Public Health Scotland

Analytical investigation into the presence of ‘winter crises’ and the impact of Covid-19 within the NHS acute hospital sector between 2018 and 2023

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Study questions:

1. To what extent are the ‘winter crises’ reported by the media real?

2. How has the Covid-19 pandemic affected provision of acute care in Scotland?

- Temporal	- when
- Geographical	- where
- Demographic	- who

Key Performance Indicators (KPI)

When:

- Waiting times in Accident and Emergency departments (A&E)
- How many times do people ‘stay’ and the length of time of stays
- Bed occupancy: staffing levels and department specialty

Where:

- Health Board

Who:

- Demographics: Age, Sex and Deprivation - Scottish Index of Multiple Deprivation (SIMD)

App

Crisis? What Crisis?

Common topic in newspaper headlines:

“NHS Scotland crisis: Top medics warn Scotland to prepare for worst NHS winter on record” - The Scotsman

“A&E crisis fears as NHS ‘too busy with strikes to prepare for winter’” - The Independent

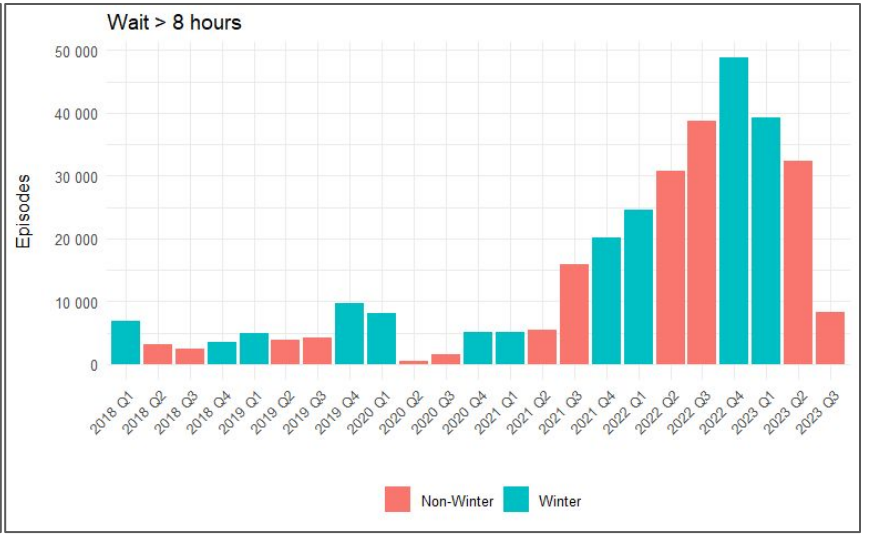
“CHILLING FRONT NHS facing ‘worst winter ever’ as strikes, Covid, flu and record wait lists pile on pressure” - The Sun

Waiting times

- Data sourced from PHS
- KPI examined was number of episodes of waiting times within four periods
    - Within 4 hours
    - Over 4 hours
    - Over 8 hours
    - Over 12 hours

- Data was plotted and statistically tested to detect differences between:
    - Winter and non-winter quarters
    - Pre-covid years and post-covid years


Seen within 4 hours
Episodes
400 000
300 000
200 000
100 000
0
2018 Q1
2018 Q2
2018 Q3
2018 Q4
2019 Q1
2019 Q2
2019 Q3
2019 Q4
2020 Q1
2020 Q2
2020 Q3
2020 Q4
2021 Q1
2021 Q2
2021 Q3
2021 Q4
2022 Q1
2022 Q2
2022 Q3
2022 Q4
2023 Q1
2023 Q2
2023 Q3
Non-Winter
Winter


Wait > 8 hours
Episodes
50 000
40 000
30 000
20 000
10 000
0
2018 Q1
2018 Q2
2018 Q3
2018 Q4
2019 Q1
2019 Q2
2019 Q3
2019 Q4
2020 Q1
2020 Q2
2020 Q3
2020 Q4
2021 Q1
2021 Q2
2021 Q3
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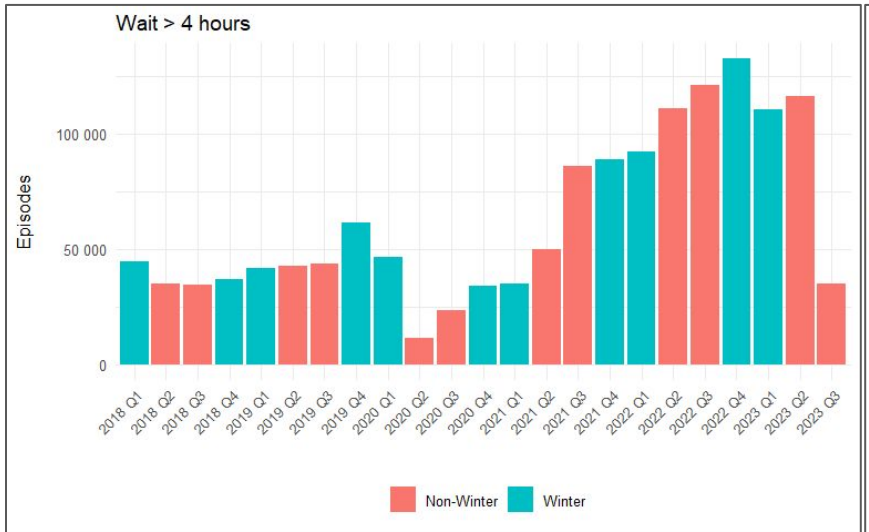
2023 Q1
2023 Q2
2023 Q3
Non-Winter
Winter


