

Physician Assistants Employed by the Federal Government

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ABSTRACT

Objective

Physician assistants (PAs) are health professionals who have received advance medical training and are licensed to diagnose illness, develop and manage treatment plans, prescribe medications, and serve as principal health care provider. Although the U.S. federal government is the largest single employer of PAs, at the same time little is known about them across the wide array of diverse settings and agencies. The objective of this project was to determine the census of PAs in federal employment, their location, and personal characteristics. This included approximating the number of uniformed PAs. Taking stock of a unique labor force sets the stage for more granular analyses of how and where PAs are utilized and are deployed.

Methods

No one central database identifies all federally employed PAs. To undertake this project, three sources were examined. Data were derived from the U.S. Office of Personnel Management and the National Commission on Certification of Physician Assistants. Uniformed PA numbers were the result of networking with senior chiefs in the military services and the U.S. Public Health Service. The data were collated and summarized for comparison and discussion.

Results

As of 2018, approximately 5,200 PAs were dispersed in most branches and agencies of the government that provide health care services, including the Departments of Defense, Veterans Affairs, Health and Human Services, Justice, and Homeland Security. Federally employed PAs are civil servants or hold a commission in the uniformed services (ie, Army, Navy, Air Force, Coast Guard, and Public Health Service). Most PAs are in clinical roles, although a few hundred are in management positions. Approximately 81% of civilian PAs have had less than 15 years of federal employment.

Conclusion

The diverse utilization and deployment of PAs validate the importance of the role they serve as medical professionals in the federal government. From 2008 to 2019, PA employment in the federal government grew by approximately 50% supporting the forecast that substantial national PA growth is on track.

INTRODUCTION

Physician assistants (PAs) are health professionals who diagnose illness, develop and manage treatment plans, prescribe medications, and often serve as the principal health care provider. Education programs include didactic content across the life span of people, and clinical training occurs in a myriad of settings, leading to a foundation in general medical knowledge. PA programs are 27 months on average and include

2,000 hours of clinical rotations.¹ Members of the military and U.S. Public Health Service (USPHS) Commissioned Corps may become PAs through the Interservice Physician Assistant Program at the Army Medical Department Center and School, Joint Base San Antonio—Fort Sam Houston, Texas.² To be licensed to practice, all PA graduates, whether civilian or military educated, must pass a national certification examination administered by the National Commission on Certification of Physician Assistants (NCCPA). PAs are required to recertify every 10 years and complete at least 100 hours of continuing medical education every 2 years. The PA scope of practice is assessed by education and experience, differing state laws that include some degree of physician oversight, policies of employers and facilities, and the needs of patients.¹ Military PAs serve as medical officers to soldiers, sailors, and airmen in battalion and division level units. They also serve as garrison health care providers to family members and other eligible beneficiaries.² Research has shown that PAs provide safe, high-quality, and cost-effective care.^{3–5}

The U.S. government has employed PAs in various roles since 1969.⁶ Through a series of policies and acts that supported the growth and development of the profession, their presence spans across all aspects of medical care delivery.^{7,8} As of 2019, the number of clinically active PAs in the United

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The views expressed are solely those of the authors and do not reflect the official policy of the U.S. Army, U.S. Navy, U.S. Air Force, U.S. Coast Guard, the Department of Defense, or the U.S. Government.

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States exceeds 131,000 across all U.S. states and territories and represented in at least 65 medical and surgical disciplines.^{9,10} With policy support of the PA profession as a needed health profession in American society, a large number of federal agencies began employing PAs in the 1970s.⁸ However, after 50 years of utilization and deployment, little is known about how many PAs are in federal service careers and the positions they hold.

The objective of this project was to determine the census of PAs in federal employment, including where they are located, and personal characteristics. Understanding the diversity and utility of PAs in the refined setting of the government sets the stage for examining trends in recruitment, career attainment, and retirement.

METHODS

Databases

No one central database comprehensively identifies all federally employed PAs. To undertake this project, three sources were used. Quantitative data were derived from the U.S. Office of Personnel Management (OPM), the NCCPA, and a census survey of PAs in the uniformed services.

