

# Clinical Governance Assessment Project: Analysis of Three Quality and Safety Questions in a National Survey of New Zealand Health Professionals

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RG and SH  
Dunedin  
23 November 2012



# 1. Overview

The Clinical Governance Assessment Project (CGAP) was jointly commissioned by the National Health Board, the Health Quality and Safety Commission (HQSC) and the District Health Boards (DHBs) through DHB Shared Services (DHBSS). The research work for the project was led by the Centre for Health Systems, University of Otago, and so was both an assessment of the present situation with clinical governance in DHBs as well as an independent study designed to promote discussion and debate. The project represented a partnership arrangement in that various activities associated with the research were undertaken by the DHBs themselves, in collaboration with the Centre for Health Systems, with facilitation and support from DHBSS.

The survey data analysed in this report was collected in May-June 2012. The CGAP involved one of the largest and most complex health professional workforce surveys ever conducted in the New Zealand's public health care sector as well as site visits and interviews with 165 managers and health care professionals in 19 of New Zealand's 20 DHBs<sup>i</sup>. Three questions in the survey were designed in collaboration with HQSC in order to obtain data on participant perceptions of aspects of the quality and safety of health care delivery in DHBs. The three questions were:

1. Health professionals in this DHB work together as a well-coordinated team.
2. Health professionals in this DHB involve patients and families in efforts to improve patient care.
3. In this clinical area, it is easy to speak up if I perceive a problem with patient care.

This report contains a detailed analysis of these three quality and safety questions and provides a baseline against which future analyses may be compared. The findings of the broader CGAP are contained in a separate report<sup>ii</sup>.

This report is structured as follows. First, it overviews the importance of quality improvement in health care and methods for evaluating staff perceptions of the quality of care and the service delivery environment, situating the CGAP survey and quality and safety questions. Second, it outlines the methods for the survey. Third, the report presents analyses of the three quality and safety questions. The final section discusses the findings.

Key findings of note include that:

- Fifty-seven percent of respondents believe health professionals in their DHB work together in well-coordinated teams;
- Seventy percent of respondents agree that health professionals involve patients and families in efforts to improve patient care;
- Sixty-nine percent of respondents agree that it is easy to speak up when they see problems with patient care;
- There were significant differences between DHBs in responses to the three questions;

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<sup>i</sup>Canterbury DHB did not participate due to the demands of the earthquake recovery process.

<sup>ii</sup>Clinical Governance Assessment Project: Final Report on a National Health Professional Survey and Site Visits to 19 New Zealand DHBs. Dunedin: Centre for Health Systems, University of Otago; 2012.

- There were associations between DHBs perceived by respondents to have enabled strong clinical leadership and decision making and stronger performances on the three questions;
- Females had significantly higher odds of responding more positively than males to the three questions;
- Younger respondents had lower odds of responding more positively to the teamwork and patient involvement questions;
- Older respondents had higher odds of responding more positively to the question about speaking up;
- Respondents with more than five years experience in the New Zealand health sector had lower odds of responding positively to the teamwork and patient involvement questions;
- Respondents with more than 15 years service had higher odds of responding positively to the speaking up question.

## 1.1. Quality in Health Care and Methods for Evaluation

The rationale for health care quality and safety improvement needs minimal introduction as this has been widely covered elsewhere.<sup>1-8</sup> It is today accepted that quality and safety are a number one priority for health care policy makers and service providers. Indeed, at least one of New Zealand's DHBs has made quality **the** number one priority, as organisations such as the Institute for Healthcare Improvement argue they should, and most have quality high on their agenda. Quality and safety questions are at the core of how clinical services are organised and the way in which health professionals are trained and practice.<sup>9,10</sup> There are several reasons for this (see Box).

**Box:** Quality and Safety are Important Because...

- Studies show high rates of medical error and harm amongst hospitalised patients, often with significant long-term consequences.<sup>5,8,11-14</sup>
- Error results in substantial costs to the health care system as well as to patients and clinicians.<sup>5,8,15,16</sup>
- Quality lapses and patient harm affect public confidence in health care services and professionals.<sup>16,17</sup>
- Methods of professional regulation have not necessarily ensured a high-quality and safe professional workforce.<sup>16,18,19</sup>
- Quality improvement can lead to efficiency gains, better patient and staff experience and satisfaction, and reduced costs.<sup>3,20-24</sup>
- Many of today's most pressing health care problems – associated with chronic disease and multi-morbidity, ageing populations and fragmentation of health care delivery systems – require new ways of working to ensure the best quality of services and improved health outcomes.<sup>25,26</sup>



Reflecting the diverse set of drivers for quality and safety concerns, the field of quality improvement offers an array of methods and initiatives.<sup>27</sup> Some may be confined to particular service areas, such as individual hospital wards, operating theatres and departments, or across services, and will be focused on process improvement;<sup>28</sup> some employ a specific technique designed to circumvent the possibility of service delivery lapses;<sup>29</sup> some involve patient input into service design;<sup>30</sup> some are intended to improve the skills of professionals and orient them toward working more closely with one another;<sup>31</sup> some are aimed at improving the governance of health care;<sup>32,33</sup> some are aimed at improving the transparency of care delivery processes and outcomes to heighten the focus on errors or the potential for them as well as service performance and variation in practice;<sup>34-37</sup> and some attempt to improve the work environment so that quality and safety naturally advance as a result.<sup>22</sup>

Obviously, each quality improvement approach requires specific evaluation methods. Sometimes, particularly where an intervention has been introduced, impact can be quantified. In other cases, a process evaluation may be more appropriate and involve interview and observational methods as well as survey research. Often, improvement studies require a mixed-method design in order to understand behaviour changes and their implications for broader rollout or transfer into different contexts.<sup>27</sup>



## 2. Methods

### 2.1. The CGAP Survey and Quality and Safety Questions

While DHBs have been variously investing in quality improvement activities, and some have sought to evaluate their 'safety climate',<sup>38,39</sup> there has been no prior work seeking to investigate health professionals' perceptions of elements of quality and safety involving all DHBs. The CGAP survey offered an opportunity for this. The development of the survey tool is described in more detail in the CGAP report<sup>1</sup>. The three quality and safety questions were designed in collaboration with HQSC. The process included appraisal of existing survey tools aimed at gauging perceptions of quality and safety, production of a list of relevant questions which were then reviewed by the HQSC Board and key HQSC staff, and an eventual selection of the three questions that were included in the survey. These questions then underwent further review and adaptation. The three questions each probed different dimensions of quality and safety.

The first looked at the teamwork environment as an emerging literature suggests that strong teams provide higher quality and safer health care.<sup>31,40</sup> The second question was around consumer involvement for the reason that care should be both patient centred and incorporate the views of patients.<sup>41</sup> The third question was intended to investigate a key component of the safety climate: whether professionals feel comfortable speaking up about problems with patient care. This is important for obvious reasons and promoted in other industries such as air transport.<sup>42</sup> When professionals are not able to voice concerns, perhaps due to an organisational culture in which management or different professional groups have not been receptive to 'speaking up' and where those voicing concerns may feel they could be punished or their career affected as a result, it is patients who are most likely to suffer.

The three questions were:

1. Health professionals in this DHB work together as a well-coordinated team.
2. Health professionals in this DHB involve patients and families in efforts to improve patient care.
3. In this clinical area, it is easy to speak up if I perceive a problem with patient care.

Each question had an associated five-point Likert scale: disagree strongly – disagree slightly – neither disagree nor agree – agree slightly – agree strongly. The full survey is included in Appendix A.

Several steps and processes were involved in conducting the survey, with all communications standard across the 19 participating DHBs:

1. The DHB CEOs each agreed to generate an internal email list of all registered health professionals in their employment to be invited to participate in the survey. It was agreed that this would be more straightforward than random sampling and, for several smaller DHBs, staff numbers in some professional categories were too small to warrant random selection;

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<sup>1</sup>Clinical Governance Assessment Project: Final Report on a National Health Professional Survey and Site Visits to 19 New Zealand DHBs. Dunedin: Centre for Health Systems, University of Otago; 2012.

2. Each DHB provided the total number of invitees in each professional category to the Centre for Health Systems in the following format to enable calculation of response rates (illustrative example):

<b>Professional Category</b>	
Allied Count	76
Junior Doctor Count	12
Medical Count	30
Nursing Count	241

3. In all, some 41030 health professionals were invited to participate across the 19 participating DHBs;
4. On 15 May 2012, each DHB sent an email invite to their professional staff list containing the link to the survey website. The staff list generation and email invites were largely managed by the GM of HR in each DHB, with national coordination by DHB Shared Services;
5. Three follow up emails were sent at weekly intervals after the launch date and the survey closed on 22 June 2012;
6. DHB Shared Services assisted with coordinating reminder notices to all DHBs, which DHBs themselves forwarded on to staff;
7. Centre for Health Systems monitored response rates and provided weekly feed back to the DHBs;
8. All analyses were the responsibility of the Centre for Health Systems.

## 2.2. Quantitative analyses

The quantitative analyses of the three CGAP survey items were broken into several parts.

1. A summary of the pattern of responses for each of the three survey items. These were explored further by examining variation in responses by individual DHB and professional group;
2. Relating the safety and quality items to aggregated summary measures of survey item responses in the form of mean ranking across items and the Clinical Governance Development Index (CGDI); and
3. Statistical models to elucidate which groups of respondents were more likely to provide positive responses to the three quality and safety survey items.

### Summary of survey item responses

Items in the CGAP survey were generally constructed so that the responses represented levels of agreement to or support of the item statements. To simplify the presentation of these analyses, the responses to most survey items have been dichotomised into those supportive of the item statement (e.g. 'some or a great extent', 'slightly or strongly agree') and those not supportive of the item statement (e.g. 'no extent' or 'slightly or strongly disagree'). Neutral categories (e.g. 'don't know', 'neither familiar nor unfamiliar', 'neither disagree nor agree')

**Table 2.1.:** Conversion of responses to numeric codes for quality and safety survey items.

Response Text	Numeric Code
Agree strongly	2
Agree slightly	1
Neither disagree nor agree	0
Disagree slightly	-1
Disagree strongly	-2

**Table 2.2.:** Occupations included in each professional group.

Professional Group	Included Occupations
Doctor	<ul style="list-style-type: none"> <li>• SMO</li> <li>• RMO</li> </ul>
Nurse	<ul style="list-style-type: none"> <li>• Designated Senior Nurse</li> <li>• Registered Nurse</li> <li>• Enrolled Nurse</li> </ul>
Midwife	<ul style="list-style-type: none"> <li>• Senior Midwife</li> <li>• Registered Midwife</li> </ul>
Allied/Other	<ul style="list-style-type: none"> <li>• Other (please write the area in box)</li> <li>• Allied health professional (please write the area in box)</li> </ul>

have not been presented. The results of these analyses are presented as percentages. Because of the removal of neutral categories, the percentages presented will not always add to 100%.

The responses for the quality and safety survey items were also converted into numeric values so that mean values could be calculated (see Table 2.1). Because the numeric values are centred on zero, a mean value greater than zero indicates that, on average, the respondents agreed with the item statement. A negative mean value indicates that, on average, respondents disagreed with the item statement.

Responses to survey items have been analysed by individual DHB and professional group. Table 2.2 shows the occupations included in each professional group.

95% Confidence intervals have been included to provide an indication of the precision of the estimates obtained in the survey. The confidence intervals appear as black lines when graphed. Because of the large sample size, the confidence intervals tend to be narrow and therefore appear as a single line. Note that the confidence intervals are only included for analyses comparing DHBs. Other analyses which combine respondents from different DHBs (for example, analyses by professional group) introduce statistical clustering, which artificially narrows the confidence intervals unless accounted for. In these cases the confidence intervals are not included on the graphs, but are presented where appropriate in the text.

## Rankings and the CGDI

One method of assessing overall DHB performance across the survey items is to calculate the mean survey item ranking of each DHB. Ranking for a survey item was determined by the percentage of responses supporting that item statement (see 2.2), with the DHB with the highest percentage being ranked first and so on. The mean of these rankings for a DHB across survey items 3 to 17 was then calculated.

The CGDI was developed and used previously in the ASMS study, and has been described in the literature.<sup>43</sup> It uses a set of seven questions to measure key aspects of the development of clinical governance within an organisation, yielding an overall percentage score. This score by itself is meaningless – it is impossible to currently say that a CGDI score of 75% is good or merely average. Rather, the CGDI is a comparative measure, and provides a useful tool to compare DHBs or, more usefully, the same DHB over time.

Unfortunately, one question used in the original CGDI was not included in the CGAP survey. An abbreviated six-item version, the CGDI<sub>6</sub>, was therefore developed for this survey.

The CGDI<sub>6</sub> ranges from 0 to a maximum of 11. For convenience, it is reported here as a percentage. The Box on page 15 lists the items included in the CGDI<sub>6</sub>, along with a description of how responses are scored. Note that only respondents with complete data for the CGDI<sub>6</sub> items (i.e. no missing data) are included in the analyses.

The advantage of calculating the mean rankings and CGDI scores for DHBs is that these can be related to DHB performance on the individual quality and safety survey items. This provides an insight into how aspects of quality and safety may relate to overall DHB clinical governance performance. Correlation coefficients were calculated to quantify the relationships<sup>ii</sup>. The relationship between the quality and safety items and the other survey items was also examined.

