

# How can PBRNs use Big Data to Create a Learning Health System

## The Canadian Primary Care Sentinel Surveillance Network (CPCSSN)

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Canadian Primary Care Sentinel Surveillance Network  
Réseau canadien de surveillance sentinelle en soins primaires

## Declaration

CPCSSN is funded by the Public Health Agency of Canada through a contribution agreement with the College of Family Physicians of Canada.

I have no conflicts of interest.

**CPCSSN:** Started in 2008; committee of the **College of Family Physicians of Canada**

11 University departments of Family Medicine

Data collected from primary care EMRs across Canada: **Primary Care database for Surveillance and Research and practice Quality Improvement**

Data **extracted, cleaned and merged** in central database **every 3 months**; **EMR case definition algorithms** for 8 chronic conditions

>650,000 patients, goal 1,000,000 by 2015

### British Columbia

- BCPCReN, Vancouver - *Wolf, OSCAR*

### Northwest Territories

- Yellowknife - *Wolf*

### Alberta

- SAPCReN, Calgary - *Med Access, Wolf*  
 - NAPCReN, Edmonton - *Med Access, Wolf*

### Manitoba

- MaPCReN, Winnipeg - *Jonoke*

### Ontario

- DELPHI, London - *Optimed, OSCAR, Healthscreen*  
 - UTOPIAN, Toronto - *Nightingale, Practice Solutions, Bell EMR*  
 - EON, Kingston - *P&P, OSCAR, Bell EMR, Nightingale, Practice Solutions*  
 - McMaster U., Hamilton - *OSCAR, Practice Solutions*

### Québec

- RRSPUM, Montréal - *Da Vinci, Purkinje*

### Nova Scotia/New Brunswick

- MaRNet, Halifax - *Nightingale, Purkinje*

### Newfoundland

- APBRN, St. John's - *Wolf, Nightingale*

Clinicians and Researchers collaborating on a national project.



**10 PC-PBRNs serving 8 provinces, 1 territory - 11 distinct EMR systems**

# Objectives

## How can PBRNs use 'big data'?

### Discuss 3 uses of CPCSSN EMR data:

- Practice Feedback
- Clinical Analytics
- Data Linkage

## CPCSSN SENTINEL FEEDBACK REPORT

Cycle: 2013-Q1  
 Province: Ontario  
 Network: CSPC  
 (Kingston)  
 Clinic ID: 1  
 Sentinel ID: 000010  
 Data Up To:  
 Mar 31, 2013



Prevalence Denominator is from Yearly Contact Group (YCG), adjusted for CCHS-2009 province specific Utilization Correction Factor (UCF)..  
**Patients under the age of 12 are excluded.**

### Glossary of Terms

**Yearly Contact Group (YCG):** All patients who had a recorded encounter in the year preceding the date of extraction.

**Utilization Correction Factor (UCF):** An adjustment factor used to account for "active" patients who may not have visited the clinic on an annual basis.

### Notes:

- All reported data is based on YCG Patients
- UCF is only applied to Sections B & C of report
- Section D provides a condition "N" (ie. Total w/HTN) as well as a target "N" (#HTN w/BP).
- The target "N" plus the "missing n" added together is equal to the condition "N".
- Detail report (ie. % sbp <140) percentages are based on the target "N".

### A. DEMOGRAPHICS (YCG)

Indicators	CPCSSN	ON	CSPC	Site	Sentinel
Age (mean years)	49.1	49.9	51	48.6	52.8
% paediatric (<18 yrs)	5.7	5.2	5.6	5.5	3.3
% adult (18-65 yrs)	71.7	70.2	67.5	72.7	69.1
% geriatric (>65 yrs)	22.6	24.6	26.8	21.8	27.6
Sex (% male)	40.2	38.8	44.1	41.8	51.2
<b>Total</b>	<b>247,288</b>	<b>99,261</b>	<b>26,832</b>	<b>9,155</b>	<b>453</b>

### B. PREVALENCE (%)

Conditions	CPCSSN	ON	CSPC	Site	Sentinel
Hypertension	19.4	18.9	21.2	19.1	24.4
Diabetes	8.4	8.6	10.5	9.1	11.7
Depression	13.5	12.4	13.7	17.2	18.7
COPD	3.2	3.0	3.5	3.3	5.7
Osteoarthritis	10.1	10.8	10.0	8.8	14.3
Parkinson's	0.3	0.4	0.5	0.7	1.1
Epilepsy	0.8	0.8	1.1	1.5	2.2
Dementia	1.7	1.8	1.9	2.1	2.9
<b>N (YCG, UCF)</b>	<b>306,817</b>	<b>119,750</b>	<b>32,340</b>	<b>11,114</b>	<b>546</b>

