

Health Care Home evaluation - updated analysis

April-September 2017

30 April 2018

This document has been prepared by Ernst & Young (EY) for Pinnacle. The information contained in this document is derived from provided data and private sources (e.g. interviews and correspondence), which we believe to be reliable and accurate but, without further investigation, their accuracy, completeness or correctness cannot be warranted. This information is supplied on the condition that EY, and any partner or employee of EY, are not liable for any error or inaccuracy contained herein, whether negligently caused or otherwise, or for loss or damage suffered by any person due to such error, omission or inaccuracy as a result of such supply. This document is provided for the sole use of Pinnacle. We shall have no responsibility whatsoever to any third party in respect of the contents of this report.

For further information please contact:

Dr Gary Jackson gary.jackson@nz.ey.com

Ernst & Young
2 Takutai Square, Britomart, Auckland 1010, New Zealand

Suggested citation: *Health Care Home evaluation - updated analysis, April-September 2017*. Auckland: Ernst & Young, 2018.

Contents

Executive summary 3

1. Introduction 5

2. The Health Care Home in 2017 6

3. Secondary care utilisation 9

4. Financial case study 19

5. Future steps..... 20

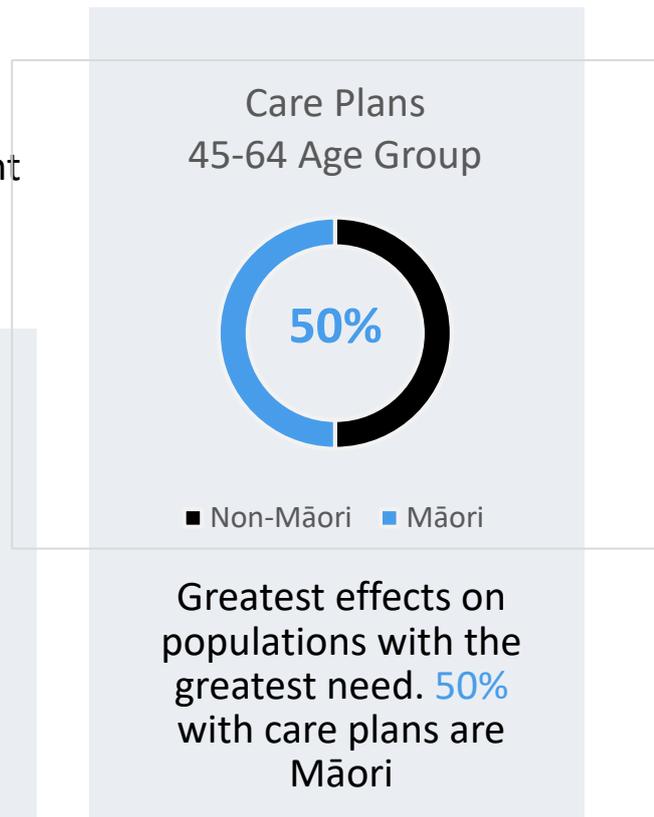
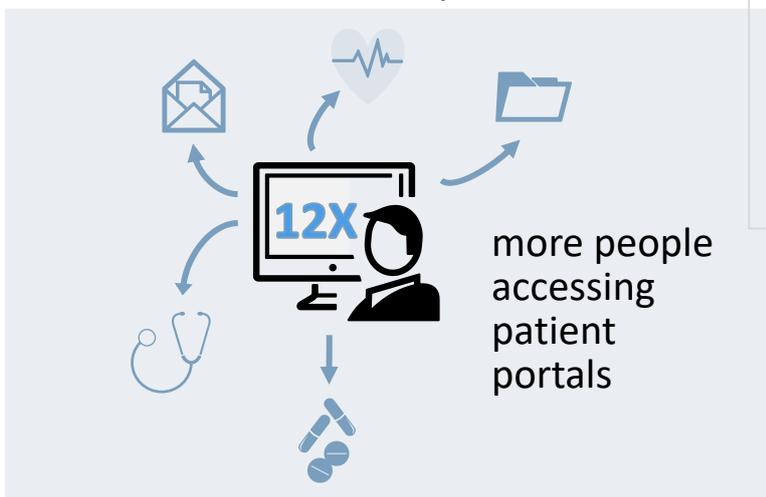
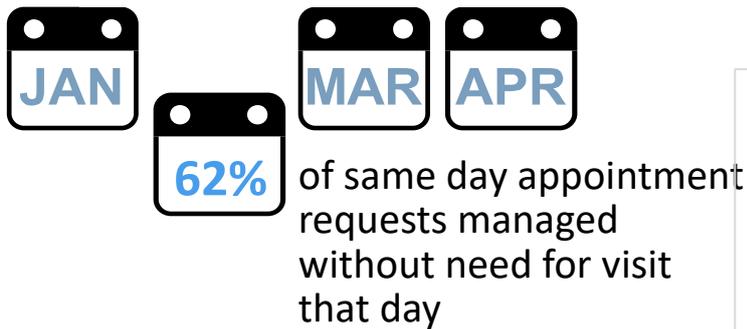
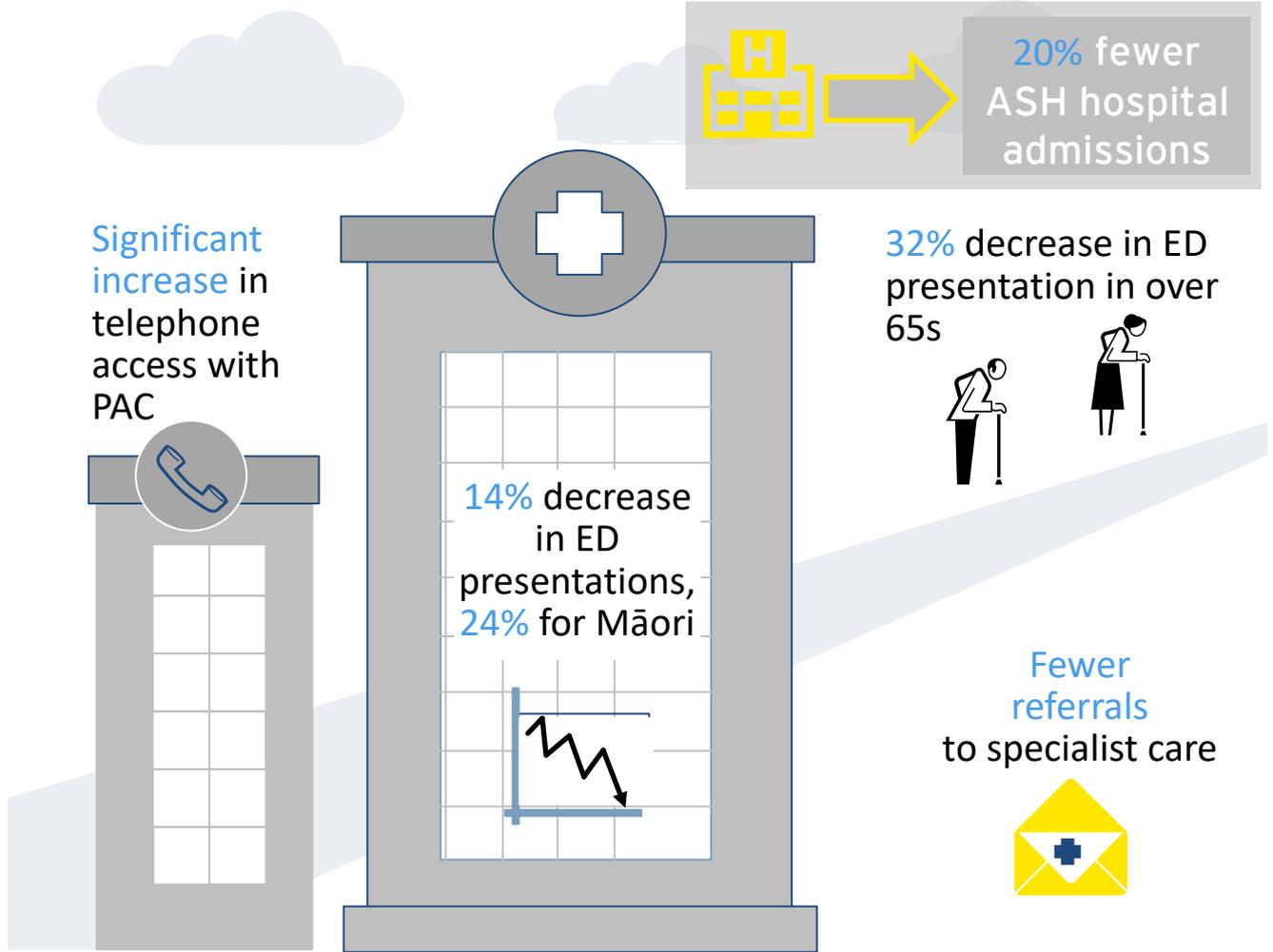
Figure 1 - Age distribution by practice type 11

