

Electronic Health Record Utilization in the State of Oregon

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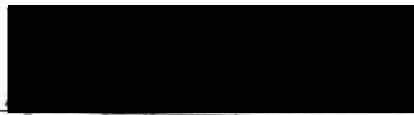
Certificate of Approval

This is to certify that the Capstone Project of

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“Electronic Health Record Utilization in the State of Oregon”

has been approved



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5/15/05

Date

Table of Contents

Abstract	1
Introduction.....	2
Methods	4
Results	7
Discussion	15
Conclusion	19 18
References	20
Appendices	22

Acknowledgements

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Working on this project has been a pleasure. Although I did not solicit the data, it was enjoyable to accumulate it, build the database and generate information based on the results.

Abstract

Objective: To evaluate the current usage of Electronic Health Records in the State of Oregon and aggregate this data among various populations of providers, geographical representations and social environments.

Design: A questionnaire was given to physician practices in the State of Oregon through individual contact and contact with Independent Physician Associations.

Methods: Physician practices were requested to give data regarding their use of Electronic Health Record systems and Practice Management Systems. The questionnaire was designed to show the current use at the practice level as well as intent to invest in this technology in the future. The information was categorized and entered into a Microsoft Access[®] database developed for this purpose.

Results: The results showed a 28.6% usage of Electronic Health Records for locations of less than 3 providers rising to an 80% usage in locations with greater than 100 providers. The use of Practice Management systems was 50% of practice sizes of 1-2 providers vs. 100% for practice sizes greater than 100. The data also showed that the smaller the practice size, the more unwilling the practices are to invest in EHRs in the near future.

Conclusions: Oregon appears to have a significant advantage in EHR adoption over the rest of the United States. In the inventory, 53.4% of the responding providers currently use an EHR. That number will increase to 83.1% when OHSU is running on their EHR

beginning in August 2005. Completion of this inventory is needed to see if these values hold. If every non-responding practice does not use an EHR, then that percentage would decrease from 83.4% to 42.6%. Regardless of the final number, a strong case can be made for further efforts into health information exchange.

Introduction

There is not a standard definition of what is all inclusive in an Electronic Health Record (EHR). But for the most part, it is a system that stores longitudinal data representing a patient's problems, medications, allergies, medical histories, progress notes and visit information. In addition to EHRs, a Practice Management Information System (PMIS) can also be used to electronically store demographic, scheduling, billing and insurance information. Together, these systems form a foundation that can allow a provider the ability to go paperless.

EHRs can save money and lives.¹⁻³ In spite of this fact, the reported nationwide usage in most surveys runs everywhere from 5% to 15%.⁴⁻⁶ Several factors exist that contribute to this lack of use and those include cost, lack of infrastructure, implementation, difficulty in making workflow changes to accommodate the system, security concerns and the lack of, or misdirected, incentives.⁶⁻⁸ The size of a practice also weighs heavily on EHR usage.⁴

Several major industry hurdles also throw up barriers to EHR utilization. The lack of standardization that will allow systems to exchange data, despite the progress of HL-7,

continues to worry potential buyers.⁹ Huge changes in feature/function of software, as well as the health of the vendor itself raises concerns. One paper referred to this scenario as “the potential for a patient to live longer than the software on which their medical record is stored”.⁷ And all of this in an industry that is in a state of flux with acquisitions, buy-outs and bankruptcies make prospective users nervous.

There are benefits to using an EHR. The ability to view all clinical data from anywhere is a huge timesaver. Electronic documentation improves the legibility of the patient visit documentation process. Templates can speed up data entry. Computerized Physician Order Entry, along with decision support systems, can reduce the errors in medication ordering as well as redundancies in ancillary orders.^{2,7,10} Cost benefits gained from the reduction of chart pulls, decrease in Medical Record staff, better drug utilization, more accurate charge capture and billing are also realized with an EHR system.^{2,3}

In March 2005, the Electronic Health Records and Data Connectivity Subcommittee prepared a report for the Oregon Health Policy Commission on Electronic Health Records & Data Connectivity. This report was submitted to the 73rd Legislative Assembly.¹¹ The report summarized the state of medical record keeping as well as EHR usage, cost, benefits and barriers. The last page of this report presented an action plan to promote the use of EHRs in the state of Oregon. One item in the plan was to “Conduct a systematic assessment of Oregon’s current status in electronic health record adoption and creation of health information exchange systems. Publish results, monitor change and

identify gaps in progress”. This project reflects the intent of the committee’s recommendation for a systematic assessment.

