NORTH YORK GENERAL

Making a World of Difference

North York Family Health Team

ANALYZING HEALTH DATA ACROSS CARE SYSTEMS: THE NYGH-NYFHT JOINT DATA WAREHOUSE

MICHELLE GREIVER, KARIM KESHAVJEE, SANDY SAGGAR, MARIA MUIA, EUGENE WONG, FRANK SULLIVAN

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InfoClin

Improving Health by Connecting People, Providers and Information

PRESENTER DISCLOSURE

Faculty: Michelle Greiver, Karim Keshavjee

Relationships with commercial interests: None

DISCLOSURE OF COMMERCIAL SUPPORT

- **Potential for conflict(s) of interest:**
  - This program has not received commercial financial support

Potential for conflict(s) of interest:

- Dr. Karim Keshavjee was a consultant to the project and was paid out of the grant

Mitigating Potential Bias

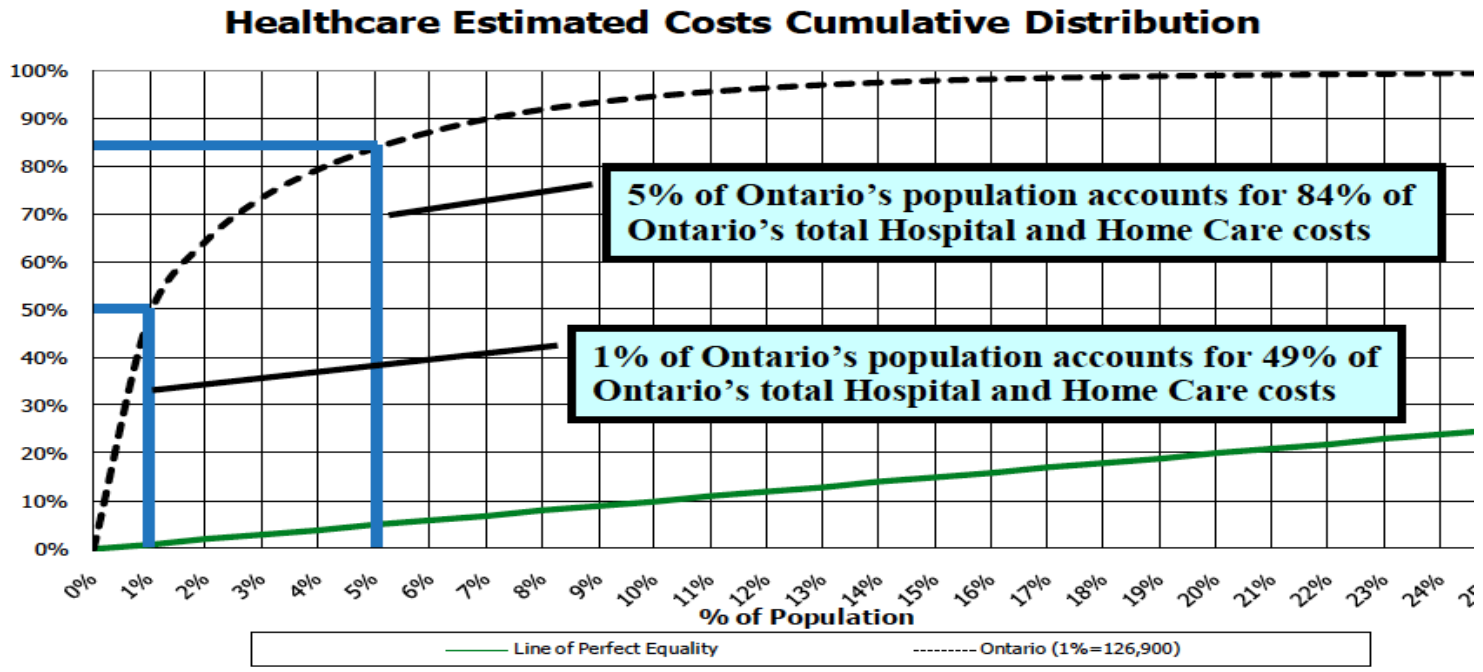
- All Intellectual Property arising from the project rests with North York General Hospital