Figure 2 - Odds ratios by ethnicity (compared to European) 12

Figure 3 - Odds ratios by deprivation (relative to quintile 1) 13

Figure 4 - Odds ratios by age group (relative to 0-4) 13

Report at a Glance



Executive summary

Since the publication of EY's initial Health Care Home (HCH) evaluation report in February 2017 there have been significant advances in data capture and analysis at Pinnacle, allowing additional quantitative analysis to be performed. In this report, a further year's data has been added to the time series, allowing an analysis of the effect of the HCH model on healthcare usage, along with an update on the ongoing development of the model in the Pinnacle practices.

This analysis compared health care utilisation rates by patients at Health Care Home (HCH) practices with patients at comparable practices with a traditional general practice model of care over a 6-month period April-September 2017. The HCH model was associated with **significantly lower rates of ambulatory sensitive hospitalisations (ASH)**, with an overall odds ratio (OR) of **0.80** favouring HCH. Additionally, patients attending HCH practices had a **significantly lower rate of emergency department (ED) presentations**, with an OR of **0.86**. Two large contributions to this effect were:

- ▶ A large difference in Māori ED presentation rates, with an incidence rate ratio (IRR) of 0.76 compared with non-HCH practices.
- ▶ A large difference in ED presentations in the elderly (aged 65+), with an incidence rate ratio of 0.68.

Both the lower ASH and ED rates were also particularly pronounced for people living in areas of the highest quintile of socioeconomic deprivation, with IRRs of 0.79 and 0.77 for ASH and ED respectively.

While the study design cannot definitively prove a causative effect, these findings suggest that **a significant proportion of acute need is being prevented or successfully dealt with out of hospital** by HCH practices. The associations for Māori, highly deprived and elderly populations suggest the model is pro-equity, and has its greatest effects on populations with the greatest needs.

Based on IDF prices (see pages 17-18) the ASH and ED impacts evaluated here are estimated at \$2.9m per year. The HCH practices in the evaluation cover around 9% of the population of the Midland DHBs. If say 75% of practices in these DHBs were to adopt models of care that achieved like reductions in acute care usage then this would be the equivalent of ~\$25m of hospital care per year.

A case study on the financial impact of the HCH model for privately-owned Health Te Aroha practice showed no negative financial return, with the owner doctors noting the freeing up of their time.

Overall these findings suggest the Pinnacle HCH practices are maturing, with downstream effects being seen in their patients' acute interactions with the secondary care system. Significant investment by the practices and Pinnacle have led to this point. The use of the Patient Access Centre and good telephony systems have led to low dropped call rates and administrative calls being handled away from the practice. Triage appears effective, with 62% of requests for care being managed by means other than a same-day visit to the practice. Patient portal use is significantly higher in HCH practices.

