

# NHS Data Analysis

## Context of the Business Scenario

The National Health Services (NHS), a publicly funded healthcare system in England. The NHS incurs significant, potentially avoidable, costs when patients miss general practitioner (GP) appointments. The reasons for missed appointments need to be better understood as explained by The British Medical Association (BMA) chair Professor Philip Banfield:

“While it is frustrating when patients do not attend, the reasons why this happens should be investigated rather than simply resorting to punishing them. Financially penalising patients inevitably impact the poorest and most vulnerable in the community”.

The government needs a data-informed approach to deciding how best to handle this problem. At this stage of the project the two main questions posed by the NHS are:

- Has there been adequate staff and capacity in the networks?
- What was the actual utilisation of resources?

## Analytical Approach

Data from the NHS locations collectively, are presented against missed appointments indicators. Where appropriate and possible, data is compared over time and against the national average for NHS trusts. Where available, the data presented for missed appointment indicators 42 locations show percentage responses by appointment mode for appointments regional and national categories datasets in comparison to NHS locations. The five locations with the highest number of records are carried in the year 2020 and 2022. For some of the indicators, the data were analysed to show ‘likelihood’ and ‘relative likelihood’ of an outcome. In service settings the ‘General Practise’ stands the highest among others, whereas, in context type the ‘Care Related Encounter’ holds the most; along with national categories ‘Inconsistent Mapping’ being large. It is helpful to outline the differences between these two concepts.

The appointments were scheduled between 2021-01 to 2022-06. Meanwhile, the ‘General Practise’ reported the most appointments in North West London from 1 January to 1 June 2022. Under national category, the year 2020-01 had the highest number of appointments compared to actual duration and appointments regional. The 2<sup>nd</sup> month in actual duration is the least records per month, whereas, 3<sup>rd</sup> month being the highest records. Little is known about which patients miss appointments or why they do so. At one end of the spectrum such people may be seen as a vulnerable group with multiple health problems and difficult lives, while at the other they may be regarded as nuisances who repeatedly fail to keep appointments which could have been used more gainfully for people in greater need.

Below in Fig. 1, the line plot shows the number of appointments per service setting in the seasons in: Summer, Autumn, Winter and Spring. The 'General Practise' being the highest ratio chosen by the patients in the collective season and 'Unmapped' being the least change in the collective season. Indeed, while missed appointments may be welcomed by many general practitioners (GPs), they are clearly seen as a source of frustration by others. However, apart from data from two small studies of United Kingdom general practice non-attenders, 1, 2 and one study, 3 there is very little about this subject in the literature in this area.

