2019 "ShuWei Cup"IMCM

Problem A: On the Improvement of Hospital's Overall Level

With the rapid development of China's economy and society, and the aging trend, the demand for hospital health service continues to increase. At the same time, along with the rapid industrialization and urbanization process, ecological and food safety are subject to different levels of challenges. These overall developments have also brought a series of new challenges to medical and health work.

The rapid growth and diversified developments of medical demand have led to an increase in the number of private hospitals. At present, private hospitals and public hospitals have formed different levels of competition and cooperation. For public hospitals, how to satisfy the growing demand for universal medical care for residents so as to improve comprehensively the residents' demand for hospitals is the main direction of efforts. For private hospitals, how to effectively meet the peak demand in public hospitals and the demand for special diseases is the main direction of their efforts. Please try to solve the following five problems in combination with network related resources.

Your tasks are the following:

Task1: Make reasonable predictions of the aging trend of China and the medical needs of the residents according to the data of residents' income, age structure of the population and the economic development level etc. in the relevant statistical analysis data of the National Bureau of Statistics (http://www.stats.gov.cn/tjsj/).

Task2: Take a certain province as an example，analyze the most common disease in the future in the province, and provide suggestions for the overall development of major public hospitals in the province.

Task3: Different types of patients may need to do different inspections in the hospital; different inspection items may be distributed in different locations and there may be a large gap in the number of people in the queue. Please propose a common queuing theory and its related optimal queuing method for this kind of queuing problem.

Task4: Combining the complex cooperation and competition between private hospitals and public hospitals, please propose the optimal cooperation and competition strategies among multiple hospitals.

Task5: Write a(n) 1-2 page(s) proposal for the relevant medical management department, and provide a reference for its preparation of the "14th Five-Year Plan".

Your submission should consist of:

● One-page Summary Sheet,

● One or two-page proposal,

● Your solution of no more than 20 pages, for a maximum of 22 pages with your summary and synopsis.

● Note: <u>Reference list and any appendices do not count toward the 22-page limit and should appear after your completed solution.</u>