Estimates of the ongoing costs of Guaranteed Hours

Final report

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The information provided in this report is based on information supplied by the Ministry of Health and providers. Unless otherwise stated, we have relied upon the truth, accuracy, and completeness of any information provided to us without independently verifying it. While we have undertaken our best endeavours, we do not make any assurance or statement that the assumptions and projections are accurate or complete. That we are unwilling to make this statement reflects in part the quality of the data made available to us, and the short time available to do the analysis restricting the amount of quality assurance able to be done.

Abbreviations

- GH = Guaranteed Hours
- SW = Support worker
- MoH = Ministry of Health
- DHB = District Health Board
- HR = Human resources
- WF = Workforce

Executive summary

Guaranteed hours for home and community support workers was implemented on 1 April 2017 meaning greater certainty for these workers in the hours they might work. This initiative was an important milestone recognising the contribution care and support workers make to the lives of many New Zealanders.

There was a level of uncertainty about the cost impact of guaranteed hours prior to implementation. The Ministry committed to undertaking a review six months after the implementation date and we report the results of this review. We gathered employee information and operational cost data about guaranteed hours and, inter alia, inform progress towards the objective (as set out in the Guaranteed Hours Funding Framework) that the majority of HCSS support workers are employed on guaranteed hours. The review also provides an estimate of the current ongoing cost of guaranteed hours. One-off system and change costs are excluded as these were claimed for via a separate arrangement.

Key assumptions

We estimate the cost of unfilled hours is $7.28M per annum. The key assumptions behind this estimate are calculated from provider data and are as follows:

- There is an 85% uptake of guaranteed hours by the support worker workforce.
- A support worker works 36 hours on Ministry of Health or DHB contracts per fortnight on average.
- 2.6% of guaranteed hours are unfilled.
- There are 16,038 support workers in the home care sector.

The estimates are an average across all workers and therefore some providers will have higher and lower values.

Based on other data sources we calculated an average support worker hourly rate of $20.58 for the September Quarter 2017. This average hourly rate will likely increase over time as the workforce becomes more qualified and as tenure extends.

An additional total cost of $13 to 15 million

We estimate additional co-ordination and administration costs are currently in the range $6.20M to $7.33M. Together with the cost of unfilled hours, this brings the estimated per annum cost to $13.48M to $14.61M. There is substantial uncertainty around this calculation as we did not receive completed returns from all providers and there were significant data quality issues thus requiring considerable judgement in application.

Considerable local variation and considerable provider variation

The assumptions are averages across providers and mask considerable variation across providers. Some of this variation will represent the operating circumstance of the provider such as its geographic locality, number of clients and population density. This natural operating variation would appear to have limited potential to change through time. However the between provider variation reflecting the differences in progress in implementing guaranteed hours can be expected to reduce as providers implement new systems and learn to run rosters of staff differently.

Take 12 months to work it through further

Overall, it is clearly a sector still in flux and it is likely there are efficiencies that can be gained via laggards catching up and other providers making incremental efficiency gains. Therefore, it is too early to tell what an efficient/steady state looks like yet and we suggest conducting the exercise again in 12 months. We suggest strongly, if it is decided in a years' time to repeat the exercise, the Ministry of Health and the sector work together proactively, to ensure the required data is recorded and stored so it can be easily and accurately provided to those doing the analysis. As part of this working together, there will like need to be the establishment of an agreed set of data protocols.

We gratefully acknowledge the substantial time and effort of provider stuff who supplied us with data allowing us to complete this report.

Purpose and scope

Purpose

Prior to implementation there was a level of uncertainty about the cost impact of guaranteed hours. The Ministry of Health (hereafter "the Ministry") committed to undertaking a review six months after the implementation date; this report records the findings of this review. Our review gathered information about the operational costs of guaranteed hours in order to inform decision making about operational policy settings and funding beyond June 2018. We note that providers have already been funded for one-off system and change costs and have had the opportunity to make a disadvantage claim to the Ministry ; hence these costs are excluded from this review.

The primary purpose of this document is to present the key results of the data collection tool. We also show what these results/assumptions mean for the quantum of funding. We do note:

- The costs shown are average costs, not those of an efficient provider.
- The data do not allow us to identify what efficient provision looks like.

Scope

The scope of this review is specific to the implementation of guaranteed hours as it relates to the IBT settlement. It is not a review of sector sustainability and does not include aspects of the Settlement Agreement beyond implementation of guaranteed hours (GH). There has been a long discussion of what is in and out of scope. We record the conclusion of that debate below.

<u>In scope:</u>

- Unfilled hours (top up funding), including when unfilled hours are owing to cancellations where more than 48hrs notice have been given.
- Payroll, legal, HR, additional co-ordinator time, and other overhead costs associated with the ongoing running of GH.
- Breaks.

<u>Out of scope:</u>

- Cancellations with <48hrs notice and cancellations with >48hrs notice where the support worker has already met their GH (up to provider to avoid).
- Travel and Ongoing reduction of hours (funded through IBT portal).

The process

- We asked providers to fill in a data collection tool by 10 November. Immediately after the pay equity data collection, it was a difficult ask for providers and there were a lot of late returns and non-returns.
- We received 25 returns representing around two-thirds of the market in terms of hours of home support provided.
- The lateness of the returns affected our ability to do the analysis. In particular, validation and reconciliation of the data with providers was not possible, nor was resolving data quality issues. We point out specific instances where this is a particular issue as we work through the results. Some examples include whether or not hours provided reflect MoH and DHB funded hours only as requested, or whether the change in co-ordinator headcount is fully attributable to GH (more on this in the box below) vs other changes in the sector.
- The data quality of returns was highly varied, with a lot of data cleaning and pragmatism of interpretation needed. In other words, this is an exercise in statistical estimation compared with an accounting exercise.
- We are conscious of market sensitivities; therefore, where we plot individual provider information, they are 'jittered' (i.e. randomised).

The issue with isolating MoH and DHB only hours

- We asked for MoH and DHB only hours, however the issue is providers don't specify guaranteed hours (GH) for each worker by funder.
- Many of the larger providers gave us scale factors to adjust the data, we are unsure about others (we therefore took the numbers on face value).
- This will not be an issue with ratios (provided ratios are stable across funders), but will be with an issue with absolute numbers (e.g. GH per fortnight).

- We presented an early version of this report to a meeting of providers, unions and DHBs and the HCHA Leaders Forum on 11 and 12 December 2017 respectively. The meetings represented an opportunity for us to validate with the sector the key findings of the data collection. Attendees were invited to provide feedback on the report by 15 December 2017.
- Feedback from these meetings was incorporated into this report where possible (in particular in the section "Feedback from the 11 and 12 December meetings" but also in other places where relevant), as was feedback received subsequent to the meeting. We are grateful to participants for this feedback.