AGENDA

- **Background for Joint Data Warehouse Project**
- **Assessing Feasibility**
  - Exploring what is needed
  - Making sure that this project is fit for purpose
  - Exploring how it can be done
- **Planning for implementation**
- **Current status**

BACKGROUND

- **A small number of patients account for a large proportion of health care use and costs**
- **These patients are looked after in multiple settings**



CARE ACROSS THE CONTINUUM

- **Health Links is being set up at NYGH to improve the management and coordination of care for complex patients**
- **These patients are much more likely to be seen in both hospital and primary care**
- **Information is needed to monitor and measure health services and patient outcomes across care settings**
- **Data are difficult to collect as integrated clinical information systems spanning different care settings do not currently exist**

PURPOSE OF PROJECT

- **Need to merge clinical data into a common analytic data warehousing system**

Project: To design a joint primary care-hospital data warehouse

- **Funded by NYGH Exploration Fund.**

PARTNERS

- **North York General Hospital**
  - Leader in computerization of hospital data
  - Was the first Ontario hospital to achieve HIMSS 6 certification
  - One of only 4 hospitals in Canada HIMSS 6 certified

- **North York Family Health Team**
  - Early adopter of EMRs
  - Nationally recognized for its meaningful use of EMR data
  - Toronto center for **CPCSSN**, Canada's national multi-disease EMR based surveillance system

PROJECT

- **Addresses feasibility and design for linked data warehouse**

- **Step 1: Literature review**
- **Step 2: Make sure that stakeholders agree BEFORE you propose an IT solution**

- **Main areas proposed, based on literature review:**

1. **Governance**
2. **Privacy**
3. **Data, IT and analytics infrastructure (hardware, software, personnel)**
4. **Value proposition, feasibility and implementation plan**

STEP 2: STAKEHOLDER INTERVIEWS

N=30 range of stakeholders interviewed at NYG, NYFHT and others (LHIN, Primary Care MD, etc)

