



New Hampshire Institute for Health Policy and Practice

UNIVERSITY of NEW HAMPSHIRE

# **ISSUE BRIEF**

## **Care Migration of Commercially Insured Patients in New Hampshire: Building the Case for Health Information Exchange**

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## REPORT PURPOSE AND SUMMARY OF FINDINGS

The analysis included in this issue brief was created in order to better understand where New Hampshire patients seek care, both within and outside of New Hampshire. The underlying hypothesis was that patients leave their home “service areas” (defined by 22 Health Analysis Areas (HAAs) in **Appendix A**) to seek clinical services. The analyses show that the majority (86%) of New Hampshire patients remain within the state for medical services. However, a high proportion leaves their resident HAA depending on geography and type of medical service encounter. The amount of care received within the community of the New Hampshire resident differs by type of service (inpatient, outpatient, all other encounters). For example, migration outside a patient’s HAA for outpatient care was less common than leaving their HAA for inpatient care. However, eight New Hampshire communities were shown to have 62% or more migration of inpatient services to other communities.

Due to the high frequency of patient migration, the case can reasonably be made that it is important for patient health information to move with the patients as they seek services across geographic boundaries. Currently, the majority of patient information that is transferred between clinicians, labs, pharmacies, and institutions occurs via paper, phone, or fax. However, this communication of medical information could be accomplished via electronic health information exchange (HIE) between medical professionals and institutions to improve information flow and quality. As New Hampshire considers further investment in health care technology, the data in this report provides information to build the case for investment in the electronic exchange of health information between communities and between states.

## DATA METHODOLOGY AND LIMITATIONS

When drawing conclusions from this report, it is important to consider the following methodology and limitations. Some of the limitations are based in aspects of the quality of the underlying data set, while others may be attributed to operational issues.

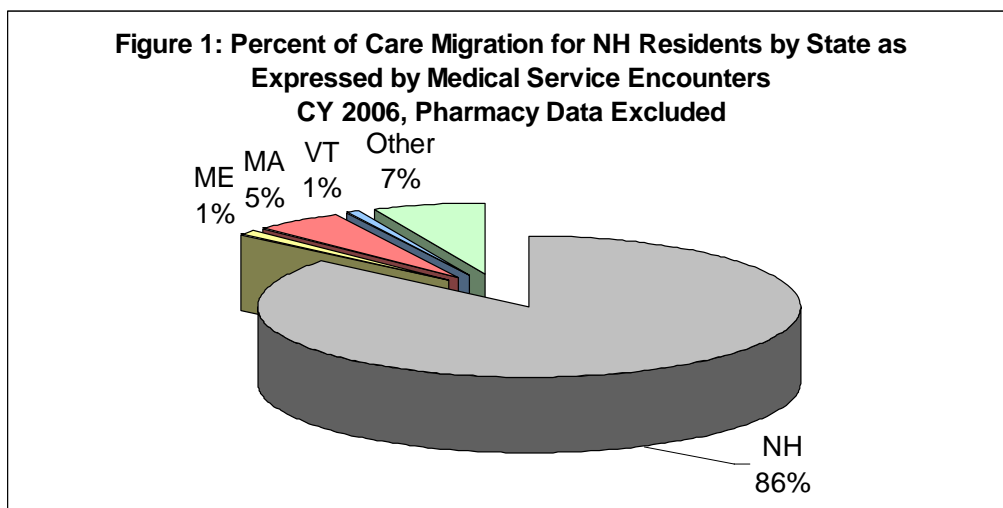
- The underlying data set includes the full commercially insured population data set from the NH Comprehensive Health Information System ([www.nhchis.org](http://www.nhchis.org)). This system is populated monthly with health care claims submitted to the State of New Hampshire by health insurance companies for those insurance policies underwritten by New Hampshire employers. One of the potential limitations to this study is that there is an expected underreporting of New Hampshire patients in the database as many New Hampshire residents, especially residing on the borders of the state, work for out-of-state employers. This underreporting likely translates to more conservative numbers when examining care migration out of New Hampshire.
- Pharmaceuticals and associated encounters were excluded from the analysis as there are a large number of out-of-state mail order pharmacies being utilized by New Hampshire patients comprising a significant number of health care encounters.



