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# **Conducting Research in the OCHIN Practice Management Data: Opportunities and Examples**

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# The Guide to Conducting Research with the OCHIN Practice Management Data

## **Purpose:**

- **Help those interested in conducting research in the safety net**
- **Foundation for long-term research agenda**
- **Describe research potential of OCHIN's Practice Management (PM) data**
- **Show examples**

# Caveats

- **Selected OCHIN clinics authorized OCHIN to release LDS**
  - Data sharing agreement
- **OCHIN, CHR signed a study-specific data use agreement for these analyses**
- **Example analyses meant to spur Qs**
  - Methods should be refined in future studies

# What is OCHIN?

## A Health Information Network for FQHC/CHC

- **Provides common data management resources**
- **EpicSystems Practice Management (PM) data system: an integrated software suite**
  - Billing
  - Claims
  - Appointments
- **Goals:**
  - Improve access to care / quality of care
  - Give access to sophisticated data systems
  - Reduce data management burden

# OCHIN Practice Management (PM) data

- **Rich data resource**
- **Unique perspective on outpatient care utilization**
- **Good data on race, ethnicity, poverty**
- **Exceptional data on the uninsured**

# About the PM data: for every encounter ...

- **A unique ID**
- **Date of service**
- **Place of service (clinic setting)**
  - Urban / rural status
  - Type of clinic (e.g., primary care, dental)
- **Patient's poverty status**
- **Patient's payment source (if any)**
  - Also available: insurance eligibility history

**OCHIN accounts: individual or household**

# About the PM data: for every encounter ...

## *Diagnosis and procedure data*

- $\geq 1$  diagnostic, procedure codes

**Codes may be:**

- **Studied individually**
- **Grouped into categories**

# About the PM data: for every encounter ...

## Appointment data

- **Cancelled? No-show?**
  - Reason
- **Type of visit**
  - Medical appointment
  - Phone encounter
  - Drop-in
  - New patient visit
- **Length of appointment**
- **Time between contact and appointment**
- **% appointment slots double-booked**
- **Copayment due**

# About the PM data: patients, providers

## Every patient:

- **Unique ID**
- **Age, gender, race, ethnicity**
- **Primary language (data questionable)**

## Every provider:

- **A unique ID**
- **Type of provider**
- **Clinic ID**

# General considerations: research in the PM data

- **Data sharing agreements needed**
- **Not all FQHCs in OR are OCHIN members**
- **OHP changes**
- **The Oregon Safety Net Research Network (OSNRN)**
  - Collaboration between OCHIN members, CHR, OHSU, other SN
  - Coordinate research involving safety net clinic populations
  - Focus is on practice-based research
- **The Oregon Clinical & Translational Research Institute (OCTRI)**

# Data considerations: research in the PM data

- **Variable-specific limitations**
- **Outpatient care only**
- **Little pharmacy data**
- **Little lab, radiology data**
- **Population rates difficult – denominators?**

# Research potential of the PM data

- **Research on individuals' course of care**
- **Patterns of certain diagnoses / procedures**
- **Patterns of cross-clinic utilization**
- **Clinic-level reports**
- **Comparisons of utilization / care patterns**
  - By region
  - In other populations
- **Health disparities research**
- **Assessment of behavioral interventions**
- **Impact of insurance coverage**
- **Research supporting evidence-based practice**
- **Health services research**
- **Health policy research**

# Future data sources, potential data linkages

## **EpicCare EMR at many OCHIN clinics**

- **Will provide data not available in the PM**
- **Will require new data use / data sharing agreements (PHI)**

## **PM / EMR data could possibly be linked to:**

- **Medicaid hospital data**
- **Hospital discharge data**
- **Birth certificates**
- **Other**

# OCHIN member agencies in these analyses

**Asher Community Health Center**  
**Benton County Health Department**  
**Clackamas County Public Health Department**  
**Deschutes County Health Department**  
**Klamath Open Door**  
**Lane County Community Health**  
**Multnomah County Health Department**  
**Ochoco Community Health**  
**OHSU (Richmond & Scappoose clinics)**  
**Tillamook County Public Health**  
**Virginia Garcia Memorial Health Center**  
**Santa Cruz Women's Health Center**

# Population in these clinics

**2005**

**553,040 encounters / 129,793 patients: outpatient primary care**

**Average # encounters per patient: 4.3**

**65% of encounters: female patients**

**Also:**

- **225 patient encounters / 130 patients: correctional facilities**
- **63,188 encounters / 25,993 patients: dental care**

