

# **Using Complex Data to Solve Complex Problems**

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# Manitoba Data - Overview

- Manitoba's data capacity
  - Data rich and data experienced
  - 2000+ business application systems
- Expertise using complex data
  - Manitoba Centre for Health Policy (MCHP)
  - Healthy Child Manitoba Office (HCMO)
- Consideration of privacy legislation

# Data Strategy

## **Vision for the Future:**

- Enhance data
- Improve access to data
- Enable open access to data
- Ensure privacy and security
- Develop stronger public-private partnerships
- Nurture a data-driven, evidence-based culture



## OUR FOCUS

Dedicating energies and efforts in four (4) critical areas:

**PEOPLE:** Creating internal staff capacity and teaching external usage on how to use the tools and data

**DATA:** Locating and qualifying potential sources of data and documenting the necessary transformations that will be required to make those sources usable for various audiences

**PROCESS:** Establishing and sustaining clearly defined roles and governance as well as developing the necessary policies and agreements for safe use

**TECHNOLOGY:** Building the underlying ICT infrastructure and adopting tools that reuse the Government of Manitoba's existing investment and utilizing low-cost open source technologies



# What is Data Science?

## Data Science



Applying advanced statistical tools to existing data to generate new insights



## Service Change



Converting new data insights into (often small) changes to work processes

## Smarter Work



More efficient and effective use of staff and resources



# Data Analytics – Maturity

## Gartner Analytic Ascendancy Model



Where  
we are  
heading

Where we  
are now

# Initiatives in Progress

## **Data Driven Program Evaluations:**

Series of on-going quick turnaround data analytics projects that look at pressing citizen needs and opportunities to improve public services.

# Data Analytics Projects

## Our Approach:

- Cross-departmental
- Multiple sets of data
- Short project cycles
- Departments provide questions
- Experts (MCHP + Data Analysts) help provide support



# Data Analytics Projects

## *QTs Completed:*

- Social impact bond doula project
- Mental health of Justice involved youth
- Life Flight
- Funding formula for Special Needs
- High users of Employment and Income Assistance (EIA)
- Utilization patterns of high-needs clients (i.e. Chronic users of Justice; Repeat users of Income Assistance)

# Data Analytics Projects

*QT Findings & Results*

## *SIB Doula Project:*

- 2.5% of children born to Winnipeg residents were placed in care during the study period.
- Children tend to be taken into care early in life. 52% within first 30 days of life.
- First Nations Southern Authority CFS had more than half (56%) of the CIC episodes.
- 1 in 5 children who are taken into Southern Authority CFS care have multiple episodes/re-enter into care.
- Mothers who had children taken into Southern Authority CFS care tended to be younger than 20 years of age (63%); had experienced abuse or neglect (93%); received CFS services or were themselves in care (86%); and had less than grade 12 education (51%).

## *Mental Health of Justice Involved Youth:*

- Of the total number of youths **charged** with crimes, 65% were charged with serious offences (violent, property, sexual crimes or assault).
- 37% of youths charged with a serious crime had a prior mental health diagnosis as compared to 32% of youths charged with a non-serious crime.
- Mental health diagnosis prior to charges does not matter for differentiating youths who are charged with serious offences from those charged with less serious offences when holding all other factors constant.

## *Life Flight:*

- The highest proportion of Life Flight pickup locations were in the North region (45%). These flights traveled long distances.
- Transports originating in the North region and traveling 400 km or more accounted for 38% of all flights.
- The most common destination for all transports was Winnipeg (84%).
- 84% of patients transported by Life Flight fell in the top 2 categories of critical illness as defined by the Canadian Triage and Acuity Scale (CTAS).
- Demand for Life Flight is projected to increase slowly from an estimated 47 flights in June 2018 to an estimated 50 flights by May 2023.



## *High Users of Employment Income Assistance:*

### Two Definitions:

1) High EIA Users: Top 5% of average case budget.

- Represent 5% of all users.
- More likely than non-high users to: be younger (12-18); reside in Northern Health Region; be involved with Child and Family Services; have received rent assistance or reside in public housing.

2) Repeat EIA Users: 3 or more closed/reopened cases within a year during the study period.

- Represent 1% of all users.
- More likely than non-repeat users to: reside in the Northern Health Region; have visited a physician for mental health or substance abuse; be involved with the justice system and/or child and family services; have received rent assistance or reside in public housing.

## *Chronic Users of the Justice System:*

- Descriptive and inferential data analysis:
  - Describe differences between chronic users of the justice system (those with 5 or more incident reports in a 12 month period) and non-chronic users (less than 5 incident reports).
- Chronic users account for 42% of incident reports.
- Are more likely than non-chronic users to be:
  - Between the ages of 12 and 18 (5.3 times);
  - In the lowest 2 income quintiles (2.9 and 2.2 times respectively);
  - Have been in the care of Child and Family Services (CFS) (2.7 times);
  - Come from the Northern RHA; and,
  - Have seen a medical professional for substance abuse (2.1 times).

# Data Analytics QTs in Progress

- Rent Assist

Do programs which decouple rent assistance or housing benefits from welfare benefits help to address the “welfare wall”? Do people come off of welfare more often or more quickly when they do not risk losing their housing benefits?

- Female offenders/ women in incarceration

Incarceration rates for women have increased while incarceration rates for men have decreased. What factors can account for this shift? Do women who are incarcerated share specific characteristics and have these characteristics changed over time?

- Extensions of care after age 18

Does extending care for young people past the age of 18 have positive implications for their lives later on? What factors come into play in an agency’s decision to offer extended care for a client?

# Data Analytics Projects

*QTs to be delivered:*

- Child welfare programs (i.e. Complex children and youth)

# Data Analytics Projects

## **Lessons Learned to Date:**

- Communication with all team members
- Resources to develop data capacity
- Data analytics and data science is insufficient
- More complex than anticipated



# Data Driven Intelligence (DDI)

- Federal, Provincial, Territorial and Municipal Community of Practice (CoP)
- DDI CoP seeks to improve public services through application of advanced data analytics techniques
- Manitoba as Deputy Minister Champion:
  - Rapidly develop awareness, skills and capacity
  - Facilitating pilot Fed-Prov DDI projects

# DDI Playbook

- Guidance and case studies:
  - Strategies, policies and skills
  - Harness/mine resources to improve outcomes
  - Case Study from Manitoba: Sharing our experience in leveraging data and data analytics

Access DDI Playbook at: <<https://iccs-isac.org/assets/uploads/publications/Analytics-Playbook.pdf>

# Case Studies

- Social Impact Bond “Doula” Project
- Mental Health of Justice Involved Youth