General practice affecting hospital visits

Systems Integration Monitoring and Evaluation

NSW Ministry of Health

August 2021

Insight

Practices that saw their patients with higher frequency were associated with patients having fewer unplanned hospital presentations

Contents

About the study

Data

This study uses data from the **Lumos** program which links deidentified general practice data with other health service data, shining a light on patient journeys through the health system. Visit www.health.nsw.gov.au/lumos for more information.

This study used:

- Patient records from 198 general practices that supplied data from the study period
- Emergency Department Data Collection
- Admitted Patient Data Collection
- Death registrations

Study period

- 01 January 2018 to 31 December 2019 (2 year study period)

Exposure

High-frequency servicing practices = practices where >30% of patients visited at least 12 times in 2 years.

High-frequency practices (%)	Lower-frequency practices (%)	Total
43 (21.7%)	155 (78.3%)	198

The breakdown of practices in this study

- Binary exposure (high vs low).
- There is no universal, established definition for high-frequency servicing practices.
- Our definition was developed using the following rationale:
  - Nationally Australians have 6.1 GP visits per person per year.
  - In Lumos practices, patients had an average of 8 GP visits per person during the study period.
  - 12 GP visits over 2 years is above the average in Lumos, similar to the national average and aligns neatly to one visit every 2 months.
  - In Lumos 28.6% of patients were at the 75th percentile of the distribution of patients that had 12 or more visits.
- The definition of 30% of patients visiting more than 12x aligns to both the average visits observed and the distribution of visits in the data at the 75th percentile.

Exposure sensitivity analyses

Main Exposure definition:

- Practices where >30% of patients visited at least 12 times in 2 years

  AND

Sensitivity analyses explored impact changing the high frequency exposure definition as follows:

1. 75th percentile when excluding patients with 3 or more chronic conditions
2. 75th percentile when excluding patients with and mental health chronic conditions
3. 75th percentile when excluding patients aged 70 years and older.

Sensitivity analysis results

- *All alternative definitions resulted in less practices being classified as high frequency.*
- *Alternative definitions reduced the difference between the categories. I.e. moved the line of difference more to the centre.*
- *Reanalysis using these definitions tended to diminish the magnitude of benefits in outcomes, particularly for ED presentations*