- This study examined health care claims incurred in calendar year 2006 and paid through March 2007. The data set examined contained a total of \$1.43B in health care provider payments comprising 4.85M medical service encounters.
- The study examined hospital inpatient encounters, hospital outpatient encounters, and all other medical encounters. The all other encounters category should be viewed with some trepidation as the analysis relies on provider zip code accuracy. Since many non-hospital providers use third party billing services, the zip code may not accurately reflect that of the provider, but of the billing service.
- This study uses both the zip code of the patient and the health care provider as the geographic basis. Each patient and health care provider is assigned to a Health Analysis Area (HAA). There are 22 HAAs designated by the NH Department of Health and Human Services. **Appendix A** contains a full description and a map of the HAAs. The data set is limited to patients with New Hampshire zip codes for residence. Zip codes were assigned for providers residing outside the state for Maine, Vermont, Massachusetts, and All Other.
- The underlying data set used for this analysis allows for analysis of New Hampshire resident patient care migrating outside of New Hampshire, but does not enable the calculation of how much care migrates into New Hampshire from patients residing in other states. For some border providers, such as Dartmouth-Hitchcock Medical Center in Lebanon, NH, a significant portion of their patients come from states other than New Hampshire.

## REPORT FINDINGS

**Figure 1** shows that in aggregate, 86% of medical service encounters for New Hampshire residents were delivered within New Hampshire, whereas the remainder took place in MA (5%), VT (1%), ME (1%), and all other states (7%). Many of the border communities have a higher proportion of care migrating to other states than the percentages shown in **Figure 1**. A total of 4.85M medical service encounters were examined. This includes all types of medical encounters including inpatient and outpatient hospital encounters as well as all other types of medical encounters.



For many Health Analysis Areas, a large percentage of medical service encounters were delivered outside of the patients' home HAA. Keene's HAA retained the highest percentage of visits at 71% and Franklin had the lowest at 29%. Because of the operating agreement between Franklin's and Laconia's hospitals, a high proportion of Franklin's HAA residents migrate outside of their HAA. Due to this, the maps on the following pages exclude Franklin. Detailed information about the percentage of encounters received within each HAA (including Franklin) and those encounters migrating outside of each HAA can be found in **Appendix B**.