Data from OPM were collected through the Enterprise Human Resources Integration-Statistical Data Mart (EHRI-SDM) and downloaded through “FedScope.”¹¹ The FedScope metadata provide federal civilian employment information. EHRI-SDM is a quarterly catalog of civilian personnel employed by the U.S. government and systematically identifies employees by department, agencies, and types of services. Embedded with EHRI-SDM is information at the personnel level, such as education, compensation, and tenure with the federal government. EHRI-SDM data exclude personnel from a few areas of the executive branch, where PAs are employed (eg, the Central Intelligence Agency, the Defense Intelligence Agency, Foreign Service, and White House).¹²

The EHRI-SDM data were compared with a second data source from the NCCPA, which has information on every PA who has been certified within the United States. NCCPA data from the end of 2018 were used, which reflected PA responses that have been updated within a 3-year period. In mid-year 2019, an “expert survey” was undertaken.¹³ We contacted senior members of each uniformed service who could provide PA data. This included USPHS, the Department of Defense (DoD), the Coast Guard (Department of Homeland Security [DHS]), and the Department of Health and Human Services (DHHS). The basic question was “what was the number of PAs on active duty mid-year 2018?” The replies were with various caveats and distilled by the authors to be meaningful for this census survey. The informants were shown the report, and none objected to the findings. Many of the chiefs and senior officers contacted were able to provide unofficial or approximate numbers of PAs in their agency or put the authors

in contact with someone who could do so. The total number of uniformed PAs on active duty was not otherwise publically available.

Analyses

The March 2018 EHRI-SDM from OPM data was utilized, via FedScope. The data were downloaded and recoded for a more straightforward quantitative analysis. Recoding comprised creating categorical variables from text fields. Civilian PAs were identified by their occupational civilian code 0603. Variables of interest included agency, age, education, length of service, salary, grade, and full-time status. SPSS 23.0 was used for statistical analysis. The FedScope dataset length of service and salary were reported at an interval level and a continuous variable, as outlined in FedScope documentation. When using the salary data on a continuous scale, each case was given a value equal to the midpoint of the range in which their salary fell.

Data tables were supplemented with data from the NCCPA. The important contribution about NCCPA is that it provided the number of certified PAs who self-identified as a member of the military and for whom would not be included within the FedScope data set. Identification, validation, and verification of PA employment information in the uniformed services (DoD, DHS, DHHS) were undertaken by contacting senior PAs in the position of leadership.

Characteristics of PAs in the uniformed services were not described given the sensitive nature of their work and dynamic changes within the military. We use the term “uniformed” to note those PAs in the military (Army, Navy, Air Force, Coast Guard) and USPHS (who wear uniforms similar to the Navy and hold a commissioned officer maritime rank).¹⁴

RESULTS

Estimated Number of PAs in Federal Employment

As of March 2018, there were 2,081,160 civilian employees listed within the U.S. government. Of this number, 3,348 (0.2%) were identified as PAs. Compared with medical, hospital, dental, and public health occupation codes (ie, 303,356 employees), PAs (nonuniformed) accounted for 1.1% of federal health professionals. Almost 90% of civilian PAs employed by the U.S. government are within three agencies: the Veterans Health Administration (VHA—a branch of the DVA) (2,399; 71.65%), Department of the Army (424; 12.66%), and DHHS (255; 7.62%) (Table I).

As a result of the communication with uniformed officers, there were an estimated 1,796 PAs in the uniformed services (95% in the military). These PAs would not be seen within the EHRI-SDM civilian data set. When parsed by type of service, PAs in the military (Army = 802, Air Force = 432, Navy = 310, Coast Guard = 40) numbered 1,584. Uniformed PAs in the USPHS were 75 (Table I). The total estimated number of federally employed PAs was 5,144 by adding the

