

MATERNITY CARE IN ALBERTA

An overview and cost comparison of various
maternity care providers



November 2016

ABOUT ASAC

ASAC's mission is to help women have better births. Our key goal is to educate families on the various maternity care options available, so they can make informed choices supported by their communities and embrace parenthood.

The Association for Safe Alternatives in Childbirth is part of a growing network of parents and health professionals who believe that childbirth is a normal and healthy part of life, of special significance to the pregnant woman and her family.

ASAC envisions a world in which every woman gives birth with dignity, and experiences an empowered transition into motherhood, allowing her children to have the best start possible to their lives.

ASAC was created in 1979 to encourage alternatives to the prevailing medical model and to create a discourse challenging mainstream approaches to maternity care. It is the oldest surviving maternity care consumer advocacy group in Canada. We believe parents have the right and the responsibility to make informed choices about childbirth and that a full range of options should be available to them — in the hospital, at home, in birthing centres and with professional care providers of their choice. We are particularly oriented toward midwifery, and we are based in Edmonton, Alberta, Canada.

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MATERNITY CARE IN ALBERTA

An overview of how much is spent on childbirth in Alberta annually, with respect to various care providers, namely, obstetricians, general practitioners and midwives including care provider fees as well as well hospital costs and other indirect costs. Whenever possible this report features comparative data at the Canadian, provincial/territorial and international levels.

ABOUT THIS REPORT



PHOTO BY: VANESSA BROWN PHOTOGRAPHY

The Purpose of this report is to provide an overview of how much is spent on childbirth in Alberta annually, with respect to various care providers, (namely: obstetricians, general practitioners and midwives,) including care provider fees, hospital costs and other indirect costs. Whenever possible it features comparative data at the Canadian, provincial/territorial and international levels.

There had been no analysis of Alberta data since the public funding of midwifery in 2009. This information was needed to allow for a comprehensive comparison of maternity care costs among care providers.

The scope of this report is to compare the average costs of birth among the various care providers, based on overall maternity care related billings in Alberta in 2013-14.

This report pulls together many resources available to show current data for the various care providers so the data can be compared and used to assist in important government policy-making decisions. The primary focus is on healthcare spending analysis to show potential areas for savings and increased quality and continuity of care, among many other benefits.

Costing data came from Alberta Health (AH), Alberta Health Services (AHS) and Canadian Institute of Health Information (CIHI). Physician fee data was based on Alberta Health fee-for-service claims for health service codes related to maternity care for the fiscal year 2013-14.

Hospital spending information came from Case Mix Group (CMG+) data held in the Canadian Management Information System (MIS) Database combined with Discharge Abstract Database (DAD) data for fiscal year 2013-14. The data in this report reflects average costs for “typical” patients and does not include cases of multiple births, stillbirth, maternal death or cases with extended hospital stays or a high number of costly interventions and complications.

A variety of research articles and data available from AH, AHS and CIHI were also used in assisting with examining other aspects of maternity care, such as breastfeeding rates, hospital readmissions and rural healthcare.

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REPORT METHODOLOGIES

The following methods were used to inform the development of this report:

Review of background documents: Pre-existing reports (e.g. Courtyard report, CIHI, Alberta Health, Alberta Perinatal Health Report, MCAN Maternity Care Priorities report), documents and research articles were reviewed in order to understand the context of maternity care in Alberta for this report. Information on the funding models and scopes of practice that relate to Obstetrical care providers in the province were included in the review.

Research on role of Midwifery in Canada: Published information related to the regulation and compensation of midwives in other Canadian jurisdictions was gathered. Information on the benefits and safety of midwifery care, including out of hospital birth, was reviewed.

Stakeholder meetings: Interviews were conducted with, and information gathered from, a variety of stakeholder groups, namely, Alberta Association of Midwives (AAM), Government of Alberta Ministries, Alberta Health, Alberta Health Services, Alberta Perinatal Health and University of Alberta researchers. These meetings were held to understand the historical relevance of various aspects of the current funding model, as well as to gain insight into areas of funding and barriers to practice that may

require modification going forward. Meetings were conducted with key stakeholders at various points to review the scope of report and gain input on areas of data they would find helpful.

Costs analysis: Data on total fee-for-service (FFS) claims relevant to Obstetrical care and Inpatient costs from Alberta Health (AH) and Alberta Health Services (AHS) for the fiscal year 2013-14 was reviewed for obstetricians, family physicians and midwives. A top down analysis of the financial data was undertaken to determine the average cost of vaginal births, vaginal births after cesarean (VBAC) and cesarean births amongst all care providers in Alberta. Data on prenatal codes, delivery codes, postnatal and newborn care were all reviewed for each care provider and weighted averages calculated. Costs for Anesthesia and Obstetrical intervention were also included in calculations. In the case of midwives, information on Inpatient costs and fee-for-service claims by physicians, when the admitting care provider was Midwife, were included in calculating weighted averages, along with course of care (CofC) fees. Data from CIHI and DAD database on National and Provincial childbirth indicators and CMG+ data on inpatient costs were also consulted for comparison.

ACKNOWLEDGEMENTS

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It should be noted that the analyses and conclusions in this report do not necessarily reflect the opinions of the individual members of the Expert Advisory Panel and Reviewers or their affiliated organizations.



STATE OF MATERNITY CARE IN ALBERTA



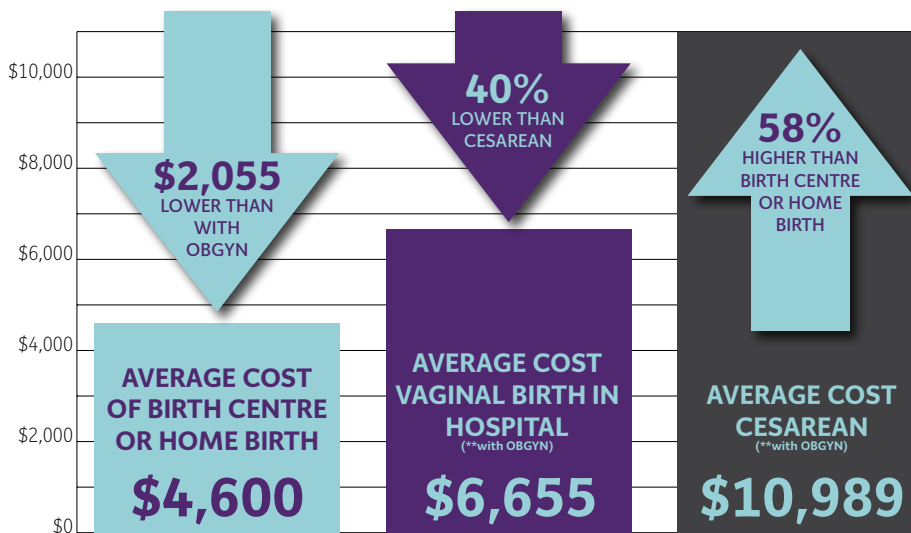
**#1 Reason For
Hospitalization
CHILDBIRTH**



**#1 Surgery in Alberta
CESAREANS**



**81% Rate of
REPEAT CESAREAN**



*Cost of birth calculations include all care from prenatal to 6 weeks postpartum
**based on 2013/14 data

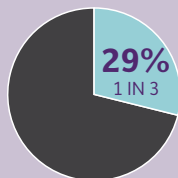
96 REGISTERED MIDWIVES

ATTEND APPROX. **5%** OF BIRTHS IN ALBERTA

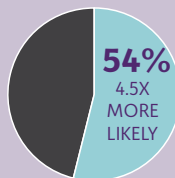
48% OF BIRTHS OUTSIDE OF HOSPITAL

1900 WOMEN ARE ON WAIT LIST

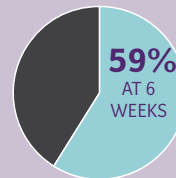
Obstetricians



**CESAREAN
RATE**

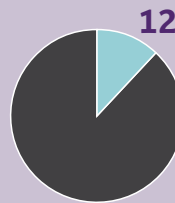
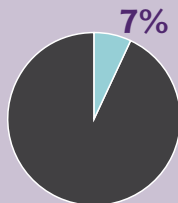


**EPIDURAL
RATE**



**BREASTFEEDING
SUCCESS**

Midwives



ONLY **7%** OF PREGNANCIES ARE CONSIDERED HIGH RISK

79% OF ATTEMPTED VBACS* WITH MIDWIVES SUCCESSFUL (*VAGINAL BIRTH AFTER CESAREAN)

POTENTIAL VBAC SAVINGS APPROX. **\$45.9 MILLION**

DECREASING CESAREANS TO **20%** COULD SAVE **\$14.5 MILLION** IN HOSPITAL COSTS



REPORT HIGHLIGHTS: HOW MUCH DOES IT COST TO HAVE A BABY IN ALBERTA?

- ❖ Healthcare spending and the sustainability of the current system has been a key area of focus throughout Canada as of late. In Alberta, healthcare spending has risen to approximately \$20.0 billion; more than 40%, of the government's total \$50.0 billion budget. Hospital, physician and drug costs consume the majority (over 70%) of the budget at \$9.2 billion for hospitals, \$3.8 billion for physicians, and \$1.4 billion for drugs.
- ❖ Of growing concern are the increasing costs currently associated with healthcare, in particular childbirth. The birth rate in Alberta has been steadily climbing and, at the time of this report, is projected to be 56,634, 56,622 and 56,670 in 2016, 2017 and 2018, respectively.
- ❖ The fact that childbirth is the most common reason for hospitalization and cesareans rank as the top surgical procedure across Canadian and Albertan hospitals should cause some serious reflection on the state of maternity care. Lowering cesarean rates and increasing vaginal birth after cesarean (VBAC) rates could represent a significant cost savings, as an estimated \$112 million Alberta healthcare dollars were spent on cesareans in 2013. If the overall cesarean rate had been 20% in 2013-14, the province could have saved \$14.5 million in hospital costs alone.
- ❖ The cesarean section rate in Alberta has been increasing steadily over the years. In 2006, the cesarean rate was 26.7% with a repeat cesarean rate of 38.7%. In 2013, the overall rate was 28.9%, while the repeat cesarean rate has climbed to an alarming 81.3%. At the same time, VBAC attempt rate and occurrence rate have been declining. In 2006, VBACs were successful 76.1% of the time, but were only attempted in 25.5% of women with a history of cesarean. By comparison, in 2013 Alberta Midwives had a cesarean rate of 7.3% and successful VBAC rate of 79.5%. Potential VBAC savings is approximately \$45.9 million.
- ❖ Maternity care providers are not necessarily interchangeable. Midwives, family physicians and obstetricians all deliver babies with different approaches. Obstetricians are skilled in managing high-risk pregnancies and births; this requires vigilance and often intervention. Having obstetricians care for women with low-risk pregnancies can result in more interventions and cesareans being done on women for whom the interventions are less appropriate, less effective, and no longer evidence-based.
- ❖ Physicians continue to provide most obstetrical services in Alberta, in contrast to midwives who provide care to less than 10% of women in Canada and 5% in Alberta. Midwives and nurse practitioners continue to remain underutilized in Alberta.
- ❖ While the majority of pregnancies end with uncomplicated vaginal deliveries, different types of deliveries can have very different costs. For example, according to the Canadian MIS database the average inpatient hospital costs in Alberta for women who had a vaginal delivery with no anesthetic or interventions was about \$2,250 per patient in 2013. The average hospital cost of a primary cesarean section during the same time period was about \$6880 per patient. Hospital costs make up the largest portion of spending on childbirth.
- ❖ By far the biggest cost savings available are related to out of hospital births (OOH). At a total cost of \$4600 per birth, they are on average \$1474 less expensive than hospital birth with a GP and \$2055 less than with an OBGYN.

“ This difference in approach translates into an average cost savings of just over \$540 per in hospital midwifery birth and a savings of \$2,055 for out of hospital births when compared to uncomplicated vaginal birth with an obstetrician. ”

- ❖ Midwives are skilled in managing low-risk pregnancies and birth and their model of care allows them to spend more time with patients, to offer out of hospital birth and water birth as options and use fewer interventions. Many studies, including several Canadian studies, have confirmed the safety and efficacy of midwifery-led care as an option that should be available to all low-risk women. This difference in approach translates into an average cost savings of just over \$540 per in hospital midwifery birth and a savings of \$2,055 for out of hospital births when compared to uncomplicated vaginal birth with an obstetrician. Midwives offer both high quality and continuity of care, relieving some of the burden on the healthcare system while also offering cost savings.
- ❖ Increases in cesarean and intervention rates are associated with a corresponding increase in suboptimal breastfeeding and adverse health outcomes, as well as rising healthcare costs. Many of which are preventable with proper training and up-to-date, evidence based policies and procedures. The potential cost savings associated with birth and associated health outcomes equals upwards of \$154.0 million. Consumers and policy makers need to be educated on the impact of various birth practices so informed choices can be made, helping to ensure a healthy Alberta.
- ❖ With increasing health issues such as childhood obesity, early onset diabetes, cancers and rising health care costs, the promotion, protection and support of breastfeeding has become even more critical as research points to relationships between breastfeeding and the onset of disease.
- ❖ In addition to the lack of care providers available in rural areas, Indigenous women face other barriers to accessing culturally specific maternity care as Indigenous practitioners are particularly scarce even within Indigenous communities. Overall, Canadian maternity care is uneven in both quality of care and access to different providers for distinct groups of women.
- ❖ In order to create a sustainable maternity care system in our province, there is a need to increase access to midwives and create a more collaborative care model amongst maternity care providers. These changes will involve costs, but the subsequent savings from lower cesarean rates and interventions, higher breastfeeding rates and the associated improved health outcomes both short and long-term will be significantly higher than the added expenses. The issues around funding models are complex and not an easy fix, especially given the current state of the economy. The cost savings presented could assist in balancing budgets and using taxpayers' money responsibly at a time where fiscal responsibility is imperative.
- ❖ Addressing concerns regarding maternity care in our province will not only have a short-term impact on the financial health and well-being of Albertans, it will have a lasting impact with savings for years to come; all the while creating a healthier Alberta.

OVERVIEW

STATUS OF MATERNITY CARE IN CANADA

Healthcare spending has consistently been the largest source of proportionate spending for provincial/territorial budgets in Canada, representing, on average, 40% of total expenditures. Healthcare spending in Canada is projected to grow to \$214.9 billion in 2014 (CIHI, 2015). Historically, total spending on healthcare for Canadian mothers and babies has been significant, with these services accounting for about 1 in 10 dollars spent by hospitals on inpatient care (CIHI, 2006). Added to this are the costs of services provided by physicians and other healthcare providers before, during, and after birth; out-of-pocket spending by families; and other costs.

The Society of Obstetricians and Gynecologists of Canada (SOGC) reports that demographic and societal trends in Canada over the past 15 to 20 years are having a significant impact on the delivery of maternity care. Factors such as “the increase in

the age of women giving birth in Canada; the decrease in fertility rates; the increase in multiple births; the increase in the number of babies requiring medical attention in intensive care units; the health human resource shortages among maternity care providers, and regional disparities in the provision of maternity care services” (The Society of Obstetricians and Gynecologists of Canada, 2008).

Variations in birthing practices across the country also influence expenditures. For example, cesarean deliveries and epidurals are much more common in some regions of Canada than in others. Lengths of stay (LOS) in hospital also vary. Overall, Canada has a lower average length of stay for maternity care than many countries of the Organization for Economic Co-operation and Development (OECD). In 2014, the average LOS for vaginal and cesarean deliveries were approximately 2 and 3 days, respectively (CIHI, 2015).

Table 1: Provincial Cesarean & Epidural Rates for 2013-14

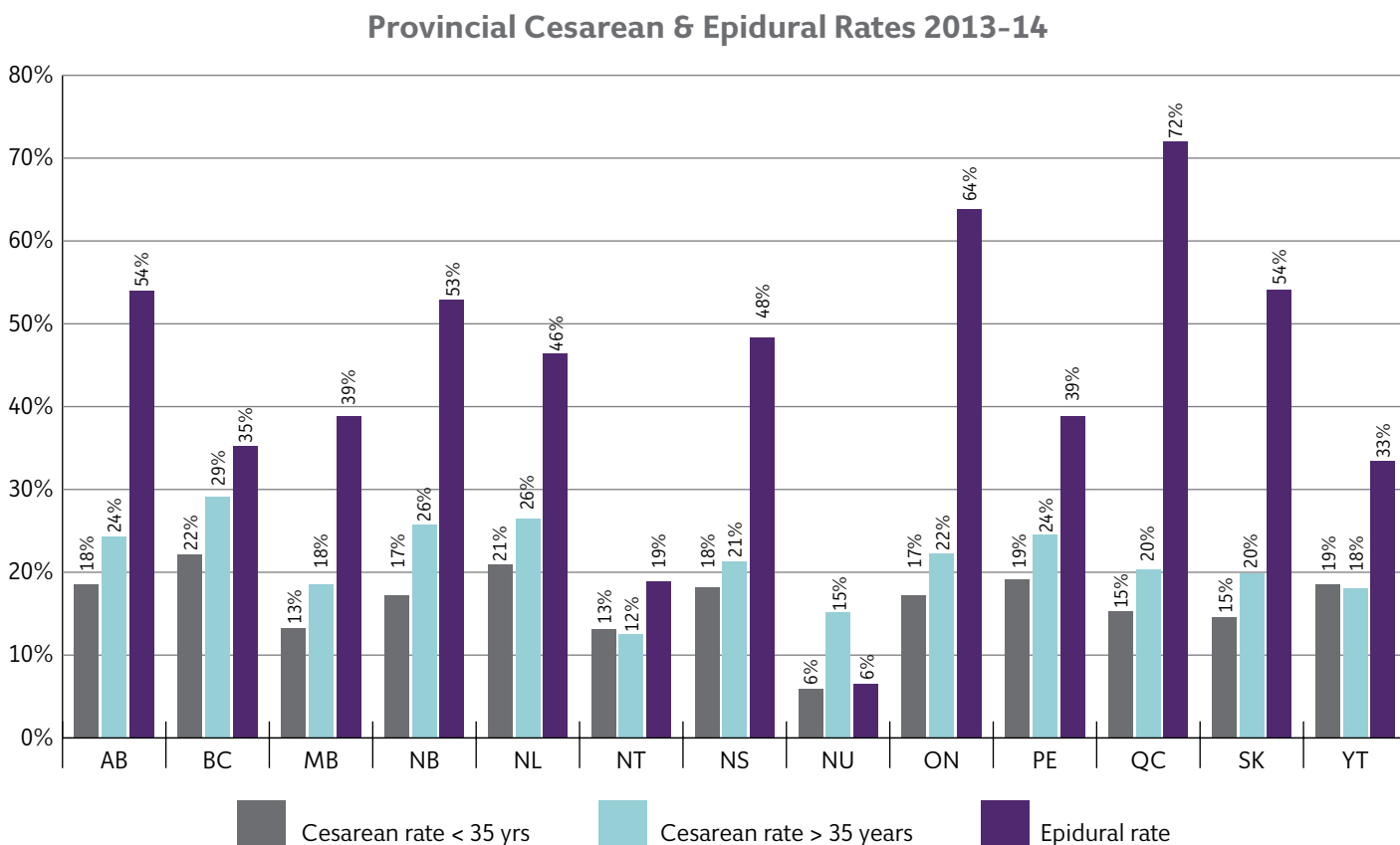




PHOTO BY: BRITTANY SARAH PHOTOGRAPHY

“Overall, Canadian maternity care is uneven in both quality of care and access to different providers for distinct groups of women.”

– Laurel Hanson et al., 2013

There are many healthcare providers and resources that may be required for fertility and perinatal care. For example, a mother and baby may need the expertise of family physicians, obstetricians/gynecologists, nurses, midwives, pediatricians and others at specific stages of their lives. Additionally, other resources such as laboratories, diagnostic equipment and neonatal intensive care units (NICUs) may be required. The cost of these services to parents and the health system prior to and immediately after birth can vary depending on the health needs of the mother and infant.

