



August 12<sup>th</sup>, 2016

To: Oregon Health Authority

Subject: HB 3396 Lewin Report

One of the requirements of House Bill 3396 passed by the Oregon Legislature in 2015 is to study and evaluate Oregon's health care workforce incentive programs, in light of current and projected health care workforce shortages. The Lewin Group was tasked to conduct an analysis of existing strategies to address these shortages and evaluate provider incentive programs to inform future funding decisions by the Oregon Legislative that ensure incentive programs are based on demonstrated effectiveness and are as cost effective as possible. The current study and recommendations will provide the Oregon Health Policy Board and the Legislature with information to help ensure Oregon is supporting programs that are both effective and cost-efficient in terms of recruiting and retaining qualified health care providers, particularly in rural and areas in high need of medical services.

We consider the incentive programs to be effective if the number of provider FTE-years in targeted areas increases as a direct result of the program. Based on this metric, we find empirical evidence that all programs increase the number of provider FTE-years above what would have been available in rural areas over the period between 2010 and 2014 without the programs. Some programs have a recruiting effect – they attract new providers into the area, some have a retention effect – they keep providers in the area longer, while some have both a recruiting effect and retention effect. More specifically, we find that:

- NHSC LRP has an important recruiting effect on primary care physicians, and an even larger effect on NPs and PAs, which makes this program an effective recruiting tool
- NHSC LRP also has a relatively minor retention effect
- The other loan repayment programs (SLRP, BHLRP and MPCLRP) are likely to have similar effects, given that they are similar in terms of award amounts and eligibility criteria
- RPTC and RMPIS have negligible recruiting effect on primary care physicians, but do have a small recruiting effect on NPs and PAs
- Instead, RPTC and RMPIS have a sizeable retention effect on all providers, which makes them efficient retention tools in rural areas
- Costs of attracting an additional FTE-year through any of the programs are lower in the case of NPs and PAs, relative to primary care physicians
- Costs of an additional primary care physician FTE-year are similar across programs, and the same is true for NPs and PAs.

We also formulate a number of recommendations that have the potential to improve the analysis and evaluation of the provider incentive programs in the future. These recommendations are aimed at increasing the programs' recruiting effect, retention effect, or both, as well as improving their cost-effectiveness. Our analysis of the key features of the current programs yields a number of insights into the features that tend to be associated with incentives that offer greater cost-effectiveness. They are centered on issues such as the:

- targeting of benefits
- budget control
- cash vs in-kind benefits
- current vs deferred benefits
- costs incurred today vs costs incurred later

We then assess the current programs through the prism of these features and provide observations on how the programs may be made more efficient and cost-effective. Also, as future efforts to enhance the effectiveness of these programs should focus on increasing the number of providers who would not serve in rural areas without incentive programs, we formulate a number of recommendations on how to achieve this objective. These include:

- Creation of a bidding mechanism allowing providers to offer more years of service in rural areas
- Increasing the value of the program “package” (for instance, by allowing for a stipend to cover moving expenses for providers who are not in rural areas)
- Relaxing job requirement as a condition for a loan repayment application
- Increasing awareness of the availability of programs, by providing a consolidated single source of information and applications across programs
- Encouraging multiple program participation
- Increasing the amount of awards
- Increasing the number of loan repayment awards
- Allowing for different award amounts by provider type

Moreover, once participating providers locate to rural areas, we propose a set of measures to increase the retention of participating providers in those areas. These recommendations include:

- Encouraging the combination of benefits
- Introducing obligation periods
- Retaining former obligors in the state
- Increasing the number of limited-funded awards

Although they are outside the scope of the incentive programs, changing clinical practices in rural centers, and boosting community support for providers may also have the beneficial effect of increasing retention of providers in rural areas.

The main conclusion of this report is that all incentive programs analyzed are successful in increasing the number of providers in rural areas in Oregon. Some programs are better recruiting tools, while other programs are better retention tools. Our program and policy recommendations are aimed at further increasing the efficacy and cost-effectiveness of programs in the future. Also, our data collection recommendations ensure that future program evaluations will have a deeper and wider scope, hence more effectively informing funding decisions by the Oregon Legislative.



HEALTHCARE AND HUMAN SERVICES POLICY, RESEARCH, AND CONSULTING—WITH REAL-WORLD PERSPECTIVE.

## **Data Analysis, Evaluation, and Recommendations Concerning Health Care Workforce Incentives in Oregon**

### ***Summary Final Report***

***Prepared for:*** Oregon Health Authority

***Submitted by:*** The Lewin Group, Inc.

***August 10, 2016***



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## I. Introduction

To meet the requirement of House Bill 3396 passed by Oregon legislature and to assess Oregon's current and projected health care workforce shortages, the Lewin Group was tasked to conduct an analysis of strategies to address these shortages, evaluate provider incentive programs to inform future funding decisions by the Oregon Legislative to ensure incentive programs are based on demonstrated effectiveness. The comprehensive study and recommendations will provide the Oregon Health Policy Board and the Legislature with information to ensure Oregon is supporting programs that are effective and cost-efficient in terms of recruiting and retaining qualified health care providers, particularly in rural and areas in high need of medical services.

