Disclaimer: this project was coursework for Codeclan (an intensive bootcamp) and was not requested by and had no involvement from Public Health Scotland or NHS Scotland. Any results or insights are not intended to be used in real life.

Trends in acute care provision

For Public Health Scotland, July 2023

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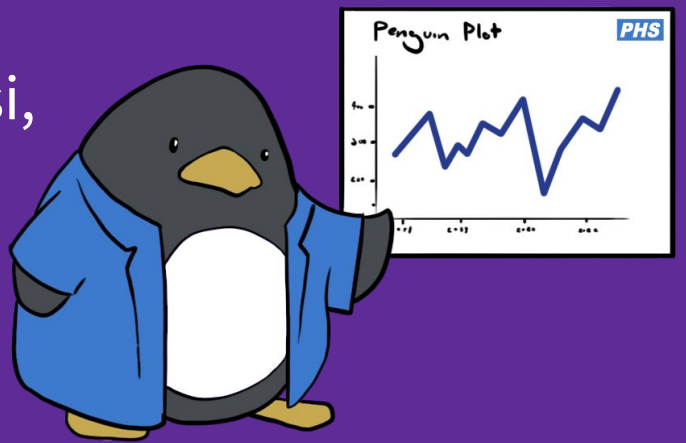
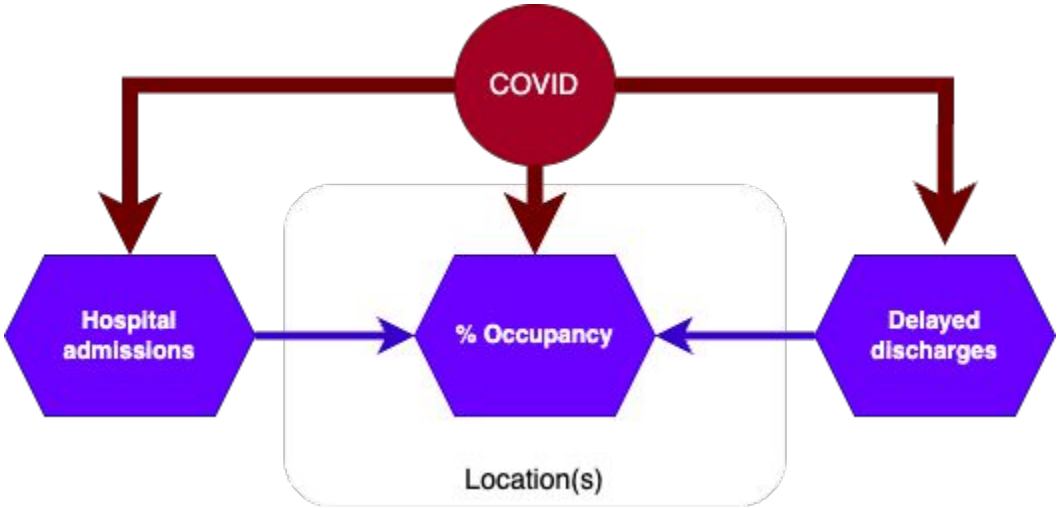