Physicians continue to provide most obstetrical services in Canada, in contrast to midwives who provide care to less than 10% of women. Vaginal deliveries make up the largest proportion of obstetrical fee-for-service (FFS) payments. “Canada’s maternity care environment is burdened by problems that include a high attrition rate for physicians, difficulty in attracting new practitioners because of demanding lifestyle issues, practitioners’ litigation fears, and payment models. Rural, [Indigenous], remote, and northern communities are particularly affected by practitioner shortages, and many studies have illustrated the negative effects of the concomitant policies of evacuation and rural facility closure that force women to leave their home communities to give birth” (Laurel Hanson, Mpofu, & Hopkins, 2013).

The declining number of family physicians providing intrapartum care has been striking in large urban settings. Though the decline has been less precipitous in smaller rural and remote areas, much smaller decreases have the potential to create tremendous disruption in obstetrical and general medical care in these communities (Biringer, Maxted, & Graves, 2009). The majority of midwifery practices in Canada continue to have waitlists and “calls for the expansion of midwifery by researchers, midwifery professional associations, and traditionally excluded groups of women, continue to rise” (Laurel Hanson et al., 2013).

“Until the middle of the 20th century, [Indigenous] women in rural and remote areas gave birth in their communities, usually assisted by family members, traditional midwives, or both. Studies of traditional birthing practices and midwifery have differed in their findings, but it is clear that despite considerable variations in approach, for most [Indigenous] cultures, birth was important to the whole community, and strong traditions governed its conduct” (Couchie, 2007). In addition to lack of care providers in rural areas, Indigenous women face other barriers to accessing culturally specific maternity care, as [Indigenous] practitioners are particularly scarce even within Indigenous communities.

“The Canadian Maternity Experiences Survey found that 88% of women who had the same provider for pregnancy and birth believed this continuity was important. 42% of women who did not experience this continuity from pregnancy to birth believed

31% of women said they would be willing to go to a birthing centre rather than a hospital to have a baby

21% were receptive to the idea of having a nurse or midwife deliver their baby instead of a doctor

85% would accept postpartum care from a nurse or midwife over a doctor (CIHI, 2004).

that it would have been important to have the same provider. Although, it is not only family physicians that are able to provide continuity of care from prenatal through to postpartum care, it is the model of family practice that confers this benefit in many rural and urban centres. Indeed, many would argue that a national maternity care system should be based on family practice and primary care” (Biringer et al., 2009). The majority of low-risk pregnant women could be cared for by midwives and general practitioners whose care can often be more responsive to their needs than that of specialist obstetricians (Theroux, 2009).

In 1994, Statistics Canada asked Canadian women about their willingness to receive care from health professionals other than doctors during their pregnancy, delivery, and postpartum. Using their responses to this survey, Wen and colleagues reported that:

- ❖ 31% of women said they would be willing to go to a birthing centre rather than a hospital to have a baby;
- ❖ 21% were receptive to the idea of having a nurse or midwife deliver their baby instead of a doctor; and
- ❖ 85% would accept postpartum care from a nurse or midwife over a doctor (CIHI, 2004).

In 2007, Statistics Canada reported that the majority of Canadian mothers polled were happy with their labour and the birth of their child. Among those who gave birth under midwife care, 71% rated it as “very positive” compared with 53% of women who had their babies under the care of obstetricians/ gynecologists, family doctors or nurses and nurse practitioners.

In 2008, the SOGC called for change to maternity care in Canada, stating that “investing in healthy mothers and babies during the prenatal, antenatal and postnatal phases of care is an investment in the future health of generations of Canadians and key to the long-term prosperity of the country as a whole. A National Birthing Initiative for Canada is therefore essential to promote the national guidelines for the provision of family-centered maternity and newborn care. This would ensure an inclusive, integrated and comprehensive pan-Canadian approach to sustainable family-centered maternity and newborn care” (The Society of Obstetricians and Gynecologists of Canada, 2008).

STATUS OF MATERNITY CARE IN ALBERTA

For many people the decision to become pregnant is a big step. It can invoke a great deal of emotion, including excitement and anxiety. In many ways, bringing new life into the world can be a wonderful life-changing experience to which no price tag can be attached. Nonetheless, health services linked to becoming pregnant and giving birth do come with a price tag. It is important that all costs are considered in order to help guide policy development. This will support best practices and the creation of a sustainable system that is able to adapt to current demands, providing the best possible maternity care for Alberta families.

Alberta Health's vision for primary care in 2014 is a "system that supports Albertans to be as healthy as they can be". Their mission is to "ensure Albertans receive the right healthcare services, at the right time, in the right place, provided by the right healthcare providers and teams" (AB Ministry of Health, 2014). Their desired outcomes include (1) Improved health outcomes for all Albertans, (2) The well-being of Albertans supported through population health initiatives, (3) Albertans receiving care from highly skilled healthcare providers and teams, working to their full scope of practice, and (4) A high quality, stable, accountable and sustainable health system.

Long-term outcomes have long since been linked to childbirth (M. C. Bartick et al., 2013a; Forster & McLachlan, 2007; Lobel & DeLuca, 2007). The quality of care and interventions during the pregnancy, birth and postpartum periods can have a lasting impact, including costs to the system, for many years. Addressing concerns regarding maternity care in our province will not only have a short-term impact on the financial health and well-being of Albertans, it will have a lasting impact with savings for years to come; all the while creating a healthier Alberta.

While the majority of pregnancies end with uncomplicated vaginal deliveries, different types of deliveries can have very different costs. For example, according to the Canadian MIS database the average inpatient hospital costs for patients who had a vaginal delivery with no anesthetic or interventions in Alberta for 2013 was about \$2,250 per patient. Patients who were admitted with a complicating diagnosis tended to have longer hospital stays and the average cost of their care was higher. The average hospital cost of a primary cesarean section during the same time period was about \$6880 per patient. Likewise, hospital

costs for newborns vary widely. In 2013-2014, average spending ranged from \$1144 for babies with a normal birth weight born by vaginal delivery to \$1910 for babies who were born via cesarean section.

The proportion of newborns that spend time in neonatal intensive care units (NICUs) is rising, which has the potential to significantly impact hospital spending. Low birth weight babies are more likely to need NICU care than those who weigh 2,500 grams or more at birth and newborn costs tend to increase as birth weight decreases (CIHI, 2006). According to the Canadian MIS database for preterm infants born in Alberta weighing < 750 grams at birth, the average hospital cost in 2013 was substantially higher than average full term babies at \$138,323.

A growing population continues to place increased strain on already overburdened hospitals and overworked care providers, such as obstetricians. "With a critical shortage of obstetricians looming, [attending low-risk pregnancies and births] may not be the best use of highly-trained experts and has financial implications. Family doctors and obstetricians operate under Alberta Health's fee-for-service model with few limitations on the number of clients and procedures they can bill. The funding model for midwifery is based on courses of care (from early conception to 6-weeks postpartum) and allocates a set number of courses of care (CofC) province-wide. The current maternity care system's constraints are escalating, negatively impacting care, and creating inefficiencies. However, babies cannot wait for the system to catch up before being born. Our maternity care system is in crisis. It is not meeting families' needs and it is unsustainable." (de Jonge, Hill, & Summerfeldt, 2014)

Midwives and nurse practitioners continue to remain underutilized in Alberta. Despite an additional \$1.8 million provided by the Alberta Government for midwifery funding in September 2015, allowing for 400 more courses of care (CofC) and an additional \$11 million over 3 years announced in spring 2016, there are still long wait lists for expectant families who wish to access midwifery care. Wait list numbers don't take into account the areas that currently do not have midwives and therefore women are not applying for their services. This is especially true in rural locations. Research suggests nurse practitioners also offer high quality, cost-effective care, while helping to increase access in underserved areas, and should be

considered an important part of the solution to the maternity care crisis in our province (Martin-Misener et al., 2015; Reay, Patterson, Halma, & Steed, 2006; Venning, Durie, Roland, Roberts, & Leese, 2000). With midwives and nurse practitioners available to work in Alberta but not being fully utilized, more capacity still exists for work in the rural, remote and underserved communities that need it most.

In 2015, an increase in government funding also allowed midwives to expand care to several smaller centres including Plamondon, Lac La Biche, Medicine Hat and St. Albert. With 12 new Midwives graduating in May 2016 and many midwives not at full capacity, it is estimated that 3,900 families could receive midwifery care in 2016 if fully funded. This could mean lower C-section rates, fewer interventions, and higher breastfeeding success rates for those families – all of which come with cost savings to the healthcare system and lead to better health outcomes.

The successful integration of Alberta midwives into various multidisciplinary teams, where there is collaboration with other care providers such as obstetricians, family physicians and nurse practitioners, is key to the successful design of a sustainable maternity care model. In Rocky Mountain House, a midwifery practice has successfully integrated with the local Primary Care Network (PCN). While specific data is not currently available on the exact improvements in health outcomes and breastfeeding success rates, the midwives have noticed fewer premature births for the First Nations families, and increased breastfeeding rates, while also allowing birthing women to remain in their home communities (de Jonge, 2015). Where the provincial average of midwife-led births is approximately 5%, Rocky Mountain House midwives deliver around 50% of all babies in the region. More programs like this throughout Alberta would allow similar successes to be realized.

MATERNITY CARE AS A HUMAN RIGHTS ISSUE

All women are entitled to maternity care that protects their fundamental rights to autonomy, privacy, equality and dignity; care which respects the right of women to make autonomous choices related to all modes of birth. Unfortunately, women in Canada are still limited in their ability to choose with whom, where and how they birth.

“Studies of pregnancy and birth experiences of diverse groups of Canadians suggest that socio-economic status, culture, and geographic location have a profound impact in limiting equitable access to quality maternity care, including midwifery services. Although geography and physical distance to services are important determinants of access, social and cultural fit have proven to be exceptionally important for both [Indigenous] and socially marginalized women. Culturally appropriate services have been shown to have an impact both on birth outcomes and on the quality of birth experiences”(Laurel Hanson et al., 2013)

“Midwifery is usually considered a service within primary healthcare. Some of the tenets of primary healthcare definitions of accessibility are: (1) the opportunity or right to receive healthcare; (2) the ability of a person to receive healthcare services, including the availability of personnel, supplies, and adequate funding; and (3) equitable access to culturally relevant services and resources. Equity, in turn, is defined as the absence of systemic barriers and disparities. Importantly, equity is not just about access to services but is also about the quality of care once services are accessed. Equity and access to care are inextricably linked, as both are rooted in the social, economic, and political contexts of the system in which service is delivered. As noted above, studies have shown that various determinants to equitable access to midwifery care in Canada are related to legislation and organization, scope, standards, and practice arrangements.”(Laurel Hanson et al., 2013).

“The lack of maternity care services available to expectant mothers in rural and remote areas would shock average Canadians. For [Indigenous] women, childbirth is less than a natural event to be anticipated with excitement, but a dreaded eventuality, because they know they will likely be airlifted to a strange hospital for weeks, perhaps even months, away from family, familiar faces, and the support networks that mainstream populations take for granted”(The Society of Obstetricians and Gynecologists of Canada, 2008).

“Like other women, First Nations, Inuit, and Métis women want control over their birth experiences: they want to choose where they give birth and who provides care for them in the childbearing year, and they want birth to be as safe as possible for themselves and their babies. When policies and practices are formulated, consideration must be given not only to the safety

of delivery, but also to family and cultural needs at the time of delivery”(Couchie, 2007).

“Despite the fact that Canada is a participant in the UN Women’s Convention, maternity care conditions in Alberta provide few women with free choices for what we consider to be “appropriate services” in the Canadian context. In this regard, there is emerging international recognition that birthing women’s fundamental human rights to physical integrity, self-determination, privacy, family life, and spiritual freedom must be upheld (Human Rights in Childbirth, 2014), calling into question the ethical relationships among maternity care providers” (de Jonge et al., 2014).

Women have the right to choose to accept or deny medical procedures based on informed consent. This includes the myriad of tests and procedures offered during pregnancy, childbirth and postpartum. Denying women the choice to attempt a vaginal birth after cesarean (VBAC) or vaginal breech birth when requested is equal to forcing them to consent to unwanted surgery. True patient-centred care values the woman as a participant in shared decision making, taking into account her values, preferences, knowledge of her own body and past experiences. It allows the woman to decide what the right care, right time and place, and who the right care providers are to meet her needs. It values both the knowledge and experience of the care provider as well as those of the woman in deciding the right course of action.

On May 5th, the International Day of the Midwife, in 2011, the SOGC issued the following statement: “The SOGC acknowledges that it is the mother’s decision to decide where she would like to give birth,” stated Dr. André Lalonde, executive vice-president of the SOGC. “Most babies are born without serious complications. As OBGYNs, our specialized training allows us to address the unique requirements of high-risk situations. What matters is that all professions acknowledge each other’s competencies and work together to provide mother and baby with the quality care they

need, when they need it, where they want it”(SOGC, 2011).

The American Congress of Obstetricians and Gynecologists (ACOG) states clearly about informed consent in maternity care: “The freedom to accept or refuse recommended medical treatment has legal as well as ethical foundations. In the obstetric setting, recognize that a competent pregnant woman is the appropriate decision maker for the fetus that she is carrying”(AGOC Committee on Ethics, 2013). While policymakers often support choice in childbirth, home birthing options may be limited, particularly in rural and remote areas.

Recent Canadian studies have proven that giving birth at home with a registered midwife can be as safe as a hospital birth for both mother and infant. Women planning to birth at home experienced reduced risk for all obstetric interventions measured, such as electronic fetal monitoring, and similar or reduced risk for adverse maternal outcomes, such as third or fourth degree tears and postpartum hemorrhage (Alberta Perinatal Health Program, 2013; Janssen, Mitton, & Aghajanian, 2015; O’Brien et al., 2010). This may be in part because women who choose home birth are determined not to have those procedures, are self-selecting and may be healthier. Infants who were born at home were also 0.23 times less likely to require resuscitation or oxygen therapy after 24 hours compared with those who were born in hospital with a midwife and 0.45 times less likely to have aspirated meconium, the inhaling a mixture of their feces and amniotic fluid (Janssen et al., 2009, 2015).

It is time for hospital policies and procedures and physician practices to catch up to the recommendations presented by well-known researchers and organizations. Not only are families demanding choice, there is substantial data to support the recommended changes. The potential for cost savings is an added benefit.

**“ The right to informed consent is meaningless
where there is no right to informed refusal. ”**

– Goer, 1999



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Review of Care Providers

In Alberta, there are 4 types of Primary Care Providers for pregnant women – registered midwives (RMs), general practitioners (GPs), obstetricians (OBGYNs), and nurse practitioners (NPs). They provide care either individually or in collaboration. “Although there is much support for collaboration, each maternity care provider should also be recognized for the unique knowledge and skills they bring to the delivery of care, both in answer to the reproductive needs and expectations of patients as well as their needs for comprehensive continuous care throughout the life cycle”(Biringer, Maxted, and Graves, 2009).

In 2013, Canada had “only 1650 obstetricians and gynecologists, not all of whom practice obstetrics, and about 600 plan to retire within the next five years. The country has just over 1000 registered midwives and, regrettably, a decreasing number of family physicians that provide maternity care; only 2142 based on the 2013 National Physician Survey. Of concern is that Canada lacks the ability to supply the maternity care, particularly intrapartum care, required in rural and remote, inner-city and [Indigenous] communities.” (Morgan, Carson, Gagnon, and Blake, 2014)

Women must choose one of the above care providers for their primary care during pregnancy as seeing multiple providers at one time is considered a duplication of services and double billing to the system. The exceptions are cases where care is transferred to a new provider for the remainder of the pregnancy or delivery and when the primary provider requests a consultation from another provider.

REGISTERED MIDWIVES

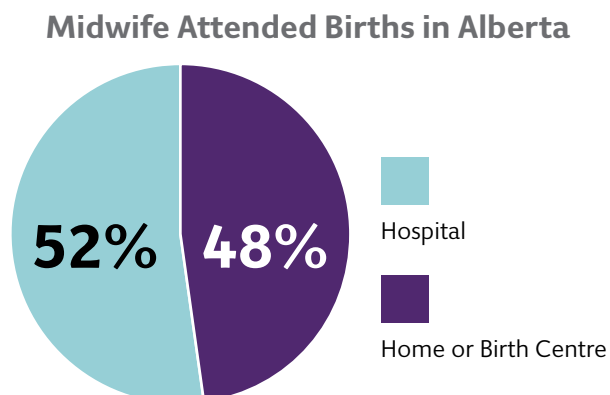
Midwives are Primary Care Providers for low-risk pregnant women. They provide on-call support during pregnancy, childbirth and the postpartum period in hospitals, birthing centres and in the homes of women.

Canadian midwives have a 4-year undergraduate degree in Midwifery Science. Due to the competitive admissions for Midwifery school, the majority of those accepted will already have an undergraduate degree or higher prior to starting their Midwifery degree. Their education and skills are often thought to fall between those of a nurse practitioner and Family Practice

physician (Courtyard Group, 2010). However, it is worth noting that the full 4-years of midwifery education is focused on perinatal care, in comparison to NPs & GPs whom only spend a small portion of their education focused on perinatal care. They are able to make medical diagnoses, perform any relevant physical exams, order screening and other relevant testing as well as prescribe medications related to the practice of Obstetrics. Pregnant women do not require a referral to access midwifery care. Midwives are also trained to provide waterbirth support.

Prenatal appointments follow a similar schedule to obstetricians and family physicians – about 10 - 16 visits per pregnancy depending on needs and length of pregnancy, including one home visit. Midwives work in pairs or teams and 2 midwives are required to be present at a birth. In the majority of cases the midwife who has been caring for the woman throughout pregnancy will be considered the lead midwife, that is, the midwife who attends her birth and accepts responsibility for the quality of her care. Midwives generally spend a significant amount of time supporting women during labour, instead of relying on the support of nursing staff as is standard in a hospital setting. They support women from the start of labour until several hours after the birth. Midwives provide postpartum care for up to 6 weeks and typically provide 3 home visits and 3 clinic visits in this time. In contrast to short family practice and obstetrical appointments, average appointments are typically between 30-60 minutes long.

Table 2: Midwife Attended Births in Alberta 2013 - 14



Alberta midwives attended on average 5% (2,774) of births in 2015-16, falling short of midwifery benchmarks in provinces with funding for more CofC: British Columbia 19%; Ontario 13.5% and Canada overall 9% (Canadian Association of Midwives, 2014).

Midwives practice solo or in practices of 2 to 4 midwives sharing on-call schedules. Some clinics offer administrative support for several midwifery practices. They see low-risk pregnancies and consult and/or refer to obstetricians when the need for a higher level of care arises. They carry medications and equipment to help manage labour, birth and the immediate postpartum period, similar to what is available in a level 1 hospital.

FAMILY OR GENERAL PRACTITIONERS

Family Medicine involves a 4-year Medicine degree and then a 2-year Family Practice specialization. Due to the competitive admissions for Medical school, the majority of those accepted will already have an undergraduate degree or higher prior to starting their Medicine degree. Only a small portion of a General Practitioners medical education is focused on Obstetrics.

General Practitioners (GPs) or Family Practitioners (FPs) are Primary Care physicians for all general health concerns across the lifespan. Obstetrics is only a small portion of a GP's practice, for those who choose to provide maternity care. There are some collective clinics that practice in a manner similar to obstetricians or midwives, seeing women for maternity care only, but they are limited in number. Most physicians attend their own patients' births, similar to midwives, but they also rely on nurses in hospital to support and monitor women during labour. In the case of maternity care practices; they work in teams of 2 to 5 GPs in an on-call schedule. A pregnant woman will be assigned to one GP but the availability of her GP for the delivery will depend on the on-call schedule. This means that a woman will often give birth with a GP she has never met. GPs generally provide care for women with low-risk pregnancies and refer women with high-risk pregnancies to obstetricians. Average appointments are 5-15 minutes long.

The number of GPs that offer labour and delivery care (intrapartum care) has been steadily declining. In 1983 the number was 68%, but as of 2007 only 11% of Canadian GPs were still offering intrapartum care. However, a much larger proportion (up to 50% in 2007) continue to offer pre and postnatal care. "The reasons for decreasing family physician involvement in intrapartum maternity care are well documented. The major factors cited include concerns about its impact on both personal and professional lifestyles, a lack of confidence in or concerns about adequate training, questions about sufficient reimbursement and for some, concerns about litigation" (Biringer et al., 2009). In addition, for those GPs who attend births, there are concerns about lost income and the inconvenience of rescheduling appointments if they are called to a birth before or during a busy practice day.

