

A PRENATAL PERSPECTIVE ON THE COST OF SUBSTANCE ABUSE IN CANADA

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ABSTRACT

The Canadian Centre for Substance Abuse recently estimated the annual cost of substance abuse in Canada to be nearly 40 billion dollars. The estimation does not contain comprehensive economic consequences of prenatal exposure to tobacco, alcohol, and illicit drug use. Although many studies have estimated the cost attributable to prenatal substance exposure in specific populations and age groups, national cost estimations cannot be made mainly due to lack of Canadian prevalence data for drug use during pregnancy. The development of objective biomarkers for prenatal substance exposure presents an opportunity to build on prevalence data for Canada. By improving prevalence data and cost estimations, the large economic impact of prenatal substance exposure may be realized and used to argue for public policy change.

Nearly 40 billion dollars per year is what substance abuse in Canada costs, according to a recent report released by the Canadian Centre for Substance Abuse (CCSA).¹ Although this estimate is conservative, it represents a burden of \$1,267 to every individual in the country. Evaluation of the costs associated with substance abuse was prepared from data collected in 2002 according to the *International Guidelines for Estimating the Costs of Substance Abuse*.² Both direct and indirect costs associated with tobacco, alcohol, and illegal drug abuse were included, such as health care, law enforcement, and loss of productivity.¹ Tobacco abuse accounted for 42.7% of substance abuse costs, followed by alcohol at 36.6%, and illegal drugs at 20.7%.¹

Two important reasons for determining the cost of substance abuse are outlined in the *International Guidelines for Estimating the Costs of Substance Abuse*.² First, estimates can be used to argue high priority for substance abuse policies on the public agenda. Second, estimates can identify research needs and information gaps within the area of substance abuse. The CCSA report¹ makes clear the lack of economic estimates associated with prenatal exposure to tobacco, alcohol, and illegal drugs. Prenatal exposure is an extremely important consideration when analyzing the economic impact of substance abuse because it leads to costly short and long-term expenditures. Also, children with prenatal exposure are more likely to abuse substances themselves, creating a cycle.³ This paper will briefly discuss costs associated with prenatal

exposure, opportunities for improving knowledge in this area, and why improving on this area should be a priority.

Determining the economic impact of prenatal substance exposure is a difficult task for three main reasons. First, an accurate estimate for the prevalence of substance use in pregnancy is currently unavailable. Second, consequences of prenatal substance exposure are not fully understood. Third, studies determining costs in a specific population are difficult to generalize to the national scene, making it necessary to repeat studies in different populations. Although difficult, several studies have shown the prevalence and economic impact of prenatal exposure to tobacco, alcohol, and illegal drugs, but each has its limitations and missing data:

Tobacco

According to Health Canada, 20-30% of women of smoke during pregnancy.⁴ The rate of maternal smoking differs dramatically between regions within Canada⁵ but Canada does not currently have adequate resources to assist with smoking cessation prior to or during pregnancy. Although the rate of maternal smoking has decreased⁵, smoking in pregnancy is still the most prevalent cause of low birth weight in developed countries.⁶ Birth weight is the strongest predictor of health outcome for the infant and low birth weight infants are significantly more likely to require additional health resources. An American study showed that infants born to mothers who smoke have an increased neonatal cost of \$724.⁷ Additionally, complicated births in smokers had a

cost 66% greater than that of a non-smoker.⁸ Furthermore, studies overwhelmingly support the economic benefits of preventing, identifying, and treating substance abuse in pregnancy.⁹ Every dollar spent on treatment of smoking during pregnancy, according to American studies in 1990 & 1993, will result in savings of \$3 for acute neonatal health care costs and \$6 in long-term costs.⁹

Alcohol

The consequences of heavy alcohol consumption during pregnancy are well characterized resulting in fetal alcohol spectrum disorder (FASD). It is estimated that 3000 babies are born with FASD per year in Canada.¹⁰ The most severe end of the spectrum is fetal alcohol syndrome (FAS), a leading cause of mental retardation. Children presently living in Canada with FASD will cost at least \$600 billion, a similar size as the entire national debt, according to Bonnie Buxton, cofounder of International FAS Awareness Day.¹¹ The most recent Canadian estimation of costs associated with one child between ages 1-21 affected with FASD was on average \$14,342, leading to an annual burden of \$344.2 million for only children between 1-21 years of age.¹² Extrapolating this cost to age 65 would result in an estimated 3-4 billion dollar annual loss. This estimate does not include, however, large neonatal costs that would occur from low birth weight or other short-term consequences of prenatal alcohol exposure.

