



THE HEALTH OF MANITOBA'S CHILDREN

A summary of the report, *How are Manitoba's Children Doing?* by Marni Brownell, Mariette Chartier, Rob Santos, Okechekwu Ekuma, Wendy Au, Joykrishna Sarkar, Leonard MacWilliam, Elaine Burland, Ina Koseva, Wendy Guenette
Summary written by Souradat Shaw

That sense of déjà vu. The feeling you get when you're in a certain situation, and the familiarity shocks you — like you know you've been here before, going through the exact same actions, saying the same words, talking to the same people. It makes you question the inevitability of things. Maybe you were meant to be here, at this exact moment, and it was all inevitable.

It is this idea of fate, of whether paths in lives can be changed, that lies behind the latest Manitoba Centre for Health Policy (MCHP) report: *How are Manitoba's Children Doing?* To explain what we mean, we have to talk a little bit about public policy. In the context of a civil society, one of the most important functions of public policy is that it tries to improve situations that need improving. Our world is not a fair place unfortunately, and policy can try to correct unfairness to the best of our ability. What this assumes is that things can be changed; that the lives of individuals are not tied to some pre-determined fate.

How researchers looked for the answers

And so it was in this context that the question was asked, how are Manitoba's children doing? Over time, are the lives of children getting better? And if not, are there ways that we can try to make things better? MCHP researchers were tasked to answer these questions because of the information-rich environment in MCHP's population-based data repository. This repository links information from government services on all Manitobans. The information is made anonymous through a de-identification process where data from doctors' visits, hospitalizations and drug prescriptions could be linked to other sources of information related to health status, such as school outcomes.

Figuring out the how in "How Are Manitoba's Children Doing?" is no simple task, as there are many things that could be examined. MCHP researchers first had to choose what to look at and decided on four different areas: 1) Physical Health and Emotional Health; 2) Safety and Security; 3) Successful Learning; and 4) Social Engagement and Responsibility. Indicators, or

measures, were then developed within each of the four areas. So for example, one of the indicators used to define Physical Health was the number of hospital visits (Hospital Utilization). Over 30 indicators were created in this report, listed in Table 1.

Once the indicators were chosen, MCHP researchers looked at the question in three ways. First, they looked at trends or patterns (when possible) over a ten-year period. Simply put, they took snapshots of what the indicators looked like at different years, for different areas in Manitoba, to see if rates were going up, going down, or remaining the same.

Second, MCHP researchers looked at whether the distribution of the indicators depended on the overall wealth of the area the children lived in, and if this changed over time. MCHP researchers measured area-level wealth by using what are called income quintiles. Income quintiles are like a five-step scale, with each move up a step meaning a higher level of income. Because income levels are different between urban and rural areas in Manitoba, separate scales were made for Winnipeg and Brandon (called urban income quintiles), and for the rest of Manitoba (called rural income quintiles). The focus of this second part was to see how equal or unequal the

Table 1: List of Indicators

Physical & Emotional Health

- Child Mortality
- Causes of Child Mortality
- Hospital Utilization (-)
- Causes of Hospital Utilization
- Physician Visits (-)
- ADHD (+)
- Asthma
- Diabetes
- Chlamydia
- Gonorrhea
- Children of Mothers with Mood and/or Anxiety Disorders
- Child Mood and/or Anxiety Disorders
- Suicide

Safety and Security

- Injury Hospitalizations
- Causes of Injury Hospitalizations
- Intentional Injury Hospitalizations (-)
- Unintentional Injury Hospitalizations
- Children in Care (+)
- Children in Families Receiving Services from CFS (-)

Successful Learning

- Special Education Funding (+)
- Grade Repetition (-)
- Grade 3 Reading
- Grade 3 Numeracy
- Grade 7 Mathematics
- Grade 8 Reading and Writing
- Grade 12 Language Arts Standards Tests
- Grade 12 Math Standards Tests
- High School Completion (+)
- Pathways from Kindergarten to Grade 3

Social Engagement & Responsibility

- Grade 7 Engagement (+)
- Teen Pregnancy (-)
- Teen Birth
- Youths on Income Assistance (-)

(+) Statistically significant increase over time
(-) Statistically significant decrease over time

distribution of the indicators were, with respect to area-level wealth. For example, did the 20 percent of children who lived in the richest areas in Winnipeg and Brandon also make up 20 percent of the children who were hospitalized for injuries? In technical terms, the researchers wanted to know just how much inequity there was in the distribution of the indicators in the population. We'll get to what we mean by inequity a little later.