### C. CHRONIC CONDITIONS (%)

Conditions	CPCSSN	ON	CSPC	Site	Sentinel
None	62.8	62.5	58.9	59.8	51.4
1 Condition	22.9	23.5	25.5	24.7	26.2
2 Conditions	10.1	10.0	11.0	10.5	15.0
3 Conditions	3.4	3.1	3.6	3.8	5.3
4 Conditions	0.8	0.7	0.8	0.9	1.3
5 Conditions	0.1	0.1	0.2	0.2	0.7
6 Conditions	0.0	0.0	0.0	0.0	0.0
7 Conditions	0.0	0.0	0.0	0.0	0.0
8 Conditions	0.0	0.0	0.0	0.0	0.0
<b>N (YCG, UCF)</b>	<b>306,817</b>	<b>119,750</b>	<b>32,340</b>	<b>11,114</b>	<b>546</b>

### D. INDICATORS

Indicators	CPCSSN	ON	CSPC	Site	Sentinel
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#### D1. HYPERTENSION

Total with HTN (n):	59,485	22,666	6,864	2,125	133
# HTN with BP (n):	56,788	21,776	6,596	2,124	133
% systolic BP <140:	70.3	71.0	69.5	68.3	63.2
% diastolic BP <90:	88.1	87.9	87.7	88.2	84.2
Missing (n):	2,697	890	268	1	0

#### D2. DIABETES

Total with DM (n)	25,736	10,246	3,390	1,014	64
#DM with HbA1C (n)	21,244	7,915	2,509	928	61
% HbA1C <7:	53.5	58.7	53.4	55.1	54.1
% HbA1C 7-8:	26.0	25.0	26.1	24.0	21.3
% HbA1C >8:	20.6	16.3	20.4	20.9	24.6
Missing (n):	4,492	2,331	881	86	3
# DM with BP (n)	24,245	9,781	3,287	1,014	64
% systolic BP <130:	49.3	51.7	48.8	46.8	51.6
% diastolic BP <80:	63.9	63.1	63.2	63.4	59.4
Missing (n):	1,491	465	103	0	0
# DM with LDL (n)	21,285	7,915	2,534	918	61
% LDL <2:	43.2	49.4	48.1	47.4	57.4
Missing (n):	4,451	2,331	856	96	3

#### D3. COPD

Total with COPD (n)	9,890	3,534	1,136	370	31
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# Hypertension



Indicators	CPCSSN	ON	CSPC	Site	Sentinel
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## D1. HYPERTENSION

Total with HTN (n):	53,068	19,478	5,910	1,968	128
# HTN with BP (n):	50,769	18,685	5,599	1,963	126
% systolic BP <140:	70.8	72.0	71.7	70.0	78.6
% diastolic BP <90:	88.2	88.5	88.5	90.0	88.1
Missing (n):	2,299	793	311	5	2



