Findings of the First Year Retention Survey of the Multi-State/NHSC Retention Collaborative

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CONTENTS

EXECUTIVE SUMMARY

In the spring of 2012, directors of Primary Care Offices and other health workforce leaders in 11 states joined to form the Multi-State/NHSC Retention Collaborative. The Collaborative's first-year goal is to document and understand the retention of clinicians within their states who serve in the National Health Service Corps (NHSC) and in similar state programs, some of which are jointly funded with the NHSC. The Collaborative seeks to identify the characteristics of clinicians, their practices and their service experiences that are associated with longer retention in order to guide future efforts to enhance retention for these valuable, publically supported clinicians. The Collaborative's efforts are supported by grant funding from the NHSC.

This report provides information from an online survey commissioned by the Collaborative addressing clinicians in the NHSC Loan Repayment and Scholarship Programs as well as in six programs run by five of the 11 states. Similar data for NHSC clinicians in these 11 states are included from the 2011 NHSC Long Term Retention Study after which the 2012 survey was fashioned. Surveyed clinicians principally served in 2009 through 2012, a period when the NHSC received supplemental funding through the American Recovery and Reinvestment Act (ARRA).

In total, survey data from 1,558 clinician-respondents to these two surveys are used to characterize and contrast the backgrounds and experiences of health professionals serving in these various programs and states. Data from the 2012 survey's 996 respondents characterize the numbers that anticipate remaining in their service sites for one, two, three and up to 10 years after their service terms are completed. One-third of surveyed clinicians had already completed their service when surveyed, and many of these thus reported their actual retention.

Anticipated retention rates are calculated at several time points after service completion and compared across disciplines, demographics, practice settings and patterns of experiences while serving. Additional analyses simultaneously control for a variety of factors to identify those clinicians, practices and service experiences independently associated with plans to remain in service sites over time. Findings from the clinician survey data, augmented by data from a brief survey of PCOs and program administrators in the 11 states, are used to make recommendations to programs and states on evidence-based ways to enhance the retention of clinicians serving in these important programs.

Key Findings about Anticipated Retention

Anticipated Retention for Clinicians in Service

1. Among participants of the NHSC and state service programs combined, more than two-thirds (69%) did or anticipate remaining in their service sites at least one year beyond their service terms, nearly half (48%) anticipate remaining at least three years, and one-in-five (20%) anticipate remaining at least 10 years.
2. Among NHSC clinicians, substantially more Loan Repayment Program participants than Scholarship Program participants anticipate remaining in their sites beyond their service terms: 70% vs. 36% at one year, 35% vs. 13% at five years and 19% vs. 2% at 10 years, respectively.
    - Although there is some state-to-state variability in anticipated retention among NHSC Loan Repayors, numbers in individual states are generally too small for definitive comparisons.

3. Among state programs there is substantial variability in anticipated retention. The highest rates are in the Delaware State Loan Repayment Program (SLRP) and the Nebraska LRP: over 90% at one year, more than two-thirds at five years and more than half at 10 years.

Correlates of Anticipated Retention for All Programs Combined

4. *Characteristics of clinicians*

    - More physicians and mental health clinicians anticipate remaining in their service sites after service than nurse practitioners, physician assistants and dentists. These group differences remain even after controlling for group demographics and the types of practices where clinicians serve.
    - More clinicians who are older than 29 years, non-Hispanic White, have children and grew up and/or trained in the states where they serve anticipate remaining in their service sites than younger, minority, childless and out-of-state clinicians. These group differences remain even after controlling for any differences in disciplines and types of practices. Anticipated retention does not vary with clinicians' gender or marital status.
    - Clinicians motivated mostly by their programs' financial support are less likely to anticipate remaining in their service sites over time.

5. *Rural versus urban county setting*

    - For all programs combined, anticipated retention is not related to whether clinicians serve in rural or urban counties. However, there are rural/urban differences in anticipated retention for specific states:
        - Among NHSC Loan Repayment Program clinicians, those serving in rural counties of Kentucky and Nebraska have higher anticipated retention rates than peers serving in urban counties of their states.
        - Among participants of states' programs, anticipated retention rates are higher for those serving in the New Mexico LRP in rural counties than urban counties. Conversely, in the Alaska SHARP program anticipated retention rates are higher in urban than rural counties.

6. *Types of sites (organizations)*

    Anticipated retention is more likely for clinicians serving in rural health centers, mental health and substance abuse facilities and in prisons than for clinicians serving in Federally Qualified Health Centers, Indian Health Service or tribal sites. This remains true even after controlling for clinicians' disciplines and demographics.

7. *Clinicians' experiences in their service practices*

    - Anticipated retention is more likely for clinicians who agree with each of eight positive statements about the people, relationships and work in their service practices than for those who disagree. Similarly, anticipated retention is more likely for clinicians who report they are satisfied with each of eight aspects of their service practices than for clinicians who report they are dissatisfied.
    - When simultaneously controlling for agreement and satisfaction with all sixteen statements and aspects of their practices, the following items remain associated with higher anticipated retention rates:

- Agreeing that one is overall satisfied with the practice.
- Being satisfied with (a) the relationship with the practice administrator, (b) one's salary/income from the practice, and (c) access to specialist consultations for patients.

8. *Clinicians' and their families experiences in their service communities*
    - Anticipated retention is more likely for clinicians who have a sense of belonging in their community and who report that their spouse is happy there and that their family is not concerned about personal safety.
9. *Clinicians' experiences with their service programs*
    - Anticipated retention is more likely for clinicians who are satisfied overall with their service programs and satisfied with the contact and support they receive from the staff of their service programs.
10. *The relative importance of these many factors to anticipated retention*
    - Characteristics of clinicians, the types of organizations where they serve and their rural/urban location—the fundamental structural design elements of service programs—account for 19% of the clinician-to-clinician variation in likelihood of anticipated retention at five years.
    - Clinicians' experiences in their service practices, service communities and service programs—what happens to clinicians as they serve—account for a greater 27% of the clinician-to-clinician variation in likelihood of anticipated retention at five years.

<u>Assistance Provided by States—Data from PCOs and State Program Directors</u>

11. *The types of assistance states now provide clinicians in service*
    - Through their PCO and other state offices, states now principally help NHSC and state program applicants know about service-eligible sites and, somewhat less often, help applicants identify well-suited sites, interview and evaluate employment contracts.
    - Far fewer states provide assistance to clinicians after they have signed NHSC and state program contracts and are serving. Few states help obligated clinicians settle into their service sites, negotiate roles, avoid burnout or help spouses find suitable employment.
    - In self-rating the assistance their states provide, most respondents feel their states provide adequate personal assistance to clinicians looking for service sites but a minority feel they give enough assistance to clinicians as they serve. Only one-quarter feel their states provide enough contact and resources to make clinicians feel well-supported, and only one respondent feels that their state provides enough assistance to maximize chances of retention.

This project was conducted by investigators of the Cecil G. Sheps Center for Health Services Research at The University of North Carolina at Chapel Hill and the North Carolina Foundation for Advanced Health Programs, under guidance and leadership from Tom Rauner, PCO Director in the Nebraska Office of Rural Health and the PCO directors and health workforce leaders of the Multi-State/NHSC Collaborative's participating states.

RECOMMENDATIONS

Few of the recommendations below are new: they largely validate and only occasionally challenge the views and preferred approaches of seasoned program and site administrators. However, they have the added force of evidence from this survey, which is among the largest ever in terms of number of service programs studied, the breadth of disciplines represented and the numbers of obligated clinicians participating.

Listed below are the study's central findings, each followed by recommendations based on the findings with the goal of enhancing the retention of future obligated clinicians. The appropriateness of the recommendations should be carefully assessed for individual programs and states. Recommendations should be balanced against a program's and state's other needs and goals beyond retention, such as filling a pressing need for services of a particular discipline or for staffing a particular type of organization. The recommendations should also be weighed against the availability of other recruitment and retention approaches—apart from loan repayment—for various types of sites, disciplines and clinician subgroups.

<u>Overall Anticipated Retention in Loan Repayment and Scholarship Programs</u>

1. *Substantial numbers of clinicians participating in loan repayment programs anticipate remaining in their service sites for at least a few and often many years after their contracted service terms. Some but fewer participants of scholarship and other student programs plan to remain*.
    - Loan repayment programs are generally a good public investment with a continued payoff beyond the years of program support.
    - From a retention perspective, loan repayment programs should be emphasized over scholarship and other programs that recruit students.

<u>Recruitment and Selection of clinicians</u>

2. *Certain disciplines—physicians and mental health practitioners—anticipate remaining longer in their service sites*.
    - Emphasize or restrict program eligibility to these disciplines, as the ones that provide the longest lasting impact on communities and the greatest return for program dollars. Loan repayment may not be a cost-effective workforce redistribution approach for some disciplines.
    - Learn why and then intervene in the particular issues that challenge retention for specific disciplines. Perhaps some need additional training or special supports to fare successfully during and after their service years.
3. *Clinicians with certain demographics—those in their 30s and older, parents and non-minorities—anticipate longer retention*.
    - Prioritize these demographics in selecting among program applicants.

- Learn why and then intervene in the issues that challenge retention for individuals with certain demographics. What can help support young clinicians and minorities as they serve and afterwards?

4. *Clinicians serving in states where they grew up and/or trained anticipate longer retention*.
    - State programs should prioritize individuals with in-state ties when selecting among applicants. They should recruit aggressively in-state.
    - The NHSC should encourage clinicians interested in loan repayment to seek opportunities in their home states and then should prioritize in-state matches when making awards.
    - Among the restricted number of sites made eligible for NHSC Scholars each year, there should be several designated sites within the home or training states of each clinician anticipating placement that year.
    - States with few in-state training programs that are thus net-importers of clinicians trained elsewhere should expand in-state training programs ("grow your own").
5. *Clinicians principally motivated by a service program's mission—to bring healthcare services to an underserved population—anticipate longer retention*.
    - Prioritize this altruism in selecting among program applicants. This can be done by assessing applicants' backgrounds for evidence of a service orientation and requiring an essay in the application process through which applicants can reflect on their pasts and future careers.
    - Beware increasing a program's financial support amounts to levels that attract clinicians more interested in financial support than service.

<u>Types of Sites</u>

6. *Clinicians serving in certain types of organizations—rural health centers, mental health and substance abuse facilities and prisons—anticipate longer retention*.
    - Prioritize placements in types of sites where clinicians remain longer after their service terms.
    - Learn why and then intervene in the issues that challenge retention for clinicians in Federally Qualified Health Centers, Indian Health Service sites and tribal sites. The principal issues are likely those that affect retention for clinicians in all settings, which are the quality of clinic and personnel management, relationships, flow of work and resources, as addressed below.
    - When making awards to clinicians in low-retaining types of organizations (e.g., FQHC's), prioritize the specific clinical sites that have demonstrated successful retention. Do not make awards to sites where turnover of obligated clinicians is high.

<u>Management of Clinicians As They Serve</u>

7. *Clinicians' experiences in their service sites are central to their plans to remain in or leave after their service terms. It is unreasonable to believe that a clinician will remain working in a site where they are unhappy. Satisfaction with the practice overall and with its administration is particularly important.*

- The satisfaction of clinicians while they serve should be a priority for practices and service programs. Satisfaction should be routinely monitored and problems that arise should be promptly addressed.
- Practice administrators are in key positions to affect clinicians' satisfaction. All should know the principles of retention and be well trained in ways to engage, empower and satisfy clinicians. Skill development opportunities should be offered (or required).
- Clinicians' jobs need to be supported with competitive salaries and benefits.

8. *Clinicians' sense of fit within their communities and how well their families' needs are met by the community are important to plans to remain in service sites after service terms*.
    - Program awards should be made to clinicians proposing to serve in a community that matches theirs and their family's needs and preferences.
    - Clinician-applicants should be helped as they look for a community to serve—some may not know how to identify well-suited communities. Clinicians in training should be taught about communities and their importance to health, healthcare and to clinicians' careers.
    - Help communities learn the important role they play in clinician retention and the things they can do to promote retention. Engage community leaders.
    - Intervene early when clinicians encounter difficulties with their communities, before small problems escalate.

<u>Operations of Service Programs</u>

9. *Clinicians' experiences with their service programs—their interactions and relationships with program staff, the assistance they receive and how programs are administered—are important to their retention plans*.
    - Programs should have a customer-service and quality improvement orientation. All interactions should be friendly and supportive. Whenever possible, contract issues that arise should be handled collegially and not bureaucratically or with legal threats.
    - All program mechanics for clinicians—applications, selection, payments, fielding questions, reporting requirements—should be convenient and customer-oriented.

<u>Assistance by States to Clinicians in Service Programs</u>

10. *Through their PCOs and other state offices, states now principally help NHSC and state program applicants locate service-eligible sites. Few states provide assistance to clinicians after they have signed contracts and are serving in the NHSC and state programs—the period that is most important to retention.*

    - The reason that states now provide too little support to NHSC and state program clinicians, especially as they are serving, should be identified and addressed. It may be that state offices do not now have the mandate, funding or staffing to personally assist clinicians in service.

- The Multi-State/NHSC Retention Collaborative could serve as a "quality collaborative" through which state workforce leaders can educate and assist each other on best ways to assist clinicians and practice sites to maximize retention. Then they can together monitor progress.
- States and the NHSC should have a clear understanding of the division of responsibilities for assisting NHSC clinicians; that is, what falls to NHSC Regional Offices and what falls to states.

Retention for clinicians serving in loan repayment and other support-for-service programs has only recently begun to receive the attention it deserves. Long-term retention for clinicians who are supported for a relatively brief time in the NHSC and state service programs can multiply the value of this public investment. Data from this and other studies show that most obligated clinicians remain in their service sites for several years after their service terms are over. But the data also show that retention could be better for many programs and states.

Data suggest many ways that state and program leaders can improve retention. Retention relates to how clinicians and sites are selected into programs, how the two are matched for fit, how clinicians and their families fare during service, and how well clinicians are supported by their service programs as they serve. For NHSC clinicians, addressing these many factors will require some programmatic changes at the federal level and also stepped up and coordinated retention efforts by NHSC and state staff.

PROJECT BACKGROUND AND OVERVIEW

In July 2011, state Primary Care Offices (PCO) participating in a National Health Service Corps American Recovery and Reinvestment Act (ARRA) grant program had the opportunity to focus part of their efforts on the retention of ARRA-funded NHSC clinicians. Eleven states (see Map) pooled a portion of their grant support or contributed funds from other in-state sources to coordinate their retention efforts. The goal of these 11 states was to work together to assess retention for obligated clinicians within their states and to identify the things that states can do to maximize the retention of NHSC clinicians.

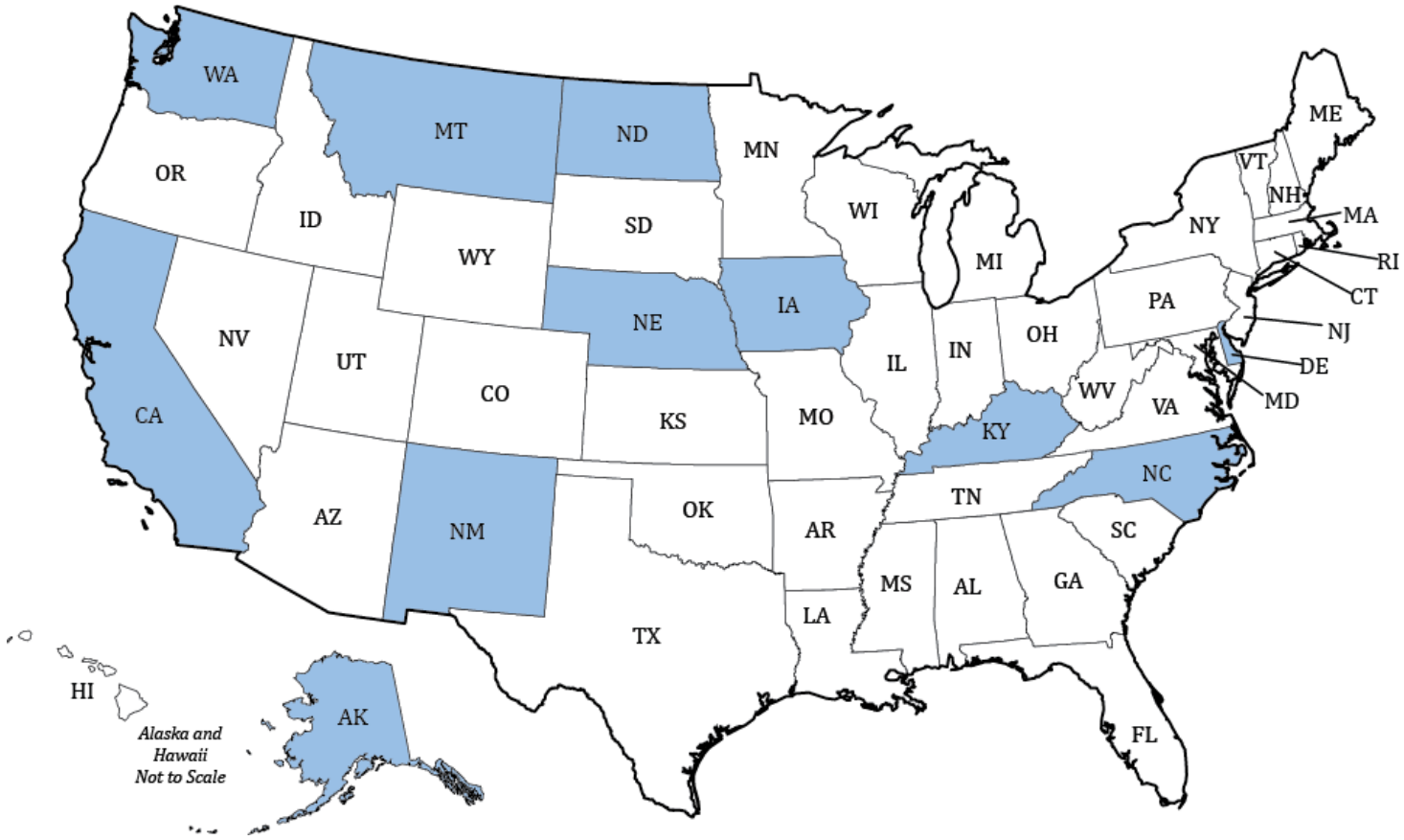
The 11 collaborating states—together called the Multi-State/NHSC Retention Collaborative—focus their joint work on the retention experiences and factors for the NHSC's recent ARRA and non-ARRA funded clinicians. Some states included retention assessments for clinicians in the loan repayment programs that they jointly fund with the NHSC ("SLRP" programs), which also received ARRA support. Some states included their similar programs supported solely with state funds. First-year joint project activities involved a survey of clinicians participating in the NHSC and state programs. The survey builds on the recently completed national NHSC Long Term Retention Survey, conducted for the NHSC by the University of North Carolina at Chapel Hill and Quality Resource Systems, Inc. of Fairfax, Virginia.

