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DISPARITIES IN THE RATES OF ADMISSION FOR AMBULATORY CARE SENSITIVE CONDITIONS AMONG CHILDREN LIVING IN PENNSYLVANIA

A Thesis in
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by

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ABSTRACT

Purpose: The purpose of this study is to investigate race/ethnic and age group disparities in the rates of admission for ambulatory care sensitive conditions (ACSC) among children living in Pennsylvania. Ambulatory care-sensitive conditions (ACSC) are illnesses such as asthma, dehydration, and bacterial pneumonia for which appropriate preventative and primary ambulatory care can greatly reduce the need for hospitalization. Rates of admission for these conditions are often viewed as indicators of the quality of primary care. Race/ethnic and age group differentials in the rates of admission for ACSC among children living in Pennsylvania during 2001 and 2005 are compared.

Study Design: Rates of admission for the 10 most common ACS conditions are examined for African American, Hispanic, and white children aged 0-4, 5-9, 10-14, and 15-19 years, using 2001 and 2005 data from the Pennsylvania Health Care Cost Containment Council's (PHC4) hospital discharge database and population information from the US Census Bureau. Logistic regression models are estimated to determine statistically significant differences in ACSC admission rates by race/ethnicity and age, and significant changes in these rate differences over time.

Population Studied: African-American, Hispanic and white children aged 0 to 19 years living in Pennsylvania during 2001 and 2005.

Principal Findings: African American children had higher rates of admission for most ACSC compared to Hispanics and whites in both 2001 and 2005. Hispanic children also had higher rates of admission for most ACSC compared to whites in both years, but the Hispanic-white disparities were not as pronounced as the African American-white disparities. Further, children who were younger tend to have higher rates of admission compared to older children. Comparisons of trends from 2001 to 2005 in ACSC hospitalization rate disparities are mixed,

with disparities for some ACSC conditions increasing and some decreasing in each childhood age group. Many disparities in 2005, however, were not significantly changed from those observed in 2001.

Conclusions: There are race/ethnic disparities in the rates of admission for ACSC among children living in Pennsylvania, and these disparities are most pronounced between African Americans and whites. Age group disparities also exist, with younger children being more likely to be admitted for ACSC compared to older children. Overall, the race/ethnic disparities have not changed significantly in 2005 compared to 2001.

Policy Implications: Mechanisms underlying disparities in the rates of admission for ACSC among Pennsylvania children need to be investigated. Also, the fact that the disparities observed in 2001 were largely unchanged in 2005 implies that little progress was made between those years. Policy interventions that promote equitable, timely, and affordable access to quality care for all Pennsylvania children are needed.

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Chapter 1

INTRODUCTION

A child's admission to the hospital can be very expensive for many low- and middle-income families, particularly if such families lack adequate health coverage. Faced with the rapidly increasing cost of health care, however, many economically challenged families may be unable to afford quality primary care that could prevent a sizable number of child hospitalizations. Recently, there has been an interest in the number of low-income children who are admitted for preventable illnesses or ambulatory care sensitive conditions (ACSC). In general, these are conditions for which appropriate preventative and primary care can reduce the need for hospital admissions (Billings et al, 1993; Billings, Anderson, & Newman, 1996). Examples of ACSCs include asthma, gastroenteritis, diabetes, dehydration, epilepsy, upper airway conditions, and hypertension (AHRQ, 2001).

Hospital admission for ACSCs is generally associated with lower socioeconomic status (Parker and Schoendorf, 2000). Since African Americans and Hispanics generally have lower socio-economic status compared to whites, admissions for ACSCs have been found to be more prevalent in these populations (Simpson, Bloom, Cohen & Parsons, 1997; Adler & Newman, 2002). However, trends in the occurrence of ACSC admissions and differences in these trends by race/ethnicity are not yet well-understood.

The objectives of this study were to 1) investigate racial and age-group differences in access to preventative care for children living in Pennsylvania, as measured by hospital admissions for ACSC; and 2) determine if these disparities increased, decreased, or remained the same between 2001 and 2005. Hence, the magnitude of the disparities in the rates of admission for 2005 and 2001, and the age distribution of children being admitted for these preventable

conditions were examined. Factors associated with ACSC admissions were also investigated. Results from this study will allow policy makers to better understand the scope of the differential rates of admissions for ACSC among children living in Pennsylvania. Also, knowledge of the age distribution of ACSC admissions rates within the different racial groups will further expose policy makers to the nature of the disparities in the rates of admissions for ACSC among children living in Pennsylvania during the periods under study. Together with the racial disparities in the rates of admission, the age-group disparities also helps identify which child socio-demographic groups are at greatest risk of preventable hospitalization. Finally, this study helps to understand how to best focus policy interventions to address the identified disparities.

Motivation and Questions to be addressed

There are substantial disparities in the access to quality primary care among the different racial groups in the United States (Simpson, et al., 1997). Since access to primary health care is contingent upon having adequate health coverage, many uninsured and/or underinsured children end up being admitted for conditions that could otherwise be avoided (Schreiber & Zielinski, 1997; Fleming, 1995). These avoidable hospitalizations can greatly exacerbate the financial burdens on low-income families. Friedman and Basu (2001) showed that African Americans and Hispanics are more likely to lack health insurance and access to primary care compared to whites. According to Roos, Walld, Uhanova, and Bond (2005), low socio-economic status also negatively impacts access to primary care. Further, children often bear a major proportion of the disparities in health care, since children from households with lower annual incomes are also more likely to lack access to quality preventative care (Roos, et al., 2001).

Clearly, unnecessary ACSC admissions further widen the inequality in access to quality primary care by depriving low-income families of resources when children from these families are admitted for avoidable medical conditions. States' overall health expenditures may also

become affected when children from these low-income families visit the emergency rooms for ACSC treatment. From a policy standpoint, the incidence of unnecessary ACSC admissions needs to be addressed. In order to address this important policy issue, however, many questions need to be satisfactorily answered. First, how big are the differences between ACSC admission rates for minority children and their white counterparts living in Pennsylvania? Also, has this gap increased, decreased, or remained constant between 2001 and 2005? Finally, are children belonging to certain age-groups more susceptible to ACSC admissions than others? Comprehensive answers to these questions will enable policy makers to better understand the scope of the problem and then formulate new initiatives to deal with it. Reduced ACSC admissions would also spare many families the financial and emotional burdens associated with child hospitalizations.

Definition of Ambulatory Care Sensitive Conditions

Ambulatory care sensitive conditions (ACSC) were first classified by Billings et al. in 1993. Recognizing that untimely and ineffective outpatient care may lead to higher hospitalization rates for residents of low-income areas, the authors identified a group of conditions for which hospitalization rates were indeed higher in low income neighborhoods of New York City (Billings et al, 1993; Billings, Anderson, & Newman, 1996). These conditions were termed ambulatory care sensitive conditions or ACSC for short. The definition offered by Billings et al is provided below:

Ambulatory care sensitive conditions are diagnoses for which timely and effective outpatient care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic illness or condition, or managing a chronic disease or condition (Billings et al. 1993, p. 163).

The original list of conditions, as identified by Billings et al, included a set of about 30 conditions. Table 1 below lists the ACSC and their ICD-9 codes:

Table 1.1 ACSC Conditions and their ICD-9 Codes

ACS Conditions	ICD-9 Codes[1]
Asthma	**493**
Severe ear, nose, and throat (ENT) infections	**382, 462, 463, 465, 472.1**
Bacterial pneumonia	**481, 482.2, 482.3, 482.9, 483, 485, 486**
Congestive heart failure	**402.01, 402.11, 402.91, 428, 518.4**
Dehydration - volume depletion	**276.5**
Epilepsy	**345**
Gastroenteritis	**558.9**
Iron deficiency anemia	**280.1, 280.8, 280.9**
Pelvic inflammatory disease	**614**
Pulmonary tuberculosis	**011**

[1] These codes are based on Billings et al (1996) definitions.

other tuberculosis	**012-018**
Angina	**411.1, 411.8, 413**
Immunization-related and preventable conditions	**033, 037, 045, 320.0, 390, 391**
Convulsions "A"	**780.3**
Convulsions "B"	**780.3**
Hypertension	**401.0, 401.9, 402.00, 402.10, 402.90**
Congenital syphilis	**090**
Failure to thrive	**783.4**
Dental conditions	**280.1, 280.8, 280.9**
Chronic obstructive pulmonary disease	**491, 492, 494, 496, 466.0**
Kidney/urinary infection	**590, 599.0, 599.9**
Congenital syphilis	**090**
Acute myocardial infarction	**410**
Skin grafts with cellulitis	**DRG 263, DRG 264**
Diabetes "A"	**250.1, 250.2, 250.3**
Diabetes "B"	**250.8, 250.9**
Diabetes "C"	**250.0**
Hypoglycemia	**251.2**
Iron deficiency anemia	**280.1, 280.8, 280.9**
Appendicitis with appendectomy	**540, 541, 542**
Gastrointestinal Obstruction	**560**

Prior Research on Ambulatory Care Sensitive Conditions

No prior research has examined patterns and trends in Ambulatory Care Sensitive Conditions among children living in Pennsylvania. However, some research has been conducted among children in other states, as well as using national data to examine patterns of ACSC admission nationwide. These studies are summarized below.

National and Multi-State Studies

Using a data from the Healthcare Cost and Utilization Project (HCUP-3) for the years 1988 and 1992, Kaestner, Joyce, and Racine (2000) investigated the effect of Medicaid on the incidence of ambulatory care sensitive condition-related hospitalizations among children (2-6 and 7-9 years of age) nationwide. First, they showed that children from ZIP code areas with median family incomes below $25,000 have significantly greater incidence of ACSC hospitalizations compared to children from non-poor areas, a result that was consistent with previous findings linking lower parental income to worse health outcomes among children. More importantly, however, they showed that there was a decline in ACSC incidence among children living in poor and non-poor areas. Following the expansion in Medicaid eligibility between 1988 and 1992, for example, the incidence of ACSC hospitalization declined for nine out of ten ACSCs that the authors looked at.

In another nationwide study, Parker and Schoendorf (2000) investigated the relationships between ACSC hospitalization rates and income category among different sub-groups of a nationally representative child population contained in the National Hospital Discharge Survey (NHDS) from 1990 to 1995. The children were categorized by age, race, region of country, and expected source of hospital payment. As expected, children living in the lowest income areas had significantly more hospitalizations than children living in higher income areas. Also, ACSC discharge rates were lower among children who were uninsured compared to those who had

Medicaid. In addition, younger children (1-4 years) had more discharges than older children (5-14 years), and black children had higher discharge rates compared to white children.

Using the 1994 NHDS, Leiyu Shi and Ning Lu (2000) examined the associations between individual socio-demographic characteristics and ACSC hospitalizations. These individual socio-demographic characteristics include age, race, and insurance status. Of these characteristics, only age and race were shown to be significantly associated with ACSC hospitalization. Specifically, they showed that younger children were more likely than older children to be admitted for ACSC. Also, black children were 1.653 times more likely to have an ACSC hospitalization compared to white children of similar age groups, but there was no significance difference in ACSC admission between males and females (pg. 381).

Finally, Friedman, Jee, Steiner, and Bierman (1999) attempted to evaluate the effectiveness of the Children's Health Insurance Program (CHIP) using hospital admissions for ACSC as the variable of interest. They used hospital data for 19 states to calculate baseline ACSC rates prior to the introduction of CHIP. Using asthma as the ACSC of interest, they found considerable variations in the rates of admission, from 1.37 per 1,000 in Iowa to 4.75 per 1,000 in New York. Since the study was conducted as a baseline measure prior to the introduction of CHIP, however, there were no conclusions about the effectiveness of CHIP in reducing incidence of ACSC admissions.

State-Level Studies

Friedman and Basu (2001) used hospital discharges for New York children to examine variations in ACSC admission rate with type of insurance coverage, severity of illness, distance to hospital, and other factors. They showed that there was a negative association between ACSCs and coverage by private HMOs in the state of New York. Similar to previously reported findings, ACSC hospitalization was significantly higher in counties with a higher proportion of Medicaid and self-pay children. Also, counties with a higher nonwhite proportion of the population had higher ACSC admission rates, independent of insurance, severity of illness, and distance traveled to the hospital. Finally, they found ACSC hospitalization rates to be inversely related to the availability of local primary care physicians, with lower ACSC admissions in counties with a higher number of local primary care physicians.

Also for New York State, Schreiber and Zielinski (1997) reported positive associations between ACSC admissions and percentage of poverty in a ZIP code area. Percentage of blacks and the primary care provider-to-population ratio were also positively associated with ACSC admissions. In addition, population density was shown to be negatively associated with ACSC admissions, with lower ACSC admission rates being reported in areas that have greater population density.

In the state of California, Bermudez and Baker (2004) showed a strong negative association between the proportion of the population enrolled in the State Children's Health Insurance Program (SCHIP) and the average number of ACSC hospitalizations. In other words, being enrolled in SCHIP was associated with a decline in hospitalization for ACSCs. Specifically, a 1 percentage point increase in enrollment for SCHIP resulted in a decline of 0.42 in the average number of ACSC admissions per 100,000 children.

Studying avoidable hospitalizations in Massachusetts and Maryland, Weissman, Gatsonis, and Epstein (1992) tested the relationships between rates of avoidable hospitalization and insurance status. They found that uninsured and Medicaid patients living in these states were more likely than insured patients to experience avoidable hospitalizations. Medicaid patients are also more likely to experience avoidable hospitalizations compared to privately insured patients. It should be noted, however, that the sample used in their study was not restricted to children. It consisted of all patients under 65 years of age who were uninsured, privately insured, or insured by Medicaid.

