Dr. Ajantha Jayabarathan

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CLOSING THE DATA GAP IN PRIMARY CARE WITH GI'S

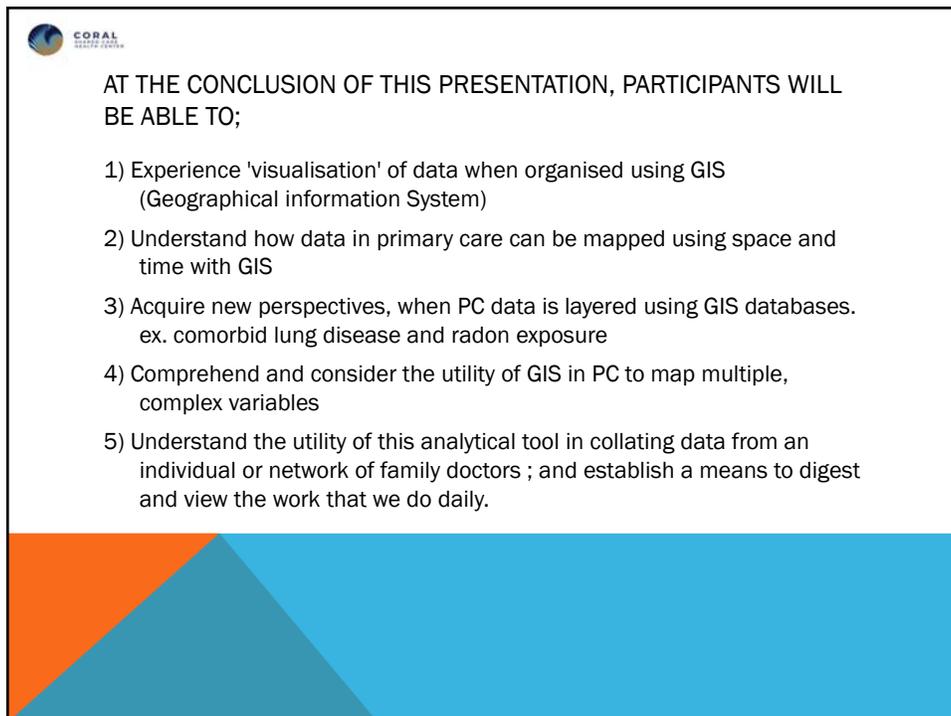PowerPoint presentation followed by discussion and audience participation

1) Experience 'visualisation' of data when organised using GIS (Geographical information System) 2) Determine how data in primary care can be mapped using space and time with GIS 3) Acquire new perspectives, when PC data is layered using GIS databases. ex. comorbid lung disease and radon exposure 4) Recognize and consider the utility of GIS in PC, to map multiple, complex variables 5) Distinguish the utility of this analytical tool in collating data from an individual or network of family doctors ; and establish a means to digest and view the work that we do daily.

CLOSING THE DATA GAP IN PRIMARY CARE WITH GIS

26th Annual Rural and Remote Medicine
April 12, 2018
conference

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SHARED-CARE
HEALTH CENTER

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AT THE CONCLUSION OF THIS PRESENTATION, PARTICIPANTS WILL BE ABLE TO;

1) Experience 'visualisation' of data when organised using GIS (Geographical information System)

2) Understand how data in primary care can be mapped using space and time with GIS

3) Acquire new perspectives, when PC data is layered using GIS databases. ex. comorbid lung disease and radon exposure

4) Comprehend and consider the utility of GIS in PC to map multiple, complex variables

5) Understand the utility of this analytical tool in collating data from an individual or network of family doctors ; and establish a means to digest and view the work that we do daily.

JEFFREY BRENNER PUT GIS ON THE MAP FOR PC

- Dr. Brenner is a family physician in Camden, NJ
- Since 2000-owned and operated a solo-practice, urban family medicine office providing health care to a Medicaid-enrolled population. His office was on a forlorn street in an impoverished city that had one of the highest crime rates in the nation.
- "I'd had patients come in all the time and tell me crazy stories about the police department and what goes on in the city. You just don't want to believe that social disorder has broken down to that extent."
- **The incident that changed everything**
- I couldn't imagine how we could have reached the point in our society in this city where you would just leave a victim lying there in their own blood.
- The victim - He had grown up in the city, worked hard and succeeded. He'd come from a very poor family, and was close to graduating. He had a job lined up at a bank, and he was one of the wonder kids that make it out of urban communities, and he was just about to make it out. He still had friends that were part of the drug trade in the city, and they were trying to get one of his friends and kind of got him instead.