Methods

Study Design

Contact was made with individual physicians as well as Independent Physician Associations (IPA). A questionnaire was distributed that asked about EHR usage, PMIS usage, vendors of the systems, number of providers, specialties, location, intent to invest in systems and contact information. A copy of this questionnaire is provided in the appendices. This questionnaire was designed to inventory the state of EHRs in Oregon and not to be a survey of attitudes, concerns or provide statistical modeling data that formal surveys are intended to achieve. Its intent was to provide a baseline to measure future progress for EHR adoption in the Oregon.

EHR usage was given either a ‘Yes’ or ‘No’ response, dependent on whether the location was using an EHR. If the location was in the process of EHR implementation, such as OHSU, the response was set to ‘No’. EHR investment was categorized into one of four responses. Those responses were ‘Not in the foreseeable future’, ‘Within 12 months’, ‘Within 24 months’ and ‘Already invested’. For the purposes of this study, if a provider location was actively implementing, an EHR, they were included in the ‘Already invested’ category. For example, OHSU is in the process of implementing their selection for an EHR, but will not begin using it for several months. By definition, that location

and its 1800 providers were categorized as already invested in an EHR, but not yet using it.

When providers were asked if they used an EHR and/or a PMIS, there was no formal definition provided as to what constitutes an EHR or PMIS and no follow-up was done to confirm exactly what they believed an EHR or PMIS was. If the providers answered 'Yes' to using an EHR and/or a PMIS, they were also asked to give the vendor name. In all but 4 cases, an industry-recognized EHR vendor name, or an electronic method of capturing data was supplied. Within this population, 6 were considered homegrown (Microsoft Word, File Maker Pro). Seventeen respondents who indicated they used a PMIS did not list the vendor name. Based on this, if a location indicated they used an EHR or PMIS, they were included in the statistics of those using the technology. However, their data was excluded from the overall users for the statistics representing percentage of vendors.

Study Population

The population included in this inventory are licensed practicing providers in the state of Oregon. This includes physicians, residents, physician assistants and nurse practitioners. Current numbers provided by the Oregon Medical Association, State of Oregon and Oregon Nurses Association show this denominator to be 11,828 providers.

Data Representation

The data was initially captured on paper and hand entered into a Microsoft Excel[®] spreadsheet. In an effort to better represent the data, provide electronic data entry and enhance reporting, the data was imported into a Microsoft Access 2003[®] database. A form was created that allowed additions, deletions, lookup and modifications of records. The name of the clinic was set as the primary key to avoid any chance of duplicate entry for a clinic. Certain data fields, such as Yes/No responses, region and investment parameters were represented in a drop down box to ensure data consistency for reporting. Additional fields were added to enhance the data. These fields were county and region. The region field was based on an article presented in the November 2, 2003 issue of The Oregonian.¹² In this article, there were nine regions defined by cultural and geographical differences. The following are the nine “States of Oregon” and some major cities within each “State”:

- Columbia Corridor - The Dalles, Pendleton, La Grande
- East/SouthEast - Klamath Falls, Burns, John Day
- Central – Bend, Madras, Prineville
- Southern – Ashland, Medford, Grants Pass
- Coastal – Seaside, Florence, Gold Beach
- Willamette Valley – Newberg, Salem, Halsey
- Educational – Eugene and Corvallis areas only
- Timber Country – Roseburg, Cottage Grove, Government Camp
- Portland Metro – Portland, Beaverton, Clackamas

This was included in the data to determine if there were EHR adoption differences based on these regions. A copy of the database structure and the data entry form is presented in the appendices.

Once the data had been entered into the Access database, SPSS[®] (version 11.5) was used to generate the statistical data used in this project. The reports were based on the queries initiated in the Access database through Access SQL. The results of these queries were passed into the SPSS database. Examples of these queries are located in the appendices.