Using the 1998 Hospital Inpatient Encounter Database, Garg et al (2003) examined personal and community factors affecting ACSC hospitalizations in the state of South Carolina. Similar to previously reported studies, they found that younger, non-white children were more likely to be hospitalized for ACSCs. In addition, children living in rural areas, health professional shortage area-designated counties, and poorer counties with fewer health care resources were more likely to experience ACSC-related hospitalization.

Gadomski, Jenkins, and Nichols (1998) used data from the Maryland Access to Care (MAC) program to evaluate the relationship between avoidable hospitalization and a Medicaid managed care program. The MAC was designed to maintain access, strengthen primary care ties, increase preventive services, and to reduce emergency department visits. The authors found that per-capita ambulatory care visits increased significantly during the period when MAC was in place. Overall, MAC enrollment was strongly associated with the probability of any preventive care visits, emergency department use, and ambulatory care visits.

Finally, Herrod and Chang (2008) showed that Tennessee's black and white patients have different discharge rates for ACSC, depending on whether the condition is classified as chronic or acute. Looking at 5 ACSCs, and using the Agency for Healthcare Research and Quality's newly defined pediatric quality indicators, the authors showed that black children had

higher rates of hospitalization than white children for the 2 chronic conditions (asthma and diabetes) included in the analyses. On the other hand, white children had higher hospitalization rates than black children for the 3 acute conditions (pediatric gastroenteritis, perforated appendix, and urinary tract infection) analyzed. According to the authors, the most likely reason for the higher white hospitalization rates for acute conditions is that symptoms of these conditions occur in a child who is otherwise thought to be healthy. Given that ethnicity and socioeconomic status have been shown to influence parent's decision to seek health care for their children (Flores, Abreu, Sun, & Tomany, 2004; Roy, Torrez, & Dale, 2004), the authors reasoned that some black parents may not be recognizing the symptoms associated with these acute conditions, leading to an artificially lower rates of admission for black children compared to whites. In addition, Herrod and Chang found that children who were insured by public insurance (TennCare) had higher discharge rates for all 5 ACSCs studied.

Trend Studies

In addition to estimating incidences and prevalence of ACSC nationally and across the states, some studies have looked at trends in the distribution of ACSC using a wide array of characteristics. In one of such studies, Derek Delia (2003) described patterns in ACSC admissions at the zip code level based on zip code demographic characteristics over time. He found that ACSC admissions are geographically concentrated, with rates showing high persistence over time. Total population, births to unwed mothers, black population, and Hispanic population were all found to be positively related to ACSC admissions. Consistent with the immigrant health paradox (Cho et al, 2004; Hummer et al, 2007), however, birth to immigrant mothers are negatively associated with ACSC admissions.

Kanter and Moran (2007) examined trends in the rates of disorders associated with child hospitalization in the state of New York. Using trends for the 100 diagnosis related groups (DRGs) with the largest number of admissions among children age 0-14 years, they showed that children were hospitalized at an average annual rate of 35 per 1000 age-specific population during 1996 to 2002. During this period, total hospitalization decreased at a rate of 2.3% per year, but admissions for mental illness showed an increase of 5.5% per year. ACSCs were the leading cause of hospitalization for children aged 0-14 years throughout the period of the study, and showed a rate of decline similar to the overall rates.

Gaps in Current Research

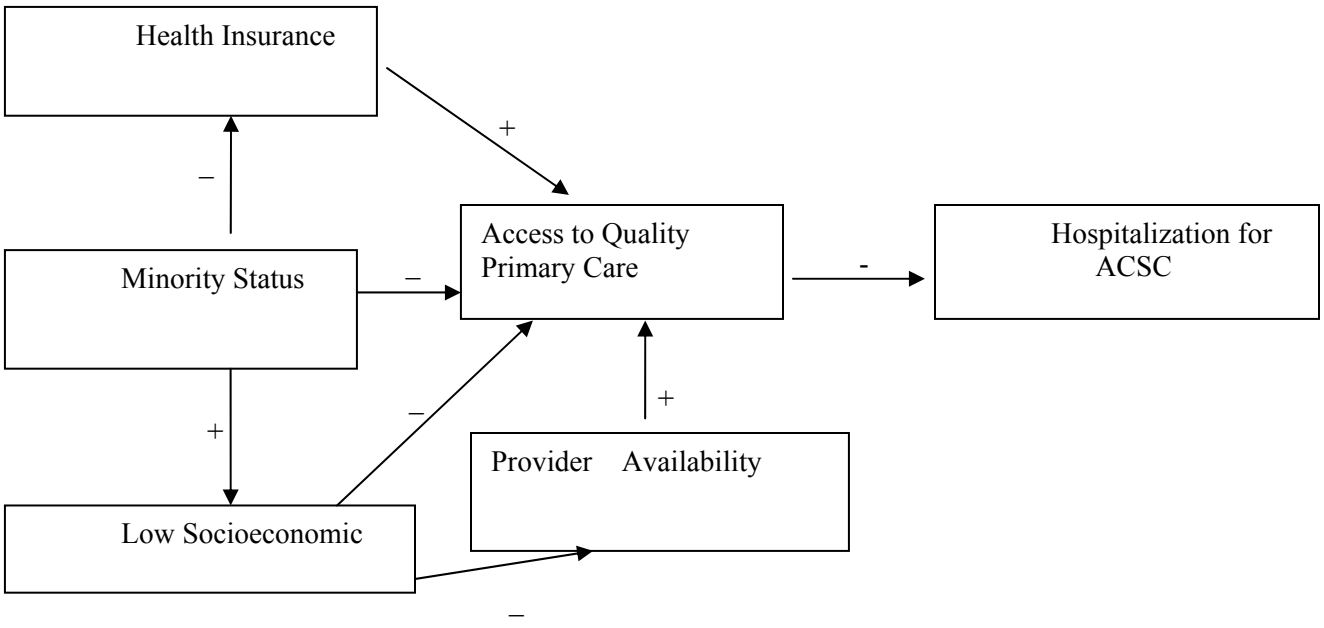
As evident from the literature review, there is still a significant gap in our understanding of ACSC admissions and trends in admissions for these conditions. In spite of the availability of data, levels and trends in hospitalization for ACSCs in Pennsylvania have not been examined, and researchers often do not examine race/ethnic differences in the complete range of childhood ages. This research fills the gap by examining the disparities in ACSC admission among children living in Pennsylvania and trends in ACSC admissions among the different racial groups at two time points, 2001 and 2005. The Pennsylvania Health Care Cost Containment Council's administrative inpatient data (PHC4), combined with age- and race-specific population counts from the US Census Bureau, provide the necessary data for this study.

Chapter 2

CONCEPTUAL FRAMEWORK AND HYPOTHESES

The conceptual framework in Figure 1 depicts various forces that affect rates of ACSC admissions for different race/ethnic groups in Pennsylvania. The unit of analysis for this study is inpatient admissions. Access to primary care is the dependent variable of interest, and it is measured indirectly by inpatient admission for ACSC. Health insurance, socio-economic status, minority status, and provider availability are all important predictors of access to primary care. Generally, health insurance improves access to primary care by reducing patients' out-of-pocket fees. Children may be unable to get the preventative care they need if they lack health coverage or if their parents are unable to afford the cost of primary care. As Friedman and Basu (2001) explain, having a low socio-economic status is positively correlated with a lack of health insurance, a scenario that also implies reduced access to quality primary care. Significant racial and ethnic differences also exist in health insurance coverage, with minorities being more likely to lack coverage compared to whites (Pappas, 1997; Friedman and Basu, 2001).

Figure 1: Conceptual Framework



Hypotheses:

Given their lower likelihood of having health insurance, as well as generally less favorable socioeconomic status, many African-American and Hispanic children may lack the primary care that is necessary to prevent ACSC. On the basis of this and previous research on avoidable hospitalization (Simpson, Bloom, Cohen & Parsons, 1997; Adler & Newman, 2002; Parker and Schoendorf, 2000; & Roos, et al., 2001), the following is hypothesized:

Hypothesis 1: African American and Hispanic children have higher rates of admission for ACSC compared to whites of similar ages living in Pennsylvania.

Current literature on infant and child health suggests that younger children tend to be admitted more frequently for ACSC than older children (Parker and Schoendorf, 2000; Shi and Lu, 2000; Garg et al, 2003; & Kanter and Moran, 2007). For the state of Pennsylvania, there is no reason to believe that the trend in the rates of admission by age group will be different from what has been described for other states and nationally. Hence, the following is hypothesized:

Hypothesis 2: Children who are younger are more likely to be admitted for ACSC than children who are older.

Although the Balanced Budget Act of 1997 was designed to improve access to healthcare for poor children (Kaestner, Joyce, & Racine, 2001), there is evidence that the relatively high number of ACSC admissions for African American and Hispanic children may have been exacerbated between 2001 and 2005. For example, Baughman (2007) argues that the expansion of health insurance eligibility for children has only slightly reduced the number

children who are uninsured. Friedman, Jee, Steiner, and Bierman (1999) also could not find conclusive evidence about the effectiveness of SCHIP in reducing the rate of admission for ACSC nationally. Further, the proportion of uninsured minority populations has been widening, while the number of employer sponsored health insurance has been declining (Iglehart, 2006). Given these trends, the following is hypothesized:

Hypothesis 3: The disparities in rates of ACSC admission among African American and Hispanic children as compared to white children living in Pennsylvania are higher in 2005 compared to 2001.

Chapter 3

RESEARCH METHODS AND DATA

Analytic Approach

The analytic approach taken is to calculate the rates of ACSC admission for African Americans, Hispanics, and white children by age group in 2001 and 2005. There are about 25 ACSC conditions present in the dataset, but these analyses focus on the ten most frequent conditions in each age-group in each year. For ACSC rate calculations, the numerator is the number of ACSC admissions for the desired age-groups (0-4, 5-9, 10-14, and 15-19) for the different race/ethnic groups, and the denominator is the total population of the corresponding age and race/ethnic groups. This calculation yields the desired age-specific ACSC admission rates for each group. In addition, the difference between the 2005 and 2001 ACSC admission rates for each racial group indicates whether a group has fared better or worse in 2005 compared to 2001. For both 2001 and 2005 years, these calculations were also done for each of the different age-groups.

In addition, logistic models were estimated to determine statistically significant differences in ACSC admission rates for white versus African Americans, and then white versus Hispanics in both 2001 and 2005. The logistic analyses were performed separately for the different age groups. This allowed the comparison of the probability of experiencing ACSC hospitalization for each minority group relative to whites. Logistic procedures were also employed in determining statistically significant changes in the rates of admission for each ACSC condition in 2005 compared to 2001.

Data

The 2001 and 2005 statewide Pennsylvania Health Care Cost Containment Council's administrative inpatient data (PHC4) together with the 2001 and 2005 Census Bureau population data are used for this study. The PHC4 is an expansive inpatient hospital discharge database that includes records from hospitals, as well as other pertinent information that are not required for this study. Data collected by these medical facilities are reported to the PHC4 for verification. After this important process, the PHC4 makes the data available to the general public on a quarterly basis. The PHC4 dataset are available for purchase by interested parties, including health researchers, provided human subjects protections are in place. This study was approved by the Pennsylvania State University Institutional Review Board (IRB). The IRB approval number is 24831.

For each year, about 3.8 million inpatient hospital discharge and ambulatory/outpatient procedure records are available in the dataset. A detailed description of each procedure, including the body system that was treated, is also available. Based on the International Classification of Disease (ICD-9) codes, admissions that are specifically for ACSC are identified.

The PHC4 data also includes restrictive identifying information such as inpatient admission numbers, some patient's personal information (race, age, and location of medical facility), total charges, method of payment, and the major diagnostics category. The analyses focus on the 2001 and 2005 ACSC inpatient hospitalization data for children who are 19 years old or younger. The unit of analysis for the study is the inpatient admission.

During 2001, there were a total of 266,234 admissions for ACSC conditions for children age 0 to 19 years living in Pennsylvania. This represents the number of ACSC admissions for all Pennsylvanian children, regardless of race/ethnicity, falling into this age category during 2001. With the total inpatient admissions for all conditions being 1,812,898 (PHC4, 2007), ACSC

admissions for these groups combined represents 14.7% of the total inpatients admissions for all Pennsylvania residents during 2001.

For the 2005 year, there were a total of 215,776 ACSC admissions for children age 0 to 19 years living in Pennsylvania. Also, during 2005, the total inpatient admission for all Pennsylvanians, regardless of age, race/ethnic, and condition was 1,888,951 (PHC4, 2007). Hence, ACSC admissions for children age 0 to 19 years account for about 11.4% of the total hospital admissions during 2005.

Information about age- and race/ethnicity-specific population sizes was obtained from the Census Bureau through the Pennsylvania State Data Center. The Pennsylvania State Data Center is the state office affiliated with the Census Bureau, which is the authoritative source for data about the nation's population dynamics. Pennsylvania's population estimates for both 2001 and 2005 for the different race/ethnic groups, as well as breakdown by age-groups were directly obtained from the Pennsylvania State Data Center.

