PHYSICIANS' USE, EXCHANGE, AND EVALUATION OF ELECTRONIC MEDICAL RECORDS 2016-2018

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The authors gratefully acknowledge the cooperation of **Patricia McSorely**, Executive Director of the Arizona Medical Board (AMB) and **Dr. Amber Brake**, Executive Director of the Arizona Board of Osteopathic Examiners (ABOE). Thanks also for the invaluable assistance of the previous directors, Lisa Wynn of AMB and Jenna Jones of ABOE. The current and previous Directors have maintained a tradition of cooperation with CHiR that began more than twenty-five years ago. Special thanks to **James Gentile** and **Pushpa Gregory** of the AMB for their excellent and enthusiastic technical support. **Lorie Mayer**, Health Information Technology Coordinator and **Terry Magden**, Senior HIT Project Manager, have been the most helpful and informed representatives of the sponsor, the Arizona Health Care Cost Containment System, since 2007.

Executive Summary

- This report focuses on physicians' use and evaluation of Electronic Medical Records (EMRs) and their effects. Physicians who treat AHCCCS patients are compared to non-AHCCCS physicians.
- The percentage of Arizona physicians using EMRs increased from 45% in 2007-2009 to 91% in 2016-2018. Solo practice physicians are less likely to adopt EMRs than are physicians in other practice settings, but the prevalence of solo practice is declining.
- Approximately 80% of physicians with EMRs also use scanned documents or both scanned and paper documents. Thus, the current situation is merely one step toward reliance on EMRs as the only type of medical record.
- The incentives provided by AHCCCS and Medicare have increased EMR adoption, but lack of interoperability and a shortage of health information networks (HIEs) have limited electronic exchanges of EMRs. The situation is improving in Arizona. Enrollment in *Health Current,* the statewide HIE, includes 500 organizations responsible for more than 8.5 million unique patients. Its future is promising with data collection starting for 72 enrollees.
- More than 90% of Arizona physicians treat AHCCCS enrollees. AHCCCS physicians are also more likely to use EMRs than non-AHCCCS physicians.
- It is often suggested that physicians are very dissatisfied with their EMRs. Our results show that physicians are somewhat positive about their EMRs, ranking them slightly above the midpoint in the 1=awful to 5=outstanding scale. The more accurate conclusion may be that physicians seek improvements in their EMRs, but recognize the advantages of EMRs relative to scanned or paper records.
- This report is one of the annual summaries of the survey of physicians. More in-depth analyses of the use of EMRs are available from scholarly publications based on the data. See Appendix B for a complete list of CHiR publications, including research on nurses and pharmacists.

Table of Contents

Introduction

This report is the most recent in a series on physicians' experiences with electronic medical records (EMRs) that began in 2007. The results include both current data and trends over time.

Since 2014, the reports include detailed comparisons between physicians who treat Arizona Health Care Cost Containment System (AHCCCS) patients and those who do not. Although this is not typical of all States, 90% of Arizona physicians treat AHCCCS patients, and their patients are more likely to receive the benefits of EMR use rather than the patients of non-AHCCCS physicians (Butler, Harootunian and Johnson 2013).

A detailed description of the methods and definitions used to analyze the data is included in Appendix A. The results include a very large number of tables and figures because of the comprehensive, multi-year nature of the data. To minimize the burden on readers without limiting access to the complete results, more than 100 pages of detailed statistics are included in Appendices E through G.

The main body of this report summarizes patterns of EMR utilization; the mix of EMRs with non-electronic records; the effects of EMR use on physician productivity; and the extent to which physicians exchange EMR data with others and the values placed on EMRs by users and non-users. The results for AHCCCS providers are then compared to the same results for non-AHCCCS physicians.

The periods discussed in this report are:

- 2007-2009 – represents July 17, 2007 to July 17, 2009
- 2009-2011 – represents November 1, 2009 to November 1, 2011
- 2012-2014 – represents March 20, 2012 to March 20, 2014
- 2013-2015 – represents April 1, 2013 to March 31, 2015
- 2015-2017 – represents April 1, 2015 to March 31, 2017
- 2016-2018 – represents April 1,2016 to March 31, 2018

We use the term Electronic Medical Records to include any electronic form of medical record, including Electronic Health Records.

Background

The National Center for Health Statistics (NCHS) conducts periodic surveys of ambulatory care physicians in office settings. Physicians in federal facilities and specialty practices are excluded. In the most recent report, the NCHS data show that the percentage of office-based physicians using some form of an EMR increased from 18% in 2001 to 87% in 2015 (Jamoom and Yang 2016). A smaller percentage of the EMRs (54% in 2015) included functions such as patient summaries, E-prescribing and lab results (Jamoom and Yang 2016).

It was predicted that EMR use would improve health care quality and increase productivity. (Chaudhry, et al. 2006; Jha, DesRoches, et al. 2009; Skolnik 2011). Analyses of the effects of EMRs conclude that the predictions have not been fully realized (Kellermann and Jones 2013); Jones, et al. 2012; Freudenheim 2012; Lau, et al. 2012). The studies assume, often because of a lack of data, that if physicians have an EMR, that it is their only form of medical record (Bae and Encinosa 2013; Fleming, et al. 2014; Adler-Milstein, Bates and Jha 2013; Furukawa 2011). The assumption fails to recognize that most physicians with EMRs use non-electronic files such as scanned records and faxes as part of their medical records.

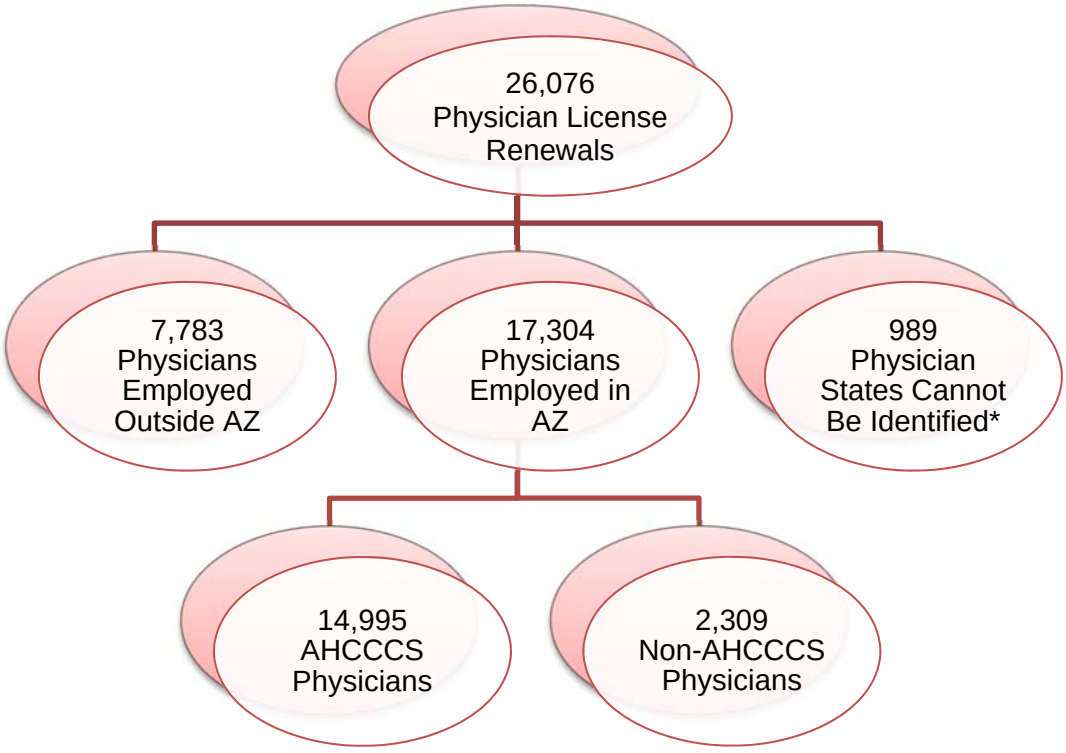
The mixing of EMRs with non-electronic records dilutes the productivity effects of EMRs by adding steps in the workflow that would not be required if EMRs were the only type of record (Johnson, Butler and Harootunian 2018). One unique feature of this report is a description of the prevalence of various combinations of EMRs with non-electronic records and how the combinations change over time.

The Data

Allopathic physicians renew their licenses every two years on their birthdays, and osteopathic physicians renew their licenses every other year. There were 26,076 physicians who renewed their licenses between April 1, 2016 and March 31, 2018 (Figure 1). Approximately 17,304 of those physicians lived in Arizona and 7,783 physicians lived elsewhere. Approximately 90% of practicing physicians in Arizona cared for AHCCCS clients. AHCCCS enrollees account for approximately one-fourth or approximately 25% of the State's population.

Some physicians who live in other States provide services, such as interpreting images, to Arizona patients. The information needed to identify these physicians is not available, so some of them may more appropriately be included in the Arizona physician workforce. There were 989 physicians whose State of residence could not be identified.

Figure 1. All Physician License Renewals, 2016-2018



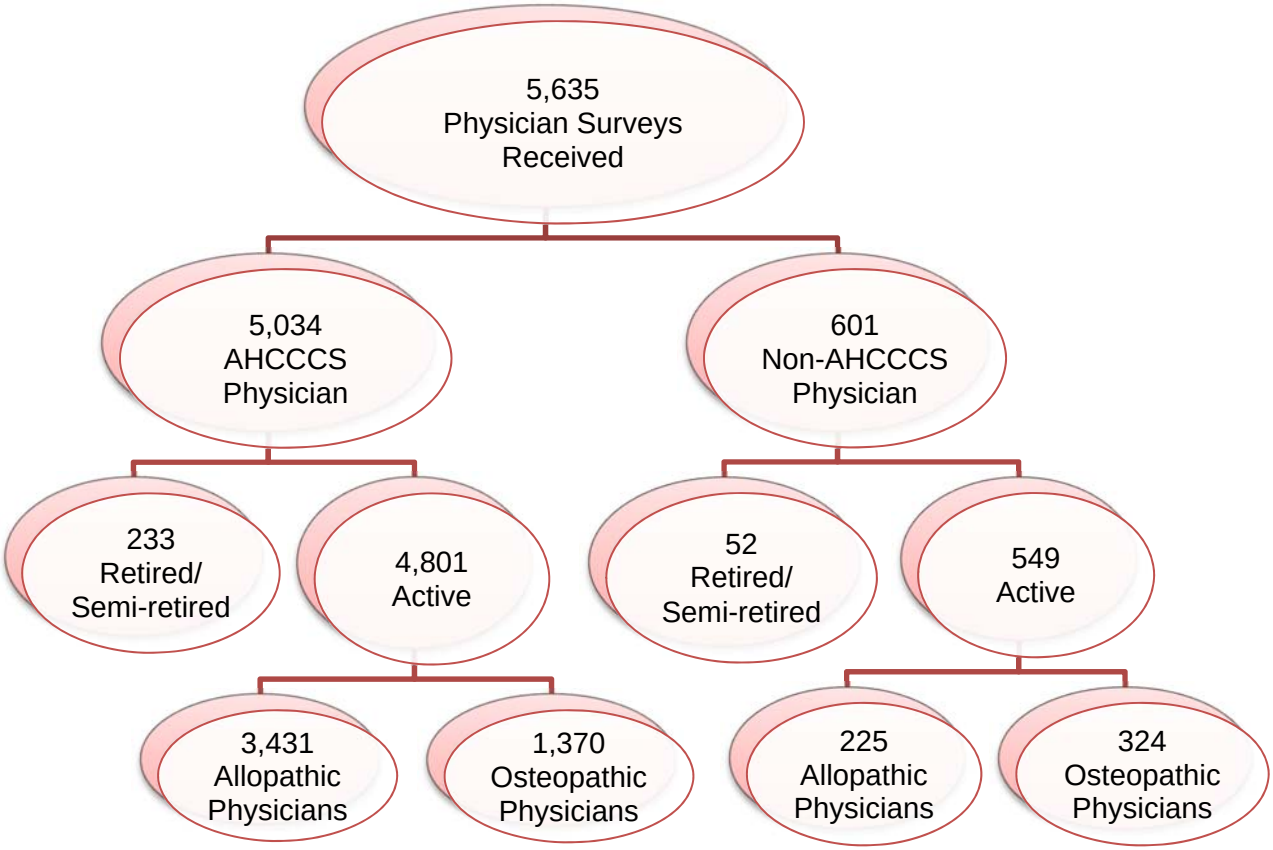
Source: Arizona Medical Board (AMB), Arizona Board of Osteopathic Examiners (ABOE) Survey and Administrative Data, April 2016-March 2018.

Note: *CHiR will employ additional methods to determine physician states and reduce this number for the final report.

As shown in Figure 2, there were 5,635 survey respondents, excluding retired/semi-retired physicians. The respondents include 3,656 allopathic physicians and 1,694 osteopathic

physicians. Each respondent represents approximately 3.2 physicians in active practice. Except where noted, the results are un-weighted counts because our primary interest is in the averages, which do not change if weighted, rather than the absolute number of responses.

Figure 2. Surveys Received, 2016-2018



Source: AMB, ABOE Survey Data, April 2016–March 2018.

Most surveys select a fraction of the target population as the survey sample. Our survey is addressed to all members of the target population (all Arizona physicians). Although not all physicians respond, the results include a much larger number of respondents than would be obtained from a fractional sample. The National Electronic Health Records Survey results, for example, include a sample of 10,302 physicians, representing more than 1,000,000 office-based physicians in the United States (Jamoom and Yang 2016). More information is provided in

Appendix A: Methods and Definitions.

All Physician Results

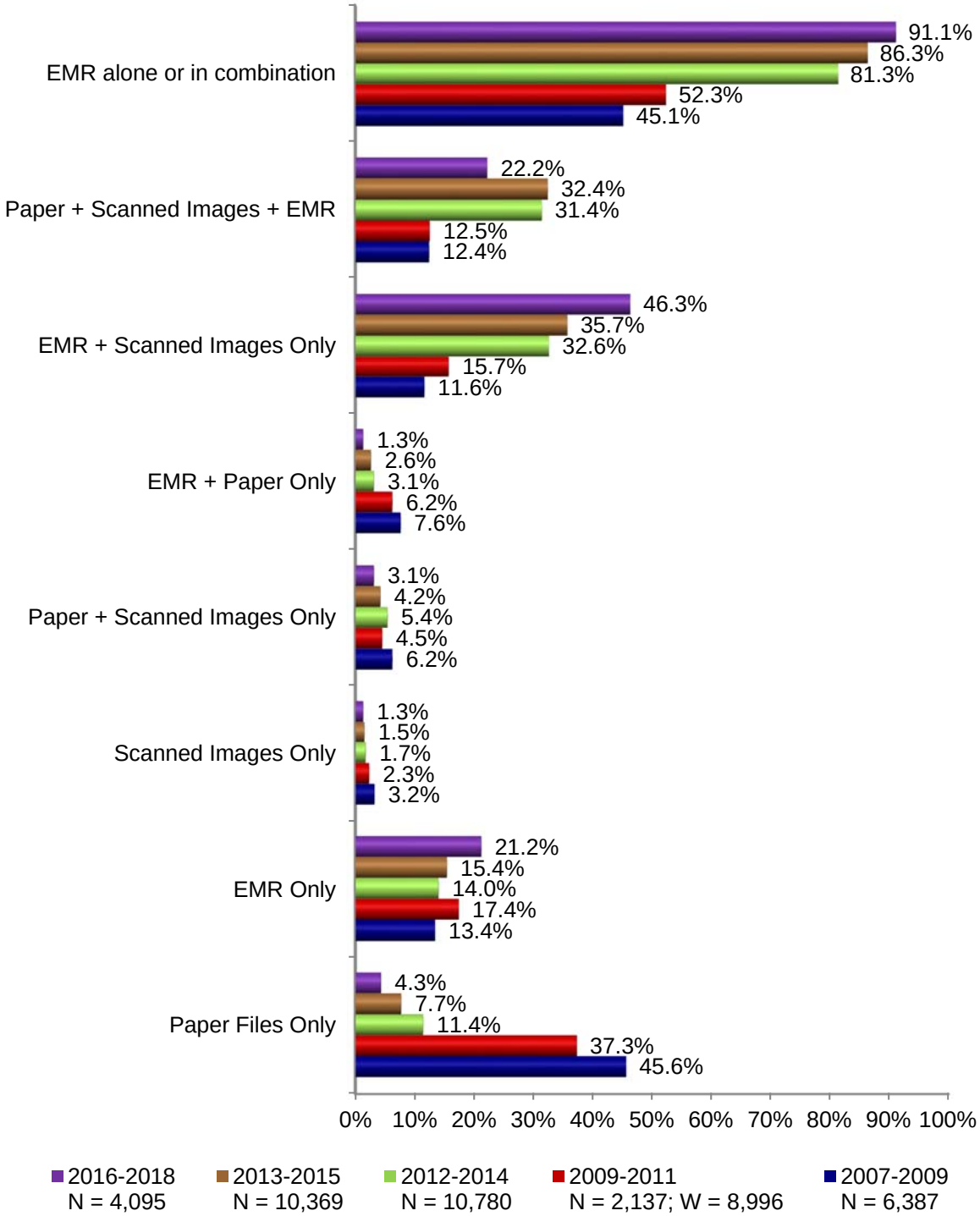
EMR Utilization

The trend in EMR use in Arizona is consistent with national trends. As indicated in Figure 3, approximately 91% of Arizona physicians used an EMR in 2016-2018 compared to 45% in 2007-2009. The percentage of *office-based* physicians in the United States who used an EMR increased from 18% in 2001 to 86.9% in 2015 according to the most recent survey results (Jamoom and Yang 2016). Nationally, 54% of physicians used EMRs that included functions such as patient summaries, E-prescribing and lab results in 2015 (Hsiao and Hing 2014) versus 48% in 2015 (Jamoom and Yang 2016). The data from the National Ambulatory Medical Care Survey (NAMCS) are not strictly comparable to our results because they exclude a number of specialty practices that are included in our results (Hsiao and Hing 2012). However, NAMCS estimates that more than 85% of physicians in office-based practices in Arizona used an EMR in 2014 (Jamoom, Yang and Hing 2015).

The use of paper files as the only type of medical record declined from nearly 46% to approximately 4% between 2007-2009 and 2016-2018 in Arizona. However, reliance on EMRs as the only medical record did not increase proportionately. The percentage of physicians using EMRs as their only medical record increased from 13% to 21% but the combination of EMRs with scanned records increased from 11% to 46% of all EMR users.

As indicated in Figure 3, the single most prevalent combination remains that of EMRs with scanned records. We believe that reliance of EMR users on scanned records reflects problems of interoperability and the relative shortage of networks for the electronic transfer of EMRs. Reliance on scanned files can be expected to decline as problems of interoperability are resolved and more physicians join the Arizona Health Information Exchange (HIE). More information on the recent expansion of Health Current, Arizona's statewide HIE, is presented in a subsequent section.

Figure 3. Methods of Storing Medical Records



Source: AMB, ABOE Survey Data, 2007-2009; 2009-2011; 2012-2014; 2013-2015; 2016-2018.

Note: The 2011 estimates are subject to substantially more uncertainty than the other renewal period data.

Respondents who did not identify a method of storing medical records (missing): 390 for 2007-2009; 2,177 for 2012-2014; 2,039 for 2013-2015; and 1,255 for 2016-2018.

*Data on "EMR alone or in combination" is not mutually exclusive from other categories.

Physician Productivity and EMRs

The adoption of EMRs was expected to increase physician productivity. Research has not supported that claim, but we suggest the results are limited by a failure to measure the extent to which EMRs are combined with faxes and scanned files. Reliance on multiple types of records limits increases in productivity from EMRs by adding steps to the workflow process. To the best of our knowledge, the only study to analyze the use of multiple types of records is a recent article (Johnson, Butler and Harootunian 2018). The article was based on the data collected as part of this project.

The study finds that physicians rate EMRs used as the only medical record in a practice as more productive than combinations of EMRs with non-electronic files. The data, however, do not reveal significant differences between the EMR as the sole record and other combinations. One function of EMRs, namely E-prescribing, does significantly increase the productivity of both office based and non-office based physicians (Johnson, Butler and Harootunian 2018).

Another possible influence on productivity is the shortage of electronic networks for the exchange of clinical information. The next section describes the extent to which physicians exchange information electronically with other healthcare organizations.

Utilization of EMR Functions

The functions included in EMR software packages vary among vendors, and physicians with access to the functions may not use all of them. This section describes the extent to which key functions are included in physicians' EMRs; the extent to which physicians use those functions; and the extent to which information is exchanged electronically with others.

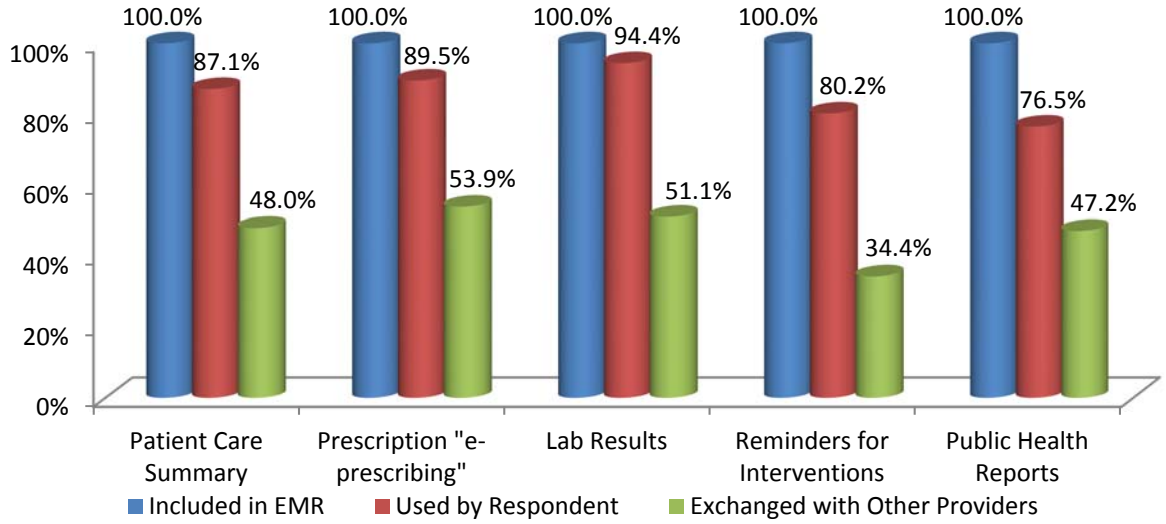
We examine the inclusion, use and exchange of five important functions of an EMR, namely:

- Patient Care Summary
- Prescription Function
- Lab Results Function
- Reminders Intervention Function
- Public Health Reports Function

Only 14% of office-based physicians in the U.S. shared data with other organizations in 2009-2013 and not all the exchanges were electronic (E Health Initiative 2012; Furukawa, et al. 2014). In Arizona, transfers of information from EMRs were also limited. In 2015, the percentage of electronic data sharing increased to 38% nationwide (The Office of the National Coordinator for Health Information Technology (ONC) 2016). The increases in Arizona have outstripped the national averages. More than 46% of physicians with EMRs, exchange one or more elements of their EMRs through an HIE compared to 25% in 2013-2015. Using 2013-2015 as the reference year rather than 2007-2009 recognizes that most of the progress in electronic exchanges is attributable to the introduction and expansion of Health Current, the statewide HIE.

The results in Figure 4 include exchanges between different health care organizations. We cannot identify the extent to which physicians include exchanges within, for example, different hospitals in one hospital system from transfers to providers outside the system. The results in Figure 4 may therefore overstate the percentage of physicians exchanging EMRs with different health care organizations. Exchanges among different organizations such as between hospital systems or among physician-owned solo or group practices are much less frequent. Since the 2013-2015 results are subject to the same bias, the estimated increase in exchanges is less biased than the absolute estimates in either of the two time periods.

Figure 4. Summary Utilization of Available EMR Functions, 2016-2018



Source: AMB, ABOE Survey Data, April 2016–March 2018.

Note: The data in this table only include those physicians that answered *"Yes"* to the Include question for each EMR function. Furthermore, the data only includes those that answered both the Used and Exchanged questions for each EMR functions; if either question was left blank the physician was excluded from the table for that function.

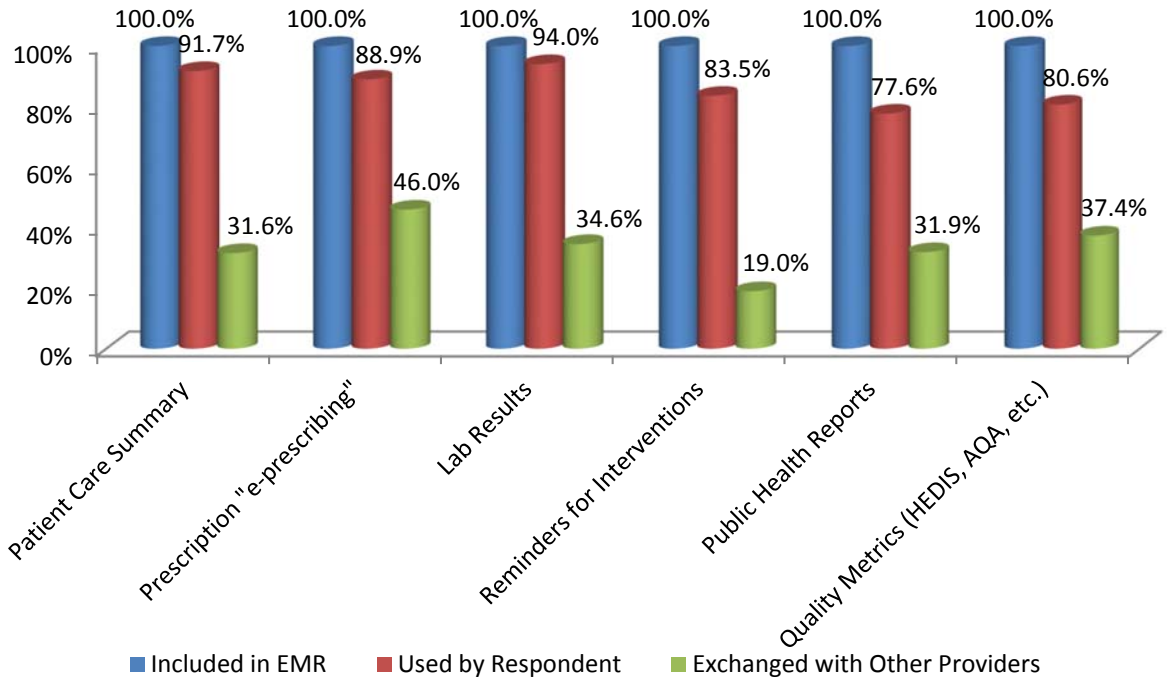
The data exclude physicians in hospitals or hospital owned practices.

The most frequently used functions are the *Lab Results*, *Patient Care Summary* and *E-Prescribing* functions. There has been a concerted effort in Arizona to incent providers to use e-prescribing, and it appears to be succeeding. The prevalence of the use of lab functions probably reflects the long-standing practice of electronic reporting by Sonora Quest Laboratories. The pre-existing reporting systems simplified the inclusion of laboratory results in EMR software.

The benefits of using EMRs are being achieved through recent strides in exchanging information in Arizona. In this cycle, 54% of physicians with EMRs reported they exchanged *E-Prescribing* with other providers, followed by 51% for *Lab Results* and 48% for *Patient Care Summaries*. Note the increase in exchanging information when compared to the previous cycle as displayed in Figure 5 below. This is due to the efforts and incentives provided by *Health Current*, Arizona's statewide health information organization.

Health Current splits operational costs with providers equally and community providers can participate in the HIE at no cost (Kotrys 2015).

Figure 5. Summary Utilization of Available EMR Functions, 2013-2015



Source: AMB, ABOE Survey Data, 2013–2015.

Note: The data in this table include only those physicians that answered *"Yes"* to the Include question for each EMR function. Furthermore, the data only includes those that answered both the Used and Exchanged questions for each EMR functions; if either question was left blank the physician was excluded from the table for that function.

Quality metrics and public health reports, such as reportable diseases, are reported by other methods, including email, faxes and separate electronic networks. Although the information is not lost, EMRs would be a more efficient and timelier means of delivery. The marked disparity between the use of EMRs and the sharing of information is a consistent feature of all the previous CHiR surveys, although the previous results are less detailed.

Arizona physicians cite their most important obstacles to the inter-organization transfer of electronic health information as the shortage of HIEs (55%) and the lack of technical support for problems (49%) (see Table E-8). The history of HIEs linking different organizations is one of frequent failure, largely traceable to the absence of viable business models (E Health Initiative 2012). Nationally, another important obstacle is interoperability, which encompasses complete access, exchange and use of accessible information securely without information blocking (The Office of the National Coordinator for Health Information Technology (ONC) 2018). The 21st Century Cures Act that was signed into law in December 2016 provides a remedy to the interoperability problem with the enactment of a Trusted Exchange Framework and common agreement for the exchange of health information that includes standardization and cooperation across the continuum of care (Morris and Sweeny Anthony 2018).

Health Current is striving to solve the problems that have hampered the expansion of HIEs in Arizona. *Health Current* has 500 participants as of July 2018, defined as organizations who have executed a Network Participation Agreement enabling data sharing. Data collection, which typically lags enrollments, is gradually increasing.

Table 1. *Health Current* Participants

Type of Organization	*Number of Participants*	*Participants Sending Data to Health Current*
Hospitals and Health Systems	41	32
Health Plans	15	--
Federally Qualified Health Centers & Rural Health Clinics	21	17
State & Local Government Agencies	7	--
Laboratories, Imaging Centers & Pharmacies	5	1
Community Providers	221	6
Behavioral Health Providers	77	12
Accountable Care Organizations & Clinically Integrated Networks	14	--
Long-Term & Post-Acute Care	83	--
Emergency Medical Services	16	--
Total	500	72

Source: (Health Current 2018); (Health Current 2018).

One promising feature of *Health Current* is the involvement of the 15 health plans. The economic benefits of exchanging patient information directly accrue to payers. The unnecessary costs of duplicate testing, treatments required because of prescription errors, and other information related problems are borne by the organizations that assume economic risk, including insurers and health care organizations that provide capitated care. Thus, they are also the primary economic beneficiaries of exchanges of information that reduce avoidable negative outcomes of care.

EMR Adoption Incentives

To encourage eligible professionals and hospitals to adopt, upgrade and further utilize certified electronic health record technology, an implementation of significant cost especially for relatively small health care organizations, CMS developed incentive programs to promote interoperability. Economic incentives increased the rate of adoption nationally, and more than 544,000 providers have received incentive payments. A study that analyzed 2006-2010 E-prescribing data showed, for example, that nearly 40 percent of E-prescribers had adopted E-prescribing in response to a federal incentive program (Joseph, et al. 2013).

To participate in the CMS Promoting Interoperability Programs, hospitals and professionals must meet the following eligibility requirements.

Table 2. CMS Promoting Interoperability Program Eligibility

Medicare Eligible Hospitals and Critical Access Hospitals (CAHs)*
• "Subsection (d) hospitals" in the 50 states or DC that are paid under the Inpatient Prospective Payment System (PPS) • CAHs • Medicare Advantage (MA-Affiliated) Hospitals
Medicaid Eligible Hospitals and CAHs*
• Acute care hospitals (including CAHs and cancer hospitals) with at least a 10% Medicaid patient volume • Children's hospitals
Dually Eligible Hospitals and CAHs*
• Qualify under both the Medicare & Medicaid eligibility requirements above
Eligible Professionals for Medicaid incentives include:
• Physicians (primarily MD and DO) • Nurse Practitioners • Certified nurse-midwives • Dentists • Physician assistants who furnish services in a federally qualified community health center or rural health clinic led by a physician assistant.
Eligible Professionals for Medicare incentives include:
• MDs and DOs • Doctor of dental surgery or dental medicine • Doctor of podiatry • Doctor of optometry • Chiropractor

Source: * (Centers for Medicare & Medicaid Services 2018).

The available survey data do not adequately distinguish between eligible and non-eligible physicians. The results include, therefore, physicians in environments to which the incentives do not apply.

As noted, we do not have the data needed to link adoptions to incentives, but the recent increases in the adoption of EMRs are correlated with the incentive payments made to health care providers.

Table 3. Total Arizona Medicare and Medicaid Incentive Provider Payments by Provider Type (January 2011 – April 2018)

Program - Provider Type	*Number of Payments*	*Amount of Incentive Payments*
Medicare - Eligible Professionals	17,055	$159,095,353
Medicaid - Eligible Professionals	6,262	$103,351,519
Total Eligible Professionals	23,317	$262,446,872
Medicare - Eligible Hospital	4	$3,059,472
Medicaid - Eligible Hospitals	7	$12,063,347
Medicare/Medicaid - Eligible Hospitals (Medicare)	253	$252,035,633
Medicare/Medicaid - Hospitals (Medicaid)	189	$162,138,544
Total Eligible Hospitals	453	$429,296,996
Total Eligible Professionals and Eligible Hospitals	23,770	$691,743,869

Source: Centers for Medicare and Medicaid Services, Combined Medicare and Medicaid Payments by State, https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Downloads/May2018_PaymentsbyStateProgramandProvider.pdf.

Prevalence of EMR Replacement

The purchase and installation of an EMR system is expensive. When a system fails to meet expectations, the initial investment is lost and the costly process of purchasing and installing a replacement package is repeated. We report the available data on the prevalence of EMR replacements among physicians in Arizona in Tables 4-6.

We asked physicians to estimate the length of time over which they had used their current EMR. The primary purpose of the question is to estimate the effects of experience in using EMRs on physician productivity, as we discuss next, but the answers give us an approximate view of the life span of an EMR package.

We emphasize that the results are a rough ordering rather than precise measures. Survey designers know that respondents are unlikely to recall events that occurred in the past accurately. Unless the timing in question is important to an individual or is correlated with an important event, even relatively short periods of time can be subject to recall error. To reduce the problems of recall error, we grouped the answers given in one-year increments into three-year increments, as indicated in Table 4.

Table 4. Duration of EMR System Use and Whether a Replacement, 2016-2018 (N = 5,081)

Duration of EMR use	*Replacement for Different Brand of EMR*						*Total (includes don't know responses)*	
	Yes		*No*		*Total*			
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
1-3 Years	454	55.0%	494	31.9%	948	39.9%	1,214	39.6%
4-6 Years	178	21.6%	458	29.6%	636	26.8%	813	26.5%
7-9 Years	56	6.7%	238	15.3%	294	12.3%	375	12.2%
10 Years or More	136	16.5%	357	23.0%	493	20.7%	659	21.5%
Total	824	100.0%	1,547	100.0%	2,371	100.0%	3,061	100.0%

Source: AMB, ABOE Survey Data, April 2016–March 2018.

The data in Table 4 show that 824, or more than 16% of the 5,081 physicians who responded to the question on EMR replacement, used EMRs that replaced a previous EMR. An additional 690 physicians who reported duration of use but did not know whether their EMR was a replacement, are included in the final right hand column of the table.

The results show the number of physicians affected by EMR replacements rather than the number of EMRs replaced, so replacements by larger organizations are implicitly weighted more heavily than smaller practices.

Table 5. Effect of EMR Replacement on Physicians Rankings of EMR Productivity, 2016-2018

Physician Productivity Ranking	*Replacement for Different Brand of EMR*						*Total*	
	Yes		*No*		*Don't Know*			
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
1 (Awful)	136	36.7%	160	43.2%	74	20.0%	370	11.9%
2	166	28.6%	291	50.2%	122	21.0%	579	18.7%
3	245	25.7%	487	51.1%	220	23.1%	952	30.8%
4	209	26.0%	396	49.4%	196	24.4%	801	25.9%
5 (Outstanding)	88	22.7%	210	54.4%	88	22.7%	386	12.5%
Total	844	100.0%	1,544	100.0%	700	100.0%	3,088	100.0%

Source: AMB, ABOE Survey Data, April 2016–March 2018.

