

**VA TRAINING PROGRAM CONTRIBUTIONS: EVALUATION OF INDIANAPOLIS VETERANS' AFFAIRS
MEDICAL CENTER TRAINING CONTRIBUTIONS TO THE STATE OF INDIANA**



PARTNERS IN TRAINING
+ HEALTH
PROFESSIONS

VA



U.S. Department
of Veterans Affairs



EXECUTIVE SUMMARY

The demand for health professionals is outpacing supply in many health care markets in Indiana and across the nation. Although the COVID-19 pandemic exacerbated workforce shortages, many were existent prior to the pandemic or projected to worsen as demand for health care increases alongside population aging. Now more than ever before, the health professions training pipeline is in the forefront of discussions related to securing the health of our population and economy.

For over 50 years, the Richard L. Roudebush Veterans Affairs Medical Center (Indianapolis VAMC) has been an active and significant figure in Indiana's health professional training landscape. Indianapolis VAMC training initiatives have supported the clinical training needs of numerous academic affiliates and reached many thousands of health professions students. That Indianapolis VAMC training contributions are critical to Indiana is indisputable; however, the specific magnitude of these contributions has not been well documented. This report presents findings of an evaluation focused on quantifying Indianapolis VAMC training investments and the direct impact these investments have had on capacity of health professionals in Indiana.

Exploration of Indianapolis VAMC training investments identified that current fiscal reporting does not completely or adequately reflect the resources dedicated to training initiatives. Much of the underreporting of VA training investments is associated with a lack of documentation for clinical care hours which dually serve as clinical training. Prior to the evaluation only \$10.7 million was able to be confidently identified and quantified as annual training costs. After accounting for non-documented costs, an additional \$80.1 million was identified, for a total of \$90.9 million in annual costs dedicated to health professions training. These significant

investments are critical to health professions training for the State of Indiana and important for strengthening its workforce.

The Indianapolis VAMC is making significant contributions to Indiana's health workforce. Nearly half of Indianapolis VAMC health professions training records matched to a health professional license in the State of Indiana. These licenses are held by many professionals serving in communities across the state, including in rural counties that have historically struggled with workforce shortages. A deeper dive into VAMC trained physicians identified they represent nearly one third of all physicians trained in Indiana and newly licensed during the years of the evaluation. VAMC training initiatives are contributing to health profession capacity overall, but most profound are those contributions for workforce development for critical shortages, such as those in mental health. More than two thirds of Indiana psychiatrists newly licensed during the evaluation period matched to a VAMC training record. The training of these physicians is having a direct impact on improving access to mental health services in Indiana.

The findings of this evaluation demonstrate that Indianapolis VAMC training investments are critical to Indiana's health professions pipeline. Undoubtedly, the Indianapolis VAMC is and will continue to be a key play in securing and strengthening Indiana's health workforce. As demand for health professionals increases, the training pipeline will need to be expanded. Commitment to health professions training is woven into the fabric of the Indianapolis VAMC but enhancing capacity of existing training initiatives to support pipeline expansion will require additional resources. The results of this evaluation and lessons learned may serve as a resource to informing future expansion and evaluation initiatives.

ACKNOWLEDGEMENTS

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Indianapolis VAMC Training Investments

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INTRODUCTION

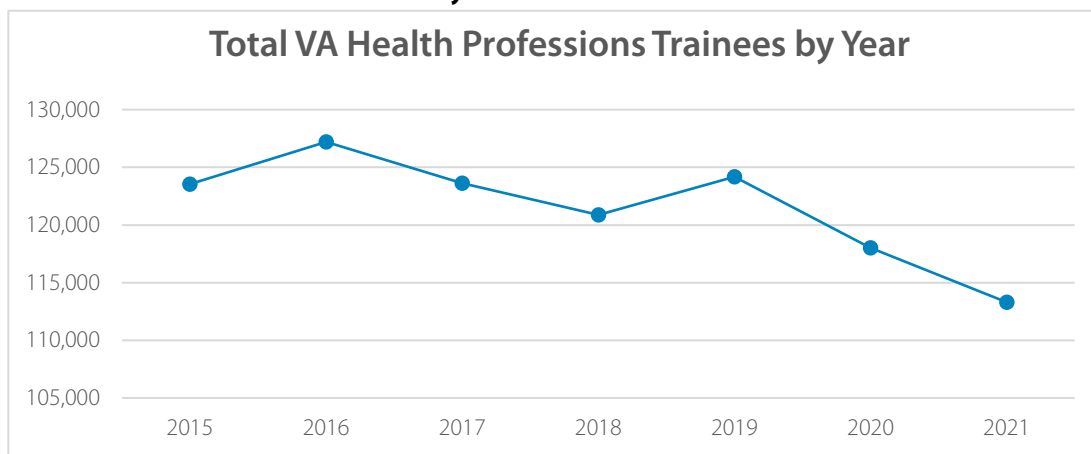
A Call to Action

Communities across the United States are experiencing critical shortages of health care professionals. Health workforce shortages are not a recent development. Shortages of health professionals have been reported for decades in rural and underserved communities. The COVID-19 pandemic worsened existing shortages and contributed new shortages across the health care delivery system. Alarming, health professional training programs are among the entities experiencing the impact of these shortages. Without sufficient training capacity and in light of the expected increased demand for health care services associated with population aging, critical health workforce shortages will become ubiquitous. Now, more than ever before, strategies are needed to strengthen health care workforce pipelines and ensure sufficiently robust training capacity.

Health Professions Education and Veteran Affairs

The United States (US) Department of Veterans Affairs (VA) has a longstanding commitment to the training of health professionals dating back more than 70 years.¹ Training programs are directed by the Office of Academic Affiliations² at the federal level, and locally through the commitment to local designated staff (such as the Designated Education Officer) to support local academic affiliations. VA training initiatives are significant and encompass trainees preparing for numerous high demand health care professions. In fact, the VA Office of Academic Affiliations reported more than 113,000 trainees participated VA training initiatives during the 2020-2021 academic year.³ Moreover, a 2016 article estimated that around 70% of physicians actively practicing in the United States have received training at a facility managed by the VA.⁴ While the trends observed in Figure 1 may be concerning, they are not surprising given the ubiquitous impact the COVID-19 pandemic has had on the health and education systems. Securing and expanding VA health professions training initiatives has never been more important. Information on the impact of VA training initiatives is required to inform initiatives to strengthen this critical pipeline and secure future workforce.

Figure 1: Trends in VA Health Professions Trainees by Year⁵



1 https://issuu.com/faircountmedia/docs/veterans_health_administration_-_75_years_vha_publ/s/13944252

2 <https://www.va.gov/oa/>

*Note: Service lines that report training health professionals include: Anesthesiology, Dental, Education, Medicine (Specialty Care), Mental Health, Neurology, Nursing (PCS Acute Care, PCS Critical Care, PCS Procedural Medicine, and PCS Surgery), Nutrition and Food, Pathology and Laboratory, Pharmacy, Physical Medicine and Rehabilitation, Primary Care, Radiation Oncology, Radiology, Social Work, and Surgery.

3 Figure sourced from Office of Academic Affiliations Report: https://www.va.gov/OAA/docs/OAA_Stats_AY_2020_2021_FINAL.pdf

4 Geppert CMA. What is the VA? The Largest Educator of Health Care Professionals in the U.S. *Fed Pract.* 2016 Jul;33(7):6-7. PMID: 30766185; PMCID: PMC6366564.

5 Note: Data sourced from Health Professions Education Statistics available at: https://www.va.gov/OAA/docs/OAA_Stats_AY_2020_2021_FINAL.pdf

Indiana Health Workforce

The State of Indiana has experienced shortages of certain health professionals and in underserved communities for many years. Similar to other states across the nation, health workforce shortages have worsened and expanded to include a greater diversity of health professionals and communities. As of September 2022, all of Indiana’s 92 counties have federal Mental Health Professional Shortage Area designations, and many counties are also designated as having primary care and dental workforce shortages.⁶ Additionally, while nursing workforce shortages have been reported by Indiana’s long-term care sector for years, shortages of these professionals are now being reported by other settings, such as acute care facilities. Developing strategies to enhance recruitment and retain health professionals in the state is a priority for state officials and health systems leaders, and research shows that health professionals are more likely to practice where they train.⁷ The “Grow Your Own” approach will be important to address Indiana’s health workforce shortages.

Indiana’s health professions training programs represent the state’s primary pipeline for health professionals. These programs prepare students with the skills and competencies required for practice. Clinical training is a requirement for the development of clinical skills and interdisciplinary experiences required to successfully prepare students for practice. Significant resources are needed to support the clinical training of health professions students. Clinical training happens outside of traditional classrooms in patient care settings. It requires a workforce of practicing clinicians who dually serve as faculty/instructors/mentors. Clinical training capacity is the keystone of the health professions pipeline.

Indianapolis Richard L. Roudebush VA Medical Center

The Richard L. Roudebush Veterans Affairs Medical Center (Indianapolis VAMC) provides clinical training experiences for many Indiana health professions trainees (HPTs) through academic partnerships with numerous academic affiliates (Table 1). These training partnerships include many health professional programs (Table 2). The Indianapolis VAMC has been actively involved in training partnerships for more than 50 years, during which time significant investments of time and resources have been made to train thousands of HPTs. In fact, Indianapolis VAMC trainee counts for academic years 2016 to 2021 demonstrate that, except for years impacted by the COVID-19 pandemic, the number of trainees has increased steadily (Figure 2).

Table 1: Indianapolis VAMC Academic Affiliates with 50+ HPTs⁸

Indiana University
Purdue University Lafayette
Butler University
University of Indianapolis
Ivy Tech Community College-Indianapolis
Marian University Indianapolis
Western Governors University
Chamberlain University College of Nursing
Indiana Wesleyan University-Marion
Ball State University
Indiana State University



DID YOU KNOW?

Indiana boasts the largest medical school in the nation: Indiana University School of Medicine.

6 For information on Health Professional Shortage Areas designated by the U.S. Department of Health and Human Services, see: <https://data.hrsa.gov/maps/map-gallery>

7 See article: https://onlinelibrary.wiley.com/doi/full/10.1046/j.1365-2923.2003.01472.x?casa_token=FBRNm-R4kjlAAAAA%3Aqvr43FqZ6sWO4LfK4_BxakMg8F_dg-SbJ-sA0_2l0zZp8L3jG-AZ8cOBWh6Zb_sQfp6mGSVTmkRw

8 Table includes Affiliates with 50 or more HPTs that participated in Indianapolis VAMC training. Additional affiliates include: Harrison College, Christian Theological Seminary, Chamberlain University, Manchester University, National University of Health Sciences, Parker University, Purdue University Global, Rutgers University-New Brunswick, University of Findlay, University of Western States, The Ohio State University, University of Southern Indiana, Cedarville University, Duquesne University, North Central University, University of Kentucky-Lexington, University of Michigan-Ann Arbor, Walden University, Illinois Wesleyan University, Independence University, Meridian Institute of Surgical Assisting, Inc, National University-La Jolla, Palmer College of Chiropractic-Davenport, Regis College, Saint Mary-of-the-Woods College, University of Evansville, University of Iowa, University of Montevallo, University of Phoenix, University of Cincinnati, University of Tennessee, Wheeling Jesuit University, Yale University

Table 2: Program Types⁹

Physician Resident
Medical Student
Registered Nurse
Physician Fellow
Radiology/CT
Pharmacy Student
Physician Assistant Student
Pharmacy Resident
Behavioral Health
Other
Licensed Practical Nurse

The importance of the Indianapolis VAMC to Indiana’s health profession training pipeline is unquestionable. The extent of investments and their impact on Indiana’s workforce of practicing health professionals is more elusive. Current financial reporting systems used to monitor Indianapolis VAMC investments in training are limited as they do not account for all the resources dedicated to supporting training in various formats. Additionally, tracking subsequent placement of trainees to measure their impact on Indiana’s health care workforce has not been possible due to a systematic inability to link data. As the Indianapolis VAMC considers the resources that would be needed to strengthen partnerships and expand clinical training capacity, better information on the full scope of investment and contributions is needed.

Evaluating Impact

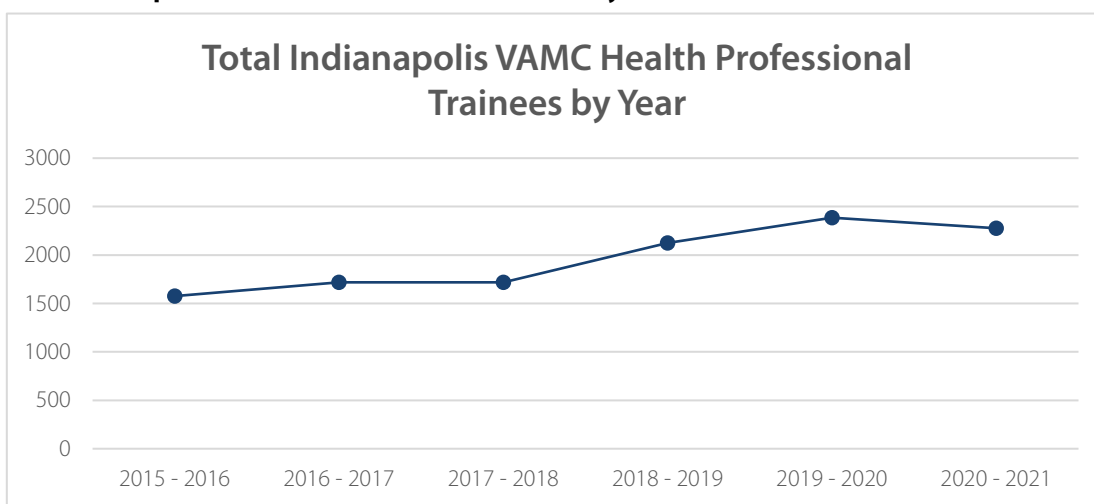
The Bowen Center for Health Workforce Research and Policy (Bowen Center) is a research organization housed at Indiana University School of Medicine in the Department of Family Medicine. Nationally recognized as a leader in state health workforce policy research, the Bowen Center provides expert technical assistance to the State of Indiana for health workforce data collection and reporting, as well as policy research and analysis, and has partnered with numerous organizations on health workforce related program evaluations.

Beginning in late 2021, the Indianapolis VAMC collaborated with the Bowen Center on an evaluation project designed to provide information to inform policy and planning related to future clinical training initiatives. The evaluation had three objectives:

1. Quantify Indianapolis VAMC training investments in clinical training.
2. Assess Indianapolis VAMC impact on Indiana’s health workforce by tracking trainees into the workforce.
3. Consider the “Gap” in Indiana’s health professional training capacity that would occur in the absence of the Indianapolis VAMC.

This report describes the methods and presents and explores findings from the evaluation. Questions regarding this project can be directed to Bowenctr@iu.edu.

Figure 2: Trends in Indianapolis VA Health Professions Trainees by Year¹⁰



⁹ Table includes program types which had 100 or more HPTs at the Indianapolis VAMC. “Other” program types include: Radiation Therapy Student, Medical Assistant (Paramedic) Student, Optometry Student, Ophthalmic Assistant Student, Chiropractic Student, Rehabilitation/Vo Tech/Art/Music/Kenesiotherapy/Recreation/Other, Technical Career Field Program, Medical Surgical Support Technician, Health Services Research Development, Biomedical/Rehab Engineer/Tech, Pathologist Assistant Student; other program types not listed include: psychology student, advanced practice registered nurse, physical therapy, respiratory therapy, dental resident, dietetics, occupational therapy, medical informatics audiology, speech pathology, and unlisted programs.

¹⁰ Note: Indianapolis VAMC reported count of Without Compensation Health Professions Trainees for academic years 2015-2016, 2016-2017, 2017-2018, 2018-2019, 2019-2020, and 2020-2021.



Indianapolis VAMC

TRAINING INVESTMENTS

BACKGROUND

Clinical training initiatives require resources and those resources have associated costs. Quantifying and clarifying the costs associated with Indianapolis VAMC training initiatives are needed to understand the extent of the investments within the State of Indiana.

Clinical training costs can be grouped into three primary areas:

1. **Infrastructure:** This category represents costs associated with the physical space, supplies, and equipment required to support training activities.
2. **Disbursements:** This category includes costs provided directly to appointed HPTs in the form of stipends or disbursements.
3. **Labor:** This category includes the largest costs associated with training learners. It represents the translation of staff time into wage/benefits costs from VA staff who spend time teaching learners in any capacity (didactic/classroom teaching, teaching-related research, related administrative activities, and clinical teaching in direct patient care).

Historically, the reporting of VA training costs has been limited to reporting on labor mapping related to “Education” and disbursements (salaries or stipends) provided to HPTs. This reporting only captures a portion of the resources required to support Indianapolis VAMC training initiatives. The Bowen Center worked in partnership with the Indianapolis VAMC to identify and prepare a more comprehensive and accurate estimate of the costs associated with Indianapolis VAMC training initiatives.

METHODS

The project period for the cost assessment was October 1, 2013 – September 30, 2021.

ASSESSING INFRASTRUCTURE COSTS THROUGH TRADITIONAL VA COST ACCOUNTING AND REVISED APPROACHES^{10,11}

Infrastructure costs include those associated with facility (property, land), maintenance, and equipment and supplies. Indianapolis VAMC facilities were constructed in 1952 and as such, have been fully depreciated, incurring no accounting cost for the facility. However, the facility continues to require maintenance (administrative) costs for activities including fiscal, human resources, janitorial and environmental services, engineering, police, etc. Therefore, after conducting key informant interviews with service chiefs (described in a subsequent section of the report) and confirming the presence of learners, revised facility estimates were calculated and distributed equally across all service lines.

Regarding equipment and supplies, although these costs are able to be quantified by service line, it is infeasible to specifically attribute a portion of a service line’s total equipment costs to training. Therefore, estimates for specific HPT-related equipment and supply costs were assessed by service line through primary data collection supplied by service chiefs in an informant interview (described below).

ASSESSING DISBURSEMENT COSTS THROUGH TRADITIONAL VA COST ACCOUNTING¹²

Disbursement costs include any payment made to appointed HPTs. Disbursement payments are the predominant and preferred mechanism to pay certain HPT salaries and fringe benefits. At Indianapolis VAMC, disbursements are typically made through a disbursing agent which administers the salary and benefit disbursements directly to the HPT for time spent contributing to approved educational activities. For purposes of disbursements, “educational activities” include any activity that residents participate in as required by their educational program (including didactic sessions, clinical simulations, research, inpatient or outpatient clinical duties, etc.). Disbursements also include salaries paid directly to fellows and residents through funding provided by the Office of Academic Affiliation (OAA).

10. <https://www.va.gov/finance/docs/va-financialpolicyvolumexiiichapter03.pdf>

11. <https://www.va.gov/finance/docs/VA-FinancialPolicyVolumeVChapter09.pdf>

12. DISBURSEMENT AGREEMENTS FOR HEALTH PROFESSIONS TRAINEES APPOINTED UNDER 38 U.S.C. § 7406 https://www.va.gov/VHApublications/ViewPublication.asp?pub_ID=9293

ASSESSING LABOR COSTS THROUGH TRADITIONAL VA LABOR MAPPING

VA utilizes a standard labor mapping system to assign labor to a specific production unit. Traditionally, there are four categories of “time” in which labor can fall. These categories include: Administration, Clinical Care, Education, and Research.⁵ Definitions for each labor category are provided in Table 3 below. Labor mapping categories are treated within the cost accounting system as mutually exclusive categories.

Table 3. VA Labor Mapping

Traditional VA Labor Mapping Categories	Traditional Labor Mapping Category Definitions ¹³
Administration	Managerial or administrative duties including performance reviewing or managing a program
Clinical Care	Time spent preparing, providing or following up on a patient’s clinical care which includes chart review, consulting with colleagues, reviewing necessary literature, supervising staff or HPTs
Education	Preparing and delivering classroom training, formal presentations and lectures
Research	Performing approved health care research and activities in direct support of this research

CHALLENGES WITH VA LABOR MAPPING PROCESSES IN QUANTIFYING COSTS ASSOCIATED WITH HPT

The traditional VA labor mapping system enables standardized reporting and comparisons across service lines and throughout reporting periods. However, when attempting to use traditional labor mapping categories to quantify costs associated with supporting training activities, the cost accounting system presents a challenge. Although some categories, such as Teaching, can be intuitively assigned as costs associated with training initiatives, the remaining categories may not be as easily mapped.

The use of traditional VA labor mapping processes to quantify labor costs associated with health professions training would result in a significant underestimate (if Education costs only were used in calculation) or a substantial overestimate (if all labor categories were used in calculation) of true costs associated with training initiatives. Therefore, a secondary strategy was pursued to obtain a more accurate estimate of labor costs by conducting informant interviews with service chiefs.

A Use Case on Limitations Associated with Traditional VA Labor Mapping

A surgeon may work 40 hours per week, 4 hours of which is dedicated to Administrative activities (operating the service line, coordinating resident schedules), 4 hours of which is dedicated to Education activities (preparing lectures for medical residents), and the remaining 32 of which are dedicated to Clinical Care (performing surgeries, documenting patients charts, and overseeing medical residents in a clinical setting). Using traditional VA labor mapping, although the surgeon may conduct activities to support HPT during Administrative and Clinical Care hours, only 4 hours of the surgeon’s weekly hours are mapped to Education activities and can be confidently categorized as a cost associated with training initiatives.

¹³. Sourced from: Managerial Cost Accounting Office (MCAO) Labor Definitions

INFORMANT INTERVIEWS WITH CHIEFS TO ASCERTAIN HPT SUPPLY COSTS AND SUPPLEMENT LABOR MAPPING COSTS

A key informant interview tool was created to obtain supplemental information related to labor and supply costs by service line. Requests for interviews were made to all 21 service chiefs at the Indianapolis VAMC. However, 2 service lines reported having no costs associated with training initiatives and were therefore excluded from the interview process.¹⁴ Upon invitation to the interview, service chiefs were invited to include additional service line staff (e.g., business managers) where appropriate to provide the necessary information. The interview tool administered to service chiefs can be found in Appendix A.1.

Key informant interviews were conducted virtually (over ZOOM®) with 19 different service chiefs or designated representatives. A full list of interviewees can be found in Appendix A.2. Interviews were standardized and followed the tool. Interviewee responses were confirmed with interviewees through verbal confirmation and/or written documentation exchanged after the interview.

Upon completion of key informant interviews, additional labor and equipment/supply details were aggregated and submitted to the financial and administrative team for revised cost estimates by service line. An example of the information submitted for revised estimates is provided in Table 4 below¹⁵:

Table 4. VA Service Lines

Service Line	Reported estimated proportion of service line staff time dedicated to HPT	Equipment/Supplies used to support HPT activities
Anesthesiology		
Dental		
Education		
Medicine (Specialty Care)		
Mental Health		
Neurology		
Nursing (Includes PCS Acute Care, PCS Critical Care, PCS Procedural Medicine, and PCS Surgery)		
Nutrition and Food		
Pathology and Laboratory		
Pharmacy		
Physical Medicine and Rehabilitation		
Primary Care		
Radiation Oncology		
Radiology		
Social Work		
Surgery		

NEW HPT COST ESTIMATES USING REVISED LABOR MAPPING AND INFRASTRUCTURE, SUPPLY ESTIMATES

Utilizing the same Financial Management Accounting System and the data acquired from KII, the VAMC Finance Team extracted new data for all the service lines in a manner which enables comparison to cost data captured for initial estimates.¹⁶

19

Indianapolis VAMC service lines report serving as partners in health professions training

14. The service lines PCS Operations and PCS Mental Health reported having no costs associated with HPT beyond traditional labor mapping to Education time.