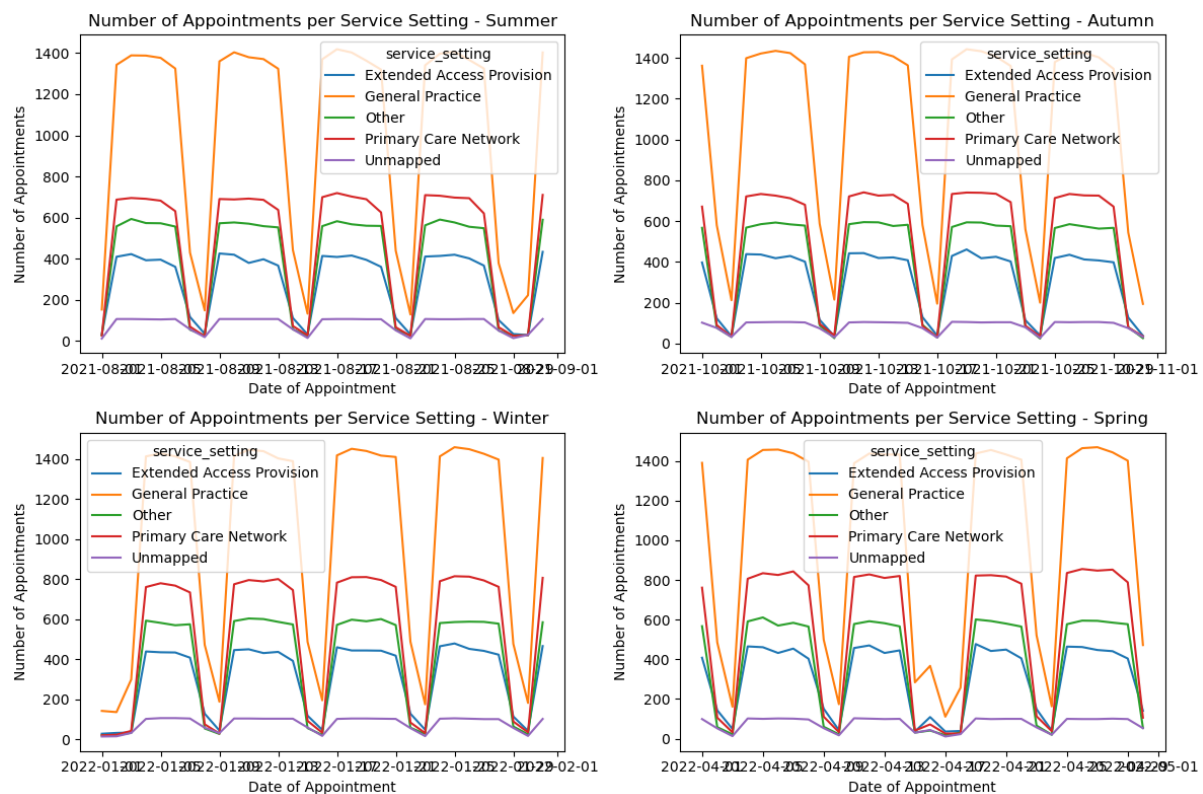


Fig. 1: Number of Appointments in every Season

To analyse tweets from Twitter to determine whether there has been a high volume of hashtags related to healthcare in the UK, the bar plot depicts the scenario below in Fig.2. Twitter enables direct communication and engagement with stakeholders. By monitoring tweets with the hashtag #healthcare and responding to user feedback, the NHS can demonstrate its commitment to listening to the public and addressing their concerns. This engagement helps build trust and fosters a sense of involvement among stakeholders. Through sentiment analysis, tweets can provide an understanding of public sentiment towards specific initiatives, policies, or healthcare experiences. This analysis helps stakeholders gauge the effectiveness and impact of their projects and make data-driven decisions. Determining who will be consuming the visualizations, such as the stakeholders within the NHS and understanding their needs, preferences, and technical expertise to tailor the visualizations accordingly.