Many expenses associated with FASD, such as medical and educational costs, are relatively easy to estimate. However, other significant costs are disregarded due to lack of data. A significant cost is associated with children within the child welfare system. Children with FASD are most likely over represented within the child welfare system, although the numbers are unknown. It has been estimated that 50% of children in care in Alberta have FAS.¹³ Moreover, there is a large cost associated with incarceration but the prevalence of prisoners affected by FASD is certainly underestimated. The proportion of young-offenders with FASD could be as high as 50%¹⁴ yet prisoners with an actual diagnosis of FAS or FASD is lower than what would be expected in the general population.¹⁵

Illicit Drugs

Data on the cost of illicit drug use in pregnancy is the most limited. Although accurate prevalence data is missing, the main limitation is that the short and long-term effects of prenatal exposure are not fully understood. Outcomes of the infants and development of the child is confounded by many other factors, such as polydrug use, nutrition, and poverty, among others. Studies have shown that cocaine-exposed infants born to women predominantly using crack cocaine had increased length of stay in hospitals after delivery and hospital charges were more than 2 fold the non-exposed group.^{16,17} Another American study has shown that the average annual cost for special education for children with prenatal cocaine was \$6335 per child.¹⁸ The limitation of the two studies is that the cost is directly attributable to cocaine exposure and does not separate it from other confounding variables.

Illicit drug use during pregnancy is undoubtedly a concern within Canada; between 1990-91, 12.5% of infants born in downtown Toronto and 3% born in suburban nurseries had prenatal cocaine exposure.¹⁹ Canadian prevalence data for other illicit drug use during pregnancy is scarce but should be a priority because of the increased use of ecstasy (MDMA) and methamphetamine, especially in females of childbearing age.

Although the exact costs associated with prenatal substance exposure are not fully elucidated, increasing data on the prevalence of prenatal exposure and increasing diagnosis of affected children will increase the ability to assign costs to this problem. Currently, estimates for the prevalence of substance use during pregnancy come from self-reporting by women. Maternal reports underestimate the prevalence due to social stigma, thereby leading to an underestimate of associated costs. Even self-reports of smoking cigarettes during pregnancy, arguably the least stigmatized substance of abuse, are inaccurate and tend to underestimate exposure.²⁰

In order to develop accurate prevalence data, objective biomarkers can be used to increase the sensitivity for identifying mothers and newborns at risk of prenatal exposure to substances of abuse.^{20,21} Population-based studies using biomarkers of substance abuse have been

completed for cocaine¹⁹ and are currently in progress for alcohol.

In addition to using biomarkers to identify the prevalence of substance use in pregnancy, better screening during pregnancy by health care workers can present the opportunity to properly diagnose affected children. Accurate diagnoses will lead to a better estimate as to how many affected children are within the welfare system or imprisoned. Currently, family physicians in Canada do not routinely screen pregnant women using an accepted screening method, i.e., TWEAK for problem drinking, and just over half of physicians reported actually counselling women in general on alcohol use in pregnancy.²² Physicians are also not confident about diagnosing fetal alcohol syndrome.²² Incorporating a comprehensive undergraduate program regarding substance use in pregnancy during medical school can improve the confidence and attitude towards identifying substance abuse in pregnancy.²³

Improving our knowledge regarding the prevalence of substance use during pregnancy will lead to better estimates of cost associated with substance abuse in Canada. An improvement was seen between the most recent 2002 estimate of \$39 billion¹ and the previous 1992 estimate of \$18 billion prepared by the CCSA.²⁴ Although the two studies cannot directly be compared, the 2002 report is a considerable improvement over the 1992 study because new data sources were consulted regarding social costs attributed to substance abuse.¹ Improving data concerning prevalence of prenatal substance exposure will lead to superior cost estimations, therefore emphasizing the importance of developing public policies regarding substance abuse. Also, by showing the large economic impact of prenatal substance exposure in Canada, the need and cost-effectiveness of funding prevention efforts will be realized.

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