

PA and NP productivity in the Veterans Health Administration

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ABSTRACT

This study assessed the 2014 clinical productivity of 5,959 physician assistants (PAs) and nurse practitioners (NPs) in the US Department of Veterans Affairs' Veterans Health Administration (VHA). Total work relative value units divided by the direct clinical full-time equivalent measured annual productivity, and correlated factors were examined using weighted analysis of variance. PAs and NPs in adult primary care roles were more productive than those in other specialties. Both providers were more productive in rural than in nonrural settings and less productive in teaching than nonteaching hospitals. Men were slightly more productive than women but age and years of VHA employment were not correlates of productivity. PAs were more productive when their scope of practice allowed significant autonomy; NP productivity was unaffected by supervisory requirements. PAs and NPs are an important component of the VHA provider workforce, and their productivity correlates with a number of factors. More organizational research is necessary to better understand the contributing roles PAs and NPs provide in a rapidly evolving, vertically integrated, national health delivery system.

Keywords: Veterans Health Administration, physician assistant, nurse practitioner, workforce, productivity, specialties

The Veterans Health Administration (VHA), an agency of the US Department of Veterans Affairs (VA), operates 140 medical centers or healthcare systems, 820 community-based outpatient clinics (CBOCs), and 135 community living centers.¹ In the late 1990s, the VHA transformed itself from a hospital-centered to a patient-centered delivery system with 21 Veteran Integrated Service Networks (VISNs) that were organized to deliver high-quality care to veterans in the most appropriate

settings, including home and community care.²⁻⁴ As of 2014, the VHA served more than 6.2 million veterans annually, a population with significantly greater morbidity than the general US population, even after accounting for age and sex.¹

In 2014, the VHA workforce consisted of nearly 285,000 employees; about 15,000 direct clinical care physicians represented more than 30 medical specialties. The medical workforce includes more than 6,000 physician assistants (PAs) and nurse practitioners (NPs) engaged in direct care.⁵ In this year of study, the PA and NP workforce was overwhelmingly female: 61% and 91%, respectively, and most were between the ages of 45 and 55 years. VHA internal administrative data show that since 2005, the number of clinical providers (physicians, PAs, NPs, and other healthcare professionals) has doubled. In addition, compared with the private sector, the VHA relies more heavily on PAs and NPs, with a physician-to-PA-or-NP ratio of 1:3, higher than the US ratio of 1:5.⁶

PA and NP presence in American society was part of a federal initiative that began with the Health Professions Act of 1973, which funded PA and NP education under Title VII, Section 747, of the Public Health Service Act.⁷ The number of PAs and NPs in all aspects of US healthcare was about 200,000 in 2014.⁶ PAs may have been used in the VHA as early as 1967.⁵ Yet after nearly half a century, surprisingly little has been published about PA and NP productivity in any health services system.

A principal reason for undertaking this study was to better understand the economics of PA and NP employment. Because PA and NP use in the VHA has grown at the same time the VHA has grown, a study was undertaken to assess which factors may influence their productivity. The VHA's provider mix and practice setting serves as a

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unique laboratory for exploring the efficiency of the provider workforce under different circumstances and different variables.⁸

METHODS

The VHA unit of productivity was measured as work relative value units (wRVUs) divided by the direct clinical full-time equivalent (FTE) of an individual, with an FTE defined as 35 hours or more per week. The wRVU is a constant value across medical specialties and geographic locations, and provides a good standard for work performed. WRVUs often are used in medical provider models where the intent is to pay the provider based on the amount of work performed, regardless of the payer mix or amount of revenue generated. In this study, the PA and NP productivity during fiscal year 2014 (October 1, 2013, to September 30, 2014) was evaluated at the individual provider level (with leave removed and overtime included). The analysis covered 5,959 providers: 30% (n=1,796) were PAs, and 70% (n=4,163) were NPs.

The following calculations were used:

$$Productivity = \frac{\Sigma wRVU}{Clinical\ FTE}$$

$$Clinical\ FTE = \frac{\Sigma Clinical\ Hours}{2,080}$$

Data source Data used in this study were from multiple sources. Staffing levels, as well as FTEs of PAs and NPs, were obtained from the Advanced Practice Provider Cube, a data management system maintained by the VHA Office of Productivity, Efficiency, and Staffing (OPES). Demographics included age, sex, years of service, and other variables obtained from VHA corporate data warehouse.