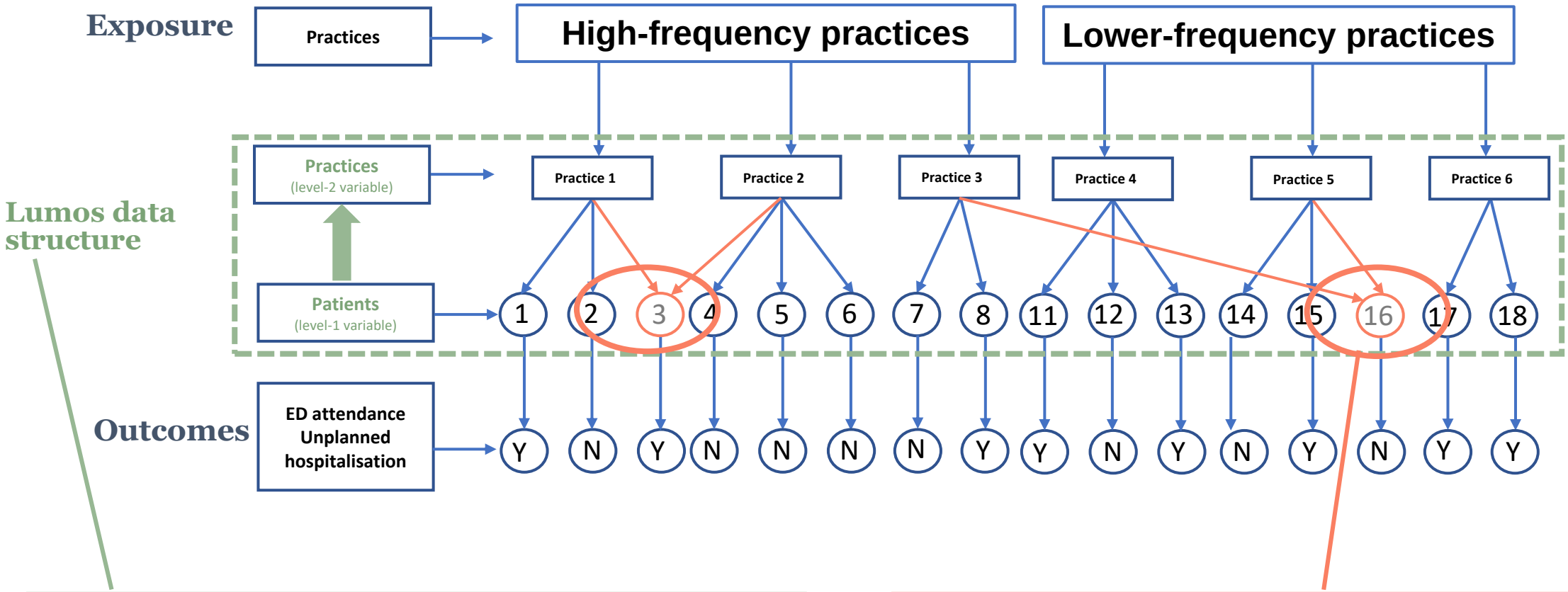
Outcomes

This study investigates impacts on **unplanned acute health service use:**

- Patient presented to the emergency department at least once during the study period; OR
- Patient had an unplanned hospital admission at least once during the study period, with unplanned admissions defined in Admitted Patient Data Collection as Emergency Status 'Yes'

Outcomes for both of the above were binary (Yes vs. No).

Lumos data structure implications



Lumos data has a hierarchical structure

- I.e. Patients are 'clustered' within practices and analyses must account for this structure

Patients may have attended multiple practices

- May have had both exposures
- Excluded from the main analysis (5.8%)

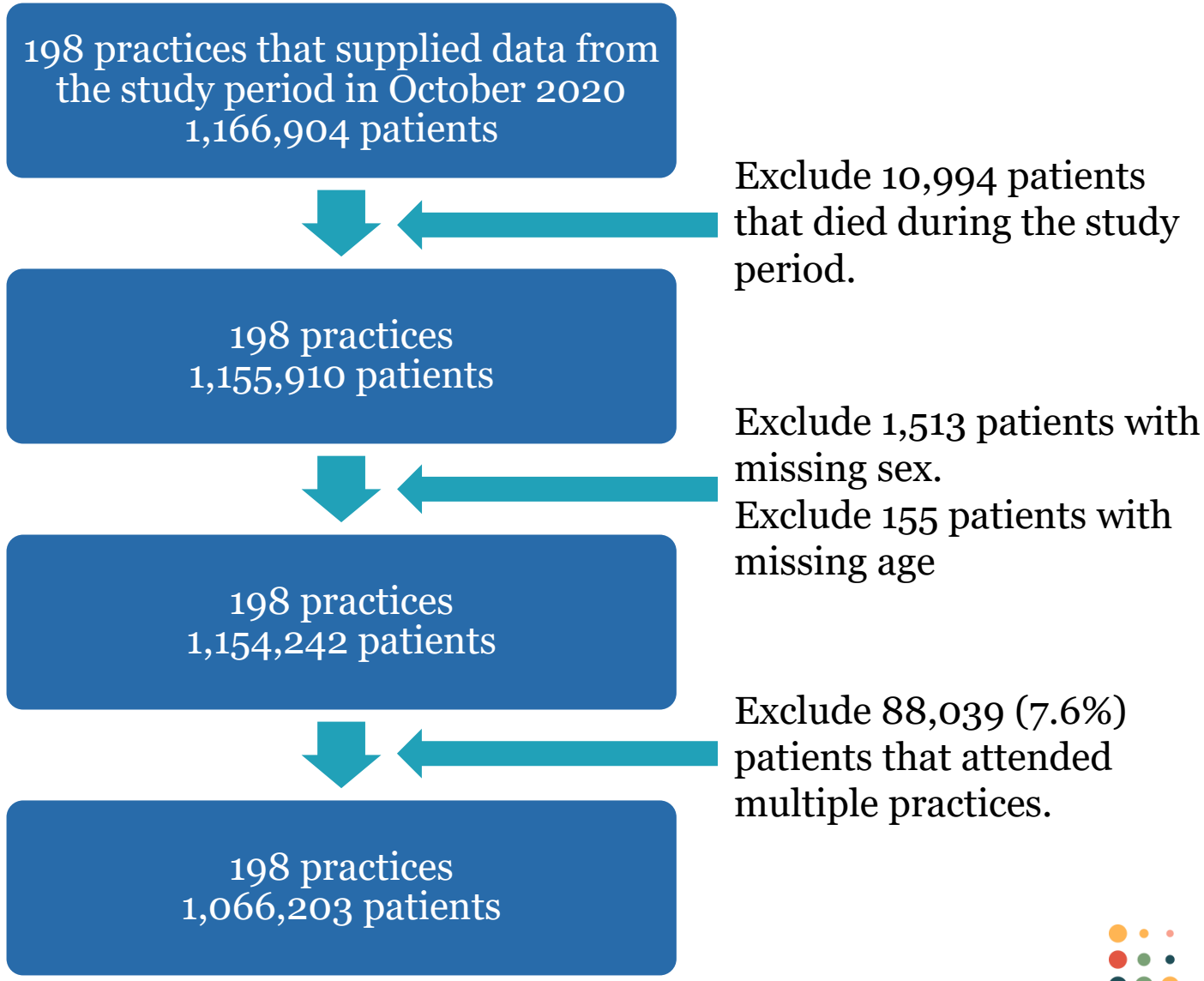
Inclusions and exclusions

Included

- All persons with at least one clinical encounter at a Lumos-participating general practice during the study period.

