




The American Society of Pediatric Hematology/Oncology workforce assessment: Part 1—Current state of the workforce

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Abstract

The American Society of Pediatric Hematology/Oncology (ASPHO) recognized recent changes in medical practice and the potential impact on pediatric hematology–oncology (PHO) workforce. ASPHO surveyed society members and PHO Division Directors between 2010 and 2016 and studied PHO workforce data collected by the American Board of Pediatrics and the American Medical Association to characterize the current state of the PHO workforce. The analysis of this information has led to a comprehensive description of PHO physicians, professional activities, and workplace. It is important to continue to collect data to identify changes in composition and needs of the PHO workforce.

KEYWORDS

advanced practice provider, hospitalist, pediatric hematology–oncology, physician demographics, workforce, workplace, work responsibilities

1 | INTRODUCTION

Hematology as a discipline emerged in the late 19th and early 20th centuries with the advent of microscopy and practical methods to

accurately quantify blood cells.¹ The specialty of pediatric hematology was recognized in the United States in the late 1920s and early 1930s in large part as a result of seminal observations in the field by pioneers, such as Thomas Cooley and Louis Diamond. In the late 1940s, divisions of pediatric hematology–oncology (PHO) were established within Departments of Pediatrics throughout the United States as funding for training and research became available through the National Institutes of Health. The American Board of

Abbreviations: ABP, American Board of Pediatrics; AMA, American Medical Association; APPs, advanced practice providers; ASPHO, American Society of Pediatric Hematology/Oncology; DOs, Osteopathic physicians; FTEs, full time equivalents; IMGs, International Medical School Graduates; PHO, pediatric hematology–oncology

Medical Specialties approved the subspecialty of PHO in 1973, with the American Board of Pediatrics (ABP) offering its first certifying examination for PHO the following year. The Accreditation Council on Graduate Medical Education approved requirements for PHO fellowship training in 1983 and then the Residency Review Committee established the accreditation process for training programs in 1984.

Over the past decade, there have been significant changes to the clinical practice of medicine, including but not limited to remarkable advances in our knowledge related to medicine, including PHO; growing PHO subspecialization; new care delivery models with increasing reliance on advanced practice providers (APPs) and hospitalists^{2,3}; broad implementation of electronic medical records in a variety of healthcare settings; specific emphasis on enhancing the quality of care delivery and patient safety; and the increasing value of work-life balance among younger generations of PHO providers.^{4,5} The leadership of the American Society of Pediatric Hematology/Oncology (ASPHO), a professional organization whose mission includes advancing professional practice within PHO, recognizes these changes and the importance of having an accurate assessment of the current PHO practice and workforce. Some workforce data regarding general pediatrics and subspecialties have been published previously.⁶⁻⁸ The objectives of this manuscript are to characterize the current state of the PHO workforce utilizing data collected through ASPHO surveys and available through relevant professional organizations.

2 | METHODS

In 2010, ASPHO began collecting PHO demographic and workforce data from its membership through voluntary surveys distributed through its Committees and Taskforces. Workforce-related questions were first introduced into the existing ASPHO Membership Compensation Survey by the ASPHO Practice Committee in 2010. However, upon reviewing the results, it was clear that the membership-at-large had insufficient knowledge about workforce-specific issues such as productivity targets and the allocation of time among PHO providers to accurately respond to such questions. As a result, the Practice Committee developed an annual survey of PHO Division Directors dedicated to workforce topics, which was distributed through e-mail from 2012 to 2015. In 2013 and 2016, ASPHO also surveyed members regarding their experiences and needs while gathering demographic information. In 2015, the Practice Committee conducted another compensation survey of ASPHO members that included questions about provider demographics and practice characteristics. All surveys remained open for 3-6 weeks to receive responses.