This report presents the pooled findings of the two surveys. It documents the proportions of current and recent NHSC and state-program participants who anticipate remaining in their service sites beyond their service terms for one, two and up to ten years. It identifies how clinicians' plans to continue work at their service sites in the years after their service terms are completed are associated with clinicians' disciplines, demographics, their practices and jobs, how well clinicians and their families fit in their service communities, and clinicians' experiences with their service programs. This project's goal is to provide information to help states understand the retention of their NHSC and state-program clinicians and to be able to knowledgably target their retention efforts going forward.

The second year activities of the Multi-State/NHSC Retention Collaborative will center on designing and building a longitudinal retention data gathering system that will routinely survey clinicians as they serve in loan repayment and other service programs. This system will gather survey data from clinicians 3 months after the start of their service obligations, at the end of each service year, at the end of their contracts and periodically thereafter for alumni as program staff wish. Practice administrators will also be surveyed annually. The system is scheduled to be initiated in the spring and summer of 2013.

This two-phased retention project was developed collaboratively between PCOs and other health workforce leaders of the 11 participating states and the staff of the University of North Carolina's Cecil G. Sheps Center for Health Services Research, with assistance from NHSC leadership. The North Carolina Foundation for Advanced Health Programs coordinates the activities of the collaborative. Computer, analytic and faculty staff of the Sheps Center constructed and fielded the project's online retention surveys and prepared this analytical report.

Map. States Participating in the Multi-State/NHSC Retention Collaborative and This Evaluation.



SURVEY METHODS

A. Study subjects

The subjects for this project are participants of two closely-linked surveys:

(1) The nationwide NHSC Long Term Retention Study was completed in early 2012 for the U.S. Bureau of Clinician Recruitment and Services (BCRS) by staff of UNC's Sheps Center and Quality Resource Systems, Inc. of Fairfax, Virginia. In this study, information on all NHSC clinicians who were serving as of September 2010 (ARRA Period) and September 2005 (pre-ARRA period) was obtained from the BCRS Management Information System Solution (BMISS) files of NHSC personnel. Random samples of all Scholars and Loan Repayors serving as of those dates were surveyed in the summer and fall of 2011. Up to six emailed survey invitations were sent with embedded links to the online questionnaire. Email addresses for many of the 2005/6 cohort proved to be out of date and new email addresses were found for some, but response rates for these alumni were affected. Response rates for this nationwide survey were as follows:

2010 ARRA Period			
	Loan Repayors—	54.7%	1,461 eligible respondents
	Scholars—	51.2%	265 eligible respondents
2005 Pre-ARRA Period			
	Loan Repayors—	22.6%	499 eligible respondents
	Scholars—	30.0%	120 eligible respondents

With permission from BCRS leadership, data from this earlier study for clinicians serving in the 11 states of the current evaluation (n=556) are included in this report.

(2) The survey of clinicians in the NHSC and state programs in the 11 states participating in the Multi-State/NHSC Retention Collaborative. Survey methods were closely patterned after the national study described above. BCRS staff again provided BMISS file information for all clinicians who served in the NHSC Scholarship and Loan Repayment Programs at any point from January 2006 through February 2012 in the 11 states of the Collaborative. Respondents to the earlier national study were not resurveyed, but non-respondents to the earlier survey were. Also included were clinicians not selected in the samples of the previous survey, those who began serving in the NHSC after September 2010 and those whose service fell between the previous study's 2005 and 2010 samples.

Project leaders from four states provided identity and email addresses for participants for five state-run programs: the Alaska Supporting Healthcare Access through Loan Repayment Program (SHARP), California State Loan Repayment Program, Delaware State Loan Repayment Program, Nebraska Loan Repayment Program and Nebraska Student Loan Program.

Sheps staff sent email invitations in sequential waves to NHSC participants of the 11 states and to participants of states' programs. Lists of those who had not responded to as many as six emailed invitations were provided to states' project staff, who used all available sources to locate clinicians when possible, e.g., online state licensure files, calls to practices, and available on-hand rosters. Email invitations were sent to new email addresses. When email addresses could not be confirmed, some states mailed invitations through the US Mail Service, with instructions for accessing the online survey. The survey process began in May 2012 and ran through September 17, 2012. Participants of New Mexico's Health Professional Loan Repayment Program were surveyed later than other programs and their returns were received through October 29, 2012. Because of the data's late arrival, they are included within all tables and graphs that present program-specific data but could not be incorporated into the many combined programs' summary figures and the analyses involving programs as a group.

Table. Survey sample and responses to the 2012 survey

	# Surveyed	# Responded	Response Rate
NHSC Loan Repayment			
ARRA period	1,259	626	50%
Pre-ARRA period	599	155	26%
NHSC Scholarship			
ARRA period	100	38	38%
Pre-ARRA period	146	29	20%
Alaska SHARP	38	29	76%
California State LRP	179	72	40%
Delaware State LRP	58	18	31%
Nebraska LRP	86	41	48%
Nebraska Student Loan Program	26	18	69%
New Mexico Health Professional LRP	50	33	66%
Overall	2,541	1,059	42%

Of the 1,059 respondents in 2012, 63 (6%) did not complete enough of the questionnaire and were excluded from analyses. The remaining 996 were included.

B. Questionnaire Design

The questionnaire used in the 2012 survey mirrored that used in the previous, 2011 NHSC Long Term Retention Survey. Survey items (questions) were drawn from the health professions literature and from previous retention studies conducted by the UNC Sheps project team. All items, at least in variations, had been used in previous studies. Items queried:

- clinicians' demographics and backgrounds;
- the processes by which they located a service practice
- the location and type of practice where they served
- the content of their work while serving
- their assessments and satisfaction with various aspects of their work and practice while serving
- their assessment of how the community met the needs of their spouses and children
- their assessments of their service programs

Clinicians provided start and end dates of their service contracts and any renewals; the dates they actually started and ended or anticipated ending their work in the practices where they served, including any sites they relocated to while still serving; and the location and nature of work they performed after completing their service contracts.

The questionnaire included dropdown menus wherever possible (e.g., for calendar years, states, types of practices). Questions that queried clinicians' attitudes, values and satisfaction used Likert formats, typically with five response options and neutral midpoint values.

Survey of PCOs and State Offices That Assist Obligated Clinicians. An additional questionnaire was constructed to gather information on retention-related activities carried out by state offices of the 11 states. These questionnaires were constructed *de novo* with input from potential respondents of four states. Items asked about state-led retention initiatives that target clinicians during the recruitment phase and also initiatives that target clinicians as they serve. The questionnaire was administered online in mid-September 2012. Questionnaires were completed by each state's PCO or their designee about the support that staff members provide to NHSC participants. A different state respondent reported on retention activities for clinicians of each participating state program. Retention support for participants of Nebraska's two state programs is the same and was reported in a single questionnaire. In total there were 16 respondents (100% participation).

C. Defining and Calculating Retention (Anticipated Retention)

There are many ways to define retention. Definitions can vary in (1) the time point from when measured retention terms start (e.g., from the date clinicians begin working in their service practices, when they begin their service contracts, when they complete their initial service contract, or when they complete their last service contract) and (2) in the locations that constitute "retention" (e.g., remaining within the service site, in the service community, in the service state, or in any practice that focuses on care for the underserved).

PCOs of the 11 states participating in this evaluation that had received funding from the Health Resources and Services Administration (HRSA) to assess retention of their NHSC clinicians and so they were required to define retention as within either service practices or within HPSAs. Because HPSA designations change and clinicians often cannot report accurately if they are working in a HPSA, retention in this report is reported and analyzed with respect to the years that clinicians remain in their service sites. The Collaborative opted to define retention from the time that clinicians complete their

last service contract, in part because this is how the NHSC had defined retention in its recent national retention study.

PCOs were also required by their HRSA funding to report the retention of their ARRA-supported NHSC clinicians. This influenced how retention could be defined. Most ARRA-supported clinicians were still serving when surveyed in 2011 and 2012. It cannot yet be known how long they will remain at their service sites after completing their service. Therefore instead of assessing actual, demonstrated retention, this project assesses "anticipated retention." This measure captures how many more years clinicians currently serving anticipate they will continue to work at their service sites after they complete their service contracts, including any contract renewals. Anticipated retention is an accepted and commonly used proxy for retention in worker turnover studies. Its predictive accuracy has been demonstrated for physicians.

For the majority of clinicians who were still serving when surveyed, anticipated retention was calculated as the number of months from the date that clinicians anticipate they will complete their last service contract until the date they anticipate leaving that site. For those who remained at their sites after completing service, the anticipated retention measure includes both the clinicians' actual retention (as of the survey date) as well as the number of additional years they anticipate remaining. For those who had completed their service and left their service site, actual retention duration was calculated and used in lieu of anticipated retention.

D. Analyses

This report presents a large amount of information organized to provide an overall understanding of the experiences of 1,558 clinicians serving in eight federal and state programs in 11 states, and the anticipated retention of 996 of these clinicians (those participating in the 2012 survey). Information is organized to reflect the overall situation for clinicians in all programs and all states, and also specific situations within each program and state. Accordingly, the analyses of all subsections are structured to first provide information describing the experiences and anticipated retention of participants of the NHSC's and states' programs combined, then separately for the NHSC Scholarship Program, NHSC Loan Repayors of each state and lastly participants of each state program.

In Section I, data on survey response numbers overall and by program are presented, followed by information on the number of clinicians still serving when they completed questionnaires and the number of clinicians who changed sites while serving. Through line graphs, anticipated retention information is presented showing the proportions of clinicians who anticipate that they will remain in their service sites each year up to 10 years after their service terms. Comparisons are made between clinician-participants of the various programs, and also of NHSC Loan Repayment participants of the 11 states.

Section II sequentially presents data characterizing clinicians, service practices, the fit between clinicians and communities, and clinicians' experiences in their service programs. Information is presented for individual programs and states. Race/Ethnicity was prepared as a single variable that placed those reporting White/Caucasian race and not of Hispanic ethnicity into one group, and those reporting all other races and Hispanic ethnicity into the other.

Next, clinician groups that differ on various aspects of their demographics, their practices, their community fit and their service program experiences are compared on their proportions that anticipate remaining in their service practices at two years, five years and 10 years. Chi square tests were used to assess statistical significance. For example, anticipated retention rates at each of the three time points are compared for males vs. females, the individual disciplines, those serving in various types of organizations, and those who are vs. are not satisfied with their service work.

Controlling for confounding factors. In a study in which anticipated retention is compared for groups that differ on numerous factors (e.g., disciplines, demographics, types of organizations, satisfaction, family situations), it is likely that some group differences found in anticipated retention rates do not reflect differences due to the specific characteristic being compared (e.g., female versus male gender), but rather reflect the effects of other, correlated factors (e.g., disciplines, if the disciplines differ in their gender make-up and disciplines also differ in their anticipated retention). The presence of confounding does not mean that, for example, female and male clinicians do not differ in their anticipated retention if this is what is found. However, *the reason* for this difference may not be an effect of gender itself, but due to differences in anticipated retention across the various disciplines which also differ in their gender compositions.

Section II presents analyses that adjust for several factors simultaneously in order to identify and explore complex but important relationships in the data, most importantly confounding. Understanding these relationships can affect how states and others interpret and respond to this project's findings. Specifically, logistic regression analyses test for how various features of physicians, practices, physician-community fit and service program experiences relate to anticipated retention while adjusting for other features of physicians, practices, physician-community fit and service program experiences and also for clinicians' disciplines. For example, since clinicians who are satisfied with one aspect of their work are more likely to be satisfied with other aspects of their work, analyses of the likelihood of anticipated retention with satisfaction with each aspect of clinicians' work include adjustments for their satisfaction with other aspects of their work. This report's final section goes one step further to control for many more factors all at once in order to identify the factors that independently correlate with anticipated retention at two and five years.

Human Subjects Review. This project was exempted from formal human subjects review by UNC's Office of Human Research Ethics (Study # 12-0626; letter dated 4/2/12).

FINDINGS

Section I

Numbers of Respondents and Characterization of Overall Retention

I.A. Numbers of Clinician-Respondents

Numbers of Respondents—Group Sizes (Tables I.A.1 and I.A.2)

- There are 1,558 clinician-respondents who participated in the NHSC and state-run programs in the 11 states combined. Of that total, 996 responded to the 2012 survey and 562 responded to the 2011 NHSC Long Term Retention Study.
- Of the 1,558 clinicians, 1,385 are NHSC participants, including 1,223 in the NHSC Loan Repayment Program and 162 in the NHSC Scholarship Program.
- California had the greatest number of NHSC participant-respondents (n=354) and Delaware had the fewest (n=26).
- There are 206 clinician-respondents from a total of six state-run programs from five states. Four of the six state programs have NHSC State Loan Repayment Program funding ("SLRPs"). Of the six state programs, the California State Loan Repayment Program has the most clinician-respondents (n=70) and the Delaware State Loan Repayment Program and the Nebraska Student Loan Program have the fewest (n=17 each).

Table I.A.1. Final Participant/Respondent Counts from the 11 States included in Analyses, for the NHSC Loan Repayment, NHSC Scholarship and States' Programs

	2011 Study Respondents	2012 Study Respondents	Total Respondents in Analyses
NHSC Loan Repayment	467	756	1,223
NHSC Scholarship	95	67	162
Alaska SHARP (NHSC SLRP)	--	29	29
California State Loan Repayment (NHSC SLRP)	--	70	70
Delaware State Loan Repayment (NHSC SLRP)	--	17	17
Nebraska Loan Repayment Program	--	40	40
Nebraska Student Loan Program	--	17	17
New Mexico Health Prof. LRP	--	33	33
Total	**562**	**996**	**1,558**

* NM Health Professionals LRP respondents not included in summary counts and report's group analyses

Table I.A.2. Final Participant/Respondent Counts within the NHSC Loan Repayment and NHSC Scholarship Program, by State

	NHSC Loan Repayment	NHSC Scholarship	Total NHSC
Alaska	49	8	57
California	301	53	354
Delaware	18	8	26
Iowa	64	1	65
Kentucky	108	3	111
Montana	138	7	145
North Carolina	143	19	162
North Dakota	69	1	70
Nebraska	70	0	70
New Mexico	105	33	138
Washington	158	29	187
Total	**1,223**	**162**	**1,385**

I.B. Clinicians' Service Status

Still Serving at the Time of the Survey

- When clinicians of all programs responded to surveys in 2011 and 2012, two-thirds (66.8%) were still participating in their service programs and one-third (33.2%) were no longer participating. The vast majority of clinicians no longer participating had fulfilled their service obligations.

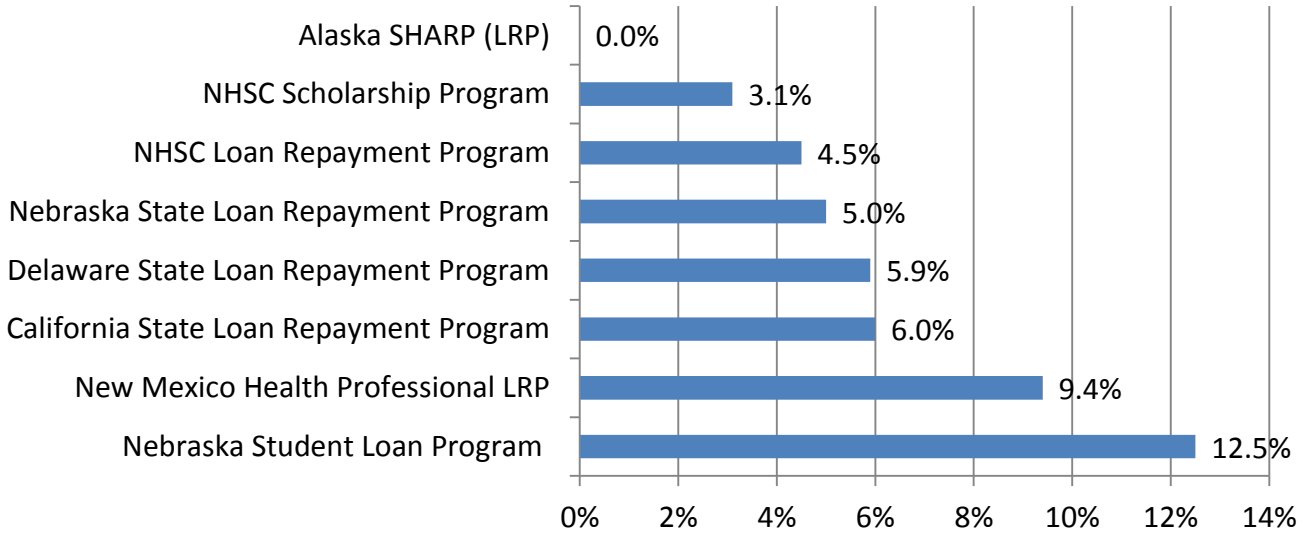
Changing Sites While Serving (Figure I.B.1)

- For all programs combined, 44 clinicians who participated in the 2012 survey (4.5%) had changed sites while serving. This included 4.7% of those who had completed their service and 4.2% of those who were still serving when they completed the survey (and for whom still more site changes would be expected).
- Among 2012 respondents, the lowest site-relocation rate was found for the Alaska SHARP Program (0%) and the highest site-relocation rate was found for the Nebraska Student Loan Program (12.5%).