Results

Based on the data and the needs of the Electronic Health Records & Data Connectivity Subcommittee needs, a series of questions were asked. These questions were designed to extract information of EHR usage based on the fields that were populated in the database. The data, where noted, is represented in the two forms of weighted and non weighted. Weighted data represents the total of all providers associated with the data (total n=6067). Non weighted data represents the total number of locations (total n = 456). Data is often represented in both forms to reflect the overall number of providers vs. the overall number of locations.

Table 1 represents the response to the inventory. It is also designed to show the bias associated with provider size in relation to the number of reporting locations. In essence, although the number of locations with more than 100 providers represents 1.1% of the overall respondent locations, their provider size represents 69.1%. Conversely, the

number of single and two provider locations represents 60.3% of the respondent locations, but only 5.8% of the total provider number. This is why, for presented statistics, the data is represented in weighted (number of providers) and non weighted (number of locations) numbers.

Table 1 - Total Overall Respondents

Provider size	# of Locations	% of overall locations	# of Providers	% of providers
1-2 providers	262	60.3%	352	5.8%
3-5 providers	94	21.7%	352	5.8%
6-9 providers	40	9.3%	286	4.7%
10-100 providers	33	7.6%	885	14.6%
> 100 providers	5	1.1%	4192	69.1%
Totals	434*	100%	6067	100%

* 22 Locations did not respond to provider size

Based on the figures above, there is a question of how many locations and providers use an EHR or a PMIS. Table 2 is representative of that data. Again, it shows the statistical bias toward larger sites by showing 64.7% of sites don't use an EHR, but 53.4% of the responding providers do use an EHR.

Table 2 – EHR and PMIS Usage

	EHR by Location	EHR by Provider	PMIS by Location	PMIS by Provider
Yes	161 (35.3%)	3241 (53.4%)	248 (54.4%)	5397 (89.0%)
No	295 (64.7%)	2826 (46.9%)	185 (40.6%)	617 (10.2%)

The data can be further detailed and refined by looking at the makeup of the respondents. The question now becomes "What are the practice size factors that make up the responses for the use, or lack of use, of an EHR and PMIS?" Tables 3 and 4 present that data. The data in table 3 shows a trend that indicates the larger the practice size, the higher the

chances are that the providers will use an EHR and/or a PMIS. In a practice size of 1-2 providers, there is a 28.6% EHR usage. That trends upwards to 80% of practices greater than 100 providers using an EHR with that percentage rising to 100% when OHSU goes live with their EHR implementation in August 2005.

Table 3 – Use of EHR/PMIS Non Weighted with percent of n in parentheses.

Number of Providers	Locations using an EHR	Locations using a PMIS	Locations using both (includes data from previous columns)
1-2 providers (n=262)	75 (28.6%)	131 (50%)	44 (16.7%)
3-5 providers (n=94)	30 (31.9%)	61 (64.8%)	24 (25.5%)
6-9 providers (n=40)	17 (42.5%)	23 (57.5%)	8 (20%)
10-100 providers (n=33)	17 (51.5%)	24 (72.7%)	15 (45.5%)
> 100 providers (n=5)	4 (80%)	5 (100%)	4 (80%)
Totals	143 (18 did not mention size)	244 (4 did not mention size)	95 (One did not mention size)

Table 4 - Use of EHR/PMIS Weighted

Number of Providers	Providers using an EHR	Providers using a PMIS	Providers using both (includes data from previous columns)
1-2 providers (n=352)	100 (28.4%)	187 (53.1%)	66 (18.7%)
3-5 providers (n=352)	113 (32.1%)	232 (65.9%)	87 (24.7%)
6-9 providers (n=286)	126 (44%)	162 (56.6%)	68 (23.8%)
10-100 providers (n=885)	510 (57.6%)	624 (70.5%)	446 (50.3%)
> 100 providers (n=4192)	2392 (57.0%)	4192 (100%)	2392 (57%)
Totals	3241	5397	3059

Tables 2-4 show the breakdown of adoption by practice size and overall provider numbers. But the data also allows a look at the regional makeup of EHR/PMIS usage. Table 5 shows the breakdown by county. By far, Multnomah County has the highest adoption of EHR and PMIS systems, but locations such the VA Hospital, Providence and Kaiser skew this data. Outside of Multnomah County, Marion County has the next highest adoption rate. The figures for Douglas County are also skewed because of the VA hospital located there. One element of this data worth further investigation is the column “Has EHR/No PMIS” since this seems somewhat contrary to usual adoption standards.

