



Analysis for NHS

Utilisation of services and missed appointments

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LSE Data Analytics Career Accelerator



Why are we doing this analysis?

- 1 Does the NHS need to increase capacity and employ more resources?
- 2 Can the NHS meet demand of services with its existing resources?

Let's start by recapping why are we doing this analysis? It's because the NHS want to know how best to budget and allocate resource to meet demand.

My initial thoughts...

Existing resources and capacity are sufficient

Improving efficiency such as minimising missed appointments would make the situation even better!



My hypothesis is that the NHS can meet demand with its existing capacity, and improving efficiency by minimising missed appointments for example. Let's go through the analysis and see if I'm right.

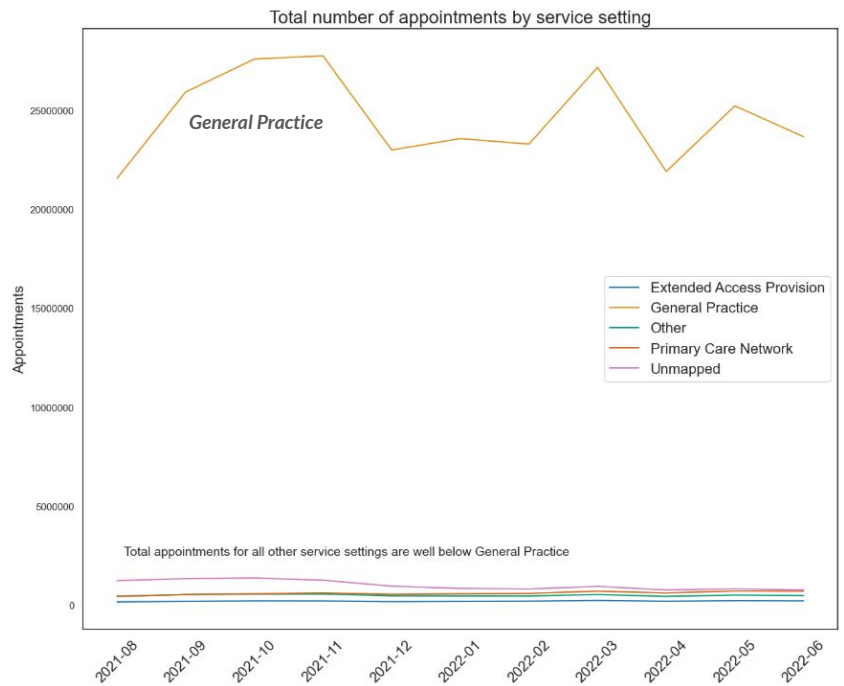
It's a story full of lines

So let me share the answer through a story that has a lot of lines.

Chapter 1

Total appointments

General Practice is a clear winner

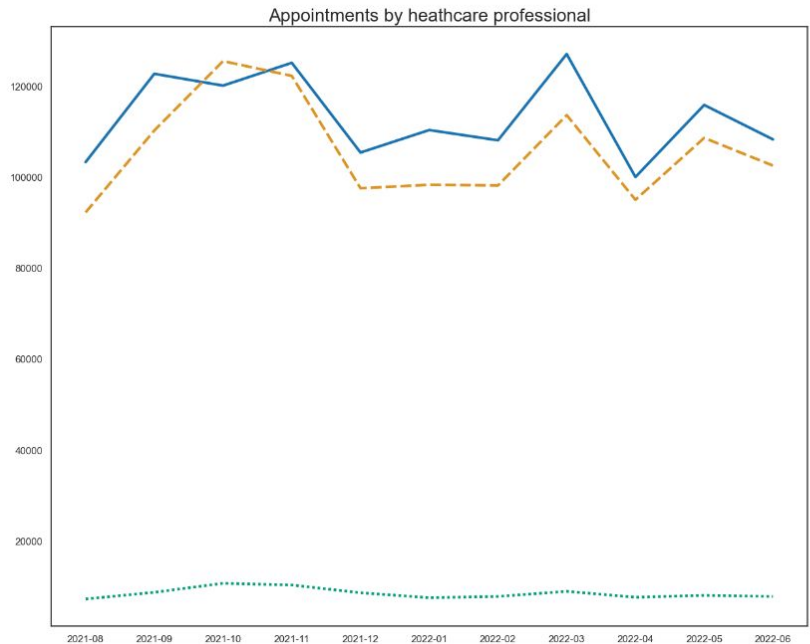


Let's start with total appointments.

