



State of Vermont  
Agency of Administration  
Health Care Reform  
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REPORT TO THE VERMONT LEGISLATURE

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# Health Care Workforce Strategic Plan

**In accordance with Act 48, Section 12a**

*Submitted to  
The General Assembly*

*Submitted by  
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Agency of Administration*

*January 15, 2013*

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## **ACKNOWLEDGEMENTS**

Special recognition and thanks to the many individuals and organizations who provided insight and guidance to the development of this plan, including:

Members of the Workforce Development Partnership

Kaiser Permanente

Vermont Department of Education

Vermont Department of Health

Vermont Department of Labor

Vermont State Colleges

This plan was developed with consultation from Craig Stevens of JSI Research and Training Institute and financial support provided by of the Vermont Department of Health, Office of Rural Health and Primary, and the University of Vermont Area Health Education Center Program.

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## INTRODUCTION TO THE STRATEGIC WORKFORCE PLAN

Workforce planning is about “getting the right staff with the right skills in the right place at the right time.”<sup>1</sup> Obviously, this is a complex undertaking. In the Vermont context, health workforce planning becomes even more difficult, given that payment and delivery system reform is a work in progress. While such planning is difficult, it is also urgently needed if Vermont’s movement toward universal health care is to be successful. *Coverage* for care without an adequate workforce to assure *access* will result in a failure of reform.

Given this, the approach taken in this plan is a systemic one. It is not, nor can it be, a profession-by-profession delineation of recommendations. Readers should not expect a discussion of specific professions but should reflect upon how each issue, finding and recommendation applies to each profession. Recommendations set forth in this report are intended to apply all licensed and non-licensed health care professions. Where professions are specifically called out in this report, it is merely to be demonstrative of the overarching issues experienced by most health care professions. As described in detail in the Capacity Issues section, this is because we lack the data and measurements to do a profession-by-profession analysis. In this, we are not alone, either compared to other states, or to efforts nationally or even internationally. A major report on health workforce planning conducted by the King’s Fund for the National Health Service in the United Kingdom points out:

*“Our key conclusion is that no country has systematically ‘got it right’ long term in terms of its health workforce planning system. All countries occasionally have staff shortages or oversupply. . . . national policy has tended to focus more on medical workforce planning than on that of other health specialties.”*<sup>2</sup>

Nonetheless, the King’s Fund report also reports that “the system (of health workforce planning) can be improved; in particular, a process is needed that continually and robustly identifies risks and trends, and can trigger flexible responses.” That is the goal of this plan. Following the requirements outlined in Section 12a of Act 48, the plan:

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<sup>1</sup> US Department of the Interior (2001). *Workforce Planning Instruction Manual*. Washington, DC: Department of the Interior. Available at [www.doi.gov/hrm/WFPImanual.pdf](http://www.doi.gov/hrm/WFPImanual.pdf)

<sup>2</sup> Imison, C., Buchan, J., Xavier, S. *NHS Workforce Planning: Limitations and Possibilities*. The Kings Fund, 2009

- reviews issues and presents findings related to assessing the capacity of the Vermont health care workforce and examining factors that affect recruitment, retention, and practicing in Vermont, and then
- frames a series of recommendations that take into account the resources and coordination needed and available to determine strategic investment in the health workforce Vermont will require.

While this plan draws from and builds upon existing health care workforce reports it differs in its approach to examining health care workforce development as integral to successful health care reform and identifies a Workgroup with the authority to convene state agencies and stakeholders towards this end.

### **GUIDING VISION FOR THE DEVELOPMENT OF AN ADEQUATE HEALTH CARE WORKFORCE**

The State of Vermont has demonstrated a strong commitment to comprehensive health reform that includes the following components: universal coverage, a novel primary care<sup>3</sup> delivery system built on a foundation of advanced primary care practices and community health teams, strong networks of home and community based long term support services, a focus on prevention across the continuum of public health and health care delivery, a statewide health information exchange, integration and parity of mental and physical health care and a robust evaluation infrastructure to support ongoing improvement with quality and cost effectiveness as guiding principles. From policy to implementation, Vermont's reforms are designed to provide access to high quality health care for all of its residents, and to control health care costs.

As Vermont builds off of its strong foundation and continues on the path of health reform, the primary goals are to:

- Control health care costs and cost growth;
- Assure that all Vermonters have access to and coverage for high-quality health care (including mental health, physical health and substance abuse treatment);

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<sup>3</sup> For this report primary care is considered OB, Internal Medicine, Family Medicine and Pediatrics.

- Support improvements in the health of Vermont's population; and,
- Assure greater fairness and equity in how we pay for health care.

Health reform must be based in a comprehensive approach that includes not only payment reform but the infrastructure, people, and resources that are necessary to support substantial change and effective health services. Patients need reliable and ready access to high quality primary care, such as that provided through advanced primary care practices. Additionally, many patients and families need support services (both medical and non-medical) that go well beyond those that are readily available in the traditional primary care setting. This type of multi-disciplinary support has not typically been closely integrated with primary care, or available to the general population to promote health and wellness. A health information technology infrastructure is also important; it should have an architecture that supports the best services for individuals and populations, and must be capable of accomplishing this in a health care environment that consists of independent practices, service providers, and organizations. Another essential component is the Learning Health System -- a demonstrable infrastructure and a systematic approach to supporting complex change. This is particularly important when trying to guide successful change in a complex 'non-system', with so many independent and disparate interests and a deeply entrenched culture of change avoidance. The quality improvement infrastructure should include highly skilled 'change agents' and the data systems to guide an objective yet engaging process with primary care practices and other providers in the community.

Advancing and sustaining this agenda will require intense and well-coordinated work among numerous parties. The entire health care community must be involved in developing and implementing these changes. To reduce health care cost growth, a committed effort is required by multiple parties focused on better prevention of illness and disease, avoiding preventable use of health care resources and managing the care of those who have chronic illnesses or disabilities. Engagement from the public is essential too, to ensure that efforts to improve our health care system are understood, reflect the values of Vermonters, encourage Vermonters to be and stay healthy, and support strong relationships between Vermonters and their health care practitioners. Creating and sustaining a health care workforce that can achieve all of this is the vision that guides this plan and its recommendations.

## **EXECUTIVE SUMMARY**

This section presents a summary of the recommendations set forth within this plan.

Recommendations were developed through an extensive review of existing literature, analysis of local and national health care workforce data, interviews with key constituents, small group work sessions across state departments of Education, Health and Labor, and ongoing input from workforce planning advisory bodies. The full plan which follows includes Section I, the findings which support and led to the recommendations. Section II presents the complete set of recommendations with explanatory text that provides the rationale for each recommendation.

### **RECOMMENDATIONS: OVERSIGHT AND PLANNING**

- *Recommendation #1: Under the auspices of the Agency of Administration, the Secretary of Administration shall convene and staff from within the Agency a permanent health care workforce working group (Workgroup) to monitor workforce trends, develop strategic objectives and activities, direct and pursue funding for health care workforce development activities, and advise and report to the Secretary on its efforts. The Workgroup shall include state government interagency representation as well as representation from health care employers, clinicians, membership organizations, secondary and higher education, and other relevant interest groups. (The full presentation of this recommendation in Section II contains additional sub-recommendations which outline the Workgroup's charge and work plan in greater detail)*
- *Recommendation #2: The Secretary of Administration should direct the Office of Professional Regulation and other state licensing bodies to collect workforce supply data.*
- *Recommendation #3: The reporting of workforce-related planning data by health care professionals should be mandatory in order to issue licenses, certifications or registration.*

### **RECOMMENDATIONS: RECRUITMENT AND RETENTION**

- *Recommendation #4 Based upon input and documentation from the Workgroup, the Secretary of Administration should educate and work with Vermont's congressional delegation to encourage changes in how National Health Service Corp assignees are*

*placed. The delegation should work with other similarly affected states' delegations in this effort.*

- *Recommendation #5: In the selection criteria and admission of qualified students, the state college system, including the UVM Medical School and the Fletcher Allen Medical and Dental Residency Programs should include assessment of the qualities which make a student more likely to specialize in primary care and practice in rural, underserved areas.*
- *Recommendation #6: In the education and training of students in the health field, the state college system, including the UVM Medical School and Fletcher Allen Residency Program, should create a culture which promotes primary care specialties, serving disadvantaged populations and practicing in rural areas.*

#### **RECOMMENDATIONS: IMPROVING, EXPANDING AND POPULATING THE EDUCATIONAL PIPELINE**

- *Recommendation #7: The state college system, including the University of Vermont College of Medicine and the Residency Program at Fletcher Allen Health Care, should prepare health care profession students for practice in a health care reform environment (as called for by IOM, Blueprint for Health, and Act 48) through post-secondary curriculum redesign.*
- *Recommendation #8: The Department of Education and the UVM and Regional AHEC Programs should coordinate activities which increase student enrollment in AHEC health career awareness programs and expose students to health care careers through hands on experiences through programs which promote internships, externships and job placements with health profession organizations.*
- *Recommendation #9: The Department of Education should accelerate efforts to align secondary education coursework with skills necessary for entry into the field of health care and to define career paths in terms of post-secondary education requirements. These efforts should consider coursework offered K-12.*
- *Recommendation #10: The Department of Education, Department of Labor and the UVM and Regional AHEC Programs should develop continuing education opportunities for guidance counselors to better prepare them to assist students considering a career in health care.*



- *Recommendation #11: Vermont state colleges should develop career ladders by facilitating enrollment of Vermont students into health care educational programs. Strategies include but are not limited to articulation agreements and dual enrollment.*
- *Recommendation #12: Vermont state colleges and the Fletcher Allen Medical Residency program should evaluate the potential to expand enrollment in health profession education, training and residency programs.*
- *Recommendation #13: Vermont state colleges should evaluate the potential to create abbreviated education and training programs.*
- *Recommendation #14: Vermont state colleges should make easier the transition of health career students and their existing academic credits from one state college to another.*
- *Recommendation #15: Within each Vermont state college, their departments should collaborate to develop coursework where health care profession students can be educated together, allowing for interdisciplinary learning.*
- *Recommendation #16: The Department of Labor in collaboration with the UVM and Regional AHEC Programs should expand programming of its Regional Career Centers to include guidance and counseling for individuals seeking to pursue a career in health care.*
- *Recommendation #17: State programs, such as those within the Department of Education, Department of Labor, Refugee Resettlement Program and others should work with state colleges and Regional AHEC Programs to increase representation of disadvantaged and under-represented populations in health care career training and education programs.*

#### **RECOMMENDATIONS: GREEN MOUNTAIN CARE BOARD AND BLUEPRINT**

- *Recommendation #18: The Green Mountain Care Board and the Blueprint for Health should evaluate the impact of incentives and penalties for reaching workforce performance measures.*
- *Recommendation #19: The Blueprint for Health shall establish systems of care re-engineering which identify workforce needs and enable professions to work to their highest clinical ability, and provide staff dedicated to ongoing re-engineering analysis.*
- *Recommendation #20: The Blueprint for Health and Green Mountain Care Board shall commit to spreading care re-engineering innovations system-wide.*

- *Recommendation #21: In its movement toward payment reform, the Green Mountain Care Board should examine and be sensitive to its impact on health care professional pay and the potential benefit a redesigned payment mechanism can have for recruitment and retention of health care professionals.*

## **SECTION I: CURRENT WORKFORCE CAPACITY AND CAPACITY ISSUES**

Workforce capacity in its simplest terms can refer to the net result of workforce supply and demand. Capacity may also be thought of in terms of knowledge and skills, i.e. whether the workforce has the capacity to perform to a defined level of expectations or competency. Based upon these two areas of capacity, the purpose of this section is to describe the extent to which we are able to describe the supply/demand capacity as well as competency capacity of the health care workforce.