OBSTETRICIANS

Obstetricians have the same 4-year Medicine degree as Family Practitioners, plus a 5-year Obstetrical specialization. Due to the competitive admissions for Medical school, the majority of those accepted will already have an undergraduate degree or higher prior to starting their Medicine degree.

Most are obstetrician-gynecologists (OBGYNs). A small number do not deliver babies in Alberta and focus only on gynecology. They are highly skilled practitioners trained to deal with high-risk pregnancies and perform approximately 67% of cesarean sections in Alberta. Most OBGYNs work in teams of 2 to 5 and share an on-call schedule in rotation with other OBGYNs. A pregnant woman will be assigned to one OBGYN but the availability of her OBGYN will depend on the on-call schedule. This means that a woman will often give birth with an OBGYN she has never met. Obstetricians generally rely on nurses to support and monitor women during labour in hospital, and will be called to the woman's bedside near the end of labour when she is pushing or if complications arise, and leave within an hour of birth. This system allows OBGYNs to provide care for multiple women in labour at any given time.

An average appointment is 5-15 minutes long. These busy practices are one of the biggest complaints from pregnant consumers who sometimes experience in-office wait times for appointments as long as 3 to 8 hours. The Society of Obstetricians and Gynecologists continues to forecast a shortage of OBGYNs that is making it increasingly difficult for women to access their care in a timely manner. In order for OBGYNs to respond to the increasing demands of high-risk births, there appears to be a need for a higher involvement from the aforementioned Primary Care Providers – registered midwives, general practitioners and nurse practitioners – in caring for low-risk pregnant patients.

NURSE PRACTITIONERS

Nurse practitioners (NPs) are advanced practice nurses with a 4-year undergraduate degree in Nursing, as well as a 2-year (or longer) Masters or PhD level Advanced Clinical Practice education.

In Alberta, NPs can be primary care providers for low-risk pregnancies, with the exception of the delivery. NPs will collaborate with a general practitioner or obstetrician, and in some cases a midwife, for the delivery portion of care, but otherwise are able to provide comprehensive prenatal and postpartum care to low-risk women. They are able to perform the relevant physical exams, order screening and other testing and prescribe medications in a similar fashion to registered midwives.

NPs can provide care through Community clinics, Primary Care Networks (PCNs) and in some hospital settings, including NICU and outpatient clinics.



PHOTO BY: VANESSA BROWN PHOTOGRAPHY

BREAKDOWN OF PROVIDER FEES

MIDWIVES

Currently, midwives in Alberta are paid under a course of care (CofC) model through Alberta Health Services. Midwifery practices are funded at \$4600 per full CofC provided to a pregnant woman. Generally, a full-time midwife will provide 40 CofC and 40 backups per year. However, many midwives are not able to work at full capacity due to limitations in the total number of CofC funded in any given year. In 2014-15, there were only 2527 total courses funded and divided amongst 89 practicing midwives. In 2015, there were 2774 CofC divided among 96 practicing midwives for an average of 29 CofC per midwife, though allocation isn't necessarily even. These numbers show that Midwives are the most underutilized Primary Care Providers in Alberta.

The CofC amount is meant to compensate primary midwives for all of their clinical and administrative work, including travel time, on-call schedules, phone consults and paying for second attendants. It is based on providing an average of 48 hours of care per CofC. Compensation for overhead costs is also included and is based on spending 38% on overhead, which is similar to the estimated overhead for GPs and NPs. \$300 is allocated to pay for the second attendant at the birth. Medical supplies for home or birth centre birth are paid by the midwife, while those supplies at a hospital birth are included in hospital fees. Unlike physicians, midwives in Alberta are not paid a supplement for rural or remote practices, travel or after-hours calls. Similar to physicians, Liability Insurance fees are subsidized leaving a \$1000 premium to be paid by the midwife annually.

In cases where midwives are integrated into Primary Care Networks, they will be paid out of the operating budget of that PCN for any care provided as part of their role within the PCN, instead of by CofC through AHS. It is up to the individual PCN to negotiate with midwives the details of the payment arrangement. In places such as Rocky Mountain House, this option has allowed for collaboration between physicians and midwives in an otherwise underserved population.

The average yearly payment to each practice in 2014 was \$184,000 per full-time midwife before subtracting overhead, practice fees and second attendant costs.

GENERAL PRACTITIONERS AND OBSTETRICIANS

In Alberta, most physicians are paid under the fee-for-service (FFS) model through Alberta Health. This means they are paid a set fee-per-interaction or intervention, including phone consults, which many argue incentivizes practitioners to see a higher volume of patients for shorter appointments. The fee paid to a physician can vary depending on the specialization of the doctor (such as obstetrician, pediatrician, anesthetist, etc.) as well as other modifiers. For example, if the patient has a body mass index higher than 35, often re-imbursement will be increased by 25%. Overhead is built into FFS schedules based on spending an average of 38% of income on overhead. Average appointments for maternity care are 5-15 minutes in length. There is some overlap as a general practitioner is typically the first point of care for pregnant women who are often referred onto an OBGYN or other GP for maternity care.

Primary Care Networks (PCN) operate under alternative payment arrangements. The Canadian Institute for Health Information says less than 18% of Alberta physicians received payments through alternative models in 2014, the lowest rate in the country (Geldart, Erik & Ng, 2014).

Physicians also receive some additional benefits on top of FFS or alternative payment arrangements. Details are included in the chart below.

Average yearly income of a GP and OBGYN in 2014 was \$327,295 and \$484,515, respectively, before subtracting overhead costs.

NURSE PRACTITIONERS

Registered nurses (RNs) in Alberta are among the highest paid in Canada. Nurse practitioners in Alberta are not allowed to belong to a union, unlike RNs. They negotiate their own salaries with their employer or, if they are working in private practice, can set their own fees for service to be paid out of pocket by the patient. For those in private practice, overhead costs are assumed to be similar to general physicians and midwives at around 38%.

In cases where NPs are integrated into Primary Care Networks, they are paid out of the operating budget of that PCN instead of through AHS. It is up to the individual PCN to negotiate with NPs the details of the payment arrangement. In rural areas, this option has allowed for collaboration between physicians and NPs in otherwise underserved populations.

Average nurse practitioner Salaries in Alberta ranged from \$80,975 to \$124,247 in 2013-14.

Unfortunately, the authors of this report did not have access to cost data for nurse practitioners in the context of maternity care in Alberta. As a result, these numbers were not included in the costs analysis. However, the authors believe they have an important role to play in helping fix the current maternity care system in Alberta.

OTHER PHYSICIAN BENEFITS

Alberta Medical Association (AMA) Incentives: A Fee paid to physicians who practice and reside in their community. \$4,000.00 per year provided his/her annual income for insured services is greater than \$50,000. Residency conditions apply, including living in the eligible community for nine of the previous twelve months ending on the payment date.

Rural, Remote & Northern Program (RRNP): Supplement to supports physicians who practice in Rural and Remote areas. Payments through the RRNP are capped at \$60,000 per physician per year.

Retention Benefit: Supports and promotes the retention of Physicians in Alberta by rewarding their continuous years of service to Albertans. Physicians receive between \$4,840 and \$12,100 depending on their years of service to Albertans.

Medical Liability Reimbursement: Reimburses physicians for their medical liability protection costs less a \$1,000 deductible.

Continuing Medical Education: Reimburses physicians for eligible continuing medical education costs. Each eligible physician receives a \$2,500 annual allotment which can be carried forward for up to three years.

Parental Leave Program: Provides \$1,000 per week for up to 17 weeks to physician parents of a newborn or newly adopted child.

Physician and Family Support Program: To provide eligible physicians and their qualified dependents with assistance in dealing with life management issues

Compassionate Assistance: To assist, on compassionate grounds, eligible physicians in need of temporary support, who have been referred by either the College of Physicians and Surgeons of Alberta or a consulting Physician of the Physician and Family Support Program

Regular Locum Program: To ensure that Residents living in communities with four or fewer Physicians (or other critical circumstances approved by the Minister) will have access to continuous medical coverage if a Physician is unable to provide Physician services due to short-term absences.

Specialist Locum Program: To ensure that regional centers outside of Calgary and Edmonton (or other critical circumstances approved by the Minister) will have access to specialist coverage due to short-term absences of specialists in regional centers. Local specialists in consultation with the Authority agree on locum needs.

Business Cost Program: Addresses escalating practice costs in community based practices. This fee modifier is added automatically to select office visits and consultations. This program applies across the province and all physicians who provide visit services in an office based setting will receive an additional \$2.75 with the exception of Calgary and Airdrie where the fee modifier is \$3.25 on select office visits and consultations.

Primary Care Network Program Management Offices: Support the various aspects of the PCN program including but not limited to, assisting with the development, implementation, and accountability processes of individual PCN's.

Towards Optimized Practice Program: To support the development, implementation and evaluation of products and services that will facilitate evidence-based best practice and support quality initiatives in medical care in Alberta.

Costs Comparison

TOTAL HEALTHCARE SPENDING BY USE OF FUNDS: CANADA

Healthcare spending in Canada has increased steadily since the mid-1990s, outpacing the overall economic growth rate. Many factors, including population growth, inflation and increases in public and private-sector spending account for rising health expenditures. Hospitals are a vital part of the healthcare system. In 2007, hospitals accounted for about 28% of total health spending (forecasted to be 10.6% of the gross domestic product [GDP]). However, while hospital spending has grown in recent years, it actually represents a shrinking part of an expanding pie. In 1975, for example, spending on hospitals accounted for roughly 45% of overall health expenditures. Today, hospitals (29.5%), drugs (15.7%) and physician services (15.5%) continue to account for the largest shares of health dollars (more than 60% of total health spending), although the pace has slowed in recent years. (Canadian Institute for Health Information, 2015)

Understanding the big picture of how healthcare dollars are spent is important, but it is also valuable to know how these monies are allocated at the hospital level. Hospital expenditures involve the provision of various services such as acute care, outpatient care,

day surgery, emergency department services and other types of care. Overall, acute inpatient care tends to account for the majority of hospital costs.

According to CIHI's report on National Health Expenditure Trends (CIHI, 2015):

- ❖ **Hospital** spending will grow by an estimated 0.9% in 2015, reaching \$1,804 per person. This is the lowest rate of growth since the late 1990s. The majority (more than 60%) of hospital expenditure is spent on compensation for the hospital workforce.
- ❖ **Drug** expenditure is projected to be \$959 per person, an increase of 0.7% in 2015. The restrained growth in drug expenditure in recent years has been due to jurisdictions introducing generic pricing control policies, patent expirations and fewer new drugs emerging on the market.
- ❖ **Physician** spending is forecast to be \$946 per person in 2015 — a growth rate of 2.2% from last year. The growth of physician expenditure has outpaced that of hospitals or drugs since 2007, due in part to more rapid growth in the supply of physicians and increases in fees.



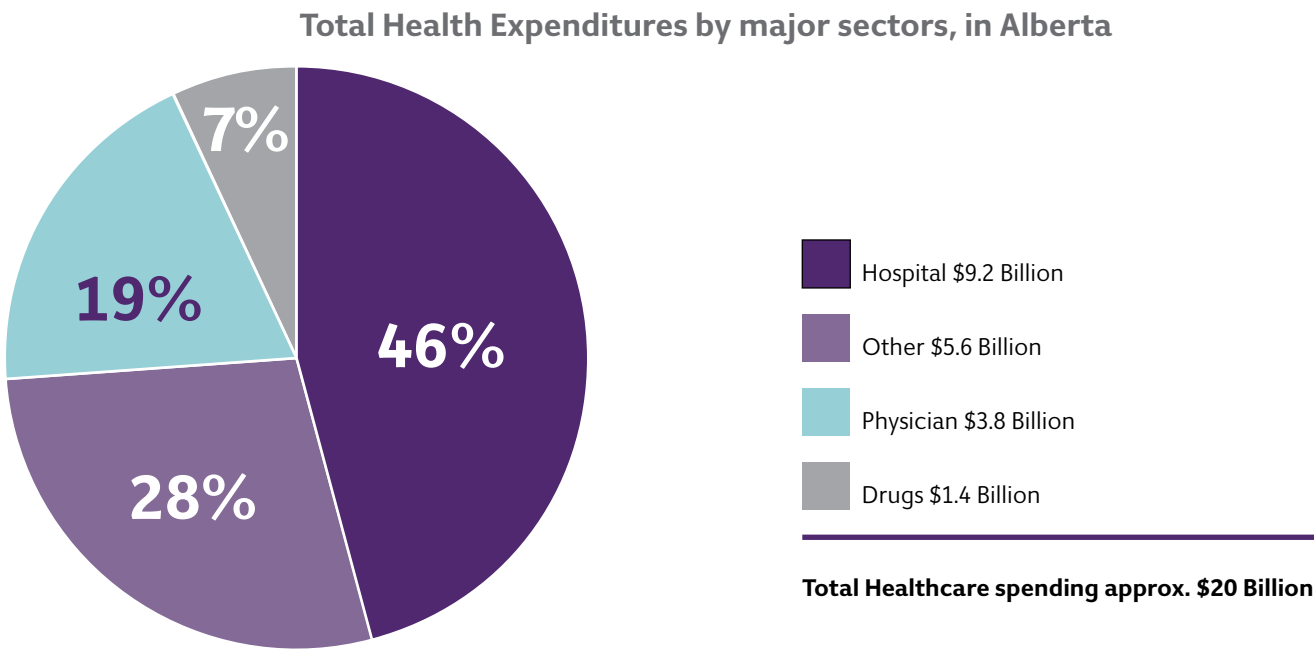
PHOTO BY: BRITTANY SARAH PHOTOGRAPHY

- ❖ The **hospital** spending share has decreased from 45% of total health expenditure in the mid-1970s to an estimated 29.5% in 2015. However, this share has been stable since 2001.
- ❖ The **drug** expenditure share has been increasing since the mid-1980s, and it has accounted for the second-largest share (15.7% in 2015), after hospital spending, since 1997.
- ❖ **Physician** spending as a percentage of total health expenditure started edging down in 1988. However, this trend reversed in the mid-2000s. Since 2007, physician spending as a share of total healthcare spending has increased. In 2015, the estimated share, at 15.5%, has recovered to levels comparable with those in the late 1980s.

TOTAL HEALTHCARE SPENDING BY USE OF FUNDS: ALBERTA

In Alberta, healthcare spending has risen approximately \$20.0 billion, to more than 40% of the government \$50.0 billion budget. As was apparent with Canadian statistics, hospital, physician and drug costs consume the majority, (over 70%) of the budget at \$9.2 billion for hospitals, \$3.8 billion for physicians, and \$1.4 billion for drugs. Hospital spending was expected to grow by 5.3% per capita in 2015, outpacing the national average of 3.6% (Strategic Services Division, 2013).

Table 3: Total health expenditures by major sectors 2013 - 14



Of growing concern are the increasing costs currently associated with healthcare, in particular childbirth. The birth rate in Alberta has been steadily climbing and is projected to be 56,634, 56,622 and 56,670 in 2016, 2017 and 2018, respectively.

According to CIHI's Hospital Morbidity Database, in 2013-2014 there were more than 2.9 million acute inpatient hospitalizations in Canada. Giving birth was among the top 5 reasons for hospitalization in every Canadian province and territory accounting for 367,090 hospitalizations, with an average length of stay (ALOS) of 2.3 days. In Alberta, childbirth is the top reason for hospitalization before major illnesses such as chronic obstructive pulmonary disease, heart attack, pneumonia, etc.

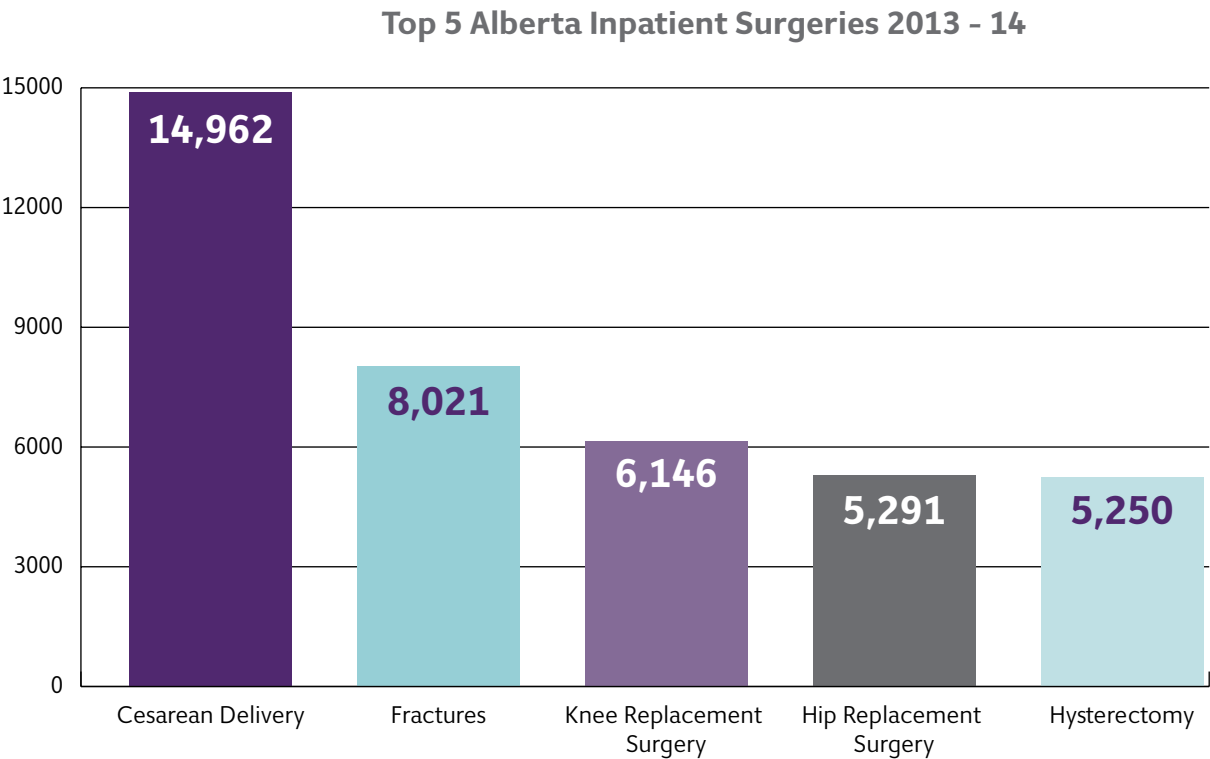


PHOTO BY: BRITTANY SARAH PHOTOGRAPHY

TOP 10 REASONS FOR HOSPITALIZATION IN ALBERTA

1. **Childbirth**
2. Chronic Obstructive Pulmonary Disease (COPD)
3. Convalescence, typically following procedure or treatment
4. Heart Attack
5. Osteoarthritis of the Knee
6. Heart Failure
7. Pneumonia
8. Substance Use Disorders
9. Mood (affective) Disorders
10. Other Medical Care (ie. Palliative, Chemotherapy. etc.)

Table 4: Top inpatient surgeries in Alberta



Cesarean section (C-section), was the most common inpatient surgery in both Canada and Alberta with an ALOS of 3.3 days. Primary cesarean rates remained higher for women 35 years and older than for their younger counterparts.

The bigger issue is that from 2000 to 2013, healthcare spending in the province grew by 8.7% per year, while overall provincial revenue only grew by 6% per year. In 2013, after adjusting for

inflation, Alberta is expecting to spend \$2774 per capita on healthcare – the second highest in Canada and \$311 above the national average (Geldart, Erik and Ng, 2014). As of 2015, it was projected annual health spending would surpass \$20 billion and physician compensation would rise to \$4.8 billion. This overview of spending further demonstrates the unsustainability of the current system.

CARE BEFORE BIRTH: THE COSTS OF PREGNANCY

PRENATAL CARE

AVERAGE CALCULATED PRENATAL COSTS FOR OBGYNs AND GPs = \$615.08
AVERAGE PRENATAL COSTS FOR MIDWIVES = INCLUDED IN COURSE OF CARE

The costs associated with prenatal care can vary considerably depending on the range of tests performed and the number of care provider visits needed. Women who experience complications during pregnancy or whom are considered high-risk will require more care provider visits, testing and possibly hospital admissions during pregnancy. This report focuses on examining the costs associated with routine prenatal visits during pregnancy.