Between August 2021 and June 2022, there are significantly more General Practice appointments compared to all other service settings, which you were probably expecting.

Who's in demand?

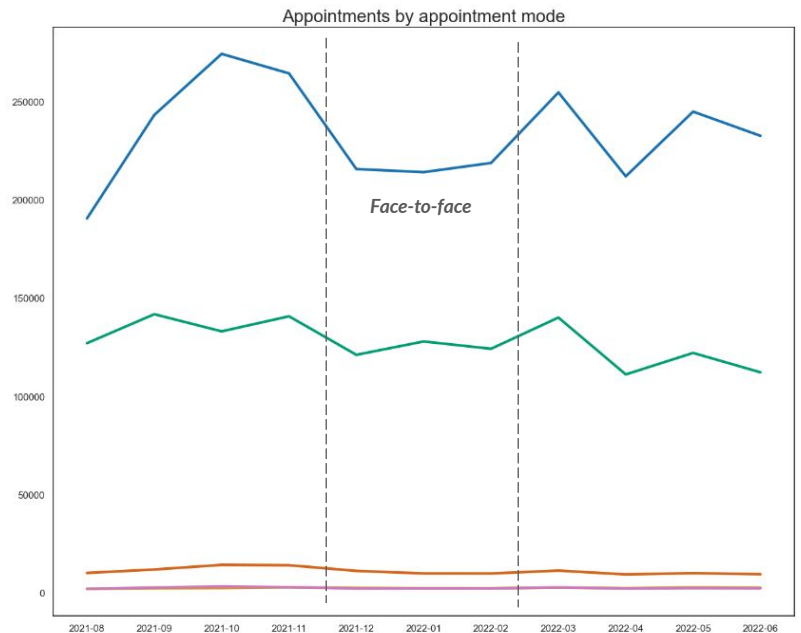
— GP
- - - Other Practice staff
... Unknown



However, it's a close race between total appointments for GPs and other practice staff each month.

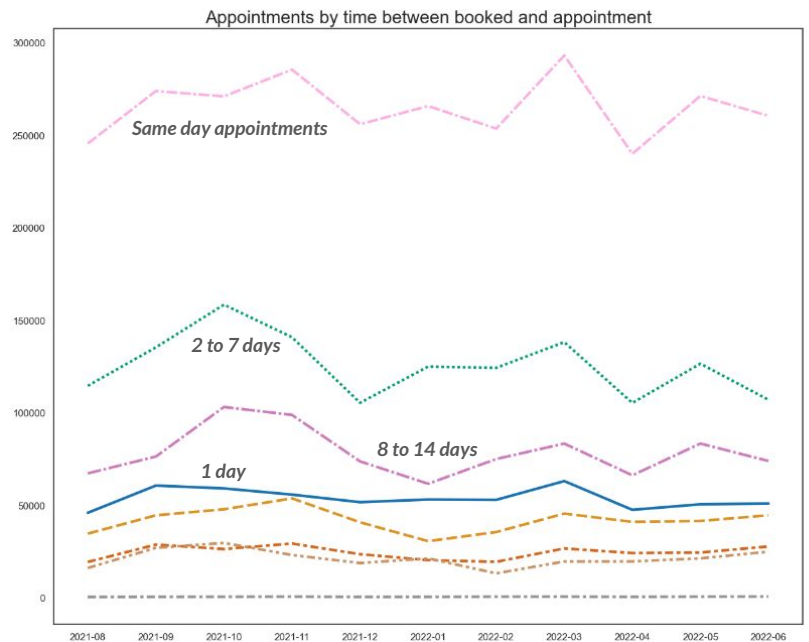
Are people too busy in December, January and February for face-to-face appointments?

