional disparity exists in the distribution of health professional licenses – the highest rate of total professional licenses per 100,000 population, in the Spokane region, is 23 percent higher than the second highest, in King.

Figure 6.1 shows that 6,016 persons for every 100,000 population held valid licenses during the study period in Spokane County, a regional hub providing specialty medical services to several counties in Washington and Idaho. Spokane's rate of total professional licenses was nearly 30 percent higher than the state average rate (4,674) and was even 23 percent higher than the next highest region, King County, which had 4,905 licenses per 100,000 population. Clark County posted the lowest rate, 3,879 professional licenses per 100,000 population. Clark's low rate can be explained by its proximity to the Portland metropolitan area. A significant number of Clark residents access health care in Oregon; analysis of 2005 discharge records from hospitals in both Washington and Oregon indicated that one-fourth of Clark residents' hospitalizations in that year were in facilities located in Oregon.[5] Close to Clark with the second-lowest rate of total professional licenses was the Yakima-TriCities region, with 3,906 per 100,000 population.

Figure 6.1



[5] Unpublished analysis by OFM staff.

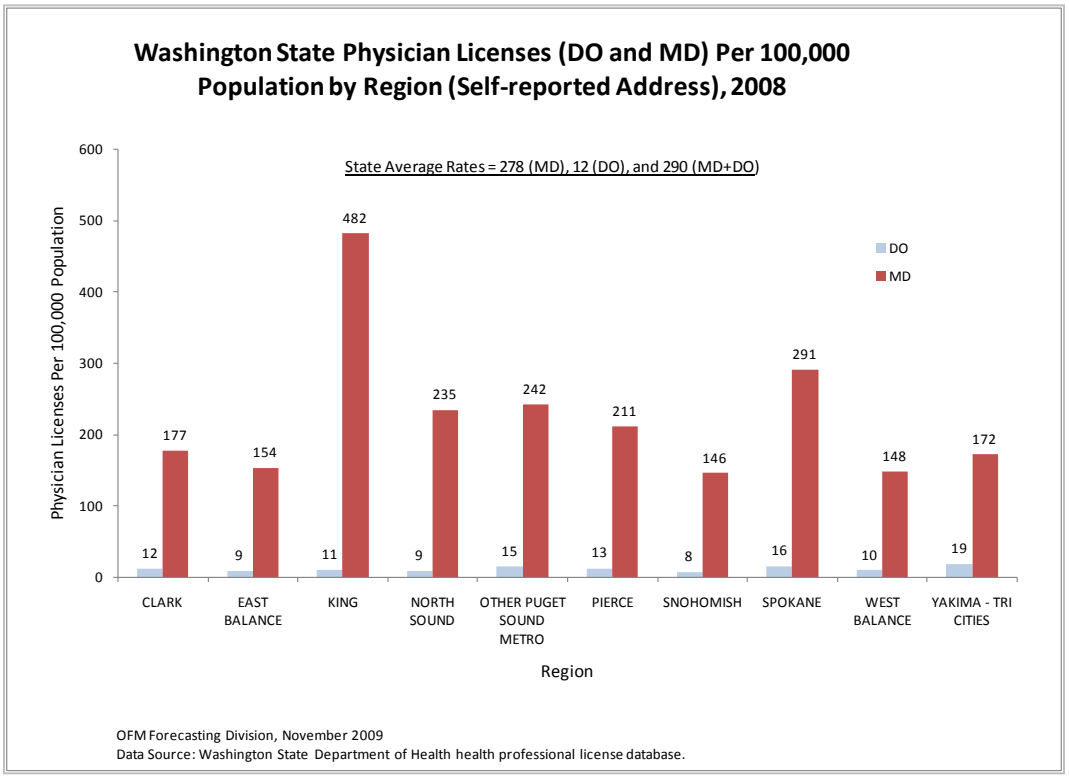
REGIONAL VARIATION IN PHYSICIAN LICENSES (MD AND DO)

Rural regions are among the lowest-ranked in rates of physician licenses.

King County was clearly at an advantage with 493 combined licenses of Doctors of Osteopathic Medicine (DO) and Doctors of Medicine (MD) per 100,000 population (Figure 6.2), compared to the state average rate of 290 per 100,000 population. King's rate is more than three times that of the lowest rate of 154 physician licenses per 100,000 population found in Snohomish County. The higher license-to-population ratio in King may be due in part to physician faculty and researchers at the University of Washington Medical School and medical research institutes located in the county. Snohomish's low rate of physician licenses could be related to the high rate of physician licenses in King, as some physicians who live or have a medical affiliation in King may practice in Snohomish County given the proximity of the two counties. However, currently available data is insufficient to provide tests on these hypotheses.

Putting King and Snohomish aside, a contrast emerges between Spokane County and two rural regions, East Balance and West Balance. Licensing data for Spokane indicated 307 physician licenses per 100,000 population, while the rates of the two rural regions were about half the size of Spokane's at 164 in East Balance and 158 in West Balance.

Figure 6.2



REGIONAL VARIATION IN NURSE LICENSES (RN, LPN AND ARNP) AND NURSE-TO-PHYSICIAN LICENSE RATIOS

Though regional disparity in nurse capacity is smaller than that in physician capacity, differences nonetheless exist between the regions with Spokane having the highest rate. Rural regions post higher nurse-physician license ratios than urban regions.

Spokane County ranked the highest in rate of nurse licenses at 1,566 per 100,000 population (Figure 6.3). Clark County and the Yakima-TriCities region tied for the lowest ranked of nurse license rates at 966 and 967, respectively. Again, Clark's low rate may be an artifact of its proximity to the Portland Metropolitan area where many of Clark residents seek health services, thus lowering the need for health professionals inside Clark. The highest rate for Spokane was 62 percent higher than the lowest rates and more than 30 percent higher than the state average (1,189). The rates of nurse licenses in other regions were fairly even, ranging from 1,125 to 1,333 licenses per 100,000 population.

Figure 6.4 reveals three distinct levels of nurse-to-physician license ratios among the regions. King County was at the lowest level by itself with a ratio of 2.4 nurse licenses per physician license. West Balance, Snohomish and East Balance made up the highest level with ratios at 7.4, 7.3, and 6.9, respectively. The remaining regions formed the middle level; nurse-physician license ratios here ranged from 5.0 to 5.4. King's unusually low ratio may be due to a sizeable number of non-practicing physician license-holders (who have no need for nursing staff) at the University of Washington Medical School and research institutes in the county. The high ratio in Snohomish could be the compound effect of some physicians licensed at a King County address practicing in Snohomish, and some licensed Snohomish nurses working in King. Again, current available data cannot provide tests on these hypotheses. King and Snohomish aside, two rural regions, East Balance and West Balance, tended toward higher nurse-to-physician license ratios and the remaining regions toward lower.

Figure 6.3

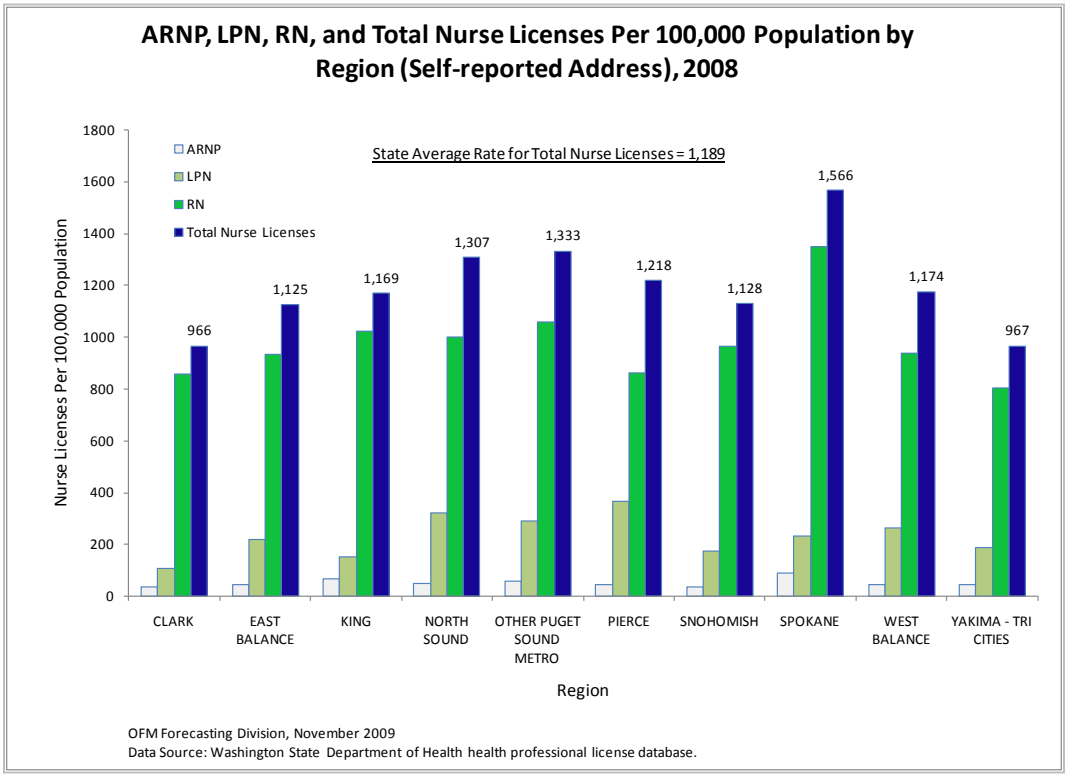
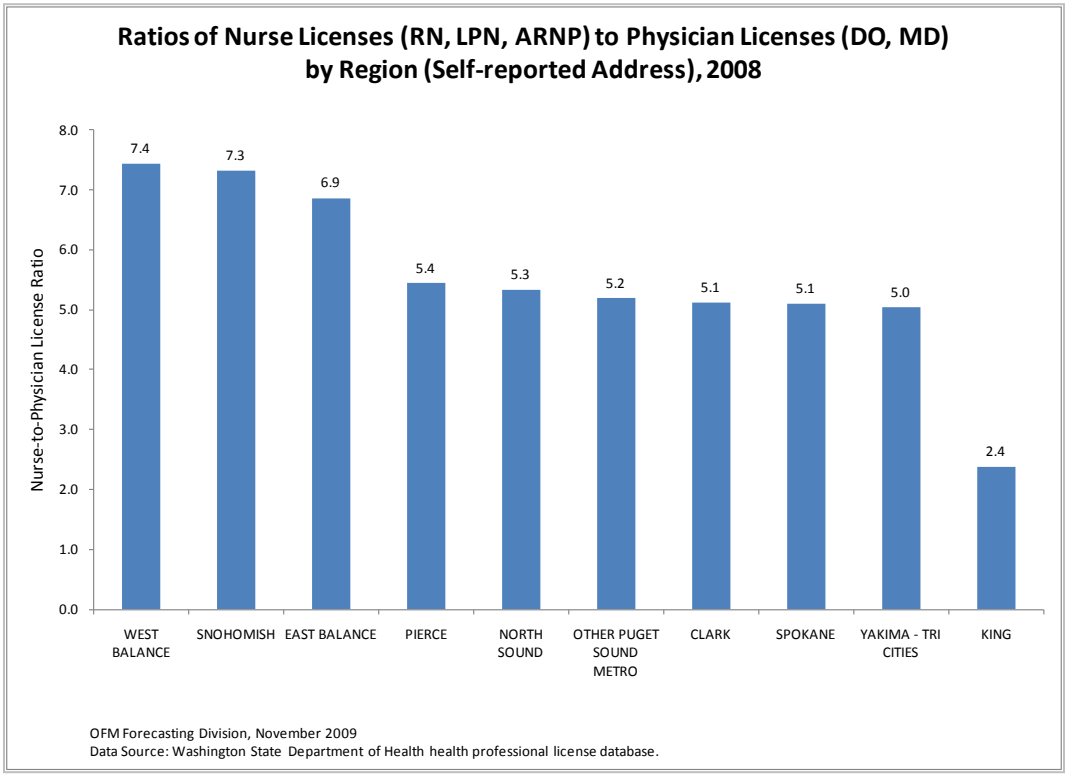


Figure 6.4



REGIONAL VARIATION IN PHARMACIST, RADIOLOGIC TECHNOLOGIST AND DENTIST LICENSES

Spokane posted the highest rates of pharmacist and radiologic technologist licenses. Rural regions' dentists appeared to be in short supply.

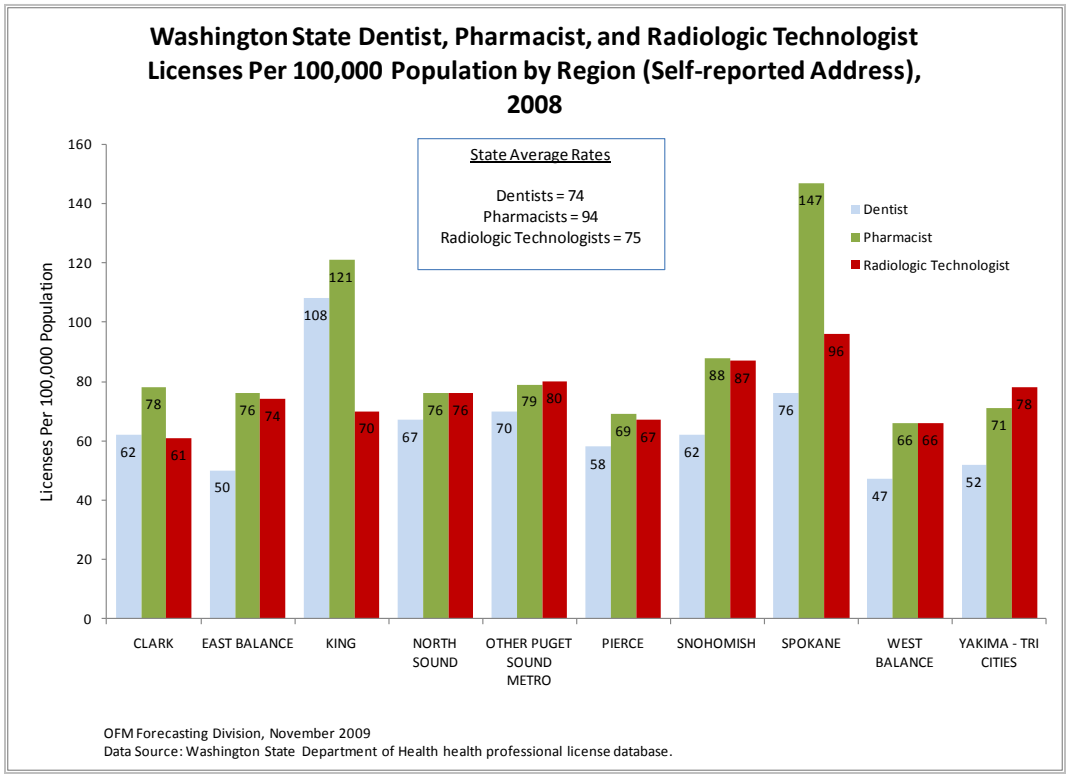
Figure 6.5 shows the regional license rates of pharmacists, radiologic technologists and dentists.

Spokane led the state's regions in pharmacist and radiologic technologist licenses with 147 and 96 respectively per 100,000 population. Its rate of pharmacist licenses was more than twice as high as the lowest rate, in the West Balance region (66 per 100,000 population).

Regional rates for radiologic technologist licenses display less variability. Spokane came out again as the leader in this category with 96 radiologic technologist licenses per 100,000 population, about 45 percent higher than the lowest rate, in West Balance (66).

The highest rate of dentist licenses, at 108 per 100,000 population, appeared in King County. The two rural regions, East Balance and West Balance, logged the lowest rates at 50 and 47 dentist licenses per 100,000 population respectively, about half of King's rate.

Figure 6.5

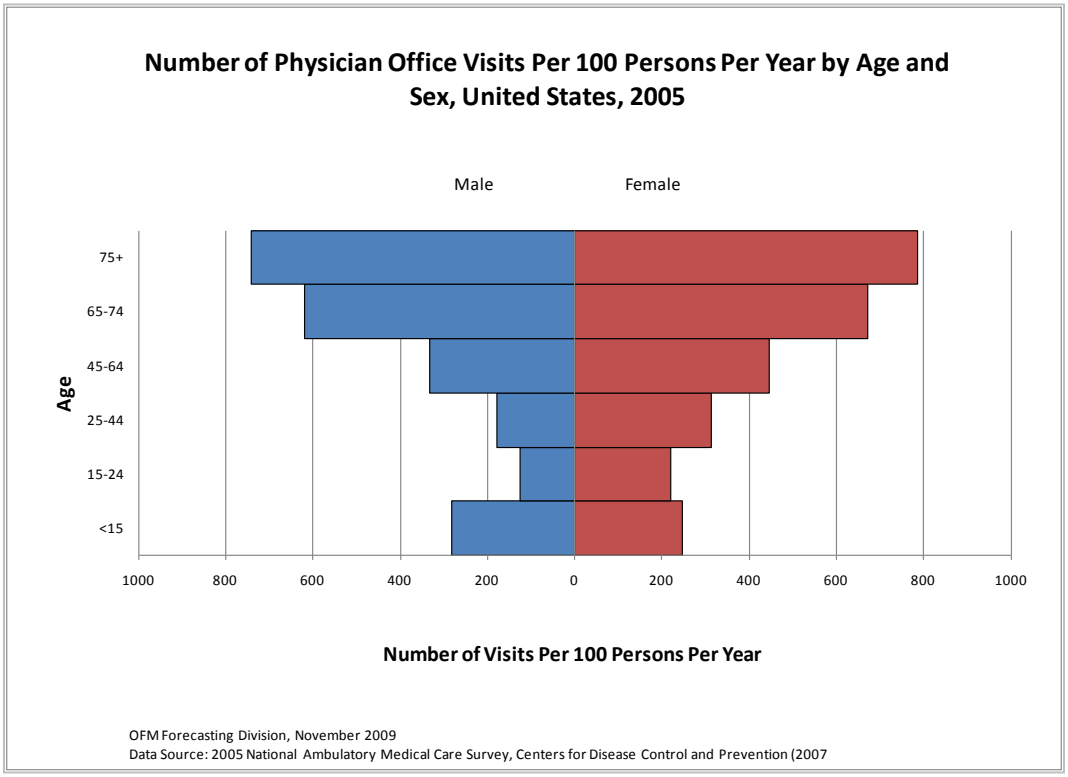


FUTURE DEMAND FOR PHYSICIANS

If current levels of physician capacity and health service utilization continue, demand for physicians will increase due to population growth and the aging of the population.

Age is positively correlated with numbers of physician office visits by people age 15 and older, according to national data. This holds true for both males and females, although females in each age category make more annual visits than do males. In 2004, in the 15-24 age category, the physician office visit rate nationally was 125 visits per 100 males and 220 visits per 100 females. The numbers increased to 740 and 780 respectively for males and females in age group of 75 and older (Figure 6.6). [6]

Figure 6.6



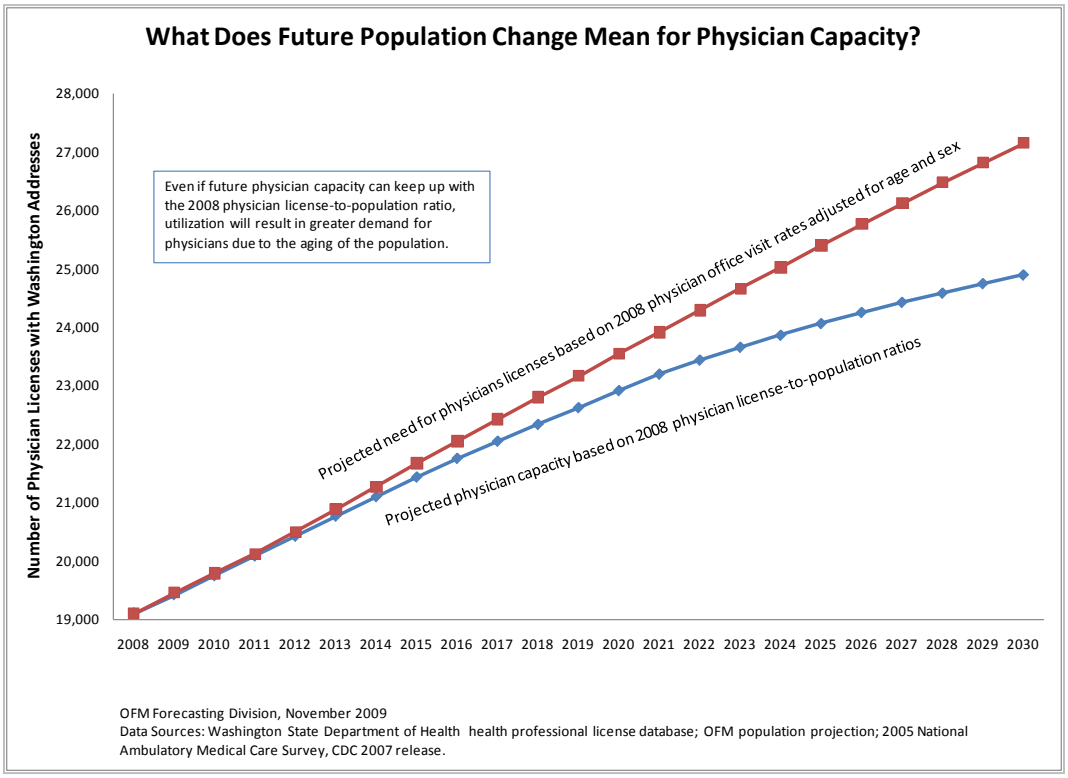
An increased numbers of office visits by an aging population plays an important role in projecting future demand for physicians. During the next two decades, Washington State's population will transition due to the Baby Boom effect. Current physician-to-population license ratios, adjusted for age and sex, indicate a projected 30 percent increase in necessary licensed physician capacity from the 2008 level of 19,100 to 24,900 licenses in 2030 (blue or lower line in Figure 6.7). However, when current by-age utilization levels are considered, the number of physician licenses needed in 2030 will be 27,150, or 42 percent higher than the 2008 level (red

[6] OFM analysis of the 2005 National Ambulatory Medical Care Survey (2007 release), U.S. Department of Health and Human Services Centers for Disease Control and Prevention.

or upper line in Figure 6.7).[7] The 12 percentage point difference between these projections indicates the impact of an older population's more intensive use of health services. In other words, aging of the population alone will exert a demand for 2,250 additional physician licenses.

It is worth reiterating that the projection on physician capacity here (blue or lower line in Figure 6.7) is based on physician licenses, not on counts of practicing physicians. This projection assumes a constant percentage of physician license holders 65 and older in the general population. Therefore, as the general population becomes older, it means the number of projected physician license holders 65 and older will become increasingly a larger share of the total physician license holders. However, the *actual* physician capacity, i.e. number of physicians actively practicing at any point of time, may be much lower than the license-based projection here if older physician license holders are less likely to be actively practicing, or less likely to practice full-time when they do practice, than younger physician license holders.

Figure 6.7



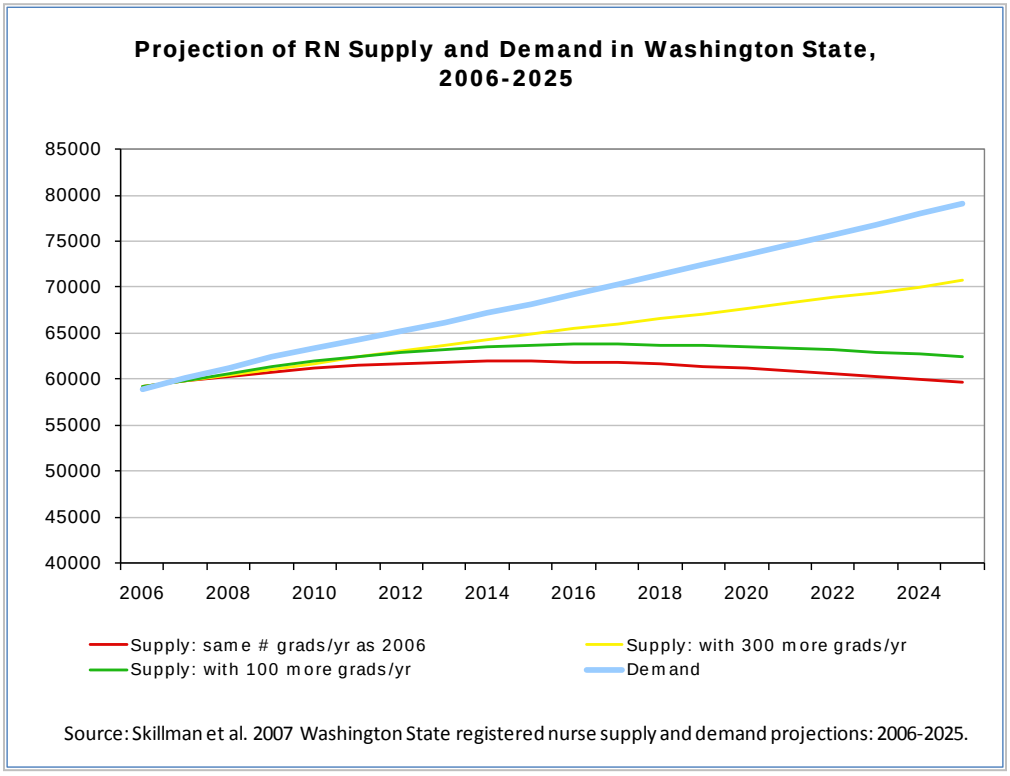
[7] The following approach was used to project demand for physician licenses associated with physician office visits (red or upper line in Figure 6.7). The 2007 National Ambulatory Medical Care Survey data (latest available at the time of analysis) were first used to obtain national rates of physician office visits for each age-sex population group. The national rates were accepted as proxies for Washington State's rates and were applied to respective population groups in Washington for 2008-2030 to obtain number of office visits in those age-sex population groups (using population projections from the Office of Financial Management). Then the total office visits by the total population in Washington were obtained by summing office visits of each age-sex population group for each year in 2008-2030. For 2008, a ratio of office visits to physician licenses was calculated by dividing the estimated total office visits by the total physician licenses. For each subsequent year in 2009-2030, the projected demand for physician licenses was then calculated by dividing the estimated total office visits by the 2008 ratio of office visits to physician licenses.

FUTURE DEMAND FOR REGISTERED NURSES

Similar increase in demand for nurses will emerge due to population changes.

Population growth and aging, as well as aging of the workforce, are also cited by University of Washington (UW) researchers at the Washington, Wyoming, Alaska, Montana, Idaho (WWAMI) Center for Health Workforce Studies (CHWS) as the main factors driving predictions of a gap between statewide demand and supply for RNs.[8] Their analysis estimated approximately 60,000 active RNs in 2008 (Figure 6.8). [9] Demand and supply of RNs started to diverge almost from the beginning of the projection, with increasingly larger gaps going towards 2025. By 2025, if nothing is done to increase RN supply, the UW researchers project a shortage of about 20,000 RNs due to population change and workforce aging. Even if Washington State's RN training programs increased numbers of graduates by 300 more per year, numbers of qualified nurses would still fall short of demand for their services in 2025.

Figure 6.8



A recent gap analysis by the Washington State Workforce Training and Education Coordination Board (WTECB) also projects a shortage of RNs in 2012-2017. The WTECB analysis projects a gap of 25 percent each year in this 5-year period based on supply estimates from Washington's education programs in 2008 and a demand that is derived from Department of Employment

[8] Skillman SM, Andrilla CHA, Hart LG. *Washington State registered nurse supply and demand projections: 2006-2025.*Final Report #112. Seattle, WA: WWAMI Center for Health Workforce Studies, University of Washington; Jun 2007. (http://depts.washington.edu/uwrhrc/uploads/CHWS_FR112_Skillman.pdf)

[9] Figure 6.8 was provided by UW authors based on their report cited above.

Security's occupational employment projections for this period augmented with additional information from job vacancy surveys and hospital surveys. [10]

CONCLUSIONS

Sound health workforce policy relies on accurate information. Current attempts to profile and project Washington State's health workforce are hampered by lack of accurate and comprehensive data. Just one already-existing information system, DOH's health license database, has potential to provide needed information. At present, DOH does not collect information on whether and where licensees are practicing, their current practice specialty, and time practicing measured in full-time-equivalence. In addition, it is unclear whether the address information now in the DOH database refers to business, home or other types of locations.

Despite its limitations, the DOH license database information already collected does offer a glimpse into the healthcare workforce's current capacity and the magnitude of emerging challenges. Analyses of existing license data suggest that current health workforce capacity varies considerably by region. Rural regions appear to be at a disadvantage in their health workforce capacity compared with urban regions. Spokane County, on the other hand, appears to have a health workforce capacity to which the other regions might aspire with perhaps the exception of King County.

During coming years, Washington State will be facing an expected increased demand for health professional workforce, especially physicians and nurses, if the current level of service utilization continues. The main driver of this increased demand will be, in addition to overall population growth, the aging of the general population as Baby Boomers reach retirement age.

As national data in early 2000s suggested that a health care workforce shortage was about to emerge, contrary to earlier findings, the 2003 Legislature directed the Workforce Training and Education Coordinating Board to convene the Health Care Personnel Shortage Task Force with the goal to develop a state plan to address shortages issues and monitor progress on that plan. Among other areas of progress since 2003, the Task Force has noted that over a five-year period, state policies have led to an increase in the number of students entering and completing many health care programs. For example, in a five-year period the numbers of individuals completing their qualifications to work as registered nurses has increased by more than 50 percent. The most recent Task Force report notes that addressing health care workforce shortage remains a challenge and outlines a number of strategies and outcome measures to achieve six goals that include increasing educational capacity, recruiting more, developing better data system, retaining current workforce, enabling community participation and continuing collaboration among stakeholders to meet future health care workforce needs. [11]

The solution to the looming health workforce shortage may need to include strategies beyond the well-trodden paths in education, recruitment and retention initiatives. Research on variations in hospital inpatient service utilization and ambulatory care-sensitive conditions elsewhere in this report suggests that Washington has room for improvement in reducing avoidable utilization.

[10] http://www.wtb.wa.gov/NursingOccupationShortages.asp
[11] http://www.wtb.wa.gov/HCTFAbout.asp

Reduction in avoidable utilization may, among other things, alleviate pressure on demands for health workforce and for facility resources. Whatever the option or combination of options ultimately selected to address the looming health care workforce shortage, the first step must be a precise definition of the issue in terms of numbers of active professionals, specialties of practice, the amount of time practicing and the geographic locations where more professionals are needed. That first step requires a source of accurate information on the active workforce. The current DOH health professional license information system can be improved, with minimum enhancements in initial licensing and license renewal processes, to become tomorrow's source of accurate information needed for assessment of the state's active health workforce.

CHAPTER 7

INVENTORYING OF WASHINGTON STATE'S HEALTH CARE FACILITIES

INTRODUCTION

E2SSB 5930 of 2007 directed the Strategic Health Planning Office to create an inventory of health care facilities in Washington. An accurate and comprehensive list of existing facilities is essential to fully understand Washington State's current health care resource distribution and also to support statewide planning.

Project inventory work began in the spring of 2008 with limited staff resources and continues as of this writing (November 2009). This section surveys work completed to date, describes processes employed and barriers encountered, and suggests directions for future data work.

WORK COMPLETED TO DATE

Table 7.1 shows the 11 types of health facilities for which project staff compiled and verified statewide inventories. The table also shows the number of facilities verified as extant, for each type of facility.

Table 7.1
Health Facilities Verified Statewide
(November 2009)

Facility Type	Existant Facilities/Agencies
*Ambulatory Surgery Centers (free-standing)**	278
Community Mental Health Centers	292
*Diagnostic Imaging Centers (free-standing)**	87
Home Health Agencies	177
Hospices (residential)	6
Hospitals	112
*Medical Laboratories (free-standing)**	59
Nursing Homes	263
Pharmacies	1,466
Renal Dialysis/Kidney Centers	66
Trauma Centers	85

**A free-standing facility refers to a financially and, often, physically discrete entity that is separate from a hospital or a medical center which may provide the same service a free-standing facility provides.*

OFM Forecasting Division, November 2009.
Data Source: Washington State Office of Financial Management.

Inventories for hospitals, ambulatory surgery centers, trauma centers, nursing homes, kidney dialysis centers, and diagnostic imaging centers have been made available in a web-based query system on the project's Health Care Delivery System webpage at http://www.ofm.wa.gov/shpo/deliverysystem/default.asp .

THE PROCESS

A. DATA COLLECTION

Minimum Information Required

The minimum information to be collected for each facility or business included facility name, type, location (street address, city and ZIP code) and contact phone number.

Data Sources

Most of the initial information for the inventory came from two types of sources: state agency administrative databases and business or professional association membership lists. It is worth noting that neither type of data source was designed for the purpose of healthcare facility inventorying. State agency sources most frequently accessed during this part of the project were the Washington State Department of Health (DOH) GIS data website (http://ww4.doh.wa.gov/gis/gisdata.htm), which was primarily built on data from the DOH facility license database, and the Industrial Insurance Accounts database at the Washington State Department of Labor and Industries (L&I).

Data Collection Methods

Staff either downloaded publicly available data from websites or made a direct request to each agency and association holding relevant data.

B. DATA PREPARATION

Staff converted the collected data to a single format, standardizing the data contents, removing duplicate records and combining different sources.

Converting Data

The first step in data preparation was to convert all source files into a single SAS format. Customized SAS codes were created and used to convert documents collected in formats other than SAS (e.g., Excel, text, HTML, Word and PDF).

Standardizing Source Data

Since the various data sources did not share a common naming convention for facility name and address, staff standardized the naming convention in those fields. For instance, the word "center" in a business name might appear in abbreviations of "CNTR" or "CTR." The abbreviations were converted to "center" to allow identification by computer programs of duplicate records. Where source data contained a single address field, it was separated into individual fields for facility name, street address, city, ZIP code and phone number.

Removing Duplicate Records and Combining Sources

Next, duplicative records in each source file were identified and removed by a computer program, and the various source files were combined into one working file. New fields added to the combined file indicated the original source(s) of a particular record. Staff inspected visually the combined list to identify possible duplicates not identified by the computer program due to discrepancies in name or address fields. The combined file was then output to a spreadsheet for verification.

C. FACILITY VERIFICATION

Multiple Objectives

During the verification process, staff employed multiple methods while accomplishing three objectives. These objectives were:

- Confirming that each facility record represented an actual service facility at the address listed rather than a central business (management or billing) office
- Determining whether each entity on a particular list met the inclusion criteria for a specific type of facility (e.g. nursing homes or ambulatory surgery centers).
- Verifying whether facility name, address, and contact information were accurate.

Multiple Methods

Resources consulted during verification included the Dex online phone directory (http://www.dexknows.com/) and information posted on the Internet. The latter was accessed via Google's search engine. Facility staff contacted by phone also confirmed or provided data.