Key assumptions

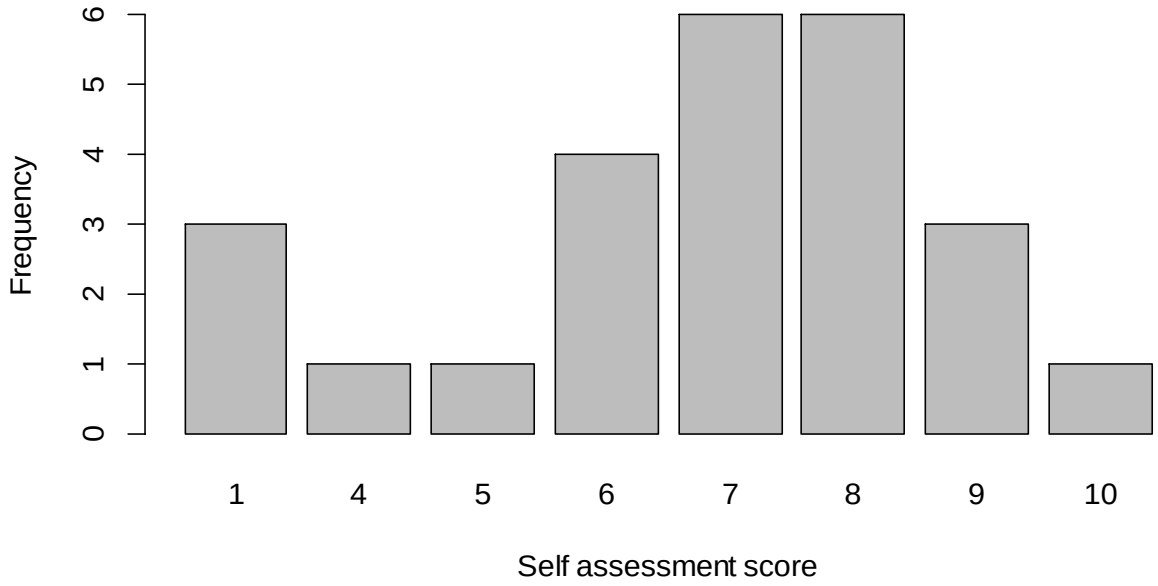
- 16,038 support workers in the sector [supplied by the Ministry of Health based on another data collection]

  Our understanding is this was generated by counting employees who were claimed for by providers for the $75 to cover the cost of meeting attendance regarding the implementation of GH. There was some uncertainty around this assumption depending on the dataset used. Looking at the number of unique IDs in the IBT portal claims in the months June and September 2017, there are 12,842 and 13,118 workers respectively. Alternatively, the Pay Equity wash up data implies between 15,050 and 21,776 workers depending on what percentage of Plan B workers are assumed to be HCSS workers.
- Average MoH/DHB funded GHs per support worker per fortnight is 36 [Sapere assumption based on data collection].
- Uptake of GHs is 85% of SW workforce [Sapere assumption based on data collection].
- 2.6% hours are unfilled (as a percent of GH) [Sapere assumption based on data collection].
- SW hourly rate: $20.58 [Pay equity data collection and Sapere data collection].
- The average co-ordinator and administrator cost is $49,648 (including the KiwiSaver, the ACC levy and 1% ‘coverage’) [Sapere assumption based on data collection, coverage assumption from original model].
- The average increase in co-ordinator and administrator headcount owing to GH is two [Sapere assumption based on data collection].

Results

The self assessment score shows heterogeneity across the sector

Fig 1. Distribution of responses to the question *What is your assessment on a scale of 1 to 10 on how well advanced you are in implementing guaranteed hours?*



There is little difference in the mean score 6.5 and the weighted (by providers' GH) mean score of 6.3. This indicates larger providers do not feel they are more advanced in terms of implementation. But the question is highly subjective and may have been interpreted differently by providers.

There is also significant variation in the uptake of GH by the support worker workforce across providers

Fig 2. Distribution of GH uptake by providers

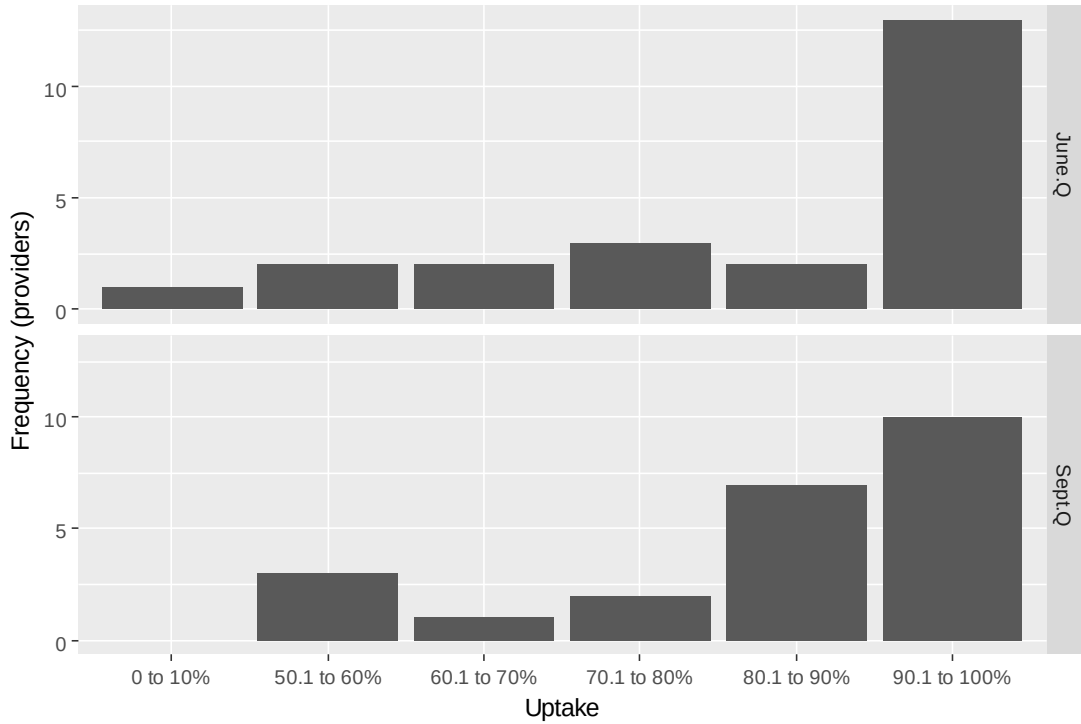


Figure 2 shows the frequency distribution of the uptake of GH by the support worker workforce of each provider. This is percent of all the workforce including ~6% of the workforce which were recorded as casual.

Providers were asked directly if the employee was causal and if the employee was on guaranteed hours.

There is only a 0.2 correlation between the two indicators (self assessment score and GH uptake in the Sept Quarter). Again, an illustration of the subjectivity of the self assessment score.

In the September quarter 2017, the mean uptake was 84.6%, the median uptake was 88.9%, and the trimmed mean (10% cut) was 85.5%. The equivalent numbers for June quarter 2017 were 81.6%, 90.8%, and 84.6% respectively.

The assumption we adopt is 85%.