Analyses

This study measures differential access to primary care by race. For both 2001 and 2005, rates of ACSC admissions for African Americans, Hispanics, and whites were computed using the equations below for each child age group (0-4, 5-9, 10-14, and 15-19):

$$R_{\text{African Americans}} = \frac{\text{Age-Specific ACSC admissions for African Americans}}{\text{Age-Specific Population of African Americans}}$$

$$R_{\text{Hispanics}} = \frac{\text{Age-Specific ACSC admissions for Hispanics}}{\text{Age-Specific- Population of Hispanics}}$$

$$R_{whites} = \frac{\text{Age-Specific ACSC admissions for whites}}{\text{Age-Specific Population of whites}}$$

Note that all rates shown in the tables are expressed per 100,000 populations.

*Measure of disparities in the rate of admissions for each type of ACSC during 2001 and 2005***:**

$(R_{African\ Americans}) - (R_{whites}) =$ White-African American disparities in ACSC admissions

$(R_{Hispanics}) - (R_{white}) =$ White-Hispanic disparities in ACSC admissions

The dependent variable is access to quality primary care, as measured by the rate of admission for ACSC. For each racial or ethnic group, the 2001 and 2005 rates of ACSC admission are determined.

Testing Hypothesis 1:

Hypothesis 1: African American and Hispanic children have higher rates of admission for ACSC compared to whites of similar age groups living in Pennsylvania.

Hypothesis 1 was tested by comparing African Americans' and Hispanic's age-specific rates of admission for ACSC to those of whites. For each age-group, the differential in the rate of admission for whites and African Americans was computed. The white-African American disparities are derived by subtracting the age-specific rates of admission for white from those of African Americans. For each ACSC condition, a positive result indicates that African Americans have higher rate of admission than white, while a negative result indicates otherwise. The same procedure was followed to compute the white-Hispanic disparities. Logistic regression models were estimated to test if the differences in the rates of admission were statistically significant.

Testing Hypothesis 2:

Hypothesis 2: Children who are younger are more likely to be admitted for ACSC than children who are older.

To test hypothesis 2, differences in the rates of admission for ACSC by age-group were compared. Regardless of race/ethnicity, age-group disparities for the conditions appearing in all age-groups (0-4, 5-9, 10-14, and 15-19) were computed. Age-group differences in the rates of admission for the qualifying conditions indicate whether younger children are being admitted for these conditions at higher rates than older children.

Testing Hypothesis 3:

Hypothesis 3: The disparities in rates of ACSC admission among African American and Hispanic children as compared to white children living in Pennsylvania are higher in 2005 compared to 2001.

The white-African American disparities and white-Hispanic disparities during 2001 were compared to the corresponding 2005 disparities. The difference between the 2005 and 2001 disparities indicates if the disparities in the rates of admission for ACSC has increased, decreased, or remained the same in 2005 compared to 2001. Logistic regression models were estimated to test if the differences in the 2005 and 2001 rates of admission were significant.

Chapter 4

RESULTS

Table 2.1 and 2.2 show the Pennsylvania's population estimates by age and race for 2001 and 2005, respectively. In 2001, 78.4% of all Pennsylvania between the ages of 0 and 19 were white. African Americans comprised 12.7%, while Hispanics made up 5.2% of the child population. The picture remained largely unchanged in 2005. The overall figures were 76.3%, 13.1%, and 6.2% for whites, African Americans, and Hispanics, respectively. In summary, while the populations of African American and Hispanic children increased by 0.4 and 1.0 percentage points respectively, the population of white children within this age bracket fell by 2.1 percentage points during the period between 2001 and 2005. Further analyses shows that the population counts of Hispanic children increased between 2001 and 2005 for all age groups between 0 and 19. The non-Hispanic black (African American) children population only increased for age groups 0-4 and 15-19, and there were in fact decline for the 5-9 and 10-14 age-groups. For whites, there were declines in all age-groups except the last one (15-19) where there was a modest increase.

Table 2.1: 2001 Population Estimates[2]

Age Groups	White Alone Non-Hispanic (%)	Black Alone Non-Hispanic (%)	Hispanic or Latino (Any Race) (%)	Total[3] Population
0-4	543215 (76.2)	92599 (13.0)	42924 (6.0)	712420
5-9	616875 (77.4)	106632 (13.4)	43585 (5.5)	797372
10-14	681379 (78.8)	113418 (13.1)	41981 (4.9)	864507
15-19	680998 (80.6)	96963 (11.5)	38005 (4.5)	845375

Table 2.2: 2005 Population Estimates

Age Groups	White Alone Non-Hispanic (%)	Black Alone Non-Hispanic (%)	Hispanic or Latino (Any Race) (%)	Total Population
0-4	533547 (73.6)	97665 (13.5)	55355 (7.6)	724905
5-9	555652 (76)	93634 (12.8)	47782 (6.5)	731823
10-14	639021 (77)	112462 (13.5)	48033 (5.8)	830500
15-19	684055 (78.4)	110852 (12.7)	45031 (5.2)	872062

[2] These are the U.S Census Bureau's 2001 and 2005 Pennsylvania population estimates. They were obtained from the Pennsylvania State Data Center.
[3] The total population includes children from racial groups other than non-Hispanic white, non Hispanic-black, and Hispanics.

Tables 3.1 and 3.2 show the characteristics (race/ethnicity, age-group, gender, and insurance status) of Pennsylvania's children admitted for ACSC during 2001 and 2005. During 2001, about 75.8% of all ACSC admissions for children between the ages of 0 and 19 were experienced by children who were white[4]. Non Hispanic blacks, who make up 12.7% of the total population of children in Pennsylvania during 2001, accounted for about 17.9% of the total number of admissions for ACSC. Hispanics, making up 5.2% of the entire children population, accounted for about 6.3% of the total ACSC admissions during 2001. The rates of admission for children belonging to other racial groups are not shown. These results were similar to what was observed during 2005. Children who were white (73.6% of population) accounted for about 73.8% of the total number of ACSC admissions during 2005. Non-Hispanic blacks, with 13.1% of the children population, accounted for about 19.2% of all ACSC admissions. Hispanics children, who make up 6.2% of the entire children population during 2005 accounted for 7.0% of the total ACSC admissions during that year.

Female children accounted for 50.4% of the total admission in 2001. This figure remains largely unchanged in 2005 when females experienced 50.2% of all ACSC admissions. The insurance statuses of children who were admitted for ACSC were classified as private, public, or uninsured. In 2001, children who were whites accounted for 88% of all privately insured, and 55% of the publicly insured children population. However, 73.6% of all uninsured children who were admitted for ACSC were non-Hispanic whites. Also for 2001, African American children accounted for 9% of admitted children using private insurance, and 33.2% of children using public insurance. African Americans make up 17.7% of all children who had no insurance when

[4] This is not surprising, given that whites comprised 78.4 of all Pennsylvania children (0-19) during the year 2001. Disparities in the rates of admission can only be established when "rates" of admission are considered.

admitted for ACSC. Finally, Hispanics accounted for 3% of admitted children using private insurance, 11.4% of publicly insured children who were admitted for ACSC, and 8.4% of all children who were admitted for ACSC without any insurance coverage during 2001.

The insurance profile of the children who were admitted for ACSC in 2005 was similar to what was observed in 2001. Whites make up 87.3% of all privately insured children who were admitted, 56.2% of all publicly insured, and 72.8% of all uninsured children who were admitted for ACSC during 2005. For African Americans, the figures are 9.7%, 31.6%, and 17.7% for private, public, and insurance statuses respectively. Finally, Hispanics comprised 3.0%, 12.2%, and 9.5% of children using private insurance, public insurance, and no insurance coverage when admitted for ACSC during 2005.

Table 3.1: Characteristics of Children admitted for ACSC (2001)

Number of Inpatient Admissions by Race and Age-Group (%)

	0-4yrs	5-9yrs	10-14yrs	15-19yrs	Total
White	119,278 (77.7)	10,004 (70.1)	13,044 (71.5)	28,652 (72.5)	170,978 (75.8)
Black	24,539 (16.0)	3,306 (23.2)	4,203 (23.0)	8,311 (21.0)	40,359 (17.9)
Hispanic	9,697(6.3)	956 (6.7)	1,012 (5.5)	2,566 (6.5)	14,231(6.3)
TOTAL	**153,514**	**14,266**	**18,259**	**39,529**	***225,568***

Gender	**Population (%)**
Male	132,080 (49.6)
Female	134, 148 (50.4)

Insurance Status

	Private	Public	Uninsured
Whites	12,1411 (88.0)	44,803 (55.1)	3,858 (73.6)
Blacks	12,398 (9.0)	26,939 (33.2)	943 (17.7)
Hispanics	4,195(3.0)	9,529 (11.7)	444 (8.4)
TOTAL	**138,004**	**81,271**	**5,245**

Inpatient Admissions

Total Inpatient Admissions 1,812,898

0 – 19 yrs Inpatient Admissions 266,234

Table 3.2: Characteristics of Children admitted for ACSC (2005)

Number of Inpatient Admissions by Race and Age-Group (%)

	0-4 yrs	5-9 yrs	10-14 yrs	15-19 yrs	Total
White	129,447(75.8)	10,571(70.1)	14,718(69.8)	34,097(69.7)	188,833 (73.8)
Black	29,168(17.1)	3,423(22.7)	5,043(23.9)	11,380(23.2)	49,014 (19.2)
Hispanic	12,069(7.1)	1,072(7.2)	1,331(6.3)	3,450 (7.1)	17,922 (7.0)
TOTAL	**170,684**	**15,066**	**21,092**	**48,927**	***255,769***

Gender	**Population (%)**
Male	139041(49.8)
Female	139892 (50.2)

Insurance Status (%)

	Private	Public	Uninsured
White	129,352 (87.3)	64,030 (56.2)	3,215 (72.8)
Blacks	14,402 (9.7)	36,045 (31.6)	780 (17.7)
Hispanics	4,431 (3.0)	13,883(12.2)	418 (9.5)
TOTAL	**148,185**	**113,958**	**4,413**

Inpatient Admissions

Total Inpatient Admissions 1,888,951

0 – 19 yrs Inpatient Admissions 278, 933

Table 4.1 shows the 10 ACSC conditions with the highest prevalence rates among non-Hispanic whites, non-Hispanic blacks, and Hispanics aged 0-4 during 2001. The rates are displayed in descending order of the white rates[5]. Race/ethnic differences in the rates of admission for these conditions are also shown. Of the 10 ACSC conditions with highest admission rates, African Americans had significantly higher rates of ACSC admission than whites for 8 conditions. The differences in the rates of admission between African Americans and whites are significant at the significance level shown. On the other hand, African Americans had lower rates of ACSC admission than whites in 2 conditions (dehydration and gastroenteritis). These differences were also significant. Hispanics had higher rates of admission than whites for 6 of these conditions. All but one (convulsions A) of these differences was significant. Hispanics also had lower rates of admission than whites for 3 ACSC conditions (dehydration, gastroenteritis, grand mal/other epilepsy); however, only the gastroenteritis disparity was statistically significant. Finally, there was no disparity in the Hispanic-white rates of admission for failure to thrive.

Table 4.2 shows the top 10 most prevalent ACSC conditions among whites, African American, and Hispanics aged 5-9 during 2001. Of the 10 most common ACSC conditions among children belonging to this age group, African Americans had higher rates of admission than whites for 6 conditions. All but one (bacterial pneumonia) of these differences was significant. Compared to whites, African American children belonging to this age group had significantly lower rates of admission for dehydration and diabetes. There was also a non-significant lower rate of admission for kidney urinary infection among African Americans. There was no African American-white disparity in the rates of admission for Severe ENT infection. Although Hispanics had higher rates of admission than whites for 5 ACSC conditions, only 3 of these disparities were significant. The higher Hispanic rates of admission for diabetes and

[5] This convention is followed throughout.

gastroenteritis were not significant. On the other hand, Hispanic children belonging to this age-group had lower rates of admission for 5 conditions, but the rate of admission for only one of the conditions (kidney urinary infection) was significantly lower than that for whites.

Table 4.3 shows the 10 ACSC conditions with the highest prevalence rates among non-Hispanic whites, non-Hispanic blacks, and Hispanics aged 10-14 during 2001. Of the 10 most prevalent ACSC conditions shown, African Americans had higher rates of admission for 7 conditions. However, the higher admission rates were not significant for 3 of these conditions (cellulitis, kidney urinary infection, and cellulitis). For 3 of the most common conditions, African American had lower rates of admissions (bacterial pneumonia, dehydration, and gastroenteritis). However, the rates of admission for these conditions were not significantly lower for African Americans. For Hispanics, on the other hand, there were higher rates of admission for 6 conditions compared to whites. However, only 2 of these rates (asthma and grand mal/other epilepsy) were significantly higher for Hispanics relative to whites. Hispanics had lower rates of admission than whites in 5 conditions, with the rate of admission for asthma being the only significantly lower rate.

Table 4.4 shows the 10 ACSC conditions with the highest prevalence rates among non-Hispanic whites, non-Hispanic blacks, and Hispanics aged 15-19 during 2001. African Americans had higher rates of admission for 8 conditions. All but 2 of these disparities (bacterial pneumonia and severe ENT infection) were statistically significant. Compared to whites, African Americans had lower rates of admission for dehydration and gastroenteritis, however these rates were not significantly lower. Compared to whites in this age group, Hispanics had higher rates of admission for 5 conditions. The rates for 2 of these conditions (asthma and grand mal/ other epilepsy) were significantly higher for Hispanics. Hispanics had lower rates of admission for the remaining 5 conditions, however these differences were not statistically significant.