Contract Renewals

- Among respondents to the 2012 survey, 33% of NHSC Loan Repayment Program participants had or intended to apply for renewal contracts and another 16% were considering doing so. Among 2012 respondents in the NHSC Scholarship program, 12% had or intended to apply for NHSC Loan Repayment and an additional 24% were considering it.
- Clinicians in states' programs varied in their renewal rates. There was somewhat more interest in renewals in California's State Loan Repayment Program (31% having already or planning to apply and 35% considering a renewal) than in the NHSC Loan Repayment Program, and less interest in Nebraska's Loan Repayment Program (5% having or planning to apply and 26% considering this). [N.B. Information about renewals for Delaware's State Loan Repayment Program and Nebraska's Student Loan Program was asked differently and cannot be reported in this way.]

Figure I.B.1. Percentage of Clinician-Participants of Each Program Who Had Changed Sites While Still Serving *



* figures based on 2012 survey respondents only (n=1,028)

I.C. Anticipated Retention

Anticipated Retention among Programs (Figures I.C.2, I.C.3, I.C.4 and I.C.5)

- Figure I.C.2 shows anticipated retention within service sites for clinician-respondents to the 2012 survey from all NHSC and state programs. Based on the dates that clinicians completed or anticipate completing their last service contract and the dates they left or anticipate leaving their service sites, more than two-thirds (69.4%) plan to remain in their service sites at least one year beyond their contracts, more than one-third (36.5%) plan to remain at least five years, and one-in-five (20.1%) plan to remain at least 10 years.
- Greater proportions of NHSC Loan Repayors than NHSC Scholars in these 11 states anticipate remaining in their service sites beyond their service terms (Figure I.C.3.). At one year the group rates are 70.1% and 35.7%, respectively; at five years rates are 35.4% and 12.5%; at 10 years respective rates are 19.3% and 1.8%.
- There is great variability among state programs and the NHSC's two programs in proportions of their clinicians that anticipate remaining in their service sites beyond their service terms (Figure I.C.4.). The highest anticipated retention rates over time were reported by clinicians of the Delaware State Loan Repayment Program and Nebraska Loan Repayment Program. The lowest anticipated retention rate was reported by clinicians of the NHSC Scholarship Program.
- Within the NHSC Loan Repayment Program, anticipated retention proportions were generally very similar across the 11 states (and not statistically different) (Figure I.C.5). Anticipated retention for Alaska's NHSC Loan Repayors was lower, but the data represent the careers of only 20 clinician-participants.

Figure I.C.2. Percentage of All 11 State Clinician-Participants (n=849) That Anticipate Remaining at Their Service Sites in Years Following Their Last Service Terms

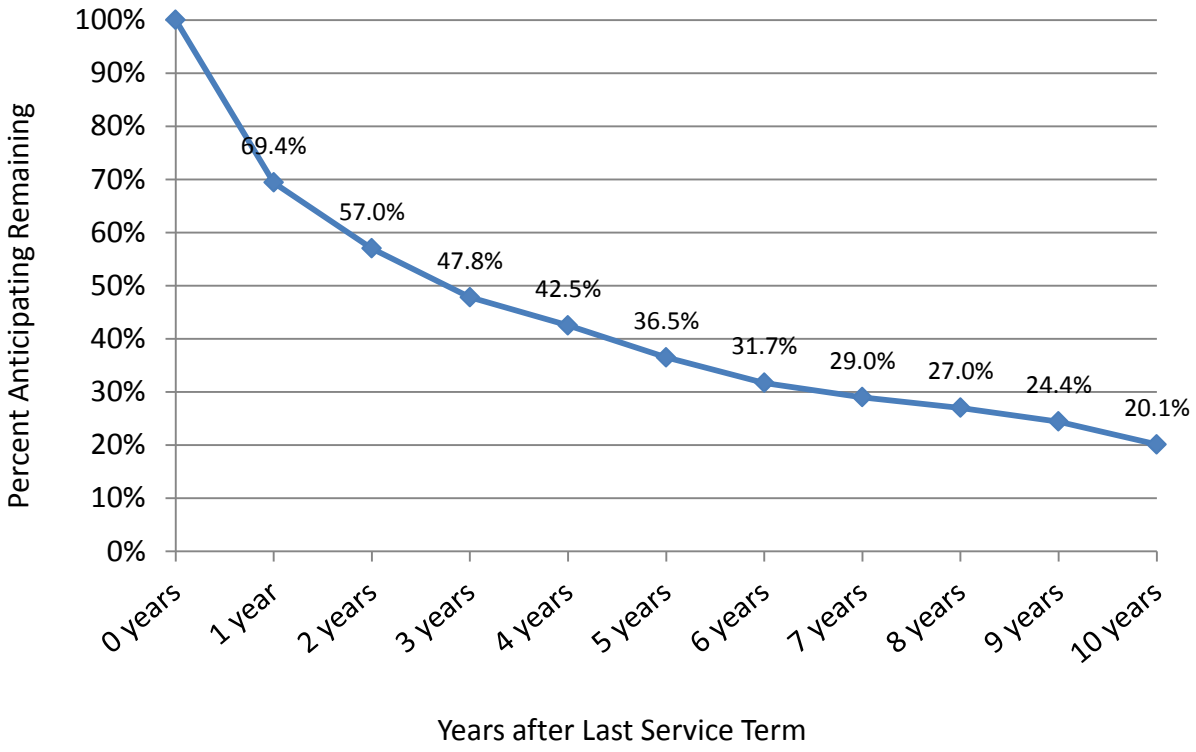


Figure I.C.3. Percentage of 11 State Clinician-Participants of the NHSC Loan Repayment (n=638) and NHSC Scholarship (n=56) Programs That Anticipate Remaining at Their Service Sites in Years Following Their Last Service Terms

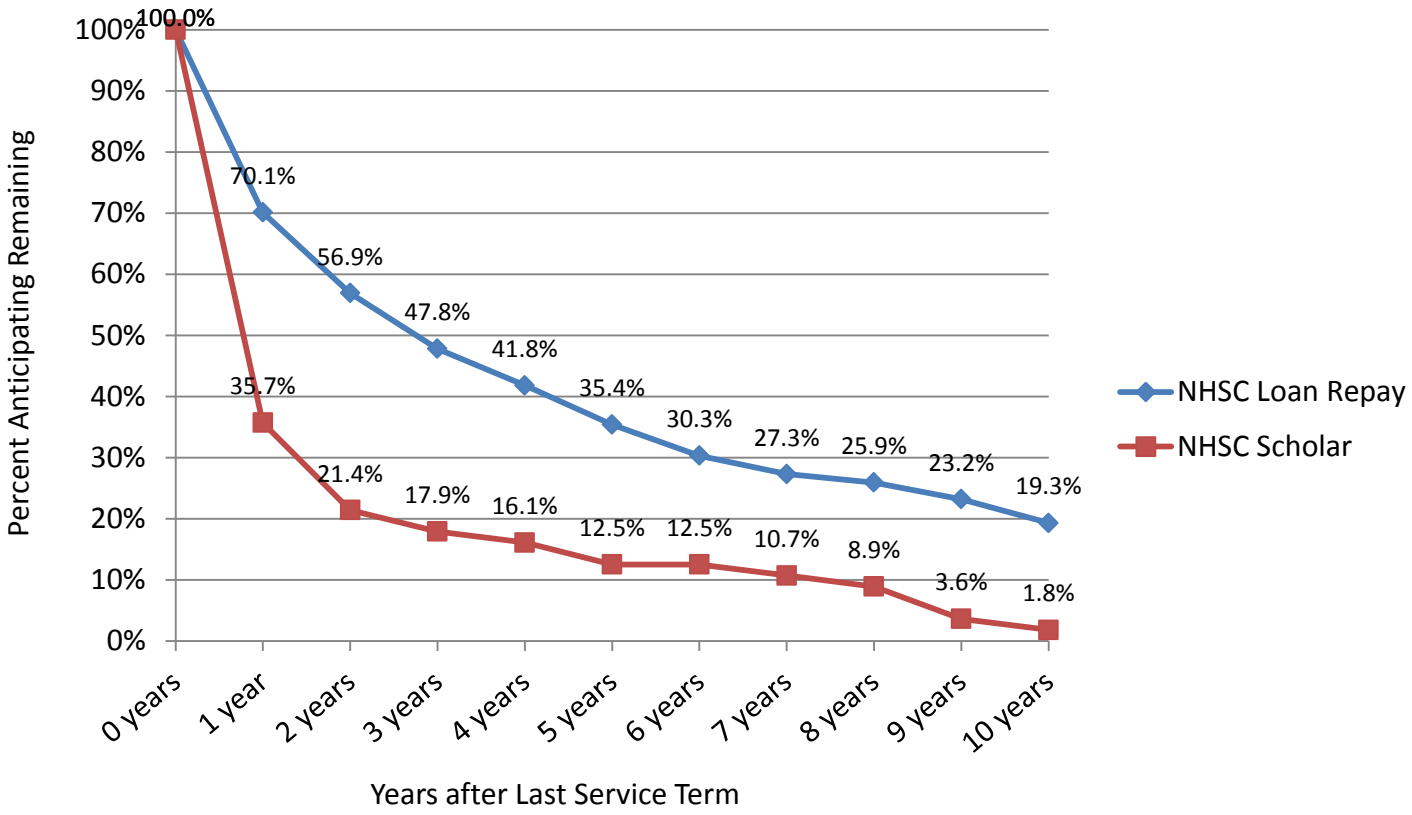
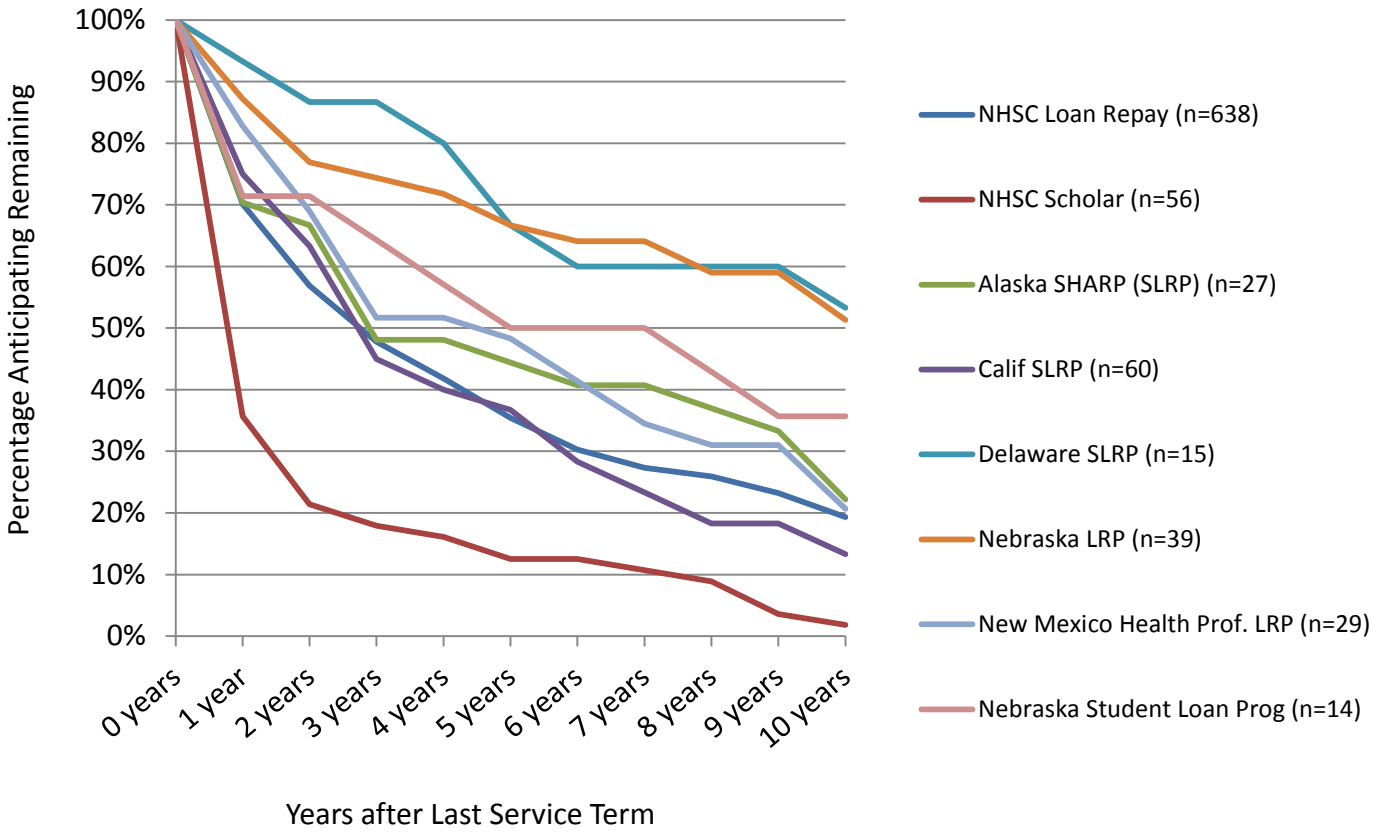
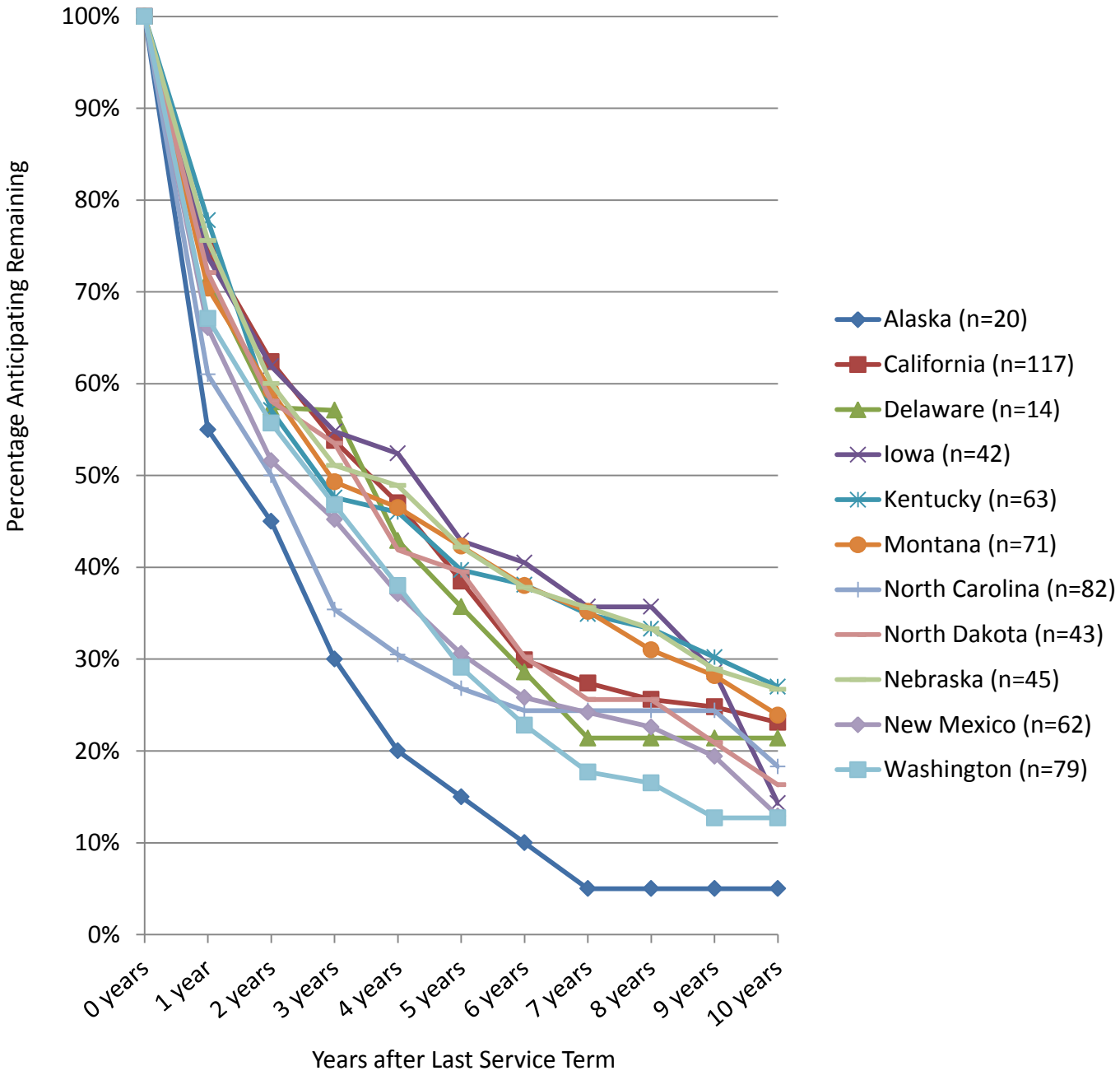


Figure I.C.4. Percentage of Clinician-Participants of the NHSC Loan Repayment and NHSC Scholarship Programs and Six State Programs That Anticipate Remaining at Their Service Sites in Years Following Their Last Service Terms



Years Past Service Term	NHSC Loan Repay (n=638)	NHSC Scholar (n=56)	Alaska SHARP (n=27)	California SLRP (n=60)	Delaware SLRP (n=15)	Nebraska LRP (n=39)	Nebraska Student Loan Prog (n=14)	New Mexico Health Prof. LRP (n=29)
0 years	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
1 year	70.1%	35.7%	70.4%	75.0%	93.3%	87.2%	71.4%	82.8%
2 years	56.9%	21.4%	66.7%	63.3%	86.7%	76.9%	71.4%	69.0%
3 years	47.8%	17.9%	48.1%	45.0%	86.7%	74.4%	64.3%	51.7%
4 years	41.8%	16.1%	48.1%	40.0%	80.0%	71.8%	57.1%	51.7%
5 years	35.4%	12.5%	44.4%	36.7%	66.7%	66.7%	50.0%	48.3%
6 years	30.3%	12.5%	40.7%	28.3%	60.0%	64.1%	50.0%	41.4%
7 years	27.3%	10.7%	40.7%	23.3%	60.0%	64.1%	50.0%	34.5%
8 years	25.9%	8.9%	37.0%	18.3%	60.0%	59.0%	42.9%	31.0%
9 years	23.2%	3.6%	33.3%	18.3%	60.0%	59.0%	35.7%	31.0.%
10 years	19.3%	1.8%	22.2%	13.3%	53.3%	51.3%	35.7%	20.7%

Figure I.C.5. Percentage of NHSC Loan Repayment Program Clinicians serving in Each of 11 States That Anticipate Remaining at Their Service Sites in Years Following Their Last Service Terms



(Counts are shown on next page)

Data for Figure I.C.5. Percentage of NHSC Loan Repayment Program Clinicians serving in Each of 11 States That Anticipate Remaining at Their Service Sites in Years Following Their Last Service Terms

Years After Last Service Term Ends	Alaska (n=20)	California (n=117)	Delaware (n=117)	Iowa (n=42)	Kentucky (n=63)	Montana (n=71)	Nebraska (n=45)	New Mexico (n=62)	North Carolina (n=82)	North Dakota (n=82)	Washington (n=79)
0 years	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
1 year	55.0%	74.4%	71.4%	73.8%	77.8%	70.4%	75.6%	66.1%	61.0%	72.1%	67.1%
2 years	45.0%	62.4%	57.4%	61.9%	57.1%	59.2%	60.0%	51.6%	50.0%	58.1%	55.7%
3 years	30.0%	53.8%	57.1%	54.8%	47.6%	49.3%	51.1%	45.2%	35.4%	53.5%	46.8%
4 years	20.0%	47.0%	42.9%	52.4%	46.0%	46.5%	48.9%	37.1%	30.5%	41.9%	38.0%
5 years	15.0%	38.5%	35.7%	42.9%	39.7%	42.3%	42.2%	30.6%	26.8%	39.5%	29.1%
6 years	10.0%	29.9%	28.6%	40.5%	38.1%	38.0%	37.8%	25.8%	24.4%	30.2%	22.8%
7 years	5.0%	27.4%	21.4%	35.7%	34.9%	35.2%	35.6%	24.2%	24.4%	25.6%	17.7%
8 years	5.0%	25.6%	21.4%	35.7%	33.3%	31.0%	33.3%	22.6%	24.4%	25.6%	16.5%
9 years	5.0%	24.8%	21.4%	28.6%	30.2%	28.2%	28.9%	19.4%	24.4%	20.9%	12.7%
10 years	5.0%	23.1%	21.4%	14.3%	27.0%	23.9%	26.7%	12.9%	18.3%	16.3%	12.7%

Findings Section II.