In general, confirmation of each record started with lookup in the online phone directory. If project and directory data matched, the facility was considered verified. When this check failed to produce a match, researchers called the facility to request current data, using a brief structured call script. This script was tailored to obtain specific types of information needed for each facility type. Attempts to find an entity's phone number on the Internet were undertaken in those cases where source files and reverse phone directory searches by address did not supply one. Source lists for a particular facility type occasionally identified what appeared to be the same facility under two or more names. In these cases, staff consulted Washington State business registration query systems online to answer questions about business ownership and trade names. These query systems included:

a. Washington State Department of Licensing License Query System (https://fortress.wa.gov/dol/dolprod/bpdLicenseQuery/)
b. Washington Secretary of State Corporations Registration Data Search (http://www.secstate.wa.gov/corps/search.aspx)
c. Washington State Department of Revenue State Business Records Database (http://dor.wa.gov/content/doingbusiness/registermybusiness/BRD/)

Minor discrepancies in address information, such as transposed numbers in a ZIP code, were resolved by consulting the United States Postal Services ZIP Code Lookup at http://zip4.usps.com/zip4/welcome.jsp.

OBSERVATIONS ON BUILDING THE HEALTHCARE FACILITY INVENTORY

Data Comparability and Quality

Data comparability across sources surfaced as an issue during verification work.

Data arrived at OFM in a variety of configurations. These ranged from electronic data files in various formats (such as SAS, text, and Excel spreadsheets), to documents prepared in HTML, PDF or Word formats.

Some source lists did not contain phone numbers. In those that did, this information was missing from individual records to varying degrees. Because a key part of the inventory process was to conduct verification of facility operational status, contact phone information was essential. Staff devoted a significant amount of project time to searching for contact numbers through the processes noted above.

Source lists frequently provide addresses as a single field, which required separating data into individual fields for project work. Different sources also adopted differing naming conventions for facility name and address. At times these varied even within a single source.

Finally, a significant proportion of records in most of the sources were invalid due to outdated data, incorrect data, or the inclusion of facilities not meeting project criteria.

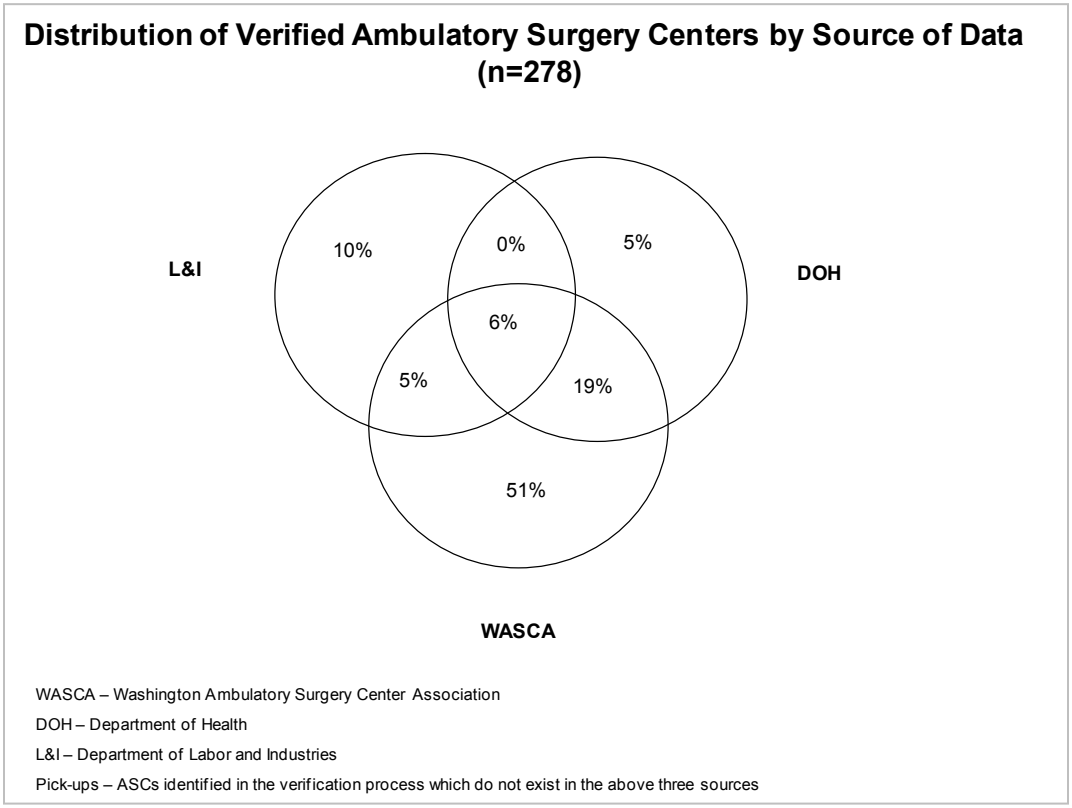
No Single Source Lists all Facilities of a Specific Type

While building the facility inventory, researchers tapped into multiple sources of data. However, none were designed to include all facilities of a particular type statewide. As a result, no single original source contained data for all facilities on any of the finished lists.

The project ambulatory surgery center inventory provides an example. Staff used three sources of data: the DOH list of ambulatory surgery centers, records extracted from L&I's Industrial Insurance Accounts database by industry code, and the Washington State Ambulatory Surgery Center Association's (WASCA's) membership list. Depending on the source, 20 to 40 percent of the original records did not make it to the verified inventory. In the verified (final) list, the WASCA data source accounted for 80 percent of the records, while the other two sources each accounted for less than 30 percent.[1] Just 6 percent of the records verified as extant facilities were on all three original source lists (Figure 7.1). Staff added ambulatory surgery centers not on the combined list when phone informants volunteered information about them, but did not undertake additional research to identify missing facilities. As a result, completed inventories may not account for all facilities of each type in Washington State.

[1] The percents here add to more than 100 because of cross-listing of records by the sources.

Figure 7.1



OFM Forecasting Division, November 2009.
Data Source: Washington State Office of Financial Management.

Key Facility Details Needed for Resource Planning do not Exist in the Majority of Data Sources

The overall facility inventory includes information on facility name, type, and location only. This information provides a good basis for understanding the distribution of facilities of various types across the state. Effective and strategic health resource planning, however, requires complex information that goes well beyond facility counts to service volumes, staffing, capacity, revenue, cost, etc. With the exception of several hospital databases, such information did not exist in any of the data sources project staff were able to access.

Limited Access to Data Sources That do Exist

Unless the source data is downloadable from a public website, access to it is limited in terms of both content and response to requests for data sharing. Source agencies or organizations generally decided what they could or would share with the project. In most cases, this was a minimum data set: facility name, type, and location. Project researchers generally made several rounds of phone calls, emails, or meetings to obtain data. At times, several months passed between initial contact and receipt of data from just one source.

Phone Call Data May Not be Reliable and Efficient

Facility data gathering through the simple ad-hoc, though structured, phone calls described above may result in inaccuracies when researcher and respondent do not share the same concepts for key terms or when the respondent does not have accurate knowledge. This problem was most apparent during verification of the laboratory inventory. Lab services may or may not require significant and obvious dedicated physical space, a "laboratory" per se; in practice, in fact, they often do not. However, employees answering the phone at facilities during early verification efforts may have assumed that a question about "medical testing" or a "laboratory" was a question about a space or facility dedicated to lab work in the same way a high school chemistry lab usually can be identified as a "lab" – defining "test" and "lab" differently than project definitions. The fact that some tests conducted in medical offices are considered "waived" by state and federal law further complicated the issue, as staff sometimes did not consider these tests when answering questions. The end result may have been some false negatives: Staff who said that a site did not perform medical testing when in fact some facility personnel did undertake testing and examination of resultant materials. In the case of the laboratory list, project staff adjusted the call script and the working definition of "laboratory" to reduce the possibility of misunderstanding. However, there is no way to know how often this type of miscommunication affected data quality during the verification aspect of the project as a whole.

Phone verification is not a particularly time-efficient method for confirming service and address data for healthcare entities. Employees in Washington facilities and offices very often are both busy and the target of frequent, sometimes aggressive, commercial solicitations. Phone receptionists occasionally were understandably reluctant to answer questions or to connect a caller directly to administrative personnel without a reason they understood to be legitimate. In an effort to quantify the impact of this issue on project work, staff tabulated the outcomes of 355 calls over a two-week period. Of these calls, 220 (62 percent) resulted in immediate verification (including some duplications) of 240 records. The remaining calls terminated in leaving a message or in failure to achieve a useful live interaction (busy signal, wrong number, cut off). Entity employees returned only an estimated 10 percent of messages without another call from project staff, necessitating time spent making additional calls.[2]

Considerable Amount of Time Required From Start to Finish

In the absence of a comprehensive health care facility database designed to track relevant data, building a valid inventory must involve a general and relatively inefficient process similar to that described. Each of the steps in such an approach can require considerable staff time. Even the shortest project inventory list required more than a month of time for verification, from start to finish. The facility lists completed above required a .50 FTE staff person for 16 months for verification in addition to approximately a two-month FTE time by a second staff person scattered over an 18-month period conducting data source identification, data acquisition, data processing, and documentation and reporting.

[2] First call success rate did vary with facility type. In a second, much smaller, test during a subsequent verification process, 16 of 20 first calls resulted in verifications, a rate of 80 percent.

Continuous Updates Needed to Keep the Inventory Current

Health care is a dynamic field and even locations, a demographic that might seem relatively stable, change. Keeping current a comprehensive facility inventory requires regular updates. This means repeating the entire process at a defined interval or continually updating the data as new information becomes available. It may also mean adding data from newly identified sources.

Toward a Single Source of Comprehensive Facility Database?

Our approach in building the health care inventory appears to be the most feasible in the absence of a single and comprehensive health care facility database. However, this approach may not be the most desirable long-term solution in supporting strategic planning of health resources in Washington. In addition to obstacles in collecting data from multiple sources and data comparability and quality issues we faced in our current approach, there is no assurance that some of the sources we used will continue to exist. The most desirable long-term solution, it seems, is a single information system that includes, and interacts directly with, all health care facilities (e.g., through licensing).

APPENDIX 4-A: SUPPLEMENTARY INFORMATION FOR CHAPTER 4 - REGIONAL VARIATIONS IN POTENTIALLY AVOIDABLE HOSPITALIZATIONS

Data Tables and Graphs

Washington State Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs), 1990-2007

(Excluding Clark County)

Rates Per 100,000 Adult Population Standardized to 2004 Population

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	National 2004 Rate
Composite Measures																			
---Overall ACSC	1,292	1,287	1,293	1,327	1,154	1,130	1,134	1,121	1,105	1,178	1,148	1,147	1,122	1,086	1,021	1,088	1,017	995	1,879
---Chronic	874	871	882	876	739	702	694	681	658	677	668	664	638	615	592	614	585	583	1,156
---Acute	418	416	411	451	415	428	440	440	447	501	480	482	484	471	430	474	432	412	723
Specific Conditions																			
---Diabetes, Short-term Complications	28	28	28	29	29	28	27	26	28	30	32	37	38	39	37	42	45	47	55
---Diabetes, Long-term Complications	72	73	75	69	62	61	67	61	63	64	65	66	65	67	65	66	69	68	127
---COPD	106	114	137	155	128	133	140	143	144	162	151	151	140	134	117	128	113	112	230
---Hypertension	13	12	12	12	13	12	11	12	12	12	15	15	14	12	16	15	18	22	50
---CHF	288	298	300	306	279	276	277	282	276	271	278	268	257	252	260	264	248	242	489
---Dehydration	71	76	77	74	71	72	74	72	67	71	76	77	76	66	62	60	54	50	127
---Bacterial Pneumonia	257	249	244	290	262	274	283	284	295	334	303	304	309	307	266	305	265	245	418
---Urinary Infections	90	90	90	87	81	82	83	85	85	96	101	101	99	98	102	110	114	117	177
---Angina without Procedure	264	251	242	205	138	93	78	65	53	46	43	37	33	24	21	20	18	16	46
---Uncontrolled Diabetes	n/a	n/a	n/a	2	10	9	8	8	7	8	8	8	7	6	6	7	6	7	22
---Adult Asthma	93	87	81	88	73	80	76	71	65	72	65	69	73	70	61	66	59	61	121
---Lower Extremity Amputation among Patients with Diabetes	19	21	20	23	23	24	25	26	26	27	26	26	25	24	24	21	23	22	39

OFM Forecasting Division, November 2009

Washington State Department of Health CHARS 1990-2007

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Overall ACSC					US 2004 Average:	1,879					Washington 2004 Average:	1,021					
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	1,333	1,343	1,392	1,459	1,300	1,253	1,201	1,283	1,210	1,384	1,369	1,367	1,361	1,309	1,243	1,352	1,252	1,179
KING	1,176	1,185	1,119	1,144	1,027	1,022	1,035	1,004	986	1,024	996	982	952	926	866	938	865	832
NORTH SOUND	1,247	1,187	1,235	1,167	954	972	1,001	973	993	1,147	1,108	1,100	1,115	1,087	1,036	1,085	988	1,051
OTHER PUGET SOUND METRO	1,327	1,327	1,294	1,325	1,161	1,080	1,075	1,019	987	1,069	982	1,055	1,102	1,056	946	1,004	958	948
PIERCE	1,066	1,029	1,165	1,265	1,026	1,013	1,054	1,047	1,098	1,112	1,124	1,099	1,120	1,118	1,116	1,188	1,133	1,129
SNOHOMISH	1,254	1,343	1,335	1,262	980	979	941	938	917	962	946	985	898	810	727	751	719	701
SPOKANE	1,357	1,355	1,335	1,464	1,234	1,183	1,225	1,275	1,174	1,300	1,225	1,162	1,101	1,032	933	1,129	1,012	952
WEST BALANCE	2,097	1,996	2,028	2,066	1,896	1,845	1,876	1,860	1,797	1,903	1,834	1,834	1,796	1,753	1,687	1,618	1,531	1,475
YAKIMA - TRI CITIES	1,303	1,278	1,351	1,434	1,358	1,305	1,253	1,173	1,250	1,338	1,341	1,373	1,303	1,299	1,211	1,302	1,236	1,270

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Chronic ACSC					US 2004 Average:	1,156					Washington 2004 Average:	592					
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	844	852	915	924	819	749	722	772	701	767	781	741	710	649	647	682	500	604
KING	788	790	747	743	649	630	636	616	580	587	573	568	547	527	505	534	516	474
NORTH SOUND	782	788	815	736	559	596	589	568	557	629	623	618	603	564	549	580	558	580
OTHER PUGET SOUND METRO	895	889	889	885	740	679	672	642	606	649	596	633	643	604	568	579	685	563
PIERCE	729	700	813	857	674	648	660	635	676	668	687	661	668	682	682	690	419	712
SNOHOMISH	905	975	951	856	646	627	596	583	571	557	533	579	506	462	446	432	573	423
SPOKANE	885	852	878	934	797	723	707	730	662	692	694	674	643	616	550	660	905	597
WEST BALANCE	1,492	1,415	1,431	1,399	1,250	1,165	1,152	1,126	1,082	1,100	1,096	1,062	1,020	1,006	983	934	714	886
YAKIMA - TRI CITIES	892	903	948	994	877	801	760	725	765	787	780	796	734	734	674	724	714	755

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Acute ACSC					US 2004 Average:			723					Washington 2004 Average:				430
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	490	491	478	534	480	504	480	512	509	617	590	627	650	659	596	671	590	576
KING	388	395	372	402	379	392	399	388	406	437	423	414	406	399	361	403	365	359
NORTH SOUND	464	399	421	431	395	377	412	404	436	517	483	483	511	524	487	503	473	469
OTHER PUGET SOUND METRO	433	438	405	441	420	403	403	377	382	419	387	422	459	453	377	426	399	386
PIERCE	337	329	353	409	351	366	394	413	422	444	436	438	453	435	434	498	449	417
SNOHOMISH	349	368	384	406	333	353	344	355	347	404	412	406	392	348	281	319	299	277
SPOKANE	471	503	456	530	438	458	519	544	513	608	533	487	458	417	383	470	437	354
WEST BALANCE	606	581	597	668	648	680	724	736	714	802	738	773	775	747	704	686	624	591
YAKIMA - TRI CITIES	410	374	403	438	481	506	493	448	485	552	560	577	569	565	537	577	520	514

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Diabetes, ST Complications				US 2004 Average:	55					Washington 2004 Average:	37						
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	19	24	18	22	28	22	22	25	17	21	23	39	36	30	32	33	40	43
KING	28	30	32	29	29	30	30	27	29	31	32	33	34	39	33	34	35	37
NORTH SOUND	20	21	30	29	21	19	15	17	21	24	24	37	36	30	33	44	60	49
OTHER PUGET SOUND METRO	26	24	21	28	26	25	27	24	22	25	26	35	39	31	28	33	42	47
PIERCE	27	21	26	31	26	29	30	34	35	34	35	42	41	44	41	47	53	56
SNOHOMISH	37	35	30	29	26	32	27	21	31	32	28	39	32	42	42	47	51	52
SPOKANE	33	27	27	34	32	21	19	22	27	28	27	39	40	45	45	58	46	55
WEST BALANCE	37	38	29	38	39	42	32	31	25	33	50	39	47	44	48	43	51	50
YAKIMA - TRI CITIES	25	23	24	27	34	27	32	35	30	28	37	43	46	44	42	53	61	60

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Diabetes, LT Complications					US 2004 Average:			127					Washington 2004 Average:				65
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	74	77	85	67	64	53	65	60	52	67	65	70	67	71	76	64	67	61
KING	66	78	65	63	56	61	62	58	59	58	61	61	60	61	56	64	66	61
NORTH SOUND	72	73	80	66	53	64	68	66	60	72	67	74	76	78	74	69	64	71
OTHER PUGET SOUND METRO	56	52	55	58	44	45	53	40	47	57	48	53	50	53	46	57	60	58
PIERCE	67	64	77	70	70	58	67	58	69	66	64	65	69	72	78	74	76	85
SNOHOMISH	59	65	80	75	58	64	68	63	63	56	53	55	60	58	55	53	54	59
SPOKANE	79	69	73	67	62	59	62	71	61	59	79	74	73	65	65	64	69	73
WEST BALANCE	114	89	102	98	97	77	96	86	87	86	81	87	74	82	89	92	102	85
YAKIMA - TRI CITIES	86	89	94	76	73	72	72	65	85	84	85	77	70	80	71	69	75	78

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	COPD					US 2004 Average:	230				Washington 2004 Average:			117				
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	113	108	174	185	152	162	156	172	186	184	185	173	157	155	142	177	171	161
KING	85	94	96	112	104	103	115	120	113	128	117	115	112	100	93	98	93	82
NORTH SOUND	89	114	113	108	84	119	111	107	120	141	140	132	119	116	121	123	106	118
OTHER PUGET SOUND METRO	113	132	153	181	159	147	148	136	119	149	129	123	135	136	110	119	84	101
PIERCE	91	83	146	178	145	143	163	146	163	173	164	153	145	152	143	154	129	135
SNOHOMISH	107	132	139	145	102	110	106	120	119	125	119	144	117	86	56	55	54	58
SPOKANE	141	139	167	198	139	155	174	206	194	217	197	196	161	162	131	182	132	124
WEST BALANCE	199	176	216	244	204	212	233	223	225	281	269	258	249	257	221	219	186	189
YAKIMA - TRI CITIES	96	120	143	161	126	144	129	138	149	177	153	178	166	161	125	140	148	151

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Hypertension					US 2004 Average:			50			Washington 2004 Average:			16			
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	19	16	19	17	13	17	18	19	12	17	19	20	16	10	13	12	11	18
KING	12	9	9	9	10	11	10	11	11	11	13	16	13	14	15	16	15	16
NORTH SOUND	13	8	14	9	12	7	9	11	15	8	14	17	14	14	13	9	11	14
OTHER PUGET SOUND METRO	11	11	10	13	10	8	12	9	11	10	7	14	13	10	15	18	22	23
PIERCE	9	10	8	10	8	7	9	10	7	7	12	12	18	14	20	15	29	38
SNOHOMISH	13	17	14	12	17	10	9	7	12	11	12	12	11	6	12	9	13	19
SPOKANE	18	18	13	18	18	18	14	20	12	14	17	13	10	11	10	13	13	19
WEST BALANCE	21	14	14	16	20	17	10	14	14	16	18	14	12	12	18	16	20	19
YAKIMA - TRI CITIES	8	9	10	21	16	23	17	11	19	22	29	23	21	17	25	28	28	34

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	CHF					US 2004 Average:	489				Washington 2004 Average:			260				
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	263	281	276	276	265	255	267	302	259	285	302	286	289	271	269	286	267	228
KING	269	282	271	273	254	249	257	257	250	243	245	238	230	224	233	245	217	204
NORTH SOUND	264	270	274	264	224	238	244	231	232	262	261	232	232	228	227	249	199	232
OTHER PUGET SOUND METRO	260	269	275	293	257	242	258	273	265	275	261	272	263	257	259	246	258	241
PIERCE	243	244	274	285	269	274	263	272	273	260	278	261	265	272	294	286	292	290
SNOHOMISH	277	311	299	295	247	246	230	236	237	229	231	242	201	197	204	197	191	177
SPOKANE	302	297	309	329	287	278	260	263	252	253	261	235	231	213	198	228	219	231
WEST BALANCE	495	479	481	494	465	474	465	493	475	423	456	437	410	413	435	394	395	384
YAKIMA - TRI CITIES	323	325	352	370	339	331	337	310	339	332	335	322	293	290	305	318	289	316

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Dehydration					US 2004 Average:			127				Washington 2004 Average:				62	
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	73	73	78	81	67	65	61	84	78	93	102	101	102	85	80	82	63	69
KING	71	76	72	67	72	70	68	62	61	65	72	75	72	66	55	55	48	42
NORTH SOUND	73	60	68	63	51	56	62	64	51	58	62	59	70	62	71	51	56	46
OTHER PUGET SOUND METRO	85	103	90	70	67	69	87	62	58	64	68	78	84	75	72	79	65	55
PIERCE	65	72	76	68	63	56	63	65	56	62	57	63	73	57	53	51	56	56
SNOHOMISH	66	72	77	75	64	67	61	76	63	63	71	75	64	47	50	55	52	36
SPOKANE	74	96	80	91	86	84	108	90	89	94	87	91	69	56	54	50	40	38
WEST BALANCE	74	76	93	104	100	110	111	105	99	86	97	80	89	78	81	70	61	68
YAKIMA - TRI CITIES	67	61	69	77	76	90	80	69	72	87	97	90	82	79	72	61	59	62

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Bacteria Pneumonia					US 2004 Average:			418					Washington 2004 Average:			266	
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	319	310	298	356	323	355	329	336	349	435	391	425	454	477	414	458	394	383
KING	229	232	213	250	222	237	248	241	258	277	252	239	239	235	209	243	208	201
NORTH SOUND	309	260	266	292	276	262	281	269	316	371	324	324	343	362	303	342	303	299
OTHER PUGET SOUND METRO	256	234	221	290	277	261	250	246	251	276	240	258	283	292	231	261	244	228
PIERCE	196	190	197	262	226	235	254	261	278	290	283	273	284	273	255	320	274	230
SNOHOMISH	214	209	223	258	209	209	214	222	219	267	255	250	245	235	168	195	171	174
SPOKANE	311	313	285	358	287	302	328	366	351	423	354	319	313	292	261	334	303	229
WEST BALANCE	396	376	391	437	419	452	494	499	482	564	501	541	535	518	463	465	413	372
YAKIMA - TRI CITIES	245	232	241	266	299	318	308	289	316	353	329	360	356	364	322	373	300	281

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Urinary Infection					US 2004 Average:			177				Washington 2004 Average:				102	
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	100	108	101	96	90	84	89	95	83	90	97	101	95	98	102	131	132	124
KING	88	88	88	85	84	84	83	85	87	95	99	100	95	98	97	105	109	115
NORTH SOUND	82	78	86	75	68	58	70	70	68	89	98	101	99	98	113	112	116	124
OTHER PUGET SOUND METRO	92	102	94	80	77	72	67	70	71	79	79	86	90	84	74	86	92	103
PIERCE	76	66	79	78	63	74	76	86	86	92	95	102	94	105	126	128	120	132
SNOHOMISH	70	86	85	74	61	77	68	58	65	73	87	81	83	65	64	70	76	66
SPOKANE	86	96	89	82	66	70	84	88	73	93	92	79	76	69	68	86	96	86
WEST BALANCE	136	131	113	127	128	117	119	132	135	154	142	152	150	151	160	152	151	150
YAKIMA - TRI CITIES	98	80	90	97	106	98	105	90	98	111	133	126	131	121	143	145	162	172

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition: Angina w/o Procedure **US 2004 Average: 46** **Washington 2004 Average: 21**

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	270	256	251	262	204	130	96	102	102	94	90	66	50	31	34	32	31	24
KING	227	210	192	164	108	86	73	55	41	33	30	23	19	17	13	14	12	10
NORTH SOUND	248	237	257	190	102	70	66	74	48	44	41	31	37	20	18	16	17	19
OTHER PUGET SOUND METRO	315	295	270	202	146	97	73	61	46	45	42	44	40	29	20	16	15	15
PIERCE	185	184	201	186	73	47	33	23	35	26	30	29	25	19	18	19	14	14
SNOHOMISH	327	313	298	210	118	83	77	55	39	31	29	26	18	13	15	16	8	8
SPOKANE	198	186	173	158	138	69	62	46	32	22	18	19	17	14	11	14	14	15
WEST BALANCE	493	481	464	372	302	210	192	166	147	136	117	111	106	76	60	56	52	46
YAKIMA - TRI CITIES	248	238	244	245	194	96	78	65	40	37	44	42	35	25	21	18	22	17

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Uncontrolled Diabetes			US 2004 Average:	22					Washington 2004 Average:	6							
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	n/a	n/a	n/a	1	11	21	12	12	7	15	11	15	17	10	12	13	8	11
KING	n/a	n/a	n/a	2	11	8	8	7	8	6	4	6	5	3	4	5	5	5
NORTH SOUND	n/a	n/a	n/a	0	5	6	6	6	4	7	7	10	8	7	8	5	5	5
OTHER PUGET SOUND METRO	n/a	n/a	n/a	3	5	6	4	7	10	5	7	8	7	5	4	7	9	6
PIERCE	n/a	n/a	n/a	2	9	7	8	10	7	8	11	9	8	7	8	12	7	9
SNOHOMISH	n/a	n/a	n/a	2	9	5	7	6	4	3	4	4	4	4	7	5	6	7
SPOKANE	n/a	n/a	n/a	2	10	9	10	7	5	7	6	4	6	5	3	4	2	6
WEST BALANCE	n/a	n/a	n/a	3	12	11	8	8	9	15	15	12	11	9	7	11	8	10
YAKIMA - TRI CITIES	n/a	n/a	n/a	2	18	13	11	11	12	10	15	12	7	7	6	9	11	14

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	Adult Asthma					US 2004 Average:	121					Washington 2004 Average:	61					
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	80	81	82	84	74	80	75	69	57	72	70	61	68	58	57	58	57	51
KING	93	78	72	80	69	74	73	72	62	66	61	67	65	60	51	54	50	52
NORTH SOUND	62	57	40	64	51	61	56	44	44	58	60	66	68	61	47	63	50	65
OTHER PUGET SOUND METRO	102	96	96	102	80	98	83	80	71	72	61	70	83	69	75	75	59	57
PIERCE	99	85	77	89	68	74	77	72	72	82	78	76	84	87	74	77	75	79
SNOHOMISH	77	89	82	81	62	66	58	60	55	57	47	42	49	43	41	44	35	39
SPOKANE	111	111	111	119	104	111	98	86	73	85	74	84	92	92	78	94	73	68
WEST BALANCE	126	128	118	118	94	106	98	91	81	92	76	87	91	94	89	92	82	93
YAKIMA - TRI CITIES	88	92	71	82	67	81	75	67	73	86	72	88	85	95	73	86	78	84

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Adult Resident Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs)
Washington State Regions (Excluding Clark County)
1990-2007
(Rates Per 100,000 Adult Population Standardized to 2004 Population)

ACSC Condition:	LE Amputation (Diabetics)					US 2004 Average:			39				Washington 2004 Average:			24		
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
EAST BALANCE	15	18	24	19	19	20	27	25	25	26	30	27	24	24	26	20	24	20
KING	18	23	21	22	21	22	22	23	21	26	25	22	22	21	20	18	20	20
NORTH SOUND	27	22	18	25	18	29	25	26	20	30	23	25	25	23	27	24	24	28
OTHER PUGET SOUND METRO	17	19	16	23	24	20	28	19	26	21	25	27	25	24	21	25	26	28
PIERCE	16	18	13	21	21	20	23	21	30	28	28	28	27	25	21	19	21	23
SNOHOMISH	16	21	21	22	19	25	28	33	24	24	26	29	24	23	28	19	21	21
SPOKANE	14	19	16	18	19	21	19	23	24	20	31	24	24	20	25	21	21	24
WEST BALANCE	25	23	21	35	38	32	42	34	42	37	30	35	38	38	37	29	34	32
YAKIMA - TRI CITIES	31	24	25	23	30	32	25	39	31	34	22	22	21	29	22	23	24	13

OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1990

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	0.94	0.88	1.06	0.65	0.95	0.95	1.42	0.79	0.95	1.11	1.00	0.95	n/a	0.81	0.76
KING	0.98	0.97	0.99	1.00	0.96	0.88	0.92	1.02	1.05	0.95	1.02	0.94	n/a	1.02	1.08
NORTH SOUND	0.89	0.83	1.01	0.71	1.00	0.79	0.92	0.83	0.93	1.09	0.88	0.87	n/a	0.64	1.43
OTHER PUGET SOUND METRO	1.02	1.02	1.03	0.95	0.78	1.07	0.96	0.91	1.22	0.97	1.02	1.20	n/a	1.05	0.93
PIERCE	0.88	0.89	0.87	0.96	0.97	0.93	0.71	0.92	0.97	0.83	0.89	0.75	n/a	1.08	0.79
SNOHOMISH	1.09	1.16	0.94	1.26	0.88	1.16	1.14	1.12	1.05	0.94	0.85	1.39	n/a	0.85	1.00
SPOKANE	0.99	0.96	1.05	1.10	1.06	1.25	1.36	0.95	0.94	1.13	0.90	0.72	n/a	1.20	0.69
WEST BALANCE	1.26	1.31	1.14	1.31	1.33	1.35	1.28	1.25	0.82	1.18	1.30	1.42	n/a	1.22	1.00
YAKIMA - TRI CITIES	1.01	1.01	0.98	0.93	1.15	0.89	0.68	1.12	0.93	0.95	1.11	0.94	n/a	0.97	1.58

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1990.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1991

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	0.94	0.88	1.07	0.80	0.98	0.85	1.32	0.82	0.86	1.11	1.11	0.92	n/a	0.87	0.71
KING	0.99	0.98	1.01	1.09	1.10	0.91	0.85	1.03	1.06	0.99	1.02	0.91	n/a	0.91	1.18
NORTH SOUND	0.85	0.84	0.88	0.86	0.91	0.93	0.65	0.81	0.75	0.95	0.79	0.88	n/a	0.66	0.95
OTHER PUGET SOUND METRO	1.04	1.03	1.06	0.89	0.74	1.14	1.07	0.92	1.33	0.95	1.15	1.20	n/a	1.08	0.94
PIERCE	0.85	0.86	0.84	0.75	0.89	0.79	0.89	0.90	1.01	0.82	0.78	0.78	n/a	1.02	0.86
SNOHOMISH	1.16	1.25	0.98	1.28	0.95	1.35	1.58	1.23	1.07	0.93	1.04	1.41	n/a	1.05	1.12
SPOKANE	0.99	0.93	1.12	0.93	0.96	1.18	1.42	0.90	1.13	1.17	0.97	0.69	n/a	1.23	0.86
WEST BALANCE	1.21	1.25	1.12	1.39	1.01	1.13	1.00	1.18	0.81	1.17	1.24	1.47	n/a	1.31	0.84
YAKIMA - TRI CITIES	0.98	1.03	0.89	0.77	1.21	1.06	0.78	1.10	0.77	0.93	0.89	0.94	n/a	1.01	1.19

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1991.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1992

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	0.97	0.94	1.05	0.64	1.09	1.13	1.68	0.80	0.93	1.09	1.03	0.95	n/a	0.94	1.13
KING	0.93	0.91	0.96	1.16	0.90	0.78	0.82	0.99	0.99	0.93	1.02	0.86	n/a	0.93	1.18
NORTH SOUND	0.88	0.85	0.93	1.10	0.99	0.77	1.29	0.82	0.80	0.98	0.87	0.98	n/a	0.51	0.84
OTHER PUGET SOUND METRO	1.02	1.01	1.02	0.73	0.77	1.11	1.08	0.93	1.23	0.93	1.06	1.13	n/a	1.17	0.78
PIERCE	0.96	0.98	0.92	0.94	1.02	1.13	0.78	1.00	1.06	0.87	0.94	0.88	n/a	0.98	0.68
SNOHOMISH	1.15	1.20	1.04	1.08	1.08	1.15	1.39	1.18	1.13	1.03	1.02	1.38	n/a	1.05	1.20
SPOKANE	0.98	0.94	1.05	0.91	1.03	1.18	1.24	0.93	0.98	1.11	0.93	0.68	n/a	1.32	0.83
WEST BALANCE	1.22	1.25	1.15	0.98	1.15	1.16	1.06	1.19	0.96	1.24	1.08	1.47	n/a	1.28	0.86
YAKIMA - TRI CITIES	1.04	1.07	0.98	0.89	1.25	1.07	1.00	1.18	0.91	0.99	0.99	1.00	n/a	0.85	1.23

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1992.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
1993

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	0.99	0.95	1.07	0.69	0.92	1.06	1.35	0.79	1.01	1.10	1.02	1.18	0.67	0.91	0.79
KING	0.92	0.91	0.95	1.01	0.95	0.80	0.78	0.97	0.96	0.92	1.02	0.86	1.23	0.93	1.05
NORTH SOUND	0.80	0.77	0.87	0.92	0.91	0.63	0.77	0.77	0.79	0.91	0.77	0.86	1.00	0.71	1.04
OTHER PUGET SOUND METRO	1.00	1.01	0.99	0.94	0.82	1.14	1.10	0.96	0.91	1.00	0.96	0.98	4.00	1.17	1.00
PIERCE	1.02	1.05	0.97	1.05	1.04	1.23	0.86	1.02	0.97	0.97	0.96	0.97	1.60	1.03	0.94
SNOHOMISH	1.07	1.10	1.01	0.98	1.12	1.09	1.03	1.14	1.13	1.01	0.95	1.14	3.00	0.94	0.99
SPOKANE	1.03	1.01	1.09	1.17	1.02	1.20	1.44	0.98	1.14	1.14	0.87	0.73	1.33	1.32	0.81
WEST BALANCE	1.22	1.24	1.18	1.31	1.19	1.17	1.15	1.19	1.11	1.18	1.25	1.38	1.60	1.22	1.18
YAKIMA - TRI CITIES	1.07	1.13	0.97	0.93	1.04	1.04	1.71	1.22	1.01	0.92	1.10	1.18	5.00	0.92	1.00

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1993.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1994