In Table 5.1, the rates of admission for the 10 most prevalent ACSC conditions among white, African American, and Hispanic children aged 0-4 years during 2005 are displayed. African American children belonging to this age group have higher rates of admission than whites for 7 conditions; of these disparities, 6 were statistically significant. African Americans have lower rates of admission for 3 conditions, only one (dehydration) of which was statistically significantly lower than whites'. Hispanics, on the other hand, had higher rates of admission than whites for 7 conditions. All but 2 (convulsions A and grand mal/ other epilepsy) of the disparities were statistically significant. They have lower rates of admission for 3 conditions, but only one (dehydration) of these was statistically significantly lower.

Table 5.2 shows the rates of admission for the 10 most prevalent ACSC conditions among white, African American, and Hispanic children aged 5-9 years during 2005. Similar to what was observed for this age group in 2001 (Table 4.2), African Americans have higher rates of admission than whites for 6 conditions. Of these, only the disparity in the rates of admission for bacterial pneumonia[6] was statistically insignificant. African Americans in this age group have lower rates of admission than whites for 4 conditions. Similar to the trend in 2001, only in the case of dehydration did African American children have a significantly lower rates of admission in 2005. Hispanic children belonging to this age group had higher rates of admission than whites for 3 conditions. Of these, only the rates of admission for asthma were significantly higher among Hispanic children as compared to whites. Hispanic children had lower rates of admission than whites for 7 conditions, but only 2 (dehydration and diabetes) of these disparities were statistically significant.

[6] This was similar to what was observed in 2001, when bacterial pneumonia was the only condition with a non- significant disparities between African American and white children. Like many age groups, the top10 conditions for the 5-9 age groups are the same for both years.

Shown in Table 5.3 are the rates of admission for the 10 most prevalent ACSC conditions among white, African American, and Hispanic children aged 10-14 during 2005. During the year 2005, African American children belonging to this age group had higher rates of admission than their white counterparts for 8 of the 10 most prevalent ACSC conditions. All of these disparities, except for one (severe ENT infection), were statistically significant. During the same year, African American children belonging to this age group had lower rates of admission for 2 (dehydration and gastroenteritis) of the 10 ACSC profiled, but neither of these differences were significant. During the same year, Hispanic children belonging to this age group had higher rates of admission than whites for 8 conditions, four of which (asthma, cellulitis, grand mal/other epilepsy, and gastroenteritis) were significant. For the remaining 2 conditions (diabetes and dehydration), Hispanics had lower rates of admission than whites, but neither of these differences were significant.

Finally, Table 5.4 shows the rates of admission for the 10 most prevalent ACSC conditions among white, African American, and Hispanic children aged 15-19 during 2005. Similar to what was observed for this age group in 2001 (Table 4.4), African Americans had higher rates of admission than whites for 8 conditions. With the exception of one condition (dehydration), all these disparities were statistically significant. Although African American children belonging to this age group had lower rates of admission than whites for the remaining 2 conditions (bacterial pneumonia and severe ENT infection), neither of these differences were significant. Also like 2001 (Table 4.4), Hispanic children belonging to this age group had higher rates of admission than whites for 5 of the 10 ACSC conditions profiled in the table. Of these 5 conditions, Hispanics had significantly higher rates of admission for 2 conditions (asthma and cellulitis). Hispanics had lower rates of admission for the remaining 5 conditions, but none of these differences were statistically significant.

Table 4.1: Rates of ACSC Admission for white, African American, and Hispanic children aged 0-4 years (2001)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American-White	Hispanic - White
Dehydration	443.8	352.1	412.4	-91.7***	-31.4
Asthma	338.7	1702.0	1039.0	+1363.3***	+700.3***
Bacterial Pneumonia	328.6	597.2	449.6	+268.6***	+121.0***
Convulsions A	120.2	231.1	137.4	+110.9***	+17.2
Gastroenteritis	120.0	70.2	58.2	-49.8***	-61.8***
Kidney urinary inf	103.1	152.3	242.3	+49.2***	+139.2***
Severe ENT Infection	69.8	171.7	142.1	+101.9**	+72.3**
Grand mal/other epilep	34.2	56.2	23.3	+22.0**	-10.9
Cellulitis	33.9	101.5	88.5	+67.6***	+54.6***
Failure to thrive	21.0	57.2	21.0	+36.2***	0.0

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.2: Rates of ACSC Admission for white, African American, and Hispanic children aged 5-9 years (2001)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American- White	Hispanic - White
Bacterial Pneumonia	110.2	117.2	105.5	+7.0	-4.7
Asthma	105.9	886.2	376.3	+780.3***	+270.4***
Dehydration	90.8	66.6	73.4	-24.2*	-17.4
Kidney urinary inf	34.7	24.4	16.1	-10.3	-18.6*
Diabetes A, B, C	34.0	21.6	50.5	-12.4*	+16.5
Gastroenteritis	17.0	15.0	19.1	+2.0**	+2.1
Cellulitis	27.4	41.3	52.8	+13.9*	+25.4**
Convulsions B	24.0	44.1	23.0	+20.1***	-1.0
Grand mal/other epilep	18.3	34.7	45.9	+16.4***	+27.6***
Severe ENT infection	15.9	15.9	13.8	0.0	-2.1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.3: Rates of ACSC Admission for white, African American, and Hispanic children aged 10-14 years (2001)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American-White	Hispanic – White
Asthma	70.9	541.4	202.5	+470.5***	+131.6***
Diabetes A, B, C	47.6	100.5	35.7	+52.9***	-11.9
Bacterial Pneumonia	45.9	41.4	33.3	-4.5	-12.6
Dehydration	35.4	26.4	21.4	-9.0	-14.0
Cellulitis	23.9	30.9	38.1	+7.0	+14.2
Convulsions B	20.0	46.7	19.1	+26.7***	-0.9
Gastroenteritis	17.0	15.0	19.1	-2.0	+2.1
Kidney urinary inf	15.6	18.5	23.8	+2.9	+8.2
Grand mal/other epilep	12.8	22.0	31.0	+9.2*	+18.2**
Severe ENT infection	7.8	7.9	11.9	+0.1	+4.1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4.4: Rates of ACSC Admission for white, African American, and Hispanic children aged 15-19 years (2001)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American – White	Hispanic – White
Diabetes A, B, C	62.0	134.1	57.9	+72.1***	-4.1
Asthma	50.2	276.4	134.2	+226.2***	+84.0***
Kidney urinary inf	44.2	82.5	36.8	+38.3***	-7.4
Bacterial Pneumonia	35.2	47.4	33.3	+12.2	-1.9
Convulsions B	30.2	57.8	28.9	+27.6***	-1.3
Dehydration	27.6	25.8	31.6	-1.8	+4.0
Severe ENT infection	22.8	23.7	23.7	+0.9	+0.9
Cellulitis	22.6	55.7	28.9	+33.1***	+6.3
Gastroenteritis	17.9	11.3	15.8	-6.6	-2.1
Grand mal/other epilep	12.6	22.7	26.3	+10.1*	+13.7*

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.1: Rates of ACSC Admission for white, African American, and Hispanic children aged 0-4 years (2005)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American-White	Hispanic – White
Dehydration	475.9	322.5	399.2	-153.4***	-76.7*
Bacterial Pneumonia	372.6	495.6	435.4	+123.0***	+62.8*
Asthma	255.8	1338.2	623.2	+1,082.4***	+367.4***
Convulsions A	113.4	217.1	133.7	+103.7***	+20.3
Kidney urinary inf	97.3	116.7	187.9	+19.4	+90.6***
Severe ENT infection	85.8	199.7	159.0	+113.9***	+73.2***
Gastroenteritis	81.3	75.8	75.9	-5.5	-5.4
Cellulitis	61.1	154.6	139.1	+93.5***	+78***
Grand mal/other epilep	48.2	102.4	50.6	+54.2***	+2.4
Diabetes A, B, C	23.6	21.5	14.4	-2.1	-9.2

* $p < 0.05$, ** $p < 0.01$, *** $p< 0.001$, ****$p< 0.0001$

Table 5.2: Rates of ACSC Admission for white, African American, and Hispanic children aged 5-9 years (2005)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American-White	Hispanic – White
Bacterial Pneumonia	372.6	495.6	435.4	+123.0	+62.8
Asthma	109.4	823.4	313.9	+714.0***	+204.5***
Dehydration	105.5	59.8	69.1	-45.7***	-36.4*
Diabetes A, B, C	41.8	38.4	10.5	-3.4	-31.3**
Kidney urinary inf	33.7	28.8	29.3	-4.9	-4.4
Cellulitis	31.7	63.1	37.7	+31.4***	+6.0
Grand mal/other epilep	28.8	52.3	25.1	+23.5***	-3.7
Gastroenteritis	25.7	16.2	20.9	-9.5	-9.5
Convulsions B	23.9	58.7	16.7	+34.8***	-7.2
Severe ENT infection	14.0	26.7	12.6	+12.7**	-1.4

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, ****$p < 0.0001$

Table 5.3: Rates of ACSC Admission for white, African American, and Hispanic children aged 10-14 years (2005)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American-White	Hispanic - White
Diabetes A, B, C	62.9	116.5	50.0	+53.6***	-12.9
Asthma	53.0	600.2	199.9	+547.2***	+146.9***
Bacterial Pneumonia	40.2	53.3	56.2	+13.1*	+16.0
Dehydration	29.6	19.6	29.1	-10.0	-0.5
Cellulitis	29.3	45.3	47.9	+16.0**	+18.6*
Convulsions B	23.5	34.7	25.0	+11.2*	+1.5
Grand mal/other epilep	17.1	39.1	45.8	+22.0***	+28.7***
Kidney urinary inf	15.0	25.8	18.7	+10.8*	+3.7
Gastroenteritis	12.2	10.7	25.0	-1.5	+12.8*
Severe ENT infection	7.8	13.3	8.3	+5.5	+0.5

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.4: Rates of ACSC Admission for white, African American, and Hispanic children aged 15-19 years (2005)

ACS Conditions	Rates of Admission	Rates of Admission	Rates of Admission	Differences in ACSC Rates	
	White	African American	Hispanic	African American-White	Hispanic – White
Diabetes A, B, C	67.4	150.6	46.6	+83.2***	-20.8
Kidney urinary inf	60.8	80.3	66.6	+19.5*	+5.8
Bacterial Pneumonia	44.0	36.1	35.5	-7.9	-8.5
Asthma	40.1	304.9	144.3	+264.8***	+104.2***
Cellulitis	36.8	50.5	57.7	+13.7*	+20.9*
Convulsions B	32.9	69.5	24.4	+36.6***	-8.5
Dehydration	30.1	30.7	37.7	+0.6	+7.6
Severe ENT infection	26.0	19.8	11.1	-6.2	-14.9
Grand mal/other epilep	19.3	29.8	17.8	+10.5*	-1.5
Gastroenteritis	19.0	35.2	24.4	+16.2***	+5.4

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.1 shows the change in the African American-whites disparities between 2001 and 2005 for children aged 0-4. Most changes were not statistically significant, however for bacterial pneumonia there was a significant decrease in the African American disadvantage over time. On the other hand, there was also a significant decrease in the white disadvantage over time related to gastroenteritis hospitalizations. Change in the African American-white disparities between 2001 and 2005 for children aged 5-9 years are shown in Table 6.2. None of the changes were statistically significant.

In Table 6.3, changes in the African American-white disparities between 2001 and 2005 for children aged 10-14 years are shown. Only one ACSC condition, asthma, showed a statistically significant change in disparity, with the African American disadvantage increasing over the study period.

Finally, Table 6.4 shows the change in African American-white disparities between 2001 and 2005 for children aged 15-19 years. African American disadvantage significantly increased over time for asthma hospitalizations, but decreased for both kidney/urinary tract infections and cellulitis hospitalizations. In two instances the direction of the disparity reversed over time. For bacterial pneumonia, African Americans had statistically significantly higher hospitalization rates in 2001 but relatively lower rates by 2005. The opposite held true for gastroenteritis, with rates for African American children becoming comparatively higher at the later time point.

Change in the Hispanic-white disparities between 2001 and 2005 are profiled in tables 7.1, 7.2, 7.3 and 7.4. Table 7.1 shows the change in the disparities between Hispanic and white children aged 0-4 during 2005 compared to 2001.In the case of asthma hospitalizations, the large Hispanic disadvantage in 2001 had decreased significantly by 2005. On the other hand, Hispanic children's comparative advantage concerning hospitalization for gastroenteritis had been significantly reduced by 2005. The majority of the disparities were not statistically significantly different. Table 7.2 shows the change in Hispanic-white disparities between 2001 and 2005 for

children aged 5-9 years. Of the 10 conditions shown in the table, there were statistically significant changes in only 2: for diabetes and grand mal/other epilepsy admissions, disparities reversed direction over time such that by 2005 rates for Hispanic children were higher than for white children.

In Table 7.3, Hispanic-white disparities in the rates of admission for the 10 most prevalent ACSC conditions among 10-14 year olds in 2001 and 2005 are shown, and in Table 7.4 comparable data for 15-19 year olds are presented. None of the differences in disparities between the two time points are statistically significant in either age group.

Table 6.1: Change in African American-white Disparities in Rates of Admission for ACSC (age 0-4)

ACS Conditions	2001 Rate Disparities (African American-White)	2005 Rate Disparities (African American-White)	Change in Disparities
Dehydration	-91.7	-153.4	N/S[7]
Asthma	+1363.3	+1,082.4	N/S
Bacterial Pneumonia	+268.6	+123.0	African American Disadvantage ↓***
Convulsions A	+110.9	+103.7	N/S
Gastroenteritis	-49.8	-5.5	White Disadvantage ↓**
Kidney urinary inf	+49.2	+19.4	N/S
Severe ENT infection	+101.9	+113.9	N/S
Cellulitis	+67.6	+93.5	N/S
Grand mal/other epilep	+22.0	+54.2	N/S
Failure to thrive	+36.2	+21.8	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[7] Non-significant change. This convention is used throughout.

