Chapter 59
Big Data Analytics for Childhood Pneumonia Monitoring

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ABSTRACT

In developing countries pediatric pneumonia is the second leading cause of deaths and 98% of pneumonia-induced deaths are identified across the world. It is mandatory to identify the symptoms of pneumonia in children to avoid mortality causing complications. Early identification of children at risk for treatment failure or at increased risk for death will help to improve overall health outcomes. If pneumonia is suspected, it is important to seek medical attention promptly so that an accurate diagnosis can be made and appropriate treatment is given in time. The proposed approach quickly provides history of previous patient's details, expert doctor's opinions who are in globe and their previous treatment for the same symptoms, all diagnostic reports such as blood tests, x-ray etc., from the cloud and gives analytics from big data to take fast and precise decisions by the doctors.

INTRODUCTION

The developing countries face many risks and obstacles for giving timely and appropriate treatment for children with pneumonia leading globally to child deaths of 1 million approximately. Childhood pneumonia is the second leading cause of deaths amongst children globally; in specific 98% of pneumonia-induced deaths (UNICEF Report) occur in developing countries. It is important to recognize how pneumonia symptoms show up in children in order to avoid any life-threatening complications. Children were at

greater risk of contracting the disease because their immune system is not fully developed. Early identification of children at risk for treatment failure or at increased risk for deaths will help improve overall health outcomes. If pneumonia is suspected, it is important to seek medical attention promptly so that an accurate diagnosis can be made and appropriate treatment can be given in time. The doctor will take a medical history and will conduct a diagnostic test to find severity of the condition of patient to give appropriate antibiotics/medicines timely for effective and immediate treatment.

The motive of this chapter is learning the things from the past will give better results for future. Now-a-days healthcare data is very large, critical and more complex. According to World Wide Web, healthcare data across the world is expected to reach 25,000 petabytes in 2020. The average healthcare spending of all the countries especially India per year accounts about 25% in the country overall GDP. Even after spending much amount for healthcare, the average life expectancy of all the countries (including developed and developing) is all about 70-75 years (Eg., India-65 yrs, UK-80 yrs, Germany-82 yrs, Japan-83 yrs, Poland-76 yrs etc.,) only.

Over 30 billion dollars were spent on hospital admissions which are unnecessary. We can reduce these unnecessary hospital admissions by identifying patients who are at high-risk and ensure they should get the appropriate treatment in time. New strategies should be evolved to identify the patient's health status well before it's too late for treatment and needs hospital admission. By this way we can reduce number of unnecessary hospital admissions. If we could able to identify the health condition of the patient primarily, then new algorithms will predict the status of patient health and need of hospital admission can be suggested to the doctor. Based on these inputs doctor suggests need of hospital admission and by this way there is decrease in healthcare cost. Regular re-admission into hospitals is harmful and cost effective. In case of heart attack, heart failure etc., especially childhood pneumonia patients get admitted into hospitals in regular intervals due to poor care after previous discharge.

This proposal is coining to save the child from Pneumonia by designing and developing an effective, efficient and timely treatment mechanism using latest technologies such as Mobile Cloud and Big Data Analytics.

Objectives

The objectives of proposed approach presented in this chapter are as follows:

- The motive of this proposed approach is to recognize the pneumonia symptoms in a child well before and identifying patients at risk of admission into hospitals.
- This approach will help the doctors in taking appropriate decisions for giving better treatment at right time.
- Digitization of patient's data should be done to store it in cloud for anywhere, anytime availability and can be accessed by any one.
- Estimating the severity level of the pneumonia disease by analyzing and accessing different patients data from cloud and provide best possible suggestions for the doctors to treat the child effectively, efficiently and timely.
- Different kinds of data (may be structured and unstructured) such as diagnosis reports, blood test reports and x-ray of pneumonia patients which can becomes big data, should be analyzed by using big data analytics techniques.

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