Our analysis of the various incentive programs offered to Oregon providers began with an examination of the main characteristics of the health care market in Oregon. The Lewin Group analyzed the current size, distribution and composition of the health care workforce in Oregon, along with the size and mix of the patient population throughout the state and in rural and medically underserved areas that are served by providers participating in relevant incentive programs. The Lewin Group first set out to assess the demand for key health care providers across the geographic areas in Oregon, evaluate the shortages of these providers in rural and medical provider shortage areas currently and in the near future, and examine the current incentive programs for health care providers who serve in those rural and underserve areas.

These analyses encompassed three major focus areas: (1) the Oregon health care market; (2) the Oregon incentive programs (state and federally funded); and (3) an assessment of the available incentive programs. Based on previous rates of growth in the population of providers and on observed utilization patterns in the Oregon patient population, The Lewin Group constructed forecasts of the demand for and supply of providers over the period between 2016 and 2020. Next, in order to assess the provider incentive programs and to gain a thorough understanding of their breadth and outreach within the state, we provide an overview of the current programs and program participation rates. We also present historical trends and changes in the composition of providers who participate and providers who do not participate in federally and state funded incentive programs.

Using various proprietary and administrative data sets covering the 2011-2015 period, we find that all provider incentive programs we analyzed increase the number of FTE-years in rural areas. This work was performed under Task 2 of this project (Lewin, 2016(2)). We measured the impact of the incentive programs in two related ways. First, we considered a program "recruiting" effect, defined as the program's ability to attract providers into targeted areas who would not be there without the program. Second, we considered a "retention" effect, defined as the program's ability to induce providers to stay in targeted areas longer than they would in the absence of the program. We find empirical evidence that some programs have both a recruiting and retention effect, some have only a recruiting effect, while others are largely limited to a retention effect. Overall though, all programs are effective in increasing the number of FTE-years relative to the level without programs. This is consistent with findings from other studies (e.g., Holmes, 2005). Also, combining estimated program effects with the program costs, we calculate the cost of attracting an additional FTE-year in a rural area. This cost, also called the marginal cost, while it varies among programs, it is of the same order of magnitude across programs.



We currently estimate that about a third of the NHSC participating primary care physicians and about two thirds of the NHSC participating NP/PAs are providers who would not have served in rural areas in Oregon in the absence of that program. The estimates are robust to a number of alternative regression specifications and they reflect a substantial recruiting effect of the NHSC loan repayment program. Combining this estimate with conditional retention rates in HPSAs after program completion, we construct estimates of the additional cost of inducing a new FTE into a rural area of \$31,756. As we discuss in Lewin (2016(2)), the actual additional cost per one new FTE is undoubtedly even lower. Even so, our additional cost estimate points to a solid return to investment for the NHSC program in Oregon, which is mainly driven by the probability of providers to serve in HPSAs even after completion of their obligation, and by the fact that many of the NHSC participants serve in HPSAs only as a result of the program. Although this estimate applies only to NHSC, it is likely that the effect of the Oregon loan repayment programs is similar in magnitude to the effect of NHSC.

Despite a number of inherent (and insurmountable for the time being) limitations, the empirical results we obtained allow us to formulate a number of policy and program recommendations. The data limitations we faced in this project provided us with a unique opportunity to formulate a number of detailed recommendations on how these limitations may be successfully overcome in the future, with the ultimate goal of being able to inform solid program evaluation and policy-making.

## II. The Oregon Health Market

The Lewin Group examined the Oregon population and its characteristics that are potential drivers of the demand for health care services and providers. Using Provider360 data, in Table II-1 we show the total number of health care providers that we observed in the state of Oregon during the 2014-2015 timeframe. In total, there are 72,766 health care providers, of which 11,567 are physicians. Approximately 60 percent of these physicians offer primary care services.<sup>1</sup> The estimated number of behavioral health providers is 5,434, while the number of dentists is 2,914. Physician assistants (PAs), nurse practitioners (NPs) and registered nurses (RNs) represent three of the largest categories of non-physician providers.