15. Of note, the Medicine Service Line administers several sub-specialty areas which vary significantly in scope of HPT involvement by sub-specialty area. Therefore, revised labor and supply estimates were produced at a sub-specialty level, which is reported both by sub-specialty area and in aggregate related to the service line.

16. Of note, during the interviews with service chiefs, it was requested that in considering values for the supplemental estimates for supplies and labor mapping, service chiefs consider an average, usual estimates. These estimates were duplicated for each year in the project period. It is acknowledged that this is a limitation of the revised methodology, as contributions to HPT likely vary by year.

FINDINGS

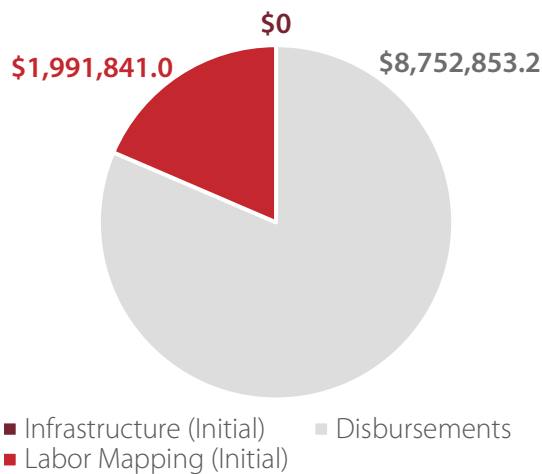
All financial data, including disbursements, infrastructure and labor costs (initial and revised), were assessed by service line and are reported below in Figure 3, Figure 4, and Table 5-6. Initial results of this data showed that traditional cost accounting reporting calculated a total cost of \$85.9 million over the project period, or approximately \$10.8 million annually dedicated to support HPT. After obtaining additional information and estimates from service chiefs, revised cost estimates were able to be performed. Revised cost estimates resulted in a total estimate of \$726.8 million dedicated to supporting health professions training activities over the project period (2014-2021) or \$90.9 million annually. The revised methodology supported the identification of an additional \$80.1 million annually which was previously unable to be identified.

Figure 3. Average Annual Initial Costs vs. Average Annual Revised Costs

Average Annual Initial Costs Dedicated by Indianapolis VAMC to HPT

- Disbursements: \$8,752,853.2
- Infrastructure (initial): \$0
- Labor Mapping (initial): \$1,991,841.0

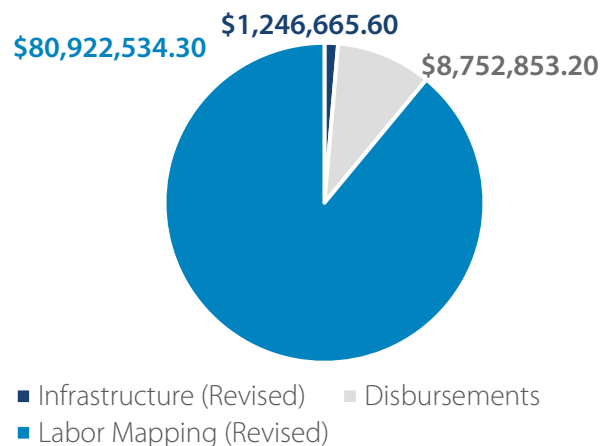
Total (initial): \$10,744,694.2



Average Annual Revised Costs Dedicated by Indianapolis VAMC to HPT

- Disbursements: \$8,752,853.2
- Infrastructure (revised): \$1,180,000.0
- Labor Mapping (revised): \$80,922,534.3

Total (revised): \$90,855,387.6



The contributions Indianapolis VAMC makes to training Indiana’s health workforce is significant, with total costs amounting to more than \$726 million and an average cost of \$90.9 million per year. These results depict the depth of Indianapolis VAMC’s commitment to training future health professionals.

LIMITATIONS OF COST REPORTING

Although it is possible to calculate an overall cost per learner, individualized learner costs are not available by HPT type. General HPT recordkeeping assigns individual HPTs to a specific service line. However, through the key informant interview process, it was identified that HPTs generally receive training associated with multiple different service lines. For example, a physician assistant student may be assigned to the Surgery service line but may also complete training hours in Primary Care and Mental Health. Unfortunately, this level of detail (all service lines contributing to training, and by-learner contributions) is not captured for each individual HPT. Therefore, training costs are presented by service line agnostic of HPT type.

Indianapolis VAMC commits approximately
★ \$90.9 million annually ★
 to support Indiana health professions training

Table 5-6. Cost Estimates Associated with Indianapolis VAMC Health Professions Training Contributions, 2014-2021 in Aggregate

INITIAL ESTIMATES

Service Line	Disbursements	Infrastructure	Labor Mapping	Total Initial Costs
Anesthesiology	\$6,904,659.8	\$0	\$0.0	\$6,904,659.8
Dental	\$23,354.1	\$0	\$3,205,712.0	\$3,229,066.1
Education	\$0	\$0	\$19,656.0	\$19,656.0
Medicine (Specialty Care)	\$35,009,873.0	\$0	\$634,289.0	\$35,644,162.0
Mental Health	\$5,099,238.4	\$0	\$2,386,431.0	\$7,485,669.4
Neurology	\$4,425,943.2	\$0	\$0.0	\$4,425,943.2
Nursing ¹⁷	\$0	\$0	\$585,534.0	\$585,534.0
Nutrition and Food	\$0	\$0	\$1,886.0	\$1,886.0
Pathology and Laboratory	\$1,316,587.3	\$0	\$7,478.0	\$1,324,065.3
Pharmacy	\$0	\$0	\$8,749,496.0	\$8,749,496.0
Physical Medicine and Rehabilitation	\$1,425,324.8	\$0	\$8,722.0	\$1,434,046.8
Primary Care	\$0	\$0	\$1,992.0	\$1,992.0
Radiation Oncology	\$0	\$0	\$679.0	\$679.0
Radiology	\$2,278,188.6	\$0	\$105,640.0	\$2,383,828.6
Social Work	\$0	\$0	\$217,579.0	\$217,579.0
Surgery	\$13,539,657.1	\$0	\$9,634.0	\$13,549,291.1
Total	\$70,022,826.3	\$0.00	\$15,934,728.0	\$85,957,554.3

REVISED ESTIMATES

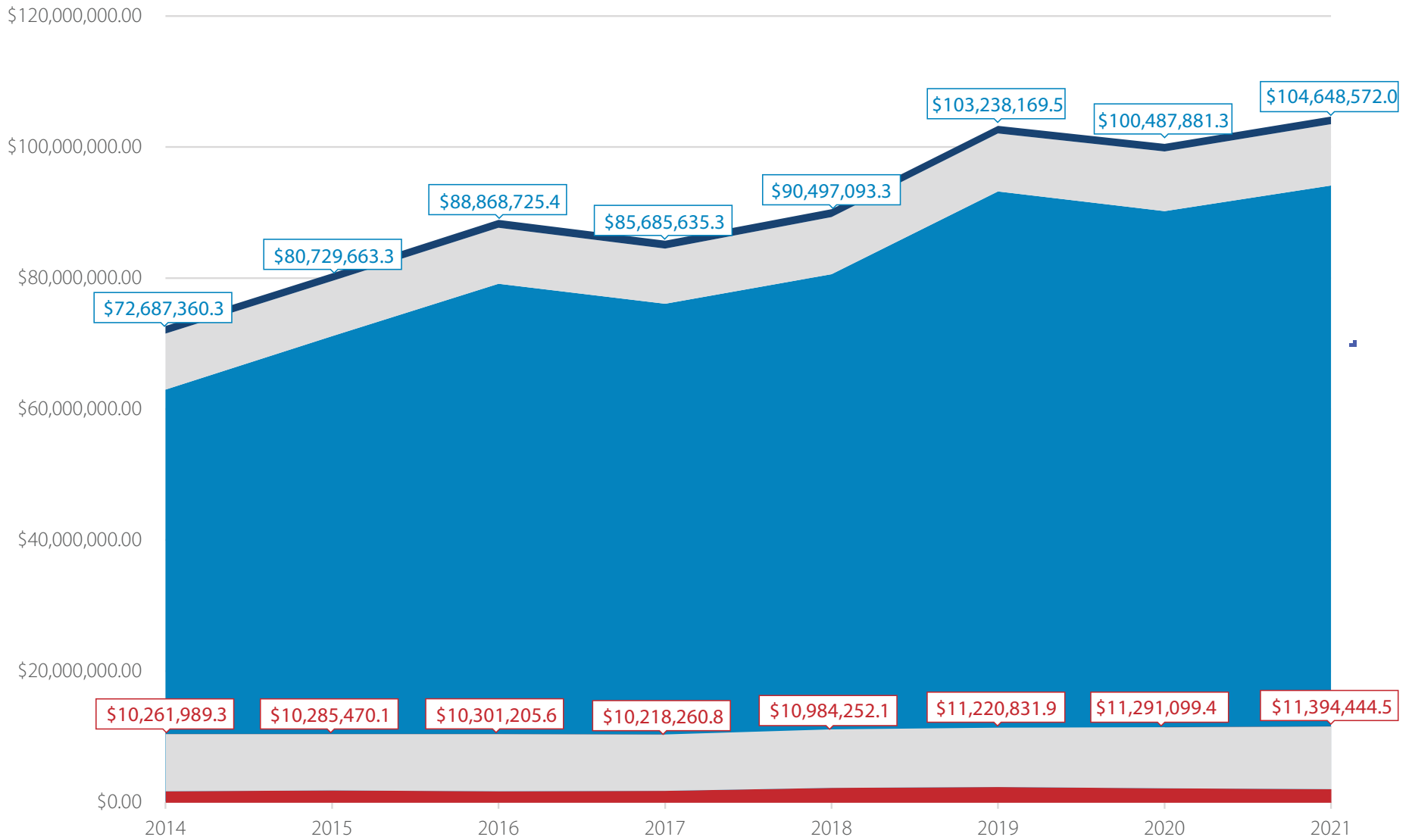
Service	Disbursements	Infrastructure	Labor Mapping	Total Revised Costs
Anesthesiology	\$6,904,659.8	\$500,000.0	\$16,955,137.2	\$24,359,797.0
Dental	\$23,354.1	\$500,000.0	\$369,690,644.4	\$370,213,998.5
Education	\$0	\$500,000.0	\$1,473,581.7	\$1,973,581.7
Medicine (Specialty Care)	\$35,009,873.0	\$500,000.0	\$76,678,262.9	\$112,188,135.8
Mental Health	\$5,099,238.4	\$500,000.0	\$15,011,983.2	\$20,611,221.6
Neurology	\$4,425,943.2	\$500,000.0	\$2,750,799.1	\$7,676,742.3
Nursing ¹⁸	\$0	\$500,000.0	\$14,054,182.7	\$14,554,182.7
Nutrition and Food	\$0	\$500,000.0	\$810,053.3	\$1,310,053.3
Pathology and Laboratory	\$1,316,587.3	\$500,000.0	\$2,872,185.1	\$4,688,772.2
Pharmacy	\$0	\$500,000.0	\$49,286,002.6	\$49,786,002.6
Physical Medicine and Rehabilitation	\$1,425,324.8	\$500,000.0	\$14,381,806.0	\$16,307,130.8
Primary Care	\$0	\$500,000.0	\$15,372,769.4	\$15,872,769.4
Radiation Oncology	\$0	\$500,000.0	\$4,167,680.5	\$4,667,680.5
Radiology	\$2,278,188.6	\$500,000.0	\$12,802,657.1	\$15,580,845.7
Social Work	\$0	\$500,000.0	\$2,786,698.4	\$3,286,698.4
Surgery	\$13,539,657.1	\$1,940,000.0	\$48,285,831.2	\$63,765,488.3
Total	\$70,022,826.3	\$9,440,000.00	\$647,380,274.8	\$726,843,100.8

17. Includes PCS Acute Care, PCS Critical Care, PCS Procedural Medicine, and PCS Surgery

18. Includes PCS Acute Care, PCS Critical Care, PCS Procedural Medicine, and PCS Surgery

Figure 4. Annual Initial Costs vs. Annual Revised Costs

Total Annual Initial Costs vs. Total Annual Revised Costs



Annual Initial Costs: ■ Labor Mapping (Initial) ■ Disbursements ■ Infrastructure (Initial)
Annual Revised Costs: ■ Labor Mapping (Revised) ■ Disbursements ■ Infrastructure (Revised)



Indianapolis VAMC

IMPACT ON INDIANA HEALTH WORKFORCE

BACKGROUND

A primary objective of this project was to evaluate the impact of the Indianapolis VAMC training contributions on Indiana's health workforce by estimating the number of VAMC health profession trainees (HPTs) retained and currently practicing in the State of Indiana. This evaluation was accomplished by matching trainee records to Indiana health professions license records to identify those currently licensed and actively practicing in the state. Further connection of matching records to supplemental information on Indiana health professional demographic and practice characteristics enables an assessment of the "Field Strength" of VAMC HPTs in Indiana's workforce, as well as a comparison between Indiana licensed health professionals who trained at the VAMC to those who did not.

The following section presents methods and findings used to evaluate the impact of the Indianapolis VAMC training initiatives on Indiana's health workforce capacity.

METHODS

At the time this evaluation was performed, no previous studies examining the impact of local VA Health System training contributions were identified. This evaluation is the first of its kind. The approach involved obtaining and verifying identifiers in VAMC HPT records. Records with sufficient identifiers were then matched to Indiana state health professions license records and corresponding supplemental data containing demographic and practice characteristics. Matching records were used to identify VAMC HPTs currently licensed and practicing in the State of Indiana. The following presents a summary of the methods used to evaluate the impact of the Indianapolis VAMC training initiative contributions on Indiana's health.

DATA SOURCES

VAMC HPT DATA

HPT data maintained by the Indianapolis VAMC were made available to the Bowen Center through two sources: 1) secure transfer of individual student rosters or HPT records; and 2) direct access to VAMC student database.¹⁹ HPT data sources included information on trainees from 2014 and 2021. HPT data included critical data elements required for matching: name, date of birth (DOB), national provider identifier (NPI), discipline or specialty, middle name, maiden name (if applicable), degree type, rotation start date, rotation end date, training institution, health profession training department, HPT classification/type, onboarding status, affiliated VA site, and expected graduation class.

HEALTH PROFESSIONS DATA

The Bowen Center maintains license and supplemental information on Indiana's license health professions in partnership with the State of Indiana. Supplemental data, including demographics (such as sex, race, ethnicity), education/training location (such as state of qualifying training), and practice characteristics (such as specialty, setting type, practice location[s], etc.), are collected by the Indiana Professional Licensing Agency (PLA) from Indiana health professionals at the time of their biennial state license renewal. Following the license renewal periods, these supplemental data, along with general license information (such as name, license number, date-of-birth, etc.), are provided to the Bowen Center by the PLA for cleaning, analysis, and storage in the Indiana Health Professions Database (IHPD). The IHPD is a longitudinal relational database maintained by the Bowen Center. License and supplemental data on Indiana health professionals maintained by the Bowen Center in the IHPD were used to match VAMC HPTs to Indiana State Licenses and determine their characteristics.

DATA VERIFICATION

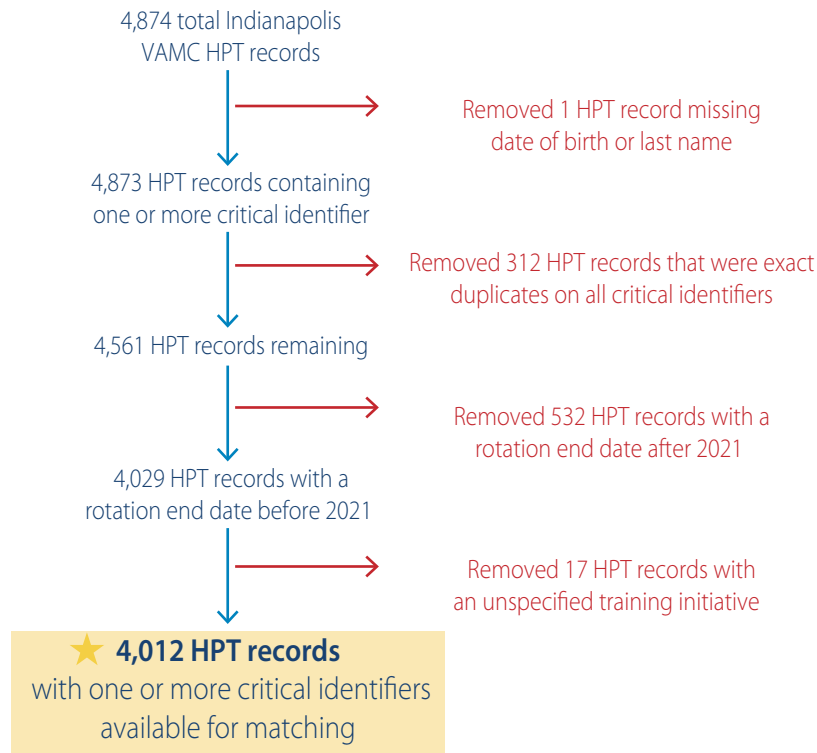
Critical data elements were required to support matching of HPT and license records. Upon inspection of the HPT data, numerous HPT records were missing key identifiers required for matching. For some HPT records, these data were available in the VAMC student database. Therefore, prior to record matching, a manual review of HPT records was conducted to identify missing critical data elements. The process involved one-to-one review of each student roster file to identify missing data elements, and then searching the VAMC student database to ascertain whether these data elements were maintained there. Full details of the data verification process are available in Appendix B. The verification process was required to maximize the number of HPT records with sufficient critical data element for matching.

¹⁹ Before obtaining HPT data from the Indianapolis VAMC, the Bowen Center ensured that all data storage and management parameter meet the requirements for data security as outlined by the Indianapolis VAMC.

HPT RECORDS AVAILABLE FOR MATCHING

A total of 4,874 HPT records were identified in the original data provided to the Bowen Center. Incomplete HPT records were not able to be included in the matching strategy. Additionally, any HPT records containing the same NPI, date of birth, last name, and first name were considered duplicates and were removed. Lastly, only records with a training end date between 2014 and 2021 were included in the assessment.²⁰ Following data verification, a total of 4,012 HPT records were identified as having select critical data elements required for matching. Figure 5 provides a diagram which summarizes the HPT data for matching.

Figure 5: Flow chart of HPT Records Review Results



Of the 4,012 HPT records included in the matching step, the majority were identified as physician residents and fellows (61.6%), followed by 16.2% representation of nursing trainees. Table 7 provides a breakdown of the total HPTs records included in the matching step by their assigned training initiative. All records were matched to health professions licenses in the IHPD using SAS 9.4. These records were matched using several strategies (summarized in Figure 7). Specific match approach varied based on training initiative and professional licensure data available.

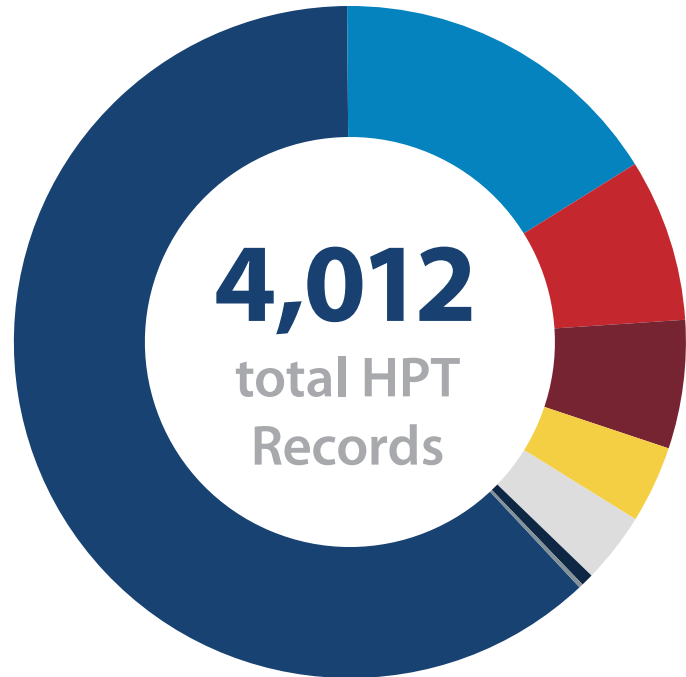
²⁰ This criterion was applied for these HPT initiatives to ensure that the rotation timelines coincided with the latest license renewal data available in the IHPD (2020 and 2021). Because resident physicians and advanced practice registered nurses likely held an Indiana State license during the completion of their training, this criterion was not applied to these records.

Table 7. Breakdown of total HPTs by health profession training initiative.

VA Training Initiative	N	%
Total	4,012	
Physician Resident / Fellow (M.D. or D.O.)	2,481	61.84
Nursing (Nurse Practitioner and Licensed Practical Nursing)	652	16.25
Pharmacy	314	7.83
Medical Student	248	6.18
Other HPT Training Initiatives *	149	3.71
Physician Assistants	136	3.39
Behavioral Health	24	0.6
Dentistry or Dental Auxiliary Program	8	0.2

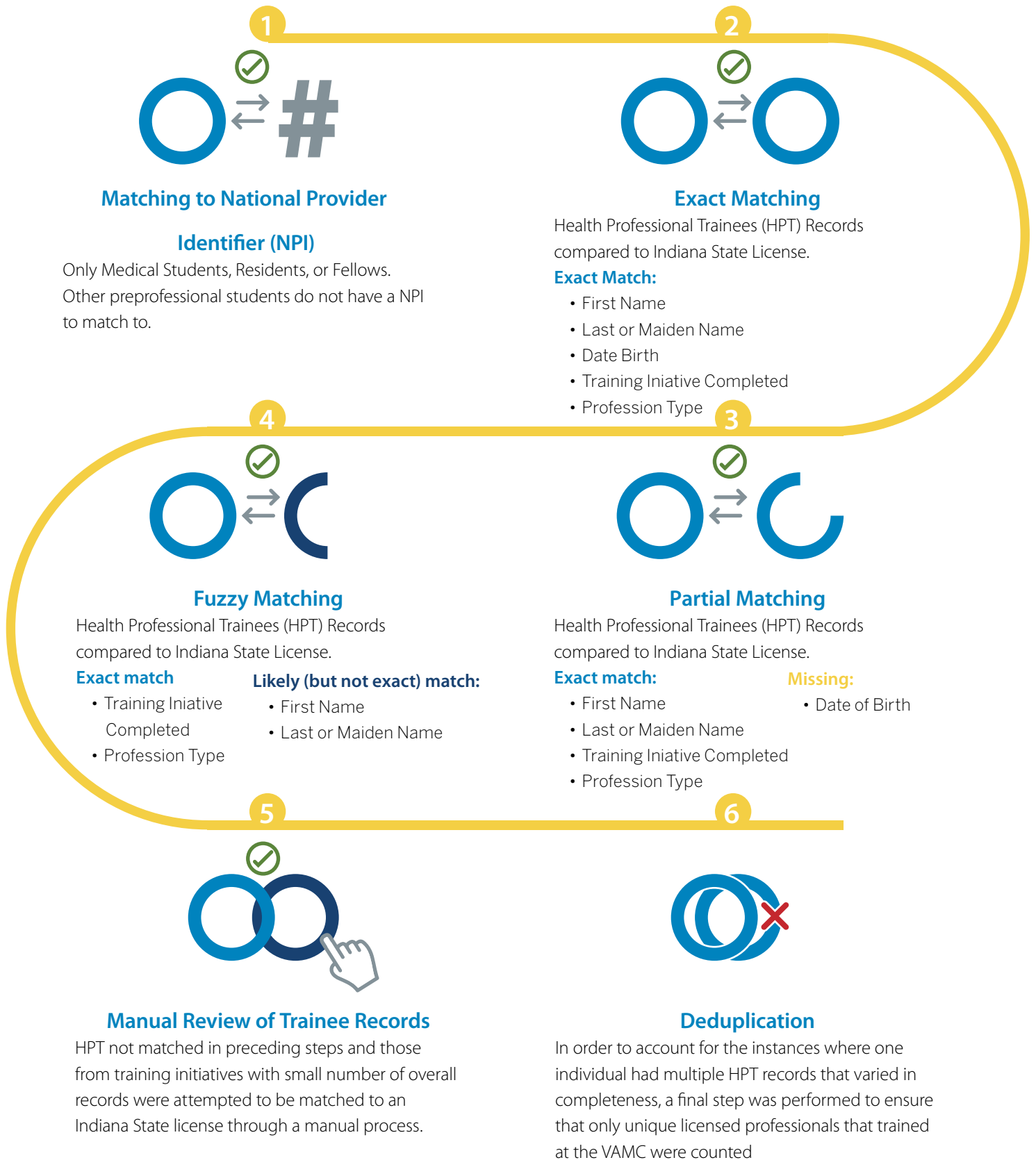
Note: Other HPT Training Initiatives include, Radiation Therapy, Laboratory, Physical Therapy, Dietetics, Occupational Therapy, Optometry, Recreation/Manual Arts Therapy, Respiratory Therapy and Other/Not Listed.