Excluded

- Persons that died during the study period.
- Patients with missing age or sex.
- Patients that attended multiple practices.



Multiple practice attenders

7.6% of patients that attended multiple practices were excluded (88,039 patients).

Sensitivity analyses were performed to explore the impact of this exclusion as follows:

- Include all as high-frequency practice attendees.
- Include all as lower-frequency practice attendees.

Sensitivity analysis results

- *Reanalysis using these classifications made no material difference to the main findings.*
- *However wWhen all were classed as high-frequency practice attenders, the reduction in ED presentations was no longer statistically significant.*

Demographic and clinical covariates

Age group (years)
0 to 9
10-19
20-29
30-39
40-49
50-59
60-69
70 and over

Chronic conditions
Including mental health
Excluding mental health

Frequency of GP visits
1 to 4
5 to 11
12 or more

Remoteness (practice and patient)
Major cities
Inner regional
Outer regional

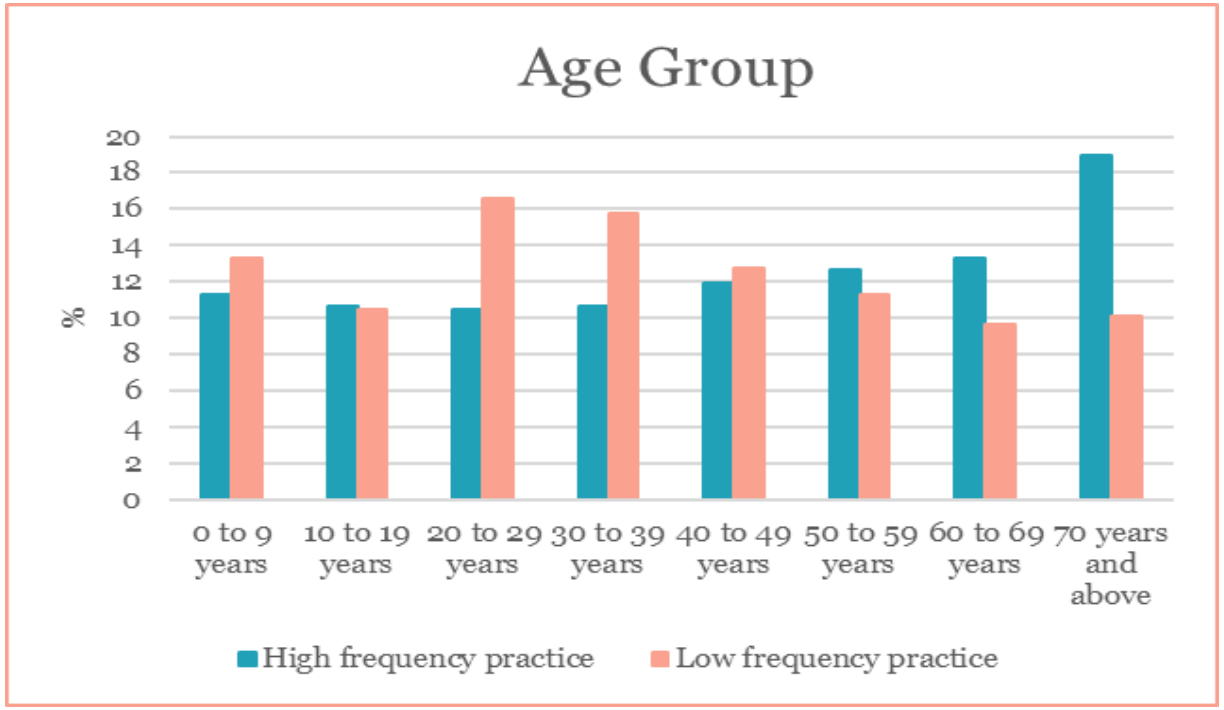
Population size (practice)
<11,999
>12,000