The Health Care Home model appears to be an effective innovation on the traditional model of general practice service delivery.

1. Introduction

EY has previously provided an evaluation of the Health Care Home (HCH) model to the N4 primary care networks.¹ Within this evaluation the Pinnacle practices made up the majority of the practices evaluated. While overall showing very positive signs, the Report noted a lack of change in secondary care outcomes, and suggested an update be carried out once a further year's data was available. The suggestion was that the chronic disease management aspects of the HCH model were among the last to be implemented and would not have had enough time to show effects.²

This document extends the evaluation analysis for the Pinnacle HCH practices to 2017, with a particular emphasis on examining secondary care usage. With the switch to the Indici practice management system a more robust collection of data is now possible from both HCH and non-HCH practices, with a more detailed and statistically robust analysis able to be performed.

The report is structured as follows:

- ▶ **Section 2** notes the developments over 2017, including changes in telephony, patient portal use and long term condition care
- ▶ **Section 3** covers the new analysis of secondary care usage, using six months of data April-September 2017
- ▶ **Section 4** provides a financial case study of a privately-owned Pinnacle practice. With the potential reduction in patient co-payments concomitant in reducing the need for face-to-face consultations with the general practitioner or nurse, it is important to consider the financial viability of the model
- ▶ **Section 5** looks at the potential next steps for the HCH model in Pinnacle.

¹ *Evaluation of the New Zealand Health Care Home, 2010-2016*. Auckland: Ernst & Young, 2017. Produced for N4 - Procure, Pinnacle, Compass and Pegasus primary care networks.

² The analysis was also not age-standardized as it was at the practice level rather than the patient level. This new analysis provides a stronger analytical approach.

2. The Health Care Home in 2017

Since the previous evaluation report the HCH National Collaborative has continued to strengthen. Additional primary care networks and DHBs have joined, and a new National Standard has been established. A Power BI performance dashboard has been commissioned to enable HCH practices to assess their own performance and compare with others through local and national benchmarking.

HCH practice numbers within Pinnacle have remained the same at 15 through 2017, covering ~101,000 enrolees or 21.5% of the Pinnacle-covered population. The need for consolidation and introduction of Indici to practices were cited as reasons for the slowing of conversions to the new model. Three practices are currently in HCH planning stages. In one locality, Lakes (covering Taupo-Turangi), all four practices, covering 38,000 enrolees, have adopted the HCH model.

Change management support continues to be provided by Pinnacle to HCH practices to support them through the change - a model which is specific to Pinnacle and not used elsewhere in the country. The support team includes general practitioner, nurse, business, information technology, and project management support.

2.1 Telephony

The Patient Access Centre (PAC) handles the phone calls for 11 of the HCH practices. The PAC handles around 32,000 calls a month, or 1600 per working day³. Abandonment rates average 2% - a significant drop from that experienced by practices without an advanced telephony system (for example, an audit of Taupo Medical Centre prior to using PAC showed a 23% call abandonment rate).

Average call duration in PAC is just over two minutes, with an average wait of 22 seconds for calls to be answered. Resolution proportions (ie, call not being transferred to the practice) for March 2017 to March 2018 were:

Appointment	100%
Account query	84%
Repeat script	10%
Test results	6%
Clinical query	5%
Emergency	0%
Triage	0%
Other	90%

³ Data covering the four months Nov 2017 to Feb 2018

A significant proportion of calls are managed solely by PAC, and do not need to involve practice staff - overall 57% of calls to PAC are so managed. Areas like emergency and triage are not expected to be handled by PAC staff, so pass through to the practice.

Based on the Power BI report on triage, for the April to September 2017 period 62% of practice calls were able to be managed in ways other than a face-to-face appointment with a doctor or nurse. The main alternate option was phone advice at 49%, with a further 12% seeing a GP but on a later day. No comparison was possible with non-HCH practices as the data is only collected for the HCH practices. As a side note, there was clear month on month variation, with the winter months having higher same day visit rates - for example 55% for August 2017, compared with only 23% in April 2017.

2.2 Patient portal usage

In line with the patient-centred aim, and with the structured telephony approach noted above, patient portal use has been encouraged in the HCH model. Patient portals allow health care users to access their medical notes, see test results, make appointments and order repeat prescriptions among other functions. Data was available for the three months April to June 2017, and compared the HCH practices (excluding Tokoroa) with control practices (see Section 3 for a description of the control practices). Around 1% of the patients in the control practices accessed the patient portal in that time, compared with 12% of HCH enrolees.

2.3 Long term condition care

Within HCH practices the HCH model continues to mature. While practices may be at different stages of implementation, consistency with the model appears higher than in other areas of the country. Practices were not specifically visited for this evaluation update, but the PHO noted that the increasing development of long term condition (LTC) care was a feature at all HCH practices⁴. Clinician time was freed up through improved triage and management of patients through means other than face to face consultations (see 2.1 Telephony above). This time was then available to 'reinvest' in long term condition patient care.

A case study example was given for the Lakes practices showing the sort of changes made, and the increased integration being shown. Across the four Lakes practices there are:

- ▶ A skilled community team with a mix of professions- two community health workers, a nurse practitioner, a dietician, an exercise consultant, a long-term care nurse, district nurses, a child health nurse, a social worker, and a pharmacist
- ▶ Single point of access to the community team
- ▶ A new offering for patients with long-term conditions - shared medical appointments (see box below)
- ▶ Multi-disciplinary team care planning meetings for high care need patients

⁴ It is likely that many non-HCH practices have also been improving their LTC care.