# 2005 encounters / patients by age and sex

SEX	Age (years)	Encounters		Patients	
		#	%	#	%
F	0 to 17	88841	16.1	25737	19.8
	18 to 44	185100	33.5	39412	30.4
	45 to 64	65128	11.8	10823	8.3
	65 up	20332	3.7	3247	2.5
	Total	359401	65.1	79219	61.0
M	0 to 17	69841	12.7	22877	17.6
	18 to 44	63956	11.6	17631	13.6
	45 to 64	49020	8.9	7986	6.2
	65 up	10577	1.9	2060	1.6
	Total	193394	35.1	50554	39.0

# 2005 encounters / patients by race / ethnicity

	Encounters		Patients	
	#	%	#	%
<b>Hispanic</b>	169461	30.6	38286	29.5
<b>NH AIAN</b>	4872	0.9	1077	0.8
<b>NH API</b>	19933	3.6	4498	3.5
<b>NH black</b>	38503	7	7453	5.7
<b>NH white</b>	284824	51.5	68690	52.9
<b>Missing data</b>	35447	6.4	9789	7.5

# 2005 encounters / patients by Federal Poverty Level

	Encounters		Patients	
	#	%	#	%
<b>&lt; 50 % FPL*</b>	63963	11.6	19948	15.4
<b>50-100 % FPL</b>	123114	22.3	27823	21.4
<b>100-150 % FPL</b>	244845	44.3	50853	39.2
<b>150-200 % FPL</b>	37699	6.8	8532	6.6
<b>200 % FPL or up</b>	34552	6.3	9309	7.2
<b>Missing data</b>	48867	8.8	13328	10.3

# 2005 encounters by payment source

	Encounters	
	#	%
<b>Medicare</b>	55008	10.0
<b>Self-paid</b>	214777	38.8
<b>Medicaid, OMAP, CareOregon or FPEP</b>	235467	42.6
<b>Other</b>	47788	8.6

# Research potential – descriptive statistics: diagnoses

## 10 most common dx groups by % of visits associated with each

1. **Factors influencing health care (12.6%)**
2. **Immunizations & screening for infection (8.4%)**
3. **Normal pregnancy /delivery (6.8%)**
4. **Contraceptive & procreative management (6%)**
5. **Alcohol & substance-related mental disease (3.9%)**
6. **Respiratory infections (3.8%)**
7. **Viral infections (3.2%)**
8. **DM without complication (2.9%)**
9. **Diseases of female genital organs (2.7%)**
10. **Hypertension (2.7%)**

# Research potential – descriptive statistics: diagnoses Encounters / patients associated with asthma (no, yes)

	Encounters		Patients	
	No	Yes	No	Yes
<b>0 to 5</b>	98.2	1.8	96.5	3.5
<b>6 to 10</b>	94.4	5.6	93.2	6.8
<b>11 to 17</b>	97.1	2.9	95.4	4.6
<b>18 to 44</b>	98.5	1.5	96.3	3.7
<b>45 to 64</b>	98.2	1.8	94.3	5.7
<b>65 and up</b>	99.0	1.1	96.9	3.1
<b>Hispanic</b>	98.6	1.4	96.8	3.2
<b>NH AIAN</b>	97.2	2.8	93.0	7.0
<b>NH API</b>	98.3	1.7	96.8	3.2
<b>NH black</b>	97.9	2.1	94.5	5.5
<b>NH white</b>	97.9	2.1	95.3	4.7

# Research Ex. 1: Distribution of payment source by race, age, gender – Background and methods

- **40% of encounters self-paid (uninsured)**
- **40% Medicaid, OMAP, CareOregon, FPEP etc.**
- **10% Medicare**
- **9% commercial payor / other**

**Does this vary by age, gender, race / ethnicity?**

- **Describe primary payor by encounter: overall and by SES**
- **Encounters not associated with a specific payment source assumed to be self-paid**

# Primary payment source for encounters by ♀ 0-17

Age	Race / ethnicity	Medicaid, OMAP, CareOR, FPEP	Self-paid
		% encounters	
<b>0-5</b>	<b>Hispanic</b>	81.9	<b>16.7</b>
	<b>NH AIAN</b>	74.5	24.1
	<b>NH API</b>	66.2	<b>29.0</b>
	<b>NH Black</b>	88.0	10.3
	<b>NH White</b>	70.9	20.4
<b>6 to 10</b>	<b>Hispanic</b>	58.3	<b>39.2</b>
	<b>NH AIAN</b>	72.0	25.3
	<b>NH API</b>	69.9	<b>26.6</b>
	<b>NH Black</b>	91.4	6.4
	<b>NH White</b>	67.8	20.9
<b>11 to 17</b>	<b>Hispanic</b>	37.4	<b>59.4</b>
	<b>NH AIAN</b>	64.4	29.1
	<b>NH API</b>	58.9	<b>33.6</b>
	<b>NH Black</b>	77.2	19.0
	<b>NH White</b>	62.8	26.3

