Supplementary paper:

The acuity of acute care

How increasing, changing or mismatched demand for services may be creating risks to available service supply

Contents

Introduction

The Commission's quarterly insight reports to the Minister of Health are based on a *Quality Assessment Framework* (the Framework) encompassing 17 factors that cover prospective and retrospective analyses of potential risks to the quality and safety of healthcare. This framework was developed and agreed with Health New Zealand in 2024.

Factors 8 and 9 within the Framework are:

> "Is increasing, changing or mismatched demand for services creating risks to available services" and,
>
> "Modelling the likely effects of delay on acuity and complexity"

To date these factors have been monitored through interviews with the health workforce and consumers. However, both factors lend themselves to a trend analysis of health data to help to understand the impact of mismatched demand and delays in accessing services.

This paper and a further paper concerning the nature and effects of delay in elective care (produced with NZIER) are the start of this work. We anticipate finalising the sister paper in time for the December 2025 quarterly insights report.

Through our interviews with the health sector workforce, we have been told about changes in demand for care. Interviewees told us that patients being seen in both general practices and secondary care are sicker, frailer and have more complex needs. This is part of a longer-term trend exacerbated by the disruptions of the COVID period.[1] If this increase in demand outstrips availability of health services, then access is reduced, threatening effectiveness of care and leading to worse patient experiences.

There are potential flow-on risks of harm to patients. This can occur through longer wait times, which increase the likelihood of deterioration, and create sicker patients more at risk of complication and harm. Harms to patients can also occur indirectly as increased pressures reduce the system's adaptive capacity to enhance safe care.

These reductions in quality tend to affect patients inequitably. Our quarterly reporting has shown that there are inequities in access to services and ambulatory sensitive hospitalisations,[2] and this is reinforced through our interviews with the workforce.

This is why concerns about mismatched supply and demand for care and delay access to it are essentially quality concerns within the Commission's purview. All the

[1] Te Tāhū Hauora Health Quality & Safety Commission. 2024. A window on quality 2024: Turbulence, quality and the future | He tirohanga kounga 2024: He hūkeri, he kounga ki anamata hoki. URL: https://www.hqsc.govt.nz/assets/Our-data/Publications-resources/Window-2024-final-web.docx (accessed 10 September 2025)

[2] See, for example, Appendix 3 from the June 2025 Insights Report.

Institute of Medicine's six dimensions of healthcare quality[3] are likely to be negatively affected if supply and demand are mismatched. Furthermore, the effects will be self-reinforcing, as an increasing proportion of more unwell patients occupying a greater proportion of available beds will further limit hospital capacity and create longer waits.

This paper sets out our analysis[4] using the various data sets we collect and tools to highlight what appears to be happening, what has changed, the potential implications, causes and responses.

This is the first in what we expect to be an ongoing analysis of the impact of delays and demand mismatches on the operation of the health system. In the process of undertaking this analysis, further questions have emerged that will be the focus of subsequent insights reports.

The acuity of acute demand and its implications

Who is entering hospital?

Through our interviews, we understand that the health sector is managing a population with increasingly complex health conditions and additional literature points towards older, more frail people presenting in the health system post-COVID.[5]

General practitioners have told us that managing patients with more complex health conditions in the community demands greater input per patient, in terms of repeat presentations and more active management of health needs. Such interactions with the system come up against the absolute capacity (the number of general practitioners and the time they have available), potentially reducing overall accessibility.

Does data support this view?

First, we consider the balance of acute and elective patients, the former being, by definition, more urgent.[6]

Table 1, which uses the REACH tool[7] to consider medical and surgical specialties, shows that while there are definite hotspots of a major swing from elective to acute care provision within hospitals, this crude measure shows a real, but relatively small

[3] Safety, timely access, effectiveness, equity, efficiency and patient experience
[4] Throughout, analyses are HQSC analyses of national collections (principally NMDS and NNPAC) unless otherwise stated. National collection sources used are reported throughout.
[5] See, for example, König M, Gollasch M, Komleva Y. Frailty after COVID-19: The wave after? Aging Med (Milton). 2023 Jun 28;6(3):307-316. doi: 10.1002/agm2.12258.
[6] Acute or unplanned care is loosely defined as any urgent health care that a person receives for an illness or injury (Health New Zealand, URL: https://www.tewhatuora.govt.nz/health-services-and-programmes/hospitals-and-specialist-services/acute-care).
[7] McBride P, Hoang T, Hamblin R, Li Y, Shuker C, Wilson J, Bramley D. 2021. Using REACH, a new modelling and forecasting tool, to understand the delay and backlog effects of COVID-19 on New Zealand's health system. New Zealand Medical Journal. 134(1544): 159-168

shift towards acute care (total swing towards acute service provision = 2 percent increase).

Table 1: Acute versus elective admissions per week, pre (2015-19) and post (2023 onwards) COVID, medical and surgical specialities only (Source: REACH analysis of NMDS)

	Acute			Elective			
	Pre	**Post**	**Change**	**Pre**	**Post**	**Change**	**"Butlerian Swing[8]" to acute**
Auckland	1,087	1,116	3%	1,107	1,000	-10%	6%
Bay of Plenty	457	503	10%	445	439	-1%	6%
Canterbury	995	1099	11%	856	791	-8%	9%
Capital and Coast	504	493	-2%	411	428	4%	-3%
Counties Manukau	947	991	5%	426	343	-20%	12%
Hawke's Bay	334	320	-4%	240	292	22%	-13%
Hutt Valley	253	250	-1%	277	289	4%	-3%
Lakes	207	207	0%	173	192	11%	-6%
MidCentral	253	277	10%	209	199	-5%	7%
Nelson Marlborough	204	223	9%	209	185	-12%	10%
Northland	351	409	17%	311	383	23%	-3%
South Canterbury	95	92	-3%	101	106	5%	-4%
Southern	562	524	-7%	413	375	-9%	1%
Tairāwhiti	99	94	-5%	72	71	-1%	-2%
Taranaki	219	248	13%	215	225	5%	4%
Waikato	816	795	-3%	856	876	2%	-2%
Wairarapa	74	70	-5%	67	80	19%	-12%
Waitematā	979	978	0%	629	737	17%	-9%
West Coast	63	58	-8%	43	46	7%	-7%
Whanganui	125	135	8%	91	87	-4%	6%
Total	**8626**	**8881**	**3%**	**7150**	**7144**	**0%**	**2%**

Table 2 shows that the increase in acute patients are older people, and this has implications that are hidden by looking only at the high-level national measure.

[8] Butlerian swing is a measure of change in proportion of two mutually exclusive variables calculated by summing the absolute change of each variable and dividing by two.

Potential further work: comparison of table 1 with relative local performance against the access targets would be instructive

At a national level the swing to acute activity is small, but there is wide regional variation which suggest detailed analysis of some archetypes would be fruitful for example Hawkes Bay (acute to elective swing); Canterbury (elective to acute swing), Northland (dramatic increase) Southern (major reduction).

Table 2 shows that, on average for the period 2023 onwards, there have been 435 more older patients per week across country, two thirds (n=295) of whom are acute, and fewer younger patients (net reduction of 123 patients per week aged 16-64 years). This is in line with the overarching message from insight report interviews. This increase is particularly concentrated in the 75-84 age group. As a share of all admissions to hospital this age group increased by about 2% to 17.5%.

Table 2: Change in the weekly number of patients by age and admission type pre- and post-COVID (Source: REACH analysis of NMDS)

Age group	Acute Change: pre- to post-COVID	Elective Change: pre- to post-COVID	Total change, pre- to post COVID
16-64	-60	-63	-123
65+	295	140	435
65-74	69	57	126
75-84	190	106	296
85+	36	-23	13

Table 3: Average weekly ED presentations by age and triage level, pre and post COVID (source: REACH analysis of NNPAC)

	ED presentations											
Triage level	**1,2,3**			**1,2,3**			**4,5**			**4,5**		
Age	**65+**			**16-64**			**65+**			**16-64**		
	2015-19	2023 onwards	Percent change	2015-19	2023 onwards	Percent change	2015-19	2023 onwards	Percent change	2015-19	2023 onwards	Percent change
Admitted/ transferred	2,562	3,059	19%	2,864	3,024	6%	477	388	-19%	841	677	-20%
Routine discharge	1,540	2,076	35%	4,282	5,145	20%	908	830	-9%	4,376	3,650	-17%
Self discharge	24	76	217%	239	532	123%	40	75	88%	421	598	42%
Total	4,127	5,211	26%	7,385	8,701	18%	1425	1293	-9%	5,638	4,924	-13%

Note: Triage 1-3: imminently or potentially life-threatening; triage 4-5: potentially serious or less urgent.[9]

[9] URL: https://info.health.nz/services-support/emergency-departments (accessed 25 September 2025)

Table 4: Change in average weekly admissions/ transfers by age and triage level, pre and post COVID (percentage change in parenthesis (source: REACH analysis of NNPAC)

	Triage level		
Age	**1,2,3**	**4,5**	**Total**
16-64	160 (6%)	-164 (-20%)	-4(0%)
65+	497 (19%)	-89 (-19%)	408(13%)
65-74	*152 (16%)*	*-31 (-18%)*	
75-84	*255 (27%)*	*-26 (-15%)*	
85+	*92 (14%)*	*-33(-26%)*	
Total	657 (12%)	-253 (-19%)	404 (6%)

Note: Triage 1-3: imminently or potentially life-threatening; triage 4-5: potentially serious or less urgent.

Within this increase in older acute patients, emergency department data suggest that these patients were more urgent when they were seen. Tables 3 and 4 show that the increase in urgent attendances are particularly pronounced for older people.

Table 3 also shows the increase in self-discharges of urgent cases previously reported in our Quality Alerts.[10] Table 4 shows that the increases in admissions through the emergency department are entirely driven by older and particularly more urgent older patients.

Is this just an increase in the older population?

