Case Study

Diagnostic Analysis using Python

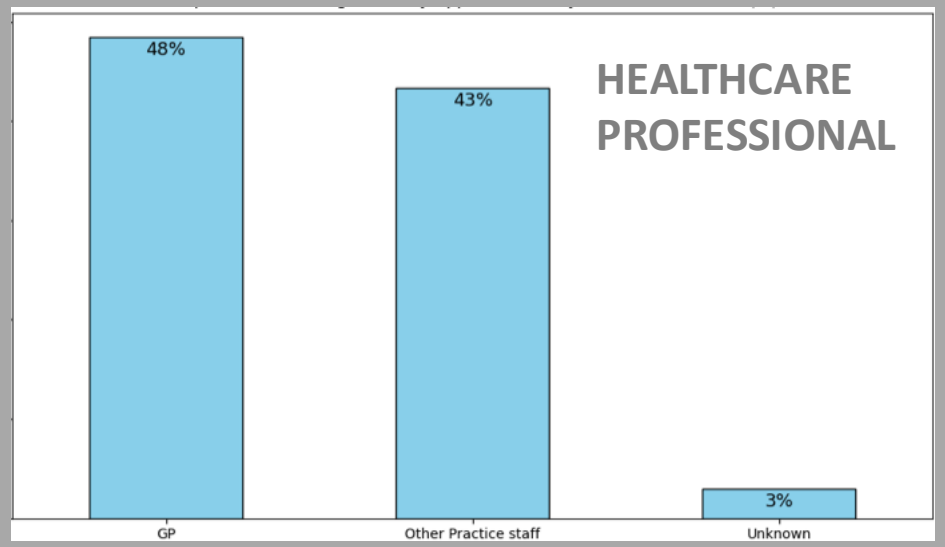
In the context of an increasing population, the NHS must plan and budget for infrastructure and resources accordingly. Hence, two questions were posed:

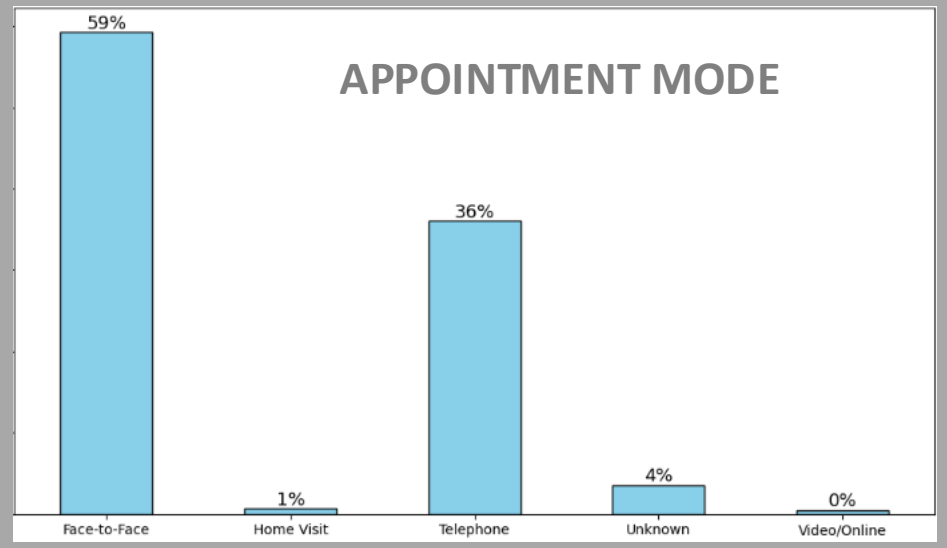
- **Has there been adequate staff and capacity in the networks?**
- **What was the actual utilisation of resources?**

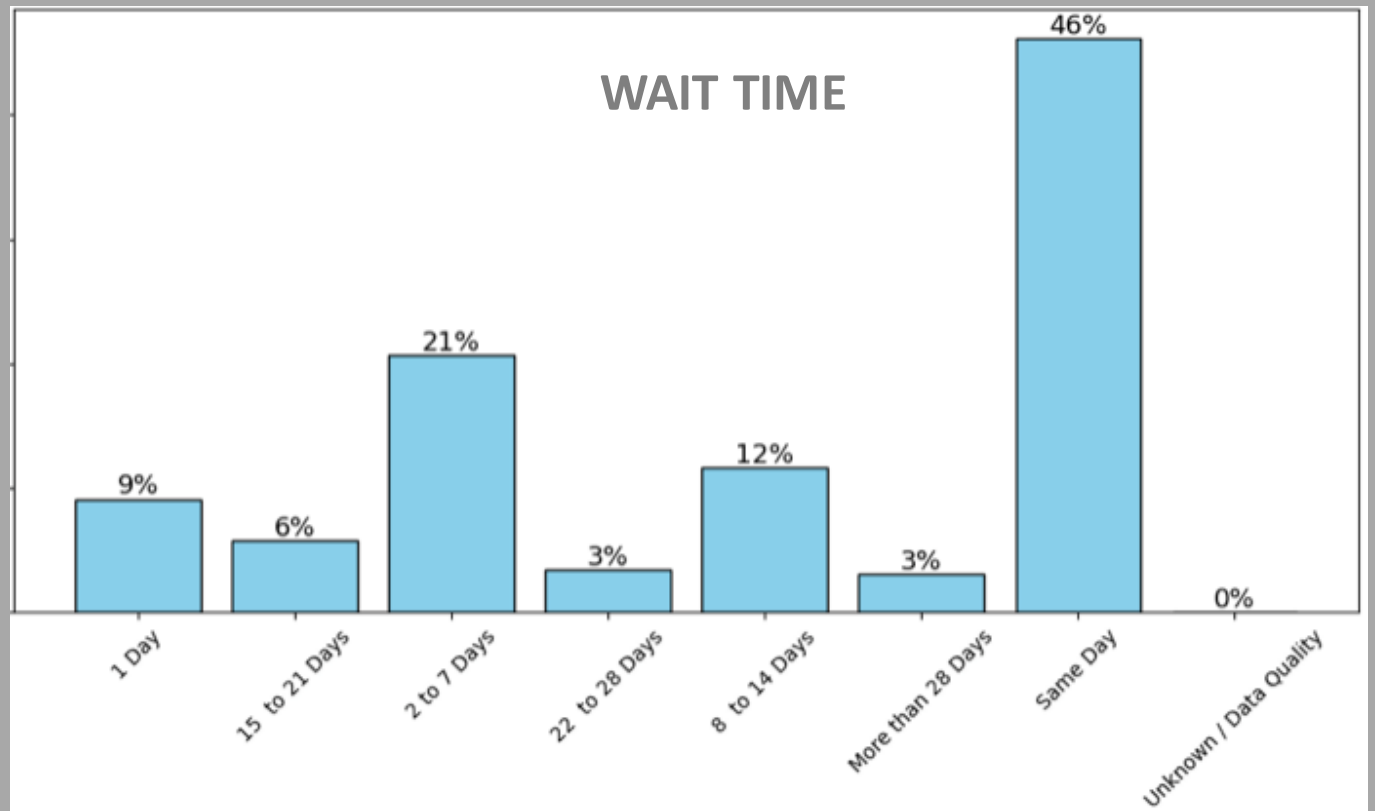
Aspects to bear in mind:

- Three datasets of varying structure, quality, and time frame (The Twitter dataset was found to be generic and irrelevant to the scope of the analysis).
- Appointments are the unit of measurement.
- No data available on current staff numbers.
- No data on appointments capacity, other than a daily average of 1.2 million as the maximum capacity guideline.

Metrics:


HEALTHCARE PROFESSIONAL
48%
43%
3%
GP
Other Practice staff
Unknown


APPOINTMENT MODE
59%
1%
36%
4%
0%
Face-to-Face
Home Visit
Telephone
Unknown
Video/Online


WAIT TIME
9%
6%
21%
3%
12%
3%
46%
0%
1 Day
15 to 21 Days
2 to 7 Days
22 to 28 Days
8 to 14 Days
More than 28 Days
Same Day
Unknown / Data Quality

Appointment Attendance

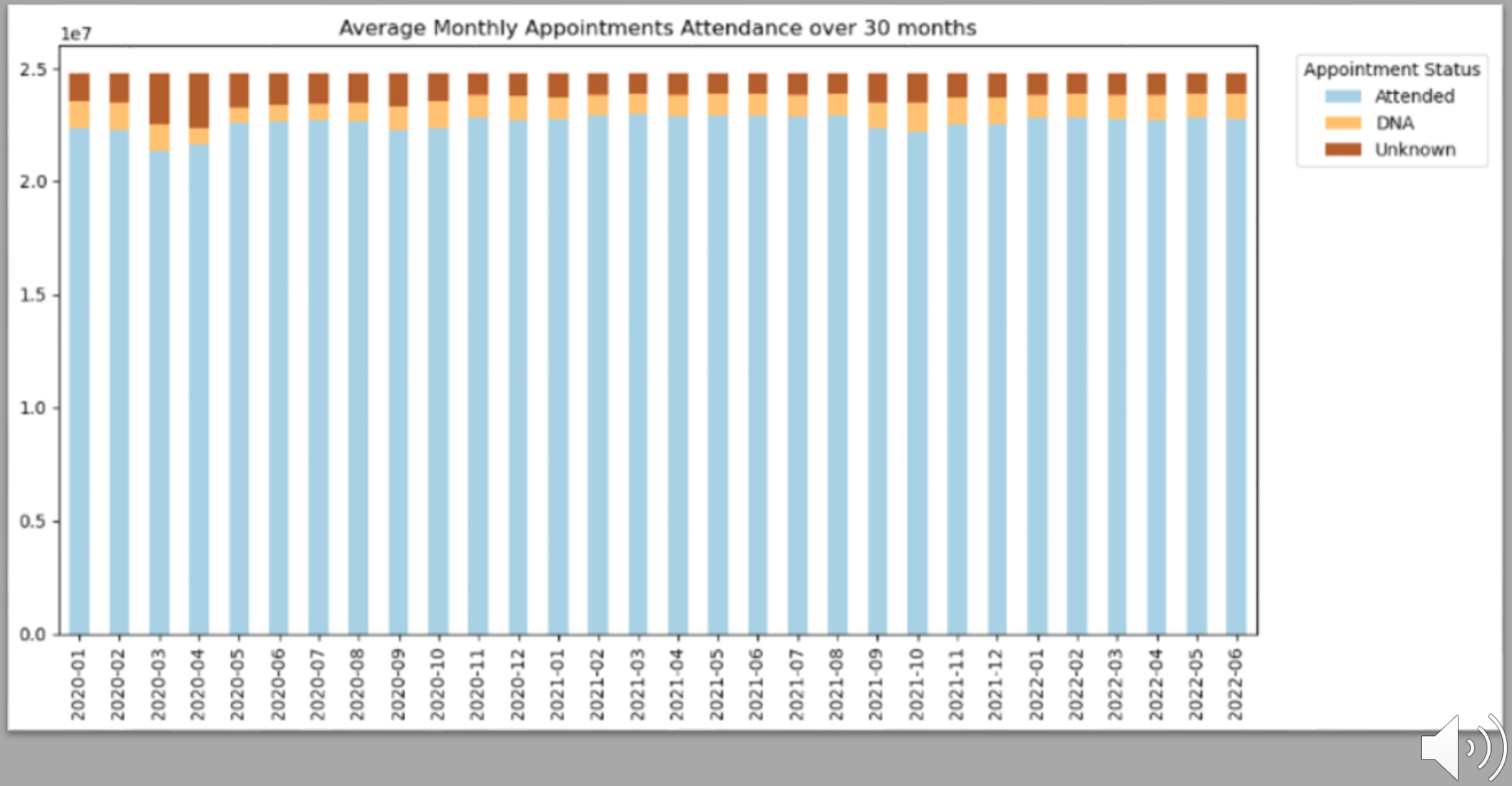
If patients book the appointment, they turn up for it.

