



Cardiovascular Diseases and Circulatory Disorders

A Comparison of Prevalence, Utilization, and Payments in New Hampshire Medicaid and Commercially Insured Populations

A report prepared for the
New Hampshire Department of Health and Human Services
By the
Maine Health Information Center

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About the New Hampshire Comprehensive Health Care Information System

The New Hampshire Comprehensive Health Care Information System (NH CHIS) is a joint project between the New Hampshire Department of Health and Human Services and the New Hampshire Insurance Department. The NH CHIS was created by state statute (RSA 420-G:11-a) to make health care data “available as a resource for insurers, employers, providers, purchasers of health care, and state agencies to continuously review health care utilization, expenditures, and performance in New Hampshire and to enhance the ability of New Hampshire consumers and employers to make informed and cost-effective health care choices.” For more information about the NH CHIS, please visit <http://www.nh.gov/nhchis> or www.nhchis.org.

About the Study

This study was conducted by the Maine Health Information Center (MHIC) under a contract with the State of New Hampshire Department of Health and Human Services, Office of Medicaid Business and Policy, titled New Hampshire Comprehensive Health Care Information System. The views expressed are those of the authors and do not necessarily represent the views of the MHIC, or the New Hampshire DHHS. For more information contact Karl Finison, Director of Research, Maine Health Information Center, 207-430-0632, kfinison@mhic.org.

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TABLE OF CONTENTS

Executive Summary.....	iii
Introduction	1
Overview and Purpose of Report.....	3
Data Sources and Methods	4
Population Studied in the Report.....	4
Interpretation of Results and Limitations	5
Results	7
Cardiovascular Diseases and Circulatory Disorders – Prevalence	7
Coronary Artery Disease – Prevalence, Utilization, and Payments.....	8
Cerebrovascular Disease – Prevalence, Utilization, and Payments	18
Congestive Heart Failure – Prevalence, Utilization, and Payments.....	20
Members “at risk” for Cardiovascular or Circulatory Disease	22
Discussion and Next Steps.....	24
Next Steps.....	26
Appendices	27
Appendix 1: Cardiovascular Diseases and Circulatory Disorders in New Hampshire – Study Methods	28
Appendix 2: NH Medicaid Eligibility Collapsed Groupings	32
Appendix 3: Health Analysis Area Definitions	33
References	37

EXECUTIVE SUMMARY

This study evaluated cardiovascular diseases and other circulatory disorders in adults age 19 and older. New Hampshire (NH) Medicaid and NH CHIS commercial administrative eligibility and claims data for services rendered during calendar (CY) year 2005 were used to study disease prevalence and associated utilization and payments.[‡]

Key Findings:

- During CY2005, 18,020 Medicaid and 75,316 CHIS commercial members were identified with some type of circulatory disorder. Medicaid covered 4,145 members with coronary artery disease (CAD), 3,028 members with congestive heart failure (CHF), and 2,775 members with cerebrovascular disease (stroke).

Coronary Artery Disease (CAD)

- Among adult NH Medicaid members, 4,145 (10.6%) were identified through the administrative claims data as having a CAD diagnosis during CY2005. For Dual Eligible members, 3,255 (17.6%) were identified with CAD and for Medicaid-only members, 890 (4.3%) had a CAD diagnosis.
- Among adult CHIS commercial members, 5,790 (2.3%) were identified with CAD.
- The prevalence rate of CAD for Medicaid-only members was double the rate for CHIS commercial, and for older age groups approached 4 times the CHIS commercial rate.
- The age-standardized inpatient hospitalization rate for Medicaid-only (350 per 1,000 members) was 51 percent higher than the CHIS commercial rate (232 per 1,000 members), a difference that was statistically significant.
- The office-clinic rate for Medicaid-only (2,645 per 1,000 members) was only one percent higher than the CHIS commercial rate (2,613 per 1,000 members), a difference that was not statistically significant.
- Medicaid typically pays less per service than CHIS commercial. The age-standardized payment PMPM rate for claims with a circulatory diagnosis or cardiovascular medications for members with CAD was 32 percent lower for Medicaid-only (\$503) compared to CHIS commercial (\$740).

[‡] This study was based on standard CHIS reports for cardiovascular disease and circulatory disorders developed July 3, 2007 for Medicaid and July 6, 2007 for CHIS commercial. Utilization and payment reports were revised and updated January 30, 2008. Due to database changes, numbers reported here may not match numbers in new versions of reports created after these dates. Members were identified as having circulatory disorders based on finding a single diagnosis on any administrative claim during the year. Payment and utilization were based on the member's payments and use of services during the entire year for claims with a circulatory diagnoses or medications classified as cardiac agents.

- For members with CAD the rate of any use of circulatory medication was slightly higher in Dual Eligible (90.2%) than Medicaid-only (88.5%) or CHIS commercial (87.7%). The difference in rate between Medicaid-only and CHIS commercial was not statistically significant.
- The rate of members using antihyperlipid medication was significantly higher in CHIS commercial members (74.1%) compared to Medicaid-only (61.0%) and Dual Eligible (49.9%) members.
- The rate of beta blocker treatment for members with acute myocardial infarction (AMI) was significantly higher in CHIS commercial (79.0%) compared to Dual Eligible (69.6%) or Medicaid-only (67.4%) members.

Cerebrovascular Disease

- Among adult NH Medicaid members, 2,775 (7.1%) were identified through the administrative claims data with a cerebrovascular disease diagnosis during CY2005. For Dual Eligible members the prevalence was 2,260 (12.2%).
- The prevalence rate for Medicaid-only members (2.5%) was almost three times the CHIS commercial rate (0.9%) and was consistently higher by individual age groups.
- The age-standardized inpatient hospitalization rate for Medicaid-only (283 per 1,000 members) was 13 percent higher than the CHIS commercial rate (249 per 1,000 members).
- The office-clinic visit rate for Medicaid-only (2,094 per 1,000 members) was 13 percent lower than the CHIS commercial rate (2,400 per 1,000 members).
- The age-standardized payment PMPM rate for claims with a circulatory diagnosis or cardiovascular medications for members with cerebrovascular disease was 10 percent lower for Medicaid-only (\$634) compared to CHIS commercial (\$704).

Congestive Heart Failure (CHF)

- Among adult NH Medicaid members, 3,028 (7.7%) were identified through the administrative claims data as having CHF during CY2005. For Dual Eligible members 2,578 (13.9%) were identified with CHF.
- The prevalence rate for Medicaid-only members (2.2%) was more than five times the CHIS commercial rate (0.4%) and was consistently higher by individual age groups.
- The age-standardized inpatient hospitalization rate for Medicaid-only (507 per 1,000 members) was 13 percent higher than the CHIS commercial rate (449 per 1,000 members).
- The office-clinic rate for Medicaid-only (2,912 per 1,000 members) was 17 percent lower than the CHIS commercial rate (3,523 per 1,000 members).

- The age-standardized payment PMPM rate for claims with a circulatory diagnosis or cardiovascular medications for members with CHF was twice as high in CHIS commercial (\$1,298) compared to Medicaid-only (\$644).

Members “at risk” for Cardiovascular or Circulatory Disease

In addition to the members identified in this study with cardiovascular and other circulatory diseases, a large number of members were also identified with hypertension (high blood pressure) or dyslipidemia (high cholesterol) only.

- In total, 5,176 Medicaid members and 32,220 CHIS commercial members were “at risk” with hypertension (high blood pressure) and 2,041 Medicaid members and 25,507 CHIS commercial members were “at risk” with dyslipidemia (high cholesterol).

Impact on Total Medicaid Payments

Medicaid paid \$850.1 million in total on claims during CY2005. This study evaluated payments with a circulatory diagnosis or circulatory medications.

- \$58 million (7%) can be directly attributed to claims with a circulatory diagnosis or circulatory medications. By comparison \$324 million (38%) can be directly attributed to mental diagnosis or psychotherapeutic medications.

Limitations: NH CHIS commercial population contains information only on New Hampshire residents whose claims are included in the NH Comprehensive Health Care Information System database, which generally only includes members whose policies were purchased in New Hampshire. Areas close to the borders of New Hampshire may be less well represented in this study than interior areas of the state.

This study is based primarily on administrative claims data. Administrative claims data is collected primarily for the purpose of making financial payments. Specific provider, diagnosis, and procedure coding are typically required as part of the financial payment process. The use of claims data is an efficient and less costly method to report on health care utilization and payments than other methods such as surveys or patient chart audits. Administrative claims data may under-report some diagnostic conditions or services; however, some studies indicate that administrative claims data may provide a more accurate rate than medical chart review.

Differences in utilization and payment measures between Medicaid and NH CHIS commercial may be influenced by differences in the health status of the members covered or differences in the insurance plan delivery model and benefit structure. Medicaid is a fee-for-service program that covers services without co-payments and that covers a wide variety of services that have limited or no benefit coverage in commercial plans. The possibility also exists that the differences in the sources of data and methods of payment may account for some of the variation.

Conclusion and Next Steps: Behavioral Risk Factor Surveillance System (BRFSS) data indicated that a high percentage of NH residents have behaviors and risk factors for circulatory diseases and that these risk factors were more prevalent in lower income NH residents. This study used CHIS claims data to demonstrate that cardiovascular and other circulatory diseases were prevalent in the NH Medicaid program. Medicaid-only hospital inpatient hospitalization rates were higher than CHIS commercial while office-clinic visit rates were lower. Finally, members with circulatory disease in Medicaid had higher rates of coexisting conditions (diabetes or mental disorders). This suggests the potential value of disease management and care coordination for members enrolled in Medicaid to help address these issues. A CHIS project evaluation of the NH Medicaid Disease Management and Enhanced Care Coordination programs using administrative claims data is currently under way.

A high proportion of Medicaid members with cardiovascular and circulatory disorders were Dual Eligible and for these members claims data payments are incomplete. It is recommended that the CHIS investigate opportunities to incorporate Medicare claims into CHIS in order to provide a complete analysis of the experience for Dual Eligibles.

INTRODUCTION

This report was developed to provide a detailed evaluation of the prevalence, utilization, and payments associated with cardiovascular and other circulatory disorders. The study used New Hampshire (NH) Medicaid and CHIS commercial administrative eligibility and claims data to evaluate rates of prevalence, utilization, and payments. The study focused on coronary artery disease (CAD), cerebrovascular disease (stroke), and congestive heart failure (CHF). Members with only hypertension (high blood pressure) or dyslipidemia (high cholesterol) were also evaluated as potentially “at risk” for disease.

Heart disease and stroke are the first and third leading causes of death in the U.S. Many of the risk factors for heart disease are well identified and preventive efforts can reduce the prevalence and cost associated with this disease. Nationally, age-adjusted death rates for heart disease declined by 60% between 1950 and 2003.¹

More than 79 million Americans currently live with a cardiovascular disease and the cost of heart disease and stroke in the United States is projected to be \$432 billion for 2007, including health care expenditures and lost productivity from death and disability.²

The Centers for Disease Control (CDC) identifies diabetes, lack of exercise, obesity, poor diet, and smoking as important risk factors associated with heart disease and stroke. Controlling high blood pressure and high cholesterol can also reduce the risk of cardiovascular disease.³

Sixty-five million Americans have high blood pressure, and another 59 million are pre-hypertensive. A 12–13 point reduction in systolic blood pressure can reduce heart attacks by 21 percent, strokes by 37 percent, and all deaths from cardiovascular disease by 25 percent. Nearly 70 percent of people diagnosed with high blood pressure do not have it under control. Diet and medications can help reduce high blood pressure.³

High cholesterol is another risk factor of cardiovascular disease. A 10 percent decrease in total blood cholesterol levels may reduce the incidence of coronary heart disease by as much as 30 percent. Only 18 percent of adults with high blood cholesterol have it under control. Lowering saturated fat and increasing fiber in the diet, maintaining a healthy weight, and getting regular physical activity can reduce a person's risk for cardiovascular disease by helping to lower LDL (bad) cholesterol and raise HDL (good) cholesterol. A class of drugs called statins can reduce deaths from heart disease by reducing cholesterol levels.³

Cigarette smokers are 2–4 times more likely than nonsmokers to develop coronary heart disease. Cigarette smoking approximately doubles a person's risk for stroke. People who quit smoking reduce their risk of death from cardiovascular disease by half within a few years.³

Adults with diabetes have heart disease death rates about 2–4 times higher than adults without diabetes, and the risk for stroke is also 2–4 times higher among people with diabe-

tes. About 65 percent of deaths among people with diabetes are due to heart disease and stroke.³

Survey information from the CDC’s BRFSS indicate that behaviors that are risk factors for heart disease and stroke are prevalent among New Hampshire adults.⁴ Among New Hampshire adult residents, 20.4 percent were current smokers, 23.1 percent were obese, 6.5 percent had diabetes, 23.3 percent had high blood pressure, and 35.3 percent had been told they had high blood cholesterol. Only about one in three NH adults had 20 minutes or more of physical exercise three or more days a week. The BRFSS data indicate that lower income adults in NH had higher rates of risk factors for heart disease and stroke. In NH, lower income adults were more likely to be current smokers, have high blood pressure, high blood cholesterol, diabetes, and obesity.