TABLE I. Physician Assistants in Federal Employment: 2018

Type of Employee	OPM Civilian Number ^a	Uniformed Estimates ^b	Total OPM and Uniformed ^c	NCCPA Estimated Total ^d
All federal employees across all agencies	2,081,160			
All federal employees within medical, hospital, dental, and public health occupations	303,356			
Federal-employed PAs	3,348	1,796	5,146	5,378
DoD total	34	0	34	0
Defense Health Agency	34			
Air Force total	25	432	457	489
Air Force Personnel Center	2			
U.S. Air Force Academy	1			
Air Education and Training Command	4			
Air Force Special Operations Command	2			
Air Combat Command	1			
Air Mobility Command	2			
Air Force Materiel Command	4			
Headquarters, Air Force Space Command	2			
Air Force Elements	2			
Air Force District of Washington	3			
Air Force Global Strike Command	2			
Army total	424	802	1,226	1,266
U.S. Army Central	1			
U.S. Army Human Resources Command	2			
Joint activities	2			
U.S. Army Medical Command	417			
Field Operating Offices of the Office of the Secretary of the Army	1			
U.S. Special Operations Command (Army)	1			
Navy total	75	310	385	388
Naval Medical Command	70			
U.S. Marine Corps	1			
Military Sealift Command	3			
Naval Special Warfare Command	1			
Homeland security (DHS) total (includes Coast Guard total)	6	40	46	48
Department of Justice total	127	56	183	358
Federal Bureau of Investigation	1			
BOP/Federal Prison System	126	56		358
DHHS total	255	170	425	650
Office of the Secretary of Health and Human Services	156			
Program Support Center	3			
Food and Drug Administration	1	2		
IHS	73	37		364
National Institutes of Health	22	6		
Center for Disease Control and Prevention		26		
Centers for Medicare and Medicaid Services		4		
USPHS		75		266
Department of Commerce total		6	6	0
National Oceanic and Atmospheric Administration		6	6	0
Department of Veterans Affairs total	2,399		2,399	
VHA	2,398			2,117
Other	3		3	82
Smithsonian Institution	1			
Federal Aviation (Administration)	2			
DOS				82
Grand total	3,348	1,637	5,175	5,398

Note: The commission corps officers of the USPHS are assigned to various departments and agencies (eg, IHS, NOAA, DOJ, NIH, CDC, etc.). They may be counted by the DHHS under one means and by the NCCPA as another.

^aThe OPM totals are derived from March 2018 EHRI-SDM from OPM data and accessed via FedScope. It reflects all civilian PAs as of March 2018.

^bThe uniformed PA estates are derived from conversations with senior PAs in the position of leadership with the branches of the military and reflect 2018 data.

^cThe estimated total OPM and uniformed PAs are calculated by adding the OPM and uniformed estimates.

^dThe NCCPA estimated total is the number of certified PAs who self-identified as a member of the military and USPHS Commissioned Corps or are federally employed as of December 31, 2018. Required input is every 3 years.

TABLE II. NCCPA PA Professional Profile Data Updated Within 3 Years: Certified PAs in the Federal Government as of 12/31/18 *N* = 5,378

Practice Settings			Females		Males	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Veterans Affairs	2,117	39.36%	1237	58.40%	880	41.60%
U.S.	1,266	23.54%	382	30.20%	884	69.80%
Military—U.S.						
Army						
U.S.	489	9.09%	200	40.90%	289	59.10%
Military—U.S. Air Force						
U.S.	388	7.21%	145	37.40%	243	62.60%
Military—U.S. Navy						
USCG	48	0.89%	18	37.50%	30	62.50%
IHS	364	6.77%	225	61.80%	139	38.20%
BOP	358	6.66%	198	55.30%	160	44.70%
Public Health Service	266	4.95%	170	63.90%	96	36.10%
DOS	82	1.52%	48	58.50%	34	41.50%
Grand total (per NCCPA)	5,378		2,623	48.80	2,755	51.20

Note: The NCCPA figures are certified PAs who self-identified as a member of the military or are federally employed as of December 31, 2018.

EHRI-SDM numbers and the uniformed officer estimates. These estimates are within 4% of the 5,378 number provided by the NCCPA.

The NCCPA estimates are based on those PAs who updated their profile within the last 3 years and provided employer information (as of year's end 2018). The overall number of 5,378 federally employed PAs in the NCCPA file included both civilian and uniformed services PAs. The largest employers, based on the NCCPA data estimates, are the VHA (2,117), Army (1,266), Air Force (489), and the Navy (388) (Table I).