Data included total fee-for-service billings for the visit codes 03.04B (Prenatal assessment), 03.03B (Prenatal appointment), 03.07C, 03.08B and 03.08M (Obstetrical consultations) by family physicians and obstetricians in 2013-14. The authors did not have access to data examining the average number of prenatal visit claims overall per patient and were left attempting to calculate based on the overall totals by provider. This became difficult because it is not uncommon for women to visit their GP for early prenatal care, only to transfer partway through the pregnancy to OBGYN care typically between 20-32 weeks. Women may also receive care from groups of physicians in a shared care model versus a single provider. In essence, both GPs and OBGYNs may bill for prenatal visits with the same patients at different points in pregnancy with the exception of prenatal assessments (03.04B), which are only allowed to be billed once per pregnancy. When attempting to calculate the average number of prenatal visits per provider, the result is an average of 5.45 prenatal appointments and 1.03-1.11 prenatal assessments per patient. In reality, the recommended schedule of prenatal appointments is 10 - 16 per pregnancy. The typical schedule is every 4-6 weeks from first prenatal appointment until 30 weeks, every 2-3 weeks from 30 to 36 weeks and then weekly until birth (38-42 weeks). The average fees for prenatal assessment were \$102.49 for GPs to \$102.64 for OBGYNs. The average fees per prenatal visit were \$36.64 for OBGYNs and \$36.67 for GPs. Average fees per obstetrical consult ranged from \$67.14 to \$111.55.

In an attempt to gain a more accurate representation of the average prenatal FFS costs, all of the prenatal visit and obstetrical consult claims were combined then divided by the total number of hospital admissions for birth in Alberta, minus midwife attended births. The average of prenatal assessment visits (03.04B) was then combined with the average prenatal visits (03.03B) to get an overall average for prenatal care FFS claims per patient of \$615.08. Using the fees from the 2015 Alberta Physicians Schedule of Medical Benefits for 03.03B and 03.04B and multiplying by the recommended 10 to 16 visits per pregnancy shows that current routine prenatal FFS costs may range from \$431.69 to \$651.53 per patient with even higher costs when obstetrical consults are included.

The data was limited to the overall claims by OBGYNs and GPs for the above prenatal billing codes. Without pulling matched data at the patient level, it cannot be determined if there are any differences in the costs of prenatal claims for pregnancies ending with births requiring more intervention or cesarean deliveries versus uncomplicated vaginal births. In addition, those women who experienced pregnancy losses or moved in or out of the province partway through prenatal care could not be taken into account. Phone consults were also not included.

Prenatal visit fees for midwives are included in the \$4600 CofC funding. Keep in mind that visits are typically 30-60 minutes in length in comparison with physician appointments that tend to be 5-15 minutes in length. Physician fees would be at least 2 to 4 times their current rate if they were to see patients for the equivalent amount of time midwives see their clients.

It is assumed that on average midwives order tests and ultrasounds less frequently than their physician counterparts, which would increase the cost savings associated with prenatal care, but this could not be confirmed with the level of data available at the time of this report.



PHOTO BY: HELGA PHOTOGRAPHY

THE COSTS OF LABOUR AND DELIVERY

AVERAGE CALCULATED VAGINAL DELIVERY COSTS FOR OBGYNS	= \$606.19
AVERAGE CALCULATED VAGINAL DELIVERY COSTS FOR GPs	= \$611.10
AVERAGE DELIVERY COSTS FOR MIDWIVES	= INCLUDED IN COURSE OF CARE

Overall the costs of intrapartum care can vary depending on mode of delivery, vaginal versus cesarean, fee modifiers and interventions. The majority of women will go into labour spontaneously and experience a vaginal birth, but as expected, cesarean sections and high intervention births represent the highest costs associated with childbirth.

Excluding births of multiples, the average fee-for-service for attending a vaginal birth paid to GPs in 2013 was \$611.10 and OBGYNs was \$606.19. In cases where the birth was a Vaginal Birth after Cesarean (VBAC), the average fee-for-service was increased to \$734.40 for GPs and \$719.06 for OBGYNs. This does not include any added fees for interventions or anesthetic which, as demonstrated later on in this section, can significantly increase the costs associated with birth.

Delivery fees for midwife-attended births are included in their \$4600 CofC funding, with the exception of hospital-related costs. \$300 of the CofC funding is allocated to pay for a second attendant at the delivery, while the reimbursement for physician second attendants is \$88.99 when required. In most cases hospital nursing staff will attend the birth with physicians. It is

also worth noting that midwives generally spend more time directly caring for women in labour, in comparison to their physician counterparts who rely on the assistance of nurses in hospital. In addition to longer appointments, the amount of time midwives spend with clients in labour can be significantly longer than physicians and often includes more travel when attending homebirths. If reimbursement of midwives and physicians are compared based on time spent in direct patient care instead of by service, it is expected the physician fees would be significantly higher.

Midwives are currently the only care providers in Alberta offering out of hospital birth (home, birth centre or hotel) and waterbirth as options for pregnant women. Recent Canadian studies have confirmed that giving birth at home with a registered midwife can be as safe as a hospital birth for both mother and infant. Women planning to birth at home experience a reduced risk for all obstetric interventions, and similar or reduced risk for adverse maternal and infant outcomes, such as perinatal death and postpartum hemorrhage (Alberta Perinatal Health Program, 2013; Janssen et al., 2009; O'Brien et al., 2010).

WHEN MOTHERS NEED MORE ASSISTANCE: THE COSTS OF INTERVENTIONS AND COMPLICATIONS

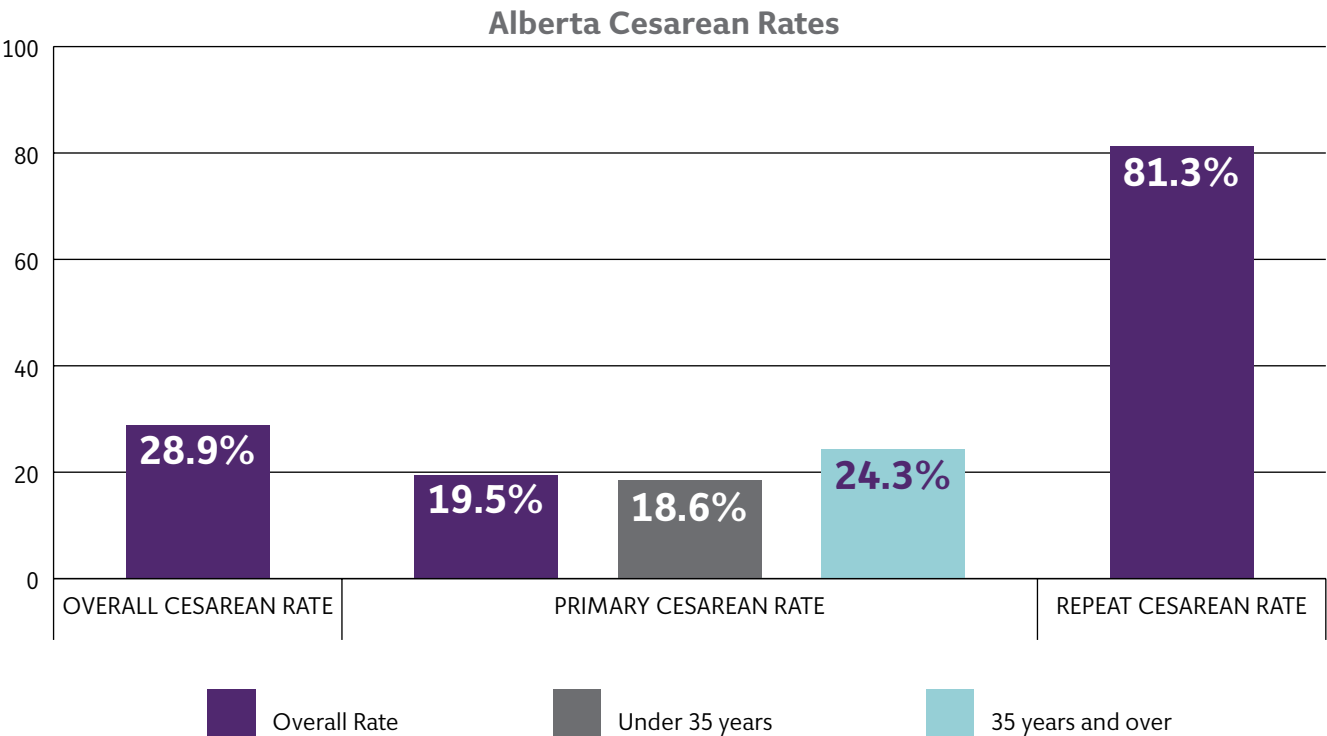
AVERAGE CALCULATED EPIDURAL AND INTERVENTION COSTS FOR OBGYNS	= \$702.26
AVERAGE CALCULATED EPIDURAL AND INTERVENTION COSTS FOR GPS	= \$635.04
AVERAGE EPIDURAL AND INTERVENTION COSTS FOR MIDWIVES*	= 111.28
AVERAGE CESAREAN DELIVERY COSTS FOR OBGYNS	= \$725.19
AVERAGE CESAREAN DELIVERY COSTS FOR GPS	= \$541.82
*PHYSICIAN FFS COSTS FOR PATIENTS UNDER MIDWIFE CARE	

Not every pregnancy or birth will proceed smoothly and without complication. In some cases, intervention will be required to protect the life and health of the mother and/or infant. In these cases, when used appropriately, the advances in medical technology and resources available to assist healthcare professionals are welcome and important.

On the other hand, research suggests that the high rates of some medical interventions in childbirth are linked to an inappropriate use of interventions rather than solely a rise in

high-risk pregnancies. The literature suggests that medical interventions are often being used without a medical necessity, rather based on maternal or provider preferences, fear of litigation, outdated hospital protocols, impatience from provider or patient, lack of patient mobility, early hospital admission, or by physicians who have less experience managing vaginal breech and multiple births, for example (Davey, McLachlan, Forster, & Flood, 2013; McKenzie, Robinson, & Tucker Edmonds, 2016; Tucker Edmonds, McKenzie, Farrow, Raglan, & Schulkin, 2015). Lack of

Table 5: Alberta Cesarean Rates 2013 - 14





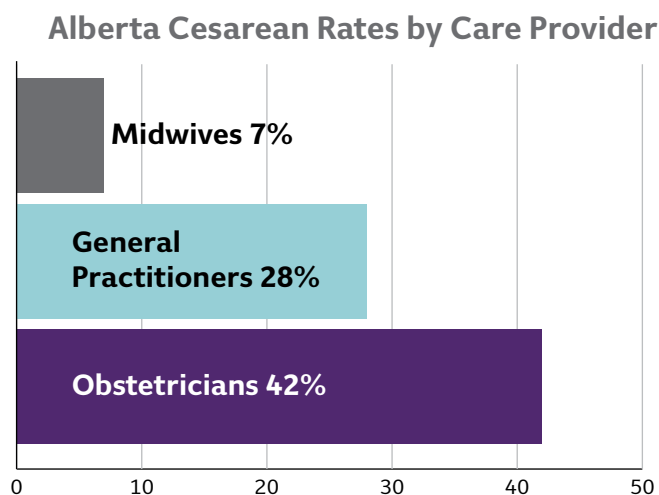
continuous support, physician and staff shortages, as well as bed shortages also play a role. In Alberta, only 6.9% of pregnancies were considered high-risk in 2013, 30.3% deemed moderate risk and the remaining 61.8% low risk. 81.8% of midwifery clients were low-risk pregnancies during the same period and 16.8% moderate risk (Alberta Perinatal Health Program, 2013). Regardless, care providers and their patients need to consider the potential consequences of intervention and weigh the risks and benefits prior to making any decision.

“Most deliveries of babies presenting in breech position now occur by cesarean section, primarily due to physician preference and concomitant declining lack of expertise in breech deliveries, rather than due to medical indication. This tendency to deliver babies in breech position by cesarean section was influenced by widespread dissemination of the results of the Term Breech Trial (i.e. Hannah et al., 2000), which seemed to show that cesarean deliveries for breech births were safer. See Kotaska et al., 2009 for a critical analysis of the Term Breech Trial findings (Ackah & Wang, 2011; Kotaska et al., 2009)”.

The cesarean section rate in Alberta has been increasing steadily over the years. In 2006, the cesarean rate was 26.7% with a repeat cesarean rate of 38.7%. In 2013, the overall rate was

28.9%, while the repeat cesarean rate has climbed to an alarming 81.3%. At the same time, VBAC attempt rate and occurrence rate have been declining. In 2006, VBACs were successful 76.1% of the time, but were only attempted in 25.5% of women with a history of cesarean. In 1997, the success rate was even higher at 81.9%. The percentage of patients births resulting in cesareans is approximately 28% (6250) for GP and 42% (13010) for OBGYN. By comparison, in 2013 Alberta Midwives had a cesarean rate of 7.3% (166) and successful VBAC rate of 79.5% (Alberta Perinatal Health Program, 2013).

Table 6: Alberta Cesarean Rates by Care Provider 2013 - 14



It is worth noting that obstetricians will see women who are considered high-risk during pregnancy or experiencing complications, so a higher cesarean rate would be expected compared to midwives who provide care for low-risk pregnancies. However, the World Health Organization (WHO) has recommended the “ideal’ average cesarean rate to balance risks and benefits as being 10-15% (WHO, 2015). High rates of cesareans will use more resources, cost the system more money and are not without risk to mom and baby (Liu et al., 2007). Contrary to what many people believe, only 2% of cesareans are planned ahead at the request of women (Hanley, Janssen, and Greyson, 2010).

For the delivery itself, GPs were paid, on average, \$541.82 for elective cesareans and cesareans after trial of labour, excluding cesarean hysterectomies. In comparison, OBGYNs were paid on average \$725.19 for cesarean deliveries. This includes fees for also attending an attempted vaginal delivery prior to the cesarean when relevant. Again, these fees do not include any additional interventions or anesthetic administered by physicians during the delivery. Midwives do not perform cesareans, though they may attend as labour support for their clients when care is transferred. Their CofC reimbursement remains unchanged when a woman transfers care during labour.

Cesarean section deliveries are major abdominal surgeries with significant post-operative morbidity rates. “Anecdotal reports suggest that an increase in the rate of cesarean deliveries without true maternal or fetal medical indication (“non-indicated cesareans”) is contributing to an increasing trend in the rate of cesarean delivery (Ackah & Wang, 2011)”. A report by Alberta Reproductive Health in 2011 confirmed the connection that

non-indicated cesareans are, in fact, contributing to an increased burden of morbidity for Alberta’s women and children (Ackah & Wang, 2011).

The maternal medical indications for cesarean (emergency or non-indicated) are fetal distress, prolapsed cord, dystocia, disproportion, obstructed labour, abnormality of forces of labour, and long labour/failure to progress. These labour complications occur in 1.7% (17.2 per 1,000) deliveries for mothers and 3.1% (311.5 per 1,000) for infants.

Cesarean births are also associated with longer hospital stays, prolonged use of Pitocin and increased use of medical supplies for wound healing, monitoring, and lactation support (Geller, Wu, Jannelli, Nguyen, & Visco, 2010; Liu et al., 2007). Once released from the hospital, a woman who has had a cesarean section will be encouraged to visit her physician to monitor the healing of her wound, in addition to scheduled visits for their baby. A woman who has had a cesarean section will need to recuperate from having this major abdominal surgery. Many women will be weak and not be able to hold or carry their children. This means additional assistance in daily living and childcare. The literature suggests that cesarean sections are associated with higher rates of postpartum depression and with increasing maternal mortality rate, especially after release from hospital (Deneux-Tharaux, Carmona, Bouvier-Colle, & Bréart, 2006; Keogh, Hughes, Ellery, Daniel, & Holdcroft, 2006; Lobel & DeLuca, 2007). This comes at a cost to society and the healthcare system.

Decreasing cesarean rates and increasing VBAC rates could represent a significant cost savings of healthcare dollars. An estimated 112 million Alberta healthcare dollars were spent on cesareans in 2013. It is the most common surgery in both Alberta

Table 7: Simulated Hospital Savings By Reducing C-Sections

Simulated Hospital Savings By Reducing C-Sections			
TYPE OF BIRTH	CURRENT COSTS AT 28.9%	COSTS AT 20%	COSTS AT 15%
Vaginal	\$ 117,384,559.32	\$ 130,141,412.35	\$ 138,275,250.62
Cesarean	\$ 95,778,264.01	\$ 68,503,586.09	\$ 51,377,689.57
Totals	\$ 213,162,823.33	\$ 198,644,998.44	\$ 189,652,940.19
PROJECTED SAVINGS		\$ 14,517,824.89	\$ 23,509,883.14

*based on 2013 - 14 data

and Canada, which is remarkable considering the majority of pregnancies are without complications and childbirth in itself is not an illness. VBACs are also not without risk, but in the absence of medical need and with the high rates of success it makes sense to encourage and support women with a history of cesarean to attempt a vaginal birth in subsequent pregnancies.

If the overall cesarean rate was at 20% in 2013-14, the province could have saved \$14.5 million in hospital costs alone. If the cesarean rate was at 15% the savings would have increased to \$23.5 million. When you take into consideration the increasing birth rate and the potential for even more cost savings through lower fee-for-service reimbursements, there exists the potential for significant cost savings by reducing cesareans, primarily through encouraging VBACs. In the case of a VBAC homebirth the savings would be even more magnified in comparison to a repeat cesarean at more than twice the cost of \$4600 and \$10,988, respectively.

Perhaps the most common medical intervention during labour is the use of epidural anesthesia for pain management. Epidural rates in the province have been steadily increasing; from 14.0% in 1994, to 27.5% in 1998, and 44.2% in 2006. As of 2013, 54.0% of vaginal births in Alberta included epidural anesthesia and 58.7% of vaginal births in Canada. Rates tend to be significantly higher in urban Level 3 hospitals than in rural Level 1 to 2 hospitals, mostly related to less access to epidural services in rural and lower level hospitals (Alberta Health Services, 2001, 2009).

Epidurals can significantly increase the costs associated with birth – especially when looking at overall costs to the system with more than half of women using this option. Hospital costs for vaginal births using anesthetic were on average \$1136 more expensive than without anesthetic.

Statistics on epidural rates for midwife-assisted births are difficult to find. According to Alberta perinatal records, midwives had an 11.7% epidural rate in 2013, significantly lower than their physician counterparts (Alberta Perinatal Health Program, 2013). The most recent Canadian study that provided these statistics examined outcomes of midwife-attended births versus physician-attended births in British Columbia between the years 2000 to 2004 (Janssen, Mitton, and Aghajanian, 2015). It found for planned homebirth with midwives, the epidural rate was 7.7% and planned

hospital birth with midwives had a 19.0% rate. Average costs of epidurals for midwifery clients were based on billing claims in 2013-14 for epidural anesthesia by GPs and anesthesiologists (ANES) when a midwife was the admitting care provider.

Physician costs for epidurals were challenging to calculate with the information provided. The authors had access to total payments for billing code 16.91C (epidural insertion for labour) and 16.91G (epidural monitoring for labour and delivery, each additional full 5-minutes) as well as the billings for ANES attending births. Based on this information, it was calculated that the average billing for insertion was \$157.38 for GPs and \$168.93 for ANES. The average billings for management were \$777.53 for GPs and \$632.63 for ANES (not including the extra \$233.21 in cases where the ANES also attended the delivery). Adding them together gives us an average of \$821.97 for provider costs associated with insertion and management of epidural anesthesia in vaginal births without other interventions. A weighted average was used to include these fees when calculating the average cost of vaginal births described later in this report.

In addition to the direct costs associated with epidurals, their use can also increase the risk of Pitocin augmentation, cesarean delivery due to poor quality contractions and prolonged labour, as well as increased risk of instrument-assisted delivery and maternal fever (Cambic & Wong, 2010; Eriksen, Nohr, & Kjiirgaard, 2011; Goetzl, 2012). Epidural use may also interfere with normal breastfeeding in the first 24 hours and infants of mothers receiving epidurals are also more prone to fevers and sepsis, requiring closer monitoring, testing and treatment (Goetzl, 2012; Smith, 2007).