Approach to Qs - data and focus choice

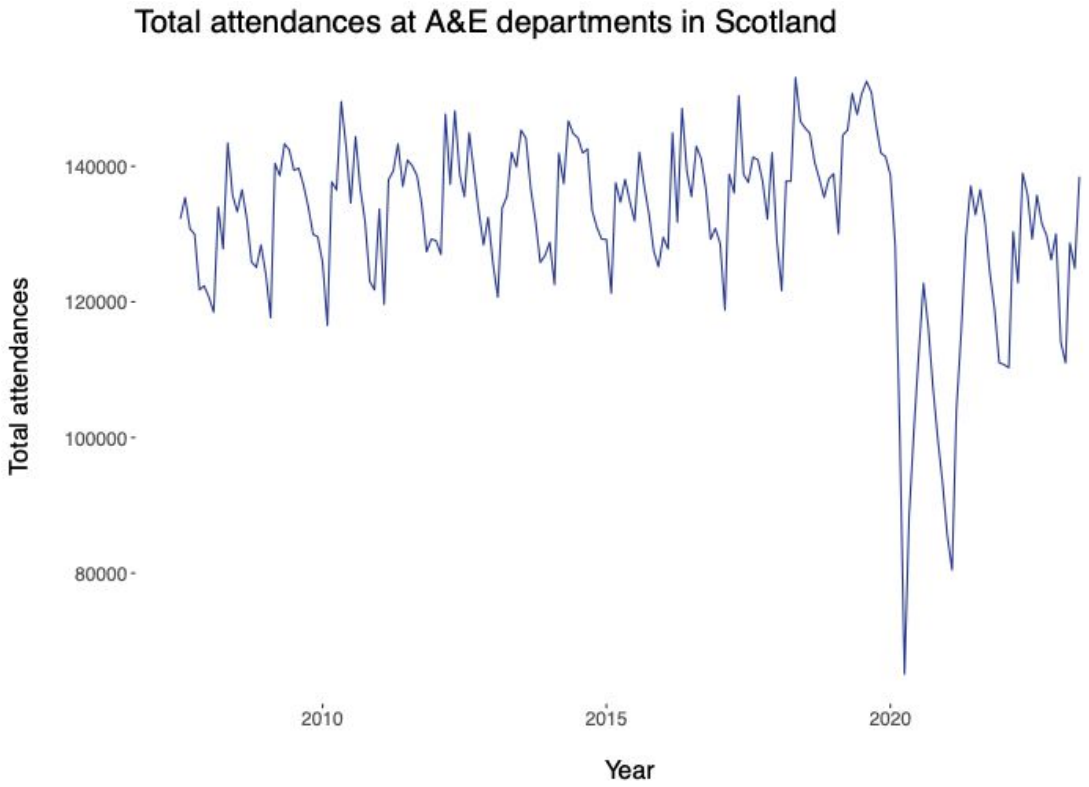
1. Seasonality effect:

   -> Biggest impact likely within A&E (seasonal activities, viruses etc.)
   -> Focus on A&E attendances
   -> Data: monthly A&E activity, comparison by season