### **Capacity: Supply and Demand**

*Finding #1: Vermont specific data to describe the supply of health professions is sparsely collected and inadequate for comprehensive health care workforce planning.*

Physicians, Physician Assistants, Podiatrists, Anesthesiologist Assistants and Radiologist Assistants are licensed with the Board of Medical Practice of the Vermont Health Department.<sup>4</sup> Approximately 35 other health care professions are licensed, certified, or registered with various state agencies and regulatory bodies<sup>5</sup>. In order to understand health care workforce supply, professional regulation bodies such as the Medical Practice Board and Office of Professional

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<sup>4</sup> [http://healthvermont.gov/hc/med\\_board/application.aspx](http://healthvermont.gov/hc/med_board/application.aspx)

<sup>5</sup> [www.vtmi.info/licocc.pdf](http://www.vtmi.info/licocc.pdf) Acupuncturist, Alcohol and Drug Abuse Counselor, Anesthesiologist Assistant, Audiologist, Chiropractor, Dental Assistant, Dental Hygienist, Dentist, Dietitian, Emergency Medical Technician, Marriage and Family Therapist, Clinical Mental Health Counselor, Midwife, Naturopathic Physician, Nuclear Medicine Technologist, Advance Practice Nurse, Licensed Practical Nurse, Registered Nurse, Licensed Nursing Assistant, Occupational Therapist, Occupational Therapy Assistant, Optician, Optometrist, Osteopath, Pharmacist, Pharmacy Technician, Physical Therapist, Physical Therapist Assistant, Physician, Physician Assistant, Podiatrist, Psychoanalyst, Psychologist (PhD), Psychologist (MS), Psychotherapist, Radiation Therapist, Radiographer – General and Limited, Radiologist Assistant, Respiratory Care Practitioner, Clinical Social Worker, Speech Language Pathologist

Regulation may engage in developing a census of specific professions. While regulatory bodies are able to identify individuals licensed, certified or registered, many health professions (such as personal care attendants) and emerging health professions (such as peer counselors) are not required to be licensed, certified or registered which poses an additional barrier to collection of adequate data.

A minimum census data set attempts to collect information on an entire population<sup>6</sup> as compared to other data collection methods which target a sample of the population. In order to understand supply data, a census of the population of health care professions must be completed and a minimum data set which describes the workforce needs to be collected. A minimum census data set should include: 1) demographics, 2) education/licensure, and 3) practice characteristics including hours of patient care, specialty, and practice location<sup>7</sup>. By way of example, Table 1 outlines the specific data elements included in a minimum data set for health professionals recommended by the University of Vermont Area Health Education Center Program.

**Table 1: Minimum Data Set**

Domain	Description
Demographics	<ul style="list-style-type: none"> <li>Unique ID, place of birth, age (year of birth), gender, ethnicity, race, instate high school</li> <li>Many of these variables are included in Certification/Registration/Licensing application/re-application</li> </ul>
Education/Licensure	<ul style="list-style-type: none"> <li>Degree/highest degree, year completed, institution &amp; location of institution, first year of certification/registration/licensing, first year in Vermont, certification/registration/licensing number, specialties associated with credentials</li> <li>Some of these variables may be in Certification/Registration/Licensing application/re-application</li> </ul>
Practice Characteristics	<ul style="list-style-type: none"> <li>Answer only if practicing direct patient care/active in clinical practice in Vermont; or employment status in Vermont (active, retired, etc.); or infer instate from zip code of any practice site</li> <li>Then for one or more sites: practice specialty, hours per week, weeks per year, practice setting (hospital, ambulatory clinic, etc.), practice location (town/county; zip code), number of patient encounters per week, accepting new patients, accepting new Medicare and Medicaid patients, hospital privileges</li> <li>Additional practice characteristics specific to a profession such as number of supervising practitioners, other practitioners at the site, other questions about specialty or practice site</li> <li>This domain is vitally important to determining the actual capacity of the professional workforce</li> <li>Some of these variables may be in Certification/Registration/Licensing application/re-application</li> </ul>
Add Ons/Special Cases	<ul style="list-style-type: none"> <li>Such as having ever received state educational loan repayment or National Health Service Corps service obligation; special questions related to professions currently in critical shortage; intention to leave/reduce hours; satisfaction</li> <li>These variables are not included in Certification/Registration/Licensing application/re-application</li> </ul>

<sup>6</sup> <http://www.ons.gov.uk/ons/guide-method/census/2011/how-our-census-works/about-censuses/what-is-a-census-index.html>

<sup>7</sup> Vermont AHEC Program, Planning Vermont's Healthcare Workforce Future, September 2011

Vermont currently only has the capacity to describe the supply of physicians, physician assistants and dentists. For no other profession is a census obtained containing adequate elements of the minimum data set. As a result, workforce planning activities using supply data have been limited to these three professions, presenting a major barrier to comprehensively understanding and planning for the overall health care workforce.

*Finding #2: Evidence-based or industry-recognized benchmarks describing workforce demand do not exist for most health care professions.*

Benchmarks or industry-recognized standards describing the demand for health care professions were reviewed to understand their utility and application in planning activities. In summary, information gathered regarding health care workforce benchmarks describing demand are available nationally for primary and specialty care physicians and for dentists. Other benchmarks cited provide insight into minimum requirements or patient panel sizes but do not provide adequate information for workforce planning.

The following table represents a sampling of health care professions for which a literature review was conducted. It describes the specific profession and lists the defined benchmark and source.

**Table 2: Benchmarking Data**

Profession	Demand Data - Benchmarks		Source of Benchmarks
Primary Care Physicians	Physician: 100,000 Population Physician to population ratios for primary care & specialty areas		GMENAC, Goodman, Hicks & Glenn, Solucient <sup>8</sup>
Specialty Care Physicians	Physician to population ratios for 23 specialty areas		GMENAC, Goodman, Hicks & Glenn, Solucient
Nurse Practitioners/APRNs/PAs	NONE		N/A
Registered Nurses	Home Health	1:20-1:30 RN:Patients	VAHHS/VONL, 1998 <sup>9</sup>
	Nursing Home	Minimum	DAIL Nursing Home Regulations <sup>10</sup>

<sup>8</sup> Merritt Hawkins, A review of physician-to-population ratios. Undated

<sup>9</sup> <http://www.vahhs.com/lucie/Vonl/nursingreport.htm>

<sup>10</sup> <http://dail.vermont.gov/dail-statutes/statutes-dlp-documents/nursing-home-regulations>

Profession	Demand Data - Benchmarks		Source of Benchmarks
		Requirements 8 hours per day 7 days per week. 1:5 RN to Patients	National Nurses United <sup>11</sup>
	Hospital	1:3-1:8 RN: Patients. 1:1-1:4 RN: Patients depending on type of hospital unit.	VAHHS/VONL, 1998  National Nurses United
LiCSW	NONE		N/A
Dentists	1:4000 Primary Care Dentist to Population ratio. 1:1200 Primary Care Dentist to Patient ratio.		Bureau of Health Professions/HRSA <sup>12</sup>  Safety-net Dental Clinic Manual <sup>13</sup>
Dental Hygienists	NONE		N/A
Medical Assistants	NONE		N/A

While supply and demand data are woefully inadequate overall, two professions have both census-like supply data and nationally recognized demand standards. The following section provides an analysis and comparison of Vermont’s dentist and physician workforce capacity utilizing these existing models for demand, and supply data obtained by the Vermont Department of Health in collaboration with the Medical Practice Board and Office of Professional Regulation. Such an analysis points out the inadequacy of these models for planning purposes, especially in determining regional vs. statewide need, but they do provide measurements at least for two professions that can help inform what we need to better assess workforce needs in general.

<sup>11</sup> <http://www.nationalnursesunited.org/issues/entry/ratios>

<sup>12</sup> <http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/dentalhpsaoverview.html>

<sup>13</sup> <http://www.dentalclinicmanual.com/>

## Physician demand models

*Finding #3: Where benchmarks exist, they represent “average demand” and provide high level estimates of workforce capacity. As a result, even promising models lack the ability to account for local conditions and the effect of health reform, the impact of which on the health care workforce has yet to be fully realized. Additional data points describing access to health care professionals need to be collected and factored into promising models, such as data regarding consumer demand and access.*

Five physician demand models were examined. From the five models, the high and low demand data points were taken and analyzed utilizing Vermont’s supply data, the results of which are included in the Appendix.