Third, because of the data available to MCHP researchers, the same children could be followed over time, and factors present in early childhood could be linked to outcomes later in life. For this report, the researchers focused on the results from the Early Development Instrument (EDI), which is measured in Kindergarten, and school outcomes for the same children at Grade 3. The EDI measures children on school-readiness, and is administered to virtually all Kindergarten-aged children in Manitoba public schools. School-readiness is measured along five factors, or domains. Each domain has a cutoff score which indicates whether children are ready in that domain. Children are considered vulnerable if they are not ready in one or more of the domains. In doing this analysis, researchers could look at whether or not vulnerability in Kindergarten has an impact on things like reading levels and numeracy in Grade 3. Numeracy is the ability to do math and use math in the real world.

What is meant by inequities?

So, to get back to inequities — what do we mean by inequities? Let us use a simple analogy. Imagine you are hosting a dinner party and you have a pie that you need to serve to 10 people. Now, the most sensible thing to do would be to slice it into 10 equally-sized pieces, and serve each person a piece. In fact, slicing up the pie into 10 pieces and giving one piece to each person is an illustration of perfect equity, or a situation with no inequity. Everybody gets a slice. Now what of the reverse? What if one person gets the entire pie and the other nine get nothing? Not only is this situation unfair, but it is what we would call total inequity.

More than 40 percent of deaths in children occur in the 20 percent of the population in the lowest income quintile.

It turns out there are several ways we can measure inequity, and actually put a number on it. The one that MCHP used for this report is called the Gini coefficient. The Gini coefficient ranges from 0 to 1, with 0 meaning no inequity, and 1 meaning total inequity. Most of the time the Gini coefficient falls somewhere between these two values. MCHP has made it even easier to interpret this score by providing cutoff points. So any indicator falling between 0 and less than 0.060 would indicate a low degree of inequity; scores between 0.060 and 0.200 would mean

moderate inequity; and anything above 0.200 would mean a high amount of inequity.

What was found?

With this in mind, let's take a look at what the researchers found. Instead of looking at all the indicators, we will focus on those that saw a statistically significant change over the study period. When we talk about statistical significance, we are talking about a change in our indicators that is not likely due to chance alone, or is just a result of normal variations. In total, of the indicators chosen, MCHP researchers found that about a third changed over time. Table 1 also lists the indicators that showed a statistically significant change over the study period. As can be seen, the results are quite mixed, with the ones showing a statistically significant change marked with a "+" or "-" depending on whether they went up or down over time.

In some cases, an indicator going down is a good news story. For example, the teen pregnancy rate decreased from 52 per 1000 at the beginning to 47 per 1000 by the end of the study period. This represents a 10 percent decrease in teen pregnancies. Even better, we saw a 20 percent decrease in intentional injuries that required a hospitalization over the same time period.

In other situations, an indicator going up is good news. Take the example of high school completion. We see that in 2002/03 about 76 percent of kids completed high school, while in 2009/10 this figure was 82 percent, which is an increase of about

Table 2: Indicators by Degree of Socioeconomic Inequity

Low Degree of Inequity
Physician Visits (Rural) (+)
Physician Visits (Urban) (-)
Asthma (Urban)
Diabetes (Urban)
Children of Mothers with Mood and/or Anxiety Disorders (Rural)
Child Mood and/or Anxiety Disorders (Rural)
Child Mood and/or Anxiety Disorders (Urban) (+)
ADHD (Urban)
Grade 3 Reading
Grade 3 Reading (Cohort Approach)
Grade 3 Numeracy
Grade 7 Mathematics (Rural)
Grade 8 Reading and Writing
High School Completion (Rural)
Grade 7 Engagement (Rural)
Youth on Income Assistance (Rural) (-)
Moderate Degree of Inequity
Hospital Utilization (Urban)
Asthma (Rural) (-)
Diabetes (Rural)
Children of Mothers with Mood and/or Anxiety Disorders (Urban) (+)
ADHD (Rural)
Unintentional Injury Hospitalizations (Urban)
Special Education Funding
Grade 3 Numeracy (Cohort Approach)
Grade 7 Mathematics (Urban)
Grade 7 Mathematics (Cohort Approach)
Grade 8 Reading and Writing (Cohort Approach)
Grade 12 Language Arts Standards Test (Urban)
Grade 12 Language Arts Standards Test (Rural) (+)
Grade 12 Mathematics Standards Test (Urban)
Grade 12 Mathematics Standards Test (Rural) (+)
High School Completion (Urban)
Grade 7 Engagement (Urban)
Grade 7 Engagement (Cohort Approach)
High Degree of Inequity
Child Mortality
Hospital Utilization (Rural) (+)
Chlamydia
Gonorrhoea
Suicide
Injury Hospitalizations (Urban)
Injury Hospitalizations (Rural) (+)
Intentional Injury Hospitalizations
Unintentional Injury Hospitalizations (Rural) (+)
Children in Care (Urban)
Children in Care (Rural) (+)
Children in Families Receiving Services from CFS (+)
Grade Repetition (Urban) (+)
Grade Repetition (Rural)
Teen Pregnancy (Urban) (+)
Teen Pregnancy (Rural)
Teen Birth
Youth on Income Assistance (Urban)