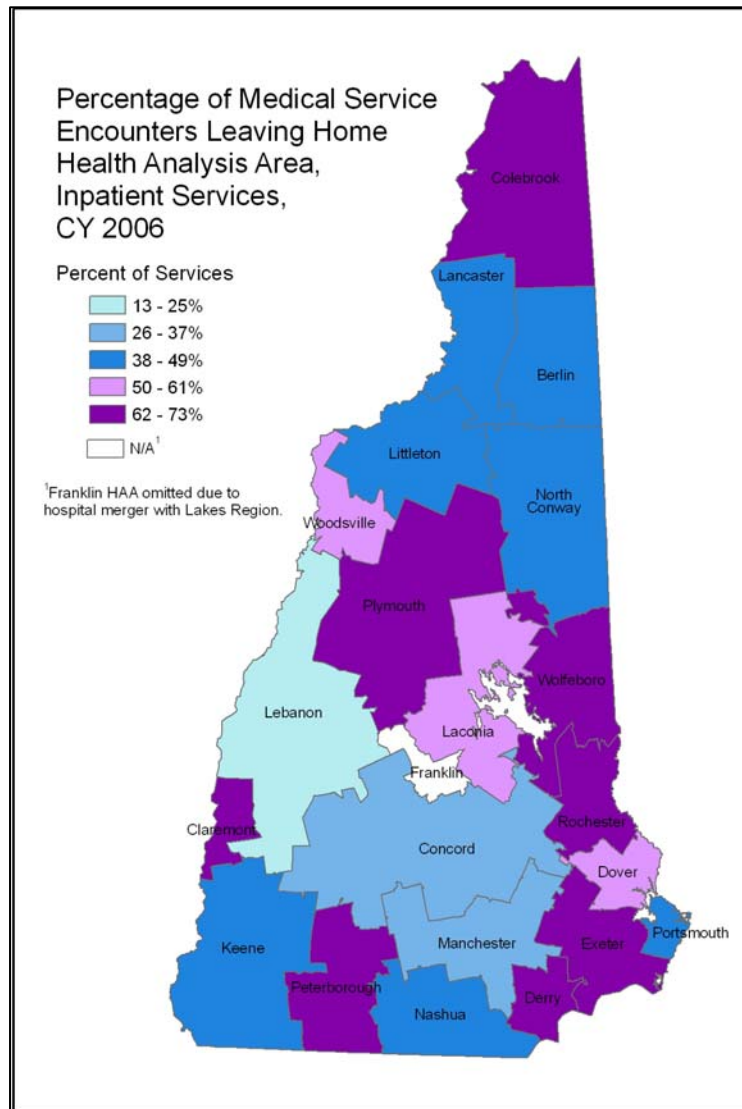
**Table 1** is a further break out of **Figure 1** by service encounter type. **Appendix C** provides detail for each HAA by service encounter type for patients in New Hampshire HAAs.

<b>Table 1: Percentage of Medical Service Encounters Occurring for Patients of NH Health Analysis Areas, CY 2006. Stratified by Inpatient Services, Outpatient Facility Services, and All Other Medical Services.</b>					
<b>Type of Service (TOS) Encounter</b>	<b>NH Providers</b>	<b>MA Providers</b>	<b>ME Providers</b>	<b>VT Providers</b>	<b>Other States Providers</b>
IP	85%	10%	1%	1%	3%
OP	92%	5%	1%	1%	1%
Other	85%	5%	1%	1%	8%
Across All TOS <i>(Taken from Figure 1)</i>	86%	5%	1%	1%	7%

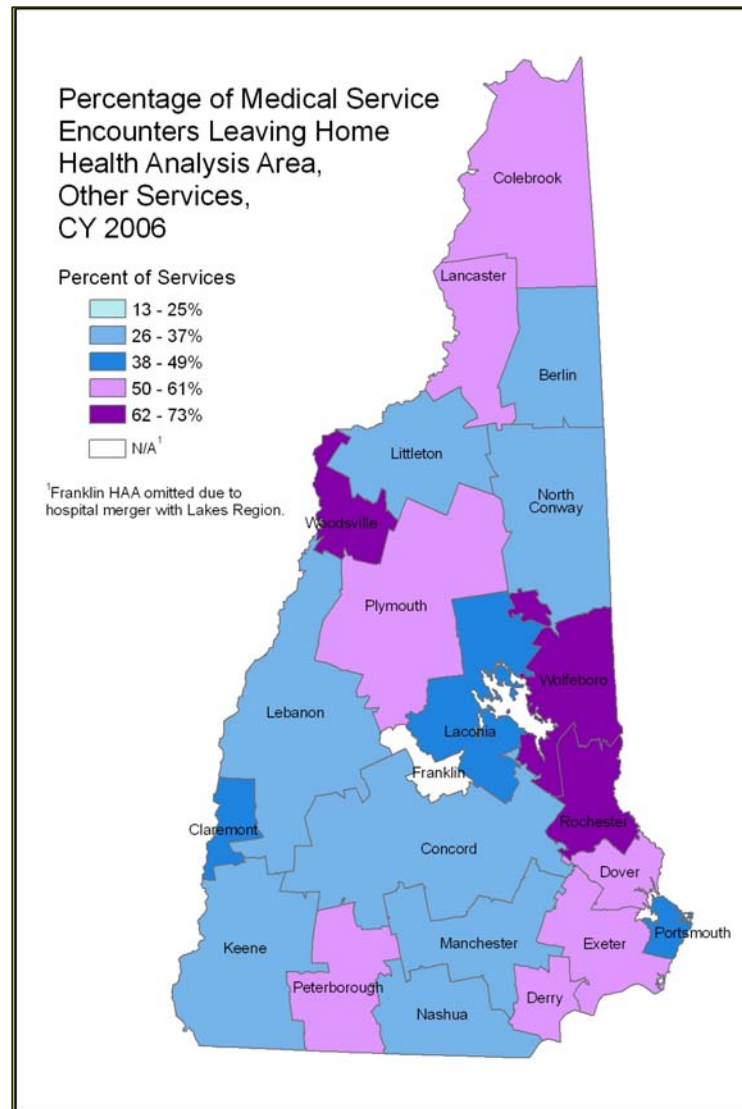
**Figures 2 and 3** show the percentage of inpatient and outpatient medical service encounters, respectively, that left the patient's HAA of residence. Possible explanations for high rates of out-migration in some communities:

- These communities are less likely to offer more complex inpatient medical services, such as cardiac surgery or oncology treatment. The same can be said for certain outpatient procedures such as certain diagnostic testing which requires migration to another community for these services.
- Many of these communities are located on a state border, and services are being provided outside of New Hampshire entirely. This is true for some HAAs such as Claremont (68%) or Derry (73%).
- Many of the HAAs cover broad geographic areas, and patients residing at the edge of one HAA may be closer to medical services in another HAA.
- In some cases, multiple HAAs are located within larger population centers that are in a relatively small geographic region (i.e., the Seacoast has 3 HAAs). In this case, patients residing within one HAA may easily see providers in another HAA.

**FIGURE 2**



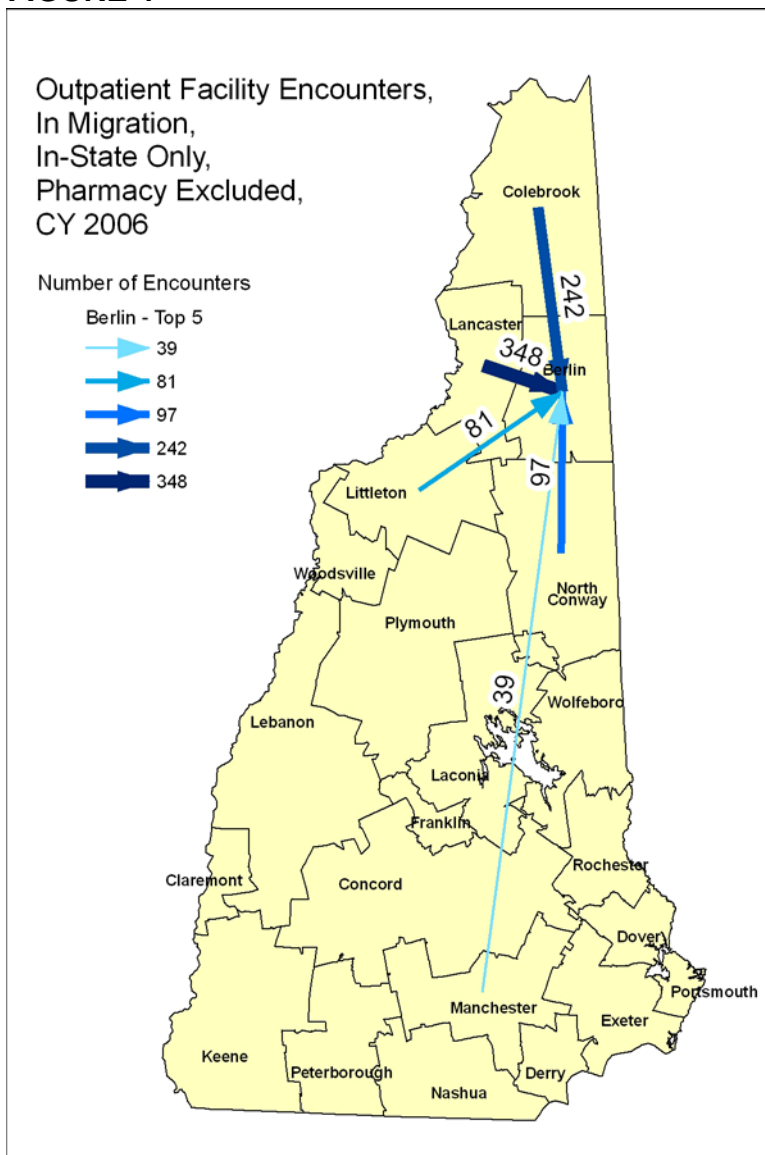
**FIGURE 3**



Another use of the data is to determine where care is migrating to and from for each HAA. The “spider diagram” in **Figure 4** is an example of in-migration of outpatient facility encounters to Berlin from the top five HAAs. It does not show the number of Berlin patients who received care in Berlin, instead it is focused on non-Berlin patients receiving outpatient encounters in Berlin. The number of encounters is shown for each of the top HAAs.

A similar diagram could be created to show where Berlin residents migrate to for care. This type of HAA-level analysis could be very useful to communities who are looking to identify their medical trading partners in order to make investments in electronic connectivity across communities.

**FIGURE 4**



## **FUTURE ANALYSIS NEEDS**

This report is an initial effort to document where New Hampshire patients seek care, both within and outside their HAA of residence. Further analysis should be conducted in two primary areas:

- An examination by and across HAAs of how far patients travel, and for what specific services (orthopedics, cardiology, oncology, etc.).
- A regional care migration analysis including Maine, Massachusetts, New Hampshire, and Vermont should be completed once Vermont and Massachusetts have implemented their comprehensive all payer databases. These databases will contain commercial health care claims similar to New Hampshire's ([www.nhchis.org](http://www.nhchis.org)) and Maine's databases. This analysis would include in-migration and out-migration for each state as a whole, as well as by type of service encounter.

