NHS Service Utilisation & Capacity Planning

Dhruval Patel

Agenda


Business Context
Analytic Approach
Patterns and Trends
Recommendations For Further Analysis
Key Takeaways

Business Context

Incremental pressure to meet healthcare demands of a growing population.

Utilisation increases mean strategic decisions must be made regarding infrastructure investment and resource allocation.

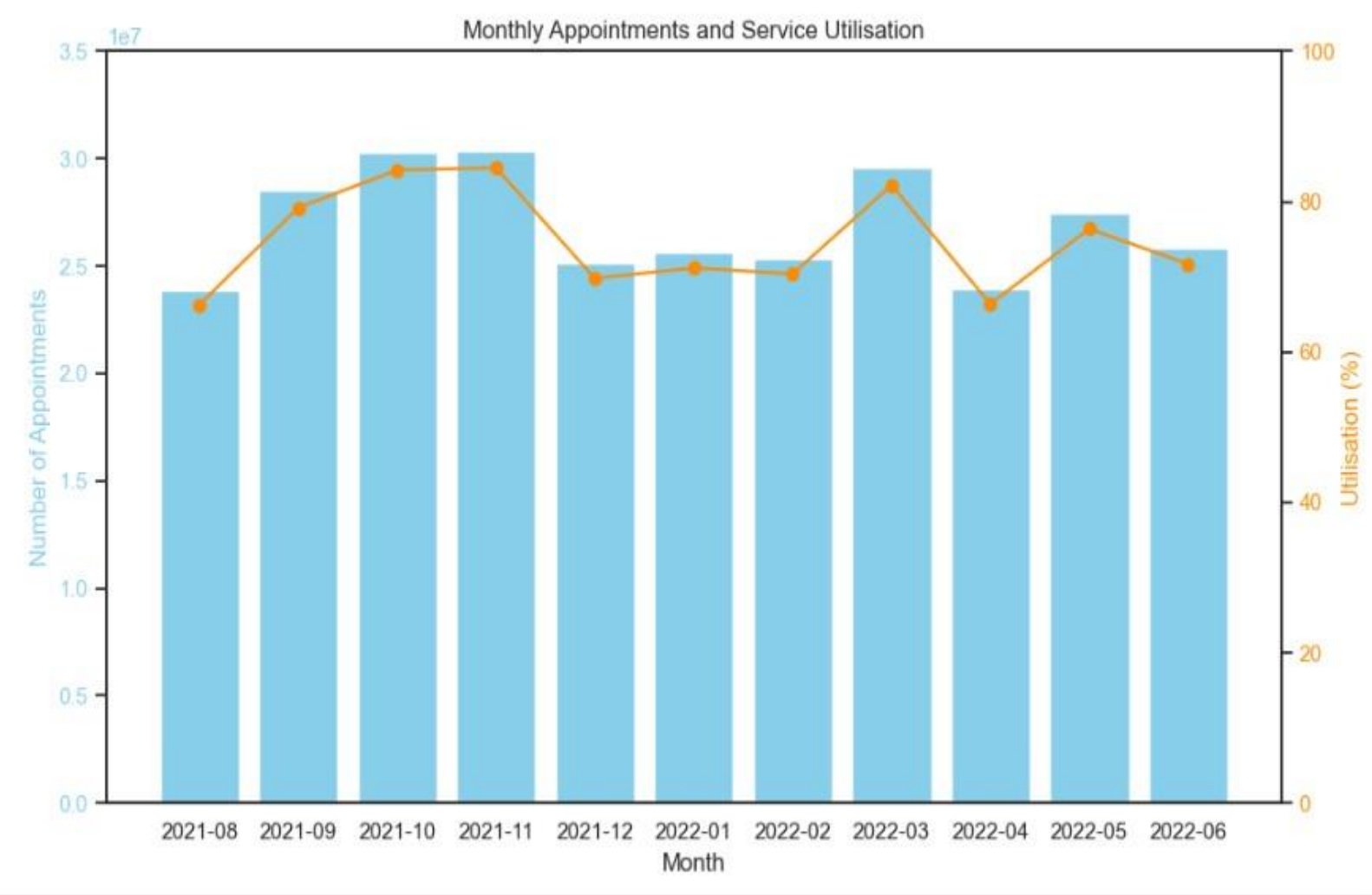
A series of visualisations will support evidence-based decisions for budget allocations and capacity management.

The analysis will inform capacity planning and support efficient budgeting.

