Data Linkage in Manitoba

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Overview of Presentation

- Introduction
- Linking the EDI using the Manitoba Birth Cohort Study (Mariette)
- Data Linkages using Manitoba Centre for Health Policy (MCHP) data (Marni)
- Future Research & Conclusions
- Questions - Discussion
Why is it so important to link datasets from different sources and over different times to better understand child development?
According to the ecological model, there are many layers of factors that influence child development. These factors continue to influence the individual throughout the life course.
Manitoba Children’s Agenda
January 28 & 29 2009

LIFE COURSE APPROACH
Lifelong impact of influences that occur early in life

SOCIAL AND PHYSICAL INFLUENCES
Socio-economic status · School Readiness · Family Functioning · Parent’s mental health · Abuse & Neglect · Neighborhood Safety · Environmental Exposures · School Quality · Nutrition

APPROACHES AND INITIATIVES
Public Health Support to Young Families · Home Visiting for At-Risk Families · Positive Parenting · Financial Supports · Child Care · Nursery School · Healthy Buddies · Reading Recovery

OUTCOMES
Physical & Emotional Health · Social Engagement & Responsibility · Safety & Security · Success at Learning

HEALTHY LIFE TRANSITIONS

Pregnancy, Birth, and Infancy
(Prenatal - 3 years)

Early Childhood Care and Learning
(3 years - 6 years)

Middle Childhood Care and Learning
(6 years - 12 years)

Adolescent Development
(12 years - 18 years)

SUCCESS AT LEARNING

Lifelong impact of influences that occur early in life
Putting Together the whole story:
How Manitoba children are doing from birth to adulthood...
1997 Manitoba Birth Cohort Study

- Children from South Eastman Region & the Francophone Community
- Started with 635 children in 2001
- 478 participated in all three phases
South Eastman Health Region and Francophone Community
Acknowledgments

- Joanne Dumaine (DSFM)
- Ales Morga (South Eastman Health)
- Teresa Mayer (HCMO)
- Healthy Child Manitoba Office Team
- Ministers in the Healthy Child Committee of Cabinet
Questions #1

- Are children identified as « vulnerable » on the EDI more likely to have academic and socio-emotional difficulties in Grade 3, compared to children who are «not vulnerable»?

- Can we identify factors that explain why some children change trajectories?
Socio-emotional outcome

- **EDI**
  - Social competence: gets along with others, accepts responsibility for actions, etc.
  - Emotional maturity: eager to explore new items, appears sad, gets into fights
  - Lower than Canadian cut-off

- **Grade 3**
  - hyperactive,
  - anxious/depressed
  - physical aggression
  - prosocial behavior
  - cut-off was 25%
Children’s *Socio-Emotional* Trajectories
South Eastman Health and DSFM (n=588)

Kindergarten  
*EDI, 2003*

- **Not Vulnerable**: 71.8%
- **Vulnerable**: 28.2%

Grade 3, 2005

- **Long-term Positive Development**: 55.4%
- **Resilient**: 15.1%
- **Newly Vulnerable**: 16.3%
- **Long-term Vulnerable**: 13.1%
- **29.4%**

Source: 1997 Manitoba Birth Cohort Study
Academic Outcomes

- **EDI**
  - Language and cognitive development: interested in games involving numbers, writes own name, reads sentences, etc.
  - Communication and general knowledge: communicates needs and understands others, shows interest in general knowledge, etc.
  - Vulnerable = lower than Canadian cut-off

- **Grade 3**
  - Reading
  - Mathematics
  - Vulnerable = could not meet expectations
Children’s **Academic** Trajectories
Division scolaire franco-manitobaine (n=251)

**Kindergarten**
*EDI, 2003*

- **Not Vulnerable**: 64.9%
- **Vulnerable**: 35.1%

**Grade 3, 2005**

- **Long-term Positive Development**: 59.0%
- **Resilient**: 19.9%
- **Newly Vulnerable**: 6.0%
- **Long-term Vulnerable**: 15.1%

Source: 1997 Manitoba Birth Cohort Study
Question #2

• Is there a link between the preschool linguistic environment and learning in a « français» school?
South Eastman Health Region and Francophone Community
Language in Child Care and Early Development Instrument and Grade 3 Assessments Among Francophone Children
Language Spoken in Child Care and EDI Results in Kindergarten

![Bar chart showing the comparison between language spoken in child care and EDI results in kindergarten. The chart compares the performance in Physical, Social, Emotional, Language, and Communicative domains for children whose language is Both/English and French.](chart.png)
Language Spoken in Child Care and Percentage with Good Reading Skills (Grade 3)

[Bar chart showing the comparison of Reflection, Oral, and Comprehension skills in Both/English and French, with asterisks indicating significant differences.]
Language Spoke in Child Care and Percentage with Good Math Skills (Grade 3)
Language Spoken in Home and Early Development Instrument and Grade 3 Assessments Among Francophone Children
Language Spoken at Home and EDI Results in Kindergarten

![Bar chart showing EDI results in different domains for languages spoken at home.](chart.png)
Language Spoken at Home and Percentage of Good Reading Skills (Grade 3)

Reflection
Oral
Comprehension

Both/English
French

* * *
Language Spoken at Home and Percentage with Good Math Skills (Grade 3)
So what did we learn?