Heart Disease and Stroke Risk Factors: US, NH, and Border States

Risk Factors for Cardiovascular Disease	US	NH	ME	VT	MA
Ever been told had high blood pressure	25.5%	23.3%	25.6%	23.7%	24.8%
Had blood cholesterol checked during the past five years.	73.0%	81.0%	78.7%	76.0%	79.3%
Ever been told had high blood cholesterol	35.6%	35.3%	36.2%	33.7%	35.7%
Current Smoker	20.6%	20.4%	20.8%	19.3%	18.1%
Diagnosis of diabetes	7.3%	6.5%	7.5%	6.0%	6.4%
Physical activity*	27.5%	32.9%	30.8%	33.1%	29.7%
Obesity (bmi 30.0-99.8)	24.4%	23.1%	22.7%	20.2%	20.7%
Consumed fruits or vegetables five or more times per day	23.2%	29.1%	28.7%	30.8%	28.6%

Source: Centers for Disease Control, Behavioral Risk Factor Surveillance System, 2005.⁴

*Adults with 20+ minutes of vigorous physical activity three or more days per week

Heart Disease and Stroke Risk Factors: New Hampshire by Income Level

Risk Factors for Cardiovascular Disease	<\$15,000	\$15,000-\$24,999	\$25,000-\$34,999	\$35,000-\$49,999	\$50,000+
Ever been told had high blood pressure	41.1%	32.7%	24.4%	18.8%	19.7%
Had blood cholesterol checked during the past five years.	76.5%	79.9%	75.3%	78.1%	84.4%
Ever been told had high blood cholesterol	45.2%	44.6%	35.8%	34.8%	31.6%
Current Smoker	32.5%	33.5%	26.6%	23.9%	14.3%
Diagnosis of diabetes	13.1%	11.5%	8.4%	6.7%	4.2%
Physical activity*	20.7%	25.8%	30.1%	32.1%	37.9%
Obesity (bmi 30.0-99.8)	27.7%	26.2%	22.6%	26.3%	21.7%
Consumed fruits or vegetables five or more times per day	28.4%	25.7%	27.2%	27.5%	31.2%

Source: Centers for Disease Control, Behavioral Risk Factor Surveillance System, 2005.⁴

*Adults with 20+ minutes of vigorous physical activity three or more days per week

Lower income adults were less likely to exercise or have their blood cholesterol checked. Adults with income <\$15,000 were less likely to have had cholesterol checked within the past five years (76.5%) compared to adults with income \$50,000 or greater (84.4%). The BRFSS data indicate that nationally, 64 percent with income less than \$15,000 had cholesterol checked while 81 percent with income \$50,000 or more had cholesterol checked.

In 1998, the U.S. Congress provided funding for CDC to initiate a national, state-based heart disease and stroke prevention program with funding for eight states. Currently, 32 states and the District of Columbia are funded, 19 as capacity building programs and 14 as basic implementation programs. New Hampshire does not have a funded capacity or implementation program; neighboring Maine and Massachusetts do have funded programs.⁵

Studies have utilized claims data to identify the prevalence of cardiovascular disease and the impact on payments made by insurance.^{6,7,8,9} A study of cardiovascular disease in the Maine Medicaid program (MaineCare) found that Medicaid-only members with cardiovascular disease or stroke averaged 5 times the payment rate compared to Medicaid-only members without cardiovascular disease or stroke.⁶ Another study indicated that 17 percent of all medical expenditures and 30 percent of all Medicare expenditures were attributable to stroke, hypertension, congestive and other heart diseases.⁹ A recent study of West Virginia claims for members under age 65, identified significantly increased payments associated with members with both diabetes and cardiovascular disease.¹⁰ A seven-state study of Medicaid managed care identified cerebrovascular disease, heart disease, and hypertension as significant predictors of higher payments for members with bipolar disorder.¹¹ These studies indicate the significant financial burden on public programs from circulatory diseases.

While this study did not evaluate quality of care or outcomes for members with circulatory diseases, members covered by different insurance types may have different health care experiences. One study comparing management of acute myocardial infarction (AMI) found that Medicaid and uninsured patients had higher hospital mortality rates compared with commercial patients.¹² Disease management programs may have an impact on utilization for members with chronic diseases. A study of Florida Medicaid patients with chronic diseases found that patients in disease management had fewer hospitalizations, shorter lengths of stay, and fewer emergency department visits.¹³

The prevalence, utilization of medical services, and amount of payments for circulatory disorders in the NH Medicaid program are unknown. Using the NH Medicaid and CHIS commercial administrative claims data, this study evaluated adult cardiovascular and other circulatory disease prevalence, utilization and payments. This study, developed by the Maine Health Information Center and the New Hampshire Department of Health and Human Services, represents the first evaluation of cardiovascular and cerebrovascular disease using the NH CHIS database.

Overview and Purpose of Report

The purpose of this study was to describe the prevalence of cardiovascular and other circulatory diseases and associated utilization and payments in the New Hampshire populations covered by Medicaid and CHIS commercial. The study evaluated:

- prevalence of any circulatory disease, coronary artery disease, congestive heart failure, or cerebrovascular disease among adults with Medicaid or CHIS commercial insurance;
- identification of additional members “at risk” for circulatory disease due to a diagnosis of hypertension or dyslipidemia only;
- inpatient, outpatient emergency department, and office-clinic visit utilization rates specific to circulatory diagnosis;
- payment rates per member per month (PMPM) for claims with a circulatory diagnosis or circulatory medications;
- use of cardiac catheterization, angioplasty, and coronary artery bypass procedures;
- use of medications to treat circulatory disease by medication type;
- age-specific and age-standardized rates;
- Dual Eligible and Medicaid-only status;
- Medicaid eligibility group (e.g. low income or disabled);
- prevalence, utilization and payment rates by geographical location (Health Analysis Area) of member residence; and
- prevalence of selected coexisting conditions.

Data Sources and Methods

This study was based on administrative eligibility and claims data from New Hampshire Medicaid and the NH CHIS commercial database for CY2005 (based on date of service). Members were identified as having a circulatory disease based on finding a single diagnosis on any administrative claim during the year. Payments and utilization were based on the member’s payments and use of services during the entire year for claims with a circulatory disease diagnosis or circulatory medications only. Methods used in this study are described in Appendix 1 at the end of the report.

Standardization for age differences was made in the comparison of Medicaid to Commercial population rates. Geographical comparisons were also standardized for age differences. The indirect method of age standardization was used and is the preferred method for standardization of rates for geographical analysis of small areas such as the HAAs used in this study. For age-standardized utilization rates, confidence intervals were computed using methods described by Breslow and Day for indirect standardized rates (Statistical Methods in Cancer Research. Volume II – The Design and Analysis of Cohort Studies. World Health Organization. 1987.).

Population Studied in the Report

The CY2005 experience of members covered by NH Medicaid and NH CHIS commercial insurance plans that reported data to the NH CHIS were studied. Consistent with other reporting for New Hampshire Medicaid, the study excluded from the NH Medicaid population members with limited or no Medicaid benefits (e.g. Medicare buy-in programs) and children

covered under the SCHIP. The study excluded from the NH CHIS commercial data members age 65 or older and members who resided outside of NH. The study included only NH CHIS commercial members who had both medical and pharmacy coverage linked.

Circulatory disorders are rare in children and increase in prevalence with age. This study was restricted to adults age 19 and older. If a member had more than one circulatory disease during the year (i.e. coronary artery disease and cerebrovascular disease) the member was included in the analysis for both diseases. Members were identified as having a circulatory disease or disorder based on finding a single diagnosis on any administrative claim during the year.

Interpretation of Results and Limitations

This is the first detailed study of circulatory disorder prevalence and use comparing NH Medicaid and NH CHIS commercial. The large number of covered members studied in this one-year sample lends credibility to the findings. However, a number of cautions about the data used and results of this study are provided.

This study was based on administrative eligibility and claims data. Variances in provider or insurer claims coding, data processing, or reimbursement arrangements may contribute to the variances shown in this report. Variances in benefits and coding by commercial insurer products (EPO, HMO, Point-of-Service, Indemnity or Third Party Administrator) and plans, may contribute to variances shown in this report.

The New Hampshire CHIS commercial population contains information on those residents whose claims are included in the NH CHIS database, which generally only includes members whose policies were purchased in New Hampshire. Areas close to the borders of New Hampshire may be less well represented than areas in the interior. Additionally, companies that self-fund their health care and do not use a TPA to pay claims are not captured in the data set. Only CHIS commercial members with medical and pharmacy coverage linked were included in the study. Because of these factors, this report underestimates the number of members covered by commercial insurance in New Hampshire.[¶]

This study compared two very different populations: NH Medicaid and NH CHIS commercial. Differences in these two populations could influence the magnitude of differences in rates reported in this study. Medicaid programs typically cover a large population of persons with chronic disease and disability. Persons institutionalized for long periods of time in nursing and other facilities are common in Medicaid but less common in the CHIS commercial population. The Medicaid population covers elders age 65 and over which were not included in the CHIS commercial population studied. Methods used to control for these differences included:

- separate reporting of Dual Eligible and Medicaid-only members;
- separate reporting of disabled and other Medicaid eligibility groups;
- use of age-specific prevalence rates;
- use of age-standardized utilization and payment rates; and
- comparison of Medicaid-only members with CHIS commercial.

[¶] The statute requiring submission of data is limited to areas regulated by the NH Department of Insurance.

Because the CHIS data does not include claims paid by Medicare, payments for Dual Eligible Medicaid members are incomplete and were suppressed in the rates reported.

Additional details about the study methods and limitations are provided in Appendix 1.

RESULTS

Cardiovascular Diseases and Circulatory Disorders – Prevalence

For this NH CHIS study, determination of circulatory diseases and disorders was based on a circulatory diagnosis on any administrative medical claim during the year. The CY2005 NH Medicaid and NH CHIS commercial circulatory disorder prevalence rates are summarized by type of disorder in Table 1.‡

Among 39,115 adult NH Medicaid average covered members, 18,020 (46.1%) were identified through the administrative claims data as having any circulatory disorder during CY2005. For 20,580 average Medicaid-only members, 5,688 (27.6%) had a circulatory diagnosis during the year and for 18,535 average Dual Eligible members, 12,332 (66.5%) had a circulatory diagnosis during the year. Among 247,478 adult CHIS commercial average covered members, 75,316 (30.4%) were identified as having a circulatory diagnosis during CY2005.

Table 1. Prevalence Rate (Number of Members) by Type of Circulatory Disorder. NH Medicaid and NH CHIS Commercial Adult Members, CY2005.

Diagnostic Cohort	Medicaid Total	Dual Eligible	Medicaid-only	CHIS Commercial
Any Circulatory Disorder*	46.1% (18,020)	66.5% (12,332)	27.6% (5,688)	30.4% (75,316)
Coronary Artery Disease (CAD)	10.6% (4,145)	17.6% (3,255)	4.3% (890)	2.3% (5,790)
Acute Myocardial Infarction (AMI)	1.3% (523)	2.1% (388)	0.7% (135)	0.2% (571)
Congestive Heart Failure	7.7% (3,028)	13.9% (2,578)	2.2% (450)	0.4% (1,077)
Cerebrovascular Disease	7.1% (2,775)	12.2% (2,260)	2.5% (515)	0.9% (2,170)
Members “at risk” for circulatory disease				
Hypertension but no other circulatory disease	13.2% (5,176)	16.9% (3,125)	10.0% (2,051)	13.0% (32,220)
Dyslipidemia but no other circulatory disease	5.2% (2,041)	5.4% (998)	5.1% (1,043)	10.3% (25,507)

* Dyslipidemia (high cholesterol) is included in the definition of any circulatory disorder. Identification of circulatory disorders was based on a diagnosis on any medical claim during the year. Pharmacy claims were not used to define the cohorts for this study.

Within the Medicaid population the largest proportion of members with coronary artery disease (CAD), congestive heart failure (CHF), and cerebrovascular disease (stroke) were Dual Eligible. In addition, a large number of members who did not have a circulatory disease were identified with hypertension (high blood pressure) or dyslipidemia (high cholesterol level) and may be “at risk” to develop disease.

Prevalence rates of circulatory disorder are summarized by age and Medicaid eligibility group in Table 2. Rates of circulatory disorder increased rapidly with age. Within NH

‡ Circulatory disorders were identified by diagnosis on medical claims. It is possible that some members utilized pharmacy medications for circulatory disorders but did not have a diagnosis on a claim during the year. Expanding the definition to any diagnosis OR cardiac medications increased the prevalence rates (number of cases) as follows: Medicaid 56.4% (22,042), Dual Eligible 81.2% (15,051), Medicaid-only 34.0% (6,991), and CHIS commercial 36.7% (90,895).

Medicaid-only, the highest prevalence rate of circulatory disorder was found in the Physically Disabled eligibility group (57.5%). The volume of cases of CAD and cerebrovascular disease was higher in Medicaid females than males. However, adjusted for the number of members covered, the prevalence rates were more than twice as high in Medicaid males than females.

Table 2. Prevalence Rate (Number of Members) with Any Circulatory Disorder by Age, Gender, and Medicaid Eligibility Group. NH Medicaid and NH CHIS Commercial Adult Members, CY2005.