Medical labour inductions are another common intervention during pregnancy. The induction rate for Midwives in Alberta was 10.9% in 2013, compared to a provincial average of 29.5%. Physicians billed for just over 16,700 inductions in 2013-14 – at an average of \$205.54 per patient not including the hospital costs or testing that may be associated with inductions. Part of the concern with inductions is several studies have shown they can promote more painful or frequent contractions and lead to increased use of epidurals, in addition to increasing the risk of uterine rupture and fetal distress (Simpson, KR & Attenbury, J 2003).

Table 8: 2015 Physician Fees for Obstetrical Interventions

Medical Induction	\$120.21
External Version	\$149.63
Mid-forceps delivery with episiotomy (in addition to base fee)	\$135.88
Shoulder Dystocia management (in addition to base fee)	\$133.54
Manually assisted delivery (breech, manual or forceps, in addition to base fee)	\$186.27
Retained Placenta removal	\$106.98
Repair obstetric laceration cervix	\$96.17
Repair obstetric laceration sphincter ani	\$106.88
Repair Obstetric laceration involving rectal mucosa	\$96.17
Repair extensive vaginal laceration	\$96.17
Postpartum hemorrhage, non-surgical management	\$96.17
Postpartum hemorrhage, surgical management of severe	\$152.68

NOTE: This list only includes base fees for select procedures and is not exhaustive.

SOURCE: Alberta Physicians Schedule of Medical Benefits

In Alberta, 16.3% of deliveries were assisted in 2013, which is slightly higher than the national average of 13.2%. In comparison, midwives had a 7.2% assisted delivery rate (Alberta Perinatal Health Program, 2013). The rate of forceps use has been decreasing over time in Canada from 11.2% in 1991 to 6.8% in 2001 (Cargill, YM and Mackinnon, 2004). The current rate in Alberta is 4.5%. In contrast, the use of vacuum has been increasing over time, replacing the use of forceps. In 2013 the rate of vacuum assisted deliveries was 11.1% in Alberta. The use of instruments in birth tends to increase the rates of episiotomy, as well as third and fourth degree tear rates (Cargill, YM and Mackinnon, 2004). The provincial episiotomy rate was 6.2% in 2013 versus 1% for midwife-assisted births (Alberta Perinatal Health Program, 2013).

The lower intervention rates for midwifery clients may in part be due to the low-risk group of women they serve, but also may attest to the benefits of the Canadian model of midwifery care. Multiple studies have found the benefits of having one-on-one continuous support during labour in decreasing intervention rates – including fewer epidurals, instrument-assisted births and cesareans. “Supportive care during labour may involve emotional support, comfort measures, information and advocacy. These may enhance normal labour processes as well as women’s feelings of control and competence, and thus reduce the need for obstetric intervention” (Fair & Morrison, 2012; Hodnett ED, Gates S, Hofmeyr GJ, 2007).

Table 9: Assisted Delivery Rates 2013 – 14

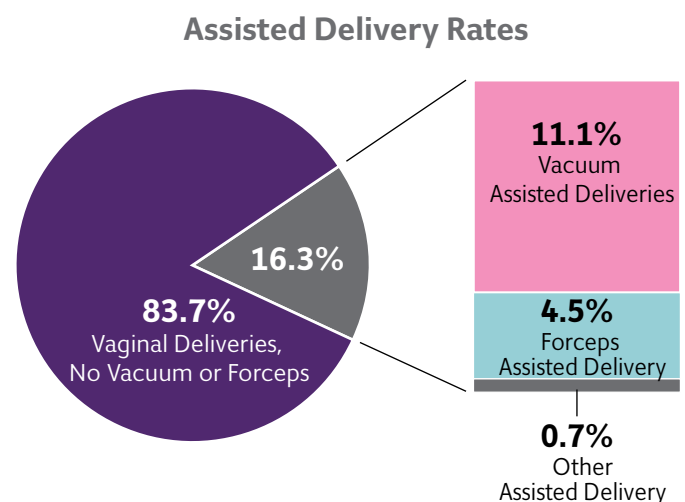
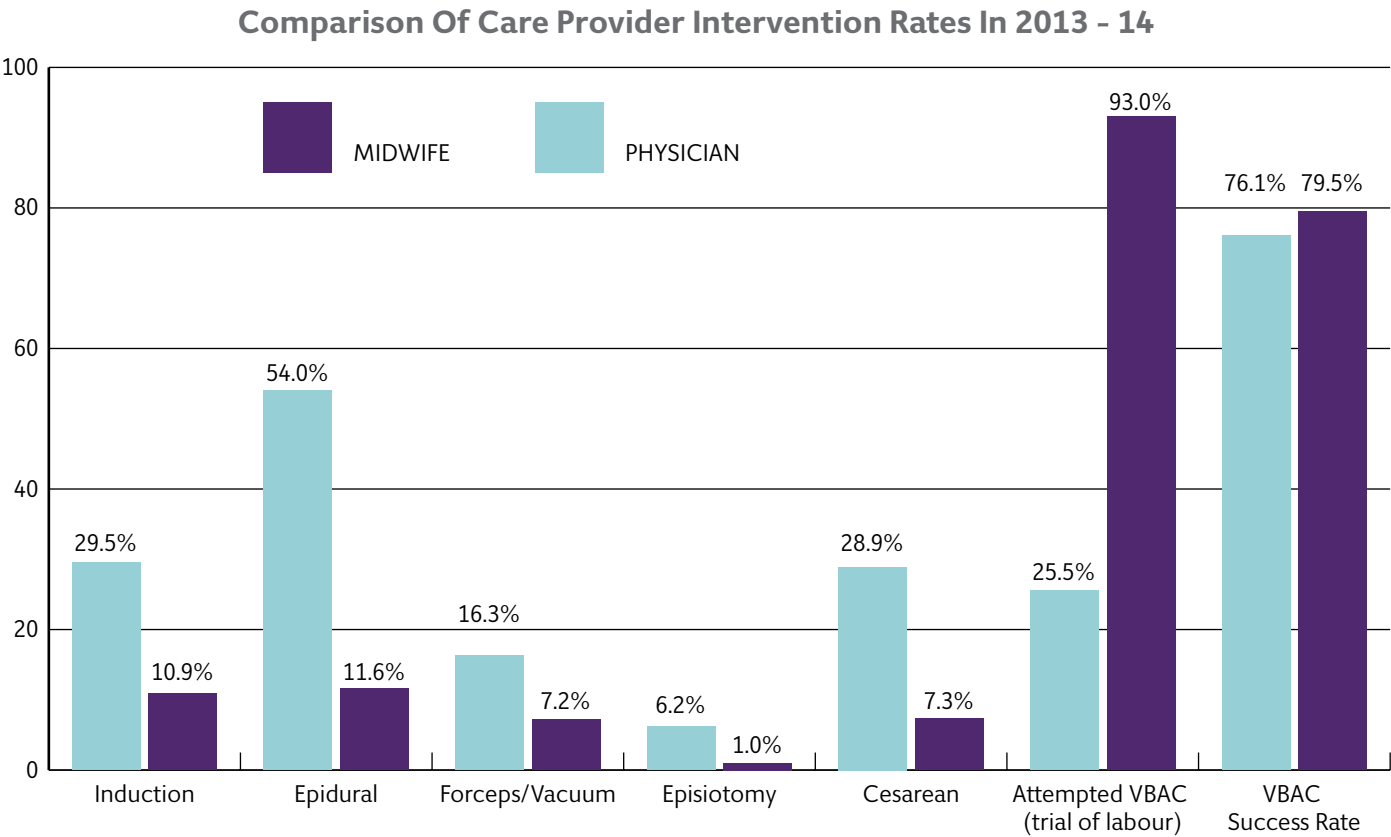


Table 10: Comparison Of Care Provider Intervention Rates In 2013



The overall costs for epidurals and interventions discussed above were weighted according to incidence and combined into an overall average for vaginal or cesarean birth by care provider, before including them in cost calculations.



PHOTO BY: HELGA PHOTOGRAPHY

POSTNATAL COSTS

AVERAGE CALCULATED POSTNATAL COSTS FOR OBGYNS	= \$43.10
AVERAGE CALCULATED POSTNATAL COSTS FOR GPs	= \$43.95
AVERAGE POSTNATAL COSTS FOR MIDWIVES	= INCLUDED IN COURSE OF CARE

There is only one Alberta billing code specific to postnatal physician visits (03.03C) and it is only allowed to be billed once per patient, per pregnancy. Total billings for this code by OBGYNs and GPs were taken and divided by their respective total recipients to find the average postnatal fees for service billed per patient. For GPs and OBGYNs, the averages were \$43.95 and \$43.10 per patient, respectively. The average number of postnatal visit claims per patient was 1.20 visits for GPs and 1.17 visits for OBGYNs. It is worth noting that of the 52,323 births in 2013-14 there were only 23,705 patient claims for this specific postnatal code. It was assumed that many postnatal visits were billed as general office visits instead of code 03.03C, as the recommended schedule of postpartum visits are at 1 week and 6 weeks postpartum, in addition to any other visits they may require for postpartum newborn concerns.

Data was limited to total FFS billed for the code 03.03C when calculating postnatal costs for the mother. It did not include any subsequent follow-up visits billed under other codes. A more detailed case matching analysis would need to be done in the future to determine the number of repeat office visits for postnatal care not billed under 03.03C and if there is any significant difference in postnatal claims based on type of birth, interventions and care provider.

The scope of this report did not include comparing data on long-term costs associated with more traumatic or intervention heavy births such as increased follow-up visits, physiotherapy claims, home care, surgical repairs done after discharge, counselling, difficulties with breastfeeding or any other relevant services that may be accessed by women following difficult births. Though it could be suggested that after looking at the birth practices, breastfeeding rates and hospital readmissions, increased postnatal visits for both mother and infant are likely, resulting in additional costs to the healthcare system not detailed in this report.

Patients who gave birth under GP or OBGYN care are also offered a phone call and 2 postpartum visits by Public Health nurses to follow up with breastfeeding, newborn health and general postpartum recovery. Patients of midwives are not offered the routine public health nurse visits for postpartum health as midwives fill this role.

Postnatal fees for midwives are included in their CofC funding. Again the midwife appointments tend to be 30-60 minutes in length versus 5-15 minutes for physicians and often includes travel to the family's home in the first week after birth. Physician fees would be significantly higher if compared with equivalent time and travel for postnatal visits as provided by a midwife. Midwives typically do 3 to 6 follow-up visits with mother and baby in the first 6-weeks postpartum.

COSTS OF ROUTINE CARE FOR NEWBORNS

AVERAGE CALCULATED NEWBORN COSTS FOR OBGYNS	= \$78.15
AVERAGE CALCULATED NEWBORN COSTS FOR GPs	= \$78.15
AVERAGE NEWBORN COSTS FOR MIDWIVES	= INCLUDED IN COURSE OF CARE

The costs associated with medical care of the newborn while in hospital are often overlooked when calculating the costs of maternity care. There are two patients to consider when discussing pregnancy, birth and postpartum: mother and baby. Both may have separate hospital costs and physician FFS associated with their care.

The authors had access to data on FFS claims by GPs for 03.05G (newborn Care, first day), which can only be billed by one care provider for the first day in hospital following birth. The average fee for newborn care by physicians on the first day was \$78.15. Unfortunately, information on claims for newborn care or visits on subsequent days in hospital or after discharge was not available to the authors, so the true cost of newborn care from birth to 6 weeks could not be determined. Newborns under the care of midwives will continue to have follow-up visits as needed until 6-weeks of age to assess general health, jaundice, feeding

and weight gain. If complications arise that require more skill, newborns will be referred to a GP or Pediatrician for further assessment and treatment. Newborn care under midwives from birth to 6-weeks is included in the CofC payment.

The costs analysis did not look at costs associated with NICU stays for infants, which can be a burden on the healthcare system. The data also did not include the costs for any subsequent hospital admissions, doctor visits, therapies (e.g. light therapy), medications or other interventions required when infants are born prematurely or with existing health conditions. The provincial preterm birth rate was 8.7% and the low birth weight (<2500grams) rate was 7% in 2013-14, which gives some indication of the number of infants potentially needing extra support.



PHOTO BY: HELGA PHOTOGRAPHY

HOSPITAL COSTS

AVERAGE HOSPITAL COSTS FOR VAGINAL BIRTH WITH OBGYNS	= \$4677.54*
AVERAGE HOSPITAL COSTS FOR VAGINAL BIRTH WITH GPS	= \$4023.54*
AVERAGE HOSPITAL COSTS FOR MIDWIVES	= \$1451.84*
AVERAGE HOSPITAL COSTS FOR CESAREAN BIRTH WITH OBGYN OR GP	= \$8497.64*

*COMBINED INPATIENT COSTS FOR MOTHER AND BABY

Hospital costs tend to make up the biggest part of the cost associated with childbirth. These costs include fees to pay for the physical space, but also nurses and other hospital staff, medications, supplies and administration. The more intervention required for birth and postpartum, the more resources needed to support mother and baby. Data used included the average hospital costs for maternity care during the 2013-14 period by care provider AHS.

For midwives the cost of an average hospital stay for vaginal birth ranged from \$1352 to \$2325 per patient depending on epidural use and interventions. The average length of stay (ALOS) varied from 1.1 to 1.7 days. Midwives are unique in that 48% of their births took place outside of hospital, in which case hospital costs for birth are \$0. The overall average hospital costs for midwives was \$1017.64 per birth for the mother. The average hospital stay for vaginal birth (excluding multiples) with OBGYN was \$3533, and median \$3052, with an ALOS of 1.7 days. For GPs, the average hospital cost was \$2879, and median cost \$2705, with an ALOS of 1.6 days.

When the method of birth was cesarean, hospital costs under an OBGYN or GP care increased to an average of \$6587 for all types of cesarean. The average costs ranged from \$5438 for repeat section without induction to \$7281 for a primary section with induction.

Data on newborn hospital costs came from CIHI data for the same period as the FFS claims. This data was not broken down by care provider, but rather by type of birth and intervention. For GPs and OBGYNs, an overall average for all physician types was used. For midwives, data using the same codes with midwife specified as the admitting care provider was used, which showed an average hospital cost of \$835 and median cost of \$678. Currently 48% of births under midwifery care occur out of hospital, which lowers the overall average to \$434.20. For physicians the average cost was \$1144.54 and median cost of \$923.96. In the case of cesarean or multiple births the hospital costs increased to an average cost of \$1910.26 and median cost of \$1713.73. The classifications “Healthy Newborn, Singleton Vaginal Birth” and “Healthy Newborn, Multiple Birth or Cesarean” were used for the comparison of newborn hospital costs.

AVERAGE TOTAL COSTS OF BIRTH

OUT OF HOSPITAL BIRTHS WITH A MIDWIFE ARE \$2055 MORE COST EFFECTIVE THAN IN HOSPITAL BIRTHS WITH OBGYN

Trying to directly compare the costs associated with care between the different primary care providers involved in maternity care is challenging. Not only do the care providers practice under different models of care, they are also paid under different funding models and out of different budgets. The scope of this report is only to compare average costs based on overall maternity care related billings in Alberta in 2013-14. Determining the actual costs or savings of care is a complex undertaking, with many different factors to take into consideration and is the reason the recommendations section of this report will outline the need for a bottom up analysis. In addition, it is difficult to account for any indirect costs or savings that may be accrued over time as a consequence of a particular intervention or model of care. With that being said, the data collected included a large sample size and incorporated a variety of resources, allowing for a thorough top-down analysis to be performed.

VAGINAL BIRTH COSTS IN ALBERTA

Looking at an average vaginal birth in Alberta, GPs and midwives have comparable overall costs and OBGYNs are just over \$540 more expensive per birth. However, the calculation may not include an accurate representation of postnatal and newborn costs due to the limited FFS data available for these calculations. The care provided by midwives includes follow-ups for both mom and baby up to 6-weeks postpartum, while the physician costs only represent the first day in hospital for newborn and one postpartum visit for the mother.

By far the biggest cost savings available are related to out of hospital births (OOH). At a total cost of \$4600 per birth (CofC), they are on average \$1474 less expensive than comparable hospital birth with a GP and \$2055 less than with an OBGYN.

Table 11: Average Costs Of Vaginal Birth In Alberta

Average Costs Of Vaginal Birth In Alberta							
CARE PROVIDER	PRENATAL FFS	DELIVERY FFS	POSTNATAL FFS	NEWBORN FFS	AVERAGE EPIDURAL AND INTERVENTION COSTS	INPATIENT COSTS*	TOTAL AVERAGE COSTS
GP	\$615.08	\$611.10	\$43.95	\$78.15	\$702.26	\$4023.54	\$6,074.08
OB	\$615.08	\$606.19	\$43.10	\$78.15	\$635.04	\$4677.54	\$6,655.10
RM	(CofC)	(CofC)	(CofC)	(CofC)	\$111.28	\$1451.84	\$6,109.70

*Costs for both mother and baby

CESAREANS AND VAGINAL BIRTH AFTER CESAREAN'S (VBAC) IN ALBERTA

“Average savings per VBAC compared to cesarean is \$4539.11.”

Cesarean sections represent a significant portion of the overall spending associated with childbirth. At nearly \$11,000 per birth on average, and almost a third of pregnancies ending in cesarean, it is easy to see why. These calculations do not include any additional costs that may come from newborns requiring extra care or treatment that may be associated with higher risk pregnancies or complications.

With an 81% repeat cesarean rate and a 76% success rate for VBACs, there is potential for significant cost savings by offering the option of attempting VBACs to more women.

VBACs were considered separately from other vaginal births as they have slightly higher re-imbursements for delivery and may require extra considerations and monitoring during labour. When successful, on average, it is only an additional \$156.72 under OBGYN care and \$179.70 under GP care compared to the average vaginal birth. In comparison to repeat cesareans, VBACs with OBGYNs and GPs are \$4220.76 and \$4608.83 less expensive, respectively. For in-hospital VBACs under midwifery care, it is \$3485.45 less expensive than repeat cesarean by OBGYN.

The following calculations show that successful VBAC's can offer significant cost savings. When the birth happens to be

a VBAC at home or birth centre, the savings are increased to \$6388 compared to repeat cesarean with an OBGYN. However, homebirth will not be appropriate for every woman birthing with a midwife and with the limited number of courses of care available to women in Alberta, areas for other potential cost savings also need to be considered. While it is a complex issue, working with physicians on lowering repeat cesarean and epidural rates can go a long way to saving Alberta significant healthcare dollars without sacrificing quality of care. With the number of births projected for 2016, if VBACs were encouraged instead of repeat cesareans, there exists the potential for nearly \$46 million in cost savings.

It is important to keep in mind that the costs listed are based on weighted averages, so the actual costs can vary based on the level of intervention and care needed, as well as location of birth. In addition, indirect and longer-term costs or savings related to recovery from complications, breastfeeding, hospital re-admissions, postpartum depression, etc. have not been factored into these calculations. Physicians are also compensated through a variety of benefits outside of fee-for-service payments, which are not factored into the cost calculations.



PHOTO BY: HEATHER HILL PHOTOGRAPHY

“An average vaginal birth costs 40% less than cesarean.”

Table 12: Average Costs Of Cesarean Deliveries In Alberta

Average Costs Of Cesarean Deliveries In Alberta

CARE PROVIDER	PRENATAL FFS	DELIVERY FFS	POSTNATAL FFS	NEWBORN FFS	AVERAGE ANESTHETIC COSTS	INPATIENT COSTS*	TOTAL AVERAGE COSTS
GP	\$615.08	\$541.82	\$43.95	\$78.15	\$1,029.57	\$8497.64	\$10,806.21
OB	\$615.08	\$725.19	\$43.10	\$78.15	\$1,029.57	\$8497.64	\$10,988.73

*Costs for both mother and baby

“With an 81% repeat cesarean rate and a 76% success rate for VBACs, there is potential for significant cost savings by offering the option of attempting VBACs to more women.”