Table 5 – EHR/PMIS Usage by county

Based on number of Locations with # of providers in parenthesis

	No EHR and No PMIS	No EHR Has PMIS	Has EHR No PMIS	Has EHR Has PMIS	Totals*
Benton		2 (8)			2 (8)
Clackamas	2 (4)	3 (5)	1 (1)	1 (9)	7 (19)
Crook	1 (2)	2 (2)			3 (4)
Deschutes	10 (48)	13 (34)	6 (43)	1 (2)	30 (127)
Douglas				1 (117)	1 (117)
Grant			1 (2)	1 (3)	2 (5)
Hood River	3 (15)	2 (3)	1 (6)		6 (24)
Jackson	23 (43)	19 (75)	4 (23)	16 (119)	62 (260)
Lane			1 (1)		1 (1)
Linn	1 (5)	2 (5)		1 (2)	4 (12)
Malheur			1 (1)		1 (1)
Marion	21 (47)	56 (211)	5 (23)	23 (125)	105 (406)
Multnomah	58 (210)	40 (1968)	19 (24)	37 (2618)	154 (4820)
Polk	4 (4)	3 (11)			7 (15)
Wasco	2 (63)	2 (4)	1 (4)	1	6 (71)
Washington	17 (47)	8 (12)	1 (1)	14 (40)	40 (100)

* 24 locations failed to answer both question and were removed from this table

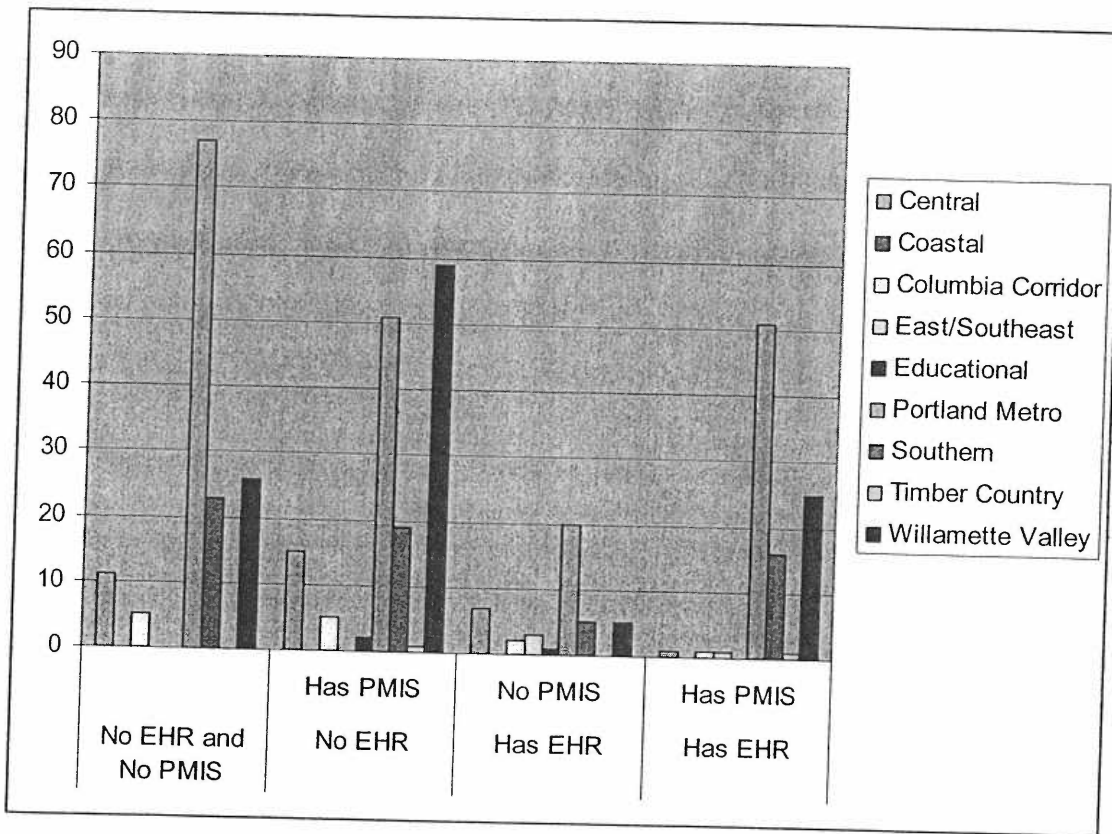
The data can also be applied to the regional characteristics defined by The Oregonian in its article on “The Nine States of Oregon”. Table 6 contains that breakdown.