Characterization of Clinicians, Practices, Communities and Service Programs and Their Relationships with Anticipated Retention

II.A. Clinician Professional Disciplines

Disciplines for Programs as a Whole (Table II.A.1)

- For all programs combined, physicians made up the largest single discipline group (27.5%). Together, the other primary care disciplines (nurse practitioners, physician assistants and certified nurse midwives) comprised 29.4% of all clinicians.
- Dentists were 10.4% of survey respondents, with far fewer dental hygienists (0.9%).
- Individuals working in the mental health disciplines comprised almost one-third of all respondents, with clinical psychologists being the most numerous.

Disciplines by Program and State (Table II.A.1)

- Disciplines within the NHSC Loan Repayment Program and NHSC Scholarship Program differed significantly, principally because there were no mental health professionals in the Scholarship Program.
- Disciplines differed significantly between the state and NHSC programs and across state programs. Dentists tended to make up a greater proportion of state program workforces compared to the NHSC workforce. Some state programs had no mental health practitioners. Several state programs supported many more physicians than practitioners of other primary care disciplines.

Disciplines and Anticipated Retention

Simple (bivariate) associations (Table II.A.2)

- Substantially more physicians, psychologists, clinical social workers and other mental health professionals anticipate remaining in their service sites two years beyond service terms than do nurse practitioners, physician assistants and dentists.
- The relative anticipated retention advantage of physicians over nurse practitioners and physician assistants remains at five and 10 years post service terms.
- The proportion of dentists who anticipate remaining in their service sites increases over time relative to other disciplines. Dentists are as likely as physicians and mental health practitioners to anticipate remaining at their service sites 10 years after completing their contracts.

Associations adjusted for clinicians' disciplines (Table II.A.3)

- These findings remained unchanged when anticipated retention of all disciplines was controlled for simultaneously. Anticipated retention rates for physician assistants, nurse practitioners and dentists remained lower at two years, and anticipated retention remained lower for physician assistants and nurse practitioners at five years.
- A clinician's discipline accounts for 4.7% of the variation across clinicians in the expectation still to be working in their service sites at two years and 4.7% at five years after their service term.

Table II.A.1. Clinician Professional Discipline, by Service Program and State

	Total Number n	Physician	PA/NP/ CNM*	Dentist	Dental Hygienist	Psychologist	Other Mental Health **	Other Discipl. ***
All Programs Combined	**1558 (100%)**	**426 (27.3%)**	**458 (29.4%)**	**162 (10.4%)**	**14 (0.9%)**	**183 (11.7%)**	**301 (19.3%)**	**14 (0.9%)**
NHSC Loan Repayment (all states)	**1233**	**19.8%**	**31.3%**	**9.6%**	**1.1%**	**14.6%**	**23.5%**	**0.2%**
Alaska	49	18.4%	42.9%	8.2%	0%	2.0%	28.6%	0%
California	301	26.9%	21.9%	9.0%	0.3%	32.6%	9.3%	0%
Delaware	18	55.6%	38.9%	0%	0%	0%	5.6%	0%
Iowa	64	17.2%	25.0%	12.5%	3.1%	7.8%	32.8%	1.6%
Kentucky	108	13.0%	30.6%	3.7%	0%	13.0%	39.8%	0%
Montana	138	16.7%	31.2%	6.5%	2.2%	3.6%	39.9%	0%
Nebraska	70	11.4%	35.7%	7.1%	1.4%	10.0%	34.3%	0%
New Mexico	105	16.2%	31.4%	19.0%	3.8%	7.6%	21.9%	0%
North Carolina	143	25.2%	42.7%	8.4%	1.4%	11.9%	10.5%	0%
North Dakota	69	11.6%	33.3%	5.8%	0%	13.0%	36.2%	0%
Washington	158	15.8%	34.8%	15.8%	0%	8.9%	24.1%	0.6%
NHSC Scholarship (all states)	**162**	**58.0%**	**33.3%**	**8.6%**	**0%**	**0%**	**0%**	**0%**
State Programs								
Alaska SHARP (Loan Repayment)	29	28%	21%	21%	0%	3%	28%	0%
California State Loan Repayment	70	61%	19%	3%	0%	1%	0%	16%
Delaware State Loan Repayment	17	47%	12%	35%	6%	0%	0%	0%
Nebraska Loan Repayment	40	68%	0%	20%	0%	8%	3%	3%
Nebraska Student Loan Program	17	24%	0%	47%	0%	0%	29%	0%

* Physician Assistant, Nurse Practitioner, Certified Nurse Midwife

** Social Worker, Licensed Professional Counselor, Marriage and Family Therapist, Psychiatric Nurse Specialist, Psychiatric Nurse Pract.

*** Chiropractor, Pharmacist, Nursing Aide, "Education"

Table II.A.2. Anticipated Retention within Service Sites, by Clinician Discipline *

	Percentage That Anticipate Remaining in Service Site		
	At Least 2 Years **	**At Least 5 Years ****	**At Least 10 Years ****
Primary Care			
Physician	62.7%	43.8%	25.3%
Nurse Practitioner	45.1%	23.8%	10.7%
Physician Assistant	46.1%	25.0%	14.1%
Dental Health			
Dentist	47.1%	33.3%	23.0%
Mental Health			
Psychologist	65.6%	43.3%	24.4%
Social Worker	64.8%	46.3%	20.4%
Other Mental Health	66.1%	39.3%	19.6%

* Only discipline groups with 35 or more clinician-respondents shown

** $p \leq .05$

Table II.A.3. Anticipated Retention within Service Sites at Two and Five Years by Clinician Discipline, Controlling for Other Disciplines

	Odds Ratios** of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
Discipline		
Physician Assistant (vs. physician)	0.55*	0.43*
Nurse Practitioner (vs. physician)	0.49*	0.41*
Dentist (vs. physician)	0.54*	0.66
Psychologist (vs. physician)	1.32	1.22
Clinical Social Worker (vs. physician)	1.13	1.16
Other mental health workers (vs. physician)	1.16	0.80
Other disciplines * (vs. physician)**	1.52	1.33
Model R-Square	.047	.047

* $p \leq .05$

** Odds ratios at two or five years are the relative odds of anticipated retention of the named group (e.g., male) relative to the comparison group (e.g., female) controlling for the other listed factors. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

*** Other disciplines include midwifes, dental hygienists, pharmacists, chiropractors and nursing aides

II.B. Clinician Demographics

Demographics for Programs as a Whole (Table II.B.1)

- Of the 1,558 total clinician-respondents from the 11 states, over two-thirds (68.1%) are women and the great majority (79.4%) reported they are married or had a partner while serving.
- The median age of the clinician-respondents is 33.8 years. A total of 77.1% reported they are non-Hispanic White and 22.9% self-identify as a racial-ethnic minority.
- Just over half (51.2%) of clinicians were serving in states where they had lived before college, and just over half (54.4%) were in states where they had graduated professional school and/or residency. Two-thirds of respondents (65.2%) were serving in states where they had either grown up or trained (not shown in table).

Demographics by Program and State (Table II.B.1)

- Gender and married/partnered proportions are similar for clinicians of the NHSC Loan Repayment and NHSC Scholarship Programs. Gender and married/partnerships are also similar for NHSC Loan Repayment participants across the 11 states.
- State-run programs show greater variation in their gender and married/partnered proportions. For only one program (California State Loan Repayment) are fewer than half of the participants female. Four state programs have more than 90% of participants married or in partnerships.
- Median age varies from 28.3 to 35.5 years for the various NHSC and state programs. There is less variation across states in the age of their NHSC Loan Repayment Program participants (31.9 to 35.3).
- States vary significantly in their proportions of NHSC Loan Repayors and state program participants who are non-Hispanic White versus racial-ethnic minority. In the NHSC Loan Repayment Program, Non-Hispanic White proportions are highest in Iowa, Kentucky, Montana and North Dakota and lowest in Delaware, New Mexico and California.
- Programs vary greatly in the proportions of their clinicians who had grown up or trained within the states where they serve. Clinicians in the NHSC Scholarship Program are significantly less likely than clinicians of the NHSC Loan Repayment Program to be serving in states where they were raised or trained. States vary greatly in the percentages of their NHSC Loan Repayors who were raised or trained in-state. For example, three-quarters of California's and Kentucky's NHSC Loan Repayors trained in-state whereas less than 10% in Alaska did. State-run programs also vary greatly in the proportions of clinicians serving in the state where they grew up or trained.

Demographics and Anticipated Retention

Simple (bivariate) associations (Table II.B.2)

- Some but not all demographics are associated with clinicians' anticipation of remaining in their service sites over time.
- Younger clinicians (under 30 years) are less likely than older clinicians to believe they will still be working in their service sites two and five years after their service terms.
- Non-Hispanic White clinicians are more likely than racial-ethnic minorities to anticipate remaining at their service sites in the future.

- Married/partnered clinicians are more likely than single clinicians to believe they will still be working at their service sites with time.
- Anticipated retention is greater for clinicians serving in states where they had grown up or in states where they graduated from professional school and/or residency.

Associations adjusted for all demographics and clinicians' disciplines (Table II.B.3)

- These findings remained essentially unchanged when controlling for the anticipated retention likelihood of all demographic factors as well as for clinicians' disciplines
- A clinician's demographics and discipline account for 12.1% of the variation across clinicians in the expectation still to be working in their service sites at two years and 13.5% at five years after their service term.

Table II.B.1. Clinician Demographics, by Service Program and State

	Total Number (n)	Female (%)	Age (median years)	White, non-Hispanic (%)	Married or Partnered (%)	Served in State S/he Grew Up * (%)	Served in State S/he Trained ** (%)
All Programs Combined	**1,558**	**68.1%**	**33.8**	**77.1%**	**79.4%**	**51.2%**	**54.4%**
NHSC Loan Repayment (all states)	**1,223**	**69.9%**	**34.3**	**79.0%**	**79.6%**	**53.0%**	**55.4%**
Alaska	49	61%	32.3	88.6%	75%	18.8%	8.2%
California	301	67%	35.3	58.8%	76%	62.2%	76.5%
Delaware	18	83%	33.0	66.7%	67%	16.7%	16.7%
Iowa	64	68%	33.5	96.7%	85%	60.9%	43.8%
Kentucky	108	79%	35.8	97.2%	79%	69.9%	75.9%
Montana	138	66%	34.4	96.3%	81%	59.1%	46.3%
Nebraska	70	77%	32.4	88.2%	79%	66.7%	62.3%
New Mexico	105	72%	34.8	67.3%	82%	39.6%	36.5%
North Carolina	143	69%	33.2	72.8%	83%	32.8%	48.2%
North Dakota	69	70%	31.9	93.9%	76%	65.2%	53.6%
Washington	158	70%	34.3	84.4%	84%	46.1%	50.0%
NHSC Scholarship (all states)	**162**	**64.3%**	**31.5**	**68.6%**	**77.4%**	**26.5%**	**33.8%**
State Programs							
Alaska SHARP (Loan Repay)	29	51.7%	35.5	89.7%	75.9%	27.6%	24.1%
California State Loan Repayment	70	45.6%	35.1	42.6%	69.1%	61.9%	75.7%
Delaware State Loan Repayment	17	76.5%	31.3	64.7%	94.1%	35.3%	43.8%
Nebraska Loan Repayment	40	70.0%	30.6	97.5%	92.5%	83.8%	75.0%
Nebraska Student Loan Program	17	81.3%	28.3	100%	93.8%	94.1%	100%
New Mexico Health Prof LRP	33	59.4%	32.0	53.1%	93.8%	45.5%	36.4%

* In state where the clinician reports s/he "live[d] most of your years before college."

** In state where the clinician reports s/he graduated professional school and/or completed residency.

Table II.B.2. Anticipated Retention within Service Sites by Clinician Demographics

	Percentage That Anticipate Remaining in Service Site		
	At Least 2 Years	**At Least 5 Years**	**At Least 10 Years**
Gender			
Female	56.3%	35.2%	20.0%
Male	58.3%	40.2%	20.8%
Age (years)			
24-29	39.8% *	22.9% *	14.5%
30-34	58.1%	38.2%	22.1%
35-39	63.5%	37.2%	24.4%
40-61	63.9%	43.8%	20.2%
Race-Ethnicity			
Non-Hispanic White	58.9% *	39.4% *	22.2% *
Minority	49.5%	26.8%	13.7%
Marital Status			
Married/Partnered	57.7%	38.6% *	21.7% *
Single	53.1%	27.5%	13.1%
Served in state where s/he grew up			
Yes	61.6% *	41.7% *	24.5% *
No	51.5%	31.1%	15.7%
Served in state where s/he trained			
Yes	63.3% *	41.0% *	22.1%
No	49.5%	31.0%	17.4%

* $p \leq .05$

Table II.B.3. Anticipated Retention within Service Sites at Two and Five Years by Clinician Demographics, Controlling for Other Demographics and Disciplines

	Odds Ratios** of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
Demographics		
Male (vs. female)	0.95	1.05
Age 24-29 (vs. 30-34)	0.52*	0.56*
Age 35-39 (vs. 30-34)	1.36	1.09
Age 40-61 (vs. 30-34)	1.36	1.47
Non-Hispanic white (vs. minority)	1.69*	2.16*
Married/Partnered (vs. not)	1.06	1.73*
Raised in service state (vs. not)	1.61*	1.67*
Trained in service state (vs. not)	1.46*	1.32
Model R-Square	.121	.135

Models control for 7 major discipline groups in addition to the demographic characteristics listed

* $p \leq .05$

** Odds ratios at two or five years are the relative odds of anticipated retention of the named group (e.g., male) relative to the comparison group (e.g., female) controlling for the other listed factors. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

II.C. Types of Organizations Where Clinicians Serve

Types of Organizations for Programs as a Whole (Table II.C.1)

- Over one-third of all clinician-respondents in these 11 states serve in Federally Qualified Health Centers (FQHCs), followed by 17% in rural health centers, 14% in mental health and substance abuse facilities and 11% in prisons. Fewer than 4% serve in each of "other types of primary care practices," Indian Health Service sites (IHS), hospital-based clinics and tribal sites.

Types of Organizations by Program and State (Table II.C.1)

- More NHSC Scholars than NHSC Loan Repayors serve in FQHCs.
- NHSC Loan Repayors in different states sometimes serve in very different spectra of sites. For example, almost half of NHSC Loan Repayors in Alaska serve at IHS and tribal sites compared to none who do so in five other states. In California, 38% of NHSC Loan Repayors serve in prisons whereas in Alaska, Delaware and New Mexico none serve in prisons.
- Participants of some state programs serve in a different spectrum of organizations than NHSC program participants. Almost no participants of the Nebraska Loan Repayment or Nebraska Student Loan Program serve in FQHCs compared to26% of Nebraska's NHSC Loan Repayors.

Types of Organizations and Anticipated Retention

Simple (bivariate) associations (Table II.C.2)

- Substantially fewer clinicians who serve in FQHCs, IHS sites and tribal sites anticipate remaining in their service sites at two, five and ten years than those who serve in other types of sites.
- Greater proportions of those working in hospital-based clinics anticipate remaining in their sites over time than those working in any other type of sites (but only 30 clinicians worked at hospital-based clinics).

Associations adjusted for all demographics and clinicians' disciplines (Table II.C.3)

- When controlling for anticipated retention likelihood within all types of sites simultaneously and for clinicians' disciplines, anticipated retention was meaningfully and statistically greater at two and five years for those serving in rural health centers, prisons and "other" types of sites compared to those serving in FQHCs.
- The types of site where clinicians serve and their disciplines together account for 7.9% of the variation across clinicians in the expectation still to be working in their service sites at two years and 9.2% at five years after their service term.