- ▶ Fortnightly meetings with clinical nurse specialists for case management and review
- ▶ Working with iwi and behaviours lifestyle change services with an obesity focus
- ▶ Group consultations for long term conditions and obesity
- ▶ Shared patient records.

Twelve of the 15 HCH practices are recording care plan usage. There were 795 patients with recorded care plans as at September 2017. The number of care plans one might expect will vary with the proportion of LTCs in the population being served. If we take an estimate that 5% of patients would

benefit from a care plan then about 20% of patients in HCH practices that would benefit have been covered to date. Comparable figures are not available for non-HCH practices. Within those covered around 20% are Māori - a similar proportion to the overall population served, but a significant excess when the age structure is taken into account - around 70% of patients with care plans are aged 65+. Taking the 45-64 age group, around 50% of the ~180 patients with recorded care plans are Māori - a likely pro-equity finding.

Shared medical appointments (SMA)

“The feedback from patients has been excellent; “a lot of beneficial information was covered”; “great to learn from someone else having the same experience”.

I think the patients benefit by having a lot more information covered in a single consultation, there is companionship and a lightening from feeling less alone with their illness. In our first COPD SMA the GP was talking to a young woman about her smoking. I could see she had heard it all before and she was resistant to change. A Kuia involved herself in the discussion and I saw a dramatic change in the younger woman from hearing the message from an older woman that she respected, who could describe her own journey. Four patients were also vaccinated after discussion having previously declined.”

Dr Glen Davies, Taupo Medical Centre

3. Use of secondary care services

This analysis assesses whether there is a difference in the rates of health care utilisation events for patients at HCH practices compared with those at similar practices that have not implemented the HCH model. The analysis is based on data provided to EY by Pinnacle at a summarised line item level.⁵ Events covered include:

- Ambulatory sensitive hospitalisation (ASH) - number of events that fit the ASH criteria as defined by the Ministry of Health (no age limit used)
- ED presentations (non-admitted)
- Outpatient referrals - referrals to secondary care that occur as a result of a consultation with a primary care provider.

In addition two measures of patient contact were used, allowing a contrast between use of primary and secondary services to be made:

- GP consultations
- Nurse consultations.

In both cases these include face-to-face, telephone and email contact with patients - so are a measure of overall 'touches' of the patient by clinicians at the practice.

3.1 Method

Practice enrolment data was linked by enrollee NHI to outpatient, ED and inpatient data provided by Waikato DHB for the months April to September 2017 (6 months in total). The analysis is based on the model of a matched open cohort study, with data from all of the HCH general practices in Pinnacle apart from Tokoroa,⁶ as well as a selection of matched control practices. The control practices were chosen on the basis of having similar:

- Geographic location - especially distance from hospital
- Very low cost access (VLCA) status
- Practice size.

Patient characteristics of HCH and control practices are shown below. Note that all four practices in the Lakes locality have implemented the HCH model so there were no controls matched by location for this locality - instead similar practices in Morrinsville, Raglan and Gisborne were selected.

⁵ Data provided by Helen Parker, Director at Pinnacle Ventures Ltd on 20/2/18, covering April to September 2017. Each line has a practice/age/ethnicity/quintile/month/event type grouping and a total.

⁶ The Tokoroa practices have acute care arrangements with the local ED, making it difficult to combine ED and inpatient rates with other HCH practices. The high rates were noted as an issue in the previous report - the most straightforward solution is to omit them from the analysis.

In the dataset there are 86,105 patients enrolled with fourteen HCH practices, and 85,256 patients enrolled with nine control practices. Due to data errors, some of these patients have been removed from the final analysis (see below). Demographic variables available for these patients include:

- Ethnicity, prioritised to level 1. It is assumed that Middle Eastern/Latin America/African (MELAA) patients are assigned to the 'Other' category
- Age - divided into 0-4, 5-14, 15-24, 25-44, 45-64 and 65+ age groups
- Deprivation quintile - taken from the NZDep13 and converted from decile to quintile. Ranges from 1-5, with 5 representing patients in the 20% most deprived households of New Zealand.

The outcomes of interest are presented as an absolute count of events and age-standardised rates over the 6-month period of study. This analysis will not describe outcomes at the practice level - for most practices this results in an issue of small numbers, and the main focus is on the HCH model overall, not performance of individual practices.

A multiple logistic regression model was developed, allowing analysis of each demographic variable to be controlled for each other variable.

A small proportion of patients (2.9%) were classed as having a quintile of 0. This is differentially distributed between HCH (3.6%) and control (2.2%) practices. This may introduce a small degree of error in comparative analyses.

3.2 Analysis - Descriptive

Patient population

Of the patients in the dataset, 110,101 (70.5%) are coded as European, with 32,427 (20.5%) Māori, 9,477 (6%) Asian, 2,812 (1.8%) Pacific and 3,203 (2%) "Other". These proportions do not differ greatly between HCH and control practices - HCH have a slightly higher proportion of Europeans (72% vs 68% in controls) and lower proportion of Asians (4.6% vs 7.4% in controls).