Figure 6: Breakdown of total HPTs by health profession training initiative.



- **61.84%** Physician Resident / Fellow (M.D. or D.O.)
- **16.25%** Nursing (Nurse Practitioner and Licensed Practical Nursing)
- **7.83%** Pharmacy
- **6.18%** Medical Student
- **3.71%** Other HPT Training Initiatives
- **3.39%** Physician Assistants
- **0.60%** Behavioral Health
- **0.20%** Dentistry or Dental Auxiliary Program

Figure 7. Data Matching Flow Chart



DATA MATCHING STRATEGIES

The following describes the specific strategies that were used to match VAMC HPT records to Indiana health profession licenses. The specific matching approach varied by and was responsive to critical data elements that were available and the number of HPTs within a given group.²¹ Based on these factors, HPT records were grouped into three categories for matching: 1) medical students and medical residents/fellows; 2) nursing, pharmacy, and physician assistants; and 3) dentistry, behavioral health, and other allied health.

The following describes various matching steps:

1. Matching to NPI

(Residents/Fellows/Medical Students Only): Any medical student, resident or fellow record with an NPI was matched to the NPI physician license crosswalk.²² Because Medical Residents and Fellows already hold a license and provide care as part of their training, the Indianapolis VAMC has NPI numbers for these HPTs. Most other VAMCs HPTs are preprofessional students, meaning that they do not yet have a license and would not be eligible for an NPI. Therefore, matching on NPI was only possible for Medicine Residents and Fellows.

2. Exact Matching

HPT Records were considered an exact match to an Indiana State License if there was a 100% concordance on [First Name]; [Last Name] or [Maiden Name]; & [Date of Birth], as well as [Training Initiative Completed] and [Profession Type] (e.g., nursing student matched to a registered nurse license).

3. Partial Match

Exact Match on [First Name], [Last Name]: In the instance that an HPT record was missing DOB, exact matches on [First Name] and [Last Name], as well as exact concordance between the [Training Initiative Completed] and associated [Profession Type] were identified.²³

4. Fuzzy Match

On [First Name] & [Last Name]: HPT records that were not matched in step 2 and 3, were matched to Indiana license records using a fuzzy matching technique which identified likely (but not exact) matches on [First Name]; [Last Name] or [Maiden Name] and had exact concordance between [health professions training initiative completed] and associated [profession type of licensure].^{24 25}

5. Manual Review of Trainee Records

HPT not matched in preceding steps and those from training initiatives with small number of overall records were attempted to be matched to an Indiana State license through a manual process.²⁶

6. Deduplication of HPT Records to Identify Unique License Professionals

In order to account for the instances where one individual had multiple HPT records that varied in completeness, a final step was performed to ensure that only unique licensed professionals that trained at the VAMC were counted.

21 While the same string-matching strategy could be applied to all HPTs, this approach would likely result in multiple inaccurate matches that would need to be manually verified. This would increase the time for string-matching and make this strategy infeasible. In order to ensure accurate measure of the Indianapolis VAMC contribution, this strategy included a parameter in which HPT programs were required to have concordance with the licensed profession to which HPT records were matched.

22 The NPI physician license crosswalk includes physicians' Indiana-issued licenses and their associated NPI. All NPI data are obtained from the Center for Medicaid and Medicare Service National Plan & Provider Enumeration System. All licensed physicians are required to have an NPI in order to be reimbursed for services rendered to Medicaid and Medicare recipients.

23 Matches in this step were reviewed manually for accuracy. During the manual review process, if an HPT record was matched to a licensed health professional in the IHPD with a license issues date before 2010, it was not considered a valid match. This was a necessary step when more than one HPT name would match across multiple names across datasets.

24 Fuzzy matching performs an approximate string matching by identifying similar but not identical elements in a data table.

25 All identified matches in this step were reviewed manually for accuracy and matches with a license issue date before 2010 were not considered a valid match.

26 Manual process for identify HPT records with a corresponding Indiana State License involved accessing publicly accessible information Indiana License Verification database, <https://mylicense.in.gov/everification/Search.aspx>, which is maintained by the Indiana Professional Licensing Agency.

RESULTS

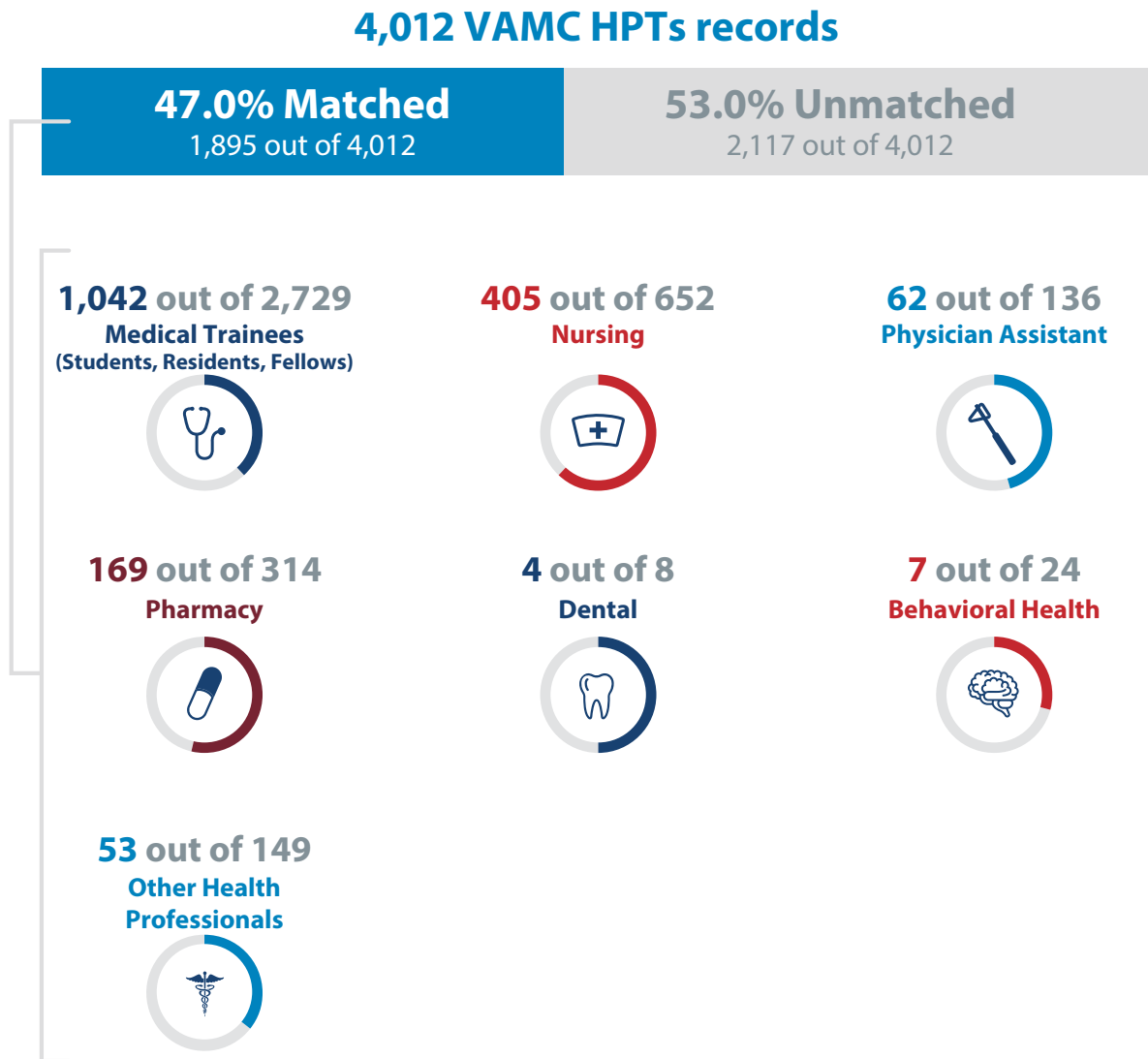
MATCHING

Matching results highlight the significant number of VAMC HPTs who were trained between 2014 and 2021 and currently holding an active Indiana State license in the profession they trained for. Overall, 1,895 (47%) of the 4,012 VAMC HPTs records were matched to an active Indiana State license. After accounting for duplicates in the HPT records, 1,742 unique licensed professional that received training at the Indianapolis VAMC were identified (Figure 8):

- 1,042 Physicians
- 405 Registered Nurses
- 62 Pharmacists
- 169 Physician Assistants
- 4 Dentists
- 7 Behavioral Health Professionals²⁷
- 56 Other Allied Health Professionals²⁸

Table 7 presents a summary of matching results for each step employed by HPT/Profession Type.²⁹

Figure 8. Matched VAMC HPT Records
















²⁷ Behavioral Health HPTs include [Marriage & Family Therapist, Social Work, and Psychology]

²⁸ Other Allied Health HPTs include [respiratory therapy, recreational/manual arts therapy, radiation therapy, physical therapy, optometry, occupational therapy, laboratory, and dietetics.]

²⁹ Note: The matching strategy varied by HPT type. For example, NPI was only available for Medical HPTs. Additionally, due to the small number of Dental, Behavioral Health, and Other Allied Health HPTs, a manual process was employed to verify Indiana State License status using the PLA search and verify tool.

Table 8. VAMC Medical HPTs Records that Matched to Indiana Physician Licenses

	 Medical Trainees (Students, Residents, Fellows)	 Nursing	 Physician Assistant	 Pharmacy	 Dental	 Behavioral Health	 Other Allied Health Professionals
Initial Records	2,729	652	136	314	8	24	149
¹  # Matching to NPI	366	n/a	n/a	n/a	n/a	n/a	n/a
²  Exact Matching	134	277	1	2	n/a	n/a	n/a
³  Partial Matching	568	21	14	4	n/a	n/a	n/a
⁴  Fuzzy Matching	0	1	32	140	n/a	n/a	n/a
⁵  Manual Review	113	111	17	30	4	7	53
⁶  Deduplication	-139	-5	-2	-7	n/a	n/a	n/a
Total Unique Matched	1,042	405	62	169	4	7	53
Unmatched Records	1,687	247	74	145	4	17	96

CHARACTERISTICS AND CONTRIBUTIONS OVERVIEW

Indiana collects supplemental information (demographic and professional characteristics) from licensed health professionals when they renew their Indiana State licenses each biennium. These data enable Indiana to better understand who the workforce is, what type of contributions they are making and where they are practicing.

★ 30% of newly licensed Indiana Physicians that trained in Indiana matched to an Indianapolis VAMC HPT record.

Each biennium, supplemental data on Indiana’s health workforce are presented in data reports and briefs that are prepared by the Bowen Center.³⁰ These reports include all licensed health professionals that had an active license and reported providing service for residents of the State of Indiana.³¹ Supplemental information contained in these reports are frequently cited in state and community-level health workforce related policy and programming.

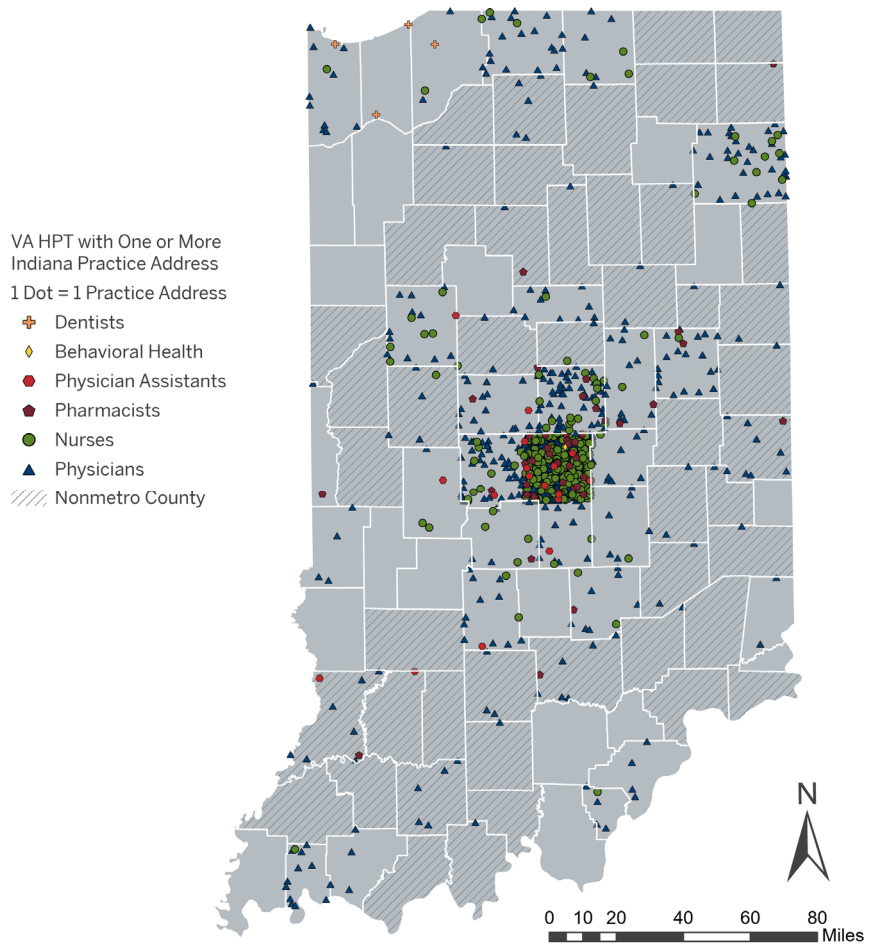
METHODS

Supplemental information is available for VAMC HPTs that matched to an Indiana State license, renewed that license electronically during a recent renewal period, and indicated that they are actively engaged in providing health care services to residents of Indiana.³² Figure 9 presents a distribution of trainees identified as licensed and currently practicing in the state of Indiana.

Summary information was prepared for all HPT types; however, medical trainees represented the largest group of VAMC HPTs overall and that are currently licensed and practicing in the state. For this reason, information on physicians is presented herein. Similar information for other HPT/ profession types can be found in Appendix B.3.1.

Geographic Distribution of VAMC HPTs

Physicians, Registered Nurses, Pharmacists, Physician Assistants, Behavioral Health & Dentists



Source: 2014 - 2021 Veterans Affairs Health Professions Trainee Data, Indiana License Supplemental Survey Data (Physicians, Registered Nurses, Physician Assistants, Pharmacists, Behavioral Health Professionals and Dentists).

Figure 9. Indiana population to physician ratio compared to the National population to physician ratio with the locations of VA community-based outpatient clinics, outpatient clinics, vet centers and VAMC highlighted.

30 2021 Indiana Physician Data Report available at: <https://hdl.handle.net/1805/28950>

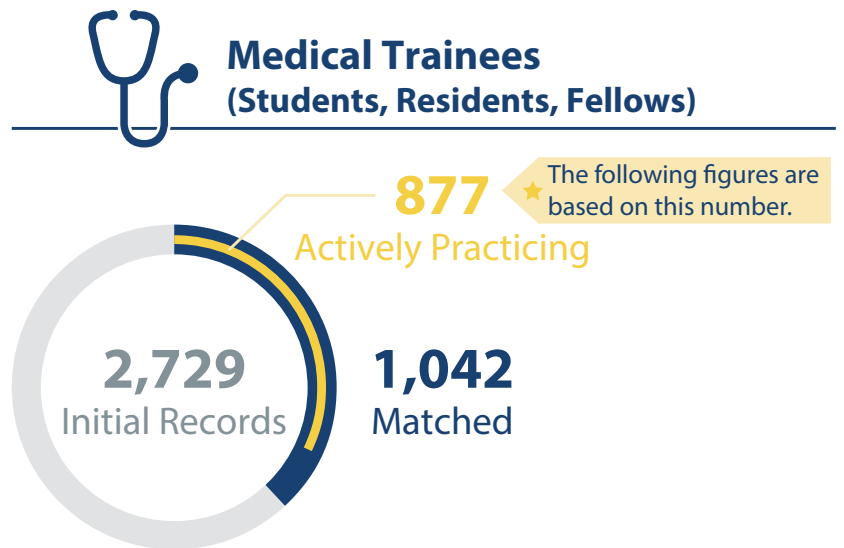
31 Note: Supplemental data is collected from licensees that renew their licenses using the PLA’s web-based system (MyLicense). Licensees submitting renewals manually (via paper copy submitted through US Postal Service) are not administered supplemental questions. The number of physician and registered nurse licensees that renew manually is small. Detailed information on the frequency of manual renewals can be found in the respective 2021 data reports in the reporting sample section.

32 Supplemental data were not available for all matching HPTs. Supplemental data is collected at license renewal only; therefore, HPTs that obtained their initial license within the last two years and have not gone through the license renewal cycle would not have supplemental data.

KEY HIGHLIGHTS FOR PHYSICIAN TRAINEES

VAMC training is making significant contributions to Indiana’s physician workforce. In fact, thirty percent of Indiana trained physicians issued licenses during the years included in this evaluation, matched to an HPT Record.³³ Additionally, physicians that trained at the VAMC are serving Hoosier in communities across the state (as seen in Figure 9). The remainder of this section provides information on the 877 VAMC trained physicians (see Figure 10) and the contributions they are making to health care delivery in Indiana.

Figure 10. Medical Trainee Sample Size



THE WHO: DEMOGRAPHIC SNAPSHOT

Diversity and representation in the health workforce is a strategic priority for policy makers and educators. Nearly two thirds of Indianapolis VAMC trained physicians identified as female. As of the 2021 Medical License renewal period, females accounted for just over 46 % of the overall physician workforce in Indiana. The higher percent of females among VAMC trained physicians is not surprising as it reflects over all trends in the “feminization of medicine” which have been documented for over 20 years.³⁴ With the exception of gender, VAMC trained physicians are demographically similar to the overall physician workforce in Indiana, with just under one third of trainees and physicians overall identifying as a race other than white.³⁵ Figures 11 and 12 presents race, gender and ethnicity characteristics of VAMC HPTs.

Figure 11. Physician Race and Ethnicity

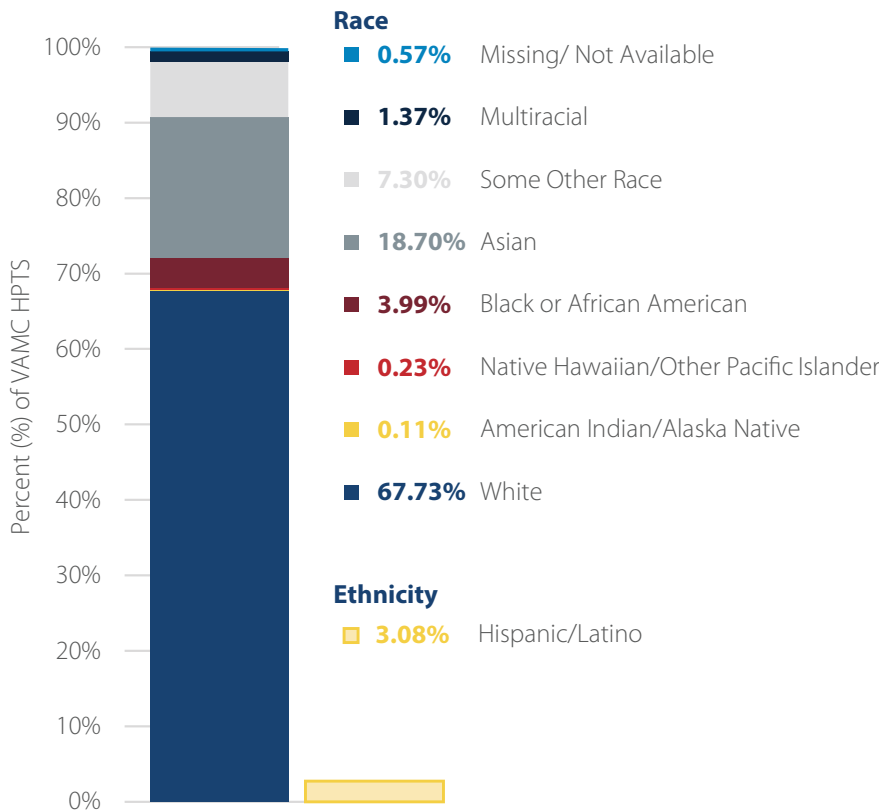
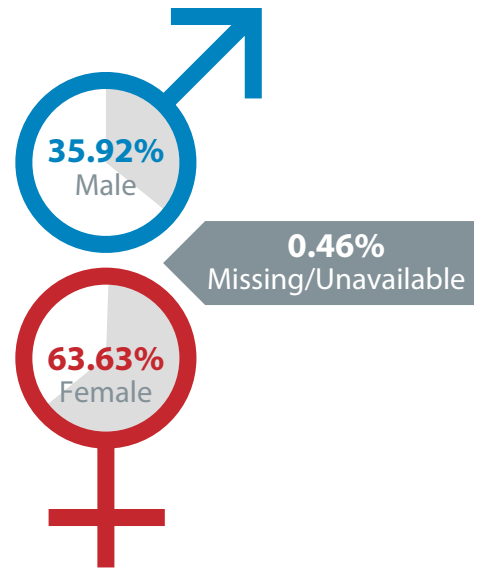


Figure 12. Physician Gender



33 Figure based on medical license issue date between July 1, 2015 and June 30, 2021 (corresponding to academic years included in this evaluation) and education characteristics reported by physicians during the 2021 Indiana Medical License renewal period.

34 Paik JE. The Feminization of Medicine. JAMA. 2000;283(5):666. doi:10.1001/jama.283.5.666-JMS0202-2-1

35 See 2021 Indiana Physician Data Report Table 2.1, accessible at: <https://scholarworks.iupui.edu/bitstream/handle/1805/28950/2021%20Physician%20Data%20Report%20Corrected%2009.15.22.pdf?sequence=7&isAllowed=y>

THE WHAT: SPECIALTY & PRACTICE SETTING

A physician's medical specialty and practice setting provide insight into their specific contribution to medical care delivery in Indiana's health system. The majority of Indianapolis VAMC trained physicians report a hospital as their primary practice setting and a specialty other than anesthesiology, psychiatry, or those classified as primary care by the U.S. Department of Health and Human Services³⁶. It is important to note that the number of psychiatrists that trained at the Indianapolis VAMC is significant. As of 2021, 707 psychiatrists reported actively practicing in Indiana, Indianapolis VAMC trained physicians from the 6 years included in this evaluation account for 8% of all psychiatrists currently practicing in the state. Further investigation into just those psychiatrists who became initially licensed during the evaluation

period found that out of 66 new psychiatrists during this period, 41 were VAMC trainees. In other words, almost two thirds of the psychiatrists that entered Indiana's workforce in the past seven year, trained at the Indianapolis VAMC. Figure 13 and Figure 14 presents specialties and practice settings reported by VAMC HPT physicians.