Analytic Approach

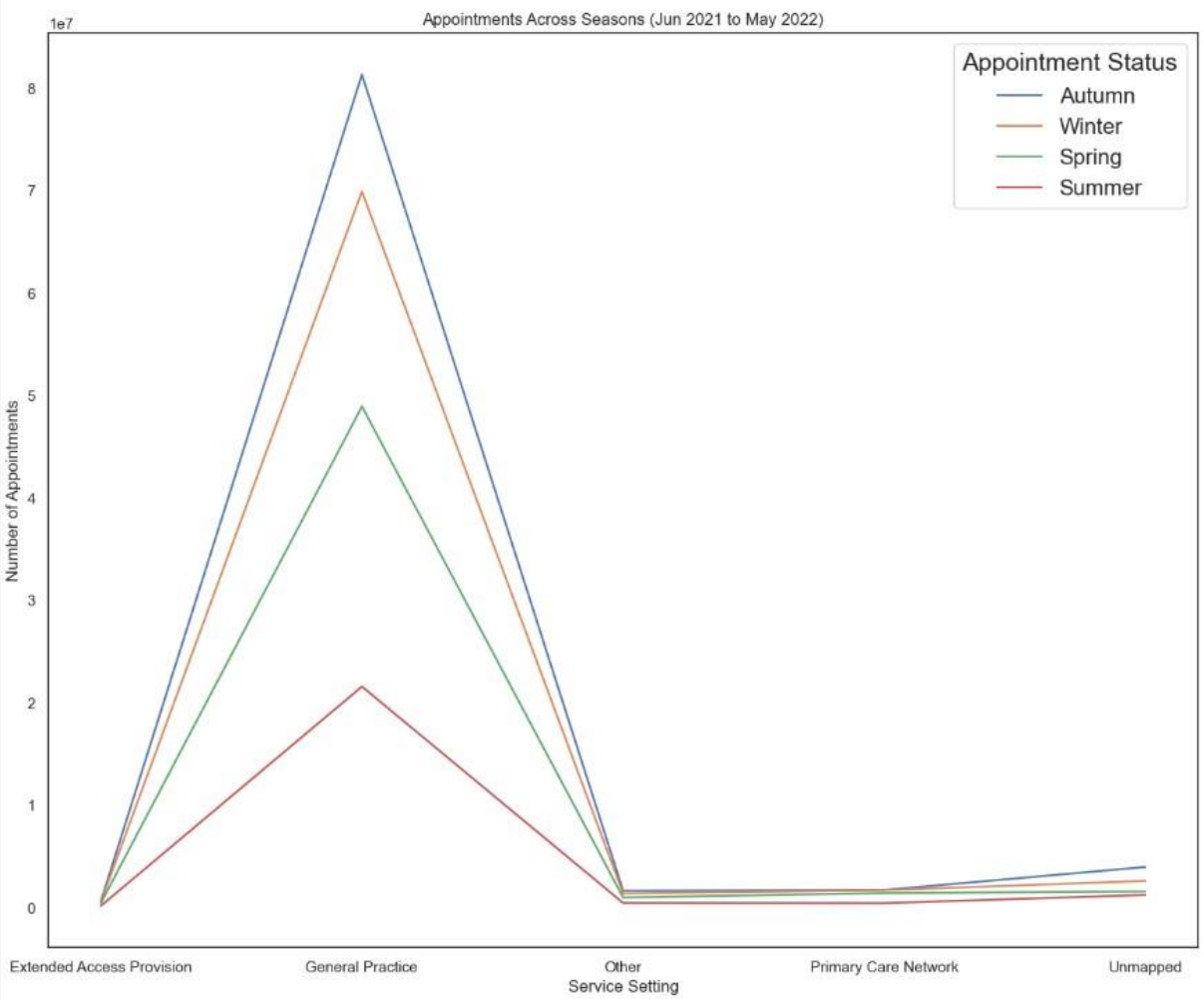
Python and Its Libraries	Data Wrangling	Aggregation & Metric Creation	Data Visualisation	Insights & Suggested Actions
Libraries such as *pandas* and *seaborn*	Using *pandas* to check for missing values, duplicated entries, and data format consistencies.	Creating variables relating to grouped data used for visualisations. Adding columns to aggregated data to present insights more accurately.	Using *seaborn* and *matplotlib to create a series of box plots, line plots and dual axis charts.*	Inform business decisions using visualised data to combat capacity planning and resource allocation.