These further analyses will assist state and regional health information exchange planning efforts and investment prioritization.

## **ACKNOWLEDGMENTS**

Funding for this report was provided by the Endowment for Health and the Norwin S. and Elizabeth N. Bean Foundation. Analytic and GIS support was provided by the Maine Health Information Center and the UNH Complex Systems Research Center. The New Hampshire Health Analysis Areas were provided by the NH Department of Health and Human Services.

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## APPENDIX A: HEALTH ANALYSIS AREAS (HAAs)<sup>1</sup>

### ***NH Health Analysis Area Definitions Developed by the Department of Health and Human Services for the Comprehensive Healthcare Information System Project***

#### *Background*

With the initiation of the Comprehensive Health Care Information System (CHIS) project at the NH Department of Health and Human Services (DHHS) it was necessary to choose a method for reporting data at the sub-state level. After considering existing methods, DHHS chose to develop a new one that would work better technically and better met the needs of the project. Two considerations were taken into account when choosing a method to define the areas. First, the areas needed to be based on patient zip code as this was previously determined to be more accurate and less cumbersome than using patient city. Second, the areas needed to provide some meaning with regard to the health care system. Since most of the health care in NH is delivered in cities with hospitals, an approach similar to the Hospital Service Area designations was selected that would base the area on the plurality service location for each zip code for common services.

#### *How the Areas Were Defined*

Analysis was done to find DRG (Diagnosis-related group) codes common to most NH hospitals over a 3-year period (2002-2004). These DRG codes were for conditions and procedures that occurred at the majority of NH hospitals. They were also selected in order to define Health Analysis Areas for general conditions and procedures that would likely be found at all NH hospitals (as opposed to very specialized treatment like cardiac surgery). Discharges with those common DRG codes were counted by the patient's residence zip code and zip code areas were assigned to the hospital with the highest count of discharges. Zip code areas were assigned to be contiguous with surrounding zip code areas and, in case of ties, the rule of contiguity was used to assign zip code areas. The following pages show a map of the state with the areas outlined and a detailed listing of which zip codes each area contains.