## Statistical models of survey response

To aid in clarifying how different demographic groups in the survey sample responded to survey questions, a statistical modelling technique called *Proportional Odds Mixed Modelling (POMM)* was used. This is a technique used when the outcome being examined consists of categories with some natural ordering, but no fixed 'distance' between them. The use of POMMs allowed examining whether certain groups were more likely to give responses to survey items at the supportive or positive end of the response ranges provided. This likelihood was quantified using odds ratios. Odds ratios are a comparative measure, and indicate how many times as likely an outcome is in one group compared to another, all other things being kept constant. For example, if females were found to have an odds ratio of three for providing a supportive response to an item statement than males, this would mean that females were three times as likely to provide a supportive response to that item statement than males, *all things being equal*. An odds ratio of 0.50 would indicate that females were half as likely to provide a supportive response to the item statement than males, *all things being equal*.

There are two further advantages to using POMMs in the context of this survey:

- Respondents from the same DHB are likely to give more similar responses than respondents from different DHBs. POMMs are able to adjust for these possible similarities in response from staff within a DHB. Respondent DHB was used as a clustering factor to achieve this adjustment.
- Some of the demographic variables are closely related. For example, many of the female respondents were also nurses. This means that if gender was looked at in isola-

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<sup>ii</sup>Interpretation of correlation coefficients are explained in detail in Appendix B.

tion, any relationship discovered between being female and the outcome might be in part due to the proportionately high number of nurses in that group. POMMs allow multiple demographic variables to be analysed in a single model. This statistically adjusts for situations where one of the variables in the model (such as professional group) might be affecting the relationship between another variable (such as gender) and the outcome. The resulting odds ratios from these models are free from the influence of other variables included in the model.

The group being compared to in the models is identified by being labelled the *reference* group in the tables reporting the results from the models.

**Box:** Items and their scoring in the CGDI<sub>6</sub>.

- To your knowledge, has your DHB established governance structures that ensure a partnership between health professionals and management?
  - No = 0
  - Yes = 1
  - (Don't know is treated as missing data)
- To what extent are health professionals in your DHB involved in a partnership with management with shared decision making, responsibility and accountability?
  - No extent = 0
  - Some extent = 1
  - A great extent = 2
- To what extent are health professionals in your DHB involved as full active participants in the design of organisational processes?
  - No extent = 0
  - Some extent = 1
  - A great extent = 2
- To what extent do you believe that quality and safety is a goal of every clinical initiative in your DHB?
  - No extent = 0
  - Some extent = 1
  - A great extent = 2
- To what extent do you believe that quality and safety is a goal of every clinical resourcing or support initiative in your DHB?
  - No extent = 0
  - Some extent = 1
  - A great extent = 2
- To what extent has your DHB sought to give responsibility to your team for clinical service decision making in your clinical areas?
  - No extent = 0
  - Some extent = 1
  - A great extent = 2





### 3. Results

#### 3.1. Relationship between responses on generic questions on clinical governance and quality questions by DHB.

Figure 3.1 graphically depicts a correlation matrix illustrating the degree of relationship between responses on different questions in the CGAP survey. Each square in Figure 3.1 represents the correlation of the mean of responses across DHBs between two survey questions. The darker the square, the stronger the correlation. A strong correlation here indicates that if the mean response for one of the questions is high, the mean response in the other question is also likely to be high. White squares indicate little, if any, linear relationship between mean response in one question and mean response in the other.

More of an explanation on how to interpret correlations, and the actual numbers, are presented in Appendix B.

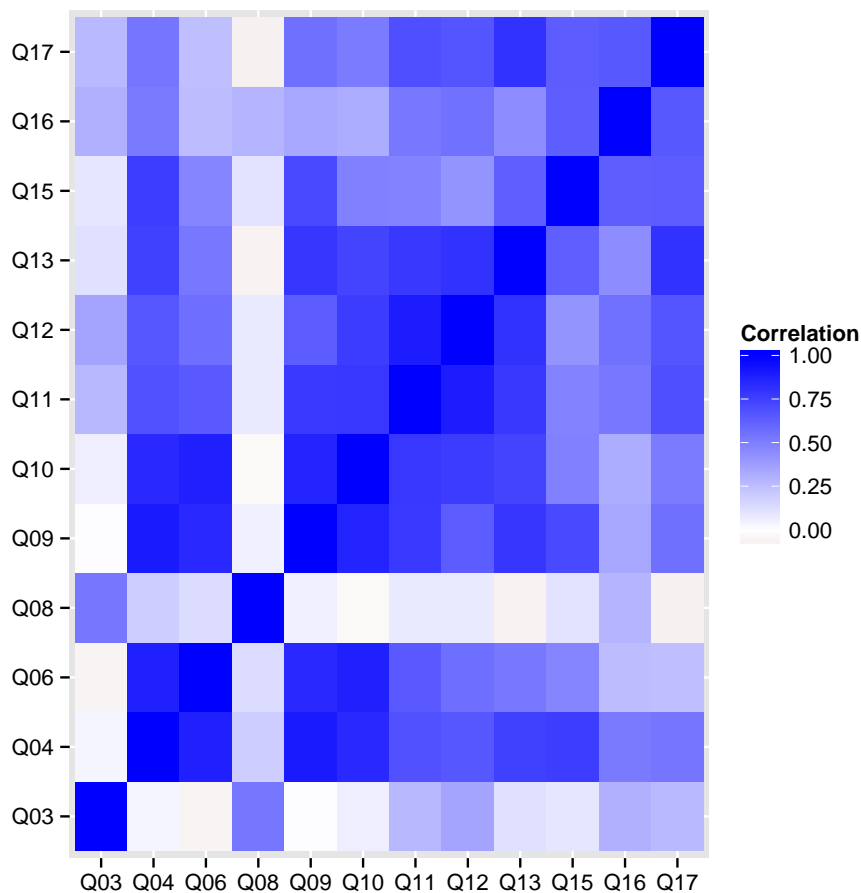
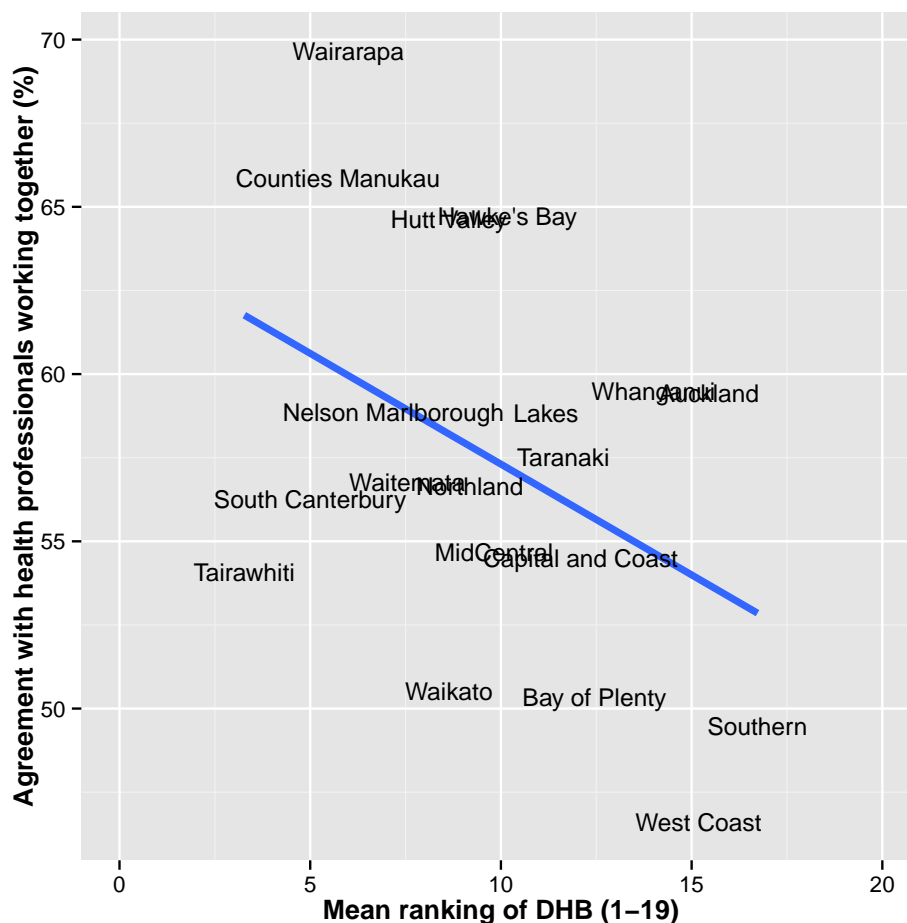


Figure 3.1.: Correlation between mean question responses.

To further assess whether any of the quality and safety questions were related to overall comparative performance of the DHB in clinical leadership development, the mean ranking for each DHB on CGAP survey items 3, 4, 5, 6, 8, 9, 10, 11, 12, 13 and 14<sup>i</sup> was correlated with the proportion of positive ('Agree strongly' and 'Agree slightly') responses for the quality and safety survey items (items 15, 16 and 17).

**Q15: Health professionals in this DHB work together as a well-coordinated team**

Figure 3.2 shows the relationship between percentage agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team' and mean DHB ranking across clinical leadership development survey items. Note that a numerically low ranking is more desirable, just as in a race. The scatterplot shown in Figure 3.2 shows a negative relationship, with mean ranking improving as percentage agreement with the statement increases. There is however a lot of variation, as evidenced by the number of DHBs with points far from the line of best fit. This is confirmed by the correlation ( $r = -0.42$ , 95% CI:  $-0.73 - 0.05$ ,  $p = 0.0761$ ), which is not statistically significant.

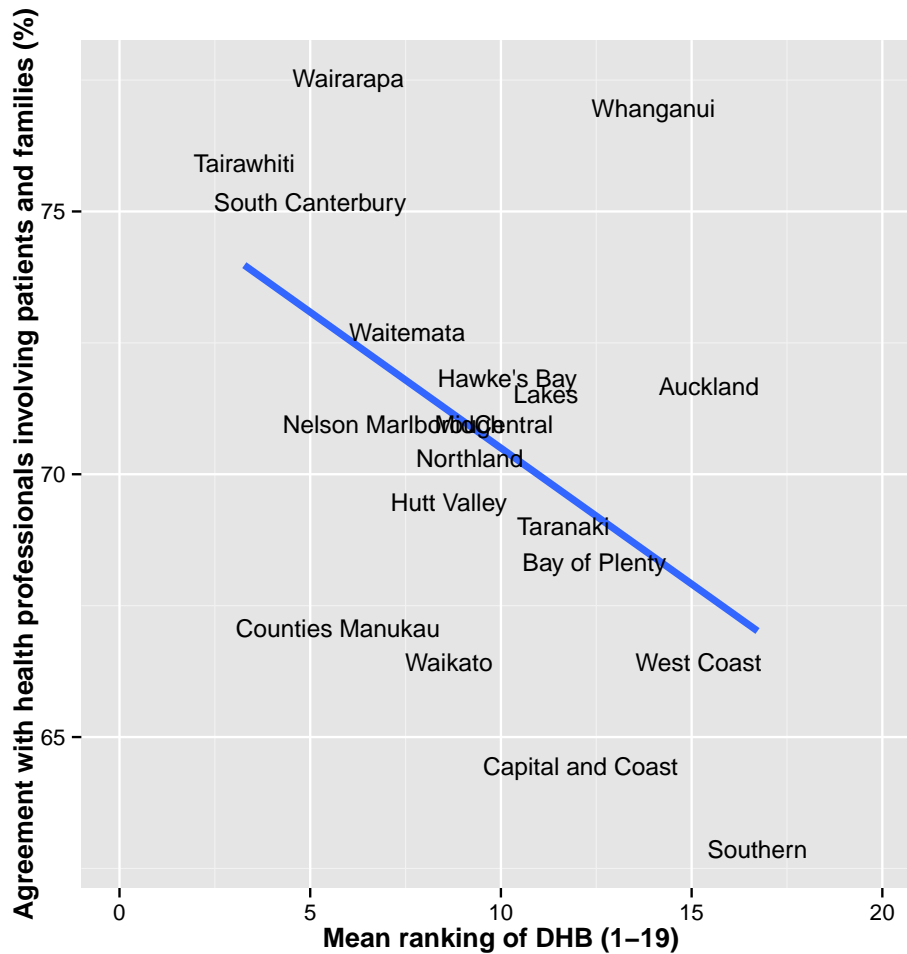


**Figure 3.2.:** Scatterplot of mean ranking of DHB and agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team'. The solid line is the line of best fit.

<sup>i</sup> These were the quantitative items in the survey which dealt with aspects of clinical leadership development.