— Face-to-Face
— Home Visit
— Telephone
— Unknown
— Video/Online



Most appointments are face-to-face with peaks in October and March. You can see there's quite a dip December to February. Which makes me wonder if people are too busy with Christmas and healthier resolutions to attend appointments?

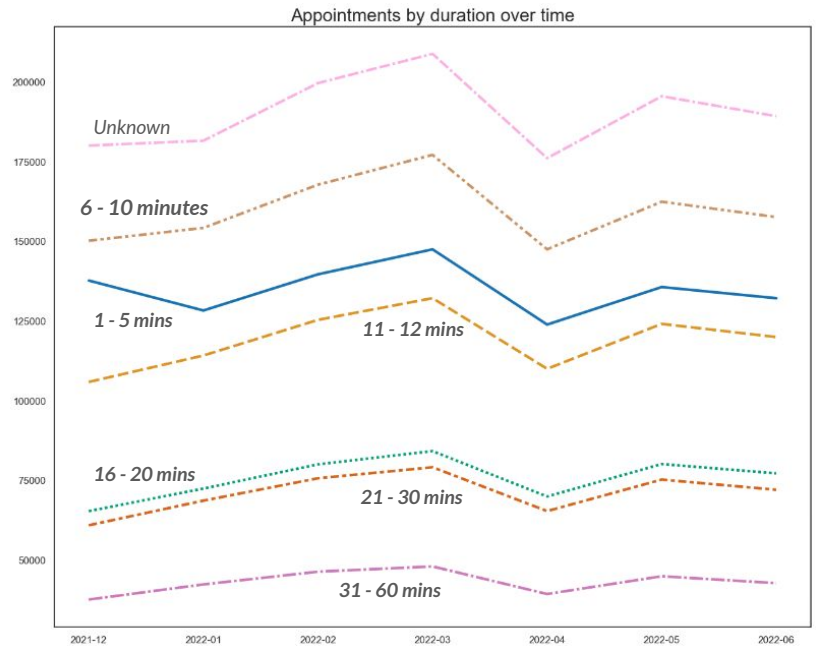
**No surprise
that most are
booked on the
same day**



It'll come as no surprise that most appointments are booked the same day. But did you know that booking 2 to 7 days in advance is next highest?

Is 6-10 minutes long enough for an appointment?

1-5 Minutes
11-15 Minutes
16-20 Minutes
21-30 Minutes
31-60 Minutes
6-10 Minutes
Unknown / Data Quality



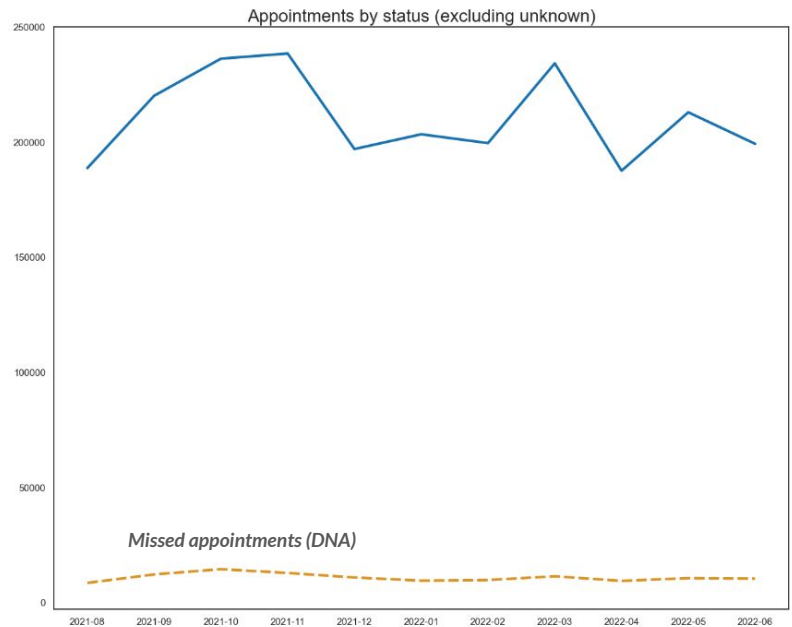
Most appointments are 6 to 10 minutes long, but there are quite a few longer appointment durations. So is 6-10 minutes enough time for an appointment?