JEFFREY BRENNER PUT GIS ON THE MAP FOR PC

- Eager to help the troubled city, Brenner joined a commission to reform the Camden police department. As part of the work, he created a database of emergency department visits by crime victims and mapped crime by analyzing patient addresses.

- Although the reform effort failed, Brenner realized he could use insurance claims to map health care use across the city. He spent three years developing a computerized system that collected data for all three Camden hospitals (Cooper University, Our Lady of Lourdes, and Virtua Health).

- The database—which has now evolved into a health information exchange with a wealth of patient data available to all Camden providers—showed that:

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JEFFREY BRENNER PUT GIS ON THE MAP FOR PC

- Nearly half of the city's approximately 77,000 residents were visiting an emergency department or hospital annually—most often for head colds, viral infections, ear infections, and sore throats.
- Thirteen percent of the patients accounted for 80 percent of hospital costs; 20 percent of the patients accounted for 90 percent of the costs.
- It showed, says Brenner, "We could make a big difference in people's lives if we could figure out how to deliver more organized services that were easier for patients to use."

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JEFFREY BRENNER PUT GIS ON THE MAP FOR PC

- The Challenge: Inefficient, High-Cost Care. Many people with complex health and social issues have high rates of emergency department use and hospitalization. Super-utilizers is the shorthand term used for these high-cost health care users.
- Super-utilizers are diverse—some may lack not only financial resources and health insurance but also an understanding of how to use the health care system. Transportation can be another hurdle. For these and other reasons, many super-utilizers have no source of regular, coordinated medical and social support services—the very thing they need for stable health.
- Used Healthcare hotspotting- the strategic use of data to reallocate resources to a small subset of high-needs, high-cost patients. Mapped postal codes, medicaid billing data and crime data.

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JEFFREY BRENNER PUT GIS ON THE MAP FOR PC

- The heart of Brenner's care model is a patient management program to improve the transition of super-utilizers from the hospital to outpatient care & ensure they continue to get the medical and social services they need—so they don't end up back in the hospital. The program, which started in 2007, includes these key ingredients:

- Database that identifies hospitalized patients with complicated medical and social needs.

- A care management team—social worker, nurse, community health worker and health "coach" visits the patient in the hospital, reviewing prescribed medications, conferring with doctors and nurses, and helping plan the discharge.

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JEFFREY BRENNER PUT GIS ON THE MAP FOR PC

- Team members visit the patient at home immediately after discharge and provide ongoing support for two to nine months, including connecting the patient to a primary care doctor, accompanying him or her to appointments, and helping line up needed social services. The goal is to leave patients with the ability to manage their health on their own.

- "**The full dataset told an unbelievable story of wasteful, disorganized services. Somehow good doctors were going to work every day at good hospitals and delivering a very disorganized set of services," he says. "My patients were in those data. They weren't getting their needs met**."

JEFFREY BRENNER PUT GIS ON THE MAP FOR PC

- He founded the **Camden Coalition of Healthcare Providers** in 2003.
- 2013 - honored with the **MacArthur "Genius" Fellowship** for his ground-breaking work in the field of population health,
- 2014 - he was elected to the Institute of Medicine
- Atul Gawande's interview for New Yorker https://www.pbs.org/wgbh/pages/frontline/doctor-hotspot/

HEALTH CARE

PRIMARY, SECONDARY, TERTIARY, QUATERNARY CARE LAB, DI, HEALTH SYSTEM INFRASTRUCTURE

Clock face   Clockwork

PRIMARY CARE

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MYTH

- PC is simple
- PC is limited to 20 common health conditions
- Patient Management in PC can be boiled down to linear algorithms
- We have valid and reliable data that informs PC policy and planning

REALITY

- PC is intertwined within a complex matrix of connected and interacting systems
- PC is integral in the management of every health condition
- Patient management in PC is continuous & multi-layered
- The Health system lacks access to data in PC . Interrelated, multi-layered connections are often boiled down to linear processes in order to simplify , understand & manage data.