**Q16: Health professionals in this DHB involve patients and families in efforts to improve patient care**

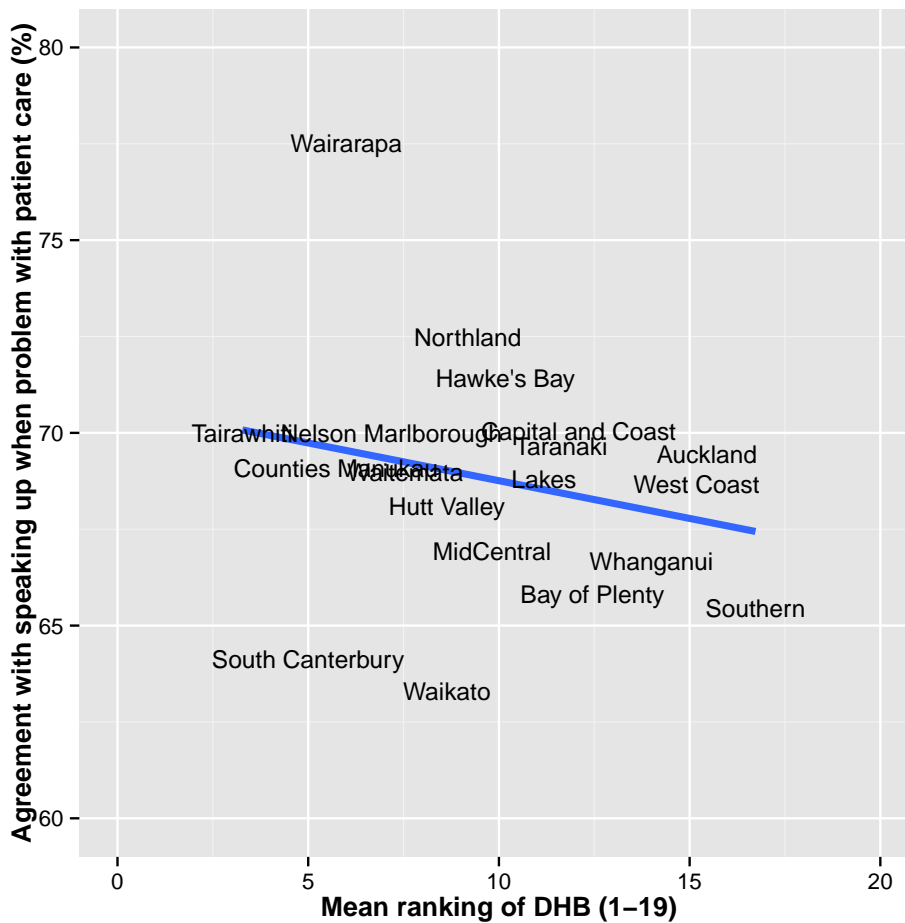
Figure 3.3 shows the relationship between percentage agreement with the statement ‘Health professionals in this DHB involve patients and families in efforts to improve patient care’ and mean DHB ranking across clinical leadership development survey items. Note that a numerically low ranking is more desirable, just as in a race. The scatterplot shown in Figure 3.3 shows a negative relationship, with mean ranking improving as percentage agreement with the statement increases. While there is still some variation, the number of DHBs close to the line of best fit has increased. This is confirmed by the correlation ( $r = -0.48$ , 95% CI:  $-0.77 - -0.03$ ,  $p = 0.0388$ ), which is statistically significant.



**Figure 3.3.:** Scatterplot of mean ranking of DHB and agreement with the statement ‘Health professionals in this DHB involve patients and families in efforts to improve patient care’. The solid line is the line of best fit.

**Q17: In this clinical area, it is easy to speak up if I perceive a problem with patient care**

Figure 3.4 shows the relationship between percentage agreement with the statement ‘In this clinical area, it is easy to speak up if I perceive a problem with patient care’ and mean DHB ranking across clinical leadership development survey items. Note that a numerically low ranking is more desirable, just as in a race. The scatterplot shown in Figure 3.4 shows a slight negative relationship, with mean ranking improving as percentage agreement with the statement increases. The correlation of  $r = -0.23$  (95% CI:  $-0.62 - 0.25$ ,  $p = 0.3408$ ) is not statistically significant.



**Figure 3.4.:** Scatterplot of mean ranking of DHB and agreement with the statement ‘In this clinical area, it is easy to speak up if I perceive a problem with patient care’. The solid line is the line of best fit.

### 3.1.1. Mean DHB ranking and the Clinical Governance Development Index in the CGAP survey

Data from respondents with any missing responses (or 'Don't know' responses) in the items which made up the CGDI<sub>6</sub> scores were removed. This left 4988 records (48%).

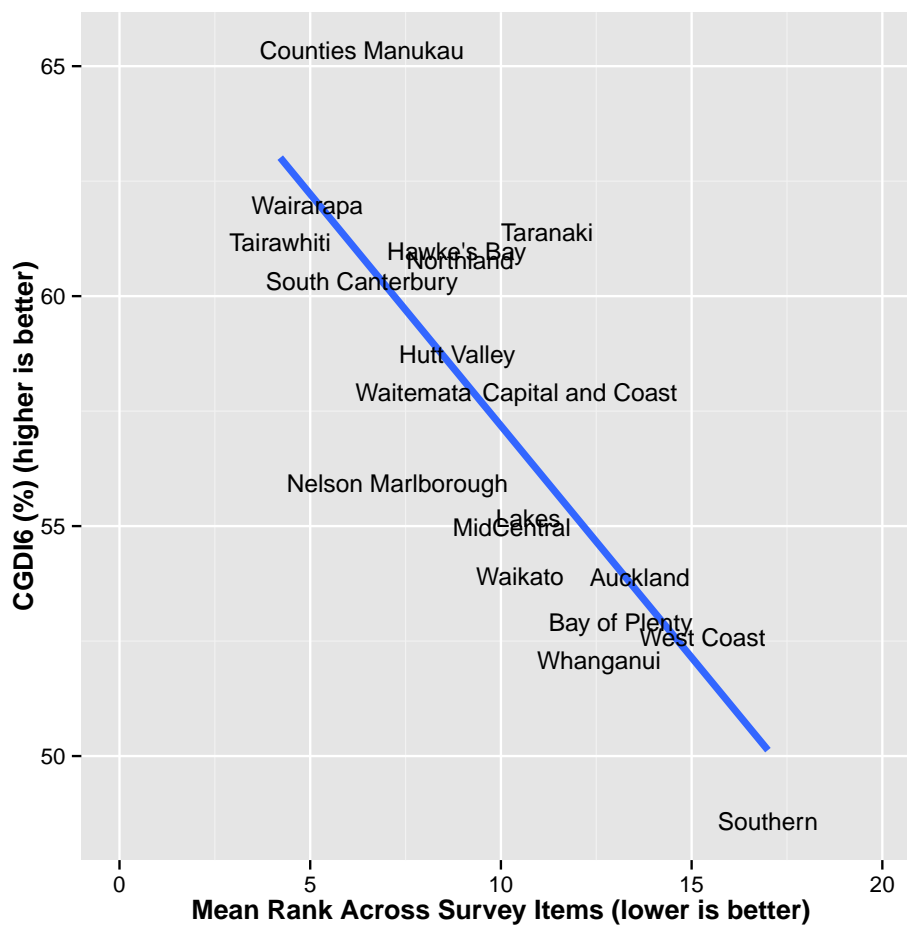
The mean CGDI<sub>6</sub> of the 19 DHBs was 57%. The correlation between the CGDI<sub>6</sub> scores and the mean ranking for each DHB on CGAP survey items 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17<sup>ii</sup> was -0.81 (95% confidence interval: -0.92 – -0.56,  $p = 0.0000$ ). The negative correlation indicates that as CGDI<sub>6</sub> score increased, mean ranking (as a number) decreased. In other words, DHBs with a higher CGDI<sub>6</sub> score tended to have a better mean ranking on CGAP survey items than DHBs with a lower CGDI<sub>6</sub> score. The relationship between mean ranking and CGDI<sub>6</sub> score is shown in Table 3.1.

**Table 3.1.:** Mean ranking and CGDI<sub>6</sub> score for each DHB in the CGAP survey.

DHB	Mean ranking	Median ranking	Lowest ranking	Highest ranking	CGDI <sub>6</sub> score
Tairāwhiti	4	4	15	2	61%
Wairarapa	5	1	15	1	62%
Counties Manukau	6	6	15	2	65%
South Canterbury	6	4	18	1	60%
Nelson Marlborough	7	7	17	2	56%
Waitemata	8	8	12	3	58%
Hawke's Bay	9	10	15	3	61%
Hutt Valley	9	8	18	1	59%
Northland	9	10	14	2	61%
MidCentral	10	10	17	2	55%
Waikato	10	10	19	3	54%
Lakes	11	12	16	3	55%
Taranaki	11	11	19	1	61%
Capital and Coast	12	12	18	4	58%
Whanganui	13	15	18	2	52%
Bay of Plenty	13	14	17	5	53%
Auckland	14	14	19	6	54%
West Coast	15	17	19	7	53%
Southern	17	18	19	6	49%

The high correlation between the CGDI<sub>6</sub> score and DHB ranking across survey questions emphasises the value of the CGDI as a comparative measurement tool for clinical governance development. The CGDI did appear to distinguish between DHBs who performed better overall in the survey and those DHBs which did not. While the range of items in the CGAP survey allow for a nuanced view of clinical governance development within a DHB, the findings here suggest that the CGDI could be a useful and valid summary comparative indicator for clinical governance development.

<sup>ii</sup>These were the quantitative items in the survey which did not deal with respondent demographics.

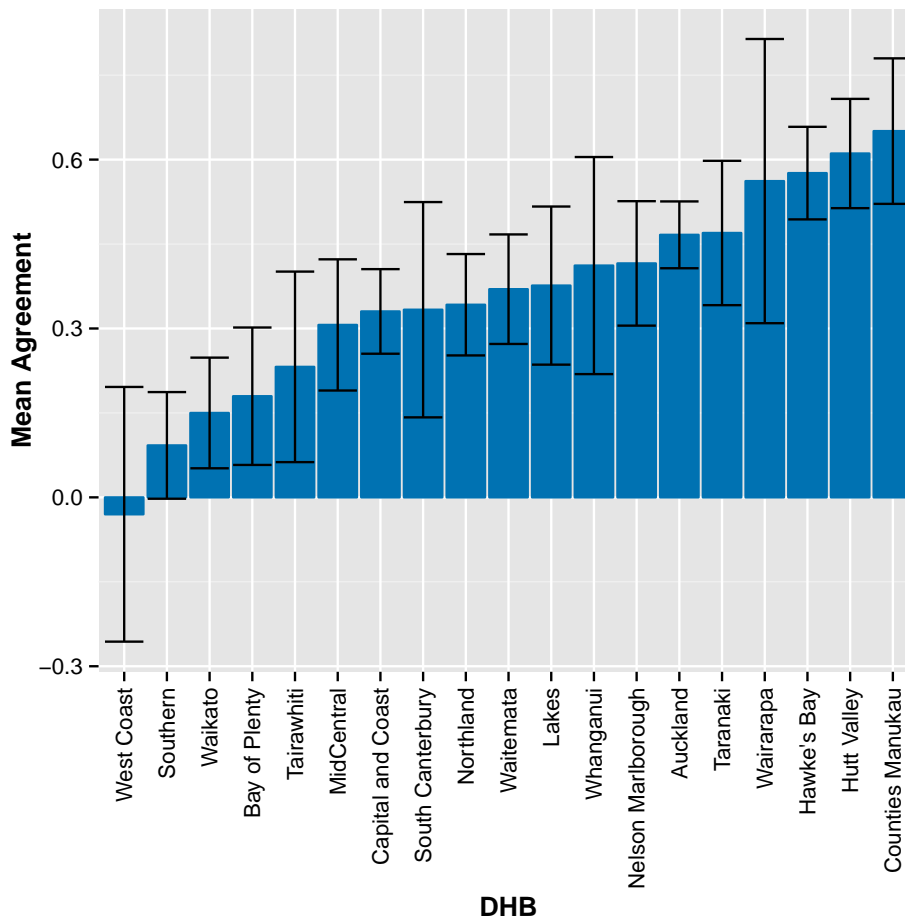


**Figure 3.5.:** Scatterplot of mean DHB ranking across CGAP survey items against DHB CGDI<sub>6</sub> score. The solid line is the line of best fit.

## 3.2. Analysis of differences between DHBS on safety & quality questions.

### 3.2.1. Q.15: Health professionals in this DHB work together as a well-coordinated team

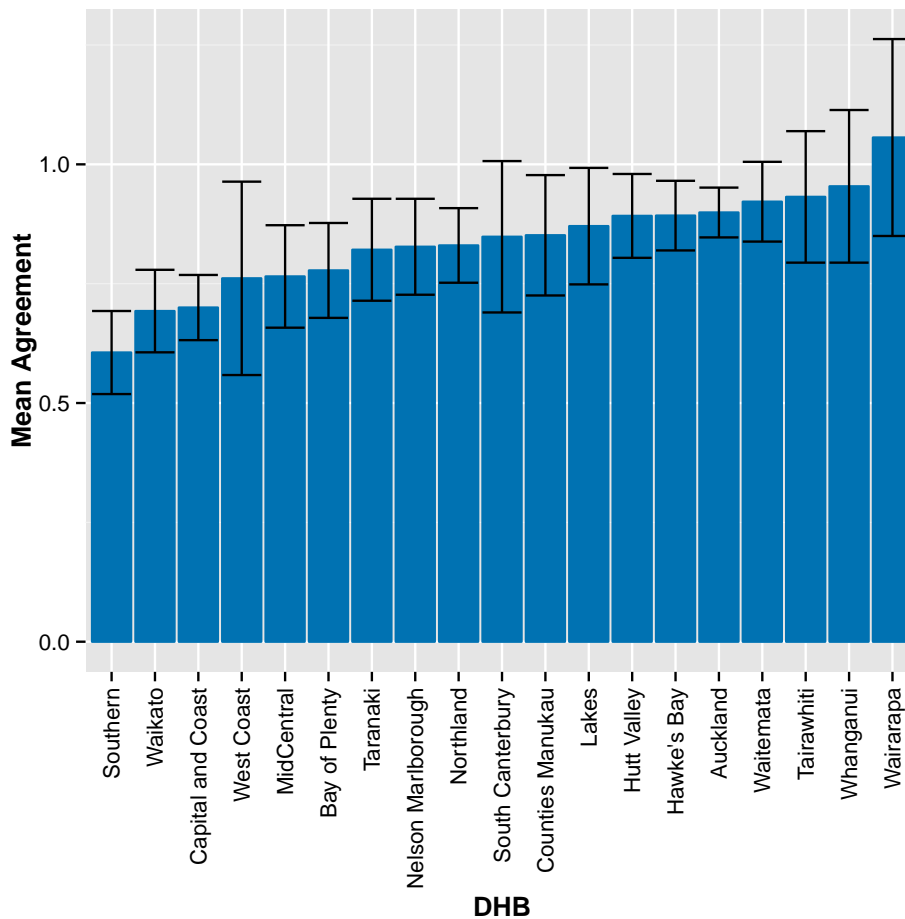
Figure 3.6 shows the mean level of agreement to this statement for each DHB. The mean level of agreement to this statement across the DHBS was 0.37 (95% CI: 0.34 – 0.39). There were statistically significant differences between DHBS in their mean agreement ( $F(18, 9254) = 8.85, p = 0.0000$ ). See Appendix C.1 for more detail on the model used to evaluate this and individual DHB results.