Table 13: Average Costs Of Vaginal Birth After Cesarean (Vbac) In Alberta

Average Costs Of Vaginal Birth After Cesarean (VBAC) In Alberta

CARE PROVIDER	PRENATAL FFS	DELIVERY FFS	POSTNATAL FFS	NEWBORN FFS	AVERAGE EPIDURAL AND INTERVENTION COSTS	INPATIENT COSTS*	TOTAL AVERAGE COSTS
GP	\$615.08	\$734.40	\$43.95	\$78.15	\$702.26	\$4023.54	\$6,197.38
OB	\$615.08	\$728.30	\$43.10	\$78.15	\$635.04	\$4677.54	\$6,767.97
RM	(CofC)	(CofC)	(CofC)	(CofC)	\$111.28	\$1451.84	\$6,109.70

*Costs for both mother and baby

Table 14: Potential Savings From Hospital VBACS

Potential Savings From Hospital VBACS

REPEAT CESAREANS (81.3%)	VBAC SUCCESS RATE	POTENTIAL VBACS	AVERAGE SAVINGS PER VBAC	TOTAL POTENTIAL SAVINGS
13,307*	76.1%	10,125	\$4,539.11	\$45,958,489

**based on estimated 56,634 births and 28.9% overall cesarean rate

Breastfeeding and Associated Health Outcomes

This section of the report examines breastfeeding, including an overview of its rates, benefits, associated health outcomes and costs. When exploring this topic, it is also important to look at birth practices, in particular interventions as well as hospital readmissions. This will assist with understanding the relationship with health outcomes, exploring solutions and identifying potential cost savings.

This cascade effect starting at birth not only impacts short-term health outcomes and breastfeeding success rates, it also leads to long-term health implications that result in increased costs to the healthcare system. With the increase in cesarean and intervention rates it is no wonder there has also been a corresponding increase in suboptimal breastfeeding and adverse health outcomes, as well as rising healthcare costs. Consumers and policy makers need to be educated on the impact of various birth practices so informed choices can be made, helping to ensure a healthy Alberta.

OVERVIEW

Breastfeeding is recognized as the normal and ideal method of feeding to ensure optimal health for both mother and baby. In physiologically normal births, breastfeeding initiation occurs between the second (pushing) and third (delivery of the placenta) stages of labour and even a brief separation of mother and baby during this time can negatively affect breastfeeding success (Forster & McLachlan, 2007). The health benefits of exclusive breastfeeding for 6 months and through to 2 years and beyond with complementary foods is well documented by the World Health Organization (WHO) and other major organizations (Kramer & Kakuma, 2012; Wall, 2013; WHO, 2016).

Breastfeeding rates continue to fall far short of current recommended guidelines. This is in part because many women experience breastfeeding challenges. However, statistics show high breastfeeding initiation rates at birth, which indicates prenatal breastfeeding education programs are working and the majority of women both attempt, and have the desire,

to breastfeed. The concern comes around the rapid drop in breastfeeding rates upon hospital discharge, indicating the need for more support. This is especially true for groups younger than 35, mothers with no partner, and those with less education. These groups have been shown to experience lower breastfeeding success rates (Gionet, 2013). Women with a university degree are almost 4 times more likely to breastfeed exclusively for the first 6 months (Jessri, Farmer, Maximova, Willows, & Bell, 2013).

Rates of breastfeeding vary widely; it is one of the few health-positive behaviours more common in low income countries than in higher income ones. In low-income countries most infants are still breastfed at 1 year, as compared with less than 20% in many high-income countries and less than 1% in the UK (Victora et al., 2016). Canadian data indicates only 26% of infants were exclusively breastfed for the recommended first 6 months (Gionet, 2013). Alberta may be slightly higher than the Canadian average at 29%, but is still far lower than BC's 41%, Canada's highest rate. In Alberta, 98.6% of infants were breastfed at least once after delivery, which is higher than the national average of 87.3%, but only 54% were exclusively breastfeeding at age 3 months, and just 15% were exclusively breastfeeding at age 6 months (Jessri et al., 2013). 71% of breastfed infants were started on complementary foods (excluding formula) between 3 and 6 months. This may help to explain why fewer women exclusively breastfed at 6 months when compared to the 3 month time point (Jessri et al., 2013).

Breastfeeding rates show considerable variation by region and demographics. Some of the variation, post-initiation drop off, and relatively low exclusive breastfeeding rates reflect medical, cultural, and psychological differences, as well as physical discomfort and inconvenience. Additional data suggests that variations in hospital practices and lack of postnatal support also account for a considerable proportion of the disparities in breastfeeding duration (Chalmers et al., 2009; Victora et al., 2016). Approximately 60% of mothers who stopped breastfeeding did so earlier than desired. Early termination was positively associated with concerns regarding maternal and child health.

“ Suboptimal breastfeeding rates result in significant excess costs and preventable deaths. Investment in strategies to promote longer breastfeeding duration and exclusivity would not only improve health outcomes, both short and long-term for mothers and babies, but would also be cost-effective. ”

– Bartlick et al, 2013

Specifically, difficulties with lactation; infant nutrition and weight; illness or the need to take medications; and the effort associated with pumping milk (Odom, Li, Scanlon, Perrine, & Grummer-Strawn, 2013). These matters are not trivial, and many mothers are without adequate breastfeeding support. In addition, many mothers receive advice on formula feeding during their hospital stay where almost 48% of infants receive formula milk. Multiplied across populations, and involving multinational commercial interests, this situation has catastrophic consequences on breastfeeding rates and the health of subsequent generations (Victora et al., 2016). Continued professional support is necessary to address these challenges and help mothers meet the desired breastfeeding duration.

In addition, several studies have linked negative breastfeeding experiences and lack of breastfeeding support with a higher risk of post-partum depression (Borra, Iacovou, & Sevilla, 2015; Flores-Quijano et al., 2008; Watkins, Meltzer-Brody, Zolnoun, & Stuebe, 2011). In mother's with no history of depression, the highest risk for post-partum depression was found in women who had

intended to breastfeed but were not successful (Borra et al., 2015).

While 87% of all Canadian mothers initiate breastfeeding, Indigenous mothers are almost 10% less likely to do so, with a 78% initiation rate. However, some studies have shown that when indigenous mothers breastfeed they do so for longer than non-Indigenous women (McIsaac, Moineddin, & Matheson, 2015).

There is very little published or public data examining the breastfeeding rates relative to care provider in Canada, and more specifically, Alberta. There is even less available on midwifery-led births. In BC, a recent study found the rate of infants exclusively breastfed at time of hospital discharge to be 91% with midwives and only 70% for other care providers (Perinatal Services BC, 2014). Ontario had similar findings with an overall breastfeeding rate at discharge of 59% compared to approximately 86% at six weeks postpartum for women under midwifery care (BORN Ontario, 2012; Cheyney et al., 2014; Ontario Association of Midwives, 2013).

Table 15: Exclusive Breastfeeding Rates

Exclusive Breastfeeding Rates

CARE PROVIDER	ATTEMPTED AT LEAST ONCE	AT DISCHARGE	6 WEEKS	3 MONTHS	6 MONTHS
Physician	98.9%	70%	59.0%	54%	15%
Midwife	98.9%	91%	86.0%	unknown	unknown

Birth practices also influence breastfeeding rates and have an impact on health outcomes. Interventions such as cesareans, inductions, forceps and vacuum use lead to lower breastfeeding success. Anesthetic use during labour reduces the ability for a baby to suck, swallow and breathe after delivery which can delay the onset of mature milk in the mother (Forster & McLachlan, 2007; Smith, 2007).

Maternity care providers are uniquely positioned to counsel mothers about the health impact of breastfeeding. They play

an integral part in ensuring both mother and infant receive appropriate, evidence-based care. Women under midwifery care are more likely to meet their breastfeeding goals, which is important in a province with escalating healthcare costs. The suboptimal breastfeeding rates outlined above should be of concern to provincial policy and decision makers. Ensuring compliance with the WHO's Baby Friendly Hospital Initiative within Alberta would further support breastfeeding success.

BENEFITS AND ASSOCIATED HEALTH OUTCOMES

“With increasing health issues such as childhood obesity, early onset diabetes, cancers and rising health care costs, the promotion, protection and support of breastfeeding has become even more critical as research points to relationships between breastfeeding and the onset of disease.”

Breastfeeding benefits all babies and mothers. Breast milk makes the world healthier, smarter, and more equal (Victora et al., 2016). Research has shown a correlation between lack of breastfeeding and increased risks to maternal and infant health. It is known that there are significant financial and social costs linked to suboptimal breastfeeding and adverse health outcomes resulting in increased rates of hospitalization in the first year of life, as well as life-long increased risk of disease for both mother and child (M. Bartick & Reinhold, 2010; Wall, 2013).

In contrast, the confirmed benefits of breastfeeding for mother and/or baby include fewer infections, along with increased intelligence, and increased protection against obesity, diabetes, cancer, hypertension, and myocardial infarction (Victora et al., 2016). Infants who have breastfed longer are at reduced risk of chronic inflammation and have a lower risk of cardiovascular and metabolic disease into adulthood (McDade et al., 2014). It is important to consider the long-term health outcomes associated with birth practices and breastfeeding.

Health outcomes in developed countries differ substantially for mothers and infants who formula feed compared with those who breastfeed. For infants, not being breastfed is associated with an increased incidence of infectious morbidity, as well as elevated risks of childhood obesity, type 1 and 2 diabetes, leukemia, and sudden infant death syndrome. For mothers, failure to breastfeed is associated with an increased incidence of premenopausal breast cancer, ovarian cancer, retained gestational weight gain, type 2 diabetes, myocardial infarction, and metabolic syndrome (Stuebe, 2009a; Wall, 2013).

There are also significantly lower rates of sudden infant death and infant mortality in areas with higher breastfeeding success (Hauck, Thompson, Tanabe, Moon, & Vennemann, 2011).

Healthy babies who are not breastfed are three times more likely to be hospitalized for respiratory syncytial virus (RSV) than those breastfed exclusively for 4 months (Bachrach, Schwarz, & Bachrach, 2003) and are hospitalized 2.5 times more often in the first year of life (Kramer & Kakuma, 2012; Wall, 2013). According to a 2015 study, increased breastfeeding rates and duration could lead to proportionately fewer instances of ear infections (3.5%), gastrointestinal infections (17.8%), hospitalizations for lower respiratory tract infections (9.7%), and SIDS (9.1%) (Mcisaac, Moineddin, & Matheson, 2015).

Indigenous babies could benefit even more from breastfeeding due to the higher rates of common illnesses experienced and the fact they are disproportionately affected by sudden infant death syndrome (SIDS). A recent study found that encouraging First Nations, Inuit and Métis mothers to breastfeed could significantly reduce the high rates of common infections, and even deaths, seen in Indigenous babies within Canada; decreasing ear infections by up to 6.5%, gastrointestinal infections by up to 41%, hospitalizations for lower respiratory tract infections by up to 26% and SIDS by up to 25% (Mcisaac et al., 2015). Policies and programs should be developed in consultation and collaboration with Indigenous populations and, where possible, delivered by Indigenous women in order to enhance cultural acceptability.

A Canadian Institute of Health Research (CIHR) research project, led by the University of Alberta's Dr. Anita Kozyrskyj, studied the development of microbes in the infant gut with a focus on identifying the relationship between asthma, allergies and obesity. The study found that mode of delivery (cesarean section versus vaginal birth) and infant nutrition (breastfeeding versus formula feeding) affect the composition and diversity of gut bacteria in infants. The same study found that breastfed infants

had significantly different gut bacteria compared to formula fed infants, confirming the connection between breastfeeding and its impact on gut health (Azad et al., 2013). Several studies have also concluded that infants with less diverse populations of bacteria are more likely to develop allergies, asthma and food sensitivities (Abrahamsson, Jakobsson, Andersson, A. F. Engstrand, & Jenmalm, 2014; Azad et al., 2013; Bridgman, Kozyrskyj, Scott, Becker, & Azad, 2016; Sjögren, Jenmalm, Böttcher, Björkstén, & Sverremark-Ekström, 2009). By identifying the microbiota profile associated with asthma, allergies and other health conditions, this work provides an early warning system and an opportunity for early intervention.

“Breastfeeding is a key modifiable risk factor for disease in both mothers and infants, making breastfeeding support one of the most cost effective ways to reduce infectious and chronic disease.”

– Stuebe, 2009

A more recent study examined the impact of antibiotic use during childbirth. In the study of 198 healthy babies, it was observed that 44 percent of the moms had received antibiotics to prevent infections either because they were delivering via cesarean or because they tested positive for Group B Streptococcus (GBS) bacteria, which if passed on to the baby can cause serious health problems. At three months, the babies of those mothers who had received antibiotics had altered microbiomes and the changes remained at 12 months of age. A key observation of the study was the positive change in microbiome in babies who were breastfed. In fact, after a year of breastfeeding, the infant microbiomes were similar to those infants born vaginally (Azad et al., 2015). This further confirms the need to avoid, wherever possible, the cascade of interventions at birth in order to prevent adverse breastfeeding and health outcomes. When avoidance is not possible, additional breastfeeding support is required in addition to the possible inclusion of probiotic supplements and improved guidance on maternal and infant nutrition (Bridgman et al., 2016).

Despite advances in infant formulas, human breast milk continues to provide a bioactive matrix of benefits that cannot be fully replicated by any other source of nutrition. When the mother's

own milk is unavailable for the sick and hospitalized newborn, the Canadian Paediatric Society recommends pasteurized human donor breast milk be made available as an alternative feeding option (Kim, JH; Unger, 2010).

Among premature infants, not receiving breast milk is associated with an increased risk of necrotizing enterocolitis (NEC) and banked donor milk has been shown to be as effective in preventing NEC as mother's milk (Herrmann & Carroll, 2014). Although infant mortality overall in Alberta is low, approximately 10% of infants born before 28 weeks in Alberta will develop NEC as will 4.5% of infants born between 32 and 36 weeks gestation

(Alberta Health, 2014). Only about half of the mothers of these babies will have an adequate milk supply, sometimes because they are sick themselves, due to the stress of having a very sick baby or from being separated from their baby. It is in the best interest of the healthcare system to prevent the occurrence of NEC through feeding protocols that foster NEC prevention (i.e., use of breast milk in the neonatal intensive care unit), where the most vulnerable babies should receive human milk. The cost of using banked donor milk to feed premature infants is inconsequential when compared to the savings from NEC prevention (Arnold, 2002).

With the opening of new breast milk banks in Alberta and their inclusion in certain hospitals, some babies who need it most can now get this precious milk (Alberta Breastfeeding Committee, 2012). Milk banks have been long overdue and greatly needed in Alberta. They were intended to address the needs of premature babies and lower the risks associated with breastfeeding difficulties and infant illnesses. Although most women in Alberta choose to initiate breastfeeding, the breastfeeding duration rates drop off quickly which means a smaller pool of women are available to donate milk. Birth interventions can interfere

with breastfeeding initiation, leading babies to require medical supplementation with donor milk, or riskier supplementation with infant formula. Currently donor milk is only occasionally available outside of Alberta's NICUs.

When looking at care providers, midwives not only report lower intervention and prematurity rates, they also have higher breastfeeding success rates (Perinatal Services BC, 2014). This is most likely a result of the comprehensive postnatal care received by a mother and infants while under midwifery care. Since women in midwifery care are more likely to breastfeed, increasing access to midwifery care also increases the number of women available to donate breast milk, potentially boosting the quantity of available donor milk. Midwives are available

lives are included, the current suboptimal breastfeeding rates in the United States result in 4,981 excess cases of breast cancer, 53,847 cases of hypertension, and 13,946 cases of myocardial infarction resulting in a total of \$17.4 billion in costs to society related to premature deaths (\$733.7 million in direct costs, and \$126.1 million indirect morbidity costs). Savings were based on modelling comparing the current one-year breastfeeding rate of 23% to mothers who breastfed for at least 1 year after each birth, followed to 70 years of age (M. C. Bartick et al., 2013).

Suboptimal breastfeeding rates result in significant excess costs and preventable deaths. Investment in strategies to promote longer breastfeeding duration and exclusivity would not only improve health outcomes, both short and long-term for

“The need to evaluate the impact of various infant and maternal factors and characteristics influencing readmissions, and finding ways to prevent readmissions, is critical when considering the overall health of Albertans and the costs to the health care system.”

– CIHI, 2012

24 hours a day, 7 days a week. Instead of the mother and baby visiting overcrowded hospitals or doctor's offices, they can simply contact their midwife for support during the first 6 weeks, without any additional costs incurred to the system.

Breastfeeding costs can be difficult to quantify. Globally, one of the most in-depth analysis done examining the health and economic benefits related to breastfeeding showed the deaths of 823,000 children and 20,000 mothers each year could be averted through universal breastfeeding, along with economic savings of US\$300 billion (Victora et al., 2016).

A US study analyzed the health burden from current breastfeeding rates, both in terms of premature deaths and economic costs. If 90% of families could comply with medical recommendations to breastfeed exclusively to six months, the study suggested it would save the healthcare system \$13 billion per year and prevent an excess of 911 deaths, nearly all of which would be infants (M. C. Bartick et al., 2013; M. Bartick & Reinhold, 2010). When maternal

mothers and babies, but would also be cost-effective. While not all illnesses would be eradicated by breastfeeding, even a modest increase in breastfeeding rates could save millions of dollars annually due to the reduction of infant infections and illnesses. Investment in effective services to increase and sustain breastfeeding rates is likely to provide a return within a few years, improving the quality of life of women and children across the province.

In general, there is an overall lack of current Canadian and Albertan breastfeeding data available. While calculating the costs associated with suboptimal breastfeeding was not the focus of this report, hospital readmission data for illnesses associated with not breastfeeding can offer some insights into estimated costs. It is recommended further data collection be undertaken in regards to increased incidence of illnesses linked to increased birth interventions and low breastfeeding rates, and the resulting costs to the health system.

HOSPITAL READMISSIONS AND ASSOCIATED COSTS

Hospital readmissions after discharge are common, costly, and often preventable, but prediction models are often poor at identifying those patients at high risk of readmission (CIHI, 2012). The need to evaluate the impact of various infant and maternal factors and characteristics influencing readmissions, and finding ways to prevent readmissions, is critical when considering the overall health of Albertans and the costs to the health care system. While readmission costs were not the main focus of this report and are out of the scope of this report to a certain extent, identifying the top reasons behind hospital readmissions and their associated costs can help in determining the impact on the long-term sustainability of the system, including maternity care. After reviewing the importance of breastfeeding and its connection with health outcomes, it comes as no surprise to see the same illnesses reported as the top reasons for hospital readmissions.

In 2012-13, there were 316,809 hospital admissions in Alberta resulting in almost \$2.3 billion in health care spending. Within Canada, 8% (1 in 12) of patients are readmitted back into the hospital within 30 days after discharge. In Alberta the number is even higher, at 10%. Soon after their discharge from hospital, more than 180,000 Canadians were readmitted to acute care with more than 2.1 million hospitalizations across the country. Inpatient readmissions within 30 days of discharge cost the Canadian health care system an estimated \$1.8 billion during the same period. While readmissions accounted for 8.5% of all patient hospitalizations to inpatient care across acute care hospitals in Canada, they accounted for a slightly higher proportion (11.0%) of total inpatient care costs (excluding physician fees for services). Researchers have indicated that between 9% and 59% of readmissions are preventable, that represents a potential reallocation of \$162 million in Canada and to other aspects of care (CIHI 2012).

Return to the emergency department (ED) within seven days of discharge from inpatient care costs an estimated \$30.6 million and accounted for 1.7% of total emergency costs for Alberta, Ontario and Yukon in 2010–2011. The average cost of an ED visit for a recently discharged patient (\$336) was almost 45% higher than the overall average ED visit cost (\$234)(CIHI, 2012).

Surgical, medical, pediatric and obstetric patient data were reviewed to better understand who returned to acute care after discharge and the clinical reasons. As mentioned in the maternity care provider costs section of this report, childbirth was the top volume for hospital admissions with cesarean being the top surgery, so it isn't surprising to see them linked to the top reasons for hospital readmission.

In Alberta, hospital readmissions for infants up to 365 days post discharge were analyzed. Respiratory concerns, enteritis, jaundice, infection, and poor nutrition were some of the top reasons for hospitalization. From 1 to 7 years of age, pneumonia, asthma and croup start to show up as top reasons and continue into the 8 to 17 year category where you also see depression, childhood development concerns, and diabetes. All of these health issues have been linked in some way to breastfeeding and account for 25,606 admissions, or approximately 8% of total hospitalizations, costing the system over \$154.6 million dollars in hospital costs (excluding physician fees).