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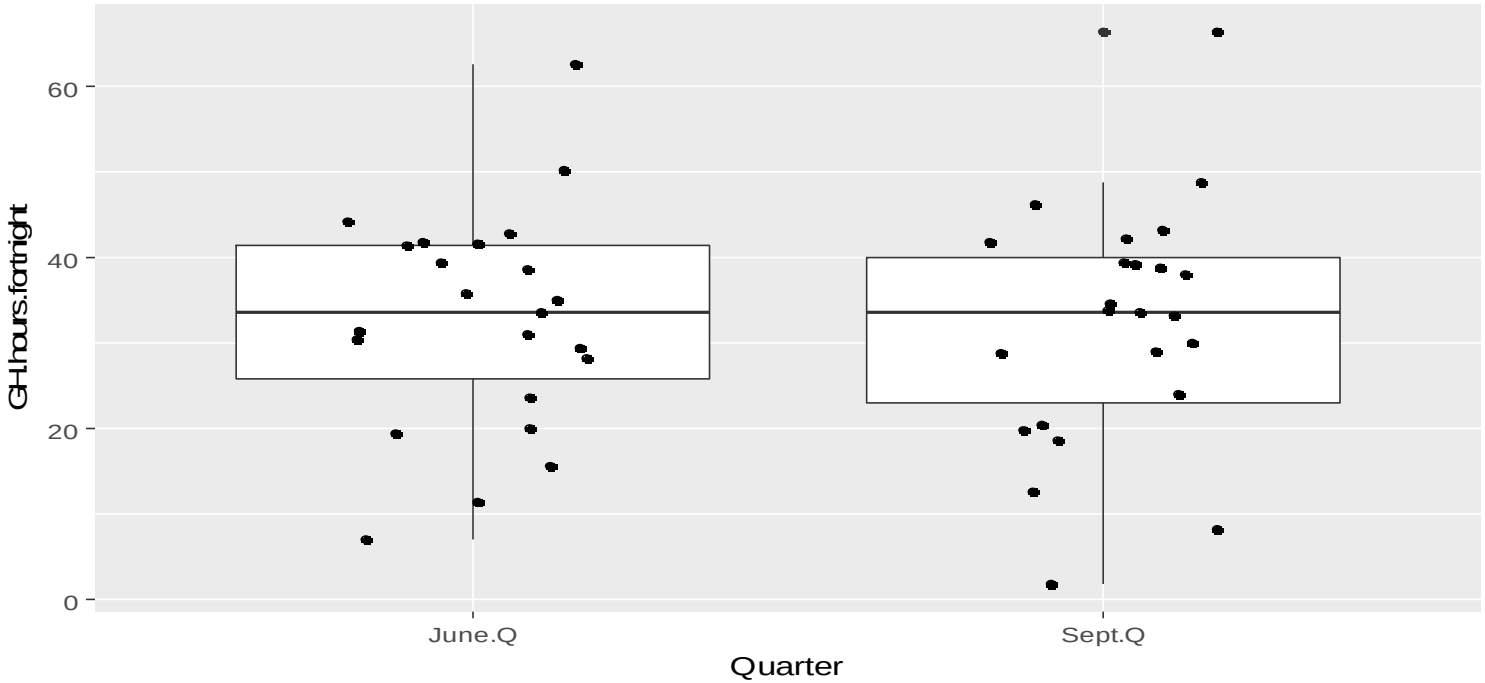
MoH/DHB funded GH per SW per fortnight looks very low for some providers. Hence to inform our assumption we look across a range of measures.

Fig 3. GH per worker per fortnight



The mean of this variable is stable at around 32 to 32.5 hours a fortnight, with the median also stable at around 33.7. Weighting provider responses by their GH gives a mean of around 35.5 hours per fortnight in both the June and September quarters respectively. This illustrates that smaller providers are reporting the lower numbers of GH per fortnight. This may be genuine or it may reflect data quality issues.

Excluding those with GH per fortnight less than 20 hours the quarterly means are both around 37 and the quarterly medians are both around 35. **Looking across all the different metrics, we adopt 36 as our assumption.**

Unfilled hours as a percentage of GH can be measured a number ways

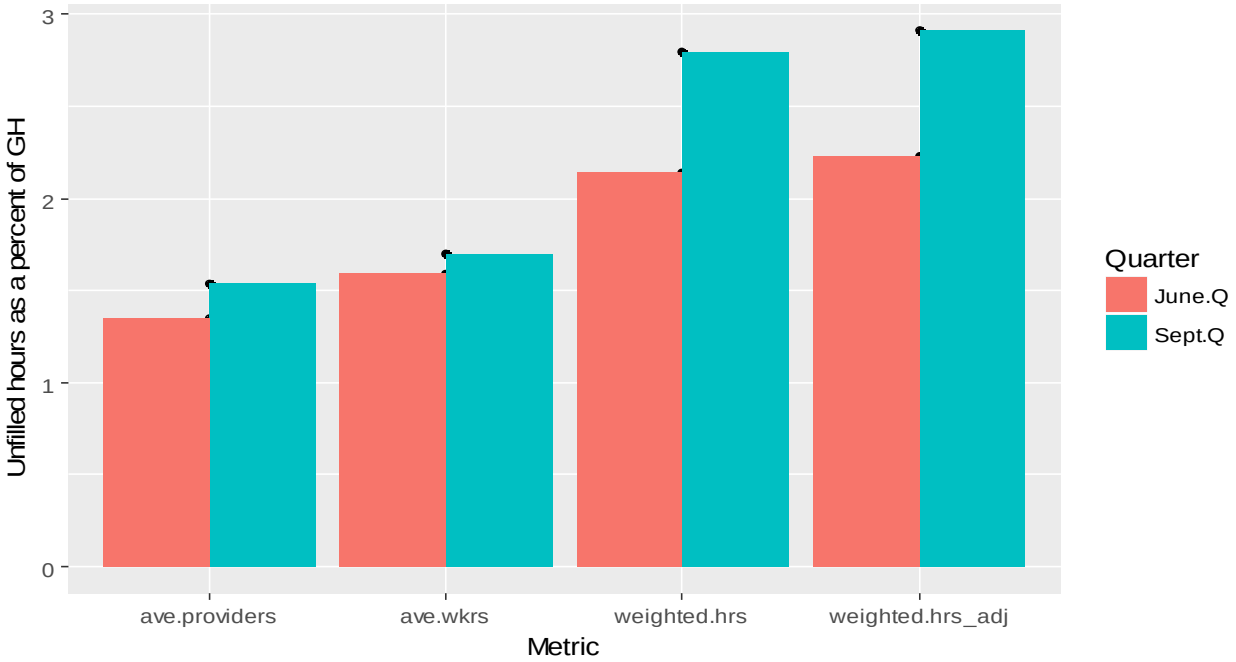
- We looked at a range of metrics (see Table 1) – our preferred one is the 'weighted.hrs_adj" as it adjusts for staff turnover.

Table 1 – Alternative ways to measure unfilled hours as a percent of GH

Short name	Description
"ave.wkrs"	Calculated by taking the straight average (arithmetic mean) percentage of unfilled hours per worker in each provider, then averaging this figure across providers using the arithmetic mean.
"ave.providers"	Calculated by summing all the unfilled hours in a given provider and dividing it by the sum of all the GH in a given provider. Then taking the straight average (arithmetic mean) across all providers.
"weighted.hrs"	Calculated by summing all unfilled hours across all workers and providers and dividing it by the sum of all GH across all workers and providers.
"weighted.hrs_adj"	This is the "weighted.hrs" measure but with the GH adjusted for each provider to reflect staff turnover

That 2.2% - 2.9% of GH are unfilled appears to represent a reasonable assumption

Fig. 4 Percentage of GH unfilled



In this discussion we focus on our preferred 'weighted.hrs_adj' measure. 2.2% and 2.9%, the unfilled hours percent in the June and September quarter respectively are low compared with the pilot data as reported by KPMG (the range they reported was 2.7-4.7%). The difference between the June quarter and the September quarter is unlikely to be statistically significant, given the between provider variation.