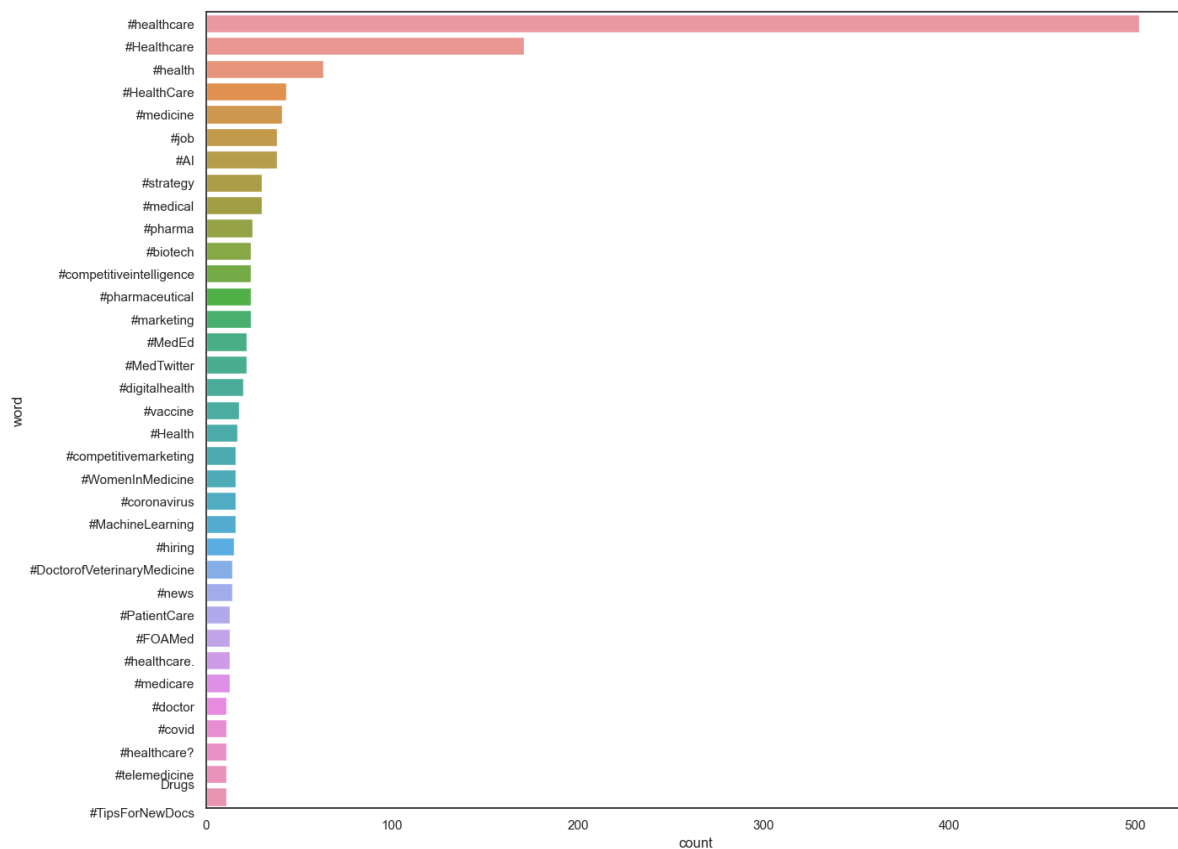


Fig. 2: The top trending hashtags with a visualisation

Further out of curiosity, I Investigated the two main concerns as part of the final analysis in the Fig.3, which were:

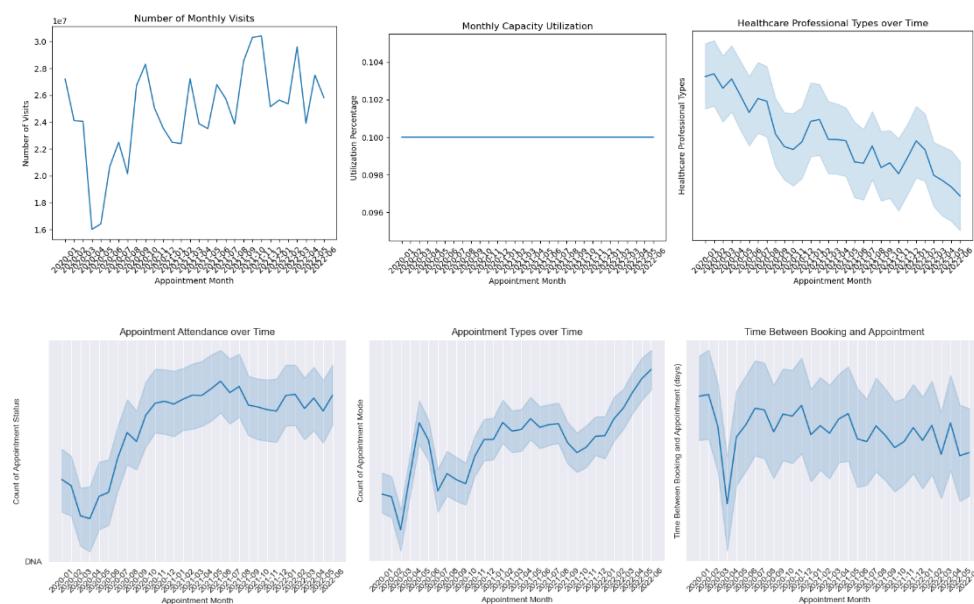


Fig.3: Findings and trends identified during the data analysis

- whether there were adequate staff and capacity in the networks - yes
- what the actual utilisation of resources was – ‘Face-to-Face’ in appointment mode, maybe due to Covid’19 affected areas.

The Fig.4 compare the service settings between the number of appointments and excluding the GP visits. It is important to consider the influence of the practice in the missed appointment rate, since there are many practice factors that may contribute.

Eventually, there has been a consistent increase in demand for healthcare services within the NHS according to my posed analysis and to my further research the factors such as an aging population, advancements in medical technology, and changing lifestyles have contributed to this trend. As a result, the NHS has faced challenges in meeting the growing demand, leading to longer waiting times and increased pressure on resources.

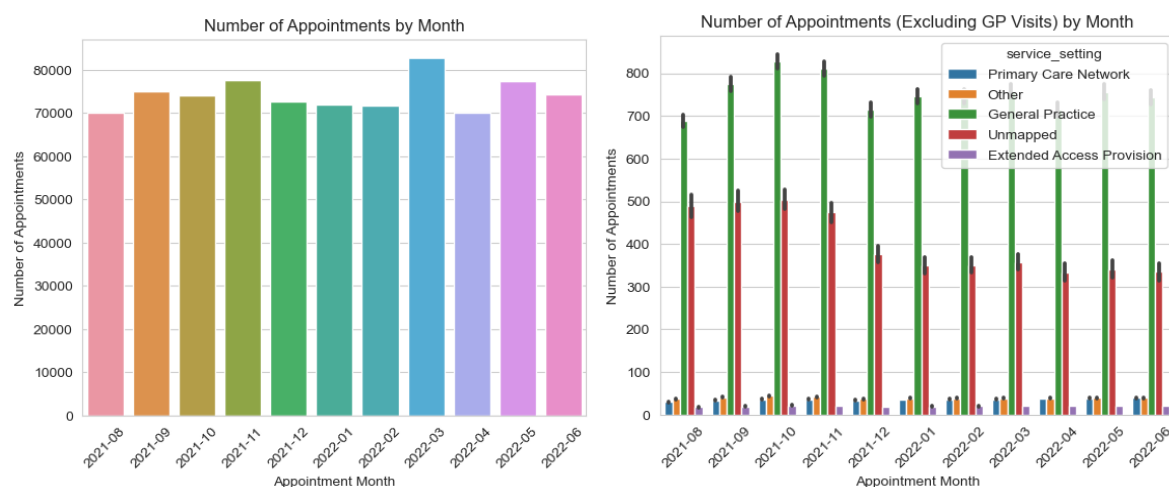


Fig. 4: The service settings for the number of appointments and the service settings excluding GP visits

## **Conclusions & Recommendations**

Over the years from 2020, there has been a consistent increase in demand for healthcare services within the NHS due to external global calamity as Covid’19. Factors such as an aging population, advancements in medical technology, and changing lifestyles have contributed to this trend. As a result, the NHS has faced challenges in meeting the growing demand, leading to longer waiting times and increased pressure on resources. Several other factors that could not be assessed in this study — primarily because these factors are complex and hard to measure — may account for some, but probably not many, of the variations between practices in the prevalence of missed appointments. These include ways in which access to GPs and their appointment systems are organised. Further exploration into strategies for managing and optimizing healthcare resources can help the NHS address the increasing demand efficiently. This could involve exploring innovative approaches like telemedicine, digital health solutions, and preventive care programs.