Chapter 2

Missed appointments

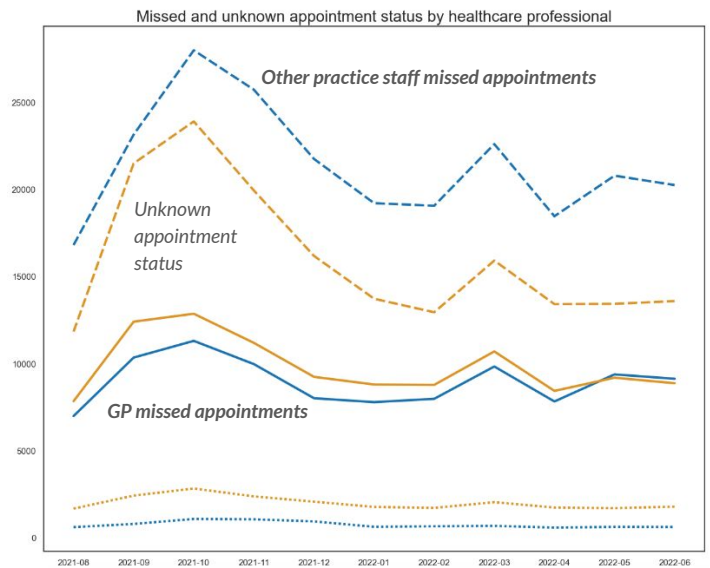
Does time of year affect DNAs?

— Attended
- - - DNA



Looking at missed appointments (or DNAs as you call them), the trend looks quite flat over time (unlike attended appointments). This could indicate the time of month does not influence DNAs.

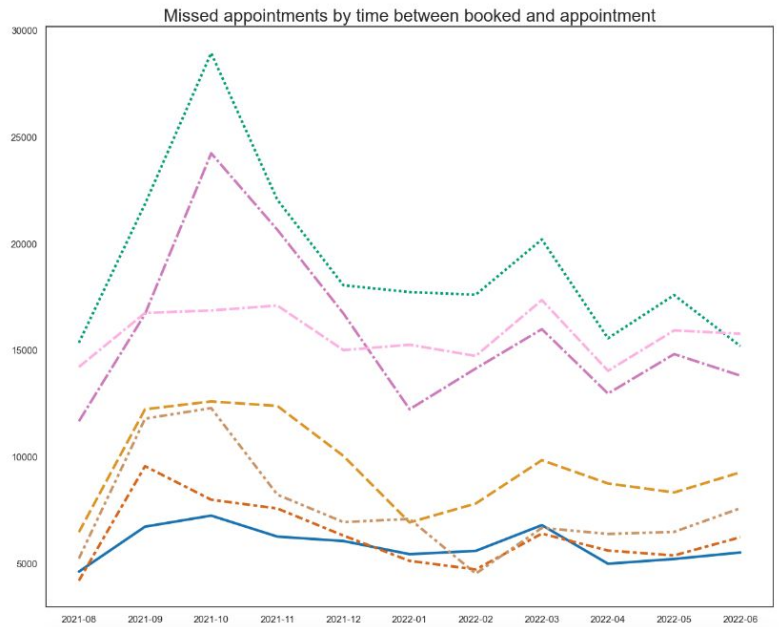
Does healthcare professional influence appointment status?



When considering missed appointments, is the type of healthcare professional a factor? In answer to this question, potentially yes!

This graph shows that missed appointments with other practice staff are the greatest, while people are less likely to miss their GP appointment.