Wait > 4 hours
Episodes
100 000
50 000
0
2018 Q1
2018 Q2
2018 Q3
2018 Q4
2019 Q1
2019 Q2
2019 Q3
2019 Q4
2020 Q1
2020 Q2
2020 Q3
2020 Q4
2021 Q1
2021 Q2
2021 Q3
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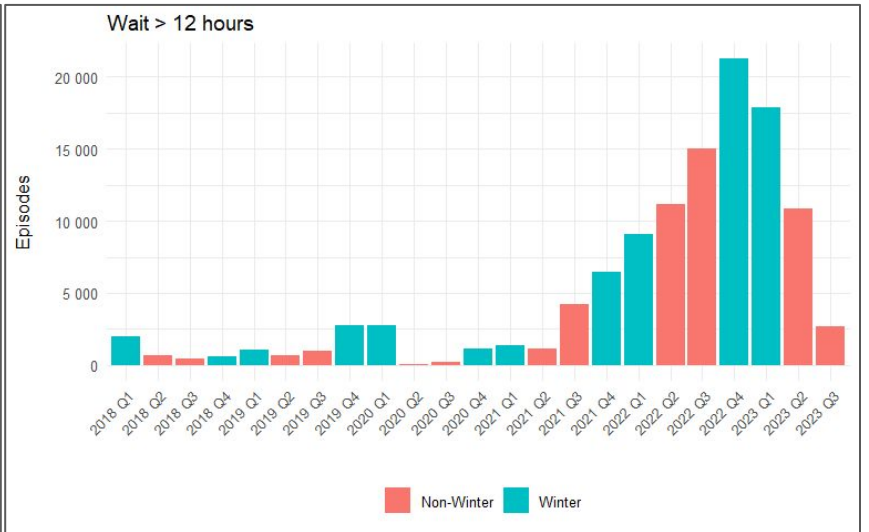
2022 Q4
2023 Q1
2023 Q2
2023 Q3
Non-Winter
Winter


Wait > 12 hours
Episodes
20 000
15 000
10 000
5 000
0
2018 Q1
2018 Q2
2018 Q3
2018 Q4
2019 Q1
2019 Q2
2019 Q3
2019 Q4
2020 Q1
2020 Q2
2020 Q3
2020 Q4
2021 Q1
2021 Q2
2021 Q3
2021 Q4
2022 Q1
2022 Q2
2022 Q3
2022 Q4
2023 Q1
2023 Q2
2023 Q3
Non-Winter
Winter

Waiting times Hypothesis testing
Evidence for Winter Crises in Emergency Depts.

Wait Period	P (<0.05)	Worst HB ED	Quarter	Month	Summary
Within 4 hours	< 0.05	na	na	na	Less short waits in winter
Over 4 hours	0.26	Lothian (26,232/ 68,236)	Q3 2022	Non-Winter	No difference between Qs
Over 8 hours	0.02	Lothian (11,898/ 70,967)	Q4 2022	Winter	More longer waits in winter Qs
Over 12 hours	0.002	Lothian (6,431/ 70,967)	Q4 2022	Winter	

Waiting times Hypothesis testing
Evidence for Covid - 19 impacting Emergency services.