Table 6. The Effect of Duration of EMR Use on Physician Productivity Ranking, 2016-2018

Duration of EMR Use	*Physician Ranking of EMR Effect on Physician Productivity*										*Total*	
	1 (Awful)		*2*		*3*		*4*		*5 (Outstanding)*			
1-3 Years	185	14.1%	250	19.1%	416	31.8%	330	25.2%	125	9.5%	1,306	39.4%
4-6 Years	91	10.4%	153	17.5%	274	31.4%	242	27.7%	111	12.7%	871	26.3%
7-9 Years	36	9.1%	75	19.1%	106	27.0%	122	31.1%	53	13.5%	392	11.8%
10 Years or More	78	10.5%	135	18.2%	233	31.5%	168	22.7%	124	16.8%	738	22.3%
Total	390	100.0%	613	100.0%	1,029	100.0%	862	100.0%	413	100.0%	3,307	100.0%

Source: AMB, ABOE Survey Data, April 2016– March 2018.

The question asks that the physician evaluate the EMR that he/she uses rather than a general perception of EMR effects and report the number of years of experience with that EMR. The data in Table 6 address the question of the extent to which physician dissatisfaction with EMRs reflects the difficulty of adjusting to new methods of record keeping rather than problems with the structure of an EMR. The comparison is indirect because it rests on the length of time over which a physician has used an EMR rather than an explicit statement of the two possibilities.

The single largest group of physicians are those who have used an EMR for one to three years and the smallest group are those with 7-9 years of EMR experience. Although the progressions are not smooth, the results generally show that the longer the period of EMR use, the higher that physicians rank the effect of having an EMR on their own productivity.

The most obvious progression occurs among physicians who rate the productivity effects as “Outstanding”. Only 9.5% of physicians with 1-3 years of experience give an outstanding rank compared to 16.8% of physicians with ten or more years of experience.

Duration of EMR use had the least effect on physicians who ranked EMR productivity as a “3”, the midpoint in the 1-5 scale, roughly interpretable as “good”. With only one exception (7-9 years) the percentage of physicians in each of the categories of years of experience is effectively the same.

The results suggest that over time, physician satisfaction with their own use of EMRs will, all else equal, improve.

The next section of this report focuses on differences between physicians who treat AHCCCS patients and those who do not.

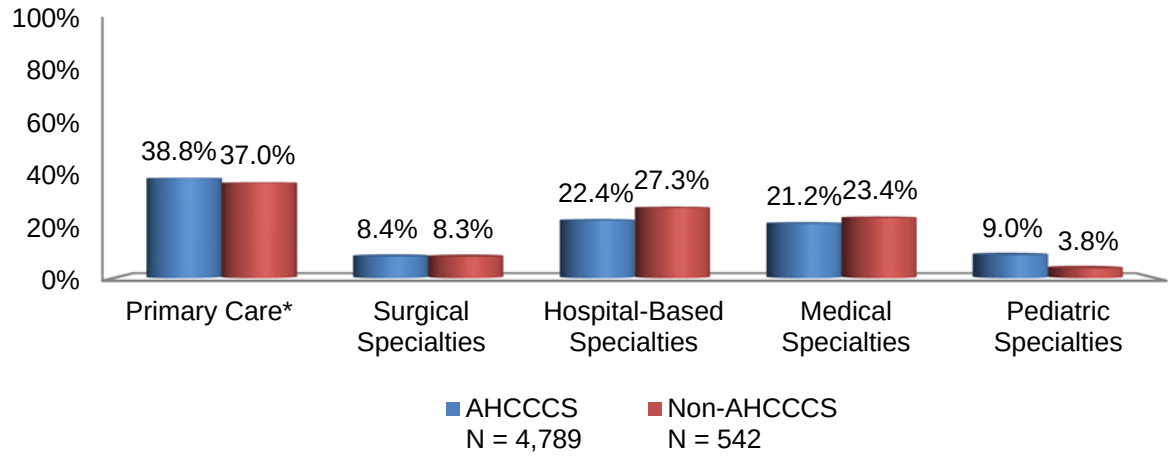
Comparing AHCCCS to Non-AHCCCS Physicians

We define an "AHCCCS Physician" as one who has an active agreement with AHCCCS, either as an individual or group/organization, to deliver health care to eligible members. AHCCCS supplies its provider database to CHiR so they can be matched with the licensing data from the medical boards.

This section of the report compares some characteristics of AHCCCS physicians to non-AHCCCS physicians (NAHC). Complete descriptions of the results on both groups are included in Appendices F and G.

It is often suggested that Medicaid enrollees do not have access to the same types of physicians as privately insured patients. The data in Figure 6 show that the distribution of AHCCCS physicians by specialty is, with slight variations, the same as the specialty distribution for NAHC providers. It is also true that the AHCCCS providers include roughly 90% of all physicians in Arizona and thereby, are the physicians who treat nearly all privately insured patients.

Figure 6. Distribution of Practicing Physicians by Specialty, 2016-2018 (N = 5,331)



Source: AMB, ABOE Survey data, April 2016-March 2018.

Note: *Primary care includes family/general practice, geriatrics, and internal medicine not involving a specialty. Primary specialty reported by physician at the time of licensure. 7 non-AHCCCS physicians and 12 AHCCCS physicians did not report specialty to the medical board.

Practice Settings

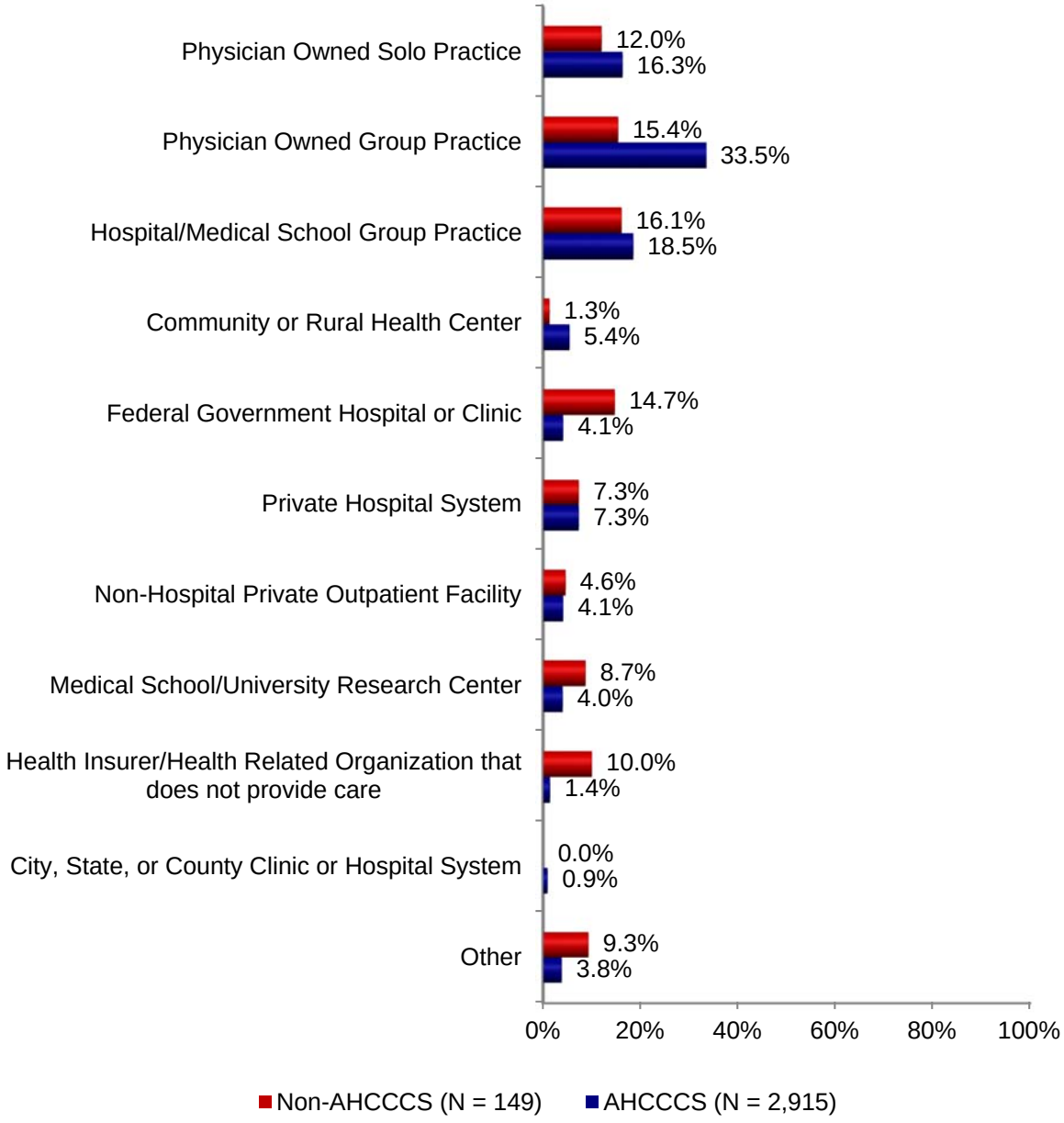
The distribution of physicians by practice type in Figure 7 represents the prevalence of practice types within each group. It is not weighted by the size distribution of physicians, so it is important to remember that 90% of the physicians are AHCCCS physicians. Approximately 10% of NAHC

physicians do not provide patient care to AHCCCS or to private health insurance patients. The corresponding results for AHCCCS physicians is approximately 1%. In terms of direct services to patients, NAHC physicians are also much less likely to practice in federal facilities than AHCCCS physicians (4.1% vs. 14.7%), which is not surprising since the exceptions are physicians who practice in both settings. If these NAHC physicians are not included in the comparisons, the overlap between physicians who treat AHCCCS patients and the services provided to privately insured patients is higher than 90%.

The largest differences between the AHCCCS and NAHC physicians are in Physician Owned Group Practice (33.5% AHCCCS vs 15.4% NAHC), Physician Owned Solo Practice (16.3% vs. 12.0%) and Community or Rural Health Center (5.4% vs. 1.3%). The practice settings in which NAHC physicians are more likely to practice than AHCCCS physicians (relative to their own colleagues) are private outpatient facility and medical school/university research center.

The prevalence of solo practice is declining in Arizona, in part due to acquisitions of practices by hospital systems. The percentage of all physicians in solo practice dropped from 24% in 2007-2009 to 15% in 2015-2017. Solo practice physicians are, all else equal, much less likely to adopt EMRs than are physicians in other practice settings and, as indicated, are less likely to serve AHCCCS patients than physicians in group practices. All else equal, utilization rates of EMRs will continue to increase as the percentage of physicians in solo practice declines.

Figure 7. Distribution of Practicing Physicians by Type of Practice, 2016-2018 (N = 3,064)

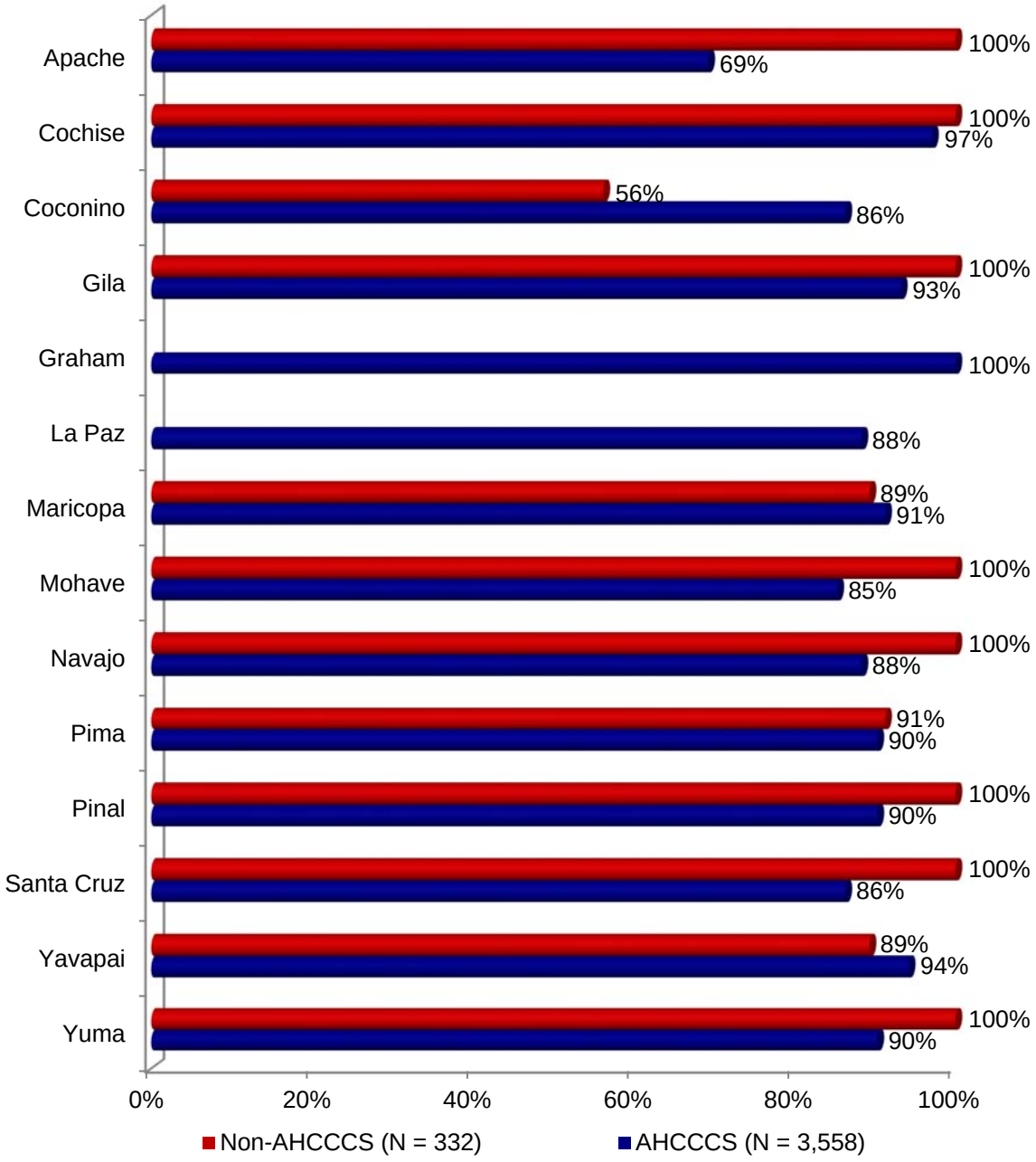


Source: AMB, ABOE Survey data, April 2016-March 2018.

Note: 1,886 AHCCCS physicians and 400 non-AHCCCS physicians did not report type of practice (missing). Percentages are based on responses. The five practice types listed under the "Other" section are a subset of the total types included in the "Other" category.

Urban-Rural Distribution by AHCCCS and Non-AHCCCS Physicians

Figure 8. Physicians EMR Utilization by County AHCCCS vs. Non-AHCCCS, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: For AHCCCS physicians, 1,053 respondents did not identify a method of storing medical records and 190 respondents did not identify their county. For Non-AHCCCS physicians, 174 respondents did not identify a method of storing medical records and 43 respondents did not identify their county. Pima and Maricopa Counties represent the urban areas. All other counties represent the rural areas. Greenlee County had no respondents. Graham and La Paz had no Non-AHCCCS respondents.

The distribution of EMR users by County is described in Figure 8. We characterize Maricopa and Pima counties as urban areas because they include the largest metropolitan areas in Arizona. However, both counties are quite large and both include areas where population density is quite low.

The percentage of AHCCCS physicians who use EMRs ranges from 69% in Apache County to 100% in Graham County. The number of practicing physicians ranges from six in Santa Cruz County to 2,226 in Maricopa County. The percentage of NAHC physicians who use EMRs ranges from 56% in Coconino County to 100% in all except Maricopa, Pima and Yavapai counties. In Maricopa County, the utilization rate among AHCCCS physicians is the fourth highest in the state, but among non-AHCCCS physicians, utilization is tied at second lowest with Yavapai.

The Utilization of Electronic Medical Records

It has been suggested that Medicaid patients in the U.S. are less likely to be treated by physicians with EMRs; however, research results are mixed. Hing and Burt (2009), for example, estimate that physicians serving Medicaid patients in the U.S. are less likely to use EMRs. A similar result was obtained by Shields, Shin and Leu (2007), although their data are restricted to Community Health Centers. The opposite conclusion was reached by Shields, Rao and Kwong (2008) using national survey data and by Jha, et al (2009) analyzing data from Massachusetts. The sensitivity of the results to the geographic base is undoubtedly influenced by interstate differences in the composition and management of Medicaid plans**.**

The results in Figure 9 show that AHCCCS physicians are more likely than NAHC physicians to use EMRs. These results are consistent with a recent study that evaluated whether persons in poverty were receiving a proportionate share of the benefits of EMRs. Butler, Harootunian and Johnson (2013) found that, controlling for a variety of characteristics, AHCCCS patients were more likely to be served by physicians with EMRs.

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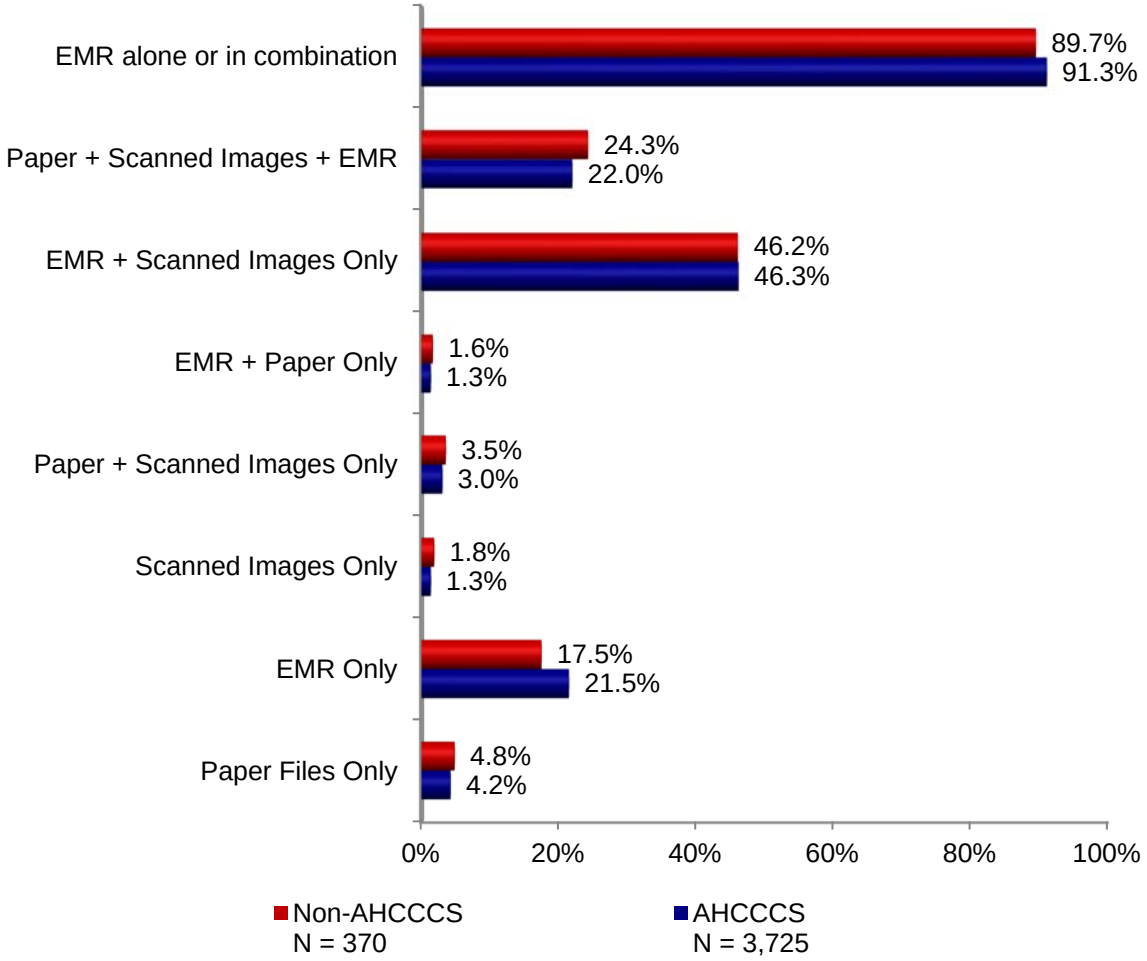
The results in Figure 9 show that AHCCCS physicians are slightly more likely than NAHC physicians to use EMRs. These results are consistent with a recent study that evaluated whether persons in poverty were receiving a proportionate share of the benefits of EMRs. Butler, Harootunian, and Johnson (2013) analyzed the Arizona data and found that AHCCCS physicians were significantly more likely to use EMRs than NAHC physicians. They also found that the EMRs used by the AHCCCS physicians were generally of a more advanced nature. The AHCCCS provider EMRs were, for example, more likely to meet Meaningful Use criteria and qualify for CMS's Promoting Interoperability programs, formerly the EHR Incentive Programs (Centers for Medicare and Medicaid Services 2018).

The current data (Figure 9) show that, rather than being denied the benefits of EMRs, AHCCCS patients are more likely to be treated by physicians with EMRs than are non-AHCCCS patients. The difference between the patient groups (AHCCCS 91% vs. NAHC 90%) is small, and it has narrowed since the previous study, which found a difference of 43% vs. 34% (Butler, Harootunian and Johnson 2013). The most important difference, however, is that 22% of AHCCS physicians use EMRs as their only medical record, compared to 18% for NAHC physicians. The percentage of AHCCCS and NAHC physicians who rely on *EMR + scanned images only* is essentially equal (46%). NAHC physicians are more likely to rely on *paper* and *scanned* files for their medical records (3.5% vs. 3%). The higher reliance of paper records by NAHC physicians reflects the higher likelihood of NAHC physicians to be solo practitioners, the type of practice with the lowest rates of EMR utilization.

The trend suggests that overall differences between AHCCCS and NAHC physicians' use of EMRs are disappearing as the use of EMRs expands, but the differences that remain still favor AHCCCS patients.

Figure 9. Methods of Storing Medical Records AHCCCS vs. Non-AHCCCS, 2016-2018 (N = 4,095)



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Respondents who did not identify a method of storing medical records (missing): 1,076 AHCCCS and 179 non-AHCCCS.

*Data on "EMR alone or in combination" is not mutually exclusive from other categories.

Physicians' Evaluation of EMR Software

Several studies address physician attitudes toward the *adoption* of EMRs, but there is relatively little information on physicians' perceptions of the effectiveness of EMRs in day-to-day practice. An exception includes a study of EMR related stress among physicians (Babbott, et al. 2014).

There is anecdotal information that some EMR contracts prohibit physicians from publically expressing their opinions of their EMRs. The evaluations of brand name specific EMRs included in Appendix C were gathered on condition of physician confidentiality.

The results in this section describe how Arizona physicians rank their EMR software on five criteria, namely:

- Ease of use
- Effect on physician productivity
- Effect on staff productivity
- Reliability
- Performance vs. promise

Each physician rates the EMR that he or she uses on a scale from 1 to 5, where 1 represents "Awful" and 5 represents "Outstanding". The intermediate values are not defined but the mid-point in the range can be thought of as approximating "acceptable" or a neutral evaluation. Rankings greater than 3 can be interpreted as positive. A ranking greater than "3" for physician or staff productivity indicates, for example, that an EMR has increased productivity, while rankings less than "3" suggest that an EMR has reduced productivity.

This section begins with a description of the rankings assigned to each of the five criteria described above. The rankings across all EMRs are a representation of a general evaluation of EMRs of several different types by different types of practices and physicians. Thus, without further clarification, individual EMR packages should not be interpreted as substitutes for one another. Many EMRs, such as *eClinicalWorks,* are general-purpose products while the *Gmed* EMR is specifically designed for gastroenterology specialists. Appendix D summarizes more well-known EMRs by vendor and intended use.

The fact that an EMR designed for primary care physicians might be ranked lower than an EMR designed for only one specialty does not imply that the primary care physicians could or should adopt the specialty EMR. Similarly, the finding that EMR brand A has a higher rating than EMR brand B should not imply that brand A is a better buy than brand B without reference to the cost (and thereby the cost effectiveness) of the two brands.

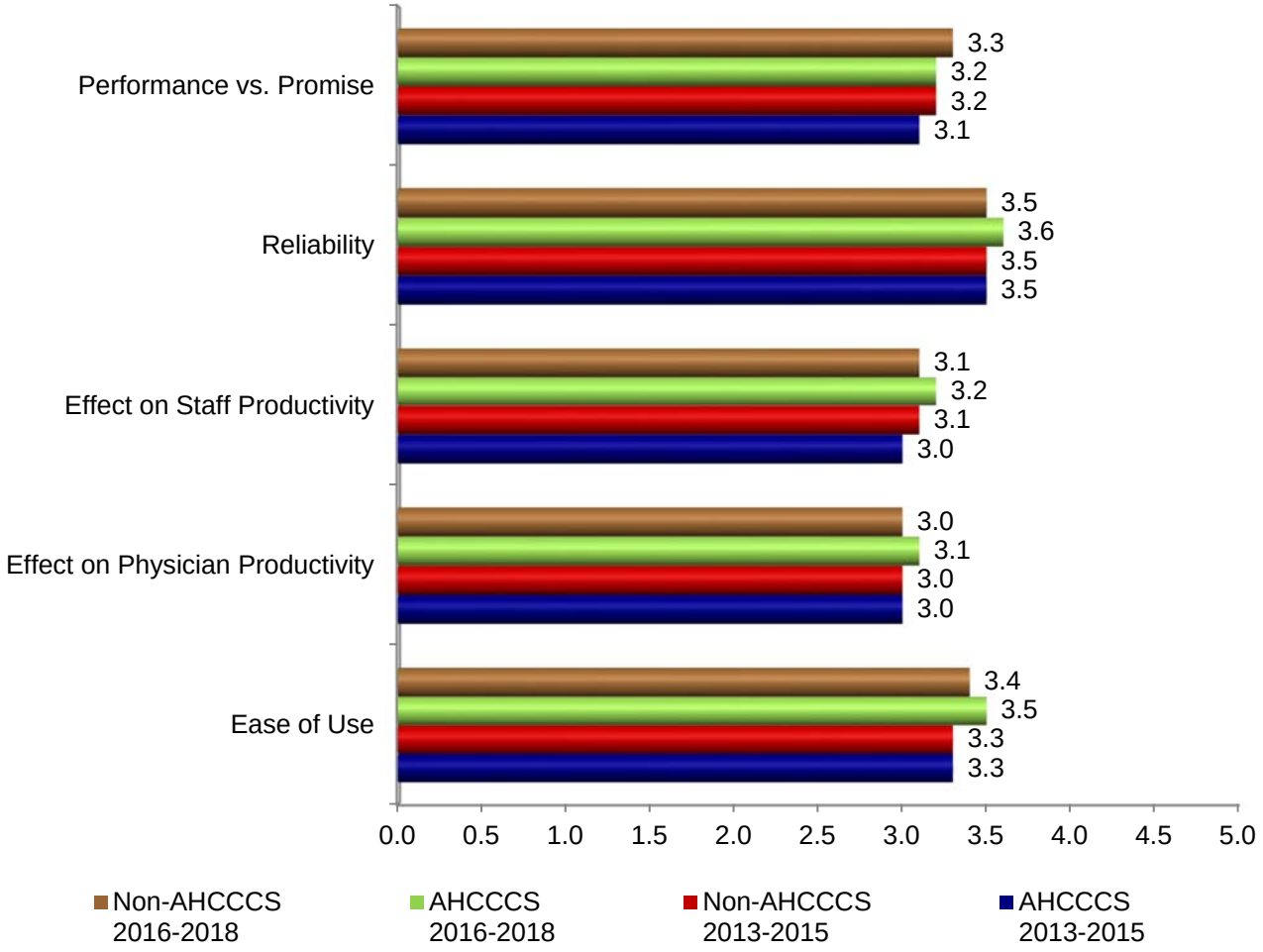
The survey does not ask if the physician respondent is using an EMR that replaced an EMR package that was not acceptable. In such cases, the rankings of the current EMR could reflect a choice that solved the problems with the previous EMR and would, presumably be more positive than a first time EMR that was acceptable, but perhaps not as well suited to the physician's

specific needs. Such situations are extremely costly, but the information on the prevalence of these problems in Arizona is not known.

The results presented next are restricted to the ten EMR packages that have the largest number of users because of the difficulty of presenting results for the very large number of vendors that serve physicians in Arizona.

A great deal of attention has been given to the shortcomings of EMRs, but the rankings described in the following tables have means equal to or slightly above the midpoint in the 1-5 scale. The results on physician satisfaction with EMRs are generally consistent with results from the NCHS survey of physicians in office-based practices. The NCHS results for 2011 show that 38% of the physicians were very satisfied with their EMRs and 46% were somewhat satisfied (Jamoom, et al. 2012). A 2014 report of a survey conducted by AmericanEHR and the American Medical Association found 34% of respondents (physicians, nurse practitioners, and physician assistants) were satisfied or very satisfied with their electronic health record systems (AmericanEHR Partners 2014).

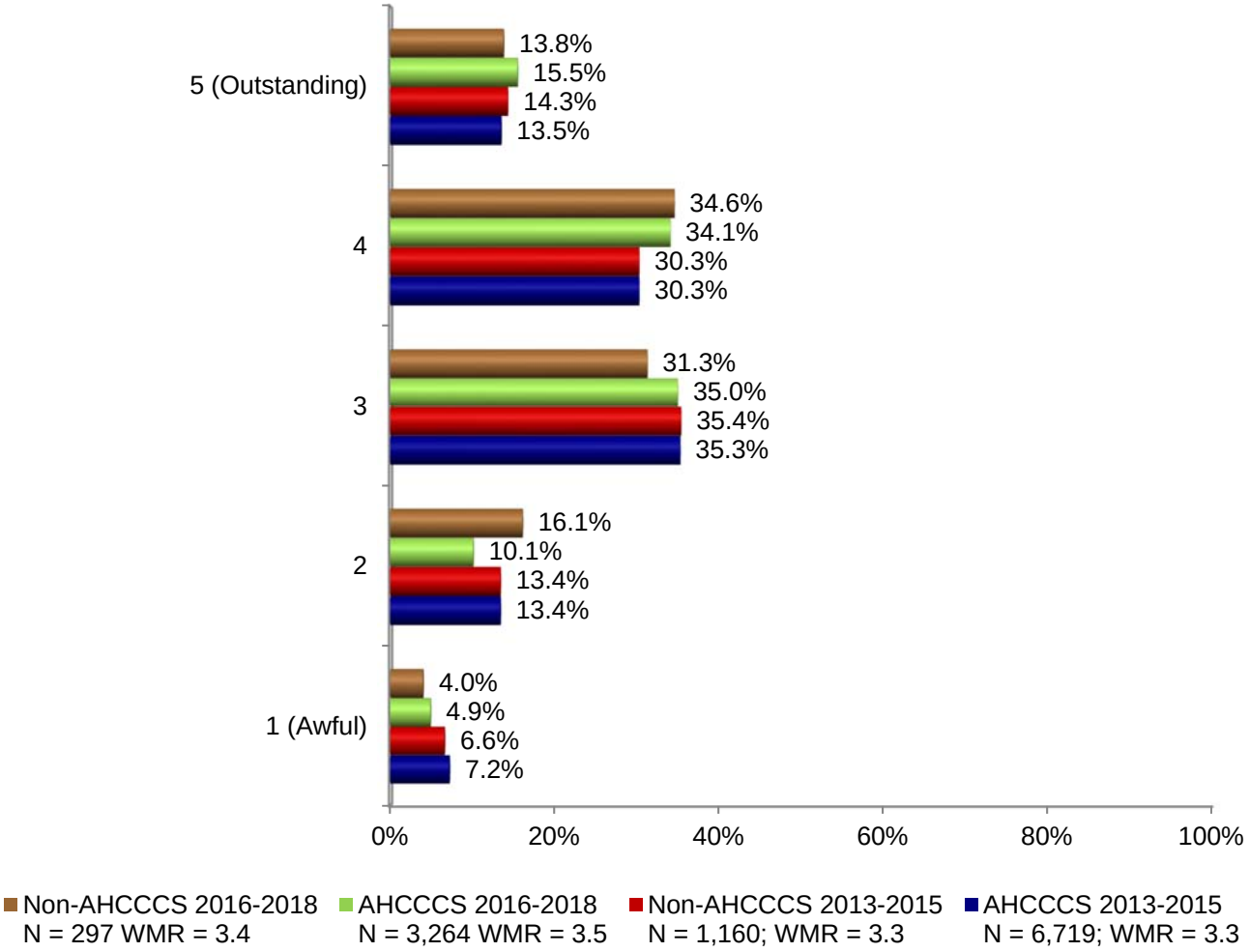
Figure 10. Summary of All EMR Rankings



Source: AMB, ABOE Survey Data, April 2013-March 2015; April 2016–March 2018.

We next consider the detailed data on the physicians' evaluations of each of the five criteria that are the components of the overall rankings for the EMRs. In general, non-AHCCCS physicians rank their EMRs slightly higher than AHCCCS physicians do on most of the five criteria.

Figure 11. Physicians Ranking of All EMRs by Ease of Use

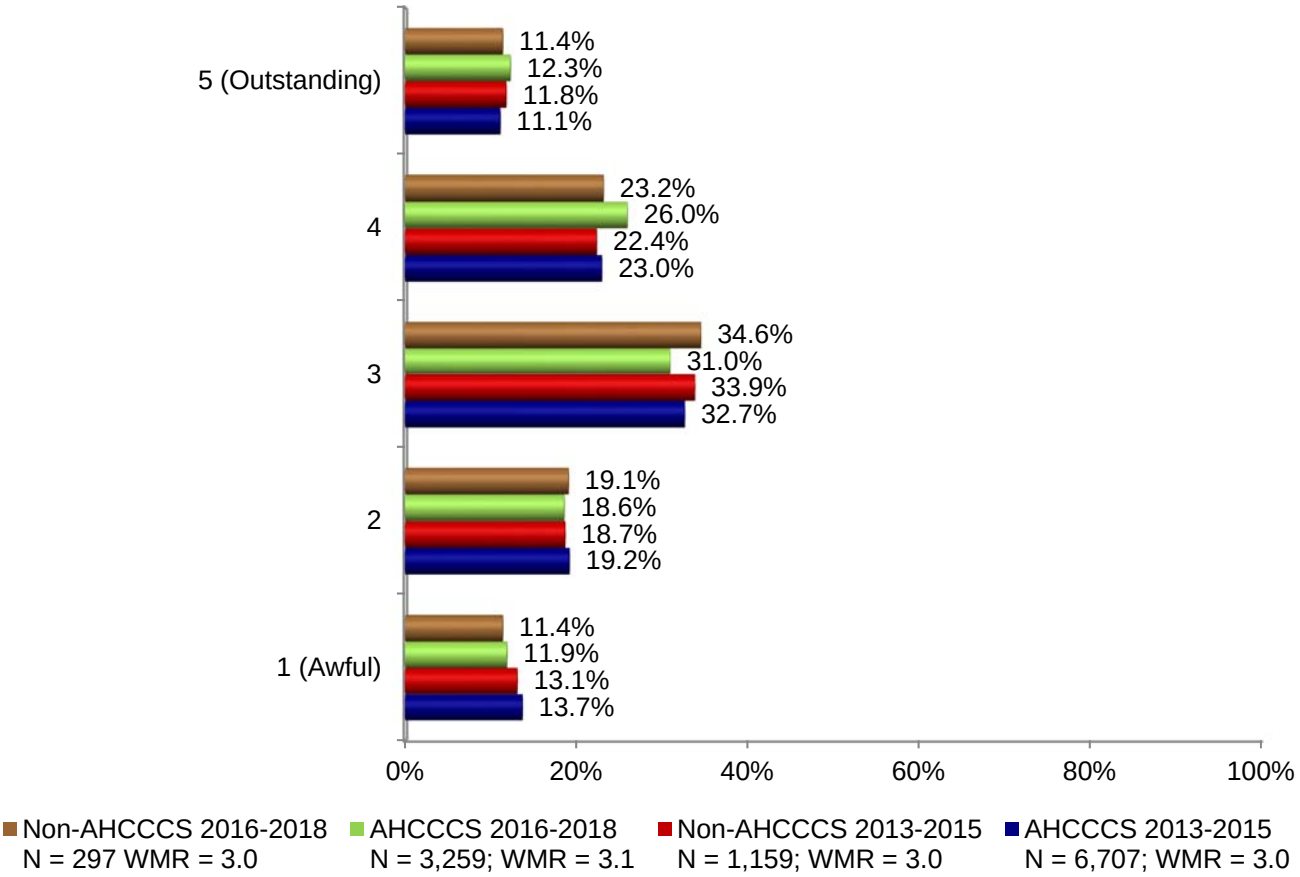


Source: AMB, ABOE Survey Data, April 2013-March 2015; April 2016–March 2018.