# Research Ex. 1: Distribution of payment source by race, age, gender - Limitations

- **Visits may be covered by different sources depending on reasons for care**
  - Distribution affected by # of encounters
- **Payment source defined according to primary payor for a given encounter**
  - Many visits covered by multiple payors

# Research Ex. 1: Distribution of payment source by race, age, gender – Questions and future research

- **Are differences affected by # of visits for people by age / race?**
- **How does payment source vary for visits associated with specific types of care / morbidities?**
- **Do results vary between clinics?**
- **Difference when 2<sup>nd</sup>ary payors included?**

## Research Ex. 2: DM by SES; comorbidity with schizophrenia – Background, methods

- **>6% of OR adults with DM**
- **Known DM-related disparities**
- **We assess % of encounters, patients with DM+, DM- *and* schizophrenia**
- **DM:  $\geq 1$  2005 encounter with DM code**

# Encounters associated with DM

		Any DM	DM-	DM+
		%	%	%
	<b>Total</b>	5.0	3.0	2.0
<b>Sex</b>	<b>Female</b>	4.7	2.9	1.8
	<b>Male</b>	5.6	3.3	2.3
<b>Age (years)</b>	<b>18 to 44</b>	3.0	1.6	1.4
	<b>45 to 64</b>	13.3	8.0	5.3
	<b>65 and up</b>	16.7	11.3	5.4
<b>Race / ethnicity (age 45 +)</b>	<b>Hispanic</b>	24.1	12.6	11.6
	<b>NH AIAN</b>	12.5	8.8	3.7
	<b>NH API</b>	13.9	10.0	3.9
	<b>NH black</b>	16.5	9.3	7.2
	<b>NH white</b>	11.8	7.9	4.0
<b>Primary insurance source</b>	<b>Medicaid</b>	3.6	2.1	1.5
	<b>Medicare</b>	14.4	9.5	4.9
	<b>Other</b>	4.4	2.9	1.6
	<b>Self-paid</b>	4.9	2.7	2.2

# #, % patients with DM and schizophrenia

- **0.7% of patients who *don't* have DM have a visit associated with schizophrenia**
- **2.3% of patients who *do* have DM have a visit associated with schizophrenia**
- **5.1% of patients who *don't* have schizophrenia have a visit associated with DM**
- **14.7% of patients who *do* have schizophrenia have a visit associated with DM**

## Research Ex. 2: DM by SES; comorbidity with schizophrenia - Limitations

- **User rates only**
- **Patients identified as DM based on a single visit with a DM diagnosis**
- **Only primary insurance source considered**

## Research Ex. 2: DM by SES; comorbidity with schizophrenia – Questions and future research

- **Is the lower % of older patients with severe DM a reflection of insurance status?**
- **Does relationship between DM, schizophrenia differ by R/E?**
- **How often does the schizophrenia diagnosis precede DM diagnosis?**
- **Other factors associated with DM patients' development of schizophrenia, and vice versa?**

# Research Ex. 3: Factors associated with receipt of preventive care – Background / methods

- **ID pts with a 2005 visit associated with DM**
- **Who received preventive care measures?**
- **What factors associated with odds of receiving these measures?**

**Preventive care measure**

**Associated procedure codes**

**HbA1c**

**BLOOD COUNT; HEMOGLOBIN  
HEMOGLOBIN A1C  
CPT code 83036**

**Lipid screening**

**LIPID PANEL  
LDL MEASURED  
CPT codes 80061, 83716, or 83721**

**Flu vaccination**

**ADMINISTRATION OF INFLUENZA VIRUS VACCINE  
INFLUENZA VIRUS VACCINE 3+ YEARS  
CPT codes 90658 or 90660**

# Research Ex. 3: Factors associated with receipt of preventive care – Methods

- **Primary coverage: based on visit when procedure administered**
  - If  $\geq 2$  visits, coverage defined by last visit
- **Poverty: highest FPL at any 2005 visit**
- **% DM receiving these measures, overall / stratified by SES**
- **Logistic regression: characteristics associated with the preventive care measures**