**DNAs: the one
time we want
the figures to
go down**



Generally in life it's nice when things increase, however in the case of missed appointments it's the opposite.

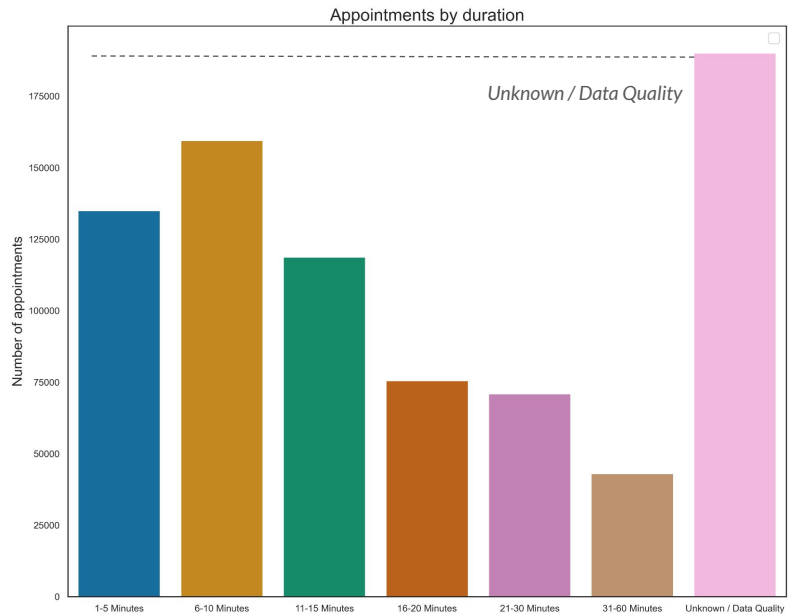
This graphs shows that while appointments booked between 2-7 days and 8-14 days in advance are the most missed appointments, the good news is that missing appointments are decreasing overall.

Chapter 3

Known unknowns

Chapter three: known unknowns. I included this chapter because unfortunately the data provided is incomplete. There are a lot recorded as 'unmapped', 'unknown' or 'inconsistently mapped'.

**Did you know
that most
appointment
durations are
unknown?**

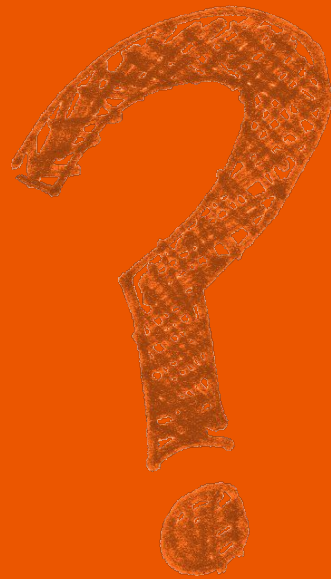


Looking at these known unknowns in more detail, did you know most appointment durations are unknown?

The pink bar on the right are unknown/data quality, which is considerably higher than 6-10 minutes which is the next highest.

33.7%

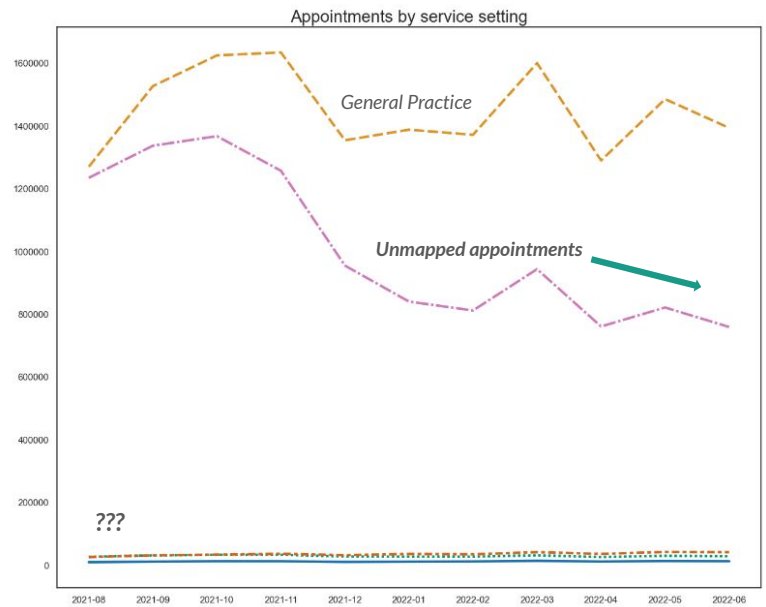
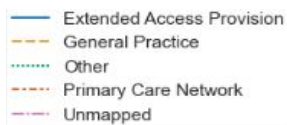
unknown if they attended or
missed their appointment