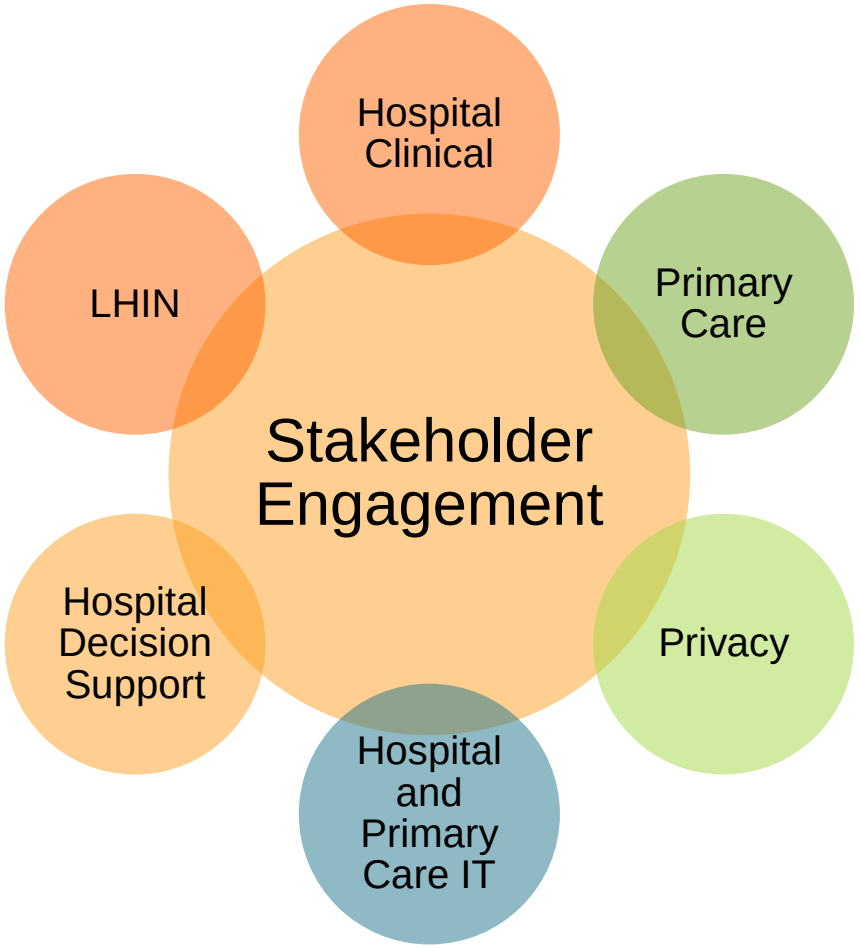
3 step process

1. **Initial set of interviews provided scope and scale of issues faced by clinicians**

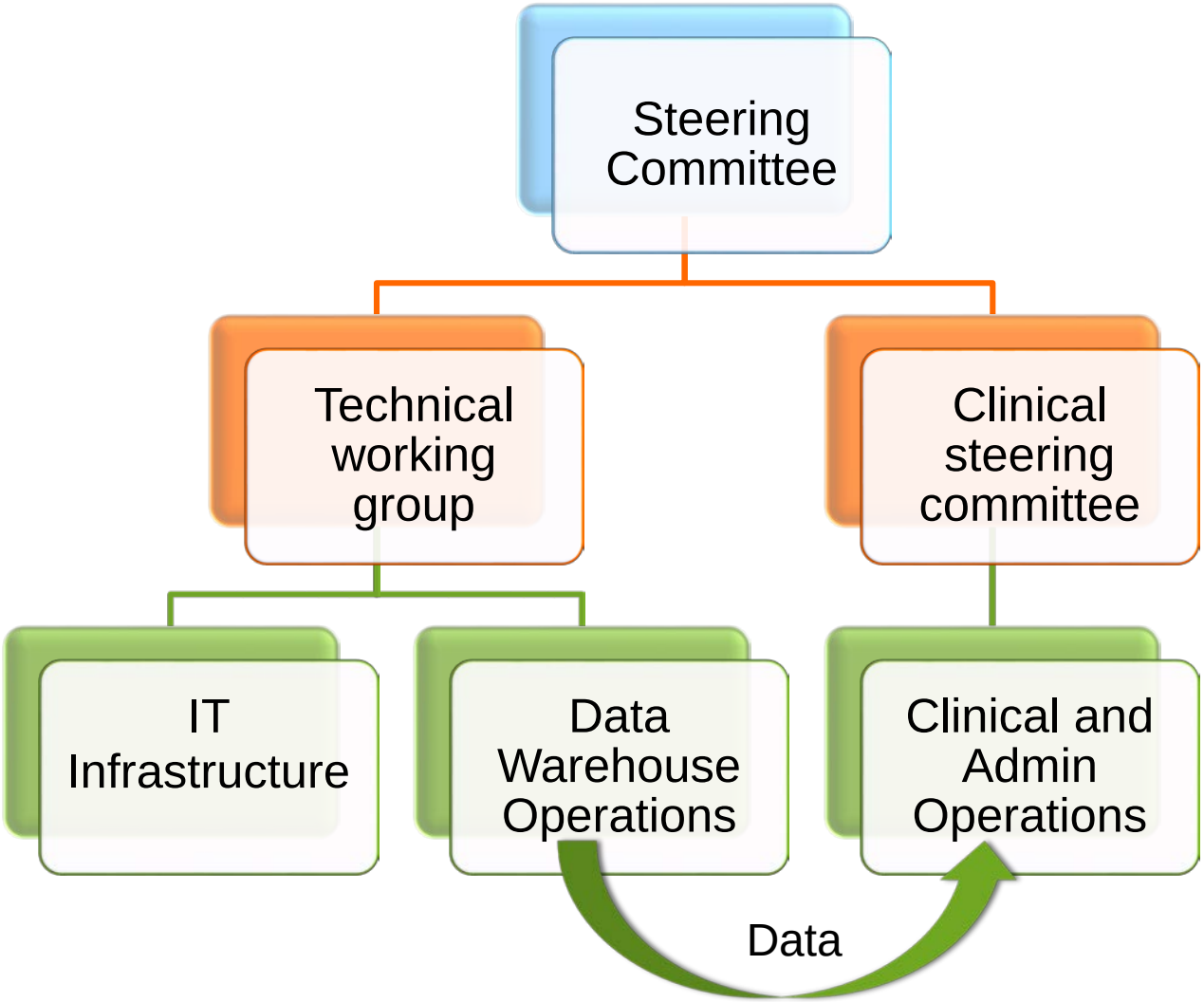
2. **Developed initial solution based on literature and responding to stakeholder issues**