The September quarter is dragged up by one provider who was very upfront about the poor quality of its data – if we exclude this provider from the September quarter, then the percentage of GH unfilled would have been 2.2%.

Our recommendation is to take 2.6% (the mid-point of the range 2.2% to 2.9% range)

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What our assumptions imply for the quantum

Original model

- SW hourly rate: $15.75
- ACC and KS costs 3.7%
- Other costs 16.8% [leave, stat holidays]
- Unfilled hours 2.7-4.7%
- 39-42 GH per SW a fortnight
- 18, 795 is the headcount of support workers

Our assumptions

- SW hourly rate: $20.58 at Sept Q ‘17
- ACC and KS costs 3.7%
- Other costs 16.8% [leave, stat holidays] – adopted original assumption
- Unfilled hours 2.6%
- 36 GH per SW a fortnight
- 16,038 is the headcount of support workers

Our formula is:

base wage*(1+(ks+acc)+other costs)*unfilled hrs %*[GH per SW per fortnight*fortnights worked per year*number of support workers*percent of SW on GH] … …

where the variables in [ ] are trying to estimate MoH and DHB funded GH per year. We assume 23 fortnights worked a year, as this allows for four weeks’ leave and approximately 11 statutory holidays.

= $20.58*(1+0.037+0.168) *2.6%*(36*23* 16,038 *0.85) = $7.28M – under our assumptions

Noting under the $15.75 wage rate originally assumed this would be: $5.57M

The original model is opaque - a cost of $1.63 per GH comes from a linked spreadsheet (linking to the P drive – a finance drive). 1.63 is then multiplied by 15M hours in the sector to get $25M. We understand MoH is of the opinion that this figure should be less cancelled visits ($14.6m) and less 20% discount for casuals not covered by GH = $8.3M

Feedback from the 11 and 12 December meetings

We received a number of pieces of feedback in the meetings on 11 and 12 December on the calculation of costs directly associated with support workers. We highlight these in turn.

The average wage assumption

A point was noted that, while the current wage assumption of $20.58 per hour is appropriate at the moment, owing to the pay equity agreement, the average wage should increase through time as the workforce becomes more qualified and as tenure extends. Given the data collected as part of the pay equity collection is probably more complete with respect to this information than the data we collected, we recommend the Ministry run some scenarios about how the qualification and tenure mix of the sector may change and what this might imply for the future average wage.

Breaks

In the presentations on 11 and 12 December we noted:

- The original model assumed $0.79 per service hour resulting in a quantum of $12.1M.
- We asked for break information and received only two responses from providers.
- Unfortunately, from our perspective, there is not enough evidence to make a robust assessment on the costs of breaks.

It should be noted that the original model and its documentation notes the modelling of breaks is highly uncertain. Some providers have indicated to us after our presentations that “breaks” cost money and need to recognised. We record this provider concern here ‘for the record’.

A lively debate on future efficiency/learning effects

We presented preliminary findings at two provider meetings. At the meetings we asked what the effect of systems improvements and learning effects might be on the unfilled hours percent; what would it eventually reduce to as provider expertise develops? For instance, a 10% efficiency improvement every year over five years would mean unfilled hours would be 1.5%. The general feeling from providers was there are efficiencies that can be gained, but is difficult at this stage to estimate these with any real certainty. Providers indicated there was considerable variation between providers (and regional branches of the same provider) and that some were higher and some lower than 2.6% (and one provider indicated it is already at 1.5%).

Other points were as follows:

- There was a concern efficiencies might come at the expense of client choice.
- The 'bucket model' allows more flexibility to fill rosters and also to meet client needs, but adversely affects support workers if implemented in an extreme way.

We suggest looking at efficiency factors in 12 months. In particular we suggest collecting data from providers who (1) made large efficiency gains (i.e. their unfilled hours have fallen materially) and (2) have low unfilled hours in absolute terms (there may be some overlap).

A case study approach may be useful to understand how efficiencies can be gained, and to check these gains are not at the expense of client choice or staff welfare. Another useful exercise might be a provider and union workshop with third party facilitation. In practical terms, this would mean developing six or so common scenarios which would generate unfilled hours and then different providers articulating how they would deal with those issues currently and how they would deal with them in an ideal world. exercise could serve three purposes:

1. To identify the roadblocks all providers face and the roadblocks only some providers face. Identifying what the roadblocks are might help with assessing the feasible set of efficiency gains.
2. To help inefficient providers to learn from efficient providers.
3. The industry and union might be able to agree guidelines about what is an acceptable implementation of the bucket model and 'self-regulate' or issue guidance moving forward.

Co-ordinator and administration costs were calculated

The steps we took to undertake this calculation were as follows:

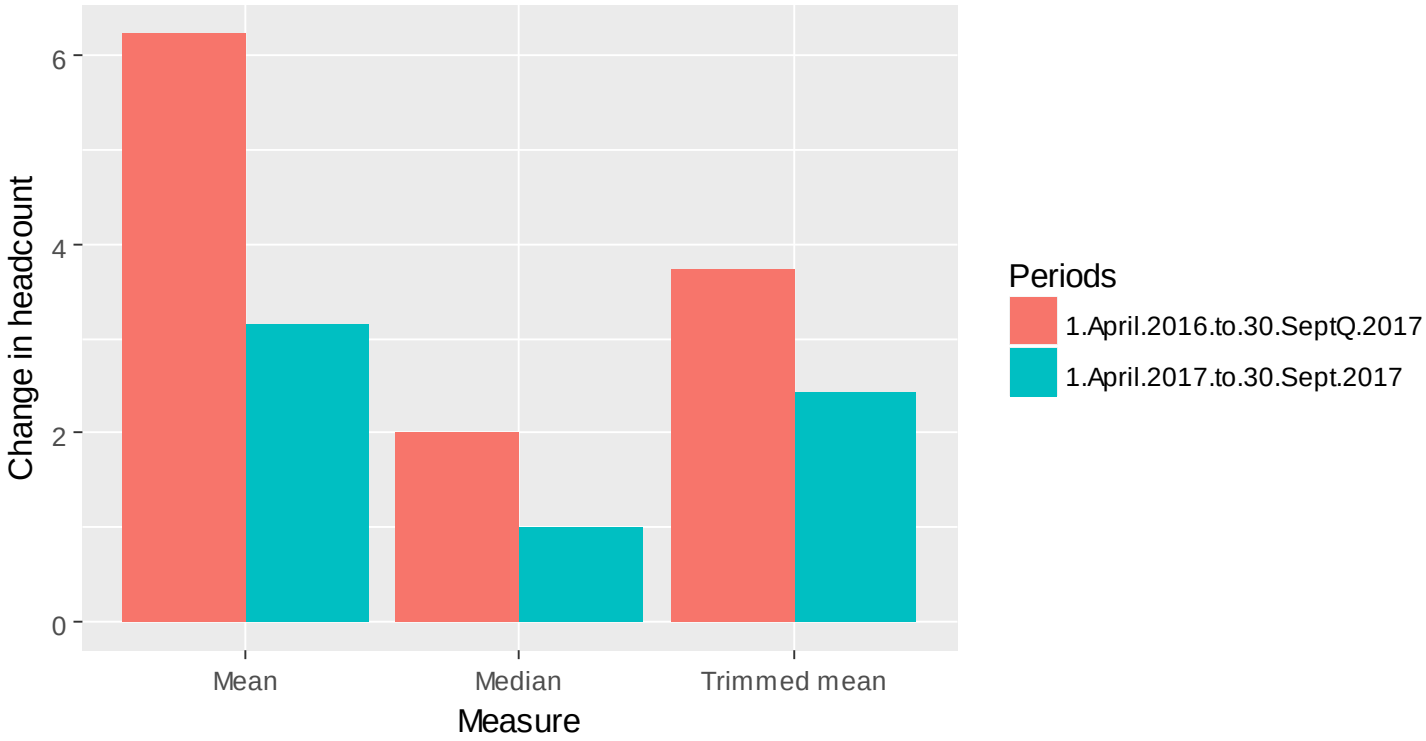
- We asked for administration and co-ordinator head count and vacancies as at 1 April 2016 and 2017 and 30 September 2017.
- For the June 2016, Jun 2017, and September 2017 quarters, we asked for average hours worked and wage.
- We filtered out any wage data less than the minimum wage and any hours less than 20 hours per week or more than 50 hours per week.
- We report the mean and the median of these measures, as well as the trimmed mean (excludes top and bottom 10% of values).