## DPT SAPCRen Network

Search Patient Data | Raw Data Viewer | Data Reports | Admin

Cycle 2013-Q3: Data up to **SEP 30, 2013**

Hello Stephanie Garies



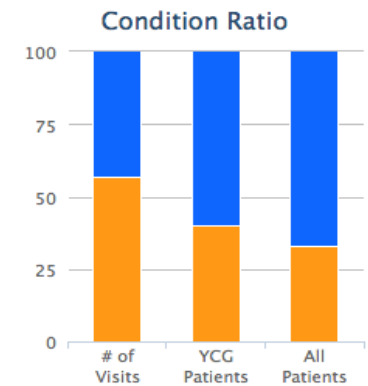
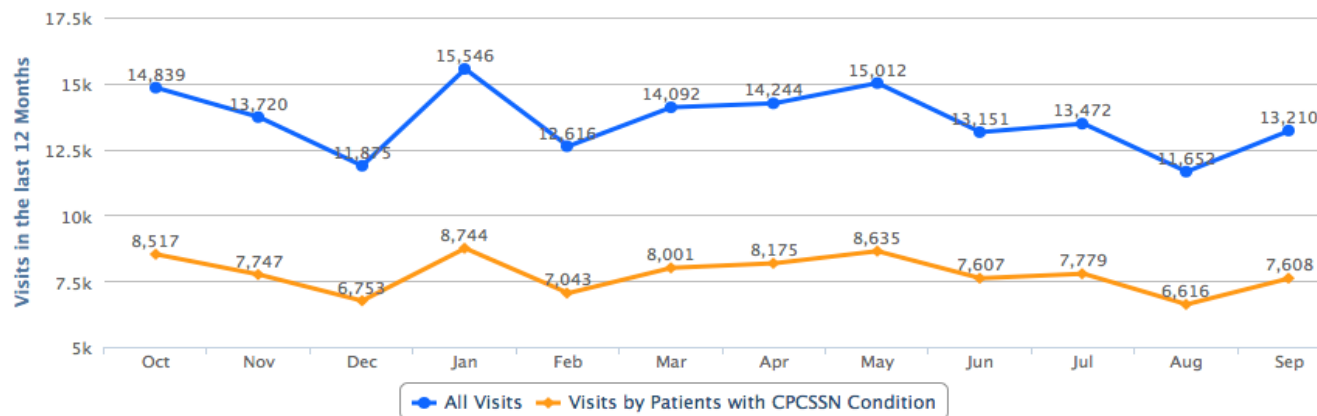
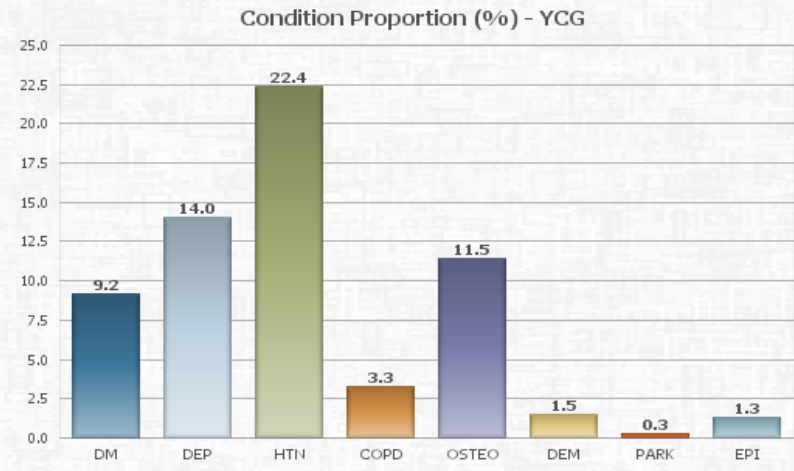
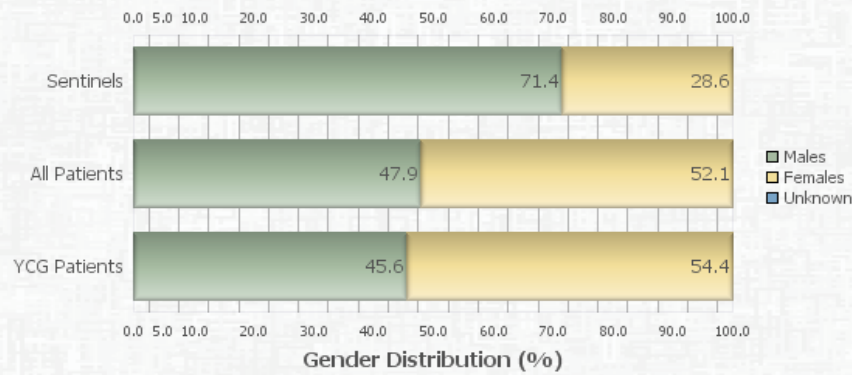
49 SENTINELS



55,053 PATIENTS

ALL DATA

Total Active Sentinels: **49.0**  
 All Patients: **55,053.0** (Ave Age: **40.0**) Pts Per Sentinel: **1,124.0**  
 YCG Patients: **31,456.0** (Ave Age: **42.0**) Pts Per Sentinel: **642.0**





