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Education for Māori: Using information to improve Māori educational success

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to improve Māori
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Wāhinga kōrero

E arataki ana a Aotearoa i te ao whānui mō tōna whakapau kaha kia piki ai a Ngāi Māori ki te karamatamata o te angitu i te ao mātauranga. Kua whakaae hoki ngā mātanga o te ao mātauranga nō wāhi kē, ā, ka haere mai ki te kimi i ngā rautaki tika, i ngā ara tika mō ō rātou ake iwi. He tohu pai tēnei e whakaatu mai ana kua āta wānangahia e ngā mātanga o te ao mātauranga o Aotearoa tēnei take e pā ana ki te manakitanga, ki te whakakipakipa hoki o ā tātou ākonga i te ahurea me te tōrangapu o te ao hurihuri nei.

Ko te tūmanako ia ka uru mai ētahi o ngā kōrero kua kohia e aua mātanga o te ao whānui ki roto i tēnei pūrongo me ngā pūrongo e toru nā te Āhuatanga Mātauranga i tuhi.

I āta tirohia e te pūrongo tātari tuatahi ki te rautaki mātauranga Māori, arā, ko Ka Hikitia. Ko te hua i puta mai kua tika ngā whāinga o te rautaki nei engari he raru tō te whakatinanatanga. I aro atu te pūrongo tātari tuarua ki te whanaungatanga o te kura me tōna whānau. Ko tōna whakatau, e whai ana ngā kura i te ara tika ki te whakarite he ara kia whakatata mai ai te pae tawhiti, arā, ko te hononga ki ō rātou whānau akoranga.

Ka titiro tēnei pūrongo tātari ki te ekenga rānei, ki te hinganga rānei o ngā ākonga Māori i te ao mātauranga me te āhua o te whakahirihiri kua tukuna ki a rātou.

Kei te tika o te whakapaunga o te pūtea mō ngā rautaki me ngā momo akoranga tētahi o ngā urupounamu matua o tēnei pūrango tātari. He uaua te urupare nā te mea e kohuku ana tē mahi rangahau i tēnei wā. He pātai nui anō, he rite te ekenga, te hinganga rānei o ngā ākonga Māori mai i ngā kura he rite te āhua. Ko te whakautu, e kao, he rerekē rawa tēnā kura, ki tēnā kura, ki tēnā kura anō.

E hika mā, ki a mātou ehara te kohikohi i te mōhiotanga, i te whakautu i te mea nui. Me ārahi te mōhiotanga me ngā whakautu ki te whakarite i ngā pātai tika kia eke panuku, kia eke tangaroa ā tātou ākonga Māori, kia tū Māori ai. Ehara i te Tiriti o Waitangi, ehara i te rerekētanga o te ekenga, o te kore ekenga rānei te take. Mā tātou kē o te ao mātauranga kia puta ā ihu te katoa i runga anō i te take ka haere mai ki Aotearoa ngā tāngata nō wī, nō wā kia kite ai i te hua ka puta i ngā rautaki kua whakaritea e tātou anō.

Hikaka ana te manawa o te ope Māori nei ki te āwhina, ki te arataki, ki te hiki i te kohu ki te haere ngātahi i te mahi o ngā kairangahau o te Tari nei. Ko te hua ka puta mai i tēnei pūrongo he mea pai mā ngā hapori me ngā whānau kia puawai ai i te pitomata o ā tātou tamariki/ mokopuna. Ko te mea nui mō ā tātou tamariki/ mokopuna i tēnei ao hurihuri, tū ki te ao, tau ana.

Foreword

Aotearoa/New Zealand leads the world with its focus and effort to ensure its indigenous people enjoy educational success. Others come to Aotearoa/New Zealand recognising that we are on a progressive pathway. They come to learn from what we are doing. They take back to their countries some of our policies, practices and publications.

We hope some of the publications those visitors return with will be this and the three other reports produced under the Education for Māori audit programme.

The first audit showed that the goals of the Ka Hikitia strategy to ensure Māori enjoy educational success as Māori were right but that implementation was a problem. The second audit about school and whānau relationships showed that much of the school sector does have in place the necessary human relationships that build successful educational relationships.