Table 6 – EHR/PMIS usage by Region.

Based on number of Locations with number of providers in parenthesis

	No EHR and No PMIS	No EHR Has PMIS	Has EHR No PMIS	Has EHR Has PMIS	Totals*
Central	11 (50)	15 (36)	7 (43)	1 (2)	34 (131)
Coastal					0 (0)
Columbia Corridor	5 (78)	5 (12)	2 (10)	1 (24)	13 (124)
East/Southeast			3 (3)	1 (3)	4 (6)
Educational		2 (8)	1 (1)		3 (9)
Portland Metro	77 (261)	51 (1985)	20 (25)	51 (2663)	199 (4934)
Southern	23 (43)	19 (75)	5 (24)	16 (119)	63 (261)
Timber Country		1 (3)		1 (117)	2 (120)
Willamette Valley	26 (56)	59 (219)	5 (23)	25 (131)	115 (429)

Figure 1. Bar graph representation of Table 6



From the examples in tables 2-6, the picture becomes somewhat clearer as to who uses EHR and PMIS systems. It tends to be large facilities. And the larger the facility, the higher the chances are that the facility will be using both a PMIS and an EHR. But the adoption of Electronic Health Record systems are growing as the benefits of these systems become more clear. The question was asked to the respondents if they had intentions of investing in an EHR system. If so, were they planning on investing in the next 12 months or 24 months. They also had the option of indicating that they were not planning to invest in the foreseeable future, or they had already invested. Table 7 shows the results of this question based on provider size of the location.

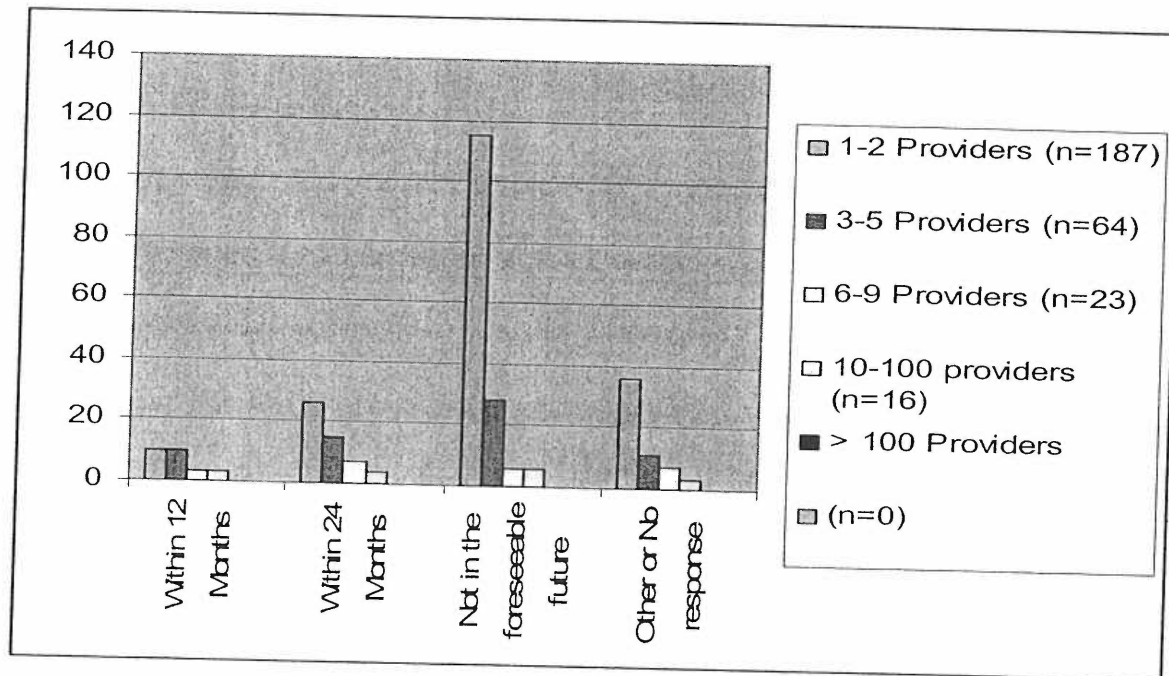
This data shows that small offices are still hesitant to adopt EHRs in their practices. Since no data was gathered regarding reasons, those reasons probably follow fairly closely with documented barriers to implementations discussed earlier. Comments contained in the

'Other' column include "On the 5 year plan", "timeframe unspecified", and "When the Sr. Doctor leaves".