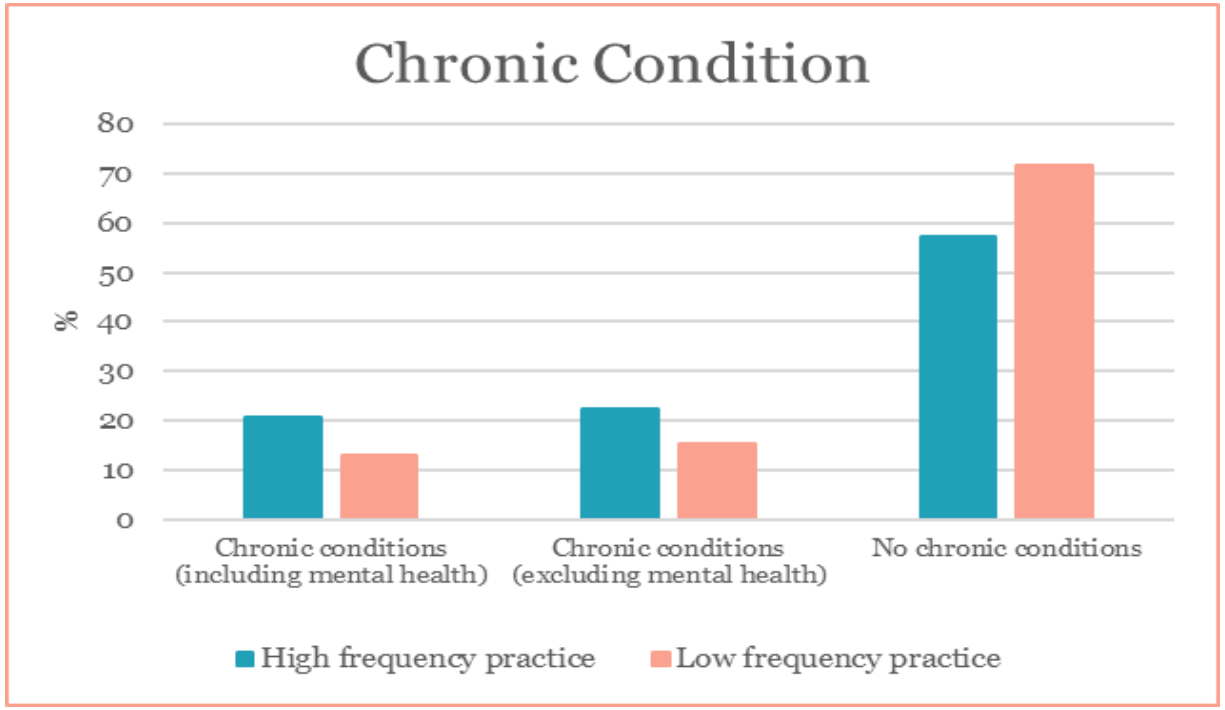
Socioeconomic status (practice and patient)
1st quintile (most disadvantaged)
2nd quintile
3rd quintile
4th quintile
5th quintile (least disadvantaged)

Practice characteristics

Age and chronic conditions

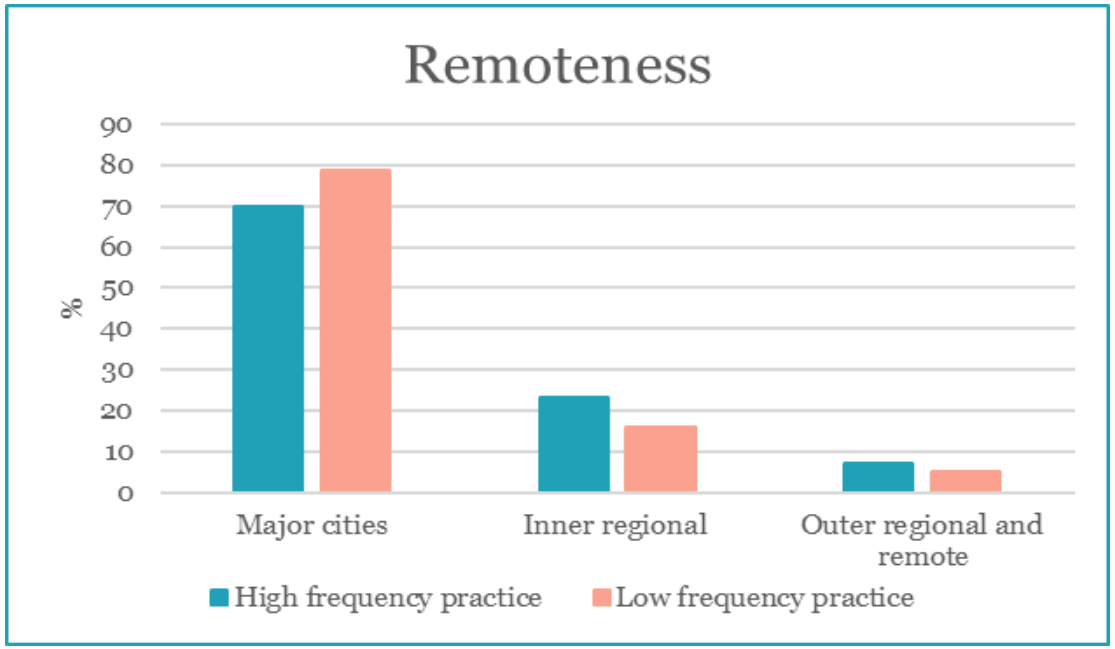
Practices that saw their patients more frequently tended to have more older patients and a higher percent with chronic condition diagnoses.