This audit report illustrates where Māori students are across the education system and the inequitable treatment they receive.

One smart question this audit asks is about whether policies and programmes to raise Māori student achievement are cost-effective. The answer is that this is hard to tell because the information is incomplete. Another question is whether Māori students in similar schools achieve similar results to one another. They do not and there can be very large variation between schools.

We urge the sector to recognise that possessing information isn't enough. Information must be used in a formative way to ask smarter questions. This sort of enquiry must lead to more and better outcomes for Māori students as Māori. Neither the Treaty of Waitangi nor the difference in achievement should be motivation. This is an opportunity for all parts of the sector to excel and for everyone to succeed, with the sort of cultural nuance that draws people from overseas to learn from us in the first place.

Mere Berryman
Lorraine Kerr
Angus Hikairo Macfarlane
Wally Penetito
Graham Hingangaroa Smith

Auditor-General's overview

In 2012, my Office started a five-year programme of work to find out how well the education system supports Māori students to achieve their full potential. This third report looks at whether the Ministry of Education, education agencies, and schools use and manage information effectively and efficiently to improve educational success for Māori.

I expected to see an education sector that collects, analyses, and shares information to improve Māori student success by targeting and using its resources to best effect.

My staff looked at what information is collected and how it is collected, analysed, and shared to support Māori students' success. We analysed data collected by the Ministry of Education and others, including the Education Review Office. We formed a view about the completeness, quality, accessibility, and usefulness of the data.

Our analysis raises several questions about how the education sector uses information. We do not answer those questions. We intended our analysis to show the sorts of questions and insights that can be explored using existing information.

When individual schools and agencies make good use of what they know about a student, it makes a difference to that student's success. However, there is a lot of room for the education sector to improve how it collects, shares, and uses information.

Using information well makes a difference

Using information provided by the Ministry of Education gives the education sector a clearer understanding of the issues affecting Māori students' achievement. Māori educational achievement is improving over time in absolute terms and relative to non-Māori educational achievement.

However, the results vary enormously for Māori students from roughly similar communities who are being educated in roughly similar settings and circumstances. The great results that some schools are achieving despite their low-decile status offers a source of learning and encouragement for other similar schools to do just as well.

We visited some schools to see how they used information and how well their students were achieving. We saw a strong relationship between using information effectively and better Māori student achievement. Schools that used information well had several common attributes:

- The school has an intense focus on using information to change processes.
- The school is managing and using information about individual students.
- The school monitors its relationship with students and whānau.

Better-performing schools also tended to do a more detailed analysis of the educational success of different groupings of students, whether by year, gender, ethnicity, learning needs, or level of transience.

Schools with better results for Māori students used data to inform their activities and to decide how and where to target resources to get the best result. These schools were committed to improvement and had management cultures that valued inquiry and challenge. The schools wanted to see continuous improvements, and people were encouraged to ask questions and challenge norms.

These successful environments do not happen by accident – strong leadership is needed to build a culture focused on performance and improvement. Once schools have achieved this, they need appropriate guidance and leadership to help them continue to use information effectively to solve problems and make the right decisions for and with Māori students.

A basic start is to ensure that schools identify the performance of Māori students in particular. School charters signal the goals and targets of a school. We looked at school charters to find out whether they had achievement targets for Māori. Of the 553 charters we examined, 23% had no achievement targets for Māori students.

Strong relationships between and within schools, local communities, and the Ministry of Education, together with the right capability and capacity, also help schools to use information effectively.

Improving information quality and how information flows

Collecting, using, and analysing information is important, but what is done and what changes are made are ultimately crucial to improving Māori student achievement. I outline in this report several initiatives the Ministry of Education has put in place to improve the use of information. For these initiatives to be successful, it is important that the Ministry has a "joined-up" approach internally and throughout the education sector. Leadership at all levels is also needed to drive improvement in the collection, quality, and active use of all kinds of information.

The Ministry of Education has started to take stock of what information it has and how it can best use and share it, to better understand performance and target resources. In my view, this is important work, because good quality information is essential to making effective decisions.