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<sup>1</sup> The complete text and map shown in Appendix A was provided by the NH Department of Health and Human Services.



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



<b>New Hampshire Health Service Area</b>	<b>Zip Code</b>	<b>Zip Name</b>	<b>New Hampshire Health Service Area</b>	<b>Zip Code</b>	<b>Zip Name</b>
Laconia	03237	Gilmanton	Littleton	03586	Sugar Hill
Laconia	03246	Laconia	Littleton	03595	Twin Mountain
Laconia	03247	Laconia	Littleton	03598	Whitefield
Laconia	03249	Gilford	Manchester	03032	Auburn
Laconia	03253	Meredith	Manchester	03034	Candia
Laconia	03254	Moultonborough	Manchester	03036	Chester
Laconia	03256	New Hampton	Manchester	03037	Deerfield
Laconia	03259	North Sandwich	Manchester	03040	East Candia
Laconia	03269	Sanbornton	Manchester	03045	Goffstown
Laconia	03289	Winnisquam	Manchester	03053	Londonderry
Laconia	03883	South Tamworth	Manchester	03070	New Boston
Lancaster	00185	Kilkenny	Manchester	03101	Manchester
Lancaster	03582	Groveton	Manchester	03102	Manchester
Lancaster	03583	Jefferson	Manchester	03103	Manchester
Lancaster	03584	Lancaster	Manchester	03104	Manchester
Lancaster	03587	Meadows	Manchester	03105	Manchester
Lancaster	03590	North Stratford	Manchester	03106	Hooksett
Lebanon	03230	Danbury	Manchester	03107	Manchester
Lebanon	03231	East Andover	Manchester	03108	Manchester
Lebanon	03233	Elkins	Manchester	03109	Manchester
Lebanon	03240	Grafton	Manchester	03110	Bedford
Lebanon	03257	New London	Manchester	03111	Manchester
Lebanon	03260	North Sutton	Manchester	03281	Weare
Lebanon	03273	South Sutton	Nashua	03031	Amherst
Lebanon	03284	Springfield	Nashua	03033	Brookline
Lebanon	03287	Wilmot	Nashua	03048	Greenville
Lebanon	03601	Acworth	Nashua	03049	Hollis
Lebanon	03605	Lempster	Nashua	03051	Hudson
Lebanon	03741	Canaan	Nashua	03052	Litchfield
Lebanon	03745	Cornish	Nashua	03054	Merrimack
Lebanon	03746	Cornish Flat	Nashua	03055	Milford
Lebanon	03748	Enfield	Nashua	03057	Mont Vernon
Lebanon	03749	Enfield Center	Nashua	03060	Nashua
Lebanon	03750	Etna	Nashua	03061	Nashua
Lebanon	03751	Georges Mills	Nashua	03062	Nashua
Lebanon	03752	Goshen	Nashua	03063	Nashua
Lebanon	03753	Grantham	Nashua	03064	Nashua
Lebanon	03754	Guild	Nashua	03076	Pelham
Lebanon	03755	Hanover	Nashua	03082	Lyndeborough
Lebanon	03756	Lebanon	Nashua	03086	Wilton
Lebanon	03765	Haverhill	North Conway	00168	Beans Purchase
Lebanon	03766	Lebanon	North Conway	00172	Hadleys Purchase
Lebanon	03768	Lyme	North Conway	00173	Cutts Grant
Lebanon	03769	Lyme Center	North Conway	00174	Beans Grant
Lebanon	03770	Meriden	North Conway	00176	Sargents Purchase
Lebanon	03773	Newport	North Conway	00177	Pinkham Grant
Lebanon	03777	Orford	North Conway	00179	Chandlers Purchase
Lebanon	03779	Piermont	North Conway	00180	Thompson/Meserves Purch
Lebanon	03781	Plainfield	North Conway	00181	Low and Burbanks Grant
Lebanon	03782	Sunapee	North Conway	00182	Crawfords Purchase
Lebanon	03784	West Lebanon	North Conway	00183	Greens Grant
Littleton	03561	Littleton	North Conway	00184	Martins Location
Littleton	03574	Bethlehem	North Conway	03575	Bretton Woods
Littleton	03580	Franconia	North Conway	03589	Mount Washington
Littleton	03585	Lisbon	North Conway	03812	Bartlett