Age Group / Gender / Medicaid Eligibility Group	Medicaid Total	Dual Eligible	Medicaid-only	CHIS Commercial
Total	46.1% (18,020)	66.5% (12,332)	27.6% (5,688)	30.4% (75,316)
Member's Age				
19-20	6.7% (100)	27.0% (12)	6.1% (88)	3.6% (305)
21-24	8.0% (290)	14.6% (50)	7.3% (240)	5.2% (840)
25-34	13.9% (1,070)	19.8% (293)	12.5% (777)	11.1% (4,821)
35-44	30.5% (2,190)	35.2% (899)	27.9% (1,291)	22.0% (14,503)
45-49	48.3% (1,540)	47.6% (742)	49.1% (798)	33.8% (12,296)
50-54	59.4% (1,519)	56.6% (794)	62.8% (725)	45.8% (14,842)
55-59	70.3% (1,428)	66.7% (771)	75.2% (657)	57.3% (15,170)
60-64	80.1% (1,364)	78.0% (764)	82.9% (600)	68.6% (12,539)
65-74	84.3% (2,464)	84.6% (2,179)	81.8% (285)	NA
75-84	89.1% (2,913)	89.5% (2,739)	82.8% (174)	NA
85+	91.1% (3,142)	91.3% (3,089)	80.5% (53)	NA
Gender				
Female	44.0% (12,421)	69.6% (8,544)	24.3% (3,877)	27.6% (35,533)
Male	51.5% (5,599)	60.6% (3,788)	39.2% (1,811)	33.5% (39,783)
Medicaid Eligibility Group				
Low Income Adult	16.4% (2,272)	34.0% (296)	15.2% (1,976)	NA
Disabled Physical	36.8% (3,090)	57.0% (2,156)	57.5% (1,976)	NA
Disabled Mental	57.3% (4,132)	38.7% (1,897)	34.1% (1,193)	NA
Elderly	88.4% (8,526)	88.8% (7,983)	82.1% (543)	NA

* Dyslipidemia (high cholesterol) is included in the definition of any circulatory disorder

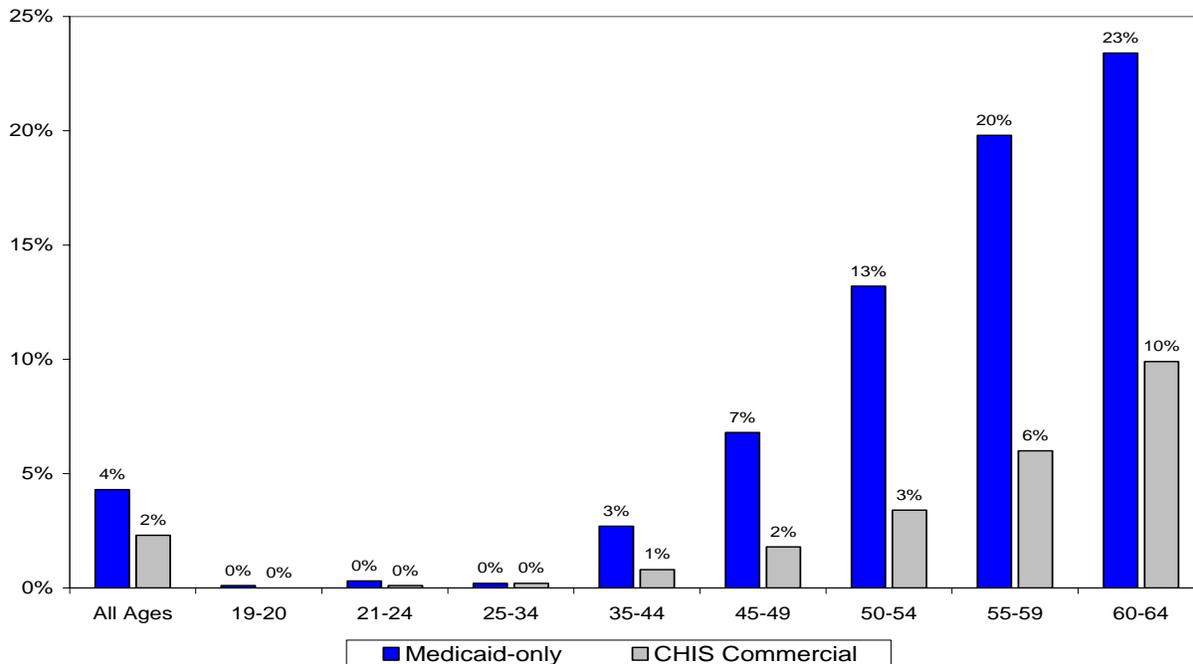
Coronary Artery Disease – Prevalence, Utilization, and Payments

Members with coronary artery disease (CAD) contributed the greatest proportion to Medicaid claims payments for circulatory diagnoses. The intent of this section is to summarize prevalence, utilization, and payment measures specific to circulatory disease for CAD. Table 3 summarizes CY2005 utilization and payments for circulatory diagnoses and cardiovascular medications for Medicaid and CHIS commercial members with CAD.

Among the average 39,115 adult NH Medicaid covered members, 4,145 (10.6%) were identified through the administrative claims data as having a CAD diagnosis during CY2005. For 18,535 Dual Eligible members, 3,255 (17.6%) were identified with CAD and for 20,580 Medicaid-only members, 890 (4.3%) had a CAD diagnosis. Among 247,478 adult CHIS commercial members, 5,790 (2.3%) were identified with CAD.

Figure 1 provides comparative CAD prevalence rates by age for members enrolled in Medicaid-only and NH CHIS commercial. The prevalence rate of CAD for Medicaid-only members was double the rate for CHIS commercial and for older age groups approached 4 times the CHIS commercial rate. Within the Medicaid-only population, a high prevalence in the Physically Disabled (13.4%) group contributed to these high rates. However, even within the Low Income Adult eligibility group, age-specific prevalence rates were higher than CHIS commercial.

Figure 1. Prevalence of Coronary Artery Disease (CAD) by Age of Member. NH Medicaid-only and NH CHIS Commercial Adult Members, CY2005.



Members with CAD may have multiple coexisting conditions that contribute to total utilization and payments. The intent of this section is to summarize utilization and payments specific to circulatory disease or medications for members with CAD. Table 3 summarizes CY2005 utilization and payments for circulatory diagnoses and circulatory medications for Medicaid and CHIS commercial members with CAD.

Medicaid members with CAD used 6,143 outpatient ED visits, 27,842 office-clinic visits, and 2,671 inpatient hospitalizations in total. Of these visits, 646 outpatient ED visits, 6,852 office-clinic visits, and 834 inpatient hospitalizations were for a circulatory diagnosis.

Table 3. Members with Coronary Artery Disease (CAD). Circulatory Disorder Utilization and Payment Rates. NH Medicaid and NH Commercial Members, CY2005.

Measure*	Medicaid Total	Dual Eligible	Medicaid-only	CHIS Commercial
Members with Condition	4,145	3,255	890	5,790
Member Months for Members with Condition	43,049	33,577	9,472	61,443
Total Payments for Members with Condition (millions)	\$22.7	\$17.9	\$4.7	\$45.5
Outpatient Emergency Department Visits	646	517	129	541
Office/Clinic Visits	6,852	4,835	2,017	13,423
Inpatient Discharges	834	555	279	1,179
Statistical Rates				
Payments Per Member Per Month (PMPM)	**	**	\$501	\$740
Outpatient Emergency Department Visits per 1,000 Members	180	185	163	106
Office/Clinic Visits per 1,000 Members	1,910	1,728	2,555	2,622
Inpatient Discharges per 1,000 Members	232	198	353	230

*All utilization metrics measure the utilization and payments for the members with CAD during the year for a circulatory disorder diagnosis or cardiovascular medications only. **Payment information for Dual Eligible members is incomplete because Medicare administrative claims are not part of the NH CHIS database.

Circulatory disease utilization and payment rates were compared between Medicaid-only and CHIS commercial members with CAD. Rates were standardized for age differences in the two populations and are shown in Table 4 and Figure 2. For these rates, 95% confidence intervals (CI) were computed.

Table 4. Members with CAD. Age-Standardized Circulatory Disease Utilization and Payment Rates. NH Medicaid-only and NH Commercial Members, CY2005. Note: 95% confidence intervals (CI) in parentheses.

Measure*	Medicaid-only	CHIS Commercial
Payments Per Member Per Month (PMPM)**	\$503	\$740
Outpatient Emergency Department Visits per 1,000 Members	163 (135-195)	107 (98-116)
Office/Clinic Visits per 1,000 Members	2,645 (2,522-2,773)	2,613 (2,569-2,658)
Inpatient Discharges per 1,000 Members	350 (308-397)	232 (219-245)

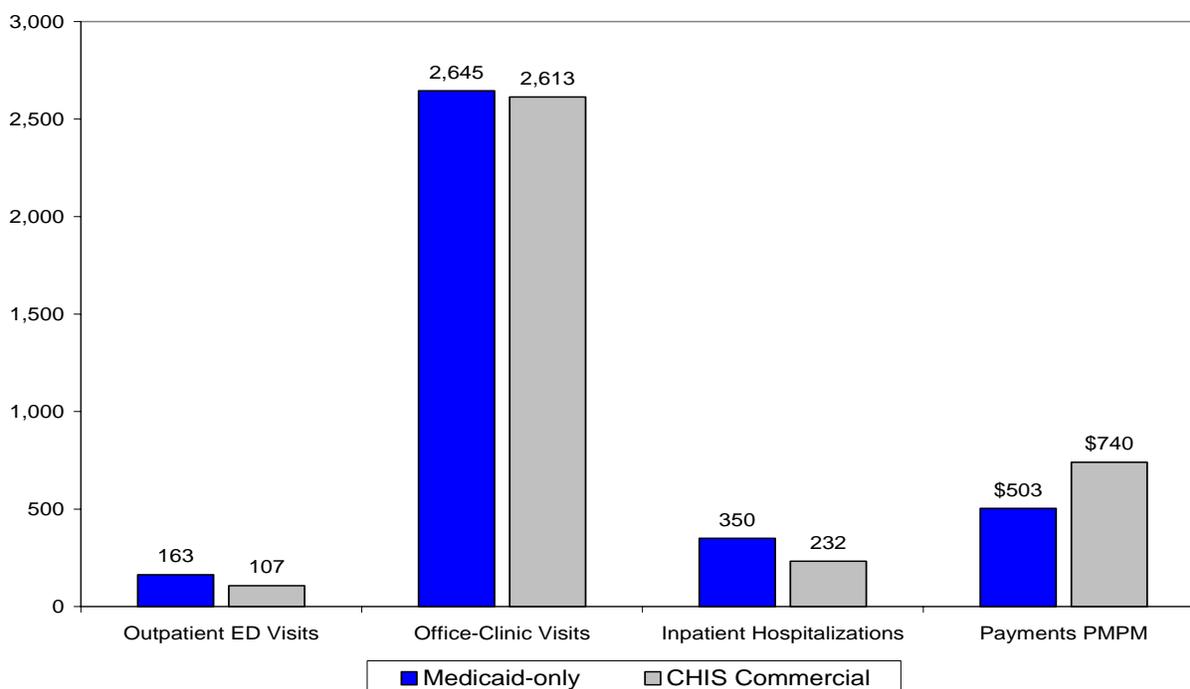
*All utilization metrics measure the utilization and payments for the members with CAD during the year for a circulatory disorder diagnosis or cardiovascular medications only. **95% CI were not computed for payment PMPM rates because CHIS reports do not provide variance estimates and the payments may be skewed by outlier cases.

For members with CAD, the age-standardized outpatient hospital ED visit rate for Medicaid-only (163 per 1,000 members) was 52 percent higher than the CHIS commercial rate (107 per 1,000 members). The age-standardized inpatient hospitalization rate for Medicaid-only (350 per 1,000 members) was 51 percent higher than the CHIS commercial rate (232

per 1,000 members), a difference that was statistically significant. The office-clinic rate for Medicaid-only (2,645 per 1,000 members) was only one percent higher than the CHIS commercial rate (2,613 per 1,000 members), a difference that was not statistically significant.

Medicaid typically pays less per service than CHIS commercial. The age-standardized payment PMPM rate for claims with a circulatory diagnosis or cardiovascular medications for members with CAD was 32 percent lower for Medicaid-only (\$503) compared to CHIS commercial (\$740).

Figure 2. Circulatory Disease Utilization and Payment Rates for Members with CAD. Age-Standardized Rates of Utilization Per 1,000 Members and Payments Per Member Per Month (PMPM). NH Medicaid-only and NH CHIS Commercial Members, CY2005.



Utilization of Selected Procedures for Members with CAD

Three procedures that are commonly associated with CAD were identified from the claims data. For Medicaid members with CAD, 549 cardiac catheterization, 186 angioplasty, and 64 coronary artery bypass procedures were identified in the claims data. For Dual Eligible members there were 291 catheterization, 103 angioplasty, and 35 coronary artery bypass procedures, and for Medicaid-only members there were 258 catheterization, 83 angioplasty, and 29 coronary artery bypass procedures. CHIS commercial members with CAD had 1,280 catheterization, 584 angioplasty, and 182 coronary bypass procedures.

Standardized for age differences, Table 5 provides rates and 95% confidence intervals for these procedures. Medicaid-only members had a higher age-standardized rate of cardiac

catheterization compared to CHIS commercial. Medicaid-only had slightly lower rates of angioplasty or coronary artery bypass procedures but not statistically significant.

Table 5. Procedures for Members with CAD. Age-Standardized Rates. NH Medicaid-only and NH Commercial Members, CY2005. *Note: 95% confidence intervals (CI) in parentheses.*

Measure	Medicaid-only	CHIS Commercial
Cardiac catheterization per 1,000 members with CAD	346 (304-393)	251 (238-265)
Angioplasty per 1,000 members with CAD	107 (84-135)	114 (105-124)
Coronary artery bypass per 1,000 members with CAD	43 (29-63)	35 (30-41)

Utilization of Circulatory Medications by Members with CAD

Circulatory medication use was determined from the National Drug Code (NDC) on pharmacy claims and the therapeutic categories defined in Red Book®.† Results are reported in Table 6.