Characteristics of Civilian PAs in Federal Employment

Table II presents the proportion of male and female PAs in federal government practice settings. A higher proportion of females to male PAs are employed in the VHA (58.4 vs. 41.6%), Indian Health Service (IHS) (61.8 vs. 38.2%), Bureau of Prisons (BOP, 55.3 vs. 44.7%), Public Health Service (63.9 vs. 36.1%), and Department of State (DOS, 58.5 vs. 41.5%). Conversely, a higher proportion of male to female PAs are employed in the Army (69.8 vs. 30.2%), Air Force (59.1 vs. 40.9%), Navy (62.6 vs. 37.4%), and Coast Guard (62.5 vs. 37.5%).

In terms of employment duration, 63.4% of federally employed civilian PAs had less than 10 years tenure, with 23.5% employed 5–9 years. Another 17.8% had 10–14 years; those with 20 or more years accounted for 10% of all civilian PAs.

Despite 81.2% of all civil service PAs having under 15 years' experience, 49.5% of civilian PAs were 50 years or

older. Education of civilian PAs ranges from below bachelor's to postdoctorate degrees (Table III).

Salary of Civilian PA in Federal Employment

Among the 10.3% of civilian PAs employed by the U.S. government that worked less than full time (<30 h/wk), the mean 2018 salary was \$80,778 (SD = \$16,052). Among full-time civilian PAs (≥30 h/wk), the mean annual wage ranged from \$88,637 (SD = \$7,434). Full-time annual wage at the Department of Justice was \$111,206 (SD = \$15,755); the VHA was \$113,755 (Table IV). In terms of length of service, salaries (2018 dollars) generally increased from \$94,117 (SD = \$27,925) for those with less than 1 year of service to a high of \$122,023 (SD = \$13,070) for those with 30–34 years of service. Among those employed on the “general schedule and equivalently grade” pay plans, the mean salary was \$92,209 (SD = \$16,887), and those on the Senior Executive Service (SES), the mean salary was \$109,969 (SD = \$18,574) (Table IV). The SES is equivalent to flag officers in the uniformed services. When an employee changes to a SES status, they may drop their occupational civilian code designation (although many identify themselves as PAs with the NCCPA practice profile).

The 2018 annual wage for federal PAs is based on a 2080-hour year. Locality pay, hazardous pay, flight pay, overtime, retention bonuses, and other pay differentials were not included in the wage analysis. Employment benefits of federal workers are standardized and include, annually, 10 paid holidays and 4 weeks of paid leave. Additional benefits, including sick pay, retirement, and overtime, compare favorably with the private sector.

TABLE III. Age, Education, and Length of Service of Civilian PAs in Federal Employment: 2018

Age Group	Total (N = 3,348)	Percent (%)
20–24	11	0.33
25–29	118	3.52
30–34	232	6.93
35–39	364	10.87
40–44	447	13.35
45–49	518	15.47
50–54	519	15.50
55–59	518	15.47
60–64	429	12.81
65 or more	192	5.73
Education		
Below Bachelors	224	6.69
Bachelors	811	24.22
Post Bachelors	305	9.11
Masters	1,895	56.60
Post Masters	49	1.46
Doctorate	56	1.67
Postdoctorate	7	0.21
Length of service		
Less than 1 year	336	10.04
1–2 years	600	17.92
3–4 years	400	11.95
5–9 years	786	23.48
10–14 years	596	17.80
15–19 years	296	8.84
20–24 years	153	4.57
25–29 years	105	3.14
30–34 years	51	1.52
35 years or more	25	0.75

Note: The March 2018 EHRI-SDM from OPM data was utilized and accessed via FedScope—reflecting all civilian PAs on that date.