**Table II-1: Number of Health Care Providers per Population, by Provider Type**

Provider type	Oregon Providers	Providers per 1,000 Population	
		Oregon	United States
All Health Care Providers	72,766	18.33	14.79
Physicians	11,567	2.91	2.83
Primary Care Physicians (PCP)	6,981	1.76	1.71
Non-Primary Care Physicians	4,586	1.16	1.12
Behavioral Health Providers (BHP)	5,434	1.37	1.08
Dentists	2,914	0.73	0.63
Physician Assistants (PA)	1,466	0.37	0.32
Nurse Practitioners (NP)	2,305	0.58	0.56
Clinical Nurse Specialists (CNS)	64	0.02	0.02
Advanced Practice Midwives (APN)	219	0.06	0.02
Registered Nurses (RN)	38,832	9.78	9.66
Licensed Practical Nurses (LPN)	3,737	0.94	2.58
Nurse Anesthetists (NA)	343	0.09	0.15
Population (2014)	3,970,239	--	--

Note: The main source of data for this table is the 2015 Provider360 Data (owned by Optum Services Incorporation). The number of RNs in 2014 comes from the OHA Report "Oregon Health Professions: Occupational and County Profiles". The national-level numbers of RNs and LPNs that are used to construct the ratios in the last column are for the year of 2016 and come from the Kaiser Family Foundation.

After reviewing the current state of the health workforce in Oregon, we analyzed the patterns in the utilization of medical services by various segments of the population, using claims data from Oregon's 'All Payer All Claims' (APAC) data. With these elements, we constructed forecasts of the future demand for medical service of the Oregon population, as well as forecasts of the supply of providers over the period between 2016 and 2020.

<sup>1</sup> Primary care includes the following categories: family practice, general practice, internal medicine, OB-GYN, Pediatrics and selected categories of Psychiatry and Neurology. Behavioral health providers include psychologists, social workers, and marriage and family therapists.

**Table II-2: Projected Demand and Supply for Oregon Providers by Provider Type**

<b>Provider Type</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
	<b>Demand</b>					
Primary Care Physicians	7,094	7,146	7,250	7,358	7,469	7,580
Specialty Care Physicians	4,689	4,736	4,823	4,906	4,995	5,088
Behavioral Health	5,487	5,484	5,521	5,549	5,587	5,618
Dentists	2,963	2,985	3,028	3,068	3,115	3,156
Physician Assistants	1,495	1,512	1,535	1,557	1,582	1,608
Nurse Practitioners	2,337	2,348	2,376	2,407	2,435	2,465
	<b>Supply</b>					
Primary Care Physicians	6,883	6,917	6,952	6,987	7,022	7,057
Specialty Care Physicians	4,505	4,631	4,761	4,894	5,031	5,172
Behavioral Health	5,291	5,317	5,344	5,371	5,398	5,425
Dentists	2,856	2,857	2,858	2,859	2,859	2,860
Physician Assistants	1,455	1,497	1,541	1,585	1,631	1,679
Nurse Practitioners	2,261	2,381	2,507	2,640	2,780	2,927

Comparing the projected demand and supply under various policy-relevant scenarios should provide insights into whether “gaps” are expected to emerge in given geographical areas, or for various provider types. Comparing the forecasts from Table II-2, we estimate that the state-level gap between demand and supply for primary care physicians will grow to about 500 providers by 2020. Similar gaps may be emerging for other categories, but note that in the cases of nurse practitioners and physicians assistants our forecasts indicate that the supply may be higher than the demand. However, it may be that the growth rates in the number of NPs and PAs are too large. The current growth rates may be capturing trends that are specific only for the last few years, dominated by the Affordable Care Act and other initiatives. In the future, the growth rates for these two categories may be smaller.

### III. Provider Incentive Programs in Oregon

#### A. Participation in Incentive Programs

In this section we examine the extent of participation in the various provider incentive programs. Table III-1 shows the number of participants in each of the financial programs available over the period between 2010 and 2015. Overall, the total number of participants increased from 3,119 providers in 2010 to 3,338 providers in 2012 and then gradually declined to 3,224 participants by 2014. Much of the increase in 2012 is due to the increase in the number of participants in NHSC LRP. On the other hand, the number of participants in state funded programs such as RPTC and EMS-TC remained relatively stable. There has been a steady decline in the number of participants in the malpractice insurance subsidy program (RMPIS) during this period.

**Table III-1: Participants in Provider Incentive Programs, by Year and Program**

Programs	2010	2011	2012	2013	2014	2015
RPTC	2,137	2,164	2,203	2,214	2,216	104*
RMPIS	861	822	769	702	687	639
EMS-TC	557	565	572	562	520	269*
J1-VW	66	64	59	74	75	84
MPC-LRP	-	-	-	-	17	42
BH-LRP	-	-	-	-	-	14
SLRP	-	6	11	27	40	50
NHSC	127	185	321	257	262	346
NHSC LRP	122	179	222	240	237	316
NHSC SP	5	6	13	17	25	27
NHSC others	0	0	86	0	0	3
<b>Total Participants</b>	<b>3,119</b>	<b>3,186</b>	<b>3,341</b>	<b>3,272</b>	<b>3,224</b>	<b>1,520*</b>

Note: \* indicates that the data on these programs for 2015 is incomplete.