**Figure 3.6.:** Mean agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' by DHB (95% confidence intervals).

### 3.2.2. Q.16: Health professionals in this DHB involve patients and families in efforts to improve patient care

Figure 3.7 shows the mean level of agreement with this statement for each DHB. The mean level of agreement to this statement across the DHBs was 0.82 (95% CI: 0.80 – 0.84). There were statistically significant differences between DHBs in their mean agreement ( $F(18, 9252) = 4.50, p = 0.0000$ ). See Appendix C.2 for more detail on the model used to evaluate this and individual DHB results.

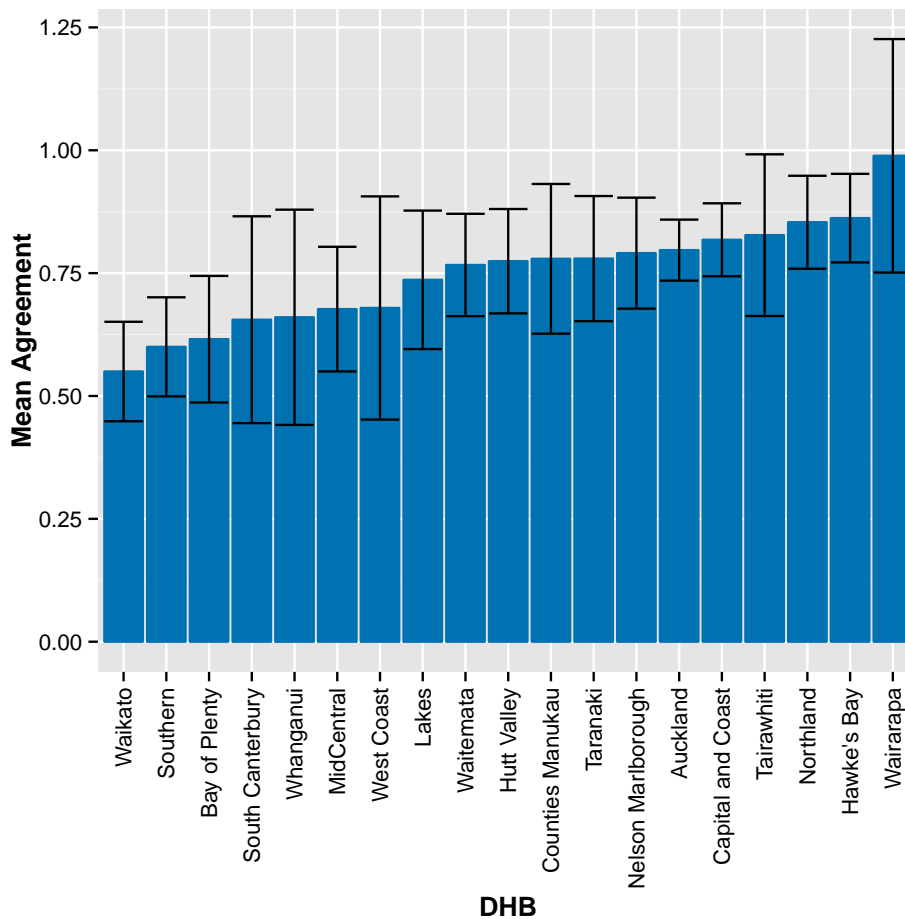


**Figure 3.7.:** Mean agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' by DHB (95% confidence intervals).



### 3.2.3. Q.17: In this clinical area, it is easy to speak up if I perceive a problem with patient care

Figure 3.8 shows the mean level of agreement with this statement for each DHB. The mean level of agreement to this statement across the DHBs was 0.75 (95% CI: 0.73 – 0.78). There were statistically significant differences between DHBs in their mean agreement ( $F(18, 9246) = 3.03, p = 0.0000$ ). See Appendix C.3 for more detail on the model used to evaluate this and individual DHB results.



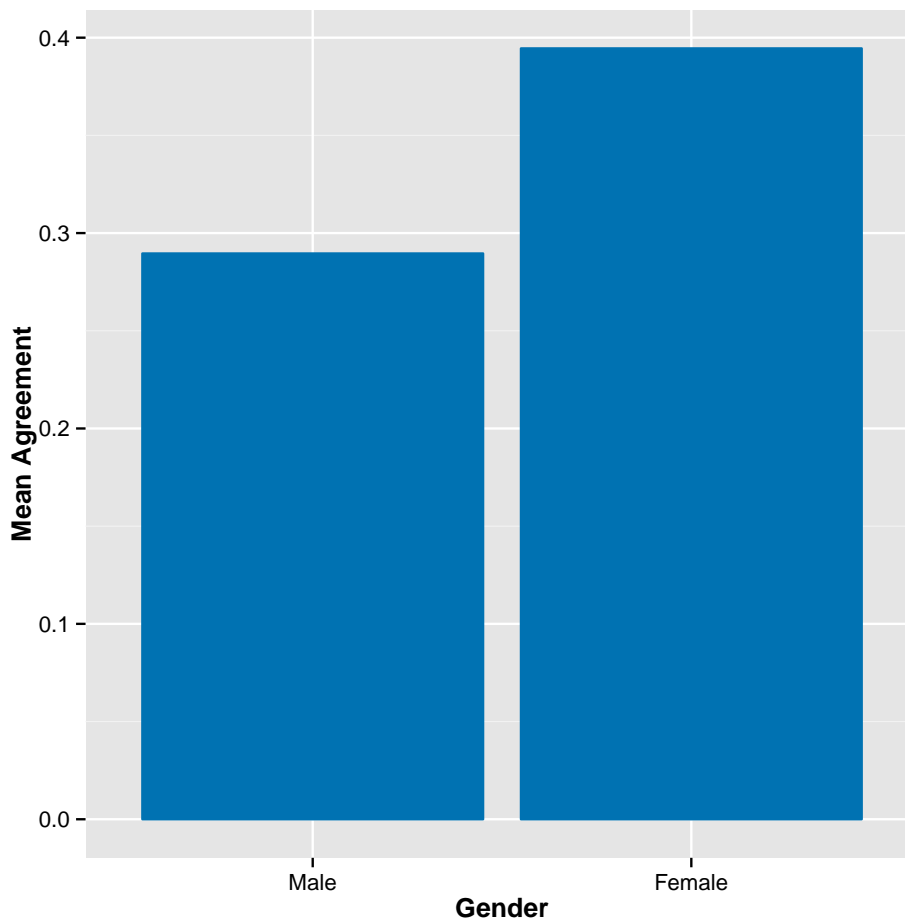
**Figure 3.8.:** Mean agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' by DHB (95% confidence intervals).

### 3.3. Relationships between demographic variables and performance on quality questions

#### 3.3.1. Q.15: Health professionals in this DHB work together as a well-coordinated team

##### Gender

The mean level of agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' was 0.37. The mean level of agreement for each gender is presented in Figure 3.9.

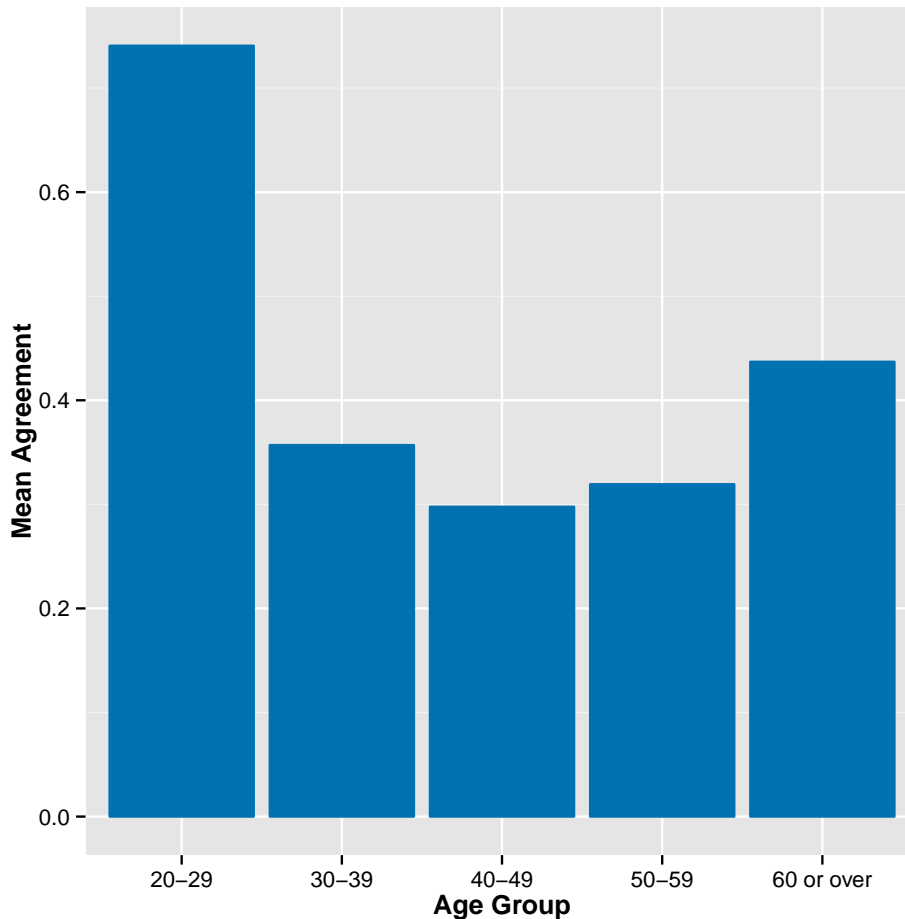


**Figure 3.9.:** Mean agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' by gender.

A proportional odds mixed model was fitted to identify a potential association between gender and agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team' whilst adjusting for the correlation between members of the same DHB. This model yielded an Odds Ratio for female compared to male respondents of 1.15 (95% CI:1.05 – 1.25,  $p = 0.0026$ ). This means that female respondents were statistically significantly more likely to respond more positively to this question than male respondents.

## Age

The mean level of agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' was 0.37. The mean level of agreement for each age group is presented in Figure 3.10.



**Figure 3.10.:** Mean agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' by age group.

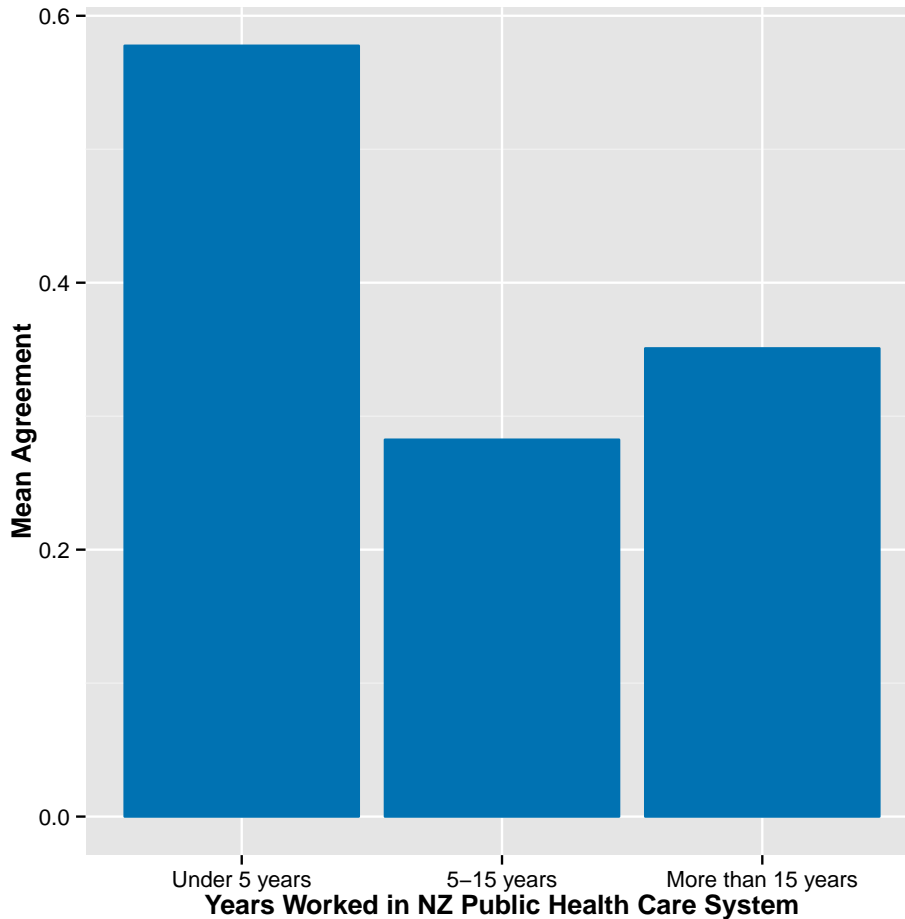
A proportional odds mixed model was fitted to identify a potential association between age group and agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team' whilst adjusting for the correlation between members of the same DHB. Table 3.2 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the age groups to respondents in the '20-29' age category (which is referred to as the reference category in Table 3.2). Each of the age groups has an odds ratio statistically significantly below one, which indicates that they are less likely to respond positively to the statement 'Health professionals in this DHB work together as a well-coordinated team' than respondents in the 20-29 age group.