Analysis of Vermont physician supply data against the low end data points from all demand models (those data points corresponding to the lowest demand for physicians) indicates that by this benchmark, the Vermont physician workforce is in a state of significant oversupply, specifically an oversupply of 232 full time equivalency physicians or 47% more physicians than this demand model estimates as adequate. On the other hand, analysis of Vermont physician supply data against the high end data points from all demand models (those data points corresponding to the highest demand for physicians) indicates that by this benchmark, the Vermont physician workforce is in a relative state of balance, with an oversupply of only 3.5 full time equivalency physicians or 1% more physicians than the demand models estimate as adequate. The “face validity” of this high end benchmark indicates it holds promise as a method to analyze physician capacity. To further test the utility of these benchmarks, the models with low end data points were eliminated and further analysis of GMENAC and Goodman’s models was conducted.

While analysis of the Goodman and GMENAC models closely resemble each other, showing overall adequacy in Vermont with maldistribution in rural areas, Goodman more uniformly estimates a higher surplus in the area of emergency medicine. Both models show a statewide oversupply in psychiatry. Given the mental health & addiction treatment facilities in Brattleboro (Brattleboro Retreat), and White River Junction (Veteran’s Hospital) and the propensity for higher concentration of psychiatrists in urban areas such as Burlington, this is understandable, but these models do not adequately allow measurement of regional shortages or surplus in psychiatry. As a result, it cannot be concluded that there is an oversupply of psychiatry and further underscores the

lack of specificity of the demand model. Of additional note is the computed undersupply of general surgeons in Burlington which is shown in both models. Overall, GMENAC produces results that we more closely would expect of Vermont's health care workforce supply and demand and, as such, is the model from which further analysis of capacity is recommended. Having said this, areas of significant shortage – such as primary care in Rutland and general surgery in Burlington – require additional analysis to determine the validity and actual extent of the shortage, and this is discussed below.

According to the 2010 Vermont Physician Survey, 100% of general surgery physicians in Burlington reported that they were taking new patients, including Medicaid and Medicare patients, which is an indicator of physician adequacy or surplus. The survey also indicates that while 87% of the primary care physicians in the Rutland area are taking new patients, only 66% are taking new Medicaid patients and only 68% are taking new Medicare patients. This indicates that there may indeed be a primary care shortage in the area, particularly for those with public insurance coverage. Data which describes the consumer experience side of demand, such as consumers having difficulty making appointments with primary care in Rutland or general surgery in Burlington, is lacking. Additional data such as this would further clarify the extent to which GMENAC is accurate and help better define the capacity of the physician workforce.

GMENAC represents a demand model based upon averages; it does not take into account other factors which would affect the demand for physician services. While promising, this model is based upon conventional systems of health care using a methodology which is almost 30 years old and does not consider the influences of a reformed health care environment. Since the development of the GMENAC benchmarks, new models of reform which impact the health care workforce have been implemented: physician specialties such as hospitalists have emerged, chronic disease management teams have developed, and there have been changes in staffing patterns – such as a reduction in hours worked per week by physicians. All of these factors influence the way workforce benchmarks should be structured. Given these changes in health care, workforce needs must be driven by emerging practice patterns and the models of care promoted under health reform. Having said this, there are still gaps in our understanding of how workforce needs will be influenced by reform. In the absence of better data, GMENAC can be used to make a case for either an oversupply or shortage, the validity of which would need further and finer analysis.

Other more anecdotal benchmarks such as vacancy rates and projected “aging-out” of the workforce are commonly used to make the case for workforce need. For the short term, these must

be taken into account. However, here caution is also called for. For long term workforce planning, reliance on such “replacement factors” will only perpetuate the workforce status quo versus the workforce that will be needed in a reformed system.

### Dentist demand models

Two dentist demand models were found through a review of literature. The Bureau of Health Professions, Shortage Designation Branch of the federal Health Resources and Services Administration sets a dentist FTE to population ratio of 25 FTEs per 100,000 population as their standard for defining the Dental Professional Shortage Areas threshold. The Safety Net Dental Clinic Manual recommends a patient panel size of 1200 patients per dentist or 83.3 FTEs per 100,000<sup>14</sup>. An analysis of the dentist supply and demand in Vermont utilizing these benchmarks and licensing data obtained by the Department of Health and Office of Professional Regulation is available in the Appendix.

The high demand model indicates a tremendous shortage of dentists, the shortage of 303.5 FTEs is larger than the actual census of dentists at 271.6 FTEs. A shortage of this magnitude would have been impossible to go unnoticed. The low demand model indicates a surplus of approximately 61 FTEs or 25% of the total dentist census. Licensing data indicates that 71% of dentists in the state take five or more new non-Medicaid patients per month versus only 27% of dentists in the state who take five or more new Medicaid patients per month. This information appears to indicate that there are access issues for Medicaid enrollees, but little is known regarding the overall consumer experience in accessing dental care. Similar to the physician demand models, while the data underscores a maldistribution of dentists, additional information is needed to understand the nature and extent of access issues vs. any shortage that may exist.

*Finding #4: Stakeholders and experts in Vermont consistently report the lack of data to engage in comprehensive and effective health care workforce development planning.*

Recognition of the paucity of data for both supply and demand is not a new concept. As early as 2001, the Blue Ribbon Commission on Nursing called for the development of an Office on

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<sup>14</sup> <http://www.dentalclinicmanual.com/index.html>



Nursing Workforce, one function of which would be to improve the data collection and workforce planning efforts for the state. Subsequent reports have also called for improvements in Vermont's capacity to plan for an adequate health care workforce through improved data collection and development of demand models relevant to Vermont. These include:

- 2005 Report of the Health Care Workforce Partnership,
- 2008 Vermont Department of Health Rural Health and Primary Care Plan,
- 2011 University of Vermont Report on the Primary Care/Mental Health Workforce,
- 2011 University of Vermont Area Health Education Center Report: State Health Care Workforce Development Plan, and
- 2012 Blue Ribbon Commission on Nursing.

To date, improved data collection has not been implemented. Having said this, existing data such as that available through the Secretary of State Office of Professional Regulation, Department of Health Medical Practice Board, UVM Area Health Education Center, Blueprint, Federally Qualified Health Centers and other health organizations should be reviewed for their utility and incorporated to the highest extent possible.

#### Workforce performance measures and continuous care redesign

*Finding #5: Current models defining health care workforce adequacy are helpful benchmarks, however they do not measure system or provider performance; this is a significant deterrent to the use of these models in isolation.*

*Finding #6: Rather than rely on health care profession FTE to population ratios to determine workforce needs. The focus should be turned to the outcomes associated with adequate and appropriate staffing.*

*Finding #7: Given the wide array of measures expected to be collected under reform, there needs to be consensus on a core set of performance measures which best define the adequacy of the health care workforce and which focus on outcomes, quality and access.*

*Finding #8: Systems of continuous care re-engineering need to be put in place in order to support ongoing efforts to improve performance indicators.*

*Finding #9: Given care re-engineering occurs at a local level, health care workforce planning should similarly have a local as well as statewide planning approach.*

Historical methods of defining workforce adequacy have typically been communicated in health care profession FTEs to population ratios. Well established demand models such as those set forth for physicians by GMENAC incorporate a multitude of considerations in determining the benchmark. Considerations such as the wellness and illness needs of the population, scope of practice, and productivity standards help to bring depth to the model and are the inputs which help the model be more responsive to the context of the provision of health care. Having said this, models such as GMENAC provide an absolute number or an average which defines workforce demand and as a result do not account for regional variations and are limited in how granular health care workforce demand can be described. For example, given the variability in scope of practice, health status, health care reimbursement and consumer patterns of accessing care, GMENAC is not responsive to the local context of the health care system. While it may be an excellent tool for high level planning at the state or national level, its shortfalls are seen when applied to smaller geographic areas. Furthermore, these models do not assert that, if the ideal ratio is met, health status and health outcomes will be good or improved. When a geographic area reaches the benchmark ratio, there should be no presumption that those health care professionals are accessible, nor performing patient care to the extent of their training and education, nor achieving health improvement performance goals.

As part of this planning project, an interview was conducted with an executive level planner for a major nationally recognized HMO to gain their insight and understand their approach to workforce planning<sup>15</sup>. As part of the conversation, their methods for managing the configuration of their health care workforce through performance measures were discussed. While they have defined panel sizes for physicians, which can be risk adjusted based upon the population, they rely on the following elements which define and determine their other health care workforce staffing:

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<sup>15</sup> Interview with Sharon Levine, Kaiser Permanente, September 14, 2012

1. Defining performance measures: The health care industry has historically had an abundance of performance measures and standards, and new standards such as those for ACA-related initiatives are being rolled out. Given the breadth of performance measures, Kaiser worked with physician leaders and agreed upon a core set of outcome, quality, access and financial indicators which provide insight into staffing needs and staffing patterns which are used throughout the system.
2. Collection of data: Requirements for the collection, reporting, exchange and sharing of data must be built into the requirements of participating in the reformed health care system so that data is available, standardized and uniform. Sophisticated data manipulation is often needed to track performance measures. Kaiser established, and required use of, data systems which enabled the collection and analysis of data.
3. Incentives and penalties: Incentives and penalties are given in respect to meeting or failing to meet identified performance measures. Kaiser has determined a set of financial incentives and penalties which are applied to physicians.
4. Care re-engineering: Care re-engineering is supported on an ongoing basis by Kaiser through a team of Quality and Operations Support Consultants. Consultants work with medical specialties to identify issues or promising innovations and support efforts to measure the impact of care re-engineering. Care re-engineering helps maximize staffing performance, enabling professionals to work to the full extent of their professional ability. An organization regularly engaged in care re-engineering may also gain important insight to changes in scope of practice which may maximize professional skills further.
5. Spread: Kaiser has a commitment to disseminating practices system-wide which demonstrate improvements in outcomes, quality, access or finances.

While this creates a system which may continuously analyze the health care workforce, the system is also based upon providing “local” flexibility. This flexibility is in the makeup and function of each health care workforce and the local teams which are created. The key provision: health care professionals within local teams are provided with a total budget and are given the flexibility to structure their staffing as they see fit as long as the performance measures are met. As a result, these types of systems see variability in their staffing patterns and allow flexibility as opposed to promoting a one size fits all staffing approach. While flexibility in staffing patterns is

provided, staffing costs still need to fit within a defined budget. As such, performance measures also include financial indicators such as operating within specified budgets.