3. **Improved and validated the solution through second round of interviews**

Obtained agreement from clinicians and managers



GOVERNANCE AND IMPLEMENTATION INFRASTRUCTURE



PRIVACY INFRASTRUCTURE

Initially

- All data will be de-identified
- Health card number will be converted to encrypted format to allow for pseudonymous linkage
- Data will only be provided for feedback on processes of care

As data warehouse evolves, could add clinical management to the retrospective tools

- Institute Concept of Circle of Care
  - All who see the patient can see the identifiable record
- Circle of Care will likely have a completely different type of software to serve their needs
- Data for research will be de-identified

DATA IN DATA WAREHOUSE

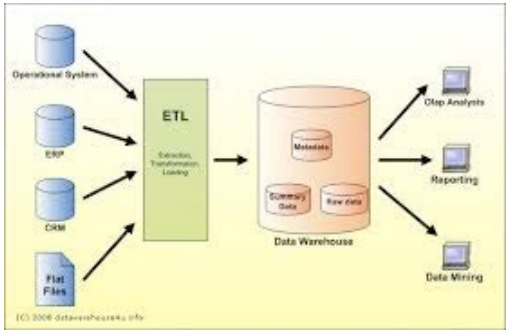
Initially

- Simple data warehouse with
  - 5-7 key hospital metrics and
  - 5-7 key primary care metrics
- Architect to make it easy to collect those metrics
  - Ensure metrics collection is within the workflow of clinicians
  - Ensure metrics are clinically relevant
- Focus on specific diagnoses that are at high risk for readmission

Later, as data warehouse grows

- Add more types of data/metrics
- Add more diseases
- Increased timeliness, consider some real-time data
- Improve workflows
- Add admissions as a focus (hot spotting, anomaly detection)

DATA IN DATA WAREHOUSE



From Hospital

- **Diagnosis at intake AND at discharge** (identify correct pt population)
- **Medications at discharge**
- **Med Rec Done** (key intervention)
- **Date of discharge**
- **Date of ED Visit**
- **Date of D/C Summary** (calculate timeliness)

From Primary Care

- **CPP diagnoses**
- **Medications in CPP**
- **Date of first visit post discharge**
- **Vitals**
- **Lab results** (ensure patients condition is under control, if appropriate)

COSTS OF CARE

Resource intensity weights for CHF and COPD are amongst the highest for any disease

<u>Annual</u> costs of care at NYG

	Admission	Readmission
CHF	**$3.1M**	**$820K**
COPD	**$2.4M**	**$565K**
TOTAL	**<u>$5.5M</u>**	**<u>$1.38M</u>**

COSTS OF INTERVENTION

Estimated cost of joint warehouse infrastructure				
	Year1	Year2	Year3	Total 3 Year Costs
Hardware	$25,000			$25,000
Software	$25,000			$25,000
Support/Maintenance	$25,000	$25,000	$25,000	$75,000
Data Manager/Programmer	$90,000	$90,000	$90,000	$270,000
Data Analyst	$90,000	$90,000	$90,000	$270,000
0.25 IT Support	$25,000	$25,000	$25,000	$75,000
Project Direction	$70,000	$35,000	$35,000	$140,000
TOTAL	$350,000	$265,000	$265,000	$880,000

