

# HealthyHer: An ML-based Chronic Disease Risk Assessment and Monitoring Platform for Rural Women

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## Abstract:

Rural women face a high prevalence of chronic diseases such as Anemia, PCOS, thyroid disorders, and diabetes, with limited access to early screening and continuous monitoring. This paper proposes *HealthyHer*, a low-cost healthcare system designed for early risk assessment and continuous health tracking. The system adopts a dual-model approach by categorizing users into fresh users and existing patients. A Random Forest-based classification method is incorporated to analyze symptoms and predict risk levels. Based on the results, the system provides structured recommendations including medical consultation, diagnostic tests, and dietary guidance. The system also supports integration with Primary Health Centre's (PHCs) to enable better follow-up and data management. The proposed solution is scalable, affordable, and suitable for deployment in low-resource rural environments.

**Keywords:** Rural Healthcare, Women Health, Chronic Diseases, Random Forest, Risk Analysis

## I. INTRODUCTION

In India, a significant proportion of women reside in rural areas and face multiple healthcare challenges due to limited access to medical facilities and lack of awareness. These limitations often result in delayed diagnosis and inadequate medical attention, further exacerbating health conditions. Chronic diseases such as anemia, diabetes, thyroid disorders, and polycystic ovary syndrome (PCOS) are highly prevalent among women, and many cases remain undiagnosed until advanced stages.

Existing healthcare systems mainly focus on treatment rather than early detection and continuous monitoring. Additionally, most digital health applications are designed for urban populations and do not address the needs of rural users. The lack of localized and accessible healthcare solutions further widens the gap between

Therefore, there is a need for an affordable, accessible, and scalable healthcare solution that supports early risk

detection and continuous monitoring. Such a system can play a crucial role in improving preventive healthcare practices and promoting timely medical intervention. The proposed system, *HealthyHer*, aims to bridge this gap by providing a structured and user-friendly healthcare platform tailored for rural women.

## II. PROBLEM STATEMENT

Rural women face significant challenges in accessing early healthcare due to limited awareness, inadequate medical infrastructure, and the absence of structured screening systems. Chronic diseases such as anemia, diabetes, thyroid disorders, and PCOS are often detected only at advanced stages, resulting in severe health complications.

Furthermore, the lack of a centralized digital monitoring system leads to poor follow-up and ineffective long-term disease management.

These challenges highlight the need for a structured and scalable system for early detection and continuous monitoring of health conditions.

**III. PROPOSED SYSTEM**

To address the identified challenges, the proposed system, HealthyHer, is developed as a healthcare support platform for rural women. The system adopts a dual-model approach by categorizing users into two groups: fresh users for early screening and existing patients for continuous monitoring.

Module	Function
User Input	Collects user data
Risk Analysis	Predicts health risk
Recommendation	Provides diet/medical advice
Data Storage	Stores patient records

Table 1: System Modules and Their Functions

**IV. METHODOLOGY**

The proposed system is designed using a structured data processing and classification framework to enable efficient health risk assessment.

Initially, user data including demographic details, symptoms, and medical history are collected through a digital interface. Based on this information, users are categorized into fresh users or existing patients.

Disease	Common symptoms
Anemia	Fatigue, pale skin, dizziness
PCOS	Irregular periods, weight gain, acne
Thyroid Disorders	Weight changes, fatigue, mood swings
Diabetes	Frequent urination, thirst, fatigue

Table 2: Common Diseases and Symptoms Considered in the System

Proposed System Architecture of HealthyHer

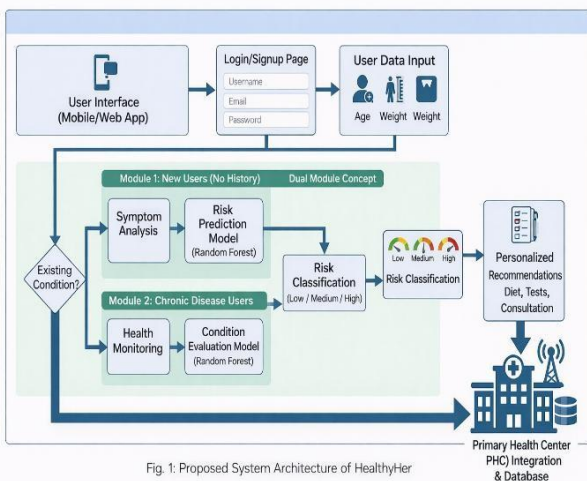


Fig. 1: Proposed System Architecture of HealthyHer

For fresh users, the system collects symptom data and performs risk assessment to identify potential health conditions at an early stage. For existing patients, the system focuses on monitoring current health status and providing personalized recommendations for effective disease management.

In addition, the system supports integration with Primary Health Centres (PHCs) to facilitate follow-up and improve healthcare tracking. This approach ensures both preventive care and continuous monitoring in a structured and scalable manner.

For fresh users, a machine learning-based classification approach using the Random Forest algorithm is incorporated

for risk prediction. Random Forest is an ensemble learning technique that constructs multiple decision trees and combines their outputs to improve prediction accuracy and reliability.

The model evaluates multiple symptoms simultaneously and classifies users into different risk levels such as low, medium, or high.

Risk Level	Description	Action
Low	Minor symptom	Preventive diet & lifestyle
Medium	Moderate symptom	Suggested medical tests
High	Severe symptom	Immediate doctor consultation

Table 3: Risk Classification and Recommended Actions

For existing patients, the system enables continuous monitoring by analysing updated health parameters and symptom progression. Based on the risk classification, the system provides structured recommendations, including medical consultation, diagnostic tests, and lifestyle or dietary modifications.

## **V. RESULTS AND DISCUSSION**

The proposed system provides an effective framework for early risk detection and continuous monitoring of chronic diseases among rural women. The implementation demonstrates that a structured symptom-based analysis combined with a classification approach can successfully identify potential health risks.

The system enables users to understand their health condition at an early stage and take appropriate preventive measures. Additionally, the integration with Primary Health Centres supports better follow-up and health record management.

The overall approach is cost-effective, easy to use, and suitable for deployment in rural environments with limited resources.

## **VI. CONCLUSION**

This paper presents HealthyHer, a scalable and cost-effective healthcare solution designed to address the challenges of early detection and monitoring of chronic diseases among rural women.

By incorporating a dual-model approach and a machine learning-based risk classification mechanism, the system provides structured and practical healthcare support.

The proposed solution has strong potential for real-world implementation and can significantly improve healthcare accessibility and outcomes in rural communities.

## **VII. FUTURE WORK**

Future enhancements of the proposed system include the development of offline functionality to support users in areas with limited internet connectivity.

The integration of voice-based interaction can improve accessibility for users with low literacy levels.

Additional features such as multilingual support and advanced machine learning models can further enhance system performance and usability.

These improvements will contribute to the scalability and wider adoption of the system in real-world scenarios.

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