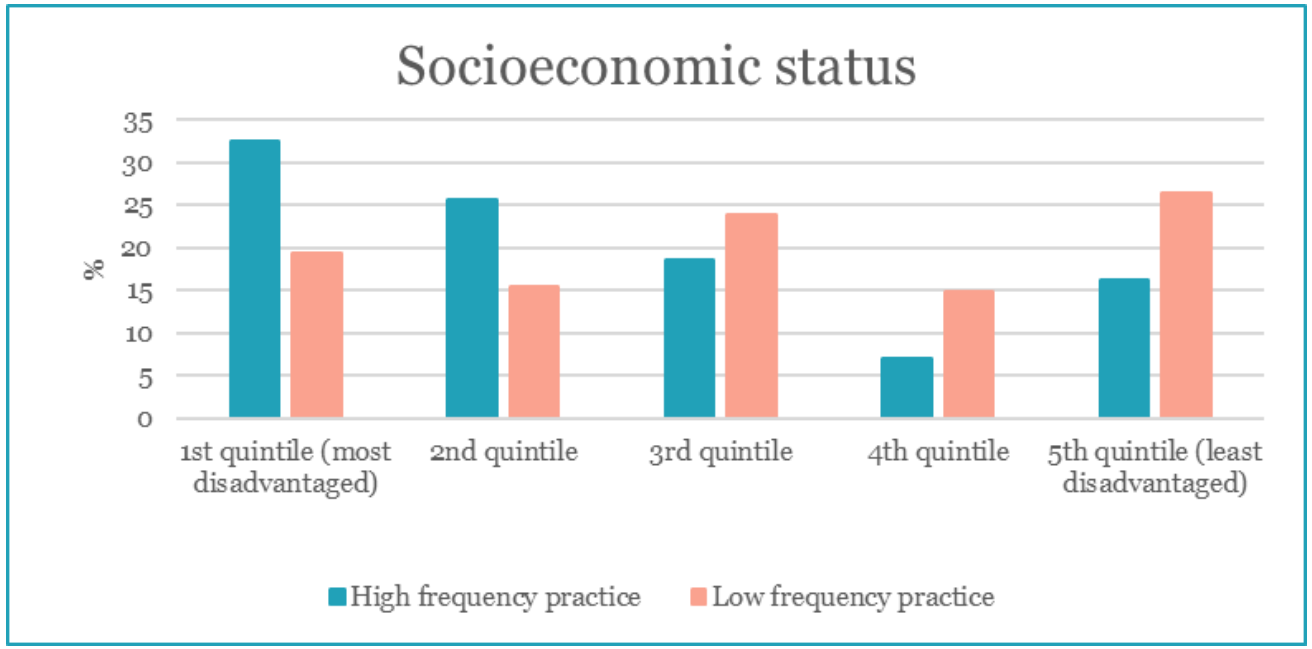




Location and socioeconomic status

Practices that saw their patients more frequently tended to be more often located outside of major cities and had higher proportions of patients living in more disadvantaged localities.





Findings

Statistical modeling approach

Hierarchical data structure - two-level

- Mixed logistic regression model
- Adjusted for the following patient-level confounders:
  - Age group, sex, chronic condition status, remoteness, socio-economic status and frequency of general practice encounters
- Adjusted for the following practice-level confounders:
  - Remoteness and socio-economic status

Practices who see their patients more often are associated with less hospital presentations

Patients that attended a high-frequency servicing practice had:

- 10% reduced odds of an ED presentation
- 12% reduced odds of an unplanned hospital admission over the two year study period.