DISCUSSION

The U.S. government is the largest single employer of PAs—this numbers approximately 5,200 in 2018 (excluding PAs in the National Guard and Reserves). As public service employees, PAs are widely distributed throughout the 50 United States, six territories, and other locations. Military PAs are found on bases foreign and domestic, aboard ships, aircraft, and where events occur globally. Civilian PAs are spread widely across agencies such as Health and Human Services, VHA, the National Oceanic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration, and other government bureaus or branches. At the diplomatic level, they are on State Department missions such as the Peace Corps, embassy assignment, and Central Intelligence Agency. Military PAs are also assigned as medical officers to the White House.¹⁵ The secondment of USPHS PA officers occurs across a number of agencies (eg, BOP, U.S. Military—Coast Guard [USCG], IHS, Centers for Disease Control and Prevention (CDC), Food and Drug Administration (FDA), NOAA, Federal Aviation Administration (FAA), Centers for Medicare and Medicaid Services (CMS)). Such assignments require adapting to a wide set of regulations and clinical situations whether they are in uniformed or civilian roles.⁸ This

role flexibility appears to be a characteristic of the American PA¹⁶ and may explain their versatility across a wide range of medical circumstances.¹⁷

When 10 years of growth are examined, the overall PA employment in the federal government grew at least by 50% (excluding Reserves and National Guard). Within the VHA alone, the growth in PAs between 2008 and 2019 grew by 43% (from 1,680 PAs to 2,399).^{8,17} Studies on the quality of care involving federally employed PAs have been reported primarily in the VHA.^{5,18,19}

A few findings emerged from this analysis that deserve commenting. One is the observation that the mean age of a civilian PA is 50 years, but the average duration of their federal employment is 10 years. One explanation is that many PAs enter federal employment after a nongovernment career. Federal employment offers some options not available in the private sector including perquisites, pay, and retirement benefits making employment desirable for many. The VHA, for example, began expanding PA and NP recruitments early in the second decade, and older, more experienced PAs are reported to be a significant source of applicants with some hoping to add on their military time toward a federal pension.

Another observation is that females are disproportionately represented in the civilian sector but not in the uniform arm, although the trend in PA graduation rates is almost 70% female. Our interpretation is that gender shifts are underway throughout all aspects of medicine, and women are leading men in nonmilitary federal PA roles. Perhaps with time, they may catch up with their male counterparts in uniform.

FUTURE DIRECTION

As for the future, the PA profession is considered a leading health care occupation in the United States.²⁰ The Bureau of Labor Statistics predicts a 37% increase in PA jobs between 2016 and 2025.⁹ Whether this U.S. labor forecast will be matched by the federal system is unclear as each department and/or agency sets policy and recruitment independent of other branches. However, the demand for PAs in both VHA and DOD seems to be growing as newer and diverse clinical assignments emerge overseas as well as on the home front.²¹

This intent of this report is to set the stage for more granular analyses of federally employed PAs. Specifically, the presented study serves as a census of civilian PAs within federal employment and an estimate of uniformed PAs. The same should be done for advanced practice registered nurses who are important members of the health care team. As of this writing, there is no clear way to identify the advanced practice registered nurse segment of the health care workforce within the EHRI-SDM data sets. In the military, the NP is in the nurse corps.

Additionally, there is no publically available documentation on the career trends of PAs in the various federal agencies. Human resource administrative questions should include matching the age and gender distribution of PAs in domestic

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TABLE IV. Salary of Civilian PAs in Federal Employment: March 2018

Work Status	Total (N = 3,339)	Mean (\$)	SD (\$)	Median (\$)
Full-time	2,994	107,715	16,052	107,435
Not Full-time	345	80,778	30,160	67,845
Salary for full-time PA employment*	Total (N = 2,994)	Mean (\$)	SD (\$)	Median (\$)
DoD	34	105,577	7,998	103,639
Department of the Navy	74	94,204	9,306	93,821
Department of the Air Force	25	98,477	12,527	97,097
Department of the Army	413	100,191	12,413	100,360
Department of Justice	127	88,637	7,434	88,433
DHHS	92	97,557	13,127	98,269
DHS (USCG, INS, other)	6	107,962	2,379	107,435
Smithsonian Institution	1	113,755	—	113,755
Department of Transportation	2	112,623	2,044	112,623
Department of Veterans Affairs	2,220	111,206	15,755	111,560
Salary by length of service for full-time PAs	Total (N = 2,994)	Mean (\$)	SD (\$)	Median (\$)
Less than 1 year	292	99,065	21,869	102,293
1–2 years	567	103,409	15,736	103,337
3–4 years	367	106,314	15,008	106,177
5–9 years	689	107,211	13,055	106,177
10–14 years	494	111,036	14,294	110,692
15–19 years	268	113,162	13,763	113,477
20–24 years	145	113,865	15,365	113,092
25–29 years	98	116,864	14,388	117,106
30–34 years	49	122,314	13,174	120,751
35 years or more	25	116,712	15,386	117,106
Salary by pay schedule for full-time civilian PAs	Total	Mean (\$)	SD (\$)	Median (\$)
General schedule and equivalently graded pay plans	775	97,707	12,223	96,683
Other	2,219	111,210	15,759	111,560