Table 7-Intent to Invest – Those currently with no EHR, or EHR implementation activity

Practice Size	Within 12 Months	Within 24 Months	Not in the foreseeable future	Other or No response
1-2 Providers (n=187)	10	26	115	36
3-5 Providers (n=64)	10	15	28	11
6-9 Providers (n=23)	3	7	6	7
10-100 providers (n=16)	3	4	6	3
> 100 Providers (n=0)	0	0	0	0

Figure 2. Bar graph representation of Table 7



But there are places in Oregon that have adopted and implemented EHR and PMIS systems. Another question on the inventory was “What Product”. This was filled in if the respondent confirmed that they had either an EHR or a PMIS system. Fifty-one different EHR systems were identified by those who used, or were in the process of implementing, EHR systems. Sixty-four PMIS vendors were given by those who are using, or will soon use, this type of system. The full list is present in the appendices, but tables 8-11 show the top 5 vendors of PMIS and EHR systems. As with other data, weighting and non weighting is represented.

Table 8 – Top 5 EHR Vendor by Location (non weighted)

Vendor	Number of provider locations	Percentage
GE Centricity (Logician)	35	21.6%
SOAPWare	24	14.8%
Practice Partner	8	4.9%
Alteer	8	4.9%
Misys	7	4.3

Table 9 – Top 5 EHR Vendors by Provider Numbers (weighted)

Vendor	Number of provider users	Percentage
Epic	3035	60.2%
CPRS	960	19.0%
GE Centricity (Logician)	566	11.2%
WebMD	73	1.4%
NextGen	55	1.1%

Table 10 – Top 5 PMIS Vendors by Provider Location (non weighted)

Vendor	Number of provider locations	Percentage
GE Centricity	33	13.3%
Medical Manager	26	10.5%
Medisoft	23	9.3%
Lytec	18	7.3%
Misys	18	7.3

Table 11 – Top 5 PMIS Vendors by Provider Numbers (weighted)

Vendor	Number of provider users	Percentage
Siemens	1800	33.4%
Epic	1100	20.4%
Vista	960	17.8%
Centricity	132	2.4%
Misys	113	2.1%

Discussion

The intention of the subcommittee was to get a baseline inventory to begin the process of examining EHR utilization in the State of Oregon. The data that has been logged to date has gone a long way in establishing that baseline. The total number of respondents, as of this writing, represents 6067 physicians, physician assistants, nurse practitioners and residents. According to the State of Oregon, there are 11,828 providers of health care in the state. That means the data presented here covers 51.3% of the provider population of Oregon.

Within this data, we see that providers in medium to large groups have a good chance of utilizing an EHR. That percentage increases from 51%, if a practice is between 10 and 100 providers, to 80% for practices over 100 providers. That figure will increase to 100% when OHSU finishes their current implementation of their EHR. The same is true with Practice Management systems. The data also indicates that a practice in the urban areas of Multnomah, Washington and Marion counties have a better chance of adopting EHR systems.

When large practice sizes are removed from the data, the information is a little more disturbing. Practices of 5 providers or less made up 82% of the respondents, yet these groups have less than one-third (30.1%) adoption rate for EHRs. When the data is furthered examined, it shows that that they have no immediate plans of acquiring this technology. Of practices that list 1-2 providers, 73% indicated their intentions to invest was "Not in the foreseeable future". That was true for 50% of the practices having 3-5 providers.

When practices do acquire this technology, the practice size again comes into play. Epic Systems (Madison, Wisconsin) has more providers using, or in the process of implementing, their EHR (60.2%) in Oregon than any other system. This is due to their contracts with Kaiser, OCHIN and OHSU. But when the numbers of users are eliminated from the data, GE Centricity (Logician) EHR system is in more locations (21.6%) than any other system.