Wait Period	P (<0.05)	Max episode pre-	Max episode post-	Summary
Within 4 hours	< 0.05	na	na	Less short waits post-covid
Over 4 hours	< 0.05	13,831 (Lothian Q1 2018)	26,242 (Lothian Q3 2022)	More longer waits in post-covd
Over 8 hours	< 0.05	2627 (Lothian Q1 2018)	11,898 (Lothian Q4 2022)	
Over 12 hours	0.004	1059 (Lothian Q1 2018)	6431 (Lothian Q4 2022)	

Summary

- Longer waiting times in are more common in winter months
- Longer waiting times are more common in post-covid Scotland
- Infers waiting times KPI is negatively impacted by ‘winter crises’ and fallout remains following covid-19 to emergency services

Bed Occupancy

No obvious difference between winter and non-winter months

Outlier in 2020 Q2 occupancy, with >3 sd difference from mean total occupancy

Difference for this quarter is due to how many beds are occupied, rather than an increase in staffed beds

Outside the scope of the report, Glasgow has an anomalous increase in accident and emergency occupancy in 2019 Q4

Reduction in Total “Stays” but Longer “Stays”

“Stay”: days patients spend in hospital during a continuous inpatient stay

Overall, there are significantly fewer stays in hospital post-covid.
Stays are longer, on average.

Theories:

- Fewer patients presenting to hospital
- Minor conditions being treated outside hospital
- Barriers to managing patient flow:
  - COVID-19
  - high bed occupancy / low spare capacity
  - delayed discharges

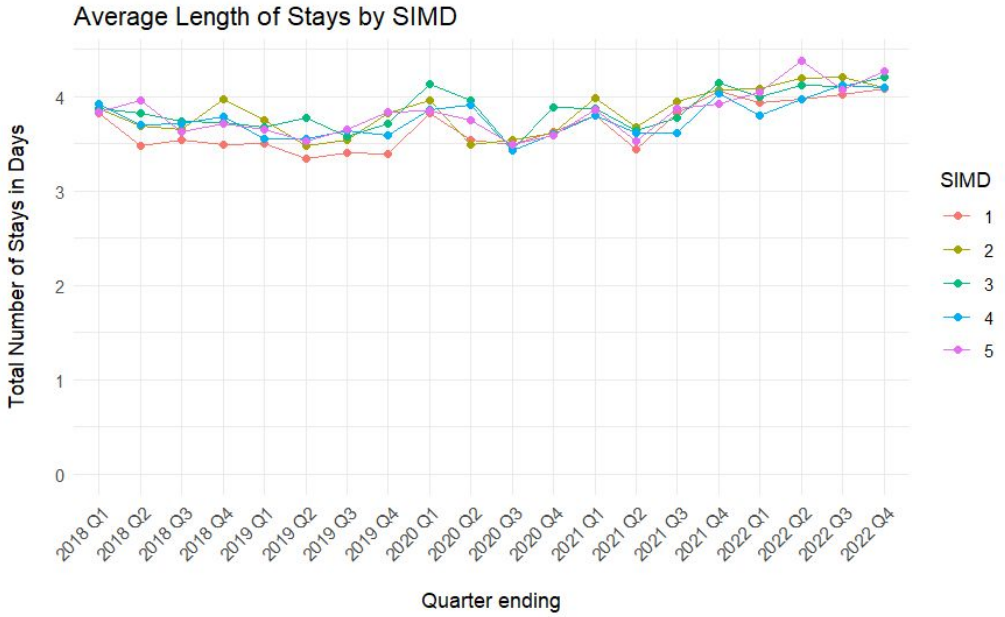
Demographics: Deprivation

Every quintile was affected by the pandemic. Post-COVID we see:

- significantly fewer stays
- significantly longer stays

During the COVID-19 pandemic, no SIMD quintile was affected disproportionately when considering stays in hospital

Residents of the most deprived areas of Scotland are significantly more likely to have a stay in hospital. COVID-19 has not changed this.