The facility complexity level is also a product of the OPES.⁸ Rural location and graduate medical education teaching statuses were obtained from other VHA program offices. The data regarding the role of PAs and NPs in primary care were retrieved from the VHA primary care management module. Finally, the state-based scope of practice for PAs and NPs was collected from the Henry J. Kaiser Family Foundation's state health facts (<http://kff.org/statedata>).

The VHA does not base the PA-physician relationship on state practice acts but rather on federal regulations and Directives.⁹ VHA Directive 1063 policy on PA use significantly changed this relationship to one of a collaborative nature but did not go into effect until after data collection was under way; the direct effects of the policy were unclear.

Analysis In the VHA, PAs and NPs provide a variety of roles, such as direct patient care, education, research, and administration in various locations such as the central office in Washington, D.C., and VISNs, medical centers, and CBOCs across the nation. To obtain more informative

TABLE 1. Variables and definitions

Discipline

- PA
- NP

Provider demographics

- Age
- Sex
- Years of VHA employment

Provider practice settings

- Rurality—more than 30 minutes from a VHA center or CBOC²⁰
- Resident supervision
- VHA medical center complexity grouping (1a, 1b, 1c, 2, 3)—five groups from 1a (most complex) to 3 (least complex) based on seven variables: number of patients served, ICU and operative complexity level, patient case-mix, number of residents, complexity of residency programs, research support, and existence of complex clinical programs such as transplant, polytrauma, and interventional radiology.

Scope of practice

- NP full prescriptive authority—whether NPs have authority to prescribe without physician or board of medicine involvement
- PA adaptable supervision—the degree of physician involvement in the PA's practice (degree of autonomy), depending on the circumstance of each practice
- Primary care role—whether NPs or PAs perform in a primary care provider capacity.

and meaningful findings, only the PAs and NPs practicing in direct patient care with at least 0.25 FTEs were included in the analysis. All patients were adults.

PA and NP productivity and potentially contributing factors such as age and scope of practice were examined by using weighted analysis of variance (ANOVA), in which the FTE of each PA and NP was used as the weight factor. Further, ANOVA required data in normal distribution; as a result, the productivity data were transferred into logarithm before the statistical tests. All the analyses are done with PROC GLM (SAS version 9.4). **Table 1** lists the variables and definitions.

RESULTS

In total, 5,959 providers met the criteria of clinically active in fiscal year 2014. The first result revealed that productivity differences existed by discipline. As shown in **Table 2**, the mean annual productivity of PAs was 2,076 wRVUs and NPs was 1,916; PA productivity was about 8% higher than NPs ($P<0.0001$). Further, provider sex is associated with productivity. Male PAs were about 8% more productive than their female counterparts ($P=0.030$); male NPs were about 6% more productive (but statistically insignificant: $P=0.140$). However, productivity is not affected by either years of VHA employment or age of providers.

TABLE 2. Productivity by discipline and demographics

	Number of providers	Sum of weight (FTEs)	Mean productivity	SD	P value
PA	1,796	1,323	2,076	1,239	0.0002
NP	4,163	3,097	1,916	1,082	
Total	5,959				
PA (female)	1,094	794	2,012	1,224	0.0298
PA (male)	702	530	2,172	1,258	
NP (female)	3,769	2,795	1,904	1,079	0.1401
NP (male)	394	302	2,025	1,105	
PA age (years)					
<35	76	52	2,171	1,396	0.1083
35-45	296	214	1,960	1,186	
45-55	844	627	2,105	1,231	
55-65	465	349	2,143	1,322	
>65	115	81	1,807	899	
NP age (years)					
<35	117	84	1,935	1,896	0.7896
35-45	474	345	1,885	967	
45-55	1,682	1,258	1,923	1,078	
55-65	1,567	1,178	1,902	1,055	
>65	323	232	1,980	995	
PA years of VHA experience					
<5	531	376	2,001	1,252	0.2189
5-10	470	355	2,168	1,353	
10-15	328	248	2,005	1,077	
15-20	168	124	2,159	1,300	
>20	299	220	2,089	1,152	
NP years of VHA experience					
<5	1,115	790	1,944	1,160	0.2962
5-10	1,056	801	1,944	1,051	
10-15	716	539	1,931	1,037	
15-20	458	350	1,888	1,085	
>20	818	617	1,843	1,048	

As reported in Table 3, the providers' practice setting significantly correlated with productivity. In particular, PAs in rural areas were 15% more productive than in nonrural areas ($P=0.003$), and NPs were 7% more productive ($P=0.001$). Annual wRVU productivity was influenced by medical center teaching missions that involved supervising or working with residents. PAs were about 8% more productive in nonteaching than in teaching hospitals ($P=0.003$); NPs in nonteaching hospitals were about 11% more productive ($P<0.0001$).