Note: WMR is Weighted Mean Rank. In 2013-2015, 371 AHCCCS physicians did not identify a brand name but answered the Ease of Use question. The WMR for those physicians is 3.11. In 2016-2018, 99 AHCCCS physicians and 13 non-AHCCCS physicians did not identify a brand name but answered the Ease of Use question. The WMR for those physicians is 3.37 (AHCCCS) and 3.85 (non-AHCCCS).

The weighted mean rank for the ease of using an EMR ranges from 3.3 – 3.5. As indicated in Figure 11, only 15%-20% of physicians in the most recent period give their EMR a rank less than 3, while just under 50% rate their EMR as greater than 3. The distribution suggests that physicians are mostly positive about the ease with which the EMR can be used. Another interesting aspect of the results is the gradual improvement, among both AHCCCS and non-AHCCCS physicians, in the percentage of physicians ranking their EMRS as a 4 or 5 on the scale with corresponding reductions in the percentage of physicians in the lowest two rankings on the scale. This trend could represent the increases in learning with experience with EMRs, improvements in the structures of EMRs or a combination of both influences. Similar trends are observed for the other criteria used to rank EMRs.

Figure 12. Ranking of All EMRs by Physicians Perception of Productivity



Source: AMB, ABOE Survey Data, April 2013-March 2015; April 2016–June 2018.

Note: WMR is Weighted Mean Rank. In 2013-2015, 368 AHCCCS physicians did not identify a brand name but answered the Physician Productivity question. The weighted mean for those physicians is 2.93. In 2016-2018, 98 AHCCCS physicians and 13 non-AHCCCS physicians did not identify a brand name but answered the Ease of Use question. The WMR for those physicians is 3.20 (AHCCCS) and 3.77 (non-AHCCCS).

The introduction of an EMR into a practice typically requires investments in physician and staff time to learn new procedures and make the transition from paper or scanned records to the EMR. In some instances, an EMR package does not fit well into a practice and must be replaced. Both situations imply a loss of physician and staff productivity, and both are often cited in critiques of EMRs. Increases in productivity attributable to the use of EMRs are much less discussed. The physician rankings of the effect of EMRs on physician and staff productivity, however, reveal an almost exact balance between increases and reductions in productivity creating an average rank approximately equal to the mid-point in the scale.

Although not a primary focus of this project, one question that arose was whether physicians' perceptions of the productivity effects of EMRs were a reflection of physicians' characteristics or whether they more reflected the characteristics of the EMRs that the physicians used. The

question was answered in a scholarly article, using the data from this project (Butler and Johnson 2016). The authors created a model that compared the desires of the physicians against the software features of the specific program, in order to highlight the demand and supply characteristics that influence physicians' perceptions of EMR productivity. The data included physicians' rankings of these same five criteria. The factors influencing the rankings were divided into three determinants, namely: physician characteristics, EMR characteristics (including vendor brand), and practice characteristics (type of practice, size, and location). They found that physician's characteristics matter for perceived ease of use and physicians' own productivity, but not for other productivity dimensions (i.e., not for staff productivity, reliability, or vendors' promised performance). For productivity and reliability perceptions, and vendors' promises, the type of practice and the EMR characteristics both had a statistically significant influence on productivity.

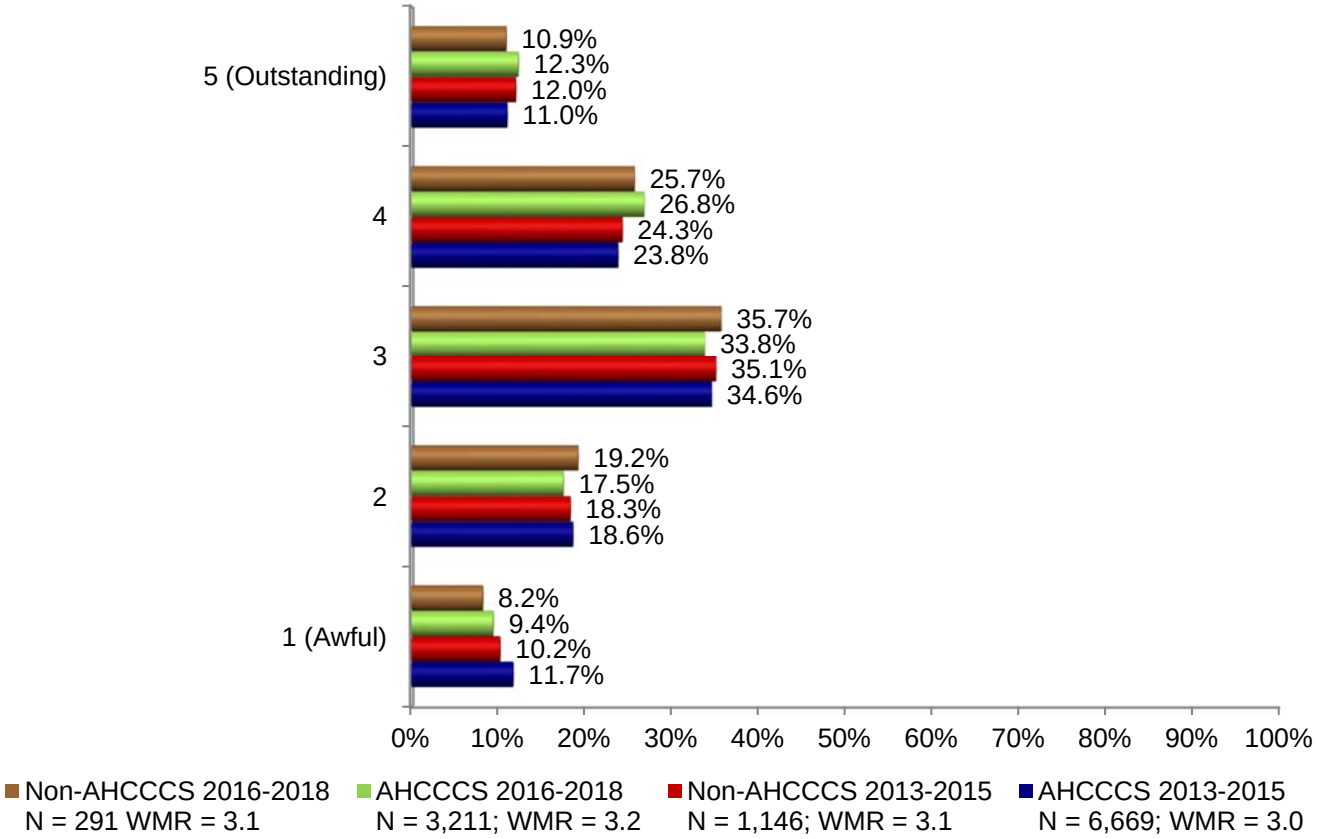
One of the problems that physicians faced in switching to EMRs was the loss of patient contact while a physician entered data on a keyboard. A response to this problem was the creation of the position of "scribe". That is, a person who either before or during the physician-patient portion of a visit does the data entry. Our information on the use of scribes is limited to the 2016-2018 survey. The current results are described in Table 7. The numbers are yet too small to compare AHCCCS to non-AHCCCS physicians usefully, but we will continue to track trends in the use of scribes (see Tables F-7 and G-7).

Table 7. Physicians Who Used a Scribe for Data Entry, 2016-2018 (N = 436)

Storage Method	*Number of Physicians*	*Percent*
EMR Only	130	16.1%
EMR + Paper Only	4	7.5%
EMR + Scanned Images Only	215	12.2%
Paper + Scanned Images + EMR	87	10.8%

Source: AMB, ABOE Survey data, April 2016-March 2018.

Figure 13. Physicians Ranking of EMRs Effects on Staff Productivity

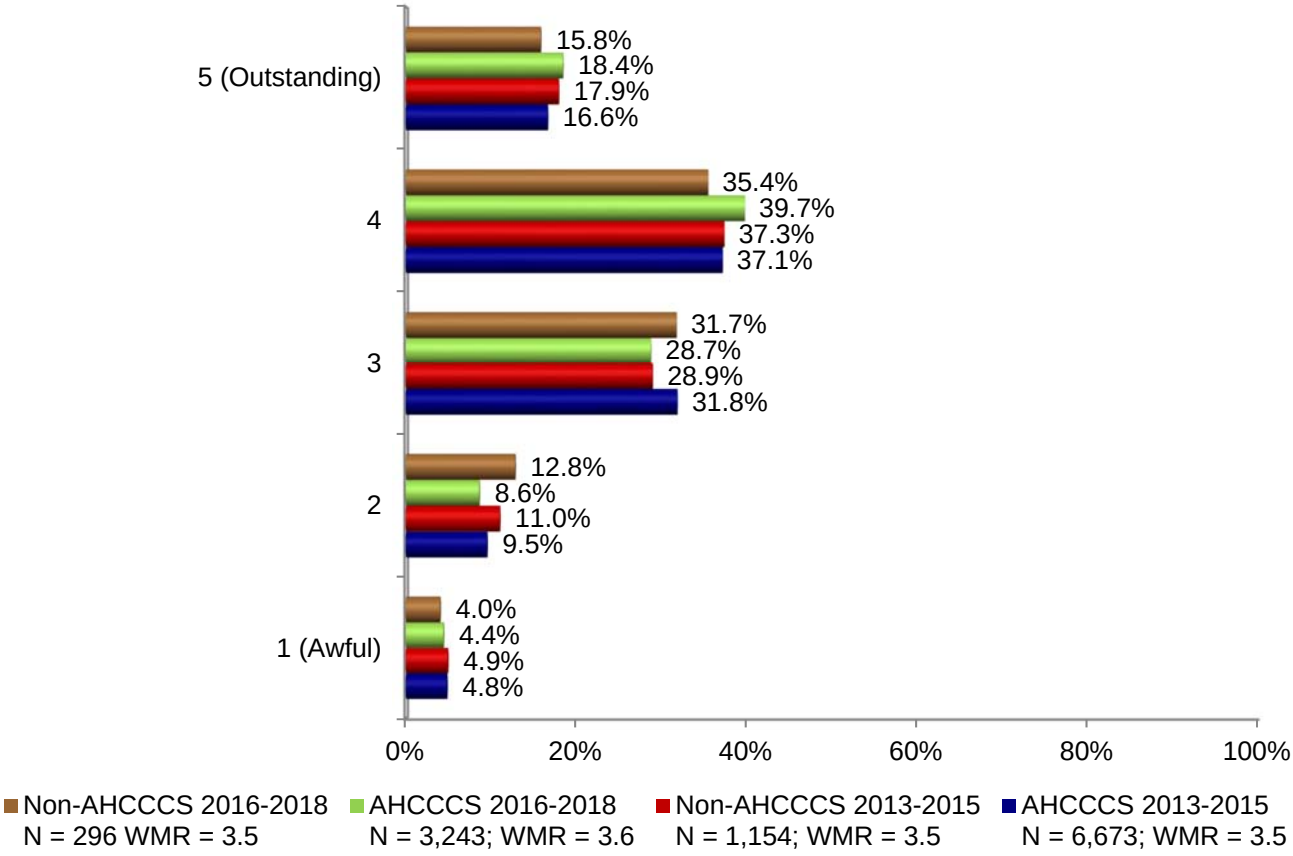


Source: AMB, ABOE Survey Data, April 2013-March 2015; April 2016–March 2018.

Note: WMR is Weighted Mean Rank. In 2013-2015, 363 AHCCCS physicians did not identify a brand name but answered the Staff Productivity question. The weighted mean for those physicians is 2.93. In 2016-2018, 97 AHCCCS physicians and 11 non-AHCCCS physicians did not identify a brand name but answered the Ease of Use question. The WMR for those physicians is 3.24 (AHCCCS) and 3.27 (non-AHCCCS).

The results on staff productivity include the gradual improvements in rankings seen for the other criteria. Although the absolute differences are small, the largest improvements are observed for the non-AHCCCS physicians. The mean rankings are, again, very slightly above the mid-points in the scale, indicating a modestly positive evaluation of the effect on staff productivity.

Figure 14. Physicians Ranking of the Reliability of EMRs

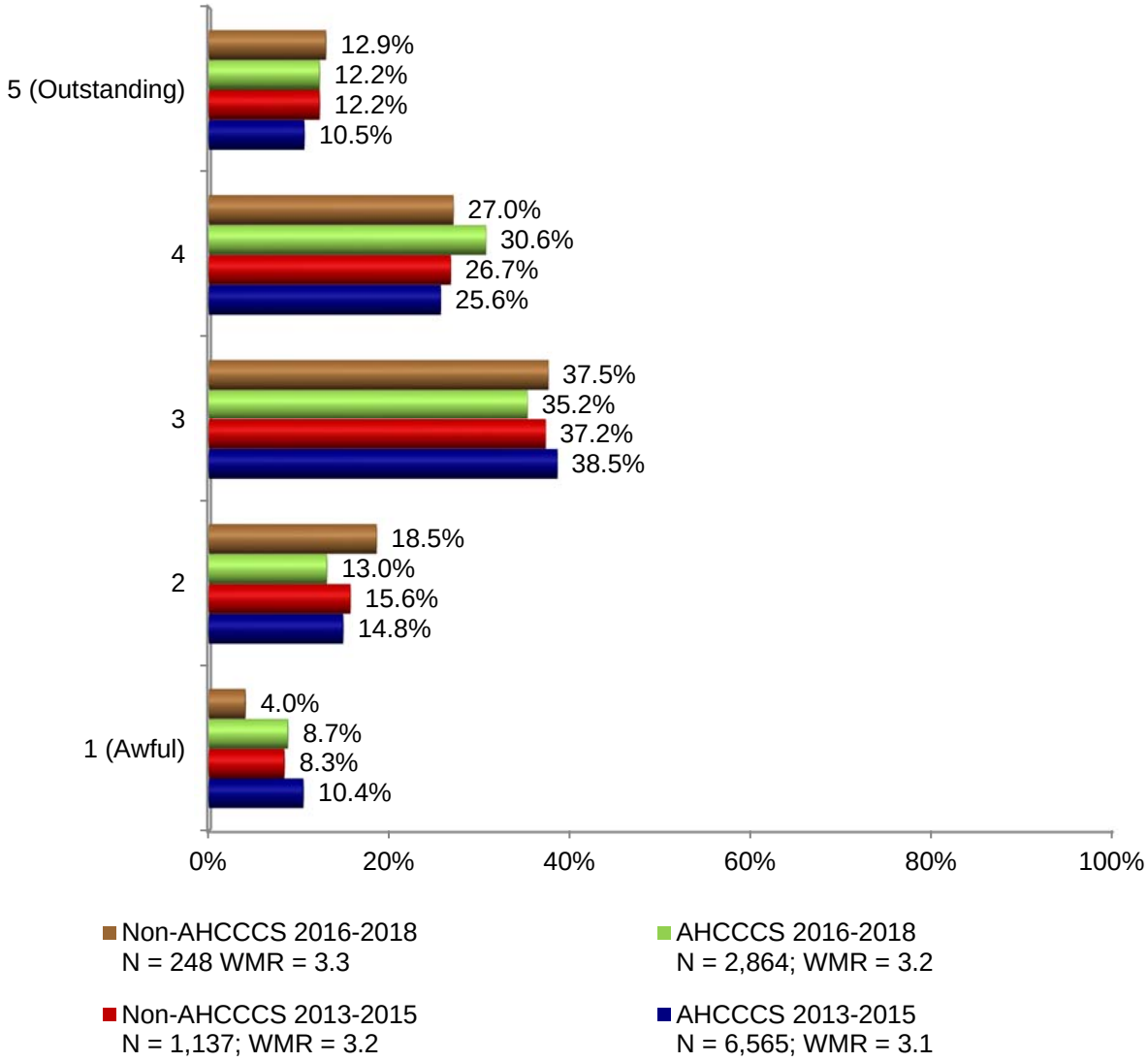


Source: AMB, ABOE Survey Data, April 2013-March 2015; April 2016–March 2018.

Note: WMR is Weighted Mean Rank. In 2013-2015, 363 AHCCCS physicians did not identify a brand name but answered the Reliability question. The weighted mean for those physicians is 3.31. In 2016-2018, 97 AHCCCS physicians and 13 non-AHCCCS physicians did not identify a brand name but answered the Ease of Use question. The WMR for those physicians is 3.42 (AHCCCS) and 4.08 (non-AHCCCS).

The reliability of EMRs receives the highest rankings of all the criteria. Given the current stage in the evolution of EMR software and the increasing experience with it by vendors and users, the result is not surprising. Further investigation into the circumstances and brand names of the software packages that received rankings of less than 3, however, warrant further investigation.

Figure 15. Physicians Ranking of EMRs Performance vs. Promise



Source: AMB, ABOE Survey Data, April 2013-March 2015; April 2016–March 2018.

Note: WMR is Weighted Mean Rank. In 2013-2015, 351 AHCCCS physicians did not identify a brand name but answered the Performance vs. Promise question. The weighted mean for those physicians is 2.96. In 2016-2018, 78 AHCCCS physicians and 10 non-AHCCCS physicians did not identify a brand name but answered the Ease of Use question. The WMR for those physicians is 3.28 (AHCCCS) and 3.80 (non-AHCCCS).

Ease of use and reliability are more highly ranked than effects of EMRs on productivity or perceptions of performance versus vendor promises. The differences are small and one must recognize that physicians who were not involved in the decision to implement a system may not be aware of vendors' promises.

Table 8. Factors that Influenced Practice's Decision to Acquire an EMR, 2016-2018 (N = 1,159)

	AHCCCS N = 1,057		*Non-AHCCCS N = 102*	
Factors	*Number of Physicians*	*Percent*	*Number of Physicians*	*Percent*
Lower Costs for Implementation	122	19.5%	11	17.4%
Medicare Based Incentives	163	26.1%	17	26.9%
Medicaid Based Incentives	98	15.7%	8	12.6%
Clear Direction on Market Leading Vendors	32	5.1%	2	3.1%
Easily Customizable Systems to Fit our Needs	131	20.9%	13	20.6%
Cost Effective Access to EMR Training	71	11.3%	7	11.1%
Ease of Integration with our Legacy Systems	63	10.0%	10	15.8%
Low Learning Curve	64	10.2%	6	9.5%
Agreed Upon & Published Industry Standards for EMRs	99	15.8%	5	7.9%
Confidence in Security and Privacy of the System	118	18.9%	16	25.3%
Access to Technology Resources to Support the System	96	15.3%	7	11.1%

Source: AMB, ABOE Survey Data, April 2016–March 2018.

Summary & Conclusion

The percentage of Arizona physicians using EMRs increased from approximately 45% in 2007-2009 to approximately 91% in 2016-2018. The trend suggests that nearly all Arizona physicians will be using EMRs soon. The growth is partly influenced by incentives provided by Medicare and Medicaid.

EMR use is lowest among older physicians and physicians in solo practices. The findings are similar to the results of national surveys. The age related effects are decreasing with the gradual replacement of retiring older physicians by younger physicians and the consolidation of solo practices into larger group practices or hospital based practices.

The introduction or replacement of an EMR in a practice typically implies a short-term loss of physician and staff productivity, but increases in productivity over time are also likely. Physicians ranked the effect of EMRs on physician and staff productivity to be approximately equal to the mid-point in the scale.

The comparisons of AHCCCS to non-AHCCCS physicians show that the physicians who treat AHCCCS patients are also the physicians who treat nearly all privately insured patients in Arizona. AHCCCS patients are somewhat more likely to be served by physicians with EMRs than are the patients of non-AHCCCS providers, although the difference is declining over time.

Many discussions among healthcare professionals suggest that physicians are very dissatisfied with their EMRs. Our results indicate that physicians are at least somewhat positive about their EMRs, ranking them slightly above the midpoint in the 1-5 scale. The more accurate conclusion may be that physicians seek to improve individual elements of their EMRs, but recognize that EMRs offer advantages not available from scanned records or paper medical records.

The use of EMRs increased more rapidly in the rural counties of Arizona than in the urbanized areas. The Medicare and Medicaid incentives and the support from organizations such as Health Current are often directed to organizations with the most need, including smaller practices, which typify rural medicine. This appears to have had a very significant impact on the use of EMRs by rural health care providers and Community Health Centers.

The expected benefits of EMRs, such as the avoidance of duplicative tests, require the exchange of information among health care providers. The lack of communication networks is now a much more important obstacle to the realization of the benefits of EMRs than is underutilization of

EMRs. Among physicians with EMRs that include functions such as E-prescribing, patient summaries and others, 19% to 46% of the physicians share information with other providers. The data, however, include exchanges among providers within organizations such as hospital systems. Exchanges between hospital systems or among solo or group practices are much less frequent.

Health Current continues to expand rapidly with 500 participants enrolled, and of those, 72 engaged in data collection.

This report is the fifth in the CHiR series to include physician rankings of EMRs by brand. EMRs were ranked on a 1-5 scale where 1=Awful and 5=Outstanding. Specific EMR packages were ranked on each of five criteria. The results are included in Appendix C.

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Appendix A: Methods and Definitions

Methods

The workforce data collection model used by CHiR is based on the principle that survey questions should be limited to information not available from administrative data. The physician survey, therefore, complements the data collected for licensing physicians. Our partners, the physician licensing Boards supply the data that they collect for licensing. The licensing data include all physicians. Each physician can voluntarily participate in the survey. The survey responses are then matched to the licensing records for each survey respondent.

The survey questions change over time and with different project sponsors. AHCCCS, an agency of the State of Arizona, has sponsored the project since 2009.

The licensing Boards used paper license renewal forms from 1992 through July 2009, greatly restricting the number and complexity of survey questions. The 2007 paper survey consisted, for example, of six questions. The licensing boards converted to electronic applications in 2009, but many physicians continued to use paper forms, and funding was not available to create an electronic survey. Results for the periods July 2007 to March 2013 are described in previous CHiR reports (See Appendix B).

A new electronic survey was implemented in early 2012 with funding from AHCCCS and the Arizona Strategic Enterprise Technology Agency (see Appendix A, page 58). The electronic survey includes a greatly expanded set of questions and a large number of decision trees, including separate questions for physicians with Arizona licenses who practice outside the state, allowing examination of the reasons physicians choose to leave Arizona (Johnson, Bannister, et al. 2008). Many of the survey questions are taken from national surveys, such as the NCHS and the NAMCS surveys, to permit direct comparisons to the national data. An expanded version of the survey instrument was implemented in April 2015 (page 65).

Some studies identify the *number of practices* with EMRs, while this report counts the *number of physicians* with EMRs, as does the NCHS. The number of physicians using EMRs is the most direct measure of potential impact on patients, but the number of practices is a more useful measure of the impact on organizations. A Massachusetts study, for example, reported that almost half of Massachusetts' physicians used EMRs, but less than one-quarter of practices in Massachusetts had adopted EMRs (Simon, et al. 2007).

Definitions

Active license: The licensing boards define active physicians as those whose license has not expired or been suspended. Some physicians renew their licenses after retirement or while on leave. The distinction between physicians with an active license and those who are actively practicing medicine is only obtainable from responses to the survey. The true status of physicians who do not respond to the survey is, therefore, unknown. Survey respondents who indicate that they are retired or semi-retired/on leave physicians with active licenses are excluded from our results.

Electronic Medical Record: Physicians were given the opportunity to select any or all of the possible methods of storing their medical records. The specific survey question is:

How does the organization in which you practice store its medical records? **(Please answer Yes or No to <u>each part</u> a, b, c)**

a) Paper ☐ Yes ☐ No
b) Scanned images of paper records ☐ Yes ☐ No
c) Electronic files (an electronic version of a patient's medical history, including progress notes, diagnosis, medications and other information used in treatment.)
☐ Yes ☐ No

{if 6 c) checked yes, continue}

i. What is the name of your current EMR/EHR system (**Please check only one box.)**

Note: Check boxes are provided for 36 different EMR systems with an open-ended response for others.

The question is more specific than the previous version, which leads some respondents to include billing software as an EMR by mistake. The current results are not, therefore strictly comparable to the results before November 2009.

Specialty: Physicians can report more than one specialty to the licensing boards, and they need not be board certified in a specialty. We adopt the first specialty reported and do not classify physicians by multiple specialties. *Pediatric Specialties* are defined as pediatricians or physicians practicing a pediatric subspecialty. *Surgical Specialties* are defined to include surgeons or any surgical subspecialty. *Hospital Based Specialties* include critical care medicine, diagnostic imaging and radiology, emergency medicine, hospitalist medicine, infectious disease, neonatology, respiratory care, transport medicine, anesthesiology, intensive care medicine, pathology, nuclear medicine, rehab and occupational medicine, or radiation oncology. *Primary*

Care is defined to include family care, general practice, geriatrics, or internal medicine when no other sub-specialty is listed. All other specialties are defined as *Medical Specialties,* including obstetrics and gynecology, following the conventions used by AHCCCS.

Type of Practice: The practice categories used from 1990-2012 were revised to be more internally consistent for the new electronic survey. Categories that were defined in terms of physician activity (e.g. semi-retired; locum tenens) were replaced by categories representing the type of practice/organization in which physicians work (e.g. solo practice, physician owned group practice). New questions were created to measure physicians' activities. Thus, some data prior to March 2012 are not strictly comparable to data collected subsequently.

A serious problem with the reporting software in 2009-2011 required estimating utilization rates from the paper surveys to the electronic survey data. The paper surveys represented a substantial portion of the total responses at that time, but the potential agreement between the paper and electronic results could not be validated. The overall results for that period can be interpreted with a reasonable level of confidence, but the results for some individual characteristics are subject to uncertainty.

Survey Sample vs. Population Estimates

Surveys typically begin by selecting some percentage of the group at interest. So, for example, the sample drawn to represent a target population of 1,000 persons might select 20% of the group or 200 persons to whom surveys would be sent. A successful survey would get responses from 60% of the sample or 120 persons. We offer the opportunity to each physician to participate in the survey rather than drawing a sample. More than 5,300 physicians in active practice in Arizona participated in the survey, providing a much larger database than would have been obtained by sampling. The 2014 NAMCS survey results, for example, include 2,179 physicians, representing hundreds of thousands of office-based physicians in the United States.

The final test of any survey is the extent to which the characteristics of the survey respondents match the characteristics of members of the target population.

Non-Response Bias

Because the licensing data include all respondents and non-respondents, it permits a unique comparison of the respondents to non-respondents. This opportunity is limited in most surveys to comparisons between persons in the survey sample and respondents since specific information on the total target population is not available.

The data in Table A-1 show no significant differences in between respondents and non-respondents by sex; physicians in the youngest and oldest age groups are less likely to have responded to the survey while physicians ages 45-54 are slightly overrepresented among respondents. Primary care and hospital-based physicians are slightly overrepresented while medical specialists and surgical specialists are very slightly under represented among the respondents. Geographically, physicians in Pima County are underrepresented but there are no significant differences for physicians in Maricopa or rural Counties. Although statistically significant, many of the absolute differences are quite small. The results should be interpreted with these limitations in mind.

Effectively, the most likely impact of significant differences in response rates will be on those sets of results that rely on variables specifically affected by the differences. Thus, for example, results that rely on comparisons among ages will be affected by the differential response rates among age groups that have been described.

Table A - 1. Comparison of Respondents to Non-Respondents, 2016-2018

Characteristic	*Respondents (N =5,350)*		*Non-Respondents (N = 11,669)*		*P-Value*
Sex					
Female	1,663	31.0%	3,598	30.8%	NS
Male	3,555	66.4%	7,757	66.4%	NS
Total	5,218	97.5%	11,355	97.3%	
Age Group					
25 - 34	556	10.3%	1,215	10.4%	NS
35 - 44	1,609	30.0%	2,931	25.1%	<0.01
45 - 54	1,454	27.1%	2,982	25.5%	<0.05
55 - 64	1,135	21.2%	2,662	22.8%	<0.05
65+	596	11.1%	1,878	16.0%	<0.01
Total	5,350	100.0%	11,668	99.9%	
Specialty					
Primary Care	2,062	38.5%	3,963	33.9%	<0.01
Medical	1,143	21.3%	2,776	23.7%	<0.01
Hospital-Based	1,222	22.8%	2,613	22.3%	NS
Pediatric	456	8.5%	1,051	9.0%	NS
Surgical	448	8.3%	1,245	10.6%	<0.01
Total	5,331	99.6%	11,648	99.8%	
Location					
Maricopa County	3,419	63.9%	7,367	63.1%	NS
Pima County	888	16.5%	2,114	18.1%	<0.05
All Other Counties	1,043	19.4%	2,188	18.7%	NS
Total	5,350	100.0%	11,669	100.0%	

Source: AMB, ABOE Administrative/Survey Data, April 2016-March 2018 retired and semi-retired physicians.

Note: A p-value of .05 or less implies only a 5% probability of declaring the relationship significant when in fact it is not. NS = no significant difference. Gender was unknown for 132 (2.4%) respondents and 314 (2.6%) non-respondents. Age was unknown for 1 (0.0%) non-respondents. Specialty was unknown for 19 (0.3%) respondents and 21 (0.1%) non-respondents.

Old Survey Instrument (2012-2015)

Since 1991, the Arizona Physician Survey has, with the cooperation of physicians, their licensing boards and their professional associations, collected important information on the physician workforce. The current survey focuses on the use of medical records that are electronic (often called electronic medical records (EMRs) or electronic health records (EHRs)). Your participation is encouraged by the *Arizona Medical Association* and the *Arizona Osteopathic Medical Association*. Your answers are confidential and results are published only in aggregate form.

1. Which one of the following **best** describes your employment status ?(check one)
    a. Actively employed in Arizona in direct patient care ☐Yes ☐No {if yes ask:}
        i. I usually treat _____patients in a typical work week.
        ii. I usually work _____hours/day, _____days/week, and _____weeks/year.
    b. Actively employed in Arizona but not in direct patient care ☐Yes ☐No
    c. Actively employed outside of Arizona ☐Yes ☐No {*skip to separate survey questions*}
    d. Semi-retired/on leave ☐Yes ☐No *{go to end fill all intermediate questions with DNA}*
    e. Retired ☐Yes ☐No {go to end fill all intermediate questions with DNA}

2. Which one of the following **best** describes the organization in which you practice
    a. a physician owned solo practice ☐Yes ☐No *{if yes, auto fill 3a=yes; skip to 4}*
    b. A physician owned group practice ☐Yes ☐No
    {if yes then ask}
        i. Approximately how many physicians are associated with this practice?
            1. 2-5 physicians ☐Yes ☐No
            2. 6-50 physicians ☐Yes ☐No
            3. 51-94 physicians ☐Yes ☐No
            4. 95 or more physicians ☐Yes ☐No
    c. A hospital or medical school physician group practice ☐Yes ☐No
    if yes then ask}
        i. Approximately how many physicians are associated with this practice?
            1. 2-5 physicians ☐Yes ☐No
            2. 6-50 physicians ☐Yes ☐No o
            3. 51-94 physicians ☐Yes ☐No
            4. 95 or more physicians ☐Yes ☐No
    d. A community or rural health center(e.g. federally qualified CHC) ☐Yes ☐No
    {if yes then ask}
        i. Approximately how many physicians are associated with this center?
            1. 2-5 physicians ☐Yes ☐No
            2. 6-50 physicians ☐Yes ☐No
            3. 51-94 physicians ☐Yes ☐No
            4. 95 or more physicians ☐Yes ☐No
    e. Federal Government hospital or clinic (e.g. VA, IHS etc.) ☐Yes ☐No { *if yes skip to 5}*
    f. State or County hospital system ☐Yes ☐No *if yes skip to 4}*
    g. Private Hospital system ☐Yes ☐No
    h. Private Outpatient Facility not part of a hospital system (e.g. Urgent Care center, insurer owned clinic, etc.) ☐Yes ☐No

{if yes then ask}

i. Approximately how many physicians are associated with this facility?
   1. 2-5 physicians ☐Yes ☐No
   2. 6-50 physicians ☐Yes ☐No
   3. 51-94 physicians ☐Yes ☐No
   4. 95 or more physicians ☐ Yes ☐ No

i. Medical school ,university, research center ☐ Yes ☐ No

j. Public or private health Insurer, pharmaceutical company or other health related organization that does not provide care. ☐ Yes ☐ No *{if yes then skip to end; auto code intermediate questions as DNA}*

k. Other_____

3. Which of the following **best** describes your primary role in the organization in which you practice? *{(if 2d=yes or 2e=yes or 2f=yes) then set 3b=yes)}*
   a. Owner , partner, part-owner ☐ Yes ☐ No
      {if yes then ask}
      i. Approximately how many of each of the following providers are associated with this practice?
         1. ____ PAs
         2. ____RNs
         3. ____NPs
         4. ____Other Licensed Health Care Providers
   b. Employee/contractor/locum tenens ☐ Yes ☐ No
   c. Faculty ☐ Yes ☐ No
   d. Student (include residents, fellows etc.) ☐ Yes ☐ No

4. Which of the following are available at your practice location? (check all that apply)
   a. Email ☐ Yes ☐ No
   b. Internet (FTP etc.) ☐ Yes ☐ No
   c. Fax ☐ Yes ☐ No
   d. US Mail ☐ Yes ☐ No
   e. Don't know ☐ Yes ☐ No

5. How does the organization in which you practice submit bills/claims to insurers or other payers? (check all that apply)
   a. Email ☐ Yes ☐ No
   b. Internet (FTP etc.) ☐ Yes ☐ No
   c. Fax ☐ Yes ☐ No
   d. US Mail ☐ Yes ☐ No
   e. Don't know ☐ Yes ☐ No

6. How does the organization in which you practice store its medical records? (Check all that apply);
   a. Paper ☐ Yes ☐ No
   b. Scanned images of paper records ☐ Yes ☐ No
   c. Electronic files (an electronic version of a patient's medical history, including progress notes, problems, medications and other information used in treatment.) ☐ Yes ☐ No *{if yes then ask}*
      i. What is the name of your EMR/EHR system

      Allscripts ☐ Yes ☐ No Aprima ☐ Yes ☐ No
      Amazing Charts ☐ Yes ☐ No Athena Health ☐ Yes ☐ No

GE Centricity ☐ Yes ☐ No
Cerner ☐ Yes ☐ No
CHARTCARE ☐ Yes ☐ No
eClinicalWorks ☐ Yes ☐ No
Epic ☐ Yes ☐ No
eMDs ☐ Yes ☐ No
Epic ☐ Yes ☐ No
GE ☐ Yes ☐ No
Greenway Medical ☐ Yes ☐ No
HealthPort ☐ Yes ☐ No
McKesson ☐ Yes ☐ No
Meditech ☐ Yes ☐ No
NextGen ☐ Yes ☐ No
Noteworthy ☐ Yes ☐ No
Office Practic.com ☐ Yes ☐ No
Sage ☐ Yes ☐ No
SOAP ware ☐ Yes ☐ No
Other_____ ☐ Yes ☐ No
Don't know ☐ Yes ☐ No

7. On a scale of 1 (awful) to 5 (outstanding), how would you rate your EMR/EHR system in terms of:
   a. Ease of use ☐1 ☐2 ☐3 ☐4 ☐5
   b. Effect on your productivity ☐1 ☐2 ☐3 ☐4 ☐5
   c. Effect on staff productivity ☐1 ☐2 ☐3 ☐4 ☐5
   d. Reliability ☐1 ☐2 ☐3 ☐4 ☐5
   e. Performance versus vendor's promises ☐1 ☐2 ☐3 ☐4 ☐5

8. *{if 6c=yes} then ask:* Does the EMR/EHR system include the following functions? (CHECK ALL THAT APPLY) *{if 6c ne yes then auto fill DNA and skip to 8}*

Functions	**Is the Function Included in the EMR?**	**Do You Use the Function?**	**Do you exchange this information using your EMR/EHR to organizations outside your practice?"**
Patient Care Summary	☐Yes ☐No ☐Don't Know {If yes then go to next row}	☐ Yes ☐ No	☐Yes ☐No ☐Don't Know
Prescriptions (e-prescribing)	☐ Yes ☐ No ☐ Don't Know {If yes then go to next row}	☐ Yes ☐ No	☐Yes ☐No ☐Don't Know
Lab Test Results	☐Yes ☐No ☐Don't Know {If yes then go to next row}	☐ Yes ☐ No	☐Yes ☐No ☐Don't Know
Reminders for Guideline Based Interventions	☐Yes ☐No ☐Don't Know {If yes then go to next row}	☐ Yes ☐ No	☐Yes ☐No ☐Don't Know
Public Health Reports: immunizations, notifiable diseases	☐Yes ☐No ☐Don't Know {If yes then go to next row}	☐ Yes ☐ No	☐Yes ☐No ☐Don't Know
Quality Metrics (HEDIS, AQA etc.)	☐Yes ☐No ☐Don't Know {If yes then go to next row}	☐ Yes ☐ No	☐Yes ☐No ☐Don't Know

9. {if 6c=yes and (3a=yes or 3b=yes or 3c=yes or 3d=yes) then ask}: Are you aware of the incentive payments from Medicare and Medicaid to physicians who adopt EMRs/EHRs that meet **meaningful use criteria**?

a. ☐ Yes ☐ No {if no skip to c}
b. Have you applied OR are you planning to apply for the meaningful use incentives offered by Medicare and Medicaid? Medicare ☐Yes ☐No Medicaid ☐Yes ☐ No {if both No *skip to c}*
c. Is your EMR/EHR vendor helping you to meet the **meaningful use criteria**?
   i. ☐ *Yes*
   ii. ☐ *No*
d. Are you aware of the support offered by the Arizona Regional Extension Center?
   i. ☐ *Yes :workin*g with them {go to wind up question}
   ii. ☐ Yes but not working with them at present
   iii. ☐ No

   If you would like more information on the Arizona Regional Extension Center you can contact them at 602-688-7200 or *her@azhec.org* Or
   Would you like us to submit a request with your name and address but not reveal any other information included on this survey? ☐ Yes ☐ No

{if (3a=yes then code 9ai=yes skip to wind up question); else ask:

10. Are you the person who would decide to purchase an EMR/EHR system?
    a. Sole decision maker ☐Yes ☐No
    b. Shared decision ☐Yes ☐No
    c. Decided by others ☐Yes ☐No
11. Are there plans for installing an EMR/EHR system in the future?
    a. ☐No
    b. ☐Don't know
    c. ☐Yes, in the next ☐6 months ☐7-12 months ☐more than 12 months
       i. {if yes}What system are you planning to install?