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seven percent. Now, there are also cases where a significant change in rates may be a little bit harder to interpret. Both hospital utilization and physician visits decreased by over 20 percent from 2000/01 to 2009/10. At first glance, this may seem a good thing — fewer hospital stays and visits to the doctor’s office usually mean better health, right? Well, not necessarily so. Maybe in the case of hospital stays this may be true. But for physician visits, it could be that children are getting healthier, or it could also mean people are using these services more appropriately — like seeing a doctor only if you were sick. On the other hand, it could be that children couldn’t access these services in a timely manner. At this point, we would need more information to know for sure if this change is good or bad.

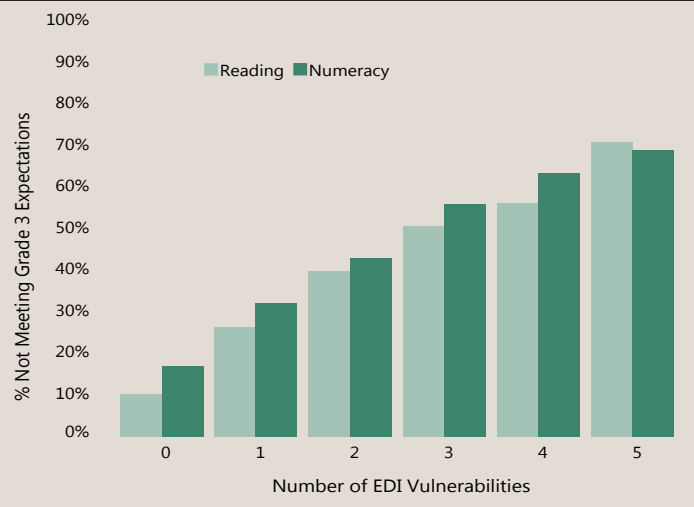
Table 2 summarizes what researchers found in the analyses looking at inequities. It can be seen that almost all indicators showed some inequity. Using cutoff scores, we can see indicators grouped into low, moderate and high inequity. Why this is important is because of the approaches that might be taken in developing programs to improve children’s health. For those indicators in the low inequity group, a universal approach, or one that covers everybody, should be an effective way of improving child health. For indicators in the high inequity group, a more targeted approach, focusing on those who shoulder the highest burden, is needed alongside the universal programs, in order to improve the health of Manitoba’s children.

With each additional vulnerability identified in Kindergarten, we see the likelihood of not meeting expectations, for both reading and numeracy in Grade 3, increases in a step-like fashion.

We can see that in Table 2, quite a number of indicators fall into the high inequity group, including episodes of chlamydia and gonorrhea, child mortality and suicide. For some of these indicators where inequities were already high at the start of the study period, the degree of inequity increased over time — for example, for injury hospitalizations in rural areas and for teen pregnancy in urban areas. It may be shocking to know that more than 40 percent of deaths in children occur in the 20 percent of the population in the lowest income quintile. In this case, adding a targeted approach to universal programs is required to address the problem — we want to reduce mortality for all children but extra resources are required in areas where the risk is greatest.

What were the results from the analysis which looked at the same set of children over time? Let’s take a look at

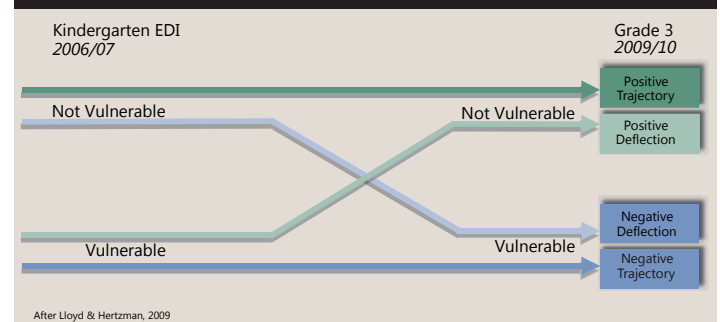
Figure 1: Relationship Between Number of EDI Vulnerabilities and Grade 3 Reading and Numeracy



Grade 3 reading and numeracy (math) levels. Figure 1 shows the relationship between the number of EDI vulnerabilities in Kindergarten, and the percentage of children who did not meet the Grade 3 expectations in reading and numeracy. That is, the percentage of children who were not performing at a level expected in Grade 3. What we see is quite remarkable. With each additional vulnerability identified in Kindergarten, we see that the likelihood of not meeting expectations, for both reading and numeracy in Grade 3, increases in a step-like fashion. So among children with no vulnerabilities identified in Kindergarten, only 10 percent did not meet expectations in Grade 3 reading, and less than 20 percent did not meet numeracy expectations in Grade 3. Compare this to children with three vulnerabilities: more than half did not meet expectations in reading, and over 55 percent did not meet expectations in numeracy in Grade 3. Worse still, among children with five vulnerabilities, about 70 percent did not meet either reading or numeracy expectations in Grade 3.