E-HEALTH COGS (TOOLS) IN NS PC

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DIS

DI

GIS

PHR

synoptic

EMR

SNO-Med CT

LAB

MSI
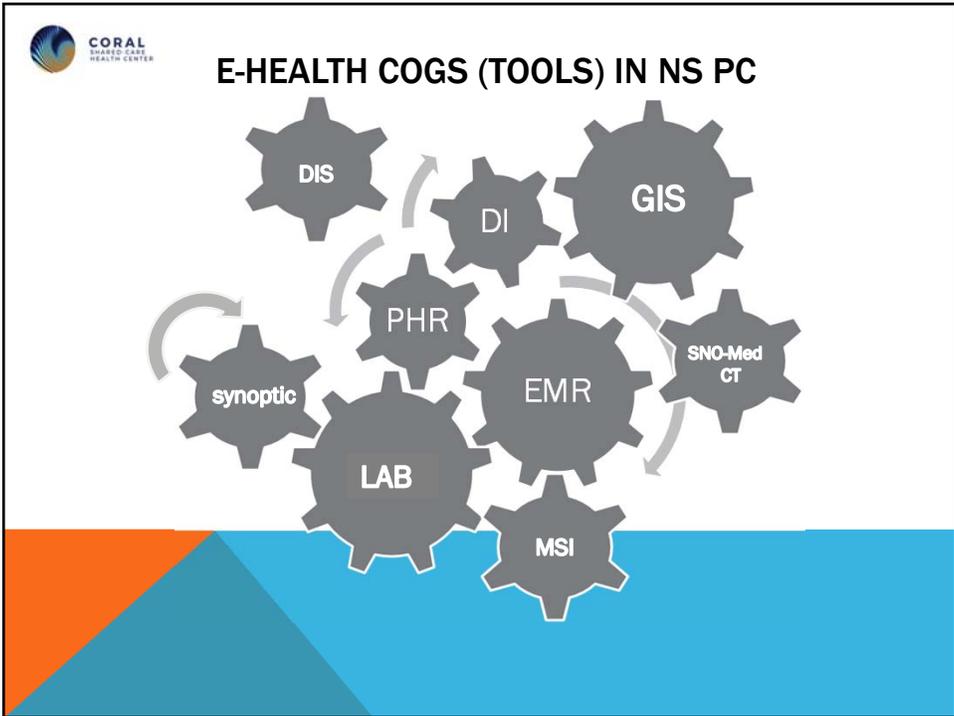
GIS FOR COMPLEX LONGITUDINAL DATA ANALYSIS

- First visualise and digest data from your practice; then interpret it.
- We can pool together our data in primary care – visualise, digest and interpret –across geography; over time. Ex distance travelled for health services; use of BP meds and health outcomes as patients age
- Map data points using postal code for location; time; and any set of patient characteristics- age, gender, chronic diseases; map multiple generations of the family- where they live, move to, over time, alongside medical conditions
- GIS has data analytics that fit the needs of primary care-measures continuity, complexity, interlinked connections to other data measures and can layer multiple data sets
- Simultaneously develop analytics for doctors and patients