The thesis that the health system is managing higher numbers of older and sicker patients with more complex health needs is supported by the data. This requires us to consider whether this is purely an effect of an aging population or if there is an alternate explanation. Our analyses below show that the answer is complex.

The estimated resident population aged 65 and over has increased by about 30 percent in the last decade. In Figure 1, as well as the number of discharges from hospital for those aged 65 years and over, we have presented the rate of acute discharges from hospital (per 1,000 population) over the last decade for those aged 65 years and over. Presenting the rate allows us to adjust for the increasing size of the population.

Figure 1 shows that increases in the number acute discharges were broadly in line with population changes such that the rate of acute discharges per 1,000 population is broadly unchanged prior to COVID (2013 to 2019). Between 2019 and 2020 there was about a 10 percent reduction in discharges per 1,000 population which was then followed by another period of plateau from 2020 to 2024.

However, the occupied bed days associated with these discharges presents a different story (Figure 2). After a reduction in the number of bed days occupied by this population between 2015 and 2019 (left hand scale), the number of occupied bed days (OBDs) per 1,000 population (right hand scale) have since increased. Between 2020 and 2023, there has been an increase of over 150 occupied bed days per 1,000 people aged 65 years and over.

The contrast between a relatively static rate of discharge and increasing bed occupancy raises the next questions. Why are these people being admitted to hospital and what else can we tell about them?

[10] Te Tāhū Hauora Health Quality & Safety Commission. 2024. Assessing system quality and safety: insights report. September. (page 10)

Figure 1 Acute discharges for people aged 65+, per 1,000 population, by year (NMDS, StatsNZ)

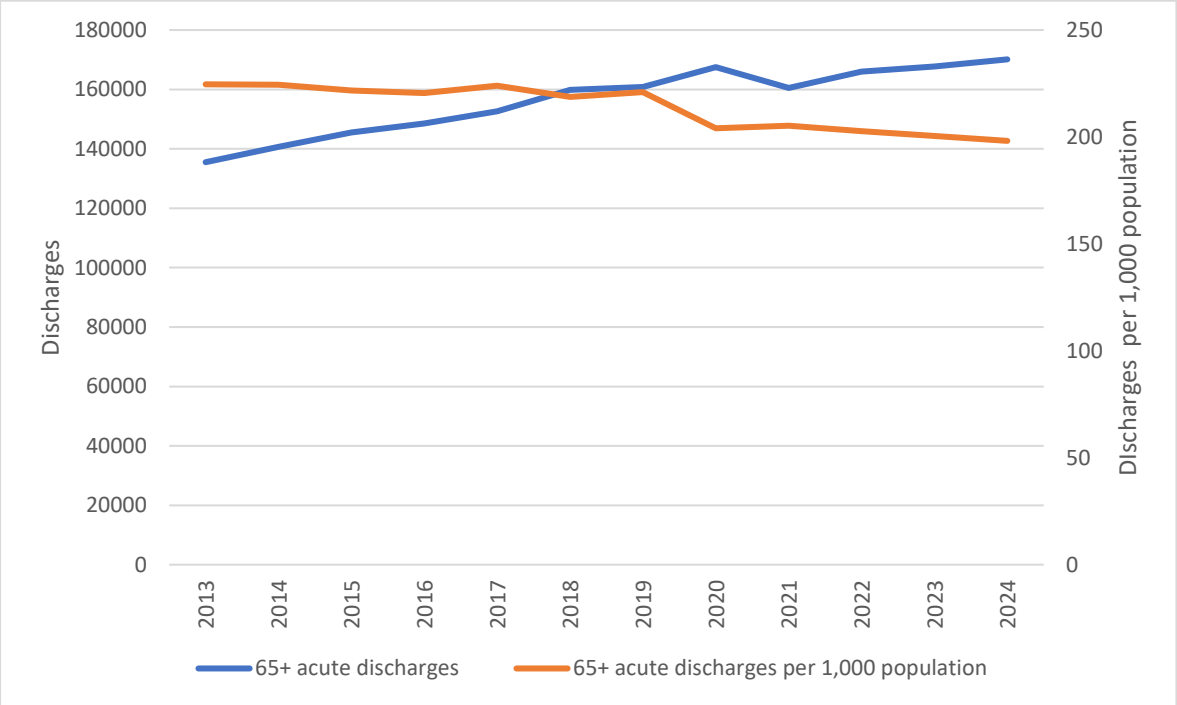
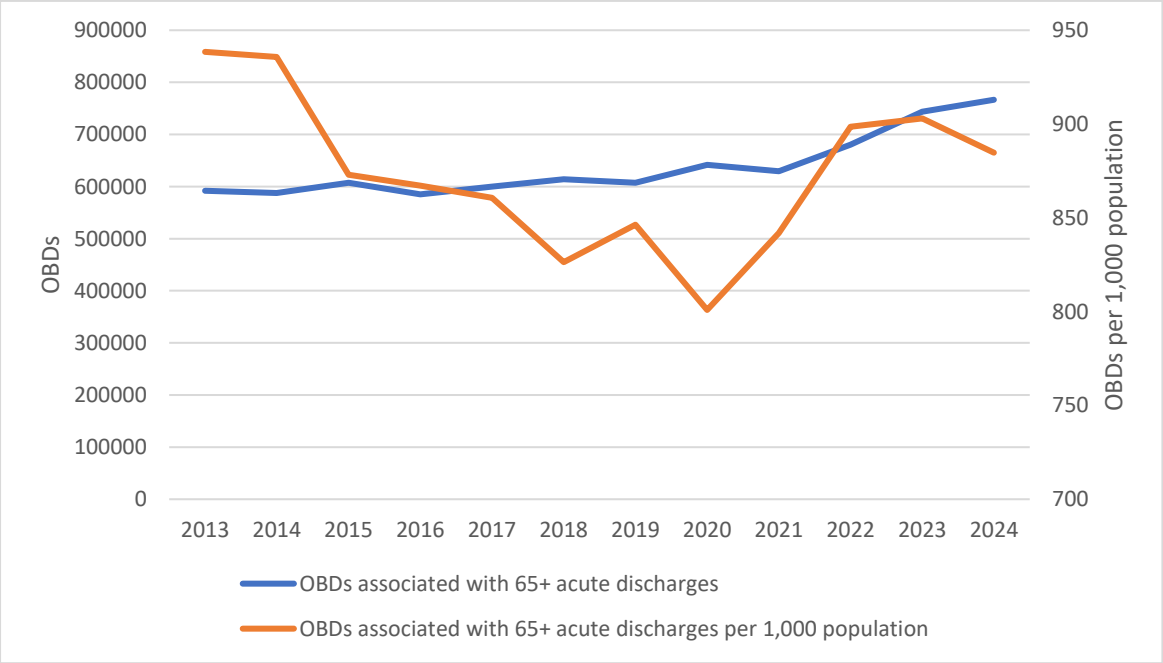


Figure 2 Occupied bed days (OBDs) from acute discharges for people aged 65+, per 1,000 population, by year (NMDS, StatsNZ)



Potential further work: The large percentage increase in self-discharge ED patients (albeit from a low base) have been raised as a QA – ongoing monitoring of this group should be accommodated in broader acute pathway performance frameworks.

Older acute patients – what are they in hospital for?

Acute patients vary from relatively short-term admission for specific issues among people who are generally healthy, through managing a deteriorating situation for individuals with multiple and complex health needs, to supporting very frail individuals often approaching the end of life. All have very different implications for appropriate pathways and treatment options, which lead to wide variation in health resource use.

To enable more precise investigation of how demand for acute care is changing, we have outlined four basic types of scenarios that may help us to understand why acute presentations to hospital may take place. In order these are:

- Acute discharges which were a discrete problem with (generally) limited co-morbidities.
    - Medical example - viral pneumonia
    - Surgical example – appendicitis
- Acute discharges where multiple, unrelated co-morbidities are common
    - Medical examples include CVA and undefined chest pain
    - Surgical example – fractured neck of femur
- Acute discharges with multiple related co- morbidities
    - Medical example. Diabetic Ketoacidosis
    - Surgical example chronic pancreatitis and PVD
- Deterioration of chronic conditions
    - Medical examples include frailty typically associated lack of mobility or chronic back pain or COPD
    - Surgical examples include bowel cancer or obstruction

By investigating the changes in the number of discharges and bed occupancy of each of these four groups we can identify and quantify the changes in demand being experienced and from this highlight risks and potential solutions.

Table 5: Acuity scenarios, pre and post COVID. (NMDS)

	Patient discharges (average annual)			% of diagnosis in primary position	
Scenario/ condition	**Pre COVID 2013-19**	**Post COVID 2022-24**	**Change in number of discharges**	**Pre COVID 2013-19**	**Post COVID 2022-24**
Acute discrete					
Appendicitis	366	679	85%	91%	94%
Viral pneumonia	534	2375	344%	74%	72%
Acute presentations multiple related					
Chronic pancreatitis	134	213	58%	40%	40%
Diabetic keto-acidosis	253	535	111%	38%	38%
PVD	1,787	1,675	-6%	37%	48%
Acute presentations multiple unrelated					
Cerebral infarction	5,703	6,573	15%	84%	85%
Chest pain	12,627	15,460	22%	75%	75%
Fracture of neck of femur	3,944	4,671	18%	92%	95%
Deteriorating chronic conditions					
Bowel Cancer	1,622	1,567	-3%	34%	35%
Bowel obstruction	3,332	4,067	22%	66%	69%
Chronic Back pain	2,731	5,859	115%	50%	30%
COPD	13,425	15,976	19%	57%	48%
Lack of mobility	1,659	6,655	301%	4%	4%

Note: Table 6 and Table 7 shows the number of patient discharges where the condition was present among the recorded diagnoses – this means that some patients will belong to more than one group, a total number of patients cannot be calculated by adding the individual rows which is why the scenario rows are kept blank.

