

PREDICTING THE CHANCES OF CORONARY HEART DISEASE

¹Agu Friday I. and ²Okeh U.M.

^{1,2}Industrial Mathematics / Applied Statistics Department, Ebonyi State University,
Abakaliki, Nigeria

E-mail: ik4muchluv@gmail.com (*Corresponding Author)

Abstract: Coronary heart disease (CHD) is a slow deposition of fat on the inner wall of the blood vessel (Heart Foundation). It is called cardiovascular disease and also a narrowing blockage of the arteries and vessels that provide oxygen and nutrients to the heart. This work focused on predicting the chances of CHD based on certain chosen risk factors. The data was collected from the Federal Teaching Hospital Abakaliki, Nigeria for 100 randomly chosen patients having one or more of the risk factors for the disease. There were patients at the age from 20 to 69. These risk factors includes: smoking, alcohol intake, cholesterol level and diet. The data was analyzed using logistic regression and applying SPSS version 20 package. It was found that those who are exposed to the risk factors have their logistic function to be 1 which indicate present of the disease. Result also showed that the odds of CHD is 2.664 which indicate that they have 2.664 chances of dying with the disease or suffering from CHD compared to those who are not at risk. The odds ratio of 0.555 for Alcohol means that there are 0.555 times chances of dying or suffering CHD. The P-value for cholesterol and age group indicates that there exists significant relationship and strong association of the two with CHD. In conclusion, cholesterol and age predicts the occurrence of CHD more than other risk factors.

Keywords: Coronary Heart Disease (CHD), Cardiovascular Disease (CVD), Odds, Odds Ratio (OR).

INTRODUCTION

Coronary heart disease (CHD) is a slow deposition of fat on the inner wall of the blood vessel (Heart Foundation). CHD is also called cardiovascular diseases and it is also a narrowing blockage of the arteries and vessels that provide oxygen and nutrients to the heart. It is caused by atherosclerosis (A disease of the arteries or heart characterized by the deposition of the fatty material on their inner walls), an accumulation of fatty materials to the inner linings of heart. The resulting blockage restricts blood flow to the heart. When the blood flow is completely cut off, the result is heart attack, stroke or unstable angina (Heart Foundation). when the coronary arteries become partially blocked or clogged. This blockage limits the flow of blood from the coronary arteries, which are the major arteries supplying oxygen-rich blood to the heart. The coronary arteries expand when the heart is working harder

and needs more oxygen. Arteries expand for example, when a person is climbing stairs, exercising or having sex. If the arteries are unable to expand, the heart is deprived of oxygen.

When the blockage is limited, chest pain or pressure, called angina (severe pain in the chest, often also spreading to the shoulders, arms, and neck, owing to an inadequate blood supply to the heart), may occur. When the blockage cuts off the flow of blood, the result is heart attack (myocardial infarction or heart muscle death).

Coronary heart disease (CHD) is the number one cause of death and disability for people over 50 in the world (Lefler, 2002). Many people, especially women, still believe that heart disease is a man's problem. A recent study conducted by Thanavaro et al, 2006, was developed to identify health promotion behavior (HPB) and predictors of HPB in man and women without previous history of CHD. The study involved 112 man and women who completed surveys regarding their CHD knowledge, HPB, and perceived benefits and barriers to CHD risk factor modification. The results of this study revealed that the women did not practice HPB regularly, had low CHD knowledge levels, and a moderate level of perceived barriers to CHD risk modification (Thanavaro et al, 2006). One study was conducted by DeVon and Zerwic (2003) to determine if there were gender differences in the symptoms of unstable angina (chest pain) (UA) and if so, to investigate if the factors related to the symptoms. The study included a convenience sample of 50 males and 50 females who were hospitalized with UA. The respondents completed a questionnaire designed by the research authors based on extensive literature review. The results suggest that women experienced more shortness of breath, weakness, difficulty breathing, nausea, back pain, fatigue, fear, and loss of appetite than men. The study included only respondents admitted to the hospital via the emergency department, which can be seen as a limitation. It is possible that clients who did not seek treatment experienced different symptoms than those who received care in the hospital.

MATERIALS AND METHODOLOGY

The data collected for this project was the number of persons affected with coronary heart disease at Federal Teaching Hospital Abakaliki from 20 to 69 years which will be use to predict the chances of coronary heart disease (secondary source). The methods used in the analysis of the data were the Binary Logistic Regression analysis.

Table 1: RISK FACTORS FOR CORONARY HEART DISEASE

Age Group	N	Abst	Prst	Normal Chol	High Chol	Smoke	Non Smoke	Alcohol	Non Alcohol	Good Diet	Poor Diet
20-29	10	9	1	3	7	8	2	8	2	7	3
30-34	15	13	2	6	9	11	4	8	7	8	7
35-39	12	9	3	4	8	10	2	10	2	4	8
40-44	15	10	5	7	8	12	3	8	7	9	6
45-49	13	7	6	9	4	8	5	5	8	6	7
50-54	8	3	5	3	5	6	2	6	2	3	5
55-59	17	4	13	5	12	13	4	13	4	9	8
60-69	10	2	8	6	4	4	6	4	6	4	6

SOURCE: MEDICAL RECORD DEPARTMENT, FEDERAL TEACHING HOSPITAL BAKALIKI EBONYI STATE.

ANALYSIS AND RESULT

Variables in the Equation

	B	S.E.	Wald	Df	Sig.	Exp(B)
Age group	0.980	0.225	18.954	1	0.000	2.664
Smoke	-1.402	0.832	2.840	1	0.092	0.246
Alcohol	-0.589	0.861	0.468	1	0.494	0.555
Diet	-1.990	1.049	3.597	1	0.058	0.137
Cholesterol	-1.780	0.859	4.298	1	0.038	0.169
Constant	-1.808	0.909	3.959	1	0.047	0.164

It indicate from the p-value that the test is significant on Age group, Cholesterol while it shows insignificant on Smoke, Alcohol, Diet Also from the odds ratio it indicate that Age group have the highest Odds Ratio as 2.664 which implies that as the age is increasing the risk of CHD also increases, Alcohol also have odds ratio of 0.555 which is interpreted as those who take Alcohol have 0.555 times chances of dying or suffering CHD, it also follow by smoke with Odds ratio of 0.246, Diet 0.137 and finally with Cholesterol odds ratio as 0.169.

SUMMARY AND CONCLUSION

The purpose of this project work is to find out the chances of coronary heart disease (CHD) among persons between the ages of (20 – 69) years.

It has been found out from the analysis of data collected at Federal Teaching Hospital, Abakaliki that between the age of (20 – 69) years of both male and female that the chances of coronary heart disease present is 1 and if absent is 0 as their level of smoking, drinking of alcohol, cholesterol level, high blood pressure, poor diet and lack of exercise increases.

REFERENCE

- [1] Lefler, L.L. (2002). The advanced practice nurse's role regarding women's delay in seeking treatment with myocardial infarction [Electronic version]. *Journal of the American Academy of Nurse Practitioners*, 14(10), 449-456.
- [2] Thanavaro, J.L., Moore, S.M., Anthony, M., Narsavage, G., & Delicath, T. (2006). Predictors of health promotion behavior in women without prior history of coronary heart disease [Electronic version]. *Applied Nursing Research*, 19(3), 149-155.
- [3] DeVon, H.A., & Zerwic, J.J. (2003). The symptoms of unstable angina: Do women and men differ? *Nursing Research*, 52(2), 108-118.