on average at the rate of

~95%

across the entire network

with only 4% cancelling


Average Monthly Appointments Attendance over 30 months
1e7
2.5
2.0
1.5
1.0
0.5
0.0
Appointment Status
Attended
DNA
Unknown
2020-01
2020-02
2020-03
2020-04
2020-05
2020-06
2020-07
2020-08
2020-09
2020-10
2020-11
2020-12
2021-01
2021-02
2021-03
2021-04
2021-05
2021-06
2021-07
2021-08
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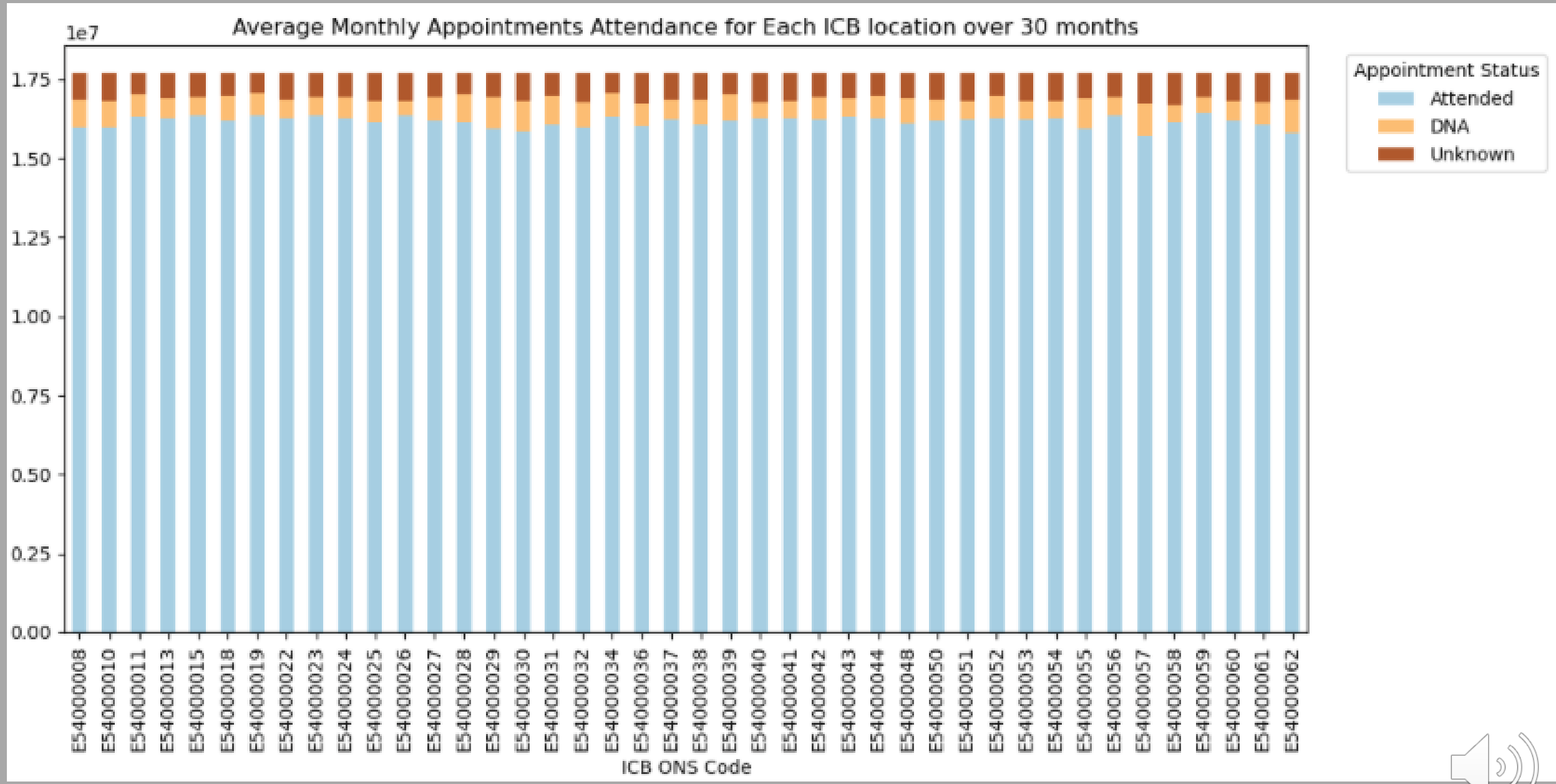
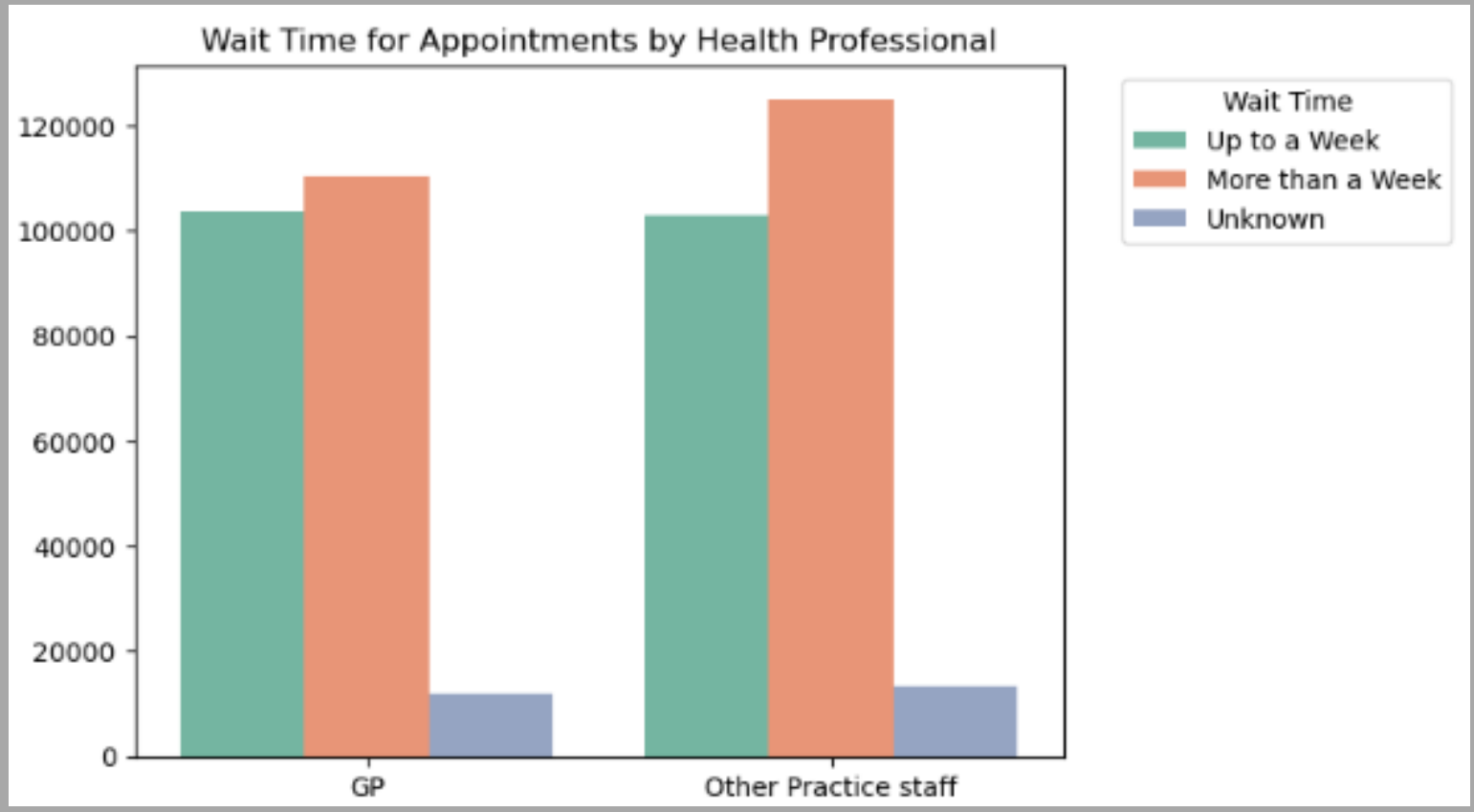
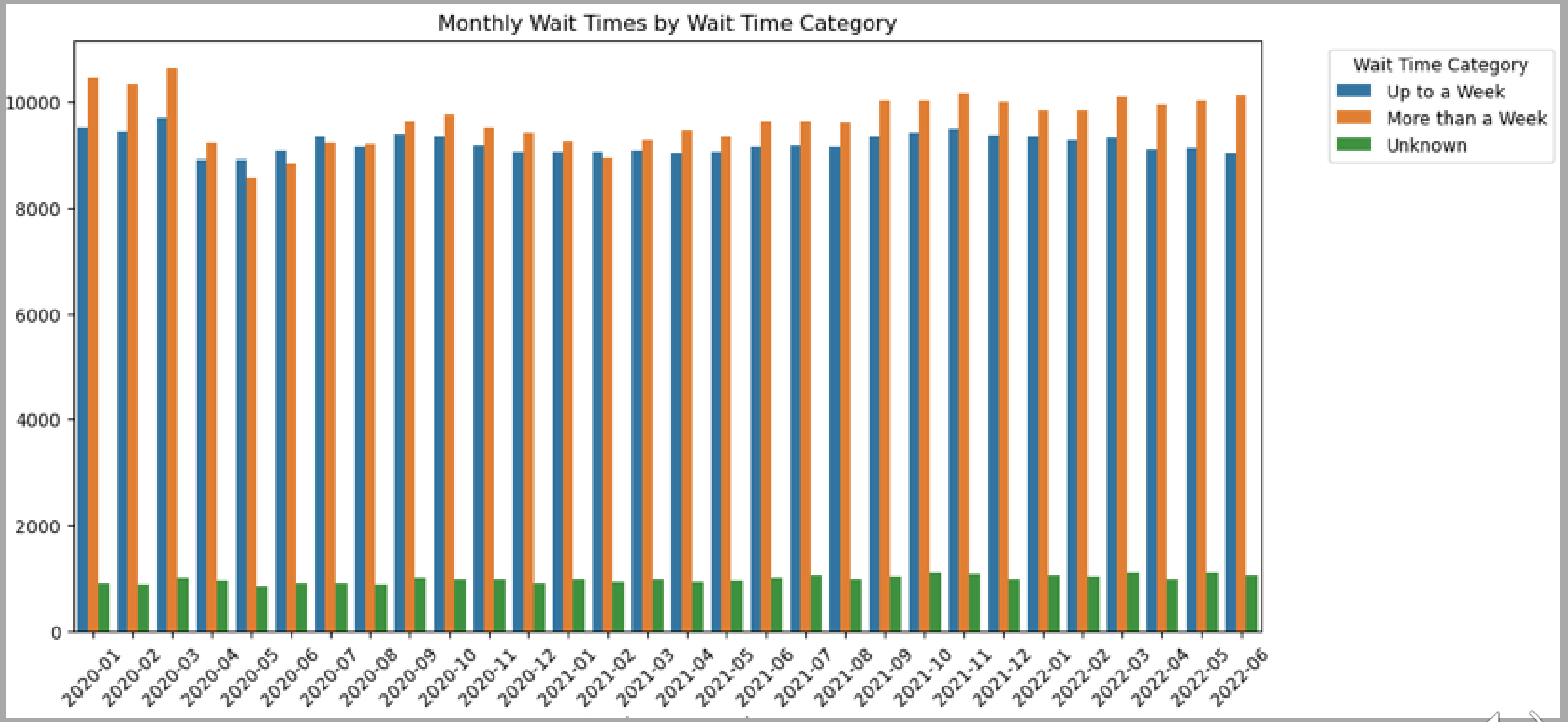
2021-11
2021-12
2022-01
2022-02
2022-03
2022-04
2022-05
2022-06