2. Covid effect:



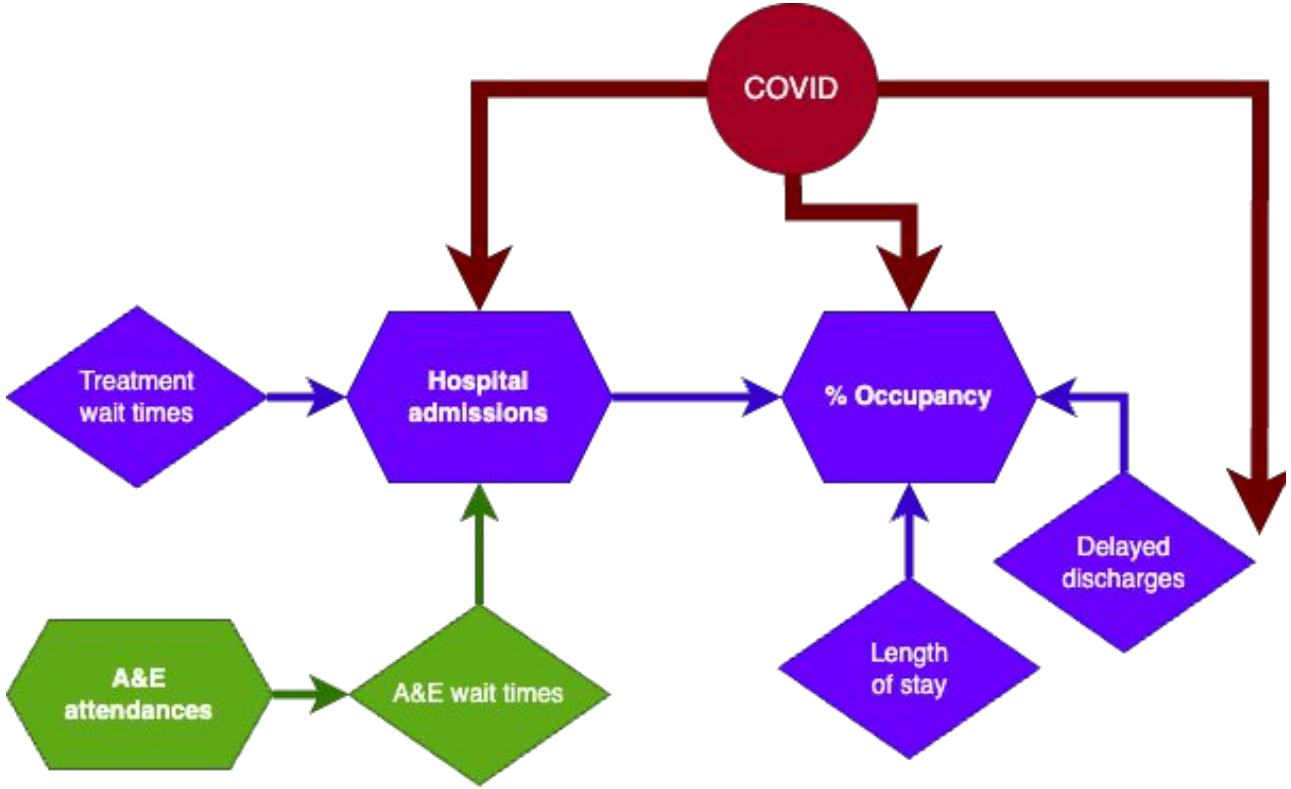
Seasonality effect on A&E attendances



Season (summer/winter) has an effect!

HB	Name	df	P-value	Reject H0? (at 95% CI)
S08000015	Ayrshire and Arran	21.922	7.557e-07	
S08000016	Borders	20.299	0.006444	
S08000017	Dumfries and Galloway	21.963	8.599e-11	
S08000029	Fife	21.752	1.157e-09	
S08000019	Forth Valley	21.621	6.276e-05	
S08000020	Grampian	21.551	9.731e-09	
S08000031	Greater Glasgow and Clyde	19.668	0.001828	
S08000022	Highland	21.604	5.793e-10	
S08000032	Lanarkshire	21.563	8.465e-05	
S08000024	Lothian	21.852	0.0502	
S08000025	Orkney	21.531	0.08875	
S08000026	Shetland	18.739	0.0003464	
S08000030	Tayside	21.613	2.694e-07	
S08000028	Western Isles	21.993	6.407e-10	

Covid impact



Covid impact on hospital admissions

- We plotted the trend of hospital admissions over time, from the beginning of 2020 (when the Covid emergency started) up to June 2023 (last month present in our dataset).

- A first plot shows the map of Scotland, where each health centre is coloured depending on the average of hospital admissions for that center during the entire period considered.

- The other two plots in this section, shows the average trend of hospital admissions calculated month by month for each health board.

    - The second of these plots, shows still the trend of hospital admissions per each health board, but distinguishing among three age's classes: under 5, 5 to 64 and over 65.

Covid impact on hospital admissions

What did we notice?

- The initial hugh fall in terms of number of admissions that is registered in the second plot, could depend on the fact that at the very beginning of the emergency could maybe be admitted at hospital only people that really needed immediate help.