Figure 13. Physician Reported Specialty

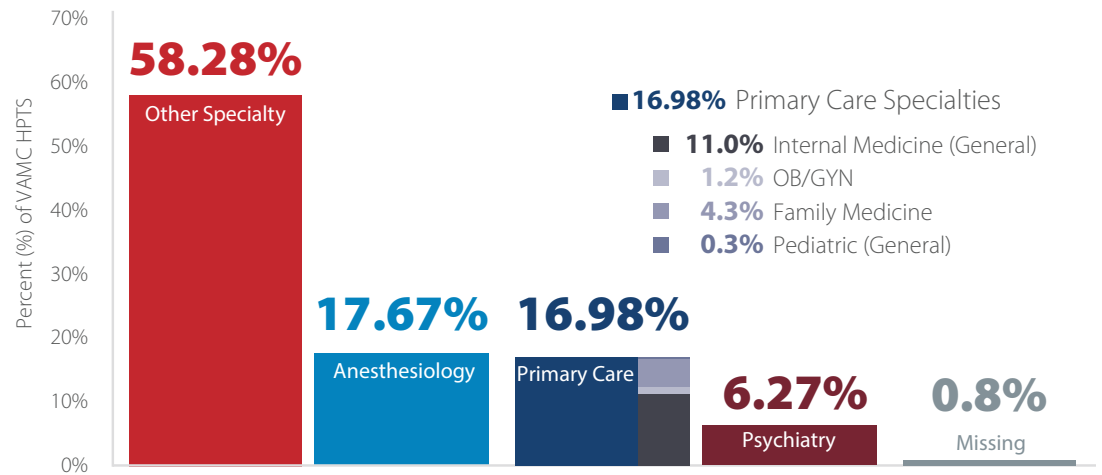
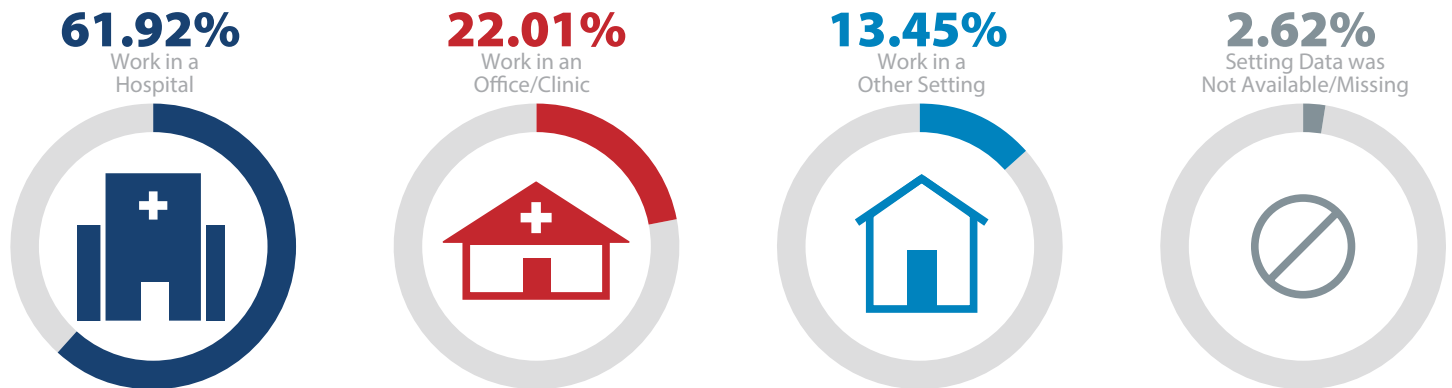


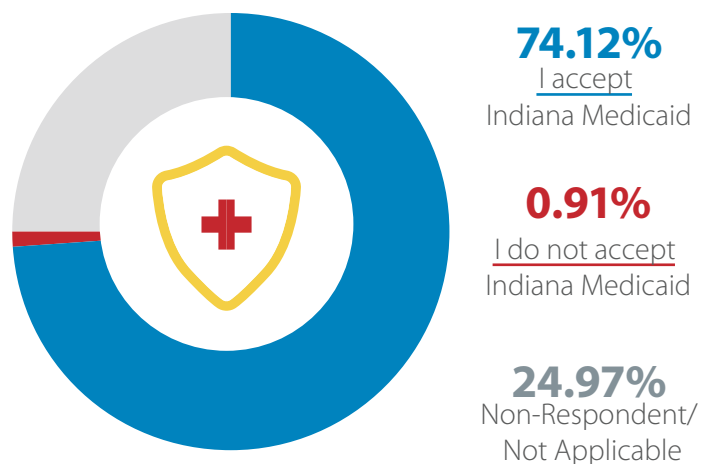
Figure 14. Physician Reported Practice Setting



SAFETY-NET PARTICIPATION SNAPSHOT

Medicaid participation is an important indicator of workforce contributions to the health care safety-net. Each biennium Indiana physicians indicate whether they are currently serving Indiana Medicaid recipients. Figure 15 presents information on Medicaid participation among Indiana physicians that were former VAMC HPTs.

Figure 15. Medicaid Service Status



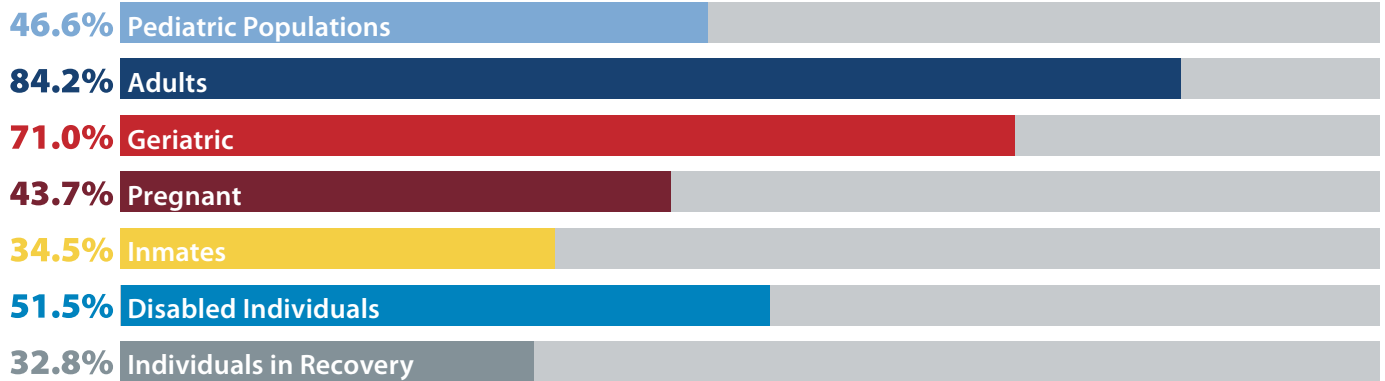
36 42 CFR Ch. 1 Pt. 5 App. A 3a available at: <https://www.ecfr.gov/current/title-42/part-5/appendix-A-appendix%20A%20to%20part%205>

SERVICES AND POPULATIONS³⁷

In order to keep a “finger on the pulse” of the health workforce contributing to health priorities in Indiana, the state monitors selected services physicians provide and selected populations they serve as part of their practice. Figure 16 present information on the populations served and services provided by Indiana physicians who were former VAMC HPTs.

Figure 16. Populations Served and Services Provided by Physicians

Adult and Special Populations Served by Physicians



Specialty and Addiction Services Provided by Physicians



Maternity Care Services Provided by Physicians



0 20 40 60 80 100

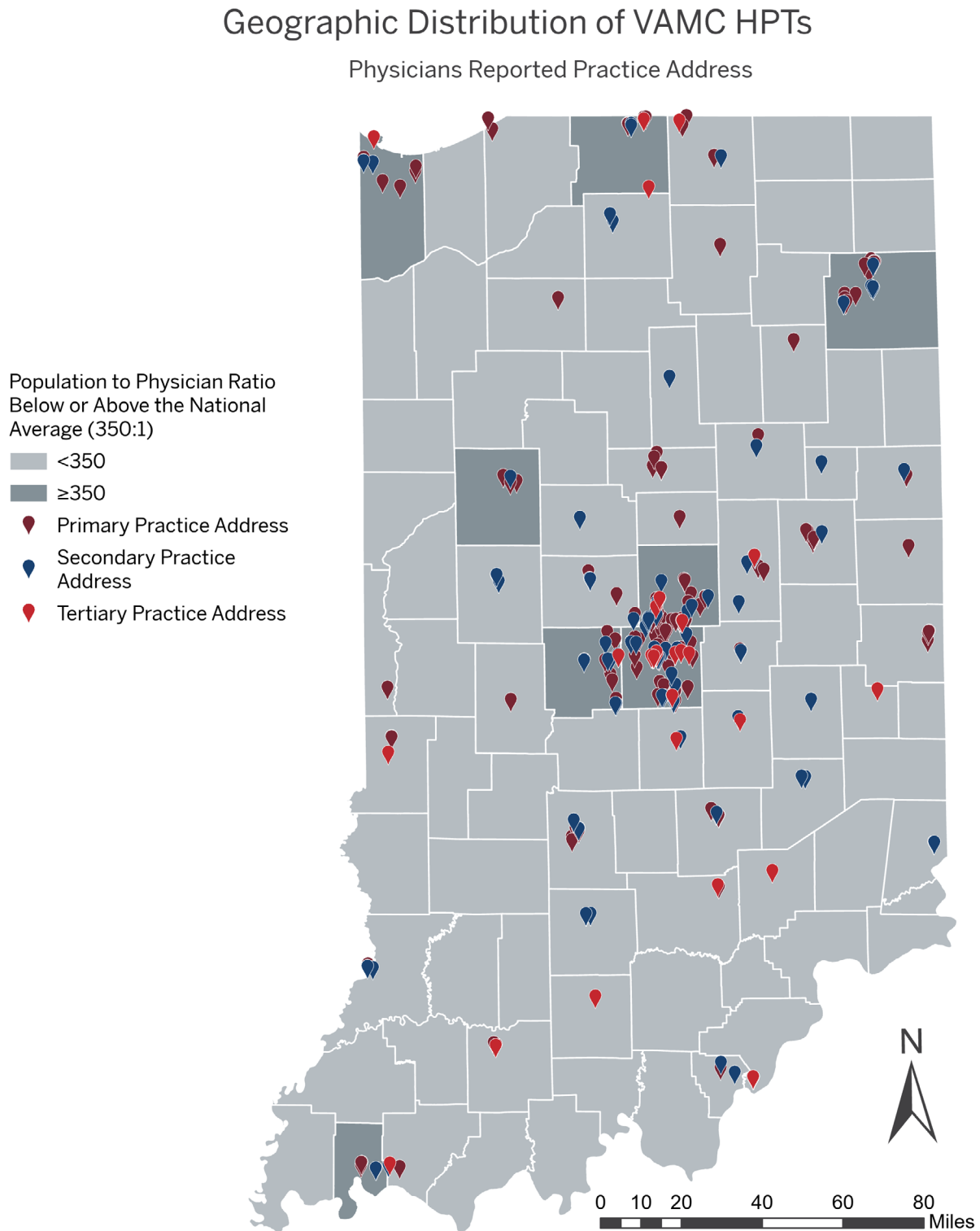
Percent (%) of VAMC HPTs

³⁷ It is important to note that while the Indianapolis VAMC does not provide training on labor and delivery, training is provided on women’s health.

THE WHERE: GEOGRAPHIC DISTRIBUTION

Indiana physicians trained at the Indianapolis VAMC are contributing to the physician workforce across the state. Recruitment of physicians (and other health professionals) into rural areas is especially challenging. Numerous former VA HPTs reported having a practice located in one of Indiana's rural counties. See Figure 17 for more information on the geographic distribution of VAMC trained physicians in Indiana

Figure 17: Indiana population to physician ratio compared to the National population to physician ratio with the locations of VA community-based outpatient clinics, outpatient clinics, vet centers and VAMC highlighted.



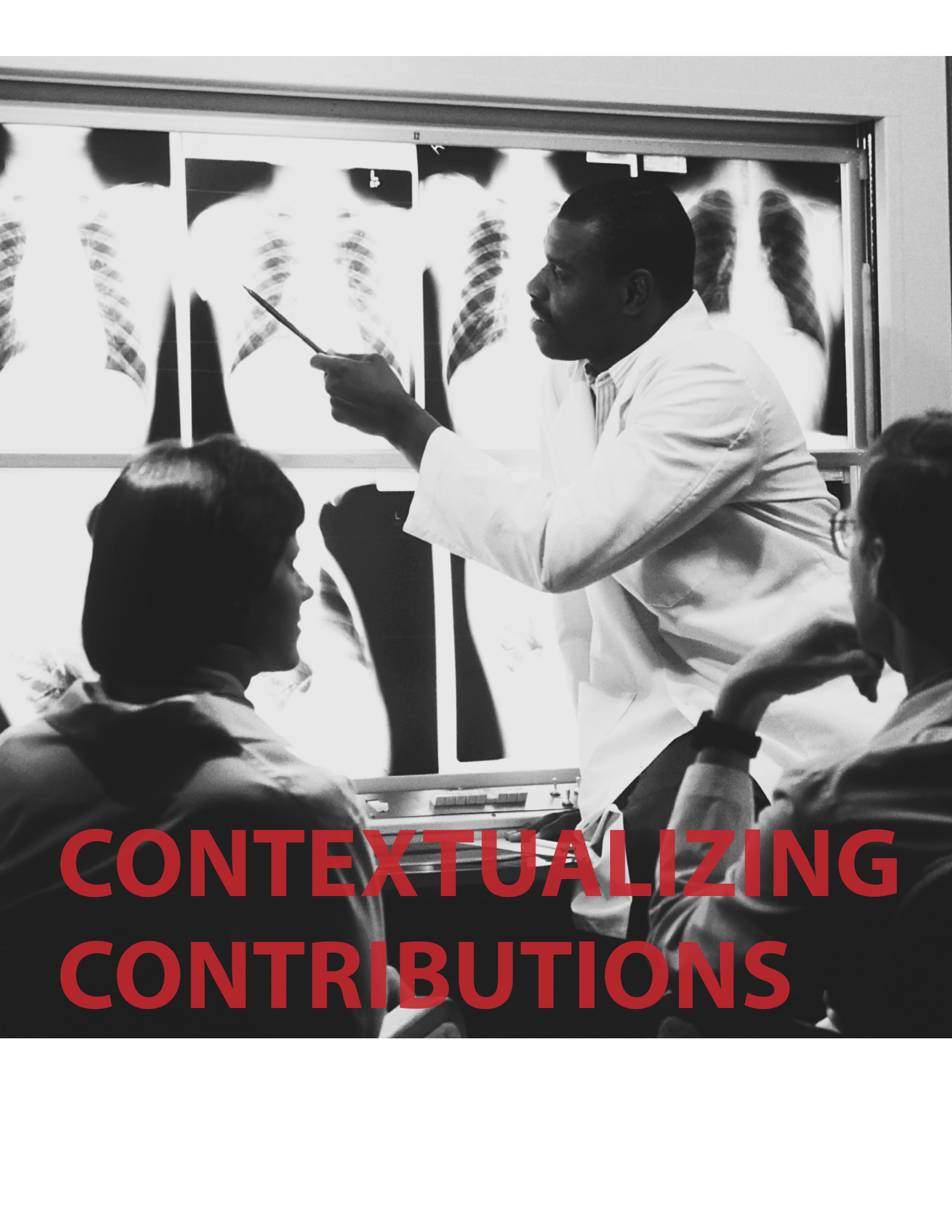
Source: 2014 - 2021 Veterans Affairs Health Professions Trainee Data, 2021 Indiana Physicians License Supplemental Survey Data

LIMITATIONS

There are several limitations that need to be considered when examining these findings and the data presented in this report. First, there were numerous issues with the HPT data that were limited and inconsistent in the identifiers that were required for matching. This resulted in a less conservative approach when utilizing matching techniques to the IHPD. However, first and last name matches were reviewed by team members to determine if matches were determined reliable.

Another limitation is the possibility of data entry error during the data collection and review process. When completing manual data entry, error is possible. However, standard operating procedures for data entry were put in place to prevent data entry error where possible. Lastly, due to the various strategies taken when matching across the VA HPT data and IHPD, several confirmed matches were unable to be included in the final comparison analysis. This is because manual matches with a recent issue date were unable to be identified in the IHPD.

Finally, this examination does not evaluate the components of the training program. Therefore, measuring the extent to which these programs impacted professional decisions of HPTs is very limited. However, the highlighted trends in professional characteristics may demonstrate the potential impact these training programs can have on diversifying the health care workforce.



CONTEXTUALIZING CONTRIBUTIONS

CONTEXUALIZING CONTRIBUTIONS

Access to health care requires a workforce of highly skilled professionals. Unfortunately, current health workforce shortages are threatening the stability of health systems and limiting access to care. With pervasive shortages and the expected increase in demand for health services in the coming years/decades, ensuring the health workforce training pipeline is sufficiently sized and resourced to meet the needs of the population is a top priority of state and community leaders. These leaders will be seeking information on the impact and outcomes of existing initiatives as they consider strategies to strength and expand training capacity. Evaluation of health professions training initiatives has never been timelier.

The Indianapolis VAMC is a significant contributor to health professions training in Indiana and to the production of its workforce. Recognizing their important role and realizing increased demand for training (now and in the future), the Indianapolis VAMC initiated an evaluation of their current health professions training contributions. This information is required to understand the current contributions and is critical to informing future initiatives. Prior to this evaluation, only limited information on the impact of the Indianapolis VAMC contributions were available.

INVESTMENTS

An accurate accounting of the full financial contribution made by the Indianapolis VAMC to training health professionals in Indiana has not previously been accomplished or was previously unknown. Existing documentation strategies for training-associated investments significantly underestimate the total financial resources the Indianapolis VAMC bring to bear in the training of health professionals in the state. Estimates based on basic reporting metrics maintained by the VA include training-allocated resources (infrastructure and staff time in “Education”) and training associated disbursements, which together approximate an investment of \$10.8 million annually.³⁸ The investigation performed as part of this evaluation identified that the basic reporting metrics do not account for all training associated costs. In fact, they do not account for the one of the largest (and arguably most critical) component of health professional training costs: Staff time spent in direct clinical training. By connecting with the leadership of each Indianapolis VAMC clinical division involved in health professional training initiatives to obtain estimates of their staff’s time also dedicated to training activities, a more accurate picture of the overall cost emerges. The revised annual estimate after accounting for previously unidentified resources is \$90.9 million, \$80 million more than was able to be quantified through basic reporting. **The magnitude of this investment significantly impacts the State of Indiana and is separate from any state appropriations directed toward health professions training. In the absence of Indianapolis VAMC investments, Indiana would need to identify other resources (around \$100 million per year) to support, sustain, and build health professions training infrastructure.**

INDIANA HEALTH WORKFORCE

This evaluation sought to determine the number of Indianapolis VAMCs trainees that successfully became licensed in the state and report providing health care services for its residents. To our knowledge, this evaluation is the first to examine state-level workforce outcomes associated with VA training initiatives by matching VA HPT records to state license records. As with many evaluations relying on existing data sources, this process was time consuming, but the findings speak for themselves. Out of 4,874 HPT records (many of which were duplicates), 1,895 unique Indiana licensed professionals were identified. Information on those professionals that have held their license through a renewal cycle, demonstrates that many of them are currently practicing in the state and providing health care services for Hoosiers. Highlights from the information on physicians that were former HPTs suggest that these professionals are making significant contributions to the state’s vulnerable populations. As compared to Indiana’s overall physician workforce,³⁹ a greater proportion of physicians trained at the VAMC report accepting Indiana Medicaid recipients at their practices, and many of them reported providing services to patients that are aging or disabled and those that are incarcerated.

But the most profound measure of the Indianapolis VAMC contributions through this evaluation is found in the number and practice locations of professionals who were former trainees (Figure 8 and 14). Figure 8 plots the current distribution of physician trainee practice locations across the state. From these figures it is clear that the VAMC is contributing to preparing physicians (and other health professionals) that serve communities across the state. **Without Indianapolis VAMC training initiatives it is uncertain where these 1,895 professions would have received training and whether they would be currently practicing in the state.**

³⁸ The project period for the cost assessment was October 1, 2013 – September 30, 2021.

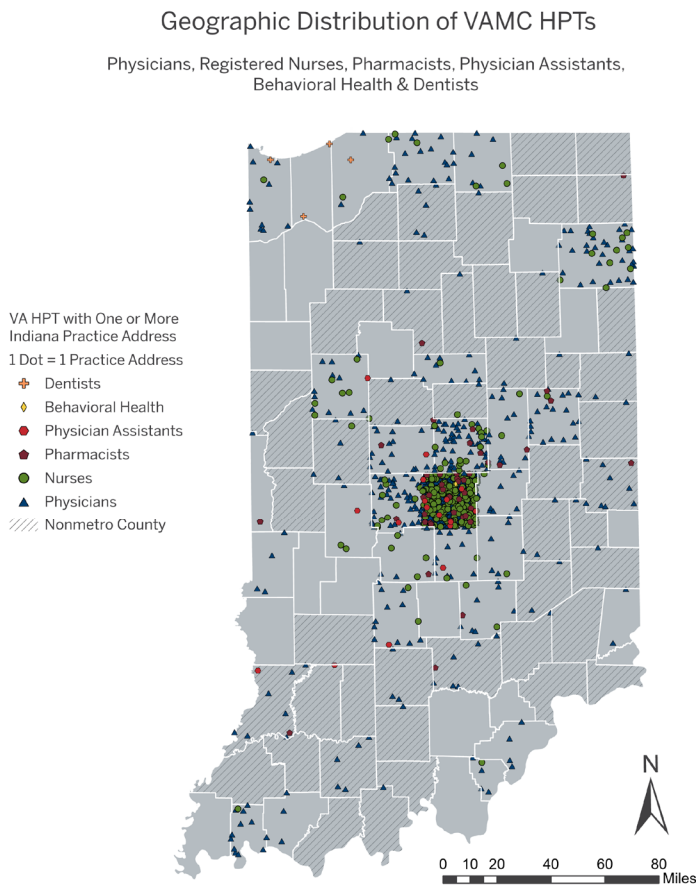
³⁹ 2021 Indiana Physician Data Report available at: <https://scholarworks.iupui.edu/handle/1805/5789>

CONCLUSION

The Indianapolis VAMC has and is making significant investments in health professions training in Indiana, and it is an important contributor to Indiana’s health care workforce. This evaluation was developed for the purpose of documenting these investments and contributions. As states across the nation consider strategies to strengthen their health care workforce, enhancing partnership with the VA will be critical. As Indiana seeks to address its workforce shortages now and into the future, Indianapolis VAMC contributions may be increasingly needed. As policy makers consider strategies to support health workforce development initiatives across the nation, investments may be needed to ensure the VA system is prepared with the infrastructure and resources required to expand training initiatives and grow training partnerships. Without the support of the VA, the landscape of health professions training in Indiana and across the nation would be hard pressed to address current and future workforce shortages.