Table II.C.1. Most Common Types of Organizations where Clinicians Served, by Service Program and State

	Federally qualified health center	Rural health center	Mental health and substance abuse facil.	Prison	"Other" Practice Type	Other Primary Care Practice	Indian Health Service	Hospital-Based Clinic	Tribal Site
All Programs Combined	**35.9%**	**17.2%**	**14.0%**	**11.1%**	**4.4%**	**3.9%**	**3.8%**	**3.6%**	**2.3%**
NHSC Loan Repayment (all states)	**33.6%**	**16.8%**	**17.2%**	**13.6%**	**4.7%**	**3.2%**	**3.0%**	**3.6%**	**1.8%**
Alaska	27%	6%	10%	0%	2%	0%	27%	2%	21%
California	40%	10%	5%	38%	2%	1%	0%	1%	0%
Delaware	67%	0%	6%	0%	0%	22%	0%	6%	0%
Iowa	26%	16%	39%	3%	5%	3%	0%	7%	0%
Kentucky	19%	24%	36%	7%	6%	3%	0%	4%	0%
Montana	26%	20%	24%	2%	13%	4%	1%	5%	2%
Nebraska	26%	26%	13%	16%	4%	4%	3%	3%	4%
New Mexico	35%	21%	13%	0%	6%	3%	11%	8%	0%
North Carolina	31%	25%	9%	9%	6%	6%	0%	6%	0%
North Dakota	15%	32%	37%	2%	4%	4%	3%	2%	0%
Washington	52%	8%	20%	8%	1%	3%	3%	3%	3%
NHSC Scholarship (all states)	**57.1%**	**19.9%**	**0%**	**3.1%**	**2.5%**	**1.2%**	**8.7%**	**1.9%**	**3.1%**
State Programs									
Alaska SHARP (Loan Repayment)	17.2%	13.8%	10.3%	0%	0%	3.4%	24.1%	3.4%	24.1%
California State Loan Repayment	67.6%	14.7%	1.5%	1.5%	0%	2.9%	1.5%	2.9%	1.5%
Delaware State Loan Repayment	11.8%	0%	0%	0%	5.9%	41.2%	0%	5.9%	0%
Nebraska Loan Repayment	2.6%	35.9%	2.6%	2.6%	5.1%	17.9%	0%	10.3%	0%
Nebraska Student Loan Program	0%	12.5%	12.5%	0%	18.8%	12.5%	6.3%	6.3%	0%
New Mexico Health Prof. LRP *	18.8%	34.4%	6.3%	3.1%	18.8%	0%	18.8%	0%	0%

Table II.C.2. Anticipated Retention within Service Sites, by Type of Service Site *

	Percentage That Anticipate Remaining in Service Site		
	At Least 2 Years **	**At Least 5 Years ****	**At Least 10 Years ****
Federally qualified health center	45.3%	25.2%	11.2%
Rural health center	61.4%	41.8%	22.9%
Mental health and substance abuse facility	65.0%	40.2%	22.2%
Prison	64.2%	46.9%	29.6%
"Other" primary care practice	65.1%	51.2%	34.9%
Indian Health Service site	45.9%	24.3%	8.1%
Hospital based clinic	70.0%	53.3%	40.0%
Tribal site	56.0%	20.0%	4.0%

* Only organizational types with 25 or more clinician-respondents shown

** $p \leq .05$

Table II.C.3. Anticipated Retention within Service Sites at Two and Five Years by Type of Service Site, Controlling for Other Service Sites and Disciplines

	Odds Ratios** of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
Demographics		
Rural Health Center (vs. FQHC)	1.97*	2.01*
Mental Health & Substance Abuse (vs. FQHC)	1.68	1.73
Prison (vs. FQHC)	2.06*	2.68*
IHS and Tribal site (vs. FQHC)	1.19	0.80
All other types of sites* (vs. FQHC)**	2.30*	2.62*
Model R-Square	.079	.092

Models control for 7 major discipline groups in addition to the service site types listed

* $p \leq .05$

** Odds ratios at two or five years are the relative odds of anticipated retention of the named group (e.g., male) relative to the comparison group (e.g., female) controlling for the other listed factors. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

*** Other types of sites include health departments, nursing homes, "other primary care practices," dental practices and university and hospital-based practices

II.D. Clinicians' Ratings of Various Aspects of Their Service Work and Practices

Ratings of Service Practices for Programs as a Whole (Figure II.D)

- Clinicians vary in their average levels of agreement with the 8 statements about their work and practices. Clinicians most strongly agree that they were doing important work, that they are pleased with their work and that they feel a strong personal connection to their patients. They agree least with the statement that work rarely encroaches upon their personal time.

Ratings of Service Practices by Program and State (Table II.D.1)

- Clinicians in the NHSC Loan Repayment Program report higher average agreement with all eight positive statements about their work and practices than clinicians of the NHSC Scholarship Program.
- Among clinicians of the NHSC Loan Repayment Program, there is generally little variation among those serving across the 11 states in their agreement with statements about work and practices.

Ratings of Service Practices and Anticipated Retention

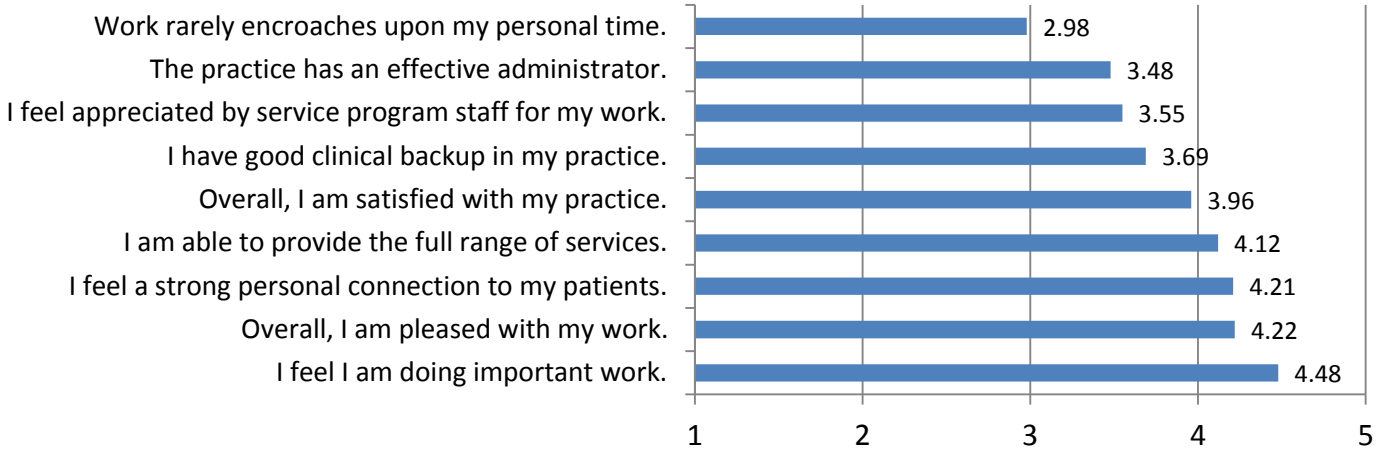
Simple (bivariate) associations (Table II.D.2)

- Clinicians who agree with each of the eight positive statements about aspects of service work and practices are more likely to anticipate remaining in those practices for two and five years, and generally also at 10 years after their service commitments.

Associations adjusted for agreement about other aspects of work and clinicians' disciplines (Table II.D.3)

- Examining clinicians' responses to the six statements about specific aspects of their work and their disciplines simultaneously, agreement with only three statements is associated with retention at two years (ability to practice full scope; having an effective administrator; work not encroaching on personal time) and agreement with only the first two of these is associated with retention at five years. Reporting adequate clinical backup, strong connections with patients and feeling one is doing important work are not associated with retention at two or five years after adjusting for other factors. A clinician's experiences with these six specific aspects of their work and practices together with their discipline account for 13.6% of the likelihood that they expect still to be working in their service site at two years and 10.7% at five years after their service term.
- Adjusting for an additional indicator of a clinician's agreement with their overall satisfaction with their work ("Overall, I am satisfied with my practice.") added to their agreement with the six specific aspects of their work and also their discipline account for an even greater, 17.0% of variation across clinicians in the expectation still to be working in their service sites at two years and 13.7% at five years after their service term (not shown in table).

Figure II.D. Mean Agreement Ratings* with Statements about Service Practice; All Respondents Combined



* 1=Strongly disagree; 3=Neither agree nor disagree; 5=Strongly agree

Table II.D.1. Mean Agreement Ratings* with Selected Statements about Service Practice, by Service Program and State

	I have good clinical backup from senior or supervis. clinicians.	I am able to provide the full range of services for which I was trained.	The practice has an effective administrator.	Work rarely encroaches upon my personal time.	I feel a strong personal connection to my patients.	I feel I am doing important work in this practice.	Overall, I am pleased with my work.	Overall, I am satisfied with my practice.
NHSC Loan Repayment (all states)	**3.73**	**4.14**	**3.53**	**3.05**	**4.21**	**4.51**	**4.28**	**3.99**
Alaska	3.60	4.23	3.23	2.60	4.31	4.65	4.23	3.98
California	3.75	4.02	3.62	3.29	4.06	4.49	4.33	4.11
Delaware	3.61	4.00	3.50	3.06	4.22	4.39	4.33	3.83
Iowa	3.82	4.34	3.69	3.23	4.25	4.46	4.38	4.08
Kentucky	3.80	4.17	3.55	3.11	4.34	4.51	4.25	4.01
Montana	3.88	4.27	3.62	2.99	4.30	4.60	4.37	4.11
Nebraska	3.61	4.19	3.52	3.10	4.09	4.43	4.14	3.91
New Mexico	3.50	4.13	3.25	3.26	4.32	4.54	4.27	3.94
North Carolina	3.66	3.94	3.40	2.81	4.16	4.58	4.25	3.70
North Dakota	3.67	4.25	3.54	3.16	4.25	4.43	4.33	4.07
Washington	3.83	4.29	3.61	2.68	4.27	4.41	4.13	3.90
NHSC Scholarship (all states)	**3.36**	**3.80**	**2.58**	**2.58**	**4.15**	**4.29**	**3.60**	**3.52**
State Programs								
Alaska SHARP	3.72	4.03	2.69	2.69	4.31	4.55	4.31	4.14
California State Loan Repayment	3.81	4.22	3.09	3.09	4.38	4.52	4.36	4.13
Delaware State Loan Repayment	3.53	4.71	2.88	2.88	4.59	4.76	4.71	4.65
Nebraska Loan Repayment	3.87	4.44	2.64	2.64	4.28	4.33	4.44	4.26
Nebraska Student Loan Program	3.56	3.94	2.94	2.94	3.69	4.19	4.06	3.38
New Mexico Health Prof LRP	3.47	4.09	3.47	3.19	4.34	4.71	4.50	4.16

* 1=Strongly disagree; 3=Neither agree nor disagree; 5=Strongly agree

Table II.D.2. Agreement Ratings* with Selected Statements about the Service Practices and Work

	Percentage That Anticipate Remaining in Service Site		
	At Least 2 Years	**At Least 5 Years**	**At Least 10 Years**
I have good clinical backup from more senior and/or supervising clinicians			
Agree	63.0%*	42.7%*	26.1%*
Disagree or neutral	51.6%	31.6%	19.7%
I am able to provide the full range of services for which I was trained			
Agree	62.6%*	41.6%*	25.2%*
Disagree or neutral	41.8%	25.5%	17.0%
The practice has an effective administrator.			
Agree	68.6%*	46.1%*	28.8%*
Disagree or neutral	44.3%	27.3%	16.4%
Work rarely encroaches upon my personal time.			
Agree	64.7%*	43.8%*	27.3%*
Disagree or neutral	54.8%	35.0%	21.3%
I feel a strong personal connection to my patients.			
Agree	60.3%*	39.2%	24.1%
Disagree or neutral	51.6%	35.7%	22.3%
I feel I am doing important work in this practice.			
Agree	60.0%*	39.4%	24.7%*
Disagree or neutral	46.6%	31.5%	13.7%
Overall, I am pleased with my work.			
Agree	61.3%*	40.8%*	25.1%*
Disagree or neutral	40.4%	22.9%	13.8%
Overall, I am satisfied with my practice.			
Agree	66.3%*	44.9%*	28.1%*
Disagree or neutral	34.0%	17.7%	9.1%

* $p \leq .05$

Table II.D.3. Anticipated Retention within Service Sites at Two and Five Years by Agreement versus Neutral or Disagreement with Selected Statements about the Service Practices and Work, Controlling for Agreement with Other Statements about Work and Disciplines

	Odds Ratios** of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
Agrees that "I have good clinical backup from more senior and/or supervising clinicians" (vs. neutral/disagree)	1.05	1.23
Agrees that "I am able to provide the full range of services for which I was trained" (vs. neutral/disagree)	1.73*	1.64*
Agrees that "The practice has an effective administrator" (vs. neutral/disagree)	2.31*	1.86*
Agrees that "Work rarely encroaches upon my personal time" (vs. neutral/disagree)	1.35*	1.25
Agrees that "I feel a strong personal connection to my patients" (vs. neutral/disagree)	1.16	0.97
Agrees that "I feel I am doing important work in this practice" (vs. neutral/disagree)	1.13	1.07
Model R-Square	.136	.107

Models control for 7 major discipline groups in addition to clinicians' agreement with the statements about work listed

* $p \leq .05$

** Odds ratios at two or five years are the relative odds of anticipated retention of the named group (e.g., those who agree with a statement) relative to the comparison group (e.g., those neutral or disagree) controlling for the other listed factors. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

II.E. Clinicians' Satisfaction with Various Aspects of Their Service Practices

Satisfaction with Service Practices for Programs as a Whole (Figure II.E)

- The satisfaction scores for clinician-participants of states and programs as a whole are in the "satisfied" range on all 8 measures queried about service practices.
- Clinicians are most satisfied with the mission and goals of their service practices and with the support they receive from other clinicians at these sites. Clinicians are least satisfied with their salaries/income from their practices and with access to specialist consultations for patients.

Satisfaction with Service Practices by Program and State (Table II.E.1)

- Participants of the NHSC Loan Repayment Program are modestly more satisfied than NHSC Scholars with seven of the eight tested aspects of their service practices.
- There is little variation in NHSC Loan Repayors serving across the 11 states in their satisfaction on the eight measures of their practices.
- Clinicians in Delaware's State Loan Repayment Program are more satisfied with every aspect of their practices than clinicians in the other state programs and in the NHSC's Loan Repayment and Scholarship Programs. Participants of Nebraska's Student Loan Program are less satisfied than participants of other state programs on seven of the eight measures.

Satisfaction with Service Practices and Anticipated Retention

Simple (bivariate) associations (Table II.E.2)

- Clinicians who are satisfied with each of the eight tested aspects of their practices more often anticipate remaining in their service sites at two years, five years and 10 years than clinicians who are not satisfied on those measures.

Associations adjusted for agreement about other aspects of work and clinicians' disciplines (Table II.E.3)

- When simultaneously adjusting for clinicians' satisfaction with all eight aspects of their practices and also their disciplines, satisfaction with only two aspects of practices are associated with greater retention rates at two and five years: satisfaction with the relationship with the practice administrator and satisfaction with access to specialist consultations for patients.
- A clinician's satisfaction with these eight aspects of their practices together with their discipline account for 15.2% of the variation across clinicians in the expectation still to be working in their service sites at two years and 11.9% at five years after their service term.

Figure II.E. Mean Satisfaction Ratings* for Aspects of the First Service Practice, for All Respondents Combined

* 1=Very dissatisfied; 3=Neutral; 5=Very Satisfied

Table II.E.1. Mean Satisfaction Ratings* with Selected Aspects of Service Practices, by Service Program and State

	Relationship with the practice administrator	Financial stability of the practice	Physical condition of the practice	Salary or income from the practice	Availability of cross coverage to leave town	Mission and goals of the practice	Access to specialist consultations for patients	Support from other clinicians at the site
NHSC Loan Repayment (all states)	**3.63**	**3.58**	**3.72**	**3.42**	**3.84**	**4.07**	**3.54**	**4.07**
Alaska	3.33	3.56	3.96	3.65	3.75	4.17	3.69	4.21
California	3.72	3.56	3.48	3.62	3.90	3.97	3.47	4.19
Delaware	3.35	3.94	4.06	3.18	3.71	4.29	3.88	4.12
Iowa	3.70	3.82	4.20	3.43	3.92	4.13	3.75	4.22
Kentucky	3.66	3.53	3.74	3.28	3.89	4.02	3.54	4.11
Montana	3.74	3.87	3.99	3.37	3.70	4.26	3.45	4.03
Nebraska	3.64	3.65	3.67	3.22	3.75	4.03	3.68	3.88
New Mexico	3.44	3.43	3.61	3.53	3.74	3.99	3.35	3.88
North Carolina	3.46	3.34	3.54	3.22	3.82	4.01	3.49	3.75
North Dakota	3.75	3.87	3.59	3.28	3.61	4.00	3.75	3.97
Washington	3.64	3.41	3.97	3.42	4.03	4.20	3.60	4.28
NHSC Scholarship (all states)	**3.09**	**3.26**	**3.67**	**3.51**	**3.68**	**3.84**	**3.13**	**3.70**
State Programs								
Alaska SHARP	4.21	3.79	3.76	3.69	3.55	4.28	3.48	4.24
California State Loan Repayment	3.71	3.77	3.71	3.38	4.04	4.30	3.26	4.14
Delaware State Loan Repayment	3.82	4.35	4.35	4.35	4.35	4.65	4.29	4.47
Nebraska Loan Repayment	4.08	4.00	3.89	3.76	3.53	4.21	3.97	3.92
Nebraska Student Loan Program	3.06	3.50	3.94	3.31	3.38	3.50	3.20	3.38
New Mexico Health Prof. LRP	3.69	3.56	3.78	3.84	3.87	4.34	3.44	4.10

* 1=Very dissatisfied; 3=Neutral; 5=Very Satisfied

Table II.E.2. Anticipated Retention within Service Sites by Satisfaction Ratings with Selected Aspects of Service Practices