# Distribution of DM pts receiving the measures

- **HbA1c screening: 56%**
- **LDL screening: 37%**
- **Flu vaccination: 32%**

# Multivariate regression: SES factors & odds of having received the preventive measure

	HbA1c	LDL	Flu vacc.
Age 11-17 vs 65 up	0.4 +/- 0.2	0.5 +/- 0.2	0.4 +/- 0.3
Age 18-44 vs 65 up	ns	ns	ns
Age 45-64 vs 65 up	ns	ns	1.2 +/- 0.2
Sex M vs F	ns	ns	ns
Hispanic vs NH white	2.0 +/- 0.2	1.4 +/- 0.2	2.0 +/- 0.3
NH AIAN vs NH white	ns	0.4 +/- 0.2	ns
NH API vs NH white	1.6 +/- 0.4	1.7 +/- 0.4	2.0 +/- 0.5
NH black vs NH white	1.6 +/- 0.3	1.7 +/- 0.3	1.4 +/- 0.3
FPL <50% vs 200%+	ns	ns	ns
FPL 50-100% FPL vs 200%+	ns	ns	ns
FPL 100-150% FPL vs 200%+	1.5 +/- 0.3	1.7 +/- 0.3	ns
FPL 150-200% FPL vs 200%+	ns	ns	ns
Medicare vs Medicaid*	0.8 +/- 0.1	0.8 +/- 0.1	ns
Other vs Medicaid*	0.4 +/- 0.1	0.4 +/- 0.1	0.5 +/- 0.1
Self-paid vs Medicaid*	0.8 +/- 0.1	0.7 +/- 0.1	0.5 +/- 0.1

# Research Ex. 3: Factors associated with receipt of preventive care – Limitations

- **User rates only**
- **Patients identified as DM based on a single visit with a DM diagnosis**
  - Conservative estimates
- **Only primary insurance source considered**
- **Missed codes?**

## Research Ex. 3: Factors associated with receipt of preventive care – Questions raised & future research

- **Do the odds of receiving care differ by disease severity?**
- **Are some patients receiving care at other clinics?**
  - NH AIAN
  - 65+
  - Commercially insured
- **Why are white patients less likely to receive these measures?**
- **Odds of receiving HbA1c screenings 2x/year?**

# Research Ex. 4: Predictors of cancellation – Methods

**Is appointment cancellation predicted by SES, insurance?**

- **Insurance usually determined by primary coverage at an encounter. If cancelled appointment, then:**
  1. If anything other than uninsured when appointment made → whatever coverage when scheduled.
  2. If no history of eligibility for any coverage → uninsured.
  3. The rest: eligibility history → eligibility at time of appointment.
- **Univariate, multivariate regression: predictors of completed vs. cancelled**

# Cancellation by selected demographic factors

- **27% appointments cancelled**
- **66% completed**
- **7% other**

# Multivariate regression: odds of cancelling

	OR	95% CI	
<b>0-5 vs 65 up</b>	0.50	0.49	0.52
<b>6-10 vs 65 up</b>	0.51	0.49	0.53
<b>11-17 vs 65 up</b>	0.63	0.61	0.65
<b>18-44 vs 65 up</b>	0.81	0.79	0.84
<b>45-64 vs 65 up</b>	0.74	0.71	0.76
<b>Male vs Female</b>	0.95	0.94	0.96
<b>Hispanic vs NH white</b>	1.01	0.99	1.04
<b>NH AIAN vs NH white</b>	1.21	1.14	1.29
<b>NH API vs NH white</b>	0.99	0.94	1.05
<b>NH black vs NH white</b>	1.37	1.34	1.41
<b>FPL &lt;50% vs 200%+</b>	1.27	1.23	1.31
<b>FPL 50-100% vs 200%+</b>	1.28	1.25	1.32
<b>FPL 100-150% vs 200%+</b>	1.22	1.19	1.25
<b>FPL 150-200% vs 200%+</b>	1.04	1.00	1.08
<b>Russian / other E. European vs English</b>	0.45	0.43	0.46
<b>Spanish vs English</b>	0.67	0.65	0.69
<b>Vietnamese / other API vs English</b>	0.55	0.51	0.58
<b>Medicare vs Medicaid *</b>	0.70	0.68	0.72
<b>Other vs Medicaid *</b>	0.90	0.88	0.92
<b>Self-paid vs Medicaid *</b>	1.04	1.02	1.05

## Research Ex. 4: Predictors of cancellation – Limitations

- **Misclassification of insurance – esp. for those who cancelled?**
- **Only primary insurance considered**
- **Primary language data: questionable**
- **OCHIN clinic appointment methods**

# Research Ex. 4: Predictors of cancellation

## – Questions raised and future research

- **Certain morbidities more likely to cancel?**
  - Disease severity?
- **Affected by time between appointment was made and when scheduled?**
- **Affected by time since previous appointments, # recent appointments?**
- **Affected by new patient status?**
- **Is clinic site / other clinic factors associated with the likelihood of appointment cancellation?**
- **Need better research on role of insurance coverage**

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## Other resources and contact information

### The Oregon Safety Net Research Network (OSNRN)

#### CHR staff:

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