Allscripts ☐Yes ☐No	Greenway Medical ☐Yes ☐No
Amazing Charts ☐Yes ☐No	HealthPort ☐Yes ☐No
Aprima ☐Yes ☐No	McKesson ☐Yes ☐No
Athena Health ☐Yes ☐No	Meditech ☐Yes ☐No
Centricity ☐Yes ☐No	NextGen ☐Yes ☐No
Cerner ☐Yes ☐No	Noteworthy ☐Yes ☐No
CHARTCARE ☐Yes ☐No	Office Practic.com ☐Yes ☐No
eClinicalWorks ☐Yes ☐No	Sage ☐Yes ☐No
Epic ☐Yes ☐No	SOAP ware ☐Yes ☐No
eMDs ☐Yes ☐No	Other_____
GE Centricity ☐Yes ☐No	Don't Know ☐Yes ☐No

Thank you very much for providing a physician's evaluation of the use and value of electronic health records. Any additional comments are most welcome:

_____

SURVEY QUESTIONS FOR PHYSICIANS WITH AZ LICENSES WHO DO NOT PRACTICE IN ARIZONA

1. When did you leave Arizona?
   a. ☐ I left Arizona in _____,(year) or
   b. ☐ I have never practiced in Arizona

   c. ☐I serve patients in multiple states via Telemedicine
   d. ☐ Travel among states at different times of year
      The states in which I serve patients
      i. ☐include Arizona
      ii. ☐ do not include Arizona

Please rate the importance of *each of the following* as an influence on your choice to practice in your current country/state/territory rather than Arizona

Code #	Factor	Important	Not Important	Does Not Apply
1.	To be Closer to Family/Friends……..	☐	☐	☐
2.	Better Elementary/Secondary Schools	☐	☐	☐No school age kids
3.	Better Climate	☐	☐	☐
4.	Better salary/compensation/career opportunity	☐	☐	☐
5.	Unable to find a position in my field in Arizona	☐	☐	☐
6.	Lower Medical Malpractice Premiums	☐	☐	☐
7.	Career Opportunity for Spouse/Partner	☐	☐	☐No spouse/partner
8.	Better Lifestyle	☐	☐	☐
9.	Better Political Climate	☐	☐	☐
10.	Transferred by the Military	☐	☐	☐
11.	To continue training (residency, fellowship)	☐	☐	☐
14.	To Practice near my Residency location	☐	☐	☐
15.	Availability of Part-time Positions/Locum Tenens	☐	☐	☐
16.	Fulfill loan repayment obligation	☐	☐	☐
17.	If other important factor, specify_____			

_____

2. Are you planning to return to practice in Arizona?
   ☐Yes ☐No
   {if yes then ask}
   a. When do you plan to return?
      i. ☐Upon completion of postgraduate training
      ii. ☐In the next 5 years.
      iii. ☐Other
3. Which one of the following **best** describes the organization in which you practice?
   a. A physician owned solo practice ☐Yes ☐No *{if yes, auto fill 3a=yes; skip to 4};*
   b. A physician owned group practice ☐Yes ☐No
      {if yes then ask}
      i. Approximately how many physicians are associated with this group?
         1. 2-5 physicians ☐Yes ☐No
         2. 6-50 physicians ☐Yes ☐No
         3. 51-94 physicians ☐Yes ☐No
         4. 95 or more physicians ☐Yes ☐No
   c. A hospital or medical school physician group practice ☐Yes ☐No
      {if yes then ask}
      i. Approximately how many physicians are associated with this center?

1. 2-5 physicians ☐Yes ☐No
2. 6-50 physicians ☐Yes ☐No
3. 51-94 physicians ☐Yes ☐No
4. 95 or more physicians ☐Yes ☐No

d. A community or rural health center(e.g. federally qualified CHC) ☐Yes ☐No
{if yes then ask}
   i. Approximately how many physicians are associated with this center?
      1. 2-5 physicians ☐Yes ☐No
      2. 6-50 physicians ☐Yes ☐No
      3. 51-94 physicians ☐Yes ☐No
      4. 95 or more physicians ☐Yes ☐No

e. Federal Government hospital or clinic (e.g. VA, HIS etc.) ☐Yes ☐No { *if yes skip to 5}*
f. State or County hospital system ☐Yes ☐No {*if yes skip to 4}*
g. Private Hospital system ☐Yes ☐No
h. Private Outpatient Facility not part of a hospital system (e.g. Urgent Care center, insurer owned clinic,) ☐Yes ☐No
{if yes then ask}
   i. Approximately how many physicians are associated with this facility?
      1. 2-5 physicians ☐Yes ☐No
      2. 6-50 physicians ☐Yes ☐No
      3. 51-94 physicians ☐Yes ☐No
      4. 95 or more physicians ☐Yes ☐No

i. Medical school ,university, research center ☐Yes ☐No
j. Public or private health Insurer, pharmaceutical company or other health related organization that does not provide care. ☐Yes ☐No *{if yes then skip to end; auto code intermediate q's as DNA}*
k. Other_____ ☐Yes ☐No

4. Which of the following **best** describes your primary role in the organization in which you practice? *{(if 5d=yes or 5e=yes or 5f=yes) then set 6a=yes)}*
   a. Owner, partner, part-owner ☐Yes ☐No
   {if yes then ask}
      i. Approximately how many of each of the following providers are associated with this practice:
         1. ____PAs
         2. ____RNs
         3. ____NPs
         4. ____Other licensed health care providers
      ii. Employee/contractor/locum tenens ☐Yes ☐No
      iii. Faculty ☐Yes ☐No
      iv. Student (include residents, fellows etc.) ☐Yes ☐No

5. Which of the following are available at your practice location? (check all that apply)
   a. Email ☐Yes ☐No
   b. Internet (FTP etc.) ☐Yes ☐No
   c. Fax ☐Yes ☐No
   d. US Mail ☐Yes ☐No
   e. Don't Know ☐Yes ☐No

6. How does the organization in which you practice submit bills/claims to insurers or other payers? (check all that apply)
   a. Email ☐Yes ☐No
   b. Internet (FTP etc.) ☐Yes ☐No
   c. Fax ☐Yes ☐No
   d. US Mail ☐Yes ☐No
   e. Don't Know ☐Yes ☐No

7. How does the organization in which you practice store its medical records? (Check all that apply);

a. Paper ☐Yes ☐No
b. Scanned images of paper records ☐Yes ☐No
c. Electronic files (an electronic version of a patient's medical history, including progress notes, problems, medications and other information used in treatment.) ☐Yes ☐No
{if yes then ask}
    i. What is the name of your EMR/EHR system*?*
        1. Allscripts ☐Yes ☐ No
        2. Amazing Charts ☐ Yes ☐No
        3. Aprima ☐Yes ☐ No
        4. Athena Health ☐ Yes ☐No
        5. Centricity ☐Yes ☐No
        6. Cerner ☐Yes ☐ No
        7. CHARTCARE ☐ Yes ☐No
        8. eClinicalWorks ☐ Yes ☐No
        9. Epic ☐Yes ☐No
        10. eMDs ☐Yes ☐No
        11. GE ☐Yes ☐No
        12. Greenway Medical ☐Yes ☐No
        13. HealthPort ☐Yes ☐No
        14. McKesson ☐Yes ☐No
        15. Meditech ☐Yes ☐ No
        16. NextGen ☐Yes ☐ No
        17. Noteworthy ☐Yes ☐No
        18. Office Practic.com ☐Yes ☐No
        19. Sage ☐Yes ☐No
        20. SOAP ware ☐Yes ☐No
        21. Other_____ _____ ☐Yes ☐ No
        22. Don't Know ☐Yes ☐No

8. On a scale of 1 (awful) to 5 (outstanding), how would you rate your EMR/HER system in terms of:
    a. Ease of use ☐1 ☐2 ☐3 ☐4 ☐5
    b. Effect on your productivity ☐1 ☐2 ☐3 ☐4 ☐5
    c. Effect on staff productivity ☐1 ☐2 ☐3 ☐4 ☐5
    d. Reliability ☐1 ☐2 ☐3 ☐4 ☐5
    e. Performance versus vendor's promises ☐1 ☐2 ☐3 ☐4 ☐5

Thank you very much for providing valuable insights into physicians' choice of practice locations and the use and value of electronic health records. Any additional comments are most welcome:

_____

New Survey Instrument (April 2015-)

Since 1991, the Arizona Physician Survey has, with the cooperation of physicians, their licensing boards and their professional associations, collected important information on the physician workforce. The current survey focuses on the use of medical records that are electronic (often called electronic medical records (EMRs) or electronic health records (EHRs). Your participation is encouraged by the ***Arizona Medical Association*** and the ***Arizona Osteopathic Medical Association***. The survey includes an opportunity for you to express your opinions on the benefits and limitations of EMRs. Your answers are confidential and results are published only in aggregate form.

1. Which one of the following **best** describes your employment status? **(check one)**

a) Actively employed in Arizona in direct patient care ☐ *{if checked ask:}*
   i. I usually treat _____patients in a typical work week.
   ii. I usually work _____hours/day, _____days/week, and _____weeks/year.

b) Provide telemedicine services to Arizona patients ☐

c) Actively employed in Arizona but not in direct patient care ☐

d) Actively employed outside of Arizona ☐ *{if checked skip to separate survey questions for out of state physicians*}

e) Retired/ Semi-retired/on leave ☐ *{if checked go to end fill all intermediate questions with DNA}*

2. Have you joined a different organization since your last licensing application?
☐ Yes ☐ No *{if yes, go to 3}*

3. Which one of the following **best** describes the organization in which you practice

a) ☐A physician owned solo practice *{if checked, skip to 4 d);*

b) ☐A physician owned group practice
   i. Approximately how many physicians are associated with this organization? [check one]
      i. 2-5 physicians ☐
      ii. 6-50 physicians ☐
      iii. 51-94 physicians ☐
      iv. 95 or more physicians ☐

c) ☐A hospital or medical school physician group practice ☐
   i. Approximately how many physicians are associated with this organization? [check one]
      i. 2-5 physicians ☐
      ii. 6-50 physicians ☐
      iii. 51-94 physician ☐
      iv. 95 or more physicians ☐

d) ☐A community or rural health center(e.g. federally qualified CHC) ☐
   i. Approximately how many physicians are associated with this organization? [check one]

i. 2-5 physicians ☐
ii. 6-50 physicians ☐
iii. 51-94 physician ☐
iv. 95 or more physicians ☐

e) ☐ Private Outpatient Facility not part of a hospital system (e.g. Urgent Care center, insurer owned clinic, etc.)

i. Approximately how many physicians are associated with this organization? [check one]

i. 2-5 physicians ☐
ii. 6-50 physicians ☐
iii. 51-94 physician ☐
iv. 95 or more physicians ☐

{*if 3f or 3g or 3h or 3i or 3j checked, then check 4a) and ask 6}*

f) ☐ Federal Government hospital or clinic (e.g. VA, IHS)
g) ☐ City, State or County clinic or hospital
h) ☐ Private For Profit Hospital system
i) ☐ Private Not for Profit Hospital System
j) ☐ Public or private health Insurer, pharmaceutical company or other health related organization that does **not** provide care. ☐ Medical school ,university, research center
k) ☐ Independent Consultant
l) ☐ Public Health Agency or Department *{if checked then check 4 a) & skip to 17; auto code intermediate questions as DNA}*
m) ☐ Other_____

4. Which of the following **best** describes your primary role in the organization in which you practice? **Please Check Only One Box**

a) ☐ Employee/contractor/locum tenens
b) ☐ Faculty
c) ☐ Student (include residents, fellows etc.)
d) ☐ Owner , partner, partner, part-owner *{if checked then ask}*

5. Are you the person who decides or would decide to purchase or replace an EMR/EHR system?

a) ☐ Sole decision maker
b) ☐ Shared decision
c) ☐ Decided by others

6. How does the organization in which you practice store its medical records**? (Please answer Yes or No to <u>each part</u> a, b, c)**

a) Paper ☐ Yes ☐ No
b) Scanned images of paper records ☐ Yes ☐ No

c) Electronic files (an electronic version of a patient's medical history, including progress notes, diagnosis, medications and other information used in treatment.)

☐ Yes ☐ No

{*if 6 c) checked no, skip to 11; code 6 c) i, ii, iii, iv, v and 7 (all parts) and 8 (all parts) as DNA; if yes, continue}*

i. What is the name of your current EMR/EHR system **Please check only one box**

1. ☐ ADP AdvancedMD
2. ☐ ALERT
3. ☐ Allscripts
4. ☐ AltaPoint
5. ☐ Amazing Charts
6. ☐ Aprima
7. ☐ Artemis/digiChart
8. ☐ Athena Health
9. ☐ Avatar
10. ☐ Cerner
11. ☐ Chart Logic
12. ☐ Chart Source
13. ☐ ClaimTrak
14. ☐ eClinicalWorks
15. ☐ Empower
16. ☐ Epic
17. ☐ eMDs
18. ☐ GE Centricity
19. ☐ Glo Stream
20. ☐ gMed/gGastro
21. ☐ Greenway Medical
22. ☐ HealthPort
23. ☐ MacPractice
24. ☐ McKesson
25. ☐ Medhost/HMS HealthTech/ PatientLogic
26. ☐ Meditech
27. ☐ NextGen
28. ☐ Noteworthy
29. ☐ Office Ally
30. ☐ Office Practice
31. ☐ Optum/CareTracker
32. ☐ Picis
33. ☐ Practice Fusion
34. ☐ Sage
35. ☐ SOAP ware
36. ☐ Sunrise
37. ☐ Other_____ (**please insert name**)
38. ☐ Don't Know

ii. On a scale of 1 (awful) to 5 (outstanding), how would you rate your EMR/EHR system in terms of:

a. Ease of use	☐1	☐2	☐3	☐4	☐5
b. Effect on your productivity	☐1	☐2	☐3	☐4	☐5
c. Effect on staff productivity	☐1	☐2	☐3	☐4	☐5
d. Effect on patient satisfaction	☐1	☐2	☐3	☐4	☐5
e. Reliability	☐1	☐2	☐3	☐4	☐5
f. Performance versus vendor's promises	☐1	☐2	☐3	☐4	☐5

iii. Do you have a scribe enter the data while you examine and communicate with the patient? ☐ Yes ☐ No

iv. In approximately what year did you first use your current electronic medical record?

☐Before 2005	☐2009	☐2013
☐2006	☐2010	☐2014
☐2007	☐2011	
☐2008	☐2012	

1. Was this a replacement for a different brand of electronic medical record? ☐ Yes {go to a} ☐ No ☐ Don't Know

7. Does your EMR/EHR system include the following functions? **(CHECK ALL THAT APPLY)**

Functions	**7 a) Is the Function Included in the EMR?**	**7 b) Do You Use the Function?**	**7 c) Do you exchange this information using your EMR/EHR to organizations outside your practice or the hospital system in which you practice?"**
i. Patient Care Summary	☐Yes ☐No ☐ Don't Know *{If ne yes set 7 b)i and 7 c) i equal No; then go to 7 a) ii else continue}*	☐ Yes ☐ No *{if No set 7 c) i to no and go to 7 a) ii}*	☐Yes ☐No ☐Don't Know *{if ne yes, go to 7 a) ii f yes then ask*: *A Health Information Exchange (HIE) an organization that provides for the electronic exchange of health information according to nationally recognized standards}* 7 c)-1: I exchange the information by ☐ email ☐ a health information exchange Other _____
ii.Prescriptions (e-prescribing)	☐ Yes ☐ No ☐ Don't Know *{If ne yes set 7 b)ii and 7 c) ii equal No then go to 7 a) iii else continue* }	☐ Yes ☐ No *{if No set 7 c) ii to no and go to 7 a) iii}*	☐Yes ☐No ☐Don't Know *{if ne yes, go to 7 a) iii if yes then ask* : *A Health Information Exchange (HIE) an organization that provides for the electronic exchange of health information according to nationally recognized standards}* 7 c)-2: I exchange the information by ☐ email ☐ a health information exchange Other _____
iii. Lab Test Results	☐Yes ☐No ☐ Don't Know *{If ne yes set 7 b)iii and 7 c) iii equal No; then go to 7a) iv else continue }*	☐ Yes ☐ No *{if No set 7 c) iii to no and go to 7 a) iv}*	☐Yes ☐No ☐Don't Know *{if ne yes, go to 7 a) iv. if yes then ask* : *A Health Information Exchange (HIE) an organization that provides for the electronic exchange of health information according to nationally recognized standards}* 7 c)-3: I exchange the information by ☐ email ☐ a health information exchange Other _____
iv. Reminders for Guideline Based Interventions	☐Yes ☐No ☐ Don't Know *{If ne yes set 7 b)ii and 7 c) iv equal No then go to 7 a) v else continue }*	☐ Yes ☐ No *{if No set 7 c) iv to no and go to 7 a) v}*	☐Yes ☐No ☐Don't Know *{if ne yes, go to 7a) v. if yes then ask*: *A Health Information Exchange (HIE) an organization that provides for the electronic exchange of health information according to nationally recognized standards }* 7 c)-4 : I exchange the information by ☐ email ☐ a health information exchange Other _____

v. Public Health Reports: immunizations, notifiable diseases	☐Yes ☐No ☐ Don't Know *{If ne yes set 7 b)v and 7 c) v equal No; then go to 8 else continue }*	☐ Yes ☐ No *{if No set 7 c) v to no and go to 8}*	☐Yes ☐No ☐Don't Know *{if ne yes, go to 8 if yes then ask: A Health Information Exchange (HIE) an organization that provides for the electronic exchange of health information according to nationally recognized standards}* 7 c)-5: I exchange the information by ☐ email ☐ a health information exchange Other _____

8. In your opinion, what are the most important obstacles to exchanging clinical information with other health care providers electronically (not fax)? (check all that apply)

a) ☐ Lack of a health information exchange
b) ☐ Concerns with maintaining patient confidentiality
c) ☐ Lack of technological support for problems
d) ☐ Cost
e) ☐ Other_____

☐ No

{Note: the next question is the first question to be answered by physicians without EMRs after they answer question #6)

9. Does the organization in which you practice plan to install an EMR/EHR system?

a) ☐ No *{go to 15}*
b) ☐ Yes, in the next:
i. ☐6 months ☐7-12 months ☐more than 12 months ☐Don't know the timing

c) What systems are you considering (check all that apply)?

1. ☐ ADP AdvancedMD
2. ☐ ALERT
3. ☐ Allscripts
4. ☐ AltaPoint
5. ☐ Amazing Charts
6. ☐ Aprima
7. ☐ Artemis/digiChart
8. ☐ Athena Health
9. ☐ Avatar
10. ☐ Cerner
11. ☐ Chart Logic
12. ☐ Chart Source
13. ☐ ClaimTrak
14. ☐ eClinicalWorks
15. ☐ Empower
16. ☐ Epic
17. ☐ eMDs
18. ☐ GE Centricity
19. ☐ Glo Stream
20. ☐ gMed/gGastro
21. ☐ Greenway Medical
22. ☐ HealthPort
23. ☐ MacPractice
24. ☐ McKesson
25. ☐ Medhost/HMS HealthTech/ PatientLogic
26. ☐ Meditech
27. ☐ NextGen
28. ☐ Noteworthy
29. ☐ Office Ally
30. ☐ Office Practice
31. ☐ Optum/CareTracker
32. ☐ Picis
33. ☐ Practice Fusion
34. ☐ Sage
35. ☐ SOAP ware
36. ☐ Sunrise
37. ☐ Other_____ (**please insert name**)
38. ☐ Don't Know

10. Which of the following factors influenced your practice's decision to acquire an EHR? **Check all that apply**.

a) ☐ Lower costs for implementation
b) ☐ Medicare based incentives
c) ☐ Medicaid based incentives
d) ☐ Clear direction on market leading vendors
e) ☐ Easily customizable systems to fit our needs
f) ☐ Cost effective access to EMR training
g) ☐ Ease of integration with our legacy systems
h) ☐ Low learning curve
i) ☐ Agreed upon and published industry standards for EMRs
j) ☐ Confidence in security and privacy of the system
k) ☐ Access to technical resources to support the system
l) ☐ Other (please specify) _____

11. In what ways do you use information from **EMRs**?

a. ☐ Population health management {if checked ask i)
   i. Do you have a separate vendor for population management
b. ☐ Tracking contagious diseases/infections
c. ☐ Outreach to patients based on analysis of EMR data
d. ☐ Evaluating appropriate utilization of care
e. ☐ Analyzing costs or cost effectiveness of care
f. ☐ Post market analysis of side effects of pharmaceuticals
g. ☐ Other_____

12. In what ways do you use information from **Claims Data**?

h. ☐ Population health management
i. ☐ Tracking contagious diseases/infections
j. ☐ Outreach to patients based on analysis of claims data
k. ☐ Evaluating appropriate utilization of care
l. ☐ Analyzing costs or cost effectiveness of care
m. ☐ Post market analysis of side effects of pharmaceuticals
n. ☐ Other_____

13. Please enter any comments that you would like to contribute.

Thank you very much for helping to create an accurate description of how practicing physicians use and rank electronic medical records.

THIS SECTION APPLIES TO PHYSICIANS WITH AZ LICENSES WHO DO NOT PRACTICE IN AZ

{Variable names should indicate that they apply to out of state physicians}

1. When did you leave Arizona?
   a. ☐ I left Arizona in _____,(year) or
   b. ☐ I have never practiced in Arizona

2. I serve patients in multiple states ☐Yes (if yes, check all that apply) ☐No (go to 3)
   a. ☐Telemedicine
   b. ☐Travel among states at different times of year
   c. The states in which I serve patients
      i. ☐include Arizona
      ii. ☐ do not include Arizona

3. Please rate the importance of *each of the following* as an influence on your choice to practice in your current country/state/territory rather than Arizona

		Important	Not Important	Not Applicable
a.	☐ To be Closer to Family/Friends……..	☐	☐	☐
b.	☐ Better Elementary/Secondary Schools	☐	☐	☐
c.	☐ Better Climate	☐	☐	☐
d.	☐ Better salary/compensation/career opportunity	☐	☐	☐
e.	☐ Unable to find a position in my field in Arizona	☐	☐	☐
f.	☐ Lower Medical Malpractice Premiums	☐	☐	☐
g.	☐ Career Opportunity for Spouse/Partner	☐	☐	☐
h.	☐ Better Lifestyle	☐	☐	☐
i.	☐ Better Political Climate	☐	☐	☐
j.	☐ Transferred by the Military	☐	☐	☐
k.	☐ To continue training (residency, fellowship)	☐	☐	☐
l.	☐ To Practice near my Residency location	☐	☐	☐
m.	☐ Availability of Part-time Positions/Locum Tenens	☐	☐	☐
n.	☐ Fulfill loan repayment obligation	☐	☐	☐

o. If other important factor,
specify_____

4. Which of the influences that you checked in #3 was the most important reason for practicing outside of Arizona? (please check only one)

   a. ☐ To be Closer to Family/Friends
   b. ☐ . Better Elementary/Secondary Schools
   c. ☐ . Better Climate
   d. ☐ . Better salary/compensation/career opportunity
   e. ☐ Unable to find a position in my field in Arizona
   f. ☐ . Lower Medical Malpractice Premiums
   g. ☐ . Career Opportunity for Spouse/Partner
   h. ☐ . Better Lifestyle
   i. ☐ . Better Political Climate
   j. ☐ . Transferred by the Military
   k. ☐ . To continue training (residency, fellowship)
   l. ☐ . To Practice near my Residency location
   m. ☐ . Availability of Part-time Positions/Locum Tenens
   n. ☐ . Fulfill loan repayment obligation
   o. ☐ Other important factor

5. Are you planning to return to practice in Arizona?
   a. ☐ Definitely yes
      i. When do you plan to return?
         1. ☐ Upon completion of postgraduate training
         2. ☐ In the next 5 years.
         3. ☐ Other(SPECIFY)_____
   b. ☐ Maybe
   c. ☐ Definitely no

6. In your opinion, what changes would make Arizona more attractive to physicians as a place in which to practice?

_____

Appendix B: CHiR Health Care Workforce Reports and Articles

Johnson, WG, Butler RJ, Harootunian G. (June 2018) Mixing Electronic and Non-Electronic Health Records Limits Physician Productivity - The Arizona Experience. *European Journal for Biomedical Informatics* 14 (3): 9-16.

Johnson WG, Harootunian G, Sama TL, Kommareddy S. (September 2017). *Physicians' use, exchange, and evaluation of electronic medical records 2015-2017*. Phoenix (AZ): Arizona State University, Center for Health Information & Research.

Johnson WG, Harootunian G, Jongsuksawas A, Kommareddy S, Sama TL. (July 2017). *Arizona's Primary Healthcare Workforce 2008-2016*. Phoenix (AZ): Center for Health Information & Research.

Johnson WG, Harootunian G, Sama TL, Dhandapani AK. (September 2016). *Physicians' use, exchange, and evaluation of electronic medical records 2015-2016*. Phoenix (AZ): Arizona State University, Center for Health Information & Research.

Butler RJ, Johnson WG. (September 2016). Rating the digital help: electronic medical records, software providers, and physicians. *Int J Health Econ Manag.* 1-15. doi:10.1007/s10754-016-9190-8.

Johnson WG, Butler R, Harootunian G, Wilson B, Linan M. (July 2016). Registered nurses: the curious case of a persistent shortage. *Journal of Nursing Scholarship.* 48:387–396. doi: 10.1111/jnu.12218.

Johnson WG, Harootunian G, Sama TL, Sivanandam S. (September 2015). *Physicians' use, exchange, and evaluation of electronic medical records 2013-2015*. Phoenix (AZ): Arizona State University, Center for Health Information & Research.

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Johnson WG, Harootunian G. (December 2012). W*hat Happened to the Shortage of Registered Nurses: The Arizona Experience 2008-2012.* (Prepared under contract for the Arizona Hospital and Healthcare Association.) Phoenix (AZ): Arizona State University, Center for Health Information & Research.

Johnson WG, Harootunian G, Sama TL. (July 2012). *The use of electronic medical records and physicians' attitudes toward a health information exchange*. Phoenix (AZ): Arizona State University, Center for Health Information & Research.

Johnson WG, Qiu Y, Harootunian G, Edge M. (2010). *The use of electronic medical records and physicians' attitudes towards a health information exchange.* Phoenix (AZ): Arizona State University, Center for Health Information & Research.

Qiu Y, Johnson WG. (August 2009). *Arizona primary care workforce report*. Phoenix (AZ): Center for Health Information & Research, Arizona State University.

Wilson BL, Johnson WG. (July/August 2009). Using innovation to assess nursing workforce in Arizona: a collaborative approach. *Nursing Economics.* 27(4):233-238.

Johnson WG, Wilson BL, Edge M, Qiu Y, Oliver EL, Russell KM. (April 2009). *The Arizona health care workforce: nurses, pharmacists, & physician assistants.* (Prepared under contract with the Arizona Hospital and Healthcare Association.) Phoenix, AZ: Center for Health Information & Research.

Johnson WG, Bannister WM, Russell KM, Edge M, Gray H, Merritt R. (June 2008). *Arizona physician trends: reasons for leaving Arizona*. Phoenix (AZ): Arizona State University, Center for Health Information & Research.

Friedman AL, Basco WT, Hotaling AJ, Pletcher BA, Rimsza ME, Shipman SA, et al. (2007). Enhancing the diversity of the pediatrician workforce. *Pediatrics.* 119(4):833-7. PMID: 17403859.

Furukawa MF, Ketcham JD, Rimsza ME. (2007). Physician practice revenues and use of information technology in patient care. *Medical Care.* 45(2):168-76. PMID: 17224780.

Rimsza ME, Johnson WG, Speicher M, Grossman M. (2006) *The Arizona physician workforce study: part II*. Tempe (AZ): Arizona State University, Center for Health Information and Research.

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Johnson WG, Rimsza ME, Garcy AM, Grossman M. (2005) *The Arizona physician workforce study - part I: the numbers of practicing physicians 1992-2004.* Tempe (AZ): Arizona State University, Center for Health Information and Research.

Johnson WG, Ptak BA, Casper K, Madsen B. (March 1996). The survey of physicians in residencies in Arizona academic year 1993-1994: a report to the Arizona Council for Graduate Medical Education. Tempe (AZ): Arizona State University.

Johnson WG, Meenan RT, Klett D, Ott J, Liddon M, Schneller ES. (1994). *The 1992 survey of physicians: a report to the Arizona Council for Graduate Medical Education*. Tempe (AZ): Arizona State University.

Johnson WG, Meenan RT, Preuss N, Schneller ES. (1993). The survey of medical residents: a report to the Arizona Council for Graduate Medical Education. Tempe (AZ): Arizona State University.

Schneller ES, Preuss N, Johnson WG, Klett D. (1993). The survey of medical residency programs: a report to the Arizona Council for Graduate Medical Education. Tempe (AZ): Arizona State University.