PHR PILOT PROJECT PATIENT DATA DISTRIBUTION. POINTS SHOW DURATION OF INTERACTION WITH PHR
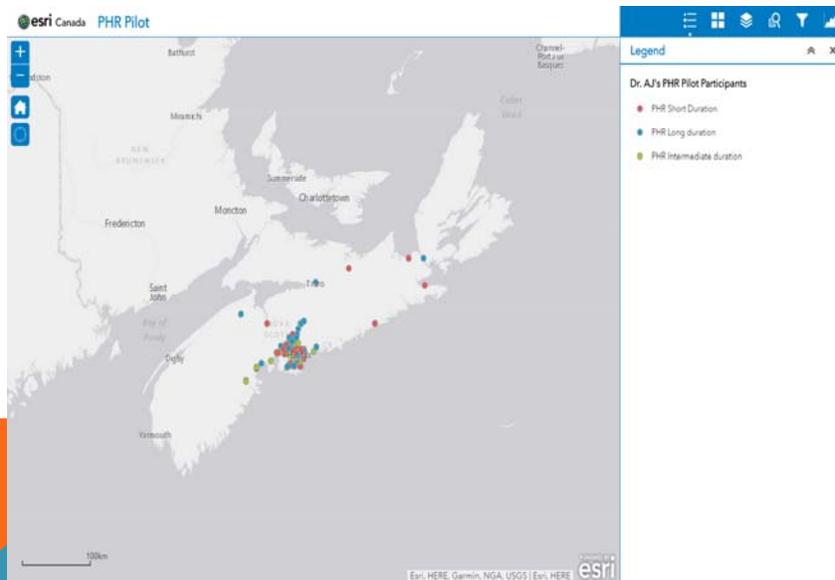
PHR PILOT PROJECT PATIENT DATA DISTRIBUTION. BLUE SHAPES SHOW THE CONCENTRATION OF PHR PILOT PARTICIPANTS FOR THE NSHA COMMUNITY HEALTH REGIONS. DARK SHAPES HAVE HIGHER CONCENTRATION.