Table 1 - Patient numbers by age group and practice type

	0-4	5-14	15-24	25-44	45-64	65+	Total
<i>Control</i>	5,759	11,382	9,794	20,079	19,995	11,641	78,650
<i>HCH</i>	5,334	11,308	8,801	17,923	21,062	14,942	79,370
Total	11,093	22,690	18,595	38,002	41,057	26,583	158,020

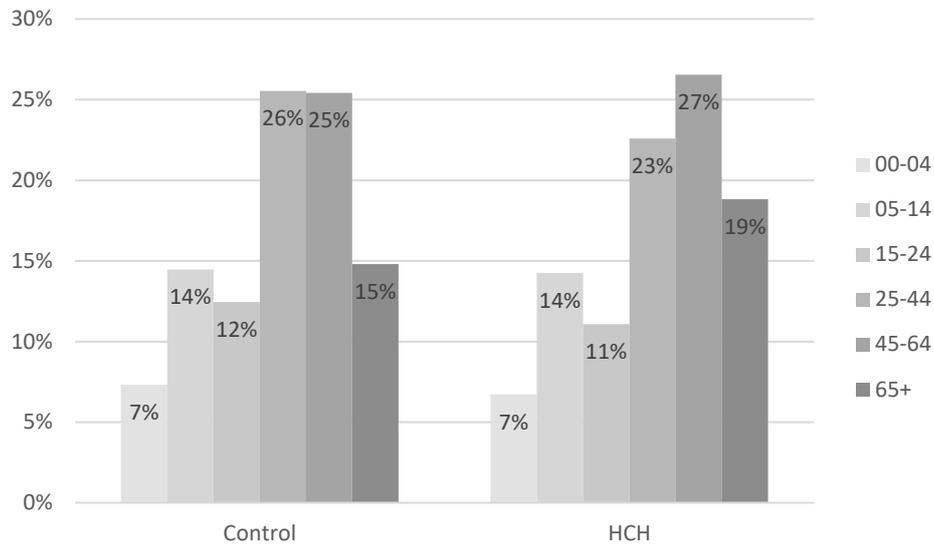


Figure 1 - Age distribution by practice type

Age distributions are quite similar between practices, and in line with the general distribution of PHO enrolment expected in New Zealand.⁷ Age-standardisation was used to account for the residual differences.

Table 2 - Distribution of deprivation by practice type (5 = most deprived)

	Undefined	1	2	3	4	5
<i>Control</i>	2%	20%	14%	19%	25%	19%
<i>HCH</i>	4%	12%	20%	22%	23%	19%
Total	3%	16%	17%	21%	24%	19%

The undefined results are presented here for completeness - it is unknown whether this is a systematic or random error. Deprivation is roughly distributed in accordance with national averages (+/- 5%), with the exception of a lower proportion of quintile 1 patients in HCH practices.

Admissions and ED presentations:

We performed a multiple logistic regression (MLR) to determine overall adjusted risks by various attributes for ASH and ED presentation. The MLR is discussed further in a later section. Across both HCH and control practices these rates are affected by age, ethnicity and deprivation quintile.

⁷ <https://www.health.govt.nz/our-work/primary-health-care/about-primary-health-organisations/enrolment-primary-health-organisation>

Table 3 - Numbers of hospital events by ethnicity and practice type

		Asian	European	Māori	Other	Pacific	Total
Control	ASH	67	831	333	14	35	1,280
	ED	356	5,535	2,634	126	210	8,861
HCH	ASH	25	818	296	14	22	1,175
	ED	208	5,861	2,026	102	126	8,323

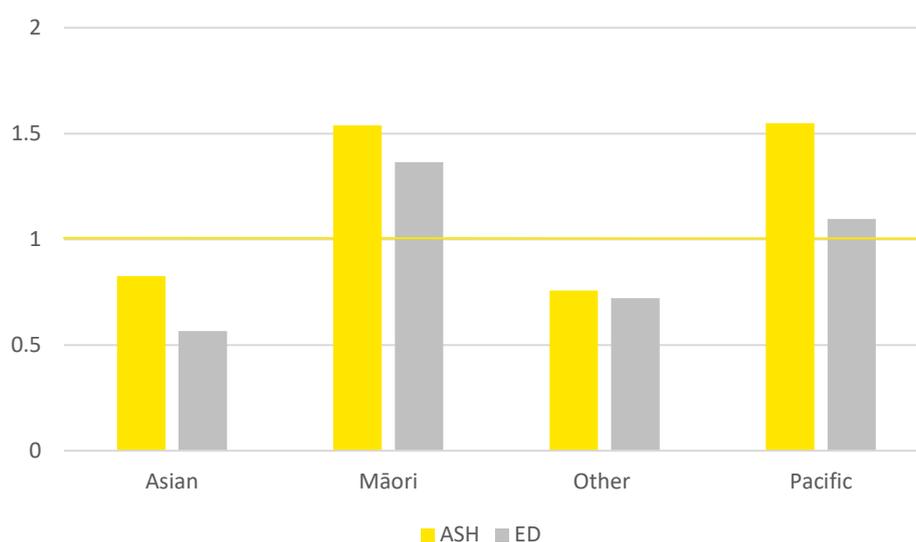


Figure 2 - Odds ratios by ethnicity (compared to European)

The effects of Asian and Other ethnicity are not significant for ASH rates in the MLR model, while the effect of Pacific ethnicity is not significant for ED presentation - there are small numbers of events for these patients in the dataset. These results show an increased odds associated with Māori ethnicity for both ASH and ED, controlling for age and deprivation quintile, and an increased odds associated with Pacific ethnicity for ASH.

Table 4 - Numbers of hospital events by deprivation and practice type

		1	2	3	4	5	Total
Control	ASH	163	146	223	361	356	1,280
	ED	1,220	1,044	1,467	2,293	2,652	8,861
HCH	ASH	109	203	199	301	284	1,175
	ED	762	1,493	1,648	1,928	2,048	8,323

