

**Title of the project:** Development of low-cost point-of-care technology for early screening of chronic obstructive pulmonary disease (COPD) for remote population of West Bengal.

Duration: 2019-2022

Total approved funding: INR10.8 Lakhs (approx.)

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### **Summary of the project proposal:**

In remote and underdeveloped localities like Purulia district in the state of West Bengal, an enormous number of people suffer from Chronic Obstructive Pulmonary Disease (COPD) due to addiction towards tobacco and use of bio-fuels like, kerosene, cake of cow dung, coal etc.

The aim of the proposal is to develop a low cost, portable point of care technology (PoCT) for early screening of COPD with high level of accuracy using cardiovascular and respiratory signals. The developed system will be able to predict the nature of aggravation, i.e., early stage or matured stage in a quantitative scale. In case of early stage of COPD the patient will be advised to take the preventive measures and may be subjected to periodic monitoring. In case of Acute Exacerbation COPD (AECOPD) being detected the patient will be referred to the hospital on an urgent basis. The portable system will acquire short duration biomedical signals like Electrocardiogram (ECG), Photoplethysmogram (PPG), arterial partial carbon dioxide pressure (PaCO<sub>2</sub>) which are easy to acquire. From the acquired signals clinical features will be extracted and a machine learning based signal processing algorithm will be developed to detect the COPD and its grade.

The developed system will be battery powered and can be provided to primary healthcare centers for regular monitoring of early stage COPD patients. At the same time, an electronic COPD database development can be initiated to track the patients through link with interested parties (NGOs) under the guidance of district administration and healthcare policymakers.