Satisfaction with:	Percentage That Anticipate Remaining in Service Site		
	At Least 2 Years	At Least 5 Years	At Least 10 Years
Relationship with Administrator			
Satisfied	68.9% *	46.2% *	29.7% *
Dissatisfied or neutral	43.6%	27.1%	14.5%
Financial stability of practice			
Satisfied	67.1% *	45.3% *	28.3% *
Dissatisfied or neutral	46.8%	28.8%	16.9%
Physical condition of practice			
Satisfied	63.1% *	42.0% *	26.0% *
Dissatisfied or neutral	51.7%	32.5%	19.5%
Salary/Income from practice			
Satisfied	63.1% *	43.2% *	29.2% *
Dissatisfied or neutral	53.4%	32.9%	16.7%
Availability of cross-coverage			
Satisfied	62.5% *	42.2% *	26.1% *
Dissatisfied or neutral	52.1%	32.2%	19.3%
Mission and goals of the practice			
Satisfied	63.2% *	42.3% *	25..6% *
Dissatisfied or neutral	43.4%	26.3%	17.2%
Access to specialist consultations for patients			
Satisfied	67.1% *	45.8% *	27.6% *
Dissatisfied or neutral	48.5%	29.3%	18.7%
Support from other clinicians working at the site			
Satisfied	63.3% *	42.1% *	26.2% *
Dissatisfied or neutral	45.0%	27.9%	16.2%

* $p \leq .05$

Table II.E.3. Anticipated Retention within Service Sites at Two and Five Years by Satisfaction versus Neutral or Dissatisfaction with Selected Aspects of Service Practices, Controlling for Satisfaction with Other Aspects of Practices and Clinicians' Disciplines

	Odds Ratios** of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
Satisfaction * with:**		
Relationship with Administrator	1.94*	1.63*
Financial stability of practice	1.23	1.10
Physical condition of practice	1.04	1.01
Salary/Income from practice	1.22	1.29
Availability of cross-coverage	0.96	1.01
Mission and goals of the practice	1.30	1.27
Access to specialist consultations for patients	1.72*	1.67*
Support from other clinicians working at site	1.26	1.20
Model R-Square	.152	.119

Models control for 7 major discipline groups in addition to clinicians' satisfaction with the other aspects of service practices listed

* $p \leq .05$

** Odds ratios at two or five years are the relative odds of anticipated retention of the named group (e.g., those who are satisfied with an aspect of their practice) relative to the comparison group (e.g., those neutral or dissatisfied) controlling for the other listed factors. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

*** Versus neutral/dissatisfied

II.F. Service in Metro (Urban) and Non-Metro (Rural) Counties

Rural vs. Urban County Service Site Locations by Program and State (Table II.F.1)

- Somewhat under half (45%) of clinicians in the NHSC Loan Repayment Program report serving in sites that are within designated non-metropolitan (rural) counties. Somewhat fewer (39%) NHSC Scholars report sites in rural counties.
- There is great state-to-state variability in the percentage of NHSC Loan Repayors who are serving in rural counties, from a low of 9% in California to greater than two-thirds of those serving in Montana, North Dakota, Kentucky and Alaska.
- There is also great variability across states' programs in percentages serving in rural counties, from 4% in California to 100% in Nebraska's two programs.

Rural vs. Urban County Service Site Locations of NHSC Clinicians and Anticipated Retention

Simple (bivariate) associations (Figure II.F.1, Table II.F.2 and Table II.F.3)

- For clinicians of both the NHSC Loan Repayment and Scholarship Programs as a whole, anticipated retention differs minimally, and not statistically significantly, for those serving in rural versus urban counties.
- Within individual states, NHSC Loan Repayment Program participants serving in rural versus urban counties are generally similar in the proportions who anticipate remaining in their service sites at two, five and 10 years. Statistically and meaningfully differences in anticipated retention are found at one or more time points for NHSC Loan Repayors serving Kentucky and Nebraska: in both states greater percentages of those serving in rural counties anticipate remaining in their service sites.
- Among states' programs, only within the Alaska SHARP program and New Mexico Health Professional Loan Repayment Program are both rural and urban group sizes large enough to permit comparisons. In New Mexico greater percentages serving in rural than urban counties anticipate that they will still be working in their service sites over time, whereas it is the opposite in Alaska.

Associations adjusted for agreement about other aspects of work and clinicians' disciplines (Table II.F.4)

- When simultaneously accounting for clinicians' rural versus urban service location and their specialties, rural versus urban location is still not related to anticipated retention.
- A clinician's rural versus urban site of service together with their discipline account for 4.8% of the variation across clinicians in the expectation still to be working in their service sites at two years and 4.8% at five years after their service term.

Table II.F.1. Percentage of Clinicians Serving in Non-Metro (Rural) Counties, by Service Program and State

	Total #	Rural %
NHSC Loan Repayment (all states)	**1,213**	**45.4%**
Alaska	47	68.1%
California	299	9.0%
Delaware	18	22.2%
Iowa	62	61.3%
Kentucky	108	70.4%
Montana	138	76.1%
North Carolina	142	54.2%
North Dakota	69	71.0%
Nebraska	70	55.7%
New Mexico	105	54.3%
Washington	155	30.3%
NHSC Scholarship (all states)	**160**	**39.4%**
State Programs		
Alaska SHARP (Loan Repayment)	25	64.0%
California State Loan Repayment	68	4.4%
Delaware State Loan Repayment	16	50%
Nebraska Loan Repayment	40	100%
Nebraska Student Loan Program	17	100%
New Mexico Health Prof. LRP	33	75.8%

Figure II.F.1. Percentage of 11 State Clinician-Participants of the NHSC Loan Repayment (n=638) and NHSC Scholarship (n=56) Programs That Anticipate Remaining at Their Service Sites in Years Following Their Last Service Terms, by Metro (Urban) vs. non-Metro (Rural) County Location

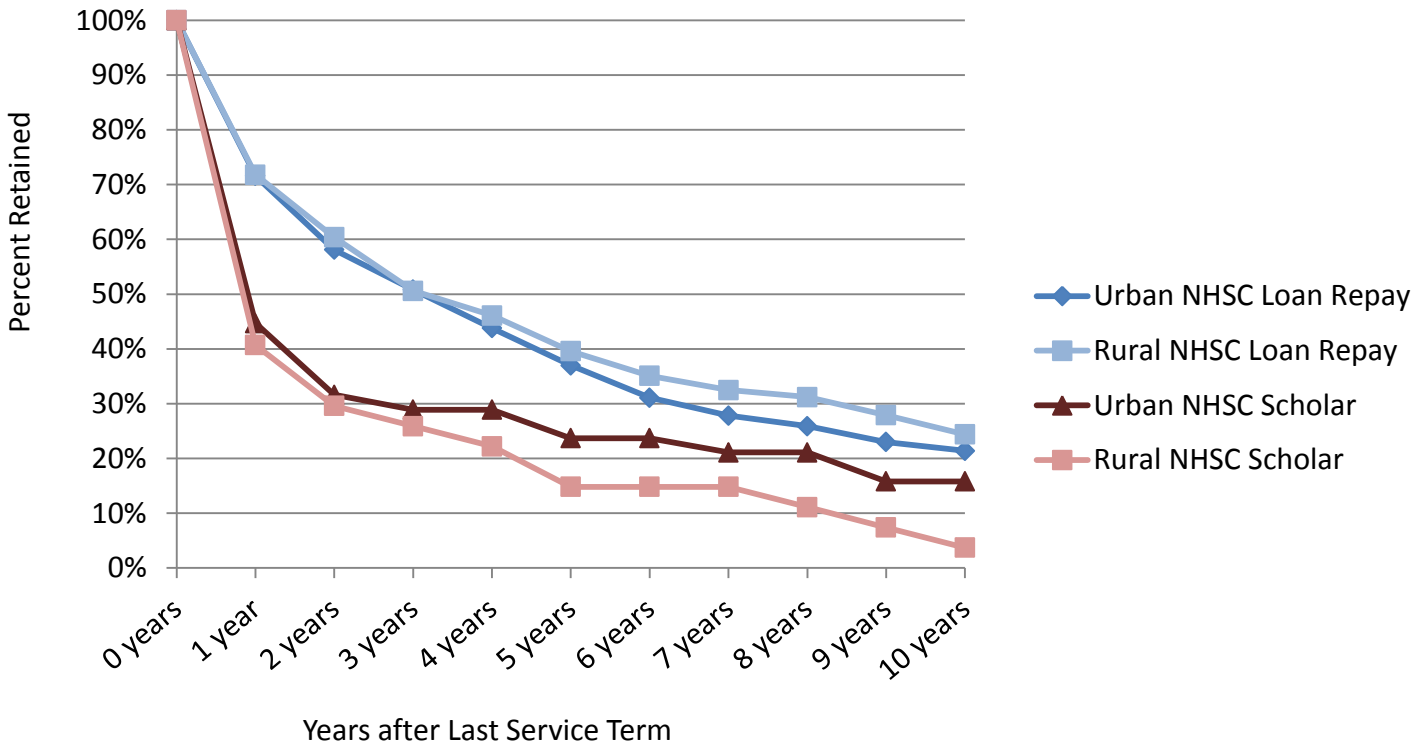


Table II.F.2. Anticipated Retention within Service Sites for NHSC Loan Repayment Clinicians Serving in Metro (Urban) vs. Non-Metro (Rural) Counties, by State

	Number in analyses	Percentage That Anticipate Remaining in Service Site		
		At Least 2 Years	At Least 5 Years	At Least 10 Years
Alaska				
Urban	7	43%	14%	0%
Rural	13	54%	23%	8%
California				
Urban	130	68%	45%	30%
Rural	9	56%	44%	22%
Delaware				
Urban	11	46%	27%	18%
Rural	3	100%	67%	33%
Iowa				
Urban	17	71%	47%	29%
Rural	25	60%	44%	20%
Kentucky				
Urban	19	32% *	26%	11% *
Rural	45	69%	47%	40%
Montana				
Urban	18	61%	50%	28%
Rural	58	60%	38%	22%
Nebraska				
Urban	20	45%	25% *	15%
Rural	25	72%	56%	36%
New Mexico				
Urban	34	59%	35%	12%
Rural	30	47%	30%	17%
North Carolina				
Urban	38	42%	21%	18%
Rural	46	57%	33%	24%
North Dakota				
Urban	12	50%	33%	17%
Rural	33	61%	42%	18%
Washington				
Urban	64	61%	36%	16%
Rural	21	57%	33%	19%

* $p \leq .05$

Table II.F.3. Anticipated Retention within Service Sites for Clinicians Serving States' Programs in Metro (Urban) vs. Non-Metro (Rural) Counties

	Number in analyses	Percentage That Anticipate Remaining in Service Site		
		At Least 2 Years	At Least 5 Years	At Least 10 Years
Alaska SHARP				
Urban	8	75%	63%	50% *
Rural	15	53%	20%	7%
California State Loan Repayment Program				
Urban	57	63%	33%	18%
Rural	3	33%	33%	0%
Delaware State Loan Repayment Program				
Urban	7	71%	71%	71%
Rural	7	100%	57%	43%
Nebraska Loan Repayment Program				
Urban	0	--	--	--
Rural	39	77%	67%	54%
Nebraska Student Loan Program				
Urban	0	--	--	--
Rural	14	71%	50%	36%
New Mexico Health Professional LRP				
Urban	6	33% *	17%	0%
Rural	23	78%	57%	26%

* $p \leq .05$

Table II.F.4. Anticipated Retention within Service Sites at Two and Five Years for Clinicians Serving in Metro (Urban) vs. Non-Metro (Rural) Counties, Controlling for Clinicians' Disciplines

	Odds Ratios* of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
County Location		
Rural (vs. urban)	1.23	1.30
Model R-Square	.048	.048

Models control for seven major discipline groups

The odds ratio for the rural/urban indicator is not statistically significant

* Odds ratios at two or five years are the relative odds of anticipated retention for clinicians serving in rural counties relative to those in urban counties, controlling for clinicians' disciplines. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

II.G. Clinician and Family Fit with the Service Community

Clinician/Community Fit for programs as a Whole (Figure II.G)

- Clinician-participants as a whole responded in the "agree" range for all six questions querying the fit of clinicians and families in their communities.
- Clinicians provided the highest agreement ratings for their children's happiness in the community and lowest ratings for professional opportunities available to their spouses.

Clinician/Community Fit by Program and State (Table II.G.1)

- Participants of the NHSC Loan Repayment Program provided higher assessments on all six measures of the fit for them and their families with their communities than participants of the NHSC Scholarship Program.
- Within the NHSC Loan Repayment Program, measures of clinician/family fit with the community do not vary substantially across the 11 states.
- There is some variation across the 5 state programs on some measures of clinician/family fit with the community, but in no consistent pattern. The experiences of children of clinicians in both of New Mexico's programs—the NHSC Loan Repayment and the NM Health Professional Loan Repayment Program—are rated lower than are the experiences of children of clinicians in other states.

Clinician/Community Fit and Anticipated Retention

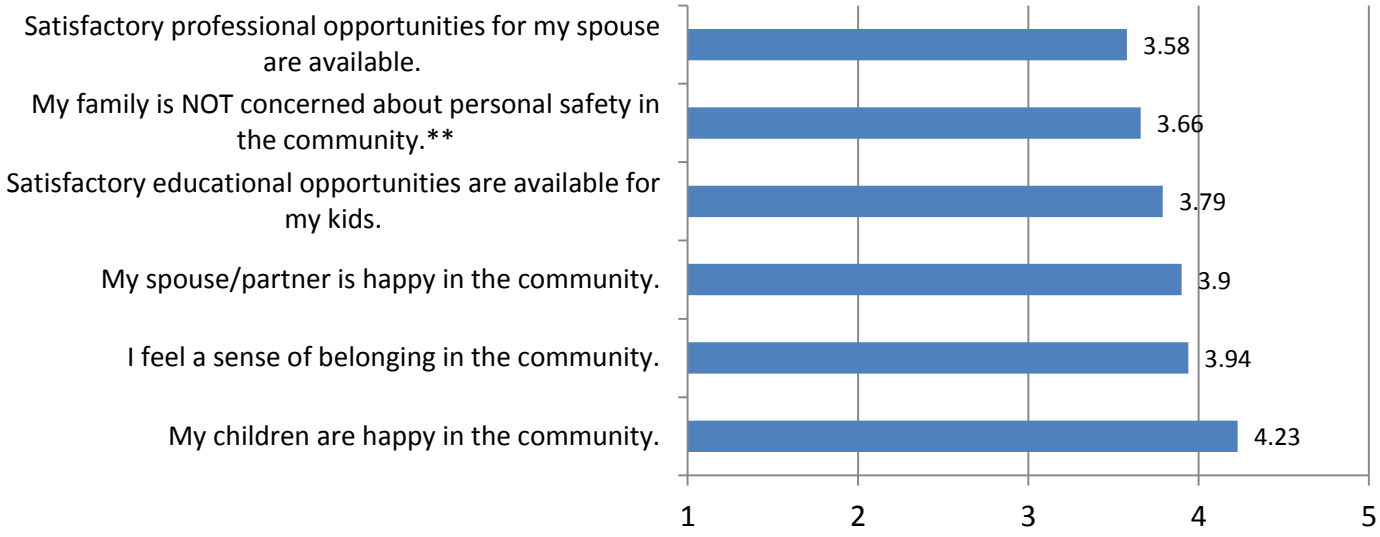
Simple (bivariate) associations (Table II.G.2)

- How clinicians rate theirs and their family's fit with the service community is significantly associated with how long they believe they will remain in their service sites. For all six statements reflecting clinicians' and families' fit with communities, better fit is associated with greater likelihood that clinicians anticipate still to be working in their sites at two, five and 10 years beyond their service obligations.

Associations adjusted for agreement about other measures of clinician and family fit with the community and clinicians' disciplines (Table II.G.3.)

- When simultaneously assessing for how anticipated retention relates to all six measures of clinician and family fit with communities and accounting for whether clinicians are married/partnered, have children, work in rural settings, and their disciplines, most but not all of the above relationships hold true. The relationships with anticipated retention at two years for a couple of the measures of family-community fit no longer reach the level of statistical significance (spouse satisfaction and children's satisfaction). Similarly, when controlling for these other factors two measures of family-community fit and anticipated retention at five years no longer reach the level of statistical significance (professional opportunities for spouses and children's satisfaction).
- A clinician's assessment of these six measures of clinician and family fit in the community, their rural vs. urban site of service, marital status and their discipline together account for 15.1% of the variation across clinicians in the expectation still to be working in their service sites at two years and 17.2% at five years after their service term.