Patrick Leavey, as the principal investigator, and coinvestigators Sally Williams and Sushma Sharma on behalf of ASPHO and with funding from the St. Baldrick's Foundation surveyed Texas hospitals to catalogue the PHO workforce in Texas. Those survey results were correlated with patient demographic data held by the Dallas-Fort Worth Hospital Council Foundation (DFWHCF).

In addition to analyzing ASPHO-collected survey data, ASPHO created a Workforce Taskforce and Workforce Strategy Group to study the PHO workforce and evaluate other relevant data from the ABP and the American Medical Association (AMA).

Descriptive statistics and frequencies were produced for quantitative variables and for categorical and scaled variables.

3 | RESULTS

Between 1974 and 2015, the ABP certified 3,027 pediatric hematologist/ oncologists.^{1,8} ABP and AMA 2016 data suggest there are currently between 2,100 and 2,300 active PHO physicians in the United States with an average age between 51 and 55 years.⁸ Based on the data collected from ASPHO surveys and through the review of external data from the ABP and AMA, we were able to characterize PHO physicians according to demographics, clinical practice, and workplace.

The annual Division Directors' Workforce Survey was e-mailed to between 202 and 215 PHO Division Directors from 2012 to 2015 and rate of completion ranged between 29% and 35%. ASPHO e-mailed a Membership Compensation Survey to 1,018 society members in 2010 and to 1,828 members in 2015 and the response rates were 51% and 31%, respectively. ASPHO sent Membership Demographic Surveys to 1,911 members in 2013 and 1,882 members in 2016 but surveys were often only partially completed such that the response rate was widely variable and question specific. The response rate data for the ASPHO-produced surveys are included in Supplementary Table S1.

3.1 | PHO physician demographic characteristics

In 2015, women constituted between 45 and 50% of the active PHO physician workforce—313 of 635 from ASPHO Workforce Survey and 278 of 567 from ASPHO Compensation Survey. The proportion of females in the PHO physician workforce has increased significantly over the past three decades. Prior to 1988, only 32% of board-certified PHO physicians were women compared to 53% of those who have become board certified since 1988.⁸ Among PHO postdoctoral clinical fellows in training, the proportion of women has increased from 50% in 2001 (138 of 274) to 59% in 2008 (242 of 411) to 68% in 2015 (365 of 537).⁸ Moreover, in 2015, nearly three quarters of all first year PHO fellows were women (140 of 193).⁸ However, the proportion of female PHO Division Directors lags behind at approximately 36% (J Hord for ASPHO, unpublished data, February 2015).

International medical school graduates (IMGs) represent 24.3% (535 of 2,199) of practicing PHO physicians and 23.7% (113 of 476) of PHO fellows in training. This is consistent with the proportion of IMGs in the overall U.S. physician workforce. The representation of osteopathic physicians (DOs) in PHO is likely to increase with 1.8% (39 of 2,199) of active PHO physicians being DOs, but 11.8% (56 of 476) of PHO fellows are DOs (AMA, unpublished data, September 2016).⁸

There are limited data published regarding the ethnicity of PHO physicians, but three recent surveys indicate that among PHO

physician faculty in the United States, 73–79% are Caucasian, 10–14% are Asian/Pacific Islander, 3–8% are Hispanic, and 2% are African American (J Hord for ASPHO, unpublished date, February 2015/November 2015; S Williams for ASPHO, unpublished data, December 2015).

3.2 | PHO physician work responsibilities

While Pediatrics has the highest percentage of part-time providers among medical specialties, the percentage of part-time PHO physicians is relatively low at approximately 10% based upon the data from the ASPHO Workforce Surveys from 2012 to 2014 (see Supplementary Table S2).⁹

The primary area of professional activity identified by the majority of PHO physicians was direct patient care (58% or 789/1,364 of ASPHO members in 2016 and 82% or 1,805/2,199 of those in AMA database in 2016) followed next by research (11% or 236/2,199 in AMA database in 2016 and 22% or 289/1,364 among ASPHO members in 2016) and to lesser degrees administration and teaching. When PHO physician ASPHO members ($n = 594$) were asked in 2015 to identify all their different job responsibilities, 97% reported having clinical duties, 91% reported having teaching responsibilities, 76% reported involvement in research activities, and 71% reported having some administrative responsibilities.