Did you know that for 33.7% of all records we don't know if the appointment was attended or missed? That's a lot in my opinion.

Good news!
Unmapped
are on the
decrease...

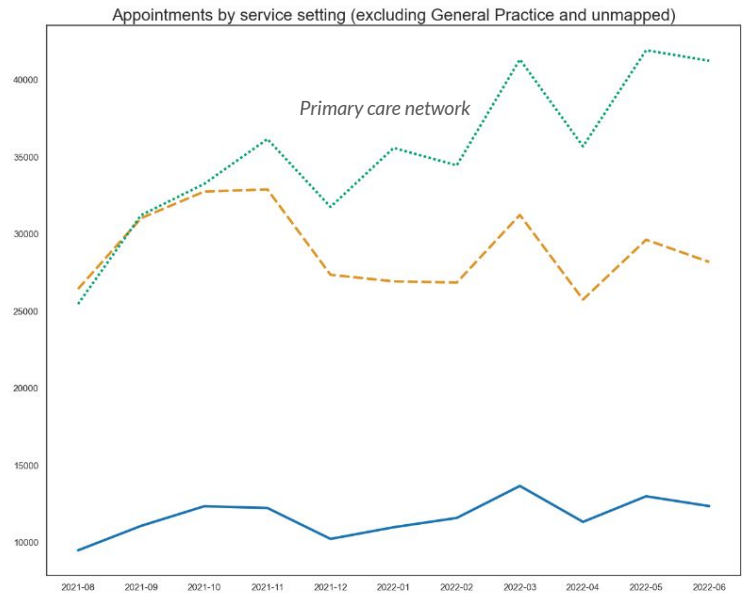
but what are all the lines
at the bottom?



There is some good news! Unmapped appointments are thankfully decreasing. And if you're wondering what that colourful cluster at the bottom is...

**I can see
clearly now
that primary
care networks
are on the up**

— Extended Access Provision
- - - Other
..... Primary Care Network



Zooming in you can see that total appointments for primary care networks are increasing over time.

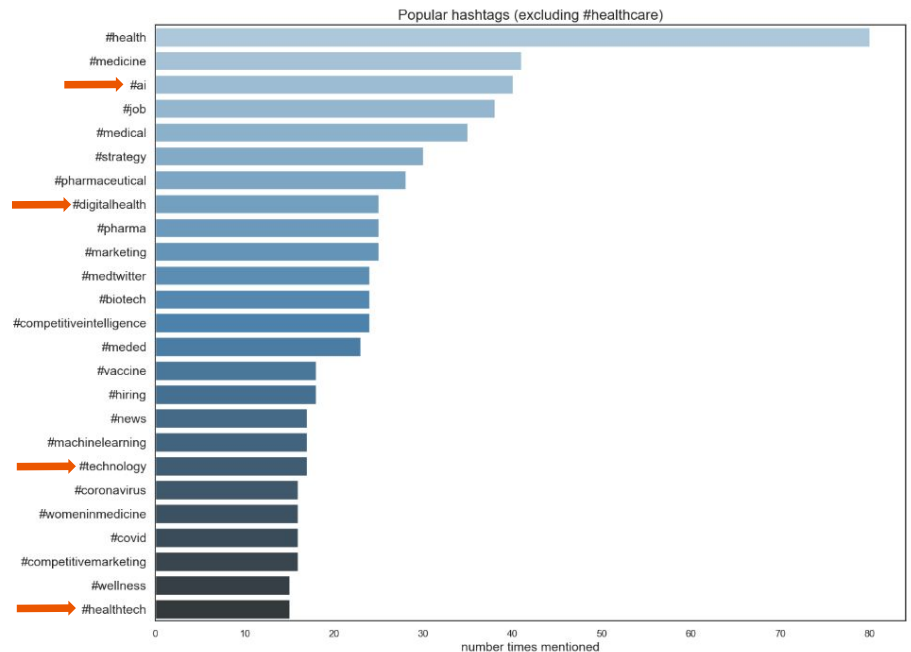
This is a slight sideline from discussing unknown data points, but I know I was intrigued to know what those elements were and thought you may too.