Table 6.2: Change in African American-White Disparities in the Rates of Admission for ACSC (age 5-9)

ACS Conditions	2001 Rate Disparities (African American-White)	2005 Rate Disparities (African American-White)	Change in Disparities
Bacterial Pneumonia	+7.0	+123.0	N/S
Asthma	+780.3	+714.0	N/S
Dehydration	-24.2	-45.7	N/S
Kidney urinary inf	-10.3	-4.9	N/S
Diabetes A, B, C	-12.4	-3.4	N/S
Gastroenteritis	+2.0	-9.5	N/S
Cellulitis	+13.9	+31.4	N/S
Convulsions B	+20.1	+34.8	N/S
Grand mal/other epilep	+16.4	+23.5	N/S
Severe ENT infection	0.0	+12.7	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.3: Change in African American-White Disparities in the Rates of Admission for ACSC (age 10-14)

ACS Conditions	2001 Rate Disparities (African American-White)	2005 Rate Disparities (African American-White)	Change in Disparities
Asthma	+470.5	+547.2	African American Disadvantage ↑***
Diabetes A, B, C	+52.9	+53.6	N/S
Bacterial Pneumonia	-4.5	+13.1	N/S
Dehydration	-9.0	-10.0	N/S
Cellulitis	+7.0	+16.0	N/S
Convulsions B	+26.7	+11.2	N/S
Gastroenteritis	-2.0	-1.5	N/S
Kidney urinary inf	+2.9	+10.8	N/S
Grand mal/other epilep	+9.2	+22.0	N/S
Severe ENT infection	+0.1	+5.5	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6.4: Change in African American-White Disparities in the Rates of Admission for ACSC (age 15-19)

ACS Conditions	2001 Rate Disparities (African American-White)	2005 Rate Disparities (African American-White)	Change in Disparities
Diabetes A, B, C	+72.1	+83.2	N/S
Asthma	+226.2	+264.8	African American Disadvantage ↑**
Kidney urinary inf	+38.3	+19.5	African American Disadvantage ↓*
Bacterial Pneumonia	+12.2	-7.9	Reversed Direction to African American Advantage*
Convulsions B	+27.6	+36.6	N/S
Dehydration	-1.8	+0.6	N/S
Severe ENT infection	+0.9	-6.2	N/S
Cellulitis	+33.1	+13.7	African American Disadvantage ↓**
Gastroenteritis	-6.6	+16.2	Reversed Direction to African American Disadvantage**
Grand mal/other epilep	+10.1	+10.5	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7.1: Change in Hispanic-White Disparities in the Rates of Admission for ACSC (age 0-4)

ACS Conditions	2001 Rate Disparities (Hispanic-White)	2005 Rate Disparities (Hispanic-White)	Change in Disparities
Dehydration	-31.4	-76.7	N/S
Asthma	+700.3	+367.4	Hispanic Disadvantage ↓**
Bacterial Pneumonia	+121.0	+62.8	N/S
Convulsions A	+17.2	+20.3	N/S
Gastroenteritis	-61.8	-5.4	Hispanic Advantage ↓*
Kidney urinary inf	+139.2	+90.6	N/S
Severe ENT Infection	+72.3	+73.2	N/S
Cellulitis	+54.6	+78.0	N/S
Grand mal/other epilep	-10.9	+2.4	N/S
Failure to thrive	0.0	-6.7	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7.2: Change in Hispanic-White Disparities in the Rates of Admission for ACSC (age 5-9)

ACS Conditions	2001 Rate Disparities (Hispanic-White)	2005 Rate Disparities (Hispanic-White)	Change in Disparities
Bacterial Pneumonia	-4.7	+62.8	N/S
Asthma	+270.4	+204.5	N/S
Dehydration	-17.4	-36.4	N/S
Kidney urinary inf	-18.6	-4.4	N/S
Diabetes A, B, C	+16.5	-31.3	Reversed Direction to Hispanic Advantage***
Gastroenteritis	+2.1	-9.5	N/S
Cellulitis	+25.4	+6.0	N/S
Convulsions B	-1.0	+34.8	N/S
Grand mal/other epilep	+27.6	-3.7	Reversed Direction to Hispanic Advantage**
Severe ENT infection	-2.1	-1.4	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7.3: Change in Hispanic-White Disparities in the Rates of Admission for ACSC (age 10-14)

ACS Conditions	2001 Rate Disparities (Hispanic-White)	2005 Rate Disparities (Hispanic-White)	Change in Disparities
Asthma	-338.9	+146.9	N/S
Diabetes A, B, C	-11.9	-12.9	N/S
Bacterial Pneumonia	-12.6	+16.0	N/S
Dehydration	-14.0	-0.5	N/S
Cellulitis	+14.2	+18.6	N/S
Convulsions B	-0.9	+1.5	N/S
Gastroenteritis	+2.1	+12.8	N/S
Kidney urinary inf	+8.2	+3.7	N/S
Grand mal/other epilep	+18.2	+28.7	N/S
Severe ENT infection	+4.1	+0.5	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7.4: Change in Hispanic-White Disparities in the Rates of Admission for ACSC (age 15-19)

ACS Conditions	2001 Rate Disparities (Hispanic-White)	2005 Rate Disparities (Hispanic-White)	Change in Disparities
Diabetes A, B, C	-4.1	-20.8	N/S
Asthma	+84.0	+104.2	N/S
Kidney urinary inf	-7.4	+5.8	N/S
Bacterial Pneumonia	-1.9	-8.5	N/S
Convulsions B	-1.3	-8.5	N/S
Dehydration	+4.0	+7.6	N/S
Severe ENT infection	+0.9	-14.6	N/S
Cellulitis	+6.3	+20.9	N/S
Gastroenteritis	-2.1	+5.4	N/S
Grand mal/other epilep	+13.7	-1.5	N/S

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Chapter 5

DISCUSSION AND CONCLUSIONS

Summary of Findings

The objectives of this study were to 1) investigate race/ethnic and age-group differences in access to preventative care for children living in Pennsylvania, as measured by hospital admissions for ACSC; and 2) determine the extent to which these disparities have changed in 2005 compared to 2001. Three hypotheses were proposed: (1) African American and Hispanic children have higher rates of admission for ACSC compared to whites of similar ages living in Pennsylvania; (2) Children who are younger are more likely to be admitted for ACSC than children who are older; and (3) The disparities in rates of ACSC admission among African American and Hispanic children as compared to white children living in Pennsylvania are higher in 2005 compared to 2001.

For African Americans, the results presented strongly support Hypothesis 1. Overall, African American children have significantly higher rates of admission for most ACSC compared to their white counterparts. In the youngest age group (0-4), for example, African American children have significantly higher rates of admission for 8 of the 10 most prevalent ACSC conditions. The same is true for the next age group (5-9), where African Americans had higher rates of admission for 6 of the 10 most common ACSC conditions, 5 of which were significant. The picture did not change for the older age groups, as African Americans continue to be disproportionately admitted than whites for most of these otherwise preventable hospitalizations. For Hispanics, on the other hand, the results for Hypothesis 1 tests were somewhat mixed.

Although they tend to have higher rates of admission for many ACSC conditions compared to whites of similar age groups, many of the disparities in the rates of ACSC admission between Hispanics and whites were not statistically significant. This is particularly evident in the older age groups, where the disparities between Hispanics and whites were largely non-significant[8]. Although this observation is consistent with the so called "Hispanic epidemiologic paradox" (Hummer et al, 2007; Padilla et al, 2002), our data and analytic approach are not conclusive on this point, since the lower Hispanic disadvantage may simply reflect the tendency of Hispanics to seek health care from places other than the traditional health care environment and are therefore not been properly captured in the available data (Palloni & Arias, 2004).

Hypothesis 2 was largely supported for all race/ethnic groups examined in this study. Rates of admission for ACSC are higher in the younger age groups and become lower as one moves up the age ladder[9]. Children in the youngest age group (0-4) experience disproportionately high rates of admission for ACSC compared to the older age groups. The tendency of younger children to experience more ACSC hospitalizations can be attributed to the unique characteristics of this population. First, some ACSC conditions are though to be more responsive to primary care in older children compared to younger ones (Parker & Schoendorf, 2000). In addition, the health care needs in this age-group may be greater, due to their high susceptibility to respiratory conditions. The effect of barriers to access may therefore be accentuated for the youngest age-group compared to the older ones.

Overall, Hypothesis 3 was not supported by the findings from this study. For most of the ACSC conditions examined, there was no significant difference between the African American-

[8] For the oldest age group (15-19), whites actually have higher rates of admission than Hispanics for 7 of the 10 most prevalent ACSC conditions, although only 2 of these were significant.

[9] Diabetes is the only exception to this pattern. Due to its etiology, diabetes is most often diagnosed in older children (AHRQ, 2006). It is basically an "older" children ACSC condition, hence the rates is expected to increase in the older age groups. In our study, diabetes only showed up in the 5-9 age group and the rates increased progressively for all race/ethnic groups.

white disparities in 2001 and 2005 (Tables 6.1 to 6.4). Of the 10 most prevalent ACSC conditions in the 0-4 age group (Table 6.1) for example, only the African American-white disparities for bacterial pneumonia and gastroenteritis had changed significantly in 2005 compared to 2001[10]. The same is generally true for the older age groups, although the 5-9 age groups had no significantly higher disparities for any ACSC in 2005 compared to 2001. Similar to the African American-white disparities, the Hispanic-white disparities were not significantly higher in 2005 compared to 2001 even though a lot of the disparities were "carried over" between the 2 years (Tables 7.1 to 7.4). This is particularly true for the older age groups (10-14 and 15-19) where none of the changes over time were significant. Rather, it appears as if no progress has been made in the quest to eliminate race/ethnic disparities in the rates of admission for preventable conditions among Pennsylvania children. Barriers that prevent minority children from accessing quality care in a timely manner appear to remain important.

[10] On average, only about 2 ACSC in each age group have significantly different rates of admission in 2005 compared to 2001. The direction of the change was not fixed, as some disparities increased while other decreased.

Policy Implications

The results of this study provide valuable information that can help shape policies that govern children access to quality health care in Pennsylvania as well as other states. For all race/ethnic groups, rates of admission for ACSC are highest in the youngest age group. Policy makers therefore need to put stronger emphasis on the health care needs of the most vulnerable child populations. Policies that guarantee timely, accessible and quality health care for children, particularly the youngest ones, should be enacted. The provisions under the current SCHIP may be expanded to include comprehensive preventative care for Pennsylvania's child population.

As has been suggested by earlier research (Shi & Lu, 2000), results from this study have several implications for the way SCHIP is currently being implemented in most states. Given the observed pattern, race and age-group composition of a state should be important in the allocation of federal funding for SCHIP and other public insurance schemes. States with a greater proportion of very young children and uninsured minority children should henceforth be allocated higher proportion of federal funding than states with lower proportion of these demographic groups. Provision of copayment waivers for poor minority families may also go a long way in eliminating barriers to quality care for children from these families.

The fact that the race/ethnic and age group disparities in 2001 were largely carried over to 2005 without significant improvement in children's likelihood of ACSC admission also implies that the current policies regarding children's health care needs have been largely ineffective. Hence, policies that will offer sustainable improvement in access to quality health care for children, particularly minorities, need to be implemented. This will likely reduce the current pervasive disparities, particularly between African Americans and whites. Overall, provision of quality health care for all children in Pennsylvania should henceforth occupy a primary position when measures to improve the wellbeing of the state are being discussed.

Limitations

Since this is an observational study, the findings need to be interpreted carefully. Any observed relationships between children's race/ethnicity or age and admission for ACSCs may not necessarily be causal. Hence, higher rates of ACSC admissions for minorities in Pennsylvania may not necessarily be explained completely by lower access to quality health care compared to whites. As Schreiber and Zielinski (1997) have noted, high ACSC admissions may also be explained by other factors, including variations in disease prevalence, variations in the propensity to seek health care, and differences in physician practice patterns.

Also, the implications of a higher rate of ACSCs may be difficult to assess from a policy perspective. High rates of ACSCs may indicate "lack of access to primary care," or "lack of access to quality primary care." This distinction is crucial to policy formulations. Finally, the rate of admissions for ACSCs is influenced by the size of the population under study. For example, the statistical significance of a high ACSC admission rate for Hispanics could be as a result of fluctuations in the size of the Hispanic population in Pennsylvania and not deficiencies in the primary care that Hispanic children receive. In spite of these limitations, however, this research design is strong enough to identify racial disparities in the rates of ACSC admission in Pennsylvania, whether the observed disparities are due to a lack of access to primary care or a lack of access to quality primary care.

Future Research

In light of the results presented in this thesis, future research is needed to investigate the specific mechanisms through which disparities in the rates of ACSC admission arise among Pennsylvania children from diverse race/ethnic and age groups. For example, the relationship between the characteristics of the ambulatory healthcare settings and the quality of care received for ACSC among whites and minority children aged 0-19 need to be further elucidated. The disparities in the rates of admission for ACSC observed among these different socio-demographic groups may be largely related to the differences in the characteristics of the ambulatory or primary care that these children receive when they visit a physician.