The association between the service frequency level of practice (high compared to lower frequency), and outcome, after adjusting for patient- and practice-level confounders:

Outcome over study period	Odds ratio	95% Confidence interval	P value
ED presentation	0.89	0.80-1.0	**0.045**
ED triage 1-3	0.93	0.84-1.02	0.110
ED triage 4-5	0.90	0.79-1.02	0.090
Unplanned hospital admission	0.88	0.80-0.97	**0.010**

Practice size interaction

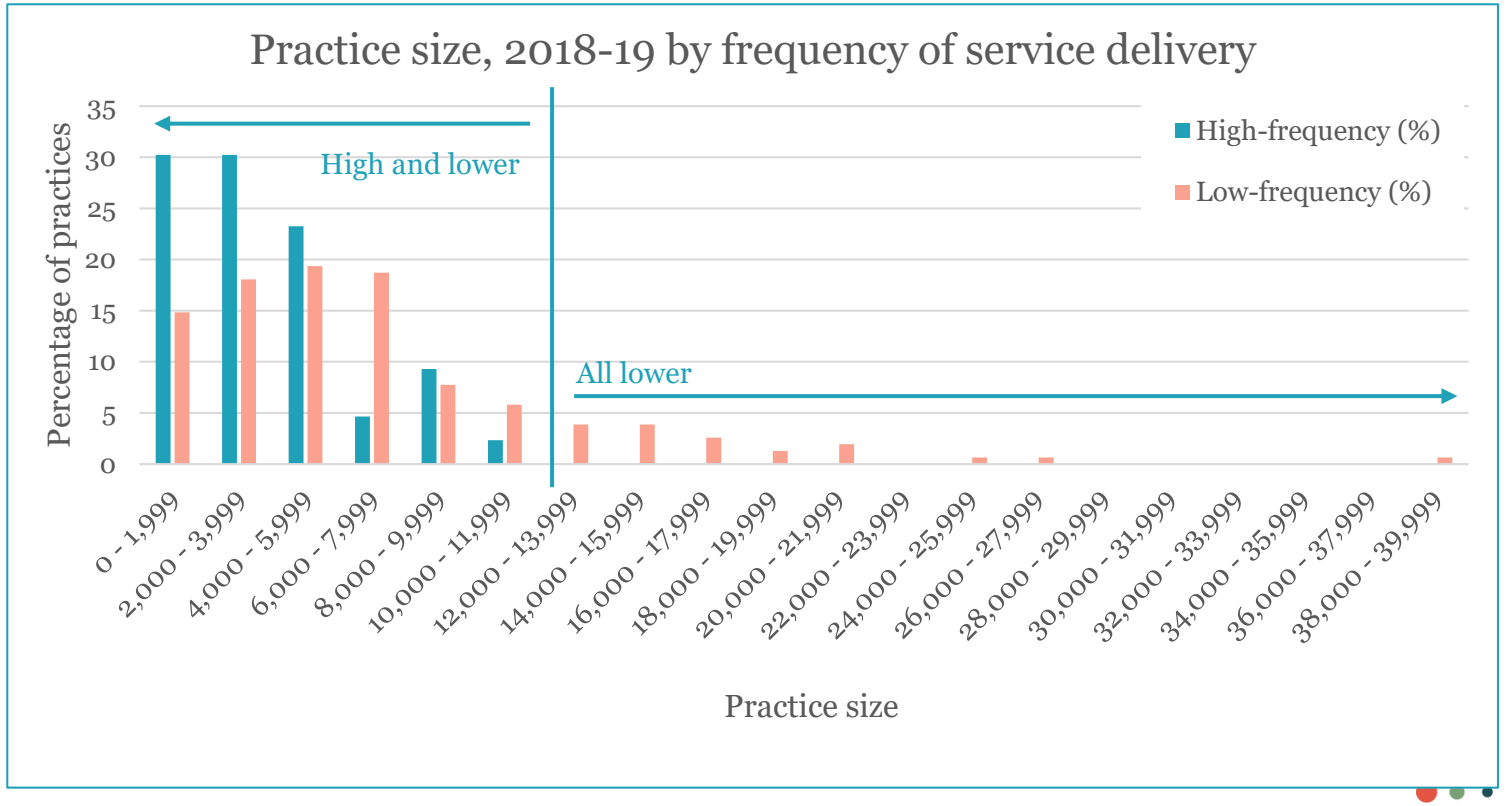
- High-frequency servicing practices were smaller than lower-frequency servicing practices.
- There were no high-frequency servicing practices that had more than 12,000 patients.

Sensitivity analyses were performed to explore the impact of this interaction

- The 24 lower-frequency servicing practices with more than 12,000 patients were excluded.

