**To Analyze the risk of survival of a patient for the next one year after Thoracic Surgery**

This analysis is undertaken to predict the chances of survival of a patient for the next one year who has undergone a Thoracic Surgery. Surgeries are a crucial part of the humanity, this helps us to minimise our troubles and live past them to live longer. With passage of time, surgical equipment, surgical training, surgical awareness has increased manifold leading into a more efficient, successful and trustworthy medical treatment pattern. With growing availability and accessibility more and more people are agreeing for these surgeries. Even after all the advanced resources, the risk for the survival after the surgeries remains a chance of luck, hope and care.

**Primary Lung Cancer**: According to the google definition, “A **primary lung cancer** refers to an original **cancer** in the **lungs** that is unrelated to any previous **cancer**. In other words, it is not metastases from another **cancer**.”

**Thoracic surgery:** It is a surgery including major resections for primary lung cancer patients.

**Dataset background information**: This data was collected from the 2007-2011 thoracic surgery patients at Wroclaw Thoracic Surgery Centre, Poland. The link for the data is mentioned in the citations.

**Pre-operative criteria for risk assessment:**

1. Age (Younger age is more preferable).

2. Pulmonary function (A preoperative forced expiratory volume in 1 second (FEV1) of >1.5 litre for lobectomy, and >2.0 litre for pneumonectomy generally indicates suitability for surgery or consequently forced vital capacity (FVC) is very high).

Note that FVC indicates the amount of air that a person can forcefully and quickly exhale after taking a deep breath, FEV1 shows the amount of air that a person can forcefully exhale in one second of the FVC test. The present report is based on the data set which was collected at Wroclaw Thoracic Surgery Centre for primary lung cancer patients who underwent major lung resections during the years 2007 to 2011.

3. Nutrition and Performance status; and in terms of operability to be.

4. Diagnosis and Staging (patients are considered for surgery if they have a plain chest radiograph and a computed tomographic scan of the thorax including the liver and adrenal glands).

**Attribute: Background Information and Consideration basis:**

Var1: Diagnosis (DGN)-specific combination of ICD-10 codes for primary (=1), secondary (=2) and multiple tumor’s (=3) if any (DGN3, DGN2, DGN4, DGN6, DGN5, DGN8, DGN1)

Var2: Forced vital capacity (FVC)

Var3: Volume that has an exhaled at the end of the first second of forced expiration (FEV1)

Var4: Performance status in Zubrod scale (PRZ) (PRZ2=3, PRZ1=2, PRZ0=1)

Var5: Pain before surgery (PBS)

Var6: Haemoptysis before surgery (HBS)

Var7: Dyspnoea before surgery (DBS)

Var8: Cough before surgery (CBS)

Var9: Weakness before surgery (WBS)

Var10: Size of the original tumour (SOT) (OC11=1 (smallest), OC12=2, OC13=3, OC=14=4 (largest))

Var11: Diabetes mellitus (DM) (Type 2)

Var12: Myocardial infraction (MI) up to 6 months

Var13: Peripheral arterial disease (PAD)

Var14: Smoking

Var15: Age

Var16: 1Year Risk