For members with CAD the rate of any use of circulatory medication was slightly higher in Dual Eligible (90.2%) than Medicaid-only (88.5%) or CHIS commercial (87.7%). The difference in rates between Medicaid-only and CHIS commercial was not statistically significant. The rate of members using antihyperlipid medication was significantly higher in CHIS commercial members (74.1%) compared to Medicaid-only (61.0%) and Dual Eligible (49.9%) members.

Members with acute myocardial infarction (AMI), heart attack, were identified among the members with CAD. During CY2005, 388 Dual Eligible, 135 Medicaid-only, and 571 CHIS commercial had a diagnosis indicating an AMI. Use of beta blockers is one recommended preventive therapy to reduce the risk of death after an AMI. The rate of beta blocker treatment for members with AMI was significantly higher in CHIS commercial (79.0%) compared to Dual Eligible (69.6%) or Medicaid-only (67.4%) members.

Table 6. Circulatory Medication Use for Members with CAD. NH Medicaid and NH Commercial Members, CY2005. *Note: 95% confidence intervals (CI) in parentheses.*

Measure	Dual Eligible	Medicaid- only	CHIS Commercial
Members with CAD	3,255	890	5,790
Members with any Circulatory Medication Use	90.2% (89.2-91.3)	88.5% (86.4-90.6)	87.7% (86.9-88.6)
Antihyperlipid	49.9% (48.2-51.6)	61.0% (57.8-64.2)	74.1% (73.0-75.3)
ACE Inhibitors	39.5% (37.8-41.2)	42.6% (39.3-45.8)	40.7% (39.4-42.0)

† For CHIS standard reporting the Red Book® database is used to classify and group pharmacy claims into therapeutic class based on the National Drug Code (NDC) on the claim. For this project all therapeutic classes defined as cardiac agents by Red Book® were included. Examples of common drugs by class include Lipitor (antihyperlipid), lisinopril (ACE inhibitor), atenolol (beta blocker), Norvasc (calcium channel blocker), hydrochlorothiazide (diuretics).

Beta Blockers	59.8% (58.1-61.4)	62.2% (59.1-65.4)	64.4% (63.1-65.6)
Calcium Channel Blockers	31.7% (30.1-33.3)	24.8% (22.0-27.7)	19.2% (18.2-20.3)
Diuretics	56.0% (54.3-57.7)	40.0% (36.8-43.2)	22.1% (21.1-23.2)
Members with acute myocardial infarction (AMI)	388	135	571
Beta Blocker Treatment	69.6% (65.0-74.2)	67.4% (59.5-75.3)	79.0% (75.6-82.3)

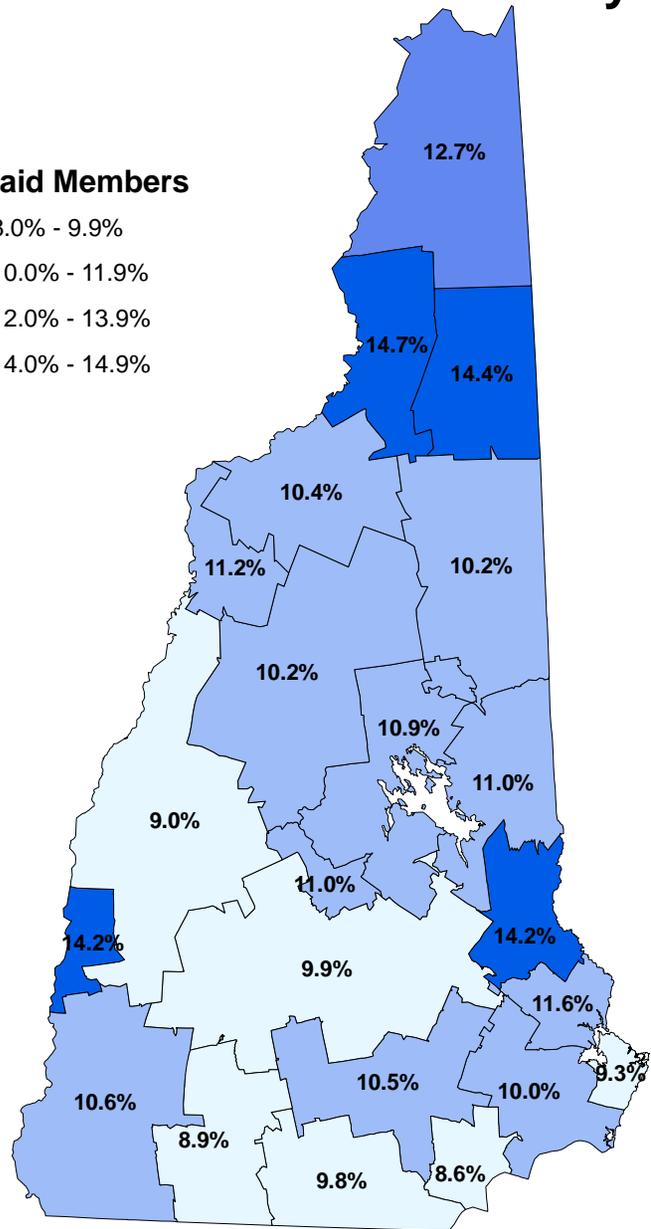
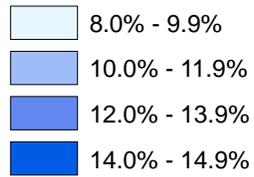
Geographical Variation in Prevalence and Utilization for Members with CAD

Evaluation of geographical variation in rates was based on the Health Analysis Area (HAA) of the member's residence. Prevalence and utilization rates for members with CAD are reported in Table 7 for NH Medicaid and Table 8 for CHIS commercial.

Manchester (769), Nashua (423), and Concord (432), had the highest volume of Medicaid members with CAD. Standardized for age differences, the highest prevalence rates for CAD in the NH Medicaid population were Lancaster (14.7%) and Berlin (14.4%) and the lowest rate area was Derry (8.6%). The southern border HAAs (Peterborough, Nashua, Derry, Exeter, and Portsmouth) all had prevalence rates of CAD lower than the state average for NH Medicaid.

Coronary Artery Disease

Medicaid Members



CHIS Commercial

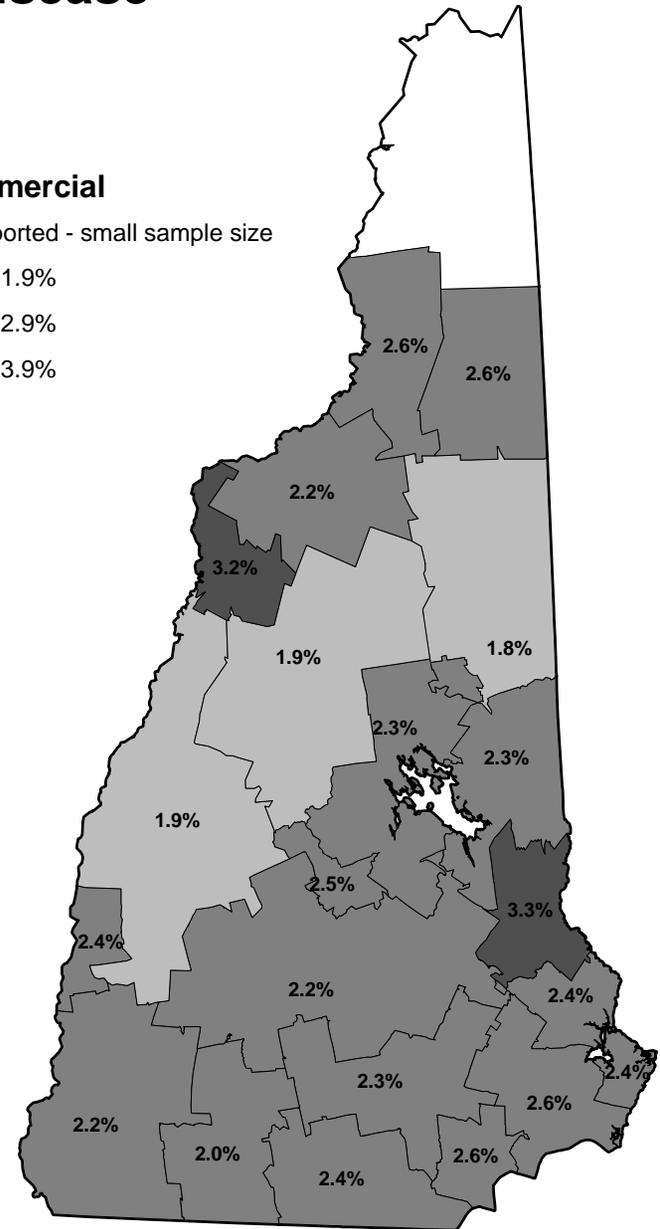
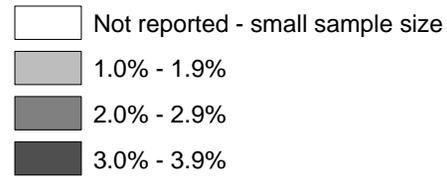


Table 7. Prevalence and Circulatory Diagnosis Utilization for Members with CAD by Health Analysis Area. NH Medicaid Members, CY2005.

Health Analysis Area	CAD Prevalence (Number of Members)	CAD Prevalence Standardized for Age*	Outpatient Emergency Department Visit Rate per 1,000 Members*	Office-Clinic Visit Rate per 1,000 Members*	Inpatient Rate per 1,000 Members*
Total	10.6% (4,145)	10.6%	180	1,910	232
Berlin	14.5% (150)	14.4%	300	985	226
Claremont	13.6% (162)	14.2%	193	2,407	162
Colebrook	15.2% (47)	12.7%	348	2,850	209
Concord	10.6% (432)	9.9%	160	1,508	225
Derry	9.0% (147)	8.6%	74	1,493	172
Dover	11.1% (220)	11.6%	165	1,842	258
Exeter	10.0% (201)	10.0%	116	2,012	264
Franklin	9.7% (80)	11.0%	359	2,029	276
Keene	10.3% (211)	10.6%	149	2,177	208
Laconia	10.2% (182)	10.9%	259	2,227	206
Lancaster	15.4% (65)	14.7%	229	3,162	281
Lebanon	9.6% (137)	9.0%	325	1,860	182
Littleton	12.4% (102)	10.4%	322	2,666	255
Manchester	10.4% (769)	10.5%	115	1,682	229
Nashua	9.2% (423)	9.8%	152	2,096	256
North Conway	9.2% (64)	10.2%	57	1,962	161
Peterborough	8.7% (55)	8.9%	374	1,501	290
Plymouth	8.6% (65)	10.2%	190	2,161	234
Portsmouth	10.1% (104)	9.3%	128	1,493	146
Rochester	11.7% (255)	14.2%	266	2,208	299
Wolfeboro	11.1% (78)	11.0%	169	1,586	291
Woodsville	16.7% (43)	11.2%	191	3,066	259

* Rates are standardized for age differences in the population using CY2005 Medicaid statewide rates as the basis.

Standardized for age differences, rates of utilization with a circulatory diagnosis varied by HAA for the Medicaid members with CAD. Peterborough (374 per 1,000 members) had the highest age-standardized outpatient ED use rate while North Conway (57 per 1,000 members) had the lowest. With the exception of Peterborough, members with CAD living in southern border HAAs had lower rates of outpatient ED use while northern areas had higher rates. The rate of office-clinic visits with a circulatory diagnosis for members with CAD was highest in Lancaster (3,162 per 1,000 members) and lowest in Berlin (985 per 1,000 members). The rate of inpatient hospitalizations with a circulatory diagnosis for members with CAD was highest in Rochester (299 per 1,000 members) and lowest in Portsmouth (146 per 1,000 members).

Prevalence and utilization rates for CHIS commercial members with CAD are reported in Table 8. Manchester (936), Nashua (933), and Concord (735) had the highest volume of members with CAD in the study. Standardized for age differences, the highest prevalence rate for CAD in the NH CHIS commercial population was Rochester (3.3%) and the lowest was North Conway (1.8%).

Table 8. Prevalence and Circulatory Diagnosis Utilization for Members with CAD by Health Analysis Area. NH CHIS Commercial, CY2005.

Health Analysis Area	CAD Prevalence (Number of Members)	CAD Prevalence Standardized for Age*	Outpatient Emergency Department Visit Rate per 1,000 Members*	Office-Clinic Visit Rate per 1,000 Members*	Inpatient Rate per 1,000 Members*
Total	2.3% (5,785)	2.3%	106	2,622	230
Berlin	2.7% (59)	2.6%	121	2,403	157
Claremont	2.3% (77)	2.4%	206	2,445	310
Colebrook	2.5% (18)	**	**	**	**
Concord	2.3% (735)	2.2%	112	2,649	199
Derry	2.4% (288)	2.6%	92	2,865	292
Dover	2.3% (270)	2.4%	83	2,449	172
Exeter	2.5% (424)	2.6%	62	2,520	240
Franklin	2.6% (107)	2.5%	99	3,014	286
Keene	2.5% (250)	2.2%	142	2,591	213
Laconia	2.6% (296)	2.3%	104	2,989	232
Lancaster	3.0% (55)	2.6%	127	2,061	167
Lebanon	2.0% (332)	1.9%	132	2,459	172
Littleton	2.5% (78)	2.2%	150	2,944	174
Manchester	2.1% (956)	2.3%	93	2,599	233
Nashua	2.4% (933)	2.4%	108	2,773	273
North Conway	2.0% (73)	1.8%	123	2,192	123
Peterborough	2.0% (135)	2.0%	124	2,172	269
Plymouth	2.0% (112)	1.9%	105	3,109	212
Portsmouth	2.4% (175)	2.4%	65	2,362	170
Rochester	2.9% (238)	3.3%	134	2,596	255
Wolfeboro	2.8% (138)	2.3%	79	2,238	262
Woodsville	3.3% (36)	3.2%	291	2,492	386

* Rates are standardized for age differences in the population using CY2005 CHIS commercial rates as the basis. **Colebrook rates not reported due to small sample size.