Appendix C: Evaluations of EMRs by Vendor

Table C - 1. All Physicians' Summary Rankings of EMR Vendors, 2016-2018

Vendor	*Total Weighted Average Rank*	*Ease of Use N = 3,458*	*Physician Productivity N = 3,454*	*Staff Productivity N = 3,409*	*Reliability N = 3,438*	*Performance vs. Promise N = 3,034*	*Total Responses N = 3,461*
ADP AdvancedMD	3.4	3.3	2.9	3.4	3.8	3.4	19
AHLTA	2.5	2.8	2.4	2.4	2.3	2	9
ALERT	1.8	1	1	1	3	2	1
Allscripts	3.1	3.2	2.9	3	3.3	3	284
AltaPoint	3.6	3	4	4	4	.	1
Amazing Charts	3.7	4.1	3.4	3.7	3.9	3.7	30
Aprima	3.4	3.7	3.3	3.5	3.5	3.3	31
ARIA	4	4.1	3.9	3.9	4.3	4.1	7
Athena Health	3.8	4	3.5	3.7	4.2	3.8	127
Avatar	2.5	3	2.1	2.3	2.7	1.8	7
Centricity	3.5	3.6	3.3	3.4	3.6	3.5	74
Cerner	3.1	3.2	2.9	2.8	3.4	3	1,001
Chart Logic	2.9	3	3.2	3.2	2.8	2.8	5
CHARTCARE	3	3	3	3	3	3	1
ClaimTrak	2.2	2.5	2.1	1.9	2.6	1.9	8
digiChart	3.7	4	3.7	3.6	3.9	3.6	9
DocuTAB	3.8	4	4	4	3.4	3.3	5
EBIO	2.7	3	2	2	3	3	1
eClinicalWorks	3.6	3.8	3.4	3.6	3.9	3.6	250
EMA Modernizing	3.8	4.1	3.5	3.5	4.1	3.8	24
e-MDs	3.3	3.6	3.1	3.2	3.4	3.3	34
Empower	3.7	4	3	3	5	4	1
Epic	3.5	3.7	3.3	3.3	3.9	3.4	449
GE	3.9	3.9	3.7	4	3.9	3.7	7
GE Centricity	2.9	3.3	2.8	2.5	3.3	2.7	4
gMed/gGastro	4	4.2	4.1	4	4.2	3.7	19
Greenway Medical	3.2	3.3	2.9	3.2	3.4	3.1	78
Health Fusion	3.6	3.6	3.3	3.7	3.4	3.3	7
IC-Chart	5	5	5	5	5	5	2
IKnowMed	3.9	4	3.5	4	4	3.5	2
Indian Health Se	2.7	3	2.3	2.7	3	3	3
Intelligent Medi	3.7	3.8	3.6	3.8	3.8	3.6	5
MacPractice	3.5	3.9	3.5	3.3	3.6	3.6	8
McKesson	3.1	3.2	2.9	3	3.4	3	38
MEDHOST	2.8	3.2	2.6	2.5	2.9	2.7	27

Vendor	*Total Weighted Average Rank*	*Ease of Use N = 3,458*	*Physician Productivity N = 3,454*	*Staff Productivity N = 3,409*	*Reliability N = 3,438*	*Performance vs. Promise N = 3,034*	*Total Responses N = 3,461*
Medinformatix	4.3	4	4	4	5	4.5	2
Medinotes	3.2	3	3	3	4	3	1
Meditech	2.6	2.8	2.2	2.3	3.2	2.6	12
Modernizing Medi	3.3	3.5	3.3	3.3	3.4	3.3	8
NexTech	4.1	4.2	4	4	4.1	4.1	12
NextGen	2.9	3	2.6	2.8	3.2	2.8	221
Noteworthy	3.4	3.6	3.1	3.4	3.4	3.3	8
Office Ally	3.1	3.4	2.8	2.9	3.3	3.1	16
Office Practicum	3.6	3.6	3.2	3.7	3.5	3.7	17
ONCO	3.7	4	3.3	3.7	4.5	4	3
OptumInsight	3.2	3.3	2.9	3.2	3.5	3.1	18
Patient Now	3.2	3.7	3.3	3.3	3.3	2.3	3
Picis	3.6	3.9	3.4	3.3	3.7	3.8	9
Point N Click	4	4.7	3.8	4	4.3	3.8	6
Practice Fusion	3.7	4	3.3	3.5	3.9	3.9	75
Practice Partner	1.3	1	1	1	3	1	1
Praxis	3.6	3.3	3.8	3.3	3.8	3.8	4
PrognoCIS	2.3	2.7	2	2.3	2.7	2	3
Sage	3.6	3.7	3.3	3.4	4	3.7	20
SOAPware	3.2	3	2.8	2.8	3.5	3.8	4
SpringChart	4.6	4	4	5	5	5	1
Sunrise	2.6	2.8	2.3	2.3	2.9	2.2	13
Valant	3.8	3.9	3.7	3.9	3.8	4	9
VistA	3.2	3.3	2.8	2.9	3.5	3	38
Other	3.5	3.6	3.3	3.3	3.7	3.4	267
Don't Know	3.4	3.4	3.3	3.2	3.5	3.3	112
Average	3.3	3.4	3.1	3.1	3.6	3.2	

Source: AMB, ABOE Survey data, April 2016-March 2018.

Table C - 2. AHCCCS Physicians' Summary Rankings of EMR Vendors, 2016-2018

Vendor	*Total Weighted Average Rank*	*Ease of Use N = 3,171*	*Physician Productivity N = 3,167*	*Staff Productivity N = 3,128*	*Reliability N = 3,152*	*Performance vs. Promise N = 2,795*	*Total Respondents N = 3,174*
ADP AdvancedMD	3.4	3.3	2.9	3.4	3.8	3.4	19
AHLTA	2.3	2.6	2.2	2	2.4	1.7	5
ALERT	1.8	1	1	1	3	2	1
Allscripts	3.1	3.2	2.9	3	3.3	3	266
AltaPoint	3.6	3	4	4	4	.	1
Amazing Charts	3.7	4.1	3.4	3.7	3.9	3.8	29
Aprima	3.5	3.8	3.3	3.5	3.6	3.3	29
ARIA	4.1	4.2	4	4	4.3	4.2	6
Athena Health	3.8	4	3.5	3.7	4.2	3.8	119
Avatar	2.6	3.2	2.2	2.3	3	2	6
Centricity	3.5	3.6	3.3	3.4	3.6	3.5	72
Cerner	3.1	3.2	2.9	2.8	3.5	3	912
Chart Logic	2.9	3	3.2	3.2	2.8	2.8	5
CHARTCARE	3	3	3	3	3	3	1
ClaimTrak	2.2	2.5	2.1	1.9	2.6	1.9	8
digiChart	3.7	4	3.7	3.6	3.9	3.6	9
DocuTAB	3.8	4	4	4	3.4	3.3	5
EBIO	2.7	3	2	2	3	3	1
eClinicalWorks	3.6	3.8	3.4	3.6	3.9	3.6	235
EMA Modernizing	3.6	3.9	3.4	3.3	3.9	3.5	16
e-MDs	3.3	3.6	3.1	3.3	3.4	3.3	31
Empower	3.7	4	3	3	5	4	1
Epic	3.5	3.7	3.2	3.3	3.8	3.4	414
GE	3.9	3.9	3.7	4	3.9	3.7	7
GE Centricity	2.9	3.3	2.8	2.5	3.3	2.7	4
gMed/gGastro	4	4.2	4.1	4	4.2	3.7	19
Greenway Medical	3.2	3.3	2.9	3.2	3.4	3.1	76
Health Fusion	3.6	3.6	3.3	3.7	3.4	3.3	7
IC-Chart	5	5	5	5	5	5	2
IKnowMed	3.9	4	3.5	4	4	3.5	2
Indian Health Se	2.7	3	2.3	2.7	3	3	3
Intelligent Medi	3.7	3.8	3.6	3.8	3.8	3.6	5
MacPractice	3.7	3.9	3.9	3.6	3.4	3.7	7
McKesson	3.1	3.2	2.9	2.9	3.4	3	36
MEDHOST	2.8	3.2	2.6	2.5	2.9	2.7	26
Medinformatix	4.3	4	4	4	5	4.5	2
Medinotes	3.2	3	3	3	4	3	1
Meditech	2.6	2.8	2.2	2.3	3.2	2.6	11
Modernizing Medi	3.1	3.3	2.8	2.8	3.5	3	4
NexTech	4	4	3.8	3.8	4.1	4.1	8

Vendor	*Total Weighted Average Rank*	*Ease of Use N = 3,171*	*Physician Productivity N = 3,167*	*Staff Productivity N = 3,128*	*Reliability N = 3,152*	*Performance vs. Promise N = 2,795*	*Total Respondents N = 3,174*
NextGen	2.9	3	2.6	2.8	3.2	2.8	204
Noteworthy	3.4	3.6	3.1	3.4	3.4	3.3	8
Office Ally	3.1	3.4	2.8	2.9	3.3	3.1	16
Office Practicum	3.6	3.6	3.2	3.7	3.5	3.7	17
ONCO	3.7	4	3.3	3.7	4.5	4	3
OptumInsight	3.2	3.3	2.9	3.2	3.5	3.1	18
Patient Now	3.2	3.7	3.3	3.3	3.3	2.3	3
Picis	3.6	3.9	3.4	3.3	3.7	3.8	9
Point N Click	4	4.6	4	4	4.4	3.8	5
Practice Fusion	3.7	4	3.3	3.5	3.9	3.9	73
Practice Partner	1.3	1	1	1	3	1	1
Praxis	3.7	3.3	4	3.5	4	3.7	3
PrognoCIS	2.3	2.7	2	2.3	2.7	2	3
Sage	3.6	3.8	3.3	3.4	4.1	3.7	18
SOAPware	3.2	3	2.8	2.8	3.5	3.8	4
SpringChart	4.6	4	4	5	5	5	1
Sunrise	2.5	2.6	2.2	2.1	2.8	2.1	11
Valant	3.7	3.9	3.6	3.8	3.6	3.9	8
VistA	3.2	3.4	2.9	3	3.6	3.2	29
Other	3.5	3.7	3.4	3.4	3.8	3.5	230
Don't Know	3.3	3.4	3.2	3.2	3.4	3.3	99
Average	3.3	3.4	3.1	3.1	3.6	3.2	

Source: AMB, ABOE Survey data, April 2016-March 2018.

Table C - 3. Non-AHCCCS Physicians' Summary Rankings of EMR Vendors, 2016-2018

Vendor Name	*Total Weighted Average Rank*	*Ease of Use N = 287*	*Physician Productivity N = 287*	*Staff Productivity N = 281*	*Reliability N = 286*	*Performance vs. Promise N = 239*	*Total Responses N = 287*
AHLTA	2.8	3	2.8	3	2.3	2.3	4
Allscripts	2.8	2.8	2.5	2.7	3.1	2.7	18
Amazing Charts	3.3	4	3	3	4	3	1
Aprima	2.9	3.5	3	3	2	3	2
ARIA	3.5	4	3	3	4	4	1
Athena Health	3.5	3.6	3.6	3.5	3.4	3.7	8
Avatar	1.7	2	2	2	1	1	1
Centricity	3.2	3.5	3	3	3	3	2
Cerner	2.9	3	2.7	2.8	3.1	2.8	89
eClinicalWorks	3.4	3.5	3	3.4	3.7	3.4	15
EMA Modernizing	4.3	4.5	3.9	3.9	4.5	4.4	8
e-MDs	3.1	3.3	2.7	2.7	3.7	3.7	3
Epic	3.9	4.2	3.7	3.8	4.1	4	35
Greenway Medical	3.8	3.5	3.5	3.5	4	4	2
MacPractice	2.5	4	1	1	5	3	1
McKesson	3.4	3.5	3	4	3.5	.	2
MEDHOST	3.5	4	4	4	3	3	1
Meditech	2.6	3	2	2	3	3	1
Modernizing Medi	3.6	3.8	3.8	3.8	3.3	3.5	4
NexTech	4.3	4.5	4.5	4.5	4	4	4
NextGen	2.8	2.8	2.4	2.6	3.1	3.1	17
Point N Click	4	5	3	4	4	4	1
Practice Fusion	4	4	4	3.5	4	4	2
Praxis	3.2	3	3	3	3	4	1
Sage	3	3	3	3	3	4	2
Sunrise	3.4	3.5	3	3.5	3.5	3	2
Valant	4.3	4	4	5	5	5	1
VistA	2.9	3	2.7	2.7	3.2	2.4	9
Other	3.2	3.3	2.9	2.9	3.6	3.1	37
Don't Know	3.8	3.8	3.8	3.3	4.1	3.8	13
Average	3.2	3.4	3.0	3.1	3.4	3.2	

Source: AMB, ABOE Survey data, April 2016-March 2018.

Appendix D: Most Popular EMR Software Descriptions

Table D - 1. Intended Use of EMR Software for Most Popular Vendors

EMR Vendor	*Intended Use*
ACOM Health	Fully web-based chiropractic EHR that is HIPAA compliant and scalable.
ADP advancedmd	Complete cloud software for independent medical practices includes E-prescribing, clinical decision support, mobile application, and physician dashboard.
Advanced Data Systems Corporation	Separate EHR, practice management system or all-in-one with cloud access, streamlined workflow, patient portal, Stage 2 Meaningful Use Certified, ICD-10 compliant.
AllegianceMD	Web-based EHR, billing and practice management software incorporates artificial intelligence for a system that learns and includes E-prescribing, patient portal, e-lab, e-fax.
Allscripts	Open platform EHR caters to small to mid-size ambulatory and physician practices or large ambulatory and multispecialty practices to create a fully connected community.
Amazing Charts	For solo or multi-clinician practices; Includes office flow, charting, scheduling, messaging, E-prescribing, reporting, billing & templates.
Aprima	Transcription/dictation; E-prescribing; diagnosis & payer Info; electronic lab orders & results; patient portal; patient compliance alerts; Meaningful Use stage 2 certified.
Athena Health	Quality management for Meaningful Use, pay-for-performance; cloud-based full-service solution; interfaces w/pharmacies, hospitals, registries and HIEs.
CareCloud	Cloud-based EHR fully functional for physician and practice, customizable and scalable for nine specific specialties.
Care360	Complete web-based practice and enterprise solution that includes a stand-alone E-prescribing system, lab management, clinical decision support, and clinical encounter documentation.
Centricity	Caters to physician practices of all sizes; Fully interoperable; meets Meaningful Use; automated workflows; ICD-9/ICD-10 compatible; clinical decision support; E-prescribing.
Cerner	Clinical summary; chart search; E-prescribe; computer assisted coding; electronic orders & results; pre-completed notes for documentation; electronic immunization download/upload; Meaningful Use.
CT|One (formerly ClaimTrak)	Behavioral health EHR fully integrating client intake through claims submission.
ClinicSource	Cloud-based EMR and practice management system designed and customized for therapy practices (physical, speech, occupational, etc.).
Compulink	Designed for specific specialties with E-prescribing, patient portal, automated coding and compliance reporting.
CureMD	EHR and practice management system with patient portal, medical billing service, mobile app, and customizable to multiple specialty types.
Drchrono	A patient care platform that offers customization at the point of care and on the go.
eClinicalWorks	Caters to all size private practices, CHCs & hospitals; ONC-HIT 2014 Complete EHR Certified, ICD-10 compliant, integrated voice to text capabilities, clinical decision support, E-prescribing, and meets Meaningful Use.
Eclipse	An all-inclusive practice management program including billing, EHR/documentation, scheduling and comprehensive reporting.
e-MDs	Adaptable to multiple clinical settings & sizes; clinical decision support; customizable templates & patient flow sheets; E-prescribing.

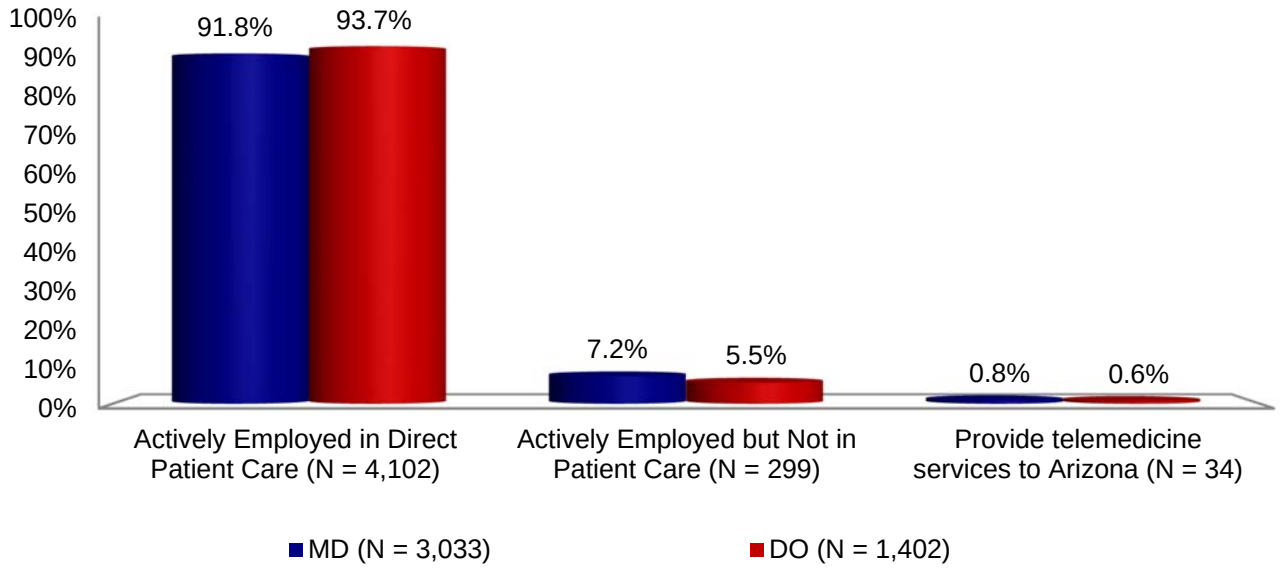
EMR Vendor	*Intended Use*
Epic	Meaningful Use stage 2 certified; accommodates >40 specialties; chart review; order management; documentation; clinical & financial decision support; telemedicine options.
gloStream	Customizable to individual physicians in a multi-physician setting; Cloud-based; Meaningful Use certified; E-prescribing; labs/orders; scheduling and tasking; note taking.
GMed	Caters to small, large & surgery centers and hospitals for gastro, cardio & urology practices; customizable workflow; interoperable; clinical decision support.
Greenway Health	Combined EHR/Practice Management solution integrating clinical/financial/administrative functions for primary care & >30 specialties in all types/sizes of practices; interoperable; Meaningful Use certified.
iSALUS	Key features include E-prescribing, orders & labs, Meaningful use certified for Stage 1 & 2; automated workflows.
Kareo	Cloud-based EHR focused on ease of use with a comprehensive dashboard, E-prescribing, e-labs, patient portal, Meaningful Use Stage 2 Certified.
McKesson	Certified Meaningful Use stage 1; separate web-based solutions for different types/sizes of practices; complete medical billing, scheduling & clinical functionality.
Meditab	Offer clients choice between cloud-based or on-site systems with solutions for PC and Mac devices in a suite of tools from the patient portal to practice management.
Meditech	Integrated medical and practice management solution for all types/sizes of practices which includes scheduling, labs, registration, EHRs, billing, ordering, reporting.
MediTouch	Web-based integrated health and medical records system customizable and Meaningful Use certified.
NextGen	Certified Meaningful Use stage 2; scalable; ICD-10 ready; accommodates 25 specialties; patient workflows/summaries; health information exchange.
Noteworthy	Certified Meaningful Use stage 1; full EHR/PM solution scalable for all physician practices.
NueMD	Cloud-based system with full EHR/PM solution scalable and accessible anywhere.
Office Practicum	Pediatric only EHR solution that includes encounters/flow sheets; prescriptions/diagnostic tests; vaccine recording/forecasting; billing; practice management.
OptumInsight	Offers a family of cloud-based products and services including practice management, EHR, patient portal and revenue cycle management.
PracticeEHR	A specialty-specific EHR/PM solution for small practices.
Practice Fusion	Free, web-based EHR/PM solution for >25 specialties; scalable to all practice types/sizes; includes E-prescribing; charting; scheduling mobile access; labs/imaging; patient health record; Meaningful Use certified.
PrognoCIS	Solutions for HER, PM, revenue cycle management and telemedicine with customizable workflow and content for your specialty, online payments, e-signing and E-prescribing.
Sage	Certified Meaningful Use; scalable for practice size and multiple specialties; charting; scheduling; orders; labs; E-prescribing; quality measure reporting; HL7 interoperable.
SOAPware	Scheduling; coding; integrate data from specific medical devices; order entry; E-prescribing; patient education/maintenance; additional practice management tools.
Sunrise	EHR solution specifically for hospitals and health systems; addresses Meaningful Use; contains interoperable, fully connected care with order entry, clinical decision support, E-prescribing/medication management.
WebPT	Web-based EMR for therapists.

Source: EMR Vendors' individual websites.

Appendix E: All Physician Results

All Physician Characteristics

Figure E - 1. Physicians Providing Patient Care, 2016-2018 (N = 4,435)



Source: AMB, ABOE Survey data, April 2016-March 2018.

Note: Employment status was unknown for 915 of physicians.

Practice Settings

Table E - 1. Type of Practice by Physician Type, 2016-2018 (N = 3,064)

Type of Practice	*Number of Physicians*	*Percent*
Physician Owned Solo Practice	494	16.1%
Physician Owned Group Practice	1,002	32.7%
Hospital/Medical School Group Practice	565	18.4%
Community or Rural Health Center	160	5.2%
Federal Government Hospital or Clinic	144	4.6%
Private Hospital System	225	7.3%
Non-Hospital Private Outpatient Facility	127	4.1%
Medical School/University Research Center	132	4.3%
Health Insurer/Health Related Organization that does not provide care	58	1.8%
City, State or County Clinic or Hospital System	29	0.9%
Other	127	4.1%
Hospice or SNF	5	0.2%
Independent Contractor	7	0.2%
Medical Consultant	29	0.9%
Mental/Behavioral Health	3	0.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 2,286 physicians did not report type of practice (missing). Percentages are based on responses. The five practice types listed under the "Other" section are a subset of the total types included in the Other category.

Table E - 2. Type of Practice by Number of MDs, 2016-2018 (N = 1,138)

Type of Practice	*Number of Physicians*				*Total*
	2-5	*6-50*	*51-94*	*95+*	
Physician Owned Group Practice	276 83.1%	253 57.8%	22 35.5%	79 25.8%	630 55.4%
Hospital/Medical School Group Practice	20 6.0%	107 24.4%	26 41.9%	200 65.4%	353 31.0%
Community or Rural Health Center	15 4.5%	54 12.3%	13 21%	13 4.2%	95 8.3%
Non-Hospital Private Outpatient Facility	21 6.3%	24 5.5%	1 1.6%	14 4.6	60 5.3%
Total	332 29.2%	438 38.4%	62 5.4%	306 26.8%	1,138 100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 1,471 MD's did not report practice type, and 1,635 MD's did not report the number of physicians in their practice for the above practice types.

Table E - 3. Type of Practice by Number of DOs, 2016-2018 (N = 491)

Type of Practice	*Number of Physicians*				*Total*
	2-5	*6-50*	*51-94*	*95+*	
Physician Owned Group Practice	105 82.0%	109 49.3%	14 42.4%	33 30.3%	261 53.2%
Hospital/Medical School Group Practice	7 5.5%	63 28.5%	16 48.5%	61 56.0%	147 29.9%
Community or Rural Health Center	8 6.3%	36 16.3%	2 6.1%	7 6.4%	53 10.8%
Non-Hospital Private Outpatient Facility	8 6.3%	12 5.4%	1 3.0%	8 7.3%	29 5.9%
Total	128 26.1%	221 45.0%	33 6.7%	109 22.2%	491 100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 491 DO's did not report practice type, and 897 DO's did not report the number of physicians in their practice for the above practice types.

Characteristics of EMR Users

Table E - 4. EMR Utilization by Type of Practice, 2016-2018 (N = 2,594)

Type of Practice	*Utilization Rates*
Physician Owned Solo Practice	74.3%
Physician Owned Group Practice	91.1%
Hospital/Medical School Group Practice	96.1%
Community or Rural Health Center	94.8%
Federal Government Hospital or Clinic	97.0%
Private Hospital System	94.0%
Non-Hospital Private Outpatient Facility	88.3%
Medical School/University Research Center	93.4%
Health Insurer/Health Related Organization that does not provide care	72.5%
City, State or County Clinic or Hospital System	86.2%
Other	84.9%
Hospice or SNF	100.0%
Independent Contractor	100.0%
Medical Consultant	91.6%
Mental/Behavioral Health	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Rates = % of physicians within each practice type. 2,286 respondents were missing type of practice. 1,227 respondents were missing EMR utilization.

The Utilization of Electronic Medical Records

Table E - 5. Methods of Storing Medical Records, 2016-2018

Method	*2016-2018 N = 4,095*		*2013-2015 N = 10,369*		*2012-2014 N = 10,780*		*2009-2011 N = 2,137; W = 8,996*		*2007-2009 N = 6,387*	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Weighted*	*Percent*	*Number*	*Percent*
Paper Files Only	178	4.3%	807	7.7%	1,229	11.4%	3,140	37.3%	2,911	45.6%
EMR Only	869	21.2%	1,602	15.4%	1,510	14.0%	1,565	17.4%	859	13.4%
Scanned Images Only	56	1.3%	164	1.5%	194	1.7%	204	2.3%	205	3.2%
Paper + Scanned Images Only	128	3.1%	444	4.2%	592	5.4%	404	4.5 %	393	6.2%
EMR + Paper Only	56	1.3%	276	2.6%	335	3.1%	559	6.2%	484	7.6%
EMR + Scanned Images Only	1,897	46.3%	3,709	35.7%	3,525	32.6%	1,411	15.7%	742	11.6%
Paper + Scanned Images + EMR	911	22.2%	3,367	32.4%	3,395	31.4%	1,126	12.5%	793	12.4%
EMR alone or in combination*	3,733	91.1%	8,954	86.3%	8,765	81.3%	4,700	52.3%	2,878	45.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: The 2011 estimates are subject to substantially more uncertainty than the other renewal period data.

Respondents who did not identify a method of storing medical records (missing): 390 for 2007-2009; 2,177 for 2012-2014; 2,039 for 2013-2015; and 1,255 for 2016-2018.

*Data on "EMR alone or in combination" is not mutually exclusive from other categories.

A Multivariate Model of the Determinants of EMR Adoption & Information Exchange

Table E - 6. Predictors of Being an EMR User/Partially or Fully Connected EMR User, 2016-2018

Variable	*Odds Ratio*		
	EMR User N=2,772	*Partially Connected EMR User N=2,517*	*Fully Connected EMR User N=2,517*
DO (vs. MD)	1.08	1.83*	2.19*
Type of Practice (vs. Federal Government)			
Physician Owned Solo Practice	0.08*	1.21	0.85
Physician Owned Group Practice	0.23*	1.16	1.00
Hospital/Med School Group Practice	0.53	0.84	0.87
Community or Rural Health Center	0.42	1.11	0.98
Private Hospital System	0.32	0.83	0.66
Non-Hospital Private Outpatient Facility	0.18*	1.05	0.65
Medical School, University Research Center	0.32	0.93	0.75
City, State or County Clinic or Hospital System	0.15*	1.12	0.00
Other	0.15*	0.69	0.93
Age (vs. 65 and older)			
25 to 34	2.65*	0.54*	0.55
35 to 44	2.90*	0.56*	0.53*
45 to 54	1.89*	0.67*	0.55*
55 to 64	0.95	0.88	0.93
Gender (Female vs. Male)	0.81	1.01	1.17
Location (vs. all other AZ counties)			
Maricopa County	1.06	1.01	1.28
Pima County	1.03	1.07	0.86
Specialty (vs. Hospital Based Specialists)			
Primary Care	1.51*	2.96*	4.22*
Medical Care	1.04	2.56*	1.70
Pediatric Care	2.78*	3.99*	3.73*
Surgical Care	1.38	2.19*	1.45

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 2,578 observations were deleted due to missing values for EMR Users and 1,260 observations were deleted for Partially Connected EMR Users and Fully Connected EMR Users. *Statistically significant at p less than or equal to 0 .05.

Utilization of EMR Functions

Table E - 7. Utilization of Available EMR Functions, 2016-2018

EMR Functions	*Included in EMR*	*Used by the Respondent Number/Percent*		*Exchanged with Other Providers Number/Percent*	
Patient Care Summary	2,684	2,339	87.1%	1,289	48.0%
Prescription "E-prescribing"	2,531	2,266	89.5%	1,363	53.9%
Lab Results	2,481	2,342	94.4%	1,268	51.1%
Reminders for Interventions	1,574	1,263	80.2%	542	34.4%
Public Health Reports	1,194	913	76.5%	564	47.2%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: *The data in this table effectively treat *"Don't Know"* answers as *"No"* since the questions ask for the respondent's experience, not for the practices of other physicians in the same organization.

The data in this table only include those physicians that answered *"Yes"* to the Include question for each EMR function. Furthermore, the data only includes those that answered both the Used and Exchanged questions for each EMR functions; if either question was left blank the physician was excluded from the table for that function.

Table E - 8. Most Important Obstacles to Exchanging Clinical Information, 2016-2018 (N = 5,897)

Obstacles to Exchange Information	*Number of Physicians*	*Percent*
Lack of a health Information exchange	1,974	54.8%
Concerns with maintaining patient confidentiality	1,307	36.2%
Lack of technological support for problems	1,747	48.5%
Cost	869	24.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Utilization of EMRs by Vendor

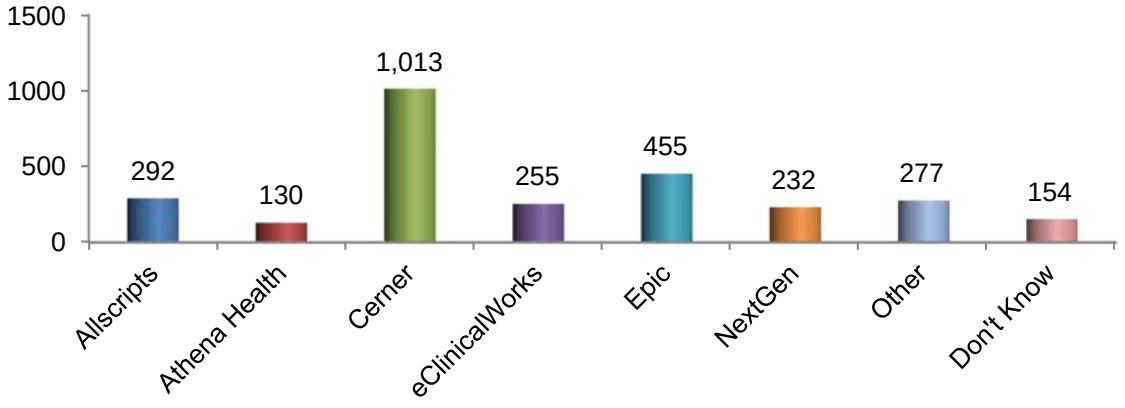
Table E - 9. EMR Users Unaware of EMR Vendor Name by Type of Practice, 2016-2018 (N = 239)

Type of Practice	*Number of Physicians*	*Percent*
Physician Owned Solo Practice	16	14.2%
Physician Owned Group Practice	34	30.3%
Hospital/Medical School Group Practice	7	6.2%
Community or Rural Health Center	8	7.1%
Private Hospital System	-	-
Non-Hospital Private Outpatient Facility	12	10.7%
Medical School/University Research Center	8	7.1%
Health Insurer/Health Related Organization that does not provide care	4	3.5%
City, State or County Clinic or Hospital System	7	6.2%
Other	6	5.3%
Hospice or SNF	10	8.9%
Independent Contractor	-	-
Medical Consultant	-	-
Mental/Behavioral Health	4	3.5%
Total	112	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: N represents the number of physicians who answered "Don't Know" for this survey question. Governmental hospitals or clinics are excluded. There were 42 physicians who didn't respond to practice type.

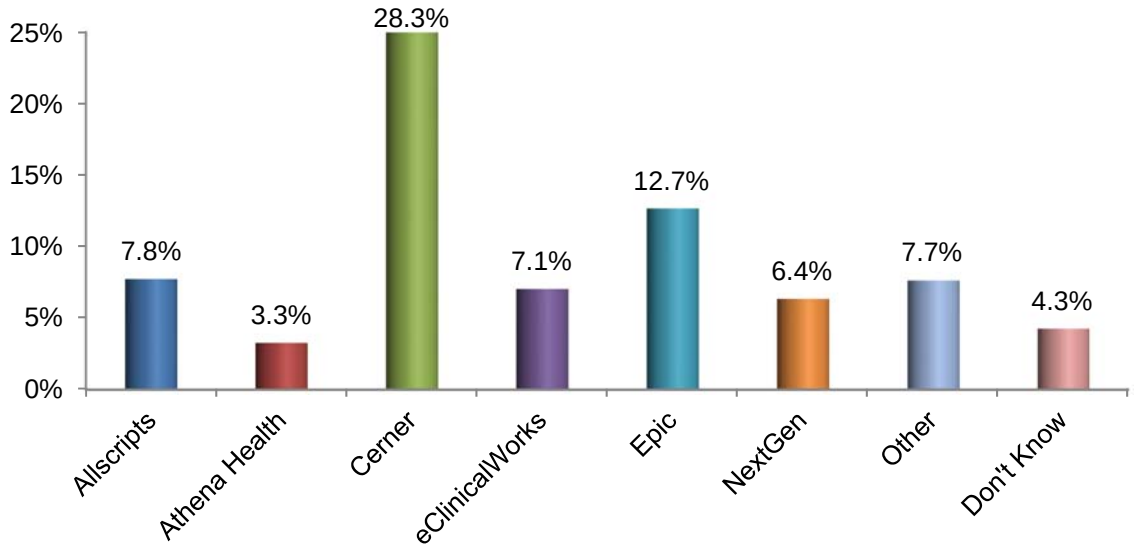
Figure E - 2. Number of EMR Users by Vendor ≥ 130 Users, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: The "Other" vendor excludes vendors contracted with government hospitals/clinics.

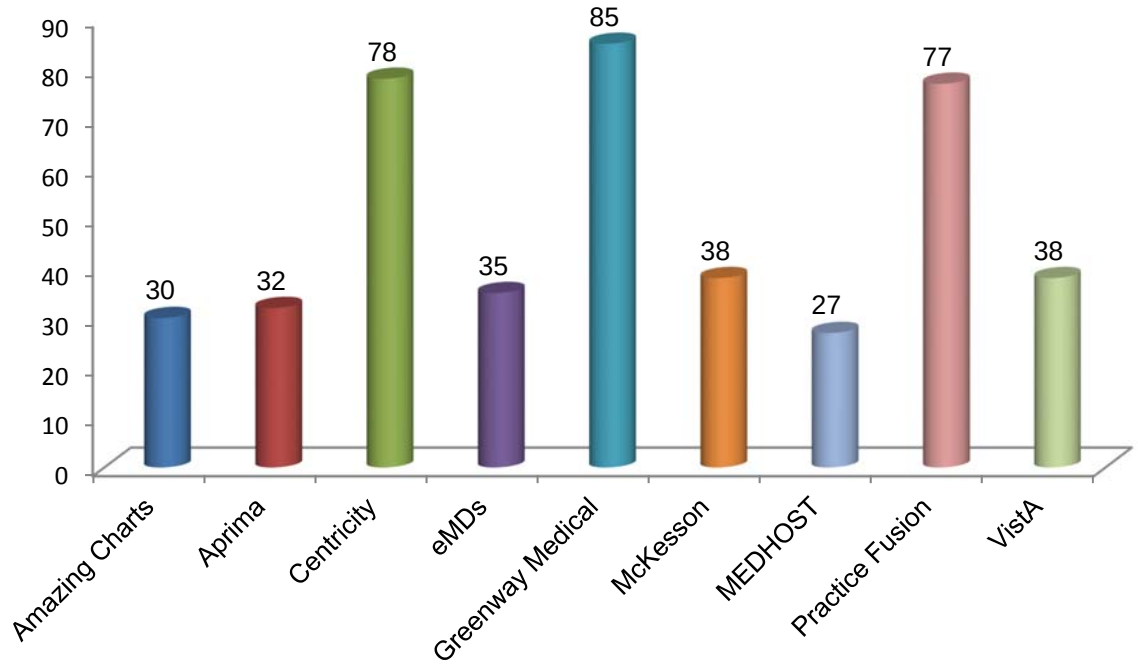
Figure E - 3. Percent of EMR Users by Vendor ≥ 130 Users, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: The "Other" vendor includes all vendors contracted with government hospitals/clinics.