We make two cautionary comments about this calculation:

- Other changes in the sector, such as regularisation and pay equity, mean it is hard to know what to attribute to GH. Providers restored pay relativities between co-ordinators and support workers post pay equity, but likely that was about pay equity rather than GH.
- There is a survivorship bias in data – we received data from providers which have expanded, but not those who have been taken over or left the market.

The change in co-ordinator/administrator headcount

Fig 5. Estimated change in co-ordinator/administrator headcount



The mean change in co-ordinator and administrator headcount between 1 April 2016 and 30 September 2017 is affected by 'M&A activity'. Looking a Fig. 5, our best estimate of impact has between 1-3 people on average per provider. **We assume a two person increase in headcount.**

At a provider level, in percentage change terms, there was a 9-16% change between 1 April 2016 and 30 September 2017, and 5-7% between 1 April 2017 and 30 September 2017.

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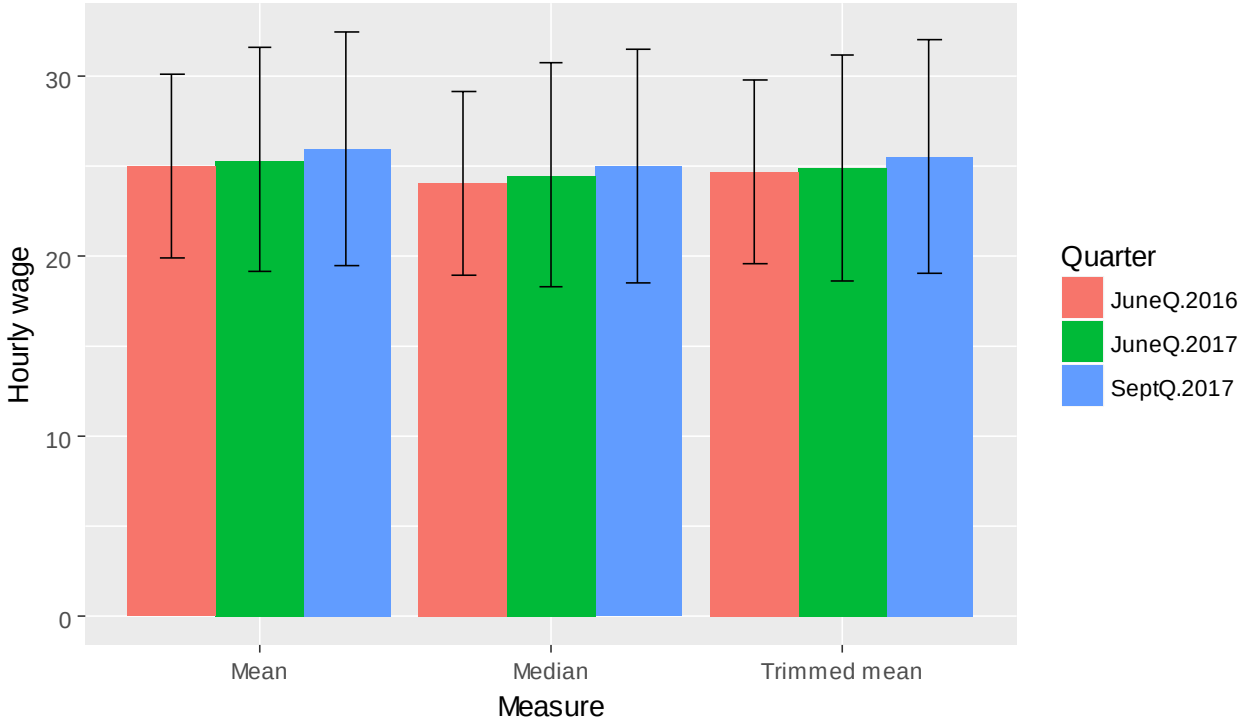
There a slight wage increase, but judgement is needed about how much to attribute to GH

Fig 6. Co-ordinator/administrator wage



We observe an 80c to $1 increase in hourly wage between the June quarter 2016 and Sept quarter 2017, which is between a 3.8-4% increase. There is question how much of this change to attribute to GH [vis-à-vis restoring relativities post pay equity]. Following our discussions at the 11 December meeting, participants indicated most (75%) of the wage change was related to restoring relativities.

Wage inflation (private sector, ordinary time) from Quarterly Employment Survey, Statistics New Zealand was 1.9% over the same period. It seems an appropriate solution to grow the June quarter 2016 wage forward by this percent.