Standardized for age differences, rates of utilization with a circulatory diagnosis varied by HAA for the CHIS commercial members with CAD. The highest age-standardized outpatient ED use rate was in Woodsville (291 per 1,000 members) and the lowest was Exeter (62 per 1,000 members). The rate of office-clinic visits with a circulatory diagnosis for members with CAD was highest in Plymouth (3,109 per 1,000 members) and lowest in Lancaster (2,061 per 1,000 members). The rate of inpatient hospitalizations with a circulatory diagnosis for members with CAD was highest in Woodsville (386 per 1,000 members) and lowest in North Conway (123 per 1,000 members). The pattern of higher rates of hospital use found in Medicaid for northern rural areas compared to southern border HAAs was less apparent in the CHIS commercial population.

CAD and Coexisting Conditions

During CY2005, NH Medicaid members incurred \$850.1 million in claims payment expenses. Of this, \$89.6 million (11%) was incurred by members who had CAD. For the members with CAD only \$22.7 million (25%) was directly attributable to claims with a cir-

culatory diagnosis or circulatory medication. This large difference may be explained by other coexisting conditions these members had.

Because CAD is prevalent among older persons, members with CAD may have other coexisting conditions. Among the 890 Medicaid-only members with CAD, 393 (44%) had diabetes and 473 (53%) had a mental disorder. By comparison among CHIS commercial members with CAD only 27 percent had diabetes and 22 percent had a mental disorder. Among 3,255 Dual Eligible members with CAD, 1,454 (45%) had diabetes and 1,659 (51%) had a mental disorder. Persons with diabetes are at higher risk of developing circulatory disorders compared with persons without diabetes.

Cerebrovascular Disease – Prevalence, Utilization, and Payments

After CAD, members with cerebrovascular disease (stroke) had the highest total circulatory disease payments. The intent of this section is to summarize prevalence, utilization and payment measures specific to circulatory disease for cerebrovascular disease.

Among adult NH Medicaid members, 2,775 (7.1%) were identified through the administrative claims data with a cerebrovascular disease diagnosis during CY2005. For Dual Eligible members the prevalence was 2,260 (12.2%). The prevalence rate for Medicaid-only members (2.5%) was almost three times the CHIS commercial rate (0.9%) and was consistently higher by individual age groups. The prevalence of cerebrovascular disease increased rapidly with age. For Medicaid-only members the prevalence of cerebrovascular disease reached 13 percent for age 60-64 compared to 3 percent for CHIS commercial members of the same age. Within Medicaid-only, the Physically Disabled eligibility group contributed to the high rate and accounted for 287 of the 515 Medicaid-only cases.

Table 9 summarizes CY2005 utilization and payments for circulatory diagnoses and medications for Medicaid and CHIS commercial members with cerebrovascular disease. Medicaid members with cerebrovascular disease used 3,313 outpatient ED visits, 14,555 office-clinic visits, and 1,583 inpatient hospitalizations in total. Of these visits, only 345 outpatient ED visits, 3,339 office-clinic visits, and 404 inpatient hospitalizations had a circulatory diagnosis.

Table 9. Members with Cerebrovascular Disease. Circulatory Disorder Utilization and Payment Rates. NH Medicaid and NH Commercial Members, CY2005.

Measure*	Medicaid Total	Dual Eligible	Medicaid-only	CHIS Commercial
Members with Condition	2,775	2,260	515	2,170
Member Months for Members with Condition	28,816	23,467	5,349	23,218
Total Payments for Members with Condition (millions)	\$22.4	\$19.1	\$3.2	\$16.5
Outpatient Emergency Department Visits	345	286	59	281
Office/Clinic Visits	3,339	2,451	888	4,705
Inpatient Discharges	404	283	121	488
Statistical Rates				
Payments Per Member Per Month (PMPM)	**	**	\$601	\$710
Outpatient Emergency Department Visits per 1,000 Members	144	146	132	145
Office/Clinic Visits per 1,000 Members	1,390	1,253	1,992	2,432
Inpatient Discharges per 1,000 Members	168	145	271	252

*All utilization metrics measure the utilization and payments for the members with cerebrovascular disease during the year for a circulatory disorder diagnosis or cardiovascular medications only. **Payment information for Dual Eligible members is incomplete because Medicare administrative claims are not part of the NH CHIS database.

Circulatory disease utilization and payment rates were compared between Medicaid-only and CHIS commercial members with cerebrovascular disease. Rates were standardized for

age differences in the two populations and are shown in Table 10. For these rates, 95% confidence intervals (CI) were computed.

For members with cerebrovascular disease, the age-standardized outpatient hospital ED visit rate for Medicaid-only (129 per 1,000 members) was 11 percent lower than the CHIS commercial rate (145 per 1,000 members). The age-standardized inpatient hospitalization rate for Medicaid-only (283 per 1,000 members) was 13 percent higher than the CHIS commercial rate (249 per 1,000 members). For these rates of hospital use, the 95% confidence intervals indicate that the differences between Medicaid-only and CHIS commercial were not statistically significant. The office-clinic rate for Medicaid-only (2,094 per 1,000 members) was 13 percent lower than the CHIS commercial rate (2,400 per 1,000 members), a difference that was statistically significant.

Table 10. Members with Cerebrovascular Disease. Age-Standardized Circulatory Disease Utilization and Payment Rates. NH Medicaid-only and NH Commercial Members, CY2005. *Note: 95% confidence intervals (CI) in parentheses.*

Measure*	Medicaid-only	CHIS Commercial
Payments Per Member Per Month (PMPM)**	\$634	\$704
Outpatient Emergency Department Visits per 1,000 Members	129 (95-171)	145 (128-163)
Office/Clinic Visits per 1,000 Members	2,094 (1,947-2,250)	2,400 (2,332-2,470)
Inpatient Discharges per 1,000 Members	283 (231-343)	249 (228-272)

*All utilization metrics measure the utilization and payments for the members with cerebrovascular disease during the year for a circulatory disorder diagnosis or cardiovascular medications only. **95% CI were not computed for payment PMPM rates because CHIS reports do not provide variance estimates and the payments may be skewed by outlier cases.

Medicaid typically pays less per service than CHIS commercial. The age-standardized payment PMPM rate for claims with a circulatory diagnosis or cardiovascular medications for members with cerebrovascular disease was 10 percent lower for Medicaid-only (\$634) compared to CHIS commercial (\$704).

During CY2005, NH Medicaid members incurred \$850.1 million in claims payment expenses. Of this, \$78.9 million (9%) was incurred by members who had cerebrovascular disease. For the members with cerebrovascular disease only \$22.4 million (28%) was directly attributable to claims with a circulatory diagnosis or circulatory medication. This large difference may be explained by other coexisting conditions these members had.

Because cerebrovascular disease is prevalent among older persons, members with cerebrovascular disease may have other coexisting conditions. Among 2,775 Medicaid members with cerebrovascular disease 1,039 had diabetes and 1,562 had a mental disorder. For Medicaid-only members with cerebrovascular disease the prevalence of diabetes (37%) was higher than CHIS commercial (21%) and the prevalence of mental disorder (57%) was higher than CHIS commercial (31%). Persons with diabetes are at higher risk of developing circulatory disorders compared with persons without diabetes.

Congestive Heart Failure – Prevalence, Utilization, and Payments

After CAD and cerebrovascular disease, members with congestive heart failure (CHF) contributed to circulatory disease payments. The intent of this section is to summarize prevalence, utilization and payment measures specific to circulatory disease for CHF.

Among adult NH Medicaid members, 3,028 (7.7%) were identified through the administrative claims data as having CHF during CY2005. For Dual Eligible members 2,578 (13.9%) were identified with CHF. The prevalence rate for Medicaid-only members (2.2%) was more than five times the CHIS commercial rate (0.4%) and was consistently higher by individual age groups. The prevalence of CHF increased rapidly with age. For Medicaid-only members the prevalence of CHF reached 13 percent for age 60-64 compared to 2 percent for CHIS commercial members of the same age. Within Medicaid-only, the Physically Disabled eligibility group contributed to the high rate and accounted for 252 of the 450 Medicaid-only cases.

Table 11 summarizes CY2005 utilization and payments for circulatory diagnoses and medications for Medicaid and CHIS commercial members with CHF. Medicaid members with CHF used 4,436 outpatient ED visits, 18,228 office-clinic visits, and 2,334 inpatient hospitalizations in total. Of these visits, only 585 outpatient ED visits, 4,529 office-clinic visits, and 665 inpatient hospitalizations were for circulatory diagnoses.

Table 11. Members with Congestive Heart Failure (CHF). Circulatory Disorder Utilization and Payment Rates. NH Medicaid and NH Commercial Members, CY2005.

Measure*	Medicaid Total	Dual Eligible	Medicaid-only	CHIS Commercial
Members with Condition	3,028	2,578	450	1,077
Member Months for Members with Condition	30,300	25,643	4,657	11,345
Total Payments for Members with Condition (millions)	\$19.2	\$16.3	\$2.9	\$14.9
Outpatient Emergency Department Visits	585	493	92	216
Office/Clinic Visits	4,529	3,477	1,052	3,371
Inpatient Discharges	665	481	184	425
Statistical Rates				
Payments Per Member Per Month (PMPM)	**	**	\$621	\$1,312
Outpatient Emergency Department Visits per 1,000 Members	232	231	237	228
Office/Clinic Visits per 1,000 Members	1,794	1,627	2,711	3,566
Inpatient Discharges per 1,000 Members	263	225	474	450

*All utilization metrics measure the utilization and payments for the members with CHF during the year for a circulatory disorder diagnosis or cardiovascular medications only. **Payment information for Dual Eligible members is incomplete because Medicare administrative claims are not part of the NH CHIS database.

Circulatory disease utilization and payment rates were compared between Medicaid-only and CHIS commercial members with CHF. Rates were standardized for age differences in the two populations and are shown in Table 12. For these rates, 95% confidence intervals (CI) were computed.

For members with CHF, the age-standardized outpatient hospital ED visit rate for Medicaid-only (262 per 1,000 members) was 15 percent higher than the CHIS commercial rate (228 per 1,000 members). The age-standardized inpatient hospitalization rate for Medicaid-only (507 per 1,000 members) was 13 percent higher than the CHIS commercial rate (449 per 1,000 members). For the outpatient ED and inpatient use rates, the 95% confidence intervals indicate that the differences between Medicaid-only and CHIS commercial were not statistically significant. The office-clinic rate for Medicaid-only (2,912 per 1,000 members) was 17 percent lower than the CHIS commercial rate (3,523 per 1,000 members), a difference that was statistically significant.

Table 12. Members with Congestive Heart Failure (CHF). Age-Standardized Circulatory Disease Utilization and Payment Rates. NH Medicaid-only and NH Commercial Members, CY2005. *Note: 95% confidence intervals (CI) in parentheses.*

Measure*	Medicaid-only	CHIS Commercial
Payments Per Member Per Month (PMPM)**	\$644	\$1,298
Outpatient Emergency Department Visits per 1,000 Members	262 (208-325)	228 (198-260)
Office/Clinic Visits per 1,000 Members	2,912 (2,724-3,110)	3,523 (3,405-3,644)
Inpatient Discharges per 1,000 Members	507 (431-592)	449 (407-494)

*All utilization metrics measure the utilization and payments for the members with CHF during the year for a circulatory disorder diagnosis or cardiovascular medications only. **95% CI were not computed for payment PMPM rates because CHIS reports do not provide variance estimates and the payments may be skewed by outlier cases.

Medicaid typically pays less per service than CHIS commercial. The age-standardized payment PMPM rate for claims with a circulatory diagnosis or cardiovascular medications for members with CHF was twice as high in CHIS commercial (\$1,298) compared to Medicaid-only (\$644).

During CY2005, NH Medicaid members incurred \$850.1 million in claims payment expenses. Of this, \$76.8 million (9%) was incurred by members who had CHF. For the members with CHF disease only \$19.2 million (25%) was directly attributable to claims with a circulatory diagnosis or circulatory medication. This large difference may be explained by other coexisting conditions these members had.