Table 5 shows growth in the frailty diagnoses of chronic back pain and lack of mobility. Lack of mobility is almost always a secondary diagnosis.[11] Chronic back pain is increasingly recorded as a secondary diagnosis. The proportion of discharges with a secondary diagnosis of chronic back pain rose from a half to over two thirds in the period 2013-19 to 2022-24.

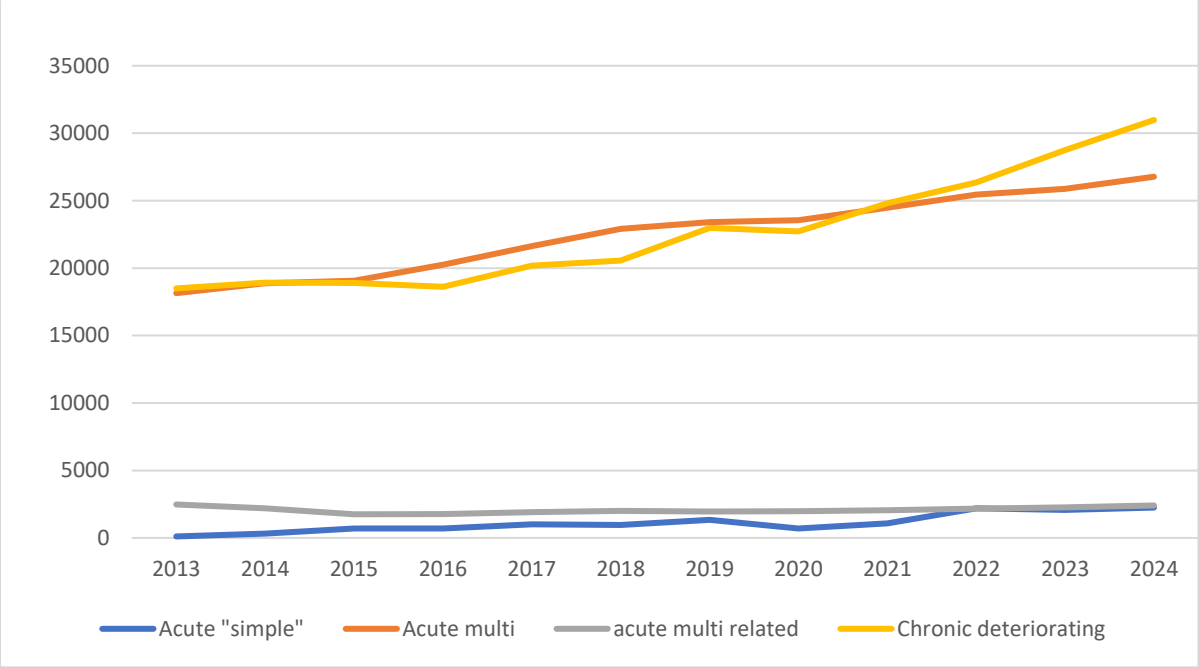
Elsewhere, there are substantial increases, albeit from low bases, for viral pneumonia and diabetic ketoacidosis. However, when considering our second and

[11] The National Minimum Data Set of Hospital Discharges lists both primary and secondary diagnoses. The primary diagnosis is the main reason for the patient's episode of care. Secondary diagnoses are clinical conditions recorded during a hospital admission that aren't the primary reason for admission but is relevant to the patient's care. We note that there is less consistency in the recording of secondary diagnoses than primary diagnoses, so there may be other underlying reasons for the shifts noted in this analysis.

fourth scenarios, multiple unrelated comorbidities and chronic deterioration stand out (see Figure 3).

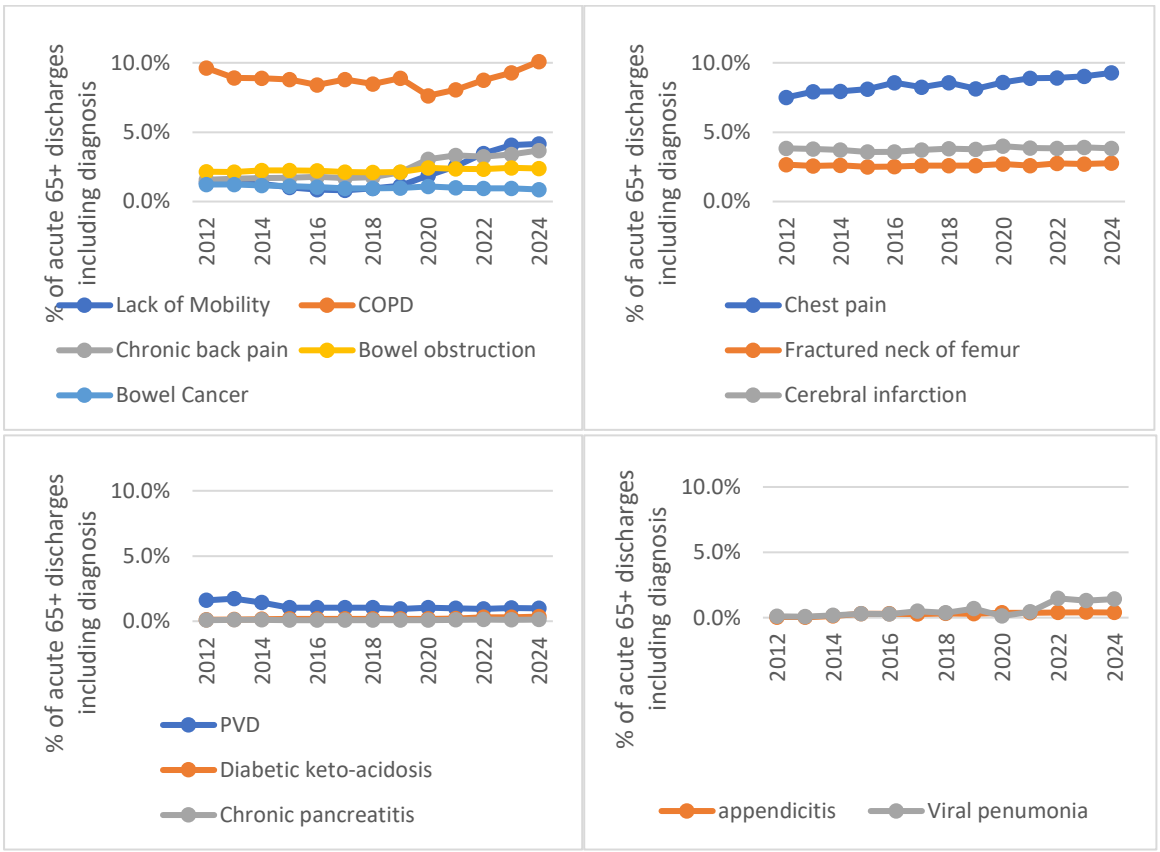
When considered at the condition level (Figure 4) a similar pattern emerges. Both overall scale, and absolute increase are dominated by these two groupings. While many of the trends are long-term, the increased number of discharges for frail patients (those with deteriorating chronic conditions) is noticeable post the COVID period.[12]

Figure 3 Discharges by scenario, patients aged 65, by year (NMDS)



Note: Figure 3 and Figure 5 both use a hierarchical approach to place each patient in one scenario type only – this means that the figures presented here cannot be estimated by summing rows in Table 5.

Figure 4a – 4d Percent of acute discharges for patients aged 65+ with specific diagnoses, by year, by acuity scenario, (NMDS)

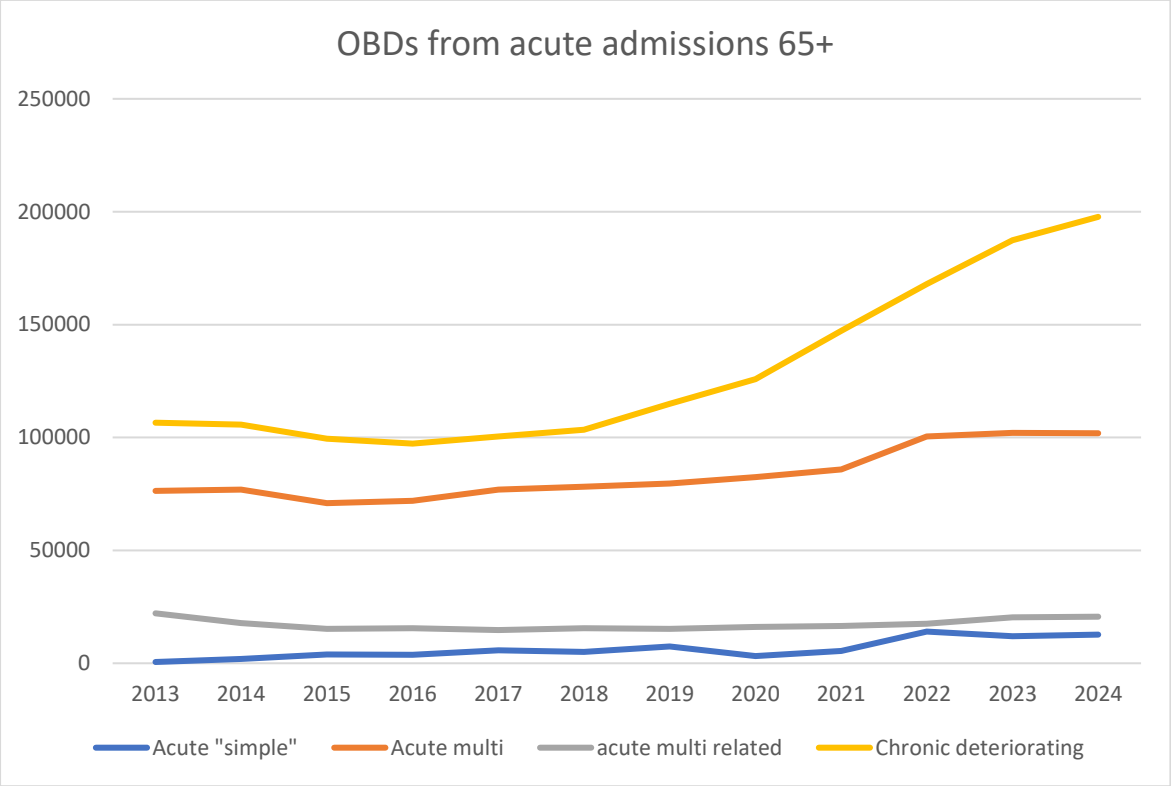


When we consider bed use, these trends are even more pronounced with the frailty co-diagnoses of lack of mobility and chronic back pain standing out alongside the increase in bed use to treat viral pneumonia (Table 6 and Figure 6).