Additionally, the practice setting determined by VHA medical center complexity levels also makes a difference in productivity. The 140 VHA medical centers range in five levels of complexity from large regional tertiary care centers to small rural hospitals. The PAs in the least complex facilities were, on average, 8% more productive ($P=0.001$); NPs in the least complex facilities were 18% more productive than those in the most complex facilities.

Scope of practice based on state or jurisdiction regulations appears to affect productivity. Providers practicing in adult ambulatory care (that is, following a panel of patients) were more productive than those who were not. As shown in Table 4, PAs and NPs listed as primary care providers were 17% and 9% more productive, respectively, than those not having a primary care provider role.

Finally, the level of physician involvement required by

the states appears to affect PAs' productivity. Although scope of practice is based on VA policy, PA practice laws in the state in which the site of practice is located may influence the degree of physician involvement. PAs in states requiring minimal physician involvement were 15% more productive than those in states requiring significant physician involvement; however, the requirement appears to make no difference in NPs' productivity in the VHA system.

DISCUSSION

Discipline and sex as factors of productivity Within the VHA in 2014, the mean annual productivity of clinically active PAs and NPs was significant when compared with other health systems in the United States. What emerged in the aggregate was that PAs were about 7% more productive than NPs, all things considered ($P<0.001$). Fiscal year 2014 wRVU summary per encounter was 1.3 (NP) versus 1.34 (PA). This may have been attributed to the type of workload performed by each discipline. In general, PAs were proportionally more represented in specialty care services; about 75% (994) of PAs in the VHA were employed in nonprimary care services versus 63% (1,949) of NPs. Specialty services involving more complex patients and providers generally conducted various complex procedures; thus, PAs more likely produced higher wRVUs.

TABLE 3. Productivity by practice setting

	Number of providers	Sum of weight (FTEs)	Mean productivity (wRVUs)	SD	P value
PA (nonrural)	1,616	1,192	2,046	1,202	0.0025
PA (rural)	180	132	2,349	1,510	
NP (nonrural)	3,825	2,842	1,904	1,083	0.001
NP (rural)	338	255	2,042	1,061	
Total	5,959				
PA (nonteaching)	204	150	2,215	1,063	0.0031
PA (teaching)	1,592	1,174	2,058	1,259	
NP (nonteaching)	514	381	2,102	1,022	<0.0001
NP (teaching)	3,649	2,716	1,889	1,088	
PAs in complexity level ...					
1a	765	565	2,050	1,287	0.0011
1b	251	186	1,915	1,199	
1c	343	251	2,171	1,206	
2	291	212	2,103	1,218	
3	146	109	2,214	1,150	
NPs in complexity level ...					
1a	1,933	1,446	1,785	1,040	<0.0001
1b	792	591	1,882	1,026	
1c	586	428	2,168	1,315	
2	407	303	2,030	1,019	
3	445	330	2,113	1,002	

TABLE 4. Productivity by practice scope

	Number of providers	Sum of weight (FTEs)	Mean productivity	SD	P value
PA without PCP role	1,361	994	1,994	1,297	<0
PA with PCP role	435	329	2,323	1,007	
NP without PCP role	2,644	1,949	1,855	1,173	<0
NP with PCP role	1,519	1,148	2,018	895	
PA without supervision	974	714	2,205	1,327	<0
PA with supervision	822	609	1,924	1,112	
NP without supervision	2,198	1,644	1,913	1,129	0.6791
NP with supervision	1,965	1,453	1,919	1,027	

Productivity among PAs and NPs also correlated with sex. Women accounted for about 61% of the VHA's PAs and 91% of its NPs. In this study, men were more productive than women, which carried over to the overall productivity of each discipline. Male NPs were about 7% more productive on average than female NPs, and male PAs were about 8% more productive on average than female PAs. Age and years of service did not emerge as influencers of productivity in this study.

