OLD DOMINION
UNIVERSITY
School of Community and Environmental Health
MPH Program

Research Methods in Public Health: MPH 616

Data Analysis Project

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For this assessment exercise, you are asked to analyze data comprise of 641 records on mothers who had births. The data is called MPH 616_Data_Analysis_Project.sav. You are asked to analyze the data with the aim to find out whether or not birth weight as an outcome variable is significantly higher in the intervention group compared to no-intervention group. You need also to investigate whether birth weight is significantly related to each maternal age, hypertension, sex of the infant, and gestational age. You may like to categorize a certain variable during this analysis.

Comment on whether birth weight is higher in intervention group. (Max. 2 point)

First, I checked the distribution of birthweight with and without intervention using a histogram (Figure 1). Birthweight is quantitative, intervention is qualitative, and both sets of data are normally distributed, therefore; I will do an unpaired t-test. The p-value from the t-test is 0.534 which is not statistically significant due to it being greater than 0.05 (Table 1). The mean of the intervention group is 3113.09g and the standard deviation is 684.34g (Table 1). The mean of the control group is 3145.23g and the standard deviation is 620.17g (Table 1). The birthweight for the intervention group was not higher than in the control group.

Analyze the association between the birth weight and sex of the infant (Max. 2 point)

The data is normally distributed per the histogram (Figure 2). Birthweight is a quantitative value, sex is a qualitative value, therefore; I will perform an unpaired t-test. The p-value from the t-test is 0.001 which makes it statistically significant due to be lower than 0.05 (Table 1). The mean birthweight of males is 3211.28g with a standard deviation of 665.98g (Table 1). The mean birthweight of females was 3044.13g with a standard deviation of 628.66g (Table 1). It seems that females generally have a lower birthweight than males.

Analyze the association between the birth weight and hypertension (Max. 2 points)

I first checked the normality of the data with a histogram (Figure 3). The data is normally distributed, birthweight is quantitative, hypertension is qualitative, therefore; I will perform an unpaired t-test. The p-value is <0.001, therefore it is statistically significant (Table 1). The mean birthweight of babies born to mothers with hypertension is 2742.16g with a standard deviation of 812.94g (Table 1). The mean birthweight of babies born to mothers without hypertension is 3191.53g with a standard deviation of 601.1g (Table 1). Babies tend to have a higher birth weight if their mother does not have hypertension.

Analyze the association between the birth weight and gestational age (Max. 2 points)

Birthweight and gestational age are both quantitative variables. I will do a scatterplot to test the normality of the data, which is linear (Figure 4). Since we have met these assumptions, I will do the Pearson correlation coefficient. The correlation coefficient is 0.738 and the p-value is <0.001 (Table 2). Since the correlation coefficient

is close to 1 and the p-value is less than 0.05, this is statistically significant. The birthweight of the baby is associated with the mother's gestational age. The regression equation is y=-4865.25+206.64x.

Analyze the association between the birth weight and maternal age (Max. 2 points)

I checked to see if the data is linear through a scatterplot (Figure 5), which it is not. Next, I used the correlation coefficient. The correlation coefficient is 0.034, this is very far from one showing almost no association at all (Table 2). The p-value is 0.394, which is greater than 0.05, showing no statistical significance (Table 2). There is little to no association between birth weight and maternal age.

Check if the impact of the intervention is affected by the confounding by sex of the child (Max. 2 points)

I ran an independent t-test for a crude analysis and got a p-value of 0.534, which is not statistically significant (Table 3). I stratified by sex to see if there was confounding present on the impact of the intervention. When stratified by male the p-value was 0.704, when stratified by female the p-value was 0.813, neither of which are statistically significant (Table 3). There was no change in significance when stratifying by sex, therefore; sex has no impact on the effectiveness of the intervention.

Check if the impact of the intervention is affected by hypertension (Max. 2 points)

First, I ran a t-test for a crude analysis and received a p-value of 0.534, which is not statistically significant (Table 3). Next, I stratified the data by hypertension being present. This analysis produced a p-value of 0.057, which is close to being statistically significant but still not fully there (Table 3). I then stratified by hypertension not being present and that p-value is 0.847, also not statistically significant (Table 3). Since there was no change in the significance of the p-value, there was no confounding by hypertension to the impact of the intervention.