Table 6: Bed use by acuity scenario (NMDS)

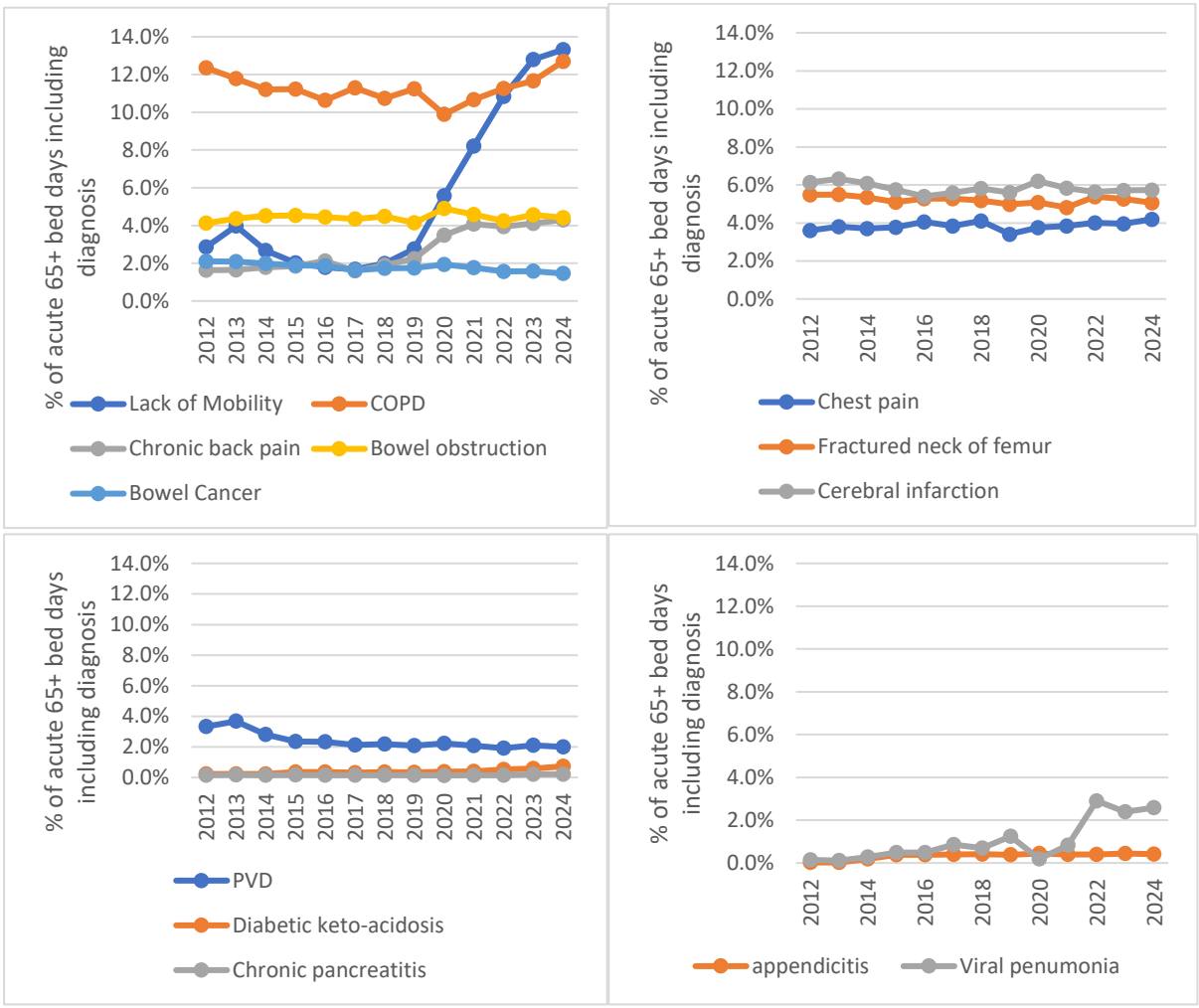
	Average Annual Occupied bed days		
Scenario/condition	Pre Covid	Post COVID	Change
Acute discrete			
Appendicitis	1904	3147	65%
Viral pneumonia	3676	19959	443%
Acute presentations multiple related			
Chronic pancreatitis	937	1469	57%
Diabetic ketoacidosis	1861	4646	150%
PVD	15152	15247	1%
Acute presentations multiple unrelated			
Cerebral infarction	35107	43374	24%
Chest pain	23112	30856	34%
Fracture of neck of femur	31736	39831	26%
Deteriorating chronic conditions			
Bowel Cancer	11170	11639	4%
Bowel obstruction	26671	33576	26%
Chronic Back pain	11384	31330	175%
COPD	67650	90418	34%
Lack of mobility	14600	93899	543%

Figure 5: Bed use by scenario, patients aged 65, by year (NMDS)



However, the increase in occupied bed days (OBD) associated with both frailty patients and viral pneumonia cannot be solely explained by the increase in patients. This can be shown clearly from share of bed days associated with each diagnosis (Figure 6a-6d)

Figure 6a – 6d Percent of OBDs associated with acute admissions for patients aged 65+ with specific diagnoses, by year, by acuity scenario, (NMDS)



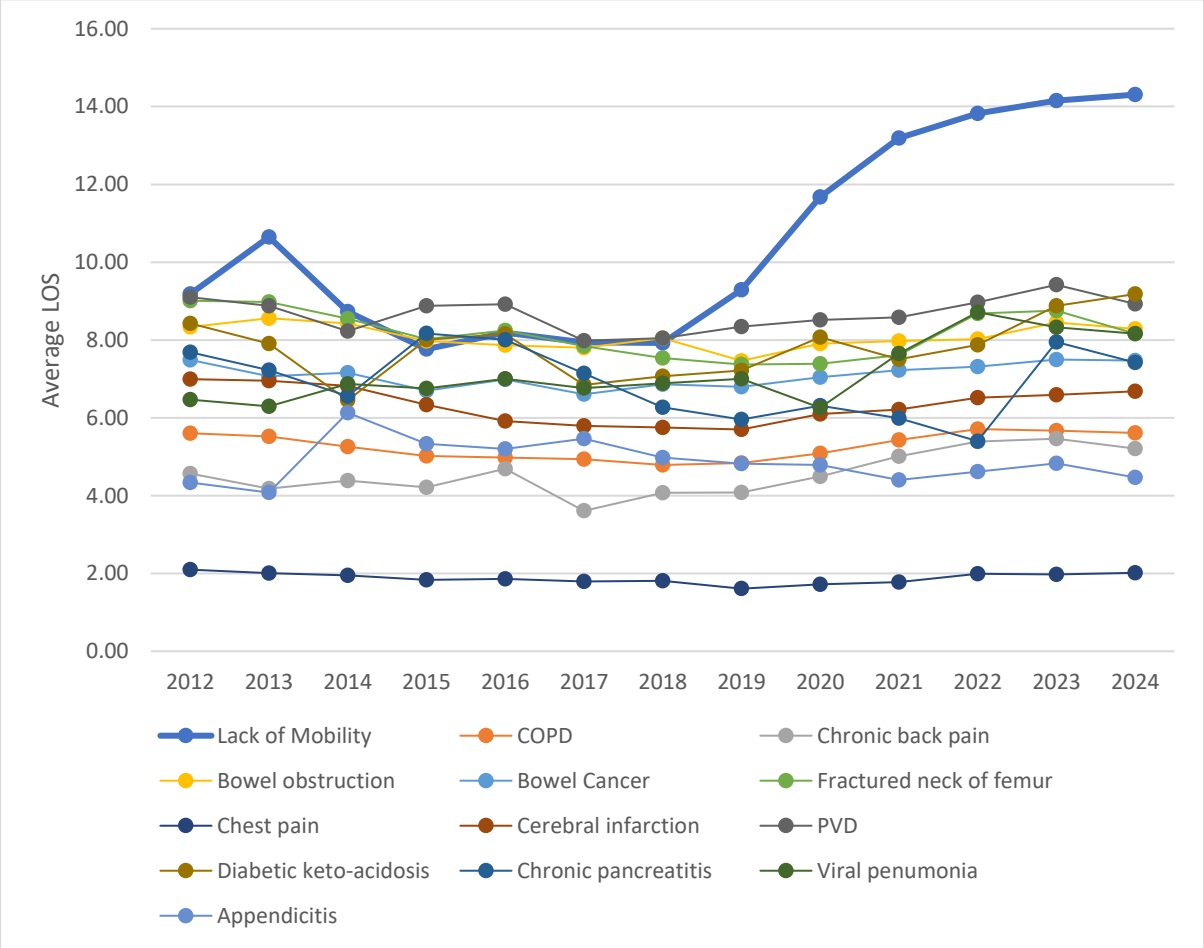
In general, the shape of the OBD graphs are similar to the previous graphs indicating relatively consistent individual lengths of stay (LOS, Figure 7) for each diagnosis.

For lack of mobility, the increase in LOS is concerning. While the percentage of acute patients aged 65+ with this diagnosis rose from 1 to 4% over a decade, the percentage of occupied bed days associated with a lack of mobility diagnosis has risen from 2 to 14% since 2018.