**Table 3.2.:** Results of the proportional odds mixed model for relationship between age group and agreement with the statement ‘Health professionals in this DHB work together as a well-coordinated team’.

Age group	Odds ratio	95% CI	<i>p</i> =
20–29	reference		
30–39	0.56	0.49–0.65	0.0000
40–49	0.53	0.46–0.61	0.0000
50–59	0.55	0.48–0.63	0.0000
60 or over	0.64	0.54–0.76	0.0000

### Years Worked In NZ Public Health Care System

The mean level of agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' was 0.37. The mean level of agreement for each experience category is presented in Figure 3.11.



**Figure 3.11.:** Mean agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' by years worked in NZ public health care system.

A proportional odds mixed model was fitted to identify a potential association between years of experience and agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team' whilst adjusting for the correlation between members of the same DHB. Table 3.3 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the experience groups to respondents in the 'Under 5 years' experience category (which is referred to as the reference category in Table 3.3). Each of the experience groups has an odds ratio statistically significantly below one, which indicates that they are less likely to respond positively to the statement 'Health professionals in this DHB work together as a well-coordinated team' than respondents in the 'Under 5 years' group.

**Table 3.3.:** Results of the proportional odds mixed model for relationship between years of experience and agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team'.

<b>Years of experience</b>	<b>Odds ratio</b>	<b>95% CI</b>	<b>p =</b>
Under 5 years	reference		
5–15 years	0.66	0.59–0.73	0.0000
More than 15 years	0.74	0.67–0.82	0.0000

A proportional odds mixed model was fitted to identify a potential association between years of experience and agreement with the statement ‘Health professionals in this DHB work together as a well-coordinated team’ whilst adjusting for the correlation between members of the same DHB. Table 3.4 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the experience groups to respondents in the ‘Under 5 years’ experience category (which is referred to as the reference category in Table 3.4). Each of the experience groups has an odds ratio statistically significantly below one, which indicates that they are less likely to respond positively to the statement ‘Health professionals in this DHB work together as a well-coordinated team’ than respondents in the ‘Under 5 years’ group.

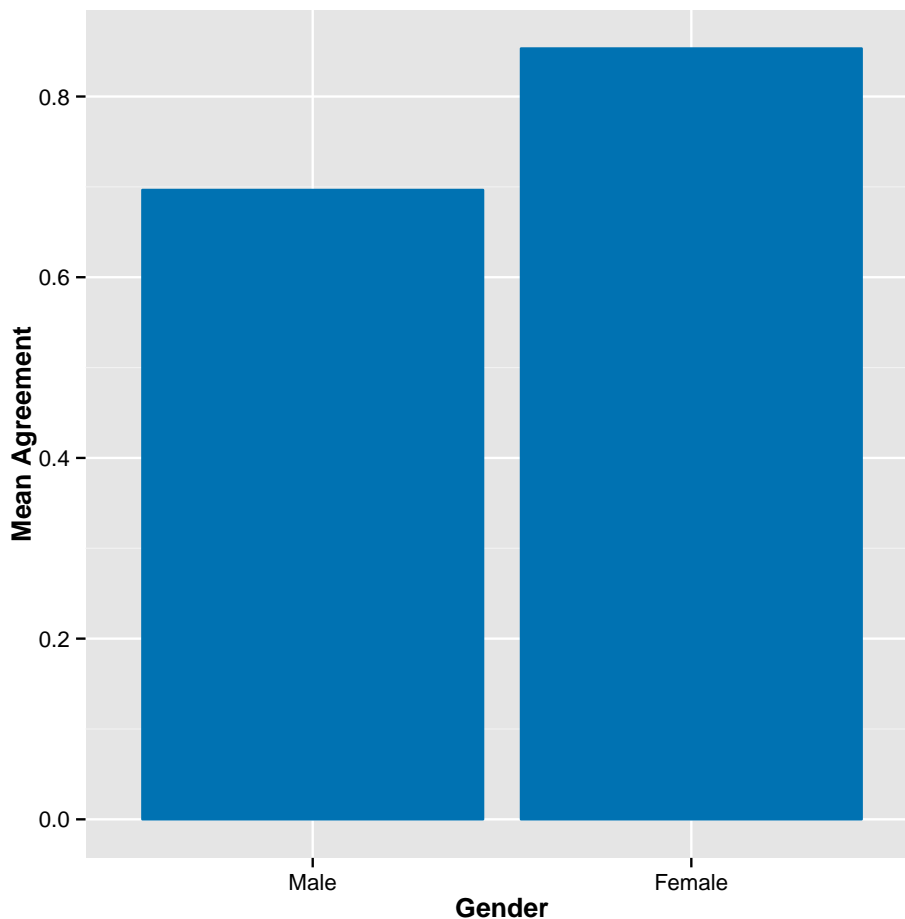
**Table 3.4.:** Results of the proportional odds mixed model for relationship between gender, age and years of experience and agreement with the statement ‘Health professionals in this DHB work together as a well-coordinated team’.

	Odds ratio	95% CI	p =
<b>Gender</b>			
Female	reference		
<b>Age</b>			
20–29 years	reference		
<b>Years of experience</b>			
Under 5 years	reference		
5–15 years	1.15	1.05–1.25	0.0031
More than 15 years	0.64	0.55–0.75	0.0000

### 3.3.2. Q.16: Health professionals in this DHB involve patients and families in efforts to improve patient care

#### Gender

The mean level of agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' was 0.82. The mean level of agreement for each gender is presented in Figure 3.12.



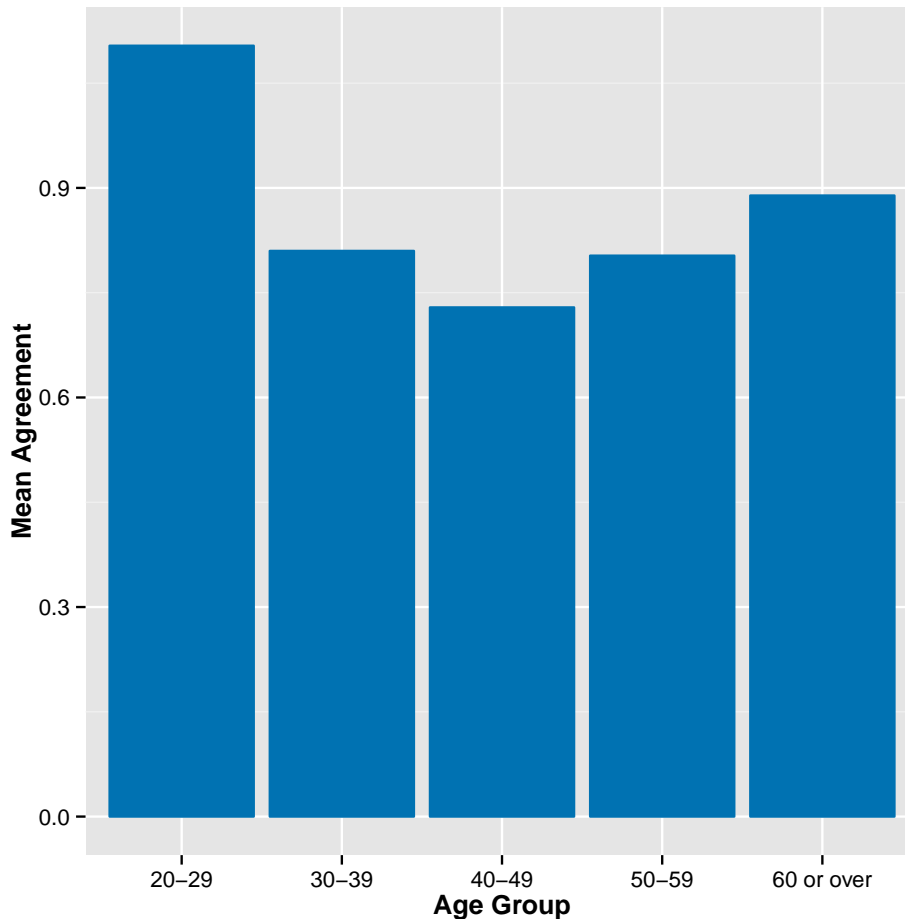
**Figure 3.12.:** Mean agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' by gender.

A proportional odds mixed model was fitted to identify a potential association between gender and agreement with the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' whilst adjusting for the correlation between members of the same DHB. This model yielded an Odds Ratio for female compared to male respondents of 1.33 (95% CI:1.22 – 1.45,  $p = 0.00$ ). This means that female respondents were statistically significantly more likely to respond more positively to this question than male respondents.



## Age

The mean level of agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' was 0.82. The mean level of agreement for each age group is presented in Figure 3.13.



**Figure 3.13.:** Mean agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' by age group.

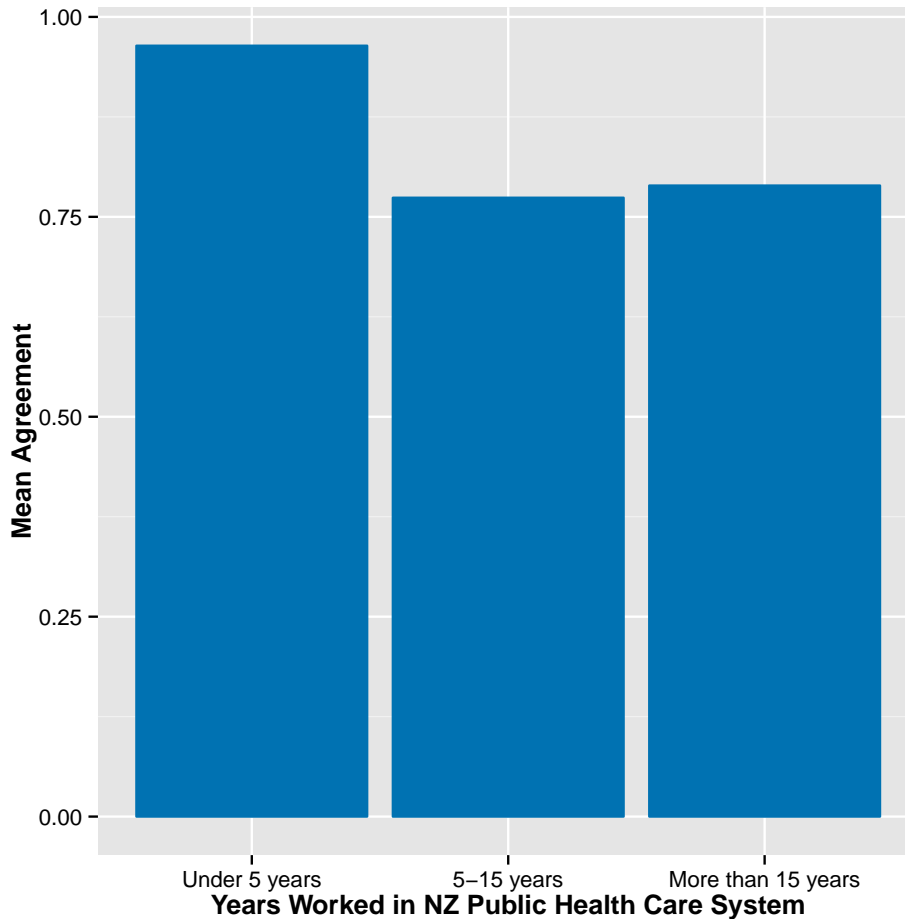
A proportional odds mixed model was fitted to identify a potential association between age group and agreement with the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' whilst adjusting for the correlation between members of the same DHB. Table 3.5 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the age groups to respondents in the '20-29' age category (which is referred to as the reference category in Table 3.5). Each of the age groups has an odds ratio statistically significantly below one, which indicates that they are less likely to respond positively to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' than respondents in the 20-29 age group.

**Table 3.5.:** Results of the proportional odds mixed model for relationship between age group and agreement with the statement ‘Health professionals in this DHB involve patients and families in efforts to improve patient care’.

Age group	Odds ratio	95% CI	<i>p</i> =
20–29	reference		
30–39	0.62	0.54–0.72	0.0000
40–49	0.55	0.48–0.64	0.0000
50–59	0.63	0.55–0.72	0.0000
60 or over	0.70	0.59–0.83	0.0000

### Years Worked In NZ Public Health Care System

The mean level of agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' was 0.82. The mean level of agreement by years of experience is presented in Figure 3.14.



**Figure 3.14.:** Mean agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' by years worked in NZ public health care system.

