

# Summary Report on Hepatitis C and Cleft Prediction Models

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## Introduction

This report summarizes two research papers that use machine learning to solve healthcare problems. One paper focuses on predicting Hepatitis C early, while the other aims to predict cleft lip and palate before birth. These studies show how technology can improve healthcare by allowing early detection and better treatment.

## Paper 1: Hepatitis C Prediction

### Outcome

This paper explains how Hepatitis C can be predicted using machine learning models. The dataset contained 500 samples (250 patients and 250 healthy individuals). Several models were tested, including:

- Random Forest
- K-Nearest Neighbor (KNN)
- Decision Tree
- Support Vector Classifier (SVC)
- Multi-Layer Perceptron (MLP)

The best performance came from the MLP model, which achieved an accuracy of 92.38%. This early prediction helps patients begin treatment sooner and improves their recovery chances.

### Observations

The study showed that using MLP can improve prediction accuracy. The collection and preparation of data were essential steps in the process. This research highlights the importance of early diagnosis for better treatment.

# **Paper 2: Cleft Prediction Before Birth**

## **Outcome**

This paper focuses on predicting cleft lip and palate (CLP) in unborn babies. Data was collected from 1000 pregnant women across hospitals in Lahore, including information about:

- Family history of cleft
- Smoking and drug use
- Health conditions like diabetes and anemia

The MLP model provided the best result, with 92.6% accuracy. Early prediction helps families and doctors prepare for necessary treatments.

## **Observations**

The research showed that factors like parental health and smoking habits affect the chances of a baby being born with a cleft. This study demonstrates the role of technology in helping parents prepare for their child's healthcare needs.

## **Conclusion**

Both studies show how useful machine learning models, especially MLP, are in healthcare. With better data and early prediction, patients and doctors can make more informed decisions. These technologies can improve health outcomes by enabling early treatment and care.