> *Potential further work: this scenario analysis needs to be undertaken for different parts of the country and for different population groups (age, gender and ethnicity) as the patterns of balance the scenarios will be different in different places. For example, the ages at which frailty first presents varies according to both ethnicity and gender, and the interaction of demand and supply across the whole of the acute pathway will be distinct in each district.*

Figure 7 shows the increase in average LOS, per year, for hospital stays which involve each of the diagnoses in the hospital discharge record. Average LOS for discharges with a lack of mobility diagnosis (i.e. part of the frailty cohort) has increased by 6 days since 2018. Nearly all other diagnoses have broadly consistent LOS, with increases typically being less than a day on average.

Figure 7 Average LOS for acute admissions for patients aged 65+ with specific diagnoses, by year (NMDS)



Our analyses suggest a “triple whammy” for the health system:

- The older population who are more prone to be frail has grown 30 per cent in a decade.
- Discharges associated with frailty have more than doubled.
- Each individual admission is taking more time and resource to treat.

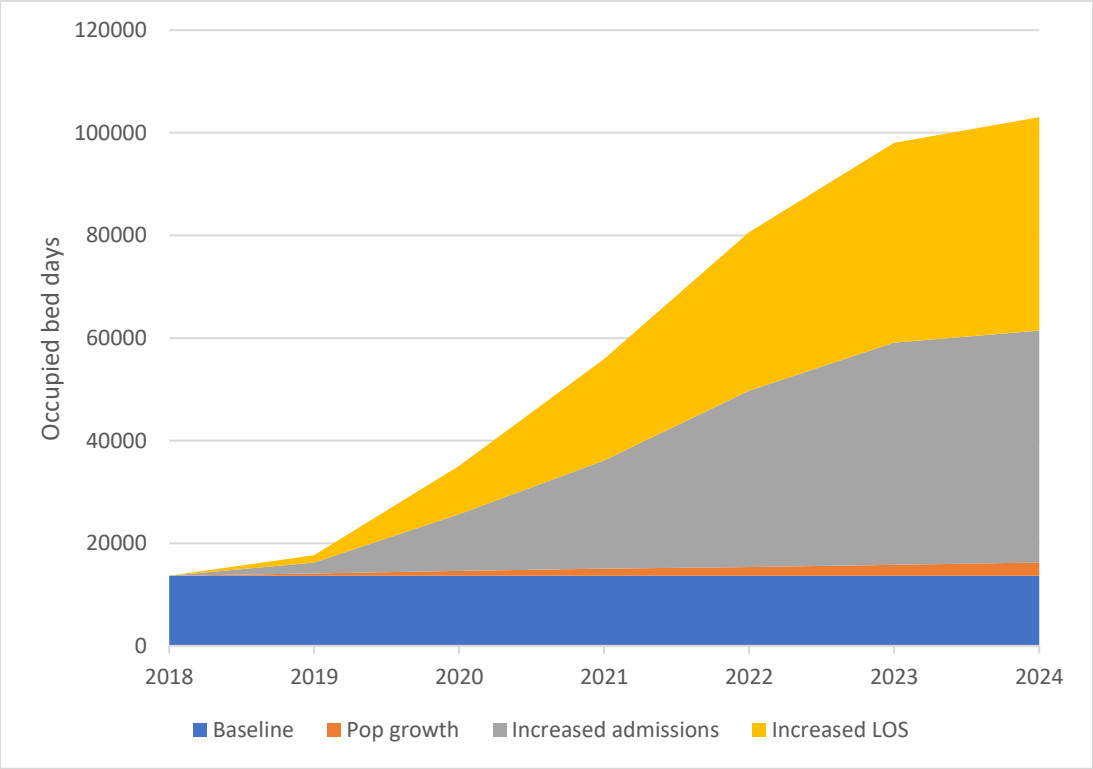
The results presented above point to problems with the pathways for keeping older, frailer people out of hospital, as well as discharging them back into community care in a timely manner. This is an issue closely connected with the availability of aged-residential care and other forms of community care.

A decomposition analysis[13] of the effects of additional population, increased admissions and increased LOS was undertaken to understand the increased occupied bed use since 2018 and is set out in Figure 8.

The analysis demonstrates that the increased older population plays only a minor role in the increased use of resources. Since 2020, just shy of an additional 300,000 bed days have been taken up by older people with a diagnosis of lack of mobility, more than could be explained just by the increase of older people.

We propose two explanations: an increase in the number of *frail* older people disproportionately greater than the increase of older people in total; and/or the dysfunction of care pathways that minimise the need for hospital admission and help patients return home (and community-based care) more quickly. There is confirmatory evidence of the latter.

Figure 8: Decomposition analysis of the cause of increase OBDs associated with loss of mobility diagnosis admissions (NMDS, Stats NZ)

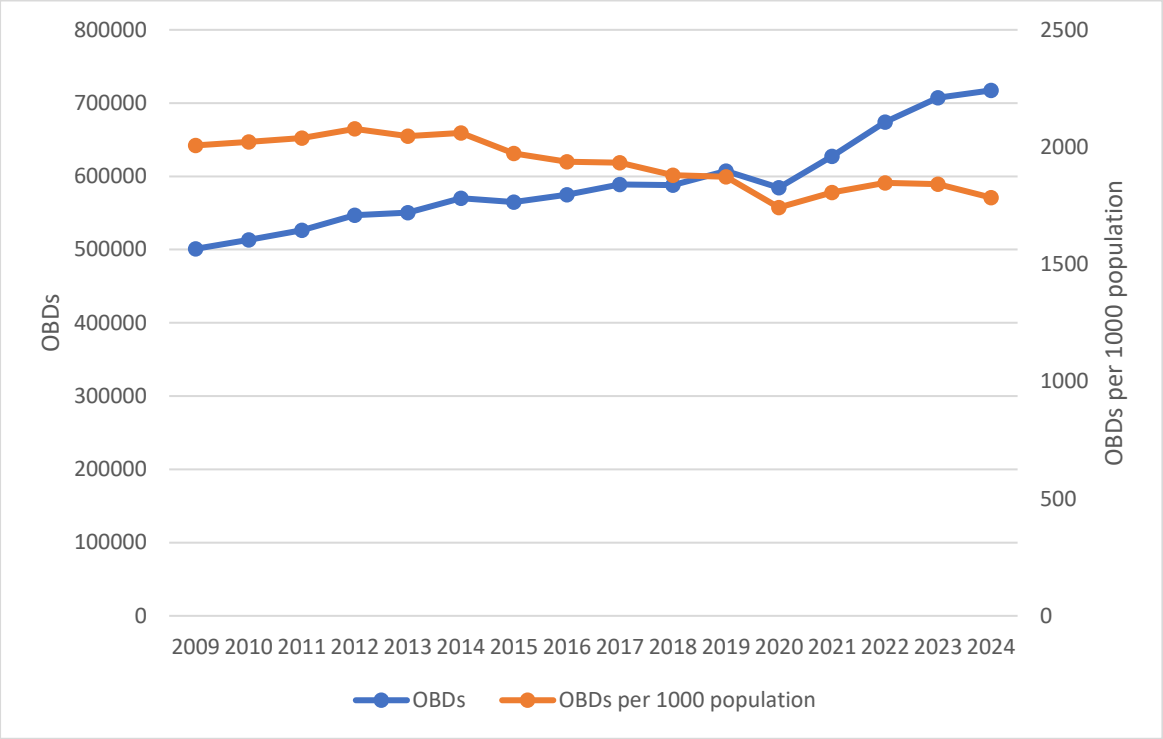


A separate but similar analysis is to look at bed use for people aged 75 and over who were admitted acutely more than once in 12 months (Figure 9). This is a proxy measure for integration of care that the Commission has used for a decade as it combines both preventable admissions and initiatives to reduce lengths of stay

[13] A decomposition analysis is a method for breaking down a complex outcome (in this case secondary care resource use by the population of adults aged 65 years and over) into its component parts or influencing factors to understand their individual contribution.

which require available out of hospital care, combined with well-defined and operating care pathways.

Figure 9: Bed days per 1,000 75+ population for people who admit acutely more than once in 12 months (NMDS, Stats NZ)

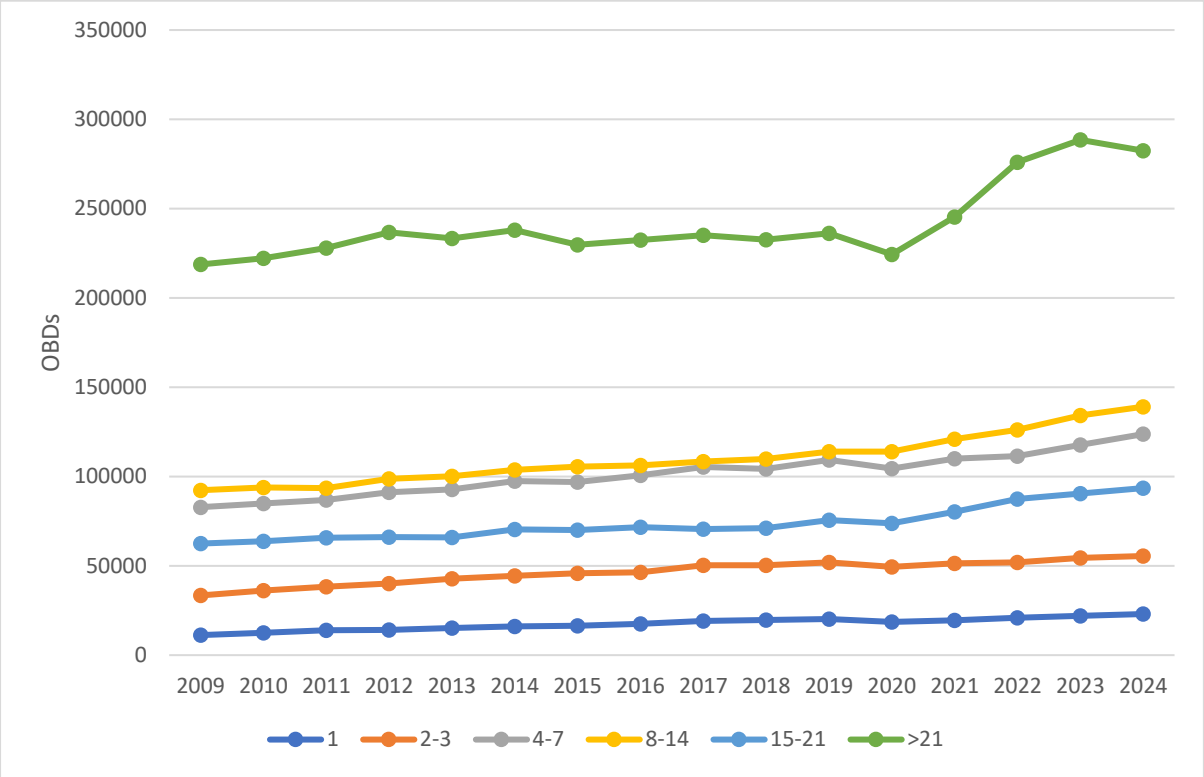


Note: OBDs 2024 may be understated, reflecting data latency of patients still occupying a hospital bed and not yet included in the data.