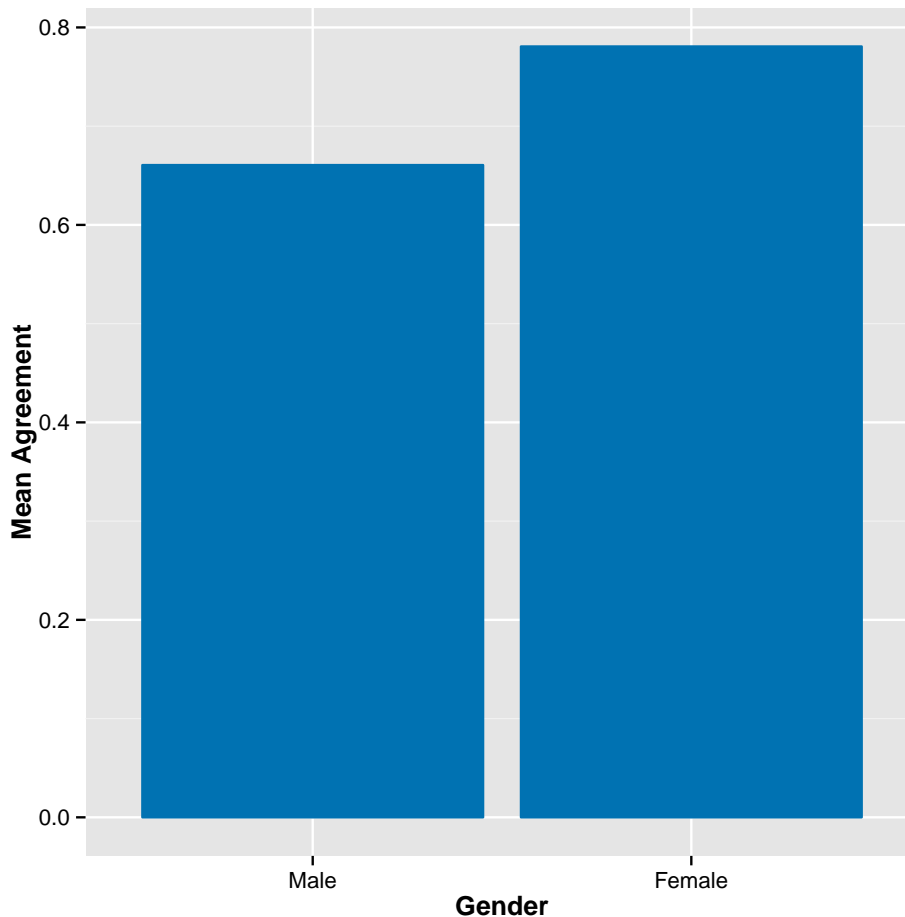
A proportional odds mixed model was fitted to identify a potential association between years of experience and agreement with the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' whilst adjusting for the correlation between members of the same DHB. Table 3.6 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the experience groups to respondents in the 'Under 5 years' experience category (which is referred to as the reference category in Table 3.6). Each of the experience groups has an odds ratio statistically significantly below one, which indicates that they are less likely to respond positively to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' than respondents in the 'Under 5 years' group.

**Table 3.6.:** Results of the proportional odds mixed model for relationship between years of experience and agreement with the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care'.

<b>Years of experience</b>	<b>Odds ratio</b>	<b>95% CI</b>	<b><i>p</i> =</b>
Under 5 years	reference		
5–15 years	0.74	0.67–0.82	0.0000
More than 15 years	0.75	0.68–0.83	0.0000

**3.3.3. Q.17: In this clinical area, it is easy to speak up if I perceive a problem with patient care****Gender**

The mean level of agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' was 0.75. The mean level of agreement by gender is presented in Figure 3.15.

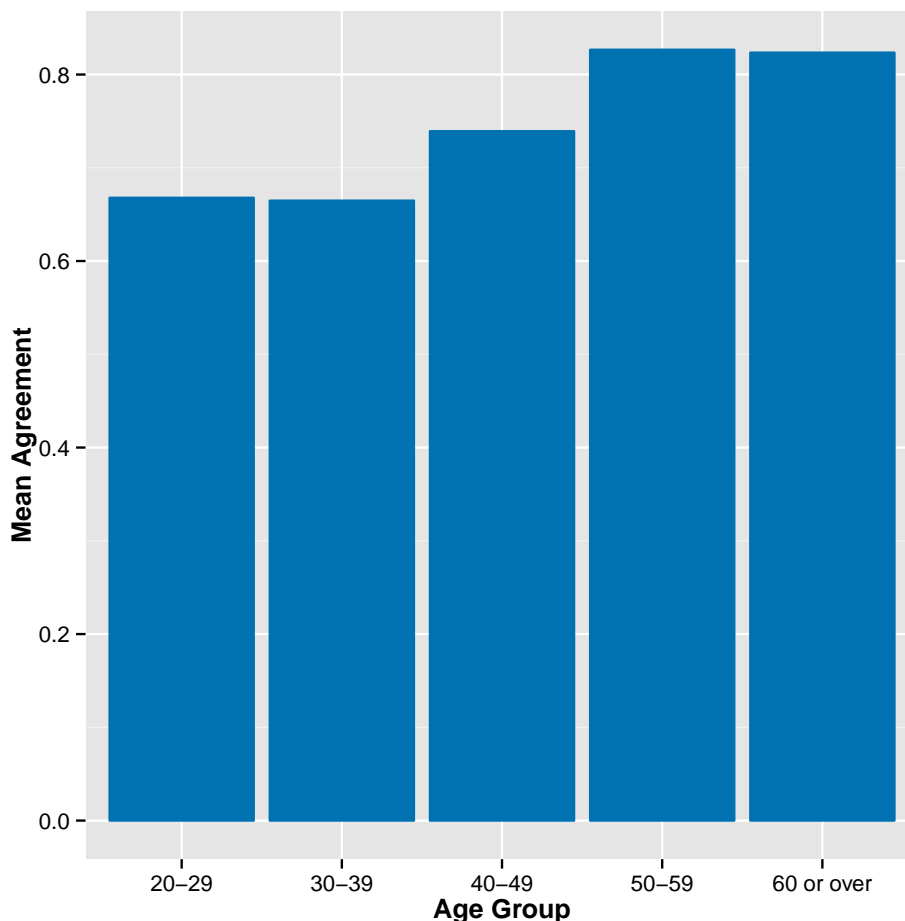


**Figure 3.15.:** Mean agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' by gender.

A proportional odds mixed model was fitted to identify a potential association between gender and agreement with the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' whilst adjusting for the correlation between members of the same DHB. This model yielded an Odds Ratio for female compared to male respondents of 1.18 (95% CI:1.08 – 1.29,  $p = 0.0002$ ). This means that female respondents were statistically significantly more likely to respond more positively to this question than male respondents.

## Age

The mean level of agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' was 0.75. The mean level of agreement for each age group is presented in Figure 3.16.



**Figure 3.16.:** Mean agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' by age group.

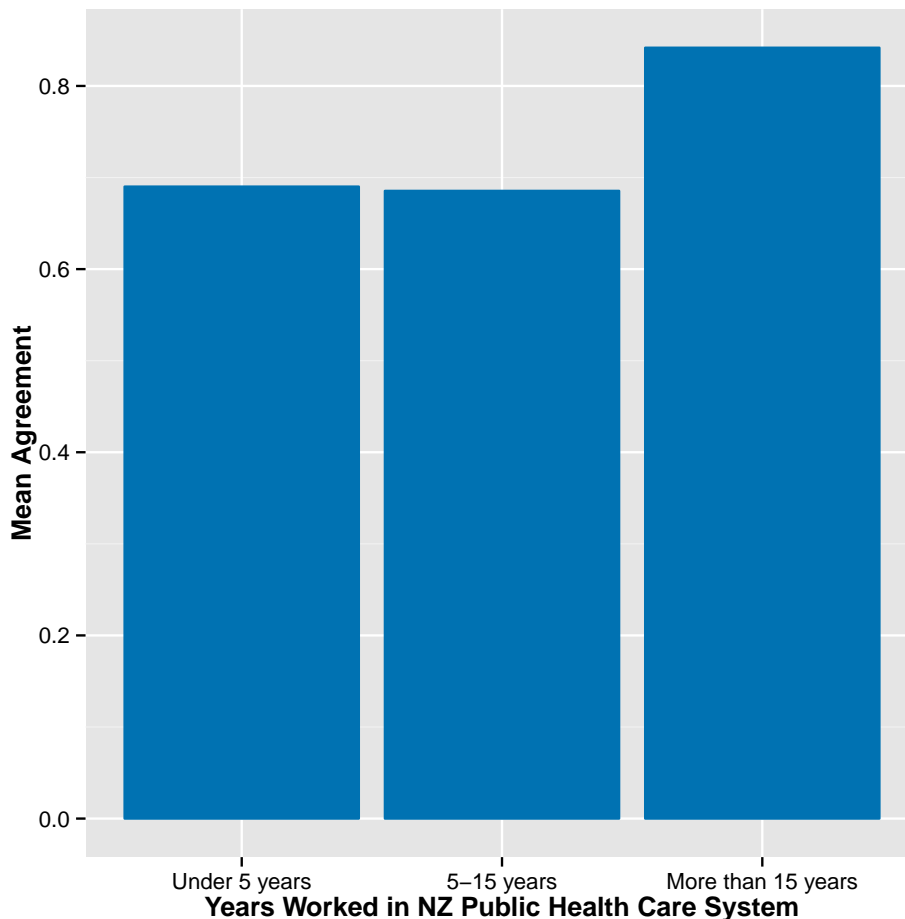
A proportional odds mixed model was fitted to identify a potential association between age group and agreement with the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' whilst adjusting for the correlation between members of the same DHB. Table 3.7 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the age groups to respondents in the '20-29' age category (which is referred to as the reference category in Table 3.7). The age groups for 40 and over have an odds ratio statistically significantly above one, which indicates that they are more likely to respond positively to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' than respondents in the 20-29 age group. The odds ratio for respondents in the 30-39 age group is not statistically significantly different from one.

**Table 3.7.:** Results of the proportional odds mixed model for relationship between age group and agreement with the statement ‘In this clinical area, it is easy to speak up if I perceive a problem with patient care’.

Age group	Odds ratio	95% CI	<i>p</i> =
20–29	reference		
30–39	1.03	0.89–1.19	0.7056
40–49	1.20	1.05–1.38	0.0071
50–59	1.38	1.20–1.58	0.0000
60 or over	1.33	1.13–1.57	0.0007

### Years Worked In NZ Public Health Care System

The mean level of agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' was 0.75. The mean level of agreement by years of experience is presented in Figure 3.17.



**Figure 3.17.:** Mean agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' by years worked in NZ public health care system.

A proportional odds mixed model was fitted to identify a potential association between years of experience and agreement with the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' whilst adjusting for the correlation between members of the same DHB. Table 3.8 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the experience groups to respondents in the 'Under 5 years' experience category (which is referred to as the reference category in Table 3.8). The 'More than 15 years' experience group has an odds ratio statistically significantly above one, which indicates that those respondents are more likely to respond positively to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' than respondents in the 'Under 5 years' group. The odds ratio for the respondents in the '5-15 years' is not statistically significantly different to one.



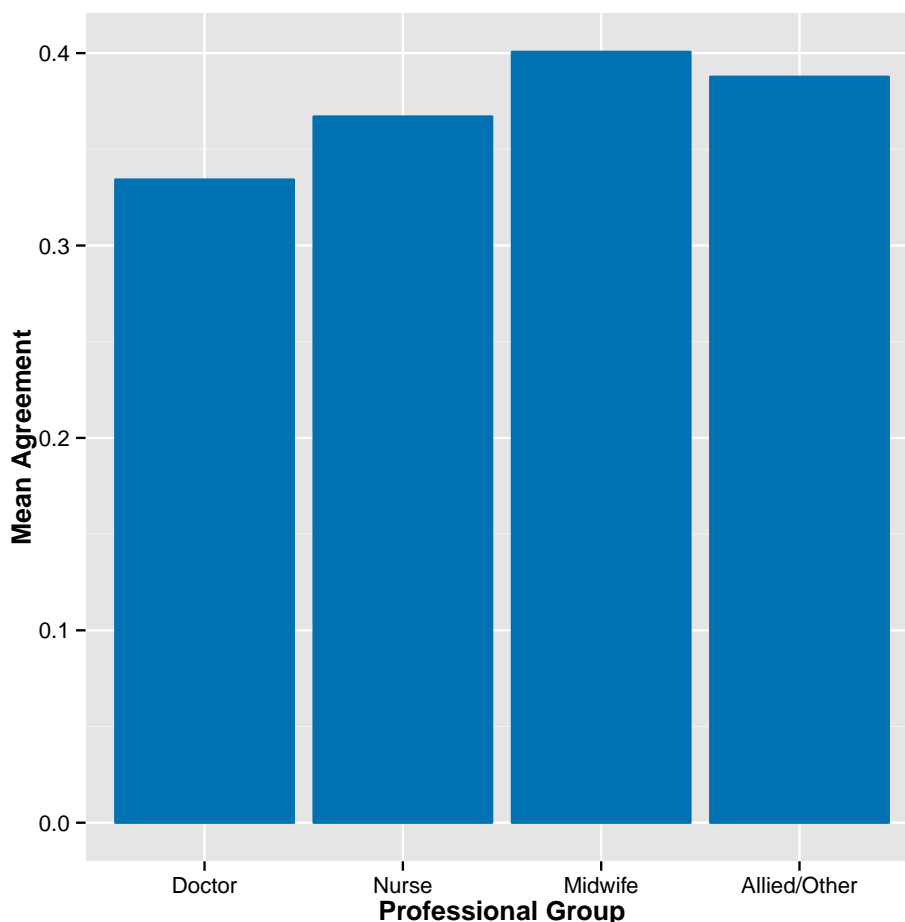
**Table 3.8.:** Results of the proportional odds mixed model for relationship between years of experience and agreement with the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care'.

<b>Years of experience</b>	<b>Odds ratio</b>	<b>95% CI</b>	<b>p =</b>
Under 5 years	reference		
5–15 years	1.06	0.96–1.17	0.2623
More than 15 years	1.35	1.22–1.49	0.0000

### 3.4. Analysis of relationships between professional groups and performance on quality questions.

#### 3.4.1. Q.15: Health professionals in this DHB work together as a well-coordinated team

The mean level of agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' was 0.37. The mean level of agreement for each professional group is presented in Figure 3.18.



**Figure 3.18.:** Mean agreement to the statement 'Health professionals in this DHB work together as a well-coordinated team' by professional group.