Figure E - 4. Number of EMR Users by Vendor: 25-130 Users, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Physicians' Evaluation of EMR Software

Table E - 10. Physicians Ranking of EMRs by Ease of Use, 2016-2018 (N = 3,561; WMR = 3.4)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	175	4.9%
2	380	10.6%
3	1,238	34.7%
4	1,218	34.2%
5 (Outstanding)	550	15.4%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

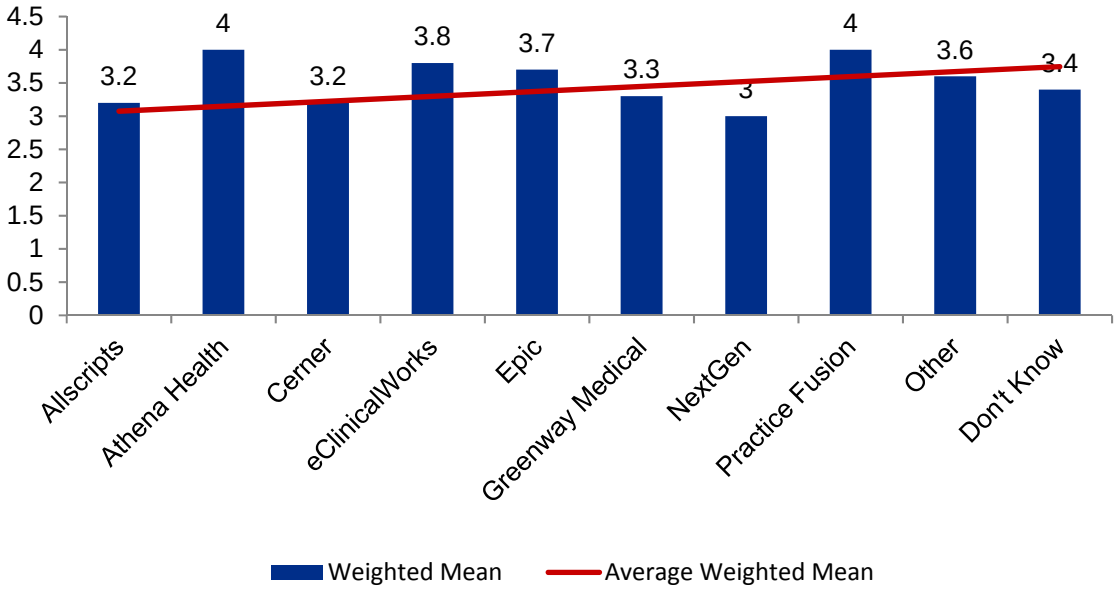
Table E - 11. Ease of Use by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	20 7.0%	45 15.8%	117 41.1%	75 26.4%	27 9.5%	284 9.9%	3.2
Athena Health	3 2.3%	7 5.5%	25 19.6%	46 36.2%	46 36.2%	127 4.4%	4.0
Cerner	62 6.2%	157 15.7%	385 38.5%	310 31.0%	86 8.6%	1,000 34.9%	3.2
eClinicalWorks	3 1.2%	7 2.8%	78 31.2%	107 42.8%	55 22.0%	250 8.7%	3.8
Epic	17 3.7%	22 4.8%	124 27.6%	192 42.7%	94 20.9%	449 15.6%	3.7
Greenway Medical	4 5.1%	5 6.4%	36 46.1%	29 37.1%	4 5.1%	78 2.7%	3.3
NextGen	25 11.3%	41 18.5%	91 41.1%	47 21.2%	17 7.6%	221 7.7%	3.0
Practice Fusion	1 1.3%	2 2.6%	18 24.0%	29 38.6%	25 33.3%	75 2.6%	4.0
Other	9 3.3%	26 9.7%	81 30.4%	89 33.4%	61 22.9%	266 9.2%	3.6
Don't Know	6 5.3%	8 7.1%	48 42.8%	32 28.5%	18 16.0%	112 3.9%	3.4
Top 10 Total	150 5.2%	320 11.1%	1,003 35.0%	956 33.4%	433 15.1%	2,862 100.0%	3.4

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 112 physicians answered 'Don't Know' for the Ease of Use question. The weighted mean for those physicians is 3.43.

Figure E - 5. Weighted Mean Rank of Ease of Use by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table E - 12. Ranking of EMRs by Physicians Perception of Productivity, 2016-2018 (N = 3,556; WMR = 3.1)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	423	11.8%
2	665	18.7%
3	1,115	31.3%
4	917	25.7%
5 (Outstanding)	436	12.2%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

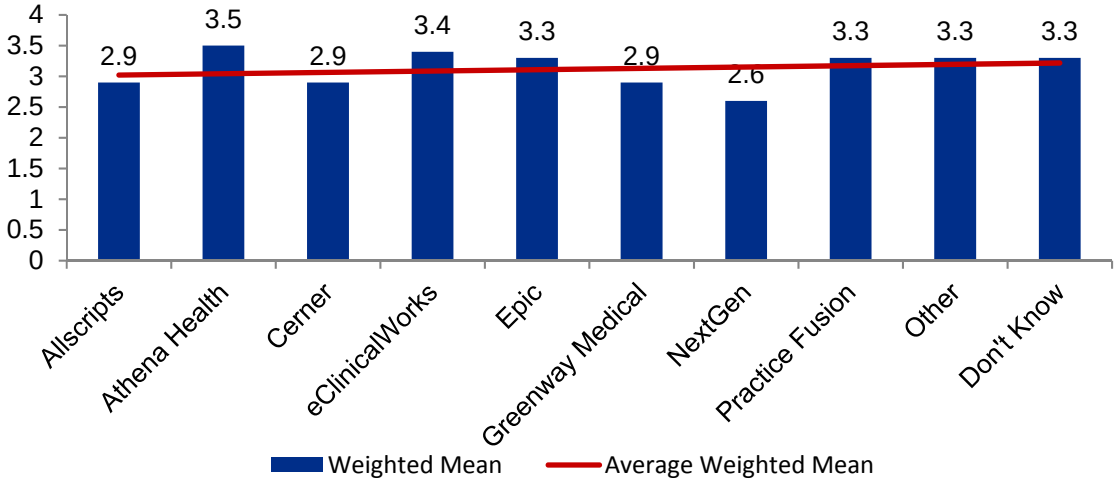
Table E - 13. Physician Perception of Productivity by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean**
Allscripts	35 12.3%	87 30.6%	73 25.7%	63 22.1%	26 9.1%	284 9.9%	2.9
Athena Health	7 5.5%	20 15.7%	32 25.1%	34 26.7%	34 26.7%	127 4.4%	3.5
Cerner	158 15.8%	206 20.6%	326 32.6%	231 23.1%	77 7.7%	998 34.9%	2.9
eClinicalWorks	19 7.6%	39 15.6%	72 28.8%	75 30.0%	45 18.0%	250 8.7%	3.4
Epic	48 10.7%	66 14.7%	121 27.0%	138 30.8%	74 16.5%	447 15.6%	3.3
Greenway Medical	11 14.1%	14 17.9%	28 35.8%	21 26.9%	4 5.1%	78 2.7%	2.9
NextGen	43 19.4%	61 27.6%	70 31.6%	34 15.3%	13 5.8%	221 7.7%	2.6
Practice Fusion	5 6.6%	11 14.6%	26 34.6%	22 29.3%	11 14.6%	75 2.6%	3.3
Other	20 7.4%	42 15.7%	83 31.0%	77 28.8%	45 16.8%	267 9.3%	3.3
Don't Know	8 7.2%	16 14.4%	39 35.1%	34 30.6%	14 12.6%	111 3.8%	3.3
Top 10 Total	354 12.3%	562 19.6%	870 30.4%	729 25.5%	343 12.0%	2,858 100.0%	3.1

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 111 physicians answered 'Don't Know' for the Physician Productivity question. The weighted mean for those physicians is 3.27.

Figure E - 6. Weighted Mean Rank of Physician Productivity by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table E - 14. Physicians Ranking of EMRs Effects on Staff Productivity, 2016-2018 (N = 3,502; WMR = 3.1)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	326	9.3%
2	619	17.6%
3	1,192	34.0%
4	938	26.7%
5 (Outstanding)	427	12.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

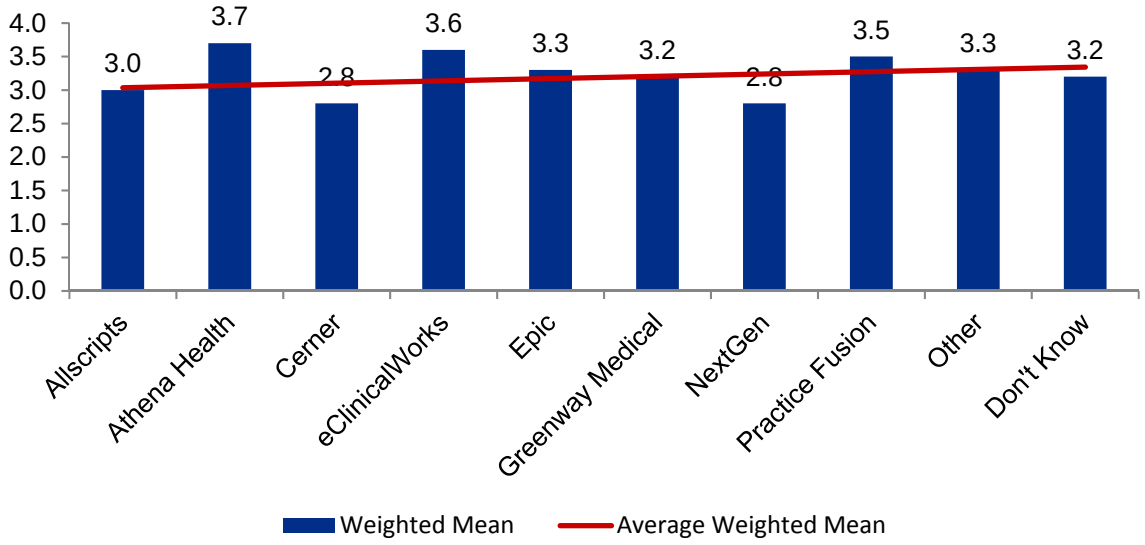
Table E - 15. Effects on Staff Productivity by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	29 10.2%	69 24.3%	90 31.8%	74 26.1%	21 7.4%	283 10.0%	3.0
Athena Health	5 3.9%	16 12.5%	30 23.6%	35 27.5%	41 32.2%	127 4.5%	3.7
Cerner	131 13.3%	237 24.0%	339 34.4%	206 20.9%	71 7.2%	984 34.8%	2.8
eClinicalWorks	10 4.0%	18 7.2%	88 35.4%	87 35.0%	45 18.1%	248 8.7%	3.6
Epic	32 7.3%	64 14.6%	140 31.9%	140 31.9%	62 14.1%	438 15.5%	3.3
Greenway Medical	7 8.9%	8 10.2%	31 39.7%	25 32.0%	7 8.9%	78 2.7%	3.2
NextGen	29 13.3%	57 26.1%	81 37.1%	40 18.3%	11 5.0%	218 7.7%	2.8
Practice Fusion	3 4.1%	10 13.6%	23 31.5%	24 32.8%	13 17.8%	73 2.5%	3.5
Other	19 7.1%	38 14.3%	86 32.4%	78 29.4%	44 16.6%	265 9.3%	3.3
Don't Know	10 9.2%	11 10.1%	43 39.8%	31 28.7%	13 12.0%	108 3.8%	3.2
Top 10 Total	275 9.7%	528 18.7%	951 33.6%	740 26.2%	328 11.6%	2,822 100.0%	3.1

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 108 physicians answered 'Don't Know' for the Staff Productivity question. The weighted mean for those physicians is 3.24.

Figure E - 7. Weighted Mean Rank of Staff Productivity by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table E - 16. Physicians Ranking of the Reliability of EMRs, 2016-2018 (N = 3,539; WMR = 3.6)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	155	4.3%
2	319	9.0%
3	1,027	29.0%
4	1,394	39.3%
5 (Outstanding)	644	18.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

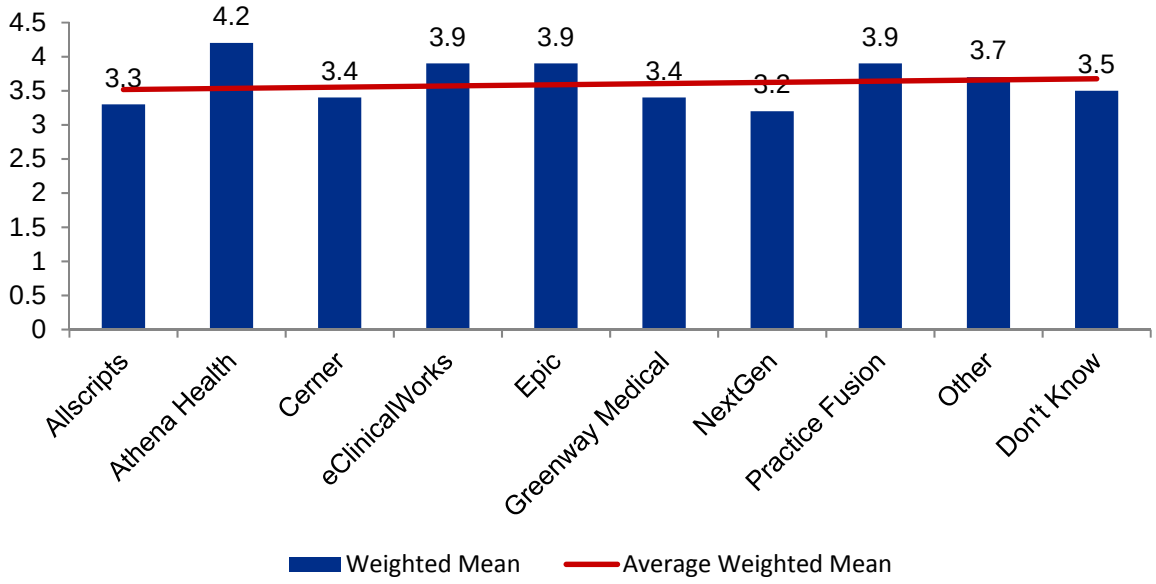
Table E - 17. Reliability of EMRs by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	20 7.1%	36 12.8%	100 35.7%	94 33.5%	30 10.7%	280 9.8%	3.3
Athena Health	2 1.5%	3 2.3%	23 18.1%	42 33.0%	57 44.8%	127 4.4%	4.2
Cerner	47 4.7%	125 12.6%	306 30.8%	390 39.3%	124 12.5%	992 34.8%	3.4
eClinicalWorks	3 1.2%	11 4.4%	60 24.0%	116 46.5%	59 23.6%	249 8.7%	3.9
Epic	8 1.7%	22 4.9%	100 22.4%	207 46.5%	108 24.2%	445 15.6%	3.9
Greenway Medical	3 3.8%	8 10.2%	25 32.0%	35 44.8%	7 8.9%	78 2.7%	3.4
NextGen	16 7.2%	32 14.5%	81 36.8%	70 31.8%	21 9.5%	220 7.7%	3.2
Practice Fusion	-	1 1.3%	24 32.0%	30 40.0%	20 26.6%	75 2.6%	3.9
Other	10 3.7%	21 7.8%	70 26.2%	97 36.3%	69 25.8%	267 9.3%	3.7
Don't Know	5 4.5%	8 7.2%	45 40.9%	31 28.1%	21 19.0%	110 3.8%	3.5
Top 10 Total	114 4.0%	267 9.3%	834 29.3%	1,112 39.1%	516 18.1%	2,843 100.0%	3.6

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 110 physicians did not identify a brand name but answered the Reliability question. The weighted mean for those physicians is 3.50.

Figure E - 8. Weighted Mean Rank of Reliability of EMRs by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table E - 18. Physicians Ranking of EMRs Performance vs. Promise, 2016-2018 (N = 3,112; WMR = 3.2)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	262	8.4%
2	419	13.4%
3	1,102	35.4%
4	945	30.3%
5 (Outstanding)	384	12.3%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

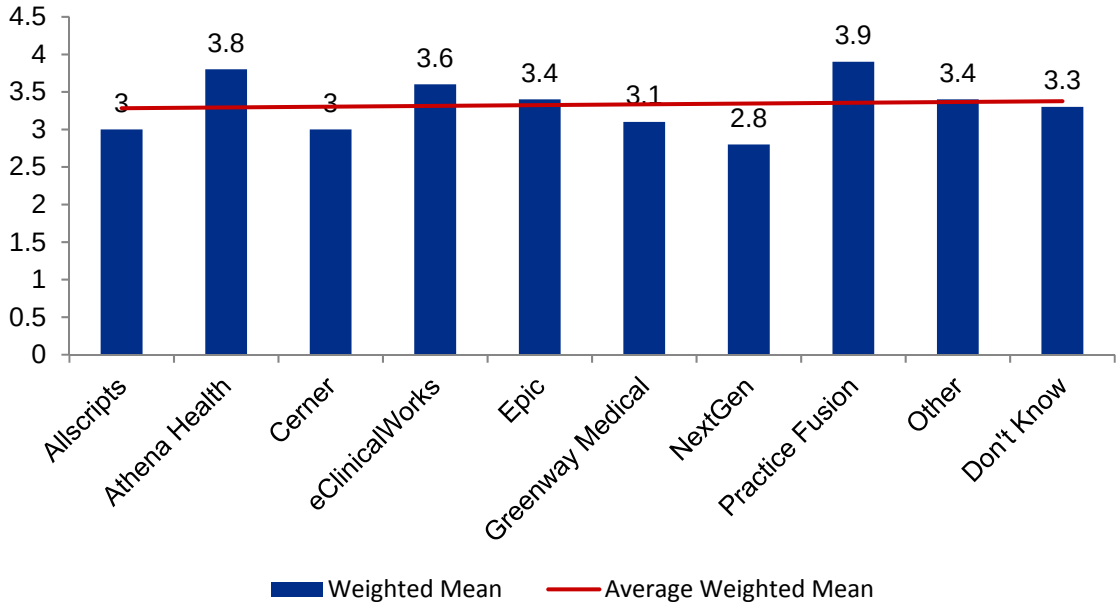
Table E - 19. Performance vs. Promise by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	30 11.9%	46 18.2%	103 40.8%	52 20.6%	21 8.3%	252 10.0%	3.0
Athena Health	6 4.8%	10 8.1%	31 25.2%	35 28.4%	41 33.3%	123 4.9%	3.8
Cerner	96 11.4%	150 17.8%	309 36.7%	225 26.7%	60 7.1%	840 33.6%	3.0
eClinicalWorks	5 2.1%	17 7.1%	80 33.7%	93 39.2%	42 17.7%	237 9.4%	3.6
Epic	21 5.3%	44 11.3%	129 33.1%	138 35.4%	57 14.6%	389 15.5%	3.4
Greenway Medical	7 9.3%	12 16.0%	27 36.0%	26 34.6%	3 4.0%	75 3.0%	3.1
NextGen	27 14.4%	35 18.7%	76 40.6%	42 22.4%	7 3.7%	187 7.4%	2.8
Practice Fusion	1 1.3%	3 4.1%	19 26.0%	28 38.3%	22 30.1%	73 2.9%	3.9
Other	19 8.1%	22 9.4%	76 32.4%	77 32.9%	40 17.0%	234 9.3%	3.4
Don't Know	6 6.8%	4 4.5%	43 48.8%	24 27.2%	11 12.5%	88 3.5%	3.3
Top 10 Total	218 8.7%	343 13.7%	893 35.7%	740 29.6%	304 12.1%	2,498 100.0%	3.2

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 88 physicians did not identify a brand name but answered the Performance vs Promise question. The weighted mean for those physicians is 3.34.

Figure E - 9. Weighted Mean Rank of Performance vs. Promise by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table E - 20. Summary of All EMR Ranking Criterion, 2016-2018

Criterion	*Weighted Mean*	*Number of Physicians*
Ease of Use	3.4	3561
Effect on Physician Productivity	3.1	3556
Effect on Staff Productivity	3.1	3502
Reliability	3.6	3539
Performance vs. Promise	3.2	3112

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Installation/Replacement of EMRs

Table E - 21. Plans to Install EMRs by Vendor for Non-EMR Users, 2018-2018 (N = 103)

Vendor	*Number of Physicians*	*Percent*
Advanced MD	7	6.8%
Allscripts	12	11.7%
Amazing Charts	6	5.8%
Cerner	9	8.7%
Chart Logic	1	1.0%
eClinicalWorks	3	2.9%
e-MDs	3	2.9%
Epic	9	8.7%
Greenway Medical	2	1.9%
McKesson	3	2.9%
Meditech	1	1.0%
NextGen	3	2.9%
Office Ally	2	1.9%
Office Practicum	1	1.0%
Practice Fusion	6	5.8%
Don't Know	35	34.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Physicians practicing in government settings are excluded from these results. Selection of EMR systems are not mutually exclusive.

Table E - 22. Plans to Install EMRs by Vendor for EMR Users, 2016-2018 (N = 459)

Vendor	*Number of Physicians*	*Percent*
Advanced MD	1	0.2%
ALERT	2	0.4%
Allscripts	26	5.7%
Alta Point	1	0.2%
Amazing Charts	3	0.7%
Aprima	4	0.9%
Athena Health	14	3.1%
Avatar	1	0.2%
Care Tracker	1	0.2%
Cerner	145	31.6%
Chart Logic	1	0.2%
ClaimTrak	1	0.2%
digiChart	1	0.2%

Vendor	*Number of Physicians*	*Percent*
eClinicalWorks	16	3.5%
e-MDs	1	0.2%
Epic	109	23.7%
Greenway Medical	1	0.2%
McKesson	7	1.5%
Meditech	17	3.7%
NextGen	19	4.1%
Office Ally	1	0.2%
Office Practicum	2	0.4%
PICIS	1	0.2%
Practice Fusion	4	0.9%
Sage	1	0.2%
Don't Know	79	17.2%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Physicians practicing in government settings are excluded from these results. Selection of EMR systems are not mutually exclusive.

Table E - 23. Factors That Influenced Practice's Decision to Acquire an EHR, 2016-2018 (N = 1,159)

Factors	*Number of Physicians*	*Percent*
Lower Costs for Implementation	133	19.3%
Medicare Based Incentives	180	26.2%
Medicaid Based Incentives	106	15.4%
Clear Direction on Market Leading Vendors	34	4.9%
Easily Customizable Systems to Fit our Needs	144	20.9%
Cost Effective Access to EMR Training	78	11.3%
Ease of Integration with our Legacy Systems	73	10.6%
Low Learning Curve	70	10.1%
Agreed Upon & Published Industry Standards for EMRs	104	15.1%
Confidence in Security and Privacy of the System	134	19.5%
Access to Technology Resources to Support the System	103	14.9%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table E - 24. Uses of Information from Claims Data, 2016-2018 (N = 328)

Uses	*Number of Physicians*	*Percent*
Population Health Management	67	9.7%
Tracking Contagious Diseases/Infections	23	3.3%
Outreach to Patients Based on Analysis of EMR Data	47	6.8%
Evaluating Appropriate Utilization of Care	95	13.8%
Analyzing Costs or Cost Effectiveness of Care	81	11.7%
Post Market Analysis of Side Effects of Pharmaceuticals	15	2.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table E - 25. Uses of Information from EMRs, 2016-2018 (N = 608)

Uses	*Number of Physicians*	*Percent*
Population Health Management	101	14.7%
Tracking Contagious Diseases/Infections	60	8.7%
Outreach to Patients Based on Analysis of EMR Data	112	16.3%
Evaluating Appropriate Utilization of Care	189	27.5%
Analyzing Costs or Cost Effectiveness of Care	119	17.3%
Post Market Analysis of Side Effects of Pharmaceuticals	27	3.9%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

The Target Population

Table E - 26. The Target Population of Physicians without EMRs by County, 2016-2018 (N = 3,987)

Location	*All Survey Respondents (N)*	*Survey Respondents EMR Users (N)*	*Survey Respondents Non-EMR Users (N)*	*Projected Target Population (W*N)*
Apache	10	7	3	3
Cochise	34	33	1	1
Coconino	89	73	16	18
Gila	14	13	1	1
Graham	12	12	-	0
Greenlee	-	-	-	-
La Paz	8	7	1	1
Maricopa	2,591	2,349	242	266
Mohave	104	92	12	13
Navajo	31	27	4	4
Pima	628	565	63	69
Pinal	57	52	5	6
Santa Cruz	8	7	1	1
Yavapai	111	104	7	8
Yuma	65	59	6	7
Missing	129	118	11	12
Unknown	96	83	13	14
Total	3,987	3,601	386	425

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Table does not include physicians practicing in government settings.

The target population is calculated as the number of non-EMR users multiplied by the population weight.

Table E - 27. Trends in the Target Population of Physicians without EMRs by County, 2007-2018

Location	*Non-Users of EMRs as a Percent of Physicians*			
	2016-2018	*2013-2015*	*2012-2014*	*2007-2009*
Apache	30.0%	25.0%	31.6%	47.1%
Cochise	2.9%	8.3%	17.0%	56.6%
Coconino	18.0%	11.7%	16.7%	56.8%
Gila	7.1%	13.0%	18.2%	67.7%
Graham	0.0%	12.0%	13.3%	57.9%
Greenlee	0.0%	0.0%	0.0%	57.9%
La Paz	12.5%	0.0%	36.4%	66.7%
Maricopa	9.3%	14.9%	20.3%	57.2%
Mohave	11.5%	14.6%	16.9%	64.1%
Navajo	12.9%	12.5%	29.2%	52.9%
Pima	10.0%	15.5%	19.7%	56.0%
Pinal	8.8%	15.9%	14.3%	52.1%
Santa Cruz	12.5%	11.8%	5.3%	77.8%
Yavapai	6.3%	10.4%	13.6%	62.6%
Yuma	9.2%	7.4%	16.5%	73.3%
Total	9.7%	14.8%	20.5%	57.6%

Source: AMB, ABOE Survey Data, 2007-2009; 2012-2014, 2013-2015, 2016-2018.

Appendix F: AHCCCS Physician Results

AHCCCS Physician Characteristics

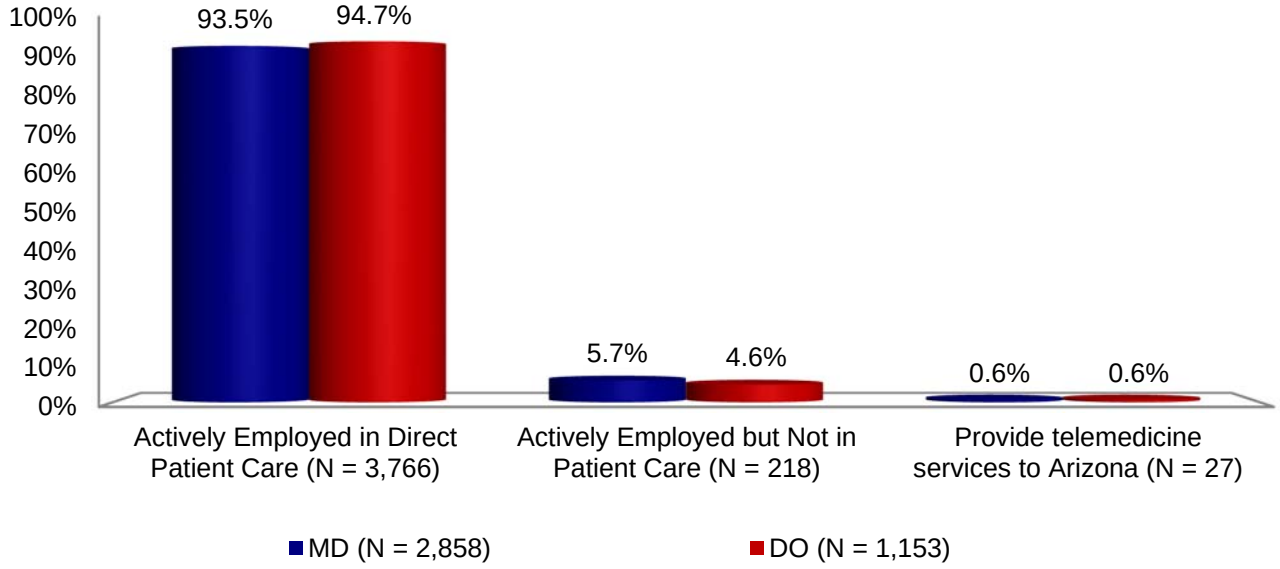
Table F - 1. Comparison of AHCCCS Respondents to Non-Respondents, 2016-2018

Characteristic	*Respondents (N = 4,801)*		*Non-Respondents (N = 9,961)*		*P-Value*
Sex					
Female	1,472	30.6%	2,966	29.7%	<0.01
Male	3,203	66.7%	6,699	67.2%	<0.01
Total	4,675	97.3%	9,665	97.0%	
Age Group					
25 - 34	348	7.2%	555	5.5%	NS
35 - 44	1,473	30.6%	2,511	25.2%	<0.01
45 - 54	1,369	28.5%	2,727	27.3%	<0.01
55 - 64	1,059	22.0%	2,451	24.6%	NS
65+	552	11.4%	1,717	17.2%	<0.01
Total	4,801	100.0%	9,961	100.0%	
Specialty					
Primary Care	1,861	38.7%	3,413	34.2%	<0.01
Medical	1,016	21.1%	2,398	24.0%	<0.01
Hospital-Based	1,074	22.3%	2,200	22.0%	<0.01
Pediatric	435	9.0%	922	9.2%	NS
Surgical	403	8.3%	1,011	10.1%	<0.05
Total	4,789	99.7%	9,944	99.8%	
Location					
Maricopa County	3,092	64.4%	6,272	62.9%	NS
Pima County	811	16.8%	1,760	17.6%	NS
All Other Counties	898	18.7%	1,929	19.3%	<0.01
Total	4,801	100.0%	9,961	100.0%	

Source: AMB, ABOE Administrative/Survey Data, April 2016-March 2018.

Note: Data include retired and semi-retired physicians. A p-value of .05 or less implies only a 5% probability of declaring the relationship significant when in fact it is not. NS = no significant difference. Gender was unknown for 126 (2.6%) respondents and 296 (2.9%) non-respondents. Specialty was unknown for 12 (0.2%) respondents and 17 (0.1%) non-respondents.

Figure F - 1. AHCCCS Physicians Providing Patient Care, 2016-2018 (N = 4,011)



Source: AMB, ABOE Survey data, April 2016-March 2018.

Note: Employment status was unknown for 790 of physicians.

Practice Settings of AHCCCS Physicians

Table F - 2. Type of Practice by Physician Type, 2016-2018 (N = 2,915)

Type of Practice	*Number of Physicians*	*Percent*
Physician Owned Solo Practice	476	16.3%
Physician Owned Group Practice	979	33.5%
Hospital/Medical School Group Practice	541	18.5%
Community or Rural Health Center	158	5.4%
Federal Government Hospital or Clinic	122	4.1%
Private Hospital System	214	7.3%
Non-Hospital Private Outpatient Facility	120	4.1%
Medical School/University Research Center	119	4.0%
Health Insurer/Health Related Organization that does not provide care	43	1.4%
City, State or County Clinic or Hospital System	29	0.9%
Other	114	3.8%
Hospice or SNF	4	0.1%
Independent Contractor	6	0.2%
Medical Consultant	26	0.8%
Mental/Behavioral Health	3	0.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 1,886 physicians did not report type of practice (missing). Percentages are based on responses. The five practice types listed under the "Other" section are a subset of the total types included in the Other category.

Table F - 3. Type of Practice by Number of MDs, 2016-2018 (N = 1,121)

Type of Practice	*Number of Physicians*				*Total*
	2-5	*6-50*	*51-94*	*95+*	
Physician Owned Group Practice	271 43.4%	251 40.2%	22 3.5%	79 12.6%	623 55.6%
Hospital/Medical School Group Practice	20 5.7%	104 30.1%	25 7.2%	196 56.8%	345 30.8%
Community or Rural Health Center	15 15.7%	54 56.8%	13 13.6%	13 13.6%	95 8.5%
Non-Hospital Private Outpatient Facility	21 36.2%	24 41.3%	1 1.7%	12 20.6%	58 5.2%
Total	327 29.1%	433 38.6%	61 5.4%	300 26.7%	1,121 100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 1,329 MD's did not report practice type, and 1,490 MD's did not report the number of physicians in their practice for the above practice types.

Table F - 4. Type of Practice by Number of DOs, 2016-2017 (N = 459)

Type of Practice	*Number of Physicians*				*Total*
	2-5	*6-50*	*51-94*	*95+*	
Physician Owned Group Practice	101 41.0%	102 41.4%	14 5.6%	29 11.7%	246 53.6%
Hospital/Medical School Group Practice	7 5.3%	58 43.9%	13 9.8%	54 40.9%	132 28.8%
Community or Rural Health Center	8 15.6%	34 66.6%	2 3.9%	7 13.7%	51 11.1%
Non-Hospital Private Outpatient Facility	8 27.5%	13 41.3%	1 3.4%	8 27.5%	30 6.5%
Total	124 27.0%	207 45.0%	30 6.5%	98 21.3%	459 100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 557 DO's did not report practice type, and 630 DO's did not report the number of physicians in their practice for the above practice types.

Characteristics of AHCCCS EMR Users

Table F - 5. EMR Utilization by Type of Practice, 2016-2018 (N = 2,491)

Type of Practice	*Utilization Rates*
Physician Owned Solo Practice	74.8%
Physician Owned Group Practice	91.2%
Hospital/Medical School Group Practice	96.0%
Community or Rural Health Center	95.4%
Federal Government Hospital or Clinic	97.4%
Private Hospital System	93.7%
Non-Hospital Private Outpatient Facility	89.3%
Medical School/University Research Center	94.6%
Health Insurer/Health Related Organization that does not provide care	80.6%
City, State or County Clinic or Hospital System	86.2%
Other	86.1%
Hospice or SNF	100.0%
Independent Contractor	100.0%
Medical Consultant	95.4%
Mental/Behavioral Health	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Rates = % of physicians within each practice type. 1,886 respondents were missing type of practice. 1,053 respondents were missing EMR utilization.

The Utilization of Electronic Medical Records by AHCCCS Physicians

Table F - 6. Methods of Storing Medical Records, 2016-2018 (N = 3,725)

Method	*Number*	*Percent*
Paper Files Only	160	4.2%
EMR Only	804	21.5%
Scanned Images Only	49	1.3%
Paper + Scanned Images Only	115	3.0%
EMR + Paper Only	50	1.3%
EMR + Scanned Images Only	1,726	46.3%
Paper + Scanned Images + EMR	821	22.0%
EMR alone or in combination*	3,401	91.3%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 1,076 respondents did not identify a method of storing medical records (missing). *Data on "EMR alone or in combination" is not mutually exclusive from other categories.

Table F - 7. Physicians Who Used a Scribe for Data Entry, 2016-2018 (N = 397)

Storage Method	*Number of Physicians*	*Percent*
EMR Only	118	15.8%
EMR + Paper Only	5	6.1%
EMR + Scanned Images Only	4	8.5%
Paper + Scanned Images + EMR	199	12.3%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

A Multivariate Model of the Determinants of EMR Adoption & Information Exchange

Table F - 8. Predictors of Being an EMR User/Partially or Fully Connected EMR User, 2016-2018

	Odds Ratio		
Variable	*EMR User N=2,657*	*Partially Connected EMR User N=2,419*	*Fully Connected EMR User N=2,419*
DO (vs. MD)	1.06	1.96*	2.30*
Type of Practice (vs. Federal Government)			
Physician Owned Solo Practice	0.07*	1.22	0.74
Physician Owned Group Practice	0.20*	1.12	0.84
Hospital/Med School Group Practice	0.44	0.81	0.77
Community or Rural Health Center	0.44	1.04	0.83
Private Hospital System	0.26*	0.84	0.59
Non-Hospital Private Outpatient Facility	0.18*	1.04	0.57
Medical School, University Research Center	0.34	1.00	0.75
City, State or County Clinic or Hospital System	0.13*	1.04	0.00
Other	0.15*	0.71	0.78
Age (vs. 65 and older)			
25 to 34	2.51	0.57*	0.44
35 to 44	3.10*	0.54*	0.51*
45 to 54	1.94*	0.65*	0.53*
55 to 64	0.98	0.83	0.90
Gender (Female vs. Male)	0.85	1.01	1.13
Location (vs. all other AZ counties)			
Maricopa County	1.09	0.95	1.23
Pima County	1.05	1.02	0.86
Specialty (vs. Hospital Based Specialists)			
Primary Care	1.50*	3.03*	4.47*
Medical Care	0.97	2.71*	1.80
Pediatric Care	2.62*	4.01*	4.02*
Surgical Care	1.66	2.20*	1.51

Source: AMB, ABOE Survey & Licensing Data, April 2016-March 2018.

Note: 2,144 observations were deleted due to missing values for EMR Users and 1,023 observations were deleted for Partially Connected EMR Users and Fully Connected EMR Users. *Statistically significant at p less than or equal to 0 .05.