In terms of the number of participants, RPTC is the largest program and the number of participants remained relatively stable at around 2,200 providers over our timeframe. This is consistent with our assessment that there have not been any substantial changes in the funding, scope or eligibility of this program. On the other hand, there has been a substantial increase in NHSC participation over recent years, most likely as a result of the injection of additional funding under the American Recovery and Reinvestment Act (ARRA) in 2009 and the Affordable Care Act (ACA) in 2011.<sup>2</sup> Although a few changes in terms of eligibility rules for RMPIS have been made in the recent past, it is unlikely that such changes may explain the gradual decline in the number of program participants. Further study is required to understand the specific cause of the decline in participation in this program, but it is possible that as

<sup>2</sup> Source: <https://aspe.hhs.gov/report/provider-retention-high-need-areas/american-recovery-and-reinvestment-act-arr-a-and-patient-protection-and-affordable-care-act-aca-funding-expansion>.

providers get employed with hospitals they drop from RMPIS since hospitals cover their insurance premium.

## B. Retention Analysis of Incentive Programs

To be able to measure the benefits of the incentive programs considered in this study, we need to determine by how much the number of providers in targeted areas increases as a direct result of the program, as well as the extent to which time served in those areas increases due to the program. We call the first effect the *recruiting effect* of the program, and it measures the number of providers who would not have located in those areas without the program. The second effect is called the *retention effect*, and it reflects the amount of time a typical participating provider spends in a targeted area above what he or she would have in the absence of the program. In this section we focus on the retention analysis. While typically recruiting is viewed as preceding retention, in this report we examine the retention effects first, because that analysis yields a number of relevant program-specific descriptive statistics that are then used in the econometric analysis of the recruiting effects. We return to recruiting effects in the next chapter.

## C. Recruitment Analysis of Incentive Programs

We conducted an analysis to evaluate the effectiveness of the various Oregon incentive programs in terms of their ability to attract providers to locate and practice in certain targeted underserved or rural areas. In return for receiving the incentive, the eligible provider must be located in or move to a geographical area designated by the program. These targeted areas are usually rural areas, or other areas where it is believed that the population is “underserved” because of too few providers of certain types in the vicinity.

To be effective, the program must induce some providers to locate in targeted areas that would not have otherwise chosen. Many providers do, of course, choose to practice in these areas and do not require an incentive to induce them to do so. However, those who would have located in the targeted areas without the incentive may, of course, apply for and receive the incentive, if they are otherwise qualified. Hence, the incentive payments to such a type of program participants are unnecessary payments (or “economic rent”, as it is typically referred to in the economics literature) in the sense that these participants would have been practicing in the targeted areas even without the incentive, and the payment of the incentive to these providers does not increase the supply of providers to the targeted area. Some providers, however, who would not have chosen to practice in the targeted areas may be induced to do so by the incentive. If so, they increase the supply of providers in the area. This is a major purpose of the programs, and this is what we call the *recruiting effect* of the incentive programs. From a policy perspective, the best outcome is to determine the optimal range of energy and resources that are needed to bring into rural areas those providers who are unlikely (or less likely) to go to those areas.

In Table VI.2 we present the estimates of the total effects of all the programs considered for both primary care physicians and NPs and PAs. We find that some programs have only a retention effect (RPTC, RMPIS in the case of primary care physicians), while the other programs have both a recruiting effect and a retention effect. In the cases of programs that generate both effects, the recruiting effect tends to be substantially larger than the retention effect. Most importantly, as shown by the rightmost column in Table III-2, in the case of all programs and for each provider

type, the programs have a positive impact on the number of FTE-years in rural areas. These are FTE-years that would not be supplied in those areas without the programs.

**Table III-2: Recruiting, Retention and Total Program Effects by Provider Type**

	Providers	Recruiting Effect (FTE-years)	Retention Effect (FTE-years)	Total Effect (FTE-years)
<b>Primary Care Physicians</b>				
RPTC	827	0	736	<b>736</b>
RMPIS	459	0	459	<b>459</b>
SLRP	26	39	13	<b>52</b>
BHLRP	--	--	--	<b>--</b>
MCPLRP	8	15	4	<b>19</b>
NHSC	64	99	32	<b>131</b>
NHSC & RPTC	30	58	18	<b>76</b>
<b>NPs and PAs</b>				
RPTC	632	90	510	<b>600</b>
RMPIS	78	54	57	<b>111</b>
SLRP	20	56	7	<b>63</b>
BHLRP	14	39	5	<b>44</b>
MCPLRP	15	43	5	<b>48</b>
NHSC	108	301	40	<b>341</b>
NHSC & RPTC	74	250	28	<b>278</b>

As mentioned above, due to the fact that participation into the state-funded loan repayment programs is limited, and in some cases the number of providers ending their obligation is very low, we could not identify any statistically significant effect of these programs. However, it does not mean that those effects are truly zero. In fact, given that those programs are similar in structure, administration, target population and generosity, it is likely that they have a similar effect as the NHSC LRP program. Therefore, the magnitude of the NHSC effect we estimate may serve as a benchmark or a range over which the true effect of the Oregon loan repayment programs may be.

