

**The addition of the measure blood glucose level results in more accurate prediction model  
(based on causal risk factors) for Chronic Heart Disease.**

Cardiovascular diseases (CVDs) are the leading cause of death globally, and has been for the last 15 years (WHO, 2016). In the US, 1 in every 3 deaths is attributed to CVDs (American Heart Association, 2015), and is estimated to be costing \$1 billion in healthcare cost and lost productivity (CDC Foundation, 2015). Extensive research and studies like the Framingham Heart Study have led to the identification of high blood pressure and high cholesterol as two important causal risks factors (Mahmood, Levy, Vasan, & Wang, 2014). Coronary heart disease (CHD) is the most dangerous and the most prevalent CVD. However, with proper screening and education CHD is preventable (Center for Disease Control and Prevention, 2013).

Despite decades of clinical and epidemiological research, estimating the risk of CHD has remains challenging, with classification errors as high as 37% in some cases (Kones, 2011). Recently, Diabetes has also been implicated as an additional risk factor, based on evidence of its comorbidity, but additional analysis could lead to further refinement of the screening programs (Fox, 2010). Also, clinical evidence confirms significant increases in blood glucose fluctuation in diabetic patients with CHD compared to those without, along with clinically relevant cardiovascular benefits of the many glycemic control agents (Cheng, Badreldin, Patel, & Bhatt, 2017; Xu & Rajaratnam, 2017). This implies that a more accurate prediction model could include the measure of the blood glucose levels, as opposed to simply the presence or absence of diabetes (Davidson, & Parkin, 2009; Zhang et al., 2014). Such a model would be more accurate and improve efforts to screen for and educate about all CVDs, and particularly CHD.

### Approach for the Study

This quantitative research will involve a logistic regression analysis of the Framingham Heart Study data set (that includes a series of three time measures) on the 10-year eventual outcome Coronary Heart Disease.

### References

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