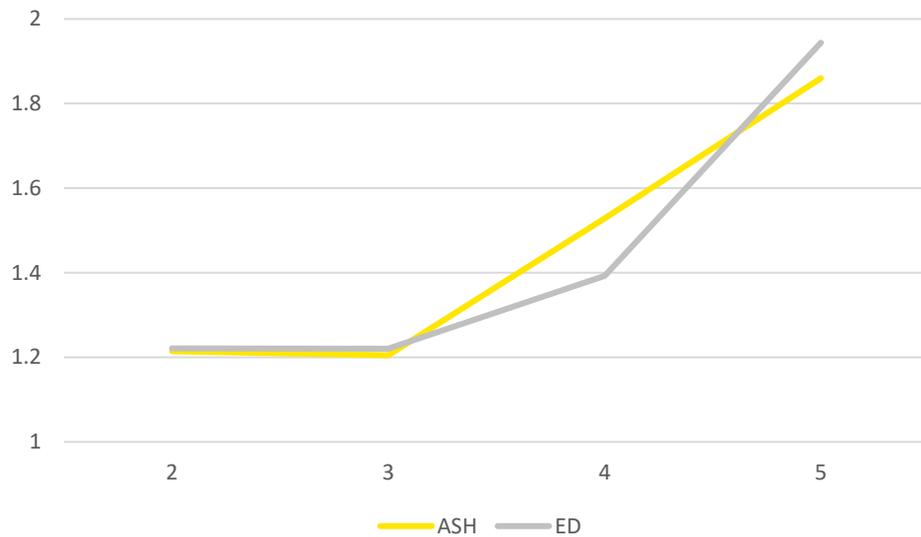


Figure 3 - Odds ratios by deprivation (relative to quintile 1)

Controlling for age and ethnicity, all odds ratios for deprivation are significant. There is a gradually increasing relationship between level of deprivation and odds of ASH and ED presentation, following roughly the same trajectory.

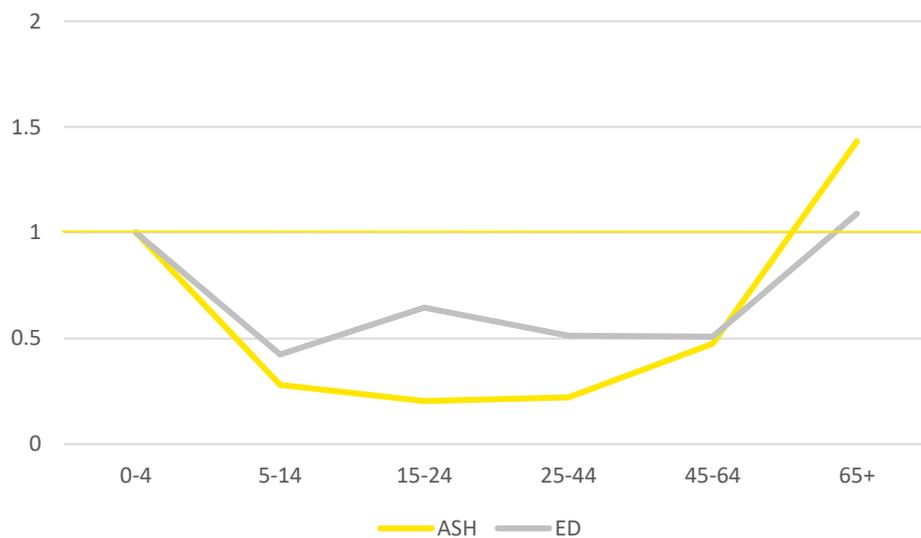


Figure 4 - Odds ratios by age group (relative to 0-4)

For age groups the lowest risk group for ASH is 15-24 years, while the lowest risk for ED presentation is 5-14 year olds- controlling for ethnicity and deprivation. 0-4 and 65+ year olds have similar odds for these events.

3.3 Analysis - comparative

Overall outcomes

Table 5 - Age-adjusted incidence rate ratios (IRR) for HCH vs control practices

	n (HCH)	IRR	95% CI
ASH	1,175	0.84	0.77-0.91
ED	8,323	0.92	0.89-0.94
Referral	14,033	0.85	0.83-0.87
GP consult	113,409	0.98	0.97-0.98
Nurse consult	29,068	1.36	1.33-1.38

(all p-values <0.00001)

Rate ratios for HCH practices have been age-standardised, using the control practice population as a reference. These results (all highly significant) suggest that the HCH model has a significant effect on rates of health care use. Patients at HCH practices were 16% less likely to be hospitalised for an ambulatory sensitive condition, and were 8% less likely to attend an emergency department compared with patients at traditional model of care practices. HCH patients also had fewer referrals to secondary care. Within the practice patients were slightly less likely to see their GP and to have more interactions with their practice nurse on a per person basis - this finding fits with the task-shifting and top-of-scope facets of the HCH model.

Table 6 - Incidence rate ratios in HCH practices compared to controls, by age group

	ASH	ED	Referral	GP consult	Nurse consult
0-4	0.78	1.24	0.71	0.88	2.93
5-14	0.67	1.11	0.92	0.90	1.30
15-24	0.75 (n.s)	1.08	0.81	0.92	1.44
25-44	1.09 (n.s)	0.98 (n.s)	0.88	1.00 (n.s)	1.38
45-64	0.84	0.86	0.95	1.05	1.36
65+	0.86	0.68	0.81	1.02	1.12

Note: All significant unless otherwise stated. n.s = not significant

Table 6 reports age-specific incidence rate ratios by age group. While the overall directions of change are as expected from the model of care and the age-adjusted rates (Table 5), there are some unexpected findings, particularly for children - 0-4 and 5-14 year olds at HCH practices appear to have higher rates of ED attendances. This is incongruous with

other findings (i.e. lower rate of ASH admissions) and not the expected outcome from the HCH model of care.

In order to investigate this finding further, data on triage categories for ED presentations for children was examined to assess whether this increased rate represented more appropriate use of the ED. This data showed that children aged 0-14 at HCH practices were more likely to have ED presentations for less acute triage categories, with an IRR of 1.6 for category 4 and 5 presentations. This was discussed with Pinnacle, and it was an effect that had been identified by some of the practices already. It was felt to be related to the free visits policy for children, and was seen as parents seeking reassurance through a face-to-face meeting in preference - so if a same-day practice visit was not scheduled the parent was more likely to take the child to ED. That the increase was only seen in the less acute triage categories implies that the HCH triage practices were appropriately targeted. Practices are looking to modify their triage protocols (effectively increasing same day visit numbers for children) to moderate this effect.