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.02	1.00	1.05	0.94	1.00	1.08	1.08	0.83	0.89	1.11	1.02	1.34	1.00	0.95	0.75
KING	0.95	0.94	0.97	1.03	0.94	0.89	0.81	0.98	1.06	0.91	1.08	0.85	1.12	0.98	1.01
NORTH SOUND	0.75	0.69	0.86	0.79	0.82	0.60	0.86	0.71	0.70	0.94	0.76	0.69	0.46	0.68	0.74
OTHER PUGET SOUND METRO	1.01	1.00	1.02	0.84	0.71	1.21	0.81	0.95	0.95	1.06	0.96	1.05	0.46	1.12	1.12
PIERCE	0.95	0.97	0.91	0.89	1.15	1.22	0.63	1.06	0.94	0.93	0.82	0.56	1.02	0.95	0.96
SNOHOMISH	0.95	0.98	0.90	0.92	0.98	0.92	1.53	1.04	1.01	0.89	0.83	0.94	0.94	0.87	0.94
SPOKANE	1.01	1.02	0.98	1.07	1.06	1.04	1.66	0.92	1.11	1.02	0.73	0.94	0.88	1.43	0.84
WEST BALANCE	1.28	1.31	1.23	1.39	1.30	1.18	1.33	1.24	1.10	1.24	1.31	1.66	1.03	1.18	1.29
YAKIMA - TRI CITIES	1.17	1.17	1.16	1.10	1.13	0.99	1.40	1.22	1.06	1.13	1.33	1.38	1.54	0.94	1.28

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1994.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1995

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.00	0.96	1.06	0.75	0.82	1.07	1.26	0.82	0.83	1.16	0.93	1.25	2.10	0.96	0.80
KING	0.96	0.96	0.97	1.06	1.03	0.85	0.97	0.97	1.01	0.92	1.07	0.99	0.91	0.93	1.01
NORTH SOUND	0.78	0.77	0.80	0.64	1.00	0.79	0.58	0.76	0.73	0.86	0.67	0.66	0.62	0.74	1.13
OTHER PUGET SOUND METRO	0.96	0.97	0.94	0.87	0.71	1.11	0.71	0.90	0.95	0.97	0.89	1.04	0.72	1.20	0.83
PIERCE	0.96	0.98	0.92	0.99	0.98	1.16	0.61	1.08	0.83	0.93	0.97	0.54	0.80	0.97	0.92
SNOHOMISH	0.97	1.00	0.92	1.15	1.14	0.94	0.83	1.07	1.04	0.85	1.03	1.00	0.63	0.83	1.12
SPOKANE	0.99	0.98	1.00	0.76	0.94	1.10	1.44	0.92	1.11	1.03	0.79	0.71	0.92	1.36	0.83
WEST BALANCE	1.28	1.30	1.25	1.59	1.10	1.18	1.09	1.27	1.22	1.28	1.21	1.75	1.07	1.22	1.00
YAKIMA - TRI CITIES	1.15	1.13	1.17	0.95	1.16	1.08	1.94	1.20	1.25	1.15	1.20	1.02	1.48	0.99	1.29

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1995.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1996

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	0.96	0.95	0.98	0.80	0.94	1.00	1.68	0.85	0.76	1.05	0.96	1.12	1.36	0.99	0.95
KING	0.97	0.98	0.97	1.08	0.98	0.89	0.91	1.01	0.97	0.94	1.04	0.99	1.00	0.98	0.95
NORTH SOUND	0.80	0.77	0.85	0.57	0.99	0.69	0.78	0.77	0.78	0.89	0.77	0.79	0.70	0.71	0.89
OTHER PUGET SOUND METRO	0.96	0.98	0.92	1.02	0.76	1.08	1.06	0.95	1.14	0.89	0.82	0.93	0.50	1.09	1.13
PIERCE	0.99	1.01	0.96	1.16	1.04	1.24	0.83	1.04	0.91	0.96	0.98	0.44	1.06	1.04	0.92
SNOHOMISH	0.93	0.96	0.88	0.96	1.07	0.87	0.79	0.99	0.92	0.86	0.92	1.09	0.93	0.78	1.26
SPOKANE	1.01	0.95	1.09	0.70	0.92	1.18	1.19	0.84	1.31	1.07	0.92	0.74	1.15	1.27	0.72
WEST BALANCE	1.29	1.30	1.29	1.12	1.20	1.23	0.76	1.24	1.18	1.35	1.17	1.95	0.81	1.21	1.34
YAKIMA - TRI CITIES	1.09	1.08	1.10	1.16	1.08	0.90	1.61	1.21	1.06	1.07	1.28	0.97	1.16	0.95	0.93

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1996.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1997

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.04	1.02	1.05	0.95	0.92	1.07	1.61	0.94	1.05	1.06	1.01	1.43	1.37	0.94	0.85
KING	0.95	0.97	0.94	1.00	1.01	0.91	1.01	0.98	0.92	0.91	1.04	0.91	0.89	1.02	0.99
NORTH SOUND	0.80	0.77	0.84	0.61	1.03	0.67	0.87	0.73	0.83	0.88	0.77	1.05	0.61	0.62	0.88
OTHER PUGET SOUND METRO	0.92	0.95	0.86	0.90	0.64	0.96	0.75	0.99	0.88	0.87	0.83	0.94	0.89	1.12	0.77
PIERCE	1.00	1.00	1.00	1.28	0.96	1.07	0.89	1.06	0.96	0.99	1.09	0.39	1.34	1.03	0.84
SNOHOMISH	0.94	0.96	0.92	0.80	1.10	0.96	0.64	0.98	1.18	0.89	0.77	0.93	0.73	0.86	1.41
SPOKANE	1.06	1.01	1.14	0.89	1.17	1.34	1.69	0.85	1.17	1.18	0.96	0.67	0.74	1.20	0.86
WEST BALANCE	1.29	1.28	1.30	1.14	1.16	1.16	0.91	1.29	1.15	1.34	1.27	1.94	0.96	1.17	1.01
YAKIMA - TRI CITIES	1.04	1.06	1.02	1.27	1.01	0.94	0.82	1.10	0.97	1.01	1.05	0.98	1.33	0.94	1.51

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1997.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

1998

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	0.99	0.96	1.03	0.61	0.79	1.15	0.95	0.82	1.06	1.05	0.89	1.73	1.00	0.87	0.91
KING	0.95	0.94	0.96	1.07	0.98	0.86	0.93	0.98	0.96	0.94	1.06	0.82	1.08	0.97	0.90
NORTH SOUND	0.82	0.77	0.89	0.72	0.92	0.74	1.27	0.75	0.70	0.97	0.76	0.81	0.60	0.66	0.73
OTHER PUGET SOUND METRO	0.90	0.93	0.87	0.82	0.76	0.83	0.97	0.98	0.88	0.87	0.85	0.86	1.39	1.08	1.03
PIERCE	1.06	1.09	1.02	1.24	1.13	1.20	0.68	1.08	0.91	1.02	1.08	0.71	0.97	1.14	1.26
SNOHOMISH	0.94	0.97	0.88	1.11	1.06	0.95	1.07	1.02	1.06	0.85	0.84	0.82	0.55	0.86	1.01
SPOKANE	0.99	0.95	1.06	0.96	0.93	1.28	0.95	0.83	1.19	1.10	0.80	0.57	0.61	1.12	0.92
WEST BALANCE	1.27	1.28	1.24	0.92	1.15	1.15	1.07	1.27	1.16	1.25	1.30	2.14	1.26	1.19	1.23
YAKIMA - TRI CITIES	1.13	1.15	1.09	1.06	1.34	1.02	1.65	1.23	1.11	1.06	1.20	0.76	1.62	1.15	1.24

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1998.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
1999

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.06	1.03	1.10	0.70	0.98	1.01	1.31	0.92	1.17	1.16	0.86	1.87	1.78	0.98	0.88
KING	0.93	0.93	0.93	1.04	0.95	0.86	0.95	0.97	0.97	0.89	1.04	0.78	0.82	0.93	1.07
NORTH SOUND	0.88	0.85	0.94	0.82	1.06	0.78	0.72	0.85	0.73	1.00	0.85	0.88	0.79	0.79	0.99
OTHER PUGET SOUND METRO	0.91	0.96	0.84	0.86	0.87	0.93	0.75	1.03	0.90	0.83	0.84	0.98	0.57	0.99	0.80
PIERCE	1.02	1.06	0.96	1.18	1.10	1.15	0.60	1.05	0.93	0.94	1.05	0.59	1.14	1.15	1.11
SNOHOMISH	0.92	0.92	0.92	1.05	0.93	0.89	0.98	0.99	1.01	0.91	0.86	0.74	0.48	0.82	1.01
SPOKANE	1.02	0.96	1.11	0.97	0.89	1.25	1.03	0.84	1.21	1.17	0.88	0.44	0.84	1.16	0.73
WEST BALANCE	1.26	1.26	1.24	1.15	1.08	1.29	1.11	1.15	0.94	1.29	1.30	2.29	1.68	1.15	1.04
YAKIMA - TRI CITIES	1.13	1.16	1.10	0.96	1.26	1.09	1.79	1.22	1.23	1.06	1.15	0.79	1.25	1.17	1.24

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 1999.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
2000

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.07	1.06	1.10	0.69	0.96	1.07	1.27	0.96	1.20	1.15	0.87	1.89	1.46	1.06	1.02
KING	0.93	0.92	0.94	1.00	0.98	0.85	0.93	0.96	1.01	0.89	1.03	0.73	0.58	0.95	1.04
NORTH SOUND	0.88	0.85	0.91	0.76	0.97	0.83	0.93	0.83	0.75	0.96	0.90	0.88	0.91	0.90	0.79
OTHER PUGET SOUND METRO	0.87	0.90	0.82	0.82	0.75	0.87	0.50	0.96	0.91	0.80	0.81	0.98	0.88	0.93	0.94
PIERCE	1.05	1.10	0.98	1.09	1.04	1.16	0.87	1.10	0.82	1.02	1.01	0.75	1.41	1.22	1.11
SNOHOMISH	0.93	0.90	0.97	0.90	0.88	0.90	0.83	0.98	1.06	0.96	0.97	0.75	0.59	0.75	1.09
SPOKANE	0.99	0.97	1.02	0.87	1.19	1.22	1.08	0.85	1.04	1.08	0.84	0.41	0.76	1.11	1.15
WEST BALANCE	1.24	1.28	1.20	1.62	1.02	1.31	1.02	1.21	0.99	1.26	1.15	2.09	1.75	1.09	0.86
YAKIMA - TRI CITIES	1.17	1.17	1.17	1.19	1.33	1.01	1.93	1.20	1.27	1.09	1.33	1.04	1.91	1.12	0.90

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 2000.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

2001

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.08	1.02	1.17	1.02	0.99	1.03	1.26	0.94	1.18	1.25	0.91	1.62	1.72	0.87	0.98
KING	0.91	0.91	0.91	0.87	0.99	0.83	1.05	0.96	1.04	0.84	1.03	0.66	0.73	0.97	0.93
NORTH SOUND	0.88	0.85	0.91	1.04	1.06	0.79	1.09	0.77	0.70	0.96	0.92	0.78	1.43	0.95	0.93
OTHER PUGET SOUND METRO	0.93	0.96	0.89	0.95	0.79	0.83	0.94	1.04	1.01	0.86	0.87	1.16	0.97	1.01	1.05
PIERCE	1.03	1.06	0.98	1.13	1.01	1.08	0.83	1.07	0.88	0.98	1.09	0.80	1.21	1.12	1.13
SNOHOMISH	0.97	0.98	0.96	1.04	0.89	1.09	0.83	1.06	1.10	0.94	0.91	0.77	0.53	0.63	1.20
SPOKANE	0.94	0.95	0.93	1.02	1.11	1.22	0.87	0.79	1.07	0.97	0.70	0.48	0.52	1.20	0.93
WEST BALANCE	1.25	1.25	1.25	1.08	1.09	1.28	0.75	1.21	0.81	1.37	1.21	2.32	1.39	1.15	1.09
YAKIMA - TRI CITIES	1.20	1.20	1.20	1.17	1.16	1.18	1.50	1.20	1.18	1.18	1.25	1.13	1.40	1.26	0.87

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 2001.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
2002

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.10	1.01	1.21	0.92	0.96	0.99	1.04	0.99	1.22	1.32	0.87	1.40	2.36	0.91	0.90
KING	0.90	0.91	0.89	0.90	0.98	0.87	0.99	0.97	1.00	0.83	1.01	0.63	0.65	0.90	0.97
NORTH SOUND	0.91	0.87	0.96	0.94	1.11	0.76	0.90	0.81	0.84	1.01	0.91	1.05	1.16	0.91	0.91
OTHER PUGET SOUND METRO	0.99	1.02	0.96	1.04	0.77	0.97	0.93	1.04	1.13	0.93	0.94	1.19	1.00	1.13	1.01
PIERCE	1.07	1.11	1.01	1.10	1.13	1.10	1.32	1.13	1.03	1.00	1.02	0.82	1.07	1.18	1.13
SNOHOMISH	0.90	0.89	0.92	0.87	0.97	0.96	0.85	0.92	0.96	0.91	0.94	0.64	0.65	0.70	1.07
SPOKANE	0.91	0.95	0.87	1.04	1.11	1.07	0.71	0.81	0.84	0.93	0.70	0.52	0.87	1.24	0.94
WEST BALANCE	1.25	1.26	1.25	1.30	0.93	1.31	0.73	1.19	0.92	1.33	1.25	2.52	1.42	1.14	1.18
YAKIMA - TRI CITIES	1.16	1.15	1.18	1.21	1.10	1.18	1.48	1.14	1.08	1.15	1.33	1.07	1.05	1.19	0.91

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 2002.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
2003

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.10	0.97	1.26	0.77	1.00	1.04	0.86	0.95	1.16	1.40	0.91	1.20	1.84	0.82	0.94
KING	0.91	0.91	0.90	0.98	0.96	0.81	1.16	0.96	1.06	0.82	1.05	0.75	0.61	0.88	0.94
NORTH SOUND	0.92	0.84	1.01	0.77	1.11	0.78	1.08	0.81	0.87	1.07	0.93	0.79	1.40	0.86	0.90
OTHER PUGET SOUND METRO	0.98	0.99	0.97	0.80	0.80	1.02	0.88	1.04	1.16	0.96	0.88	1.21	1.06	0.98	1.04
PIERCE	1.10	1.18	1.00	1.12	1.13	1.21	1.18	1.18	0.92	0.96	1.16	0.86	1.24	1.27	1.09
SNOHOMISH	0.84	0.84	0.84	1.06	0.92	0.74	0.54	0.92	0.81	0.87	0.76	0.65	0.72	0.63	1.05
SPOKANE	0.89	0.94	0.81	1.13	0.96	1.15	0.88	0.76	0.78	0.88	0.64	0.56	1.00	1.30	0.83
WEST BALANCE	1.27	1.29	1.24	1.20	1.04	1.42	0.80	1.23	0.93	1.30	1.26	2.43	1.38	1.24	1.19
YAKIMA - TRI CITIES	1.20	1.19	1.20	1.13	1.22	1.21	1.47	1.15	1.21	1.19	1.25	1.10	1.31	1.36	1.21

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 2003.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)

2004

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.11	1.00	1.25	0.85	1.11	1.08	0.81	0.91	1.19	1.39	0.92	1.58	2.15	0.91	1.02
KING	0.90	0.91	0.90	0.87	0.91	0.87	1.01	0.97	0.95	0.84	0.99	0.69	0.66	0.85	0.88
NORTH SOUND	0.93	0.85	1.03	0.91	1.05	0.92	0.81	0.78	1.04	1.03	1.01	0.84	1.29	0.76	1.04
OTHER PUGET SOUND METRO	0.93	0.97	0.89	0.75	0.70	0.94	1.02	1.01	1.18	0.88	0.73	0.96	0.78	1.22	0.90
PIERCE	1.17	1.23	1.09	1.08	1.24	1.30	1.33	1.24	0.92	1.04	1.32	0.93	1.24	1.23	0.93
SNOHOMISH	0.80	0.84	0.74	1.09	0.90	0.55	0.80	0.92	0.91	0.72	0.70	0.81	1.18	0.68	1.31
SPOKANE	0.85	0.87	0.82	1.20	0.99	1.05	0.60	0.69	0.82	0.91	0.60	0.50	0.65	1.24	1.04
WEST BALANCE	1.30	1.31	1.28	1.39	1.16	1.40	0.94	1.25	1.03	1.34	1.26	2.35	1.10	1.32	1.22
YAKIMA - TRI CITIES	1.19	1.14	1.25	1.10	1.09	1.07	1.58	1.17	1.17	1.21	1.40	1.00	1.00	1.19	0.89

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 2004.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
2005

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.13	1.02	1.28	0.79	0.93	1.24	0.77	0.96	1.26	1.35	1.08	1.49	1.73	0.86	0.90
KING	0.92	0.92	0.91	0.82	1.01	0.83	1.09	1.00	0.99	0.85	1.01	0.75	0.66	0.83	0.93
NORTH SOUND	0.91	0.87	0.96	1.08	0.98	0.86	0.56	0.84	0.77	1.02	0.93	0.75	0.71	0.91	1.10
OTHER PUGET SOUND METRO	0.93	0.95	0.91	0.80	0.85	0.92	1.21	0.95	1.34	0.86	0.79	0.84	0.96	1.12	1.19
PIERCE	1.17	1.19	1.13	1.12	1.17	1.28	1.00	1.19	0.92	1.13	1.25	0.98	1.76	1.18	0.95
SNOHOMISH	0.77	0.78	0.76	1.11	0.84	0.49	0.66	0.87	1.04	0.73	0.72	0.89	0.76	0.67	1.00
SPOKANE	0.96	1.01	0.91	1.39	0.95	1.34	0.82	0.78	0.77	1.01	0.70	0.66	0.57	1.38	0.96
WEST BALANCE	1.18	1.21	1.13	1.12	1.16	1.27	0.92	1.12	0.93	1.17	1.12	2.29	1.33	1.27	1.10
YAKIMA - TRI CITIES	1.20	1.18	1.22	1.29	1.03	1.08	1.89	1.20	1.02	1.22	1.32	0.87	1.33	1.30	1.13

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 2005.

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
2006

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.12	1.04	1.23	0.90	0.93	1.35	0.58	0.95	1.08	1.33	1.06	1.59	1.17	0.94	1.02
KING	0.90	0.91	0.90	0.76	1.00	0.90	0.90	0.94	0.95	0.84	1.01	0.73	0.78	0.88	0.94
NORTH SOUND	0.89	0.81	1.00	1.30	0.88	0.83	0.62	0.72	0.93	1.04	0.94	0.84	0.78	0.80	0.97
OTHER PUGET SOUND METRO	0.95	0.96	0.93	0.93	0.86	0.74	1.29	1.05	1.22	0.93	0.81	0.83	1.41	1.00	1.15
PIERCE	1.19	1.24	1.12	1.15	1.14	1.22	1.67	1.29	1.11	1.12	1.14	0.84	1.14	1.32	0.94
SNOHOMISH	0.79	0.80	0.79	1.11	0.83	0.54	0.73	0.90	1.09	0.73	0.77	0.52	0.94	0.60	1.01
SPOKANE	0.92	0.92	0.93	0.98	0.98	1.10	0.72	0.79	0.68	1.05	0.75	0.73	0.36	1.20	0.94
WEST BALANCE	1.19	1.24	1.13	1.21	1.24	1.23	0.97	1.20	0.89	1.20	1.07	2.28	1.17	1.27	1.23
YAKIMA - TRI CITIES	1.22	1.22	1.21	1.32	1.10	1.30	1.68	1.16	1.12	1.13	1.43	1.17	1.75	1.31	1.04

OFM Forecasting Division, November 2009

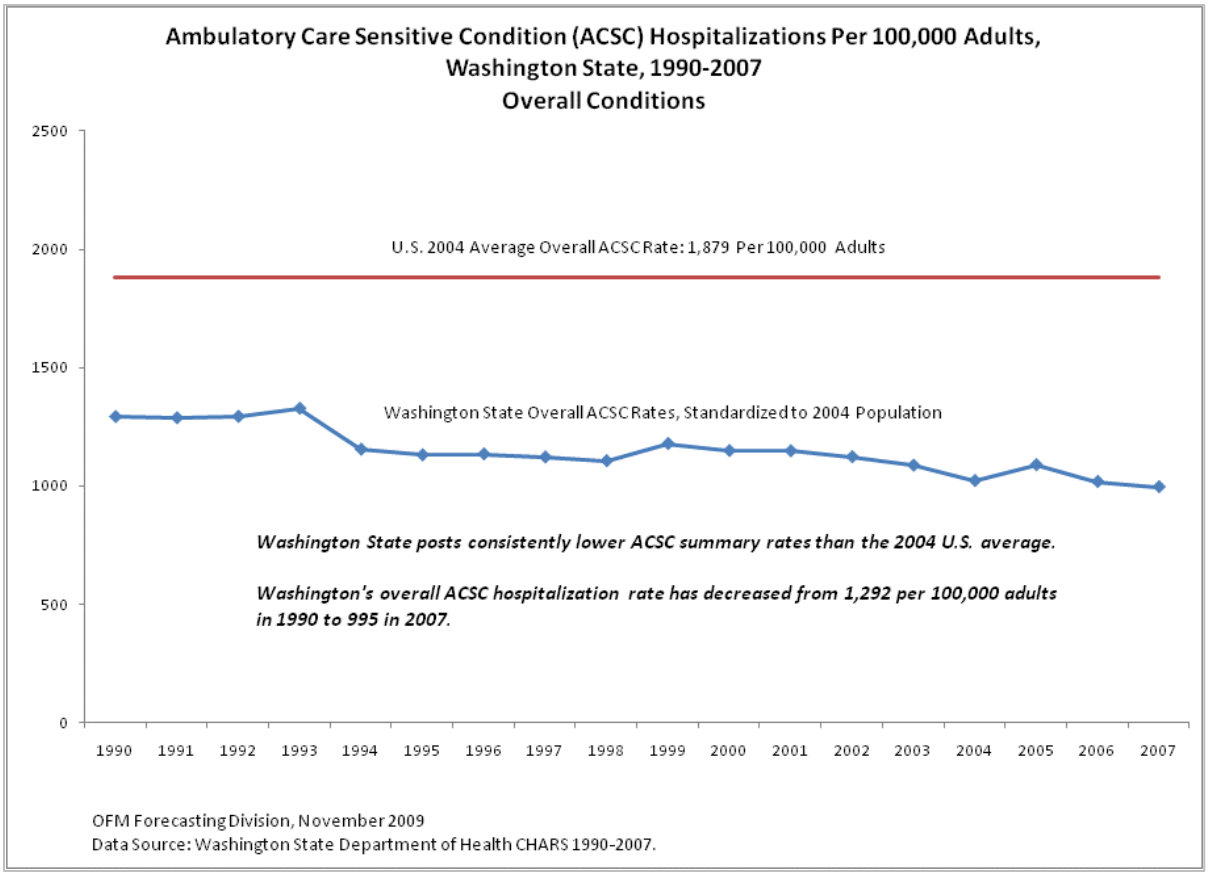
Data Source: Washington State Department of Health CHARS 2006.

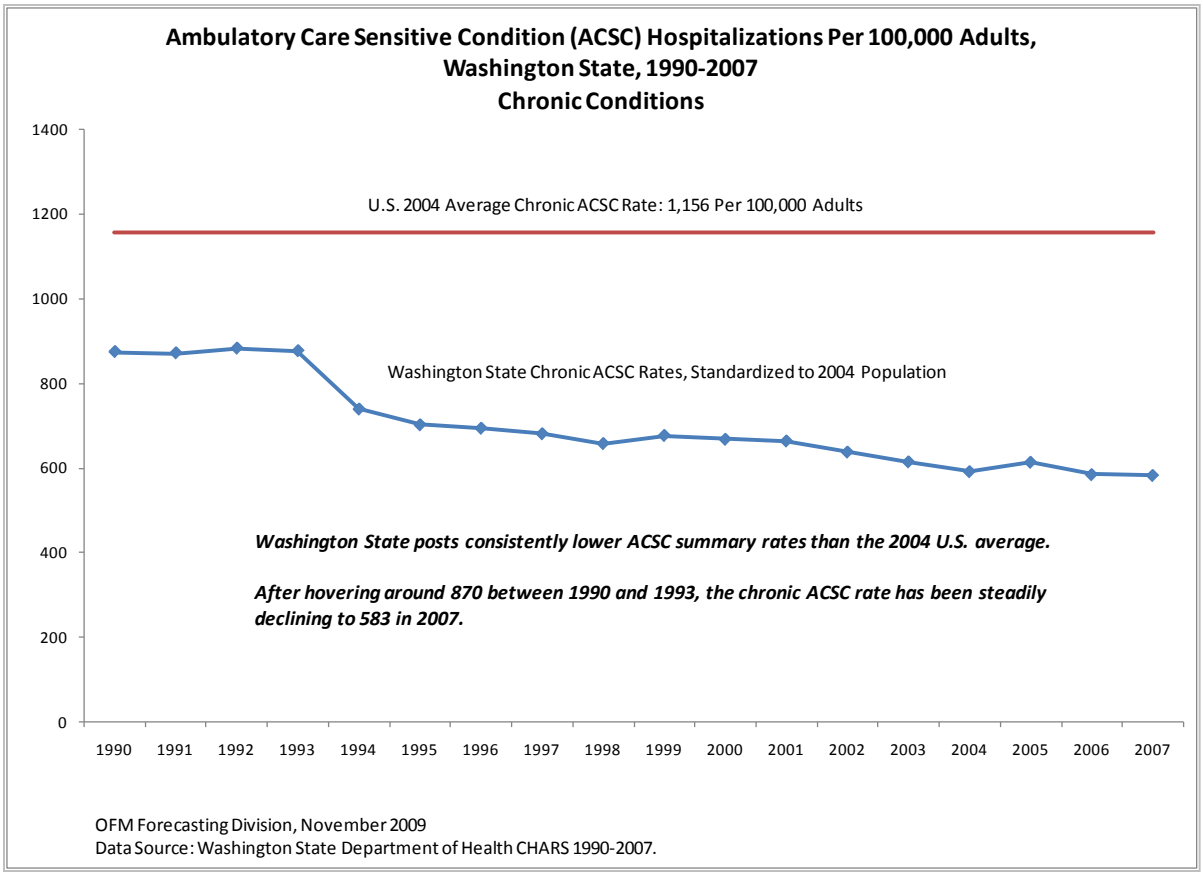
Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions
Washington State Regions (Excluding Clark County)
2007

(Ratio of 1.0 = State Average)	Composite Measures			Specific Conditions											
Region	Overall	Chronic	Acute	Diabetes, Short-term Complications	Diabetes, Long-term Complications	COPD	Hypertension	CHF	Dehydration	Bacterial Pneumonia	Urinary Infections	Angina without Procedure	Uncontrolled Diabetes	Adult Asthma	Lower Extremity Amputation among Patients with Diabetes
EAST BALANCE	1.08	0.95	1.26	0.91	0.85	1.29	0.74	0.83	1.27	1.40	0.96	1.45	1.50	0.80	0.82
KING	0.89	0.86	0.93	0.78	0.93	0.80	0.80	0.91	0.91	0.88	1.05	0.66	0.72	0.86	0.96
NORTH SOUND	0.97	0.92	1.04	1.03	1.00	0.94	0.59	0.86	0.84	1.11	0.97	1.16	0.61	1.04	1.18
OTHER PUGET SOUND METRO	0.96	0.97	0.95	1.02	0.84	0.89	1.08	1.01	1.11	0.94	0.90	0.88	0.77	0.90	1.21
PIERCE	1.21	1.29	1.09	1.18	1.28	1.28	1.82	1.31	1.21	1.01	1.21	0.97	1.27	1.29	1.06
SNOHOMISH	0.79	0.80	0.76	1.09	0.91	0.58	0.95	0.85	0.82	0.81	0.65	0.55	0.91	0.65	1.05
SPOKANE	0.89	0.96	0.79	1.18	1.06	1.04	0.84	0.87	0.72	0.87	0.66	0.89	0.76	1.06	1.04
WEST BALANCE	1.18	1.22	1.12	1.18	1.07	1.26	0.74	1.20	1.08	1.17	1.04	2.28	1.32	1.38	1.13
YAKIMA - TRI CITIES	1.28	1.30	1.24	1.27	1.15	1.35	1.57	1.31	1.25	1.15	1.45	1.08	1.87	1.39	0.63

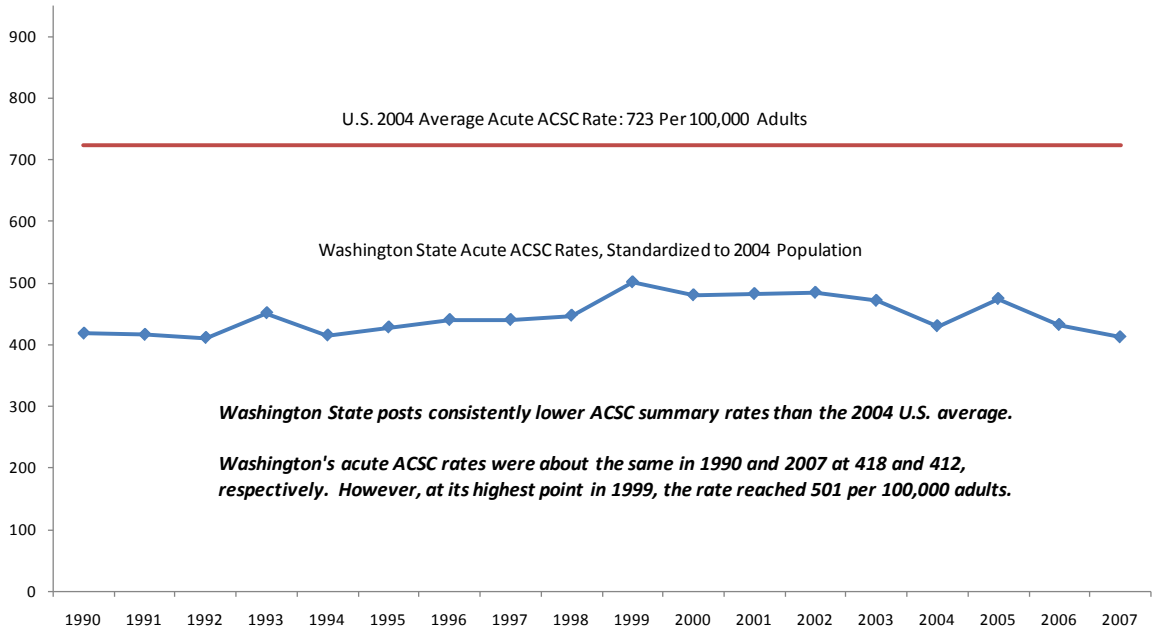
OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health CHARS 2007.


Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults,
Washington State, 1990-2007
Overall Conditions
2500
2000
1500
1000
500
0
U.S. 2004 Average Overall ACSC Rate: 1,879 Per 100,000 Adults
Washington State Overall ACSC Rates, Standardized to 2004 Population
Washington State posts consistently lower ACSC summary rates than the 2004 U.S. average.
Washington's overall ACSC hospitalization rate has decreased from 1,292 per 100,000 adults in 1990 to 995 in 2007.
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.


Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults,
Washington State, 1990-2007
Chronic Conditions
1400
1200
1000
800
600
400
200
0
U.S. 2004 Average Chronic ACSC Rate: 1,156 Per 100,000 Adults
Washington State Chronic ACSC Rates, Standardized to 2004 Population
Washington State posts consistently lower ACSC summary rates than the 2004 U.S. average.
After hovering around 870 between 1990 and 1993, the chronic ACSC rate has been steadily declining to 583 in 2007.
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Acute Conditions

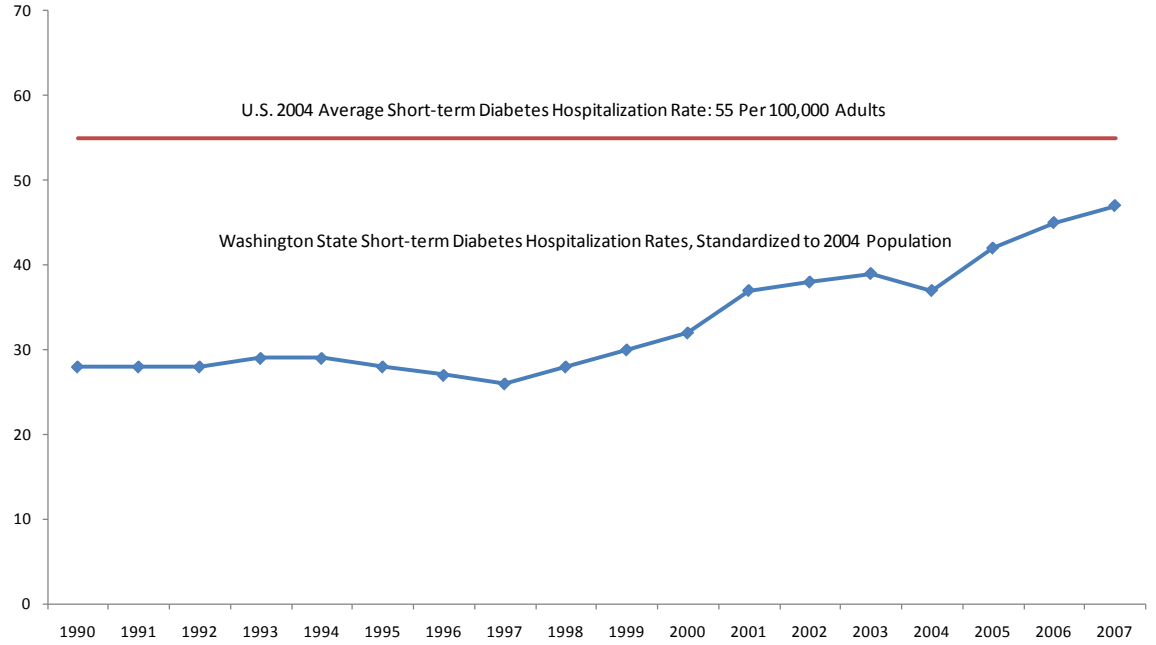


Washington State posts consistently lower ACSC summary rates than the 2004 U.S. average.

Washington's acute ACSC rates were about the same in 1990 and 2007 at 418 and 412, respectively. However, at its highest point in 1999, the rate reached 501 per 100,000 adults.