*Excludes PAs in the Military. Not adjusted for locality pay differential.

and federal status and examine not only if uniformed and nonuniformed PAs differ but also if it matters. Investment in PA education, especially in the uniformed ranks, has only been marginally explored once the employment arc of a federal PA comes to an end. Such information on veteran to civilian roles opens questions about the opportunity cost of federal training and employment.

LIMITATIONS

There are limitations inherent within the FedScope file, including the suppression of some data because of privacy or confidential classification. The central tendency of means was used to calculate interval statistics (age, length of service on 5-year intervals, salary on \$10,000 intervals). Despite these shortcomings, the data are considered robust since they include a large majority of federally employed PAs and, as such, are considered near complete. Although there remain some accounting issues for PAs within the military services (and the absence of information about PAs in the Reserves and National Guard), the numbers offer a close approximation of military PA employment and exceed what has been promulgated to date. For various reasons, the military figures were less specific because of the dynamic

nature of deployment, recruitment, retention, reactivation, and utilization. Nor was confidential information on uniformed PAs probed. One issue realized is when Reserves and National Guard are on active duty, they may or may not be counted in the active DoD ranks or counted twice since they are essentially occupying two employment positions (civilian and military).

In addition to some omitted information on uniformed officers, there is a lack of information with the FedScope data set on many other locations that PAs are found, such as those within the executive branch (eg, CIA, FBI, State Department, and White House). It is anecdotally known that PAs are located in these departments, yet as a result of security reasons, they are obfuscated within the files.¹²

Counts of PAs working as federal contractors and in other capacities such as management and administration were also not available. Our research relied primarily upon the Occupation Civilian Code 0603, which reflects PAs and by triangulating with two other resources.

Furthermore, salary comparisons between PAs who are employees of federal contractors but are not included on the General Schedule (pay) scale were not part of this project. On the plus side, we are unaware of any federal system that is so large yet transparent in disclosing what civil and uniformed

service employees are demographically and what they earn. In addition, it is the reliability of the NCCPA data that raised confidence in the results of the study. We estimate that the data derived from different sources provided results within 4% of each other depending on the department or agency.

CONCLUSIONS

The U.S. federal government is the largest single employer of clinical PAs (approximately 5,200 as of 2018). This number represents PAs in civilian roles as well as in uniform and does not include those in the Reserves and National Guard. Because of a centralized human resource employment office within the federal government, many civilian PAs are able to transfer across government agencies, increasing their utility and flexibility, as well as moving from surplus to shortages as needed. Furthermore, a growing number of PAs are in SES with a few having obtained flag rank. Federal PAs are distributed across nine cabinet-level departments and 34 agencies. Half of the civilian PA cadre is 50 years or older, and the mean employment duration is 10 years. The VHA employs the majority of civilian PAs, followed by the military and the DHHS for those in uniform. Although the deployment of PAs is vast, both domestic and international, their role and responsibility are becoming known. Understanding this dynamic health professional force provides an insight into their utility and role flexibility. The U.S. government is predicted to match the civilian forecasted growth of PAs.