### Capacity: Skills and Competencies

*Finding #10: Current and historical health professional training and education need to improve the integration of competencies relevant to today's health care reform environment, including new clinical competencies.*

In 2003, the Institutes of Medicine (IOM) published a book Health Professions Education: A Bridge to Quality. Building on concepts set forth in their previous report Bridging the Quality Chasm, the IOM states:

“Preparing health care professionals to take on this [reform] task requires a common vision across the professions centered on a commitment to, first and foremost, meeting patients’ needs as envisioned in the *Quality Chasm* report (Institute of Medicine, 2001). The committee recommends the following as an overarching vision for all programs and institutions engaged in the education of health professionals: *All health professionals should be educated to deliver patient-centered care as members of an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics.*

To this end, the committee proposes a set of simple, core competencies that all health clinicians should possess, regardless of their discipline, to meet the needs of the 21st-century health care system:

***Provide patient-centered care:*** Identify, respect, and care about patients’ differences, values, preferences, and expressed needs; relieve pain and suffering; coordinate continuous care; listen to, clearly inform, communicate with, and educate patients; share decision making and management; and continuously advocate disease prevention, wellness, and promotion of healthy lifestyles, including a focus on population health.

***Work in interdisciplinary teams:*** Cooperate, collaborate, communicate, and integrate care in teams to ensure that care is continuous and reliable.

***Employ evidence-based practice:*** Integrate best research with clinical expertise and patient values for optimum care, and participate in learning and research activities to the extent feasible.

***Apply quality improvement:*** Identify errors and hazards in care; understand and implement basic safety design principles, such as standardization and simplification; continually understand and measure quality of care in terms of structure, process, and outcomes in relation to patient and community needs; design and test interventions to change processes and systems of care, with the objective of improving quality.

*Utilize informatics:* Communicate, manage knowledge, mitigate error, and support decision making using information technology.”

Given the wave of health care reform activities in Vermont and nationally since the IOM report was completed, the need to adequately prepare health care professionals for the changing expectations of a reformed system hold especially true. By way of example, in May of 2011 the American Association of Colleges of Nursing, American Association of Colleges of Osteopathic Medicine, American Association of Colleges of Pharmacy, American Dental Education Association, Association of American Medical Colleges and the Association of Schools of Public Health convened an expert panel to begin defining the specific competencies needed for health care professionals based upon the five IOM competency domains. Their first document – *Competencies for Interprofessional Collaborative Practice* set the groundwork for a national movement. In June 2012 four foundations – Josiah Macy Jr. Foundation, the Robert Wood Johnson Foundation, the Gordon and Betty Moore Foundation, and The John A. Hartford Foundation committed a total of \$8.6 million to improve interprofessional education and collaborative practice. This announcement was preceded by the Health Resources and Services Administration announcement creating a National Center for Interprofessional Education and Collaborative Practice. The foundations committed to working closely with the Center to facilitate profession-wide change<sup>16</sup>.

While health professional education has not kept up with the rapidly changing reform landscape, existing health professionals similarly experience the challenge of being thrust into new systems with new arrangements and expectations without being provided the tools and competencies to assure their success. Both work with education and training systems to improve training within the pipeline as well as work with currently practicing health professionals will need to be initiated.

#### Other emerging issues

*Finding #11: The aging of the population – including aging of the workforce – will tax the supply of health care professionals and require short term, immediate interventions.*

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<sup>16</sup> <http://macyfoundation.org/news/entry/four-major-foundations-join-together-to-advance-interprofessional-health-ed>

One of the most compelling factors for the need to address health care workforce planning is the aging of the workforce and the aging of the population. Evidence shows that potential shortages of health care workforce professions will be exacerbated or created because of the aging of Vermont's professionals and the state's population. In Vermont, 40% of the physician population is over the age of 55, indicating that a significant proportion of Vermont physicians are approaching retirement age. Similarly, the mean age of Advanced Practice Registered Nurses in Vermont was 51.6 and mean age of Registered Nurses was 52 according to a 2011 survey by the University of Vermont Office of Nursing Workforce Research, Planning and Development<sup>17</sup>. Demographic information shows similar trends across the population – with the percent of individuals over the age of 55 increasing by 50.4% by 2020 – indicating significant numbers are “aging out” of the workforce. The percent of individuals 16-54 years old is decreasing 5.9% during that same time period – indicating significant workforce “replacement” issues. The aging workforce will have a major impact on supply and demand of health care professions, across disciplines and specialties, in the near term. Exacerbating this issue is that the aging of the population will result in higher demands for health care services. The percentage of people in Vermont over the age of 75 will increase 54.5%<sup>18</sup> by 2020. These individuals represent a population segment which historically has been the highest utilizers of health care services.

To put these statistics in perspective, in the next ten years, the population will be significantly aging and the number of high utilizers of health care services will be increasing. Therefore, we will need to replace 366 physicians (given that 40% of the physician workforce is 55 or over and assuming that 50% will retire by the age of 65). Similarly, professions such as nursing, home health aides and personal care attendants will have a replacement factor in the thousands. In 2006, the Vermont Department of Labor (VDOL) estimated that these three professions represent the top three occupations in terms of largest growth with increases of 1,397, 1,039 and 3,308 in new positions respectively required by 2016<sup>19</sup>. Regardless of the innovations and efficiencies which

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<sup>17</sup> [www.choosenursingvermont.org](http://www.choosenursingvermont.org)

<sup>18</sup> Harrington, P. Vermont Demographic Projections. Presentation: Vermont's Older Worker Policy Summit. November 9-11, 2008. Grafton, VT

<sup>19</sup> <http://www.vtlni.info/lmnews/lm200808.pdf>

health care reform brings, the simple fact is that short term interventions will be required to recruit health care professionals.

*Finding #12: Low salaries make recruitment and retention of some health professionals difficult.*

Interviews with stakeholders were conducted to gain a qualitative perspective regarding health care workforce and to better understand issues not available through existing data. Of widespread discussion was the notion that many health care professions, notably mental health and substance abuse professionals as well as other direct care workers (for example home health aides and personal care attendants) were difficult to recruit or retain because organizations were not able to provide competitive salaries or benefit packages. Inevitably related to reimbursement levels and payment reform efforts, these issues are beyond the scope of this workforce development study, but they must be addressed as part of delivery system and financing reforms.

*Finding #13: New health professions are emerging and new patterns of practice for existing professions are evolving to provide improved access and to utilize health professions to their highest ability. This will require emphasis on further training and continuing education.*

Similarly important to stakeholders are new and emerging professions and adaptations of existing professions. As Vermont moves towards an integrated, primary-care oriented and coordinated system, we are seeing new types of caregivers and coordinators and we are asking different competencies of professions to operate to their maximum. This will require more diversification in the training provided as well as new approaches to workforce planning.

#### Recruitment and retention issues for practicing in Vermont

*Finding #15 – Health profession schools can influence the number of students who choose primary care and who will practice in rural or underserved regions through targeted selection of students more apt to make such choices.*

*Finding #16 – Health profession schools and residency programs can influence the number of students who choose primary care and who will practice in rural or underserved regions through the provision of clinical experiences which expose them to rural and underserved populations.*

*Finding #17 – Recruitment and retention is influenced by a multiplicity of factors unique to each individual. Programs responsive to individualizing professional placements will help facilitate the recruitment and retention process.*

In 2009 the Josiah Macy Foundation, in collaboration with the American Academy of Family Physicians Center for Policy Studies published a study “What Influences Medical Student & Resident Choices?”. While focused on the physician workforce it provides important insight into recruitment and retention issues which may be common across professions. The distinguishing characteristics of this report, as compared to the body of knowledge which came before it, is that previous studies focused on attitudinal surveys of the health care workforce. In other words, students and practicing professionals were surveyed regarding what they believed would be the factors which influence where they practice and the specialty area which would be chosen. In this report, analysis of data which affected physician choice – such as debt levels, gender, marital status, place of birth, disadvantaged status, etc. – were compared to their actual choice of specialty, populations they served and geographic location where they would ultimately practice, in order to identify correlations between individual characteristics and employment disposition.

The findings differ significantly from attitudinal surveys. Attitudinal surveys often cite that debt and pay play significant roles in physician practice choice. Additionally, they report that education and training program characteristics play small roles in physician practice choices. Select findings include<sup>20</sup>:

- Students from higher socioeconomic status were less likely to incur debt and more likely to choose a specialty other than primary care.
- Students from lower socioeconomic status were more likely to incur debt, more likely to choose a primary care specialty and more likely to practice in rural or underserved areas. They were also more likely to come from rural areas or from underrepresented groups.
- Men are more likely to choose a specialty other than primary care but are more likely to practice in rural areas.
- Students participating in the National Health Service Corps were more likely to practice in a rural or underserved area.

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<sup>20</sup> Specialty and Geographic Distribution of the Physician Workforce: What influences medical student & resident choices? The Robert Graham Center: Policy Studies in Family Medicine and Primary Care. March 2009.



- Medical student training and residency programs which have a focus on providing experiential learning in rural and primary care, particularly those located in rural areas or with rural training programs, produce more primary care physicians willing to work in these areas.

Key lessons from this study include the role of medical education in the production of primary care physicians willing to practice in rural areas or with underserved populations. Given the findings, the selection of students from lower socioeconomic status and from rural and underserved communities can influence the production of primary care and service-minded individuals. Contrary to popular belief, medical schools and residency programs have significant influence in the development of an adequate primary care workforce.

While the role of debt and income in this study was not found to play the definitive deciding factor previously reported in attitudinal studies, debt and income cannot be ignored. As cited in this study, specialty care physicians still make approximately three times the salary of their primary care counterparts. While individuals from lower socioeconomic status may be more willing to take on more debt and still commit to a career in primary care, other qualified individuals from lower socioeconomic status may simply not be selecting medicine as a career choice because of their lack of resources and low tolerance for debt. Strategies such as loan repayment, loan forgiveness (through service scholarships)<sup>21</sup>, and differential pay for physicians serving in rural, underserved areas are still important considerations in recruitment and retention as well as in reducing the maldistribution of health professionals.

While the selection, training and financial support of health care professionals can greatly influence the specialty they practice, the population served and the geographic area in which they practice, there are other less influential, but important considerations in recruitment and retention efforts. These include assistance with spousal employment, the quality of schools, the housing markets, social integration and many other issues. When recruiting health care professionals, the process should include a comprehensive process of inquiry with candidates to understand their values and needs and efforts to address them.