Utilization of EMR Functions by AHCCCS Physicians

Table F - 9. Utilization of Available EMR Functions, 2016-2018*

EMR Functions	*Included in EMR*	*Used by the Respondent Number/Percent*		*Exchanged with Other Providers Number/Percent*	
Patient Care Summary	2,484	2,169	87.3%	1,204	48.5%
Prescription "E-prescribing"	2,340	2,096	89.6%	1,273	54.4%
Lab Results	2,287	2,159	94.4%	1,183	51.7%
Reminders for Interventions	1,457	1,161	79.7%	499	34.2%
Public Health Reports	1,106	843	76.2%	528	47.7%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: *The data in this table effectively treat *"Don't Know"* answers as *"No"* since the questions ask for the respondent's experience, not for the practices of other physicians in the same organization.

The data in this table only include those physicians that answered *"Yes"* to the Include question for each EMR function. Furthermore, the data only includes those that answered both the Used and Exchanged questions for each EMR functions; if either question was left blank the physician was excluded from the table for that function.

Table F - 10. Most Important Obstacles to Exchanging Clinical Information, 2016-2018

Obstacles to Exchange Information	*Number of Physicians*	*Percent*
Lack of a health Information exchange	1,808	55.0%
Concerns with maintaining patient confidentiality	1,208	36.7%
Lack of technological support for problems	1,619	49.2%
Cost	806	24.5%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Utilization of EMRs by Vendor

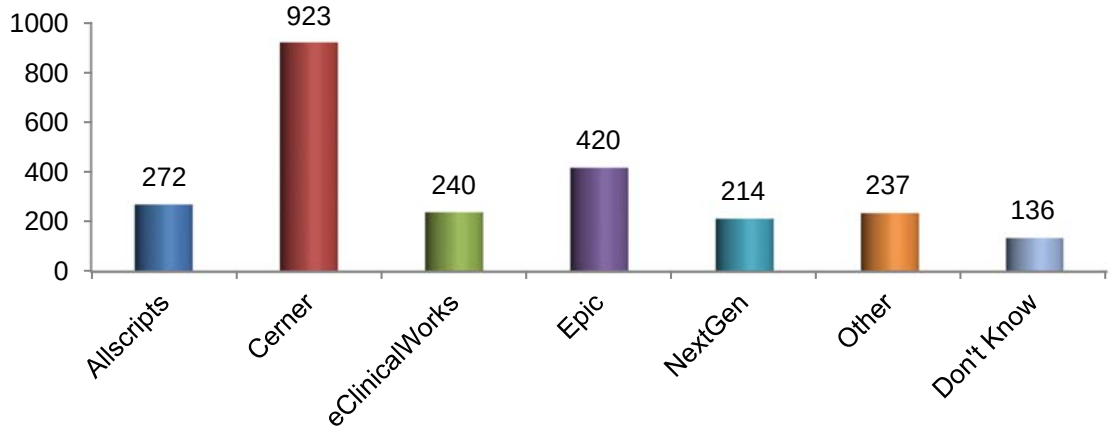
Table F - 11. EMR Users Unaware of EMR Vendor Name by Type of Practice, 2016-2018 (N = 106)

Type of Practice	*Number of Physicians*	*Percent*
Physician Owned Solo Practice	14	13.2%
Physician Owned Group Practice	34	32.0%
Hospital/Medical School Group Practice	7	6.6%
Community or Rural Health Center	8	7.5%
Private Hospital System	-	-
Non-Hospital Private Outpatient Facility	10	9.4%
Medical School/University Research Center	7	6.6%
Health Insurer/Health Related Organization that does not provide care	4	3.7%
City, State or County Clinic or Hospital System	6	5.6%
Other	6	5.6%
Hospice or SNF	10	9.4%
Independent Contractor	-	-
Medical Consultant	-	-
Mental/Behavioral Health	4	3.7%
Total	106	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: N represents the number of physicians who answered "Don't Know" for this survey question. Governmental hospitals or clinics are excluded. There were 30 physician that didn't respond to practice type.

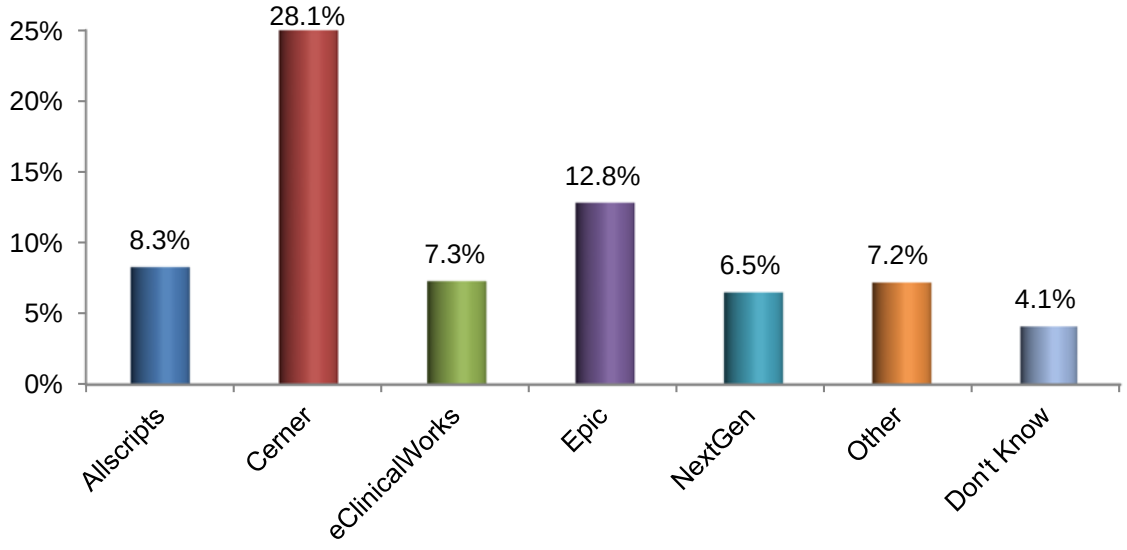
Figure F - 2. Number of EMR Users by Vendor ≥ 130 Users, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: The "Other" vendor excludes vendors contracted with government hospitals/clinics.

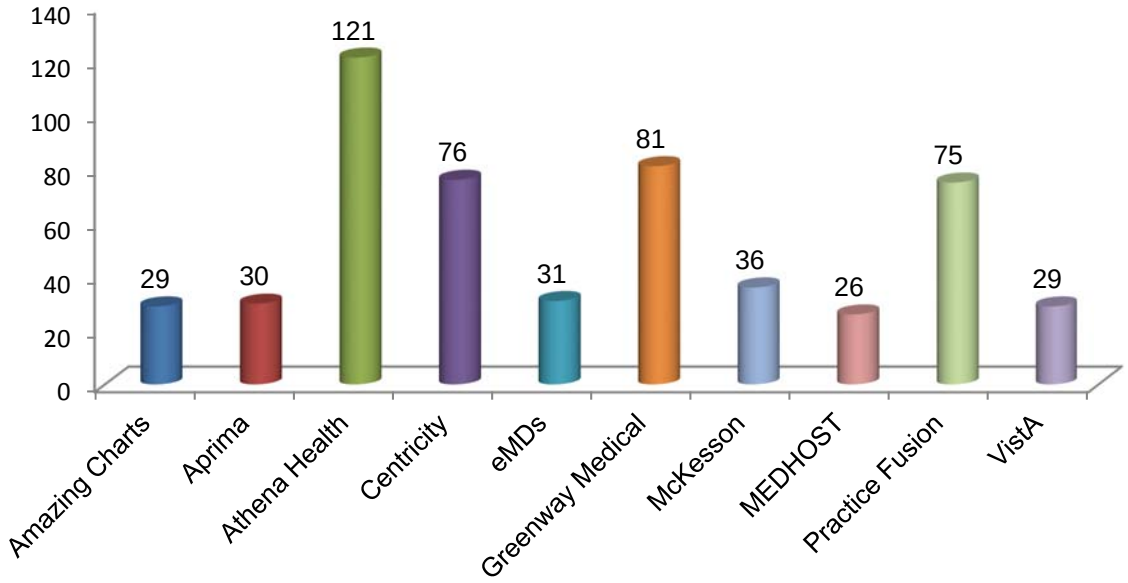
Figure F - 3. Percent of EMR Users by Vendor ≥ 130 Users, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: The "Other" vendor includes all vendors contracted with government hospitals/clinics.

Figure F - 4. Number of EMR Users by Vendor 25-130 Users, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

AHCCCS Physicians' Evaluation of EMR Software

Table F - 12. Physicians Ranking of EMRs by Ease of Use, 2016-2018 (N = 3,264; WMR = 3.5)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	163	4.9%
2	332	10.1%
3	1,145	35.0%
4	1,115	34.1%
5 (Outstanding)	509	15.5%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

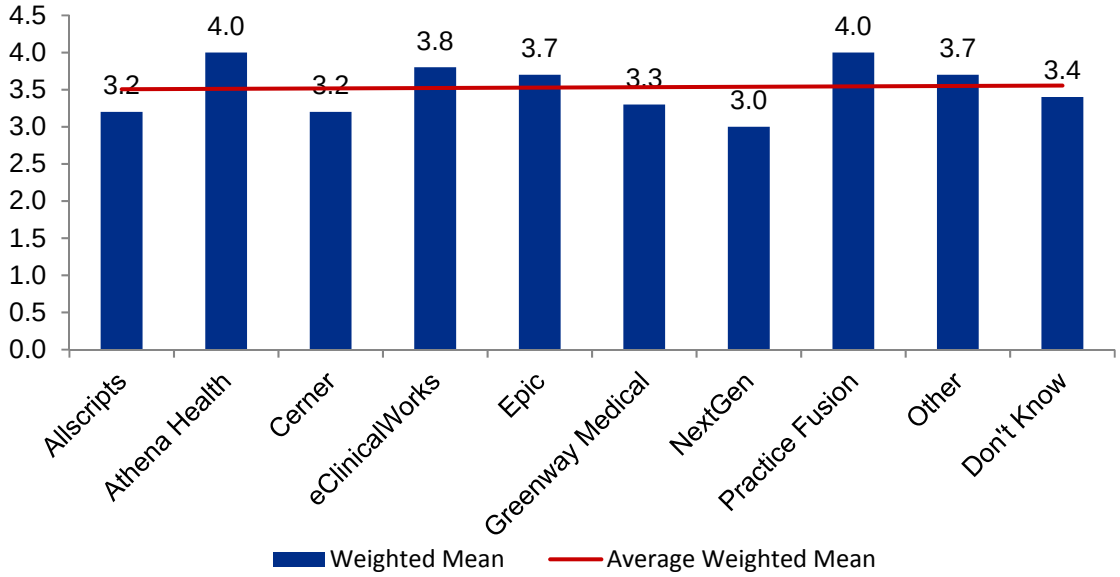
Table F - 13. EMRs Ease of Use by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	19 7.1%	40 15.0%	108 40.6%	72 27.0%	27 10.1%	266 10.1%	3.2
Athena Health	3 2.5%	6 5.0%	23 19.3%	42 35.2%	45 37.8%	119 4.5%	4.0
Cerner	59 6.4%	132 14.4%	352 38.6%	286 31.3%	82 9.0%	911 34.6%	3.2
eClinicalWorks	3 1.2%	6 2.5%	73 31.0%	98 41.7%	55 23.4%	235 8.9%	3.8
Epic	17 4.1%	22 5.3%	122 29.4%	168 40.5%	85 20.5%	414 15.7%	3.7
Greenway Medical	4 5.2%	5 6.5%	35 46.0%	28 36.8%	4 5.2%	76 2.8%	3.3
NextGen	22 10.7%	36 17.6%	87 42.6%	44 21.5%	15 7.3%	204 7.7%	3.0
Practice Fusion	1 1.3%	2 2.7%	17 23.2%	29 39.7%	24 32.8%	73 2.7%	4.0
Other	6 2.6%	20 8.7%	70 30.5%	77 33.6%	56 24.4%	229 8.7%	3.7
Don't Know	6 6.0%	8 8.0%	41 41.4%	31 31.3%	13 13.1%	99 3.7%	3.4
Top 10 Total	140 5.3%	277 10.5%	928 35.3%	875 33.3%	406 15.4%	2,626 100.0%	3.4

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 99 physicians answered 'Don't Know' for the Ease of Use question. The weighted mean for those physicians is 3.37.

Figure F - 5. Weighted Mean Rank of EMRs Ease of Use by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 14. Ranking of EMRs by Physicians Perception of Productivity, 2016-2018 (N = 3,259; WMR = 3.1)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	389	11.9%
2	608	18.6%
3	1,012	31.0%
4	848	26.0%
5 (Outstanding)	402	12.3%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

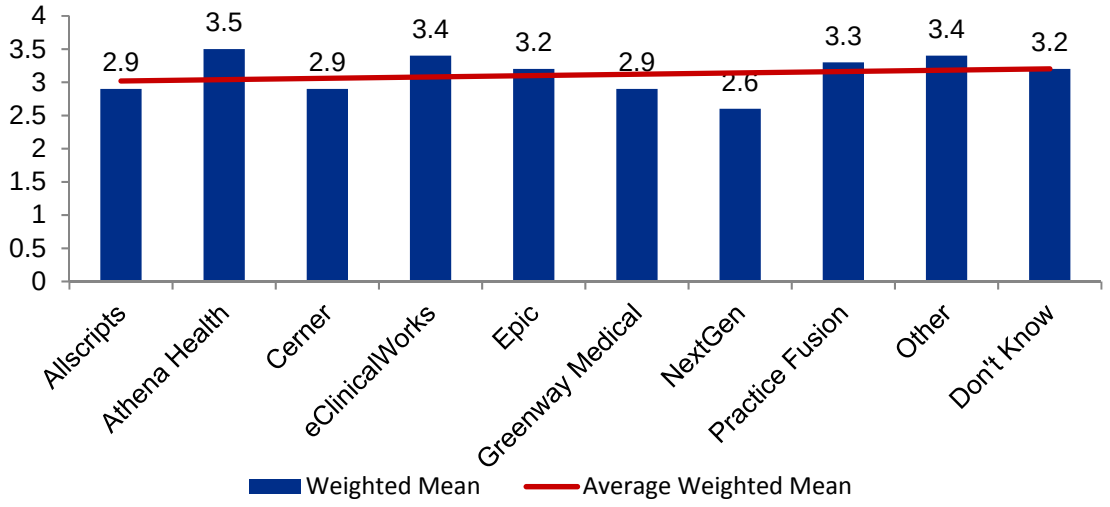
Table F - 15. Physician Perception of Productivity by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean**
Allscripts	33 12.4%	79 29.6%	68 25.5%	60 22.5%	26 9.7%	266 10.1%	2.9
Athena Health	7 5.8%	20 16.8%	29 24.3%	29 24.3%	34 28.5%	119 4.5%	3.5
Cerner	146 16.0%	185 20.3%	289 31.7%	215 23.6%	74 8.1%	909 34.6%	2.9
eClinicalWorks	17 7.2%	38 16.1%	65 27.6%	70 29.7%	45 19.1%	235 8.9%	3.4
Epic	46 11.1%	65 15.7%	112 27.1%	121 29.3%	68 16.5%	412 15.7%	3.2
Greenway Medical	11 14.4%	14 18.4%	27 35.5%	20 26.3%	4 5.2%	76 2.8%	2.9
NextGen	38 18.6%	57 27.9%	65 31.8%	32 15.6%	12 5.8%	204 7.7%	2.6
Practice Fusion	5 6.8%	11 15.0%	25 34.2%	22 30.1%	10 13.6%	73 2.7%	3.3
Other	15 6.5%	32 13.9%	72 31.3%	70 30.4%	41 17.8%	230 8.7%	3.4
Don't Know	8 8.1%	13 13.2%	37 37.7%	31 31.6%	9 9.1%	98 3.7%	3.2
Top 10 Total	326 12.4%	514 19.6%	789 30.0%	670 25.5%	323 12.3%	2,622 100.0%	3.1

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 98 physicians answered 'Don't Know' for the Physician Productivity question. The weighted mean for those physicians is 3.20.

Figure F - 6. Weighted Mean Rank of Physician Perception of Productivity by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 16. Physicians Ranking of EMRs Effects on Staff Productivity, 2016-2018 (N = 3,211; WMR = 3.2)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	302	9.4%
2	563	17.5%
3	1,088	33.8%
4	863	26.8%
5 (Outstanding)	395	12.3%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

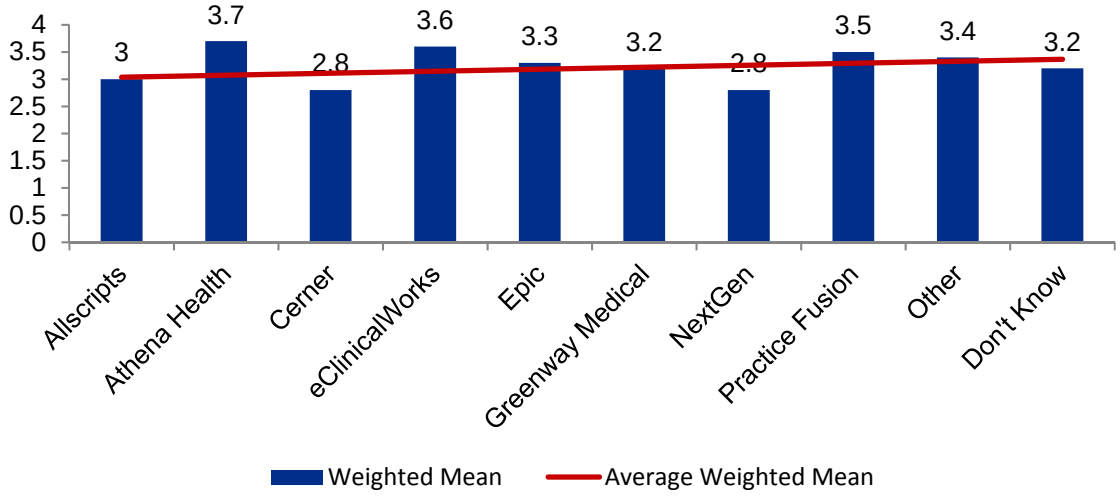
Table F - 17. EMRs Effects Staff Productivity by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	27 10.1%	64 24.1%	82 30.9%	71 26.7%	21 7.9%	265 10.2%	3.0
Athena Health	5 4.2%	16 13.4%	26 21.8%	31 26.0%	41 34.4%	119 4.5%	3.7
Centricity	125 13.9%	214 23.8%	296 33.0%	194 21.6%	67 7.4%	896 34.5%	2.8
Cerner	10 4.2%	16 6.8%	84 35.8%	79 33.7%	45 19.2%	234 9.0%	3.6
eClinicalWorks	31 7.6%	62 15.3%	132 32.7%	123 30.5%	55 13.6%	403 15.5%	3.3
Epic	7 9.2%	8 10.5%	30 39.4%	24 31.5%	7 9.2%	76 2.9%	3.2
NextGen	25 12.4%	52 25.8%	78 38.8%	36 17.9%	10 4.9%	201 7.7%	2.8
Practice Fusion	3 4.2%	9 12.6%	23 32.3%	24 33.8%	12 16.9%	71 2.7%	3.5
Other	13 5.7%	30 13.1%	76 33.3%	70 30.7%	39 17.1%	228 8.8%	3.4
Don't Know	10 10.3%	8 8.2%	39 40.2%	29 29.8%	11 11.3%	97 3.7%	3.2
Top 10 Total	256 9.8%	479 18.4%	866 33.4%	681 26.2%	308 11.8%	2,590 100.0%	3.1

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 97 physicians answered 'Don't Know' for the Staff Productivity question. The weighted mean for those physicians is 3.24.

Figure F - 7. Weighted Mean Rank of EMRs Effect on Staff Productivity by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 18. Physicians Ranking of the Reliability of EMRs, 2016-2018 (N = 3,243; WMR = 3.6)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	143	4.4%
2	281	8.6%
3	933	28.7%
4	1,289	39.7%
5 (Outstanding)	597	18.4%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

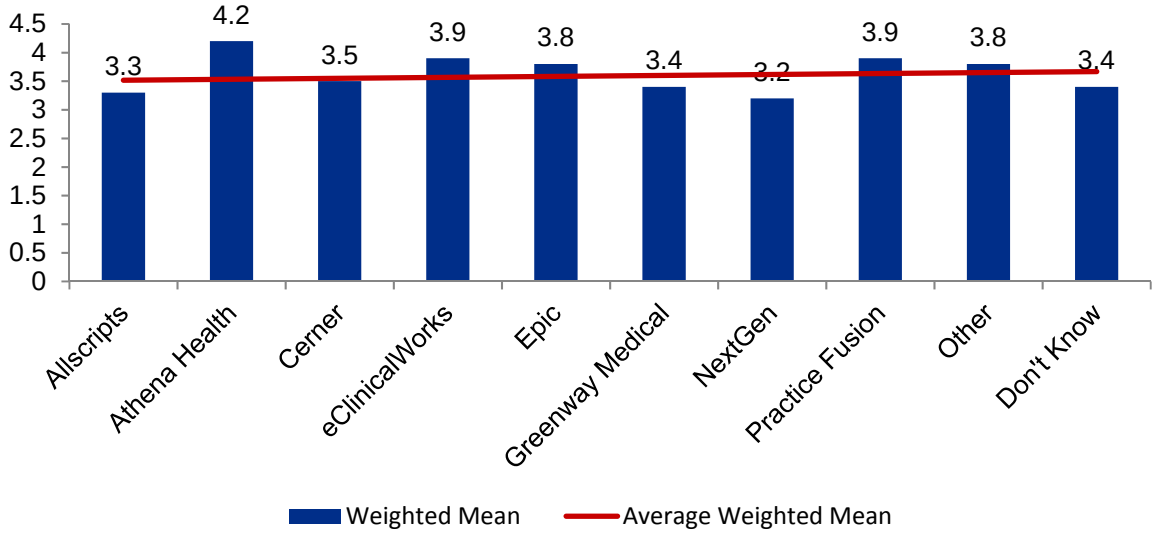
Table F - 19. Reliability of EMRs by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	20 7.6%	32 12.2%	91 34.7%	90 34.3%	29 11.0%	262 10.0%	3.3
Athena Health	2 1.6%	2 1.6%	20 16.8%	38 31.9%	57 47.8%	119 4.5%	4.2
Cerner	45 4.9%	102 11.2%	271 29.9%	369 40.8%	117 12.9%	904 34.6%	3.5
eClinicalWorks	3 1.2%	11 4.7%	55 23.5%	107 45.7%	58 24.7%	234 8.9%	3.9
Epic	8 1.9%	21 5.1%	97 23.6%	185 45.1%	99 24.1%	410 15.7%	3.8
Greenway Medical	3 3.9%	8 10.5%	25 32.8%	33 43.4%	7 9.2%	76 2.9%	3.4
NextGen	14 6.8%	29 14.2%	75 36.9%	66 32.5%	19 9.3%	203 7.7%	3.2
Practice Fusion	- -	1 1.3%	23 31.5%	30 41.0%	19 26.0%	73 2.7%	3.9
Other	8 3.4%	18 7.8%	58 25.2%	85 36.9%	61 26.5%	230 8.8%	3.8
Don't Know	5 5.1%	8 8.2%	41 42.2%	27 27.8%	16 16.4%	97 3.7%	3.4
Top 10 Total	108 4.1%	232 8.8%	756 28.9%	1,030 39.4%	482 18.4%	2,608 100.0%	3.6

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 97 physicians did not identify a brand name but answered the Reliability question. The weighted mean for those physicians is 3.42.

Figure F - 8. Weighted Mean Rank of Reliability of EMRs by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 20. Physicians Ranking of EMRs Performance vs. Promise, 2016-2018 (N = 2,864; WMR = 3.2)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	252	8.7%
2	373	13.0%
3	1,009	35.2%
4	878	30.6%
5 (Outstanding)	352	12.2%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

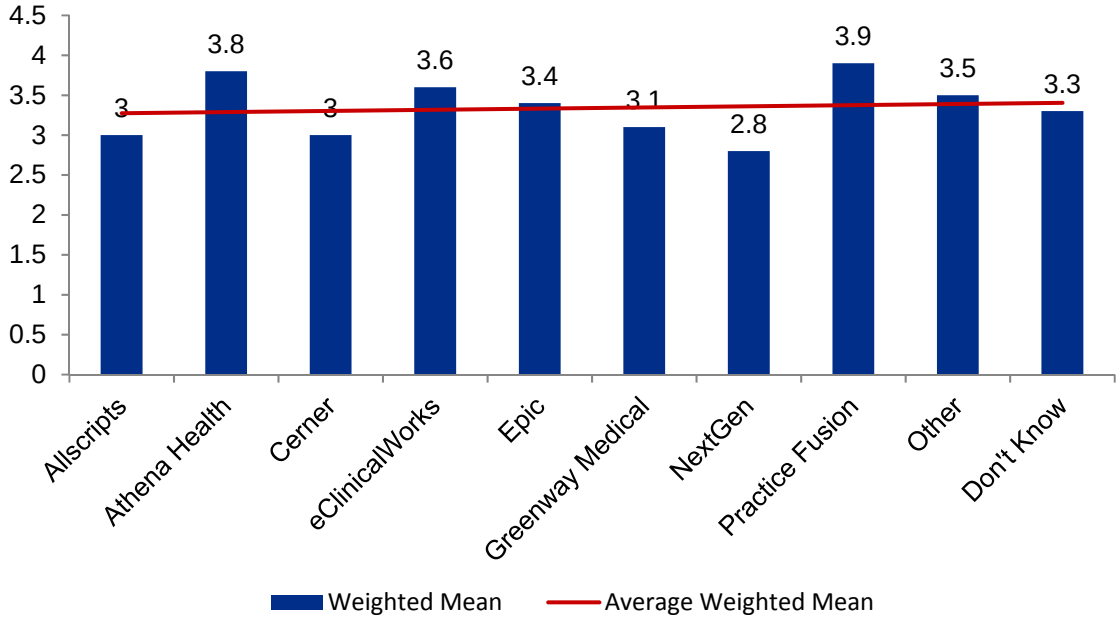
Table F - 21. Performance vs. Promise by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	29 12.2%	42 17.7%	94 39.6%	51 21.5%	21 8.8%	237 10.2%	3.0
Athena Health	6 5.1%	10 8.6%	28 24.1%	32 27.5%	40 34.4%	116 5.0%	3.8
Cerner	95 12.3%	123 15.9%	281 36.5%	213 27.6%	57 7.4%	769 33.4%	3.0
eClinicalWorks	5 2.2%	16 7.1%	74 32.8%	89 39.5%	41 18.2%	225 9.7%	3.6
Epic	21 5.8%	43 11.9%	124 34.5%	120 33.4%	51 14.2%	359 15.5%	3.4
Greenway Medical	7 9.5%	12 16.4%	27 36.9%	24 32.8%	3 4.1%	73 3.1%	3.1
NextGen	26 15.1%	31 18.0%	72 41.8%	38 22.0%	5 2.9%	172 7.4%	2.8
Practice Fusion	1 1.4%	3 4.2%	18 25.3%	28 39.4%	21 29.5%	71 3.0%	3.9
Other	15 7.4%	19 9.4%	62 30.6%	70 34.6%	36 17.8%	202 8.7%	3.5
Don't Know	6 7.6%	3 3.8%	39 50.0%	23 29.4%	7 8.9%	78 3.3%	3.3
Top 10 Total	211 9.1%	302 13.1%	819 35.5%	688 29.8%	282 12.2%	2,302 100.0%	3.2

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 78 physicians did not identify a brand name but answered the Performance vs Promise question. The weighted mean for those physicians is 3.28.

Figure F - 9. Weighted Mean Rank of EMRs Performance vs. Promise by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 22. Summary of All EMR Ranking Criterion, 2016-2018

Criterion	*Weighted Mean*	*Number of Physicians*
Ease of Use	3.5	3,264
Effect on Physician Productivity	3.1	3,259
Effect on Staff Productivity	3.2	3,211
Reliability	3.6	3,243
Performance vs. Promise	3.2	2,864

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Installation/Replacement of EMRs by AHCCCS Physicians

Table F - 23. Plans to Install EMRs by Vendor for Non-EMR Users, 2016-2018 (N = 96)

Vendor	*Number of Physicians*	*Percent*
Advanced MD	7	7.3%
Allscripts	9	9.4%
Amazing Charts	6	6.3%
Cerner	9	9.4%
Chart Logic	1	1.0%
eClinicalWorks	3	3.1%
e-MDs	3	3.1%
Epic	9	9.4%
Greenway Medical	2	2.1%
McKesson	3	3.1%
Meditech	1	1.0%
NextGen	3	3.1%
Office Ally	2	2.1%
Office Practicum	1	1.0%
Practice Fusion	6	6.3%
Don't Know	31	32.3%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Physicians practicing in government settings are excluded from these results. Selection of EMR systems are not mutually exclusive.

Table F - 24. Plans to Install EMRs by Vendor for EMR Users, 2016-2018 (N = 418)

Vendor	*Number of Physicians*	*Percent*
Advanced MD	1	0.2%
ALERT	1	0.2%
Allscripts	25	6.0%
Alta Point	1	0.2%
Amazing Charts	3	0.7%
Aprima	4	1.0%
Athena Health	14	3.3%
Avatar	1	0.2%
Care Tracker	1	0.2%
Cerner	135	32.3%
Chart Logic	1	0.2%
ClaimTrak	1	0.2%
digiChart	1	0.2%
eClinicalWorks	16	3.8%
e-MDs	1	0.2%
Epic	97	23.2%
Greenway Medical	1	0.2%
McKesson	7	1.7%
Meditech	10	2.4%
NextGen	18	4.3%
Office Ally	1	0.2%
Office Practicum	2	0.5%
PICIS	1	0.2%
Practice Fusion	4	1.0%
Sage	1	0.2%
Don't Know	70	16.7%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Physicians practicing in government settings are excluded from these results. Selection of EMR systems are not mutually exclusive.

Table F - 25. Duration of EMR System Use and Whether a Replacement, 2016-2018 (N = 2,845)

Duration of EMR use	*Replacement for Different Brand of EMR*						*Total (Includes don't know responses)*	
	Yes		*No*		*Total*			
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
1-3 Years	435	55.2%	456	31.1%	891	39.6%	1,112	39.0%
4-6 Years	166	21.0%	438	29.9%	604	26.8%	759	26.6%
7-9 Years	54	6.8%	227	15.5%	281	12.4%	353	12.4%
10 Years or More	132	16.7%	341	23.3%	473	21.0%	621	21.8%
Total	787	100.0%	1,462	100.0%	2,249	100.0%	2,845	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 26. Effect of EMR Replacement on AHCCCS Physician Productivity Ranking, 2016-2018 (N = 2,860)

Physician Productivity Ranking	*Replacement for Different Brand of EMR*						*Total*	
	Yes		*No*		*Don't Know*			
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
1 (Awful)	130	38.1%	150	43.9%	61	17.8%	341	11.9%
2	159	29.3%	280	51.7%	102	18.8%	541	18.9%
3	234	26.8%	459	52.6%	178	20.4%	871	30.4%
4	195	26.1%	376	50.3%	176	23.5%	747	26.1%
5 (Outstanding)	84	23.3%	193	53.6%	83	23.0%	360	12.5%
Total	802	28.0%	1,458	50.9%	600	20.9%	2,860	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 27. Duration of EMR Use Effects on AHCCCS Physician Productivity Ranking, 2016-2018 (3,074)

Duration of EMR Use	*Physician Productivity Ranking*										*Total*	
	1 (Awful)		*2*		*3*		*4*		*5 (Outstanding)*			
1-3 Years	173	14.4%	233	19.4%	375	31.2%	302	25.1%	118	9.8%	1,201	39.0%
4-6 Years	86	10.5%	144	17.7%	251	30.8%	228	28.0%	104	12.7%	813	26.4%
7-9 Years	34	9.2%	69	18.7%	102	27.7%	115	31.2%	48	13.0%	368	11.9%
10 Years or More	70	10.1%	129	18.6%	216	31.2%	160	23.1%	117	16.9%	692	22.5%
Total	363	11.8%	575	18.7%	944	30.7%	805	26.1%	387	12.5%	3,074	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 28. Uses of Information from Claims Data, 2016-2018 (N = 310)

Uses	*Number of Physicians*	*Percent*
Population Health Management	64	10.2%
Tracking Contagious Diseases/Infections	21	3.3%
Outreach to Patients Based on Analysis of EMR Data	45	7.2%
Evaluating Appropriate Utilization of Care	91	14.5%
Analyzing Costs or Cost Effectiveness of Care	76	12.1%
Post Market Analysis of Side Effects of Pharmaceuticals	13	2.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table F - 29. Uses of Information from EMRs, 2016-2018 (N = 568)

Uses	*Number of Physicians*	*Percent*
Population Health Management	97	15.5%
Tracking Contagious Diseases/Infections	56	8.9%
Outreach to Patients Based on Analysis of EMR Data	105	16.8%
Evaluating Appropriate Utilization of Care	177	28.3%
Analyzing Costs or Cost Effectiveness of Care	108	17.3%
Post Market Analysis of Side Effects of Pharmaceuticals	25	4.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

The Target Population of AHCCCS Physicians

Table F - 30. The Target Population of Physicians without EMRs by County, 2016-2018 (N = 3,631)

Location	*All Survey Respondents (N)*	*Survey Respondents EMR Users (N)*	*Survey Respondents Non-EMR Users (N)*	*Projected Target Population (W*N)*
Apache	9	6	3	3
Cochise	29	28	1	1
Coconino	80	68	12	13
Gila	13	12	1	1
Graham	12	12	-	0
Greenlee	-	-	-	-
La Paz	8	7	1	1
Maricopa	2,388	2,169	219	241
Mohave	82	70	12	13
Navajo	27	23	4	4
Pima	578	520	58	64
Pinal	51	46	5	6
Santa Cruz	7	6	1	1
Yavapai	102	96	6	7
Yuma	61	55	6	7
Missing	109	101	8	9
Unknown	75	68	7	8
Total	3,631	3,287	344	378

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Table does not include physicians practicing in government settings.

The target population is calculated as the number of non-EMR users multiplied by the population weight.