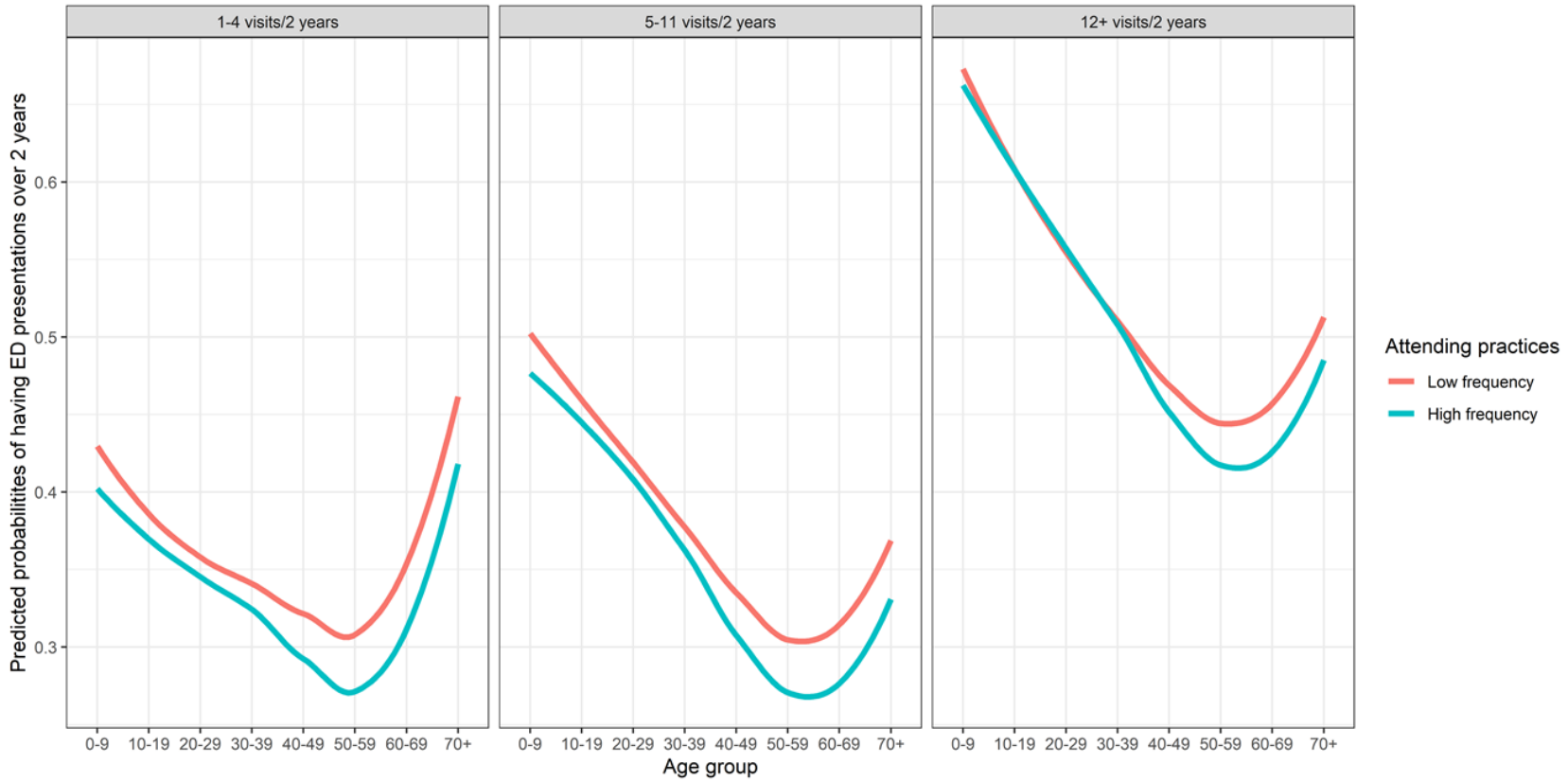
Sensitivity analysis results

Reanalysis excluding these practices made no material difference to the main findings