The percentage of professional time spent providing clinical care among PHO physician survey respondents on average was approximately 60%. While delivering clinical care, PHO physicians spend 60–70% of their time in the outpatient setting and 30–40% of their time caring for hospitalized patients (J Hord for ASPHO, unpublished data, April 2012/April 2014/February 2015; AMA, unpublished data, September 2016; S Williams for ASPHO, unpublished data, December 2015).

From 2012 to 2015, division directors were asked by ASPHO to describe how a hypothetical 100% clinical PHO physician, or 1.0 clinical full time equivalent (FTE), would spend his/her time. On average they responded that he/she would provide inpatient care 12 weeks per year and spend five to seven half-day clinic sessions per week caring for outpatients. Many institutions had a clinical productivity goal for PHO physicians measured in work relative value units and the median goal across institutions for the 100% clinical PHO physician between 2012 and 2015 ranged between 3,100 and 3,500 (see Supplementary Table S2).

Annually from 2013 through 2015, Division Directors reported to ASPHO the number of newly diagnosed oncology patients seen at their centers each year along with the number of clinical FTEs composed of both physicians and APPs caring for those patients. For most centers, there were approximately 15–20 new cancer patients diagnosed annually for every 1.0 PHO physician clinical FTE and 8–10 new cancer patients diagnosed annually for every 1.0 clinical FTE accounting for both physicians and APPs combined (see Supplementary Fig. S1). The ratio did not change when the following factors were taken into consideration: the size of the hematology program and the presence of a stem cell transplant program regardless of size.

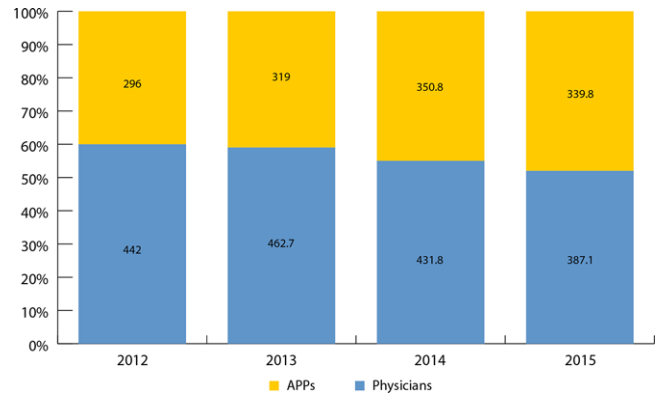


FIGURE 1 Proportion of pediatric hematology–oncology (PHO) clinical full-time equivalents (FTEs) composed of physicians and advanced practice providers (APPs) from 2012 to 2015 ASPHO Directors' Workforce Survey

In the 2010 ASPHO Compensation Survey, 27% of ASPHO members (104 of 385) reported that their clinical practice was only limited to one specific disease-based patient population (e.g., leukemia/hematologic malignancies, solid tumors, neurooncology, cancer late effects or survivorship, stem cell transplantation, coagulation, transfusion medicine, or hemoglobinopathies), a number that has increased to 40% in 2015 (246 of 614).

3.3 | Introduction of new provider groups to PHO practices

In 2015, 87% of programs responding to the workforce survey reported to ASPHO that APPs were regular members of their PHO clinical care teams (see Supplementary Table S2). Between 2012 and 2015, there was a steady increase in the amount of clinical care delivered by APPs in PHO practices as reported to ASPHO by division directors. In 2012, 40% of the clinical workload in PHO practices, as measured by clinical FTEs, was carried by APPs and this increased to 47% in 2015 (Fig. 1). APPs were more often utilized to provide outpatient care relative to inpatient care (70 vs. 30%) (J Hord for ASPHO, unpublished data, April 2012/February 2015). Note, this differentiation may be subject to individual state and institutional-specific regulations requiring APPs to obtain acute care certifications in order to work inpatient. Physician and APP reimbursement rates may vary by state, and this can also impact decisions that affect APPs in the workforce.