REFERENCES

1. American Academy of Physician Assistants. PA scope of practice. 2017. Available at https://www.aapa.org/wp-content/uploads/2017/01/Issue-brief_Scope-of-Practice_0117-1.pdf, accessed December 3, 2019.
2. Becoming an Army Physician Assistants (PA). U.S. Army Recruiting Command Official Website. Available at <https://recruiting.army.mil/armypa/becomePA/>, accessed December 3, 2019.
3. Mafi JN, Wee CC, Davis RB, Landon BE: Comparing use of low-value health care services among U.S. advanced practice clinicians and physicians. *Ann Intern Med* 2016; 165(4): 237–44. doi: 10.7326/M15-2152.
4. Kreeftenberg HG, Pouwels S, Bindels AJGH, deBie A, van der Voort PHJ: Impact of the advanced practice provider in adult critical care: a systematic review and meta-analysis. *Crit Care Med* 2019; 47(5): 722–30. doi: 10.1097/CCM.0000000000003667.
5. Morgan PA, Smith VA, Berkowitz TSZ et al: Impact of physicians, nurse practitioners, and physician assistants on utilization and costs for complex patients. *Health Aff* 2019; 38(6): 1029–36. doi: 10.1377/hlthaff.2019.00014.
6. Carter R, Ferrell K, Germino V, Scott PM: In the beginning: a PA history roundtable. *JAAPA* 2005; 18(10): 26–7.
7. Cawley JF: Physician assistants and title VII support. *Acad Med* 2008; 83(11): 1049–56. doi: 10.1097/ACM.0b013e3181890533.
8. Hooker RS: Federally employed physician assistants. *Mil Med* 2008; 173(3): 895–9. doi: 10.7205/milmed.173.9.895.
9. Occupational Employment and Wages, May 2018 29-1071 Physician Assistants. Bureau of Labor Statistics, United States Department of Labor Web site. Available at <http://www.bls.gov/oes/current/oes291071.htm>, updated March 29, 2019, accessed October 23, 2019.
10. National Commission on Certification of Physician Assistants. 2018 Statistical Profile of Certified Physician Assistants by Specialty: An Annual Report of the National Commission on Certification of Physician Assistants. Available at <https://prodcmsstoragesa.blob.core.windows.net/uploads/files/2018StatisticalProfileofCertifiedPAsbySpecialty1.pdf>, accessed October 23, 2019.
11. FedScope [database online]. Washington, DC: U.S. Office of Personnel Management. September 6, 2019. Available at <https://www.opm.gov/data/Index.aspx?tag=FedScope#content>, accessed October 23, 2019.
12. U.S. Office of Personnel Management. About our data (EHRI-SDM). Available at https://www.fedscope.opm.gov/datadefn/aecri_sdm.asp#cpdf2, accessed October 23, 2019.
13. Maetas CD, Buttice MK, Sontje WJ: Extrating wisdom from experts and small crowds: strategies for improving informant-based measures of political concepts. *Political Analysis* 2014; 22(3): 1–20. doi: 10.1093/pan/mpt050.
14. McKinnon MF, Elizondo E, Bonfiglio SM, Hunter-Buskey RN, Placide FP, Bunnell RA: A history of PAs in the US Public Health Service. *JAAPA* 2016; 29(12): 51–6. doi: 10.1097/01.JAA.0000508213.19590.19.
15. Keller JE: Presidents as patients: a white house PA recalls his service. *JAAPA* 2017; 30(1): 42–5.
16. Hooker RS, Cawley JF, Leinweber W: Career flexibility of physician assistants and the potential for more primary care. *Health Aff* 2010; 29(5): 880–6.
17. Woodmansee DJ, Hooker RS: Physician assistants working in the Department of Veterans Affairs. *JAAPA* 2010; 23(11): 41–4.
18. Moran EA, Basa E, Gao J, Woodmansee D, Almenoff PL, Hooker RS: PA and NP productivity in the veterans health administration. *JAAPA* 2016; 29(7): 1–6. doi: 10.1097/01.JAA.0000484311.96684.0c.
19. Virani SS, Akeroyd JM, Ramsey DJ, et al: Comparative effectiveness of outpatient cardiovascular disease and diabetes care delivery between advanced practice providers and physician providers in primary care: implications for care under the affordable care act. *Am Heart J* 2016; 181: 74–82. doi: 10.1016/j.ahj.2016.07.020. Epub August 28, 2016.
20. U.S. News & World Report (2019). Best healthcare jobs. Available at <https://money.usnews.com/careers/best-jobs/rankings/best-healthcare-jobs>, accessed October 23, 2019.
21. Borden Institute. US Army Physician Assistant Handbook. Washington, DC, Superintendent of Documents, US Government Publishing Office, IDCC, 2017 20402-0001.