Influence of practice setting on productivity Both PAs and NPs were more productive in rural settings than nonrural settings: PAs were about 11% more productive and NPs were about 6% more productive. These observations are not unique to the PA workforce. Doscher and colleagues reported that PAs were more productive in rural primary care visits per week than NPs by 18%, based on self-report.¹⁰

Research that evaluates clinical productivity by examining wRVUs has limitations. A study on PA and NP use at academic medical centers indicated that only about 57% of medical center administrative systems tracked wRVUs and mostly just for PAs and NPs who were in outpatient roles.¹¹ Metrics used in other studies included number of encounters, number of procedures, revenue generated, and total compensation. The compensation-to-production ratio was favorable to PAs and NPs over physicians due to the lower labor costs.¹² Another study suggested that solo-practice physicians who employ PAs and NPs were more productive in seeing more patients per week on average than solo-practice physicians not employing PAs and NPs (127.2 versus 116.4).¹³ Data from the Medical Group Management Association for 2014 found that the annual productivity of NPs and PAs in family medicine providers (without obstetrics) had similar FTE and wRVU calculations: NP=3,207, PA=3,528 (but physicians were more productive=4,965).¹⁴ Additionally, various studies indicate that rural primary care requires significant practice autonomy, and federal policies have encouraged PA employment in rural and remote areas where physicians are hard to recruit.^{15,16} Therefore, PAs and NPs in the VHA may be carrying workloads in rural settings that offset the output in wRVUs traditionally provided by physicians.

PAs and NPs in nonteaching facilities were more productive than those employed in teaching facilities. This may be attributable to how PAs and NPs were used in each setting. Many academic centers use PAs and NPs as resident substitutes, possibly limiting their scope of practice.¹¹ Additionally, rural primary care (where teaching facilities were less likely to operate) requires considerable practice autonomy. Nonteaching facilities likely used PAs and NPs more like physicians than did teaching facilities, thereby increasing their productivity.

VHA medical center group complexity levels also were associated with higher productivity among PAs and NPs. Productivity was generally higher at lower-complexity facilities than higher-complexity facilities.

Effect of scope of practice on productivity The distribution of primary care versus nonprimary care in the VHA differs from national observations; an estimated 32% of all PAs and 82% of all NPs worked in primary care in 2014.⁶ In this study, 25% of PAs and 37% of NPs had a primary care role, and both provider types were more productive in primary care than nonprimary care. Primary care in the VHA does not include pediatrics and obstetrics, and the age distribution of the patient population is skewed to an older male demographic with a higher number of comorbidities than the population at large.¹

In this VHA analysis, PAs and NPs appeared to be more productive when their scope of practice did not require physician supervision, a finding consistent with other observations. One study indicated that NPs' clinical productivity improves when scope of practice is less restrictive.^{17,18} However, another study suggests that what is being produced by PAs and NPs in terms of wRVUs may not capture all the services they were providing and some of their effort was shifted to physician wRVUs.¹⁹ The imperfections of wRVUs need refinement that is correlated with time-motion documentation and other reliable labor techniques. Finally, the trends in provider productivity need assessment; not only what PAs and NPs are producing annually in terms of diagnoses but in comparison with physician counterparts in the same setting holding the same variables constant.

In summary, practice settings among the 140 VA medical centers with their concordant CBOCs appear to have

the most effect on PA and NP productivity—the more rural and nonacademic the setting, the more productive providers were. Other demographics of the two provider types seem to have minimal influence. These findings come at a time of attention to the productivity and efficiency of the VHA to meet the needs of its unique constituents. If these findings hold up to validation, then one consideration is that the VHA may want to identify the best practice settings in which to use PAs and NPs in order to maximize their clinical productivity.

LIMITATIONS

A number of limitations are inherent in any retrospective analysis of administrative data. Evaluation of providers working in subspecialties such as surgery and mental health were excluded from this analysis but are a critical component of the broad range of health delivery services to any society. The relationship of physician productivity within specialties along with PA and NP productivity remains an important area for further analysis. Lack of specialty, interactions with physicians, support staff, examination room capacity, population density, CBOC deployment, nonclinical activity, clinical research roles, and job satisfaction all play roles in productivity and these variables remain to be delineated. One important component that needs addressing is whether the productivity and cost-efficiency of a practice model depends heavily on how providers organize their work.¹⁸

CONCLUSION

The productivity of a VHA provider is defined as the number of patient wRVUs that can be accounted for within 1 year given the clinical FTE of the individual. In the first study of VHA PA and NP annual encounter productivity, a number of factors emerged that distinguish the two providers, although both are productive when wRVUs are matched to FTE. Organizational settings were one influence and other variables may need to be considered. Provider productivity metrics are in need of refinement and validation if the nation is to understand the benefit of using PAs and NPs. However, the VHA has emerged as a reservoir of good data that sets the stage for more granularity in understanding how to optimally use providers in a vertically integrated health-care system. **JAAPA**

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