The need for inpatient continuous in-house provider coverage has increased with implementation of Accreditation Council on Graduate Medical Education mandated restrictions on resident work hours and has contributed to the rapid expansion of the hospitalist role in PHO practices.¹⁰ The proportion of PHO programs that include hospitalists increased from 20% in 2012 (15/76) to 45% in 2015 (27/60) (see Supplementary Table S2). In 2015, PHO hospitalists (defined as pediatricians who may or may not have received subspecialty training and spend >50% of work time caring for inpatients) made up 12% of the PHO physician clinical workforce (J Hord for ASPHO, unpublished data, April 2012/February 2015).

Relative Distribution of ABP Pediatric Hematology-Oncology Diplomates by State
(Total diplomates ever certified* as of December 31, 2015)

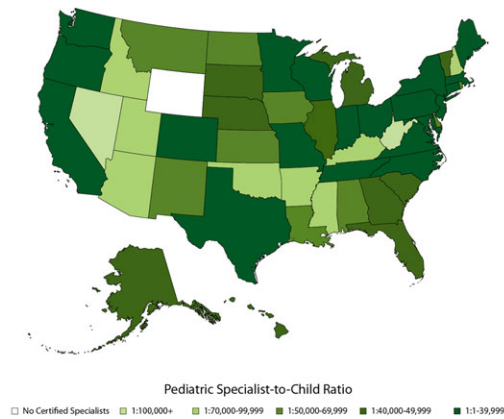


FIGURE 2 American Board of Pediatrics pediatric hematology-oncology physician distribution throughout the United States in 2015. Note: The number of diplomates includes only specialists under the age of 66 with known addresses as of 12/31/2015. Adapted, with permission, from American Board of Pediatrics Inc.⁸

3.4 | Workplace

PHO Directors, through the 2012–2015 ASPHO Workforce Surveys, and 1,756 ASPHO members through the membership demographic update consistently categorized their practices in the following categories and proportions: academic/university practice (50%), hospital-based practice (30%), and a combination of private practice, government/military hospital, nonprofit medical group, and pharmaceutical industry (20%). PHO physicians who took the PHO certifying exam for the first time in 2015 reported their workplace among a list of slightly different categories—a university/medical school (71%), a community hospital (14.8%), a private practice (6.2%), and other (6.6%) as their site of work.⁸ The variation in responses between different data sources may be related to the possible confusion about how to categorize a freestanding children's hospital that may not be located in a university campus but is affiliated with a medical school.

3.5 | Geographic distribution

AMA data indicate that across the United States there is, on average, one PHO physician for every 38,300 individuals age 20 years or younger (AMA, unpublished data, September 2016). However, ABP data show that the distribution of PHO physicians across the United States is very uneven. In 2015, PHO physicians were found in the greatest numbers relative to the number of children in Washington, DC, with 15 board-certified PHO physicians serving 115,305 children (one per 7,687 children) and in the fewest numbers in Wyoming with no board-certified PHO physicians in a State with 138,323 children (Fig. 2).⁸

4 | CONCLUSIONS/DISCUSSION

ASPHO's efforts to collect accurate data from its members and to review outside information has led to the most complete description

to date of the current U.S. PHO workforce with regard to gender, age, and ethnicity. The proportion of women in the PHO workforce relative to the proportion men has significantly increased during the last two decades and now women represent half of all practicing PHO physicians. This same gender shift has been observed within the Canadian PHO workforce.¹¹ Earlier data suggested variation in gender distribution across different pediatric subspecialties: more women enter adolescent medicine, endocrinology, critical care, and nephrology, while more men enter cardiology, gastroenterology, and pulmonology. There is almost equal number of males and females entering emergency medicine.¹²