Further, future research need to establish the relationship between rates of ACSC admission and access to care on one hand and then the relationship between ACSC admission and access to "quality care" on the other. Again, this distinction requires that rates of ACSC admission be reconciled with characteristics of quality health care such as: type of facility (solo practice, service hours/schedule number of medical staff in the facility), availability of electronic medical records, electronic billing capabilities, availability of lab testing services, and ability to refer Medicaid/Medicare/Uninsured patients for additional services. Also, apart from Pennsylvania, these research efforts should be extended to other states in the nation that are yet to have their disparities in the rates of ACSC admission analyzed.

Finally, future research should include children from other minority groups (Asian Americans, Native Americans, Pacific Islanders, etc) when estimating racial disparities in the rates of admission for ACSC. Although the relatively low population of these minority groups in Pennsylvania prevented their inclusion in the current study, research is needed in areas where these subpopulations are more concentrated

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Appendix

ACSC Conditions and their ICD-9 Codes

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'0900 '="0900 EARLY CONG SYPH SYMPTOM"
'0901 '="0901 EARLY CONGEN SYPH LATENT"
'0902 '="0902 EARLY CONGEN SYPH NOS"
'0903 '="0903 SYPHILITIC KERATITIS"
'09040'="09040 JUVENILE NEUROSYPH NOS"
'09041'="09041 CONGEN SYPH ENCEPHALITIS"
'09042'="09042 CONGEN SYPH MENINGITIS"
'09049'="09049 JUVENILE NEUROSYPH NEC"
'0905 '="0905 LATE CONGEN SYPH SYMPTOM"
'0906 '="0906 LATE CONGEN SYPH LATENT"
'0907 '="0907 LATE CONGEN SYPH NOS"
'0909 '="0909 CONGENITAL SYPHILIS NOS"
'0330 '="0330 BORDETELLA PERTUSSIS"
'0331 '="0331 BORDETELLA PARAPERTUSSIS"
'0338 '="0338 WHOOPING COUGH NEC"
'0339 '="0339 WHOOPING COUGH NOS"
'037  '="037 TETANUS"
'04500'="04500 AC BULBAR POLIO-TYPE NOS"
'04501'="04501 AC BULBAR POLIO-TYPE 1"
'04502'="04502 AC BULBAR POLIO-TYPE 2"
'04503'="04503 AC BULBAR POLIO-TYPE 3"
'04510'="04510 PARAL POLIO NEC-TYPE NOS"
'04511'="04511 PARAL POLIO NEC-TYPE 1"
'04512'="04512 PARAL POLIO NEC-TYPE 2"
'04513'="04513 PARAL POLIO NEC-TYPE 3"
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'04520'="04520 NONPARALY POLIO-TYPE NOS"
'04521'="04521 NONPARALYT POLIO-TYPE 1"
'04522'="04522 NONPARALYT POLIO-TYPE 2"
'04523'="04523 NONPARALYT POLIO-TYPE 3"
'04590'="04590 AC POLIO NOS-TYPE NOS"
'04591'="04591 AC POLIO NOS-TYPE 1"
'04592'="04592 AC POLIO NOS-TYPE 2"
'04593'="04593 AC POLIO NOS-TYPE 3"
'3200 '="3200 HEMOPHILUS MENINGITIS"
'3202 '="STREPTOCOCCAL MENINGITIS"
'390  '="390 RHEUM FEV W/O HRT INVOLV"
'3910 '="3910 ACUTE RHEUMATIC PERICARD"
'3911 '="3911 ACUTE RHEUMATIC ENDOCARD"
'3912 '="3912 AC RHEUMATIC MYOCARDITIS"
'3918 '="3918 AC RHEUMAT HRT DIS NEC"
'3919 '="3919 AC RHEUMAT HRT DIS NOS"
'3450 '="3450 GEN NONCONVULS EPILEPSY"
'34500'="34500 GEN NONCV EP W/O INTR EP"
'34501'="34501 GEN NONCONV EP W INTR EP"
'3451 '="3451 GEN CONVULSIVE EPILEPSY"
'34510'="34510 GEN CNV EPIL W/O INTR EP"
'34511'="34511 GEN CNV EPIL W INTR EPIL"
'3452 '="3452 PETIT MAL STATUS"
'3453 '="3453 GRAND MAL STATUS"
'3454 '="3454 PSYCHOMOTOR EPILEPSY"
'34540'="34540 PSYMOTR EPIL W/O INT EPI"
'34541'="34541 PSYMOTR EPIL W INTR EPIL"
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'3455 '="3455 PARTIAL EPILEPSY NEC"
'34550'="34550 PART EPIL W/O INTR EPIL"
'34551'="34551 PART EPIL W INTR EPIL"
'3456 '="3456 INFANTILE SPASMS"
'34560'="34560 INF SPASM W/O INTR EPIL"
'34561'="34561 INF SPASM W INTRACT EPIL"
'3457 '="3457 EPILEPS PARTIAL CONTINUA"
'34570'="34570 EPIL PAR CONT W/O INT EP"
'34571'="34571 EPIL PAR CONT W INTR EPI"
'3458 '="3458 EPILEPSY NEC"
'34580'="34580 EPILEP NEC W/O INTR EPIL"
'34581'="34581 EPILEPSY NEC W INTR EPIL"
'3459 '="3459 EPILEPSY NOS"
'34590'="34590 EPILEP NOS W/O INTR EPIL"
'34591'="34591 EPILEPSY NOS W INTR EPIL"
'7803 '="7803 CONVULSIONS"
'78031'="78031 FEBRILE CONVULSIONS"
'78039'="78039 OT CONVULSIONS"
'38200'="38200 AC SUPP OTITIS MEDIA NOS"
'38201'="38201 AC SUPP OM W DRUM RUPT"
'38202'="38202 AC SUPP OM IN OTH DIS"
'3821 '="3821 CHR TUBOTYMPAN SUPPUR OM"
'3822 '="3822 CHR ATTICOANTRAL SUP OM"
'3823 '="3823 CHR SUP OTITIS MEDIA NOS"
'3824 '="3824 SUPPUR OTITIS MEDIA NOS"
'3829 '="3829 OTITIS MEDIA NOS"
'462  '="462 ACUTE PHARYNGITIS"
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'463  '="463 ACUTE TONSILLITIS"
'4650 '="4650 ACUTE LARYNGOPHARYNGITIS"
'4658 '="4658 ACUTE URI MULT SITES NEC"
'4659 '="4659 ACUTE URI NOS"
'4721 '="4721 CHRONIC PHARYNGITIS"
'481  '="481 PNEUMOCOCCAL PNEUMONIA"
'4822 '="4822 H.INFLUENZAE PNEUMONIA"
'4823 '="4823 STREPTOCOCCAL PNEUMONIA"
'48230'="48230 STREP PNEUMONIA UNSPEC"
'48231'="48231 GRP A STREP PNEUMONIA"
'48232'="48232 GRP B STREP PNEUMONIA"
'48239'="48239 OTH STREP PNEUMONIA"
'4829 '="4829 BACTERIAL PNEUMONIA NOS"
'483  '="483PNEUMONIA: ORGANISM NEC"
'4830 '="4830 MYCOPLASMA PNEUMONIA"
'4831 '="4831 CHLAMYDIA PNEUMONIA"
'4838 '="4838 OTH SPEC ORG PNEUMONIA"
'485  '="485 BRONCOPNEUMONIA ORG NOS"
'486  '="486 PNEUMONIA, ORGANISM NOS"
'49300'="49300 EXT ASTHMA W/O STAT ASTH"
'49301'="49301 EXT ASTHMA W STATUS ASTH"
'49302'="49302 EXT ASTHMA W/ ACUTE EXACERBATION"
'49310'="49310 INT ASTHMA W/O STAT ASTH"
'49311'="49311 INT ASTHMA W STATUS ASTH"
'49312'="49312 INT ASTHMA W/ ACUTE EXACERBATION"
'49320'="49320 CH OB ASTH W/O STAT ASTH"
'49321'="49321 CH OB ASTHMA W STAT ASTH"
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'49322'="49322 CH OB ASTHMA W/ACUTE EXACERBATION"
'49381'="49381 EXERCISE INDUCED BRONCHOSPAS"
'49382'="49382 COUGH VARIANT ASTHMA"
'49390'="49390 ASTHMA W/O STATUS ASTHM"
'49391'="49391 ASTHMA W/ STATUS ASTHMAT"
'49392'="49392 ASTHMA W/ ACUTE EXACERBATION"
'68100'="68100 CELLULITIS, FINGER NOS"
'68101'="68101 FELON"
'68102'="68102 ONYCHIA OF FINGER"
'68110'="68110 CELLULITIS, TOE NOS"
'68111'="68111 ONYCHIA OF TOE"
'6819 '="6819 CELLULITIS OF DIGIT NOS"
'6820 '="6820 CELLULITIS OF FACE"
'6821 '="6821 CELLULITIS OF NECK"
'6822 '="6822 CELLULITIS OF TRUNK"
'6823 '="6823 CELLULITIS OF ARM"
'6824 '="6824 CELLULITIS OF HAND"
'6825 '="6825 CELLULITIS OF BUTTOCK"
'6826 '="6826 CELLULITIS OF LEG"
'6827 '="6827 CELLULITIS OF FOOT"
'6828 '="6828 CELLULITIS, SITE NEC"
'6829 '="6829 CELLULITIS NOS"
'683  '="683 ACUTE LYMPHADENITIS"
'6860 '="6860 PYODERMA"
'68600'="68600 PYODERMA NOS"
'68601'="68601 PYODERMA GANGREN"
'68609'="68609 PYODERMA NEC"
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'6861 '="6861 PYOGENIC GRANULOMA"
'6868 '="6868 LOCAL SKIN INFECTION NEC"
'6869 '="6869 LOCAL SKIN INFECTION NOS"
'25010'="25010 DIAB KETOACIDOSIS TYP II"
'25011'="25011 DIAB KETOACIDOSIS TYPE I"
'25012'="25012 DIAB KETOACID TYPE I DM UNCONT"
'25013'="25013 DIAB KETOACID TYPE I DM UNCONT"
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'25021'="25021 DM HYPEROSM COMA TYPE I"
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'25033'="25033 DIAB COMA NEC TYPE I DM UNCONT"
'25080'="25080 DIAB W MANIF NEC TYPE II"
'25081'="25081 DIAB W MANIF NEC TYPE I"
'25082'="25082 DIAB W MANIF NEC TYPE II DM UNCONT"
'25083'="25083 DIAB W MANIF NEC TYPE I DM UNCONT"
'25090'="25090 DIAB W COMPL NOS TYPE II"
'25091'="25091 DIAB W COMPL NOS TYPE I"
'25092'="25092 DIAB W COMPL NOS TYPE II DM UNCONT"
'25093'="25093 DIAB W COMPL NOS TYPE I DM UNCONT(Begin 1993)"
'25000'="25000 DIABETES UNCOMPL TYPE II"
'25001'="25001 DIABETES UNCOMPL TYPE I"
'25002'="25002 DIABETES MELL TYPE II UNCONT"
'25003'="25003 DIABETES MELL TYPE I UNCONT"
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'5589 '="5589 NONINF GASTROENTERIT NEC"
'2512 '="2512 HYPOGLYCEMIA NOS"
'59000'="59000 CHR PYELONEPHRITIS NOS"
'59001'="59001 CHR PYELONEPH W MED NECR"
'59010'="59000 AC PYELONEPHRITIS NOS"
'59011'="59011 AC PYELONEPHR W MED NECR"
'5902 '="5902 RENAL/PERIRENAL ABSCESS"
'5903 '="5903 PYELOURETERITIS CYSTICA"
'59080'="59080 PYELONEPHRITIS NOS"
'59081'="59081 PYELONEPHRIT IN OTH DIS"
'5909 '="5909 INFECTION OF KIDNEY NOS"
'5990 '="5990 URIN TRACT INFECTION NOS"
'5999 '="5999 URINARY TRACT DIS NOS"
'2765 '="2765 HYPOVOLEMIA"
'27650'="27650 VOLUME DEPLETION NOS"
'27651'="27651 DEHYDRATION"
'27652'="27652 HYPOVOLEMIA"
'2801 '="2801 IRON DEF ANEMIA DIETARY"
'2808 '="2808 IRON DEFIC ANEMIA NEC"
'2809 '="2809 IRON DEFIC ANEMIA NOS"
'260  '="260 KWASHIORKOR"
'261  '="261 NUTRITIONAL MARASMUS"
'262  '="262 OTH SEVERE MALNUTRITION"
'2680 '="2680 RICKETS, ACTIVE"
'2681 '="2681 RICKETS, LATE EFFECT"
'7834 '="7834 LACK NORM PHYSIOL DEVEL"
'78340'="78340 LACK NORM PHYSIOL DEVELOP UNSPEC"
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'78341'="78341 FAILURE TO THRIVE"
'78342'="78342 DELAYED MILESTONE"
'78343'="78343 SHORT STATURE"
'5210 '="5210 DENTAL CARIES"
'52100'="52100 UNSPECIFIED DENTAL CARIES"
'52101'="52101 DENTAL CARIES LIMITED TO ENAMEL"
'52102'="52102 DENTAL CARIES EXTENDING INTO DENTINE"
'52103'="52103 DENTAL CARIES EXTENDING INTO PULP"
'52104'="52104 ARRESTED DENTAL CARIES"
'52105'="52105 ODONTOCLASIA"
'52106'="52106 DENTL CARIES-PIT/FISSURE"
'52107'="52107 DENTL CARIES-SMOOTH SURF"
'52108'="52108 DENTAL CARIES-ROOT SURF"
'52109'="52109 OTHER DENTAL CARIES"
'5211 '="5211 EXCESS ATTRITION-TEETH"
'52110'="52110 EXCESSIVE ATTRITION NOS"
'52111'="52111 EXCESS ATTRITION-ENAMEL"
'52112'="52112 EXCESS ATTRITION-DENTINE"
'52113'="52113 EXCESSIVE ATTRITION-PULP"
'52114'="52114 EXCESS ATTRITION-LOCAL"
'52115'="52115 EXCESS ATTRITION-GENERAL"
'5212 '="5212 ABRASION OF TEETH"
'52120'="52120 ABRASION NOS"
'52121'="52121 ABRASION-ENAMEL"
'52122'="52122 ABRASION-DENTINE"
'52123'="52123 ABRASION-PULP"
'52124'="52124 ABRASION-LOCALIZED"
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'52125'="52125 ABRASION-GENERALIZED"
'5213 '="5213 EROSION OF TEETH"
'52130'="52130 EROSION NOS"
'52131'="52131 EROSION-ENAMEL"
'52132'="52132 EROSION-DENTINE"
'52133'="52133 EROSION-PULP"
'52134'="52134 EROSION-LOCALIZED"
'52135'="52135 EROSION-GENERALIZED"
'5214 '="5214 RESORPTION OF TEETH"
'52140'="52140 PATH RESORPTION NOS"
'52141'="52141 PATH RESORPTION-INTERNAL"
'52142'="52142 PATH RESORPTION-EXTERNAL"
'52149'="52149 PATH RESORPTION NEC"
'5215 '="5215 HYPERCEMENTOSIS"
'5216 '="5216 ANKYLOSIS OF TEETH"
'5217 '="5217 POSTERUPT COLOR CHANGE"
'5218 '="5218 HARD TISS DIS TEETH NEC"
'5219 '="5219 HARD TISS DIS TEETH NOS"
'5220 '="5220 PULPITIS"
'5221 '="5221 NECROSIS OF TOOTH PULP"
'5222 '="5222 TOOTH PULP DEGENERATION"
'5223 '="5223 ABN HARD TISS-TOOTH PULP"
'5224 '="5224 AC APICAL PERIODONTITIS"
'5225 '="5225 PERIAPICAL ABSCESS"
'5226 '="5226 CHR APICAL PERIODONTITIS"
'5227 '="5227 PERIAPICAL ABSC W SINUS"
'5228 '="5228 RADICULAR CYST"
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'5229 '="5229 PULP/PERIAPICAL DIS NEC"
'5230 '="5230 ACUTE GINGIVITIS"
'5231 '="5231 CHRONIC GINGIVITIS"
'5232 '="5232 GINGIVAL RECESSION"
'52320'="52320 GINGIVAL RECESSION NOS"
'52321'="52321 GINGIVAL RECESS-MINIMAL"
'52322'="52322 GINGIVAL RECESS-MODERATE"
'52323'="52323 GINGIVAL RECESS-SEVERE"
'52324'="52324 GINGIVAL RECESSION-LOCAL"
'52325'="52325 GINGIVAL RECESS-GENERAL"
'5233 '="5233 ACUTE PERIODONTITIS"
'5234 '="5234 CHRONIC PERIODONTITIS"
'5235 '="5235 PERIODONTOSIS"
'5236 '="5236 ACCRETIONS ON TEETH"
'5238 '="5238 PERIODONTAL DISEASE NEC"
'5239 '="5239 GINGIV/PERIODONT DIS NOS"
'5250 '="5250 EXFOLIATION OF TEETH"
'5251 '="5251 LOSS OF TEETH, ACQUIRED"
'52510'="52510 ACQUIRED ABSENCE OF TEETH NOS"
'52511'="52511 LOSS OF TEETH DUE TO TRAUMA"
'52512'="52512 LOSS OF TEETH DUE TO PERIODONTAL DX"
'52513'="52513 LOSS OF TEETH DUE TO CARIES"
'52519'="52519 OTHER LOSS OF TEETH"
'5252 '="5252 ATROPHY ALVEOLAR RIDGE"
'52520'="52520 ATROPHY ALVLAR RIDGE NOS"
'52521'="52521 ATROPHY MANDIBLE-MINIMAL"
'52522'="52522 ATROPHY MANDIBLE-MODRATE"
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'52523'="52523 ATROPHY MANDIBLE-SEVERE"
'52524'="52524 ATROPHY MAXILLA-MINIMAL"
'52525'="52525 ATROPHY MAXILLA-MODERATE"
'52526'="52526 ATROPHY MAXILLA-SEVERE"
'5253 '="5253 RETAINED DENTAL ROOT"
'52540'="52540 COMPLETE EDENTULISM NOS"
'52541'="52541 COMP EDENTULISM"
'52542'="52542 COMP EDENTULISM"
'52543'="52543 COMP EDENTULSM"
'52544'="52544 COMP EDENTULISM"
'52550'="52550 PARTIAL EDENTULISM NOS"
'52551'="52551 PART EDENTULISM"
'52552'="52552 PART EDENTULISM"
'52553'="52553 PART EDENTULSM"
'52554'="52554 PART EDENTULISM"
'5258 '="5258 DENTAL DISORDER NEC"
'5259 '="5259 DENTAL DISORDER NOS"
'5280 '="5280 STOMATITIS"
'5281 '="5281 CANCRUM ORIS"
'5282 '="5282 ORAL APHTHAE"
'5283 '="5283 CELLULITIS/ABSCESS MOUTH"
'5284 '="5284 ORAL SOFT TISSUE CYST"
'5285 '="5285 DISEASES OF LIPS"
'5286 '="5286 LEUKOPLAKIA ORAL MUCOSA"
'5287 '="5287 ORAL EPITHELIUM DIS NEC"
'52871'="52871 KERATIN RIDGE MUCOSA-MIN"
'52872'="52872 KERATIN RIDGE MUC-EXCESS"
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    '52879'="52879 DIST ORAL EPITHELIUM NEC"
    '5288 '="5288 ORAL SUBMUCOSAL FIBROSIS"
    '5289 '="5289 ORAL SOFT TISSUE DIS NEC"
    '5400 '="5400 AC APPEND W PERITONITIS"
    '5401 '="5401 ABSCESS OF APPENDIX"
    '5409 '="5409 ACUTE APPENDICITIS NOS"
    '541  '="541 APPENDICITIS NOS"
    '542  '="542 OTHER APPENDICITIS"
    '410 '='410 Bone marrow transplant [64.]'
    '4100'='4100 Bone marrow transplant [64.]'
    '4101'='4101 Bone marrow transplant [64.]'
    '4102'='4102 Bone marrow transplant [64.]'
    '4103'='4103 Bone marrow transplant [64.]'
    '4104'='4104 Bone marrow transplant [64.]'
    '4105'='4105 Bone marrow transplant [64.]'
    '4106'='4106 Bone marrow transplant [64.]'
    '4107'='4107 Bone marrow transplant [64.]'
    '4108'='4108 Bone marrow transplant [64.]'
    '4109'='4109 Bone marrow transplant [64.]'
    'P410'='Bone marrow transplant [64.]'
    'P556'='5561 Kidney transplant [105.]'
    'P505'='5051 Other organ transplantation [176.]'
    'P375'='375 Other organ transplantation [176.]'
    OTHER = 'Other diagnosis'
  ;
VALUE ICD
     0900  ="0900 EARLY CONG SYPH SYMPTOM"
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0901 ="0901 EARLY CONGEN SYPH LATENT"