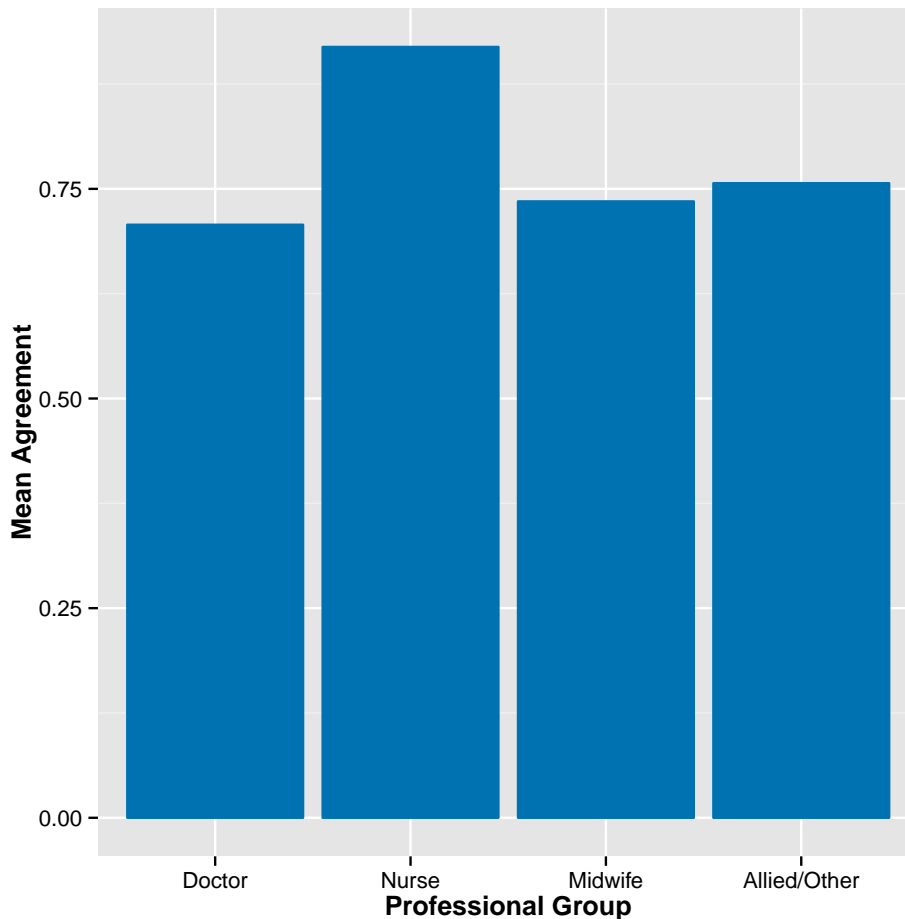
A proportional odds mixed model was fitted to identify a potential association between professional group and agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team' whilst adjusting for the correlation between members of the same DHB. Table 3.9 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the professional groups to Doctors (which is referred to as the reference category in Table 3.9). None of the other professional groups had odds ratios statistically significantly different from one, indicating a lack of difference in the odds of responding positively to the statement.

**Table 3.9.:** Results of the proportional odds mixed model for relationship between professional group and agreement with the statement 'Health professionals in this DHB work together as a well-coordinated team'.

<b>Professional group</b>	<b>Odds ratio</b>	<b>95% CI</b>	<b>p =</b>
Doctor	reference		
Nurse	1.07	0.97–1.19	0.1758
Midwife	1.12	0.90–1.39	0.3218
Allied/Other	1.04	0.94–1.16	0.4402

### 3.4.2. Q.16: Health professionals in this DHB involve patients and families in efforts to improve patient care

The mean level of agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' was 0.82. The mean level of agreement for each professional group is presented in Figure 3.19.



**Figure 3.19.:** Mean agreement to the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' by professional group.

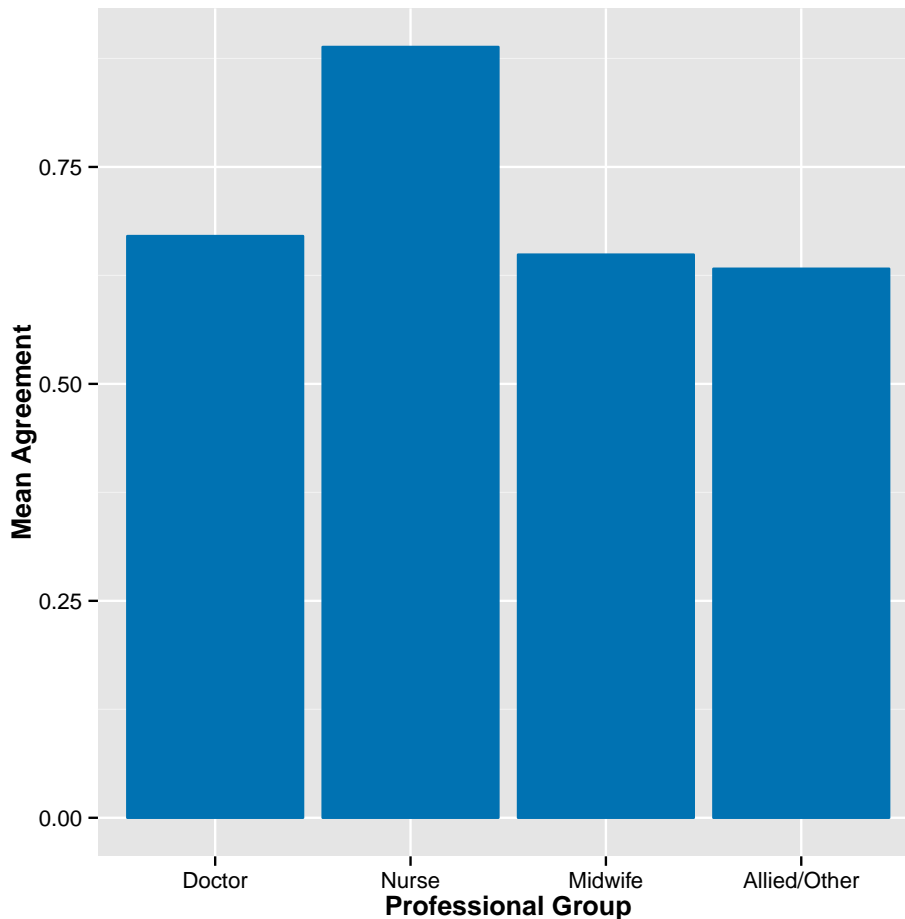
A proportional odds mixed model was fitted to identify a potential association between professional group and agreement with the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' whilst adjusting for the correlation between members of the same DHB. Table 3.10 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the professional groups to Doctors (which is referred to as the reference category in Table 3.10). Only Nurses had statistically significantly different odds for responding positively to this statement, with Nurses more likely to respond positively.

**Table 3.10.:** Results of the proportional odds mixed model for relationship between professional group and agreement with the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care'.

Professional group	Odds ratio	95% CI	<i>p</i> =
Doctor	reference		
Nurse	1.49	1.34–1.65	0.0000
Midwife	1.11	0.89–1.39	0.3431
Allied/Other	1.06	0.96–1.18	0.2491

### 3.4.3. Q.17: In this clinical area, it is easy to speak up if I perceive a problem with patient care

The mean level of agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' was 0.75. The mean level of agreement for each professional group is presented in Figure 3.20.



**Figure 3.20.:** Mean agreement to the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' by professional group.

A proportional odds mixed model was fitted to identify a potential association between professional group and agreement with the statement 'Health professionals in this DHB involve patients and families in efforts to improve patient care' whilst adjusting for the correlation between members of the same DHB. Table 3.11 shows the results from this model. This model compares the odds of responding more positively to the statement in each of the professional groups to Doctors (which is referred to as the reference category in Table 3.11). Only Nurses had statistically significantly different odds for responding positively to this statement, with Nurses more likely to respond positively.

**Table 3.11.:** Results of the proportional odds mixed model for relationship between professional group and agreement with the statement 'In this clinical area, it is easy to speak up if I perceive a problem with patient care'.

Professional group	Odds ratio	95% CI	<i>p</i> =
Doctor	reference		
Nurse	1.44	1.30–1.59	0.0000
Midwife	1.02	0.82–1.28	0.8654
Allied/Other	0.91	0.82–1.01	0.0783





## 4. Discussion

The inclusion of three quality and safety questions in the CGAP survey has provided useful baseline information. Fifty-seven percent of respondents believed health professionals in their DHB work as well coordinated teams. While this could certainly be viewed as a very good start, in the current context of emphasising teamwork, particularly given the increasing demands of chronic disease and multi-morbidity, and of enhancing the patient experience, this result suggests considerable room for improvement. While the perceptions of respondents from some DHBs were more positive than others, there is an obvious demand for national policy makers and agencies, DHB leaders, professional group representatives, and clinical training providers to consider methods for enhancing teamwork where appropriate and, very importantly, the barriers to teamwork. It could be useful to look in more depth at DHBs and services areas where teamwork is more established, with an aim of developing good examples that could be learned from and shared across the DHB sector.

Seventy percent of respondents agreed health professionals involve patients and families in efforts to improve patient care. This is positive but there is obvious room for improvement for the reason that all health professionals and the DHBs they are employed by should be working toward this. Given that patient (or consumer) involvement is a relatively recent addition to the national policy agenda, and that many DHBs have plans for this under development, the results of any follow up study should show significant improvements. While earlier studies suggest a lack of clarity around how to involve patients and the results to be expected,<sup>44,45</sup> recent efforts point to a focus on the patient experience, from enhancing clinical-patient relationships through to involvement in service design and governance,<sup>30,46,47</sup> as Bisognano suggests:

‘At truly patient-centered organizations, patient and family input and engagement are both welcomed and sought out as an integral part of the operations and culture, and staff are respectful to all patients and families, all of the time. In such organizations, patients and families participate on improvement committees, on board committees, in patient and family advisory groups and in other ways to ensure that patients play an active role in all decisions related to improvement’<sup>48</sup>

Sixty-nine percent of respondents agreed it was easy to speak up about problems with patient care. Again, this gives reason for optimism but also indicates that a solid minority are not comfortable raising patient safety concerns with their peers or superiors. Yet an emerging literature shows links between the ‘patient safety climate’ and safer health care.<sup>49</sup> Several studies also provide useful guidance for how to promote and improve the safety climate.<sup>50-53</sup>

The more detailed analysis of the three quality and safety questions contained in this report revealed some important findings. To summarise, these are that:

- DHBs perceived by survey respondents to have enabled strong clinical leadership and decision making (Q4), to have facilitated a partnership between health professionals and management (Q9), and given responsibility to their team for clinical service decision making (Q13), have a stronger performance on Q15 – that health professionals in the DHB work together as a well coordinated team.

- DHBs perceived to have enabled strong clinical leadership and decision making (Q4), where respondents believe quality and safety is the goal of every clinical initiative (Q11) and of every clinical resourcing or support initiative (Q12), have a stronger performance on Q16 – that professionals involve patients and families in efforts to improve patient care.
- DHBs, perceived, once again, to have enabled strong clinical leadership and decision making (Q4), to have facilitated a partnership between health professionals and management (Q9), involved professionals in the design of organisational processes (Q10), have made quality and safety the goal of every clinical initiative (Q11), and given responsibility to their team for clinical service decision making (Q13), have a stronger performance on Q17 – that it is easy to speak up around problems of patient care.
- There are significant differences between DHBs in responses to the three quality and safety questions, meaning a stronger sense in some DHBs of teamwork, of involving patients and families in improvement efforts, and of a culture that promotes speaking up about patient care problems

In terms of the respondent characteristics, some interesting associations were found:

- Females had significantly higher odds of responding more positively to Q15 (teamwork), Q16 (involving patients and families) and Q17 (speaking up).
- Respondents 30 years of age and above had significantly lower odds of responding more positively to Q15 (teamwork) and Q16 (involving patients and families), while those 40 and above had higher odds of responding more positively to Q17 (speaking up).
- Those with five years or more service in the New Zealand public health care sector had significantly lower odds of responding positively to Q15 (teamwork) and Q16 (involving patients and families), while those with more than 15 years service had higher odds of responding positively to Q17 (speaking up).

Finally, analysed by professional group:

- No statistically significant differences between the groups were found in responses to Q15 (teamwork).
- Nurses had significantly higher odds of responding more positively to Q16 (involving patients and families) and Q17 (speaking up).

These findings, of course, have various implications. First, the association between respondent perceptions of strong clinical leadership and decision making and performance on the three quality questions warrants attention. The obvious ramification is that all DHBs should be directing attention to supporting clinical leadership and decision making as this may promote an environment conducive to improved teamwork, patient and family involvement and to speaking up. In this regard, DHBs should be seeking to learn from one another, especially those whose performances are at the healthier end of the scale, as well as from studies into how to improve clinical engagement.<sup>54</sup> They should also be linking clinical governance and leadership to quality improvement activities. As noted elsewhere, such linkage can elicit important gains, particularly around increasing health professional engagement with quality and safety improvement.<sup>55</sup>

Second, the focus on partnership seems to have an impact on perceptions of teamwork and on speaking up, again indicating that DHBs should commit fully to partnership models of leadership at every level of the organisation.

Third, the association between performances on the teamwork and speaking up items and respondents perceptions of quality and safety as a goal of clinical initiatives suggest this should be a core component of every DHB's strategy for quality improvement; so should devolving responsibility for clinical decision making to clinical teams.<sup>56,57</sup> It may be that all DHBs have committed at the highest levels to such goals and strategies but the commitment – and the activities and organisational forms that represent this – is less obvious to front line health professionals or consistent across the DHB provider arm.