While the existing age data are limited to the current workforce, the average age of the PHO physician workforce is anticipated to decrease, assuming the doubling of the number of fellows-in-training over the last 15 years translates into all graduates entering the PHO workforce.⁸

The influx of both women and larger fellowship graduating classes may have significant workforce implications. Earlier physician workforce studies within pediatrics found that females work fewer hours per week with less on call and more leaves of absence.¹³ Male work hours on average have declined significantly over the past three decades further decreasing average FTE contributions over time, perhaps as part of a trend in which the recent generation of physicians may work fewer hours than earlier generations of physicians at the same age.¹⁴ Collecting data on PHO work hours by age group and gender over time could provide important insights into possible changes in the PHO workforce.

The U.S. PHO physician workforce has limited ethnic diversity with only 5–10% identified as African American or Hispanic despite a diversifying population of children within the United States. Other studies have shown that this limited ethnic diversity is also observed in general pediatric trainees, faculty, and leaders within departments of pediatrics with <10% in each group being African American, Hispanic, or Native American.¹⁵ Physician engagement with minority patient populations offers opportunities to encourage individuals to pursue a career in medicine, including pediatrics and pediatric subspecialties.

Most PHO physicians, roughly 80%, work in academic/university practices or hospital-based practices presumably due to the many disciplines and high level of support required to care for PHO patients. Consistent with the Canadian PHO workforce data, ASPHO survey results indicate that the average PHO physician spends about 60% of his/her time delivering clinical care and that most PHO physicians are also called upon to carry out various administrative and research tasks within the hospital/practice.¹¹ Interestingly, the ASPHO data indicate a greater degree of involvement in research and less time spent providing clinical care than the AMA data. This suggests that perhaps PHO physicians working in an academic setting may be more inclined to join a professional society such as ASPHO and if this assumption is correct, all the data from ASPHO surveys may be slightly biased toward PHO physicians working in academic/university practices. Without the ability to directly compare and contrast the data from these separate sources, this cannot be confirmed or refuted.

The amount of clinical work performed by APPs in PHO practices is increasing, with APPs now contributing nearly half of all the clinical FTEs within practices. ASPHO data may actually underestimate the contribution of APPs to PHO practices, as PHO Division Directors were asked only to report APPs who were part of their respective Divisions and in some centers APPs who provide PHO care are hospital based or part of nursing staff. The analysis of the roles for APPs in PHO practice is made more complicated by differing state regulations regarding scope of practice, physician supervision, and billing.

Data about hospitalists within the PHO workforce are likely even further limited. In the ASPHO surveys, PHO Division Directors may not have reported on hospitalists who report to a different department or cost center. Subspecialty hospitalists typically have shift work (day or night) with intense clinical responsibilities, and often with limited opportunities for teaching or scholarship. The scope of responsibilities and ultimate contribution of this role to PHO career development varies widely among institutions and is rapidly evolving. For some newly graduated PHO fellows, the hospitalist role may be viewed as temporary for personal and practical reasons; for others, as a more permanent job choice, it may better suit lifestyle and family priorities. It will be important to collect additional data in the upcoming years to better understand hospitalists as an alternate career path within PHO.

There are still notable disparities across the country in the PHO physician-to-child ratio, as PHO physicians more often reside in major metropolitan centers as opposed to rural areas. There also seems to be a trend toward "sub-sub-specialization" where a PHO physician's clinical interest and activity is limited to a focused area. The development of highly focused disease-based teams is more often seen in large centers and marketed as providing higher quality of care and better clinical outcomes but there is little in the literature to support such claims at this time.

This study was dependent upon the willingness of Division Directors and ASPHO members to respond to surveys. The response rate for the ASPHO Compensation Survey ranged from 31 to 51% and the response rate for the ASPHO Workforce Survey of division directors ranged from 29 to 35%. Our conclusions assume that the respondents are representative of the larger groups but this may not be true. ASPHO Workforce Surveys were sent by e-mail to 202–215 division directors included in the ASPHO database (independent of ASPHO membership) but this database may not include all directors. Additionally, we recognize that the survey questions and corresponding answers are in some cases subjective in nature.