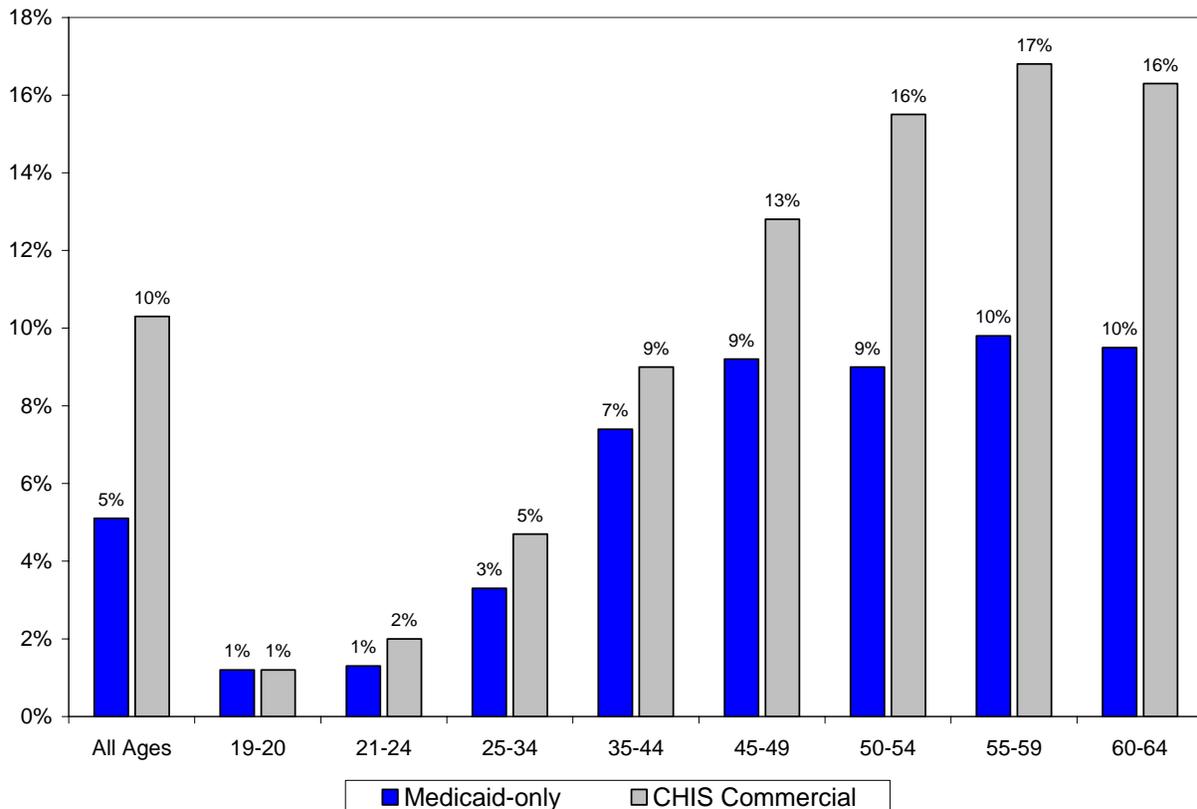
Because CHF is prevalent among older persons, members with CHF may have other coexisting conditions. Among 3,028 Medicaid members with CHF, 1,456 had diabetes and 1,577 had a mental disorder. For Medicaid-only members with CHF the prevalence of diabetes (51%) was higher than CHIS commercial (37%) and the prevalence of mental disorder (52%) was higher than CHIS commercial (32%). Persons with diabetes are at higher risk of developing circulatory disorders compared with persons without diabetes.

Members “at risk” for Cardiovascular or Circulatory Disease

In addition to the members identified in this study with cardiovascular and cerebrovascular diseases, a large number of members were also identified with hypertension (high blood pressure) or dyslipidemia (high cholesterol) only. These members did not have other circulatory disease diagnoses on claims during the year. Members with these conditions may be “at risk” of developing cardiovascular or circulatory diseases.

In total, 5,176 Medicaid members and 32,220 CHIS commercial members were “at risk” with hypertension (high blood pressure) and 2,041 Medicaid members and 25,507 CHIS commercial members were “at risk” with dyslipidemia (high cholesterol).

Figure 3. Prevalence of Members with a Dyslipidemia Diagnosis and No Other Circulatory Disorder by Age. NH Medicaid-only and NH CHIS Commercial Members, CY2005.



Prevalence rates were higher in CHIS commercial compared to Medicaid. The prevalence rates (Figure 3) for diagnosed dyslipidemia were dramatically higher in CHIS commercial (10.3%) compared to Medicaid-only (5.1%). It is possible that the lower rate in Medicaid could be the result of undiagnosed dyslipidemia which would result if Medicaid members were less likely to be tested for dyslipidemia compared to CHIS commercial members.

Table 13. Prevalence of Members “at risk” for Circulatory Disease and Medication Use. NH Medicaid and NH CHIS Commercial Adult Members, CY2005.

Diagnostic Cohort	Medicaid Total	Dual Eligible	Medicaid-only	CHIS Commercial
Hypertension and no other circulatory disorder (members)	13.2% (5,176)	16.9% (3,125)	10.0% (2,051)	13.0% (32,220)
Percent of members with hypertension and no other circulatory disorder who used a cardiac medication (95% CI)	84.0% (83.0-85.0)	86.9% (85.7-88.1)	79.7% (78.0-81.5)	81.6% (81.1-82.0)
Dyslipidemia and no other circulatory disorder	5.2% (2,041)	5.4% (998)	5.1% (1,043)	10.3% (25,507)
Percent of members with dyslipidemia and no other circulatory disorder who used an antihyperlipid medication (95% CI)	52.4% (50.2-54.5)	58.8 (55.8-61.9)	46.2% (43.2-49.2)	39.6% (39.0-40.2)

For members “at risk” with hypertension, the rate of circulatory medication use was slightly higher for CHIS commercial (81.6%) than Medicaid-only (79.7%) but this was not statistically significant. For members “at risk” with dyslipidemia, Medicaid-only members were more likely to be using an antihyperlipid medication (46.2%) compared with CHIS commercial (39.6%) and this was statistically significant.

DISCUSSION AND NEXT STEPS

Results of this study indicate that cardiovascular and other circulatory diseases were prevalent in the Medicaid and CHIS commercial populations. During CY2005, 18,020 Medicaid and 75,316 CHIS commercial members were identified with some type of circulatory disorder. Medicaid covered 4,145 members with CAD, 3,028 members with CHF, and 2,775 members with cerebrovascular disease.

The prevalence rates of CAD, CHF, and cerebrovascular disease for Medicaid-only members were significantly higher than CHIS commercial. Medicaid-only members classified as Physically Disabled contributed to this difference, but the prevalence rates within the Low Income Adult eligibility group were also higher. Finding higher prevalence of circulatory disease in Medicaid-only compared to CHIS commercial was not unexpected. Data from the CDC Behavioral Risk Factor Surveillance System indicated that low income NH residents were more likely to have risk factors for circulatory disease (smoking, diet, lack of exercise, obesity, diabetes, high blood pressure, high blood cholesterol) than NH residents with higher incomes.⁴ The evaluation of coexisting conditions from the NH CHIS claims data also indicated that Medicaid members with circulatory disease were more likely to also have coexisting diabetes compared with CHIS commercial members with circulatory disease.

The results of the study indicated Medicaid-only members with circulatory disease had higher inpatient use rates and lower office-clinic visit use rates. Medicaid-only members with CAD had significantly higher use rates of the hospital for inpatient and or outpatient ED care compared to CHIS commercial. A previous NH CHIS study demonstrated that Medicaid members had higher rates of hospital ED use compared to CHIS commercial members.¹⁴

Medicaid-only members with CAD averaged \$6,012 per year (\$501 PMPM) in claims with a circulatory disorder diagnosis. This represented only 24 percent of the total payments incurred by these members during the year. While the prevalence of diabetes and mental disorders as coexisting conditions was evaluated, a more detailed evaluation of the other contributors to utilization and cost for these members could elaborate on this.

This baseline study did not evaluate preventive or quality of care measures in detail. Medication use was evaluated. The rate of members with CAD using circulatory medications overall was the same in Medicaid and CHIS commercial. However, Medicaid-only members were less likely to have used an antihyperlipid medication than CHIS commercial. Overall, there appeared to be a pattern of lower antihyperlipid use among Medicaid members. Beta blocker treatment is recommended after a heart attack (AMI). The rate of members with AMI with beta blocker use was lower in Medicaid-only compared to CHIS commercial. Further study of variations in medication use rates is recommended. National HEDIS data indicate that members enrolled in commercial plans had a higher rate of beta blocker use after AMI (96.6%) compared to members in managed Medicaid plans (86.1%).¹⁵ NH CHIS HEDIS rates based on claims also show a higher rate of beta blocker use after AMI in CHIS

commercial (80%) compared to Medicaid-only (41%), although this Medicaid-only rate was based on a very small sample size (32 members).

A large number of members “at risk” for circulatory disease were identified in this study, including 5,176 Medicaid members with hypertension (high blood pressure) and 2,041 Medicaid members with dyslipidemia (high cholesterol) only. Further, the rates of “at risk” members with dyslipidemia in Medicaid-only were lower than CHIS commercial suggesting the possibility that problems with high cholesterol may be going undiagnosed at a greater rate in the Medicaid population.

Geographical variations in prevalence and utilization were evaluated and were reported in this study for CAD. Prevalence rates in Medicaid were lower in the southern border areas compared with northern, rural areas of the state.

This study evaluated payments with a circulatory diagnosis or medications. Medicaid paid \$850.1 million in total on claims during CY2005. Of this, \$58 million (7%) can be directly attributed to claims with a circulatory diagnosis or circulatory medications. By comparison \$324 million (38%) can be directly attributed to mental diagnosis or psychotherapeutic medications. A similar pattern was found for Medicaid-only members. Although circulatory disorder payments did not represent a larger proportion of the total Medicaid payments, it was a leading cost category after mental disorders. Changes in behavior (smoking, diet, and exercise) and secondary prevention (blood pressure and cholesterol control) can reduce the incidence of circulatory disease and could translate into significant claim payment reductions. Avoiding circulatory disease complications from diabetes could also reduce payments.

The study demonstrated that circulatory diseases were prevalent in the NH Medicaid program and members with circulatory disease contributed to the utilization and medical payments of the program. Medicaid members were hospitalized at higher rates than CHIS commercial members. While Medicaid members used pharmacy for CAD at a similar rate to CHIS commercial, they were less likely to use an antihyperlipid and were less likely to use a beta blocker if they had a heart attack. Medicaid members had higher rates of coexisting condition (diabetes and mental disorder) compared to CHIS commercial. These findings suggest the potential value of disease management and care coordination for members enrolled in Medicaid to help address these issues.

Starting in March 2005, the NH Medicaid Health Management program initiated a Disease Management program for Medicaid recipients with high-cost, chronic diseases. Two of the diseases (CAD and CHF) evaluated in this study of CY2005 Medicaid and CHIS commercial were targeted by the program. The NH Medicaid Disease Management program does not include Dual Eligible members enrolled in Medicare. This study demonstrated that the largest proportion of Medicaid covered members with the chronic diseases CAD (3,255 of 4,145), CHF (2,578 of 3,028), and cerebrovascular disease (2,260 of 2,775) were Dual Eligible.

Next Steps

The current study provided a baseline CY2005 evaluation of prevalence, utilization, and payments associated with circulatory diseases and disorders. For the first time, members with cardiovascular disease and other circulatory disorders covered by Medicaid were compared with members with CHIS commercial insurance. Several possible areas for future work and evaluation are suggested.

This study determined that Medicaid members, and to a lesser degree CHIS commercial members, with circulatory disease had coexisting medical (diabetes) and mental conditions. This study focused on evaluating the utilization and payments specifically associated with circulatory claims or medications, but noted that these payments and utilization represented a small proportion of the total use and payments for these members. A more detailed evaluation of the impact of coexisting conditions on utilization and payments could provide further insight for disease management efforts. A risk grouper can be used to quantify the overall disease burden of these two populations when comparing utilization and payment rates. This would be particularly useful in making comparisons between the Medicaid-only and CHIS commercial populations.

This NH CHIS baseline CY2005 study of circulatory diseases did not evaluate in detail preventive and quality of care measures. There was evidence that compared to CHIS commercial, Medicaid-only members had higher rates of inpatient hospitalization, lower rates of office-clinic use, lower rates of diagnosed dyslipidemia, and lower rates of beta blocker use for AMI. Hospital readmission rates and length of stay were not evaluated. A follow-up study evaluating the impact of preventive care measures on inpatient utilization and payments could help quantify the benefits of programs to increase preventive care.

The rates of “at risk” members with dyslipidemia in Medicaid-only were lower than CHIS commercial suggesting the possibility that problems with high cholesterol may be going undiagnosed at a greater rate in the Medicaid population. The U.S. Preventive Services Task Force (USPSTF) strongly recommends that clinicians routinely screen men aged 35 years and older and women aged 45 years and older for lipid disorders.¹⁹ Evaluation of lipid screening rates in the Medicaid-only adult population is recommended.

Two circulatory diseases, CAD and CHF, are addressed by the Medicaid Disease Management program that was initiated during the CY2005 study year. A more detailed evaluation of the Disease Management program is currently under way by NH CHIS in a separate project.

This study identified a high prevalence of circulatory diseases in the Medicaid Dual Eligible population. In fact, more Medicaid Dual Eligible members had CAD, CHF, and cerebrovascular disease than Medicaid-only members. Currently the NH CHIS project does not have access to Medicare claims data. Therefore, complete claims payment experience for circulatory diseases is unknown, some preventive measures cannot be evaluated, and evaluations using pharmacy will not be possible for CY2006 and after due to Medicare Part-D. It is recommended that efforts be made to acquire and include Medicare claims data into the CHIS data source.

APPENDICES

Appendix 1: Cardiovascular Diseases and Circulatory Disorders in New Hampshire – Study Methods

This study was based on administrative eligibility and claims data from New Hampshire Medicaid and the NH CHIS commercial databases for CY2005 (based on date of service). CHIS commercial includes only those members under age 65, residing in NH with both medical and pharmacy coverage linked.

1. Cardiovascular Disease and Circulatory Disorder (CD) Definitions. Members with cardiovascular disease and other circulatory disorders were identified by using the ICD-9 diagnoses codes from the administrative claims data. If any ICD-9 diagnosis code on any claim during the year was identified, the member was assigned to that CD category. A broad definition of any circulatory disorder (CD) was used for this report which included identifying members “at risk” with hypertension (high blood pressure) or dyslipidemia (high cholesterol).

