# Introduction

Some factors that are contained as errors are income of the family, what religion the kids are, area the kids are living in (the education standards in Canada are higher compare to third world country) and health condition/age of the mother. The relation between fertility and education is majorly affected by factors of health/age of the mother and income of the mother. If the health condition of the mother is poor, then successful fertility chances are less compare to a mother with well health and this factor is also affected by income. If the income of the mother is low then the living condition is poor, and the mother would be less accepting for a child, as it would increase work task for the mother.

“All other things equal” effect will not be applied to this simple regression, due to no control over other affects which are listed in (A). If the simple regression is applied to this function it would result in total statistics on the education of the women compare to fertility and it would have no possible effect on the other factors.

# Analysis

Original function is y = β0 + β1x +u, we can rewrite this as a function of E: E(y) = E(β0 + β1x +u)

Let E(u) = α0 which ≠ 0

The intercept will change let β0 = (β0 + α0)

New equation E(y) = (β0 + α0) + β1x +u

To prevent any unexpected factors affecting the function, it is best to reduce expectation of the unobservable to 0. So, subtracting α0 from both sides

E(y- α0)= (β0 + α0) + β1x +u- α0

Since E(u) = α0 the equation can be rewritten as

(y- α0)= (β0 + α0) + β1x + α0 - α0

* E(y- α0)= (β0 + α0) + β1x

In result the new intercept is (β0 + α0) which is acquired by taking out the new unobservable ϵ =u-α0)

When cigs=0, bwght = 119.77 – 0.514(0) => 119.77 ounces is the predicted birth weight. When cigs=20, bwght = 119.77-0.514(20) => 109.5 ounces is the predicted birth weight. From the results it can be said that smoking does reduce the weight of a baby, it is seen that 20 cigarettes a day during pregnancy decreases the weight of the baby by 10.28 ounces.

The simple regression on this function will provide results between weight of baby on birth and mother’s smoking habits, but there might be other factors that may negatively impact weight of the baby. For example, if the mother has lack of nutrition or may be under drugs, that may have negative affect on baby’s weight. These factors can be caused by things like income of the mother, which is also affected by education.

If bwght=125 = 119.77-0.514\*cigs. cigs = (119.77-125)/0.514. cigs= -10.2 Since the result is negative that means the data that is collected for this function does not count for average to even come close to that weight for baby greater than 119.77 ounces, as it requires the mother to unsmoked 10.2 cigarettes in this case.

# conclusion

It is hard to say if the information of 0.85 proportion of women are whom do not smoke, will provide anything useful to the function we are working with. For example, what we calculated in question (i) when cigs = 0 expected weight is 109.5 ounces, but this does not include the health of the mother. The mother that are not smoking will have greater health benefits compare to women that are smoking and this data lies towards women that smoke. From this it can be said that the 0.85 proportion of the women will most likely have babies greater than 109.5 ounces of weight. Which further helps say that this data is not suitable for this question as shown from (iii). Any result that is higher than 119.77 is not supported by this model.