In conclusion, through the work of ASPHO, there is a better understanding of the current PHO provider workforce, the job responsibilities of the individual PHO physician, and the setting in which their work takes place. Still, limited information has been collected about nonphysician PHO providers, hospitalists, the role of part-time PHO physicians, and how PHO practices differ at various size institutions. It is important to continue to collect data over time to identify changes and trends in the PHO workforce. These data will inform organizations such as ASPHO who support PHO care providers, investigators, and educators, allowing them to respond efficiently and effectively to

changes in the composition and needs of the PHO workforce in the United States.

ACKNOWLEDGMENTS

The authors acknowledge the contributions to this paper that resulted from the consultative input of The George Washington University Health Workforce Institute. The American Society of Pediatric Hematology/Oncology Workforce Advisory committee includes the following participants: Patrick J. Leavey (co-Chair), Alan Wayne (co-Chair), Joanne Hilden, A. Kim Ritchey, Caroline Hastings, Jeff Hord, Janice Olsen, Mark Atlas, Sherif M. Badawy, Mona Shah, Carl Allen, Glen Lew, Dana Matthews, George Buchanan and Susan Sencer.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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SUPPORTING INFORMATION

Additional Supporting Information may be found online in the supporting information tab for this article.

How to cite this article: Hord J, Shah M, Badawy SM, et al. The American Society of Pediatric Hematology/Oncology workforce assessment: Part 1—Current state of the workforce. *Pediatric Blood Cancer*. 2018;65:e26780. <https://doi.org/10.1002/pbc.26780>

Supplemental Table S1- Response Rates to American Society of Pediatric Hematology/Oncology Surveys of Directors and Members

	2010	2012	2013	2014	2015	2016
Membership Compensation Survey	527/1018 (51%)*				574/1828 (31%)*	
Directors' Workforce Survey**		76/215 (35%)	72/212 (34%)	65/202 (32%)	61/212 (29%)	
Membership Demographic Survey			489/1911 (26%)*			1364- 1756/1882 (72%- 93%)*

