

# IBM Data Science Professional Certificate Capstone Project

## Predicting the Severity of Car Accident

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### 1. Introduction

#### 1.1 Background

According to the World Health Organization (WHO), approximately 1.35 million people die from road traffic crashes all over the whole world every year. This being a cause for concern globally, the United Nations' Sustainable Goals' (SDGs) targets relating to road safety are to halve global fatalities resulting from road accidents by year 2020 (target 3.6) and *to provide access to safe and sustainable transport for all by 2030* (target 11.2).

The impact of road accidents is very huge ranging from human suffering caused from injuries and deaths to economic burdens imposed on the society to treat the injured and to take care of the deceased's dependents without mentioning the loss of productivity from those disabled and deceased.

#### 1.2 Problem

The International Federation of Red Cross and Red Crescent Societies in their handbook of 2007 on road safety guidelines highlighted that road accidents are not only largely preventable but also largely predictable. Wouldn't it be a good thing if we could use the data that we have collected from past accidents to predict the severity of accidents using supervised machine learning algorithms for the emergency response

teams to mobilize the required amount of resources for a particular accident occurrence?

Data about roads, users, vehicle conditions might be relevant in predicting the occurrence of an accident and its severity. According to the Haddon Matrix, one of the most popular models that is used in the field of injury prevention (Wikipedia), environmental (road design, speed limits and pedestrian facilities ), vehicle and equipment (speed management, lighting, braking, road worthiness) and human factors (police enforcement, attitudes, impairment) are identified as key factors to consider before an accident occurs (pre-crash phase). Some of these factors are also recognized by the United Nations in its efforts to curb road traffic accidents globally. To achieve SDG target 3.6, the United Nations identified key areas that need attention some of which include planning, designing and maintaining a safe road infrastructure and promoting high safety standards for new cars.

### **1.3 Interested stakeholders**

Accident severity prediction assist government authorities and health officials to activate the right emergence response procedures just at the time of an accident occurring so that the right resources are mobilized and dispatched on time. I am also persuaded to believe that such information would certainly come in handy for road traffic users to either cancel certain trips or change routes where possible. Road administration authorities could also use the same information to predict and warn road users or advise on other uncongested routes basing on the predicted severity just at the time of the accident occurring.