Schools also need to ensure that they collect good quality information. As a starting point, schools need to collect ethnicity data consistently, in keeping with the approach used by Statistics New Zealand.

Information that is currently collected is not always readily available or accessible. This limits its usefulness in making decisions. There are also gaps, particularly in "softer" information about Māori achieving as Māori and the cultural aspects that are important to Māori students. Some individual schools have this information but need to use it more consistently. These schools could also share what they learn with other education entities.

As one of the school staff we spoke with said, "There's a story behind the data." These stories are the broader information that schools value and use in their day-to-day practice.

Knowing which approaches work best and offer the best value for money

Many policies and programmes support improving student achievement, including Māori student achievement. There is a lack of information about which approaches and practices are most effective. Educational experts and officials need to assess the cost-effectiveness of policies and programmes. Although many different factors influence achievement outcomes for Māori students, a better understanding of the effect of different initiatives would help the education sector to better target its resources.

Teaching costs are the largest investment in schools, and research shows that large gains are possible when teachers engage with Māori students effectively. However, it is not possible, at a sector level, to see how effective that engagement is overall. It is also not possible to see the specific forms of support that teachers in different schools need for them to better engage with Māori students.

In my view, the education sector needs to commit to building the capability and capacity to use information effectively and efficiently to support and raise Māori students' educational achievement.

We saw that there are inexperienced principals and teaching staff in schools that operate in the most challenging circumstances. Appropriate ongoing support and mentoring is needed to help them do their job well.

Getting the strongest resources to the schools with the greatest need and improving the capability of schools to effectively use information are essential for building sustainable improvements in Māori educational achievement.

Acknowledgements

I thank the Māori Advisory and Reference Group for their review of the report and for continuing to share their experience and wisdom with my Office. I also thank the many members of school boards, principals, and teachers who met with my staff. And last but not least, I acknowledge the help of staff from various other education entities and, in particular, staff from the Ministry of Education.

Lyn Provost
Controller and Auditor-General

1 June 2016

Our recommendations

1. We recommend that the Ministry of Education work with schools to establish a framework for collecting cultural information (for example, a student's ties with their iwi) and other information (for example, a student's goals and aspirations) about Māori enjoying educational success as Māori.

2. We recommend that the Ministry of Education help those schools that do not have enough understanding about what Māori enjoying educational success as Māori means, by providing better guidance and information that they can use to measure Māori enjoying educational success as Māori.

3. We recommend that the Ministry of Education use currently available information to investigate the variation in Māori educational achievement of similar schools in similar circumstances and help the lower-performing schools to do better.

4. We recommend that the Ministry of Education work with education agencies and schools to ensure that there is effective leadership and common understanding of the purpose and use of information to improve outcomes for Māori students. This includes:
   - ensuring that school charters have targets for Māori achievement, where appropriate;
   - having a planned approach to improve the quality and use of information;
   - taking stock of information the education sector has and how it is used; and
   - encouraging the education sector to work together to ensure that staff have the capability to use information effectively.

5. We recommend that the Ministry of Education improve practices to collect, analyse, use, and share information about Māori educational achievement. Priority should be given to:
   - sharing effective collection and analysis practices throughout the education system to improve Māori student achievement;
   - sharing practices so that schools use information and enquiry effectively to improve Māori student achievement;
   - improving the way schools collect student ethnicity data, which should include updating the Ministry of Education's ethnicity data collection guidance and examples; and
   - improving the availability of important and relevant cost information to inform decisions about investing in initiatives to improve Māori student achievement.

Introduction

1.1 In this Part, we:

- summarise our five-year programme of work looking at how well the education system supports Māori students;
- outline the audit objective and our expectations for this performance audit;
- discuss how we carried out the audit; and
- explain the structure of this report.

The third audit in our five-year programme

1.2 For some time, educational outcomes for Māori students have been much lower than for other students. This difference has been acknowledged historically and exists even though New Zealand spends significant amounts on education.[1] Among Organisation for Economic Co-operation and Development (OECD) countries, New Zealand spends the fourth-largest amount as a proportion of gross domestic product on education. Denmark, Iceland, and South Korea are the only countries that spend more.