Using the estimates from the previous section we can now estimate the cost of attracting an additional FTE in a rural area. In Table III-3 we also include the average cost, which is simply the amount of the award for an individual in a given year, as well the cumulative cost paid to one provider during the period that provider participates in one or more programs.

**Table III-3 Additional Cost per New FTE by Program and Provider Type**

	PC Physicians	NP/PAs
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	Average cost (\$)	Cumulative Cost (\$)	Marginal cost (\$)	Average cost (\$)	Cumulative cost (\$)	Marginal cost (\$)
<b>RPTC</b>	5,000	18,350	20,787	5,000	17,800	18,960
<b>RMPIS</b>	3,890	14,626	14,820	3,890	14,081	9,866
<b>SLRP</b>	23,386	60,804	30,402	23,386	65,000	19,303
<b>BH LRP</b>	20,000	52,000	31,756	20,000	52,000	16,471
<b>MCP LRP</b>	27,321	71,035	29,909	27,321	65,000	22,198
<b>NHSC (No RPTC)</b>	25,000	65,000	31,756	25,000	65,000	20,587
<b>NHSC &amp; RPTC</b>	30,000	94,000	36,908	30,000	91,000	24,233

Note: The average costs for SLRP and MPC LRP are equal to the average awards observed in the data for a year of commitment. In the absence of data on the time in service, the cumulative costs of those programs were calculated by assuming a service period that is equal to the typical service period in NHSC LRP. Also, due to lack of data BH LRP average costs is equal to the maximum award under that program, and we approximate the marginal cost of BH LRP for PC physicians with the marginal cost of NHSC LRP for PC physicians.

The estimated additional cost per one new FTE is smaller for NHSC PA/NP participants than for NHSC primary care physicians. Also, the difference between the additional cost of providers who participated in both NHSC and RPTC and the NHSC participants who do not participate in RPTC is smaller for NHSC NP/PAs than for NHSC physicians. These are primarily due to the larger recruiting effect. In either case, the increase in the estimated additional costs due to participation in RPTC among additional providers is lower than the actual cumulative RPTC award per participant during the entire period they serve in the rural areas.

Comparing the RPTC and RMPIS programs, it appears that the RMPIS program is relatively more cost effective in increasing the provider years in rural areas. This difference is largely due to the higher recruiting effect of the RMPIS program, and it is particularly visible in the case of NP/PAs. Finally, all incentive programs appear to have lower additional costs for NP/PAs than for physicians. Nonetheless, the additional cost estimates are of the same order of magnitude for each program and for each program type.

## IV. Program Recommendations

In our report for Task 2, we evaluated Oregon provider incentive programs based on two major, and related criteria: the ability to attract qualified providers into select, targeted areas that are considered underserved and the ability to retain qualified providers in these areas. In that report, we provided quantitative estimates of both a recruiting effect (attracting qualified providers into targeted areas in which they would not otherwise serve) and a retention effect.

### Features Associated with Efficient, Cost-Effective Incentive Programs

The following are general propositions regarding characteristics or features associated with efficient, cost-effective incentive programs.

- A. **Targeted programs:** incentives that are “across-the-board” are likely to be less efficient than programs that attempt to target those outside of the underserved areas to provide services in select, targeted areas.
- B. **Budget control:** A program, for which explicit awards are allocated to qualified applicants based on the merit of the applicant, and for which one can terminate new awards when the budget for that time period is exhausted, offers greater budget control
- C. **Cash or Cash-like versus in-kind incentives:** incentives that represent general purchasing power to the recipient or awardee tend, for a given cost of providing the incentive, to have a greater value and greater incentive effect than incentives that are provided in-kind. Cash incentives, unless explicitly provided an exception in both state and federal legislation, would be treated as ordinary income and subject to state and federal income taxes, paid by the recipient. Even if the state were to exempt them from taxation, it is likely that they still would be subject to federal tax
- D. **Current (up front) versus deferred benefit incentives:** incentives that provide an immediate benefit will be more highly valued, in general, than otherwise equal incentives that are available only later in time. For example, providing an incentive that repays a loan that is due currently would, other things being equal, be more highly valued than, for example, a retirement benefit that is received only years in the future.
- E. **Costs incurred today versus incurred latter:** program incentives for which costs are incurred at time periods substantially before any program benefits accrue, such as program incentives that fund medical school tuition, tend to be more costly than an equivalent incentive that is provided in the form of a loan repayment while the provider is practicing in the rural or underserved area and providing health care services.