Figure II.G. Mean Agreement Ratings* with Statements about the Clinician's and Family's Fit in the Community



* 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree

** This item asked in the questionnaire in the affirmative (i.e., without the "NOT"), but presented here with "not" and reverse coded

Table II.G.1. Mean Agreement Ratings* with Statements about the Clinician's and Family's Fit in Community, by Service Program and State

	I feel a sense of belonging in the community. (n=1,541)	My spouse/partner is happy in the community. (n=1,132)	Satisfactory professional opportunities for my spouse are available in community. (n=1,089)	My children are happy in the community. (n=799)	Satisfactory educational opportunities for my kids are available in community. (n=813)	My family is <u>not</u> concerned about personal safety in the community. ** (n=1,237)
NHSC Loan Repayment (all states)	**3.97**	**3.97**	**3.64**	**4.23**	**3.82**	**3.66**
Alaska	3.98	3.85	3.63	4.39	3.20	4.00
California	4.02	3.92	3.76	4.20	3.89	3.29
Delaware	3.78	3.91	3.36	3.67	3.50	3.13
Iowa	3.95	3.71	3.47	4.07	3.92	3.90
Kentucky	4.12	4.19	3.66	4.18	3.74	3.81
Montana	4.18	4.15	3.68	4.39	3.98	3.09
Nebraska	3.78	4.10	3.82	4.40	4.28	4.02
New Mexico	3.91	3.81	3.39	3.96	3.02	3.35
North Carolina	3.83	3.89	3.56	4.15	3.65	3.82
North Dakota	4.10	3.92	3.73	4.32	4.20	3.85
Washington	3.79	4.07	3.58	4.31	3.97	3.59
NHSC Scholarship (all states)	**3.57**	**3.25**	**3.02**	**4.03**	**3.19**	**3.41**
State Programs						
Alaska SHARP	3.93	3.61	3.65	4.62	4.62	3.84
California State Loan Repayment	4.12	3.86	3.83	4.18	3.68	3.21
Delaware State Loan Repayment	4.65	4.14	3.50	4.75	3.77	4.36
Nebraska Loan Repay.	4.23	4.29	3.57	4.59	4.39	4.57
Nebraska Stud Loan Prog.	3.56	3.79	3.92	4.18	4.09	4.00
New Mexico Health Prof. Loan Repayment	3.84	3.90	3.45	3.88	2.86	3.72

* Clinician's rating of agreement with statements: 1=Strongly disagree; 2=Disagree; 3=Neutral; 4=Agree; 5=Strongly agree

** This item asked in the questionnaire in the affirmative (i.e., without the "not"), but presented here with "not" and reverse coded

Table II.G.2. Anticipated Retention within Service Sites by Agreement with Statements about the Clinician's and Family's Fit in Community

	Percentage That Anticipate Remaining in Service Site		
	At Least 2 Years	**At Least 5 Years**	**At Least 10 Years**
I feel a sense of belonging in the community.			
Agree	65.5% *	44.5% *	37.9% *
Neutral and Disagree	41.8%	23.8%	17.4%
My spouse/partner is happy in the community.			
Agree	67.1% *	49.3% *	31.3% *
Neutral and disagree	48.8%	25.7%	14.7%
Satisfactory professional opportunities for my spouse are available in community.			
Agree	67.6% *	49.3% *	32.4% *
Neutral and disagree	51.9%	32.9%	19.0%
My children are happy in the community.			
Agree	69.4% *	52.4% *	34.7% *
Neutral and disagree	51.0%	28.4%	15.6%
Satisfactory educational opportunities for my children are available in the community.			
Agree	72.2% *	56.9% *	37.9% *
Neutral and disagree	49.7%	29.0%	17.4%
My family is <u>not</u> concerned about personal safety in the community.			
Agree	65.7% *	46.7% *	30.1% *
Neutral and disagree	52.8%	33.8%	19.7%

* $p \leq .05$

Table II.G.3. Anticipated Retention within Service Sites at Two and Five Years by Agreement with Statements about the Clinician's and Family's Fit in Community, Controlling for Other Measures of Community Fit and Clinicians' Disciplines

	Odds Ratios** of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
Agrees that:		
Rural location (vs. urban)	1.38	1.55*
I feel a sense of belonging in the community. (vs. neutral/disagree)	1.86*	1.70*
Married/Partnered (vs. not)	0.55	0.29*
My spouse/partner is happy in the community. (vs. neutral/disagree)	1.49	1.92*
Satisfactory professional opportunities for my spouse are available in community. (vs. neutral/disagree)	1.57*	1.44
My children are happy in the community. (vs. neutral/disagree)	1.05	1.12
Has no children (vs. neutral/disagree that children are happy in the community)	0.61	0.54
My family is <u>not</u> concerned about personal safety in the community. (vs. neutral/disagree)	1.47*	1.48*
Model R-Square	.151	.172

Models control for seven major discipline groups in addition to all listed indicators of physicians' and their families' fit in the community.

* $p \leq .05$

** Odds ratios at two or five years are the relative odds of anticipated retention of the named group (e.g., those who are satisfied with an aspect of their practice) relative to the comparison group (e.g., those neutral or dissatisfied) controlling for the other listed factors. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

II.H. Clinicians' Experiences within Their Service Programs

Service Program Experiences for Programs Overall (Table II.H.1)

- When rating reasons for applying to their service programs, from two-thirds to more than three-quarters of clinicians across programs rate the importance of wanting to provide care to an underserved population the same or higher than needing financial assistance for their educational expenses.
- As a whole, clinicians are neutral to satisfied with their support from staff of their service programs.
- On average, clinicians are neutral in their overall satisfaction with their service programs and they generally feel the programs meet but do not exceed their expectations.

Service Program Experiences by Program and State (Table II.H.1)

- Clinicians in the NHSC Scholarship Program are more likely than clinicians of other programs to rate wanting to serve underserved populations the same or higher than financial assistance as reasons for applying to their service program. Clinicians in the NHSC Loan Repayment Program and states' programs are generally comparable in their reported reasons for applying to their service programs. These altruistic motivation rates are higher in the New Mexico Health Professional Loan Repayment Program than in other state programs.
- Among NHSC Loan Repayment Program participants across the states, altruistic motivations are somewhat higher in Alaska and Nebraska and lower in Delaware and North Dakota.
- Clinicians of the NHSC Loan Repayment Program are generally more satisfied with the support they receive from program staff than clinicians in the NHSC Scholarship Program. Clinicians in two of the state programs—the Alaska SHARP Program and the Delaware State Loan Repayment Program—give the highest satisfaction ratings for their support from program staff.
- Clinicians of the NHSC's Loan Repayment and Scholarship Programs are comparable in their levels of overall satisfaction with service programs and in how they well they felt these programs meet their expectations.
- States' programs more often exceed clinicians' expectations than the NHSC's programs. On the other hand, clinicians of the NHSC's program are somewhat more satisfied with their service program experiences.
- Among participants of the NHSC Loan Repayment Program, clinicians in California and Kentucky are more likely to have their expectations exceeded and clinicians in North Carolina, North Dakota and Nebraska more often do not have their expectations met.

Service Program Experiences and Anticipated Retention

Simple (bivariate) associations (Table II.H.2)

- The percentages that anticipate remaining in their service sites at two and five years are higher among clinicians who indicate that wanting to work with the underserved was equally or more important when applying to their service programs than the program's financial benefits.
- The percentages that anticipate remaining in their service sites at two and five years are higher among those who feel appreciated by staff of their service programs, feel satisfied with their contacts and support from service program staff and are overall satisfied with their service programs. Anticipated retention percentages at two and five years are also higher in those whose service programs exceed their expectations.

Associations adjusted for all aspects of clinicians' experiences with their service programs and clinicians' disciplines (Table II.H.3)

- Essentially the same associations remain between the various indicators of clinicians' experiences in their service programs and anticipated retention after controlling for all other indicators of clinicians' program experiences and their disciplines.
- A clinician's assessment of their service program experiences and their principal motivation for participating in their service program, along with their discipline account for 15.6% of the variation across clinicians in the expectation still to be working in their service sites at two years and 13.6% at five years after their service term.

Table II.H.1. Clinicians' Experiences within Their Service Programs, by Service Program and State

	Motivated to participate in service program to provide care to underserved the same or more than for financial assistance (%)	Satisfied with contacts and other support from service program staff (1=very dissat 3=neutral 5=very sat)	Overall satisfaction with the service program * (0=very dissat 5=neutral 10=very sat)	Extent to which service program exceeded or fell short of expectations * (0=fell well short 5=met expectations 10=far exceeded)
NHSC Loan Repayment (all states)	**68.5%**	**3.45**	**4.97**	**4.84**
Alaska	79.6%	3.21	5.16	4.68
California	69.2%	3.55	5.61	6.29
Delaware	50.0%	3.25	4.24	5.06
Iowa	60.3%	3.84	4.67	5.22
Kentucky	68.5%	3.60	4.88	6.51
Montana	70.1%	3.45	5.01	5.20
Nebraska	78.6%	3.45	4.55	3.02
New Mexico	63.8%	3.20	4.78	4.54
North Carolina	74.6%	3.40	4.66	2.81
North Dakota	55.9%	3.54	4.87	3.72
Washington	66.0%	3.33	4.83	4.27
NHSC Scholarship (all states)	**85.0%**	**2.32**	**4.70**	**4.82**
State Programs				
Alaska SHARP (Loan Repayment)	72.4%	4.39	4.52	7.72
California State Loan Repayment	78.3%	3.88	4.54	7.34
Delaware State Loan Repayment	75.0%	4.18	4.59	6.41
Nebraska Loan Repayment	67.5%	3.65	4.43	6.82
Nebraska Student Loan Program	52.9%	3.19	4.06	5.50
New Mexico Health Prof. LRP	87.9%	3.94	4.44	6.78

* Not asked of "current clinicians" in the 2011 survey of the NHSC's Programs

Table II.H.2. Anticipated Retention within Service Sites by Clinicians' Experiences in Their Service Programs

	Percentage That Anticipate Remaining in Service Site		
	At Least 2 Years	**At Least 5 Years**	**At Least 10 Years**
Reasons for participating in the service program			
To provide care to underserved the same or more than for financial assistance	62.4% *	41.5% *	25.2%
Primarily for financial assistance	50.7%	31.7%	20.1%
Agreement with statement that s/he feels appreciated by program staff			
Agrees	67.2% *	45.0% *	28.2% *
Neutral or disagrees	49.2%	31.4%	18.5%
Satisfaction with contacts and other support from service program staff			
Satisfied	68.7% *	47.1% *	29.4% *
Neutral or dissatisfied	49.9%	30.6%	18.2%
Overall satisfaction with the service program			
Satisfied	91.7% *	75.0% *	56.3% *
Neutral or dissatisfied	57.0%	36.8%	22.1%
Extent to which the service program met expectations **			
Exceeded expectations	65.9% *	43.4% *	25.5%
Met expectations	57.9%	42.1%	28.3%
Fell short of expectations	40.8%	19.7%	15.5%

* $p \leq .05$

** Not asked of "current clinicians" in the 2011 survey of the NHSC's Programs

Table II.H.3. Anticipated Retention within Service Sites at Two and Five Years by Measures of Clinicians' Experiences in Their Service Programs, Controlling for Other Indicators of Their Service Program Experiences and Disciplines

	Odds Ratios** of Anticipated Retention	
	Model 1: Anticipated Retention at 2 Years	**Model 2: Anticipated Retention at 5 Years**
Joined the service program to provide care to underserved the same or more than for financial assistance (vs. joining principally for financial assistance)	1.68*	1.58*
Agree that s/he feels appreciated by program staff (vs. neutral/disagree)	1.55*	1.28
Satisfied with contacts and other support from service program staff (vs. neutral/dissatisfied)	1.63*	1.79*
Overall satisfied with the service program (vs. neutral/dissatisfied)	7.15*	4.48*
Extent to which the service program met expectations:		
Exceeded expectations (vs. fell short)	1.48*	1.24
Met expectations (vs. fell short)	1.37	1.58*
Model R-Square	.156	.136

Models control for 7 major discipline groups in addition to all listed indicators of physicians' and all listed indicators of clinicians' service program experiences

* $p \leq .05$

** Odds ratios at two or five years are the relative odds of anticipated retention of the named group (e.g., those who are satisfied with an aspect of their practice) relative to the comparison group (e.g., those neutral or dissatisfied) controlling for the other listed factors. An odds ratio of "1.00" means that the odds of anticipated retention are identical for the two groups after controlling for the other factors. The greater the odds ratio is above"1.00" (e.g., 2.00 or 3.00), the greater are the odds of anticipated retention for the named group relative to the comparison group. The lower the odds ratio is below "1.00" (e.g., 0.50 or 0.20), the lower are the odds of anticipated retention for the named group relative to the comparison group.

II. I. Anticipated Retention: Importance of Group Characteristics of Clinicians and Practices versus Clinicians' Experiences While Serving

This section presents another way to identify important factors that can best explain why some clinicians participating in the NHSC's and states' loan repayment and scholarship programs leave their service sites shortly after their service terms are fulfilled while others remain there many years. Like the previous analyses, this approach controls for various factors simultaneously to identify the factors that, independent of other factors, appear to be most directly related to anticipated retention. This approach goes beyond the earlier analyses by:

1. controlling for more factors at a time to reveal the relative importance of factors of different types (e.g., it assesses the important of satisfaction with work alongside the importance of a family's satisfaction in the community)
2. assessing separately the importance of two distinct realms of factors which fall within the two periods during which states and programs can intervene on to improve retention. Specifically, it assesses the importance of factors important (a) when selecting clinicians (characteristics of disciplines, backgrounds, motivations) and sites (organizational types, rural/urban location) that apply to be part of the program, and (b) when clinicians serve in the program (their satisfaction with their practices, jobs, communities and service programs, and their families' experiences).

Assessment of Anticipated Retention by Features of Clinicians and Types of Practices (Tables II.I.1 and II.I.2)

Accounting simultaneously for clinicians' disciplines, demographics, principal reason for participating in the service program and the types of practices where they serve explains 16.3% of the variation across clinicians in the expectation to remain in their service sites at least two years beyond their service term (Table II.I.1) and 18.7% of the variation at five years (Table II.I.2). After removing unimportant factors (see the "Reduced Models"), the factors that remain important in anticipated retention at two years and/or five years are:

(1) being a physician,

(2) being age 30 and over, non-Hispanic White race/ethnicity, having children and serving in a state where one grew up and where one trained;

(3) being principally motivated to commit to the service program for the chance to work with the underserved rather than for the program's financial support;

(4) serving in a rural health center, mental health or substance abuse facility, a prison or "other" type of practice.

Assessment of Anticipated Retention by Aspects of Clinicians' Experiences While Serving (Tables II.I.3 and II.I.4)

Accounting simultaneously for clinicians' assessments of various aspects of their service work, their satisfaction with their work and practices, their families' satisfaction with the community, and for their assessments of their service program explains 28.6% of the variation across clinicians in the expectation to remain in their service sites at least two years beyond their service terms (Table II.I.3) and 27.1% of the variation across clinicians at five years (Table II.I.4). After removing unimportant factors (see the "Reduced Models"), the aspects of clinicians' experiences while serving that remain important in variation across clinicians in the expectation to remain at least two years and/or at least five years are:

(1) being satisfied with the administrator, one's salary, access to specialist consultants, and the practice overall;

(2) feeling that you are a part of the community, your spouse is happy with the community, and the family feels safe in the community;

(3) being overall satisfied with your service program and satisfied with the contact and support you had from program staff.

Curiously, those who *disagree* with the statement that they are doing important work in their practices were *more likely* to anticipate remaining five years beyond their service terms. This finding runs counter to the positive relationship found in other studies between a worker's sense that they are doing important work and longer retention. Since this finding is based on the relatively few (8%) clinicians who do not feel they are doing important work, this may be a spurious finding due to small numbers.

Table II.I.1. Simultaneously Assessing the Importance of Characteristics of Clinicians and Practices to Anticipated Retention at Two Years *

	Characteristics of Clinicians and Practice	Anticipated Retention at Two Years			
		Full Model		Reduced Model	
		Odds Ratio	p-value	Odds Ratio	p-value
Discipline	**Physician assistant (vs. physician)**	0.53	.13	0.49	.001
	Nurse practitioner (vs. physician)	0.44	.002	0.40	<.001
	Dentist (vs. physician)	0.71	.24	0.61	.064
	Mental health disciplines (vs. physician)	1.04	.90	- -	- -
	Other disciplines (vs. physician)**	1.65	.30	- -	- -
Demographics	**Male (vs. female)**	1.00	.98	- -	- -
	Age 24-29 years (vs. 30+)	0.48	<.001	.046	<.001
	Non-Hispanic White (vs. racial-ethnic minority)	1.47	.059	1.62	.009
	Married/Partnered (vs. single/widowed/divorced)	0.85	.45	- -	- -
	Has children (vs. no children)	1.23	.23	- -	- -
	Raised within service state (vs. not)	1.54	.012	1.66	.003
	Trained within service state (vs. not)	1.49	.020	1.47	.021
Motivation	**Joined the service program to provide care to underserved the same or more than for financial assistance (vs. principally for financial assistance)**	1.91	<.001	1.80	.001
Type of Practice	**Rural health center (vs. FQHC)**	1.72	.032	- -	- -
	Mental health or substance abuse facility (vs. FQHC)	1.54	.18	- -	- -
	IHS or tribal site (vs. FQHC)	1.43	.29	- -	- -
	Prison (vs. FQHC)	1.79	.089	- -	- -
	Other types of practice * (vs. FQHC)**	2.46	<.001	1.84	.003
	Rural county location (vs. urban)	1.03	.86	- -	- -
	(Model constant)	0.49	.087	0.55	.012
	Model R-Square	.163		.147	

* Results of logistic regression models, with all variable entered (full model) and by backward elimination stepwise logistic regression (reduced model). N=775.

** Other disciplines include midwifes, dental hygienists, pharmacists, chiropractors and nursing aides

*** Other types of practice include "other primary care, health department, nursing home, hospitals-based and university-based

Table II.I.2. Simultaneously Assessing the Importance of Characteristics of Clinicians and Practices to Anticipated Retention at Five Years *

	Characteristics of Clinicians and Practice	Anticipated Retention at Five Years			
		Full Model		Reduced Model	
		Odds Ratio	p-value	Odds Ratio	p-value
Discipline	**Physician assistant (vs. physician)**	0.38	.001	.38	<.001
	Nurse practitioner (vs. physician)	0.36	<.001	.36	<.001
	Dentist (vs. physician)	0.44	.79	- -	- -
	Mental health disciplines (vs. physician)	0.59	.059	0.60	.049
	Other disciplines (vs. physician)**	1.98	.14	- -	- -
Demographics	**Male (vs. female)**	1.06	.75	- -	- -
	Age 24-29 years (vs. 30+)	0.54	.006	0.52	.003
	Non-Hispanic White (vs. racial-ethnic minority)	1.89	.005	1.92	.002
	Married/Partnered (vs. single/widowed/divorced)	1.26	.34	- -	- -
	Has children (vs. no children)	1.68	.003	1.80	<.001
	Raised within service state (vs. not)	1.54	.016	1.61	.004
	Trained within service state (vs. not)	1.23	.24	- -	- -
Motivation	**Joined the service program to provide care to underserved the same or more than for financial assistance (vs. principally for financial assistance)**	1.60	.01	1.58	.011
Type of Practice	**Rural health center (vs. FQHC)**	2.04	.008	2.08	.002
	Mental health or substance abuse facility (vs. FQHC)	2.20	.017	2.18	.013
	IHS or tribal site (vs. FQHC)	0.88	.73	- -	- -
	Prison (vs. FQHC)	3.34	<.001	3.34	<.001
	Other types of practice * (vs. FQHC)**	2.58	<.001	2.60	<.001
	Rural county location (vs. urban)	1.02	0.90	- -	- -
	(Model constant)	0.18	<.001	0.25	<.001
	Model R-Square	.187		.178	

* Results of logistic regression models, with all variable entered (full model) and by backward elimination stepwise logistic regression (reduced model). N=775.