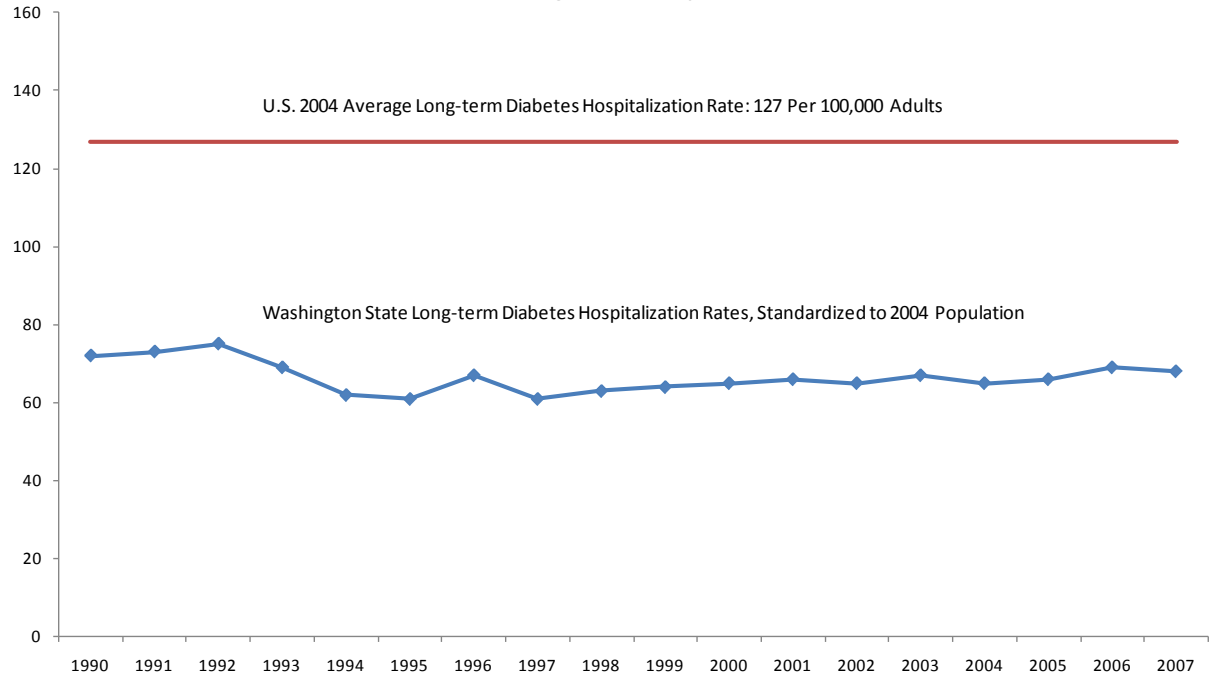
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007.

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Diabetes, Short-term Complications



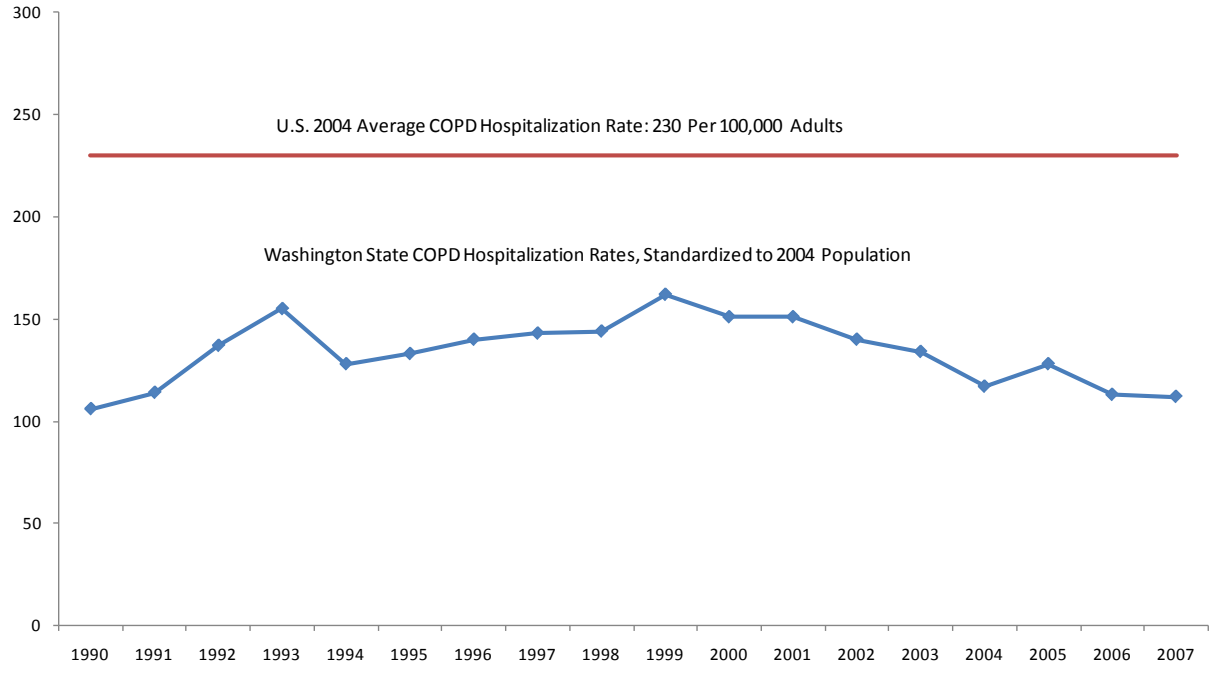
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Diabetes, Long-term Complications



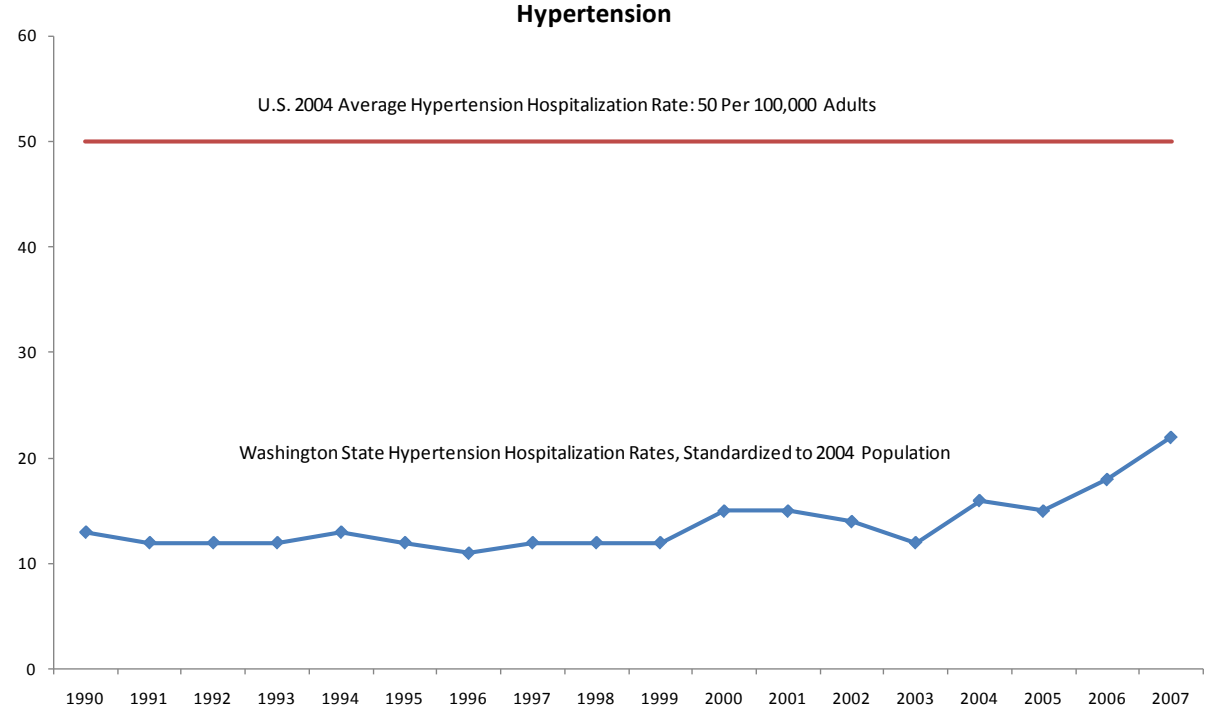
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Chronic Obstructive Pulmonary Disease (COPD)



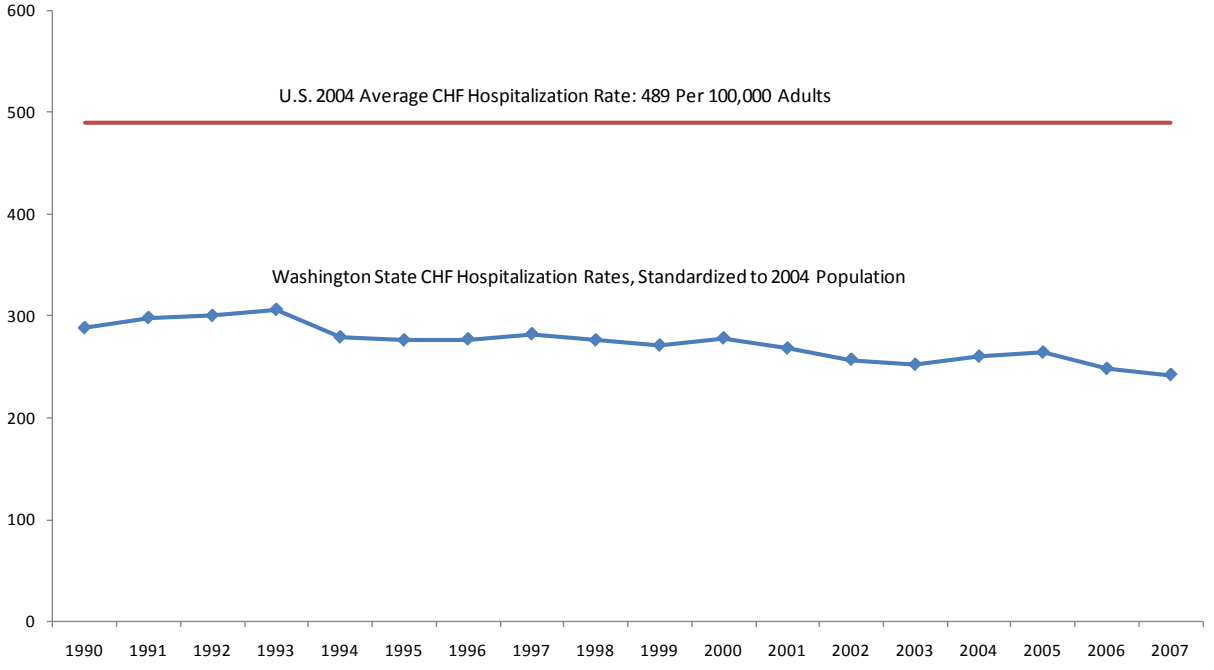
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Hypertension



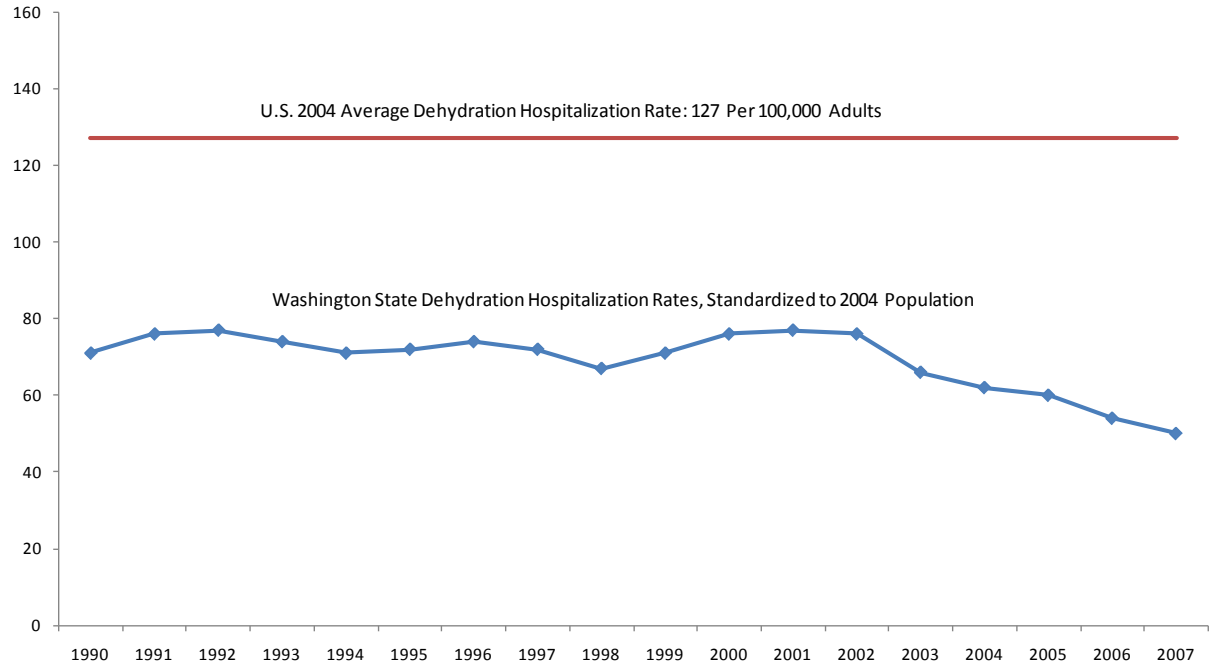
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Congestive Heart Failure (CHF)



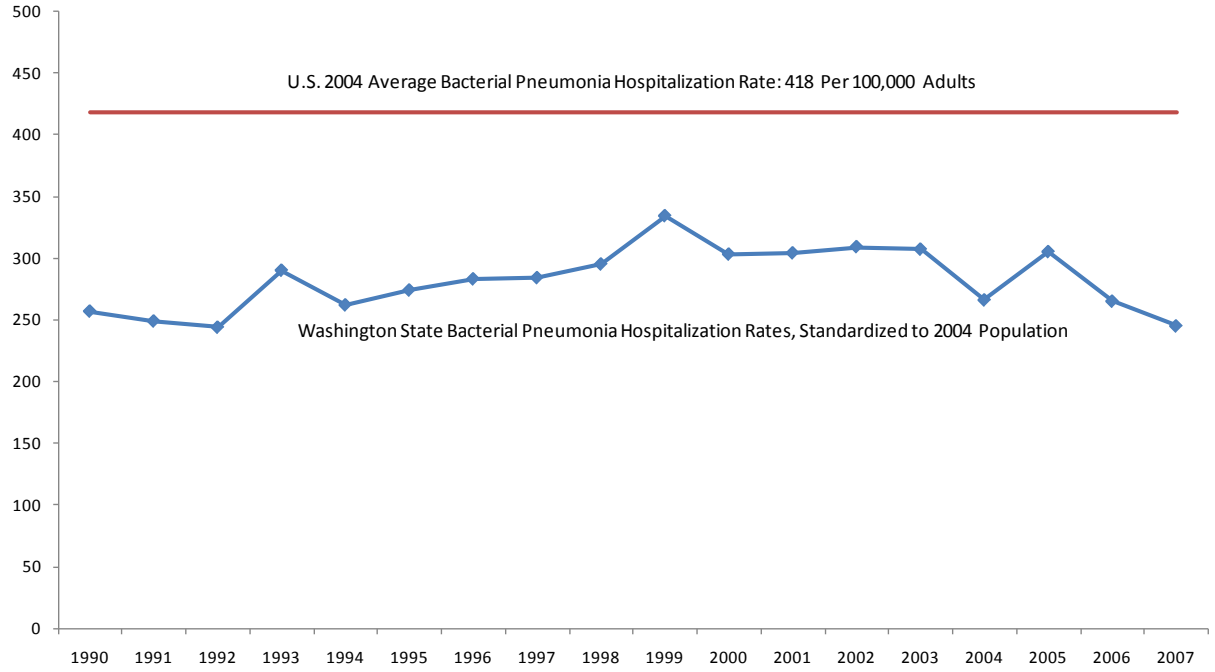
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Dehydration



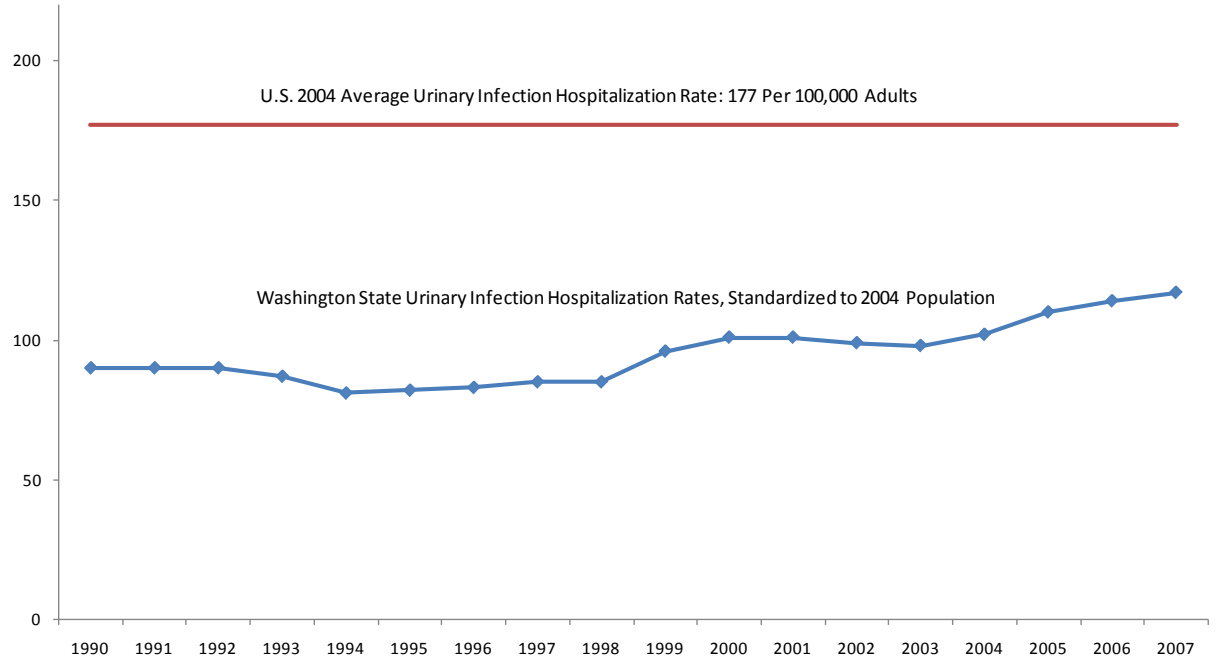
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Bacterial Pneumonia



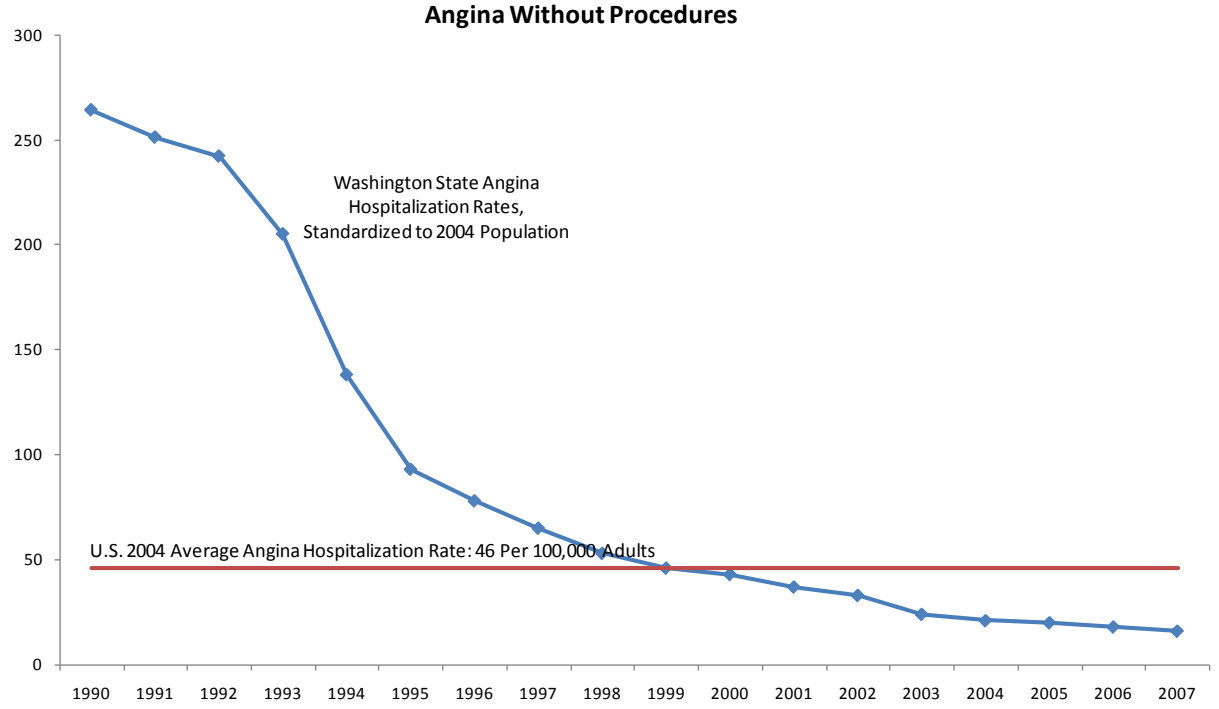
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Urinary Infection

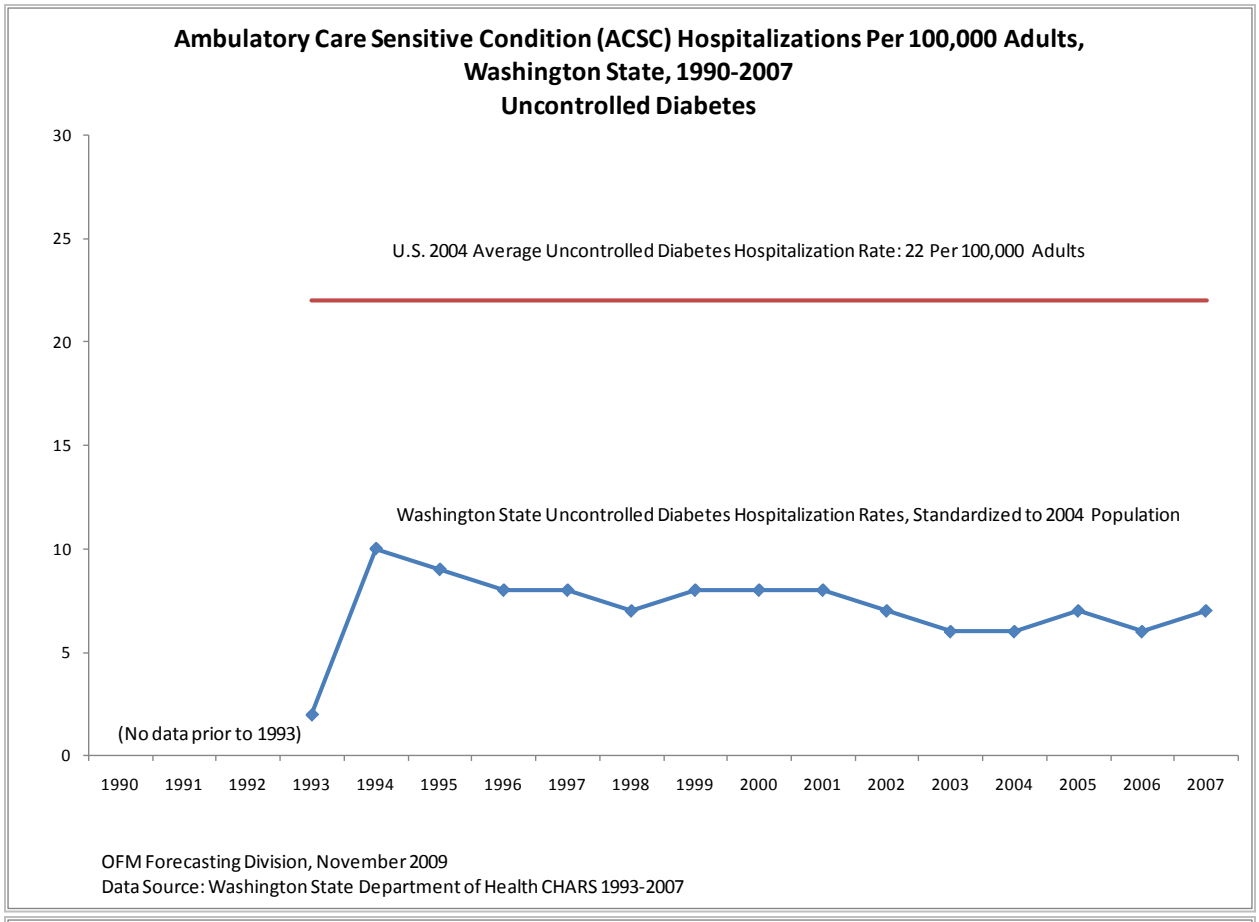


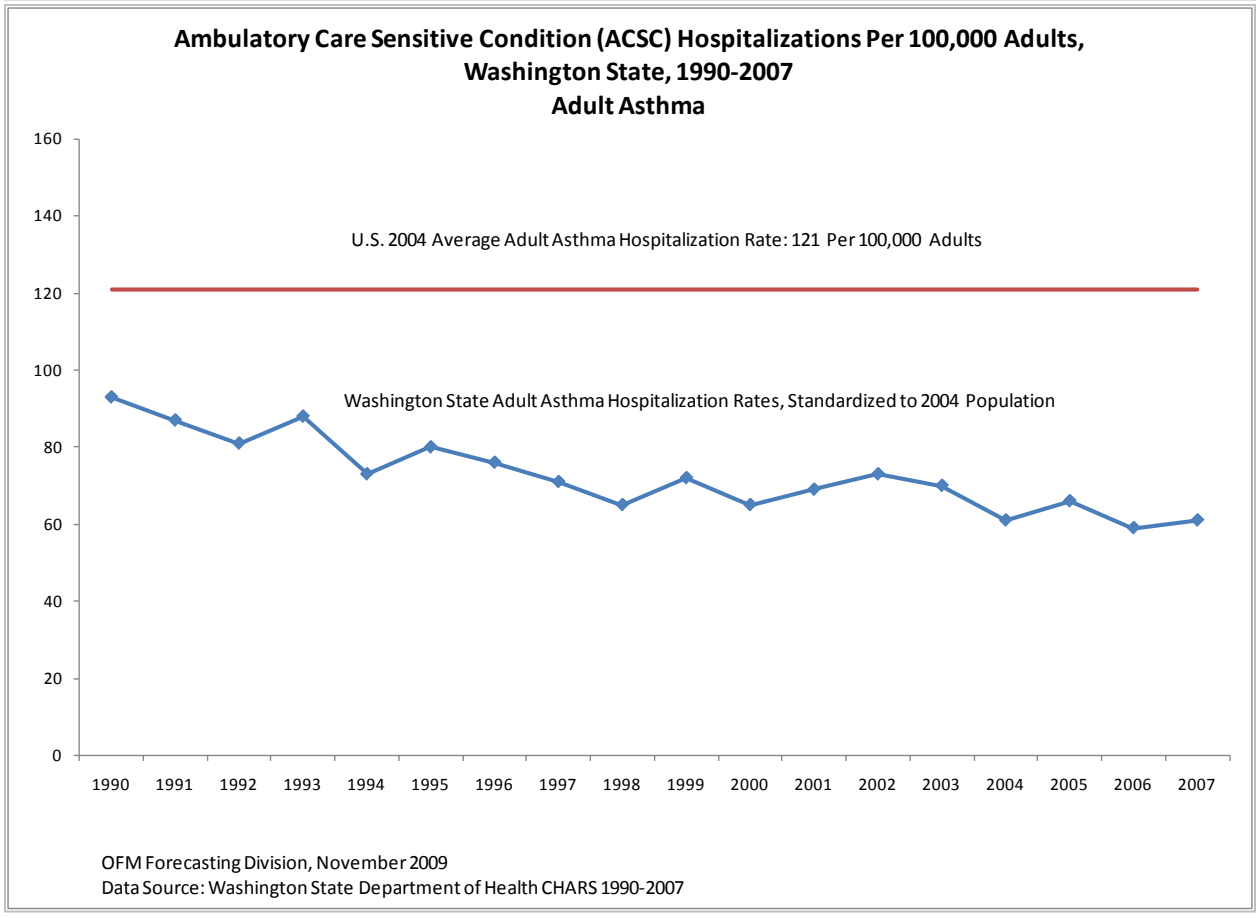
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

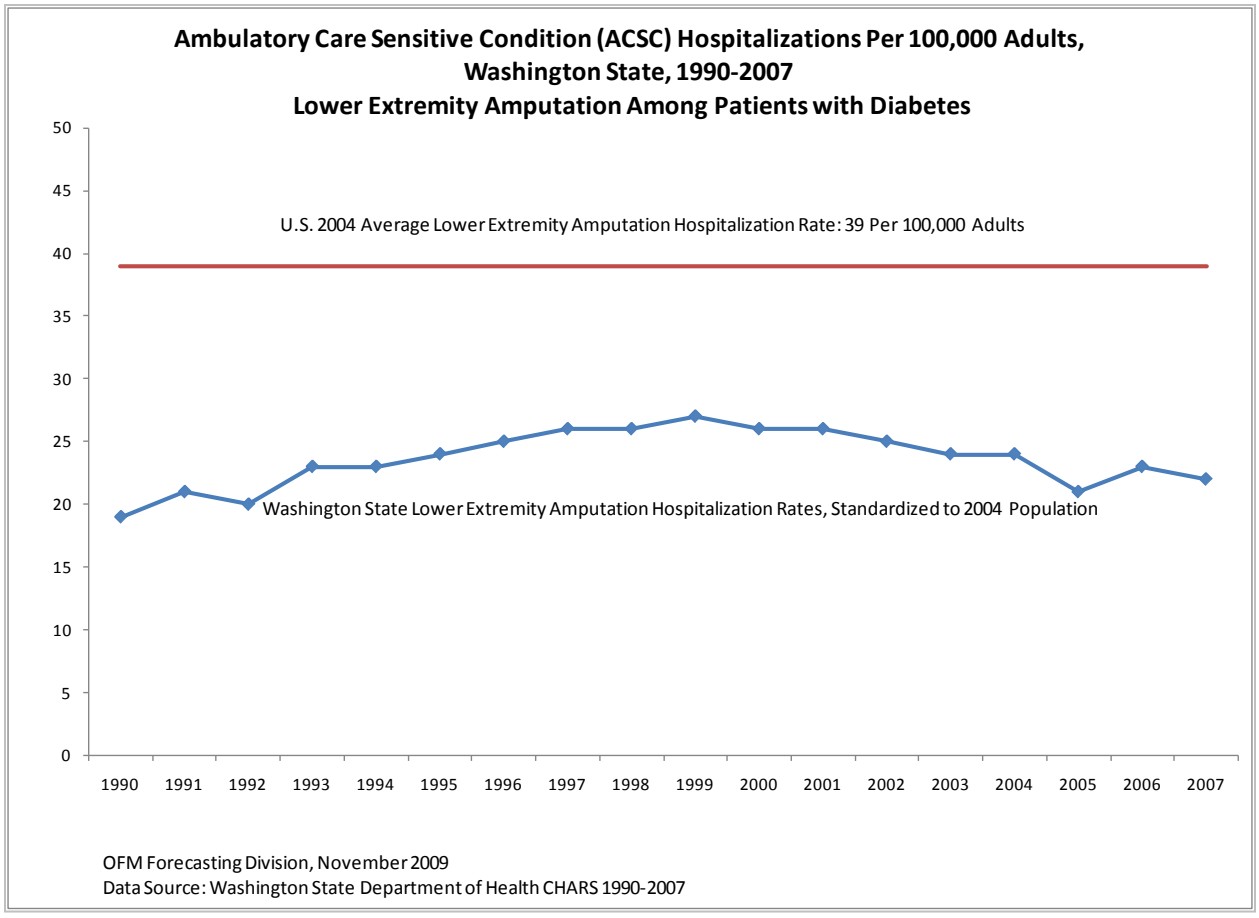
Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults, Washington State, 1990-2007
Angina Without Procedures

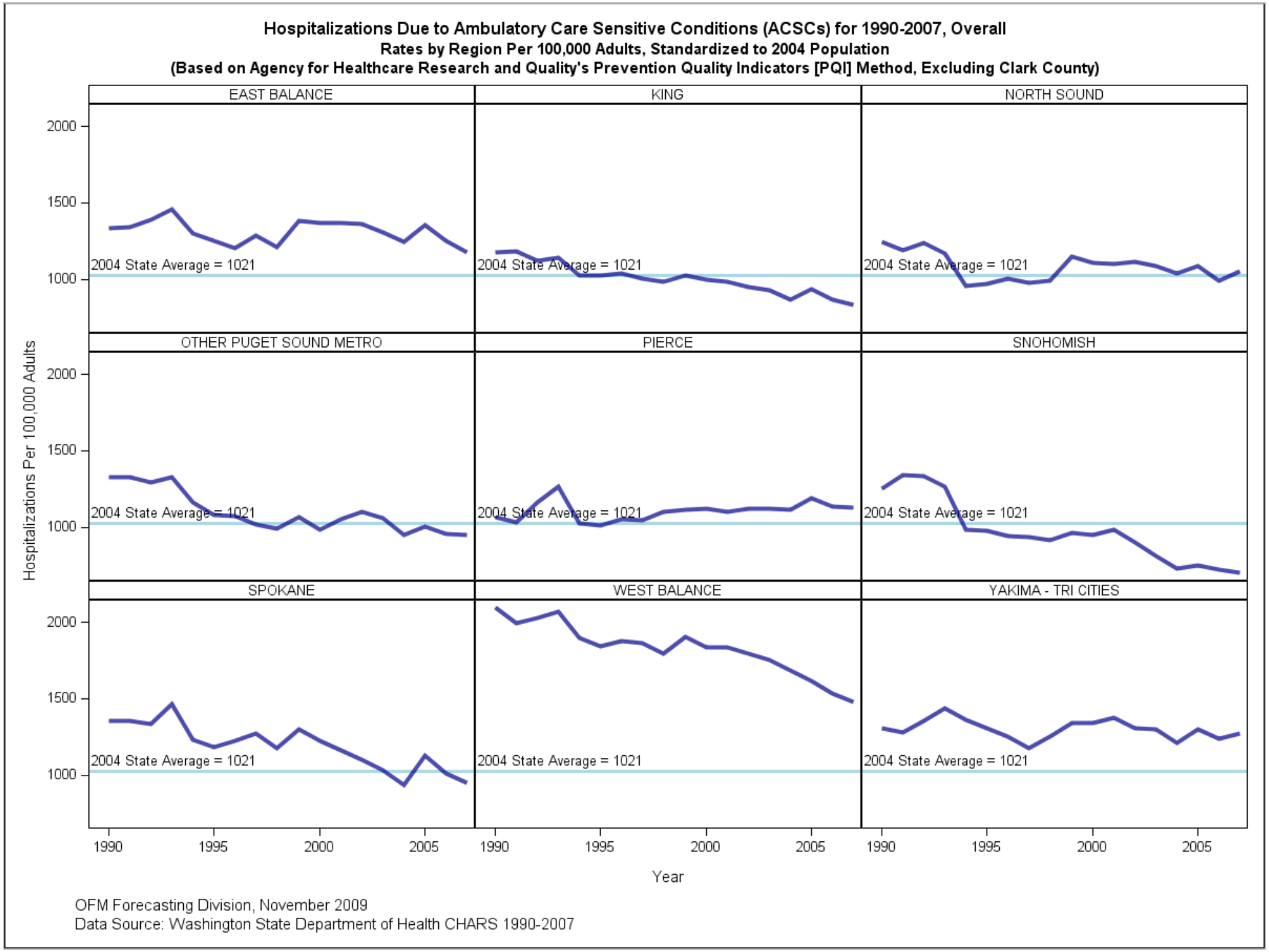


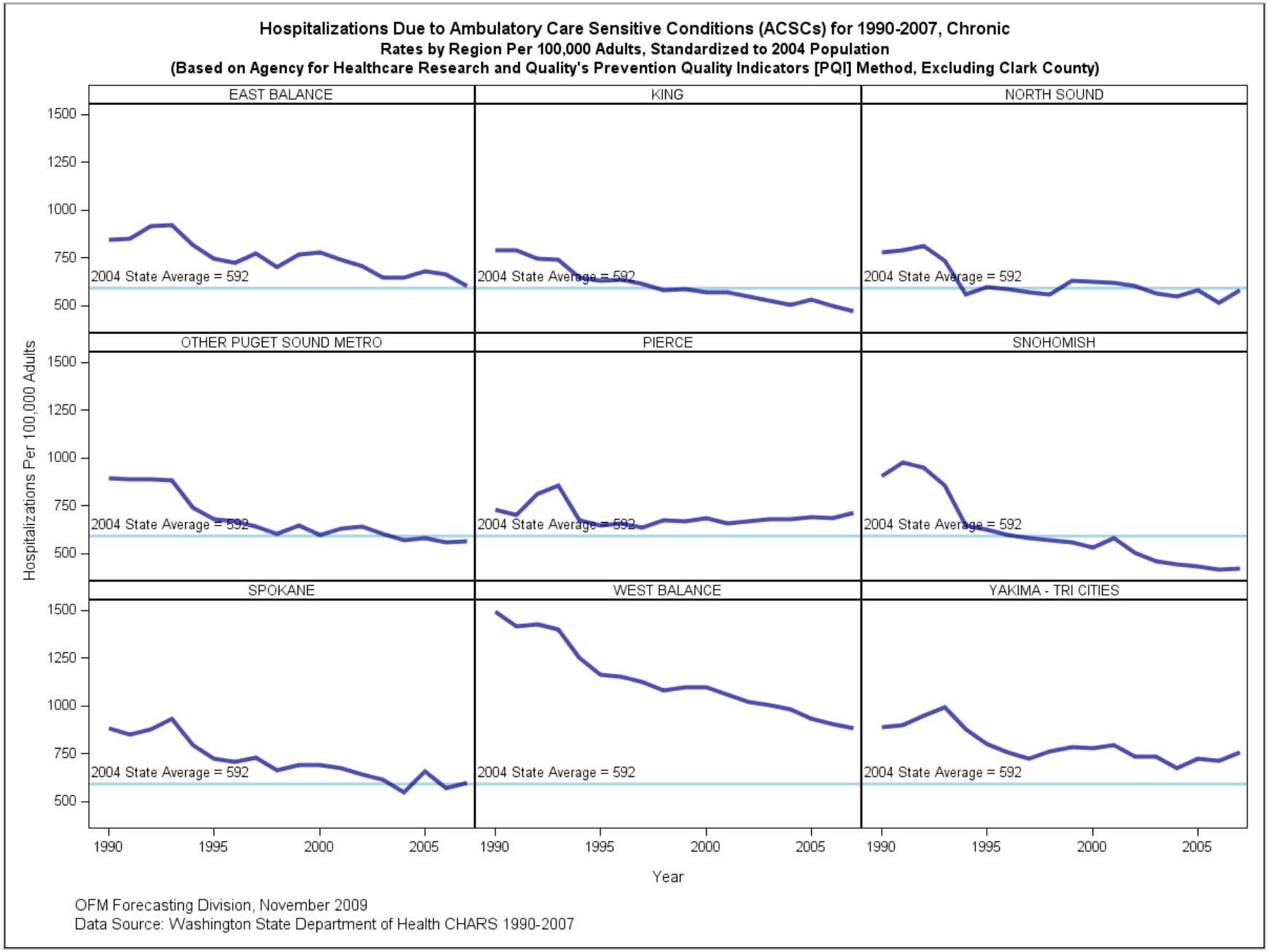
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