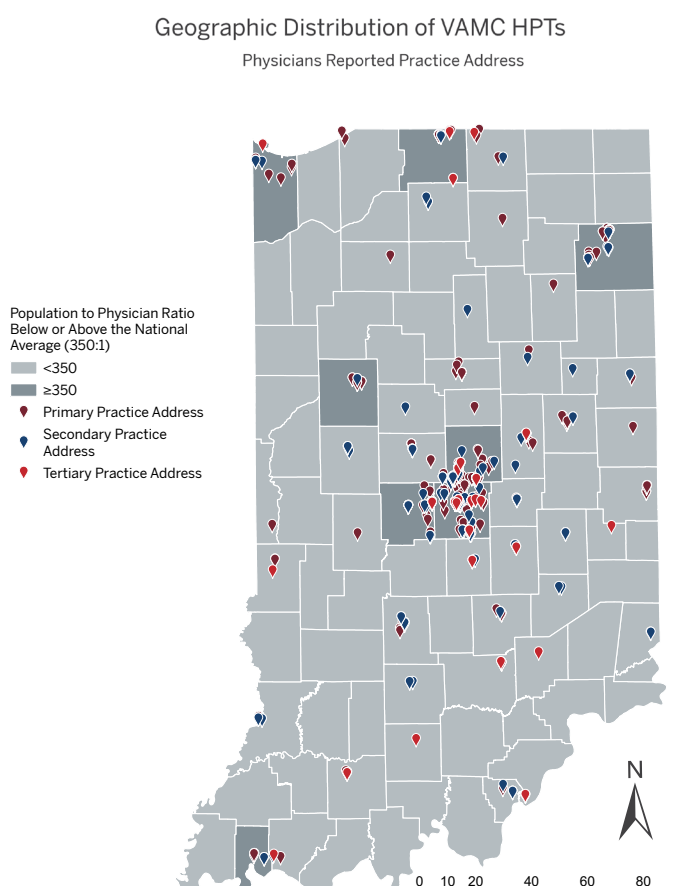
Figure 9: Indiana population to physician ratio compared to the National population to physician ratio with the locations of VA community-based outpatient clinics, outpatient clinics, vet centers and VAMC highlighted.

Figure 17: Indiana population to physician ratio compared to the National population to physician ratio with the locations of VA community-based outpatient clinics, outpatient clinics, vet centers and VAMC highlighted.



Source: 2014 - 2021 Veterans Affairs Health Professions Trainee Data, Indiana License Supplemental Survey Data (Physicians, Registered Nurses, Physician Assistants, Pharmacists, Behavioral Health Professionals and Dentists).

This map displays the dispersion of Indianapolis VAMC trainees’ practice locations across the state of Indiana, demonstrating the statewide impact of Indianapolis VAMC training initiatives.



Source: 2014 - 2021 Veterans Affairs Health Professions Trainee Data, 2021 Indiana Physicians License Supplemental Survey Data

This map displays whether Indiana counties fair better (darker) or worse (lighter) than the national average based on population per physician ratio alongside the distribution of VAMC trainees to demonstrate key contributions to physician workforce capacity.

LESSONS LEARNED

Throughout the course of this evaluation there were several lessons learned which may inform future, related initiatives:

EVALUATIONS

Labor mapping which accounts for training that occurs in conjunction with Clinical Care would support reporting of comprehensive training investments. This evaluation identified that current labor mapping does not enable tracking of overall training contributions including, importantly, those that happen during the course of clinical care. Clinical training is foundational to the preparation of health care professionals. Developing sustainable strategies for tracking and reporting investments associated with clinical training is needed to ensure adequate recognition of training contributions.

The collection and management of standardized information on HPTs would simplify future evaluations. Information is maintained on all learners involved in training initiatives at the Indianapolis VAMC; however, the format (electronic versus paper) and completeness (availability) of this information varies widely by academic affiliate and training program type. Collecting and maintaining HPT information in electronic format with common identifiers would greatly enhance the Indianapolis VAMC's ability to evaluate training outcomes in the future. The development of this 'minimum dataset' will be crucial to ensure the completeness of the data necessary for these program evaluations. This would also require investment in a sustainable and comprehensive HPT database.

Understanding whether and to what extent Indianapolis VAMC trainees become part of the VAMC workforce post training would provide insight on impact these initiatives have on workforce capacity to serve Hoosier veterans. Such an analysis was outside of the scope of this current evaluation project; however, recruitment and retention of VAMC HPTs is likely a strategic priority for the Indianapolis VAMC. Opportunities exist for quantifying and assessing the impact of training initiatives on direct recruitment or retention of professionals into VA employment during hiring process or establish a data sharing mechanism between HPT Records and onboarding.

TRAINING INITIATIVES

Demand for training is outpacing the resources available for training initiatives. During interviews with the Service Chiefs and their team members, several indicated receiving requests to take on additional trainees that they are unable to accommodate due to staff or space constraints. Given the current state of healthcare workforce shortages, demand for health professions training is likely to increase in the future. Should the Indianapolis VAMC desire to expand their training initiatives, capacity building would be necessary.

Enhancing recognition of training contributions may increase morale and participation in training initiatives.

Commitment to training health professional students is woven into the fabric of the clinical team and staff at the Indianapolis VAMC. Although critical to the organization, community and our nation, training contributions are not recognized at the same level as clinical contributions. Identifying opportunities to enhance recognition of training contributions would signal to existing and future staff the value placed upon these initiatives. As previously mentioned, enhanced strategies to monitor and report on the extent of these contributions is an important first step. Opportunities may exist for enhancing recognition in partnership with affiliates through expanded academic appointments or other designations which demonstrate value.

APPENDIX A: INDIANAPOLIS VAMC CLINICAL TRAINING INVESTMENTS

APPENDIX A.1 KEY INFORMANT INTERVIEW TOOL ADMINISTERED TO SERVICE CHIEFS

Interview Date:

Interviewee Names and Titles/Roles:

What service area do you represent?

HPT Affiliations Under Your Service Line

What types of HPTs do you host in your serve area and from what affiliate institution?

HPT Type	Affiliate Name
(EXAMPLE) Medical Student	IUSM – Indianapolis Campus

Is there one site (training) director for all HPTs under your service line or does each affiliate or HPT type have a specific site (training) director?

Quantifying VA Supervising Practitioners Training Time (Beyond Labor Reporting)

How many staff from your service line serve as supervising practitioners (those that are involved in supervising activities of HPTs)? We recognize that the VA system only allows practitioners to designate their time as either clinical service (seeing patients/providing services) or teaching. However, there are likely many “clinical” hours for which the supervising practitioners is also training HPTs. How many hours do your supervising practitioners assign as “clinical service” but are also with HPTs? (Preferably reported as a weekly average, but can be reported as monthly, yearly, or as a percentage of total clinical service time if easier. Below is a breakdown of an example of reporting we are hoping to get to with this information).

1. Sample of Reporting for Primary Care Service Line (Note: All figures are fictional and are included only for demonstration purposes).
 - Total supervising practitioner teaching hours in December 2021: 8.5 (Source: VA Finance Team)
 - Total supervising practitioner clinical service hours in December 2021: 127.3 (Source: VA Finance Team)
 - Clinical service hours that the supervising practitioner also had HPTs: ~20% or 25 hours (Source: Key Informant Interview with Service Chief)

Quantifying Costs Associated with Training Space(s)

Does your service area have a physical space that is used to train HPTs?

What is the room number/location of this space?

Is this space exclusively used for training of HPTs or does it also serve other purposes?

- If this space is not only used for HPTs, how much time per week do you estimate it being used for training purposes?

Quantifying Costs Associated with Supplies

Does your service area provide equipment/supplies for HPTs training?

If so, what types of supplies are provided per student and in what quantity?

APPENDIX A.2: KEY INFORMANT INTERVIEWS TO OBTAIN ADDITIONAL COST DATA BY SERVICE LINE

Service Line	Interviewee (Name(s), Title)
Anesthesiology	Dr. Wolf Stapelfeldt, Service Chief Sandra Bragdon, Business/Practice Manager
Dental	Dr. Leslie Brooks, Service Chief
Education	Libby Frey, Designated Learning Officer
Medicine (Specialty Care)	Dr. Grant Gilroy, Service Chief Brittany Hook, Business/Practice Manager
Mental Health	Dr. Eric Boss, Service Chief Andy Brown, Business/Practice Manager
Neurology	Dr. Loretta VanEvery, Service Chief
Nursing	Libby Frey, Designated Learning Officer ⁴⁰ Adam Smith, Service Chief of PCS Acute Care Kailee Walton, Service Chief of PCS Critical Care
Nutrition and Food	Amanda Majewski, Service Chief
Pathology and Laboratory	Dr. Christopher Wade, Service Chief Amanda Reuille, Business/Practice Manager
Pharmacy	Dr. Marshall Jones, Service Chief
Physical Medicine and Rehabilitation	Dr. Lois Buschbacher, Service Chief
Primary Care	Dr. Kathir Palanisamy, Service Chief Tony Lopez, Business/Practice Manager
Radiation Oncology	Dr. Ron Shapiro, Service Chief Robert Slack, Business/Practice Manager
Radiology	Dr. Greg Katzman
Social Work	Liz Chapline, Service Chief Christina Silas, MSW Committee Chair
Surgery	Dr. Tom Hayward, Service Chief Derek Payne, Business/Practice Manager

⁴⁰ Representing PCS Procedural Medicine and PCS Surgery.

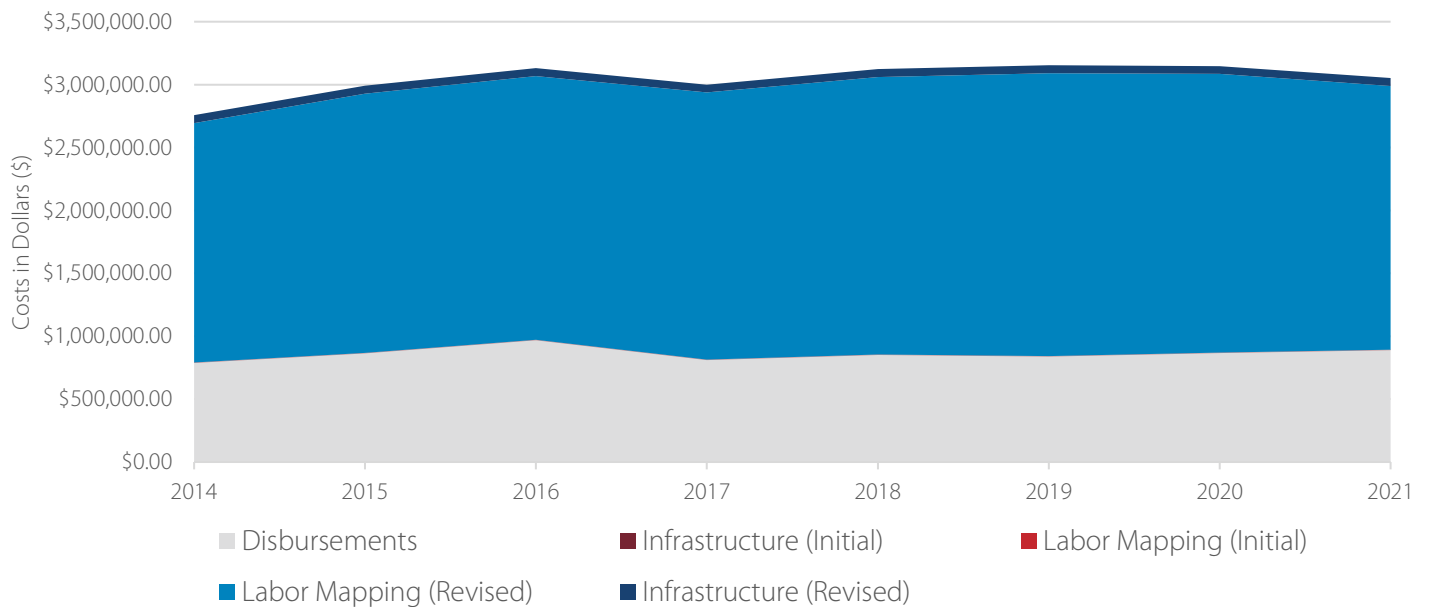
Appendix A.3: COST ESTIMATES ASSOCIATED WITH INDIANAPOLIS VAMC HEALTH PROFESSIONS

TRAINING, Contributions using Initial and Revised Cost Accounting Mechanisms, 2014-2021 YOY

Initial Costs vs. Revised Costs for Anesthesiology Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$790,715.3	\$867,995.3	\$972,330.0	\$814,258.5	\$854,233.1	\$841,910.5	\$870,126.0	\$893,091.1	\$6,904,659.8
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Initial Costs	\$790,715.3	\$867,995.3	\$972,330.0	\$814,258.5	\$854,233.1	\$841,910.5	\$870,126.0	\$893,091.1	\$6,904,659.8
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$790,715.3	\$867,995.3	\$972,330.0	\$814,258.5	\$854,233.1	\$841,910.5	\$870,126.0	\$893,091.1	\$6,904,659.8
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$1,904,793.1	\$2,061,630.5	\$2,096,473.8	\$2,123,351.9	\$2,207,701.0	\$2,249,275.5	\$2,215,529.3	\$2,096,382.1	\$16,955,137.2
Total Revised Costs	\$2,758,008.4	\$2,992,125.8	\$3,131,303.8	\$3,000,110.4	\$3,124,434.1	\$3,153,686.0	\$3,148,155.3	\$3,051,973.2	\$24,359,797.0
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$1,967,293.1	\$2,124,130.5	\$2,158,973.8	\$2,185,851.9	\$2,270,201.0	\$2,311,775.5	\$2,278,029.3	\$2,158,882.1	\$17,455,137.2

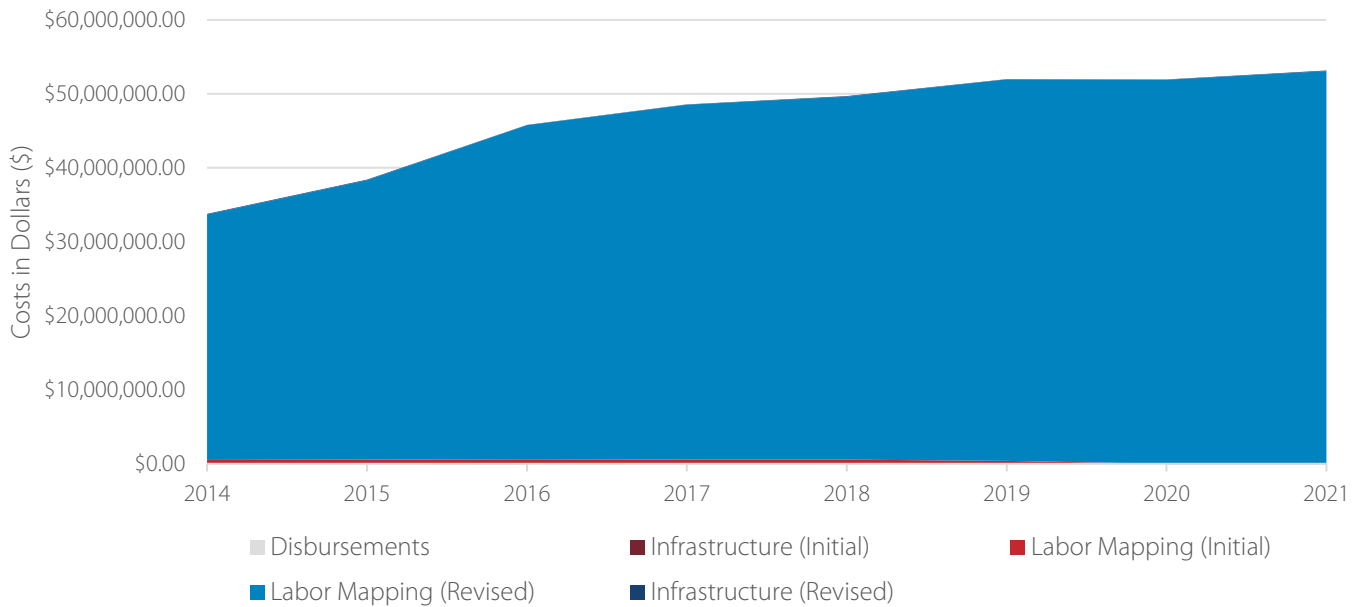
Costs Associated with Anesthesiology Service Line



Initial Costs vs. Revised Costs for Dental Service Line

Initial Estimate									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$13,090.4	\$6,444.8	\$0	\$3,819.0	\$0	\$0	\$0	\$0	\$23,354.1
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$516,744.0	\$542,858.0	\$618,139.0	\$573,115.0	\$550,512.0	\$402,600.0	\$791.0	\$953.0	\$3,205,712.0
Total Initial Costs	\$529,834.4	\$549,302.8	\$618,139.0	\$576,934.0	\$550,512.0	\$402,600.0	\$791.0	\$953.0	\$3,229,066.1
Revised Costs									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$13,090.4	\$6,444.8	\$0	\$3,819.0	\$0	\$0	\$0	\$0	\$23,354.1
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$33,176,519.8	\$37,796,802.1	\$45,147,015.4	\$47,948,076.3	\$49,082,943.3	\$51,547,366.7	\$51,904,639.6	\$53,087,281.2	\$369,690,644.4
Total Revised Costs	\$33,252,110.2	\$37,865,746.8	\$45,209,515.4	\$48,014,395.3	\$49,145,443.3	\$51,609,866.7	\$51,967,139.6	\$53,149,781.2	\$370,213,998.5
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
(Total Revised Costs – Total Initial Costs)	\$32,722,275.8	\$37,316,444.1	\$44,591,376.4	\$47,437,461.3	\$48,594,931.3	\$51,207,266.7	\$51,966,348.6	\$53,148,828.2	\$366,984,932.4

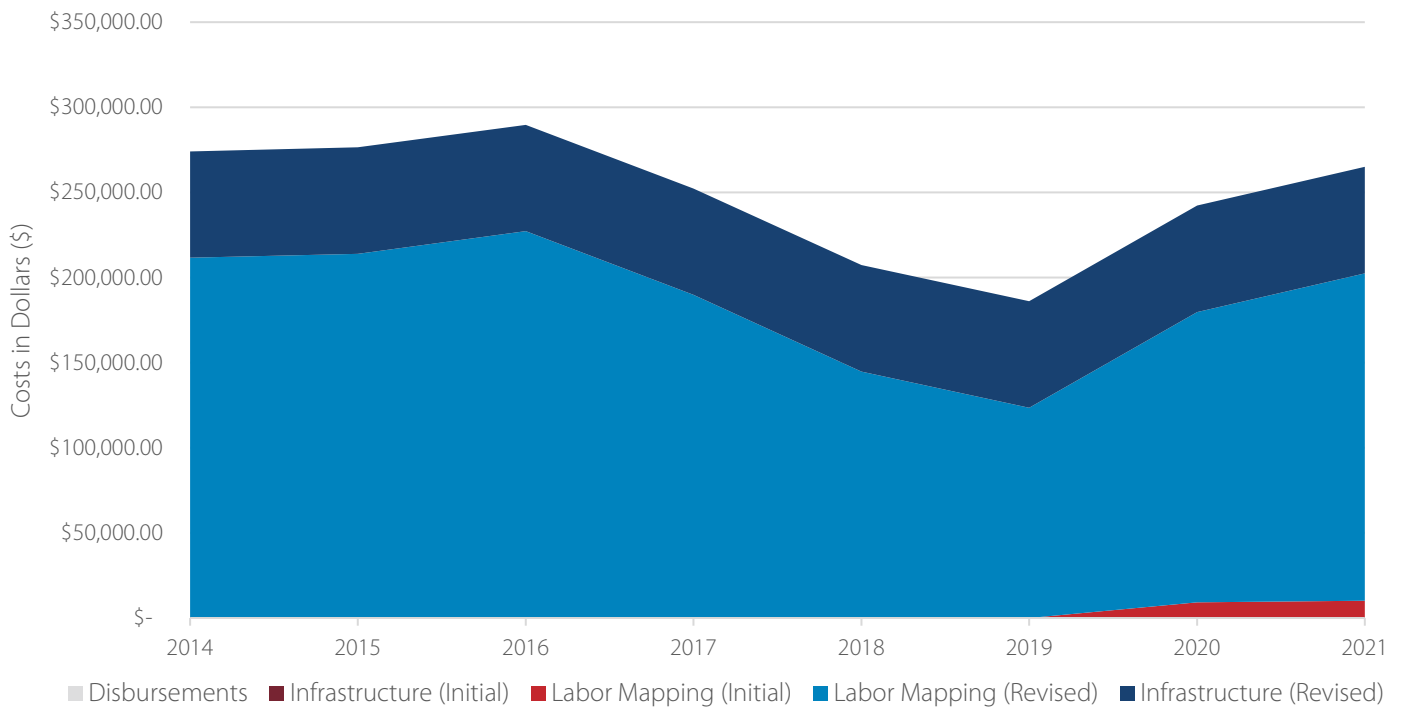
Costs Associated with Dental Service Line



Initial Costs vs. Revised Costs for Education Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$9,372.0	\$10,284.0	\$19,656.0
Total Initial Costs	\$0	\$0	\$0	\$0	\$0	\$0	\$9,372.0	\$10,284.0	\$19,656.0
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$211,584.8	\$213,924.0	\$227,184.2	\$189,845.2	\$144,857.7	\$123,573.7	\$170,348.2	\$192,263.9	\$1,473,581.7
Total Revised Costs	\$274,084.8	\$276,424.0	\$289,684.2	\$252,345.2	\$207,357.7	\$186,073.7	\$232,848.2	\$254,763.9	\$1,973,581.7
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
(Total Revised Costs - Total Initial Costs)	\$274,084.8	\$276,424.0	\$289,684.2	\$252,345.2	\$207,357.7	\$186,073.7	\$223,476.2	\$244,479.9	\$1,953,925.7

Costs Associated with Education Service Line



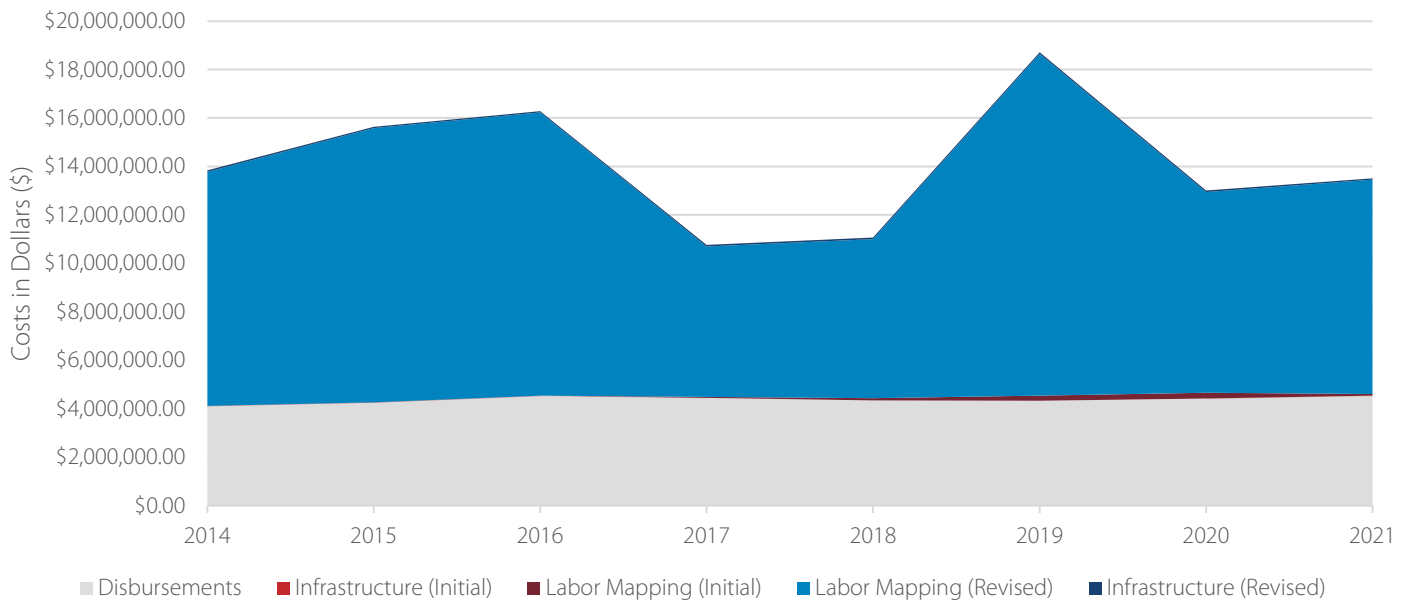
Initial Costs vs. Revised Costs for Medicine (Specialty Care) Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$4,113,896.8	\$4,258,695.1	\$4,536,232.7	\$4,453,215.2	\$4,347,614.3	\$4,334,413.7	\$4,424,514.7	\$4,541,290.5	\$35,009,873.0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0.0	\$0.0	\$0.0	\$36,858.0	\$92,238.0	\$204,780.0	\$232,607.0	\$67,806.0	\$634,289.0
Total Initial Costs	\$4,113,896.8	\$4,258,695.1	\$4,536,232.7	\$4,490,073.2	\$4,439,852.3	\$4,539,193.7	\$4,657,121.7	\$4,609,096.5	\$35,644,162.0

Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$4,113,896.8	\$4,258,695.1	\$4,536,232.7	\$4,453,215.2	\$4,347,614.3	\$4,334,413.7	\$4,424,514.7	\$4,541,290.5	\$35,009,873.0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$9,665,381.8	\$11,320,280.4	\$11,689,373.6	\$6,207,020.1	\$6,560,078.2	\$14,107,299.8	\$8,286,069.2	\$8,842,759.8	\$76,678,262.9
Total Revised Costs	\$13,841,778.6	\$15,641,475.5	\$16,288,106.2	\$10,722,735.4	\$10,970,192.5	\$18,504,213.5	\$12,773,083.9	\$13,446,550.2	\$112,188,135.8

Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs - Total Initial Costs	\$9,727,881.8	\$11,382,780.4	\$11,751,873.6	\$6,232,662.1	\$6,530,340.2	\$13,965,019.8	\$8,115,962.2	\$8,837,453.8	\$76,543,973.8

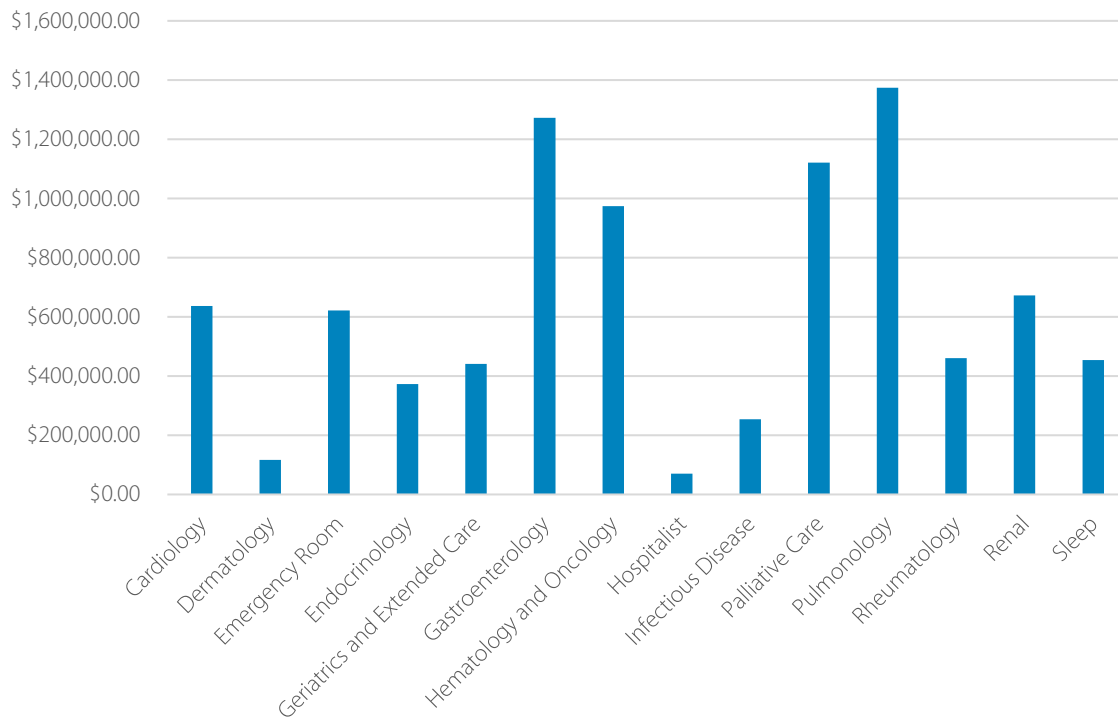
Costs Associated with Medicine (Specialty Care) Service Line



Initial Costs vs. Revised Costs for Medicine (Specialty Care) Service Line by Subspecialty

	2014	2015	2016	2017	2018	2019	2020	2021	Total
Cardiology	\$919,883.4	\$864,047.6	\$951,622.5	\$531,324.1	\$552,820.0	\$1,070,077.9	\$619,168.6	\$636,375.3	\$6,145,319.3
Dermatology	\$0	\$288,501.3	\$86,771.3	\$94,748.2	\$0.0	\$102,903.1	\$33,851.8	\$116,834.7	\$723,610.4
Emergency Room	\$653,027.8	\$908,666.3	\$969,540.9	\$474,745.7	\$484,004.7	\$1,051,720.3	\$587,701.3	\$622,031.3	\$5,751,438.3
Endocrinology	\$668,014.1	\$715,039.4	\$743,408.1	\$380,990.5	\$330,563.8	\$655,794.2	\$383,343.2	\$373,300.8	\$4,250,454.1
Geriatrics and Extended Care	\$84,331.3	\$169,492.1	\$191,185.3	\$98,985.3	\$99,880.6	\$307,583.8	\$398,066.0	\$441,389.1	\$1,790,913.4
Gastroenterology	\$2,158,206.5	\$2,207,189.0	\$2,487,449.0	\$1,270,626.5	\$1,282,888.6	\$2,605,032.7	\$1,307,690.2	\$1,272,291.6	\$14,591,374.1
Hematology and Oncology	\$1,045,955.1	\$1,328,861.0	\$1,509,244.5	\$809,879.3	\$794,747.4	\$1,716,429.3	\$955,919.5	\$974,276.6	\$9,135,312.7
Hospitalist	\$60,969.6	\$164,609.0	\$154,237.4	\$49,378.0	\$108,419.3	\$47,794.0	\$117,489.2	\$69,630.1	\$772,526.6
Infectious Disease	\$79,612.8	\$73,577.5	\$35,005.5	\$40,489.1	\$69,172.7	\$136,568.0	\$220,429.9	\$254,520.1	\$909,375.7
Palliative Care	\$683,985.8	\$624,304.1	\$643,370.5	\$371,312.4	\$648,334.8	\$1,478,175.5	\$1,059,288.7	\$1,121,046.7	\$6,629,818.5
Pulmonology	\$1,756,991.9	\$2,112,625.6	\$1,604,223.9	\$870,223.8	\$1,013,949.6	\$2,307,343.1	\$1,128,279.1	\$1,374,283.2	\$12,167,920.1
Rheumatology	\$506,253.9	\$757,843.0	\$849,815.8	\$422,680.9	\$425,543.4	\$869,612.1	\$435,436.5	\$460,140.2	\$4,727,325.7
Renal	\$837,063.1	\$887,059.1	\$1,007,623.7	\$561,192.7	\$506,508.3	\$1,042,291.9	\$669,329.1	\$672,257.0	\$6,183,324.8
Sleep	\$211,086.6	\$218,465.4	\$455,875.3	\$230,443.7	\$243,245.1	\$715,974.0	\$370,075.9	\$454,383.3	\$2,899,549.2
Total	\$9,665,381.8	\$11,320,280.4	\$11,689,373.6	\$6,207,020.1	\$6,560,078.2	\$14,107,299.8	\$8,286,069.2	\$8,842,759.8	\$76,678,262.8

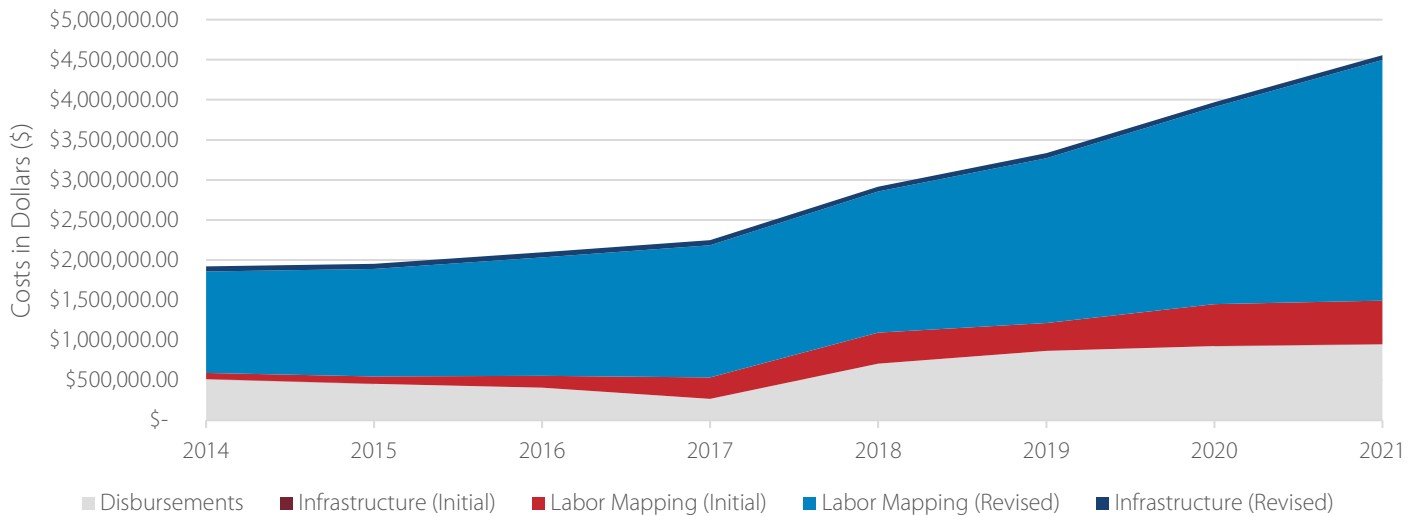
2021 Specialty Care Service Lines



Initial Costs vs. Revised Costs for Mental Health Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$516,686.1	\$455,019.4	\$407,535.2	\$267,551.7	\$706,128.1	\$866,661.2	\$927,587.5	\$952,069.2	\$5,099,238.4
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$74,860.0	\$92,944.0	\$148,443.0	\$270,288.0	\$387,481.0	\$347,149.0	\$524,020.0	\$541,246.0	\$2,386,431.0
Total Initial Costs	\$591,546.1	\$547,963.4	\$555,978.2	\$537,839.7	\$1,093,609.1	\$1,213,810.2	\$1,451,607.5	\$1,493,315.2	\$7,485,669.4
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$516,686.1	\$455,019.4	\$407,535.2	\$267,551.7	\$706,128.1	\$866,661.2	\$927,587.5	\$952,069.2	\$5,099,238.4
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$1,266,495.8	\$1,343,216.7	\$1,477,489.4	\$1,647,016.9	\$1,760,321.9	\$2,057,878.0	\$2,457,085.5	\$3,002,479.0	\$15,011,983.2
Total Revised Costs	\$1,845,681.9	\$1,860,736.1	\$1,947,524.6	\$1,977,068.6	\$2,528,950.0	\$2,987,039.2	\$3,447,173.0	\$4,017,048.2	\$20,611,221.6
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs - Total Initial Costs	\$1,254,135.8	\$1,312,772.7	\$1,391,546.4	\$1,439,228.9	\$1,435,340.9	\$1,773,229.0	\$1,995,565.5	\$2,523,733.0	\$13,125,552.2

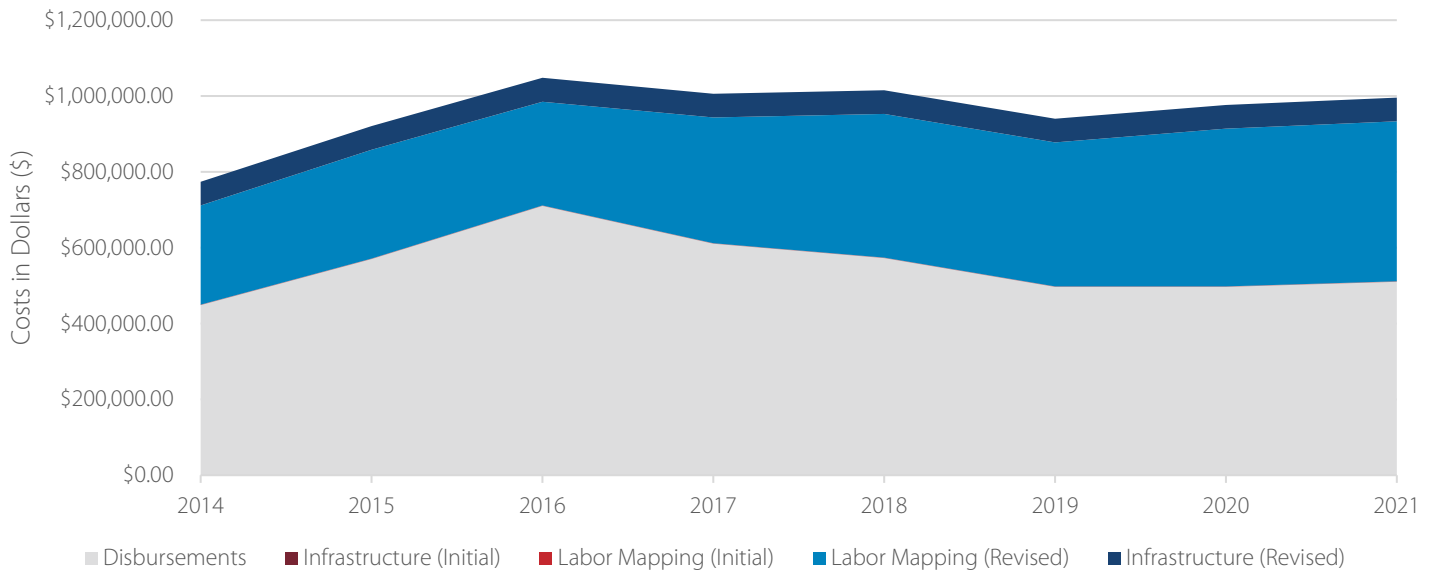
Costs Associated with Mental Health Service Line



Initial Costs vs. Revised Costs for Neurology Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$450,043.4	\$571,678.1	\$711,131.5	\$611,579.5	\$574,256.6	\$497,651.6	\$498,226.4	\$511,376.1	\$4,425,943.2
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Initial Costs	\$450,043.4	\$571,678.1	\$711,131.5	\$611,579.5	\$574,256.6	\$497,651.6	\$498,226.4	\$511,376.1	\$4,425,943.2
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$450,043.4	\$571,678.1	\$711,131.5	\$611,579.5	\$574,256.6	\$497,651.6	\$498,226.4	\$511,376.1	\$4,425,943.2
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$261,724.7	\$286,833.4	\$274,049.1	\$331,941.5	\$378,541.5	\$380,079.5	\$415,995.0	\$421,634.4	\$2,750,799.1
Total Revised Costs	\$774,268.0	\$921,011.5	\$1,047,680.6	\$1,006,021.1	\$1,015,298.1	\$940,231.1	\$976,721.5	\$995,510.4	\$7,676,742.3
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs - Total Initial Costs	\$324,224.7	\$349,333.4	\$336,549.1	\$394,441.5	\$441,041.5	\$442,579.5	\$478,495.0	\$484,134.4	\$3,250,799.1

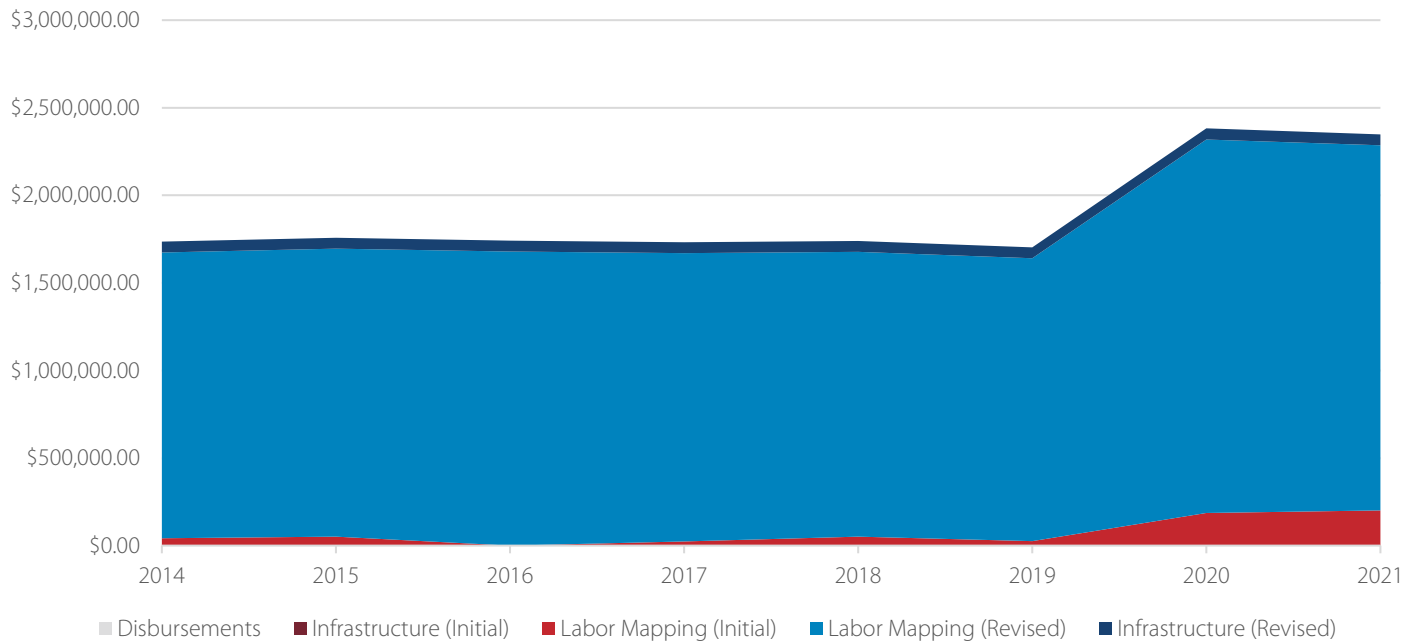
Costs Associated with Neurology Service Line



Initial Costs vs. Revised Costs for Nursing Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$42,343.0	\$51,401.0	\$0.0	\$24,497.0	\$52,179.0	\$25,741.0	\$187,437.0	\$201,936.0	\$585,534.0
Total Initial Costs	\$42,343.0	\$51,401.0	\$0.0	\$24,497.0	\$52,179.0	\$25,741.0	\$187,437.0	\$201,936.0	\$585,534.0
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$1,631,632.0	\$1,643,524.2	\$1,679,478.2	\$1,644,675.3	\$1,624,652.9	\$1,614,858.5	\$2,131,631.2	\$2,083,730.4	\$14,054,182.7
Total Revised Costs	\$1,694,132.0	\$1,706,024.2	\$1,741,978.2	\$1,707,175.3	\$1,687,152.9	\$1,677,358.5	\$2,194,131.2	\$2,146,230.4	\$14,554,182.7
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$1,651,789.0	\$1,654,623.2	\$1,741,978.2	\$1,682,678.3	\$1,634,973.9	\$1,651,617.5	\$2,006,694.2	\$1,944,294.4	\$13,968,648.7

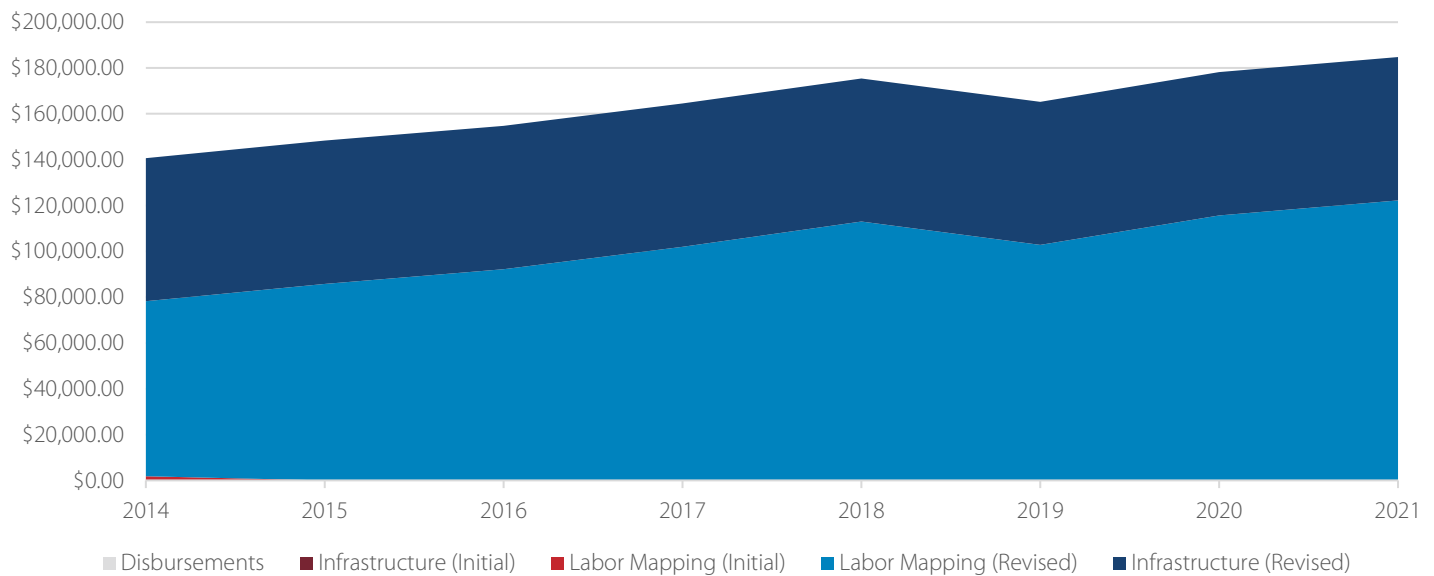
Costs Associated with Nursing Service Lines



Initial Costs vs. Revised Costs for Nutrition and Food Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$1,886.0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,886.0
Total Initial Costs	\$1,886.0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,886.0
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$76,290.0	\$85,765.2	\$92,256.3	\$102,013.6	\$112,962.4	\$102,787.1	\$115,714.1	\$122,264.6	\$810,053.3
Total Revised Costs	\$138,790.0	\$148,265.2	\$154,756.3	\$164,513.6	\$175,462.4	\$165,287.1	\$178,214.1	\$184,764.6	\$1,310,053.3
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs - Total Initial Costs	\$136,904.0	\$148,265.2	\$154,756.3	\$164,513.6	\$175,462.4	\$165,287.1	\$178,214.1	\$184,764.6	\$1,308,167.3