Throughout the 2010s, while the absolute number of bed days increased only slowly, the rate relative to the population fell consistently. Since 2020 there has been a sharp increase in these bed days while the rate relative to the population has plateaued. This has been driven primarily by an increase in stays of three weeks and longer among this cohort of people (Figure 10). This result aligns with the post COVID increased LOS for frail older people identified above.

> *Potential further work: this analysis needs to be undertaken at a district level – historically there has been widespread variation in this measure between different districts, and the likely pressures will vary geographically and demographically*

Figure 10 Bed days for people aged 75+ who admit acutely more than once in 12 months (NMDS, Stats NZ)



What has caused this increase? Thinking about acute care as a pathway

While the sharp end of ward use and ED occupancy highlights the issue, the acute pathway is, ultimately, a pathway where bed (and thus resource) use in hospital is influenced by what happens outside of hospital and vice versa. It also is highly germane to the achievement of ED waiting times.

Figure 11 gives a potentially simplified model of the complexity and interrelationships that operate on the acute pathway, originally designed to show what would need to be considered to drive genuine changes in ED waiting experiences. This argues that the ED wait time is ultimately a signal in the middle of a complex, multiagency pathway influenced by the efficient and effective operation of the pathway as a whole.

This is particularly dependent on the accessibility of out of hospital care (OOH). While we have described the change seen at step four, *ward occupancy*, understanding what is driving this change (and how to address it) requires some consideration of other parts of the model.

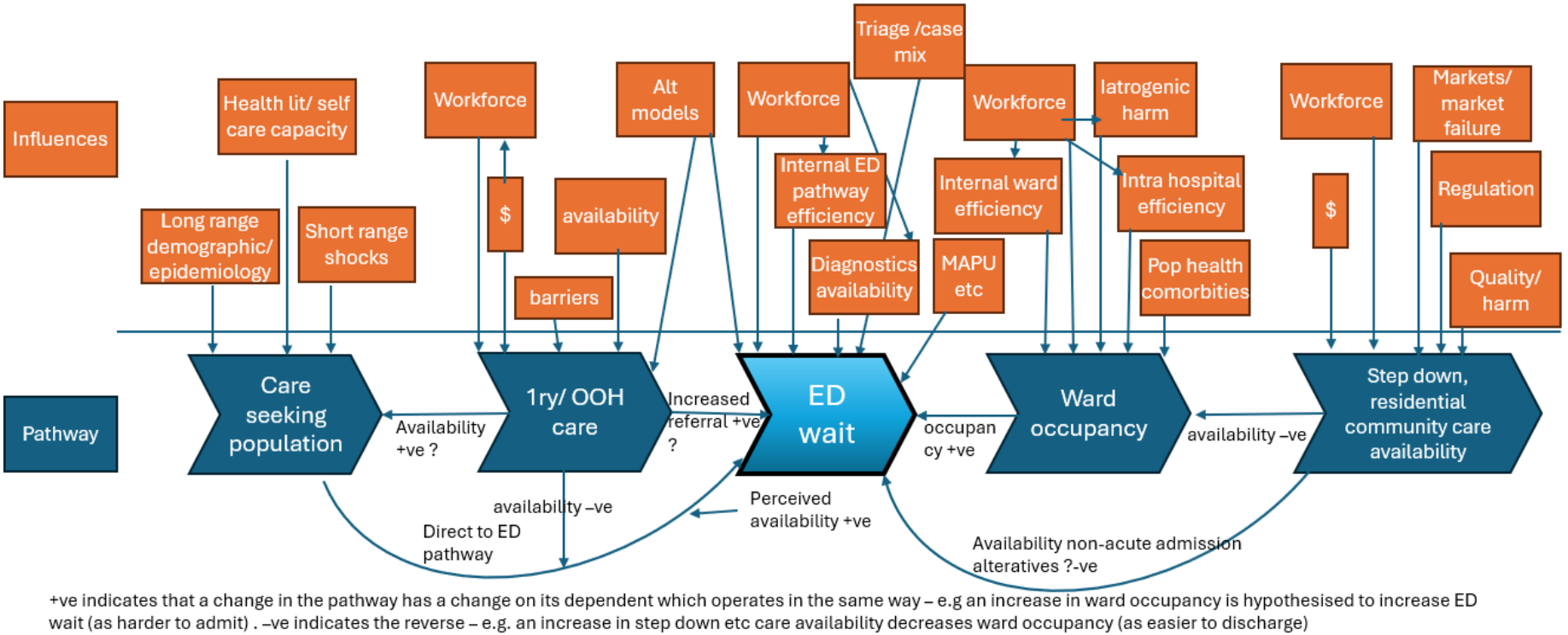
There are a number of hypotheses about stressors in the system. First, care seeking population at point one is likely to have increased more rapidly than population growth alone would suggest. One consequence of the success in reducing mortality, particularly among older people, during the COVID period (see Figure 12) is a

disproportionate increase in the cohort of older, sicker people. Whilst a positive byproduct of the COVID response, this has longer term implications for system pressure that require consideration for the operation of the system as a whole.

In terms of primary care (point two on the pathway), we know from results of patient experience surveys over time that access to primary care has become harder. The proportion of respondents to the primary care survey reporting some difficulties in getting access when they want it has increased from the high teens (percent) to the low twenties since COVID, albeit with recent improvements (Figure 13). Concurrently, the proportion of patients who access primary care within a week has reduced, with increasing proportions believing that they waited “a bit” or “far” too long (Figure 14)

What we know about ED attendance (Tables 4-5) is that the increases have been in the more urgent cases, with the less urgent cases (where primary care could more appropriately have been used) have reduced since 2023. Our data does not indicate that patients are choosing to go to the emergency department in the absence of available primary care. However, there may be a delay effect whereby patients who have been unable to access primary care have to access acute care at a later stage when they are more unwell (potentially driving the increased triage 1, 2 and 3 numbers).

Figure 11. Simplified estimate of ED pathway



Note: This is a very simplified schema, we anticipate there are other causal factors and feedback loops that operate and which have not been captured.

Figure 12: Comparison of observed and expected mortality, based on crude five-year rate, among people aged over 60years, by week, New Zealand, 2020-22 (Stats NZ data)

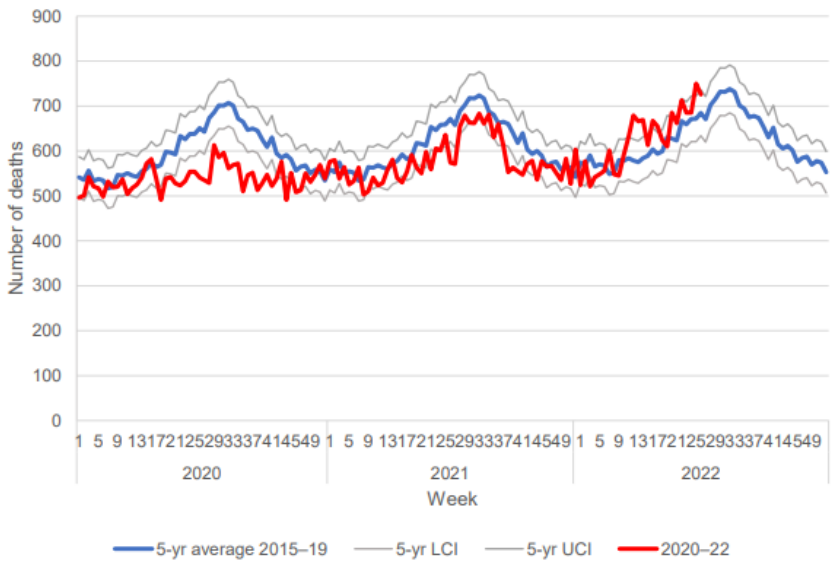


Figure 13: Percentage of primary care survey respondents who reported always being able to access primary care when they wanted it. (source HQSC primary care survey)