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<sup>21</sup> Links to state and federal loan repayment programs and program descriptions are included in the Appendix.

*Finding #18 – Prior authorization requirements may be one of a multiplicity of factors which affect health professional satisfaction. However empirical evidence indicating it as a reason to initiate or cease practice does not exist.*

It is a popular belief that prior authorization and prior authorization policies can impact health professional satisfaction. However a review of literature provides no insight as to studies which indicate it is a reason for initiating or ceasing practice. This area may be of concern, yet the body of knowledge in this area is small and it may be because the practice of prior authorization is very widespread. While health care professionals may find prior authorization problematic and onerous, it is pervasive throughout the health care industry, state to state and setting to setting. Having said this, Vermont in its health care reform efforts is directly addressing the issue of prior authorization and overall administrative burden. It is likely that these efforts will prove beneficial to increasing the overall satisfaction of health care professionals and may become more important in marketing of Vermont to recruit new health care professionals.

*Finding #19 – Vermont is making significant progress towards implementing EHRs and promoting interoperability of health information.*

With a Regional Extension Center grant from Office of the National Coordinator for Health Information, Vermont Information Technology Leaders (VITL) provides electronic health record (EHR) adoption services to primary care providers in Vermont. More than eight hundred and fifty providers are participating in the program. This represents more than 85% of the primary care providers in Vermont. Seventy-eight percent of participating primary care providers (659) are using their EHRs, generating quality reports and using electronic e-prescribing. One hundred primary care providers (12%) have achieved “Meaningful Use of Certified EHR technology” as specified by the Centers for Medicaid and Medicare Services. Primary care providers at Fletcher Allen Health Care are scheduled to achieve Meaningful Use in FY 2013 Q2-Q3. This will significantly increase the primary care providers achieving meaningful use, which makes them eligible for federal funds to finance EHR systems for each physician and nurse practitioner within a practice.

VITL provides primary care providers (at no fee) with consulting services including: outreach and education, EHR implementation assistance, workflow redesign and support for achieving Meaningful Use. They also provide guidance to connect to the Vermont Health

Information Exchange (VHIE). When fully implemented, this provides practices with a capability to electronically send and receive lab orders and results, radiology orders and results, transcribed reports and clinical summaries for patients. Connecting to the VHIE also gives providers the ability to send clinical data to the Blueprint registry. All these services are available to specialists on a fee for service basis.

## **SECTION II: RECOMMENDATIONS AND INDICATORS OF SUCCESS**

### **RECOMMENDATIONS: OVERSIGHT AND PLANNING**

*Recommendation #1: Under the auspices of the Agency of Administration, the Secretary of Administration shall convene and staff from within the Agency a permanent health care workforce working group (Workgroup) to monitor workforce trends, develop strategic objectives and activities, direct and pursue funding for health care workforce development activities, and advise and report to the Secretary on its efforts. The Workgroup shall include state government interagency representation as well as representation from health care employers, clinicians, membership organizations, secondary and higher education, and other relevant interest groups.*

A Workgroup composed of stakeholders from within state government and the health care industry should be established to provide statewide direction and planning for workforce activities. This Workgroup will require multisectoral participation including health care employers, secondary and postsecondary education, relevant governmental departments (such as the Department of Labor, Department of Education and Department of Health) and nongovernmental organizations. The Workgroup should have adequate staffing and resources to carry out all the appointed functions as well as access to resources to implement programs and initiatives aimed at improving the quality, quantity and distribution of the health care workforce. The Workgroup should include, but not be limited to: directing other existing state and federally awarded funds to programs and initiatives which move the Workgroup's workforce agenda forward; coordinating activities of other state agencies and departments who also have a shared investment or role in health care workforce development; and pursuing federal or foundation grants aimed at workforce development on behalf of the state. The Secretary of Administration should establish and oversee the activities of the Workgroup.

In carrying out its responsibilities, the Workgroup shall implement the following sub-recommendations, which constitute its “job description”:

- Sub-recommendation #1a: Monitor federal and foundation funding opportunities on an ongoing basis. For each funding opportunity the Workgroup will analyze the extent to which it addresses established strategies of the Workgroup, determine the composition of Vermont stakeholders to be engaged and develop proposals as appropriate. Initial analysis of funding opportunities, such as those outlined in the Appendix, should be completed within the first six months of the Workgroup establishment.

A number of federal and foundation resources have been identified. It will be the role of the Workgroup to review these opportunities to determine the extent to which they may provide funding to accomplish activities established in this plan. Subsequently the Workgroup will be responsible for convening potential partners and pursuing funding opportunities.

- Sub-recommendation #1b: Develop short and long term workforce supply, demand and performance measures in order to conduct ongoing strategic planning which direct workforce development activities.

Given the lack of existing planning models and the uniqueness of Vermont’s health care reform efforts, it will be necessary for the Workgroup to explore new models to assist in planning for health care workforce adequacy. It will be critical to define the metrics which define adequacy, with particular attention to metrics which measure performance as opposed to metrics which solely rely on measures of volume of the workforce. This will be particularly important in fields such as mental health where a multiplicity of factors which indicate adequacy and access will need to be considered and differences in provider types (such as Vermont’s system of Designated Agencies) influence supply and demand.

Funding from outside sources or an appropriation within the state budget will be required to carry out this activity. Already the state has applied for a State Innovation Model Grant through Centers for Medicaid and Medicare Services which includes an allocation for workforce development activities such as this.

- Sub-recommendation #1c: Work with the Green Mountain Care Board (GMCB) to develop and align workforce performance measurement and data collection with overall measurements for assessing health care reform progress to assure all data collected is streamlined and not overly burdensome.

As health care workforce planning moves away from the static workforce to population ratios, performance measures will need to be identified which are indicative of workforce performance. These indicators should be selected in a joint process by policymakers as well as practicing health care professionals. The Workgroup should devise other data collection or sampling methods to collect data which more completely describes the adequacy of the health care workforce. Indicators may include health status, access, consumer and provider satisfaction, financial and other indicators. The Workgroup will convene state departments and health care stakeholders and review evidence-based and best-practices to define a common set of measures that will be utilized across all health reform initiatives.

- Sub-recommendation #1d: Work with the Green Mountain Care Board to assure that overall performance measures are reported in a unified manner and able to be exchanged or transmitted in formats which can be manipulated for data analysis.

This will require the state to define specific information technology and data requirements conducive to the collection and analysis of performance indicator data and for providers to conform to these standards.

- Sub-recommendation #1e: Work with the Department of Labor to expand the availability of internship, certificate or training programs through the provision of workforce development grants to health care employers, including leveraging existing programs within the Department.

Within health reform, professions will be asked to work to the fullest extent of their scope of practice and asked to take on new responsibilities and new roles. In addition new professions are emerging. These factors will require the development of programs which support their ongoing professional development and increasing the competencies and skill sets of the workforce. Current

programs within the Department of Labor provide models for workforce development such as the Workforce Education and Training Funds (WET Funds) and should be leveraged and expanded further in support of health care workforce efforts. WET Funds promote the creation and retention of high quality jobs and the growth of a highly skilled workforce by funding occupational skills training, internships for secondary and post-secondary students, and other specialized training activities that lead to employment with new and existing businesses.

While the existing DOL programs have been excellent in cultivating partnerships with health care employers, the Workgroup should strategically work with the Department of Labor to direct their workforce development programs to expand and further maximize their impact on health care workforce development activities.

- *Sub-recommendation #1f: Assess and make recommendations regarding of the resources available to, and number of professions eligible for, Vermont's Loan Repayment Program.*

State resources currently available for loan repayment and loan forgiveness should be analyzed to assure that they are being directed to reducing the maldistribution and to enhancing recruitment and retention of health care professionals. Better focus on providing larger, multi-year awards to secure and retain new health care professionals should be central to the program. Similar to federal resources, the state program is currently only accessible to a limited number of professions. The program should be expanded to include more resources and the flexibility to target a wider breadth of professions. Demand modeling and supply data gathered by the Workgroup will provide the foundation for directing loan repayment resources to the highest need professions and geographic areas based on priority identified over time. While it is beyond the scope of this plan to address issues of pay, an issue seen to especially affect the availability of mental health professionals, loan repayment can be a valuable tool to help reduce the debt and financial burden until efforts for reform in this area can be made.

- *Sub-recommendation #1g: Work with the UVM and Regional AHEC Programs, UVM Office of Continuing Medical Education and professional membership organizations to increase continuing education opportunities for existing health care professionals regarding how to practice in a reformed health care environment.*

Many health care professionals currently practicing in Vermont were not educated nor trained to perform to the peak of their ability in today's health care reform environment and the team-based medical home approach. During the education and training of most current practitioners, health reform was not on the horizon, or barely so, and the impact it would have on the careers of health professionals was unknown. As a result, efforts need to be made in educating existing professionals regarding the specific models of health care reform in Vermont, as well as on the Institutes of Medicine recommendations for health care professionals to be proficient in providing patient-centered care, working in interdisciplinary teams, employing evidence-based practice, utilizing informatics, and applying quality improvement. Many professions have continuing education requirements to maintain their license and as a result, every effort should be made to provide learning opportunities in these areas which also help fulfill their licensing obligations. Professional membership organizations, the University of Vermont Area Health Education Center Program and the University of Vermont College of Medicine Office of Continuing Medical Education Program which provide continuing education programs must develop a cadre of training opportunities targeting currently practicing professionals from all areas of health care. The Workgroup will request an annual report on the status of these activities from all collaborating partners. The Workgroup will encourage and support applications and requests to funding agencies for proposals by collaborating partners for this work.

- *Sub-recommendation #1h: Recommend activities to recruit health care professionals and expand community based recruitment and retention activities and national marketing of Vermont.*

Vermont's investment in workforce development and loan repayment has helped the state maintain status quo in terms of recruitment and retention; however, it does not address impending recruitment needs. Vermont competes in a national market. Investment in a strategy of national marketing and outreach is therefore needed to complement the existing system. There is no State funding being directed to national marketing and outreach to primary care clinicians. This results in Vermont communities needing to rely heavily on out-of-state, for-profit recruitment firms to meet their immediate needs. Some communities have established relationships with these firms, but others need more technical assistance and support to ensure successful recruitment than the for-

profit firms can provide. Furthermore, such marketing can help target, educate, and attract those interested in Vermont's health reform.