### D. Observations on Oregon Provider Incentive Programs

In this section, we briefly review and provide observations regarding the major Oregon provider incentive programs.

**Rural Practitioner Tax Credit (RPTC):** It is not likely to target, especially, those practitioners who would not have otherwise practiced in rural areas. In fact, a provision of the program allows the provider to apply for and receive up to three years of tax credits retroactively. Hence, for these providers, it would be difficult to argue that they would not have been practicing in the rural area without the RPTC. In addition, the RPTC does not target, within rural areas, those areas that are in greater need than others. Finally, because the program is open, passively, to all



who meet the eligibility requirements, the cost of the program may be difficult to control, at least in the short run, because it depends from year to year on how many eligible providers apply

***Rural Medical Practitioners Insurance Subsidy Program (RMPIS):*** the incentive clearly has no impact on practitioners who are working within organizational relationships in which they do not, themselves, directly pay for medical liability insurance. This feature suggests that, perhaps, a pure cash stipend, independent of whom pays for medical liability insurance, may be more efficient.

***Scholars for a Health Oregon Initiative (SHOI):*** The program is limited in that only OHSU students are eligible. Moreover, preference is given to applicants who are from rural areas. This “targeting” of the program may limit its effectiveness in that it may tend to select out a high proportion of students who would have served in rural and underserved areas anyway. The program is more costly than, for example, a loan repayment program in which costs are incurred as the provider is practicing in rural or underserved areas. Moreover, it may limit flexibility in that, if priorities change over a period of two or three years, resources are already committed to the students in the program.

***Oregon State Partnership Loan Repayment Program (SLRP):*** the program allows one to select, to an extent, based on additional criteria such as where the provider will actually practice and which type of provider is added to the area. Because the number of awardees is selected from among qualified applications, the budget can be directly controlled by selecting fewer, or more, awardees, depending on the budget (B).

***Medicaid Primary Care Loan Repayment Program (MPCLRP):*** This program targets specific providers and, in particular, ensures that they serve Medicaid patients (A). In other respects, it is similar to other loan repayment programs.

## V. Policy Recommendations

In this section we articulate several policy recommendations that are aimed at increasing the effectiveness of the current incentive programs. More specifically, the focus is on increasing the number of providers that current programs attract and retain in rural and underserved areas.

### Improving Recruiting

It is recommendable to increase the number of providers that are induced by the program and to the extent possible, reduce the program awards to providers who would serve in rural areas without the program. In what follows, we provide details on the potential ways in which the Oregon can achieve a greater return, in recruiting, retention, or both.

#### 1. *A Bidding Mechanism*

One way to increase the effectiveness of such programs is to allow all qualified applicants to “bid” for awards, where the “bid” is a dimension which increases the FTE to the rural areas. This may be done by allowing applicants to offer additional years of obligated service. The number of years served in rural areas will increase relative to the current state. From a cost perspective, this increase will have a cost of zero if the bidding is set up in such a way that those who offer to serve additional years agree to receive no payments or additional loan payments for those additional years

#### 2. *An Incentive “Package”*

It may be important to add program features that would be most valued by providers who are not currently serving in a targeted area, to induce them to move to such an area. For example, if program participation would result in a move from a non-qualified area to a target area, a moving expense stipend of a non-trivial amount could be offered. Other non-financial features that would be most valued by providers who are not currently serving in a targeted area may include support with spousal employment.

#### 3. *Relax Job Requirement as Condition for a Loan Repayment Award*

In the case of some loan repayment programs, there is a requirement for providers to first obtain a job in an underserved area in order to be eligible for the program. It is advisable to relax the job requirement as a pre-condition for program application. In this way, the program will be more likely to act in a desired way, that is, induce providers to serve in rural areas.

#### 4. *Increase Awareness on the Availability of Programs and Ease of Use*

Increasing awareness in general may be done through appropriate dissemination of information through relevant medical, dental, nursing, physician assistant and behavioral health undergraduate and graduate programs, through the use of social media, and other sources. Easy access to program information may help attract providers who would not have gone to rural areas in the absence of the program. Develop a truly “one-stop” website source with available information for all programs, eligibility requirements, application

procedures, and further contact points. It is advisable to make the application process as easy, understandable and low cost as possible.

### **5. *Multiple Program Participation - NHSC, RPTC and RPMIS***

Being able to participate in multiple programs has the effect of increasing the value of the “package” for providers. In this sense, if providers with negative preferences for rural areas are induced to serve there by being compensated for these negative preferences, having a combined total of benefits that is larger than the award of only one program may potentially increase the number of providers with negative preferences to serve in rural areas. Since these are the providers who would not serve in rural areas without incentives, allowing for multiple program participation can conceivably have the effect of increasing the recruiting effect.