Summary of the findings from all analysis (Max. 2 points)

To summarize the findings, the mean birth weight in the intervention group was 3113.09g compared to 3145.23g in the control group, showing that the intervention did not aid birth weight, also followed by an insignificant p-value of 0.534. Next, the mean birth weight among males was 3211.28g compared to 3044.13g in females, meaning that males generally have a higher birth weight than females, supported by a statistically significant p-value of 0.001. The mean birth weight of babies born to mothers with hypertension is 2742.16g and those born to mothers without hypertension is 3194.53g. Coupled with a statistically significant p-value of <0.001, there is an association between birth weight and hypertension. A Pearson correlation coefficient of 0.738 was found when analyzing the association between birth weight and gestational age. The p-value was <0.001, showing there is a strong association between these two factors. Next, a correlation coefficient of 0.034 and p-value of 0.394 was used to determine if there was an association between birth weight and maternal age. Both if these measures are insignificant, lending to little association between the factors. Hypertension and sex of

the child were measured for confounding factors. When the data was stratified by sex, the p-value did not become more significant, therefore; the data was not affected by sex. When the data was stratified by hypertension being present or not, the p-value did become more significant but not enough to be significant in confounding.

Table(s) (Max. 2 point)

Table 1: Unpaired T-Tests

Birthweight Group	**Mean**	**p-value**	**Interpretation**
Intervention	3113.09g±684.34g	0.534	Not significant
Control	3145.23g±620.17g		
Male	3211.28g±665.98g	0.001	Significant
Female	3044.13g±628.66g		
Hypertension	2742.16g±812.94g	<0.001	Significant
No Hypertension	3191.53g±601.1g		

Table 2: Association of Birth Weight and Gestational/Maternal Age

	Correlation coefficient	**p-value**	**Interpretation**
Birth weight & gestational age	0.738	<.001	Significant
Birth weight & maternal age	0.034	0.394	Not significant

Table 3: Impact of Confounding

Stratified by:	**p-value crude**	**p-value stratified**	**Interpretation**
Sex	0.534	Male: 0.704	Not a confounder
		Female: 0.813	
Hypertension	0.534	Hypertension: 0.057	Not a confounder
		No Hypertension: 0.847	

Figures (Max. 2 point)