** Other disciplines include midwifes, dental hygienists, pharmacists, chiropractors and nursing aides

*** Other types of practice include "other primary care, health department, nursing home, hospitals-based and university-based

Table II.I.3. Simultaneously Assessing the Importance of All Aspects of Clinicians' Experiences While Serving to Their Anticipated Retention at Two Years *

	Service Experiences	Anticipated Retention at Two Years			
		Full Model		Reduced Model	
		Odds Ratio	p-value	Odds Ratio	p-value
Service Program	**Overall satisfied with the service program ****	28.4	.001	27.97	.001
	Service program exceeded my expectations	1.05	.81	- -	- -
	Satisfied with contacts and support received from program	1.37	.19	1.62	.015
	Agree: I feel appreciated by program staff ***	1.35	.20	- -	- -
Practice and Work	**Agree: I have good clinical backup**	0.71	.16	- -	- -
	Agree: I can provide full range of services	1.42	.22	- -	- -
	Agree: Practice has an effective administrator	0.95	.86	- -	- -
	Agree: Work rarely encroaches on personal time	0.84	.41	- -	- -
	Agree: I feel strong personal connection to my patients	1.07	.83	- -	- -
	Agree: I feel I am doing important work in this practice	0.57	.23	- -	- -
	Agree: Overall, I am pleased with my work	0.55	.15	- -	- -
	Agree: Overall, I am satisfied with my practice	2.52	.005	1.85	0.14
	Satisfied with relationship with administrator	2.04	.01	1.90	.002
	Satisfied with financial stability of the practice	0.87	.57	- -	- -
	Satisfied with physical condition of practice	0.87	.54	- -	- -
	Satisfied with salary/income from practice	1.33	.17	- -	- -
	Satisfied with availability of cross coverage	1.16	.50	- -	- -
	Satisfied with mission and goals of the practice	1.27	.40	- -	- -
	Satisfied with access to specialist consultation	1.92	.002	1.88	.001
	Satisfied with support from other clinicians in practice	1.07	.79	- -	- -
Family and Community	**Agree: I feel a sense of belonging in community**	1.58	.07	1.48	.085
	Agree: my spouse/partner is happy in community	1.45	.17	1.56	.042
	Agree: my spouse/partner has satisfactory professional opportunities in community	1.10	.70	- -	- -
	Agree: my family is NOT concerned about personal safety	1.64	.01	1.59	.018
	(Model constant)	0.18	<.001	0.14	<.001
	Model R-Square	.286		.262	

* Results of logistic regression models, with all variable entered (full model) and by backward elimination stepwise logistic regression (reduced model). N=603, which includes only clinicians who are married or have partners

** Comparison groups for satisfaction factors are clinicians who responded not satisfied or neutral

*** Comparison group for agreement statements are clinicians who responded disagree or neutral

Table II.I.4. Simultaneously Assessing the Importance of All Aspects of Clinicians' Experiences While Serving to Their Anticipated Retention at Five Years *

	Service Experiences	Anticipated Retention at Five Years			
		Full Model		Reduced Model	
		Odds Ratio	p-value	Odds Ratio	p-value
Service Program	**Overall satisfied with the service program ****	9.29	<.001	8.92	<.001
	Service program exceeded my expectations	0.76	.167	- -	- -
	Satisfied with contacts and support received from program	1.76	.017	1.96	<.001
	Agree: I feel appreciated by program staff ***	1.35	.20	- -	- -
Practice and Work	**Agree: I have good clinical backup**	0.82	.40	- -	- -
	Agree: I can provide full range of services	1.26	.44	- -	- -
	Agree: Practice has an effective administrator	0.84	.55	- -	- -
	Agree: Work rarely encroaches on personal time	0.78	.22	- -	- -
	Agree: I feel strong personal connection to my patients	0.92	.79	- -	- -
	Agree: I feel I am doing important work in this practice	0.09	.44	0.39	.023
	Agree: Overall, I am pleased with my work	0.49	.14	- -	- -
	Agree: Overall, I am satisfied with my practice	3.10	.003	2.39	.002
	Satisfied with relationship with administrator	1.56	.13	- -	- -
	Satisfied with financial stability of the practice	0.99	.96	- -	- -
	Satisfied with physical condition of practice	0.91	.66	- -	- -
	Satisfied with salary/income from practice	1.42	.08	1.46	.046
	Satisfied with availability of cross coverage	0.99	.95	- -	- -
	Satisfied with mission and goals of the practice	1.40	.26	- -	- -
	Satisfied with access to specialist consultation	1.81	.004	1.71	.006
	Satisfied with support from other clinicians in practice	0.97	.91	- -	- -
Family and Community	**Agree: I feel a sense of belonging in community**	1.73	.040	1.77	.024
	Agree: my spouse/partner is happy in community	1.82	.025	1.83	.008
	Agree: my spouse/partner has satisfactory professional opportunities in community	1.06	.81	- -	- -
	Agree: my family is NOT concerned about personal safety	1.66	.01	1.66	.009
	(Model constant)	<.001	0.11	0.10	<.001
	Model R-Square	.271		.248	

* Results of logistic regression models, with all variable entered (full model) and by backward elimination stepwise logistic regression (reduced model). N=603, which includes only clinicians who are married or have partners.

** Comparison groups for satisfaction factors are clinicians who responded not satisfied or neutral

*** Comparison group for agreement statements are clinicians who responded disagree or neutral

Findings Section III.

Survey of PCOs and Program Directors: Assistance Provided by States to Clinicians As They Serve

III. Assistance Provided by States to Clinicians As They Serve

Assistance Provided to Service Program *Applicants during the Recruitment Phase* (Figure III.1)

- Respondents for all 11 states indicated that an office in their state provides one-on-one assistance so that all NHSC applicants know what NHSC eligible sites are available to them. Respondents for three-quarters of states report that state offices also help applicants assess their fit with communities and select a best-suited service site. Only half of the 11 states reported that they help applicants know how to interview at NHSC eligible sites and one-third help them evaluate contracts with sites.
- Respondents for this study's five state programs report that state assistance to applicants to these programs is provided less often than assistance to NHSC program applicants.

Assistance Provided to Service Program *Participants as They Serve* (Figure III.2)

- Overall, states provide fewer services and supports to clinicians when they are actually serving than they do when clinicians are being recruited. Respondents for only two of the 11 states indicate that state personnel help NHSC clinicians settle into their new service sites, help them negotiate their roles and responsibilities in their service sites, help them avoid burnout and help their spouses find suitable jobs. Only assistance with conflict resolution is provided to NHSC clinicians by more than half of states.
- States' assistance to state loan repayment program participants as they serve is comparably infrequent.

Self-Ratings of the Adequacy of Assistance Provided to Service Program Participants (Figure III.3)

- Whereas respondents for only two of 11 states (18%) indicated that offices in their state cannot provide much personal assistance to clinicians looking for NHSC sites, respondents for seven of 11 states (64%) indicate that their states cannot give much personal assistance to NHSC clinicians as they serve.
- Similarly, only three of 11 states (27%) reportedly can provide the contacts and resources that enable NHSC clinicians to feel well-supported and only one of 11 states (9%) reportedly can provide all of the proactive, personal assistance that NHSC clinicians need to maximize chances of retention.

Figure III.1. Percentages of PCOs and Other Respondents for States Who Agree That an Office in Their State "*Provides adequate and effective, one-on-one assistance to NHSC or state loan repayment program applicants to help them . . .*"

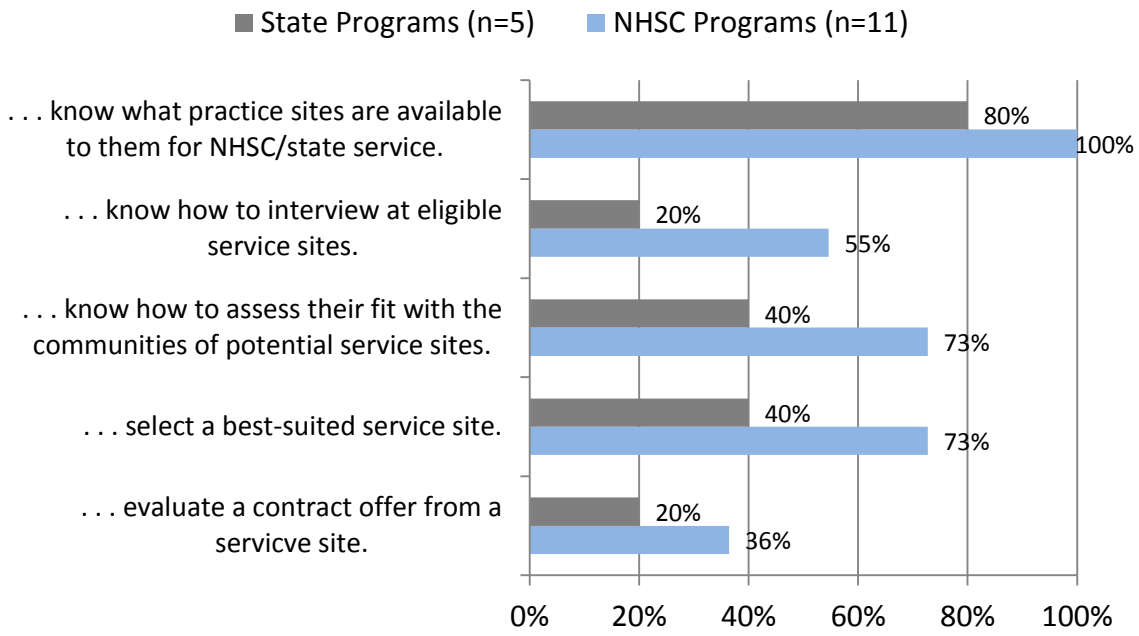


Figure III.2. Percentages of PCOs and Other Respondents for States Who Agree That an Office in Their State "*Provides adequate and effective, one-on-one assistance to NHSC or state loan repayment program clinicians as they serve to help them do each of the following:*"

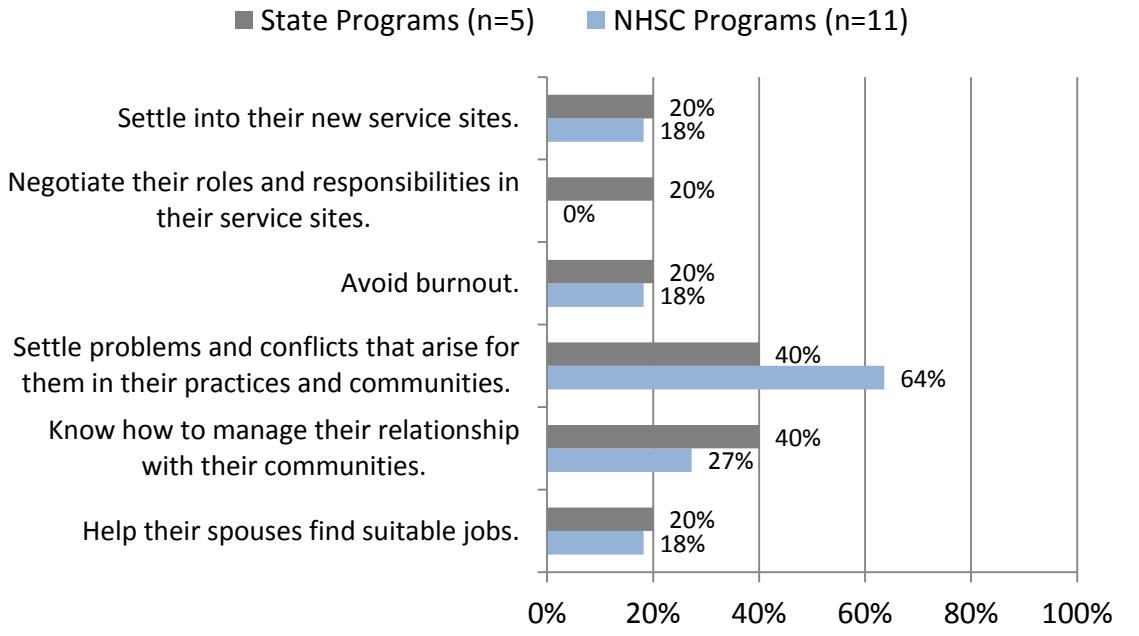
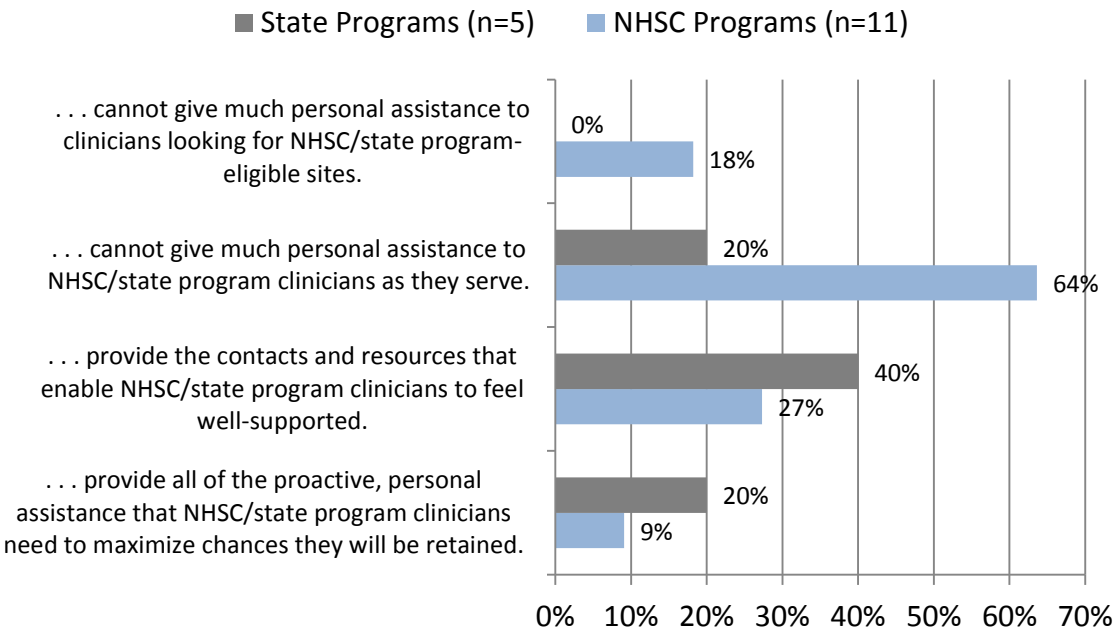


Figure III.3. Percentages of PCOs and Other Respondents for States Who Agree That *"My office and/or another in my state . . ."*



LIMITATIONS OF STUDY AND REPORT

LIMITATIONS OF STUDY AND REPORT

This study and the data within this report have important limitations that are common to survey studies and observational studies generally. Other limitations arise from the nature of the groups and outcomes studied and data issues particular to this study.

Limitations Standard in Studies of This Nature

1. **Response rate bias.** The approximately 50% of participants of the NHSC and states' service programs that did not participate in this project's surveys may differ from those who responded in their characteristics and/or retention plans. Their absence from the data may have affected the findings in important ways.
2. **Reporting inaccuracies and bias.** Respondents may not have always accurately recalled the dates and other information they reported in the survey (recall bias). Some respondents may have hesitated to report information truthfully, perhaps wanting to provide favorable or socially desirable responses (social desirability bias) or for concerns that their responses will be revealed to people they know. Respondents also tend to see and report situations in ways that reflect favorably upon themselves (self-serving bias). These issues do not appear to be major for this study, as respondents provided critical assessments of various aspects of their work, communities and programs.
3. **Limitations of observational studies.** Group differences and other associations noted in analyses do not necessarily reflect causal relationships. Group differences can occur due to chance, other unmeasured factors that co-vary with the measured factors (omitted variables bias) or to other biases. There are many unmeasured differences in the 11 participating states (in climate, population characteristics, amenities, politics, etc.) and programs (dollar support amounts, service terms, option to renew or not) which surely affect clinicians' retention.
4. **Limitations due to small group sizes.** Some of this study's cohorts were too small to be handled as stand-alone groups in detailed analyses. For example, there were too few NHSC Scholars to compare how their retention varies state-to-state. When groups were too small, they were combined into larger groups for analyses and in reporting. Small group sizes also mean that numerical estimates cannot be as precise.

Limitations for This Particular Study

5. **The difficulty of studying retention within recent cohorts.** Retention is a difficult phenomenon to study because it unfolds over years and even decades. Because most states' required retention data for ARRA period clinicians, this study focused on currently or very recently serving clinicians. Retention, therefore, was operationalized as "anticipated retention." How long these clinicians will actually remain in their service sites may prove over time to differ from what they now anticipate.
6. **Choices made in operationalizing anticipated retention.** Retention in this report was defined as the period from the end of a clinician's last service term until the time they leave the practice where they worked when they completed their service. Retention could have been defined with respect to other time periods—for example from the start or end of clinicians' first service term—and the correlates of retention identified may have been somewhat different. Service terms differ for the

various programs of this study, and some programs offer renewal contracts and others do not, and programs differ in how likely a renewal application is to be honored. These program differences may have affected the average anticipated retention estimated for clinicians of each rogram.

7. **Few subgroup analyses done.** For purposes of this report, analyses are generally for all survey groups: we did not assess whether associations found and not found for service programs, states and clinicians as a whole held also for all important subgroups.
8. **Some situations were not considered in the surveys and analyses.** For example, some individuals serve sequentially within the NHSC and states' programs, and how this affects careers and measurement of anticipated retention were not addressed in these analyses and their interpretation.

Efforts were made through this project to minimize bias: (1) group sizes were maximized wherever possible; (2) repeated and varied mailings were used to maximize response rates, (3) factors possibly affecting retention were identified solely based on associations found between variables (e.g., more satisfied clinicians remained longer) and were not identified by asking clinicians "why" they stayed or "why" left, thus avoiding attribution bias, (4) survey items were drawn from previous studies where they have proven to work with obligated clinicians and have demonstrated validity, and (5) multivariate analyses were carried out to help account for confounding from key factors.