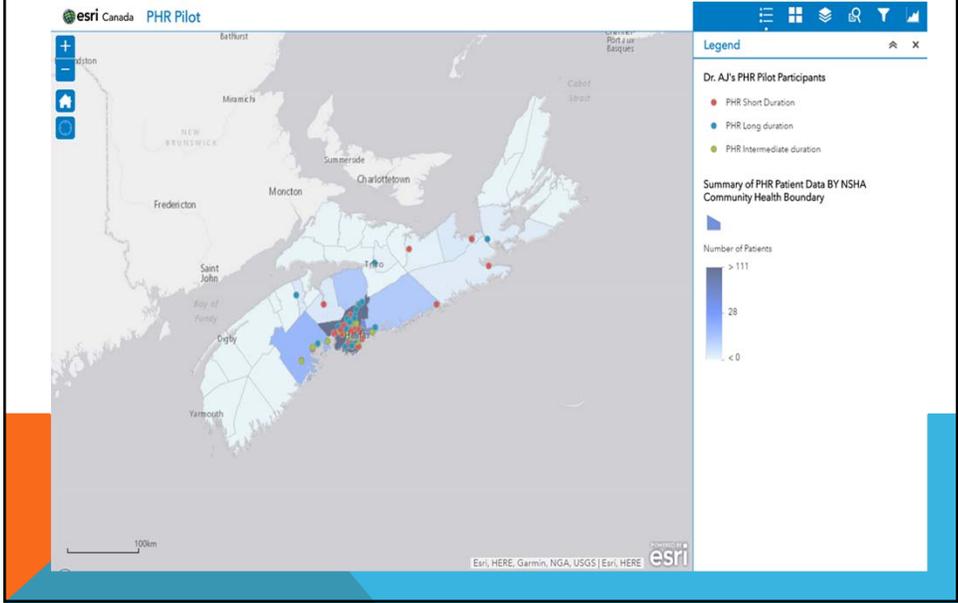
THIS CLOSE UP VIEW SHOWS THE PENINSULA HIGHLIGHTED AND THE FACT THAT ONLY 35% OF THE PARTICIPANTS COME FROM THE PENINSULA.
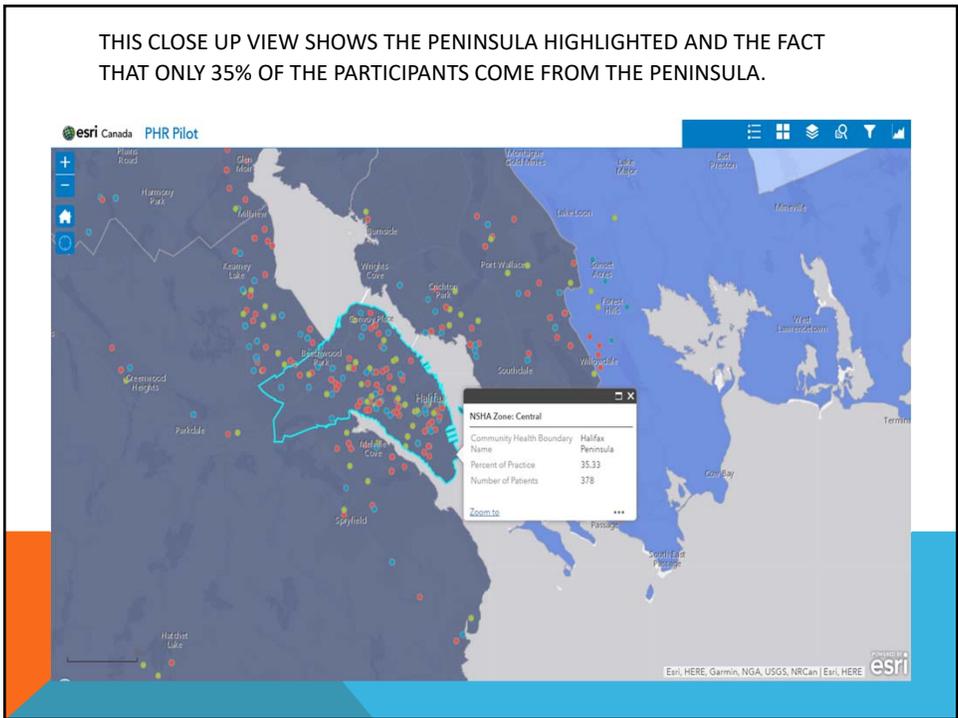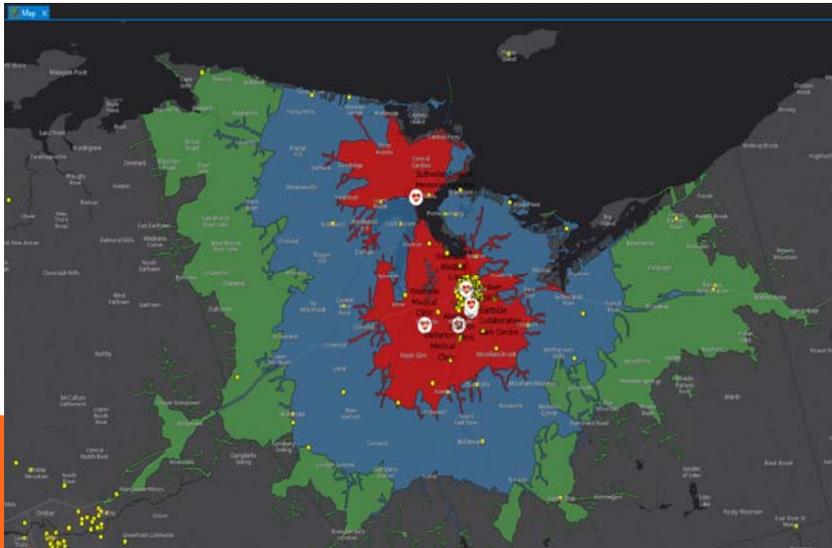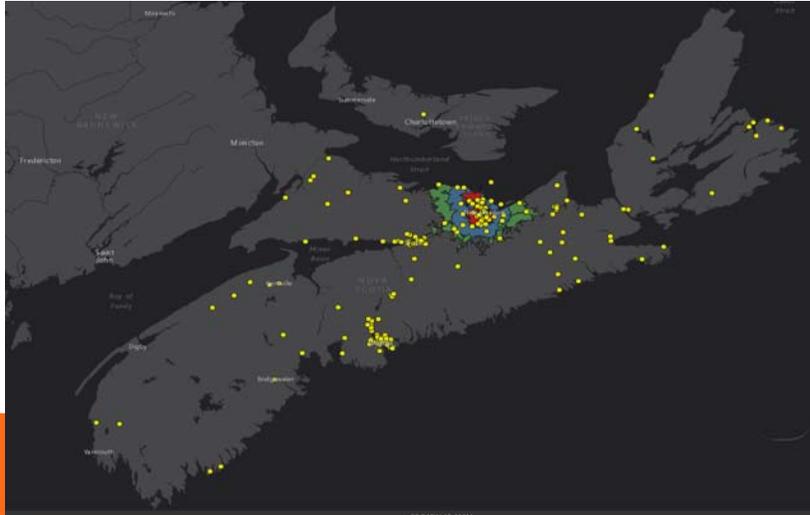
GIS FOR COMPLEX LONGITUDINAL DATA ANALYSIS