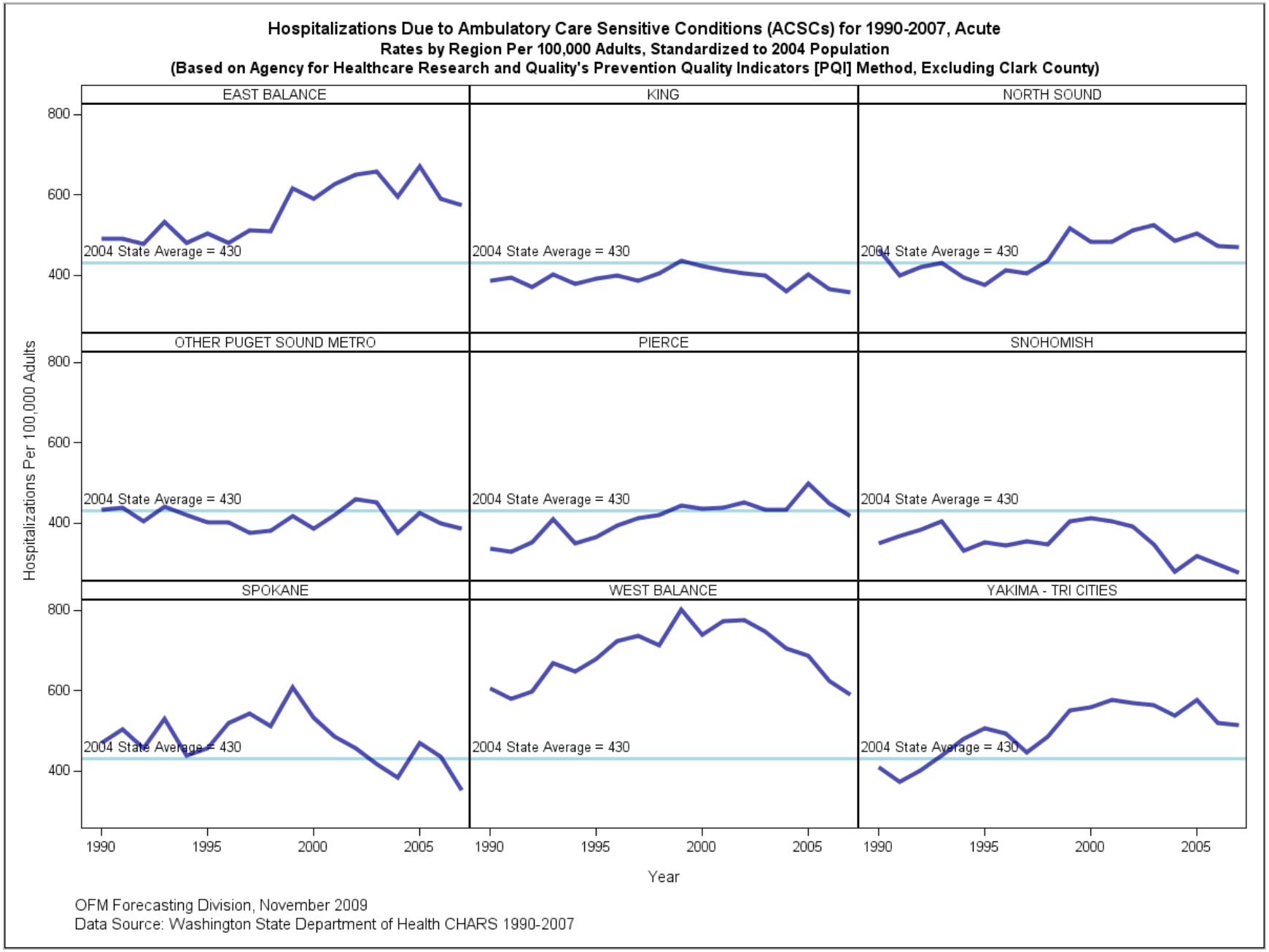

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults,
Washington State, 1990-2007
Uncontrolled Diabetes
30
25
20
15
10
5
0
U.S. 2004 Average Uncontrolled Diabetes Hospitalization Rate: 22 Per 100,000 Adults
Washington State Uncontrolled Diabetes Hospitalization Rates, Standardized to 2004 Population
(No data prior to 1993)
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1993-2007

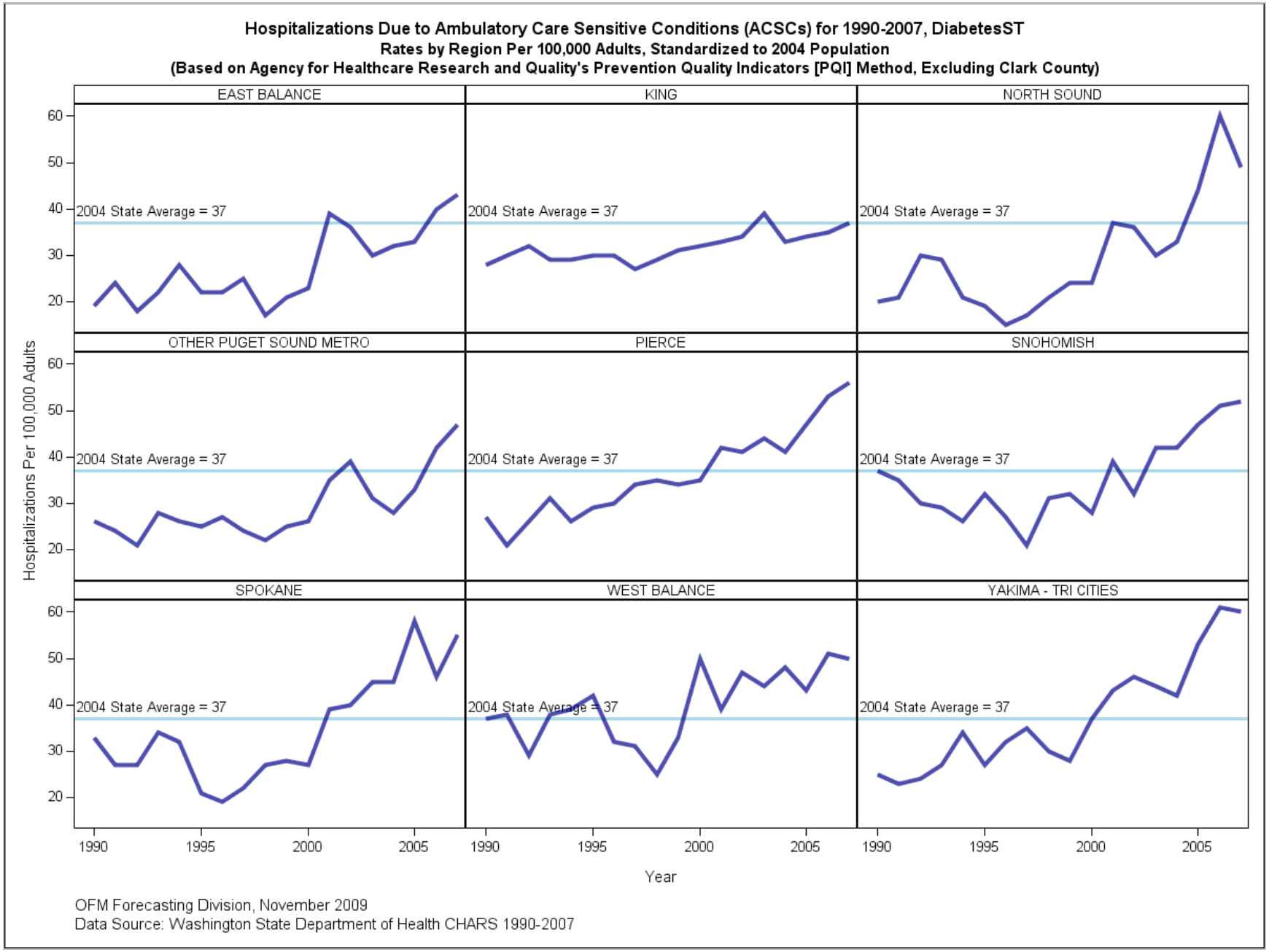

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults,
Washington State, 1990-2007
Adult Asthma
160
140
120
100
80
60
40
20
0
U.S. 2004 Average Adult Asthma Hospitalization Rate: 121 Per 100,000 Adults
Washington State Adult Asthma Hospitalization Rates, Standardized to 2004 Population
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

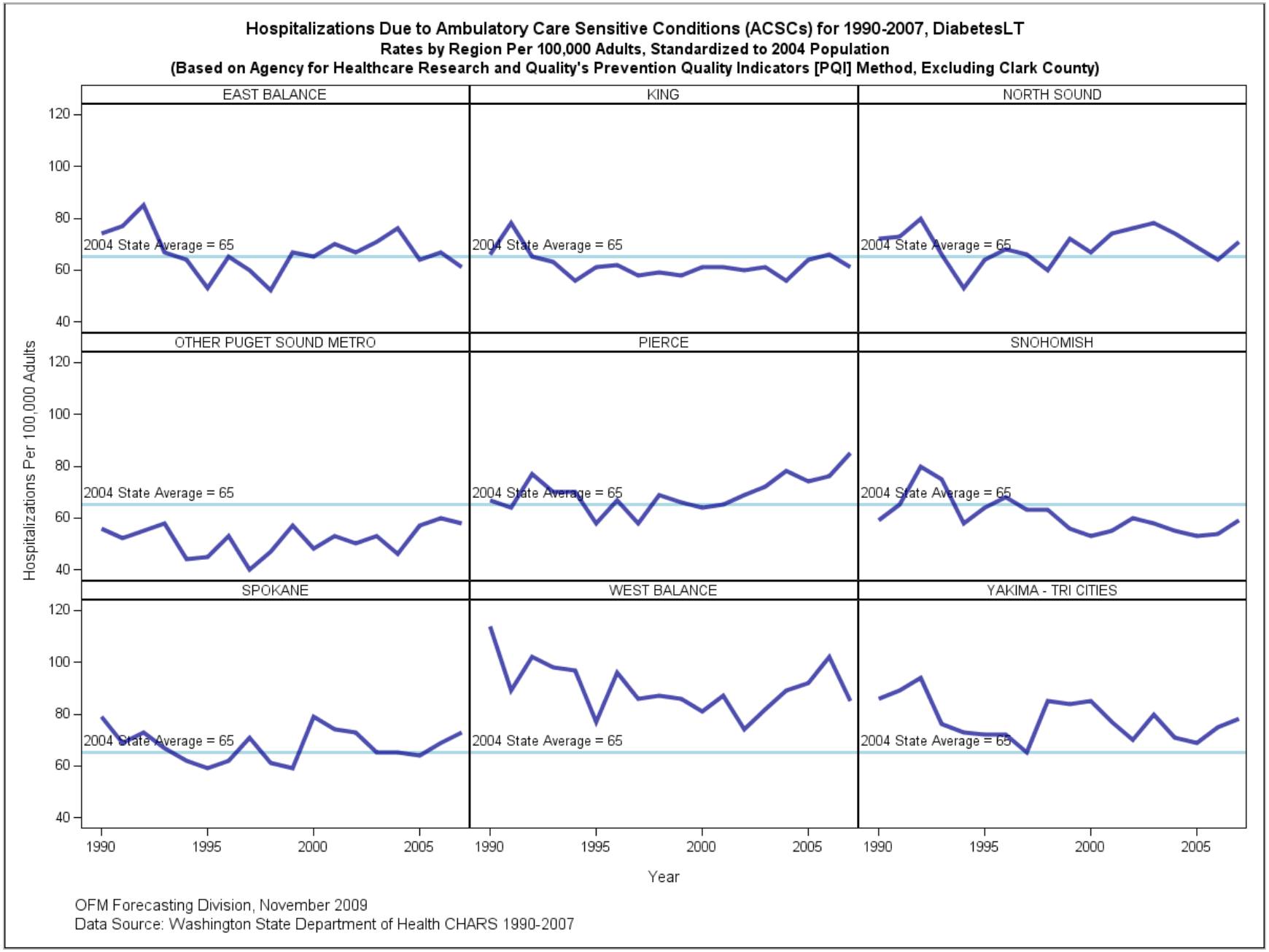

Ambulatory Care Sensitive Condition (ACSC) Hospitalizations Per 100,000 Adults,
Washington State, 1990-2007
Lower Extremity Amputation Among Patients with Diabetes
50
45
40
35
30
25
20
15
10
5
0
U.S. 2004 Average Lower Extremity Amputation Hospitalization Rate: 39 Per 100,000 Adults
Washington State Lower Extremity Amputation Hospitalization Rates, Standardized to 2004 Population
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

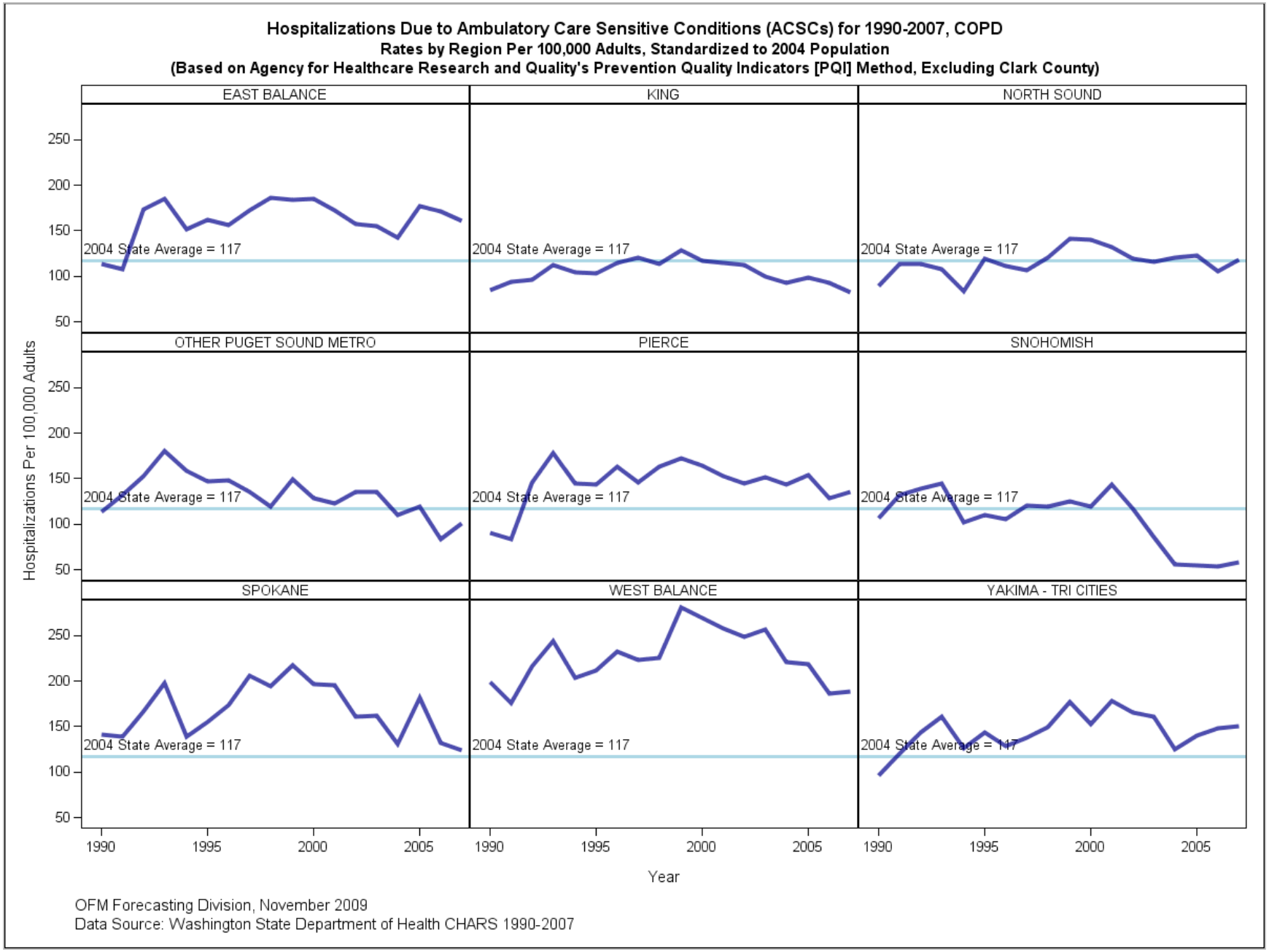

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Overall
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 1021
Hospitalizations Per 100,000 Adults
2000
1500
1000
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

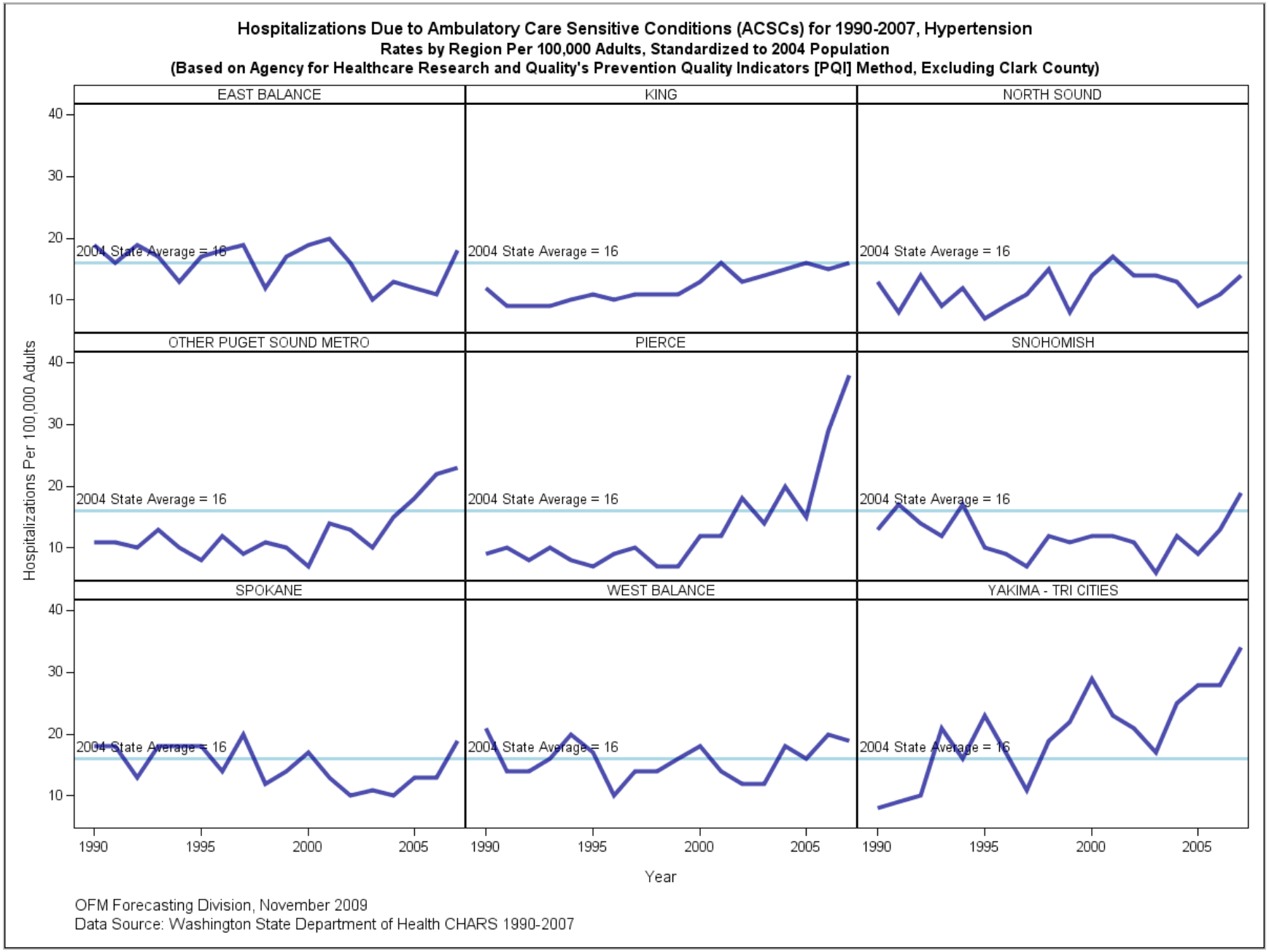

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Chronic
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 592
Hospitalizations Per 100,000 Adults
1500
1250
1000
750
500
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

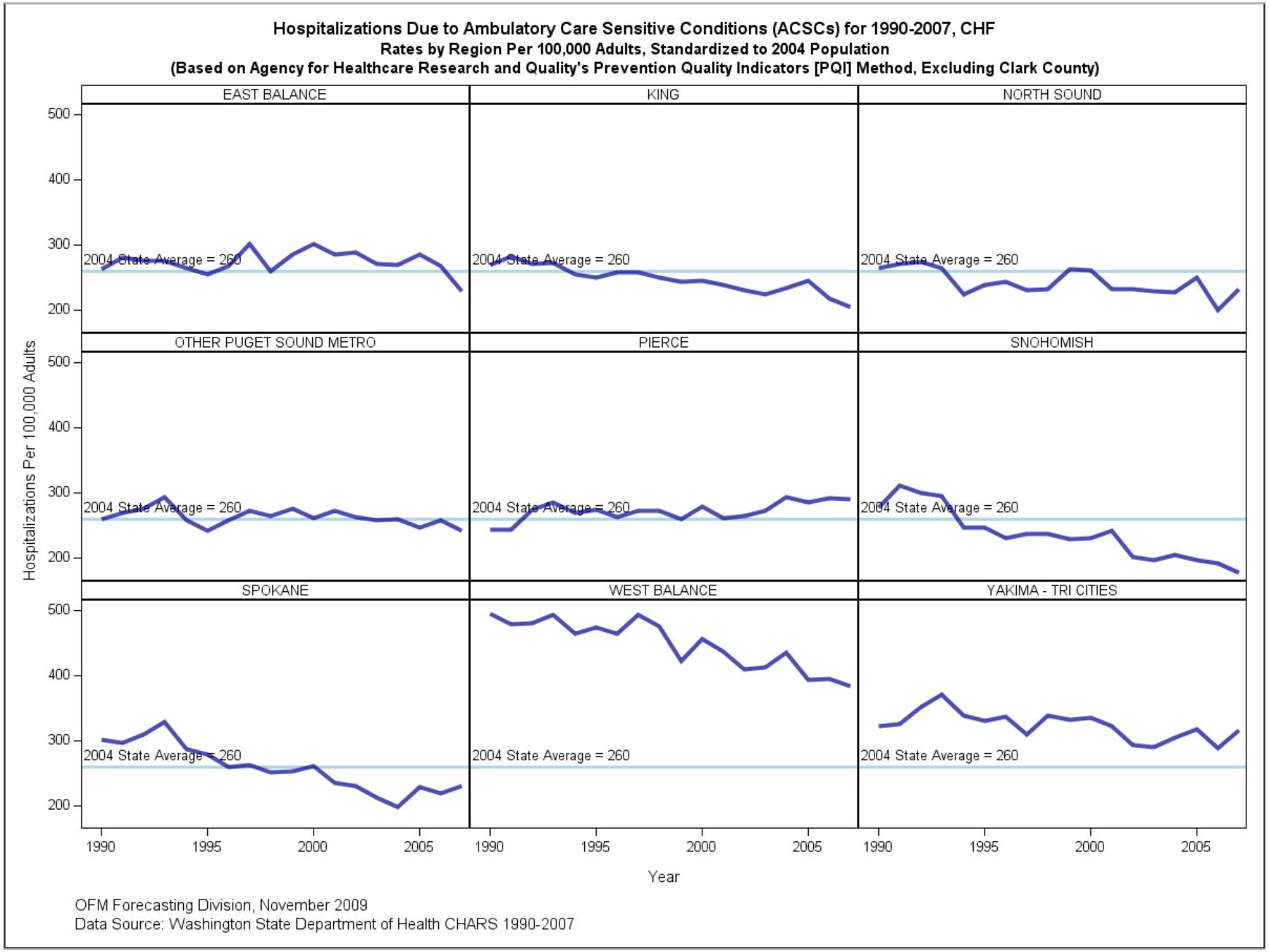

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Acute
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 430
800
600
400
1990
1995
2000
2005
Hospitalizations Per 100,000 Adults
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

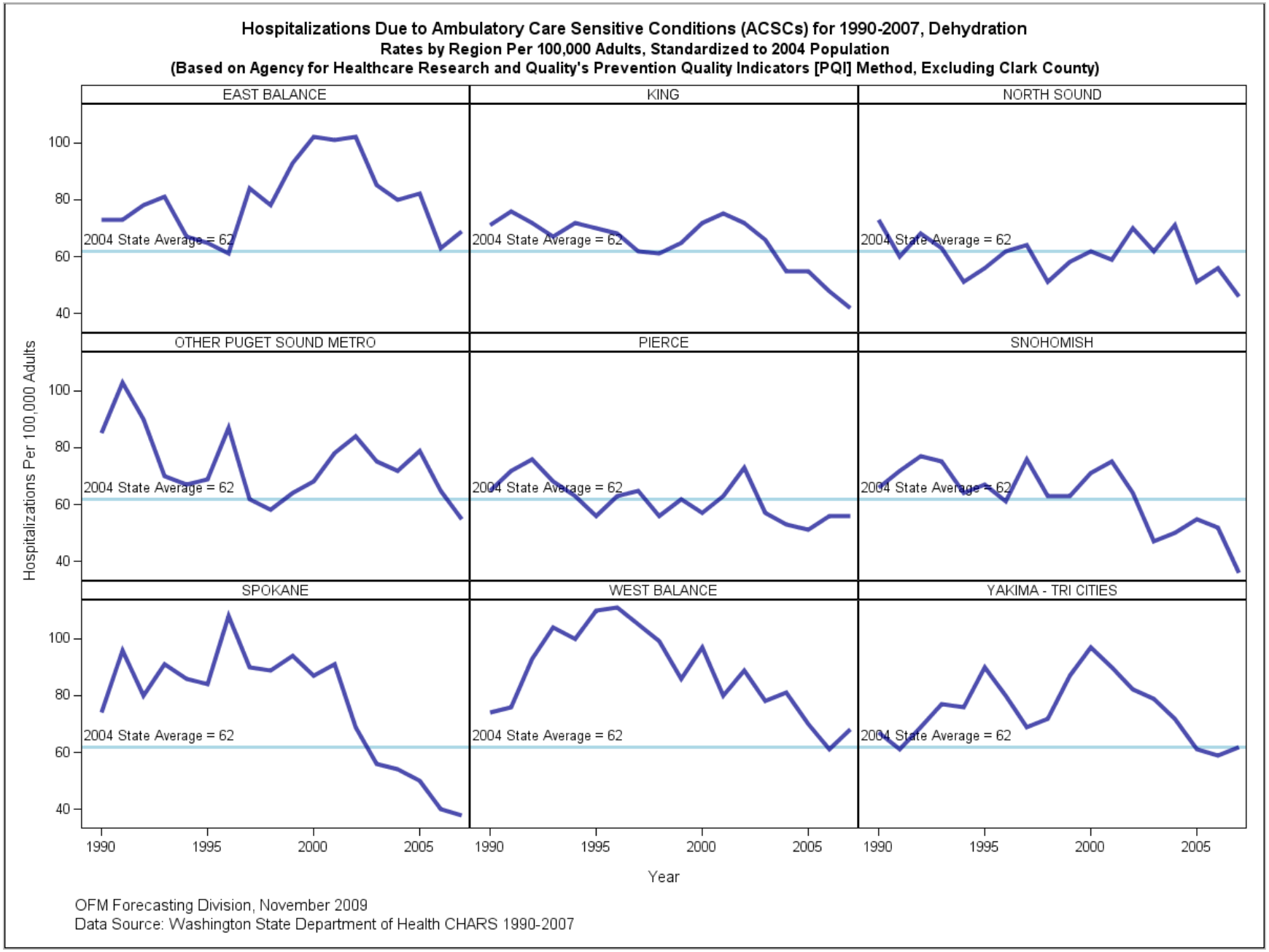

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, DiabetesST
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 37
Hospitalizations Per 100,000 Adults
20
30
40
50
60
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

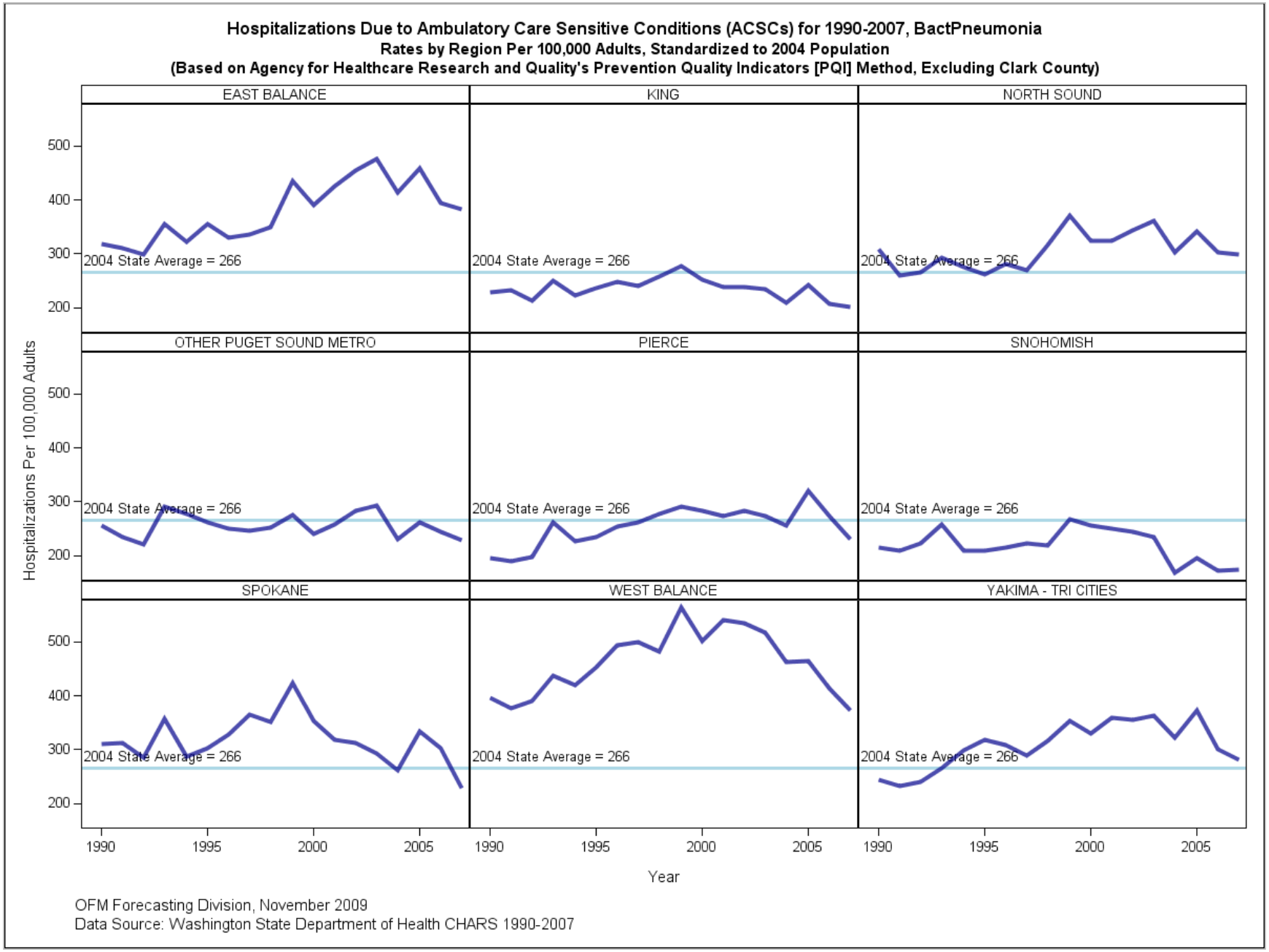

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, DiabetesLT
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 65
Hospitalizations Per 100,000 Adults
120
100
80
60
40
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