Table 16: Associated Health Outcomes

Associated Health Outcomes		
DIAGNOSIS	VOLUME	COSTS
Pneumonia	6,660	\$58,877,035
Respiratory	5,360	\$25,296,062
Non - Severe Enteritis	3,734	\$16,205,560
Urinary Tract	2,995	\$21,564,000
Diabetes	2,430	\$15,219,090
Jaundice	1,729	\$4,146,142
Asthma	1,220	\$4,779,960
Nutrition, Digestion, Nervous	351	\$3,341,956
Influenza	750	\$3,300,750
Infection (Septicemia)	169	\$1,442,584
TOTAL	25,606	\$154,618,051

*Calculated based on data from: Hospital Morbidity Database (HMDb), 2013–2014, Canadian Institute for Health Information

Among obstetric patients, those who were originally hospitalized for antepartum disorders had the highest readmission volumes. While these readmissions were unplanned, they were not necessarily unexpected. In this study, the top antepartum disorders in the index hospitalization included diseases and complications of pregnancy, false labour before 37 weeks of gestation and preterm labour without delivery. Upon readmission, postpartum disorders treated either medically or surgically were the conditions most frequently observed and found in more than 70% of the readmitted cases. An in-depth examination of patients readmitted after undergoing a cesarean section delivery (both primary and repeated) indicated that 23.1% were readmitted for infections of an obstetric surgical wound. (CIHI, 2012)

Within Canada, discharges with a primary C-section had the highest rate of return to the emergency department within seven days (8.7%), while patients who were in hospital for a vaginal delivery without other interventions had the lowest rate (3.7%) among the high-volume conditions. In all five Case Mix Groups (CMGs) representing the highest volume of return visits to the ED, the clinical condition upon return was a disease or disorder of the female anatomy. Upon further review of this Comprehensive Ambulatory Classification System (CACS) group, the diagnoses most often observed were infection of an obstetric surgical wound and delayed and secondary postpartum hemorrhage.



PHOTO BY: HEATHER HILL PHOTOGRAPHY

TABLE 17: CONDITIONS REPRESENTING THE LARGEST NUMBER OF ED RETURNS AND THEIR REASONS FOR RETURN, FOR OBSTETRIC PATIENTS

Conditions Representing The Largest Number Of ED Returns And Their Reasons For Return, For Obstetric Patients in Alberta

MOST FREQUENT CONDITIONS AT INDEX (CMG)	RETURN TO ED RATE %	RETURN TO ED VOLUME	TWO MOST FREQUENT CONDITIONS AT RETURN (CACS, PERCENTAGE)	
Vaginal Delivery, No Other Intervention	3.7	3,608	Disease or Disorder, Female Anatomy (36.8)	Maternal Care (9.6)
Primary Cesarean Section	8.7	2,334	Disease or Disorder, Female Anatomy (31.3)	Follow-Up Examination and Other Non- Emergent Condition (15.1)
Cesarean Section With Previous Uterine Scar	7.2	1,458	Disease or Disorder, Female Anatomy (27.8)	Follow-Up Examination and Other Non- Emergent Condition (19.3)
Forceps/Vacuum Delivery, No Other Intervention	5.7	835	Disease or Disorder, Female Anatomy (38.4)	Maternal Care (12.0)
Antepartum Disorder Treated Medically	6.1	681	Disease or Disorder, Female Anatomy (30.7)	Other Condition With Acute Admission/ Transfer (25.8)

Note: Results are based on Ontario, Alberta and Yukon. Sources: Discharge Abstract Database and National Ambulatory Care Reporting System, 2010–2011, Canadian Institute for Health Information.

Among pediatric patients, respiratory infection, pneumonia, chemotherapy/radiotherapy, non-severe enteritis and seizure disorder were the conditions associated with the highest number of readmissions. Rates were higher for those living in rural areas, where emergency rooms may serve as a focal point for a variety of types of care, compared to urban hospitals, and in some cases accessed for follow-up appointments due to lack of access to care in rural populations. People living in the least affluent neighbourhoods also showed higher readmissions versus the wealthiest, indicating the need to reduce the primary health care gap across socio-economic groups (CIHI, 2012).

When examining community factors, rural emergency departments may play a unique role in compensating for lower levels of community and primary health care services, reflected in a return to ED rate of approximately 13% whereas in urban environments the rate was 8%. Due to access in rural populations, many surgical and obstetric patients returned to the ED where hospitals may be the best, or only, place to return to receive follow-up care when primary health care and home care services are not available. Significantly fewer physician visits per capita were observed in small urban, rural or remote

locations, compared with those in urban settings. The proportion of patients receiving home care or community-based care services was also significantly lower for people in rural/remote locations. Given the fact that these patients were in contact with a team of health care providers within the previous week, there may be opportunities to reduce the number of return ED visits with enhanced discharge planning or scheduled follow-up visits outside of hospital (CIHI, 2012).

Although readmission for medical conditions may involve factors outside the direct control of the hospital, high rates of readmission act as a signal to hospitals to look more carefully at their practices, including the risk of discharging patients too early and the relationship with community physicians and community-based care. While not all admissions for the above reasons will be avoided, in many cases they can be prevented. It all starts by addressing the cascade effect at birth; starting with supporting vaginal childbirth with fewer interventions and increased breastfeeding support, allowing babies to have a more optimal start to life.

While current research on the number of hospital readmissions by women and babies under midwifery care is not available,



PHOTO BY: DAPHNE CHEN PHOTOGRAPHY

the level of postnatal care provided suggests many hospital and medical doctor visits may be avoided, resulting in additional savings to the system. It is recommended that further research is done in this area, including comparing breastfeeding rates across various care providers. Several studies have shown midwife-led births have high rates of normal physiological birth, with equal or better outcomes to physician-led hospital births for low risk women. Home birth has been shown to have low rates of resulting surgical birth, with no concomitant increase in adverse events or poor outcomes (Cheyney et al., 2014; Hutton, Reitsma, & Kaufman, 2009; Janssen et al., 2009). Increased referrals for pregnancy complications, fewer admissions to neonatal intensive care units, and shorter stays in neonatal units are examples of outcomes that indicate both improved care and resource use. Importantly, women reported a higher rate of satisfaction with care in general and with pain relief in labour in particular, and improved mother-baby interaction (Victora et al., 2016).

Midwives as well as other complementary care providers (Lactation consultants, doulas, etc.) have shown to be beneficial in

offering breastfeeding support and potentially lowering hospital readmissions, as post-partum support is included in their care, as well as improving outcomes through collaborative practice with other healthcare professionals (Renfrew et al., 2014). Reviewing the health risks of not breastfeeding, for infants and for mothers, as well as the care provider's role in educating and supporting women regarding infant feeding and ensuring an optimal start for breastfeeding are critical to ensure positive health outcomes. Improvement in the quality of antenatal and perinatal support could have a substantial impact on maternal and infant health, as well as health care spending in both the short and long term; lowering hospital readmissions and decreasing physician costs among other benefits. A focus on birth practices, breastfeeding and associated health outcomes is essential and is included as a key recommendation in the respective section of this report. A better understanding of the factors influencing readmission rates is an important step in improving quality of care.

MATERNAL AND INFANT MORBIDITY COSTS

Maternal and Infant Morbidity are serious concerns. In Alberta, the overall rate of severe morbidity across all deliveries was 21.4 (per 1,000 deliveries) for mothers, and 212.1 for infants. Demonstrating severe morbidities were much more likely to be reported for infants than for mothers. Morbidity rates for mothers and for infants were shown to be higher in the cesarean deliveries; and in particular, in non-indicated elective cesarean deliveries (Ackah & Wang, 2011).

The most common severe maternal morbidities include (per 1,000 deliveries): postpartum depression (74.2), Obstetric wound hematoma, hemorrhage and infection (6.2), major puerperal infection (5.4), chronic pelvic pain (2.9), anesthetic or sedation complications (2.5), any hysterectomy (1.1), cardiac arrest (1.1), in-hospital wound disruption (1.0), and uterine rupture (0.6). The rate of postpartum depression was the highest of all morbidities, ranging from 66.9 to 82.5 (per 1,000 deliveries) among the comparison groups. Obstetric-wound hematoma, hemorrhage, or infection were the next most common severe maternal morbidity, followed by major puerperal infection. The remainder of severe maternal morbidities occurred in fewer than three out of every 1,000 deliveries overall. Morbidities (such as obstetric wounds and infections) result directly from the delivery itself; other morbidities (such as cardiac arrest or anesthetic complications) are likely mediated by other factors, both biological and procedural (Ackah & Wang, 2011).

For infants, the most common severe morbidities include (per 1,000 deliveries): respiratory and cardiovascular disorders specific to the perinatal period (107.6), followed by hemorrhagic and hematological disorders of fetus and newborn (96.7), birth trauma (31.9), other disturbances of the cerebral status of newborn (13.4), feeding problems of newborn/neonatal difficulty in feeding at breast (11.7), infections specific to the perinatal period (8.3), and convulsion of newborn (1.4) (Ackah & Wang, 2011).

The previous section showed one of the main reasons behind hospital readmission for obstetric patients was due to infection following cesarean. With postpartum depression as the top morbidity, the Alberta Reproductive health report compared data to see if there was a correlation between mode of delivery (cesarean or vaginal) and postpartum depression. The results confirmed that maternal postpartum depression rates are indeed associated with morbidities and increased occurrence

was associated with non-indicated cesareans more than other selected categories of deliveries. Specifically, the postpartum depression morbidity rates for scheduled cesarean and non-indicated cesarean were 82.5 and 81.7 per 1,000 deliveries,

“One of the main reasons behind hospital readmission for obstetric patients was due to infection following cesarean.”

– Ackah & Wang, 2011

respectively, compared to 66.9 vaginal deliveries (non-indicated). Even breech vaginal deliveries showed lower rates of postpartum depression (74.9) than cesareans (Ackah & Wang, 2011).

About one in ten women are diagnosed with depression during pregnancy or within 12 months of giving birth (Ackah & Wang, 2011). The consequences can be devastating for both women and children, especially since depression and anxiety are largely undiagnosed and untreated, most often due to the stigma associated to this maternal morbidity. In addition, there is a lot of guilt around postpartum depression. It is critical women feel safe to talk about their illness and seek help so they, along with their babies and family, receive much-needed support.

“Recent advances in early development research show that the prenatal period is a particularly critical, vulnerable time for neurobiological development. Maternal depression and anxiety affect the growth and development of the fetus, and are associated with social, emotional and attention problems and chronic illnesses in childhood and adulthood. Depressed, stressed out moms are more likely to experience preterm labour and deliver low-birth weight babies. Their depression, if left untreated, can continue and worsen after the birth, undermining their ability to bond with and care for their children (WCHRI, 2015)”.

Postpartum depression is typically evaluated during the postnatal stage of pregnancy, but research out of the Women’s and Children’s Health Institute shows that in terms of screening and treatment, it’s too little, too late. They suggest the time to start thinking about and discussing depression is during prenatal care. “A minority of the respondents said they felt comfortable



PHOTO BY: DAPHNE CHEN PHOTOGRAPHY

initiating discussions about mental health concerns, while 97 per cent preferred service-provider initiated screening. Surprisingly, most preferred online questionnaires rather than face-to-face interviews. The online screening tool was then developed in

resulted from biological or procedural mediating factors, cannot be determined from the available data. Birth trauma was in fact consistently lower in non-indicated elective cesarean deliveries. In the comparison, overall severe morbidity rates were indeed

“About one in ten women are diagnosed with depression during pregnancy or within 12 months of giving birth.”

– Ackah & Wang, 2011

response to the women’s stated preferences and needs”(WCHRI, 2015). Women admitted to the high-risk pregnancy unit at the Lois Hole Hospital for Women in Edmonton are currently being screened for depression and anxiety using the online screening tool developed by WCHRI. Women who are then found to have symptoms or are at risk for anxiety or depression are offered appropriate care, including e-therapy, which is provided through bedside computer terminals (WCHRI, 2015).

In most (but not all) comparisons, these higher maternal morbidity rates are not accompanied by lower rates of infant morbidity but rather by higher rates of infant morbidity (Ackah & Wang, 2011) “Whether infant morbidities occurred as a direct result of the delivery itself (e.g. from laceration of the placenta or fetal injury during the cesarean section, from the presence or absence of the mechanical forces of vaginal delivery, etc.), or

significantly lower in non-indicated elective cesarean deliveries than in all other deliveries (Ackah & Wang, 2011)”.

While the costs of postpartum depression and other maternal and infant morbidities were not the focus of the report, the analyses by Alberta Reproductive Health indicate that as many as 100 serious maternal morbidities and nearly 200 serious infant morbidities could be avoided in Alberta every year, in the absence of non-indicated cesareans (Ackah & Wang, 2011). The results of the study further confirm the importance of addressing birth practices to ensure better birth outcomes, reduce hospital admission and unnecessary healthcare spending; and present additional potential costs savings that should be explored further.

Key Barriers to Care

After reviewing the data and literature, meeting with stakeholders and listening to consumers, several barriers to maternity care in Alberta became apparent. These barriers influence the ability of women to access care, limit choices for pregnant women, hinder the integration of midwives and nurse practitioners into the current system, and contribute to the current unsustainable system.

- 1. Currently, midwives are the only care provider able to offer out of hospital birth to women.** Unfortunately, due to the funding constraints of midwives, for many women choice of birth location and care provider is limited. Physicians in Alberta currently do not have the ability to bill for out of hospital births, further limiting options for childbearing women. There is an increased need to support a woman's choice of birthplace, be it home, hospital or birth centre.
- 2. Shortage of care providers in rural communities.** Canada lacks the ability to supply the maternity care (particularly intrapartum care) required, especially in rural and remote, inner-city and Indigenous communities. The declining number of GPs and OBGYNs practicing obstetrical services is placing an extra strain on the system.
- 3. Segregation of maternity care funding.** The current funding model has physicians reimbursed by fee-for-service through Alberta Health and midwives by course of care under Alberta Health Services. At the same time, midwives are capped in both the funding for the total of number of births that can be provided by midwives in any given year (2774 in 2015-16), as well as an individual cap for each midwife (40 CofC). Ideally, the money should follow the mother and baby instead of care provider. No birthing mother is ever turned away from the hospital/physician-led birth, yet thousands of women sit on waitlists wanting midwife-led births.
- 4. Lack of full integration of midwives into the health care system, even though the current long waitlist for care shows there is a demand.** In addition, midwives still have difficulty gaining hospital privileges in some institutions and especially in rural areas. Nurse practitioners are also currently under-utilized in Alberta, while obstetricians and general practitioners often have long wait times, both in their ability to schedule timely appointments and in-office waiting. All of which, affects the quality of care provided to Albertan families.
- 5. Non Evidence-based hospital policies and procedures.** There is a lack of up-to-date, evidence-based policies in hospitals, particularly in regard to labour interventions, water birth, and breastfeeding practices that need to be addressed. Informed choice is a right that should be available to every woman but is often lacking in Alberta.
- 6. Lack of culturally appropriate care available for Indigenous communities.** There is an overall lack of care providers in rural and remote areas that often serve Indigenous communities. In addition, there are very few providers that offer care specific to Indigenous culture throughout the province, including urban areas. Across Canada there is a shortage of registered Indigenous midwives to meet the needs of Indigenous birthing women. "[Indigenous] rural women are at greater risk than their urban counterparts of experiencing poor childbirth outcomes and heightened financial and social stress due to birthing away from their family and community. Historically, [Indigenous] women ... have given birth close to home with the help of experienced women in the community"(Centre for Rural Health Research, 2012). This is no longer an option for many Indigenous women.
- 7. Lack of education on the benefits of midwifery and nurse practitioners.** Much of the general population still lacks an understanding of the role and scope of these care providers. Misconceptions also often exist among other health professionals, hindering referrals and collaborative care.

Key Recommendations

BOTTOM UP COSTS ANALYSIS

The data available for this report limited the analysis to a top-down approach, mainly examining total financial costs and calculating average unit costs from that information. Ideally, a patient level bottom-up costs comparison using matched cases should be undertaken. The combination of both a top-down and bottom-up costs analysis would provide a baseline and well-rounded picture of maternity costs in Alberta and highlight areas for potential savings. The costs associated with maternity care and its associated outcomes go beyond pregnancy and the immediate postpartum period, well into the first year and beyond. If at all possible, the use of other resources, such as public health nurses, lactation consultants and physiotherapists during the first year should also be included in a costs analysis. Variations in quality of care and overall health outcomes should be considered, as short-term expense could lead to long-term savings or vice versa. Including the costs of other resources and outcomes in an analysis would allow the true economic costs to society, including those activities that do not require direct payment by the government, to be considered before implementing any policy changes.

DEVELOPMENT OF AN INTEGRATED PROVINCIAL DATABASE FOR MATERNITY CARE OUTCOMES

Currently there is no fully integrated database for maternity care statistics in Alberta. The Alberta Perinatal Health Program (APHP) does collect and manage data on maternity care in the province, but there can be a significant delay between when providers collect data and when it is publicly available through APHP.

The Better Outcomes Registry and Network (BORN) system in Ontario could be used as a good starting point for further development of the Alberta reporting system. BORN's integration of reporting with the variety of stakeholders involved in maternal and child health and through a variety of methods helps provide data to guide policy decisions, monitor outcomes, and evaluate programs in a timelier manner than has been available in the past. It allows for reference of key performance indicators, such as cesarean and breastfeeding rates, which can also support increased transparency and information sharing between care

providers, stakeholders and the public. Integrating data collection with electronic charting when possible can help streamline this process. Some of these changes are already underway in Alberta.

FUNDING MODEL EVALUATIONS

Currently in Alberta, there are 96 midwives practicing, but that isn't enough to meet demand. The current funding model makes it difficult for AHS to fund more courses of care, especially considering the current fiscal challenges faced in Alberta. This limits the number of midwives able to practice and year-to-year contracts create further uncertainty. Ideally, the funding for midwives and physicians offering maternity care should come from the same budget and agreements should span several years, providing stability and allowing women the freedom to choose the care provider of their choice without the limits of funding caps.

At the same time, the flat fee CofC model can create issues when clients are transferred to another care provider partway through pregnancy and, in some cases, includes the potential for double billing. A system similar to British Columbia, where midwives compensation is in 5 phases (1st trimester, 2nd trimester, 3rd trimester, labour and delivery, and postpartum) and integrated into the same billing system as physicians should be assessed for feasibility in Alberta. The fee-for-service model for physicians should also be reviewed and alternative funding models considered. The status of healthcare spending is currently unsustainable in Alberta. These are complex issues that require creative solutions and innovative thinking.

When evaluating funding models, consideration should also be given to: ways to encourage increased access to care in rural areas, collaboration between care providers, and allowing practitioners to operate to their full scopes of practice.

INCREASE COLLABORATION AND INTEGRATION

The successful integration of Alberta Midwives into various multidisciplinary teams, where there is collaboration with other care providers such as obstetricians, family physicians and nurse practitioners, is key to the successful design of a sustainable maternity care model. Primary Care Networks (PCNs) in High

Level, Rocky Mountain House and High River have already successfully integrated midwives into their practices, increasing access to care in rural and remote areas and for surrounding Indigenous populations. Integrative models such as the Community Birth Programs in Surrey and Vancouver, BC provide innovative, collaborative primary care through a multidisciplinary program. Family physicians, midwives, community health nurses and doulas all collaborate to provide care in a community-based, culturally-appropriate, and woman-centered manner during pregnancy, birth and the newborn period (Community Birth Program, 2016; SCBP, 2012)

In 2015, the Association for Safe Alternatives in Childbirth (ASAC) created an educational video entitled “What is Midwifery?” (<http://bit.ly/1ZzgC2l>) as a tool to be used in educating consumers and health care practitioners on the benefits and scope of midwifery care in Alberta. Further education should help to alleviate many of the concerns around the safety of home birthing, the skills of midwives and encourage collaboration.

Hospital privileges for midwives also need to be expanded, particularly in rural areas, to allow for increased access and safe options for pregnant women.