<b>New Hampshire Health Service Area</b>	<b>Zip Code</b>	<b>Zip Name</b>	<b>New Hampshire Health Service Area</b>	<b>Zip Code</b>	<b>Zip Name</b>
North Conway	03813	Center Conway	Portsmouth	03803	Portsmouth
North Conway	03817	Chocorua	Portsmouth	03804	Portsmouth
North Conway	03818	Conway	Portsmouth	03840	Greenland
North Conway	03832	Eaton Center	Portsmouth	03843	Hampton
North Conway	03838	Glen	Portsmouth	03854	New Castle
North Conway	03845	Intervale	Portsmouth	03862	North Hampton
North Conway	03846	Jackson	Portsmouth	03870	Rye
North Conway	03847	Kearsarge	Portsmouth	03871	Rye Beach
North Conway	03849	Madison	Rochester	03815	Center Strafford
North Conway	03860	North Conway	Rochester	03835	Farmington
North Conway	03875	Silver Lake	Rochester	03839	Rochester
North Conway	03890	West Ossipee	Rochester	03851	Milton
Peterborough	03043	Francestown	Rochester	03852	Milton Mills
Peterborough	03047	Greenfield	Rochester	03855	New Durham
Peterborough	03071	New Ipswich	Rochester	03866	Rochester
Peterborough	03084	Temple	Rochester	03867	Rochester
Peterborough	03440	Antrim	Rochester	03868	Rochester
Peterborough	03442	Bennington	Rochester	03884	Strafford
Peterborough	03444	Dublin	Rochester	03887	Union
Peterborough	03449	Hancock	Wolfeboro	03809	Alton
Peterborough	03452	Jaffrey	Wolfeboro	03810	Alton Bay
Peterborough	03458	Peterborough	Wolfeboro	03814	Center Ossipee
Peterborough	03461	Rindge	Wolfeboro	03816	Center Tuftonboro
Peterborough	03468	West Peterborough	Wolfeboro	03830	East Wakefield
Plymouth	03215	Waterville Valley	Wolfeboro	03836	Freedom
Plymouth	03217	Ashland	Wolfeboro	03850	Melvin Village
Plymouth	03222	Bristol	Wolfeboro	03853	Mirror Lake
Plymouth	03223	Campton	Wolfeboro	03864	Ossipee
Plymouth	03232	East Hebron	Wolfeboro	03872	Sanbornville
Plymouth	03241	Hebron	Wolfeboro	03882	Effingham
Plymouth	03245	Holderness	Wolfeboro	03886	Tamworth
Plymouth	03251	Lincoln	Wolfeboro	03894	Wolfeboro
Plymouth	03262	North Woodstock	Wolfeboro	03896	Wolfeboro Falls
Plymouth	03264	Plymouth	Wolfeboro	03897	Wonalancet
Plymouth	03266	Rumney	Woodsville	03238	Glenciff
Plymouth	03274	Stinson Lake	Woodsville	03740	Bath
Plymouth	03279	Warren	Woodsville	03771	Monroe
Plymouth	03282	Wentworth	Woodsville	03774	North Haverhill
Plymouth	03293	Woodstock	Woodsville	03780	Pike
Portsmouth	03801	Portsmouth	Woodsville	03785	Woodsville
Portsmouth	03802	Portsmouth			