### **6. *Increase Award Amounts***

Allowing for the award amounts to increase in value may have the result of suggesting to a larger number of providers with negative preferences that they consider the possibility of serving in those areas. A more generous award would increase the number of providers with negative preferences who are at the “margin”. Also, as above, if the number of providers at the margin (i.e., those who would not serve without incentives) dominates the number of providers who are ready to serve without incentives, then this recommendation may increase the recruiting effect.

### **7. *Increase Number of Loan Repayment Awards***

If feasible from a budgetary perspective, it may be efficacious to increase the number of loan repayment program slots. However, this initiative builds on the assumption that the “margin” is “dense” enough. In other words, there exists a sufficiently large pool of eligible applicants who can be induced to serve in rural areas by the availability of the award.<sup>3</sup>

### **8. *Different Award Amounts by Provider Type***

Loan repayment programs tend to have higher recruiting effects among NP/PAs than among primary care physicians. If there is a large number of NP/PAs who are at the margin (i.e., the density of the preferences distribution around the value of the award amount is high), then it may be worth increasing the award amount for those providers. That way the recruiting effect may be further increased.

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<sup>3</sup> If the density of the distribution of preferences is high around the value that is equal to the (negative of the) award amount, then an increase in the number of program slots would increase the “margin”. Conversely, if the density of the preferences distribution is low around the value of the award amount, then an increase in the number of program slots would not increase the number of applicants who would not have served without the award. It would instead increase the applications from providers who would serve in rural areas without incentives. If the latter effect is dominated by the former, then the recruiting effect would increase. This depends on how many providers are at the margin given the current distribution of preferences and the current value of the awards.

## **E. Improving Retention**

The recruiting effect tends to dominate the retention effect for many programs. In this section we focus on recommendations that have the goal of increasing retention, or at least maintaining retention at the same level as before when recruiting is increased.

### **1. Support for Clinical Practices of Team-Based Care**

Providers cannot form accurate ex-ante expectations on neither how their rural experience will unfold, nor how they will perceive that experience. In other words, serving in a rural area is an “experience” good for many providers. A change in perception may be caused by factors that pertain to the individual and may include: a high level of community support, well-trained supporting staff, or a positive working environment. To the extent that these characteristics can be changed by policy makers in substantial and systematic ways, the retention of providers in rural areas will increase relative to the programs’ current retention effects.

While we recognize that changing or adoption of team-based practices is not within the scope of the incentive programs, a beneficial by-product of team-based settings in rural areas may be to increase the effectiveness of incentive programs.

### **2. Increase Community Support**

Other ways in which perceptions of participants may change in positive ways include the availability of amenities like good schools for their children, support in finding job opportunities for spouses or partners, or access to cultural events and opportunities. As before, these elements are not directly actionable within the scope of the incentive programs; nonetheless, if they are achieved as a result of other state- or local-level programs or initiatives, they can contribute to the increasing of provider retention in rural areas.

### **3. Combine Benefits**

The expected years in rural years is larger for NHSC participants who participate in the RPTC program, than it is for those who only participate in NHSC. To the extent that this option is feasible from a budgetary perspective, it may be useful to recommend combining those benefits once a NHSC participant is approaching the end of their service obligation.

### **4. Include Obligation for Some Programs**

To the extent possible, it may be useful to consider including an obligation to serve for a year or more in the case of programs like RPTC and RMPIS. The introduction of an obligation period for the programs that do not have one can increase the retention effect across all categories of program participants.

### **5. Retain Former Obligor in the State**

Negrusa, Ghosh and Warner (2014) found that once NHSC participants complete their obligation, many of them move away from the location where they served, but many tend to move to other similar areas. To further increase the retention effect, it may therefore be important to try to retain within the state these former obligors (from NHSC as well as from

the state loan repayment programs). Preventing them to move to other states will have the effect of increasing the amount of services supplied to rural locations in Oregon.

#### ***6. Increase the Number of Limited-Funded Awards***

This measure would increase the number of loan repayment participants and to the extent that the new participants are similar to those who would have received the awards without this proposed expansion in the number of awards, the number of FTE-years in rural areas would increase. This is merely the result of having more program participants who generate a higher volume of FTE-years. This assumes that the new participating providers who are similar to the ones already participating are sufficiently numerous.

## **VI. Recommendations on Data Collection**

The work we performed with the administrative data received from OHA for this project helped us have a detailed understanding of the advantages and limitations of these data. While the APAC data, as well as the individual-level data on provider participation in the various programs offer unique opportunities for analysis and evaluation, there are a number of shortcomings which, if addressed in the future, may provide much more comprehensive insights into the drivers of program participation, provider retention and program effectiveness that would be valuable for improving programs in the future.

