# THE IRISH HEALTHCARE SYSTEM

The Health Services Executives (HSE) has been in charge of the finance and management of Irish healthcare services since 2005, replacing the health boards. HSE is Ireland's principal health care reform program, employing over 100,000 full-time equivalents to provide a wide range of public health services. 65 percent are directly employed, while 35 percent are contracted through HSE-funded entities.

**BUSINESS PROBLEM:**

The HSE faces severe staffing shortages. There was a 13% drop in healthcare professionals between 2007 and 2014.  As a result of this challenge, working hours are increased and budget allocations are reduced. Because of rising demand, budget constraints, a shortage of competent medical staff, shifting public expectations, and increased complications within the system, hospital staffing and scheduling decisions are becoming more complex.

**PROJECT GOAL:**

This project gives a thorough examination of integer programming methodologies for medical staffing and scheduling in hospital settings.

**SOFTWARE:**

The optimization model would be formulated using GAMS 22.5 and solved it to optimality with CPLEX 10.2.

**DEVELOPMENT TIME:**

For each sort of day, we will devise a distinct staff timetable; that is, all days linked with the same daily plan has the same schedule. We will calculate the demand estimate for each time

block within a given day to ensure the required service level on each day. It might approximately take six months to implement the same.

**METHOD FOR MEASURING OPTIMIZATION:**

The integer programming model can be used to tackle this issue. It identifies initial staffing levels and shift schedules using aggregate-demand estimates. The optimization model determines the number of doctors of each type to schedule at each hospital and the type of shifts to satisfy service and operational requirements while minimizing the total staffing cost. Among the operational requirements are upper and lower limits on the staffing levels at each hospital and constraints ensure that the aggregated service capacity provided by the doctors on duty in each hospital is sufficient to cover the expected demand for service in the corresponding hospital. We also consider constraints that prevent the resulting schedules from dictating abrupt changes in the total number of doctors in consecutive periods. Finally, the optimization model includes lower bounds on the number of doctors in each hospital, which are updated iteratively according to the feedback provided by the discrete-event simulation mode.

**CONCLUSION:**

This project will develop a high-performance tool to solve the staff scheduling issue in a cost-effective manner. Also, the Irish healthcare system is expected to have better performance in the health care domain.

**REFERENCES:**

Jaime Miranda, Pablo A. Rey, Antoine Sauré, Metro uses a Simulation - Optimization Approach to improve Fare-collection Shift Scheduling. Informs Journal on Applied Analytics