Service Utilisation



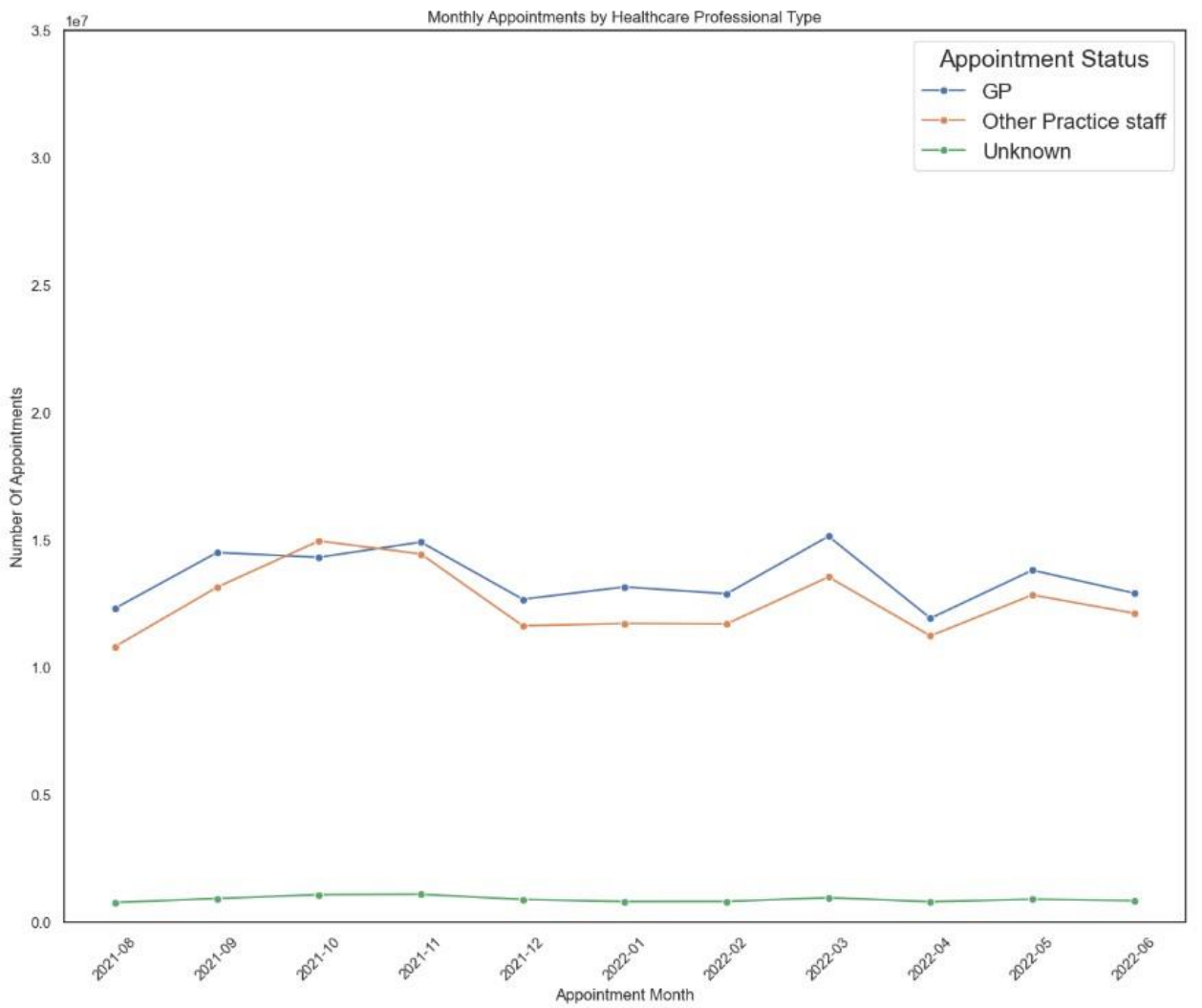
- Dual axis chart comparing appointment volumes with service utilisation.
- Utilisation remained high. (reaching peaks of 80%)
- Opportunity to redistribute capacity or prepare for increased demand.