- Map data points using postal code for location; time; and any set of patient characteristics- age, gender, chronic diseases; map multiple generations of the family- where they live, move to, over time, alongside medical conditions
- Data analytics that fits the needs of primary care; continuity, complexity, interlinked connections and multi-layers
- Digesting and interpreting our own data is a first step
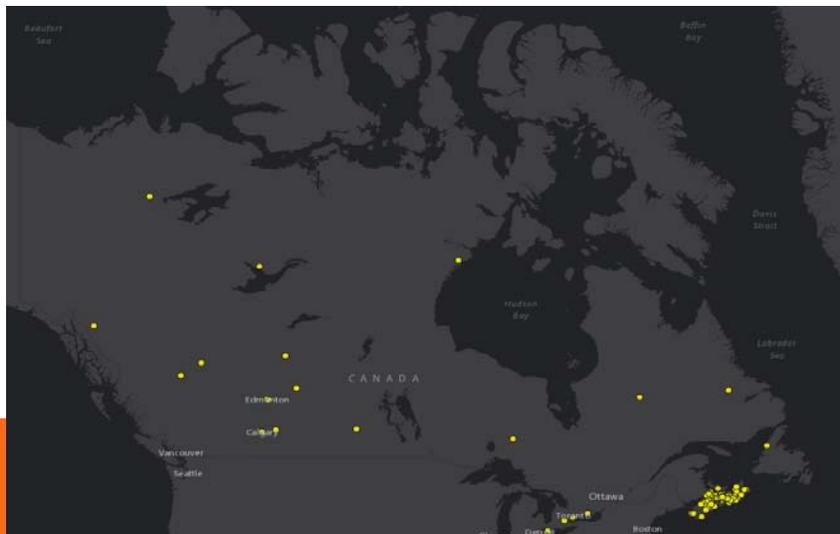- Simultaneously develop analytics for doctors and patients