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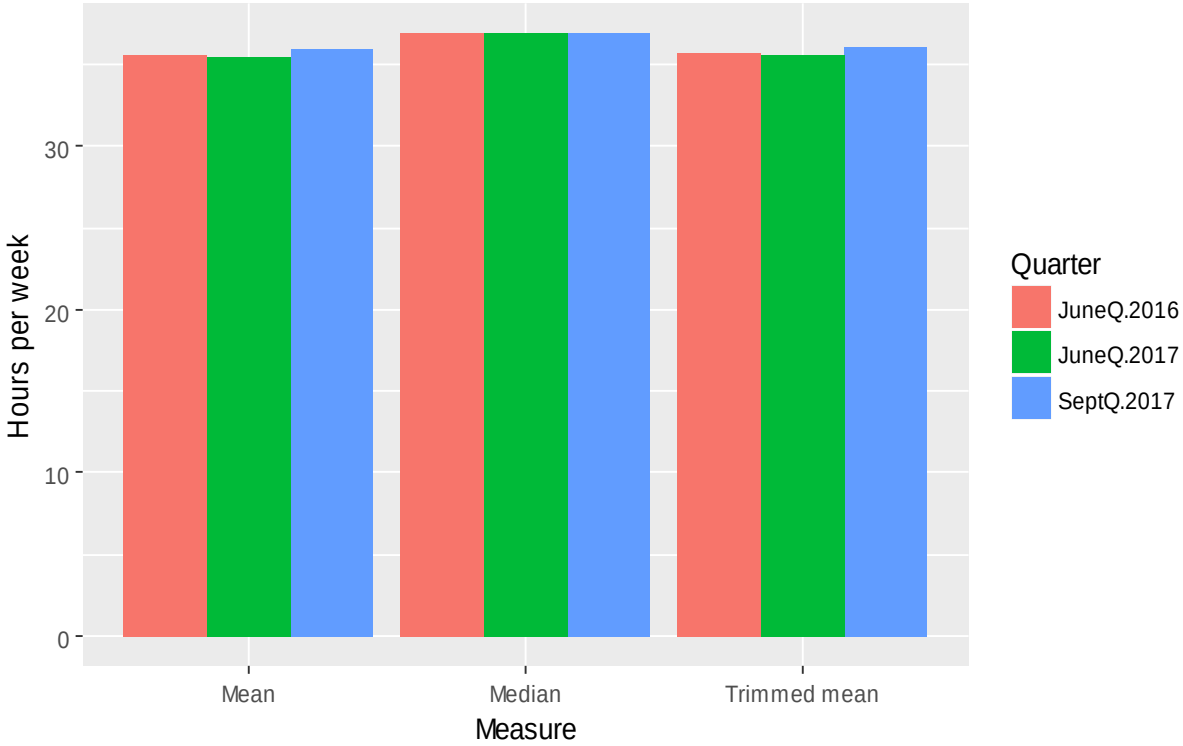
We estimate the additional co-ordinator/administrator cost to be $3.7M

Fig 7. Average hours worked per week per co-ordinator/administrator



Under our assumptions, the average co-ordinator/administrator cost would be: $49.6k (as at Sept Q '17).

This is based on:

- 36 hours per week as average hours worked per employee.
- The June 2016 trimmed mean wage $24.67 grown forward at 1.9% = $25.14.
- 5.5% on-costs (ACC, KiwiSaver, 1% 'coverage' as per original model).

Additional cost calculation:

*Additional people*salary*number of providers*scale factor*. Where the scale factor (3/2) reflects the fact, we only have data for 2/3 of the market.
This gives 2* $49, 648 *25*3/2 = $3.72M.

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Expected co-ordinator and administrator efficiencies

In the meeting on 11 and 12 December, we asked if a 5% efficiency gain each year for five years could be expected in co-ordinator and administrator costs, meaning the associated cost would fall to $2.9M.

There was less resistance to the idea there may be efficiencies with respect to administrator and co-ordinator costs compared with the lively discussion around the proposed efficiencies around unfilled hours.

General comments from providers were that efficiency should be helped by:

- Technology.
- A reduction in turnover should help co-ordinators.

Again, it was felt too early to tell whether or not any efficiency would be achieved and meeting participants felt it is more realistic to look again in 12 months' time. We recommend this course of action, particularly as collecting data on co-ordinators and administrators is less intensive than support workers.

A robustness check: An alternative method to calculate additional resource

At our meeting on 11 December 2017, it was suggested that we look at the change in co-ordinator and administrator co-ordinator per support worker (rather than per provider).

Fig. 8 SW and co-ordinator and admin headcount

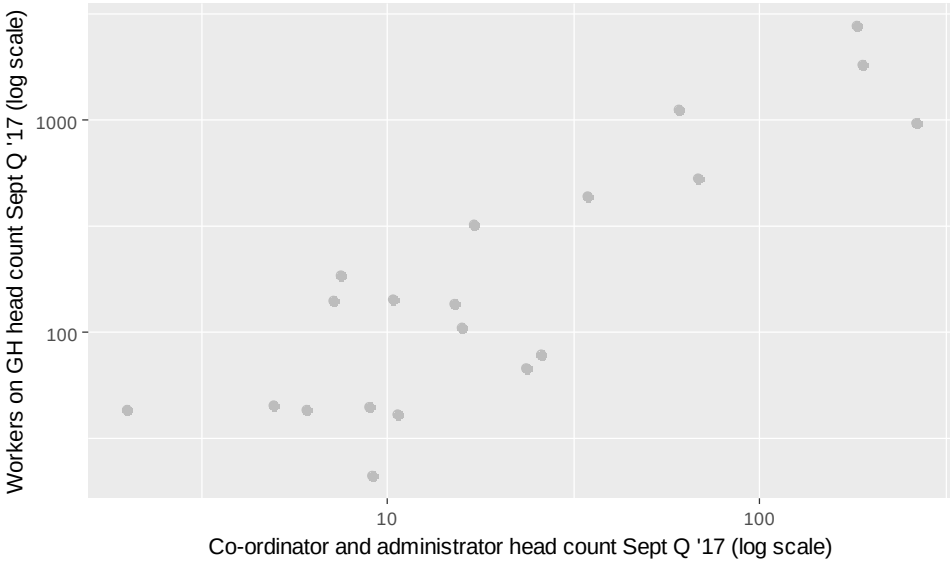

Fig.8 shows, at a provider level, there is a relatively stable relationship between the headcount of co-ordinators and the headcount of support workers on GH in the Sept. quarter. Fitting a linear regression model indicates a provider that has 1% more support workers on GH requires 0.79% more co-ordinator and administrator FTW. The relationship is similar for the June quarter. The stability of this relationship across providers gives us confidence about using this for the purposes of this calculation.

The trimmed mean change in the ratio of co-ordinator and admin headcount to SW on GHs between the June and September quarters 2017 was 0.007, the median was 0.0036. Using the formula:
*Change in headcount per SW on GH*uptake of GH*number of SW* co-ordinator salary*
gives:
0.007*0.85*16,038* $ 49,648 = 4.7M around $1 million higher than our original calculation.
Using 0.0036 (i.e. the median) gives a quantum of $2.4M, around $1.3 million lower.

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We also asked for other costs

- We asked for other staff and non-staff ongoing costs related to GH, as well as an assessment of how these costs might change in two years.
- We used that assessment to scale these costs; if no assessment was given, then we assumed the cost would remain the same.
- We then categorised costs as four types – "Co-ordination", "HR", "Legal", "Payroll" or "Miscellaneous".
- Staff costs associated with co-ordination are excluded – we felt they were already captured in the previous calculation of administrator and co-ordinator costs. Also where we could easily and directly identify 'double counting' of additional administration headcount (again already captured under administrator and co-ordinator headcount calculation), we excluded these costs from this calculation.
- Our reported mean and median measures of other costs (defined per GH) is calculated for those who reported values for the cost category. That is, if a provider did not report a cost for that category. then it is assumed they overlooked the cost. If some providers genuinely did not have any costs, then we are likely to overstate additional costs.