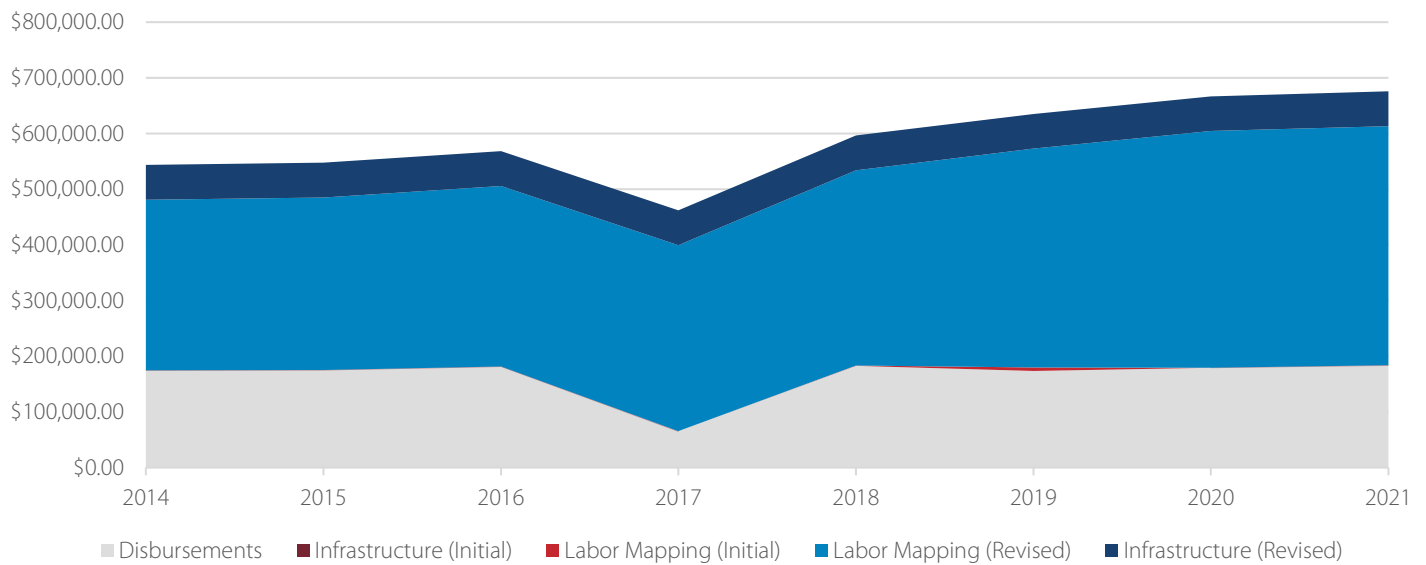
Costs Associated with Nutrition and Food Service Line



Initial Costs vs. Revised Costs for Pathology & Laboratory Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$174,921.7	\$175,495.7	\$181,539.7	\$65,431.2	\$182,582.7	\$173,577.1	\$179,155.4	\$183,883.8	\$1,316,587.3
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$799.0	\$6,679.0	\$0	\$0	\$7,478.0
Total Initial Costs	\$174,921.7	\$175,495.7	\$181,539.7	\$65,431.2	\$183,381.7	\$180,256.1	\$179,155.4	\$183,883.8	\$1,324,065.3
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$174,921.7	\$175,495.7	\$181,539.7	\$65,431.2	\$182,582.7	\$173,577.1	\$179,155.4	\$183,883.8	\$1,316,587.3
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$306,060.2	\$309,807.2	\$324,358.1	\$334,172.2	\$350,570.1	\$392,494.8	\$425,269.8	\$429,452.7	\$2,872,185.1
Total Revised Costs	\$543,481.8	\$547,802.9	\$568,397.8	\$462,103.4	\$595,652.7	\$628,571.9	\$666,925.1	\$675,836.5	\$4,688,772.1
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$368,560.2	\$372,307.2	\$386,858.1	\$396,672.2	\$412,271.1	\$448,315.8	\$487,769.8	\$491,952.7	\$3,364,707.1

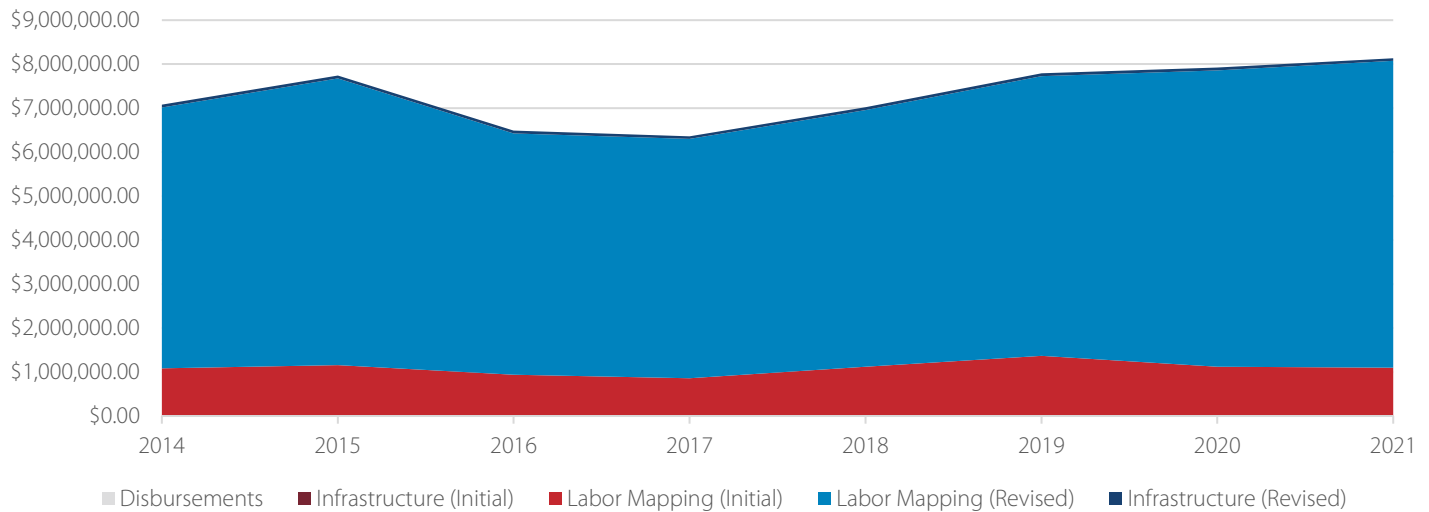
Costs Associated with Pathology & Laboratory Service Line



Initial Costs vs. Revised Costs for Pharmacy Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$1,083,545.0	\$1,158,855.0	\$943,557.0	\$857,116.0	\$1,122,889.0	\$1,366,498.0	\$1,120,409.0	\$1,096,627.0	\$8,749,496.0
Total Initial Costs	\$1,083,545.0	\$1,158,855.0	\$943,557.0	\$857,116.0	\$1,122,889.0	\$1,366,498.0	\$1,120,409.0	\$1,096,627.0	\$8,749,496.0
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$5,929,982.1	\$6,519,417.6	\$5,483,219.1	\$5,441,594.1	\$5,834,531.4	\$6,361,810.3	\$6,738,919.8	\$6,976,528.1	\$49,286,002.6
Total Revised Costs	\$5,992,482.1	\$6,581,917.6	\$5,545,719.1	\$5,504,094.1	\$5,897,031.4	\$6,424,310.3	\$6,801,419.8	\$7,039,028.1	\$49,786,002.6
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$4,908,937.1	\$5,423,062.6	\$4,602,162.1	\$4,646,978.1	\$4,774,142.4	\$5,057,812.3	\$5,681,010.8	\$5,942,401.1	\$41,036,506.6

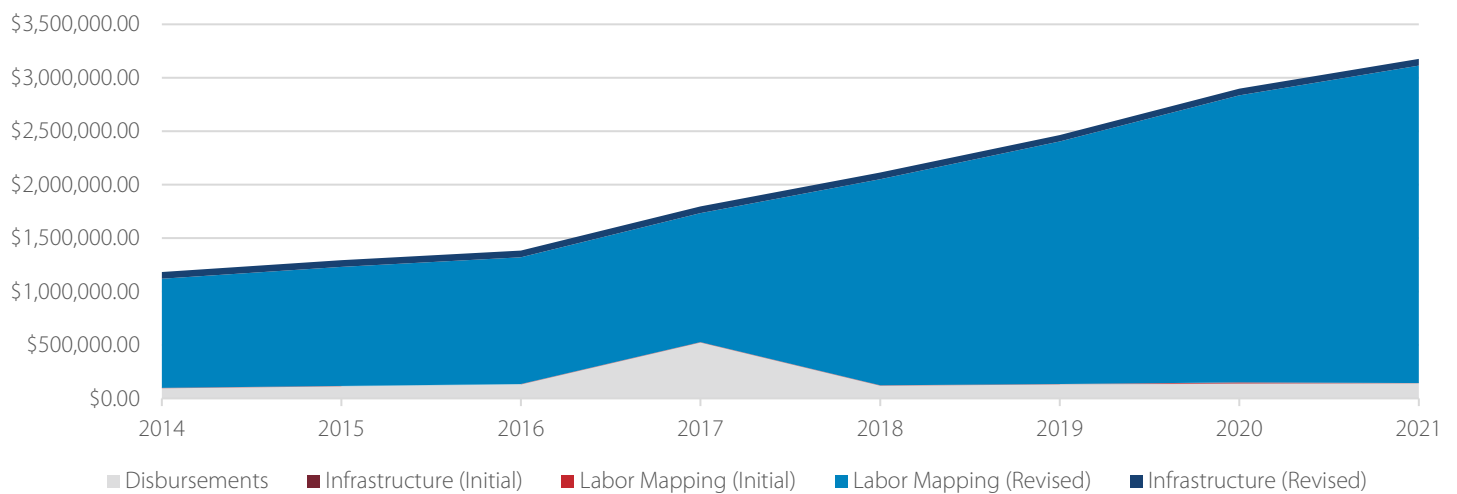
Costs Associated with Pharmacy Service Line



Initial Costs vs. Revised Costs for Physical Medicine and Rehabilitation Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$99,465.5	\$116,303.6	\$136,766.8	\$528,986.2	\$122,930.5	\$134,206.1	\$141,466.1	\$145,199.8	\$1,425,324.8
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$8,722.0	\$0	\$8,722.0
Total Initial Costs	\$99,465.5	\$116,303.6	\$136,766.8	\$528,986.2	\$122,930.5	\$134,206.1	\$150,188.1	\$145,199.8	\$1,434,046.8
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$99,465.5	\$116,303.6	\$136,766.8	\$528,986.2	\$122,930.5	\$134,206.1	\$141,466.1	\$145,199.8	\$1,425,324.8
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$1,021,058.9	\$1,115,201.5	\$1,185,389.7	\$1,204,124.1	\$1,929,719.6	\$2,269,159.8	\$2,686,656.5	\$2,970,495.8	\$14,381,806.0
Total Revised Costs	\$1,183,024.4	\$1,294,005.2	\$1,384,656.6	\$1,795,610.3	\$2,115,150.2	\$2,465,865.9	\$2,890,622.7	\$3,178,195.6	\$16,307,130.8
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$1,083,558.9	\$1,177,701.5	\$1,247,889.7	\$1,266,624.1	\$1,992,219.6	\$2,331,659.8	\$2,740,434.5	\$3,032,995.8	\$14,873,084.0

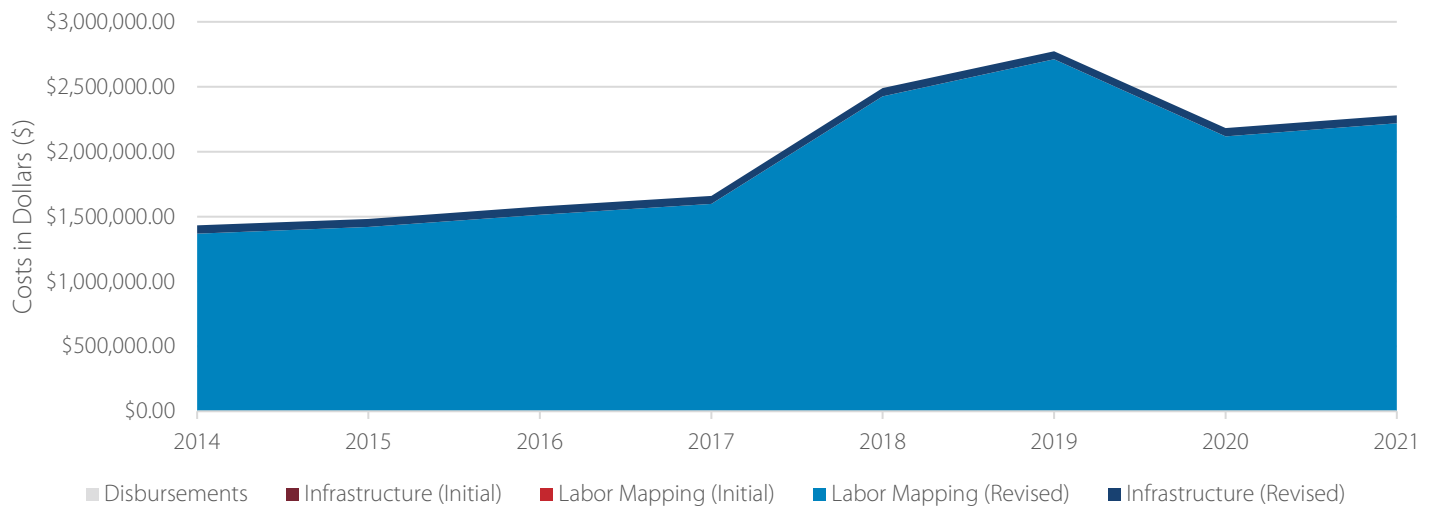
Costs Associated with Physical Medicine and Rehabilitation Service Line



Initial Costs vs. Revised Costs for Primary Care Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$1,992.0	\$0	\$0	\$1,992.0
Total Initial Costs	\$0	\$0	\$0	\$0	\$0	\$1,992.0	\$0	\$0	\$1,992.0
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$1,368,972.8	\$1,419,838.1	\$1,514,489.1	\$1,595,243.9	\$2,425,964.3	\$2,711,440.7	\$2,118,491.3	\$2,218,329.1	\$15,372,769.4
Total Revised Costs	\$1,431,472.8	\$1,482,338.1	\$1,576,989.1	\$1,657,743.9	\$2,488,464.3	\$2,773,940.7	\$2,180,991.3	\$2,280,829.1	\$15,872,769.4
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$1,431,472.8	\$1,482,338.1	\$1,576,989.1	\$1,655,751.9	\$2,488,464.3	\$2,773,940.7	\$2,180,991.3	\$2,280,829.1	\$15,870,777.4

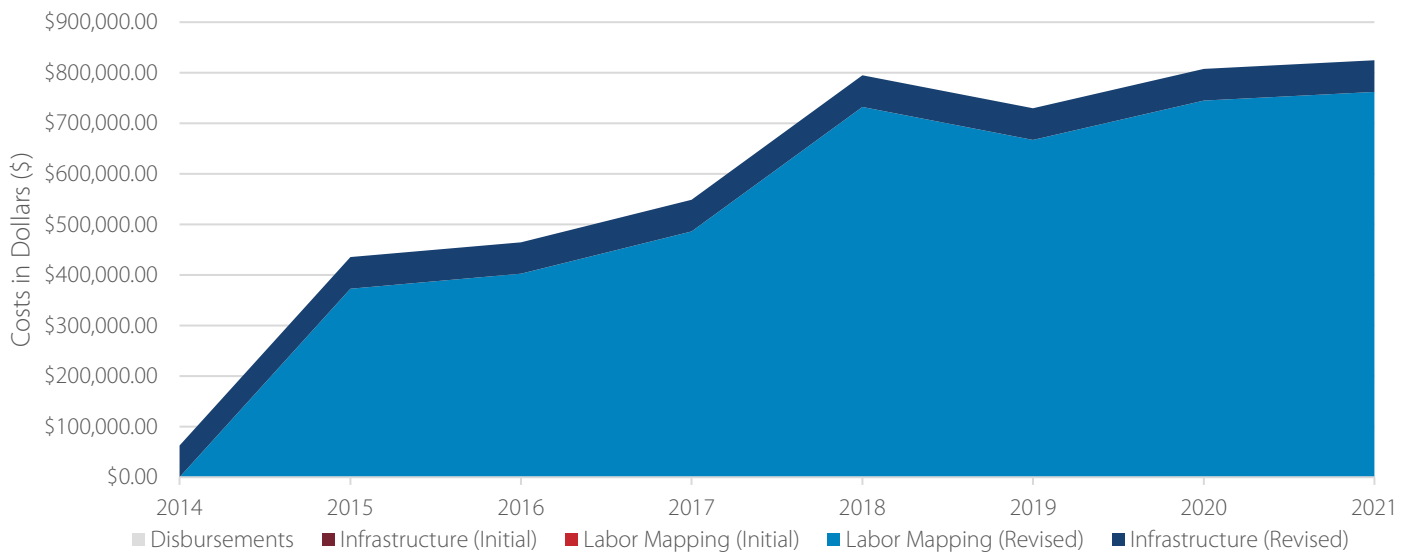
Costs Associated with Primary Care Service Line



Initial Costs vs. Revised Costs for Radiation Oncology Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0.0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0.0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$679.0	\$0	\$679.0
Total Initial Costs	\$0	\$0	\$0	\$0	\$0	\$0	\$679.0	\$0	\$679.0
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)		\$372,819.9	\$402,414.3	\$486,305.6	\$732,373.2	\$667,159.6	\$744,310.9	\$762,297.0	\$4,167,680.5
Total Revised Costs	\$62,500.0	\$435,319.9	\$464,914.3	\$548,805.6	\$794,873.2	\$729,659.6	\$806,810.9	\$824,797.0	\$4,667,680.5
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$62,500.0	\$435,319.9	\$464,914.3	\$548,805.6	\$794,873.2	\$729,659.6	\$806,131.9	\$824,797.0	\$4,667,001.5

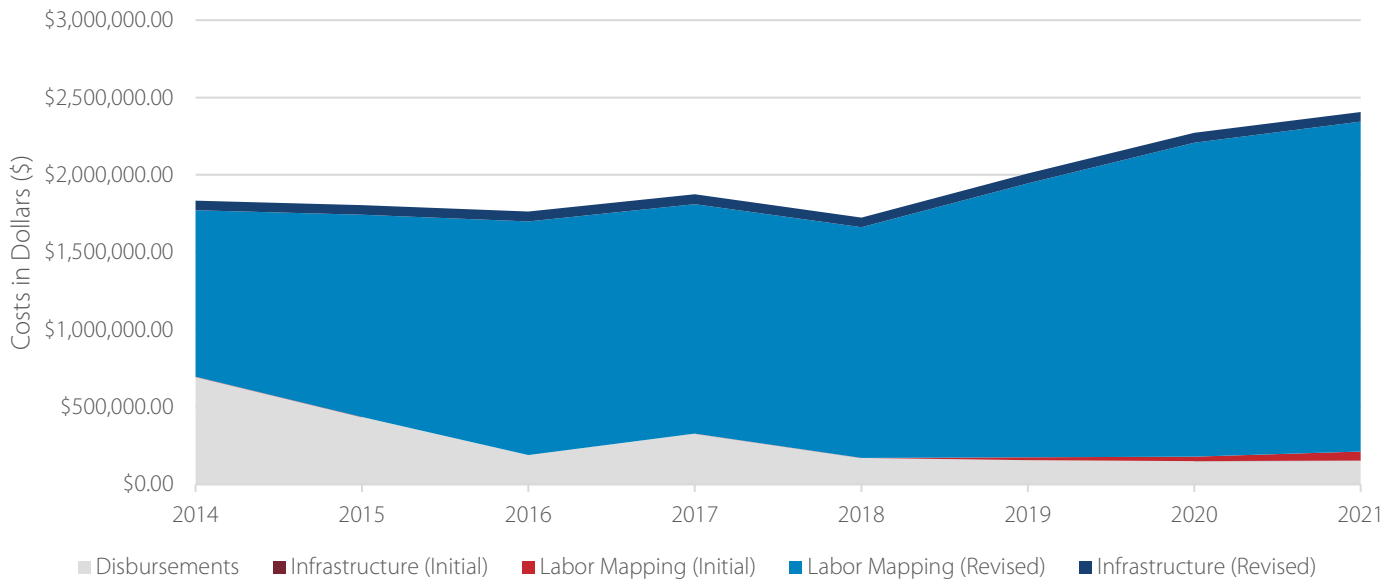
Costs Associated with Radiation Oncology Service Line



Initial Costs vs. Revised Costs for Radiology Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$696,219.5	\$435,514.4	\$188,383.8	\$327,549.7	\$170,958.7	\$156,142.2	\$149,734.2	\$153,686.1	\$2,278,188.6
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$19,075.0	\$28,538.0	\$58,027.0	\$105,640.0
Total Initial Costs	\$696,219.5	\$435,514.4	\$188,383.8	\$327,549.7	\$170,958.7	\$175,217.2	\$178,272.2	\$211,713.1	\$2,383,828.6
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$696,219.5	\$435,514.4	\$188,383.8	\$327,549.7	\$170,958.7	\$156,142.2	\$149,734.2	\$153,686.1	\$2,278,188.6
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$1,074,964.7	\$1,307,510.7	\$1,511,267.0	\$1,484,030.3	\$1,491,226.9	\$1,770,755.9	\$2,030,092.6	\$2,132,809.0	\$12,802,657.1
Total Revised Costs	\$1,833,684.2	\$1,805,525.0	\$1,762,150.8	\$1,874,080.1	\$1,724,685.6	\$1,989,398.0	\$2,242,326.8	\$2,348,995.1	\$15,580,845.7
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$1,137,464.7	\$1,370,010.7	\$1,573,767.0	\$1,546,530.3	\$1,553,726.9	\$1,814,180.9	\$2,064,054.6	\$2,137,282.0	\$13,197,017.1

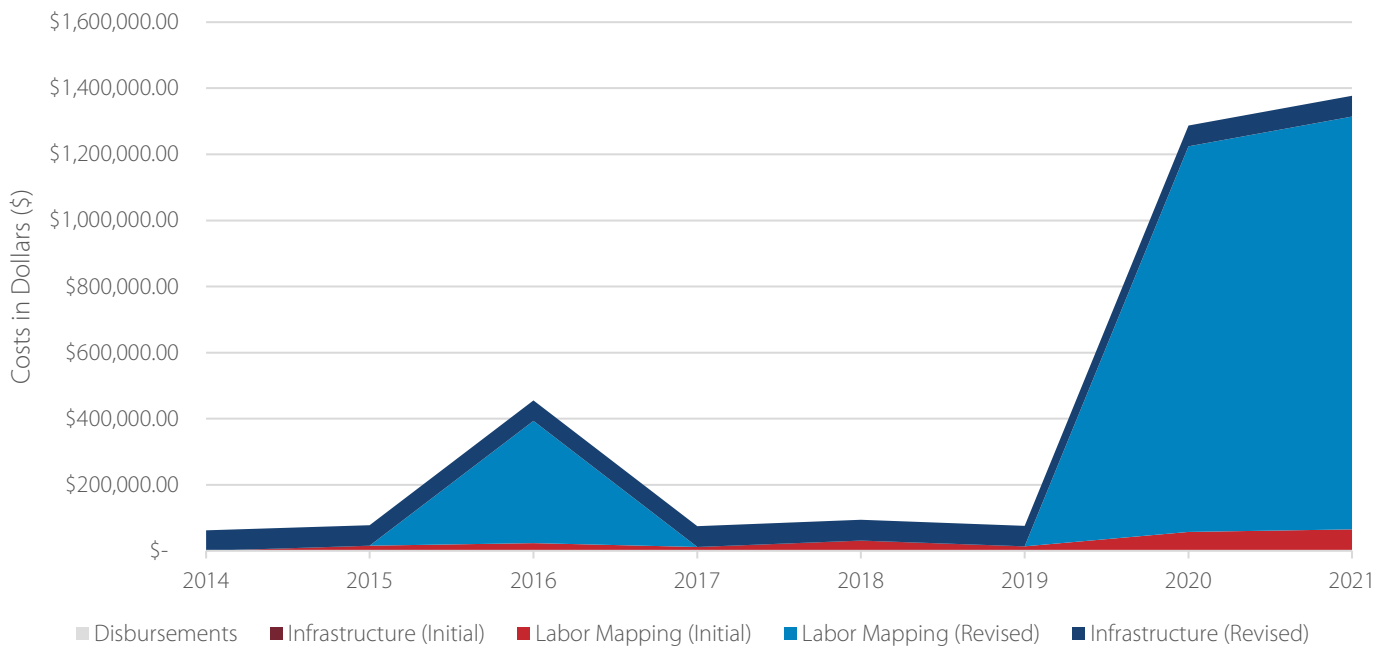
Costs Associated with Radiology Service Line