Another finding to emphasise is the large 32% lower ED attendance rate for elderly patients (age 65+) in HCH practices. In the context of increasing morbidity and complexity in the elderly, this is an important finding with major implications for primary care systems.

Effect by ethnicity

Table 7 - IRRs for outcome events, by ethnicity, with European as comparator

	ASH	ED	eReferral	GP consult	Nurse consult
<i>Asian</i>	0.65	0.57	0.62	0.70	0.64
<i>Māori</i>	1.30	1.39	0.75	0.78	0.80
<i>Other</i>	0.58	0.69	0.74	0.66	0.56
<i>Pacific</i>	1.35	1.15	0.81	0.70	0.60

Pacific and Māori patients at all practices have higher rates of hospital service use, but lower rates of referrals and GP/nurse consults when compared with Europeans. Asian patients also have lower rates of referral and GP/nurse consults, but have lower rates of ASH and ED presentations as well.

Table 8 - Incidence of outcome events (per 1,000 patient-years) by ethnicity

	ASH	ED	eReferral	GP consult	Nurse consult
Control	16	113	195	1,386	256
<i>Asian</i>	12	61	134	1,088	164
<i>European</i>	16	104	209	1,489	275
<i>Māori</i>	21	163	175	1,219	248
<i>Other</i>	8	73	160	1,040	124
<i>Pacific</i>	22	130	186	1,075	158
HCH	15	105	177	1,429	366
<i>Asian</i>	7	57	114	1,021	295
<i>European</i>	14	103	197	1,553	396
<i>Māori</i>	18	124	128	1,157	295
<i>Other</i>	10	69	139	957	265
<i>Pacific</i>	18	106	136	1,065	261

Without adjustment for different age structures, there are large differences in rates of hospitalisation and ED attendance between ethnic groups (Table 8).

Table 9 - IRRs of outcome events in patients enrolled with HCH practices, by ethnicity

	ASH	ED	eReferral	GP Consult	Nurse Consult
<i>Asian</i>	0.59	0.93 (n.s)	0.85	0.94	1.80
<i>European</i>	0.93	1.00 (n.s)	0.94	1.04	1.44
<i>Māori</i>	0.88 (n.s)	0.76	0.73	0.95	1.19
<i>Other</i>	1.18 (n.s)	0.96 (n.s)	0.87	0.92	2.14
<i>Pacific</i>	0.85 (n.s)	0.81	0.73	0.99	1.66

All significant unless otherwise stated. n.s = not significant

In this comparison of crude rate ratios by ethnicity, there are significant differences in the rates of most outcome events, both overall and when broken into ethnic groups. Reduction in both ASH and ED attendance rates is an important finding, as this corresponds to a reduction in demand for high cost hospital resources. That the HCH model appears to work well for Māori (with a lower rate of ED attendance and no associated higher rate in ASH rates) is another important result, as this implies that the HCH model is improving primary care access in this population. Numbers of "Other" and "Pacific" groups are low in both populations, which may explain lack of statistical significance in these groups for ASH.

Effect by deprivation

Table 10 - Incidence of outcome events (per 1,000 patient-years) by deprivation quintile

Quintile	ASH	ED	eReferral	GP consult	Nurse consult
Control	16.3	113	195	1,386	256
1	10.4	77	159	1,305	195
2	12.8	92	189	1,406	228
3	14.9	98	194	1,390	287
4	18.4	117	216	1,467	313
5	23.3	174	208	1,350	243
HCH	14.8	105	177	1,429	366
1	11.1	78	138	1,143	267
2	13.1	96	137	1,368	328
3	11.2	93	171	1,408	339
4	16.7	107	191	1,555	401
5	18.4	133	175	1,439	384

Rates of ASH and ED attendance gradually increase as deprivation increases, as is the case in the general population, with an overall incidence rate ratio between deprivation quintile five and one of 1.95 for ASH and 1.97 for ED attendances.

Table 11 - IRRs of outcome events in patients enrolled with HCH practices, by deprivation quintile

Quintile	ASH	ED	eReferral	GP consult	Nurse consult
1	1.07 (n.s)	1.00 (n.s)	0.87	0.88	1.37
2	1.02 (n.s)	1.05 (n.s)	0.72	0.97	1.44
3	0.75	0.95 (n.s)	0.88	1.01 (n.s)	1.18
4	0.90 (n.s)	0.91	0.89	1.06	1.28
5	0.79	0.77	0.84	1.07	1.59

All significant unless otherwise stated. n.s = not significant

The results in Table 11 suggest that the HCH model is particularly effective at reducing the rates of ASH and ED attendances for people with the highest level of deprivation, and has little or no effect on the same measures for people with low levels of deprivation. This finding fits with the HCH model of care, which aims to coordinate care and improve access to primary care for people with high needs, who are often also people with the highest levels of deprivation.

Multiple logistic regression

In order to fully account for the interacting effects of ethnicity, age and deprivation, and to check the validity of the above findings, we performed a multiple logistic regression (MLR) analysis for both ASH and ED presentation. The beta-coefficients were generated relative to a European 0-4 year old in quintile 1. This model was found to explain a significant degree of variance, with most factors producing a statistically significant effect, and is likely valid for the population being modelled.

The MLR found that for:

- **ASH:** The overall exponentiated coefficient (odds ratio) for patients at a HCH practice being admitted with an ASH was **0.80**
- **ED:** The overall odds ratio for patients at a HCH practice presenting to ED was **0.86**.

These findings are congruent with both the expectations of effects of the model of care, and with the unadjusted and partially adjusted results presented above. They are thus likely to be valid on a population basis. It is important to note that this model is not validated for use with individuals (i.e. it cannot be used to predict the odds of ASH or ED attendance for a particular patient), it is only capable of explaining the factors that are contributing to event rates across the population.