WESTVILLE MEDICAL CLINIC PATIENT SPREAD

WESTVILLE MEDICAL CLINIC: PATIENT SPREAD IN PROVINCE

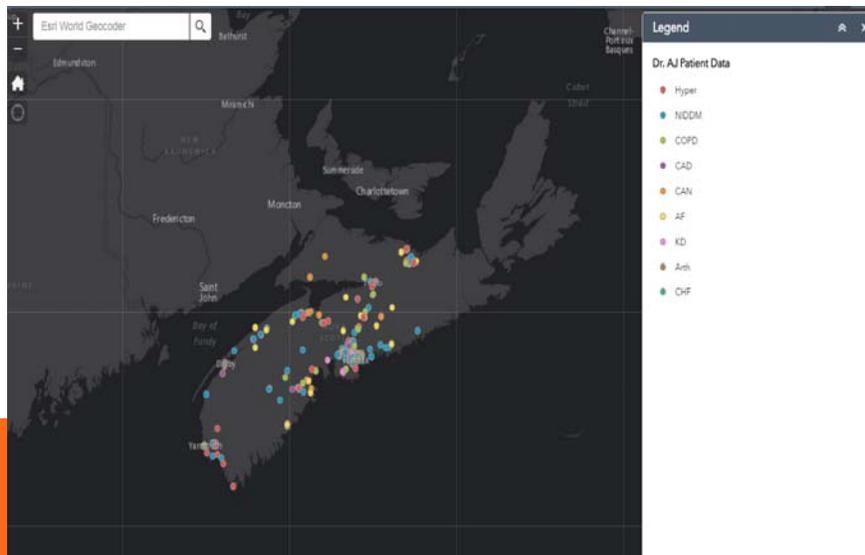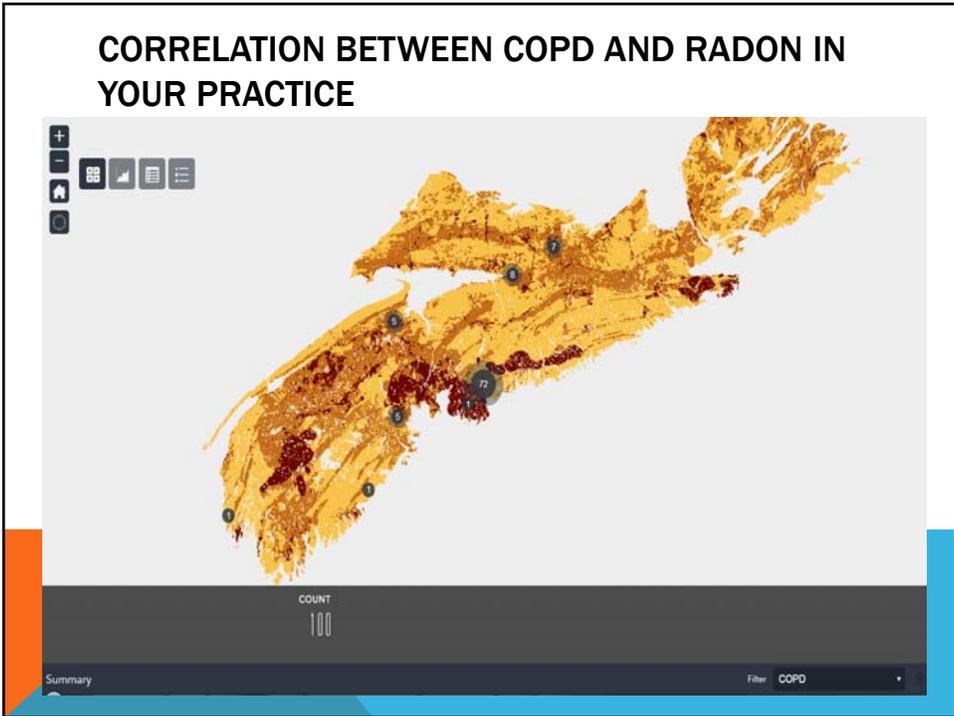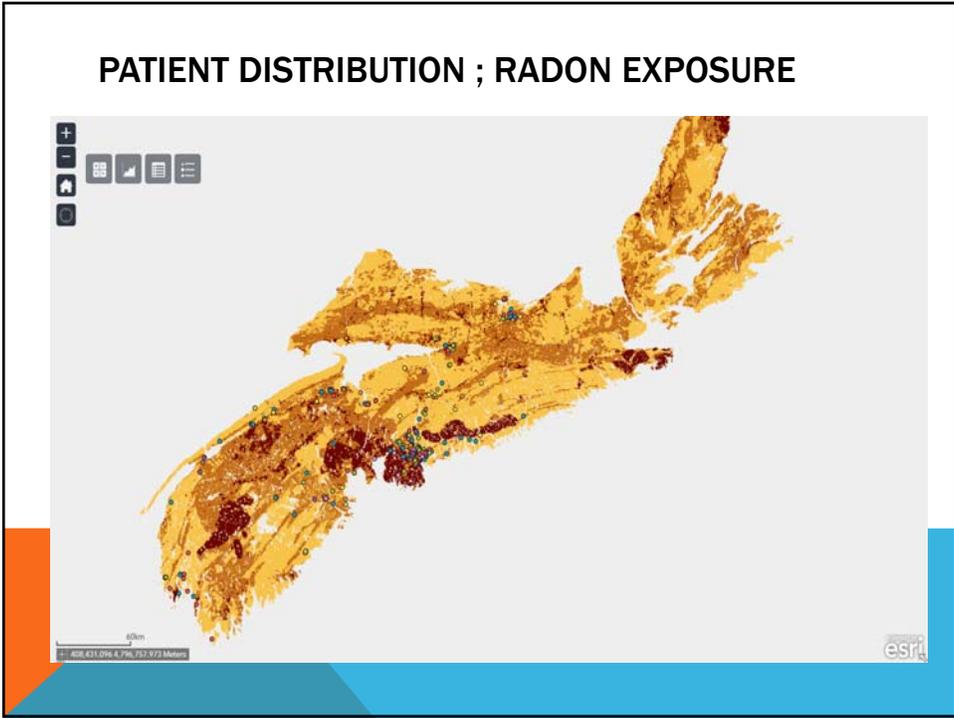WESTVILLE MEDICAL CLINIC ; SPREAD OF PATIENTS ACROSS CANADA