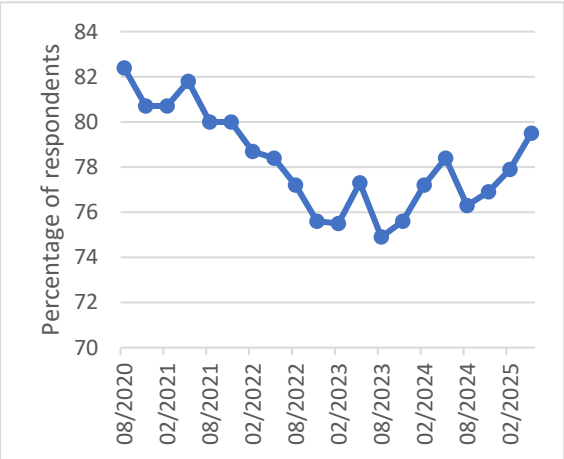
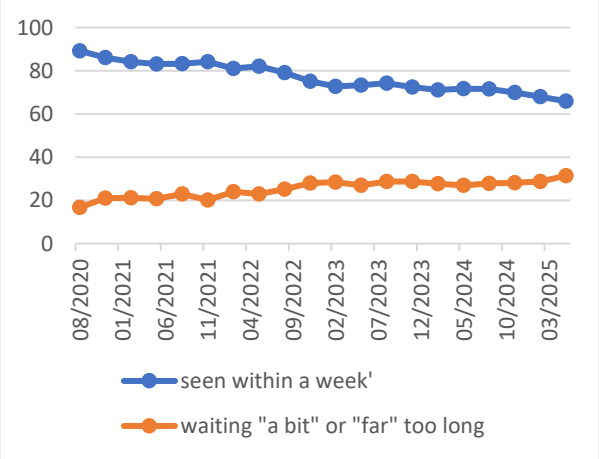
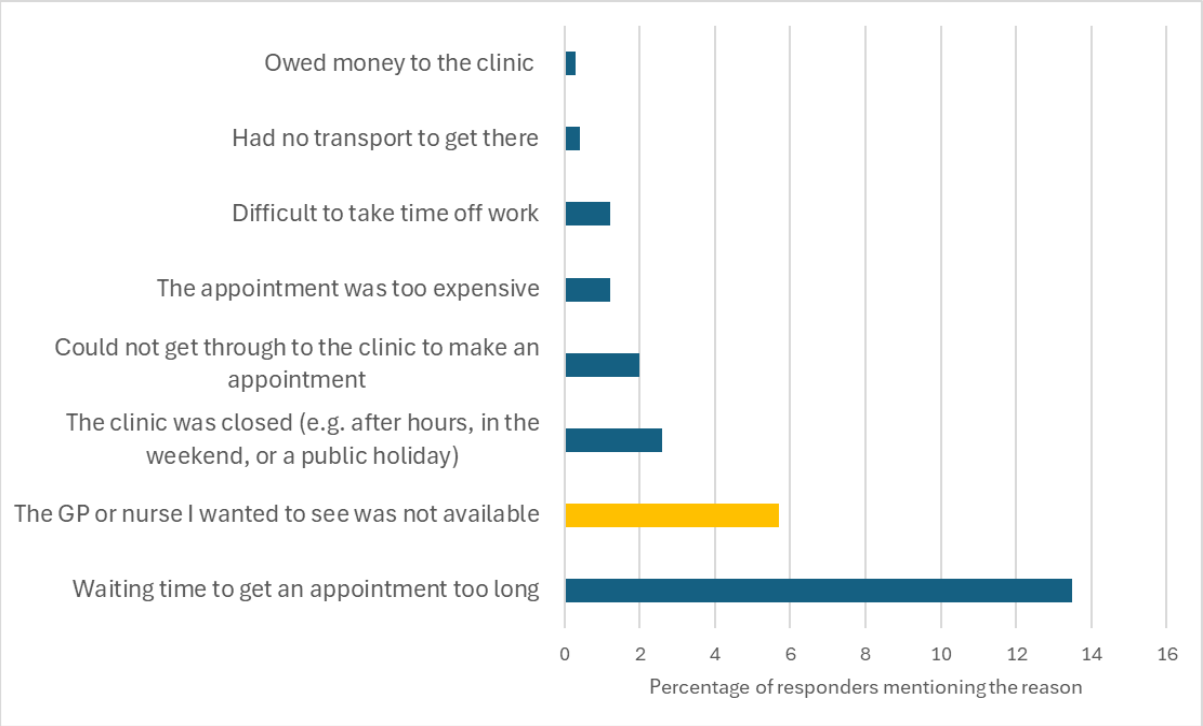


Figure 14: Percentage of primary care survey respondents seen within a week for an appointment and the percentage who felt this was a "bit" or "far" too long. (source HQSC primary care survey)



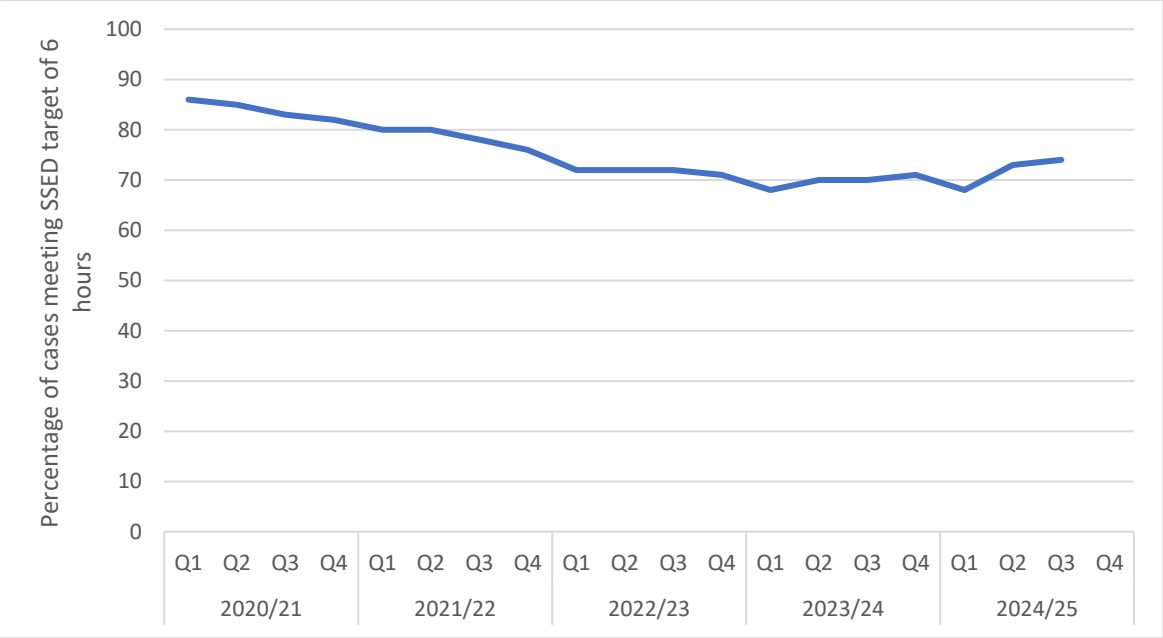
Alongside increased wait times, respondents to our patient experience survey highlight not being able to see the GP or nurse of their choice as a barrier to access. Around a third of respondents who report a barrier to access cite this as a cause – the second most common barrier to access (Figure 15)

Figure 15: Percentage of primary care survey respondents citing specific barriers to access, May 2025. (source HQSC primary care survey)



In ED itself, performance against the short stay emergency department target (i.e. percentage of patients admitted, discharged or transferred with six hours) looks as though it may have bottomed out at around 70 per cent (Figure 16).

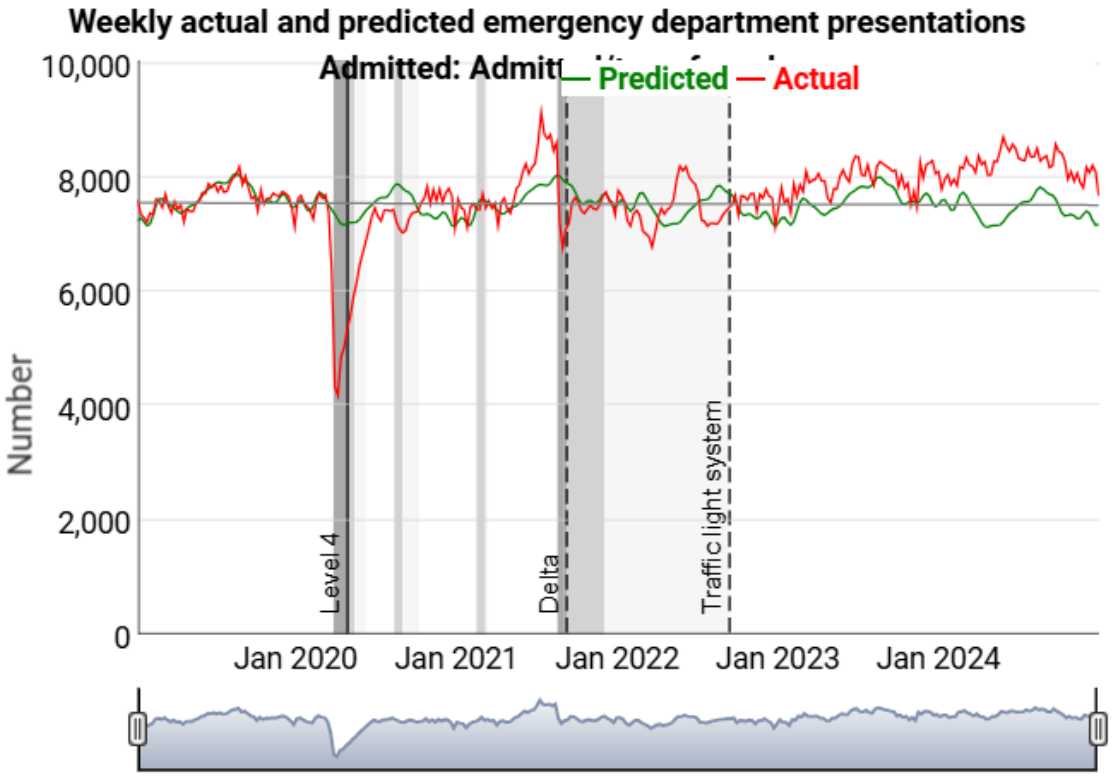
Figure 16: Performance against ED target since 2020/21 (HNZ)



This needs to fuller analysis including stratification by disposition (admission, discharge, self discharge) and full distribution of times by triage level

Concurrently, there has been an increase in the average number of admissions to hospital from EDs of about 500 additional admissions per week since 2023 (Figure 17). This increase is made up of around 800 more presentations per week in the more urgent triage categories and a reduction of 300 presentations per week in the least urgent triage 4 and 5. This is an increase above long term trend (Figure 17), reflecting an increasing proportion of higher urgency patients (who have historically been four times more likely to be admitted).