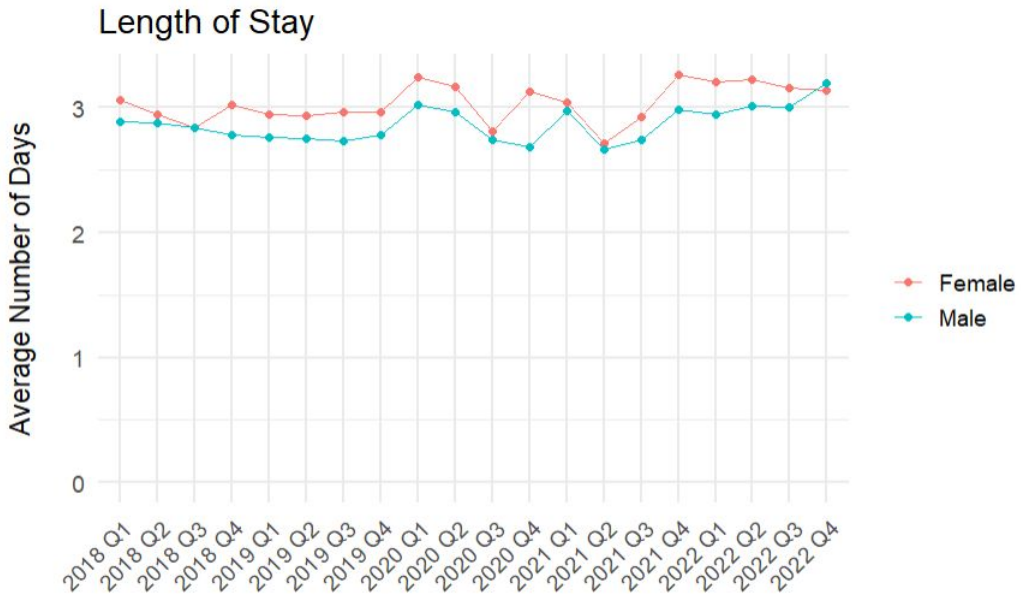
Demographics: Sex

Both sexes were affected by the pandemic.
Post-COVID we see:

- significantly fewer stays
- significantly longer stays

During the COVID-19 pandemic, neither sex was affected disproportionately when considering stays in hospital

Women are more likely to have a stay in hospital, and are more likely to stay in for marginally longer. This may be to do with having a longer life expectancy, as well as maternity stays.
COVID-19 has not changed this.



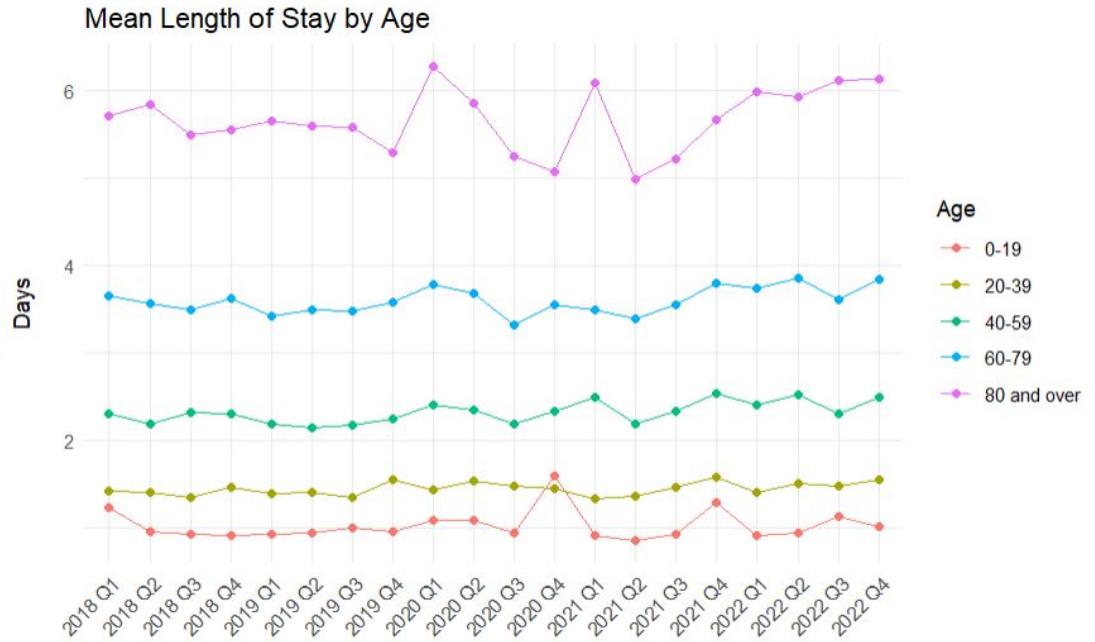
Demographics: Age

All age groups were affected by the pandemic. Post-COVID we see:

- significantly fewer stays
- significantly longer stays

During the COVID-19 pandemic, no age group was affected disproportionately when considering stays in hospital

The oldest age groups are more likely to have a longer stay in hospital. This is to be expected. Since the start of the pandemic, the average length of stay for people aged 80 and over has not increased significantly.



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Summary

- Number of stays in hospital has **fallen** post-COVID, and stays are getting **longer** on average. Little research available into why this is.

- No demographic was significantly disproportionately affected by COVID-19. Trends that were present before persisted through the pandemic.

Conclusions

Is there a winter crisis?

In winter, A&E waiting times are significantly longer.

Demographics and bed occupancy do not indicate unusual activity in winter.

How has the Covid-19 pandemic affected provision of acute care in Scotland?

A&E wait times are significantly longer than before.

General increase in bed occupancy levels continues through pandemic after initial dip.

No single demographic affected more than the others.

Stays have significantly decreased across the board, but length of stay is longer.