Appendix G: Non-AHCCCS Physician Results

Non-AHCCCS Physician Characteristics

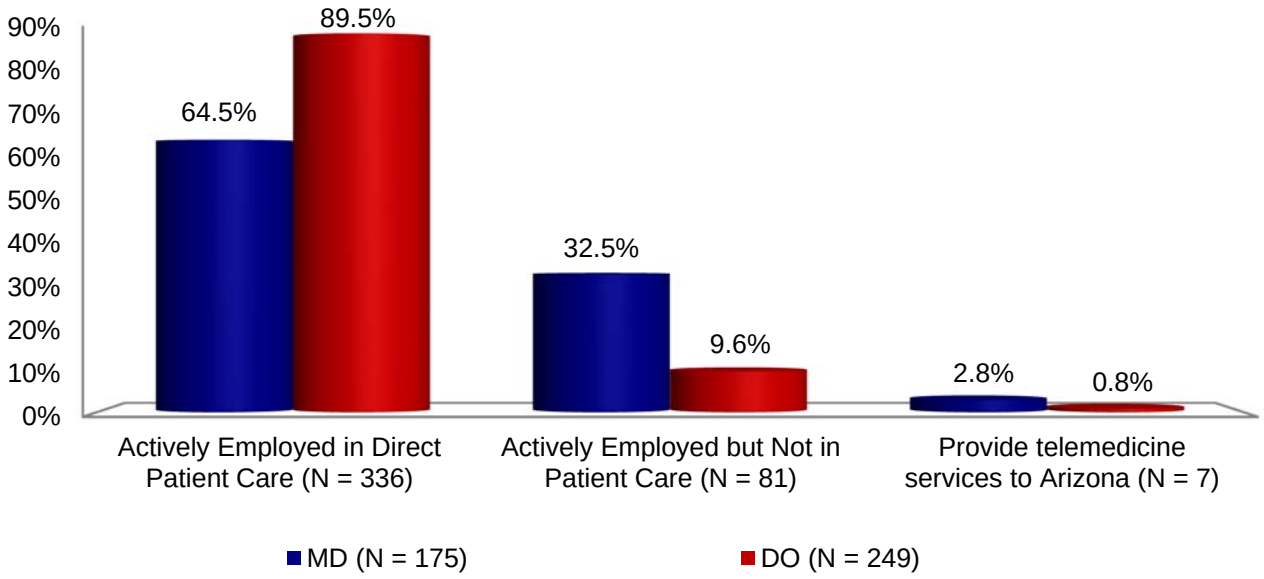
Table G - 1. Comparison of Respondents to Non-Respondents, 2016-2018

Characteristic	*Respondents (N = 698)*		*Non-Respondents (N = 596)*		*P-Value*
Sex					
Female	191	34.7%	632	37.0%	NS
Male	543	98.9%	1,690	98.9%	NS
Total	543	98.9%	1,690	98.9%	
Age Group					
25 - 34	208	37.8%	660	38.6%	NS
35 - 44	136	24.7%	420	24.5%	NS
45 - 54	85	15.4%	255	14.9%	NS
55 - 64	76	13.8%	211	12.3%	NS
65+	44	8.0%	161	9.4%	NS
Total	549	100.0%	1,707	99.9%	
Specialty					
Primary Care	201	36.6%	550	32.2%	<0.05
Medical	127	23.1%	378	22.1%	NS
Hospital-Based	148	26.9%	413	24.1%	NS
Pediatric	21	3.8%	129	7.5%	<0.01
Surgical	45	8.1%	234	13.7%	<0.01
Total	542	98.7%	1,704	99.7%	
Location					
Maricopa County	327	59.5%	1,095	64.1%	NS
Pima County	77	14.0%	354	20.7%	<0.01
All Other Counties	145	26.4%	259	15.1%	<0.01
Total	549	100.0%	1,708	100.0%	

Source: AMB, ABOE Survey & Licensing Data, April 2016-March 2018.

Note: Data include retired and semi-retired physicians. A p-value of .05 or less implies only a 5% probability of declaring the relationship significant when in fact it is not. NS = no significant difference. Gender was unknown for 6 (1.0%) respondents and 18 (1.0%) non-respondents. Age was unknown for 1 (0.0%) non-respondent. Specialty was unknown for 7 (1.2%) respondents and 4 (0.2%) non-respondents.

Figure G - 1. Non-AHCCCS Physicians Providing Patient Care, 2016-2018 (N = 424)



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Employment status was unknown for 125 of physicians.

Practice Settings

Table G - 2. Type of Practice by Physician Type, 2016-2018 (N = 149)

Type of Practice	*Number of Physicians*	*Percent*
Physician Owned Solo Practice	18	12.0%
Physician Owned Group Practice	23	15.4%
Hospital/Medical School Group Practice	24	16.1%
Community or Rural Health Center	2	1.3%
Federal Government Hospital or Clinic	22	14.7%
Private Hospital System	11	7.3%
Non-Hospital Private Outpatient Facility	7	4.6%
Medical School/University Research Center	13	8.7%
Health Insurer/Health Related Organization that does not provide care	15	10.0%
City, State or County Clinic or Hospital System	-	0.0%
Other	14	9.3%
Hospice or SNF	-	0.0%
Independent Contractor	1	0.6%
Medical Consultant	3	2.0%
Mental/Behavioral Health	-	0.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 400 physicians did not report type of practice (missing). Percentages are based on responses. The five practice types listed under the "Other" section are a subset of the total types included in the Other category.

Table G - 3. Type of Practice by Number of MDs, 2016-2018 (N = 17)

Type of Practice	*Number of Physicians*				*Total*
	2-5	*6-50*	*51-94*	*95+*	
Physician Owned Group Practice	5 71.4%	2 28.5%	-	-	7 41.2%
Hospital/Medical School Group Practice	-	3 37.5%	1 12.5%	4 50.0%	8 47.1%
Non-Hospital Private Outpatient Facility	1 16.6%	-	-	2 100.0%	3 17.6%
Total	5 29.4%	5 29.4%	1 5.8%	6 35.2%	17 100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 142 MD's did not report practice type, and 145 MD's did not report the number of physicians in their practice for the above practice types.

Table G - 4. Type of Practice by Number of DOs, 2016-2018 (N = 32)

Type of Practice	*Number of Physicians*				*Total*
	2-5	*6-50*	*51-94*	*95+*	
Physician Owned Group Practice	4 26.6%	7 46.6%	-	4 26.6%	15 46.9%
Hospital/Medical School Group Practice	-	5 33.3%	3 20.0%	7 46.6%	15 46.9%
Community or Rural Health Center	-	2 100.0%	-	-	2 6.3%
Total	4 12.5%	14 43.7%	3 9.3%	11 34.3%	32 100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 258 DO's did not report practice type, and 267 DO's did not report the number of physicians in their practice for the above practice types.

Characteristics of Non-AHCCCS EMR Users

Table G - 5. EMR Utilization by Type of Practice, 2016-2018 (N = 103)

Type of Practice	*Utilization Rates*
Physician Owned Solo Practice	58.8%
Physician Owned Group Practice	86.9%
Hospital/Medical School Group Practice	100.0%
Community or Rural Health Center	-
Federal Government Hospital or Clinic	94.7%
Private Hospital System	100.0%
Non-Hospital Private Outpatient Facility	71.4%
Medical School/University Research Center	80.0%
Health Insurer/Health Related Organization that does not provide care	44.4%
City, State or County Clinic or Hospital System	-
Other	44.4%
Hospice or SNF	-
Independent Contractor	100.0%
Medical Consultant	50.0%
Mental/Behavioral Health	-

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Rates = % of physicians within each practice type. 400 respondents were missing type of practice. 174 respondents were missing EMR utilization.

The Utilization of Electronic Medical Records by Non-AHCCCS Physicians

Table G - 6. Methods of Storing Medical Records, 2016-2018 (N = 370)

Method	*Number*	*Percent*
Paper Files Only	18	4.8%
EMR Only	65	17.5%
Scanned Images Only	7	1.8%
Paper + Scanned Images Only	13	3.5%
EMR + Paper Only	6	1.6%
EMR + Scanned Images Only	171	46.2%
Paper + Scanned Images + EMR	90	24.3%
EMR alone or in combination*	332	89.7%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 179 respondents did not identify a method of storing medical records (missing). *Data on "EMR alone or in combination" is not mutually exclusive from other categories.

Table G - 7. Physicians Who Used a Scribe for Data Entry, 2016-2018 (N = 30)

Storage Method	*Number of Physicians*	*Percent*
EMR Only	12	20.3%
EMR + Paper Only	2	3.3%
EMR + Scanned Images Only	-	-
Paper + Scanned Images + EMR	16	10.7%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Utilization of EMR Functions by Non-AHCCCS Physicians

Table G - 8. Utilization of Available EMR Functions, 2016-2018*

EMR Functions	*Included in EMR*	*Used by the Respondent Number/Percent*		*Exchanged with Other Providers Number/Percent*	
Patient Care Summary	200	170	85.0%	85	42.5%
Prescription "E-prescribing"	191	170	89.0%	90	47.1%
Lab Results	194	183	94.3%	85	43.8%
Reminders for Interventions	117	102	87.2%	43	36.8%
Public Health Reports	88	70	79.5%	36	40.9%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: *The data in this table effectively treat *"Don't Know"* answers as *"No"* since the questions ask for the respondent's experience, not for the practices of other physicians in the same organization.

The data in this table only include those physicians that answered *"Yes"* to the Include question for each EMR function. Furthermore, the data only includes those that answered both the Used and Exchanged questions for each EMR functions; if either question was left blank the physician was excluded from the table for that function.

Table G - 9. Most Important Obstacles to Exchanging Clinical Information, 2016-2018 (N = 456)

Obstacles to Exchange Information	*Number of Physicians*	*Percent*
Lack of a health Information exchange	166	52.8%
Concerns with maintaining patient confidentiality	99	31.5%
Lack of technological support for problems	128	40.7%
Cost	63	20.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Utilization of EMRs by Vendor

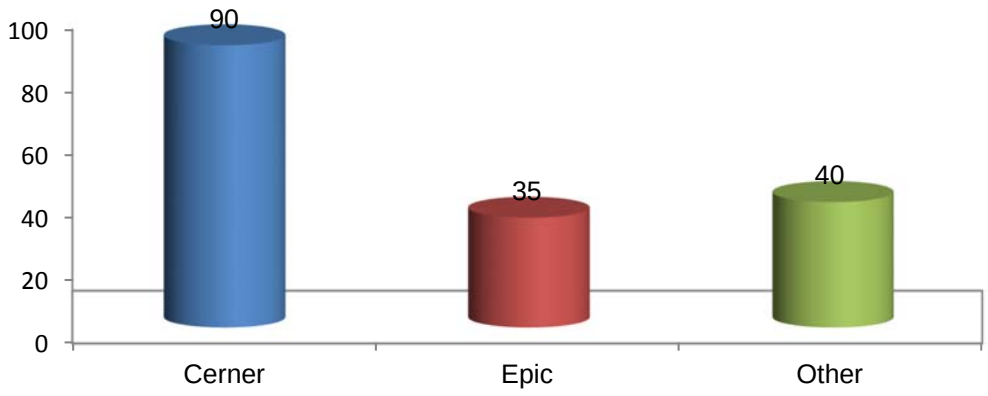
Table G - 10. EMR Users Unaware of EMR Vendor Name by Type of Practice, 2016-2018 (N = 6)

Type of Practice	*Number of Physicians*	*Percent*
Physician Owned Solo Practice	2	33.3%
Physician Owned Group Practice	-	-
Hospital/Medical School Group Practice	-	-
Community or Rural Health Center	-	-
Private Hospital System	2	33.3%
Non-Hospital Private Outpatient Facility	1	16.6%
Medical School/University Research Center	-	-
Health Insurer/Health Related Organization that does not provide care	1	16.6%
City, State or County Clinic or Hospital System	-	-
Other	-	-
Hospice or SNF	-	-
Independent Contractor	-	-
Medical Consultant	-	-
Mental/Behavioral Health	-	-

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: N represents the number of physicians who answered "Don't Know" for this survey question. Governmental hospitals or clinics are excluded. There were 12 physicians that didn't respond to practice type.

Figure G - 2. Number of EMR Users by Vendor 25-130 Users, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: The "Other" vendor includes all vendors contracted with government hospitals/clinics. There were no EMR vendors with users >130 for Non-AHCCCS physicians.

Non-AHCCCS Physicians' Evaluation of EMR Software

Table G - 11. Physicians Ranking of EMRs by Ease of Use, 2016-2018 (N = 297; WMR = 3.4)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	12	4.0%
2	48	16.1%
3	93	31.3%
4	103	34.6%
5 (Outstanding)	41	13.8%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

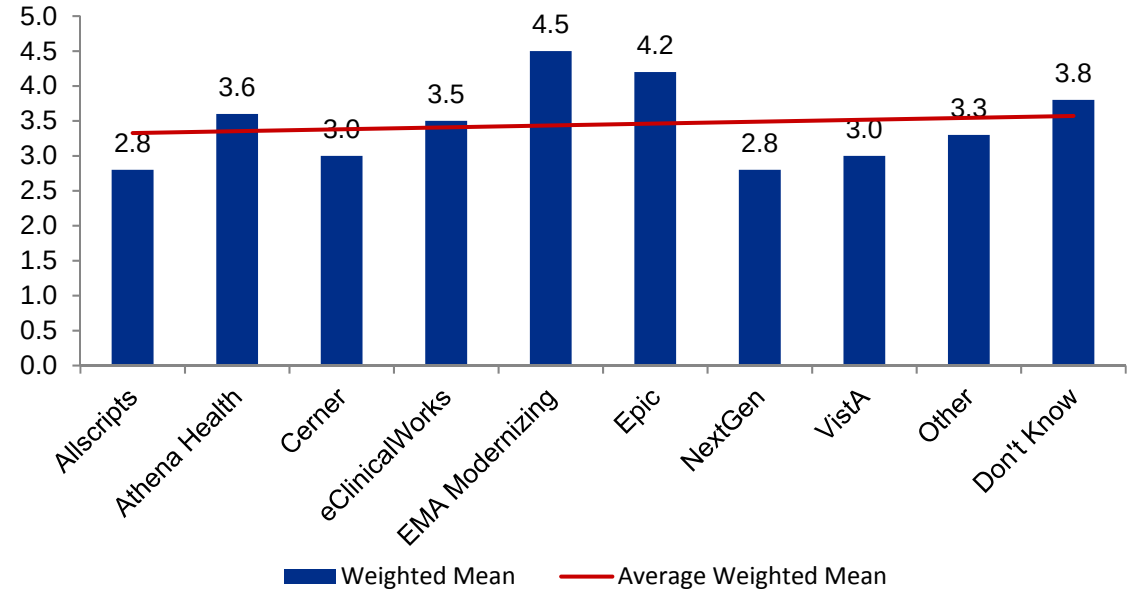
Table G - 12. EMRs Ease of Use by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	1 5.5%	5 27.7%	9 50.0%	3 16.6%	- -	18 7.2%	2.8
Athena Health	- -	1 12.5%	2 25.0%	4 50.0%	1 12.5%	8 3.2%	3.6
Cerner	3 3.3%	25 28.0%	33 37.0%	24 26.9%	4 4.4%	89 35.7%	3.0
eClinicalWorks	- -	1 6.6%	5 33.3%	9 60.0%	- -	15 6.0%	3.5
EMA Modernizing	- -	- -	1 12.5%	2 25.0%	5 62.5%	8 3.2%	4.5
Epic	- -	- -	2 5.7%	24 68.5%	9 25.7%	35 14.0%	4.2
NextGen	3 17.6%	5 29.4%	4 23.5%	3 17.6%	2 11.7%	17 6.8%	2.8
VistA	2 22.2%	1 11.1%	2 22.2%	3 33.3%	1 11.1%	9 3.6%	3.0
Other	3 8.1%	6 16.2%	11 29.7%	12 32.4%	5 13.5%	37 14.8%	3.3
Don't Know	- -	- -	7 53.8%	1 7.6%	5 38.4%	13 5.2%	3.8
Top 10 Total	12 4.8%	44 17.6%	76 30.5%	85 34.1%	32 12.8%	249 100.0%	3.3

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 13 physicians answered 'Don't Know' for the Ease of Use question. The weighted mean for those physicians is 3.85.

Figure G - 3. Weighted Mean Rank of EMRs Ease of Use by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 13. Ranking of EMRs by Physician Perception of Productivity, 2016-2018 (N = 297; WMR = 3.0)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	34	11.4%
2	57	19.1%
3	103	34.6%
4	69	23.2%
5 (Outstanding)	34	11.4%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

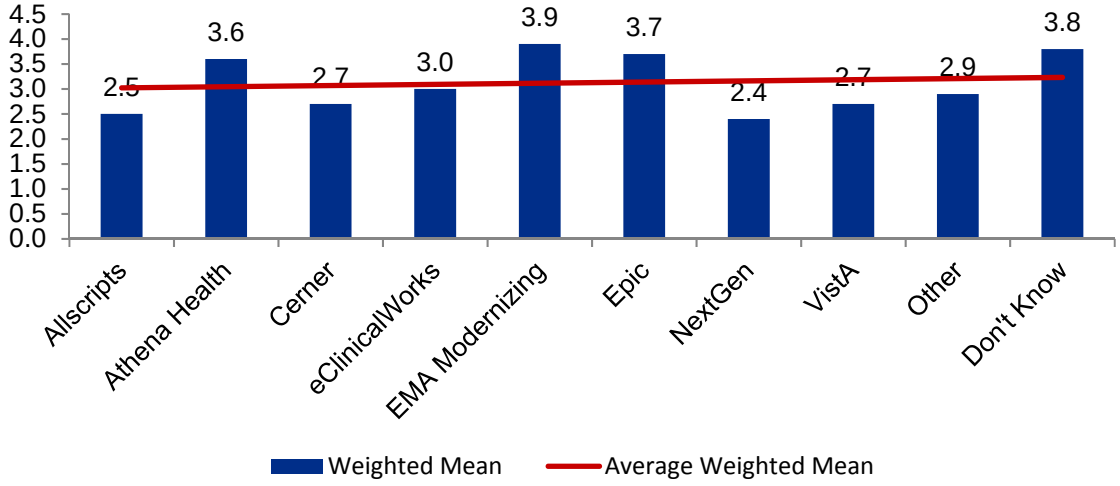
Table G - 14. Physician Perception of Productivity by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	2 11.1%	8 44.4%	5 27.7%	3 16.6%	- -	18 7.2%	2.5
Cerner	- -	- -	3 37.5%	5 62.5%	- -	8 3.2%	3.6
eClinicalWorks	12 13.4%	21 23.5%	37 41.5%	16 17.9%	3 3.3%	89 35.7%	2.7
EMA Modernizing	2 13.3%	1 6.6%	7 46.6%	5 33.3%	- -	15 6.0%	3.0
Epic	- -	1 12.5%	2 25.0%	2 25.0%	3 37.5%	8 3.2%	3.9
NextGen	2 5.7%	1 2.8%	9 25.7%	17 48.5%	6 17.1%	35 14.0%	3.7
NexTech	5 29.4%	4 23.5%	5 29.4%	2 11.7%	1 5.8%	17 6.8%	2.4
VistA	3 33.3%	2 22.2%	- -	3 33.3%	1 11.1%	9 3.6%	2.7
Other	5 13.5%	10 27.0%	11 29.7%	7 18.9%	4 10.8%	37 14.8%	2.9
Don't Know	- -	3 23.0%	2 15.3%	3 23.0%	5 38.4%	13 5.2%	3.8
Top 10 Total	31 12.4%	51 20.4%	81 32.5%	63 25.3%	23 9.2%	249 100.0%	3.0

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 13 physicians answered 'Don't Know' for the Physician Productivity question. The weighted mean for those physicians is 3.77.

Figure G - 4. Weighted Mean Rank of Physician Perception of Productivity by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 15. Physicians Ranking of EMRs Effects on Staff Productivity, 2016-2018 (N = 291; WMR = 3.1)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	24	8.2%
2	56	19.2%
3	104	35.7%
4	75	25.7%
5 (Outstanding)	32	10.9%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

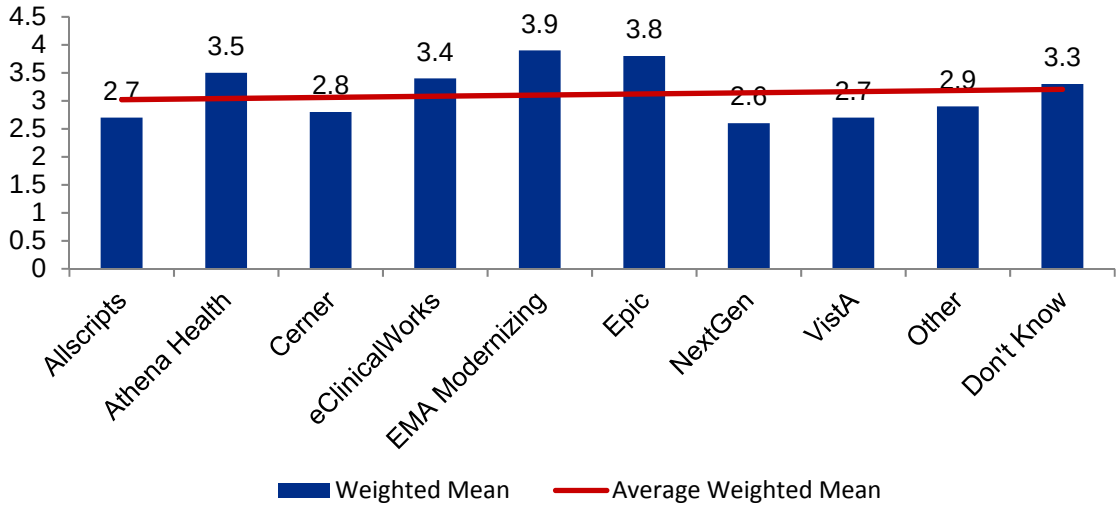
Table G - 16. EMRs Effects on Staff Productivity by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	2 11.1%	5 27.7%	8 44.4%	3 16.6%	- -	18 7.3%	2.7
Cerner	- -	- -	4 50.0%	4 50.0%	- -	8 3.2%	3.5
eClinicalWorks	6 6.8%	23 26.1%	43 48.8%	12 13.6%	4 4.5%	88 36.0%	2.8
EMA Modernizing	- -	2 14.2%	4 28.5%	8 57.1%	- -	14 5.7%	3.4
Epic	- -	1 14.2%	1 14.2%	3 42.8%	2 28.5%	7 2.8%	3.9
NextGen	1 2.8%	2 5.7%	8 22.8%	17 48.5%	7 20.0%	35 14.3%	3.8
NexTech	4 23.5%	5 29.4%	3 17.6%	4 23.5%	1 5.8%	17 6.9%	2.6
VistA	3 33.3%	- -	3 33.3%	3 33.3%	- -	9 3.6%	2.7
Other	6 16.2%	8 21.6%	10 27.0%	8 21.6%	5 13.5%	37 15.1%	2.9
Don't Know	- -	3 27.2%	4 36.3%	2 18.1%	2 18.1%	11 4.5%	3.3
Top 10 Total	22 9.0%	49 20.0%	88 36.0%	64 26.2%	21 8.6%	244 100.0%	3.1

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 11 physicians answered 'Don't Know' for the Staff Productivity question. The weighted mean for those physicians is 3.27.

Figure G - 5. Weighted Mean Rank of EMRs Effects on Staff Productivity by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 17. Physician Ranking of the Reliability of EMRs, 2016-2018 (N = 296; WMR = 3.5)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	12	4.0%
2	38	12.8%
3	94	31.7%
4	105	35.4%
5 (Outstanding)	47	15.8%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

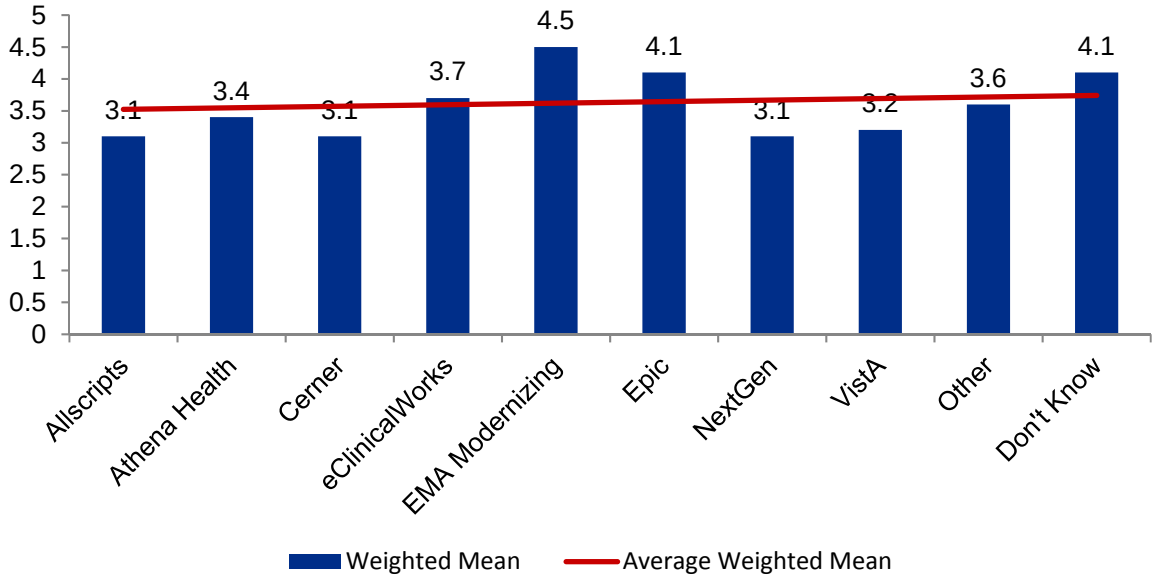
Table G - 18. Reliability of EMRs by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	- -	4 22.2%	9 50.0%	4 22.2%	1 5.5%	18 7.2%	3.1
Athena Health	- -	1 12.5%	3 37.5%	4 50.0%	- -	8 3.2%	3.4
Cerner	2 2.2%	23 26.1%	35 39.7%	21 23.8%	7 7.9%	88 35.4%	3.1
eClinicalWorks	-	- -	5 33.3%	9 60.0%	1 6.6%	15 6.0%	3.7
EMA Modernizing	- -	- -	- -	4 50.0%	4 50.0%	8 3.2%	4.5
Epic	- -	1 2.8%	3 8.5%	22 62.8%	9 25.7%	35 14.1%	4.1
NextGen	2 11.7%	3 17.6%	6 35.2%	4 23.5%	2 11.7%	17 6.8%	3.1
VistA	2 22.2%	- -	2 22.2%	4 44.4%	1 11.1%	9 3.6%	3.2
Other	2 5.4%	3 8.1%	12 32.4%	12 32.4%	8 21.6%	37 14.9%	3.6
Don't Know	- -	- -	4 30.7%	4 30.7%	5 38.4%	13 5.2%	4.1
Top 10 Total	8 3.2%	35 14.1%	79 31.8%	88 35.4%	38 15.3%	248 100.0%	3.5

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 13 physicians did not identify a brand name but answered the Reliability question. The weighted mean for those physicians is 4.08.

Figure G - 6. Weighted Mean Rank of Reliability of EMRs by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 19. Physicians Ranking of EMRs Performance vs. Promise, 2016-2018 (N = 248; WMR = 3.3)

Ranking	*Number of Physicians*	*Percent*
1 (Awful)	10	4.0%
2	46	18.5%
3	93	37.5%
4	67	27.0%
5 (Outstanding)	32	12.9%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: WMR is Weighted Mean Rank.

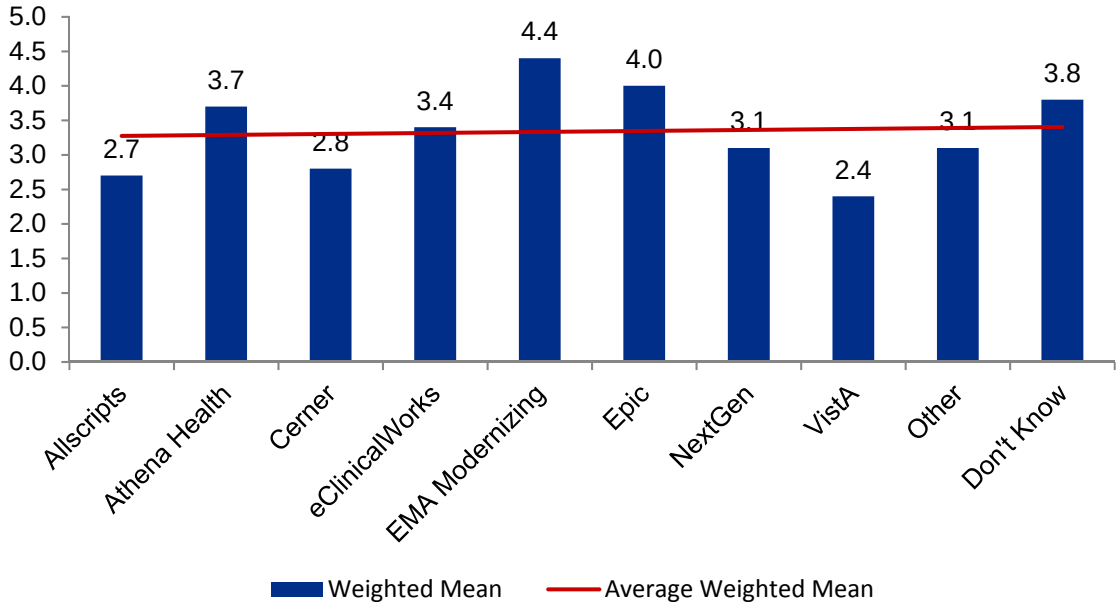
Table G - 20. EMRs Performance vs. Promise by Top 10 Vendors, 2016-2018

Vendor	*1 Awful*	*2*	*3*	*4*	*5 Outstanding*	*Total*	*Weighted Mean*
Allscripts	1 6.6%	4 26.6%	9 60.0%	1 6.6%	- -	15 7.2%	2.7
Cerner	-	- -	3 42.8%	3 42.8%	1 14.2%	7 3.3%	3.7
eClinicalWorks	1 1.4%	27 38.0%	28 39.4%	12 16.9%	3 4.2%	71 34.2%	2.8
EMA Modernizing	- -	1 8.3%	6 50.0%	4 33.3%	1 8.3%	12 5.7%	3.4
Epic	- -	- -	1 12.5%	3 37.5%	4 50.0%	8 3.8%	4.4
NextGen	- -	1 3.3%	5 16.6%	18 60.0%	6 20.0%	30 14.4%	4.0
NexTech	1 6.6%	4 26.6%	4 26.6%	4 26.6%	2 13.3%	15 7.2%	3.1
VistA	2 28.5%	1 14.2%	3 42.8%	1 14.2%	- -	7 3.3%	2.4
Other	4 12.5%	3 9.3%	14 43.7%	7 21.8%	4 12.5%	32 15.4%	3.1
Don't Know	- -	1 10.0%	4 40.0%	1 10.0%	4 40.0%	10 4.8%	3.8
Top 10 Total	9 4.3%	42 20.2%	77 37.1%	54 26.0%	25 12.0%	207 100.0%	3.2

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: 10 physicians did not identify a brand name but answered the Performance vs Promise question. The weighted mean for those physicians is 3.80.

Figure G - 7. Weighted Mean Rank of EMRs Performance vs. Promise by Top 10 Vendors, 2016-2018



Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 21. Summary of All EMR Ranking Criterion, 2016-2018

Criterion	*Weighted Mean*	*Number of Physicians*
Ease of Use	3.4	297
Effect on Physician Productivity	3.0	297
Effect on Staff Productivity	3.1	291
Reliability	3.5	296
Performance vs. Promise	3.3	248

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Installation/Replacement of EMRs by Non-AHCCCS Physicians

Table G - 22. Plans to Install EMRs by Vendor for Non-EMR Users, 2016-2018 (N = 7)

Vendor	*Number of Physicians*	*Percent*
Allscripts	3	42.9%
Don't Know	4	57.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Physicians practicing in government settings are excluded from these results. Selection of EMR systems are not mutually exclusive.

Table G - 23. Plans to Install EMRs by Vendor for EMR Users, 2016-2018 (N = 41)

Vendor	*Number of Physicians*	*Percent*
ALERT	1	2.4%
Allscripts	1	2.4%
Cerner	10	24.4%
Epic	12	29.3%
Meditech	7	17.1%
NextGen	1	2.4%
Don't Know	9	22.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Physicians practicing in government settings are excluded from these results. Selection of EMR systems are not mutually exclusive.

Table G - 24. Duration of EMR System Use and Whether a Replacement, 2016-2018 (N = 216)

Duration of EMR use	*Replacement for Different Brand of EMR*						*Total (includes don't know responses)*	
	Yes		*No*		*Total*			
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
1-3 Years	19	51.3%	38	44.7%	57	46.7%	102	47.2%
4-6 Years	12	32.4%	20	23.5%	32	26.2%	54	25.0%
7-9 Years	2	5.4%	11	12.9%	13	10.6%	22	10.1%
10 Years or More	4	10.8%	16	18.8%	20	16.3%	38	17.5%
Total	37	100.0%	85	100.0%	122	100.0%	216	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 25. Effect of EMR Replacement on Non-AHCCCS Physician Productivity Ranking, 2016-2018 (N = 228)

Physician Productivity Ranking	*Replacement for Different Brand of EMR*						*Total*	
	Yes		*No*		*Don't Know*			
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
1 (Awful)	6	20.6%	10	34.4%	13	44.8%	29	12.7%
2	7	18.4%	11	28.9%	20	52.6%	38	16.6%
3	11	13.5%	28	34.5%	42	51.8%	81	35.5%
4	14	25.9%	20	37.0%	20	37.0%	54	23.6%
5 (Outstanding)	4	15.3%	17	65.3%	5	19.2%	26	11.4%
Total	42	18.4%	86	37.7%	100	43.8%	228	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 26. Duration of EMR Use Effects on Non-AHCCCS Physician Productivity Ranking, 2016-2018 (N = 281)

Duration of EMR Use	*Physician Productivity Ranking*										*Total*	
	1 (Awful)		*2*		*3*		*4*		*5 (Outstanding)*			
1-3 Years	12	11.4%	17	16.1%	41	39.0%	28	26.6%	7	6.6%	105	45.0%
4-6 Years	5	8.6%	9	15.5%	23	39.6%	14	24.1%	7	12.0%	58	24.8%
7-9 Years	2	8.3%	6	25.0%	4	16.6%	7	29.1%	5	20.8%	24	10.3%
10 Years or More	8	17.3%	6	13.0%	17	36.9%	8	17.3%	7	15.2%	46	19.7%
Total	27	11.5%	38	16.3%	85	36.4%	57	24.4%	26	11.1%	233	100.0%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 27. Uses of Information from Claims Data, 2016-2018 (N = 18)

Uses	*Number of Physicians*	*Percent*
Population Health Management	3	4.7%
Tracking Contagious Diseases/Infections	2	3.1%
Outreach to Patients Based on Analysis of EMR Data	2	3.1%
Evaluating Appropriate Utilization of Care	4	6.3%
Analyzing Costs or Cost Effectiveness of Care	5	7.9%
Post Market Analysis of Side Effects of Pharmaceuticals	2	3.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Table G - 28. Uses of Information from EMRs, 2016-2018 (N = 40)

Uses	*Number of Physicians*	*Percent*
Population Health Management	4	6.3%
Tracking Contagious Diseases/Infections	4	6.3%
Outreach to Patients Based on Analysis of EMR Data	7	11.1%
Evaluating Appropriate Utilization of Care	12	19.0%
Analyzing Costs or Cost Effectiveness of Care	11	17.4%
Post Market Analysis of Side Effects of Pharmaceuticals	2	3.1%

Source: AMB, ABOE Survey Data, April 2016-March 2018.

The Target Population of Non-AHCCCS Physicians

Table G - 29. The Target Population of Physicians without EMRs by County, 2016-2018 (N = 356)

Location	*All Survey Respondents (N)*	*Survey Respondents EMR Users (N)*	*Survey Respondents Non-EMR Users (N)*	*Target Population (W*N)*
Apache	1	1	-	0
Cochise	5	5	-	0
Coconino	9	5	4	4
Gila	1	1	-	0
Graham	-	-	-	-
Greenlee	-	-	-	-
La Paz	-	-	-	-
Maricopa	203	180	23	25
Mohave	22	22	-	0
Navajo	4	4	-	0
Pima	50	45	5	6
Pinal	6	6	-	0
Santa Cruz	1	1	-	0
Yavapai	9	8	1	1
Yuma	4	4	-	0
Missing	20	17	3	3
Unknown	21	15	6	7
Total	356	314	42	46

Source: AMB, ABOE Survey Data, April 2016-March 2018.

Note: Table does not include physicians practicing in government settings.

The target population is calculated as the number of non-EMR users multiplied by the population weight.