



# The Analysis of Demand and Supply of Blood in Hospital in Surabaya City Using Panel Data Regression

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**Abstract:** Blood is a vital component in body health because it distributes oxygen, food, and hormones in the whole body. However, there are some cases such as the lack of blood, accidents, or other diseases when humans need blood transfusions, which depend on the demand and supply of blood in hospitals. In this research, panel data regression is used to analyse the demand and supply of blood in hospitals in Surabaya city. There are three models in panel data regression, namely, common effect (CE), fixed effect (FE), and random effect (RE). In this panel data regression, the number of demands of blood type O, A, B, and AB is the independent variable. In contrast, the blood supply is the dependent variable. First, we will determine the best model, common effect (CE), fixed effect (FE), or random effect (RE), through the Chow test, Hausman test, and Lagrange Multiplier test. From the result, the best model of the quantity of blood supply is fixed effect (FE). Then, the fixed effect (FE) model parameters are tested by using the F-test and T-test for testing the impact of independent variables on the dependent variable and R-squared for finding the proportion of effectiveness of independent variables. According to our simulation results, the R-squared is 0.998, which is very satisfactory.

**Keywords:** *panel data regression; demand and supply of blood; fixed effect model; statistics.*

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