Diagnostic Category	ICD-9
Any Circulatory Disorder	390-447, 272.0-272.4
Coronary Heart Disease	410-414
Acute Myocardial Infarction (AMI)	410xx
Congestive Heart Failure	428.xx
Cerebrovascular disease (stroke)	430-438
Members “At Risk” for Circulatory Disorder	
Hypertension but no other CD	401xx
Dyslipidemia but no other CD	272.0-272.4

*Diseases of the veins (ICD-9 451-459) were not included in the identification of disease cohorts for this study.

2. NH Medicaid AID groupings. Aggregated enrollment groupings based on the Medicaid program they were eligible for (Appendix 2 provides crosswalk to NH Medicaid detailed eligibility categories).

- Elderly
- Disabled due to physical condition
- Disabled due to mental condition
- Severely disabled children
- Low income adult
- Low income children

Members who had limited or no Medicaid benefits, referred to as the Medicare Buy-In Program (e.g., Qualified Medicare Beneficiary (QMB), or Specified Low-Income Medicare Beneficiary (SLMBY)) were excluded. The Healthy Kids Silver (SCHIP) is not a Medicaid program and members in this category were also excluded.

3. NH Medicaid was further stratified by Dual Eligible (Medicaid members who were also enrolled in Medicare) and Medicaid-only (Medicaid members who were not also enrolled in Medicare).

4. NH Medicaid Health Analysis Areas. Aggregation of zip codes based on New Hampshire Medicaid Health Analysis Area (HAA) for NH Medicaid enrollees was utilized (Appendix D). Health Analysis Areas are more relevant to how health care is delivered in NH than counties. HAAs are based on the plurality of hospital preference in a given zipcode.

5. Definition of children. Children are defined as age 0-18. A member age 18 is considered a child as requested by New Hampshire DHHS and corresponds to the definition of child for Medicaid eligibility purposes. Age 19 and older defines adults in this report.

6. Member Assignment. Because members may change age, location of residence, or eligibility grouping during the year, each member was assigned to one and only one category for reporting. Their eligibility group and Health Analysis Area on the last day of the last month enrolled and their age on the first day of the last month enrolled were used. This methodology is consistent with other NH CHIS reporting.

7. Health Analysis Areas are defined in Appendix 3.

8. Coexisting Conditions. Two coexisting conditions (diabetes and mental illness) were evaluated for members with circulatory diseases.

a) Diabetes. This broad definition identified any member with any diagnosis code of diabetes (ICD-9 250, 357.2, 362.0, 366.41, 648.0) or dispensed insulin or oral hypoglycemics/antihyperglycemics, MHICDRUG 3410,3420,3430.

b) Mental Illness. This definition identified any member with any diagnosis code of mental disorder (ICD-9 295, 296.2 -296.3, 296-296.1, 296.4-296.7, 296.8, 296.9, 293, 294, 297, 298, 299, 300, 301, 302, 306, 307, 308, 309, 310, 311, 312, 313, 314, 316). Substance abuse was not included.

9. Outpatient Emergency Department Visit Definition. This study focused on outpatient hospital emergency department visits. Emergency department visits were selected based on UB revenue codes 0450-0459 or CPT codes 99281-99285. Visits resulting in inpatient hospitalization were excluded by using Medicaid category of service codes 1,3,103. This definition includes revenue code 0456 hospital urgent care visits which are sometimes excluded from other studies. Outpatient ED visits were further stratified to identify those visits associated with a circulatory primary ICD-9 diagnosis code 390-459, 272.0-272.4.

10. Office/Clinic Visit Definition. Office or Clinic visits were identified based on CPT codes: 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99354, 99355, 99381, 99382, 99383, 99384, 99385, 99386, 99387, 99391, 99392, 99393, 99394, 99395, 99396, 99397, 99401, 99402, 99403, 99404, 99411, 99412, 99420, 99429, 99432, T1015, 99241, 99242, 99243, 99244, 99245 or UB revenue codes 510-519, 520-529, or 983. This definition was based on codes found in NCQA HEDIS specifications plus additional codes for NH rural health centers and federally qualified health centers. Office-clinic visits were further stratified to identify those visits associated with a circulatory primary ICD-9 diagnosis code 390-459, 272.0-272.4.

11. Inpatient Discharges. NH_CTG_SVC= 1 (corresponds to NH Medicaid category of service codes 1, 3, and 103). Inpatient discharges were further stratified to identify those visits associated with a circulatory primary ICD-9 diagnosis code 390-459, 272.0-272.4.

12. Payments. For Medicaid and CHIS commercial, payments are determined as the claim payments to the provider from the administrative claim files. NH Medicaid or commercial payers may make retroactive payment settlements with hospitals. This study is based only on the payments reflected in the administrative claim files and could not adjust for any retroactive payment settlements. Payments were further stratified to identify those visits associated with a circulatory primary ICD-9 diagnosis code 390-459, 272.0-272.4 or circulatory medications.

13. Cardiac Procedures. Three common cardiac procedures were evaluated. These procedures were identified through the CPT codes in the administrative claims data.

Procedure	CPT codes
Cardiac catheterization	93501, 93510, 93511, 93514, 93524, 93526,-93529, 93539-93545
Angioplasty (PTCA)	92980-92982, 92984, 92995, 92996
Coronary bypass graft	33510-33514, 33516-33519, 33521-33523, 33533-33536

14. Circulatory Medication Use. For this report, use of circulatory medications was evaluated. These included medications used for circulatory diseases and antihyperlipid medications for reducing cholesterol levels. A member was assigned to the use category if they had any medication use in the class during the year. Circulatory medication use was determined from the National Drug Code (NDC) on pharmacy claims and the therapeutic categories defined in Red Book®.

Drug Class	MHICDRUG class code	Example drug in this class
Cardiovascular – Antihyperlipid	1610	Atorvastatin (Lipitor™)
Cardiovascular - ACE Inhibitors	1620	Lisinopril
Cardiovascular - Beta Blockers	1630	Atenolol
Cardiovascular - Channel Blockers	1640	Amlodipine (Norvasc™)
Cardiovascular - Diuretics	1670	Hydrochlorothiazide
Cardiovascular - Other	1660	Valsartan (Diovan™)

15. Denominator for Population-Based Rates. This study was based on rates of use per member population covered. Not all members are covered for a full year. This is particularly true for the Medicaid population where a significant proportion of persons are not covered under Medicaid for the entire year. Therefore, a person covered for a full 12 months would be twice as likely to have an ED visit during the year compared with a person covered for only 6 months. We used standard methods to adjust our denominators for these differences in exposure time. Thus, average members (cumulative member months divided by 12) was utilized as denominator for rates in this study.

16. Limitations of Medicaid and CHIS Commercial Comparisons. There are some limitations in the rate comparisons made in this report. Detailed examination of the NH CHIS commercial data revealed that about 4 percent of members were covered by Indemnity

plans (fee-for-service, TPAs). Of the 75,316 CHIS Commercial members identified with any circulatory disorder, only 1,892 (3%) were enrolled in Indemnity plans. Differences in rates could be due to the benefit structures of these plans; claims may not be submitted or paid due to deductibles.

Age was limited to age 19-64 in the NH Commercial data; however, the NH Medicaid data includes members age 65 or older. These older members were included as part of standard reporting rules for NH Medicaid. For age-standardized rates comparing Medicaid-only to CHIS commercial, Medicaid-only members age 19-64 were selected.

20. Standardization of rates for age differences in the Medicaid-only and CHIS commercial populations was used in this report. The indirect method of age standardization was used and is the preferred method for standardization of rates for geographical analysis of small areas such as the HAAs used in this study. Confidence intervals were computed using methods described by Breslow and Day for indirect standardized rates.¹⁸

21. Claims paid by Medicare were not available to the CHIS project and the completeness of data for NH Medicaid members who were Dual Eligible cannot be evaluated. Payment amounts for Dual Eligibles are provided but payment rates PMPM for Dual Eligible members were suppressed.

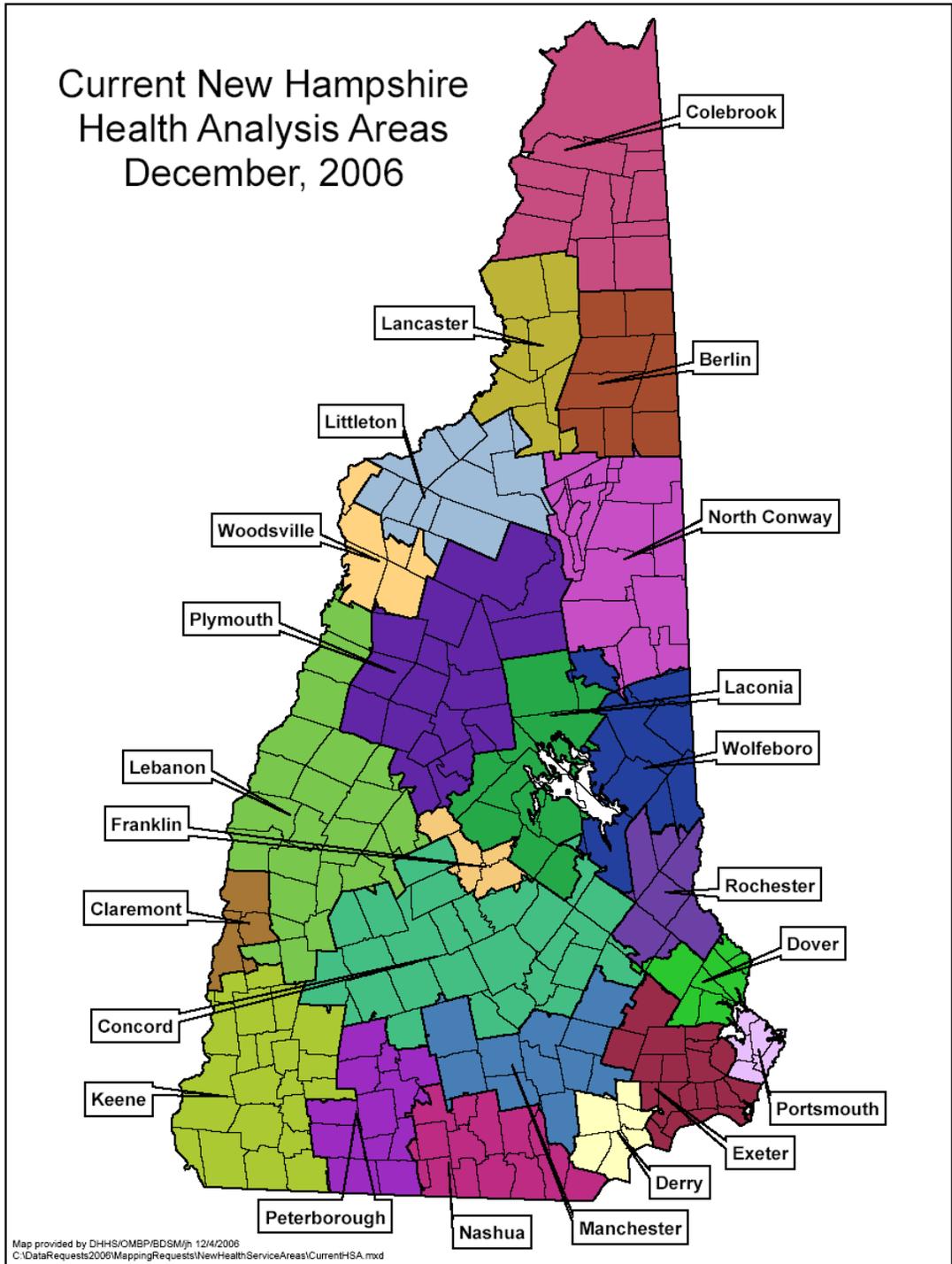
Appendix 2: NH Medicaid Eligibility Collapsed Groupings

Source: New Hampshire Comprehensive Health Information System Special Project: Defining Medicaid Eligibility Groups. Institute for Health Policy, Muskie School of Public Service, University of Southern Maine.