For what concerns ages:

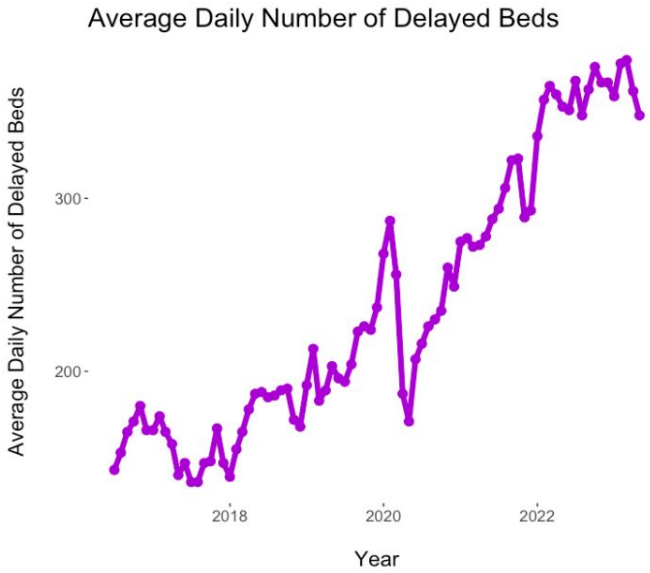
- It seems that there is a significant difference, in terms of trend, for people aged “under 5” with respect to the others. In particular there are often picks during Autumn 2021.

Covid impact on bed occupancy

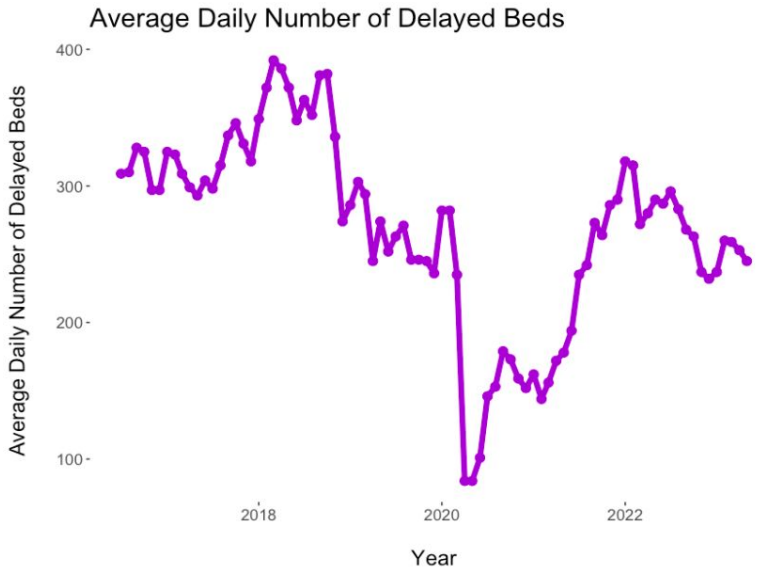
- Data: “Hospital beds information”, covering Q4 2017 to Q4 2022
- KPI: **% occupancy** is a marker of hospital activity: the greater the occupancy, the more strain the system is under.
- No demographics data available for this indicator
- Dashboard shows:
  - most recent occupancy of hospitals across Scotland
  - trend from 2018-2022, showing response to Covid pandemic and subsequent recovery to usual levels (or not)