## APPENDIX B

Percentage of Medical Service Encounters Occurring for Patients of NH Health Analysis Areas (HAAs), CY 2006. Stratified by Location of Services Rendered.							
Member Health Analysis Area of Residence	% Within Home HAA	% Left Home HAA	% Other NH	% To MA	% to ME	% to VT	% to Other States
Berlin	72%	28%	21%	1%	1%	1%	4%
Claremont	51%	49%	33%	1%	0%	9%	5%
Colebrook	48%	53%	43%	2%	1%	2%	5%
Concord	70%	30%	21%	3%	0%	0%	6%
Derry	41%	59%	32%	18%	0%	0%	8%
Dover	46%	54%	35%	5%	4%	0%	10%
Exeter	44%	56%	35%	10%	1%	0%	9%
Franklin	29%	71%	64%	2%	1%	0%	4%
Keene	71%	29%	16%	2%	0%	4%	7%
Laconia	62%	38%	29%	2%	1%	0%	6%
Lancaster	52%	48%	40%	1%	1%	3%	3%
Lebanon	70%	30%	14%	2%	0%	6%	8%
Littleton	64%	36%	24%	1%	0%	4%	6%
Manchester	66%	34%	23%	4%	0%	0%	6%
Nashua	70%	30%	18%	7%	0%	0%	4%
North Conway	67%	33%	14%	2%	11%	0%	5%
Peterborough	50%	50%	40%	5%	0%	0%	4%
Plymouth	49%	51%	44%	2%	0%	0%	5%
Portsmouth	54%	47%	24%	7%	5%	0%	11%
Rochester	33%	67%	50%	5%	3%	0%	9%
Wolfeboro	43%	57%	44%	3%	3%	0%	6%
Woodsville	39%	62%	38%	1%	0%	18%	4%
<b>Legend:</b>	<b>= &gt; 62% of care is migrating outside of HAA.</b>						



## APPENDIX C

Percentage of Medical Service Encounters Occurring for Patients of NH Health Analysis Areas, CY 2006. Stratified by Inpatient Services, Outpatient Facility Services, and All Other Medical Services.						
Health Analysis Area	Inpatient Services		Outpatient Facility Services		All Other Medical Services	
	% Within Home HAA	% Left Home HAA	% Within Home HAA	% Left Home HAA	% Within Home HAA	% Left Home HAA
Berlin	53%	47%	86%	14%	66%	34%
Claremont	32%	68%	52%	48%	51%	49%
Colebrook	27%	73%	62%	38%	40%	60%
Concord	67%	33%	80%	20%	67%	33%
Derry	27%	73%	41%	59%	41%	59%
Dover	49%	51%	56%	44%	44%	56%
Exeter	38%	62%	50%	50%	43%	57%
Franklin	15%	85%	39%	61%	26%	74%
Keene	59%	41%	74%	26%	70%	30%
Laconia	49%	51%	72%	28%	58%	42%
Lancaster	54%	46%	69%	31%	43%	57%
Lebanon	79%	21%	87%	13%	65%	35%
Littleton	53%	47%	63%	37%	64%	36%
Manchester	68%	32%	67%	33%	66%	34%
Nashua	62%	38%	76%	24%	69%	31%
North Conway	52%	48%	75%	25%	65%	35%
Peterborough	38%	62%	63%	37%	46%	54%
Plymouth	36%	64%	53%	47%	47%	53%
Portsmouth	55%	45%	63%	37%	52%	48%
Rochester	30%	70%	50%	50%	30%	70%
Wolfeboro	30%	70%	60%	40%	37%	63%
Woodsville	42%	58%	60%	40%	28%	72%
<b>Legend:</b>	<b>= &gt; 62% of care is migrating outside of HAA.</b>					
	Due to integration Franklin and Laconia institutions, this is not highlighted in green, although the percentage of migration is over 60% in all types of encounters.					