FEASIBILITY TRIAL

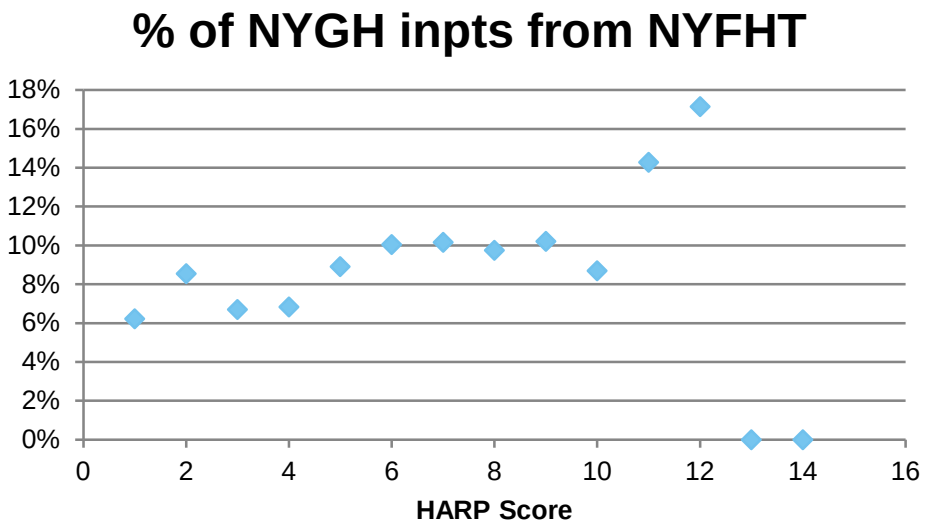
- **Primary care (NYFHT):**
  - Patients with COPD or Heart Failure (CPCSSN)
  - Seen past 3 years
  - **1650** patients

Health Card Numbers linked at hospital, validated

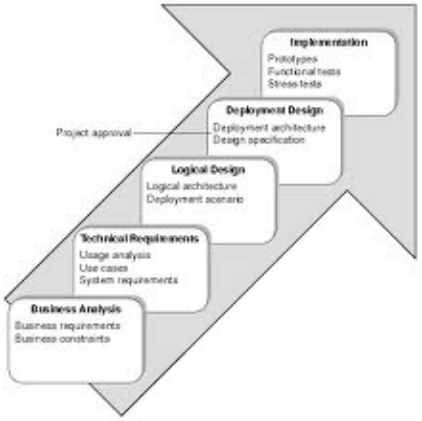
- **Hospital (NYGH):**
  - Out of 1650 primary care patients with COPD or HF:
  - 1284 **(78%)** have record in **hospital** database
  - 660 **(40%)** had **ED visit** 3 years, max 20 visits for 1 patient
  - 391 **(24%)** had **Admission** 3 years, max 12 admissions for 1 patient

JOINT DATA ON HIGH RISK PATIENTS

- **Inpatients NYGH past 2 yrs: 42,398**
- **732 (2%) of these pts had high risk of readmission at 15 months (HARP score >=9)**
- **NYFHT patients at NYGH: 3,036 (7% of all admissions)**
- **High risk NYFHT patients: 74 (10% of all high risk admissions)**



HIGH LEVEL DEPLOYMENT PLAN



Start slowly with a simple plan

Grow the data warehouse and workflows over time

Initially:

- Simple data warehouse with **5-7 key hospital metrics** and **5-7 key primary care metrics**
- Simple workflow that keeps track of each of the 10-14 metrics, ensures they are completed and reports on them on a regular basis
- Start working on statistical analysis for predictive analytics
- Will need information about matched cases for comparison

<u>CPCSSN data are quite sophisticated</u> and could already be used to work on identifying patients likely to be admitted

CPCSSN data are <u>standardized</u>. Not limited to NYGH / NYFHT

CURRENTLY:

- **Strong support from hospital and primary care**
- **Took a while to get things sorted out**
  - Data sharing agreement
  - Access to servers
  - Access to data
- **Starting to build a demo system**
  - Database
  - Analytics tools
- **Application for project on decreasing admissions for high risk patients has been submitted**
- **Looking for sustainable funding**

THANK YOU!

Questions?