From a Practice Management view, Siemens has the largest user base at 33.4%, primarily because of the influence of OHSU on the data. When the numbers of practices are used in the formula, GE Centricity has the highest location-dependent base at 13.3%. For those practices with 5 or fewer providers, Medisoft is used in more locations with 12.6% for PMIS and SOAPWare is the EHR used most with 27.8% usage among vendors.

Limitations

This data represents an inventory of EHR and PMIS usage across the State of Oregon. The data was gathered by contacting individual practices and managers of IPAs to distribute and return the questionnaire. The data is representative of the practice. In essence, a practice of 10 providers did not have 10 questionnaires, they had one questionnaire that reflected the entire practice. Other data, such as the number of providers at OHSU, was gathered by inquiry from those that worked on the Epic acquisition (which requires total number of users for licensing). Because of the disparate nature of the data collection, it is quite possible that some providers have been counted multiple times. For instance, physicians that work between the VA and OHSU may have been counted as users of the CPRS system and users of the Epic system.

Also, it is difficult to make inferences to the overall use of EHRs in more rural areas until an entire inventory can be made. This would include non-respondents to this particular questionnaire. But that is what this inventory is designed for. It is a baseline for further research into the usage patterns of the State and can be built upon accordingly.

What does cause a bias in the data is the higher response rate of the larger facilities in urban areas. These providers are much easier to target and tend to respond to requests for data. Because of this, adoption rates may be skewed from those in smaller, more rural areas. To compensate for this, to a degree, the data was presented in groups of practice sizes.

It is important as this project proceeds, to work on normalizing the data. There was a rather large cleanup effort on a number of fields to allow for valid statistics. Items such as EHR vendor names had to be looked at and corrected. For instance, some people used GE Logician, Logician, Logician from GE, or Centricity Logician as their vendor. These were all consolidated into GE Centricity (Logician). The two areas that could still use the most cleanup are practice size and specialty. Practice size was left off by a number of respondents (22) and a fair number also left vendor name off of their questionnaire. These groups should be contacted to determine this information so the statistics can represent them correctly. Also, it would be helpful to categorize this data based on specialty. However, there are so many representations of the same specialty that it was difficult to gather accurate sampling. For instance, Family Practice was represented as F.P, FamPrac, FPractice, Family Practice, FP/IM, FP/OBGyn, etc. As this database matures, I would suggest the use of dropdown boxes that don't allow a great deal of latitude for responses. This should help normalize this database and improve the quality of the statistics.

Conclusion

The data indicates that members of large provider networks in Multnomah County have pretty good odds of using both a PMIS and an EHR in day-to-day activities. Fifty-three percent of responding providers indicated that they use EHR technology in their practice. When OHSU begins using their EHR, that number will increase to 83.1%.

Conversely, providers in small and rural networks are most likely not using an EHR. Since this population makes up a significant portion of the non-responders, the overall EHR usage could drop to 42.6% if they all are not currently using an EHR.

The trick for the subcommittee is now how to provide this technology to those who responded “Not in the foreseeable future” and encourage them to adopt an EHR. The data is strong to support that fact that it not only improves patient care, but has some significant cost benefits also.

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Oregon Electronic Health Record Inventory:

The Electronic Health Records subcommittee for the state is working to collect the following information to assess the penetration of EHR in Oregon.

1. Does your clinic use electronic health records (same as electronic medical records)?

_____ yes _____ no

If yes, which product? _____

2. Does your clinic have an electronic practice management system ?

_____ yes _____ no

If yes, which product? _____

3. How many practicing clinicians in your office?

4. In what specialty or subspecialty do your clinicians practice? Please list all.

5. Please provide the name and email of a contact person for your clinic:

Name: _____

Email address: _____ (we promise not to spam you!)