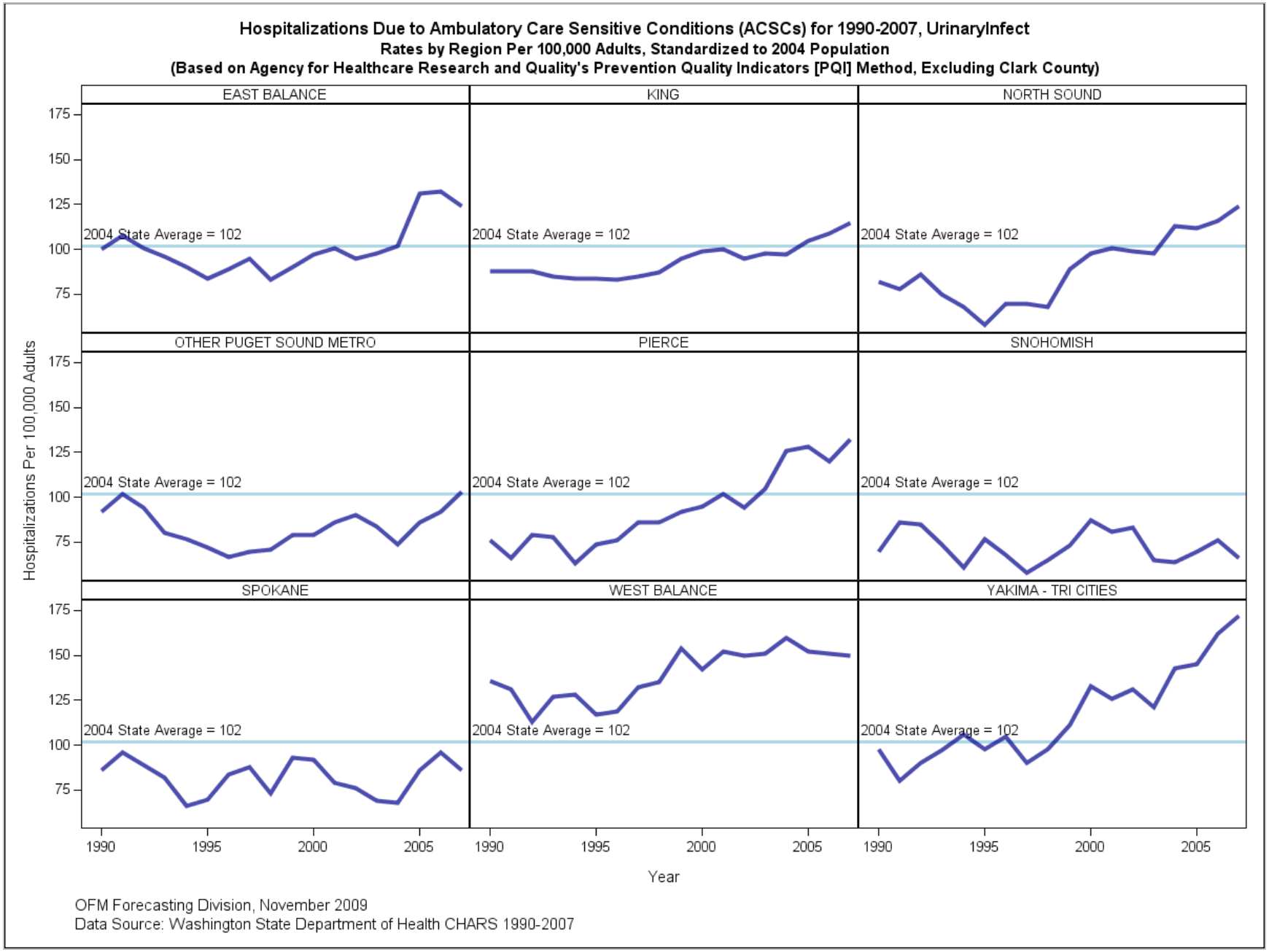

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, COPD
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 117
Hospitalizations Per 100,000 Adults
250
200
150
100
50
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

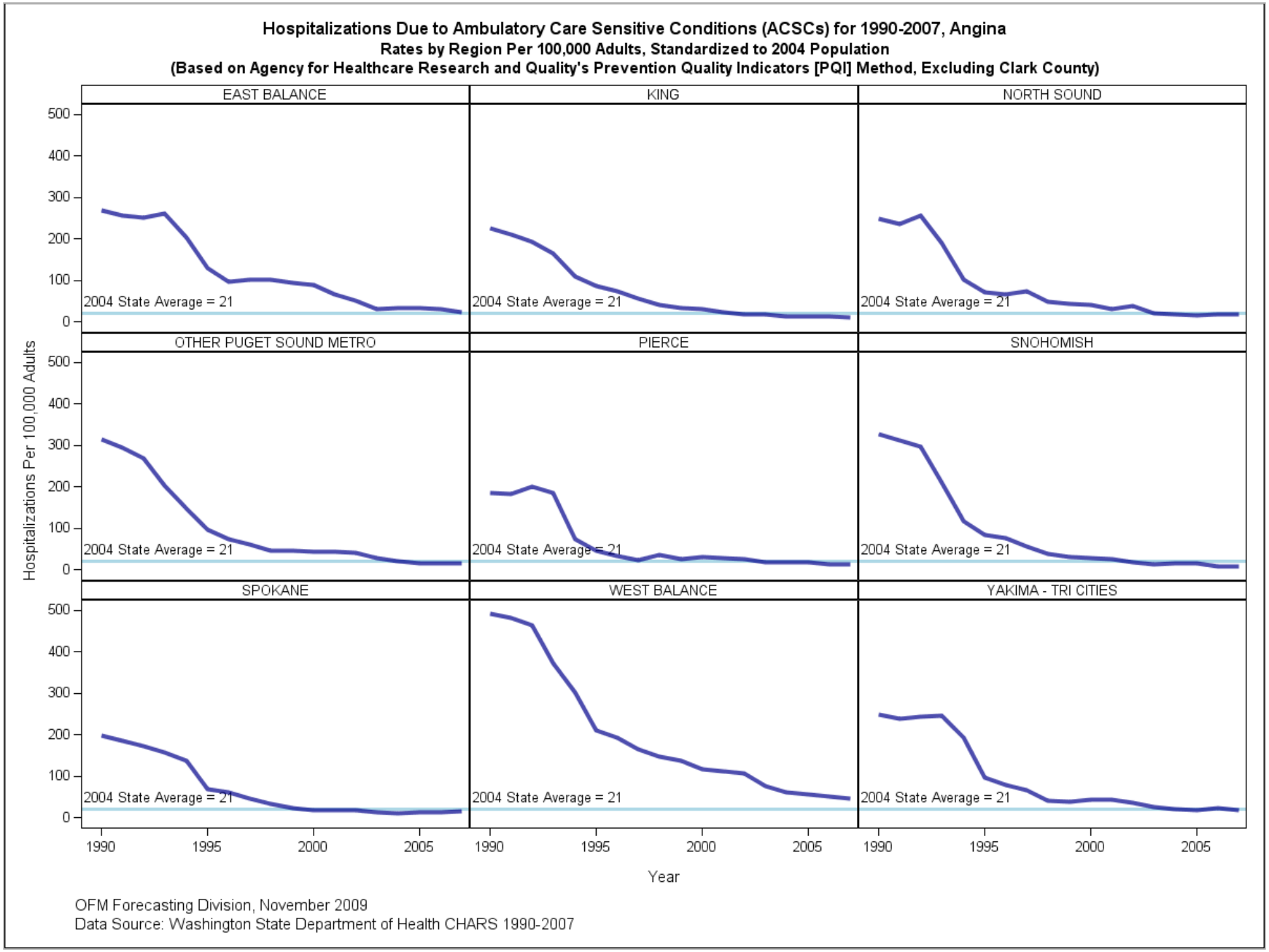

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Hypertension
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 16
Hospitalizations Per 100,000 Adults
40
30
20
10
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

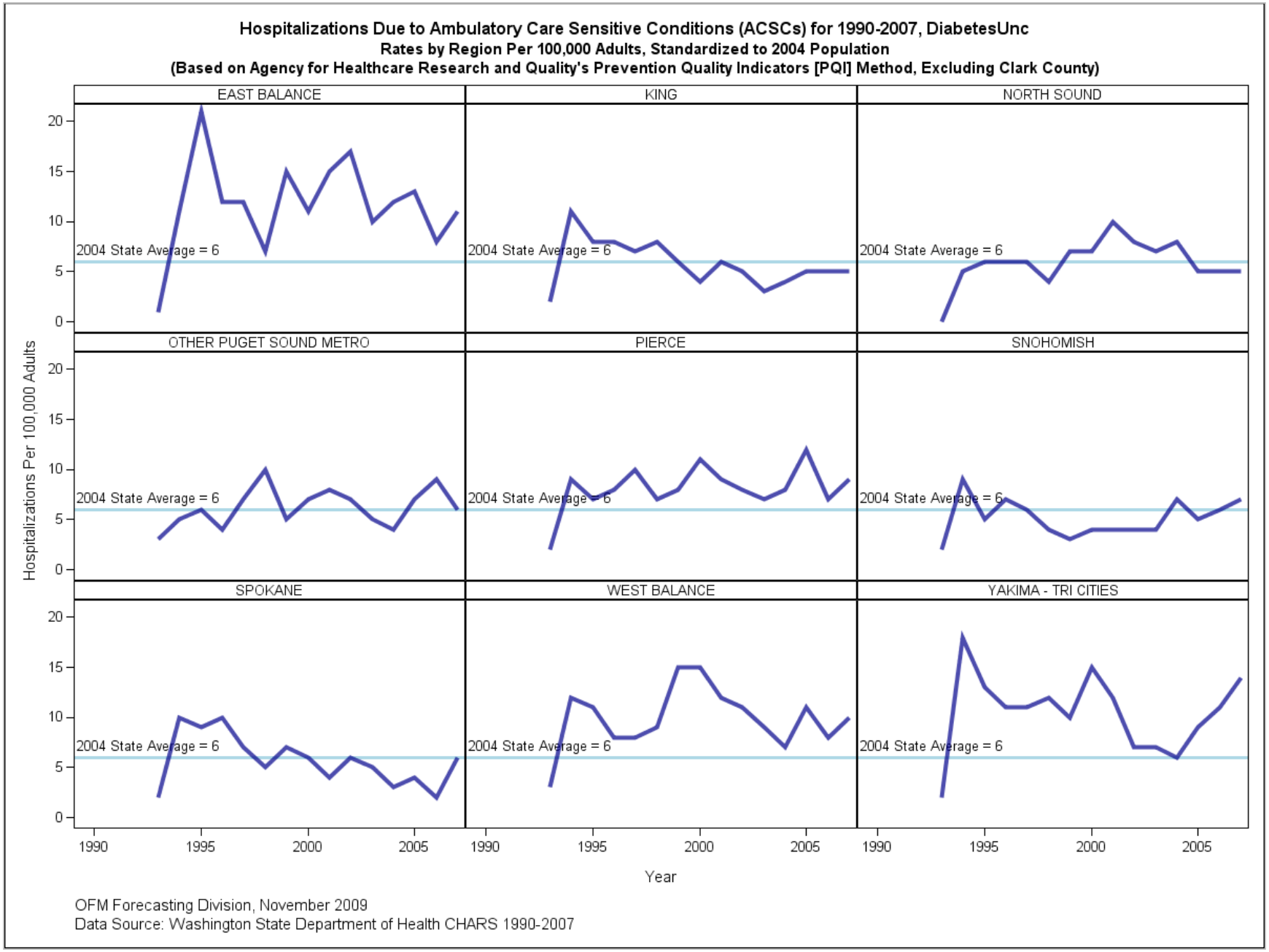

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, CHF
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 260
Hospitalizations Per 100,000 Adults
500
400
300
200
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

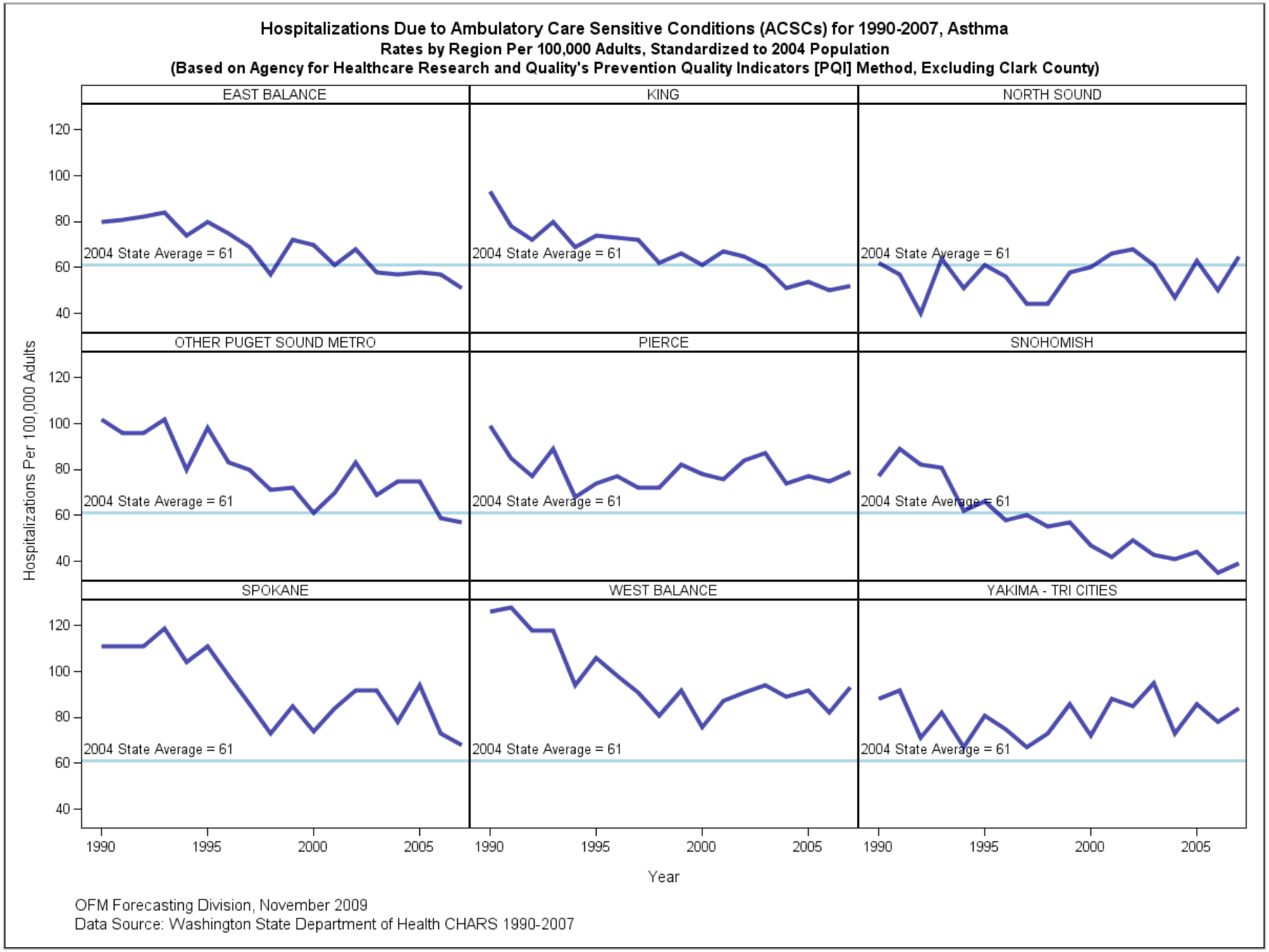

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Dehydration
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 62
Hospitalizations Per 100,000 Adults
100
80
60
40
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

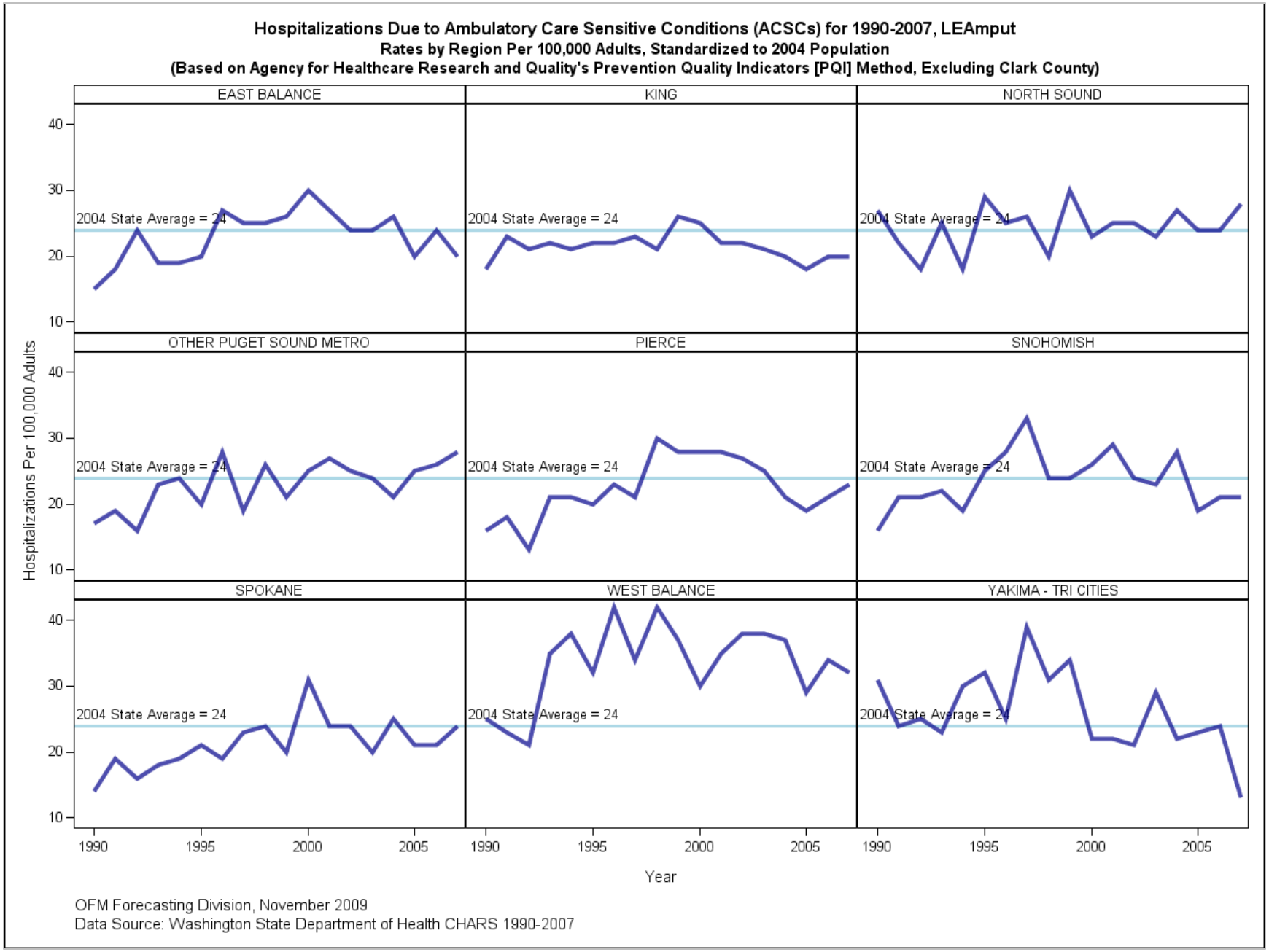

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, BactPneumonia
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 266
Hospitalizations Per 100,000 Adults
500
400
300
200
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

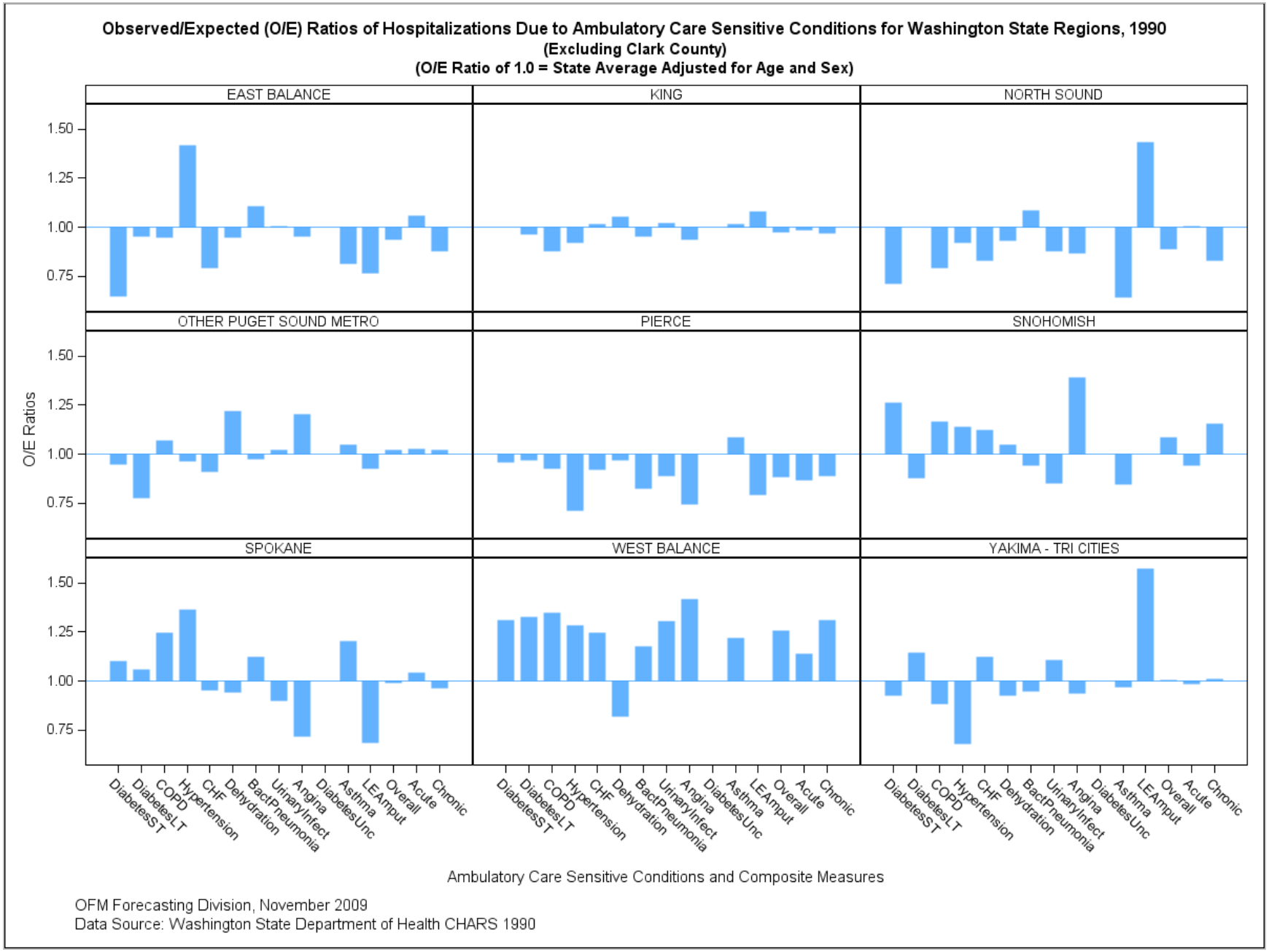

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, UrinaryInfect
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 102
Hospitalizations Per 100,000 Adults
175
150
125
100
75
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

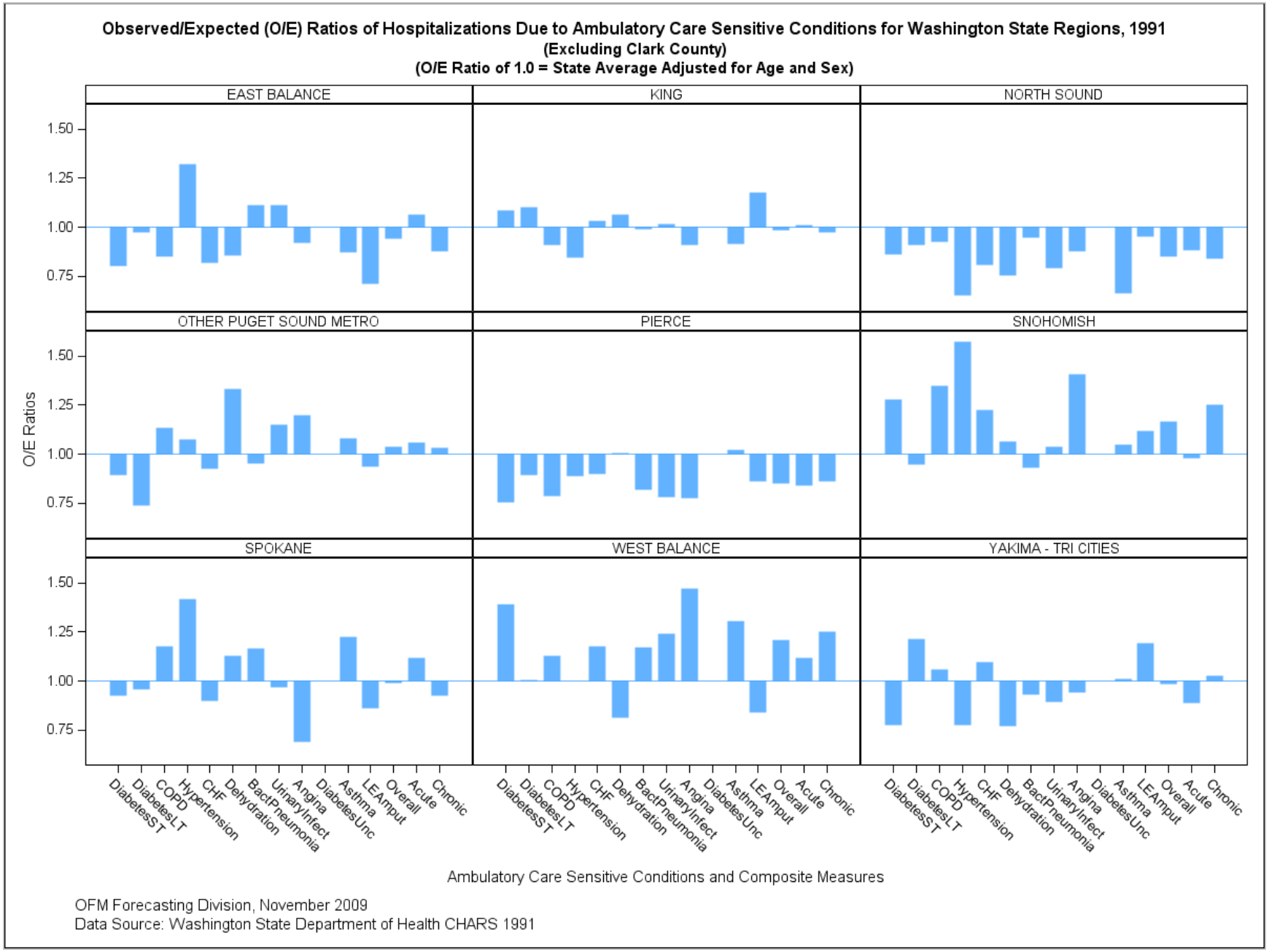

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Angina
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 21
Hospitalizations Per 100,000 Adults
0
100
200
300
400
500
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

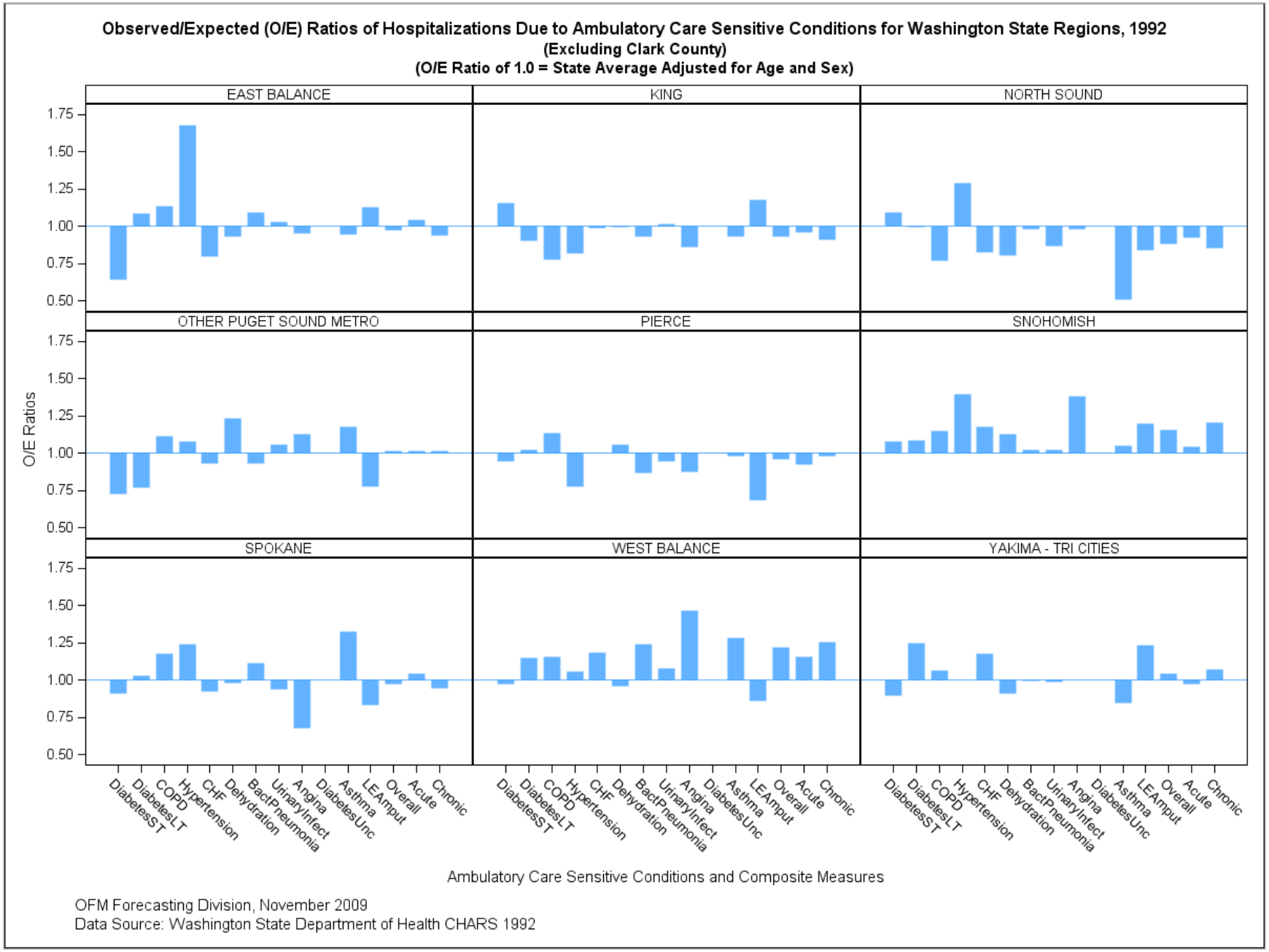

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, DiabetesUnc
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 6
Hospitalizations Per 100,000 Adults
0
5
10
15
20
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

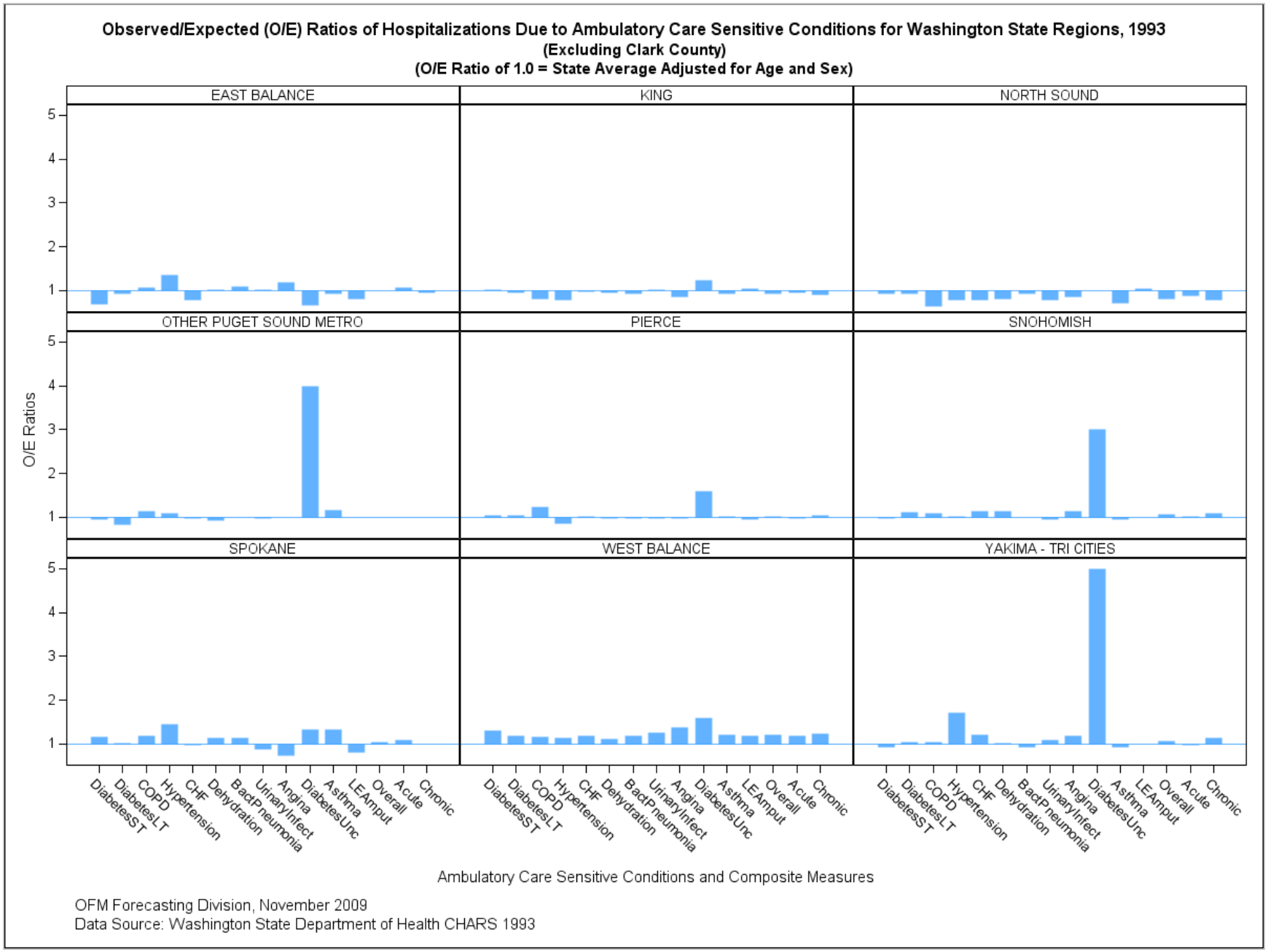

Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, Asthma
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 61
Hospitalizations Per 100,000 Adults
120
100
80
60
40
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007