Chapter 4

Outside world

Let's have a quick peek into the outside world.

What are people talking about?



Our analysis of external data of Twitter hashtags indicates digital technology is a popular topic. Perhaps it could be used to minimise the missed appointments.

I did some additional research and found that two common reasons for missing appointments are forgetting about them and difficulty cancelling appointments.

For example, it can be a challenge getting through to a doctor's surgery with a lot of time on hold just to book the appointment. So would people go through the hassle again to cancel?

With this in mind digital technology could maximise appointment availability and minimise no shows.

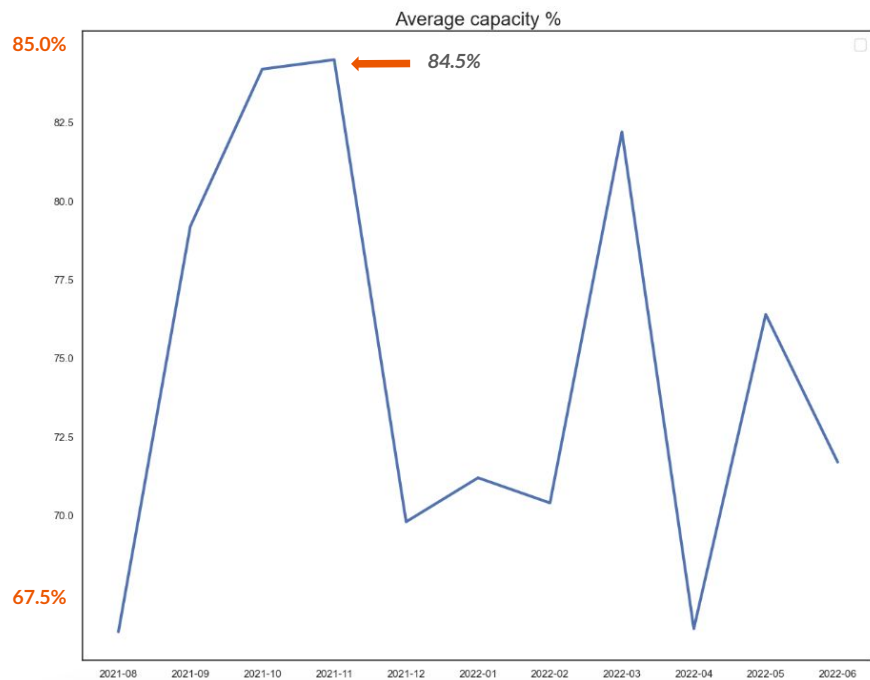
For example, text and/or email reminders with quick links to cancel or reschedule. And an online appointment manager or app could make booking, cancelling or reschedule their appointment as easy as ordering an Uber. I know I would appreciate that!

While it is a capital investment, I think the benefits would outweigh the costs... and give us even more data to work with!

Was I right?