6. What is the name of your clinic and in what city are you located?

Name of clinic: _____

City or Town : _____

7. Will your practice invest in Electronic Health Records? (please check one)

_____ Already invested

_____ Within 12 months

_____ Within 24 months

_____ not in foreseeable future

Appendix 2 – Data Entry Form

Combined

Oregon EHR Inventory

Health System or Clinic:

Have EHR? Electronic Health Record Product:

Have PMIS? Practice Management IS product:

Clinician User #: Specialty:

City or Town: County: Region:

Contact Person: email address:

Intent to Invest:

Add Record Delete Record Save Record Find Record

Record:

Appendix 3 – Database Structure of the Microsoft Access Database

Field Name	Data Type	Description
Health System or Clinic:	Text	Primary Key to the database
Have EHR?	Text	Yes or No response
Electronic Health Record Proc	Text	Vendor, if yes
Have PMIS?	Text	Yes or No Response
Practice Management IS proc	Text	Vendor, if yes
Server Location:	Text	Left over from earlier data. Not used in the stats
Clinician User #:	Number	number of providers in the location
Specialty:	Text	SPecialty of the providers
City or Town:	Text	Which town
County	Text	Which county does the town reside
Region	Text	What region. Based on Oregonian Nine States of Oregon
Contact Person:	Text	Who to contact
email address:	Text	Contacts email address
▶ Intent to Invest:	Text	Planning to invest. Drop down selection list to maintain consistency

Appendix 4 – Example of Database queries

1. This query was used to pass all unidentifiable information to the SPSS database.

```
SELECT Combined.[Have EHR?], Combined.[Have PMIS?], Combined.[Clinician User #:], Combined.[Specialty:], Combined.County, Combined.Region, Combined.[Intent to Invest:], Combined.[Electronic Health Record Product:], Combined.[Practice Management IS product:]  
FROM Combined;
```

2. Query to find clinician numbers, county and region where the response to “Have EHR” and “Have PMIS” was Yes.

```
SELECT Combined.[Clinician User #:], Combined.[Have EHR?], Combined.[Have PMIS?], Combined.County, Combined.Region  
FROM Combined  
WHERE (((Combined.[Have EHR?])="yes") AND ((Combined.[Have PMIS?])="yes"));
```

3. Although not passed to SPSS, this query was used initially to look at who was planning to invest, when and what county they resided in.

```
SELECT Combined.[Health System or Clinic:], Combined.[Intent to Invest:],  
Combined.County  
FROM Combined  
WHERE (((Combined.[Have EHR?])="no"));
```

Appendix 5 – List of EHR Vendors as given by respondents

Query1
Electronic Health Record Product:
A4
Acermed
Alteer
Amazing Charts
Centricity (Logician)
Cerner
Charting Plus
CHARTLOGIC
Clinicalogic
COPATH
CPRS
Crowell-Medformix
DHS
DR Systems
Dr. Notes
e-Clinical Works
E-MD's
Epic
ERECS
Filemaker
GE Centricity (Logician)
Growthbase
Homegrown
Impac's PowerPath2000
InteGreat
Lytec
Med Notes (Health Chart)
Medflow
Medformix
Medic
Medical Manager
Micro Four Practice Studio
Microsoft Word

Query1
Electronic Health Record Product:
Misys
M-Track
NA
Name not given
NextGen
notfull health record
Practice One
Practice Partner
Praxis
Protomed
QuickMeds
Shasta Networks
Soapware
Synamed
Talk notes (pravox)
Topssuite
Varian
WebMD

Appendix 6 Practice Management Information System Vendor list

Query1
Practice Management IS product:
A4
ACEC
Advantx
Alteer
Aries
Centricity
Cerner
Champion
Companion
Compulink Advantage
Crowell-Medformix
Dairyland
Data Perspectives
e-Clinical Works
E-MD's
Epic
GE (CPO3/Healthco)
GPMS
Healthcare data systems
HealthCo
IDX
Inform & Enhance (specialized for plastic surgery)
InteGreat and McKesson
Intergy
Lytec
MBA Health Pro 7000
Medformix
Medic
Medical Manager
Medical Manager/Web MD
Medisoft
Medshare Microdata
Medtask
Medware
Micro Four Practice Studio
Millbrook

Query1
Practice Management IS product:
Misys
Name not given
NDS
NextGen
Not Specified
office haus-just does scheduling
PCN
Physician Microsystems
PIMS by Vitalworks
Practice One
Practice One / e-Medsys
Practice Partner
Prism
Prodata
Protomed
Shasta Networks
Siemens
Synamed
Telecom
through our billing service
topssuite
Visionary
VISTA
Vitalworks
WebMD
WebMD/Medical Manager
Windent
Wisdom