Title: Supporting our development of an A&E model/s

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Subject areas: Data Science; Decision Making, Healthcare.

Project Description:

Public Health Scotland is Scotland's lead national agency for improving and protecting health and wellbeing of all of Scotland's people. One of Public Health Scotland's goals is the use of intelligence and data to support the system and improve the experience we will have with the system.

Unscheduled care is a key part of our health and social care system. We have had a range of tools over the years that help predict the demand for A&E services. Public Health Scotland has developed a model that currently covers primarily the acute hospital part of the system. We want to expand this with a more detailed A&E model. This model would then be used to help understand the flow of patients being admitted to the hospital system. An example if provided in Figure 1, where we illustrate the locations of the emergency sites together with an indication of the number of attendances.
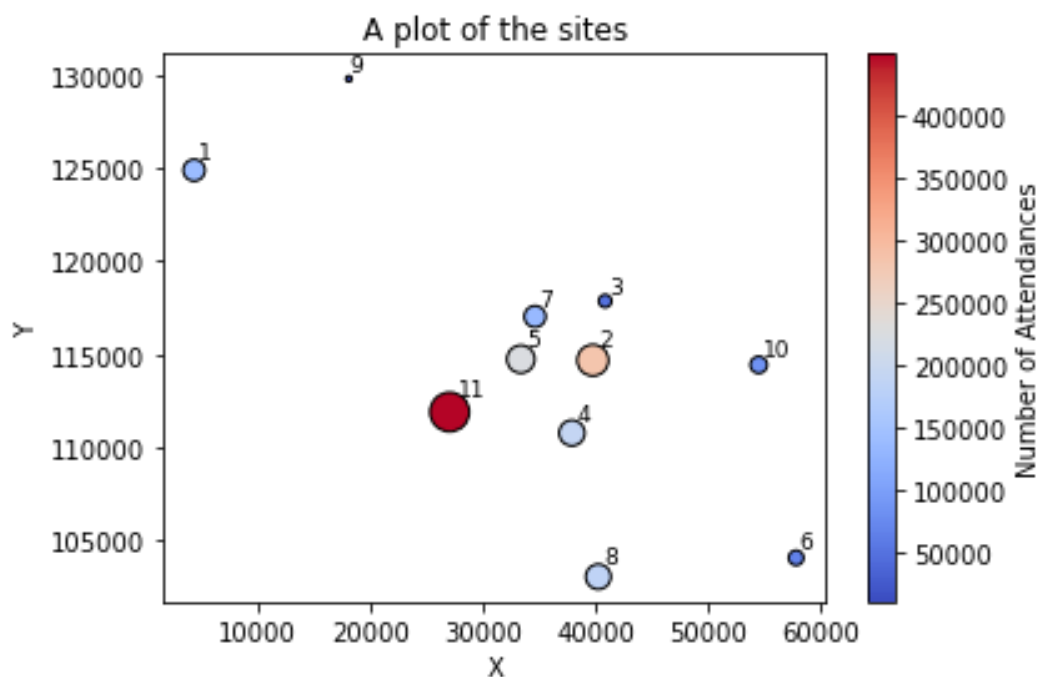

Figure 1 - A graphical illustration of the usage of the emergency department sites. The size of the site provides an indication of the number of attendances.

This project aims to look at A&E attendances in a different way. We are providing a dataset that shows the demand for services along with the time it takes to meet that demand. We want you to look at the additional data we have provided about the A&E departments (type of department, catchment population) and details about those attending (age group, distance to department) and better understand the way people use the service and whether there are other ways of providing the support. Use your operational research methodologies to understand the catchments of departments and how individuals could use the services differently.

Based on this the following is the specific objective for this project:

- Using the dataset provided explore how can you re-allocate demand for A&E services between the departments provided?
- If you could expand capacity in departments or create new departments, how would you solution change?

You will be supporting the Whole system modelling team within Public Health Scotland which brings together data to understand the current system. As a result, you can also find out more about our work and our wider organisation. The winner of the challenge will have the opportunity to explore our wider work and methods in a paid consultancy style project.

References:

Public Health Scotland https://www.publichealthscotland.scot/our-organisation/a-scotland-where-everybody-thrives-public-health-scotland-s-strategic-plan-2020-23/

Data definitions

Site_Code = A code denoting different Emergency Department Sites

Site_Type = Differentiates between sites that are full Emergency Departments and those that are Minor Injury Units

Site_X = An X co-ordinate for the site, this has been altered from the sites original location

Site_Y = A Y co-ordinate for the site, this has been altered from the sites original location

Site_Loc_GPs = No of GPs within the postcode area of the site

Site_Loc_GP_List = No of patients listed for the GPs in the postcode area of the site

Site_Pop_20miles = Population within 20 miles of the site

Pat_X = An X co-ordinate for the postcode area of the patient, this has been altered from the sites original location

Pat_Y = A Y co-ordinate for the postcode area of the patient, this has been altered from the sites original location

Pat_Loc_GPs = No of GPs within the postcode area of the patient

Pat_Loc_GP_List = No of patients listed for the GPs in the postcode area of the patient

Drive_Distance_Miles = Distance from the postcode area of the patient to the site

Driving_Time_mins = approx. drive time from the postcode area of the patient to the site

Attendance_Type = Type of attendance at ED

Age_Group = Age grouping for the patient, note no under 20 are in this dataset

Wait_Time = The group of wait time in 30 minutes groups

Year = A year number to differentiate year of admission

Month = Month number

Number_Of_Attendances = Number of patients in each category