1.3 Currently, the Ministry of Education (the Ministry) has an important focus on improving outcomes for Māori students and other priority learners.

1.4 In 2012, we began a programme of work to answer the question:

How well does the education system currently support Māori students to achieve their full potential and contribute to the future prosperity of New Zealand?

1.5 We set out our programme of work in our report *Education for Māori: Context for our proposed audit work until 2017*.[2]

1.6 Our first performance audit in the programme examined how effectively the Ministry and schools were carrying out *Ka Hikitia – Managing for Success: 2008-2012* (Ka Hikitia).[3] This was the long-term educational strategy for supporting young Māori to thrive academically, socially, and culturally for New Zealand's future.

1.7 The overall goal of the Ka Hikitia strategy is to enable Māori to enjoy and achieve education success as Māori. The Ministry has described this as being when "Māori students are succeeding in our education system and achieving equitable results while maintaining and enhancing their identity, language and culture as Māori".

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1   We set out the historical and current context for Māori education in Controller and Auditor-General (2012), *Education for Māori: Context for our proposed audit work until 2017*.

2   Controller and Auditor-General (2012), *Education for Māori: Context for our proposed audit work until 2017*.

3   Controller and Auditor-General (2013), *Education for Māori: Implementing Ka Hikitia – Managing for Success*.

1.8   There were some implementation problems with Ka Hikitia. However, the strategy was helping to create the conditions for improved Māori student success. We were optimistic that the Ministry would better implement a "refreshed" Ka Hikitia strategy.

1.9   Ka Hikitia was updated in 2013. The updated strategy gave greater focus to "educationally powerful" partnerships. These are where a school's governors, teachers, students, and families work together to improve a student's overall performance.

1.10   Our second performance audit in the programme examined the relationships between schools and whānau.[4] These relationships are more effective where there is good communication, there is a willingness to be flexible to enable effective participation, and communities feel listened to. This is not easy and requires constant attention.

Our audit objective and expectations

1.11   The objective of this performance audit, the third in our programme, was to determine whether the Education Review Office (ERO), the New Zealand Qualifications Authority (NZQA), the Education Council of Aotearoa New Zealand, and Careers New Zealand (the agencies), the Ministry, and schools use and manage information effectively and efficiently to improve educational success for Māori.

1.12   When we refer to the "education sector", we mean all of the public entities involved in education. When we refer to the "education system", we mean everyone – the agencies, Ministry, schools, other governmental organisations dealing with education matters, parents, students, and whānau.

1.13   By data, we mean discrete facts, figures, and words that do not have any context. In this report, we refer to "hard" and "soft" data. Hard data is organised into a pre-existing format or structure, such as data collected through a form. Soft data has no pre-existing format or structure, such as a recorded conversation.

1.14   Hard and soft data can be summed up or put together to make information. Information is made of sentences, paragraphs, diagrams, and reports. Information gives data a context.

1.15   We expected that, to use and manage information effectively and efficiently to improve educational success for Māori, the Ministry, agencies, and schools would:

- know what the right information is;
- get the right information;
- understand the information;

4   Controller and Auditor-General (2015), *Education for Māori: Relationships between schools and whānau*.

- use the information appropriately to make informed decisions; and
- make informed investment decisions about practices and initiatives that improve educational success for Māori by putting resources into effective programmes that show value for money.

1.16 These expectations are broadly cumulative. For example, an agency that does not have the right information is unlikely to make informed investment decisions. This is also the case when the agency has the right information but does not understand that information.

Audit scope and context

1.17 We did not include early childhood education entities or private schools in our audit. We initially included tertiary education institutions and the Tertiary Education Commission. As our work progressed, we excluded these entities to keep our work focused and the scale manageable.

1.18 During recent years, there has been a strong policy focus on supporting and encouraging the education sector to actively use information to enhance educational outcomes rather than only for administrative purposes.