Investment in national marketing and outreach will develop a pool of clinicians who are not currently in Vermont but who are interested in practicing here. These clinicians will help to address the short term recruitment needs in communities throughout the state as the workforce plan efforts unfolds. Bi-State Primary Care Association's Recruitment Center is a model program which should be examined when developing this effort. It is a not for profit organization whose approach is to recruit with retention in mind. Bi-State seeks to identify clinicians who are in training or in practice outside of the state who may be connected to Vermont or who may have an interest in relocating to a rural area. Its works with the communities to identify the "right-fit" for "recruits" in terms of training, clinical, and lifestyle interests. Bi-State screens, matches, and refers clinicians to Vermont practices based on these criteria so that the practices are not wasting resources interviewing clinicians who are not interested in what the community has to offer.

Additional funding should be provided to sustain and expand activities and to conduct national marketing and outreach. Funding would support outreach such as participation in career fairs and national recruiting meetings and events, as well as visits to residency training programs outside the state. Funds would also support staffing to work with practices to track their current and projected short term vacancies. Funding from outside sources or an appropriation within the state budget will be required to carry out this activity. Already the state has applied for a State Innovation Model Grant through Centers for Medicaid and Medicare Services which includes an allocation for workforce development activities such as this.

- *Sub-recommendation #1i: Convene the Department of Education and UVM and Regional AHEC Programs to develop statewide efforts which increase the overall awareness of health care careers within secondary education.*

The field of health care is very broad and represents a wide array of professions. However, the public view is narrow. Physicians, nurses and dentists are often seen as the primary health care professions. Integration of health care career awareness can greatly expand student understanding of careers and open up student perception and introduce them to the wide variety of health care career options available. Specifically, the University of Vermont Area Health Education Center Program health career information activities should be expanded. AHEC provides health career



information through a health careers directory, school conferences, career fairs and classroom career exploration presentations to engage students in health careers discussions with a well-developed curriculum. However, current school programming by AHEC does not engage with all schools throughout the state. Expanding AHEC activities would significantly improve Vermont's ability to provide more health career activities, improve engagement with guidance staff and promote development of student health career clubs and programs.

- *Sub-recommendation #1j: Work with the Department of Labor to develop a statewide marketing campaign aimed at increasing the number of non-traditional adult students pursuing careers in health care and accessing supportive services through regional Career Resource Centers.*

Recent experiences by the University of Vermont College of Nursing include an increase in non-traditional students enrolled in their nursing program when the program expanded. Marketing and informational plans to expose non-traditional and second career students to careers in health may increase the numbers interested and enrolling in a program. The University engaged in a marketing campaign, "Be a nurse. One of life's heroes." which promoted careers in nursing. Expansion of this marketing to include print materials, collaboration with existing regional Department of Labor Career Resource Centers to inform job-seekers, public service announcements and participation in job fairs, along with a "drive-to-web" campaign and robust informational website regarding health careers, resources and educational opportunities should be developed in support of this effort.

- *Sub-recommendation #1k: Gather data and continue planning efforts in order to prioritize the long term recommendations set forth in this plan. The Workgroup shall work with state departments and other stakeholders to determine the timing and ongoing financial resources necessary to initiate and complete its long term recommendations and present to the legislature a more detailed, action-oriented plan for appropriating funds towards workforce development that enhances health care reform success for review during the 2014 legislative session. The Workgroup shall present an overview of its activities and progress to the GMCB twice annually.*

While it is understood that additional data gathering activities should occur to better understand the supply and demand of the health care workforce, the Workgroup can continue the work set forth in this plan by engaging state departments to identify the resources and further action steps necessary to fulfill the recommendations set forth.

*Recommendation #2: The Secretary of Administration should direct the Office of Professional Regulation and other state licensing bodies to collect workforce supply data.*

*Recommendation #3: The reporting of workforce-related planning data by health care professionals should be mandatory in order to issue licenses, certifications or registration.*

The Workgroup must have health care professional data which can be obtained as part of the state licensing process. Central to health care workforce planning is understanding the supply of various professions. Minimum data sets which define the volume, type and distribution of the workforce should be collected on the variety of professions for which Vermont is planning. All licensed, certified and registered professions should be accessed and surveyed through the regulatory entity overseeing their licensing, certification or registration. Collection of this data should be mandatory as part of the licensing, certification or registration process and collected at regular intervals. Attention should also be paid to those allied health and paraprofessionals not regulated and methods or strategies to enumerate and collect data for those professions should be devised. Funding from outside sources or an appropriation within the state budget will be required to carry out this activity. Already the state has applied for a State Innovation Model Grant through Centers for Medicaid and Medicare Services which includes an allocation for workforce development activities such as this.

#### **RECOMMENDATIONS: RECRUITMENT AND RETENTION**

*Recommendation #4 Based on input and documentation from the Workgroup, the Secretary of Administration should educate and work with Vermont's congressional delegation to encourage changes in how National Health Service Corp assignees are placed. The delegation should work with other similarly affected states' delegations in this effort.*

At present, federal resources are minimally accessible to health care professionals in Vermont. The National Health Service Corp (NHSC) is a case in point. The breadth of professionals eligible for federal loan repayment or forgiveness through NHSC programs is narrow; furthermore, the criteria by which resources are awarded are set very high. Because past state investments in health care and workforce development have led to significant improvements, Vermont is at a disadvantage in competing for federal resources since they are allocated based upon measures of acute need. Each year there are students enrolled at the UVM College of Medicine who become NHSC scholars with the intent of practicing in Vermont. Their scholarships obligate them to practice in a federally designated underserved area. However, given the current NHSC criteria, those students are not able to return to Vermont to fulfill their scholarship upon completion of their residency.

The situation is no less dire for accessing federal loan repayment for similar reasons. There are currently only 30 health professionals practicing in Vermont who have been able to access loan repayment. This is in sharp contrast to comparable states which have similar demographics and population size but which have many more NHSC assignees. For example, while it has the same number of areas designated as federal health professional shortage areas as Vermont, the state of Wyoming has twice the number of NHSC assignees.

Vermont should not be in a disadvantaged position because of past and ongoing commitments and investments in health care and workforce development. Instead, a minimum number of NHSC scholars should be awarded to each state, above which the remainder would be assigned competitively. Advocacy and legislation at the federal level will be necessary to change the NHSC allocation methodology. Vermont's congressional delegation will need to work with other similarly affected states' delegations to change the NHSC criteria, in order to improve the accessibility of federal resources.

*Recommendation #5: In the selection criteria and admission of qualified students, the state college system, including the UVM Medical School and the Fletcher Allen Medical and Dental Residency Programs should include assessment of the qualities which make a student more likely to specialize in primary care and practice in rural, underserved areas.*

*Recommendation #6: In the education and training of students in the health field, the state college system, including the UVM Medical School and Fletcher Allen Residency Program, should create a*

*culture which promotes primary care specialties, serving disadvantaged populations and practicing in rural areas.*

Current research has identified student qualities which are indicators of their career disposition. Similarly, intentional program offerings and the culture of education and training programs can significantly influence the career choices.<sup>22</sup> The state college system including the UVM Medical School and the Fletcher Allen Residency Program should revise their student and resident recruitment and selection criteria to enroll individuals more likely to choose a career in primary care and serve a rural or underserved population. Collaborating partners will be asked to report to the Workgroup on an annual basis regarding changes to admission review and the number and profile of students matriculated.

**RECOMMENDATIONS: IMPROVING, EXPANDING AND POPULATING THE EDUCATIONAL PIPELINE**

*Recommendation #7: The state college system, including the University of Vermont College of Medicine and the Residency Program at Fletcher Allen Health Care, should prepare health care profession students for practice in a health care reform environment (as called for by IOM, Blueprint for Health, and Act 48) through post-secondary curriculum redesign.*

In 2003, the Institutes of Medicine (IOM) published a book Health Professions Education: A Bridge to Quality which recommends competencies for developing an adequate health care workforce which should be incorporated into the current training and education within postsecondary education institutions. The concepts of providing patient-centered care; working in interdisciplinary teams; employing evidence-based practice; utilizing informatics and; applying quality improvement are universal for all professions across the nation. Postsecondary educational institutions share the responsibility for redesigning their curriculum to prepare health care students for a changed and reformed environment. Because particular weight is given to physicians as the leaders in team care and the central entity around which care is provided and coordinated, medical

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<sup>22</sup> Specialty and Geographic Distribution of the Physician Workforce: What influences medical student & resident choices? The Robert Graham Center: Policy Studies in Family Medicine and Primary Care. March 2009.

schools have particular responsibility to be ahead of the curve in curriculum redesign and reform. The state college system including the University of Vermont College of Medicine and the Residency Program at Fletcher Allen Health Care should accelerate efforts to design a curriculum which provides the foundational educational instruction as well as direct clinical experiences which best translate the Institute of Medicine principles into practice. This should be integrated with the education and training programs of other health professions to provide skills and experiences in team-based care. On an annual basis, collaborating partners will be asked to report to the Workgroup regarding their curriculum reform efforts and programs.

*Recommendation #8: The Department of Education and the UVM and Regional AHEC Programs should coordinate activities which increase student enrollment in AHEC health career awareness programs and expose students to health care careers through hands on experiences through programs which promote internships, externships and job placements with health profession organizations.*

To further inform students regarding health care careers, opportunities for direct experiential learning should be expanded. Student exposure to practicing professionals, the health care environment, and student observation of clinical application can dramatically inform and shape career choices.<sup>23</sup> Partnerships between secondary schools, postsecondary schools and health care employers need to be more widely established to create opportunities for this exposure and experience. Expansion of current AHEC programs focused on building career exposure and Department of Education collaboration will greatly impact student exposure opportunities.

AHEC MedQuest and Advanced MedQuest are week-long residential summer sessions for high school students to explore health careers. AHEC Health Careers Shadow Days are day-long explorations with a health professional in the field and AHEC CollegeQuest is a six-week summer residential program for current eleventh grade Vermont students interested in health careers, targeted specifically to disadvantaged, rural, underserved students and their families in order to support health career choice and “pathways” for training and financial resources. AHEC and the

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<sup>23</sup> Specialty and Geographic Distribution of the Physician Workforce: What influences medical student & resident choices? The Robert Graham Center: Policy Studies in Family Medicine and Primary Care. March 2009.