Average Monthly Appointments Attendance for Each ICB location over 30 months
1e7
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Appointment Status
Attended
DNA
Unknown
E54000008
E54000010
E54000011
E54000013
E54000015
E54000018
E54000019
E54000022
E54000023
E54000024
E54000025
E54000026
E54000027
E54000028
E54000029
E54000030
E54000031
E54000032
E54000034
E54000036
E54000037
E54000038
E54000039
E54000040
E54000041
E54000042
E54000043
E54000044
E54000048
E54000050
E54000051
E54000052
E54000053
E54000054
E54000055
E54000056
E54000057
E54000058
E54000059
E54000060
E54000061
E54000062
ICB ONS Code

The real challenge appears to lie in the availability of appointments by Other Practice Staff, and even more so, by specialists' appointments




Monthly Wait Times by Wait Time Category
Wait Time Category
Up to a Week
More than a Week
Unknown
0
2000
4000
6000
8000
10000
2020-01
2020-02
2020-03
2020-04
2020-05
2020-06
2020-07
2020-08
2020-09
2020-10
2020-11
2020-12
2021-01
2021-02
2021-03
2021-04
2021-05
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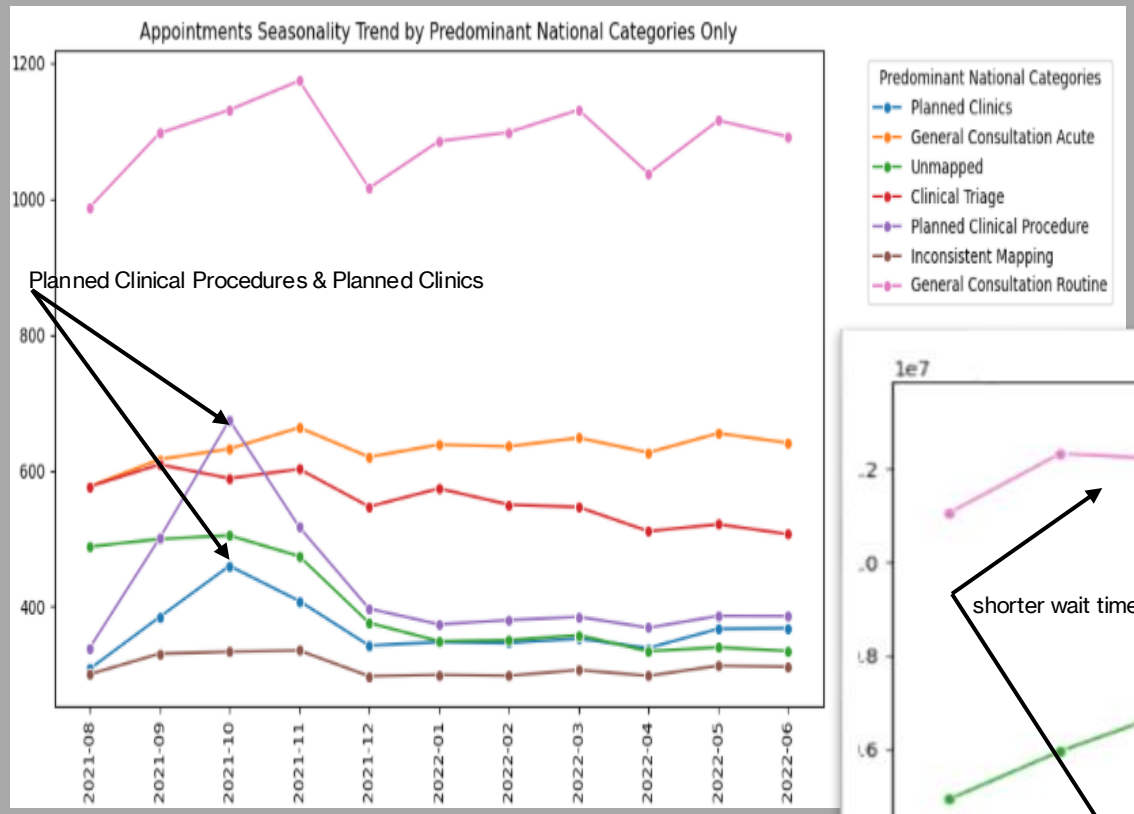
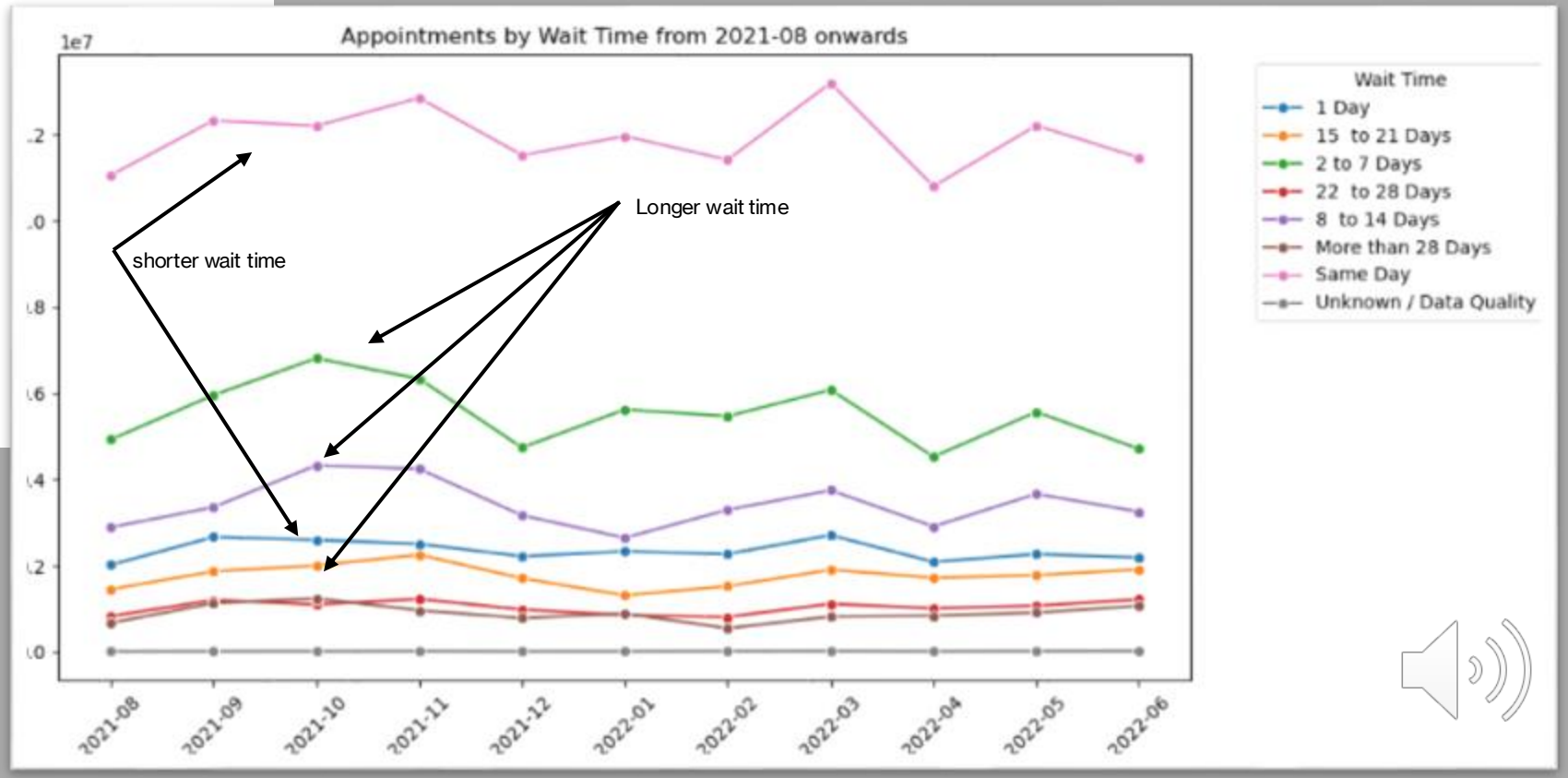
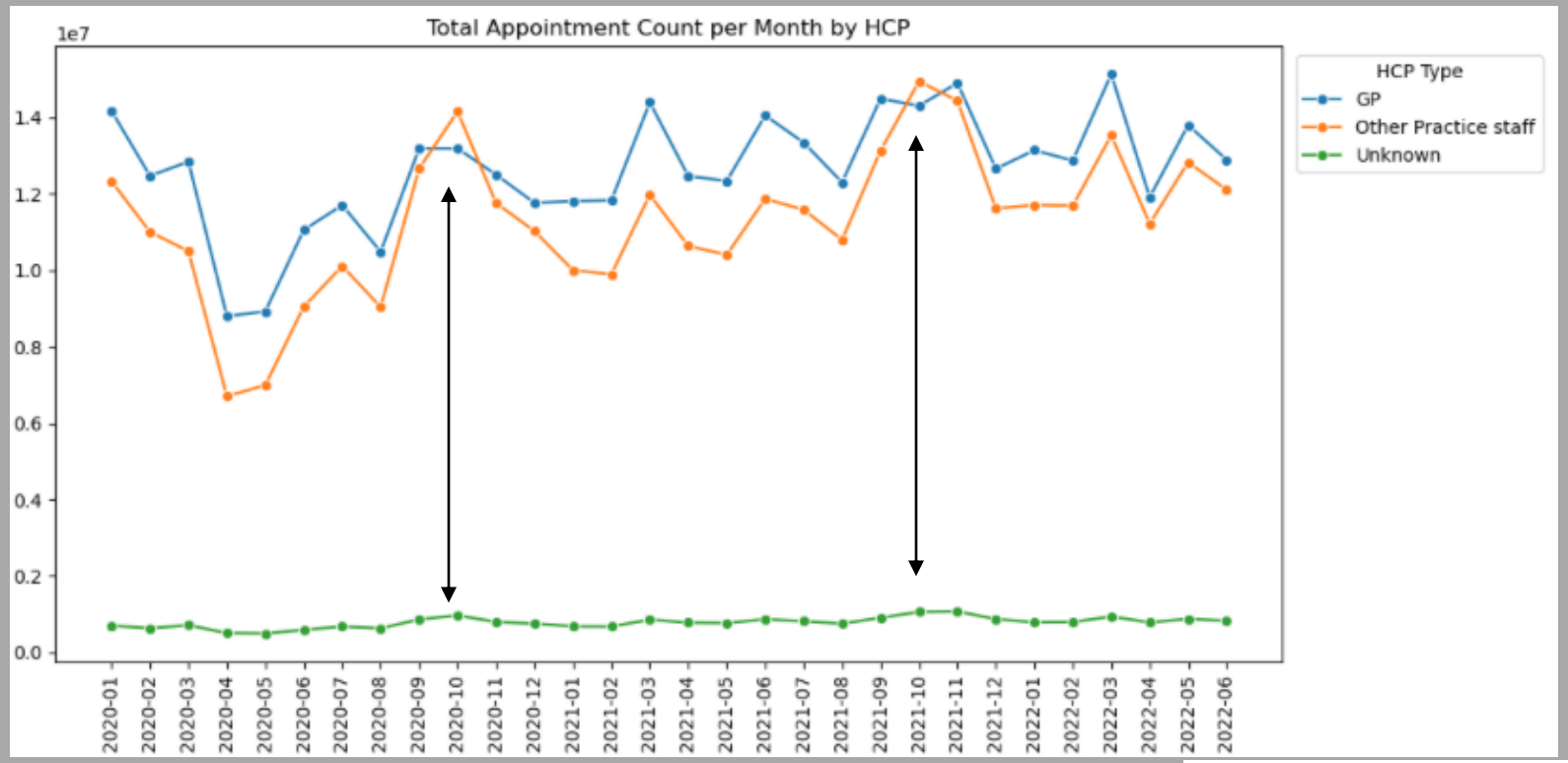
2021-08
2021-09
2021-10
2021-11
2021-12
2022-01
2022-02
2022-03
2022-04
2022-05
2022-06