1.19 We asked the Ministry for access to school achievement, engagement, participation, and administrative data for the 2014 school year. We used this to explore Māori students' achievement. We did not use any individual student information.

1.20 The largest investment in schools is in salaries. In 2014, about $4.4 billion of the $5.5 billion spent on schooling was spent on salaries for teachers and support staff.[5] There is an appropriation for investment in initiatives that aim to improve the outcomes of target student groups. In 2014, this was $271 million.[6] Some of these initiatives are aimed directly at improving educational success for Māori. However, many more initiatives are funded from other parts of Vote Education.

1.21 Appendix 1 describes many of these initiatives. We did not look into all of them because there are many and some were more established and well-known than others.

1.22 Some initiatives focus on helping parents, whānau, teachers, early childhood centres, and schools address problem behaviour, improve children's well-being, and increase educational achievement (for example, Positive Behaviour for Learning). Some initiatives are directly targeted at lifting academic performance (for example, Mutukaroa). Other initiatives are designed to improve the transition from school to work (for example, Youth Guarantee programmes).

5   Ministry of Education, *Annual Report 2014*, page 9.

6   Ministry of Education, *Annual Report 2014*, page 104.

1.23   Many of the initiatives do not have specific measures of success other than general expectations of improved educational outcomes.

How we carried out our audit

1.24   Our audit focused on the education sector as a whole, rather than individual agencies or schools.

1.25   This is because we wanted to take a strategic look at how information is used throughout the education system to inform decision-making and improve outcomes for Māori students.

1.26   To carry out our audit:

- We interviewed principals, staff, and members of boards of trustees. We visited and obtained information from 13 schools. Using the Ministry's data, we selected 10 of these schools as contrasting pairs to identify whether the way each school used information made a difference. The pairs were of similar size, type, and decile.[7] Each pair consisted of one high-scoring and one low-scoring school based on the performance of Māori students in National Certification in Educational Achievement (NCEA) level 2 or National Standards.[8] When our auditors visited these schools, they did not know the achievement score of the school.

- We interviewed staff and reviewed information and documents from the agencies.

- We randomly selected 50 online school enrolment forms and reviewed these against various good-practice criteria for collecting ethnicity data.

- We used information from our review of school charters from our previous Māori education performance audit (see paragraphs 4.15-4.21).

1.27   We also obtained advice and guidance from our Māori Advisory and Reference Group.

1.28   We obtained data from the Ministry and ERO. We used this data to perform an analysis of achievement, participation, and engagement against various factors that may relate to student achievement. We measured Māori student achievement using National Standards and NCEA Level 2, where it was available. We intended this analysis to be a "jar opener" to show the sorts of questions and insights that can be explored and understood using available information. Part of the data we obtained from the Ministry (Ngā Whanaketanga Rumaki Māori achievement data) was not analysed by us because it was incomplete.

7   Decile measures the socio-economic position of a school's student community relative to other schools throughout the country.

8   For information on the National Certificate of Educational Achievement, see www.nzqa.govt.nz. For information on the National Standards, see www.education.govt.nz.

1.29   This report outlines the results of this analysis. Appendix 2 sets out information about the data we obtained, the methods we used to analyse it, and the criteria we used to select the schools we visited.

The structure of this report

1.30   In Part 2, we show how we used the data we obtained from the Ministry and ERO to carry out some descriptive analysis and statistical tests about achievement, participation, and engagement for Māori students.

1.31   In Part 3, we outline the student and achievement information that the Ministry, agencies, and schools currently use, and its gaps and quality. We also look at the limitations of student management systems.

1.32   In Part 4, we outline where the education sector can use information better to improve Māori students' achievement. We also describe improvements that are currently under way in the sector.

2

What is understood about Māori student achievement

2.1   In this Part, we show how we used the data we obtained from the Ministry and ERO.

2.2   We used this data to carry out some descriptive analysis and statistical tests about Māori students' achievement, participation, and engagement.

2.3   The descriptive analysis shows large variability in achievement for Māori students who attend similar schools. Our analysis led us to look at which factors might relate to the achievement of Māori students.