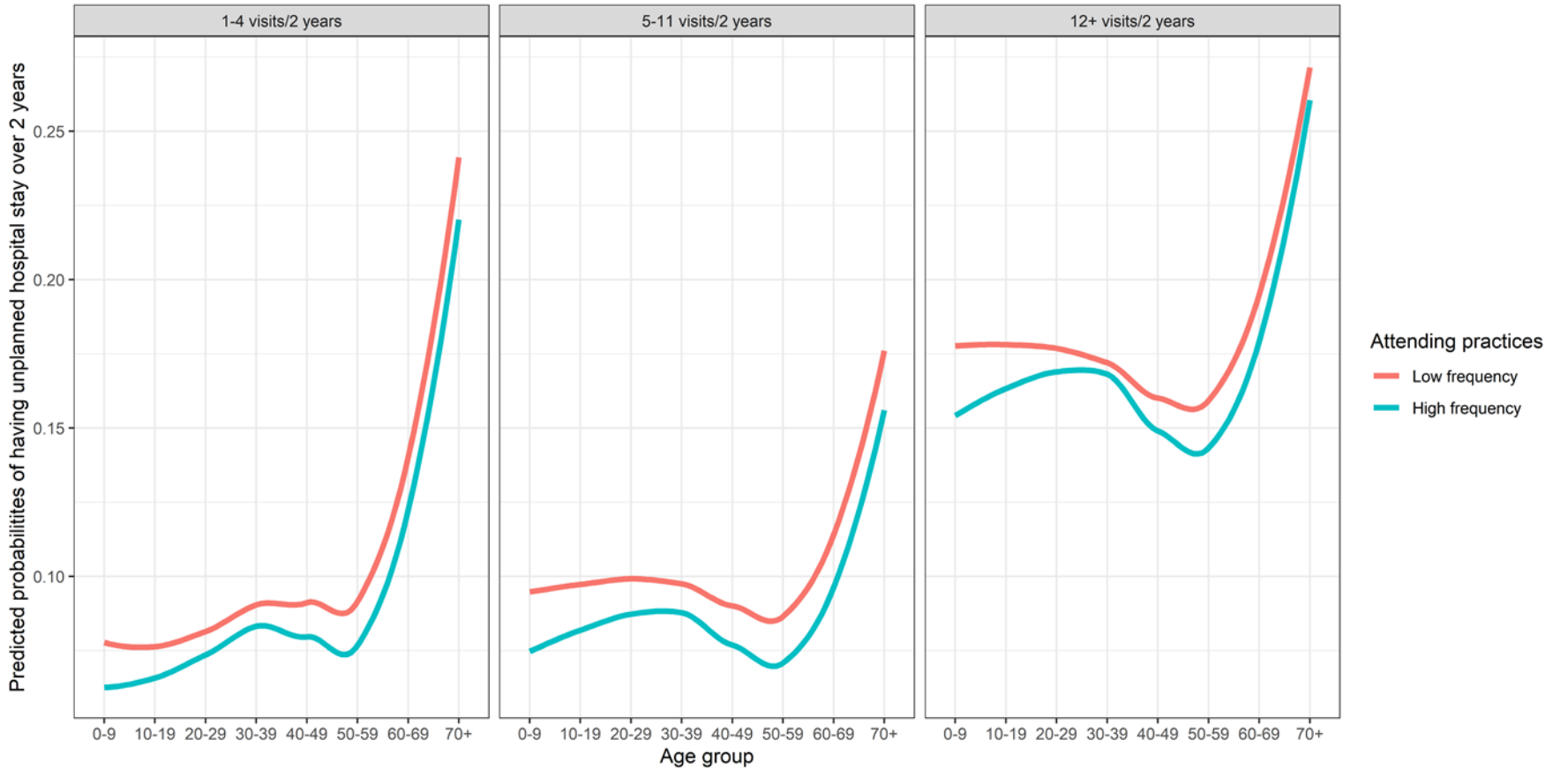
ED presentations

- ED presentations were significantly reduced in patients that attended high frequency servicing general practices among both those that visited less than 12 times as well as those who visited 12 or more times during the study period.
- The greatest reduction in ED presentations was seen in patients attending a high frequency servicing practice who were aged 50-69 years.
- This was also true by chronic condition status, and across triage categories (not shown).



Unplanned hospitalisations

- Unplanned hospitalisations were reduced for patients who attended high frequency servicing practices among both those that visited less than 12 times as well as those who visited 12 or more times during the study period.
- The effect was greatest among people aged less than 70 years.
- This was also true by chronic condition status (not shown).



Discussion

Main findings and limitations

There were 10% fewer ED presentations and 12% fewer unplanned hospitalisations in high-frequency servicing practices.

- Benefits were observed in both patients that actually attended frequently (>12 times in 2 years) and also among those that did not.
- High-frequency servicing practices are associated with having patients who are older, have chronic conditions, more socioeconomic disadvantage and live outside of major cities.

Limitations:

- Only up to 10% of NSW practices are including in this Lumos linkage and participation is voluntary. This affects generalisability but not the internal validity. However, it is noteworthy that the Lumos program has demonstrated representativeness to the NSW census population by age, sex, socioeconomic status and remoteness (https://ihj.bmj.com/content/3/1/e000074).
- No detailed information about practice characteristics such as FTE and specialities is available in Lumos.

Further work

- Cost-benefit analysis to understand the financial impacts of high-frequency servicing practices.
- Linkage to Medicare Benefits Scheme (MBS) data to determine when patients have other GP encounters with non-Lumos practices.
- Repeat the study as Lumos coverage grows.

Further information

Further information

A **fact sheet** about this study is available at www.health.nsw.gov.au/lumos/pages/insights

For further information about the **Lumos program** please visit www.health.nsw.gov.au/lumos

To subscribe to our program **newsletter**, contact Lumos@health.nsw.gov.au

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