Figure 1: Distribution of Birthweight with or without intervention

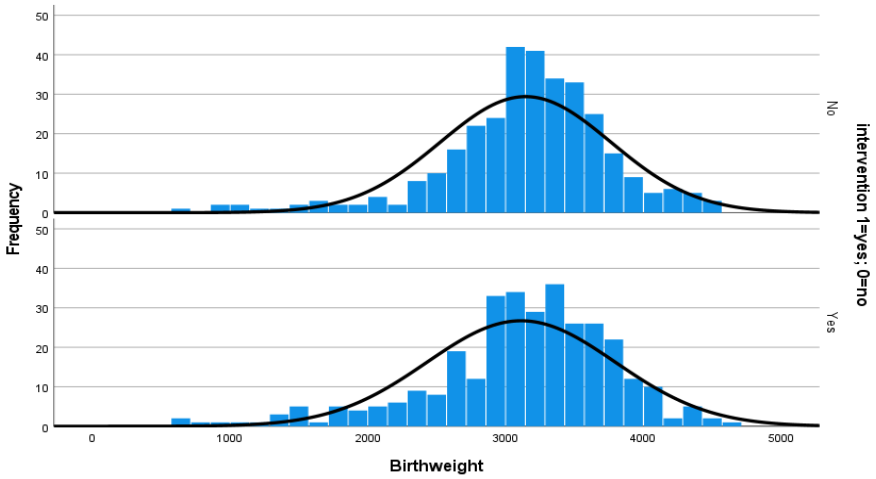

Figure 2: Distribution of Birthweight by Sex

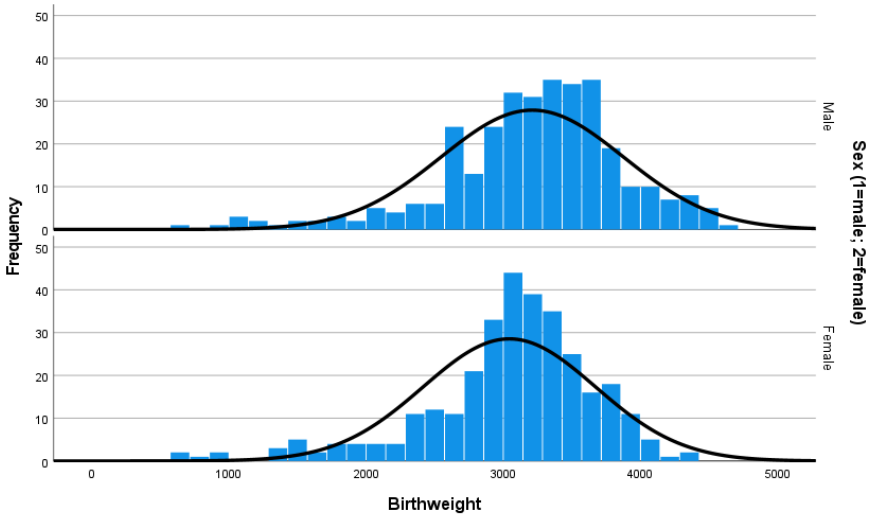

Figure 3: Distribution of Birthweight by Hypertension

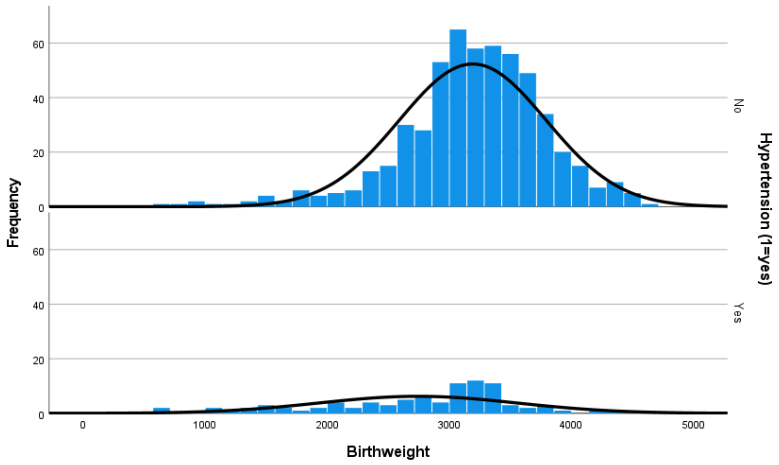

Figure 4: Scatterplot of birthweight and gestational age

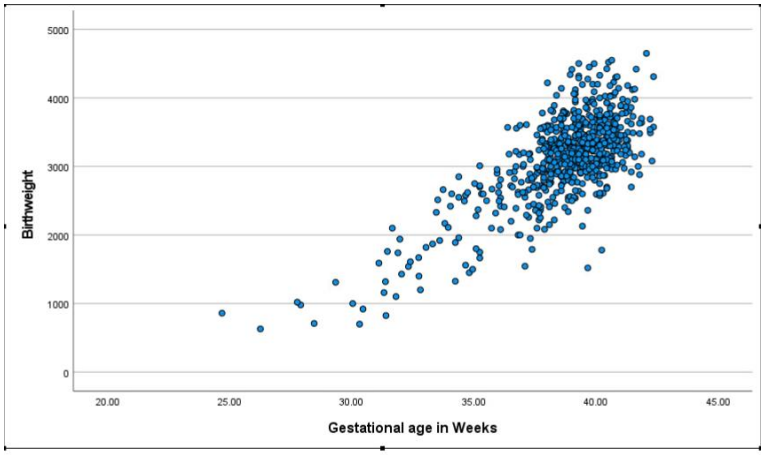

Figure 5: Scatterplot of Birthweight and Maternal Age