## 9,736 Patients Found

Unnamed Search Results - 9736

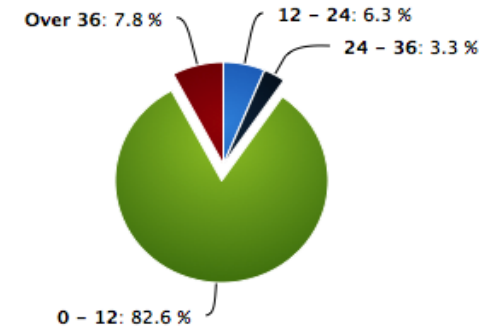


All Hypertensive Patients - 9736

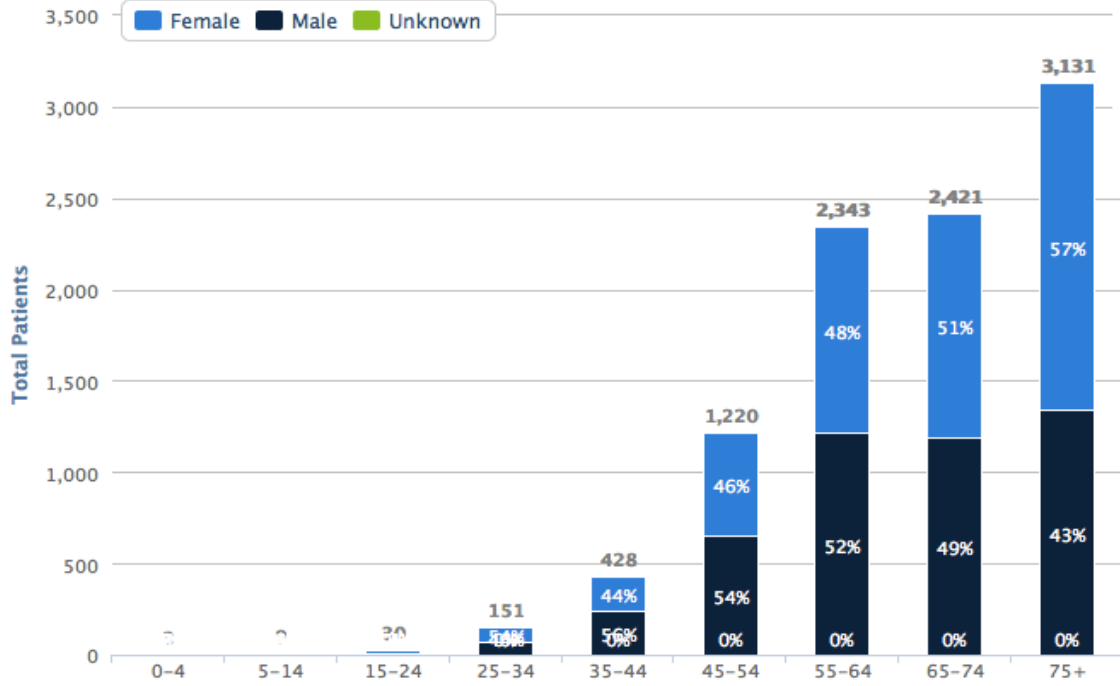
Ave Age: **67.0**    Ave BMI: **30.9**    % Rural: **45.6%**    [View Results](#)

[New Search](#)    [OTHER REPORTS](#)    [Export / Print](#)    [Home](#)

Time Since Last Visit - Months



Age Gender Distribution





Condition Prevalance

Diabetes	2,522	- 25.9%
Depression	1,887	- 19.4%
Hypertension	9,736	- 100.0%
COPD	918	- 9.4%
Osteoarthritis	2,639	- 27.1%
Dementia	546	- 5.6%
Parkinson's	93	- 1.0%
Epilepsy	162	- 1.7%
1 Condition	3,881	- 39.9%
2 Conditions	3,653	- 37.5%
3 Conditions	1,604	- 16.5%
4 Conditions	499	- 5.1%
Over 4 Conditions	99	- 1.0%

IDP **Patient Details:** Data up to **SEPTEMBER 30, 2013**

[Show All](#) | [Search Patient Data](#) | [Summary](#) | [Dashboard](#)

1 of 9,736 (55,053 TOTAL)

 Patient ID: 
 Sentinel ID: 
 Site ID: 
 Network:

First:  Last:  DOB:  PHN:  Provider Name:

Sex:  Age:  Birth year:  Province:  FSA:  Ethnicity:

Language:

Occupation:

Housing Status:

Education:

**EMR STATUS**

Cleaned:

Original:

Rostered:

**TIME SINCE LAST VISIT**

6 Months:  12 Months:

24 Months:  36 Months:

Over 36 Months:

**CONDITIONS**

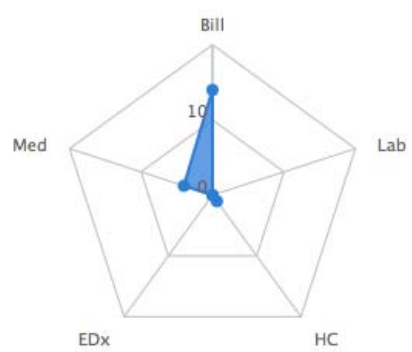
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**Disease Case Indicator**

Condition	Indicator Value	Indicator Type
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing
Hypertension	401.9	Billing

Filter:

Classification Breakdown:



