Coughlizer

Abstract:

Tuberculosis (TB) is one of the top ten leading causes of mortality across the globe, ranking above HIV/AIDS (Glaziou, et al., 2015). Approximately 25 percent of the global population is infected with latent TB and one in 10 of these people develop active TB (Houben & Dodd, 2016). In 2017, there were approximately 10 million new cases of TB, leading to 1.6 million deaths (WHO, 2018). TB affects all age groups but the overall estimates identified that 90 percent of TB patients were adults of 15 years old or above and 64 percent were males (Glaziou, et al., 2015). Five percent cases of TB were reported from Pakistan and 27 percent and 9 percent cases of TB were reported from its neighboring countries India and China respectively (WHO, 2018). Majority of the deaths from TB are preventable with early diagnosis and treatment (Houben & Dodd, 2016). A study by Proaño, et al. (2016), described patterns of cough frequency at the onset of disease an after the treatment and evaluated the correlation between frequency of cough and TB microbiological resolution. The study identified that the frequency of cough provides additional information related to the progress of the respiratory disease. We present the idea of a software application for diagnosis of TB through machine learning. The data related to cough patterns of healthy individuals and TB patients will be incorporated and the machine learning would help in diagnosing TB in real time through differentiating cough patterns of TB patients with healthy individuals. Cough is one of the earliest and most common symptoms of different respiratory diseases and also a key symptom of TB (Proaño, et al., 2016). Cough frequency and coughing patterns have been useful in the differential diagnosis of respiratory diseases (Turner, 2018). The 2015 CHEST guidelines recommended auditory parameters for the assessment of the frequency of cough (Proaño, et al., 2016). The software application will use a standardized method of automated cough counted with a validated machine learning algorithms to classify between healthy and infected cough to ensure accurate measurement. This software application would be helpful in prognosis of TB in ambulatory care particularly in rural areas. The TB is a curable disease but the death rate is high enough due to later diagnosing when it reaches at fatal stage, specially in third world countries. Out software application will be in reach of every individual to record and get classified his cough if it is healthy or infected with TB. This way TB can be diagnosed at earlier stage and cured. This will not only save the time and money but eventually will save a life.

References:

Glaziou, P., Sismanidis, C., Floyd, K. & Raviglione, M., 2015. Global epidemiology of tuberculosis. *Cold Spring Harbor perspectives in medicine,* 5(2), p. a017798.

Houben, R. M. & Dodd, P. J., 2016. The global burden of latent tuberculosis infection: A re-estimation using mathematical modelling. *PLoS medicine,* 13(10), p. e1002152.

Proaño, A. et al., 2016. Protocol for studying cough frequency in people with pulmonary tuberculosis. *BMJ Open,* 6(4), p. e010365.

Turner, R. D. B. S. S. D. M. H. R. L. K. H. M. S. &. B. G. H., 2018. Daily cough frequency in tuberculosis and association with household infection. *The International Journal of Tuberculosis and Lung Disease,* 22(8), pp. 863-870.

WHO, 2018. *Tuberculosis.* [Online]
Available at: https://www.who.int/news-room/fact-sheets/detail/tuberculosis
[Accessed 21 June 2019].