Hospitalizations Due to Ambulatory Care Sensitive Conditions (ACSCs) for 1990-2007, LEAmput
Rates by Region Per 100,000 Adults, Standardized to 2004 Population
(Based on Agency for Healthcare Research and Quality's Prevention Quality Indicators [PQI] Method, Excluding Clark County)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
2004 State Average = 24
Hospitalizations Per 100,000 Adults
10
20
30
40
1990
1995
2000
2005
Year
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990-2007

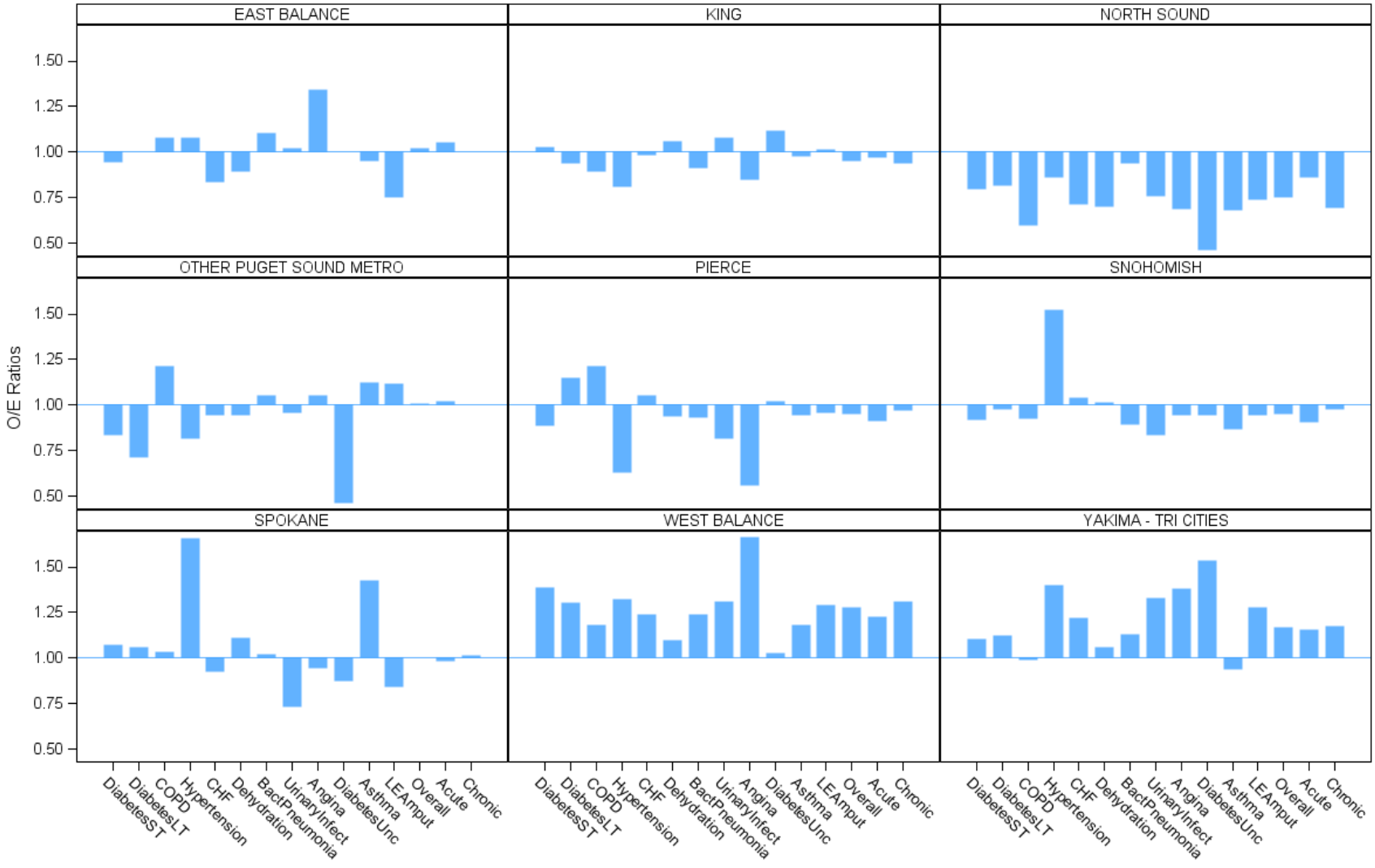

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1990
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
1.50
1.25
1.00
0.75
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1990


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1991
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
1.50
1.25
1.00
0.75
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1991


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1992
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
1.75
1.50
1.25
1.00
0.75
0.50
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1992

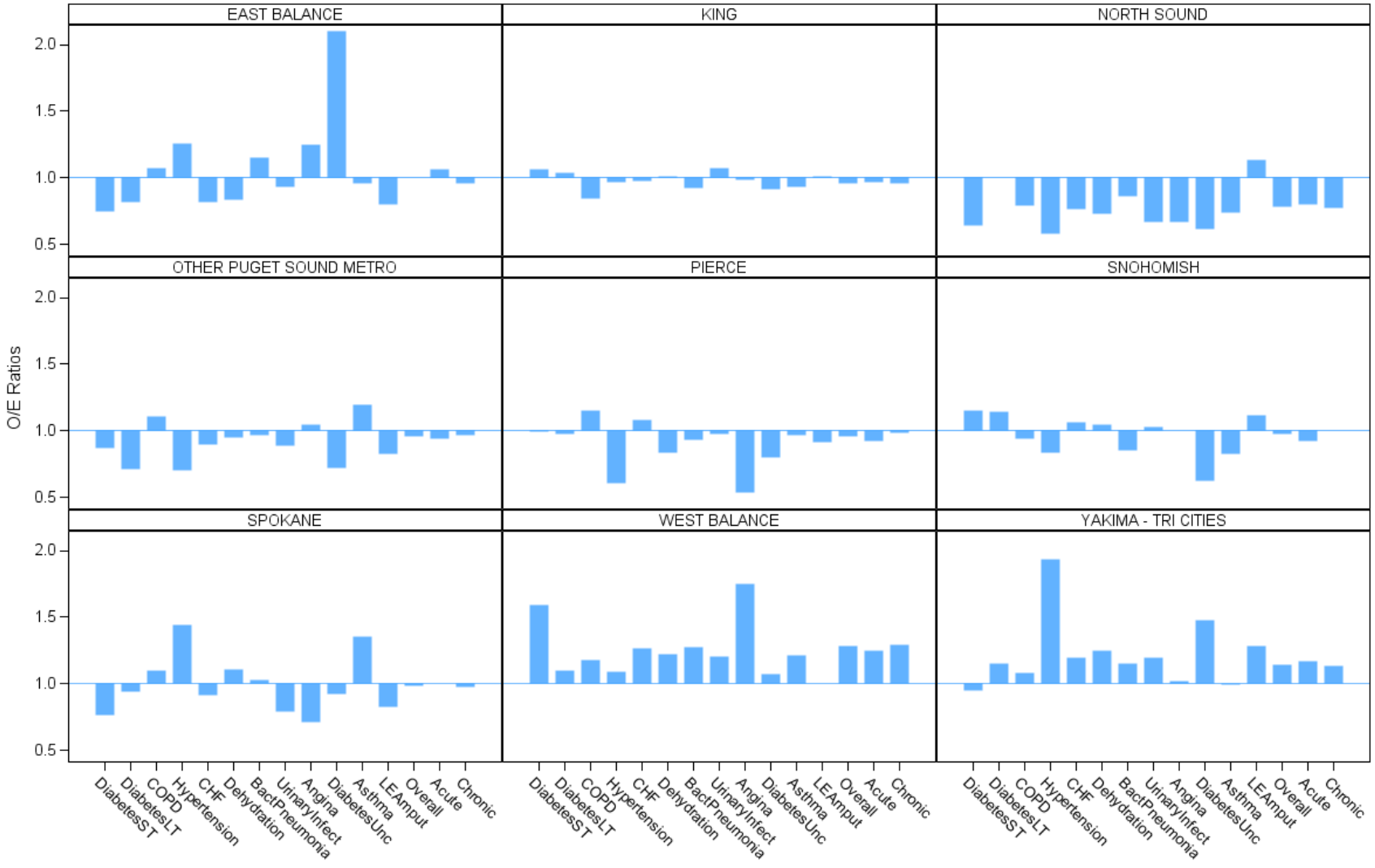

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1993
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
1
2
3
4
5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1993

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1994
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)

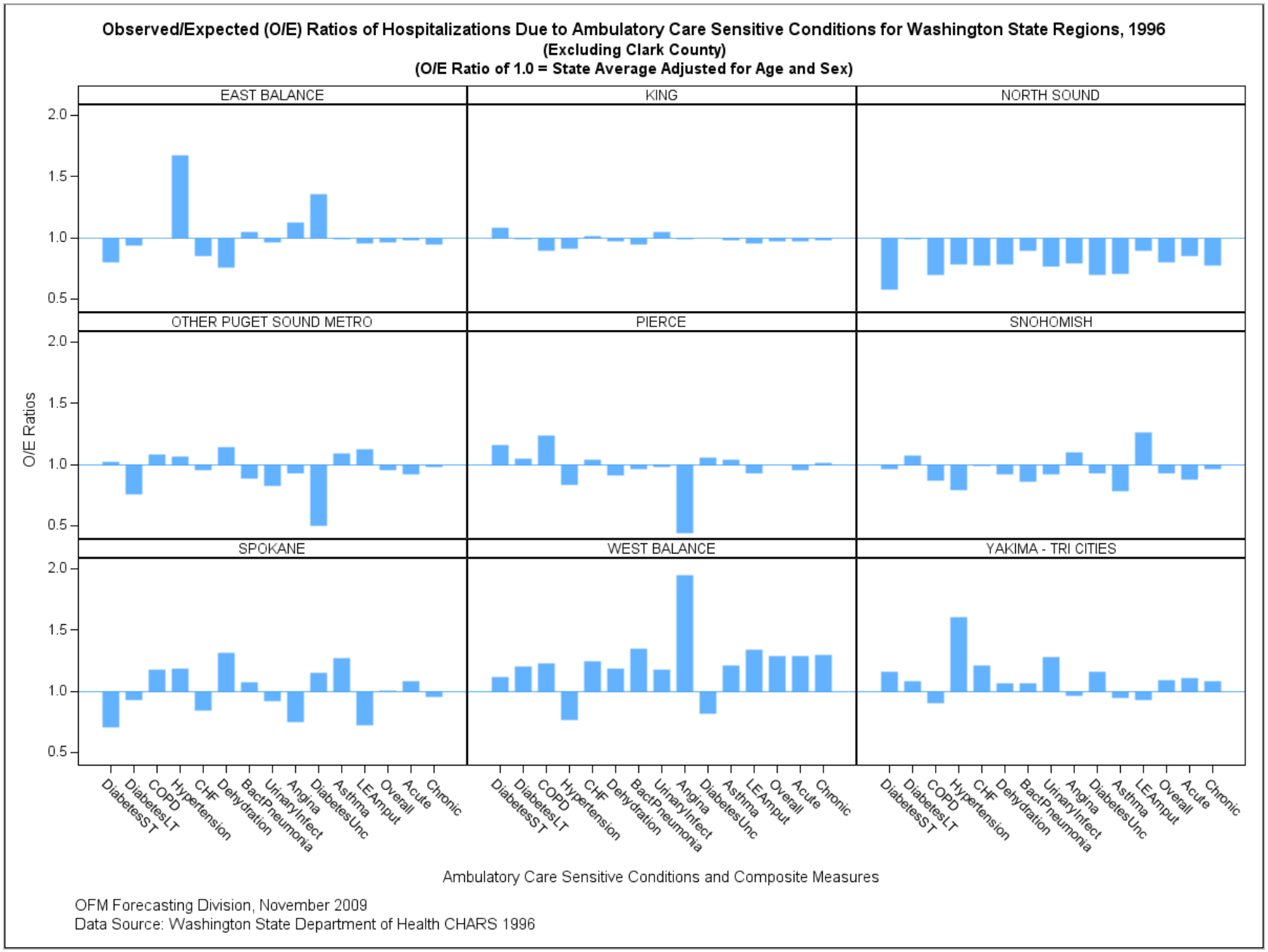


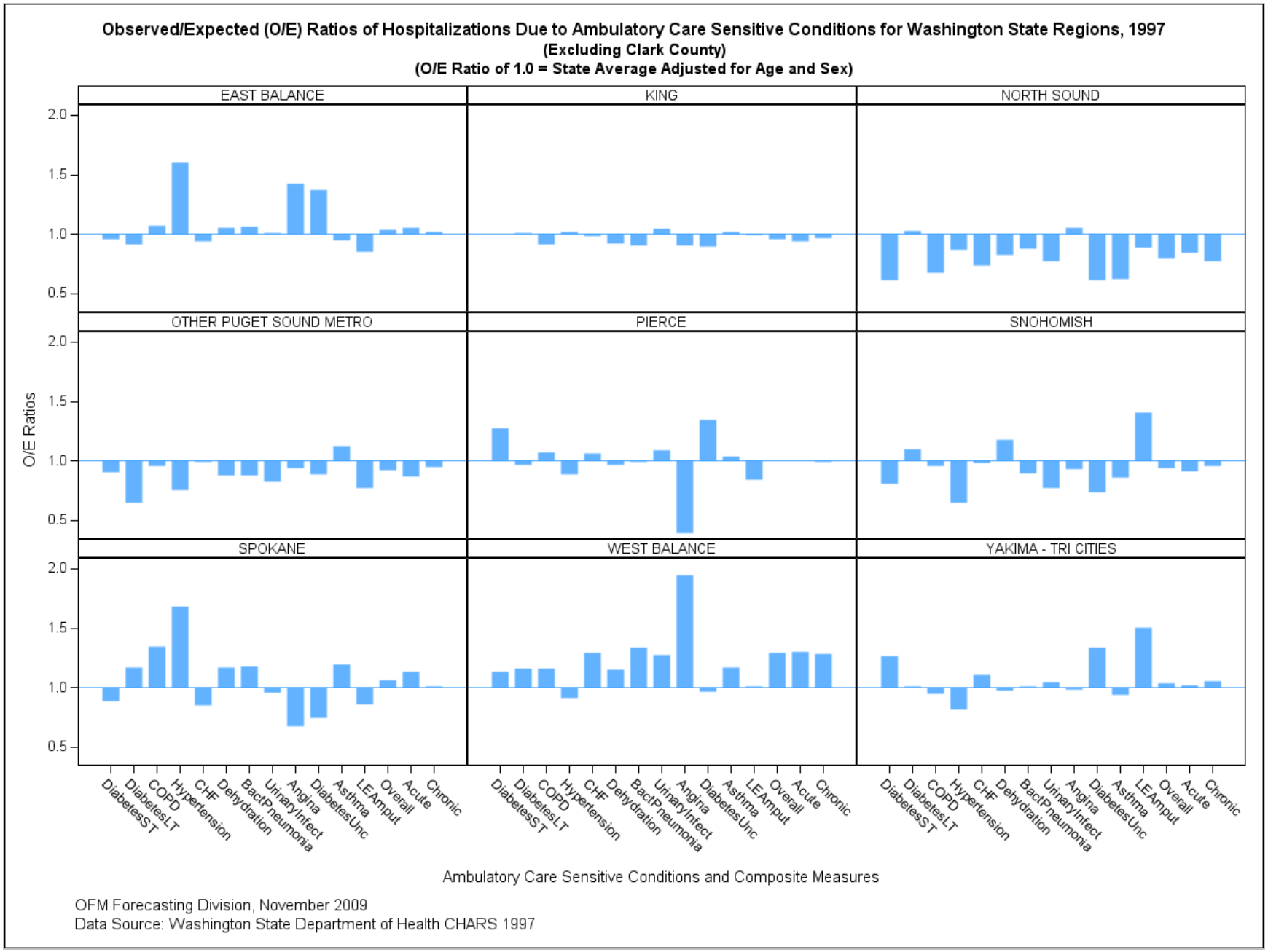
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1994

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1995
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)

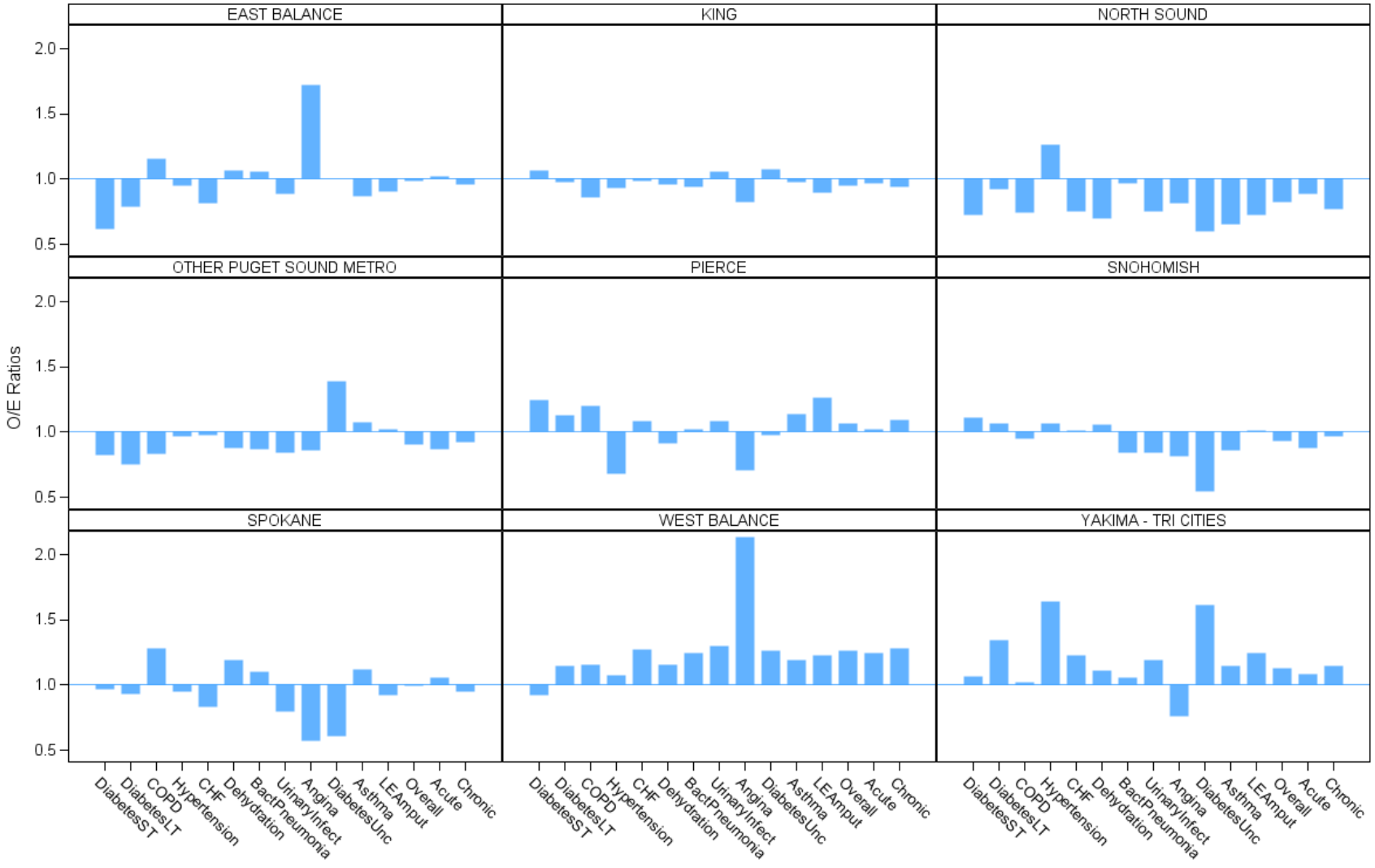


OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1995


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1996
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1996

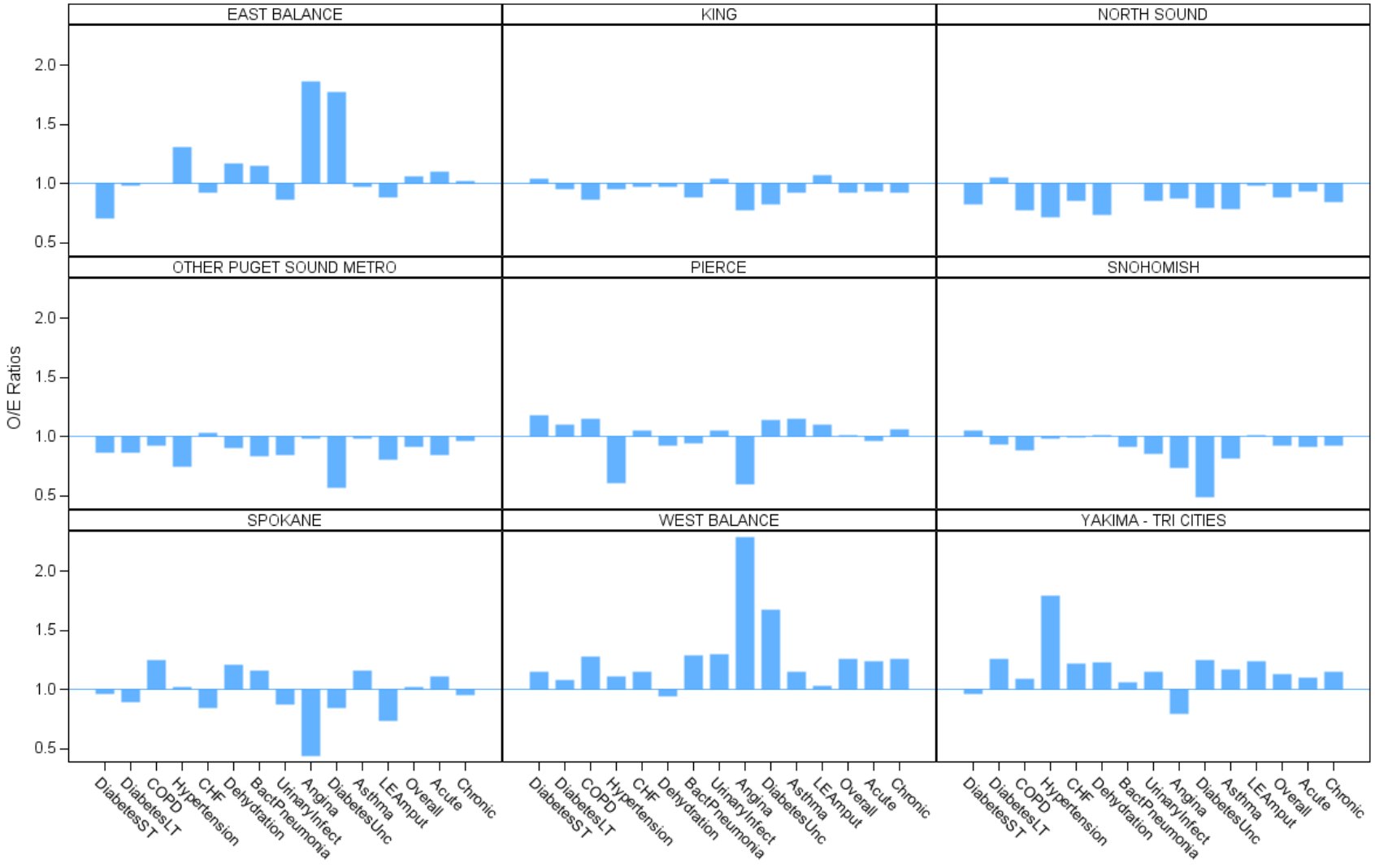

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1997
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1997

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1998
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)

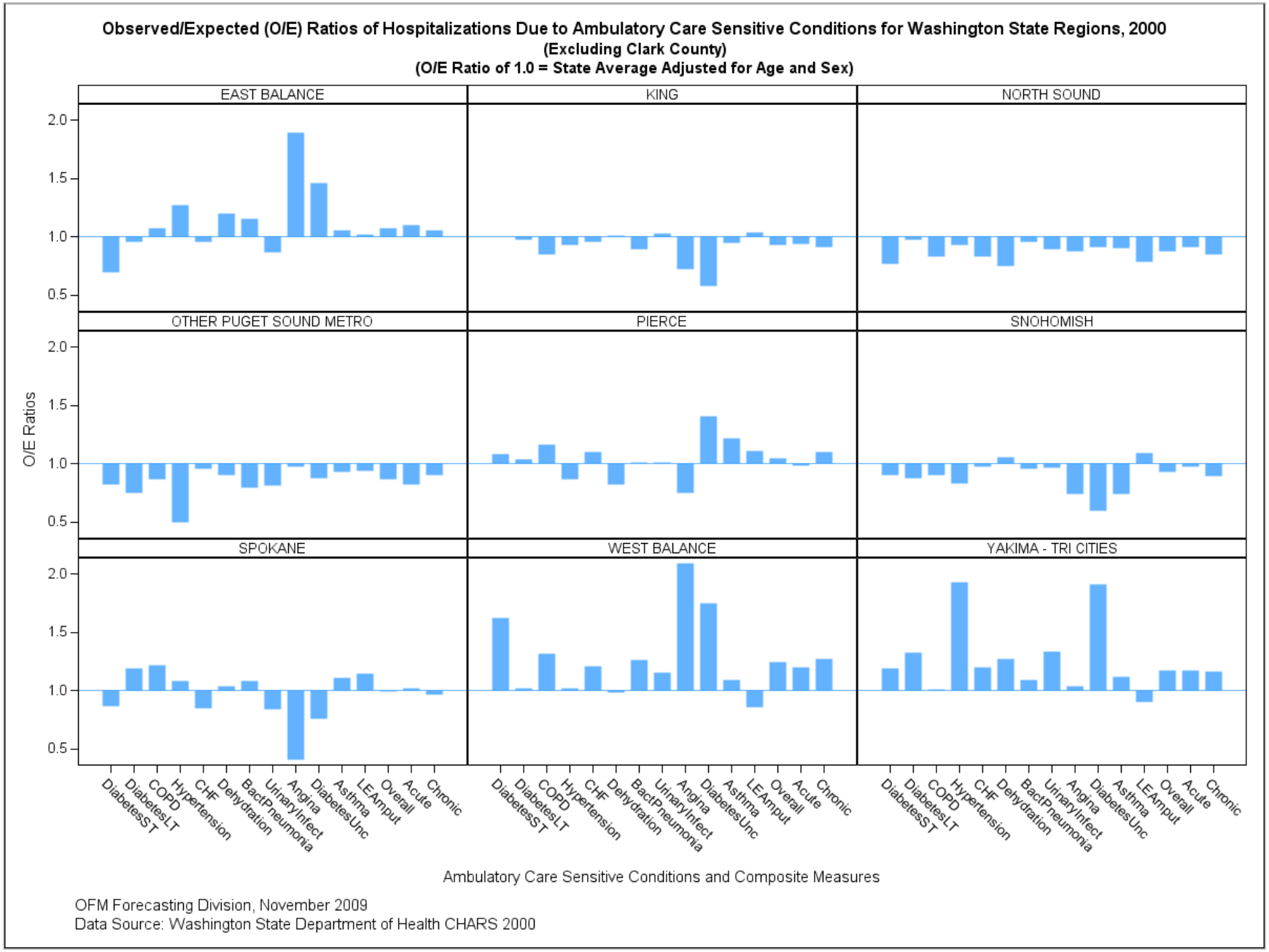


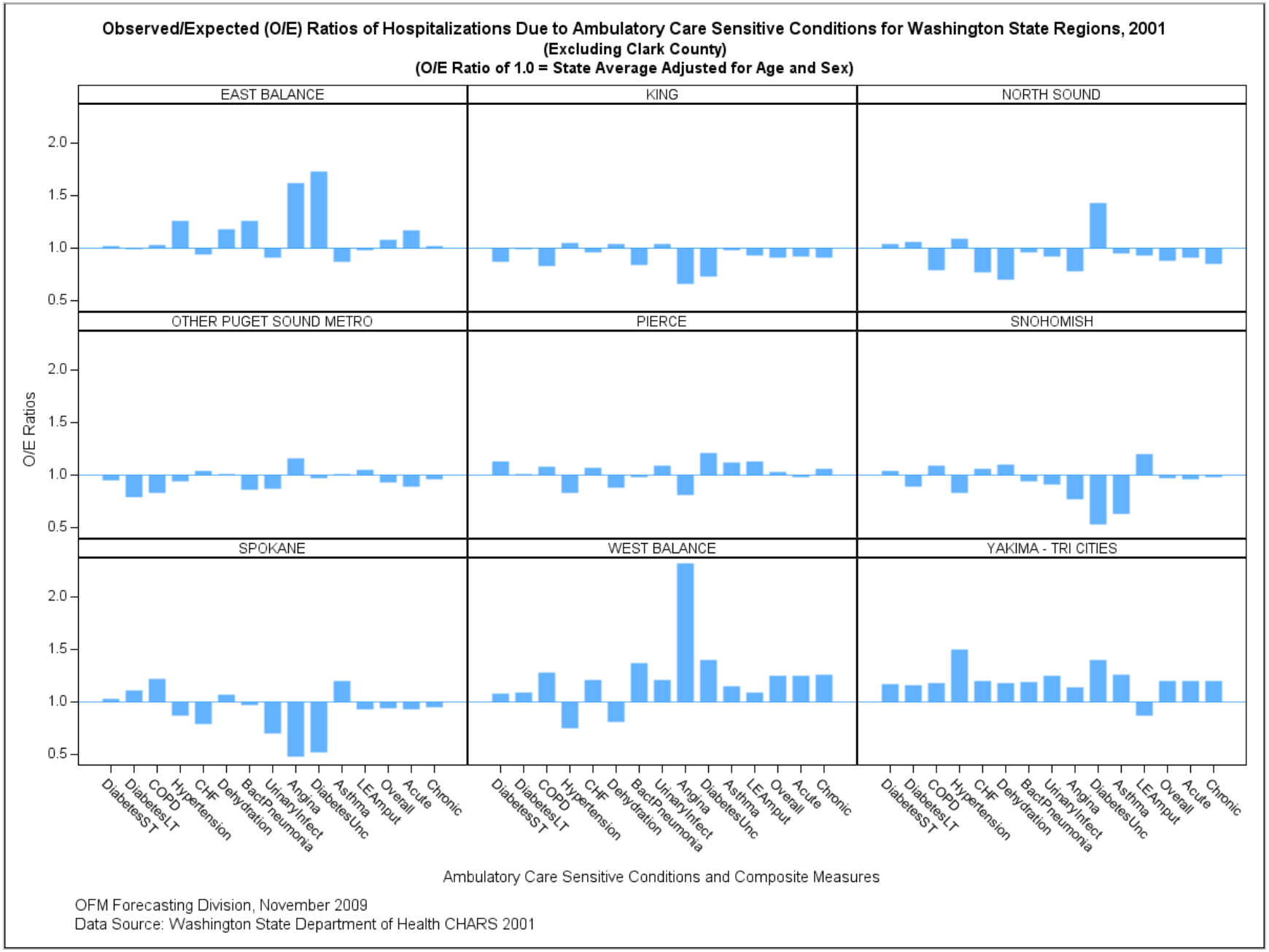
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1998

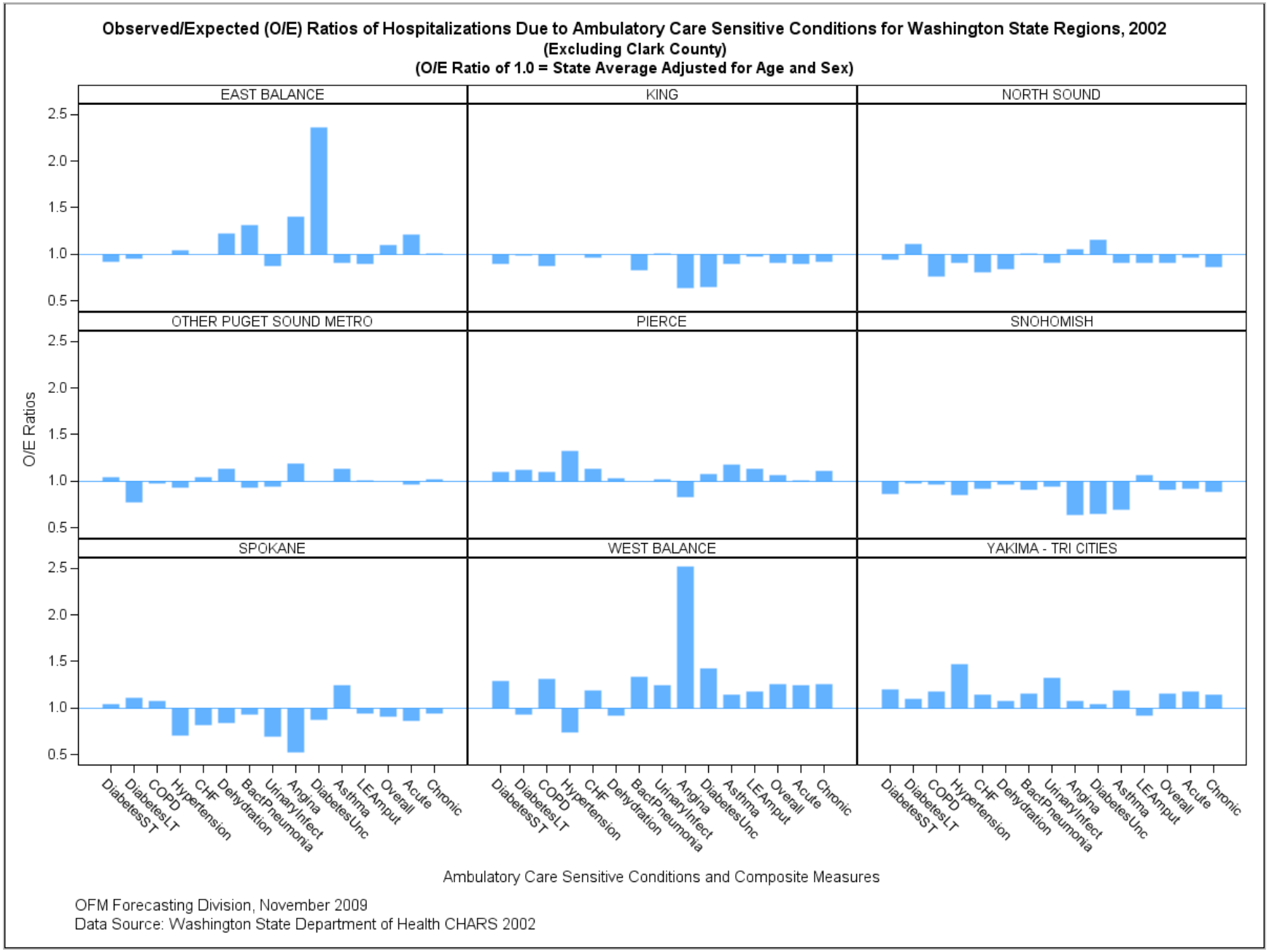
Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 1999
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)