Date specific period 08-2021 to 06-2022






Total Appointment Count per Month by HCP
1e7
HCP Type
GP
Other Practice staff
Unknown
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2020-01
2020-02
2020-03
2020-04
2020-05
2020-06
2020-07
2020-08
2020-09
2020-10
2020-11
2020-12
2021-01
2021-02
2021-03
2021-04
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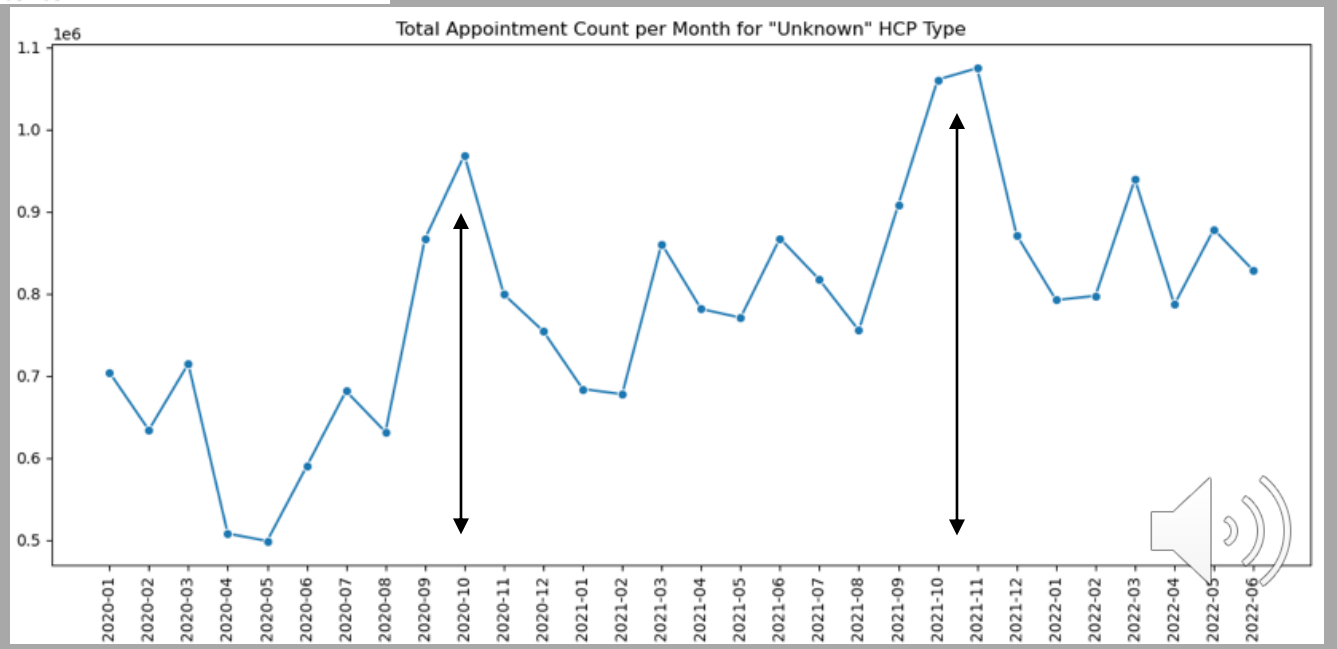
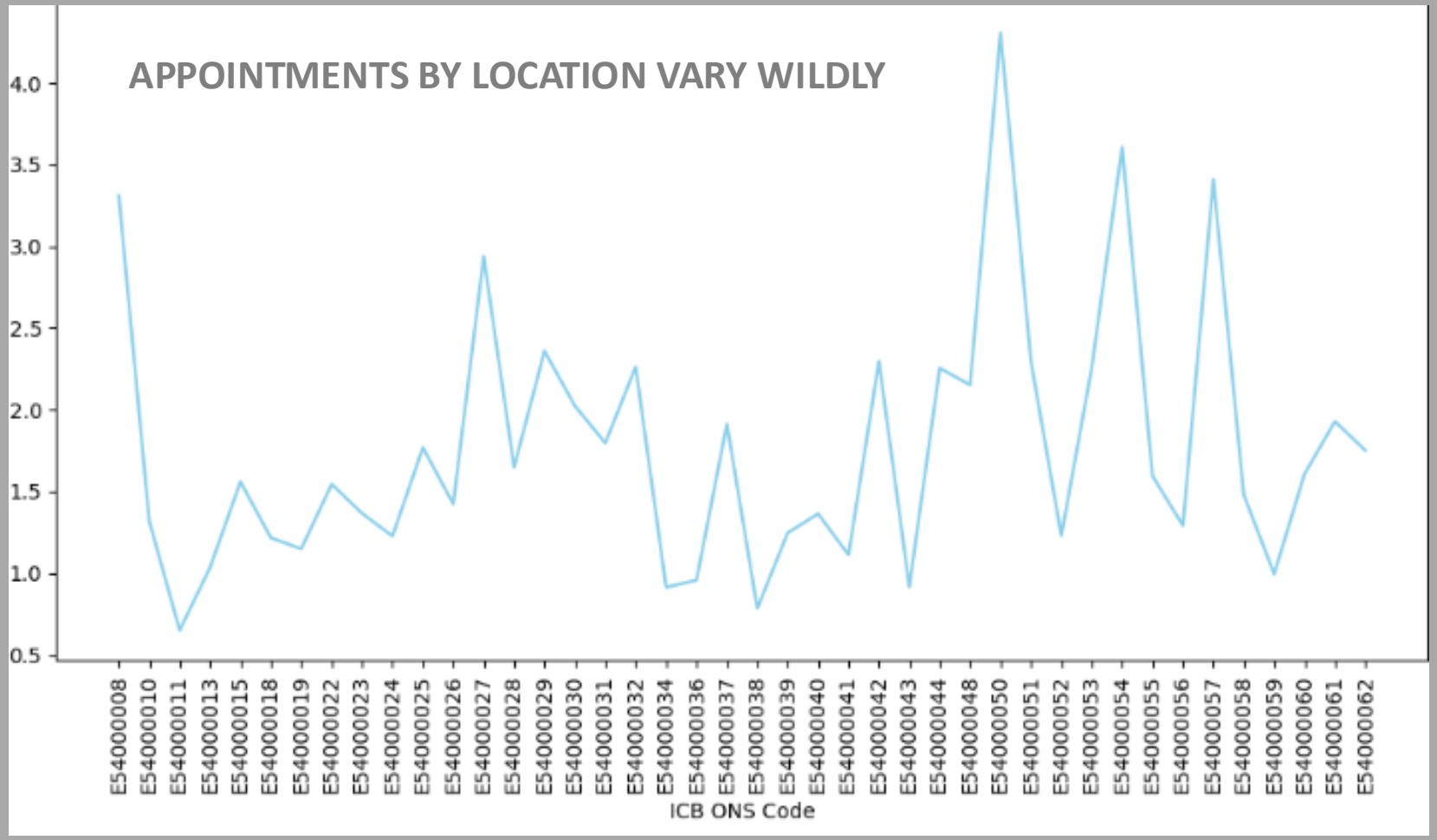

Total Appointment Count per Month for "Unknown" HCP Type
1e6
1.1
1.0
0.9
0.8
0.7
0.6
0.5
2020-01
2020-02
2020-03
2020-04
2020-05
2020-06
2020-07
2020-08
2020-09
2020-10
2020-11
2020-12
2021-01
2021-02
2021-03
2021-04
2021-05
2021-06
2021-07
2021-08
2021-09
2021-10
2021-11
2021-12
2022-01
2022-02
2022-03
2022-04
2022-05
2022-06

1.2 million appointments per day = 70-85% utilization capacity on average across the entire network HOWEVER



Conclusions and Recommendations

- Data quality remains a notable issue. Improving data collection through staff incentives and standardizing systems across the network could be effective solutions.
- Appointment attendance is over 90%.
- There are peak appointment periods adding strain on resources.
- While there is evidence of a shortage of staff within the broad category of Other Practice Staff, more granular analysis at specific locations is necessary.