*Survey conducted with assistance from InfoSurv

**Survey conducted through SurveyGizmo

***Survey conducted with assistance from McKinley Advisors

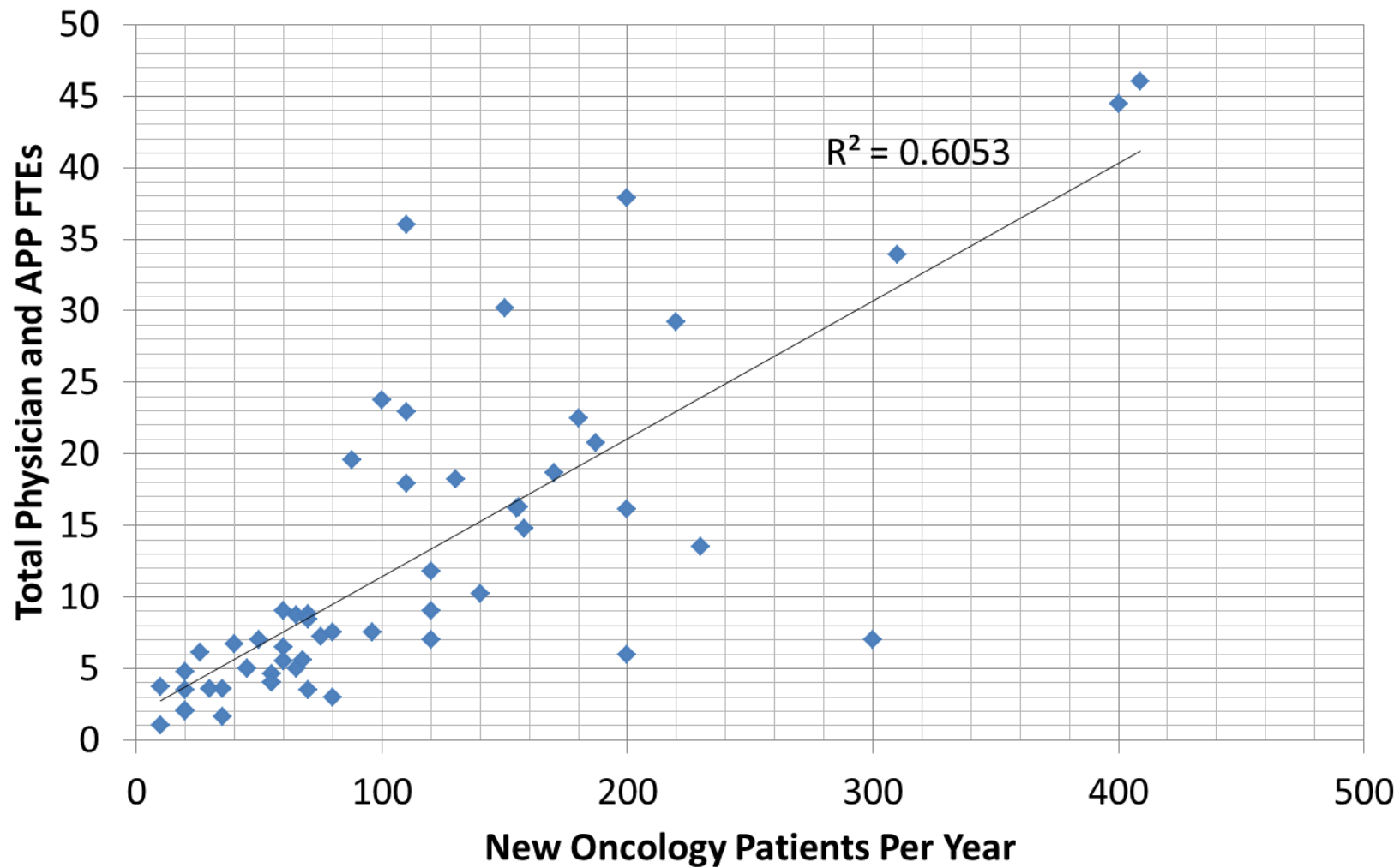
****Survey conducted with assistance from Avenue M

*****Member demographics updated by ASPHO staff without contracted vendor

Supplemental Table S2- Data from ASPHO Division Director Workforce Surveys 2012-1015

	2012 ASPHO Workforce Survey	2013 ASPHO Workforce Survey	2014 ASPHO Workforce Survey	2015 ASPHO Workforce Survey
# of part-time PHO physicians/total # of PHO physicians reported	87/699	70/731	75/736	---
# of half-day clinic sessions worked/week by 1.0 clinical FTE PHO physician (median) independent of inpatient work obligations	7	7	6	5
# of programs that include APPs/ total # of programs reported	72/76	59/72	57/65	52/61
# of programs that include PHO hospitalists/ total # of programs reported	15/76	8/72	8/65	27/60
# of University-based PHO practices/total # of practices reported	50/76	45/72	41/65	38/60
# of Hospital-based PHO practices/total # of practices reported	20/76	18/72	15/65	18/60
# of wRVUs set as goal for 1.0 FTE clinical PHO physician (median)	3400	3475	3100	3500
# of new oncology patients diagnosed annually/1.0 PHO clinical physician FTE (median)	17	15-18	18	20.4

Abbreviations include APPs (Advanced Practice Providers), ASPHO (American Society of Pediatric Hematology/Oncology), FTE (Full-Time Equivalent), PHO (Pediatric Hematology Oncology), wRVUs (Work Relative Value Units).



Supplemental Figure S1: Number of newly diagnosed oncology patients per year with total number of clinical FTEs of physicians and APPs caring for them.