0902 ="0902 EARLY CONGEN SYPH NOS"

0903 ="0903 SYPHILITIC KERATITIS"

09040 ="09040 JUVENILE NEUROSYPH NOS"

09041 ="09041 CONGEN SYPH ENCEPHALITIS"

09042 ="09042 CONGEN SYPH MENINGITIS"

09049 ="09049 JUVENILE NEUROSYPH NEC"

0905 ="0905 LATE CONGEN SYPH SYMPTOM"

0906 ="0906 LATE CONGEN SYPH LATENT"

0907 ="0907 LATE CONGEN SYPH NOS"

0909 ="0909 CONGENITAL SYPHILIS NOS"

0330 ="0330 BORDETELLA PERTUSSIS"

0331 ="0331 BORDETELLA PARAPERTUSSIS"

0338 ="0338 WHOOPING COUGH NEC"

0339 ="0339 WHOOPING COUGH NOS"

037 ="037 TETANUS"

04500 ="04500 AC BULBAR POLIO-TYPE NOS"

04501 ="04501 AC BULBAR POLIO-TYPE 1"

04502 ="04502 AC BULBAR POLIO-TYPE 2"

04503 ="04503 AC BULBAR POLIO-TYPE 3"

04510 ="04510 PARAL POLIO NEC-TYPE NOS"

04511 ="04511 PARAL POLIO NEC-TYPE 1"

04512 ="04512 PARAL POLIO NEC-TYPE 2"

04513 ="04513 PARAL POLIO NEC-TYPE 3"

04520 ="04520 NONPARALY POLIO-TYPE NOS"

04521 ="04521 NONPARALYT POLIO-TYPE 1"

04522 ="04522 NONPARALYT POLIO-TYPE 2"

04523 ="04523 NONPARALYT POLIO-TYPE 3"

04590 ="04590 AC POLIO NOS-TYPE NOS"

04591 ="04591 AC POLIO NOS-TYPE 1"

04592 ="04592 AC POLIO NOS-TYPE 2"

04593 ="04593 AC POLIO NOS-TYPE 3"

3200 ="3200 HEMOPHILUS MENINGITIS"

3202 ="STREPTOCOCCAL MENINGITIS"

390 ="390 RHEUM FEV W/O HRT INVOLV"

3910 ="3910 ACUTE RHEUMATIC PERICARD"

3911 ="3911 ACUTE RHEUMATIC ENDOCARD"

3912 ="3912 AC RHEUMATIC MYOCARDITIS"

3918 ="3918 AC RHEUMAT HRT DIS NEC"

3919 ="3919 AC RHEUMAT HRT DIS NOS"

3450 ="3450 GEN NONCONVULS EPILEPSY"

34500 ="34500 GEN NONCV EP W/O INTR EP"

34501 ="34501 GEN NONCONV EP W INTR EP"

3451 ="3451 GEN CONVULSIVE EPILEPSY"

34510 ="34510 GEN CNV EPIL W/O INTR EP"

34511 ="34511 GEN CNV EPIL W INTR EPIL"

3452 ="3452 PETIT MAL STATUS"

3453 ="3453 GRAND MAL STATUS"

3454 ="3454 PSYCHOMOTOR EPILEPSY"

34540 ="34540 PSYMOTR EPIL W/O INT EPI"

34541 ="34541 PSYMOTR EPIL W INTR EPIL"

3455 ="3455 PARTIAL EPILEPSY NEC"

34550 ="34550 PART EPIL W/O INTR EPIL"

34551 ="34551 PART EPIL W INTR EPIL"

3456 ="3456 INFANTILE SPASMS"

34560 ="34560 INF SPASM W/O INTR EPIL"

34561 ="34561 INF SPASM W INTRACT EPIL"

3457 ="3457 EPILEPS PARTIAL CONTINUA"

34570 ="34570 EPIL PAR CONT W/O INT EP"

34571 ="34571 EPIL PAR CONT W INTR EPI"

3458 ="3458 EPILEPSY NEC"

34580 ="34580 EPILEP NEC W/O INTR EPIL"

34581 ="34581 EPILEPSY NEC W INTR EPIL"

3459 ="3459 EPILEPSY NOS"

34590 ="34590 EPILEP NOS W/O INTR EPIL"

34591 ="34591 EPILEPSY NOS W INTR EPIL"

7803 ="7803 CONVULSIONS"

78031 ="78031 FEBRILE CONVULSIONS"

78039 ="78039 OT CONVULSIONS"

38200 ="38200 AC SUPP OTITIS MEDIA NOS"

38201 ="38201 AC SUPP OM W DRUM RUPT"

38202 ="38202 AC SUPP OM IN OTH DIS"

3821 ="3821 CHR TUBOTYMPAN SUPPUR OM"

3822 ="3822 CHR ATTICOANTRAL SUP OM"

3823 ="3823 CHR SUP OTITIS MEDIA NOS"

3824 ="3824 SUPPUR OTITIS MEDIA NOS"

3829 ="3829 OTITIS MEDIA NOS"

462 ="462 ACUTE PHARYNGITIS"

463 ="463 ACUTE TONSILLITIS"

4650 ="4650 ACUTE LARYNGOPHARYNGITIS"

4658 ="4658 ACUTE URI MULT SITES NEC"

4659 ="4659 ACUTE URI NOS"

4721 ="4721 CHRONIC PHARYNGITIS"

481 ="481 PNEUMOCOCCAL PNEUMONIA"

4822 ="4822 H.INFLUENZAE PNEUMONIA"

4823 ="4823 STREPTOCOCCAL PNEUMONIA"

48230 ="48230 STREP PNEUMONIA UNSPEC"

48231 ="48231 GRP A STREP PNEUMONIA"

48232 ="48232 GRP B STREP PNEUMONIA"

48239 ="48239 OTH STREP PNEUMONIA"

4829 ="4829 BACTERIAL PNEUMONIA NOS"

483 ="483 PNEUMONIA: ORGANISM NEC"

4830 ="4830 MYCOPLASMA PNEUMONIA"

4831 ="4831 CHLAMYDIA PNEUMONIA"

4838 ="4838 OTH SPEC ORG PNEUMONIA"

