

**A MATHEMATICAL MODEL OF TRANSMISSION DYNAMICS OF
HEPATITIS B VIRUS**

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Abstract: In this paper, we have formulated a new mathematical model for transmission dynamics of Hepatitis B virus by using system of differential equations. Also we have obtained the conditions under which the model will be in disease free equilibrium state as well as we have found its basic reproduction number.

Keywords and Phrases: Hepatitis B virus (HBV), mathematical model, disease-free equilibrium, stability analysis, basic reproduction number.

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1. Introduction

Hepatitis B is an infectious disease caused by the Hepatitis B virus (HBV) that affects the liver. It can cause both mild to severe infections which can result in death. According to WHO, 257 million people were living with severe Hepatitis B infection. Hepatitis B can be prevented by vaccines that are safe, available and effective and 80 - 90% of infants infected during the first year of life develop chronic infections and 20 - 30% of adults who are chronically infected will develop cirrhosis and liver cancer. There is still limited access to diagnosis and treatment of Hepatitis B in many resource contained settings. Since the observance of World Hepatitis Day 2019, WHO has been focusing on the eradication of Hepatitis B by the year 2030. For this, control strategies should be decided and the most effective control measure is vaccination. One of the primary reasons for studying Hepatitis B virus