SAPCren

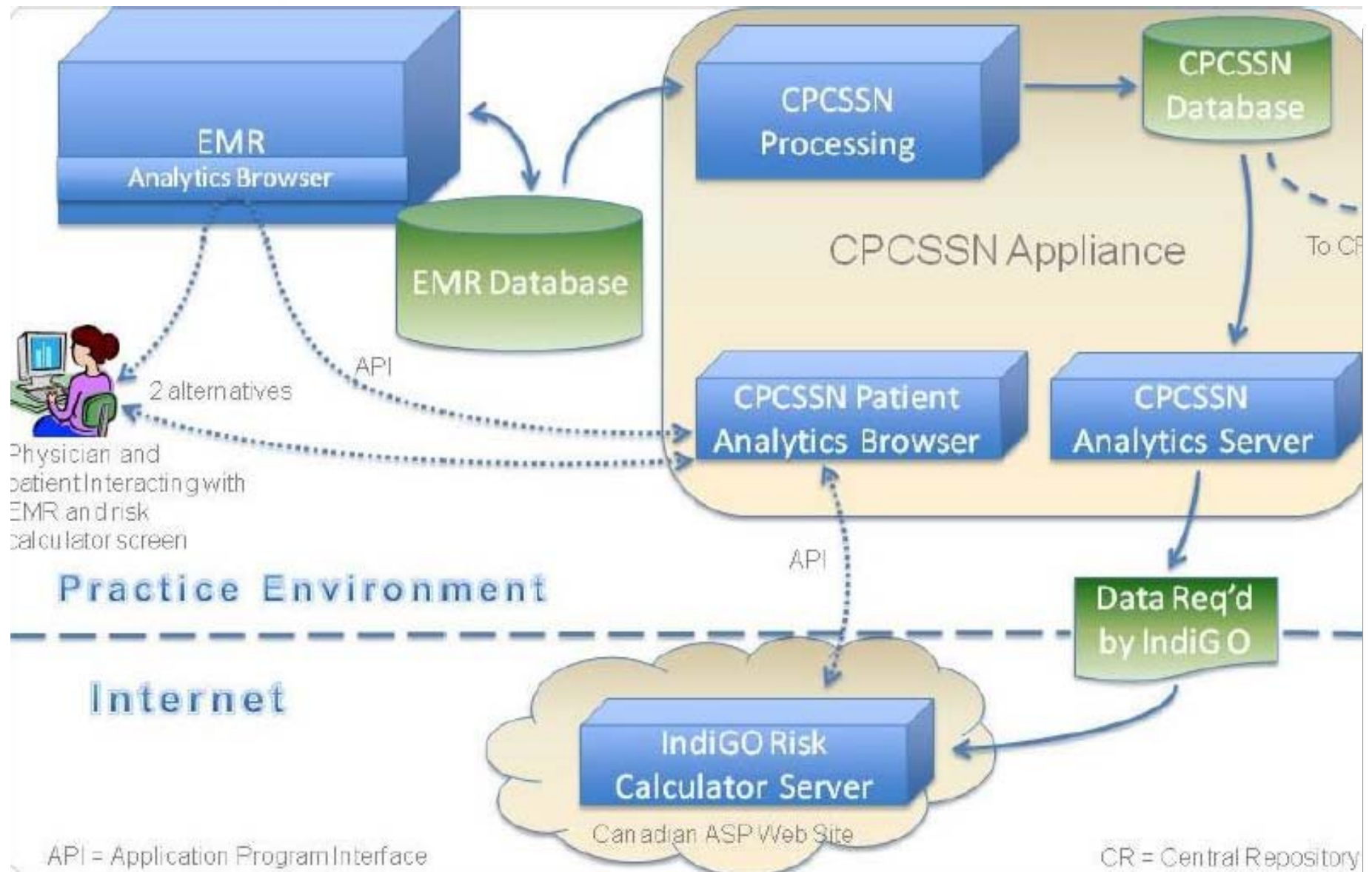
- DEMOGRAPHICS
- ENCOUNTERS
- ENCOUNTER DX
- HEALTH CONDITIONS
- PROCEDURES
- LAB RESULTS
- ALLERGIES
- MEDICATIONS
- EXAMS
- RISK FACTORS
- REFERRALS
- BILLINGS
- VACCINES
- SNO MED - HEALTH CONDITIONS

## Canadian Health Infoway Funded project



- Meaningful use of EMRs
- Using CPCSSN data processing
- Archimedes IndiGO tool by Evidera
  - Tool which calculates and dynamically displays patient cardiovascular risk profiles
  - Prioritizes appropriate lifestyle and/or medication interventions which have the greatest benefit
- Patient specific risk vs. general risk





# Objectives

1. Validate the IndiGO algorithms
2. Improve current CPCSSN processes
3. Pilot in 3 CPCSSN networks
4. Determine value to clinicians and patients



## Linking EMR with Administrative Data