### ***A. Collect Information on All Program Applicants***

To better inform decision-makers on the efficiency and cost-effectiveness of these programs, it is paramount to collect longitudinal data on all program applicants, including those not offered awards.

### ***B. Collect Additional Provider-level Information***

Some of the characteristics that are correlated with the providers' decision to locate to a rural area, such as rural upbringing, race/ethnicity, marital status, spousal employment status, family size, compensation package, or level of community support, may potentially be obtained through more systematic data collection efforts.

### ***C. Field a Provider Survey***

Even with more focused administrative efforts to collect additional individual-level provider information, a number of relevant characteristics would remain undocumented. A potential solution would be to field a comprehensive survey on program applicants, including those not offered awards in order to determine:

- i. key factors that drive their decision to locate and stay in rural/underserve areas;
- ii. the importance of program's financial incentives versus other factors in their decision to apply for programs and remain in target areas
- iii. level of difficulty associated with the application process
- iv. experience with clinical practices in target areas
- v. level of community support and its role in the location decision
- vi. experience with service in target areas
- vii. other socio-demographic characteristics that are difficult to obtain through administrative efforts (e.g., spousal employment status, or family size).

Another survey of potential use would be a survey of providers who serve in target areas, but did not apply for the incentive programs. This data would allow for the identification of the:

- i. availability and accessibility of information related to programs
- ii. perception about the level of financial incentives

- iii. perception of whether additional benefits, such as relocation bonuses, or better community support, would make them more likely to apply for incentive programs.

#### ***D. Collect Data on Tele-Medicine***

Currently there is no systematic way to collect data on the amount of services that providers supply in the form of tele-medicine throughout the state. Such information would be valuable in order to accurately determine the volume of services provided in rural areas, and the degree to which telemedicine can substitute for providers who practice in a specific area.

#### ***E. Identify Providers in APAC Data***

As APAC data includes the universe of medical claims in the state, identifying providers in APAC data would allow for a clear tracking of the volume, nature of services supplied and populations served in target areas by providers in general, and by participating providers in particular. As of now, it is difficult to identify individual providers in APAC data, as in most cases only identifiers of practices or health care facilities are being reported.

#### ***F. Create a Unique Provider Identifier***

Additional research and evaluation of incentive programs would be greatly enhanced if it were possible to construct a common provider unique identifier that would allow researcher to determine multiple program participation over time in a consistent fashion. Currently there is no standardized ID used across programs to track multiple program participation.

#### ***G. Create a Comprehensive Provider Dataset***

With the help of a unique provider identifier, it would be possible to track all providers in the state longitudinally in a centralized fashion and record the year of entry in the program(s), location of the place of service in every year, main services provided, along with the provider's age, gender, marital status, provider type, discipline, specialty, size of practice and so on.

This comprehensive database, linked to APAC data, may be then used for workforce policy, and it would help with the tracking and monitoring of migration patterns over time and could open the door to evaluations of how public health improved as a result of the providers induced by programs, in the form of: number of lives saved, decrease in preventable hospitalizations and emergency department visits, or decrease in incidence/prevalence of various diseases.

## VII. Conclusions

We find evidence that is consistent with the assertion that the state programs appear to contribute to an increase in the retention of providers in rural areas, as reflected by the differences in retention in rural areas between program participants and non-participating providers. At this point we cannot rule out the possibility that those differences are in part due to the selection of some providers in the RPTC program.

We find evidence of a pronounced imbalance in the distribution of providers across rural versus urban areas within the state. Less than one fifth of physicians serve in rural areas, while the fraction of PAs and NPs serving in rural areas is lower than one third. Also, there is a notable heterogeneity across counties in terms of provider-to-population ratios for physicians, behavioral health providers, dentists and non-physicians, with the more rural counties having lower provider-to-population ratios. This pronounced imbalance in the distribution of medical providers across rural and urban areas in Oregon emphasizes the important role provider incentive programs may have in attracting providers in rural and underserved areas.

In addition to the current maldistribution of providers, Oregon may face an even more acute lack of medical services in the future, as the fraction of the population that is more likely to be insured through Medicaid and less likely to have employer-provided insurance is projected to increase. Also, these categories of the population are much more likely to be under the federal poverty line (FPL) or in the lower FPL categories, and although declining as a result of the ACA, their uninsurance rates may still be relatively large. Our analyses of the APAC data indicate that if current population trends continue over the next years, the number of visits demanded will continue to increase. Comparing these projections of the demand for providers with our provider supply forecasts indicate that some gaps between demand and supply are likely to emerge in the future. Under certain scenarios, these gaps may prove to be substantial.