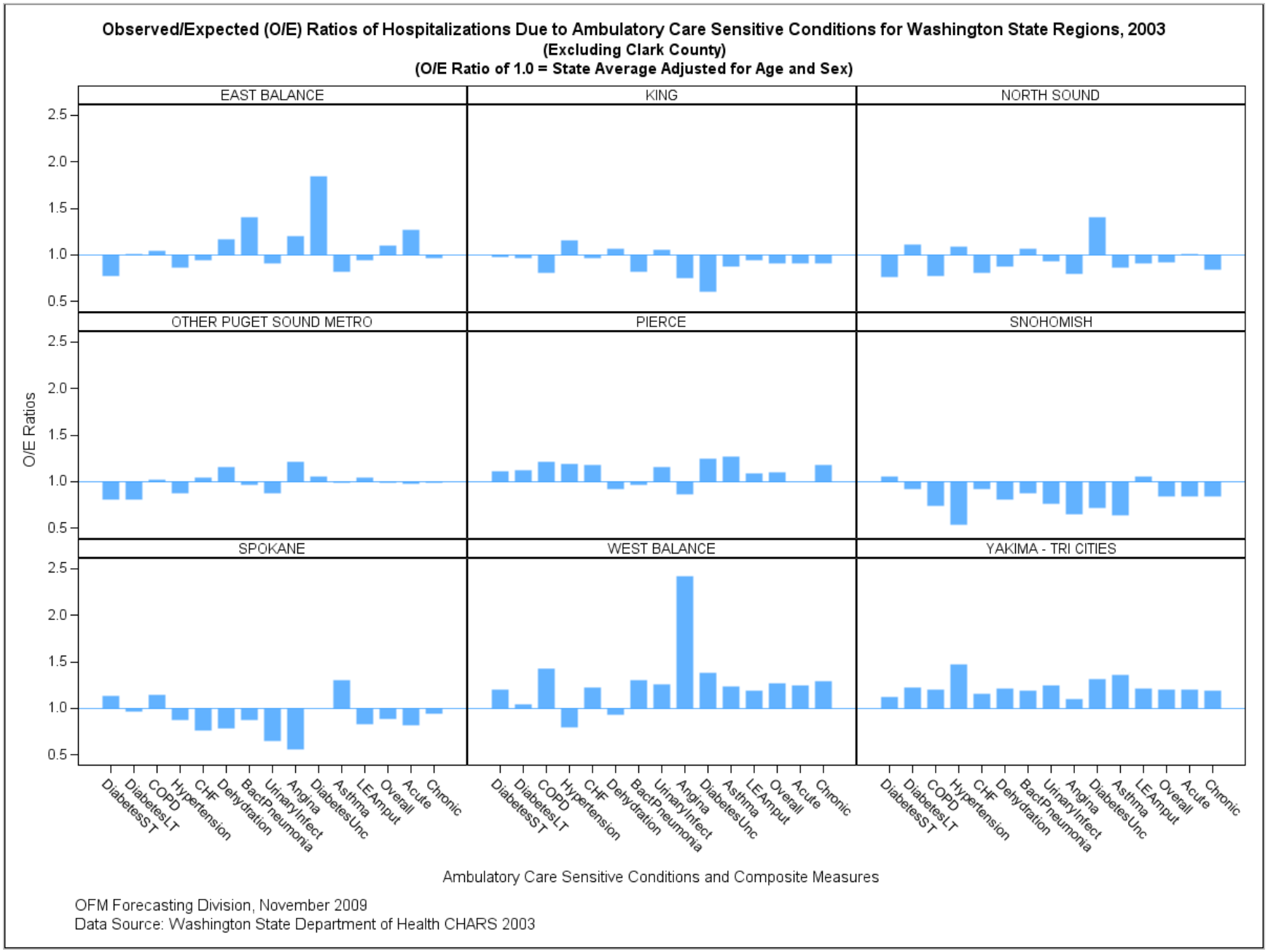


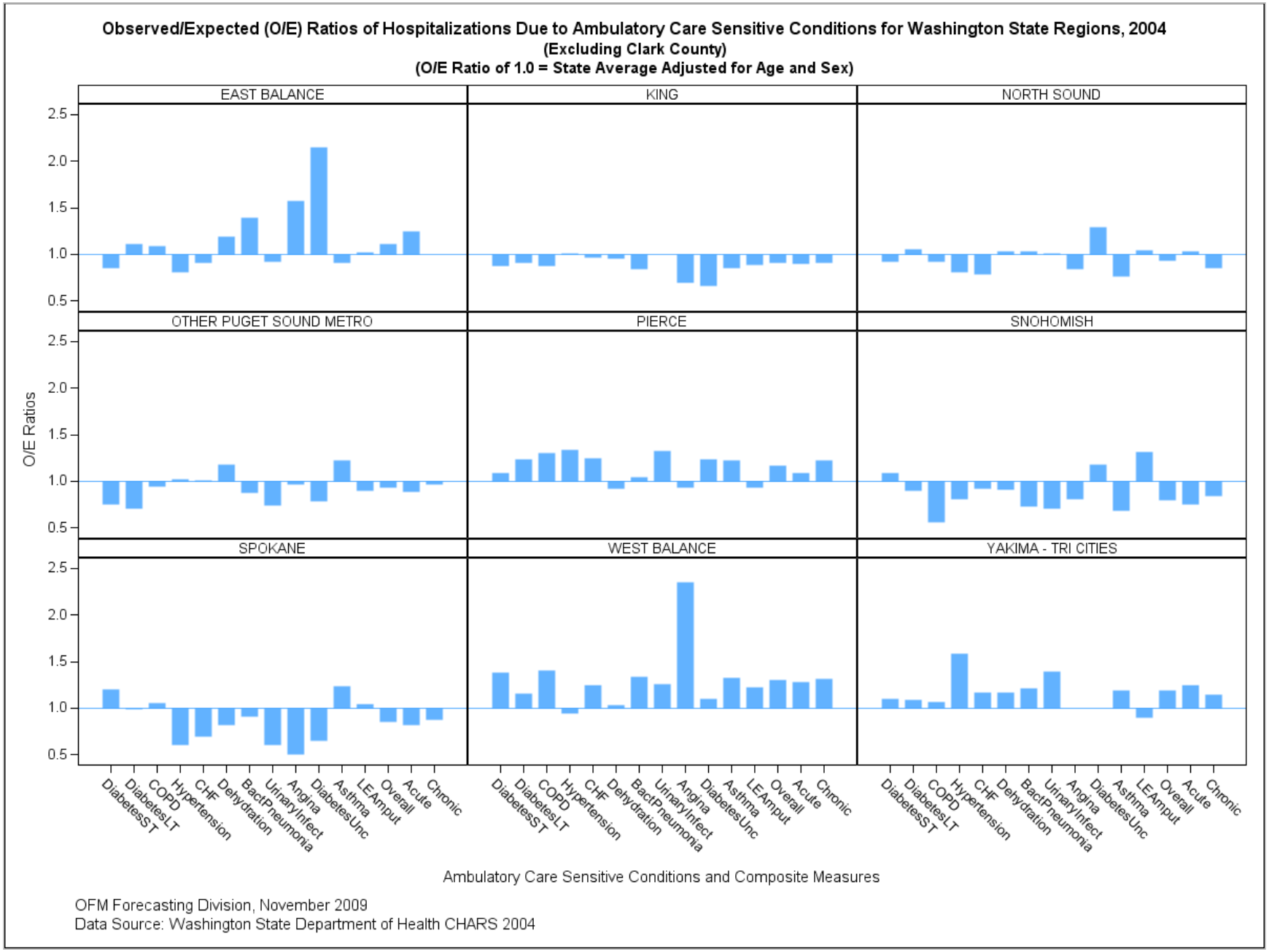
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 1999

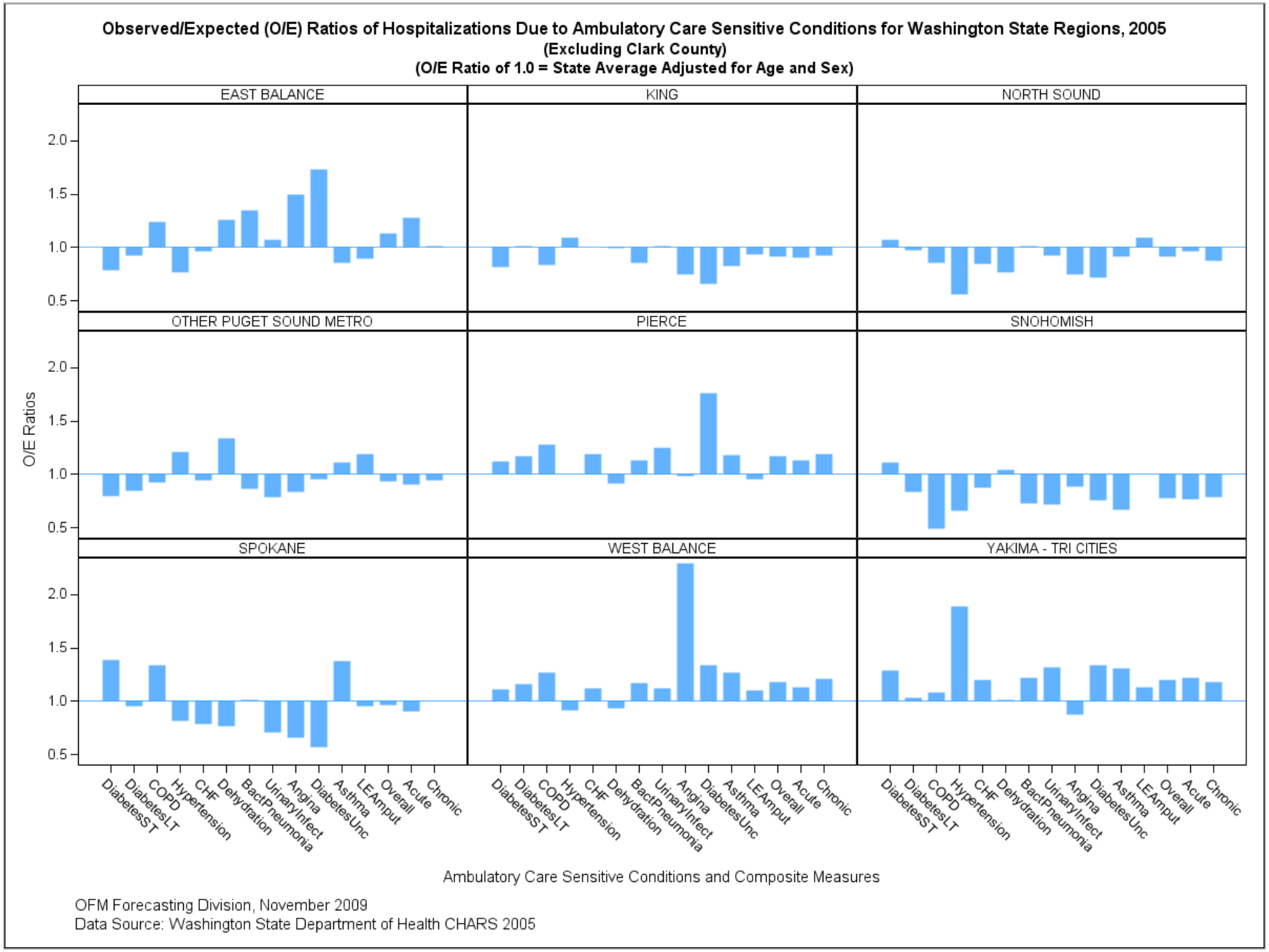

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2000
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2000

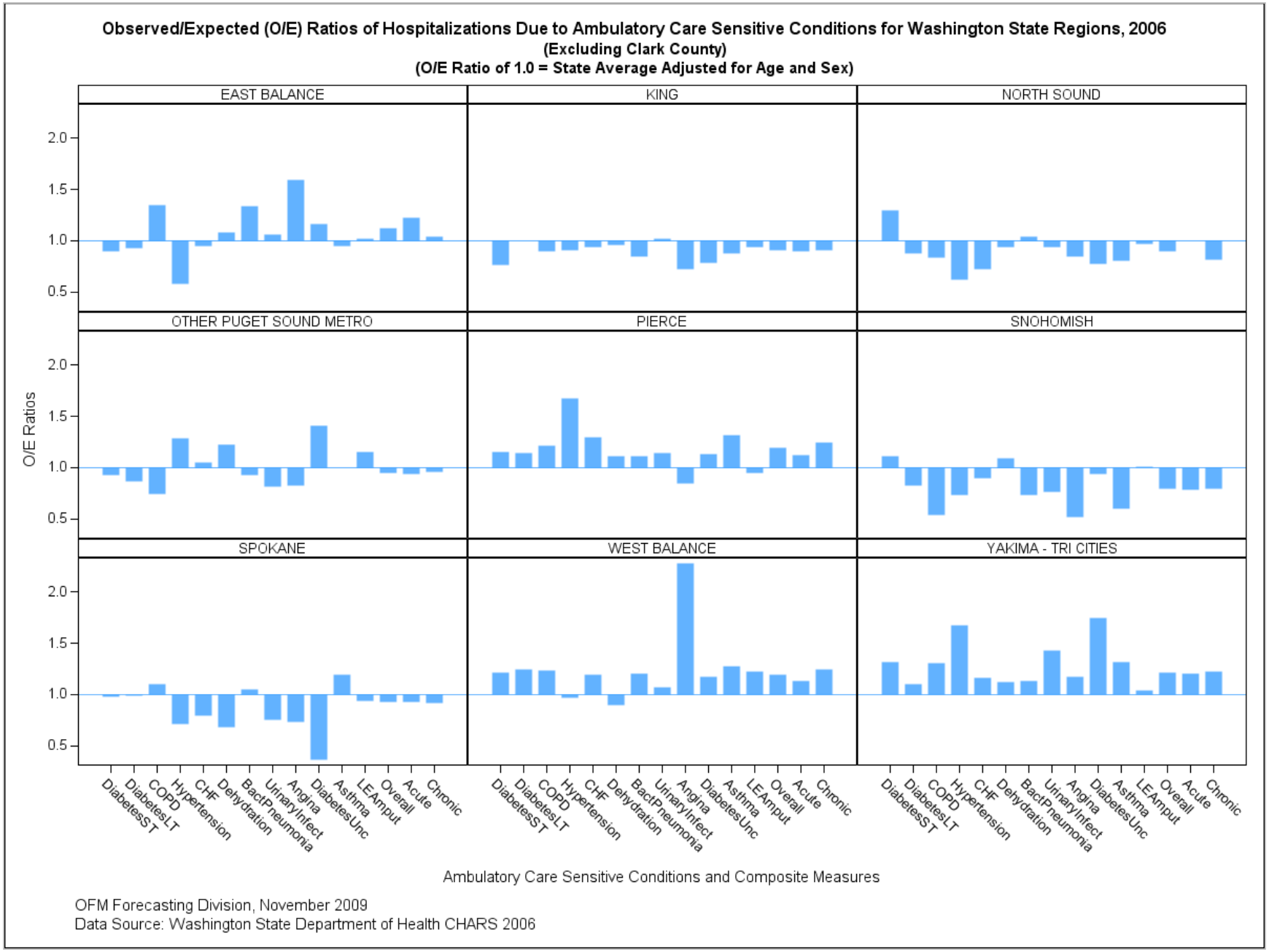

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2001
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2001


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2002
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.5
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2002


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2003
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.5
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2003


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2004
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.5
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2004


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2005
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2005


Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2006
(Excluding Clark County)
(O/E Ratio of 1.0 = State Average Adjusted for Age and Sex)
EAST BALANCE
KING
NORTH SOUND
OTHER PUGET SOUND METRO
PIERCE
SNOHOMISH
SPOKANE
WEST BALANCE
YAKIMA - TRI CITIES
O/E Ratios
2.0
1.5
1.0
0.5
DiabetesST
DiabetesLT
COPD
Hypertension
CHF
Dehydration
BactPneumonia
UrinaryInfect
Angina
DiabetesUnc
Asthma
LEAmput
Overall
Acute
Chronic
Ambulatory Care Sensitive Conditions and Composite Measures
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2006

Observed/Expected (O/E) Ratios of Hospitalizations Due to Ambulatory Care Sensitive Conditions for Washington State Regions, 2007
(Excluding Clark County)
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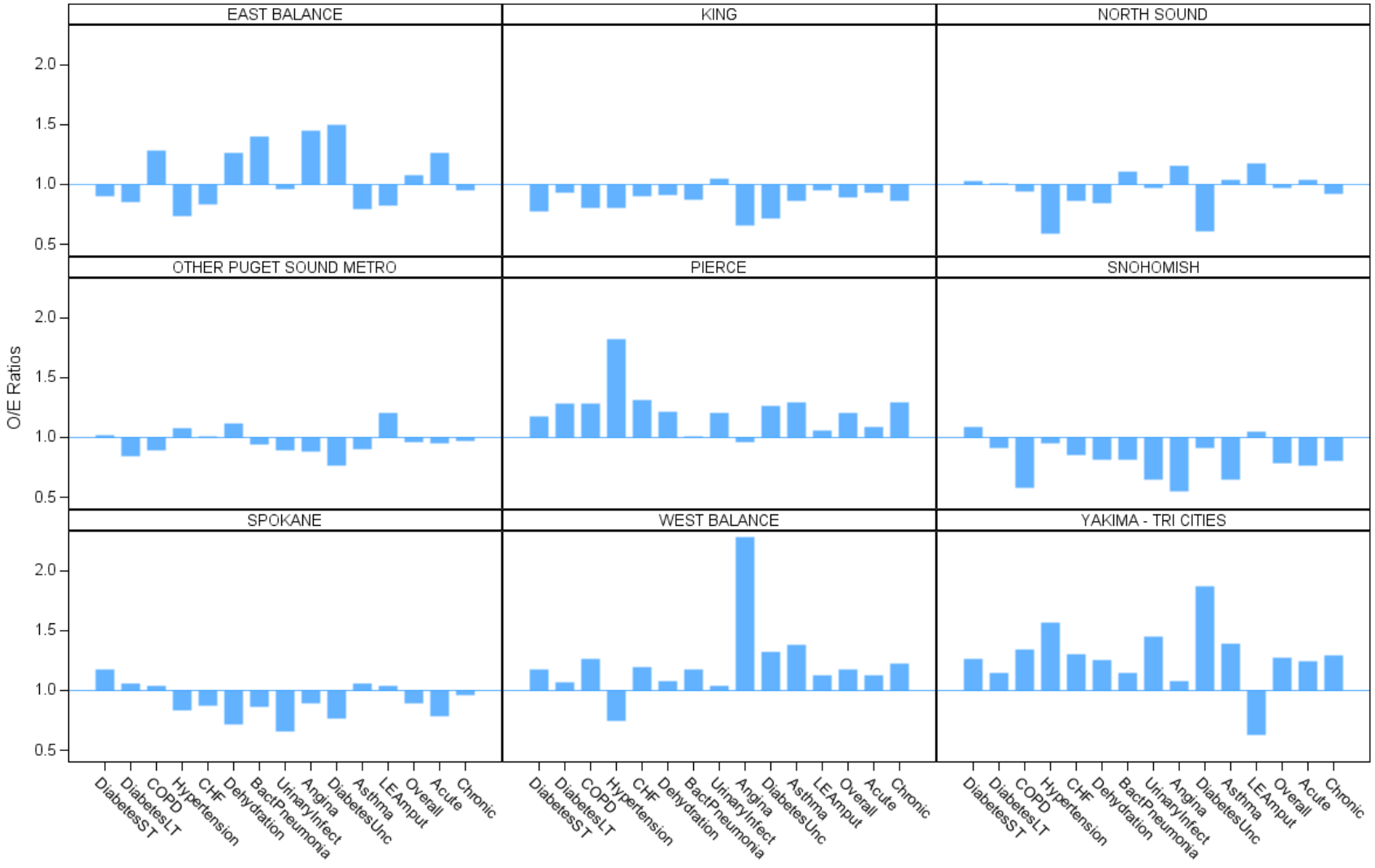
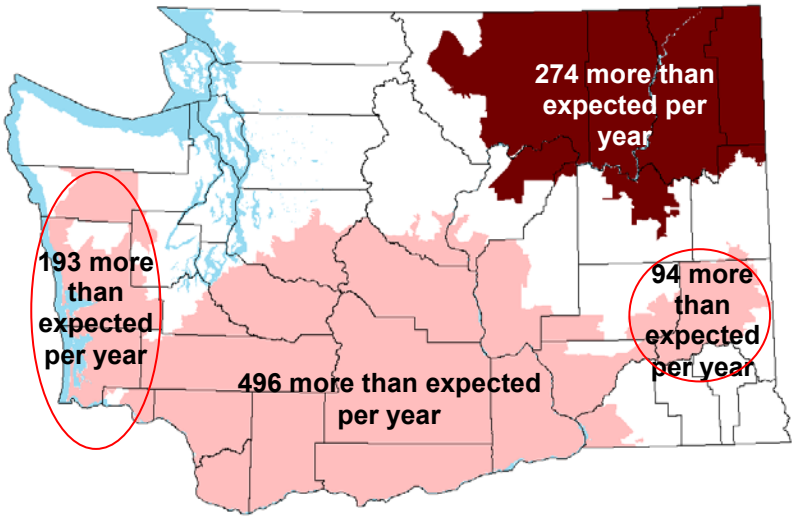


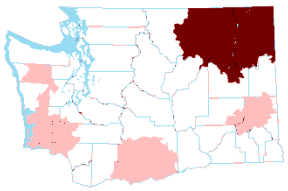
OFM Forecasting Division, November 2009
Data Source: Washington State Department of Health CHARS 2007

Bacterial Pneumonia Hospitalizations (AHRQ PQI 11), 2003-2005

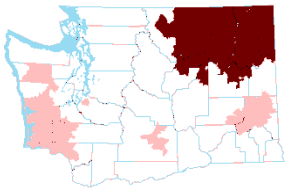
More Than Expected Bacterial Pneumonia Hospitalizations



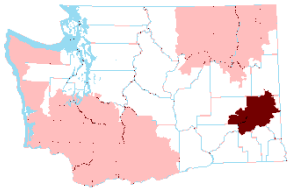
2003 – 2005 combined



2003



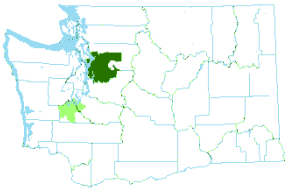
2004



2005

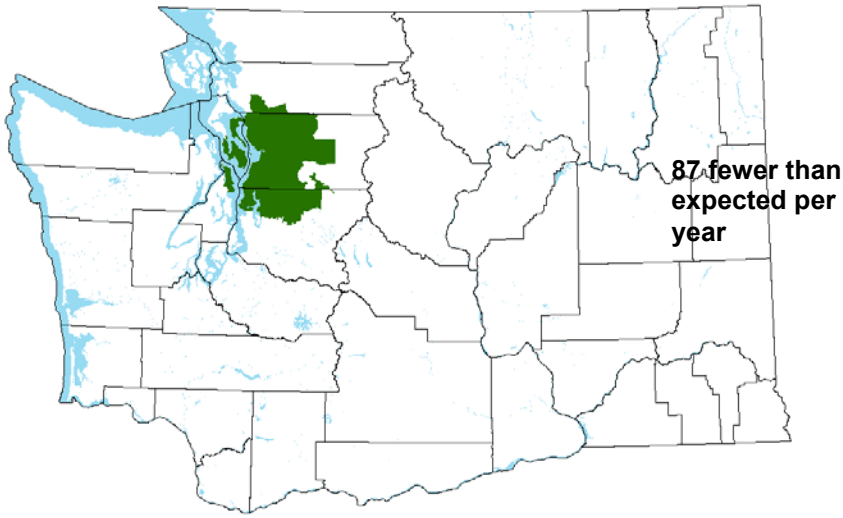
Fewer Than Expected Bacterial Pneumonia Hospitalizations

2003



2004

2005

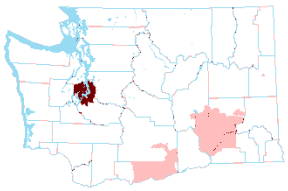


2003 – 2005 combined

Diabetes, Long-Term Complications Hospitalizations (AHRQ PQI 3), 2003-2005

More Than Expected Diabetes Long-Term Complications Hospitalizations

2003 – 2005 combined

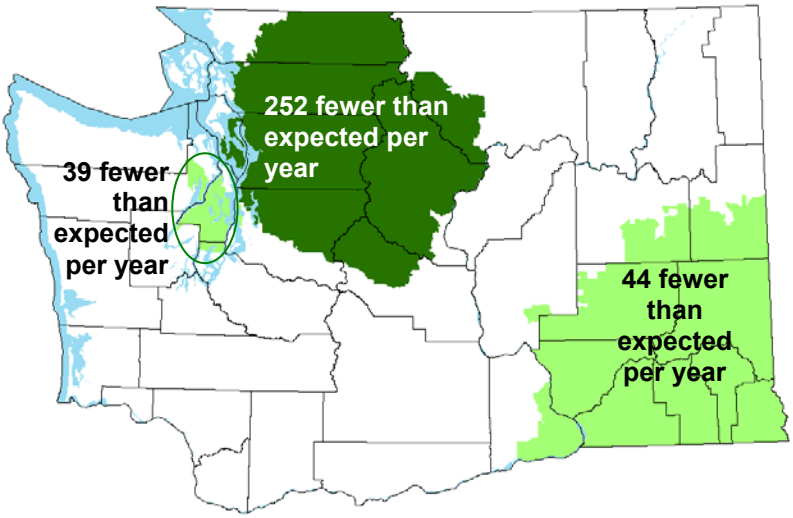


2003

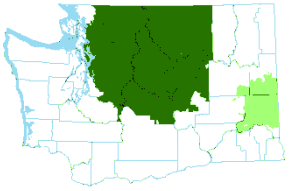
2004

2005

Fewer Than Expected Diabetes Long-Term Complications Hospitalizations



2003 – 2005 combined



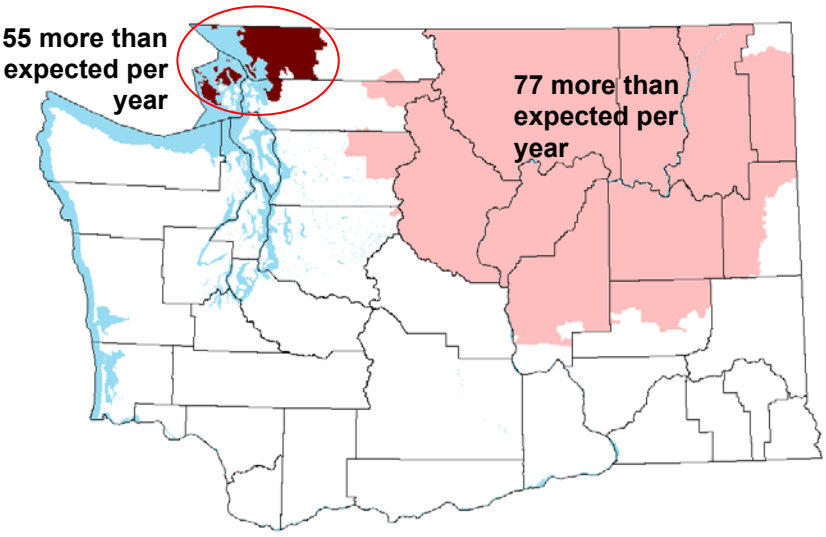
2003

2004

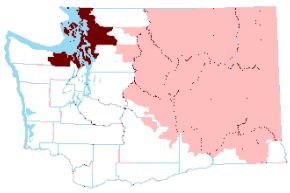
2005

Prostate Cancer Hospitalizations, 2003-2005

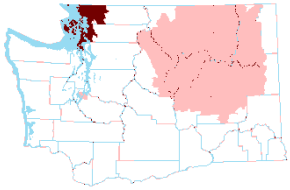
More Than Expected Prostate Cancer Hospitalizations



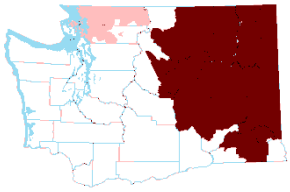
2003 – 2005 combined



2003



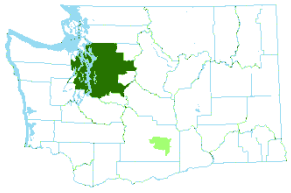
2004



2005

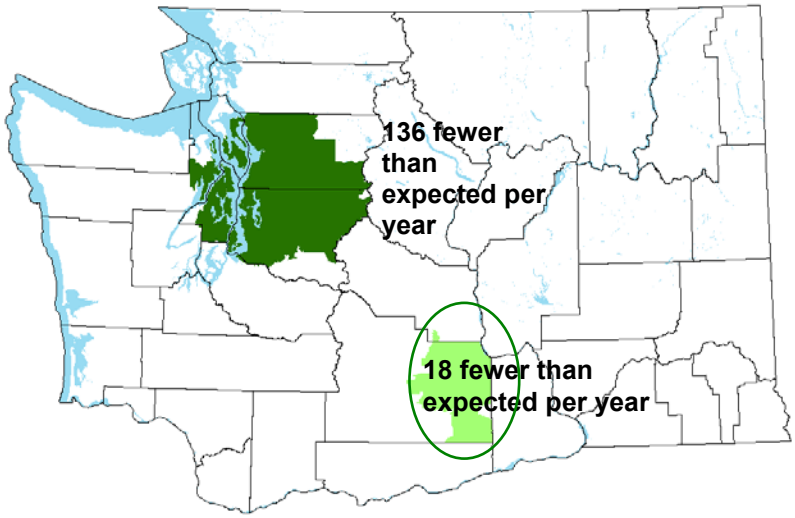
Fewer Than Expected Prostate Cancer Hospitalizations

2003



2004

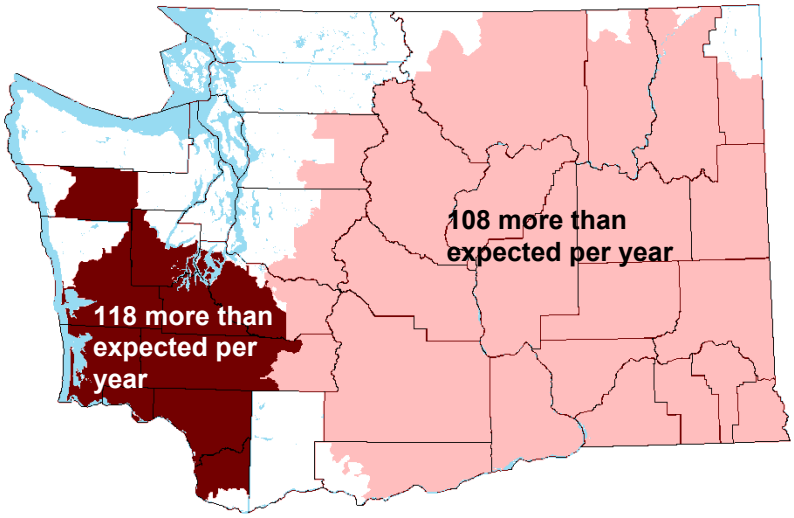
2005



2003 – 2005 combined

Coronary Artery Bypass Graph Surgery (CABG) Hospitalizations, 2003-2005

More Than Expected CABG Hospitalizations



2003 – 2005 combined

2003

2004

2005

Fewer Than Expected CABG Hospitalizations

2003

2004

2005

2003 – 2005 combined

Population and Rates of Select Types of Health Professional Licenses, Washington State Regions, 2008

Region	CLARK	EAST BALANCE	KING	NORTH SOUND	OTHER PUGET SOUND METRO	PIERCE	SNOHOMISH	SPOKANE	WEST BALANCE	YAKIMA - TRI CITIES
Population	424,200	495,000	1,884,200	403,900	492,100	805,400	696,600	459,000	455,600	471,600
Rates:	**Rate Per 100,000 Population**									
Total Professional Licenses	3,879	4,401	4,905	4,736	4,871	4,412	4,277	6,016	4,597	3,906
- MDs	177	154	482	235	242	211	146	291	148	172
- DOs	12	9	11	9	15	13	8	16	10	19
- Dentists	62	50	108	67	70	58	62	76	47	52
- Pharmacists	78	76	121	76	79	69	88	147	66	71
- Radiological Technologists	61	74	70	76	80	67	87	96	66	78
- ARNP, LPN, or RN*	966	1,125	1,169	1,307	1,333	1,218	1,128	1,566	1,174	967
ARNP	37	44	69	48	60	45	37	89	43	43
LPN	109	221	151	324	289	368	176	233	265	187
RN	859	934	1,025	999	1,058	863	964	1,349	940	805

*Sums of ARNP, LPN and RN licenses will be greater than numbers of individuals because some individuals hold two or all three of these license types.

OFM Forecasting Division, November 2009

Data Source: Washington State Department of Health health professional license database.

Facility Inventory Lists and Data Sources

Facility Type	Sources for Combined Lists Used During Verification Process	Verification Completed
Dialysis/ Kidney Centers	• Northwest Renal Network • Washington State Department of Health Geographic Information System • Washington State Dept. of Labor and Industries Industrial Insurance Accounts	April 2008
Hospitals (Acute Care)	• Washington State Department of Health Geographic Information System • Washington State Dept. of Labor and Industries Industrial Insurance Accounts • Washington State Hospital Association	May 2008
Ambulatory Surgery Centers	• Washington Ambulatory Surgery Center Association • Washington State Department of Health Geographic Information System • Washington State Dept. of Labor and Industries Industrial Insurance Accounts	May 2008
Nursing Homes	• Washington State Department of Social and Health Services • Washington State Department of Health • Washington State Dept. of Labor and Industries Industrial Insurance Accounts • Washington Health Care Association	June 2008
Labs	• U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Clinical Laboratory Improvement Act website • Washington State Department of Health Geographic Information System • Washington State Dept. of Labor and Industries Industrial Insurance Accounts	December 2008
Diagnostic Imaging Centers	• Washington State Department of Health Office of Radiation Protection • Washington State Dept. of Labor and Industries Industrial Insurance Accounts • Washington State Radiological Society	December 2008
Trauma Centers	• Washington State Department of Health	March 2009
Pharmacies	• DSHS Integrated Provider Network Database • Washington State Department of Health • Washington State Dept. of Labor and Industries Industrial Insurance Accounts	May 2009
Hospices	• HospiceDirectory.Org • Washington State Department of Health • Washington State Dept. of Labor and Industries Industrial Insurance Accounts • Washington State Home and Palliative Care Organization	June 2009
Home Health and Home Care Agencies	• CarePathways • Washington State Department of Health • Washington State Dept. of Labor and Industries Industrial Insurance Accounts	August 2009
Community Mental Health Agencies	• U.S. Department of Health and Human Services Substance Abuse & Mental Health Services Administration website • Washington Community Mental Health Council • Washington State Dept. of Labor and Industries Industrial Insurance Accounts • Washington State Department of Social and Health Services Mental Health Division	September 2009
Drug and Alcohol Treatment Facilities	• U.S. Department of Health and Human Services Substance Abuse & Mental Health Services Administration website • Washington State Department of Social and Health Services Division of Alcohol and Substance Abuse • Washington State Dept. of Labor and Industries Industrial Insurance Accounts	Pending

OFM Forecasting Division, November 2009.
Data Source: Washington State Office of Financial Management.

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OLYMPIA, WA 98504-3113 ◆ (360) 902-0555 ◆ FAX (360) 664-2832