Figure 17: Increase in admissions from ED compared with long term trend (source: REACH analysis of NNPAC data)



The challenge for the ward of an increasing proportion of multi-morbid, older and frailer patients is set out in the first section of this paper, but the final aspect of the pathway is the availability of step-down (community) care including aged-residential care. Additional analysis is required to understand the situation here, but the increase in LOS in frailer patients (Figures 5-7, Figure 10) is supported by reported

evidence of increased pressure in community care and a lack of step-down care options.[14,15]

> *Potential additional work: local analysis of the cohorts of patients staying longer and the implications on resource use of these will be important – this may include analysis of specific complication and adverse events among these cohort and an estimation of the effects of these adverse events. At a very granular level, case review of a representative sample of the cohort – again which needs to be at a local level, can identify sub-optimal pathways of patients who did not need to enter hospital and those that stayed longer than they needed to. This could link with the sort of economic analysis of treatment options within pathways such as the STAR approach.*

What are the quality risks of the "frailty effect"?

The increase in the size of the cohort of frail older people has direct increases in risks of harm. Less mobile people have risks of both pressure injury and fall. These risks may be compounded by less "time to care" because of time pressures on a stretched ward, due to staffing pressures as described in our insights reports.

Pressure injuries have increased in nearly all parts of the country both inside and outside of hospital since 2022 (Figures 18 and 19). Pressure injuries acquired outside of the hospital results in entering hospital with an additional issue that needs addressing.

Falls have largely remained stable (at least as marked by serious falls with fractured neck of femur) although there have been concerns in some localities (Figure 20).

[14] North Shore Hospital has entire ward of people with no medical reason to be there | RNZ News
[15] Aged Care Association says ward for medically discharged shows need for funding | RNZ News

Figure 18 Percentage of hospital admissions with a Hospital-Acquired Pressure Injury

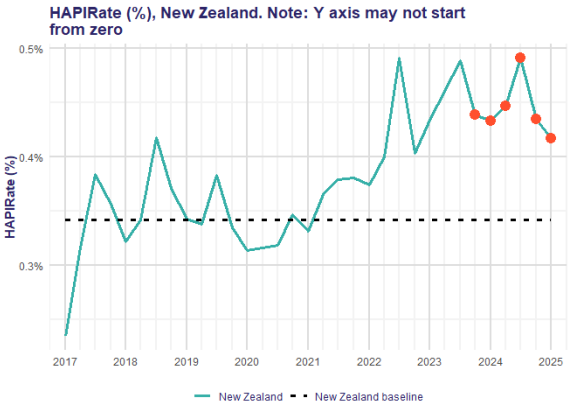
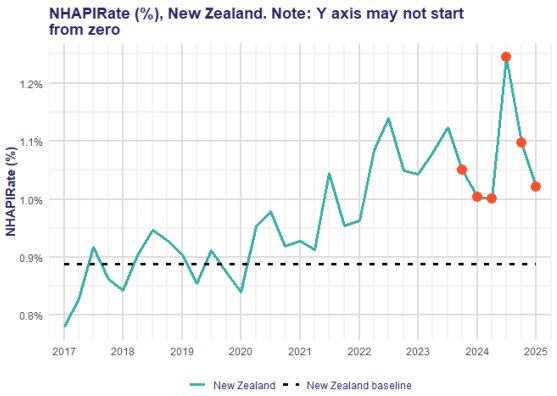
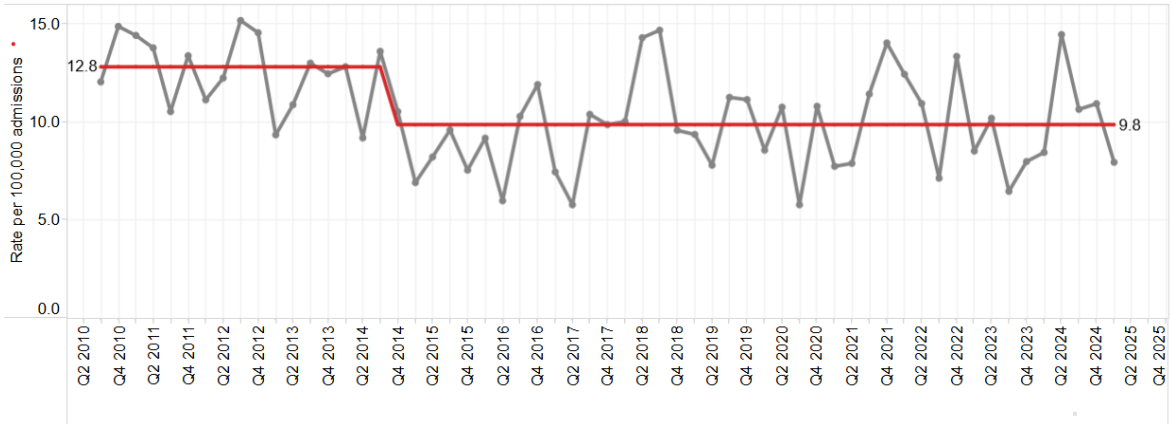


Figure 19 Percentage of hospital admissions with a Non Hospital-Acquired Pressure Injury Rate



Note: Red dots on the charts are alerts, where the number sits outside of the expected range

Figure 20 In hospital falls with a fractured neck of femur per 100,000 hospital admissions



Prolonged stays in hospital may also increase the risk of other hospital acquired complications such as healthcare associated infections, as the opportunity to acquire the complication increases with increased length of stay.

> *Potential additional work: additional analysis of a broader range of potential harms and complications to quantify the iterative effects.*

Conclusions and unanswered questions

Broadly, we have found that the number of hospital bed days occupied by frail older people have increased by about 100,000 since 2018. This is both statistically and

operationally significant and cannot be solely attributed to an increase in older people, nor even frail older people.

Both a disproportionate increase in hospital discharges and an increase in length of stay for specific cohorts of patients points to lack of integration in the acute care pathway between primary, community, acute hospital, step-down and residential care.

Our findings imply that any solutions need to take a whole system view and will need to involve parties from across the continuum of care, including consumers. We have heard from our interviewees and other stakeholders the dangers of the health system "going solid" – a figurative "seizing up" where attempts to address issues in one setting fail because of problems elsewhere.[16]

This provisional conclusion is important but difficult to address. Making the pathway sustainable will require co-ordination of efforts between public (Health New Zealand), private (aged-residential care, private hospitals), NGO and PHOs/primary care, where it is unclear that their incentives and authorising environments are necessarily aligned.

The effects of this lack of integration are nuanced and do not lend themselves to easy explanation. For example, it is often suggested that patients struggling to get access to primary care turn up at ED – a straight substitutionary effect. In fact, the evidence we have does not support this – the increase in ED presentation is in the high urgency (including potentially life threatening) categories. There may be the more subtle effects of delayed (or completely thwarted access) leading to deterioration of conditions that necessitate emergency presentation which need further investigation. Alternatively, less urgent patients may be being turned away from emergency departments in an effort to manage workflow. Instead, such patients could be presenting through out-of-hour care facilities through general practice.

Synergistic and interacting negative effects seem likely but need further unpicking. This includes the old frail cohort more at risk of some harms and complications, but also the knock-on effects on elective capacity, workforce capacity for discretionary activity (such as quality assurance and improvement) and the overall efficient operation of care pathways.

In particular, we need to explore further the effect on productivity from both a precise and whole pathway view. Our hypothesis of an increased level frailty among acute patients is likely to demand greater "care input" (i.e. number and complexity of care

[16] 'Going solid' refers to a state where there are no longer buffers built into a system to accommodate changes such as surges in demand. "As a result, situations occur in which activities in one area of the hospital become critically dependent on seemingly insignificant events in seemingly distant areas." In the current example, lack of capacity within primary care and community care may be driving increased bed occupancy – the first by resulting in patient deterioration prior to accessing care and the second by limiting discharge options and resulting in 'bed blocking'. Cook R, Rasmussen J"Going solid": a model of system dynamics and consequences for patient safety. BMJ Quality & Safety 2005;14:130-134.

giving activities and decisions) per occupied bed day or FTE day. It is unclear whether existing cost weights fully capture this.

> *Potential additional work: A fuller cost weight analysis considering the distribution of cost weights (including where no weights are recorded) across the cohorts described above. Early results from some similar analysis undertaken for elective cases by NZIER suggest an increase in cost weights*

Next steps

Throughout this paper we set out a series of further insights needed to effectively understand (potentially leading to recommendations on how to address) what appears to be a rapidly changing and challenging situation. In summary these are:

- Comparison of relative shift from elective to acute activity with relative local performance against the access targets
- Detailed analysis of local level swing to acute activity
- Ongoing monitoring of self-discharge ED patients
- Extend scenario analysis to include different parts of the country and for different population groups (age, gender and ethnicity)
- Provide analysis of repeat acute admissions for older people at a district level
- Extend ED admission target data to stratify by disposition (admission, discharge, self-discharge) and analyses full distribution of times by triage level
- Local analysis of the cohorts of patients staying longer in hospital including:
    - analysis of specific complications and adverse events among long stay cohorts
    - case review of a representative sample of the cohort to identify sub-optimal pathways of patients who did not need to enter hospital/or those that stayed longer than they needed to.
- A fuller cost weight analysis considering the distribution of cost weights (including where no weights are recorded) across the cohorts

To address the issues outlined in this paper, we again highlight the importance of developing solutions that take a whole system view (primary care through secondary and community care options) and will need to involve parties from across the continuum of care, including consumers.