Cost category	Staff hours per GH	Other costs per GH
Weighted mean		
HR	$ 0.05	$ 0.01
Legal	$ 0.02	$ 0.01
Misc	$ 0.05	$ 0.03
Payroll	$ 0.04	$ 0.02
Total	**$ 0.16**	**$ 0.06**
Median		
HR	$ 0.05	$ 0.01
Legal	$ 0.04	$ 0.01
Misc	$ 0.07	$ 0.04
Payroll	$ 0.08	$ 0.02
Total	**$ 0.25**	**$ 0.07**
Count of respondees		
HR	9	3
Legal	10	4
Misc	6	2
Payroll	10	4

The weighted mean (by provider GH) of staff costs per GH is slightly higher than the median suggesting economies of scale. There does not appear to economies of scale with respect to 'other costs'.

This analysis would suggest funding 'other costs' at $0.22 to $0.32 per GH.

Total additional overhead, administration and co-ordination costs can be calculated

Original model

- EA changes $0.64M pa
- Roster management $3.0M
- Branch costs $1.2M
- Corp. overhead $3.0M

Total $7.8M (this excludes the $2.5M included for the one-off changes to client/roster management system)

Our model

- Additional co-ordinator and admin staff $3.72M
- If other costs are funded at $0.32 a GH then their quantum would be $3.61M. If funded at $0.22 a GH then the quantum would be $2.48M.
- Total cost is therefore $6.20M to $7.33M.

Table 2. Summary of findings from both models

	Original modelling	Our modelling
Unfilled hours	$8.3M	$7.28M
Breaks	$12.1M	not quantified
Co-ordinator and administrator costs	$7.8M	$6.20M to $7.33M
Total (excluding breaks)	$16.1M	$13.48 to $14.61M

In conclusion

We said we would review the existing model and decide if its robust and fit for purpose. As far as we can tell, the methodology for modelling of unfilled hours was fit for purpose (excluding the original double counting of cancelled hours). Therefore, we have just updated the assumptions based on data collected. We took a different approach to modelling co-ordinator and administration costs. Rather than trying to infer additional FTE based on changes to processes from the bottom up, we asked providers for headcount and other costs directly. Table 2 provides an overall summary of the original modelling and our modelling. We had hoped to look at potential efficiency gains, via a benchmarking exercise, but the sector is clearly still in too much of a state of flux for this to be sensible.

We set out sufficient detail in this technical appendix such that the datasets and analytical steps can be replicated by others if need be.

Technical appendix

Appendix one: The analysis process

25 providers completed the data collection tool and were returned to us in time for us to incorporate them into the analysis. To protect commercial sensitivity we refer to providers by randomised numbered IDs.

The data collection tool was five sheets. We will discuss each sheet in turn noting the associated R file(s) and any data quality issues. In order to efficiently read data into R each sheet was saved as a csv file.

Note: for numeric input '$' and thousands commas need to be removed.

1. 'Your business'

R file: 'Your.business'

Input file CSV file format: 'YB_*pvd*' where *pvd* is a unique three letter nomenclature for each provider. The look up schema is at the end of this section.

Output file: 'Business_info.csv"

Purpose: Aggregate the information provided about the providers' businesses.

Data quality issues:

- Provider 9 did not give us total hours, we have estimated these by multiplying average hours per client by the number of clients.
- Provider 8 did not give us average hours, therefore we have calculated these using total hours divided by the number of clients.
- For providers who pay weekly we've assumed each quarter has 6.5 fortnights.
- One provider pays 28.5% of their workforce one week and 71.5% the next. Based on the distribution of the weeks we assume the June quarter is 6.25 weeks and the September quarter is 6.71 weeks.
- Provider 24 said they pay fortnightly but then stated there were 12 fortnights per quarter. We have halved this to 6.
- Two smaller providers 21 and 23 are missing a lot of information.

2. Support worker details

2a. Data processing steps

R file: ‘cleaningfile’ and ‘rebuilt_sw_code’

Input file CSV file format: ‘SW_*pvd*’ where *pvd* is a unique three letter nomenclature for each provider. Where a providers’ support worker information requires cleaning (via the ‘cleaningfile’), a new file ‘SW_*pvd*R’ is produced and supersedes the original file for the purposes of reading in to the ‘rebuilt_sw_code’ file.

Output file: ‘sw_final.csv’

Purpose: The ‘cleaningfile’ deals with some data issues which will be discussed more below. The ‘rebuilt_sw_code’ summarises up the individual support worker information into aggregate information for each provider.

Data quality issues:

Alignment with the pay equity tool

Appending the additional support worker information about GH to the pay equity tool caused some issues as the pay equity tool disaggregated support workers’ hours by contract. GH however are not disaggregated by contract. Providers took a number of different strategies. They either:

- Provided all the GH information the first time the support worker’s ID appeared (but ordinary hours needed to be summed across contracts).
- Repeated all the GH the every time the support worker’s ID appeared (but ordinary hours needed to be summed across contracts).
- Provided all the ordinary hours and GH the first time the support worker’s ID appeared.
- Adjusted the tool themselves and only reported the information for each support worker once.

Scale factors for MoH and DHB funded hours

We asked for MoH and DHB funded hours only, although in employment contracts providers do not specify GH like this. Most of the medium to large provided us with scale factors to scale the total hours by. With the exception of provider 15 this scaling occurs either in the 'cleaning.file' file or the 'SW calculation' file (depending on where it is easiest to do it). The scaling for provider 15 was done in the spreadsheet: 'SW_<omitted>_calcs_to_scale_MoH'.

Other issues.

- All 'yes' or "Y" or "YES" were set to "Yes" in the input files and an equivalent procedure was done for the variants of "No". 'data.quality.onsupport.wkr.file.csv' contains other minor data issues (minor in the sense they were to do with smaller providers).
- Provider 20 did not provide data on GH, so they were excluded.
- One large providers' data (provider 25) was particularly problematic. Two particularly salient issues were 1) support workers with implausibly large unfilled hours as a percent of their GH, and 2) it being stated support workers were on GH, but then having zero GH per fortnight stated. We tried a variety of strategies to deal with these issues, all had drawbacks. The approach we settled on was to replace support workers with more than 20% of their GH unfilled by the mean unfilled percent for the rest of provider 25' s support workers. Further where a support worker was stated to be on GH, but had zero GH recorded, we assumed they were not on GH. This was the best of a bad options set. It improves our confidence in the overall average unfilled hours percent across all providers (which is a key assumption), but appears to understate uptake of GH by provider 25' s staff. Hence we exclude provider 25 from the calculation of the uptake of GH.

2b. Summaring the data

R file: ‘SW calculation’

Input file CSV file format: ‘Your_business.csv’ and ‘sw_final.csv’

Outfile: idx_GH.csv’ (summary of GH by provider to use in the calculation of other costs per GH).

Purpose: The file produces summary tables and charts.

Data issues:

Wage

We excluded wage data for one provider whose mean wage was less than the minimum wage. We excluded provider 25 from the calculation, as $18 is too low given returns from the Pay Equity tool.