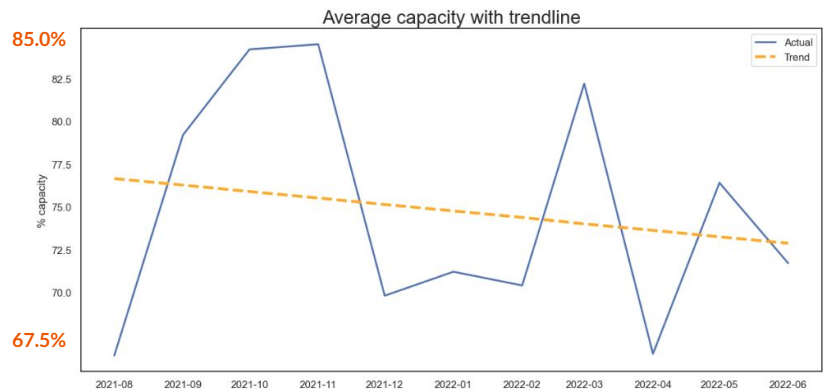
Going back to the main question. Was I right in my hypothesis? Can the NHS meet demand with existing capacity?

At your
busiest,
you were at
84.5 %
capacity!



Absolutely! At the busiest period in November 2021, the NHS was only at 85% of capacity.

Another instance when we're happy with a downward trend



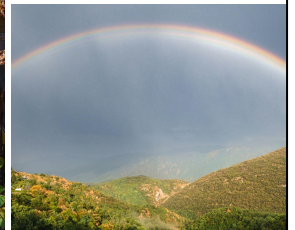
Looking at the trend line, the percentage average capacity (in other words how much of available resources are used) is decreasing. This is good news because the NHS should be able to meet demand with current resources.

Chapter 5

Next steps

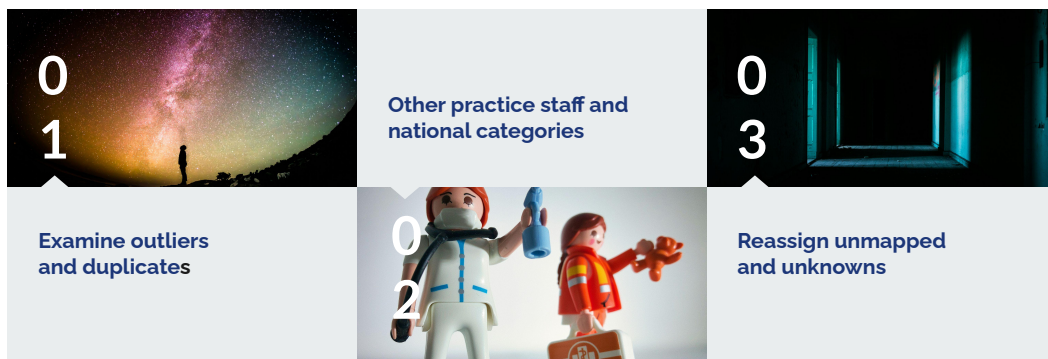
Recommendations

- 01 | Maintain existing capacity and resources.
- 02 | Reduce missed appointments.
- 03 | Improve data quality and completeness.



Based on the results of the analysis my recommendations are to use the existing resources at current capacity, reduce missed appointments, and improve data quality and completeness.

Further analysis



At the moment I feel we're only getting part of the picture because of the data quality.

I recommend further analysis and would like to examine outliers and duplicates, and expand 'other practice staff' to include specific job roles.

For example, 'other practice staff' consists of 12 different roles including nurse, dispenser and interpreter. I think the analysis could be more insightful and allow us to identify particular resources that are more or less required.

There are also a lot of national categories but the bulk of the data is unmapped/unknown. Consolidating the categories may give more accurate data in the future because staff will be more inclined to select from the list, rather than not selecting at all.

As we saw there were considerable number of unknown data points. It would great if we could find out what those values are. Because it could change the outcome of this analysis.

The end... or is it?

Further analysis and more data will help us get closer to the full picture – and the ending of this story may change.

Because the suggested further analysis will help us get closer to the full picture, the ending of this story may change.



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