Seasonal Appointment Trends



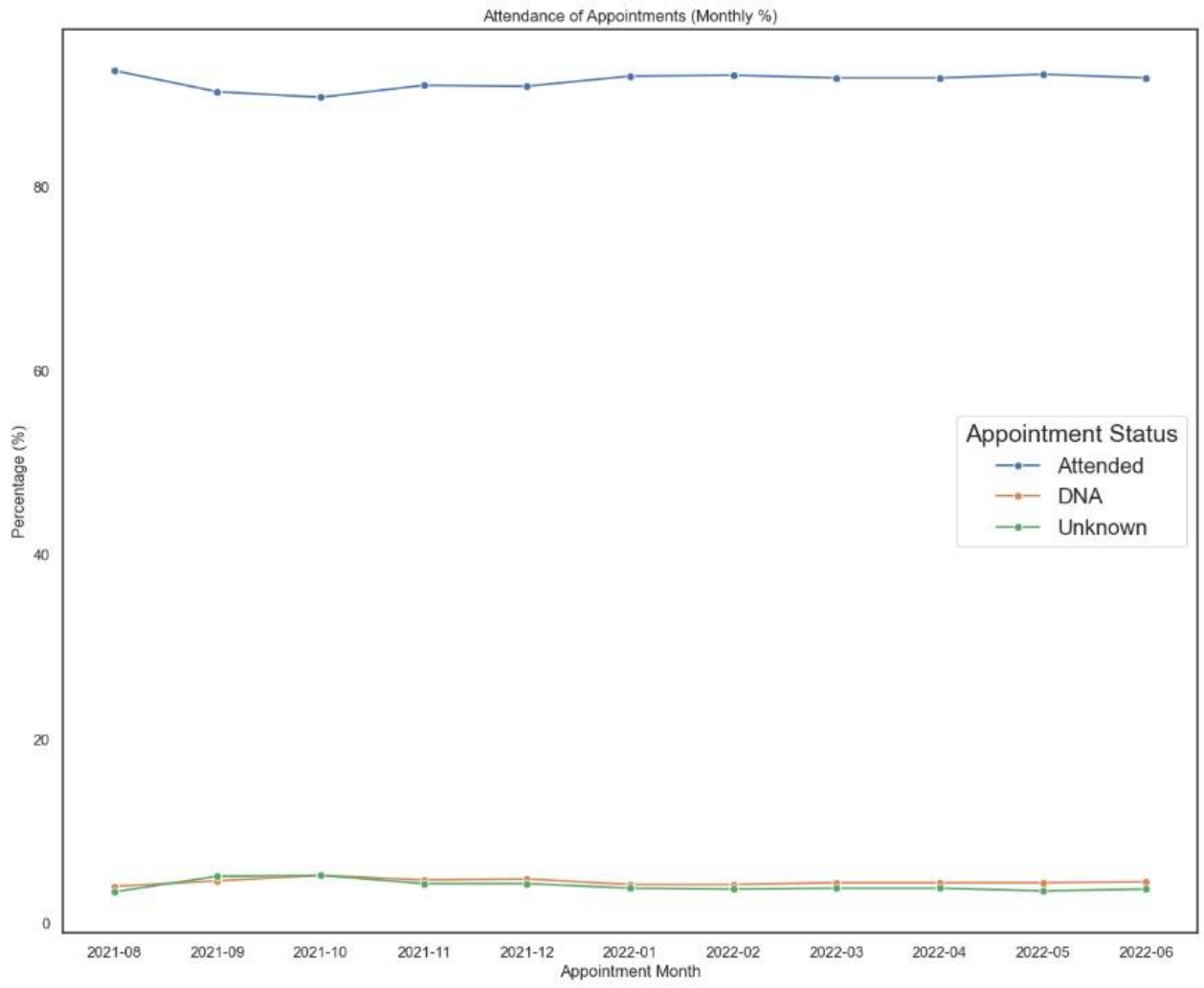
- Appointments for each season combined into one dataset
- Autumn followed by Winter were the months of most demand
- GPs were consistently delivering the most appointments throughout the year.

Healthcare Professionals



- Majority of appointments conducted by GPs.
- Other Practice Staff remain slightly behind throughout with the gap closing.
- Utilisation of other healthcare staff may reduce strain on GPs.

Appointment Attendance



Converting the total number of appointments to a percentage prevents dips in appointment volume from skewing the percentages for appointment status.

Trending Hashtags

	hashtag	count
2	#ai	47
4	#job	38
6	#digitalhealth	31
7	#strategy	31
8	#pharmaceutical	28

- Removal of over-represented hashtags such as: (#medical, #healthcare, #medicine)
- Growing interest in #ai, #digitalhealth and #job

Analytic Recommendations

Data Limitations

Data regarding staffing numbers would help establish resource allocation within the network.

Twitter data does not contain the dates of tweets which prevent the ability of pinpointing time periods of tweet popularity

Accurate Mapping

Ensuring healthcare services complete records will reduce the number of unknowns present amongst the datasets.

Summary

Valuable insights into NHS service utilisation, appointment trends and healthcare interest uncovered.

Pressure on existing capacity and potential to optimize operations is present.

Exploration of Twitter data reveals public interest into digital health, jobs and AI.

Findings support a data-driven approach to capacity planning.

Enhanced data collection and integration of digital tools strengthen the NHS ability to deliver sustainable, high-quality care.




Thank you

Dhruval Patel