485 ="485 BRONCOPNEUMONIA ORG NOS"

486 ="486 PNEUMONIA, ORGANISM NOS"

49300 ="49300 EXT ASTHMA W/O STAT ASTH"

49301 ="49301 EXT ASTHMA W STATUS ASTH"

49302 ="49302 EXT ASTHMA W/ ACUTE EXACERBATION"

49310 ="49310 INT ASTHMA W/O STAT ASTH"

49311 ="49311 INT ASTHMA W STATUS ASTH"

49312 ="49312 INT ASTHMA W/ ACUTE EXACERBATION"

49320 ="49320 CH OB ASTH W/O STAT ASTH"

49321 ="49321 CH OB ASTHMA W STAT ASTH"

49322 ="49322 CH OB ASTHMA W/ACUTE EXACERBATION"

49381 ="49381 EXERCISE INDUCED BRONCHOSPAS"

49382 ="49382 COUGH VARIANT ASTHMA"

49390 ="49390 ASTHMA W/O STATUS ASTHM"

49391 ="49391 ASTHMA W/ STATUS ASTHMAT"

49392 ="49392 ASTHMA W/ ACUTE EXACERBATION"

68100 ="68100 CELLULITIS, FINGER NOS"

68101 ="68101 FELON"

68102 ="68102 ONYCHIA OF FINGER"

68110 ="68110 CELLULITIS, TOE NOS"

68111 ="68111 ONYCHIA OF TOE"

6819 ="6819 CELLULITIS OF DIGIT NOS"

6820 ="6820 CELLULITIS OF FACE"

6821 ="6821 CELLULITIS OF NECK"

6822 ="6822 CELLULITIS OF TRUNK"

6823 ="6823 CELLULITIS OF ARM"

6824 ="6824 CELLULITIS OF HAND"

6825 ="6825 CELLULITIS OF BUTTOCK"

6826 ="6826 CELLULITIS OF LEG"

6827 ="6827 CELLULITIS OF FOOT"

6828 ="6828 CELLULITIS, SITE NEC"

6829 ="6829 CELLULITIS NOS"

683 ="683 ACUTE LYMPHADENITIS"

6860 ="6860 PYODERMA"

68600 ="68600 PYODERMA NOS"

68601 ="68601 PYODERMA GANGREN"

68609 ="68609 PYODERMA NEC"

6861 ="6861 PYOGENIC GRANULOMA"

6868 ="6868 LOCAL SKIN INFECTION NEC"

6869 ="6869 LOCAL SKIN INFECTION NOS"

25010 ="25010 DIAB KETOACIDOSIS TYP II"

25011 ="25011 DIAB KETOACIDOSIS TYPE I"

25012 ="25012 DIAB KETOACID TYPE I DM UNCONT"

25013 ="25013 DIAB KETOACID TYPE I DM UNCONT"

25020 ="25020 DM HYPEROSM COMA TYPE II"

25021 ="25021 DM HYPEROSM COMA TYPE I"

25022 ="25022 DM W/ HYPEROSMO TYPE II DM UNCONT"

25023 ="25023 DM W/ HYPEROSMO TYPE I DM UNCONT"

25030 ="25030 DIABETES COMA NEC TYP II"

25031 ="25031 DIABETES COMA NEC TYPE I"

25032 ="25032 DIAB COMA NEC TYP II DM UNCONT"

25033 ="25033 DIAB COMA NEC TYPE I DM UNCONT"

25080 ="25080 DIAB W MANIF NEC TYPE II"

25081 ="25081 DIAB W MANIF NEC TYPE I"

25082 ="25082 DIAB W MANIF NEC TYPE II DM UNCONT"

25083 ="25083 DIAB W MANIF NEC TYPE I DM UNCONT"

25090 ="25090 DIAB W COMPL NOS TYPE II"

25091 ="25091 DIAB W COMPL NOS TYPE I"

25092 ="25092 DIAB W COMPL NOS TYPE II DM UNCONT"

25093 ="25093 DIAB W COMPL NOS TYPE I DM UNCONT(Begin 1993)"

25000 ="25000 DIABETES UNCOMPL TYPE II"

25001 ="25001 DIABETES UNCOMPL TYPE I"

25002 ="25002 DIABETES MELL TYPE II UNCONT"

25003 ="25003 DIABETES MELL TYPE I UNCONT"

5589 ="5589 NONINF GASTROENTERIT NEC"

2512 ="2512 HYPOGLYCEMIA NOS"

59000 ="59000 CHR PYELONEPHRITIS NOS"

59001 ="59001 CHR PYELONEPH W MED NECR"

59010 ="59000 AC PYELONEPHRITIS NOS"

59011 ="59011 AC PYELONEPHR W MED NECR"

5902 ="5902 RENAL/PERIRENAL ABSCESS"

5903 ="5903 PYELOURETERITIS CYSTICA"

59080 ="59080 PYELONEPHRITIS NOS"

59081 ="59081 PYELONEPHRIT IN OTH DIS"

5909 ="5909 INFECTION OF KIDNEY NOS"

5990 ="5990 URIN TRACT INFECTION NOS"

5999 ="5999 URINARY TRACT DIS NOS"

2765 ="2765 HYPOVOLEMIA"

27650 ="27650 VOLUME DEPLETION NOS"

27651 ="27651 DEHYDRATION"

27652 ="27652 HYPOVOLEMIA"

2801 ="2801 IRON DEF ANEMIA DIETARY"

2808 ="2808 IRON DEFIC ANEMIA NEC"

2809 ="2809 IRON DEFIC ANEMIA NOS"

260 ="260 KWASHIORKOR"

261 ="261 NUTRITIONAL MARASMUS"

262 ="262 OTH SEVERE MALNUTRITION"

2680 ="2680 RICKETS, ACTIVE"

2681 ="2681 RICKETS, LATE EFFECT"

7834 ="7834 LACK NORM PHYSIOL DEVEL"

78340 ="78340 LACK NORM PHYSIOL DEVELOP UNSPEC"

78341 ="78341 FAILURE TO THRIVE"

78342 ="78342 DELAYED MILESTONE"

78343 ="78343 SHORT STATURE"

5210 ="5210 DENTAL CARIES"

52100 ="52100 UNSPECIFIED DENTAL CARIES"

52101 ="52101 DENTAL CARIES LIMITED TO ENAMEL"

52102 ="52102 DENTAL CARIES EXTENDING INTO DENTINE"

52103 ="52103 DENTAL CARIES EXTENDING INTO PULP"

52104 ="52104 ARRESTED DENTAL CARIES"

52105 ="52105 ODONTOCLASIA"

52106 ="52106 DENTL CARIES-PIT/FISSURE"

52107 ="52107 DENTL CARIES-SMOOTH SURF"

52108 ="52108 DENTAL CARIES-ROOT SURF"

52109 ="52109 OTHER DENTAL CARIES"

5211 ="5211 EXCESS ATTRITION-TEETH"

52110 ="52110 EXCESSIVE ATTRITION NOS"

52111 ="52111 EXCESS ATTRITION-ENAMEL"

52112 ="52112 EXCESS ATTRITION-DENTINE"

52113 ="52113 EXCESSIVE ATTRITION-PULP"

52114 ="52114 EXCESS ATTRITION-LOCAL"

52115 ="52115 EXCESS ATTRITION-GENERAL"

5212 ="5212 ABRASION OF TEETH"

52120 ="52120 ABRASION NOS"

52121 ="52121 ABRASION-ENAMEL"

52122 ="52122 ABRASION-DENTINE"

52123 ="52123 ABRASION-PULP"

52124 ="52124 ABRASION-LOCALIZED"

52125 ="52125 ABRASION-GENERALIZED"

5213 ="5213 EROSION OF TEETH"

52130 ="52130 EROSION NOS"

52131 ="52131 EROSION-ENAMEL"

52132 ="52132 EROSION-DENTINE"

52133 ="52133 EROSION-PULP"

52134 ="52134 EROSION-LOCALIZED"

52135 ="52135 EROSION-GENERALIZED"

5214 ="5214 RESORPTION OF TEETH"

52140 ="52140 PATH RESORPTION NOS"

52141 ="52141 PATH RESORPTION-INTERNAL"

52142 ="52142 PATH RESORPTION-EXTERNAL"

52149 ="52149 PATH RESORPTION NEC"

5215 ="5215 HYPERCEMENTOSIS"

5216 ="5216 ANKYLOSIS OF TEETH"

5217 ="5217 POSTERUPT COLOR CHANGE"

5218 ="5218 HARD TISS DIS TEETH NEC"

5219 ="5219 HARD TISS DIS TEETH NOS"

5220 ="5220 PULPITIS"

5221 ="5221 NECROSIS OF TOOTH PULP"

5222 ="5222 TOOTH PULP DEGENERATION"

5223 ="5223 ABN HARD TISS-TOOTH PULP"

5224 ="5224 AC APICAL PERIODONTITIS"

5225 ="5225 PERIAPICAL ABSCESS"

5226 ="5226 CHR APICAL PERIODONTITIS"

5227 ="5227 PERIAPICAL ABSC W SINUS"

5228 ="5228 RADICULAR CYST"

5229 ="5229 PULP/PERIAPICAL DIS NEC"

5230 ="5230 ACUTE GINGIVITIS"

5231 ="5231 CHRONIC GINGIVITIS"

5232 ="5232 GINGIVAL RECESSION"

52320 ="52320 GINGIVAL RECESSION NOS"

52321 ="52321 GINGIVAL RECESS-MINIMAL"

52322 ="52322 GINGIVAL RECESS-MODERATE"

52323 ="52323 GINGIVAL RECESS-SEVERE"

52324 ="52324 GINGIVAL RECESSION-LOCAL"

52325 ="52325 GINGIVAL RECESS-GENERAL"

5233 ="5233 ACUTE PERIODONTITIS"

5234 ="5234 CHRONIC PERIODONTITIS"

5235 ="5235 PERIODONTOSIS"

5236 ="5236 ACCRETIONS ON TEETH"

5238 ="5238 PERIODONTAL DISEASE NEC"

5239 ="5239 GINGIV/PERIODONT DIS NOS"

5250 ="5250 EXFOLIATION OF TEETH"

5251 ="5251 LOSS OF TEETH, ACQUIRED"

52510 ="52510 ACQUIRED ABSENCE OF TEETH NOS"

52511 ="52511 LOSS OF TEETH DUE TO TRAUMA"

52512 ="52512 LOSS OF TEETH DUE TO PERIODONTAL DX"

52513 ="52513 LOSS OF TEETH DUE TO CARIES"

52519 ="52519 OTHER LOSS OF TEETH"

5252 ="5252 ATROPHY ALVEOLAR RIDGE"

52520 ="52520 ATROPHY ALVLAR RIDGE NOS"

52521 ="52521 ATROPHY MANDIBLE-MINIMAL"

52522 ="52522 ATROPHY MANDIBLE-MODRATE"

52523 ="52523 ATROPHY MANDIBLE-SEVERE"

52524 ="52524 ATROPHY MAXILLA-MINIMAL"

52525 ="52525 ATROPHY MAXILLA-MODERATE"

52526 ="52526 ATROPHY MAXILLA-SEVERE"

5253 ="5253 RETAINED DENTAL ROOT"

52540 ="52540 COMPLETE EDENTULISM NOS"

52541 ="52541 COMP EDENTULISM"

52542 ="52542 COMP EDENTULISM"

52543 ="52543 COMP EDENTULSM"

52544 ="52544 COMP EDENTULISM"

52550 ="52550 PARTIAL EDENTULISM NOS"

52551 ="52551 PART EDENTULISM"

52552 ="52552 PART EDENTULISM"

52553 ="52553 PART EDENTULSM"

52554 ="52554 PART EDENTULISM"

5258 ="5258 DENTAL DISORDER NEC"

5259 ="5259 DENTAL DISORDER NOS"

5280 ="5280 STOMATITIS"

5281 ="5281 CANCRUM ORIS"

5282 ="5282 ORAL APHTHAE"

5283 ="5283 CELLULITIS/ABSCESS MOUTH"

5284 ="5284 ORAL SOFT TISSUE CYST"

5285 ="5285 DISEASES OF LIPS"

5286 ="5286 LEUKOPLAKIA ORAL MUCOSA"

5287 ="5287 ORAL EPITHELIUM DIS NEC"

52871 ="52871 KERATIN RIDGE MUCOSA-MIN"

52872 ="52872 KERATIN RIDGE MUC-EXCESS"

52879 ="52879 DIST ORAL EPITHELIUM NEC"

5288 ="5288 ORAL SUBMUCOSAL FIBROSIS"

5289 ="5289 ORAL SOFT TISSUE DIS NEC"

5400 ="5400 AC APPEND W PERITONITIS"

5401 ="5401 ABSCESS OF APPENDIX"

5409 ="5409 ACUTE APPENDICITIS NOS"

541 ="541 APPENDICITIS NOS"

542 ="542 OTHER APPENDICITIS"

410 ='410 Bone marrow transplant [64.]'

4100 ='4100 Bone marrow transplant [64.]'

4101 ='4101 Bone marrow transplant [64.]'

4102 ='4102 Bone marrow transplant [64.]'

4103 ='4103 Bone marrow transplant [64.]'

4104 ='4104 Bone marrow transplant [64.]'

4105 ='4105 Bone marrow transplant [64.]'

4106 ='4106 Bone marrow transplant [64.]'

4107 ='4107 Bone marrow transplant [64.]'

4108 ='4108 Bone marrow transplant [64.]'

4109 ='4109 Bone marrow transplant [64.]'