GIS FOR COMPLEX LONGITUDINAL DATA ANALYSIS

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RADON / COPD DISCUSSION
THIS IS THE DEMONSTRATION (SAMPLE) DATASET OF FICTITIOUS PATIENTS WITH VARIOUS CHRONIC DISEASES
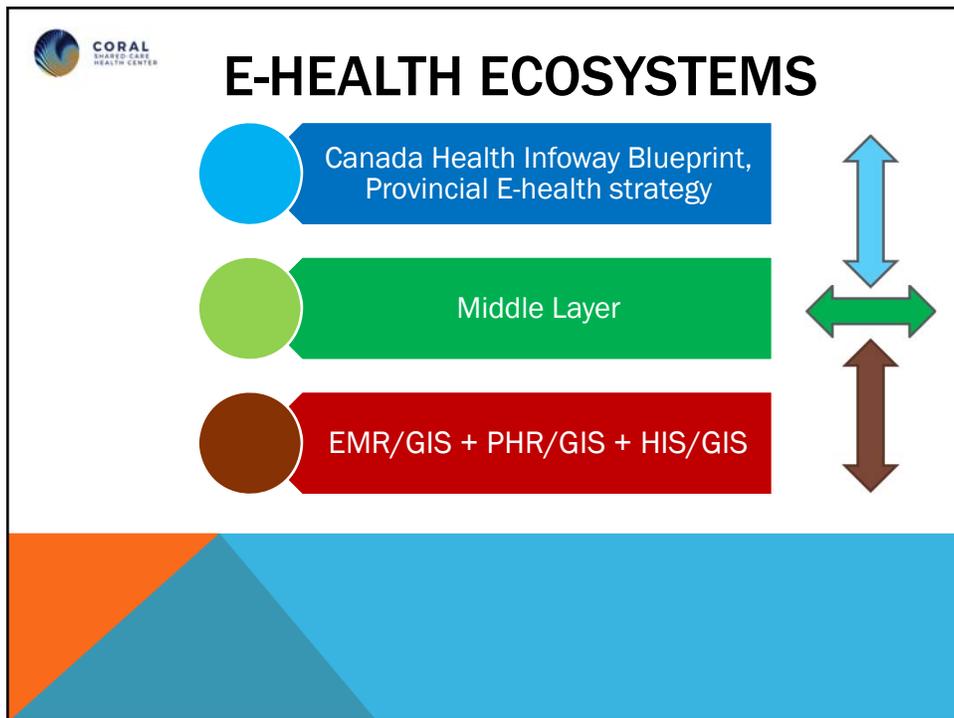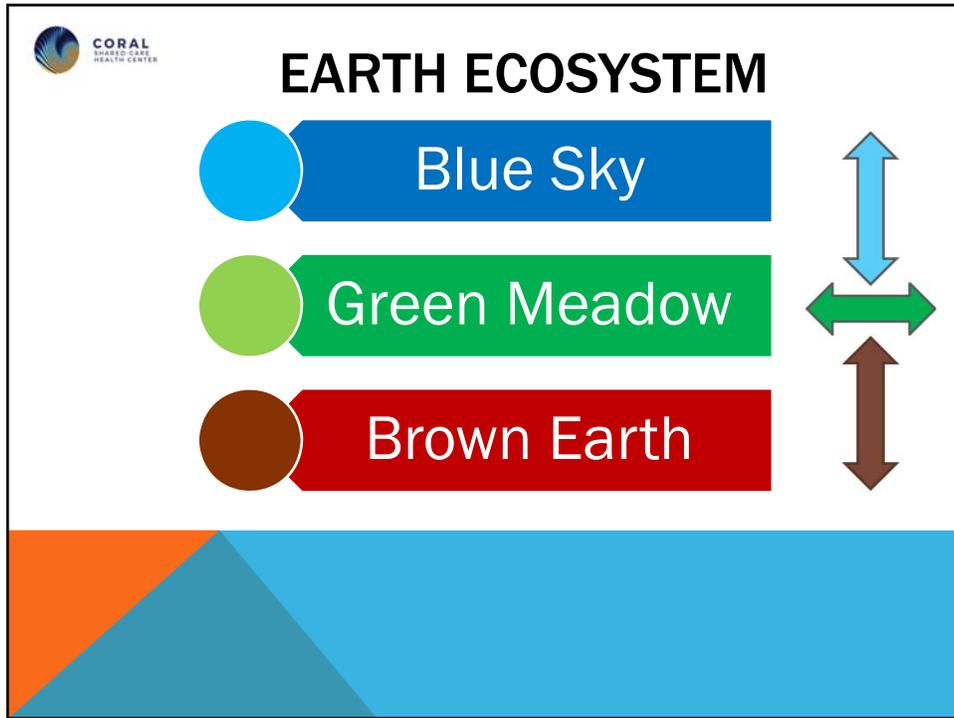
PATIENT DISTRIBUTION ; RADON EXPOSURE

CORRELATION BETWEEN COPD AND RADON IN YOUR PRACTICE

CORRELATION BETWEEN COPD AND RADON IN YOUR PRACTICE

COUNT
67

Summary   Filter   COPD

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GIS FOR COMPLEX LONGITUDINAL DATA ANALYSIS

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EARTH ECOSYSTEM

Blue Sky

Green Meadow

Brown Earth

E-HEALTH ECOSYSTEMS

Canada Health Infoway Blueprint, Provincial E-health strategy

Middle Layer

EMR/GIS + PHR/GIS + HIS/GIS

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Questions?