LOWER INTERVENTION AND CESAREAN RATES

Cesarean births will continue to be the best choice in cases where the risks to mother and baby of continuing with a vaginal birth outweigh the risks of a surgical birth. Better outcomes for mother and baby are worth more than the financial cost of surgery. But it is becoming increasingly clear that cesareans are being performed more often than medically indicated and represent a large cost to the healthcare system. Reducing rates even modestly could save the healthcare system millions, but is no easy task.

“All available research suggests that the public needs better information about pregnancy, labour and birth. A strategy to engage consumer-oriented media should be central to this work, and will contribute to better understanding and decision-making by the public. Childbearing women and their families should be provided with evidence-based information about pre-existing or demographic factors and modifiable factors that contribute to obstetric interventions in childbirth. High quality information will

allow women to be active participants in their own care” (BCPHP, 2009). A Canadian example of this is the Power to Push campaign in BC (www.powertopush.ca).

“Malpractice continues to be the leading cause of litigation against healthcare providers in Canada and obstetrical care providers are sued more often than other specialists: “Awards against them can be very large, and they pay more for liability insurance coverage than any other specialty except neurosurgeons” (Yang et al., 2009). The Canadian Institute, which hosts an annual conference on medical liability, describes the effect of medical liability on obstetrical providers as potentially devastating: “The issues, both medical and legal, are extremely complex. The cost of malpractice—monetary, human, and professional reputation—can be devastating. In this high-risk area, every healthcare professional and institution providing obstetric care needs up-to-the-minute information on the medical and legal issues, as well as current strategies to minimize the risk of liability” (Canadian Institute, 2006). As Yang et al. write, cesarean section is not risk free, but it is widely believed to reduce the risk of rare catastrophic birth injuries (2009). Any approach taken to reduce cesarean section will need to address this very real issue for obstetrical care providers (BCPHP, 2009)”.

Another complex part of the problem to be considered is the ‘cost of waiting’ for physicians. Attending to a mother in labour involves waiting for an uncertain amount of time, no matter which care provider is present. For physicians with busy practices, this waiting can be an inefficient use of their time, where they could be seeing other patients, and to avoid waiting through a long labour they may choose to intervene to augment labour or perform a cesarean. In hospital, long labours also represent a problem for resource management, as labouring women occupy beds, making them unavailable for other birthing women. “Similarly, the low rates of C-section for mothers who begin at birth centers or are attended by midwives elsewhere may be due in part to the lower opportunity costs of waiting for midwives than for obstetricians (and to selection of mothers who do not need C-sections; Chambliss et al. 1992)(BCPHP, 2009)”. The costs of waiting are reduced for physicians when other care providers (nurses, nurse practitioners, midwives, etc.) are able to attend the labouring women in their place and on-call rotations shared with other physicians.

Midwives in Alberta have low cesarean rates and high VBAC success, combined with the fact they offer out of hospital birth, it only makes sense to increase access for women wanting midwifery care. “The Dutch insurance system gives preferential reimbursement to midwife deliveries and covers home assistance by nursing aides, creating strong incentives for delivery by midwives out of hospital rather than by physicians in hospitals (BCPHP, 2009)”. In addition, increased training and mentorship in vaginal breech births and VBACs for physicians and midwives would allow more women to have this option instead of cesareans.

In order for a sustainable system to be created, all maternity care providers and stakeholders need to be engaged; involved in finding solutions and promoting innovation. Strategies employed to decrease cesarean rates should be realistic, positive and focused on making Alberta a leader in the delivery of high quality evidence-based maternity care, instead of shame based and punitive.

BIRTH CENTRE FUNDING

Birth centres offer a cost effective alternative to hospital birth. They provide an option other than home birth for women with uncomplicated pregnancies wishing to give birth out of hospital. Births that take place in birth centres or at home reduce medical interventions, save significant healthcare dollars and free up beds in hospitals for those who need them. The cost of funding birth centres should only be a fraction of what would otherwise be spent on hospital costs and interventions. Incentives for home birth could also help accomplish this goal. Funding and training for Physicians willing to attend out of hospital births would increase the options for women wanting this choice.

Beginning in 2012, Ministry of Health and Long-term Care in Ontario undertook a pilot project funding two not-for-profit birth centres for two years; one in Toronto and one in Ottawa. Since midwives are the only care providers offering out of hospital births, they have tasked the College of Midwives of Ontario with regulating these facilities. The government stated they wish to provide women with healthy pregnancies more choices around the care they and their babies receive. A similar pilot should be considered in Alberta.

Currently in Alberta there are 2 freestanding birth centres in operation. The Lucina Centre in Edmonton and Arbour Birth Centre in Calgary. Both are privately run centres which allow midwifery clients an alternative to hospital or home birth. The Lucina Centre is also the first of its kind in Canada, combining both a birth centre and wellness centre in one location.

FOCUS ON RURAL, REMOTE AND UNDERSERVED POPULATIONS

Rural areas continue to struggle to attract and retain enough health care providers to meet the needs of communities. Creating incentives for new graduates to enter rural practice, including both physician and midwife mentorship programs, extra support through evidence-based rural practice education programs and encouraging collaboration between care providers are important steps for attracting care providers to underserved areas. Financial incentives, such as student loan forgiveness programs, travel expenses for rural midwifery preceptors and extending rural incentives currently offered to physicians to midwives and nurse practitioners should also be considered.

Particular attention should be given to the cultural needs of Indigenous students, including training closer to home and facilitating the training of Indigenous midwives. For all care providers, education should be “provided with attention to the unique issues that [Indigenous] birthing women face within a culturally responsive framework” (Centre for Rural Health Research, 2012). Indigenous communities in particular need to be engaged in finding solutions that meet their needs.

INCREASE BREASTFEEDING SUPPORTS

With increasing health issues such as childhood obesity, early onset diabetes, cancers and rising health care costs, the promotion, protection, and support of breastfeeding has become even more critical as research points to relationships between breastfeeding and the onset of disease. The Baby-Friendly Initiative (BFI) is an integrated approach for hospitals and community health services, based on the Baby-Friendly Hospital Initiative and provides ten evidence-based steps to optimally support maternal-child health for all mothers and babies. Improving breastfeeding data collection and research, reducing

unnecessary birth interventions, and supporting a breastfeeding rights culture in Alberta are important ways to support increased breastfeeding success.

Breastfeeding policies and programs should be developed in consultation and collaboration with Indigenous populations and, where possible, delivered by Indigenous women to enhance cultural acceptability. Increased funding for breastfeeding supports for rural, remote and underserved populations will help meet the needs of the highest risk populations while also having the potential for the greatest impact on illness prevention.

Genuine and urgent commitment is needed from governments and health authorities to establish a new normal: where every woman can expect to breastfeed, and to receive every support she needs to do so.

DOULA SUPPORTS

An often cited quote by Dr. John H. Kennell is “If a doula were a drug, it would be unethical not to use it.” Doulas do not provide any medical care, but offer emotional and physical support, as well as information to pregnant women and their families. A 2012 Cochrane review showed women who have continuous labour support were more likely to experience a spontaneous vaginal birth using less analgesia, had shorter labours, lower cesarean rates and higher satisfaction (Hodnett ED, Gates S, Hofmeyr GJ, 2007). All of those have the potential to reduce healthcare costs in a cost effective way.

Doula services are not provincially funded and are paid out of pocket by families. In some places, such as Swedish Medical Center in Seattle, Washington and Village Health Clinic in Surrey, BC, doulas are being integrated into hospitals and clinics to further support pregnant women and work in collaboration with a variety of healthcare providers (Community Birth Program, 2016; Swedish Medical Center, 2016).

“It has been shown that trained doulas will help keep caesarean section rates down but doula support is especially scarce in rural settings. Moreover, the complex and often solitary role of the rural maternity nurse makes it even more unlikely that nurse will have the time to function as support person and may not be successful in this role (BCPHP, 2009)”. Investing in doula training,

particularly Indigenous doula programs, or funding doula care in rural populations and for high-risk clients should be considered.

COMPARE NATIONAL AND INTERNATIONAL MODELS

In some countries, such as the UK, New Zealand, Sweden and Netherlands, midwives deliver between 68% and 90% of babies. The models of care offered in other countries should be examined, including costs and health outcomes, to guide workforce planning and policy decisions in Alberta.

It is important to note that countries with higher midwifery utilization do not necessarily follow the same model of care practiced by Canadian midwives, which could impact the quality of care provided and satisfaction of birthing women who are attracted to the one-on-one care midwives are able to provide in our country.

Waterbirth is also more common in other countries. Considering its popularity among midwifery clients and the number of women who are requesting this option (but denied) for hospital births in Alberta, the practice of in hospital waterbirth in other countries should be explored. This should include the opportunity for education and mentorship by care providers experienced in waterbirth both internationally and within Alberta.

In addition to reviewing international models, midwifery care within other Canadian provinces, specifically Ontario and British Columbia, should also be examined in order to learn from their successes and failures in achieving a higher percentage of midwife-led births.

Cost Comparison among Care Providers: Conclusion

Canada is one of a few nations that has so few births attended by midwives. Alberta is even further behind. At last count, there were only 96 midwives attending fewer than 5% of births in Alberta. This figure stands in stark contrast with places like the Netherlands and New Zealand where upwards of 80% of women are cared for by a midwife, and even within Canada; where midwives attend about 19% of births in provinces such as British Columbia.

In the last 20 years, the number of midwives in Canada has grown, but only modestly. At the same time there has been a rapid exodus of family physicians no longer delivering babies, for a number of reasons, including that attending births is disruptive to one's practice and one's lifestyle. Obstetricians, specialists in high-risk maternity care, have been left to address this gap, which many feel is an inefficient use of their expertise and healthcare dollars. Family physicians largely refer pregnant women in their practice to obstetricians, in part because there are too few midwives available. Of even greater concern is that Canada lacks the ability to supply the maternity care needed, particularly in rural and remote, inner-city and [Indigenous] communities. (Morgan, Carson, Gagnon, and Blake, 2014). In Alberta, healthcare spending has risen to more than 40% (approximately \$20.0 billion) of the provincial budget. It is clear that the current system is unsustainable and needs to change.

It is important to note that maternity care providers are not necessarily interchangeable. Midwives, family physicians and obstetricians all deliver babies with different approaches. Obstetricians are skilled in managing high-risk pregnancies and births; this requires increased vigilance and often intervention. Having obstetricians care for women with low-risk pregnancies can result in more interventions and cesareans being done on women for whom the interventions are less appropriate, less effective and less evidence-based. The consequences of these actions on both short and long-term health outcomes need to be considered.

The fact that childbirth is the most common reason for hospitalization and that cesareans rank as the top surgical procedure across Canadian hospitals, surpassing the next most frequent procedures (fractures and hip/knee replacements) by almost two fold, should cause some serious reflection on the state of maternity care in Canada, and more specifically, Alberta. Decreasing cesarean rates and increasing VBAC rates could represent a significant cost savings of healthcare dollars, as an estimated \$112 million of Alberta's healthcare dollars were spent on cesareans in 2013.

Midwives are skilled in managing low-risk pregnancies and birth and their model of care allows them to spend more time with patients, to offer out of hospital and waterbirth as options, and to use fewer interventions. Many studies, including several Canadian studies, have confirmed the safety and efficacy of midwifery-led care as an option that should be available to all women with low-risk pregnancies. This difference in approach translates into an average cost savings of just over \$540 per midwifery birth and a savings of \$2,055 for home births when compared to uncomplicated vaginal birth with an obstetrician. Midwives offer high quality and continuity of care, relieving some of the burden on the healthcare system while also offering cost savings.

With increasing health issues such as childhood obesity, early onset diabetes, cancers and rising health care costs, the promotion, protection and support of breastfeeding has become even more critical as research points to relationships between breastfeeding and the onset of disease.

Suboptimal breastfeeding rates result in significant excess costs and preventable deaths. Investment in strategies to promote longer breastfeeding duration and exclusivity would not only improve health outcomes, both short and long-term for mothers and babies, but would also be cost-effective. While not all illnesses would be eradicated by breastfeeding, even a modest increase in breastfeeding rates could save millions annually due to the reduction of infant infections and illnesses.



PHOTO BY: HELGA PHOTOGRAPHY

In order to create a sustainable maternity care system in our province, we need to increase access to midwives and create a more collaborative care model amongst maternity care providers. These changes will involve costs, but the subsequent savings from lower cesarean rates and interventions, higher breastfeeding rates, and the associated improved health outcomes both short and long term will be significantly higher than the added expense. The issues around funding models are complex and not an easy

fix, especially given the current state of the economy. The costs savings presented will assist in balancing budgets and using taxpayers' money responsibly in a time where fiscal responsibility is imperative to not only creating a sustainable health care system but also a healthier Alberta.

Limitations

- ❖ The scope of this report is only to compare average costs based on overall maternity care related billings in Alberta in 2013-14. Determining the actual costs or savings of care is a complex undertaking, with many different factors to take into consideration and is the reason the recommendations section of this report outlines the need for a bottom up analysis. In addition, it is difficult to account for any indirect costs or savings that may be accrued over time as a consequence of a particular intervention or model of care. Analysis was based only on FFS remunerations coded in the source data (see Appendix 1); it is possible some codes were missed.
- ❖ The data was limited to the overall claims by OBGYNs and GPs for the prenatal billing codes. Without pulling matched data at the patient level, it cannot be determined if there are any differences in the costs of prenatal claims for pregnancies ending with births requiring more intervention or cesarean deliveries versus uncomplicated vaginal births. In addition, those women who had pregnancy losses or moved in or out of the province partway through prenatal care could not be taken into account. Phone consults were also not included.
- ❖ The authors did not have access to data examining the average number of prenatal visit claims overall per patient and were left attempting to calculate based on the overall totals by provider. This became difficult because it is not uncommon for women to visit their GP for early prenatal care, only to transfer partway through the pregnancy to OBGYN care often around 20-32 weeks. Women may also receive care from groups of physicians in a shared care model versus a single provider. In essence, both GPs and OBGYNs may bill for prenatal visits with the same patients at different points in pregnancy with the exception of Prenatal Assessments (03.04B), which are only allowed to be billed once per pregnancy. When attempting to calculate the average number of prenatal visits per provider, the result is an average of 5.45 prenatal appointments and 1.03-1.11 prenatal assessments per patient. In reality, the recommended schedule of prenatal appointments is 10 - 16 per pregnancy.
- ❖ Data on postnatal costs for the mother was limited to total Fee-for-Service payments for the code 03.03C. It did not include any subsequent follow-up visits billed under other codes. A more detailed case matching analysis would need to be done in the future to determine the number of repeat office visits for postnatal care not billed under 03.03C and if there is any significant difference in postnatal claims based on type of birth, interventions and care provider.
- ❖ Unfortunately, information on claims for newborn care or visits on subsequent days in hospital or after discharge was not available to the authors, so the true cost of newborn care from birth to 6-weeks could not be determined.
- ❖ Patients who gave birth under GP or OBGYN care are also offered a phone call and two postpartum visits by Public Health nurses to follow up with breastfeeding, newborn health and general postpartum recovery. Patients of midwives are not offered these routine public health nurse visits for postpartum health, as midwives fill this role.
- ❖ The costs analysis did not look at costs associated with NICU stays for infants, which can put increased financial strain on the healthcare system. The data also did not include the costs for any subsequent hospital admissions, doctor visits, therapies (e.g. Light therapy), medications or other interventions required when infants are born prematurely or with existing health conditions.
- ❖ The scope of this report did not include comparing data on long-term costs associated with more traumatic or intervention heavy births, such as increased follow-up visits, physiotherapy claims, home care, surgical repairs done after discharge, counselling, difficulties with breastfeeding or any other relevant services that may be accessed by women following difficult births. Though it could be suggested that after looking at the birth practices, breastfeeding rates and hospital readmissions, increased postnatal visits for both mother and infant are likely, resulting in additional costs to the healthcare system not detailed in this report.
- ❖ Midwives are paid per Course of Care vs physician Fee-for-Service. There is no data specifically comparing compensation per hour or by average hours per patient available. If reimbursement of midwives and physicians were compared based on time spent in direct patient care instead of by service, it is expected the physician fees would be significantly higher.



PHOTO BY: VANESSA BROWN PHOTOGRAPHY

- ❖ Data was calculated using weighted averages and based on midwives having a 48% out of hospital birth rate. We expect the costs of midwifery care would increase as the rate of hospital births increased.
- ❖ The biological processes underlying the health outcomes and morbidities described in this paper have not been researched, but they are nevertheless crucial to understanding the impact of current practices on women and infants. Further research into underlying mechanisms behind the health outcomes and morbidities discussed would be valuable and could then lead to the development of strategies to prevent or ameliorate adverse outcomes
- ❖ This data should be considered at the level of population health, not at the level of individual health. While the data indicates excess maternal and infant morbidity and increased adverse outcomes due to non-indicated elective cesareans at the population level, no such claim can be made at the individual level. There are many complex factors involved in any individual birth and information should not be generalized or considered to be true in all cases. A decision at the individual level would require consideration of all relevant factors specific to each individual and situation, not just the findings presented here.

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Appendix 1:

Codes used in Analysis

CASE MIX GROUPING CODES USED

CMG+ CODE	DESCRIPTION
558	Primary Caesarean Section/ with induction
559	Primary Caesarean Section/ no induction
560	Caesarean Section with uterine scar/ no induction
561	Caesarean Section with uterine scar/ and induction
562	Vaginal Birth with Anaesthetic and Non-Major Obstetric/Gynecologic Intervention
563	Vaginal Birth with Anaesthetic without Non-Major Obstetric/Gynecologic Intervention
564	Vaginal Birth without Anaesthetic with Non-Major Obstetric/Gynecologic Intervention
565	Vaginal Birth without Anaesthetic without Non-Major Obstetric/Gynecologic Intervention
576	Normal Newborn/ Singleton Vaginal Delivery
577	Normal Newborn Multiple/Caesarean Delivery

ALBERTA SCHEDULE OF MEDICAL BENEFITS CODES

SOMB CODE	DESCRIPTION
3.03B	Prenatal visit
3.03C	Routine post-natal exam (only once per physician, per pregnancy)
3.04B	Initial prenatal visit requiring complete history & physical exam (only once per pregnancy per physician)
3.07C	Obstetrical consultation, repeat, limited
3.08B	Obstetrical consultation, comprehensive
3.08M	Obstetrical consultation, comprehensive, extended per 15 min (after min 30 min)
3.05G	Care of healthy newborn in hospital (first day)
3.05GA	Care of healthy newborn in hospital (subsequent days)
13.99JA	Management of Complex Vaginal Delivery per 15 min
16.91C	Epidural insertion for labour
16.91G	Epidural monitoring for labour & delivery – top up or monitoring, each additional full min
16.91F	Epidural monitoring at forceps/vacuum delivery, vaginal breech or vaginal multiple
84.21	Mid forceps delivery with episiotomy (in addition to base delivery fee)
85.5A	Medical Induction
85.69B	Shoulder dystocia (if management needed, in addition to base delivery fee)
85.69C	Manually assisted delivery (breech, manual or forceps assisted, in addition to base delivery fee)
85.91	External Version

86.9B	Cesarean hysterectomy
86.9C	Cesarean section – elective
86.9D	Cesarean section – following trial of labour for any reason
87.54A	Interpretation of non-stress test, before labour
87.54B	Fetal monitoring, continuous – only in cases requiring greater than usual physician supervision for suspected maternal or fetal compromise.
87.6	Retained Placenta removal
87.72A	Repair obstetric laceration cervix
87.82	Repair obstetric laceration sphincter ani
87.89A	Repair obstetric laceration involving rectal mucosa
87.89B	Repair extensive vaginal laceration
87.98A	Vaginal Delivery
87.98B	Management of attempted vaginal delivery
87.98C	Vaginal Delivery after previous caesarean (VBAC)
87.98D	Vaginal delivery, multiple birth (for each additional newborn)
87.98E	Second attendant at delivery
87.99A	Post-partum hemorrhage, non-surgical management
87.99AA	Post-partum hemorrhage, surgical management of severe

*Shift premiums (EV, NTAM, NTPM, WK), and fee modifiers (such as 25% premium for BMI over 35) are included in totals when applicable, as well as info on shadow billing where available and applicable,.



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