Percent of workforce of GH

Provider 25 was excluded as we set those who had been stated as having GH, but had no GH reported ‘to not having GH’. This biases down the estimate of the percent of workforce of GH.

3. Administrator and co-ordinator costs

R file: ‘Coordcosts’

Input file CSV file format: ‘AD_*pvd*’ where *pvd* is a unique three letter nomenclature for each provider.

Purpose: Process the raw data and produce the graphs: head_count_gph, hourly_wage_gph, hours_wkd_gph which are the graphs for additional co-ordinator and administrator headcount, average hourly wage and hours worked respectively.

Data quality:

- Providers 20 and 23 were excluded owing to data quality issues.
- We undertook several pieces of data cleaning:
  - If there was nothing entered for vacancies, then we assumed these were zero.
  - If there was nothing entered for headcount in April 2016, the same headcount as April 2017 assumed.
  - Wages lower than the minimum wage were excluded, as were employee hours averaging less than 20 hours a week and more than 50.

4. Other costs

4a. Initial aggregation

R files: 'file_additionalcosts'

Input file CSV file format: 'AD_*pvd*' where *pvd* is a unique three letter nomenclature for each provider.

Output file: additionalcosts.ongoing.csv

Purpose: Aggregate data

Data quality issues:

- Providers 4, 24 and 25 appeared to interpret 'new hire' as new administrators and co-ordinators they have hired therefore we manually shifted this to ongoing costs in the 'Add_costs_inputfile.csv' file (see section 4b).
- Providers 6 and 10 have repeated similar information in on-going and new hire cells – it appears they thought they needed report information for two quarters. Therefore, we have just counted it once (under ongoing).
- Note: this R file does not process the data for providers 24 and 25. This is owing to the lateness of their submission. Their data was added manually in step 4b.

4b Intermediate processing

Input file: additionalcosts.ongoing.csv

Output file: Add_costs_inputfile.csv

Purpose:

1. Allocate line items into five cost categories ('Breaks', 'Payroll', ' Co-ordination','HR', 'Legal' and 'Miscellaneous') – see the following tables.
2. Scale current costs by providers' assessment of where the costs will be in two years (i.e. their answer to the question in the 'additional costs' tab: *Please explain if you think this cost line item will have the same cost on an ongoing basis in two years than now, or more or less. If you can please quantify how much more or less.* If no text it was assumed they'd be the same, i.e. the scale factor is set to one.
3. Exclude costs that were out of scope/insufficient information (see the following tables).

Responses to additional costs question counted or not counted

Counted	Count
HR	14
HR support to negotiate and set GH and availability term for each SW	1
Advice on Employment issues as a result of GHs.	1
e.g. HR support to negotiate and set GH and availability term for each SW	7
HR support to backfill release for Guaranteed Hours	1
HR support to negotiate and set GH and availability term for each SW	1
HR Team Increased resource to Issue contracts and manage change	1
Increase HR Support 1 FTE linked to more complex GH environment	1
Monitor changes in permanent hours and re-negoitate changes in GH (increases and decrease)	1
Legal	**16**
Contract Advice from Legal team	1
e.g. advice on contract changes	13
Legal advice	1
Legal advice	1

Counted	Count
Misc	9
50% Agency staff re backfill	1
Additional reports, returns, data queries and additional compliance checks and record keeping	1
Checking cancelled hours and making claims	1
Development of reports	1
GH Administrator - Review and action information received from consultation letters	1
IT Admin	1
IT: We recruited an additional system developer to assist with the ongoing development and management of our bespoke systems. We don	1
Project Staff to develop tools and processes to optimise rosters & minimise top-ups	1
Quality and Project Management Services	1
Payroll	15
Administration support for manager to have time to analyse, report to Trust, support payroll and coordinators with GH issues	1
BI Team/Consultants - Analyst writing reports and processes, monitoring variances, Datawarehouse	1
e.g. Payroll support to correctly identify and pay GH top-ups	7
Pay top ups	1
Payroll support to correctly identify and pay GH top-ups	4
SW payroll issues	1

Not Counted	Count	Reason
Co-ordination	5	
Additional Staff to cope with rostering	1	
co-ordExtra 2FTE required. Current call volumes continue to grow, driven by extra phone calls from SWs re GHs.	1	
Coordination (4 additional Roles @ 40hrs per week)	1	
Coordination of GH - checking top ups required, calculating rates, discussing changed hours with carer and client	1	Already captured in headcount
Co-ordinator Likely an extra 4 required and the current team is not keeping up with the management of GHs.We have 6000 roster changes pe	1	measures
HR	2	
HR	1	Unclear
HR Advisor	1	Unclear
Misc	4	
GH Staff training	1	Training paid through another mechanism
Union Dispute Advice	1	Not clear government should fund
Additional Staff meetings and in-service training with SW	1	Training paid through another mechanism
Payroll	6	
Additional Account Receivable staff - additional role due to complexity and additional process	1	
Additional Payroll Coordinator - additional role due to complexity and additional process	1	
Additional reporting, monitoring and compliance in Financial Reporting	1	
Admin support to collate verify and submit cancellation claims in the exact prescribed format	1	It was clear by the comments this had
GH Administrator - Review and action information received from consultation letters	1	already been counted in the additional
Payroll: Extra 1 FTE. Payroll team not coping with demand driven by GHs and reporting requirements.	1	admin. And coordinator tab

4c Summary

R file: ‘Additionalcosts_final’

In file: ‘Add_costs_inputfile.csv’

‘idx_GH.csv’

Output file: ‘tbl_add_costs.csv’ contains the mean cost for each category weighted by the providers’ GH. ‘tbl.costs.median’ produces the median costs.

Purpose: To calculate the mean and median of other costs.

Data quality issue:

- Provider 21’s data produces costs per GH which are a many magnitudes the size of other providers and therefore we exclude.

Table 3: Nomenclature schema

Name	Short code
Age Care Central Ltd	ACC
Access Community Health	ASS
CCS Disability Action Bay of Plenty Incorporated	CCB
CCS Disability Action Tairawhiti Hawkes Bay Incorperated	CCS
Counties Manukau Homecare Trust	CMH
CRC Ltd	CRC
Disabilities Resource Centre Trust	DRC
Forward Care Home Health Ltd	FCC
Florence Nightingale Agency Ltd	FNC
The Florence Nightingale Agency (Marlborough) Ltd	FNM
Geneva HealthCare	GHC
Healthcare of New Zealand Limited	HHL
Healthvision NZ	HVN
Smith Homehealth	LWS
Nurse Maude Association	NMC
Pacific Island Homecare Services Trust	PHC
Presbyterian Support Northern	PSN
RDNS NZ	RDN
Te Ata Resthome	TAA
Te Kohao Health	TEK
Te Hauora O Te Hiku O Te Ika	THH
Te Runanga O Ngati Whatua	TRW
Te Taiwhenua o Heretaunga Trust	TTH
VisionWest Community trust - HomeCare	VWH
Waiapu Anglican Social Services Trust Board	WAI

Note the ordering of providers in this table has no correspondence with the provider’s number. For example when we talk of ‘provider 21’ we are not talking about the 21th provider on this list (THH). The provider numbers are random.

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Sapere aude *– dare to be wise*