Initial Costs vs. Revised Costs for Social Work Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$15,356.0	\$22,996.0	\$11,895.0	\$31,468.0	\$13,516.0	\$57,080.0	\$65,268.0	\$217,579.0
Total Initial Costs	\$0	\$15,356.0	\$22,996.0	\$11,895.0	\$31,468.0	\$13,516.0	\$57,080.0	\$65,268.0	\$217,579.0
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Infrastructure (Revised)	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$62,500.0	\$500,000.0
Labor Mapping (Revised)	\$0	\$0	\$370,156.4	\$0	\$0	\$0	\$1,167,255.8	\$1,249,286.2	\$2,786,698.4
Total Revised Costs	\$62,500.0	\$62,500.0	\$432,656.4	\$62,500.0	\$62,500.0	\$62,500.0	\$1,229,755.8	\$1,311,786.2	\$3,286,698.4
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$62,500.0	\$47,144.0	\$409,660.4	\$50,605.0	\$31,032.0	\$48,984.0	\$1,172,675.8	\$1,246,518.2	\$3,069,119.4

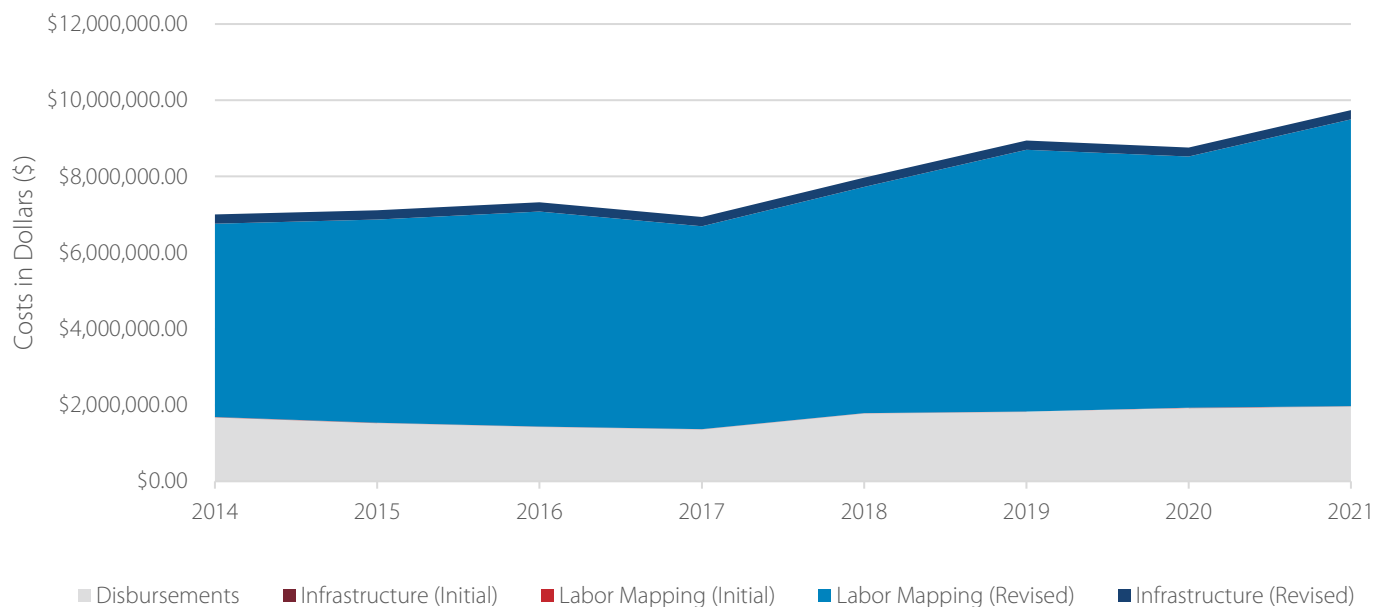
Costs Associated with Social Work Service Line



Initial Costs vs. Revised Costs for Surgery Service Line

Initial Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$1,687,572.7	\$1,536,909.8	\$1,434,150.9	\$1,370,108.8	\$1,787,982.2	\$1,830,231.6	\$1,921,000.2	\$1,971,700.9	\$13,539,657.1
Infrastructure (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Labor Mapping (Initial)	\$0	\$0	\$0	\$0	\$0	\$0	\$9,634.0	\$0	\$9,634.0
Total Initial Costs	\$1,687,572.7	\$1,536,909.8	\$1,434,150.9	\$1,370,108.8	\$1,787,982.2	\$1,830,231.6	\$1,930,634.2	\$1,971,700.9	\$13,549,291.1
Revised Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Disbursements	\$1,687,572.7	\$1,536,909.8	\$1,434,150.9	\$1,370,108.8	\$1,787,982.2	\$1,830,231.6	\$1,921,000.2	\$1,971,700.9	\$13,539,657.1
Infrastructure (Revised)	\$242,500.0	\$242,500.0	\$242,500.0	\$242,500.0	\$242,500.0	\$242,500.0	\$242,500.0	\$242,500.0	\$1,940,000.0
Labor Mapping (Revised)	\$5,069,288.4	\$5,329,035.8	\$5,646,041.2	\$5,323,724.2	\$5,933,962.7	\$6,867,435.7	\$6,588,062.0	\$7,528,281.3	\$48,285,831.2
Total Revised Costs	\$6,999,361.1	\$7,108,445.6	\$7,322,692.1	\$6,936,333.0	\$7,964,444.9	\$8,940,167.2	\$8,751,562.1	\$9,742,482.2	\$63,765,488.3
Impact of Revised Methodology on Cost Estimates									
	2014	2015	2016	2017	2018	2019	2020	2021	Total
Total Revised Costs – Total Initial Costs	\$5,311,788.4	\$5,571,535.8	\$5,888,541.2	\$5,566,224.2	\$6,176,462.7	\$7,109,935.7	\$6,820,928.0	\$7,770,781.3	\$50,216,197.2

Costs Associated with Surgery Service Line



APPENDIX B: INDIANAPOLIS VAMC IMPACT ON INDIANA'S HEALTH WORKFORCE

Appendix B.1 Data Verification Process

All trainee data were verified using Research Electronic Data Capture (REDCap™), an electronic data management application. Student roster files obtained from the Indianapolis VAMC were formatted into one CSV file and uploaded to a REDCap™ data entry form structured for data verification. Bowen Center staff first assessed whether trainee records were missing identifiers required for matching to license records (first name, last name, maiden name, DOB and NPI). If all identifiers were present in the REDCap record, then the record was marked 'complete'. In the case that an HPT record did not contain identifiers, the VAMC student database was searched to determine whether the information was contained therein. If the missing identifiers were present in the VAMC student database, Bowen Center staff entered the missing into the HPT record in RedCap™ using a process described in Appendix A. After this, the record was marked 'complete'. Any records in which missing information could not be verified using the VAMC student database were marked 'incomplete'. Once HPT data verification was complete, updated HPT records were exported from REDCap™ and imported into the Bowen Center database for matching to Indiana health professions licenses in the IHPD.

Table B 1.1 VAMC Medical HPTs Records that Matched to Indiana Physician Licenses

	Medical Trainees (Students, Residents, and Fellows)		Nursing		Physician Assistant		Pharmacy		Dental		Behavioral Health		Other Allied Health Programs	
	Total Matched	Match Rate	Total Matched	Match Rate	Total Matched	Match Rate	Total Matched	Match Rate	Total Matched	Match Rate	Total Matched	Match Rate	Total Matched	Match Rate
Total	2,729		652		136		314		8		24		149	
NPI Match														
Total Matched in Strategy	366	13.40%												
Exact Match on DOB - Last Name or First Name or Maiden Name														
Total Remaining	2,363		652		136		314							
Total Matched in Strategy	134	5.70%	277	42.40%	1	0.70%	2	0.60%						
Exact Match on Last Name/ First Name														
Total Remaining	2,229		375		135		312							
Total Matched in Strategy	568	25.50%	21	5.60%	14	10.40%	4	1.30%						
Fuzzy Match on Last Name/First Name														
Total Remaining	1,661		354		121		308							
Total Matched in Strategy	0	0.00%	1	0.30%	32	24.80%	140	45.50%						
Manual License Look-Up of Unmatched Records														
Total Remaining	1,626		350		89		167							
Total Matched in Strategy	113	6.80%	111	31.40%	17	16.50%	30	10%	4	50.00%	7	29.20%	53	35.60%
HPT Records Matched	1,181	43.30%	410	62.90%	64	47.10%	176	56.10%	4	50.00%	7	29.20%	53	35.60%
Deduplication of Matched Records														
Number of Duplicate HPT Records with the same Licenses Numbers Removed	139		5		2		7							
Unique HPT Licenses	1,042		405		62		169		4		7		53	

Appendix B.2 Data Entry Procedures

Data entry procedures were utilized to enter HPT records from the VAMC student database into the REDCap™ database. During this process research assistants sorted HPT records alphabetically by last name in the VAMC student database and entered record IDs based on two strategies; 1) HPT data identified in the VAMC student database were either added to existing HPT data previously uploaded from student roster files) or 2) entered as a new form within the REDCap™ Database.

In the case that trainee name, DOB, or NPI obtained from the VA Internal Database were already identified in the previously imported REDCap database, additional data elements (affiliated university and VA clinical training program) were used to ensure HPT was not a duplicate entry. Duplicate entries were most likely due to instances where HPTs completed multiple training sessions at the VA. In these instances, duplicate entries were thoroughly evaluated to confirm whether the HPTs completed more than one training session at the VA. If the trainee was found to have completed more than one training session, then a record in REDCap™ was entered for each rotation. If the trainee had not completed more than one training session, one REDCap™ entry was filled out.

After verifying an HPT record was unique or a duplicate, other data elements were entered into REDCap™ from the VA internal database. These data elements included discipline/specialty, middle name, maiden name (if applicable), degree type, rotation start date, rotation end date, training institution, health profession training department, HPT classification/type, onboarding status, affiliated VA site, expected graduation class. For any resident or fellow physician trainees, NPI was also collected if necessary. If one of the data elements was not found in the VA internal database, it was marked as unknown.

If name, DOB and NPI (if applicable) were identified, the REDCap™ form associated with the trainee record ID was marked as complete. If a trainee was identified as a physician/fellow with no NPI, name, or DOB, the record was marked as unverified.

This process was repeated until all records within the VA internal database were entered into REDCap™. Once entry was complete, data were exported from REDCap™ and imported into the Bowen Center database for matching with the IHPD.

Appendix B.3 Physicians

A breakdown of physician's medical specialty and practice setting are provided in the tables [B.3.1 - B.3.2] below.

Table B.3.1 Linking Final Matches to Health Professions Reporting Sample		
	VAMC HPTs	
	N	%
Total	877	100
Gender		
Male	315	35.92
Female	558	63.63
Missing/Not Available	4	0.46
Race		
White	594	67.73
American Indian/Alaska Native	1	0.11
Native Hawaiian/Other Pacific Islander	2	0.23
Black or African American	35	3.99
Asian	164	18.70
Some Other Race	64	7.30
Multiracial	12	1.37
Missing/ Not Available	5	0.57
Ethnicity		
Hispanic or Latino	27	3.08
Not Hispanic or Latino	845	96.35
Missing/Not Available	5	0.57

Table B.3.2 Physician Reported Specialty		
	VAMC HPTs	
	N	%
Total	877	100
Specialty		
Adolescent Medicine	-	-
Allergy and Immunology	1	0.11
Anesthesiology	155	17.67
Cardiology	56	6.39
Child Psychiatry	3	0.34
Colon and Rectal Surgery	2	0.23
Critical Care Medicine	23	2.62
Dermatology	13	1.48
Emergency Medicine	6	0.68
Endocrinology	18	2.05
Family Medicine/General Practice	38	4.33
Gastroenterology	42	4.79
Geriatric Medicine	3	0.34

Gynecology Only	1	0.11
Hematology and Oncology	42	4.79
Infectious Diseases	15	1.71
Internal Medicine (General)	97	11.06
Nephrology	21	2.39
Neurological Surgery	8	0.91
Neurology	25	2.85
Obstetrics and Gynecology	11	1.25
Occupational Medicine	1	0.11
Ophthalmology	21	2.39
Orthopedic Surgery	17	1.94
Other Specialties	18	2.05
Other Surgical Specialties	-	-
Otolaryngology	9	1.03
Pathology	17	1.94
Pediatrics (General)	3	0.34
Pediatrics Subspecialties	11	1.25
Physical Medicine and Rehabilitation	6	0.68
Plastic Surgery	10	1.14
Preventive Medicine/Public Health	-	-
Psychiatry	52	5.93
Pulmonology	19	2.17
Radiation Oncology	4	0.46
Radiology	38	4.33
Rheumatology	6	0.68
Surgery (General)	31	3.53
Thoracic Surgery	10	1.14
Urology	8	0.91
Vascular Surgery	9	1.03
Missing/Not Available	7	0.80

Table B.3.3 VAMC HPTs Physicians primary practice setting

	VAMC HPTs	
	N	%
Total	877	100
Practice Setting		
Office/Clinic – Solo Practice	6	0.68
Office/Clinic – Partnership	39	4.45
Office/Clinic – Single Specialty Group	71	8.10
Office/Clinic – Multi Specialty Group	77	8.78
Hospital – Ambulatory Care Center	7	0.80
Hospital – Emergency Department	7	0.80

Hospital – Inpatient	404	46.07
Hospital – Outpatient	118	13.45
Federal Government Hospital	7	0.80
Research Laboratory	9	1.03
Medical School	52	5.93
Nursing Home or Extended Care Facility	4	0.46
Home Health Setting	0	0.00
Hospice Care	4	0.46
Federal/State/Community Health Center(s)	5	0.57
Local Health Department	4	0.46
Telemedicine	5	0.57
Volunteer in a Free Clinic	0	0.00
Other	35	3.99
Not Applicable	17	1.94
Missing	6	0.68

Table B.3.4 Adult and Special Populations Served by Physicians

	VAMC HPTs	
	N	%
Total	877	100
Pediatric Populations	409	46.6
Adults	738	84.2
Geriatric	623	71.0
Pregnant	383	43.7
Inmates	303	34.5
Disabled Individuals	452	51.5
Individuals in Recovery	288	32.8
Total Unique Count	749	85.4

Note: Row percent is the total number of populations served by the total number of physicians with supplemental data. Pediatric Populations includes physicians who reported providing services to newborn, child, and adolescent populations; Row percent is the total number of populations served by the total number of physicians with supplemental data

Table B.3.5 Specialty and Addiction Services Provided by Physicians

	VAMC HPTs	
	N	%
Total	877	100
Screening for Addiction	83	9.5
Addiction Counseling	85	9.7
MAT- Buprenorphine	43	4.9
MAT-Naltrexone	29	3.3
MAT-Methadone	9	1.0
Total Unique Count	121	13.8

Note: Row percent is the total number of reported services by the total number of physicians with supplemental data.

Table B.3.6 Maternity Care Services Provided by Physicians¹

	VAMC HPTs	
	N	%
Total	877	100
Total Unique Count of Maternity Care Services	84	9.6

Note: Maternity Care Services includes high risk pregnancy screening, high-risk pregnancy treatment, labor and delivery, post-natal, pre-natal services, and OUD-Affected Pregnancy Services; Row percent is the total number of services by the total unique count of physicians who reported providing services.

¹ It is important to note that while the Indianapolis VAMC does not provide training on labor and delivery, training is provided on women's health.

Appendix B.4 Nurses

[Table B.4.1] presents the demographic characteristics of nurses who matched to an Indianapolis VAMC HPT record. Tables [B.4.2 & B.4.3] presents reported specialties and practice settings by VAMC HPT nurses. Tables [B.4.4-B.4.7] present information on the populations served and services provided by Indiana nurses that were former VAMC HPTs.

Table B.4.1. Nursing Demographic Characteristics		
	VAMC HPTs	
	N	%
Total	252	100
Gender		
Male	18	7.1
Female	213	84.5
Missing/Not Available	21	8.3
Race		
White	213	84.52
American Indian/Alaska Native	0	0.00
Native Hawaiian/Other Pacific Islander	1	0.40
Black or African American	18	7.14
Asian	8	3.17
Some Other Race	0	0.00
Multiracial	8	3.17
Missing/Not Available	4	1.59
Ethnicity		
Hispanic or Latino	11	4.37
Not Hispanic or Latino	241	95.63
Missing/Not Available	0	0.00

Table B.4.2. Nurses primary practice setting		
	VAMC HPTs	
	N	%
Total	252	100
Practice Setting		
Hospital	208	82.54
Nursing Home/Extended Care Facility/ Assisted Living Facility	7	2.78
Home Health	3	1.19
Correctional Facility	1	0.40
Academic Institution	9	3.57
Public/Community Health Agency	5	1.98
School-Based Health	0	0.00
Occupational Health	0	0.00
Outpatient Clinic	12	4.76

Insurance Claims/Benefits	0	0.00
Policy/Planning/Licensing Agency	0	0.00
Other	5	1.98
Not Applicable	0	0.00
Assisted Living	0	0.00
Hospice	0	0.00
Missing/Not Available	2	0.80

Table B.4.3. Nurses primary reported specialty

	VAMC HPTs	
	N	%
Total	252	100
Specialty		
Acute Care/Critical Care	74	29.37
Adult Health/Family Health	12	4.76
Anesthesia	1	0.40
Community	0	0.00
Geriatric/Gerontology	9	3.57
Home Health	0	0.00
Maternal-Child Health	4	1.59
Medical Surgical	20	7.94
Occupational Health	0	0.00
Oncology	9	3.57
Palliative Care	0	0.00
Patient Education	0	0.00
Pediatrics/Neonatal	23	9.13
Public Health	1	0.40
Psychiatric/Mental Health/Substance Abuse	7	2.78
Rehabilitation	0	0.00
School Health	0	0.00
Trauma	22	8.73
Women's Health	8	3.17
Other	22	8.73
Not applicable/I do not provide direct patient care	16	6.35
Nephrology	1	0.40
Family Health	3	1.19
Neonatal	19	7.54
Missing/Not Available	1	0.40

Table B.4.4 Adult and Special Populations Served by Nurses		
	VAMC HPTs	
	N	%
Total	252	
Adults	189	75.0
Geriatric	155	61.5
Pregnant	59	23.4
Inmates	57	22.6
Disabled Individuals	81	32.1
Individuals in Recovery	52	20.6
Total Unique Count	196	77.8

Note: Row percent is the total number of populations served by the total number of physicians with supplemental data.

Table B.4.5 Pediatric Populations Served by Nurses		
	VAMC HPTs	
	N	%
Total	252	100
Total Unique Count of Pediatric Populations	127	50.4

Note: Pediatric Populations includes nurses who reported providing services to newborn, child, and adolescent populations; Row percent is the total number of populations served by the total number of nurses with supplemental data

Table B.4.6 Substance Use and Addiction Services Provided by Nurses		
	VAMC HPTs	
	N	%
Total	252	
Screening for Addiction	16	6.3
Addiction Counseling	13	5.2
MAT- Buprenorphine	6	2.4
MAT-Naltrexone	8	3.2
MAT-Methadone	12	4.8
Total Unique Count	26	10.3

Note: Row percent is the total number of reported services by the total number of physicians with supplemental data.

Table B.4.7. Maternity Care Services Provided by Nurses		
	VAMC HPTs	
	N	%
Total	252	100
Total Unique Count of Maternity Care Services	28	11.1

Note: Maternity Care Services includes high risk pregnancy screening, high-risk pregnancy treatment, labor and delivery, post-natal, pre-natal services, and OUD-Affected Pregnancy Services; Row percent is the total number of services by the total unique count of physicians who reported providing services.

Appendix B.5 Pharmacists

[Table B.5.1] presents the demographic characteristics of pharmacists who matched to an Indianapolis VAMC HPT record. Tables [B.5.2 - B.5.3] presents specialties and practice settings reported by VAMC HPT Pharmacists. Due to limited numbers of HPTs matched to this profession type additional tables were unable to be produced for populations served and services provided by profession type.

Table B.5.1. Pharmacist's Demographic Characteristics		
	VAMC HPTs	
	N	%
Total	40	
Gender		
Male	16	40.0
Female	24	60.0
Race		
White	37	92.50
American Indian/Alaska Native	-	-
Native Hawaiian/Other Pacific Islander	-	-
Black or African American	-	-
Asian	-	-
Some Other Race	2	5.00
Multiracial	-	-
NULL	1	2.50
Ethnicity		
Hispanic or Latino	-	-
Not Hispanic or Latino	40	100.00

Table B.5.2 Pharmacist Primary Practice Setting		
	VAMC HPTs	
	N	%
Total	40	
Practice Setting		
Community Health Center/Public Health Clinic	1	2.50
Diagnostic Testing Facility	-	-
Emergency Room	-	-
Hospital (inpatient)	9	22.50
Long-Term Acute Care Hospital	1	2.50
Outpatient Clinic (Private Practice or Academic)	3	7.50
Outpatient Surgery Center	-	-
Pain Management Clinic	-	-
Pharmacy (Inpatient)	1	2.50
Pharmacy (Outpatient)	22	55.00
Rehabilitation Hospital	-	-
Retail Medicine Clinic	-	-

Substance Abuse Treatment Facility (Inpatient)	-	-
Urgent Care Facility	-	-
Other	3	7.50
Not Applicable	-	-

Table B.5.3. Pharmacists Reported Primary Field		
	VAMC HPTs	
	N	%
Total	40	
Primary Field		
Medication Dispensing	24	60.00
Patient Care Services	14	35.00
Business/Organization Management	1	2.50
Research	-	-
Education	-	-
Other	1	2.50
Not Applicable	-	-

Appendix B.6 Physician Assistants

[Table B.6.1] presents the demographic characteristics of physician assistants (PAs) who matched to an Indianapolis VAMC HPT record. Tables [B.6.2-B.6.3] presents the specialties and practice setting reported by VAMC HPT physician assistants. Due to limited numbers of HPTs matched to this profession type, additional tables were unable to be produced for populations served and services provided by profession type.

Table B.6.1. Physician Assistants Demographic Characteristics		
	VAMC HPTs	
	N	%
Total	16	
Gender		
Male	1	6.3
Female	15	93.8
Race		
White	12	75.00
American Indian/Alaska Native	-	-
Native Hawaiian/Other Pacific Islander	-	-
Black or African American	-	-
Asian	3	18.75
Some Other Race	-	-
Multiracial	1	6.25
Ethnicity		
Hispanic or Latino	-	-
Not Hispanic or Latino	16	100.00

Table B.6.2. Reported Physician Assistant Practice Setting		
	VAMC HPTs	
	N	%
Total	16	
Office/Clinic	4	25
Hospital	12	75
Other	0	0
Not Available/Missing	0	0

Table B.6.3. Physician Assistant Reported Supervising Physicians Specialty		
	VAMC HPTs	
	N	%
Total	16	100
Primary Care	7	44
Psychiatry	-	-
Other Specialty	8	50
Not Applicable	1	6