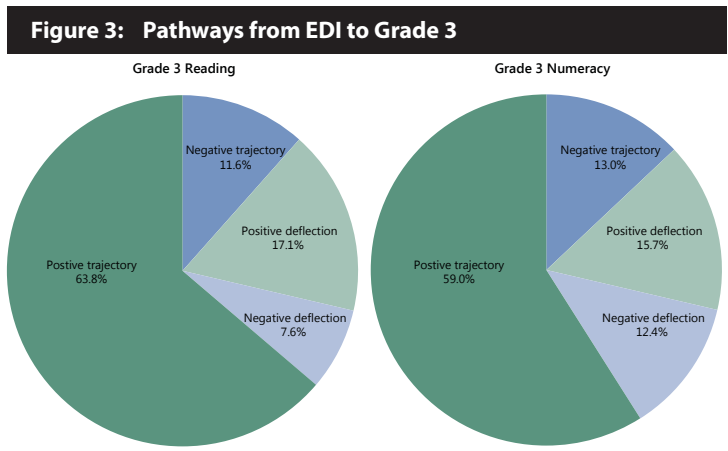
Here’s the thing: although it certainly is not good news that the most vulnerable tend to have the poorest outcomes over time, when MCHP researchers looked at the trajectories in outcomes from Kindergarten, they were able to find some good news. To simplify things, MCHP researchers imagined that children could potentially take four different paths as they progressed from Kindergarten to Grade 3. In the first path, children who were not vulnerable in Kindergarten would have positive outcomes in

Figure 2: Children’s Academic Trajectories



Grade 3. In the second path, children vulnerable in Kindergarten would have negative outcomes at a later age. Third, those who were not vulnerable at an earlier age would experience a deflection, or a change in course, and end up having negative outcomes in Grade 3. This third scenario can be referred to as negative deflection. Finally, the fourth path would have children vulnerable in Kindergarten ending up experiencing positive outcomes in Grade 3. This could be thought of as a positive deflection. These paths are illustrated in Figure 2.

Somewhat predictably, MCHP researchers saw that those who were not vulnerable in Kindergarten were most likely to have a positive outcome, while those who were vulnerable tended to have a negative outcome. For example, looking at Figure 3, for Grade 3 reading expectations, we saw that over 60 percent of the children we followed remained on the positive trajectory path, while 12 percent stayed on the negative trajectory path. However, they also found that many children who were vulnerable in Kindergarten ended up with a positive outcome — that is, a positive deflection. Importantly, 17 percent, or almost one in five children started out as vulnerable in Kindergarten, but ended up meeting Grade 3 reading expectations. Even better, when looking at this by area-level wealth, they found that as a percentage, those living in the poorest neighbourhoods were more likely to experience a positive deflection, compared to those from the richest areas.



So what can we make of this last set of findings? First, it seems that the likelihood of positive and negative outcomes is indeed set early in life — as early as Kindergarten. Second, almost a third of all children in the lowest income quintile experienced some type

of deflection in their trajectory. Although we obviously don't want children experiencing a negative deflection, what this says is that trajectories are not necessarily permanent, and that perhaps with the right types of interventions, we can work to ensure that over time there are more positive deflections than negative ones.

Over the last 10 years more children completed high school, had fewer hospitalizations, fewer teen pregnancies, and fewer intentional injuries.

In the final analysis, what can we say about how Manitoba's children are doing? First, we see that over the last 10 years, there have been positive gains in the four areas that were examined. There were more children completing high school, fewer hospitalizations, fewer teen pregnancies, and fewer intentional injuries. Just as important, we can see that there are still some things that are cause for concern, most particularly the increased rates of ADHD and children being taken into care. Second, we saw that the burden of poor outcomes in indicators is not spread evenly throughout the population. In almost every case, we see those living in the poorest areas are shouldering the burden disproportionately. What this means, practically, is that certain groups of children need extra help in gaining more positive outcomes. By grouping the indicators into low, moderate and high inequity, MCHP has provided a convenient map of where to start. Perhaps by focusing on those populations who shoulder the most disproportionate burden of poor outcomes, we can start to see even more improvement. Finally, we see that although area-level wealth does seem to have a profound impact on a child's well-being, this impact does not have to be permanent.

And so it is, in this last point, where we can catch a glimmer of hope. The world is unfair, and children are born into situations under which they have no control. But here, fate is not inevitable; here, as this report has shown, change is possible. So long as there exist the right policies and programs, delivered to the right groups of children, at the right time.

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