Department of Education will need to work together to identify and recruit eligible students and to incorporate experiential learning broadly into secondary education requirements.

*Recommendation #9: The Department of Education should accelerate efforts to align secondary education coursework with skills necessary for entry into the field of health care and to define career paths in terms of post-secondary education requirements. These efforts should consider coursework offered K-12.*

Once students have an idea of the profession, or cluster of professions, in which they are interested, it is critical that they understand the educational pathway – the courses and skills necessary – for successful preparation and entry into the field. This process of pathway development goes beyond listing the coursework necessary for preparation by delving into assuring that the courses and experiences offered provide the core competencies that adequately prepare individuals for careers in health care. The Department of Education, in collaboration with local schools will need to complete an analysis of math, science and other relevant offerings against the profession’s requirements. Subsequently, identified deficiencies would need to be remediated through curriculum redesign in order to create a pathway which best prepares students for further training and education in the field.<sup>24</sup>

*Recommendation #10: The Department of Education, Department of Labor and the UVM and Regional AHEC Programs should develop continuing education opportunities for guidance counselors to better prepare them to assist students considering a career in health care.*

AHEC should be a key partner in providing continuing education programs for guidance counselors regarding health careers, career pathways and the resources in Vermont to assist students and their success. While AHEC has had a strong focus on developing tools and materials which support secondary education, more capacity needs to be built. Given the role of guidance counselors and their efforts to assist students in identifying career options and career paths, they are critical to promoting the health professions among students.

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<sup>24</sup> Interview with Doug Webster, Vermont Department of Education, July 27, 2012

*Recommendation #11: Vermont state colleges should develop career ladders by facilitating enrollment of Vermont students into health care educational programs. Strategies include but are not limited to articulation agreements and dual enrollment.*

Ensuring success of students encompasses not only the provision of adequate information, training and resources but also breaking down barriers to bridge and transition them to the next stage of their education and career exploration. This process requires coordination and collaboration between secondary education, training programs, and postsecondary education institutions. It also requires coordination and collaboration among postsecondary education institutions as the transfers between postsecondary education should be facilitated as rigorously as transitions between secondary and postsecondary education.

Articulation agreements define the coursework and other requirements which if met, guarantee acceptance into a postsecondary education institution. Articulation agreements can help facilitate the entry of high school students into post-secondary education institutions or facilitate the movement between two year colleges and four year institutions (such as from a two year nursing program to four year nursing program). Similarly dual enrollment allows high school students to be both enrolled in secondary education and post-secondary education simultaneously. This also facilitates the transition to post-secondary education institutions as well as giving students a headstart in completing their post-secondary degree. The Department of Education should work with public schools and the state college system to develop both articulation agreements as well as dual enrollment programs. A few exist in the state but these must be expanded and spread further.

*Recommendation #12: Vermont state colleges and the Fletcher Allen Medical Residency program should evaluate the potential to expand enrollment in health profession education, training and residency programs.*

*Recommendation #13: Vermont state colleges should evaluate the potential to create abbreviated education and training programs.*

The full impact of an aging health care workforce on workforce supply is unknown, but it is plausible that the number of health care professionals educated and trained will need to be stepped up to meet demand. Health care professionals are more likely to be recruited and retained in

communities which they are from or within which they were educated and trained. Given these two factors, Vermont needs to look inward and develop plans to increase capacity to produce a larger health care workforce. Expansion of existing postsecondary education programs, by the state college system, to educate and train more professionals as well as collaboration across programs to maximize existing education and training resources will not only produce a larger supply but also increase the likelihood that they will be recruited and retained in Vermont and practice in a team-based approach.

An additional approach to broadening the capacity of health profession schools to educate and train more students is to shorten the time it takes for students to complete required education and training requirements. Programs such as New York University (NYU) are now developing programs in which physicians can complete their necessary course and clinical work in a three year period as opposed to the traditional four. The abbreviated models have explored the elimination of redundancies in their science curriculum, facilitated quicker entry into clinical training and added extra class time in the summer to produce the same high quality graduates. This approach expands the capacity to educate and train more professionals as well as reduce the potential debt students may incur. Other professions are exploring this approach which may have a significant impact on expanding the capacity of schools without overextending the school resources.<sup>25</sup>

*Recommendation #14: Vermont state colleges should make easier the transition of health career students and their existing academic credits from one state college to another.*

For those professions which have licensing standards, the professional competencies are clear and newly graduating health care professionals have to pass the same types of licensing requirements regardless of where they are educated. While post-secondary education institutions all prepare their students for these requirements, it is often difficult to transfer educational credits from one institution to another and this creates barriers to professional advancement. The same holds true

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<sup>25</sup> George Washington University School of Public Health and Health Services. Medical Education Futures Newsletter, January 3, 2013



within institutions where professionals may share a core set of competencies yet credits are not transferrable within the institution across differing colleges.

Vermont state colleges which provide programs in the field of nursing are working together to assure the transferability of credits between institutions is accomplished. This enables students the flexibility to transfer to programs conducive to their professional goals or advance their degree such as progression from a one-year Licensed Practical Nurse (LPN) to a two-year Associate Degree Registered Nurse or a four-year Bachelor Degree Registered Nurse and beyond. This model of credit transferability should be adopted and promoted. With guidance from the Workgroup, Vermont State Colleges should target high need professions and their associated educational and career ladders to develop similar credit transfer opportunities.

*Recommendation #15: Within each Vermont state college, their departments should collaborate to develop coursework where health care profession students can be educated together, allowing for interdisciplinary learning.*

In June 2010, the Macy Foundation and Carnegie Foundation hosted a workshop which convened seven universities to explore interdisciplinary education and training. Best practices such as those employed at Duke University which brings together medical, nursing, physician assistant and physical therapy students have been working for several years to promote shared learning among health professional students. Models such as this improve interdisciplinary and team-based learning and practice and provide flexibility to educate more students.

*Recommendation #16: The Department of Labor in collaboration with the UVM and Regional AHEC Programs should expand programming of its Regional Career Centers to include guidance and counseling for individuals seeking to pursue a career in health care.*

Similar to students engaged in their secondary education, individuals considering a career or a career change to the health care industry need assistance navigating the educational system. Given the breadth of available careers and abundance of training and education programs in the state, providing one-stop shopping for information, resources and referrals will reduce barriers and facilitate easier entry into a program or career in health care. With guidance from the Workgroup,

the Department of Labor should build upon the existing regional Career Resource Centers to include comprehensive information and support for job-seekers exploring careers in health care.

*Recommendation #17: State programs, such as those within the Department of Education, Department of Labor, Refugee Resettlement Program and others should work with state colleges and Regional AHEC Programs to increase representation of disadvantaged and under-represented populations in health care career training and education programs.*

While Vermont's diversity is primarily among individuals with varying socioeconomic status and rural vs. urban status, immigrants, refugees and people of color make up larger proportions of the population today. Regardless of the type of diversity, specific outreach and awareness regarding careers in health care among these populations can increase interest and ultimately representation in the workforce. State departments and programs should work with the AHEC Programs to target and recruit disadvantaged and under-represented populations to participate in the array of informational and educational activities recommended throughout this report.

#### **RECOMMENDATIONS: GREEN MOUNTAIN CARE BOARD AND BLUEPRINT**

*Recommendation #18: The Green Mountain Care Board and the Blueprint for Health should evaluate the impact of incentives and penalties for reaching workforce performance measures.*

In order to incentivize health care professionals to engage in continuous review of their workforce and performance indicators, incentives for reaching performance indicator goals and penalties for not reaching goals need to be tested and embedded in the Blueprint and GMCB payment reform pilots. These incentives and penalties should be of the scope and nature to incentivize engagement in a process of improvement.

*Recommendation #19: The Blueprint for Health shall establish systems of care re-engineering which identify workforce needs and enable professions to work to their highest clinical ability, and provide staff dedicated to ongoing re-engineering analysis.*

Most of the focus of health care workforce planning has been on the establishment of workforce to population ratios. However these ratios in no way communicate whether Vermont is achieving improved health for the public and efficiency of the health care system. While workforce to population ratios may still be used to provide guidance and shape our ideas on the supply and demand of health care professionals, we need to move to a system which defines supply and demand based upon the desired outcomes of the health care system. This system must include components which define, incentivize and support health care professionals in this process. These components are further described in the following sub-recommendations.

Support and staffing should be provided to physician practices and community health teams to review their performance measures and engage in an analysis and improvement process to meet or exceed performance measures. Efforts should be made to create innovation and go beyond expectations set forth by the performance measures.

*Recommendation #20: The Blueprint for Health and Green Mountain Care Board shall commit to spreading care re-engineering innovations system-wide.*

While this system of improvement is aimed at providing flexibility in the way in which performance measures are met, there must also be a commitment to spreading innovations that work system-wide. This commitment to spread provides assurance that high quality services are available to consumers regardless of where they seek care as well as assurance that cost efficiencies are promoted system-wide.

*Recommendation #21: In its movement toward payment reform, the Green Mountain Care Board should examine and be sensitive to its impact on health care professional pay, benefits, cost shift and the potential benefit a redesigned payment mechanism can have for recruitment and retention of health care professionals.*

Stakeholders interviewed through the process of developing this plan often cited the impact reimbursement rates and methods have on the inability to provide competitive pay to recruit and retain needed health care professionals. This is most notable in the area of personal care and mental health services. Therefore payment reform must consider mechanisms which will encourage entry, retention and practice in these professions.