- Linking the EDI to preschool factors and Grade 3 assessments can shed light into what influences children’s trajectories.
- Can confirm what we suspect – but also give new insights.
Manitoba Centre for Health Policy

- University of Manitoba
- unit of the Department of Community Health Sciences, Faculty of Medicine
- 1991 … but a long history pre-dates this
- Five-year contracts with Manitoba Health; 6 deliverables per year
- Independently funded research
Making decisions “in the dark”??
…
or using population-based research evidence

Birthday Game Disasters
Manitoba Population Health Research Data Repository

Key health databases start in 1970

Family Services
Hospital
Education
Home Care
Physician
Pharmaceuticals
Nursing Home
Immunize
Vital Statistics
Costs
Census Data at area level
National surveys
Healthy Child Manitoba Data

Population-Based Research Registry

University of Manitoba
Total Number of Data Files in MCHP Repository

Continual expansion of databases - CFI funding 1999-2003 ($2.7 million)
MCHP: Respect for Privacy

- Highest standards of security, privacy & confidentiality of data (PHIA, FIPPA)
  - No names, no addresses; “scrambled” identifier numbers
  - Memorandum/Data Sharing Agreements with data providers
  - Limited access on project-specific basis; data stored in unlinked files
  - Ethics review committee, Health Information Privacy Committee, other stakeholder groups as required
  - Data for research not for administrative use
Using linked data to build picture of development throughout childhood

Prenatal:
- FF screen
- Prenatal care
- Maternal serum screen

At birth:
- Birth weight
- Gestational age
- Apgar scores
- Breastfeeding
- Complications
- FF screen

Early Years:
- Immunization
- Child care

School Entry:
- EDI
- School enrolment
- Early literacy

Middle Years (~7-11):
- Grade 3 assessment
- School enrolment
- Grade retention

Middle Years (~12-14):
- Grade 7/8 assessments
- School enrolment
- Grade retention

Youth (~15-19):
- Grade 12 assessments
- High school marks
- High school completion

At all stages: health status (hospitalizations, doctor visits, medications prescribed, FASD), residence (area-level income, number of moves), family or youth receipt of income assistance, involvement with child welfare, family composition (marital status, number of siblings)
How information in the MCHP data Repository has been linked together to better understand Socioeconomic Gradients in Education Outcomes

- Population registry
- Grade 12 Standards tests
Getting the “True” Story
Grade 12 Performance on LA test by SES Group

### Pass/Fail rates of test writers

<table>
<thead>
<tr>
<th>SES</th>
<th>IA</th>
<th>Low</th>
<th>Lo-Mid</th>
<th>Middle</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>76%</td>
<td>87%</td>
<td>87%</td>
<td>90%</td>
<td>96%</td>
</tr>
</tbody>
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### 17/18 year olds who should have written

- **Withdrawn**
- **In Grade 11 or lower**
- **In Grade 12 but not LA test mark**
- **Drop Course, Absent, Exempt, Incomplete**
- **Fail**
- **Pass**
Grade 3 Performance by SES Group (Language Arts Standards Test, 1998/99)

- Grade 2 or lower
- Incomplete
- Exempt
- Absent
- Failed
- Passed
Healthiness of Children at Birth

Birthweights by SES

- IA: 95%
- Low: 93%
- Lo-Mid: 95%
- Middle: 95%
- High: 96%

SES

- 2500+ gm
- Low BW
How information in the MCHP data Repository has been used to study kids at risk

- Kids involved in child welfare
- Kids in families receiving income assistance
- Kids born to teen mothers
Percent of Winnipeg Youth Who Failed to Graduate within Six Years of Entering Grade 9, by Risk Factors

CFS = in care or receiving services from Child and Family Services
IA = family receipt of income assistance

Source: Manitoba Centre for Health Policy, 2007
Percent of Young Adults Who Received Income Assistance, by Risk Factors

CFS = in care or receiving services from Child and Family Services
IA = family receipt of income assistance

Source: Manitoba Centre for Health Policy, 2007
Percent of Children with Normal Birth Outcomes, by Number of Risk Factors

Source: Manitoba Centre for Health Policy, 2007
Future Research

- Santos and others – what factors predict EDI performance?
- Ens and others – what is the association between EDI scores and early literacy programs?
- What can EDI performance tell us about future outcomes?

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Concluding thoughts…