Aid Category w Code	Medicaid Benefits	Collapsed Groupings
10 OAA/CATEGORICALLY NEEDY	Yes	Elderly
11 OAA/MONEY PAYMENT/CATEGORICALLY NEEDY	Yes	Elderly
12 OAA/MEDICALLY NEEDY	Yes	Elderly
20 AFDC/CATEGORICALLY NEEDY	Yes	Low Income Adult/Child ²
21 AFDC/MONEY PAYMENT/CATEGORICALLY NEEDY	Yes	Low Income Adult/Child
22 AFDC/MEDICALLY NEEDY	Yes	Low Income Adult/Child
24 AFDC/REG POV LVL/CAT NEEDY 185%FPL	Yes	Low Income Adult/Child
27 HEALTHY KIDS GOLD - EXPANDED ELIGIBILITY	Yes	Low Income Child
28 AFDC/POVLEV PREG WOMAN/CHILD/CAT/NEEDY170% FPL	Yes	Low Income Adult/Child
2B AFDC/HOME CARE-CHILD/SEVERE DISA/MEDI NEEDY	Yes	Severely Disabled Child
2C AFDC/CHILD WITH SEVERE DISABILITIES/CAT NEEDY	Yes	Severely Disabled Child
2D AFDC/CHILD WITH SEVERE DISABILITIES/MEDI NEEDY	Yes	Severely Disabled Child
2E AFDC/EXTENDED MA/FIRST 6 MONTH PERIOD/CAT NEEDY	Yes	Low Income Adult/Child
2F AFDC/EXT MA/SCND 6 MNTH PER/CAT NEEDY	Yes	Low Income Adult/Child
2H AFDC/POV LVL PREG WMN/CHILD/CAT NDY/REF170% FPL	Yes	Low Income Adult/Child
2K AFDC/HOME CARE-CHILD SEV DIS/CAT. NDY FOR INSTI	Yes	Severely Disabled Child
2U AFDC/AFDC-UP/MONEY PAYMENT/CATEGORICALLY NDY	Yes	Low Income Adult/Child
2V AFDC/AFDC-UP/CATEGORICALLY NEEDY/MA	Yes	Low Income Adult/Child
2W AFDC/AFDC-UP/MEDICALLY NEEDY	Yes	Low Income Adult/Child
2X ADFC/POV LVL PREG WOMEN/POV LVL CHLD CAT NEEDY	Yes	Low Income Adult/Child
30 ANB/CATEGORICALLY NEEDY	Yes	Disabled Physical
31 ANB/MONEY PAYMENT/CATEGORICALLY NEEDY	Yes	Disabled Physical
32 ANB/MEDICALLY NEEDY	Yes	Disabled Physical
40 IV-E-OR-MA /ADOPT SUB-CAT NEEDY	Yes	Low Income Child
41 AFDC/FC OR MONEY PAYMENT/CATEGORICALLY NDY	Yes	Low Income Child
42 AFDC/FC OR MEDICALLY NEEDY	Yes	Low Income Child
50 APTD/MENTAL/CATEGORICALLY NEEDY	Yes	Disabled Mental
51 APTD/MENTAL/MONEY PAYMENT/CATEGORICALLY NEEDY	Yes	Disabled Mental
52 APTD/MENTAL/MEDICALLY NEEDY	Yes	Disabled Mental
61 HEALTHY KIDS SILVER	No	Omitted
66 QUALIFIED MEDICARE BENEFICIARY - SLMB120	No	Omitted
67 QUALIFIED MEDICARE BENEFICIARY - SLMB135	No	Omitted
68 QUALIFIED MEDICARE BENEFICIARY - QDWI	No	Omitted
69 QMB	No	Omitted
70 APTD/PHYSICAL/CATEGORICALLY NEEDY	Yes	Disabled Physical
71 APTD/PHYSICAL/MONEY PAYMENT	Yes	Disabled Physical
72 APTD-PHYSICAL/MEDICALLY NEEDY	Yes	Disabled Physical
80 MEAD WITH ANB/APTD APPROVAL - BLIND	Yes	Disabled Physical
81 MEAD WITH ANB/APTD APPROVAL - PHYSICAL	Yes	Disabled Physical
82 MEAD WITH ANB/APTD APPROVAL - MENTAL	Yes	Disabled Mental
83 MEAD ONLY APPROVAL - BLIND	Yes	Disabled Physical
84 MEAD ONLY APPROVAL - PHYSICAL	Yes	Disabled Physical
85 MEAD ONLY APPROVAL - MENTAL	Yes	Disabled Mental

² Age at beginning of the month is used to designate member as Child <=18 or Adult >18.

Appendix 3: Health Analysis Area Definitions



New Hampshire			New Hampshire		
Health Service	Zip	Zip Name	Health Service	Zip	Zip Name
Area	Code		Area	Code	
Berlin	00169	Sucess	Dover	03878	Somersworth
Berlin	03570	Berlin	Exeter	03042	Epping
Berlin	03581	Gorham	Exeter	03044	Fremont
Berlin	03588	Milan	Exeter	03077	Raymond
Berlin	03593	Randolph	Exeter	03290	Nottingham
Claremont	03603	Charlestown	Exeter	03291	West Nottingham
Claremont	03743	Claremont	Exeter	03819	Danville
Colebrook	00170	Second College Grant	Exeter	03827	East Kingston
Colebrook	00186	Erving's Location	Exeter	03833	Exeter
Colebrook	00187	Dix Grant	Exeter	03842	Hampton
Colebrook	03576	Colebrook	Exeter	03844	Hampton Falls
Colebrook	03579	Errol	Exeter	03848	Kingston
Colebrook	03592	Pittsburg	Exeter	03856	Newfields
Colebrook	03597	West Stewartstown	Exeter	03857	Newmarket
Concord	03046	Dunbarton	Exeter	03858	Newton
Concord	03216	Andover	Exeter	03859	Newton Junction
Concord	03218	Barnstead	Exeter	03865	Plaistow
Concord	03221	Bradford	Exeter	03874	Seabrook
Concord	03224	Canterbury	Exeter	03885	Stratham
Concord	03225	Center Barnstead	Franklin	03235	Franklin
Concord	03229	Contoocook	Franklin	03235	Franklin
Concord	03234	Epsom	Franklin	03243	Hill
Concord	03242	Henniker	Franklin	03276	Tilton
Concord	03244	Hillsboro	Franklin	03298	Tilton
Concord	03252	Lochmere	Franklin	03299	Tilton
Concord	03255	Newbury	Keene	03431	Keene
Concord	03258	Chichester	Keene	03435	Keene
Concord	03261	Northwood	Keene	03441	Ashuelot
Concord	03263	Pittsfield	Keene	03443	Chesterfield
Concord	03268	Salisbury	Keene	03445	Sullivan
Concord	03272	South Newbury	Keene	03446	Swanzy
Concord	03275	Suncook	Keene	03447	Fitzwilliam
Concord	03278	Warner	Keene	03448	Gilsum
Concord	03280	Washington	Keene	03450	Harrisville
Concord	03301	Concord	Keene	03451	Hinsdale
Concord	03302	Concord	Keene	03455	Marlborough
Concord	03303	Concord	Keene	03456	Marlow
Concord	03304	Bow	Keene	03457	Nelson
Concord	03305	Concord	Keene	03462	Spofford
Concord	03307	Loudon	Keene	03464	Stoddard
Concord	03837	Gilmanton Iron Works	Keene	03465	Troy
Derry	03038	Derry	Keene	03466	West Chesterfield
Derry	03041	East Derry	Keene	03467	Westmoreland
Derry	03073	North Salem	Keene	03469	West Swanzy
Derry	03079	Salem	Keene	03470	Winchester
Derry	03087	Windham	Keene	03602	Alstead
Derry	03811	Atkinson	Keene	03604	Drewsville
Derry	03826	East Hampstead	Keene	03607	South Acworth
Derry	03841	Hampstead	Keene	03608	Walpole
Derry	03873	Sandown	Keene	03609	North Walpole
Dover	03805	Rollinsford	Laconia	03220	Belmont
Dover	03820	Dover	Laconia	03226	Center Harbor
Dover	03821	Dover	Laconia	03227	Center Sandwich
Dover	03822	Dover	Laconia	03237	Gilmanton
Dover	03823	Madbury	Laconia	03246	Laconia
Dover	03824	Durham	Laconia	03247	Laconia
Dover	03825	Barrington	Laconia	03249	Gilford
Dover	03869	Rollinsford	Laconia	03253	Meredith
			Laconia	03254	Moultonborough
			Laconia	03256	New Hampton

New Hampshire Health Service Area			New Hampshire Health Service Area		
Zip Code	Zip Name	Zip Code	Zip Name	Zip Code	Zip Name
03259	North Sandwich	03101	Manchester	03101	Manchester
03269	Sanbornton	03102	Manchester	03102	Manchester
03289	Winnisquam	03103	Manchester	03103	Manchester
03883	South Tamworth	03104	Manchester	03104	Manchester
00185	Kilkenny	03105	Manchester	03105	Manchester
03582	Groveton	03106	Manchester	03106	Hooksett
03583	Jefferson	03107	Manchester	03107	Manchester
03584	Lancaster	03108	Manchester	03108	Manchester
03587	Meadows	03109	Manchester	03109	Manchester
03590	North Stratford	03110	Manchester	03110	Bedford
03230	Danbury	03111	Manchester	03111	Manchester
03231	East Andover	03281	Manchester	03281	Weare
03233	Elkins	03031	Nashua	03031	Amherst
03240	Grafton	03033	Nashua	03033	Brookline
03257	New London	03048	Nashua	03048	Greenville
03260	North Sutton	03049	Nashua	03049	Hollis
03273	South Sutton	03051	Nashua	03051	Hudson
03284	Springfield	03052	Nashua	03052	Litchfield
03287	Wilmot	03054	Nashua	03054	Merrimack
03601	Acworth	03055	Nashua	03055	Milford
03605	Lempster	03057	Nashua	03057	Mont Vernon
03741	Canaan	03060	Nashua	03060	Nashua
03745	Cornish	03061	Nashua	03061	Nashua
03746	Cornish Flat	03062	Nashua	03062	Nashua
03748	Enfield	03063	Nashua	03063	Nashua
03749	Enfield Center	03064	Nashua	03064	Nashua
03750	Etna	03076	Nashua	03076	Pelham
03751	Georges Mills	03082	Nashua	03082	Lyndeborough
03752	Goshen	03086	Nashua	03086	Wilton
03753	Grantham	00168	North Conway	00168	Beans Purchase
03754	Guild	00172	North Conway	00172	Hadleys Purchase
03755	Hanover	00173	North Conway	00173	Cutts Grant
03756	Lebanon	00174	North Conway	00174	Beans Grant
03765	Haverhill	00176	North Conway	00176	Sargents Purchase
03766	Lebanon	00177	North Conway	00177	Pinkham Grant
03768	Lyme	00179	North Conway	00179	Chandlers Purchase
03769	Lyme Center	00180	North Conway	00180	Thompson/Meserves Purch
03770	Meriden	00181	North Conway	00181	Low and Burbanks Grant
03773	Newport	00182	North Conway	00182	Crawfords Purchase
03777	Orford	00183	North Conway	00183	Greens Grant
03779	Piermont	00184	North Conway	00184	Martins Location
03781	Plainfield	03575	North Conway	03575	Bretton Woods
03782	Sunapee	03589	North Conway	03589	Mount Washington
03784	West Lebanon	03812	North Conway	03812	Bartlett
03561	Littleton	03813	North Conway	03813	Center Conway
03574	Bethlehem	03817	North Conway	03817	Chocorua
03580	Franconia	03818	North Conway	03818	Conway
03585	Lisbon	03832	North Conway	03832	Eaton Center
03586	Sugar Hill	03838	North Conway	03838	Glen
03595	Twin Mountain	03845	North Conway	03845	Intervale
03598	Whitefield	03846	North Conway	03846	Jackson
03032	Auburn	03847	North Conway	03847	Kearsarge
03034	Candia	03849	North Conway	03849	Madison
03036	Chester	03860	North Conway	03860	North Conway
03037	Deerfield	03875	North Conway	03875	Silver Lake
03040	East Candia	03890	North Conway	03890	West Ossipee
03045	Goffstown	03043	Peterborough	03043	Francestown
03053	Londonderry	03047	Peterborough	03047	Greenfield
03070	New Boston	03071	Peterborough	03071	New Ipswich

New Hampshire			New Hampshire		
Health Service Area	Zip Code	Zip Name	Health Service Area	Zip Code	Zip Name
Peterborough	03084	Temple	Wolfeboro	03897	Wonalancet
Peterborough	03440	Antrim	Woodsville	03238	Glenciff
Peterborough	03442	Bennington	Woodsville	03740	Bath
Peterborough	03444	Dublin	Woodsville	03771	Monroe
Peterborough	03449	Hancock	Woodsville	03774	North Haverhill
Peterborough	03452	Jaffrey	Woodsville	03780	Pike
Peterborough	03458	Peterborough	Woodsville	03785	Woodsville
Peterborough	03461	Rindge			
Peterborough	03468	West Peterborough			
Plymouth	03215	Waterville Valley			
Plymouth	03217	Ashland			
Plymouth	03222	Bristol			
Plymouth	03223	Campton			
Plymouth	03232	East Hebron			
Plymouth	03241	Hebron			
Plymouth	03245	Holderness			
Plymouth	03251	Lincoln			
Plymouth	03262	North Woodstock			
Plymouth	03264	Plymouth			
Plymouth	03266	Rumney			
Plymouth	03274	Stinson Lake			
Plymouth	03279	Warren			
Plymouth	03282	Wentworth			
Plymouth	03293	Woodstock			
Portsmouth	03801	Portsmouth			
Portsmouth	03802	Portsmouth			
Portsmouth	03803	Portsmouth			
Portsmouth	03804	Portsmouth			
Portsmouth	03840	Greenland			
Portsmouth	03843	Hampton			
Portsmouth	03854	New Castle			
Portsmouth	03862	North Hampton			
Portsmouth	03870	Rye			
Portsmouth	03871	Rye Beach			
Rochester	03815	Center Strafford			
Rochester	03835	Farmington			
Rochester	03839	Rochester			
Rochester	03851	Milton			
Rochester	03852	Milton Mills			
Rochester	03855	New Durham			
Rochester	03866	Rochester			
Rochester	03867	Rochester			
Rochester	03868	Rochester			
Rochester	03884	Strafford			
Rochester	03887	Union			
Wolfeboro	03809	Alton			
Wolfeboro	03810	Alton Bay			
Wolfeboro	03814	Center Ossipee			
Wolfeboro	03816	Center Tuftonboro			
Wolfeboro	03830	East Wakefield			
Wolfeboro	03836	Freedom			
Wolfeboro	03850	Melvin Village			
Wolfeboro	03853	Mirror Lake			
Wolfeboro	03864	Ossipee			
Wolfeboro	03872	Sanbornville			
Wolfeboro	03882	Effingham			
Wolfeboro	03886	Tamworth			
Wolfeboro	03894	Wolfeboro			
Wolfeboro	03896	Wolfeboro Falls			

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