Covid impact on delayed discharges

Covid impact on delayed discharges

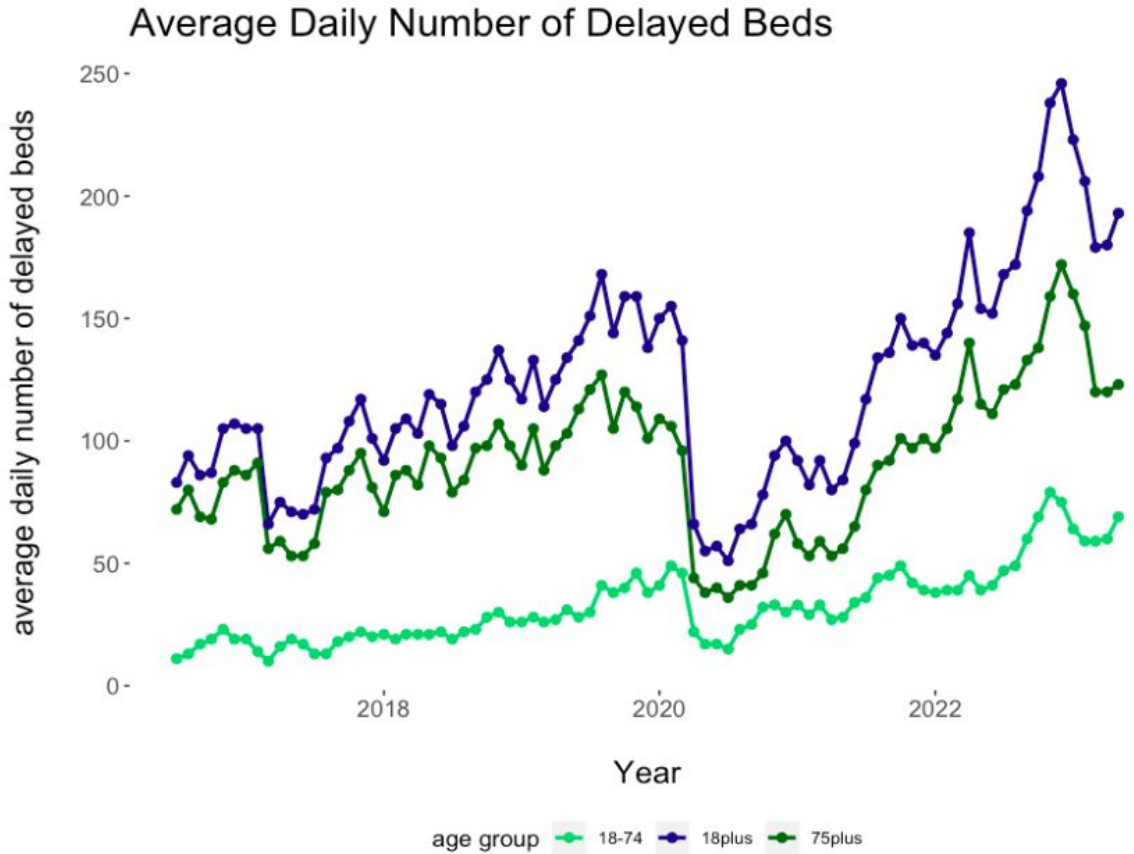


P-value for mean difference < 2.2e-16



P-value for mean difference = 0.002712

Covid impact on delayed discharges



Summary of findings

How has acute care provision been impacted by COVID-19?

Acute care provision was dramatically curtailed in March 2020, as the Government responded to the COVID-19 pandemic. Recovery to normal service provision and activity has varied; in some cases, trends in KPIs have not yet returned to pre-COVID-19 patterns.

Is the “winter crisis” reported by the media real?

Due to the continuing impact of COVID-19, it has not been possible to assess whether there are any seasonality effects in the most recent years. However, we find that A&E attendances were significantly higher in the summer months compared to winter in the decade before COVID-19 in all but two healthboards (Lothian and Orkney). We did not find any seasonality in several other (non A&E-related) indicators.

Summary of findings

Who is affected?

- Acute care demand is highest in the largest cities: Edinburgh, Glasgow, Aberdeen.
- People in more deprived areas attend A&E the most.
- Delayed discharges mostly affect people 75 years and over.
- Hospital activity is primarily driven by people in older age groups and those in more deprived areas, although we have seen an increase in hospital admissions for under 5s in the past 2 years.

What next? Data-driven insights can support decision making about where to direct support for acute care provision in Scotland. The dashboard is designed to help understand provision of acute care in individual health boards. Together, the insights in this presentation and the dashboard are intended to help guide which additional analyses are required. However, understanding past activity is not guaranteed to predict future demand, especially in light of the dramatic effect of the response to COVID-19.