Impact

If the HCH practice had had the same ASH admission rates as the control practices an additional 20% x 1280 = 256 admissions might have occurred over the six month period, or ~500 for an annual period. For the Midland DHBs served by Pinnacle the average WIES⁸ for ASH admissions was 0.86 in 2017, giving an annualised ~430 WIES lower amount.

⁸ Weighted Inlier Equivalent Separation - a measure of resource-use intensity for inpatient care. A WIES of 1 is equivalent to an average inpatient admission - for example inserting a grommet as a daycase might have a WIES of 0.3, an appendectomy 1.2, while an uncomplicated elective hip replacement might be 3.8.

Using the 2017/18 IDF price⁹ for WIES this would equate to around **\$2.1m** if the DHBs were paying for that care being provided from other DHBs. Note that this is not the 'savings' that have accrued - for that one might be examining marginal costs - but does give a sense of the size of the impact. Indeed as DHBs look to their primary and community strategies to avoid costly additional inpatient growth at their secondary care facilities they might use the full IDF price as a guide to the value in avoiding the fully-imputed capital and operational costs of constructing and running more wards.

Similar calculations for non-admitted ED suggest an IDF price value of **\$0.78m**.

This gives a combined estimated impact of **\$2.9m per year**, covering around 9%¹⁰ of the population of the Midland DHBs - Waikato, Bay of Plenty, Taranaki, Lakes and Tairāwhiti. If say 75% of practices in these DHBs were to adopt models of care that achieved like savings then this would be the equivalent of **~\$25m** of hospital care per year (Table 12).

Table 12 - Impact at IDF price if 75% of practices were able to achieve HCH levels of ASH and ED usage

DHB	Population 2017/18	\$m
Waikato	412,900	11.3
Bay of Plenty	234,400	6.4
Taranaki	118,900	3.3
Lakes	109,200	3.0
Tairāwhiti	48,800	1.3
Midland	924,200	\$25.3

⁹ DHBs get funding for their population. Where care is required at another DHB a transfer of funds occurs, using the Inter-District Flow (IDF) price list as a guide. The price list is based on cost analyses, and is updated annually.

¹⁰ The evaluation covers 79,370 HCH enrollees. Total estimated resident population of the five DHBs in 2017/18 was 924,200. $79,370 / 924,200 = 8.6\%$. Age/deprivation/ethnicity structure effects are ignored in the rough extrapolation to whole population coverage.

4. Financial case study

It is difficult to assess the impact of the change on practice finances in moving to the HCH model given the natural reticence for practices to share their financial details. Health Te Aroha, with around 5,500 enrolled patients, volunteered to be a case study for this report. They were one of the first practices to sign up to the HCH model when Pinnacle launched it in 2011. As a privately-owned practice Health Te Aroha provides a different view to the Pinnacle-owned practices.

Over the last six years the programme of work has been similar to that of other HCH sites, with an increased focus on how patients flow through the practice and how the practice maximises the skills and expertise of the workforce and the total capacity. This change is summarised by Dr Hayley Scott, one of the practice owners:

“Health Care Home is about shifting general practice from a reactive service, to one where all doctors’ or nurses’ consults are planned with the patient. Six years in, our patients and our staff are both better off for it. The way we work means more ‘urgent’ patients on our roll of 5,500 are seen on the day of their appointment, with less urgent needs treated in alternative ways such as over the phone, via virtual consults using a patient portal so they don’t have to come in, or at an appropriate time later in the week.

“Now in our practice each GP has just 20 appointment slots daily, with two reserved for paperwork, one for phone consults, and one for phone triage. We have more time to deal with necessary paperwork without overloading ourselves.

“As a result of increasing capacity with the same FTE and managing urgent care demand more effectively we have not had to use locums for the past two years, even when a GP was off for 3 months unexpectedly. This, together with ‘seeing’ more patients through the use of virtual care, has resulted in a small year-on-year increase in financial turnover.

“With our increased turnover, the Directors decided to take a bit more time off having run faster to stand still for a number of years and having appointed more GPs. We had no difficulty finding GPs, even in our rural area, as they were previous registrars who enjoyed the new model of care.”

5. Future steps

Pinnacle remains committed to the HCH model, continuing to encourage practices to make the switch. Three further practices are in the preparatory stage. No major change in the model is planned, with Pinnacle happy to fit with the National Standard for HCH.

A number of developments by Pinnacle are now in place, or are planned. While these benefit all practices, not just HCH practices, they should assist the HCH practices in continuing to make gains. These include:

- ▶ *Indici*. The new practice management software allows greater control of long-term condition management, with shared care records, and easier sharing across practices. It has much improved data collection and reporting
- ▶ *Patient portal*. Patient portal growth continues. The portal functionality in Indici should improve the health consumer experience
- ▶ *Patient-centred tools*. Push My Button terminals have been installed in 14 practices to capture patients experience in real time. Such feedback can be a useful part of a quality improvement programme, and can be assuring to patients that their views are of value, potentially engaging patients in feedback and co-design. The terminal enables patients to express how they feel about their experience whilst they are in the practice 'HappyOrNot' by pushing a button
- ▶ *Video consults*. Improved video consult tools, either through Indici or other parties will allow easier 'face-to-face' interactions without the need for the patient to travel to see the clinician, providing an alternative to email or telephone consultations.

EY | Assurance | Tax | Transactions | Advisory

About EY

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. We develop outstanding leaders who team to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world for our people, for our clients and for our communities.

EY refers to the global organisation and may refer to one or more of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. For more information about our organisation, please visit ey.com.

© 2018 Ernst & Young, New Zealand.
All Rights Reserved.

ey.com