Fourth, the associations by demographic and professional group have a series of implications. It would be useful to know why female respondents have more positive perceptions on the three questions. There is a need to further investigate why younger respondents had reduced odds of responding positively on the teamwork and patient involvement questions. Perhaps this is a function of training and confidence in leading in these areas that may develop with experience, as well as peer and organisational encouragement and support. Similar questions surround the finding that respondents 40 years and over have greater odds of speaking up. Why those with longer service have less positive perceptions of teamwork and patient involvement yet higher odds of speaking up also demands further investigation and discussion.

There are, of course, caveats around the research contained in this report. The key one is probably the survey method that underpins the analyses and, especially, the response rate. However, as noted in the main CGAP report<sup>i</sup>, the data set is large and relatively representative of the health professional workforce which boosts confidence in the data. Several follow-up emails were sent in the attempt to raise response rates and some DHBs put considerable effort into increasing their staff participation. Given the complicated nature of the survey across 19 DHBs, each with different internal structures, and several professional groups, the response rate could be considered quite reasonable and certainly on a par with response rates in other complex fields.<sup>58-60</sup> The survey method also delivers only quantitative data. While important for gauging perceptions and establishing a baseline against which to compare future studies, it could be useful to further investigate several of the issues highlighted by the analysis in this report. This would perhaps best be done through qualitative methods that permit in-depth exploration of experiences.

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<sup>i</sup>Clinical Governance Assessment Project: Final Report on a National Health Professional Survey and Site Visits to 19 New Zealand DHBs. Dunedin: Centre for Health Systems, University of Otago; 2012.



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# A. Copy of the full survey

**Advancing clinical leadership in New Zealand: DHB workforce survey -**

**1.**

**\*1. Which DHB are you primarily employed by? (Please tick one)**

<input type="radio"/> Northland	<input type="radio"/> Tairāwhiti	<input type="radio"/> Capital and Coast
<input type="radio"/> Waitemata	<input type="radio"/> Hawke's Bay	<input type="radio"/> Nelson Marlborough
<input type="radio"/> Auckland	<input type="radio"/> Taranaki	<input type="radio"/> West Coast
<input type="radio"/> Counties Manukau	<input type="radio"/> Whanganui	<input type="radio"/> Canterbury
<input type="radio"/> Waikato	<input type="radio"/> MidCentral	<input type="radio"/> South Canterbury
<input type="radio"/> Lakes	<input type="radio"/> Wairarapa	<input type="radio"/> Southern
<input type="radio"/> Bay of Plenty	<input type="radio"/> Hutt Valley	

**\*2. What are you primarily employed as? (Please tick one)**

SMO

RMO

Designated Senior Nurse

Registered Nurse

Enrolled Nurse

Senior Midwife

Registered Midwife

Allied health professional (please write the area in box)

Other (please write the area in box)

Allied profession or Other

**\*3. Clinical leadership is described as '...a new obligation to step up, work with other leaders, both clinical and managerial, and change the system where it would benefit patients'. How familiar are you with this concept? (Please tick one)**

Very unfamiliar

Unfamiliar

Neither unfamiliar nor familiar

Familiar

Very familiar

**Advancing clinical leadership in New Zealand: DHB workforce survey -**

**\*4. To what extent do you believe that your DHB has worked to enable strong clinical leadership and decision making throughout the organisation? (Please tick one)**

- No extent
- Some extent
- A great extent
- Don't know

**\*5. To your knowledge, has your DHB established governance structures that ensure a partnership between health professionals and management? (Please tick one)**

- No
- Yes
- Don't know

**\*6. To what extent has management within your DHB sought to foster and support the development of clinical leadership? (Please tick one)**

- No extent
- Some extent
- A great extent
- Don't know

**7. Please give examples of any specific leadership development programmes that your DHB has provided:**

Advancing clinical leadership in New Zealand: DHB workforce survey -

2.

**\*8. To what extent have you sought to take up opportunities to work with other DHB staff, both clinical and managerial, to change the system where it would benefit patients? (Please tick one)**

- No extent
- Some extent
- A great extent
- There have been no opportunities

**\*9. To what extent are health professionals in your DHB involved in a partnership with management with shared decision making, responsibility and accountability? (Please tick one)**

- No extent
- Some extent
- A great extent
- Don't know

**\*10. To what extent are health professionals in your DHB involved as full active participants in the design of organisational processes? (Please tick one)**

- No extent
- Some extent
- A great extent
- Don't know

**\*11. To what extent do you believe that quality and safety is a goal of every clinical initiative in your DHB? (Please tick one)**

- No extent
- Some extent
- A great extent
- Don't know

**Advancing clinical leadership in New Zealand: DHB workforce survey -**

**\*12. To what extent do you believe that quality and safety is a goal of every clinical resourcing or support initiative in your DHB? (Please tick one)**

- No extent
- Some extent
- A great extent
- Don't know

**\*13. To what extent has your DHB sought to give responsibility to your team for clinical service decision making in your clinical areas? (Please tick one)**

- No extent
- Some extent
- A great extent
- Don't know

**\*14. Do you feel that your DHB provides sufficient support for you to engage in clinical leadership activities?**

- No
- Yes

**Advancing clinical leadership in New Zealand: DHB workforce survey -**

**3.**

**15. Health professionals in this DHB work together as a well-coordinated team**

- Disagree strongly
- Disagree slightly
- Neither disagree nor agree
- Agree slightly
- Agree strongly

**16. Health professionals in this DHB involve patients and families in efforts to improve patient care**

- Disagree strongly
- Disagree slightly
- Neither disagree nor agree
- Agree slightly
- Agree strongly

**17. In this clinical area, it is easy to speak up if I perceive a problem with patient care**

- Disagree strongly
- Disagree slightly
- Neither disagree nor agree
- Agree slightly
- Agree strongly

**Advancing clinical leadership in New Zealand: DHB workforce survey -**

**4.**

**\*18. Are you (please tick one)**

- Male
- Female

**\*19. What is your age group? (Please tick one)**

- 20-29
- 30-39
- 40-49
- 50-59
- 60 or over

**\*20. How many years have you worked in the New Zealand public health care system? (Please tick one)**

- Under 5 years
- 5-15 years
- More than 15 years

**21. We are interested in any further thoughts, especially on strengths and weaknesses in your DHB with regard to clinical leadership. Please feel free to add any comments in the box below.**

## B. Correlation between survey items

The correlation matrix in Table B.1 shows the Pearson correlations between the DHB means for each question in the CGAP survey, excluding demographic questions. These numbers were derived by calculating the mean for each DHB for each question, and then calculating the correlation for these DHB means. Correlations provide an indication of linear relationship between two variables. Correlation values range between -1.00 and +1.00, with the sign of the correlation indicating the direction of the relationship and the proximity to 1.00 indicating the strength. A correlation of 0.00 indicates no linear relationship, while a correlation of +1.00 indicates a perfect positive linear relationship (i.e. as the value for one variable increases the value for the other variable also increases). A correlation of -1.00 indicates a perfect negative linear relationship (i.e. as the value for one variable increases the value for the other variable will decrease).

**Table B.1.:** Correlation matrix of DHB means for each CGAP survey question.

	Q3	Q4	Q6	Q8	Q9	Q10	Q11	Q12	Q13	Q15	Q16	Q17
Q3	1.00	0.04	-0.05	0.54	0.01	0.06	0.28	0.36	0.12	0.09	0.31	0.27
Q4	0.04	1.00	0.87	0.20	0.90	0.84	0.68	0.66	0.75	0.76	0.52	0.54
Q6	-0.05	0.87	1.00	0.14	0.84	0.87	0.65	0.56	0.53	0.48	0.26	0.25
Q8	0.54	0.20	0.14	1.00	0.06	-0.03	0.08	0.08	-0.05	0.11	0.29	-0.07
Q9	0.01	0.90	0.84	0.06	1.00	0.86	0.78	0.64	0.79	0.71	0.34	0.56
Q10	0.06	0.84	0.87	-0.03	0.86	1.00	0.78	0.76	0.73	0.49	0.32	0.52
Q11	0.28	0.68	0.65	0.08	0.78	0.78	1.00	0.89	0.78	0.49	0.53	0.69
Q12	0.36	0.66	0.56	0.08	0.64	0.76	0.89	1.00	0.80	0.42	0.56	0.67
Q13	0.12	0.75	0.53	-0.05	0.79	0.73	0.78	0.80	1.00	0.62	0.44	0.80
Q15	0.09	0.76	0.48	0.11	0.71	0.49	0.49	0.42	0.62	1.00	0.63	0.63
Q16	0.31	0.52	0.26	0.29	0.34	0.32	0.53	0.56	0.44	0.63	1.00	0.65
Q17	0.27	0.54	0.25	-0.07	0.56	0.52	0.69	0.67	0.80	0.63	0.65	1.00





## C. Linear models for quality and safety questions

### C.1. Q15: Health professionals in this DHB work together as a well-coordinated team

The linear model used to identify statistically significance differences in the mean response for the survey item 'Health professionals in this DHB work together as a well-coordinated team' between DHBs is presented in Table C.1. The intercept coefficient represents the mean response for this item for Auckland. The coefficients for the other DHBs can be added to the intercept coefficient to obtain the mean for that DHB. So for example, the mean for Bay of Plenty is  $0.47 + -0.29$ , or 0.18. The  $p$ -values indicate whether the difference between a DHB's mean and that of the intercept DHB is statistically significant.

**Table C.1.:** Linear model for survey item 'Health professionals in this DHB work together as a well-coordinated team' by DHB.

DHB	Coefficient	95% CI	$p =$
Intercept (Auckland)	0.47	0.41 – 0.53	0.0000
SexprIDs[2]	-0.29	-0.42 – -0.16	0.0000
Capital and Coast	-0.14	-0.23 – -0.04	0.0056
Counties Manukau	0.18	0.02 – 0.35	0.0251
Hawke's Bay	0.11	0.00 – 0.22	0.0440
Hutt Valley	0.14	0.03 – 0.26	0.0167
Lakes	-0.09	-0.24 – 0.06	0.2286
MidCentral	-0.16	-0.29 – -0.03	0.0185
Nelson Marlborough	-0.05	-0.17 – 0.07	0.4224
Northland	-0.12	-0.23 – -0.02	0.0253
South Canterbury	-0.13	-0.34 – 0.07	0.2051
Southern	-0.37	-0.48 – -0.26	0.0000
Tairāwhiti	-0.23	-0.40 – -0.06	0.0069
Taranaki	0.00	-0.14 – 0.15	0.9649
Waikato	-0.32	-0.43 – -0.21	0.0000
Wairarapa	0.10	-0.16 – 0.35	0.4675
Waitemata	-0.10	-0.21 – 0.02	0.1006
West Coast	-0.50	-0.71 – -0.28	0.0000
Whanganui	-0.05	-0.25 – 0.15	0.5928

## C.2. Q16: Health professionals in this DHB involve patients and families in efforts to improve patient care

**Table C.2.:** Linear model for survey item 'Health professionals in this DHB involve patients and families in efforts to improve patient care' by DHB.

DHB	Coefficient	95% CI	p =
Intercept (Auckland)	0.90	0.85 – 0.95	0.0000
Bay of Plenty	-0.12	-0.24 – -0.01	0.0375
Capital and Coast	-0.20	-0.28 – -0.11	0.0000
Counties Manukau	-0.05	-0.19 – 0.09	0.5111
Hawke's Bay	-0.01	-0.10 – 0.09	0.8925
Hutt Valley	-0.01	-0.11 – 0.10	0.8939
Lakes	-0.03	-0.16 – 0.10	0.6664
MidCentral	-0.13	-0.25 – -0.02	0.0252
Nelson Marlborough	-0.07	-0.18 – 0.04	0.1982
Northland	-0.07	-0.16 – 0.03	0.1591
South Canterbury	-0.05	-0.23 – 0.13	0.5819
Southern	-0.29	-0.39 – -0.20	0.0000
Tairāwhiti	0.03	-0.12 – 0.18	0.6691
Taranaki	-0.08	-0.21 – 0.05	0.2363
Waikato	-0.21	-0.30 – -0.11	0.0000
Wairarapa	0.16	-0.07 – 0.38	0.1751
Waitemata	0.02	-0.08 – 0.12	0.6627
West Coast	-0.14	-0.33 – 0.05	0.1496
Whanganui	0.05	-0.12 – 0.23	0.5437

### C.3. Q17: In this clinical area, it is easy to speak up if I perceive a problem with patient care

**Table C.3.:** Linear model for survey item 'In this clinical area, it is easy to speak up if I perceive a problem with patient care' by DHB.

DHB	Coefficient	95% CI	p =
Intercept (Auckland)	0.80	0.73 – 0.86	0.0000
Bay of Plenty	-0.18	-0.32 – -0.05	0.0088
Capital and Coast	0.02	-0.08 – 0.12	0.6820
Counties Manukau	-0.02	-0.19 – 0.15	0.8377
Hawke's Bay	0.07	-0.05 – 0.18	0.2530
Hutt Valley	-0.02	-0.15 – 0.10	0.7218
Lakes	-0.06	-0.21 – 0.09	0.4408
MidCentral	-0.12	-0.26 – 0.02	0.0912
Nelson Marlborough	-0.01	-0.14 – 0.12	0.9271
Northland	0.06	-0.06 – 0.17	0.3289
South Canterbury	-0.14	-0.36 – 0.07	0.1962
Southern	-0.20	-0.31 – -0.08	0.0008
Tairāwhiti	0.03	-0.15 – 0.21	0.7371
Taranaki	-0.02	-0.17 – 0.14	0.8258
Waikato	-0.25	-0.36 – -0.13	0.0000
Wairarapa	0.19	-0.08 – 0.46	0.1626
Waitemata	-0.03	-0.15 – 0.09	0.6241
West Coast	-0.12	-0.34 – 0.10	0.3003
Whanganui	-0.14	-0.35 – 0.07	0.2012