## Appendix A: Analysis of Existing Physician and Dentist Demand Models

Low Estimate Model Ratio	Statewide	Barre	Bennington	Brattleboro	Burlington	Middlebury	Morrisville	Newport	Randolph	Rutland	Springfield	St. Albans	St. Johnsbury	WRJ	
	625741.0	67389.0	40138.0	32750.0	175617.0	28404.0	26010.0	28123.0	14573.0	62360.0	28664.0	44653.0	28519.0	48496.0	
Family Practice	16.2	121.5	13.7	12.8	10.7	32.6	8.9	9.2	1.5	3.0	12.2	3.1	2.7	4.3	6.9
Internal Medicine	11.3	50.0	4.7	3.1	3.8	23.7	1.4	-0.7	63.5	1.1	-0.1	2.1	0.8	1.5	5.6
Pediatrics	6.05	51.4	2.0	1.4	2.3	19.7	5.4	-0.6	2.1	2.8	1.3	2.9	6.7	1.6	4.0
Psychiatry	3.9	105.9	15.4	2.5	16.5	37.8	1.3	0.9	2.3	0.2	3.8	2.9	2.1	2.2	18.2
OB/GYN	8	9.0	0.1	1.1	0.9	8.7	0.7	-0.5	-0.6	0.3	-1.2	0.7	-0.1	1.0	-3.4
Emergency Medicine	2.6	67.9	6.8	8.1	4.4	12.9	4.9	4.1	5.5	4.2	9.2	0.3	5.3	4.0	-1.0
Urology	1.9	10.4	1.3	1.2	1.2	5.0	-0.1	0.2	-0.5	-0.1	-0.2	0.5	0.9	0.7	0.6
Neurology	1.4	19.5	0.0	1.0	0.9	14.3	-0.2	0.6	0.3	1.2	1.1	-0.1	0.0	0.6	-0.4
General Surgery	4.1	18.9	2.2	4.0	1.7	3.7	0.8	0.7	0.5	1.3	1.9	0.8	1.2	1.1	-0.9
Orthopedic Surgery	4.2	33.4	0.8	4.1	2.2	17.6	0.8	1.8	-0.1	1.0	2.4	0.0	1.1	0.8	1.1
All Primary Care		232.0	20.5	18.3	17.7	84.5	16.4	7.4	66.5	7.2	12.2	8.7	10.0	8.4	13.1

High Estimate Model Ratios	Statewide	Barre	Bennington	Brattleboro	Burlington	Middlebury	Morrisville	Newport	Randolph	Rutland	Springfield	St. Albans	St. Johnsbury	WRJ	
	625741.0	67389.0	40138.0	32750.0	175617.0	28404.0	26010.0	28123.0	14573.0	62360.0	28664.0	44653.0	28519.0	48496.0	
Family Practice	25.2	65.2	7.6	9.2	7.7	16.7	6.3	6.8	-1.0	1.7	6.6	0.5	-1.4	1.7	2.6
Internal Medicine	28.8	-59.5	-7.1	-4.0	-1.9	-7.1	-3.6	-5.3	-1.4	-1.5	-11.1	-3.0	-7.1	-3.5	-2.9
Pediatrics	13.9	2.3	-3.3	-1.8	-0.3	5.9	3.2	-2.6	-0.1	1.7	-3.6	0.6	3.2	-0.7	0.2
Psychiatry	15.9	30.8	7.3	-2.3	12.6	16.7	-2.1	-2.2	-1.1	-1.5	-3.7	-0.6	-3.3	-1.2	12.4
OB/GYN	10.17	-4.5	-1.4	0.2	0.2	4.8	0.1	-1.0	-1.3	0.0	-2.5	0.1	-1.0	0.4	-4.4
Emergency Medicine	12.4	6.6	0.2	4.1	1.2	-4.3	2.1	1.6	5.5	2.8	3.1	-2.6	1.0	1.2	-5.7
Urology	3.2	2.3	0.4	0.7	0.8	2.7	-0.5	-0.1	-0.9	-0.3	-1.0	0.1	0.3	0.3	-0.1
Neurology	2.3	13.9	-0.6	0.7	0.6	12.8	-0.5	0.4	0.1	1.1	0.6	-0.4	-0.4	0.3	-0.8
General Surgery	9.7	-16.1	-1.5	1.7	-0.2	-6.1	-0.8	-0.7	-1.0	0.5	-1.5	-0.8	-1.3	-0.5	-3.6
Orthopedic Surgery	6.2	20.9	-0.6	3.3	1.6	14.1	0.2	1.3	-0.6	0.7	1.1	-0.6	0.2	0.2	0.1
All Primary Care		3.5	-4.1	3.7	5.7	20.4	6.0	-2.1	-3.8	1.9	-10.6	-1.8	-6.3	-2.1	-4.6

GMENAC Recommended Ratios	Statewide	Barre	Bennington	Brattleboro	Burlington	Middlebury	Morrisville	Newport	Randolph	Rutland	Springfield	St. Albans	St. Johnsbury	WRJ	
	625741.0	67389.0	40138.0	32750.0	175617.0	28404.0	26010.0	28123.0	14573.0	62360.0	28664.0	44653.0	28519.0	48496.0	
Family Practice	25.2	65.2	7.6	9.2	7.7	16.7	6.3	6.8	-1.0	1.7	6.6	0.5	-1.4	1.7	2.6
Internal Medicine	28.8	-59.5	-7.1	-4.0	-1.9	-7.1	-3.6	-5.3	-1.4	-1.5	-11.1	-3.0	-7.1	-3.5	-2.9
Pediatrics	12.8	9.2	-2.5	-1.3	0.1	7.8	3.5	-2.3	0.2	1.8	-2.9	0.9	3.7	-0.4	0.7
Psychiatry	15.9	30.8	7.3	-2.3	12.6	16.7	-2.1	-2.2	-1.1	-1.5	-3.7	-0.6	-3.3	-1.2	12.4
OB/GYN	9.9	-2.8	-1.2	0.3	0.3	5.3	0.2	-1.0	-1.2	0.1	-2.4	0.2	-0.9	0.5	-4.3
Emergency Medicine	8.5	31.0	2.9	5.7	2.5	2.6	3.2	2.6	5.5	3.4	5.5	-1.4	2.7	2.3	-3.8
Urology	3.2	2.3	0.4	0.7	0.8	2.7	-0.5	-0.1	-0.9	-0.3	-1.0	0.1	0.3	0.3	-0.1
Neurology	2.3	13.9	-0.6	0.7	0.6	12.8	-0.5	0.4	0.1	1.1	0.6	-0.4	-0.4	0.3	-0.8
General Surgery	9.7	-16.1	-1.5	1.7	-0.2	-6.1	-0.8	-0.7	-1.0	0.5	-1.5	-0.8	-1.3	-0.5	-3.6
Orthopedic Surgery	6.2	20.9	-0.6	3.3	1.6	14.1	0.2	1.3	-0.6	0.7	1.1	-0.6	0.2	0.2	0.1
All Primary Care		12.1	-3.2	4.2	6.2	22.8	6.4	-1.7	-3.4	2.1	-9.7	-1.4	-5.6	-1.7	-3.9

	Goodman Model Ratios	Statewide	Barre	Bennington	Brattleboro	Burlington	Middlebury	Morrisville	Newport	Randolph	Rutland	Springfield	St. Albans	St. Johnsbury	WRJ
		625741.0	67389.0	40138.0	32750.0	175617.0	28404.0	26010.0	28123.0	14573.0	62360.0	28664.0	44653.0	28519.0	48496.0
Family Practice	N/A														
Internal Medicine	N/A														
Pediatrics	N/A														
Psychiatry	7.2	85.2	13.1	1.2	15.4	32.0	0.4	0.0	1.4	-0.2	1.7	1.9	0.6	1.2	16.6
OB/GYN	8.4	6.5	-0.2	0.9	0.7	7.9	0.6	-0.6	-0.8	0.3	-1.4	0.6	-0.3	0.9	-3.6
Emergency Medicine	2.7	67.3	6.8	8.0	4.4	12.8	4.8	4.1	5.5	4.2	9.1	0.2	5.3	3.9	-1.0
Urology	2.6	6.0	0.8	1.0	0.9	3.7	-0.3	0.0	-0.7	-0.2	-0.6	0.3	0.5	0.5	0.2
Neurology	2.1	15.2	-0.5	0.8	0.7	13.1	-0.4	0.5	0.1	1.1	0.7	-0.3	-0.3	0.4	-0.7
General Surgery	9.7	-16.1	-1.5	1.7	-0.2	-6.1	-0.8	-0.7	-1.0	0.5	-1.5	-0.8	-1.3	-0.5	-3.6
Orthopedic Surgery	5.9	22.8	-0.4	3.4	1.7	14.6	0.3	1.4	-0.6	0.7	1.3	-0.5	0.4	0.3	0.2

	High Demand Model Ratio	Statewide	Barre	Bennington	Brattleboro	Burlington	Middlebury	Morrisville	Newport	Randolph	Rutland	Springfield	St. Albans	St. Johnsbury	WRJ	
		625741.0	67389.0	40138.0	32750.0	175617.0	28404.0	26010.0	28123.0	14573.0	62360.0	28664.0	44653.0	28519.0	48496.0	
Primary Care Dentists	83.3		-303.5	-34.5	-16.6	-13.8	-76.9	-14.3	-13.6	-17.9	-8.2	-27.9	-14.7	-24.6	-15.5	-25.0

	Low Demand Model Ratio	Statewide	Barre	Bennington	Brattleboro	Burlington	Middlebury	Morrisville	Newport	Randolph	Rutland	Springfield	St. Albans	St. Johnsbury	WRJ	
		625741.0	67389.0	40138.0	32750.0	175617.0	28404.0	26010.0	28123.0	14573.0	62360.0	28664.0	44653.0	28519.0	48496.0	
Primary Care Dentists	25		61.3	4.8	6.8	5.3	25.5	2.3	1.6	-1.5	0.3	8.4	2.0	1.4	1.2	3.3

## Appendix B: Inventory of Health Care Workforce State and Federal Resources

Links to each resource has been embedded.

### **Vermont Resources**

[Vermont Educational Loan Repayment Program for Primary Care Practitioners](#)

[Vermont Educational Loan Repayment Program for Nurses](#)

[Vermont Educational Loan Repayment Program for Dentists](#)

[Vermont Educational Loan Repayment Program for Nurse Educators/Faculty](#)

[Regional Workforce Investment Funds](#)

[VSAC](#)

[Vermont Training Program](#)

### **Federal Resources**

[Nursing Education Loan Repayment Program](#)

[H-1B Technical Skills Training Grants](#)

[Indian Health Service Loan Repayment Program for Repayment of Health Professions Educational Loans](#)

[National Health Service Corps Scholarship Program](#)

[National Health Service Corps Recruitment and Retention Assistance](#)

[Residency Training in Primary Care](#)

[National Guard Healthcare Bonuses and Loans](#)

Affordable Care Act – Listing funded and unfunded workforce programs. To be included.

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