Summary

2.4   By using information provided by the Ministry, the education sector can gain a clearer understanding of the issues affecting Māori students' achievement.

2.5   Māori educational achievement is improving over time, but the results for Māori students from roughly similar communities who are being educated in roughly similar settings and circumstances vary markedly.

2.6   Our visits to schools highlighted the wide variation in how schools use information. We saw a high correlation between schools using information effectively and better Māori student achievement.

2.7   Although not all data collected is readily accessible, it can be used to ask important questions and inform decisions about resourcing, quality of teaching, and how schools use information. We were not able to analyse softer information because this information is unavailable at the aggregate level.

2.8   We also found that many of the schools operating in the most challenging circumstances had the least experienced leaders. It is important that new principals and teaching staff receive enough ongoing support and mentoring to help them do their job well.

2.9   Our work indicates that there could be better use of, and different ways of viewing, information to improve decision-making and outcomes for Māori students.

The education sector understands the importance of having good information

2.10   It is important that people are able to understand and use the information the education system produces. The Ministry publishes information so that parents, students, whānau, and communities can improve their understanding about the education system and, in particular, outcomes for Māori students:

> *The public availability of a range of information is intended to build*
> *understanding of the progress and achievement of students at all levels of the*

education system, and to focus attention on where there is limited progress or barriers to achievement. Good quality information will provide the basis for communities, families, parents and whānau to engage and collaborate with schools and kura, and with other local stakeholders to support the achievement of their students.[9]

2.11   Schools take a "teaching as inquiry" approach. The Ministry describes this approach as one where teachers look into what is most important to help an individual student learn, what approaches are most likely to help that student learn, and what happens as a result of that teaching.

The schools Māori students attend

2.12   We looked at enrolment data from the Ministry to understand the context of Māori students in schools.

2.13   Figure 1 shows that Māori students are heavily concentrated in low-decile schools compared with the total school population.

Figure 1
Distribution of Māori students by school decile, as at July 2014
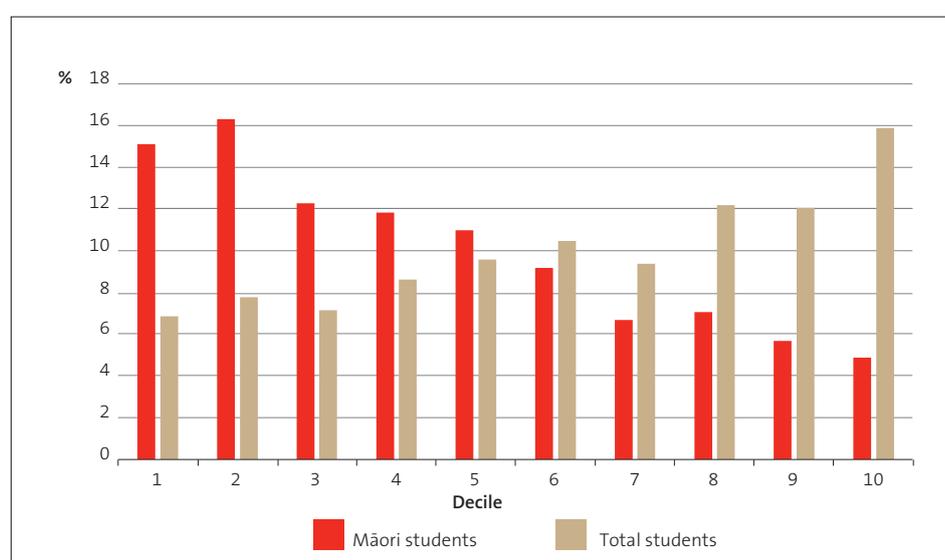
Source: Data from the Ministry of Education, Education Counts, School Directory July 2014.

2.14   Figure 2 shows that Māori students are geographically widely dispersed and
        highly concentrated in certain localities. This is more clearly illustrated in Figure 3,
        where we show greater detail for two particular regions – Northland, a semi-rural
        region, and Auckland, a large city region.

Concentration of Māori students
by location of school

High

Low

Figure 3
Number of Māori students, by school and decile, in the Northland and Auckland regions
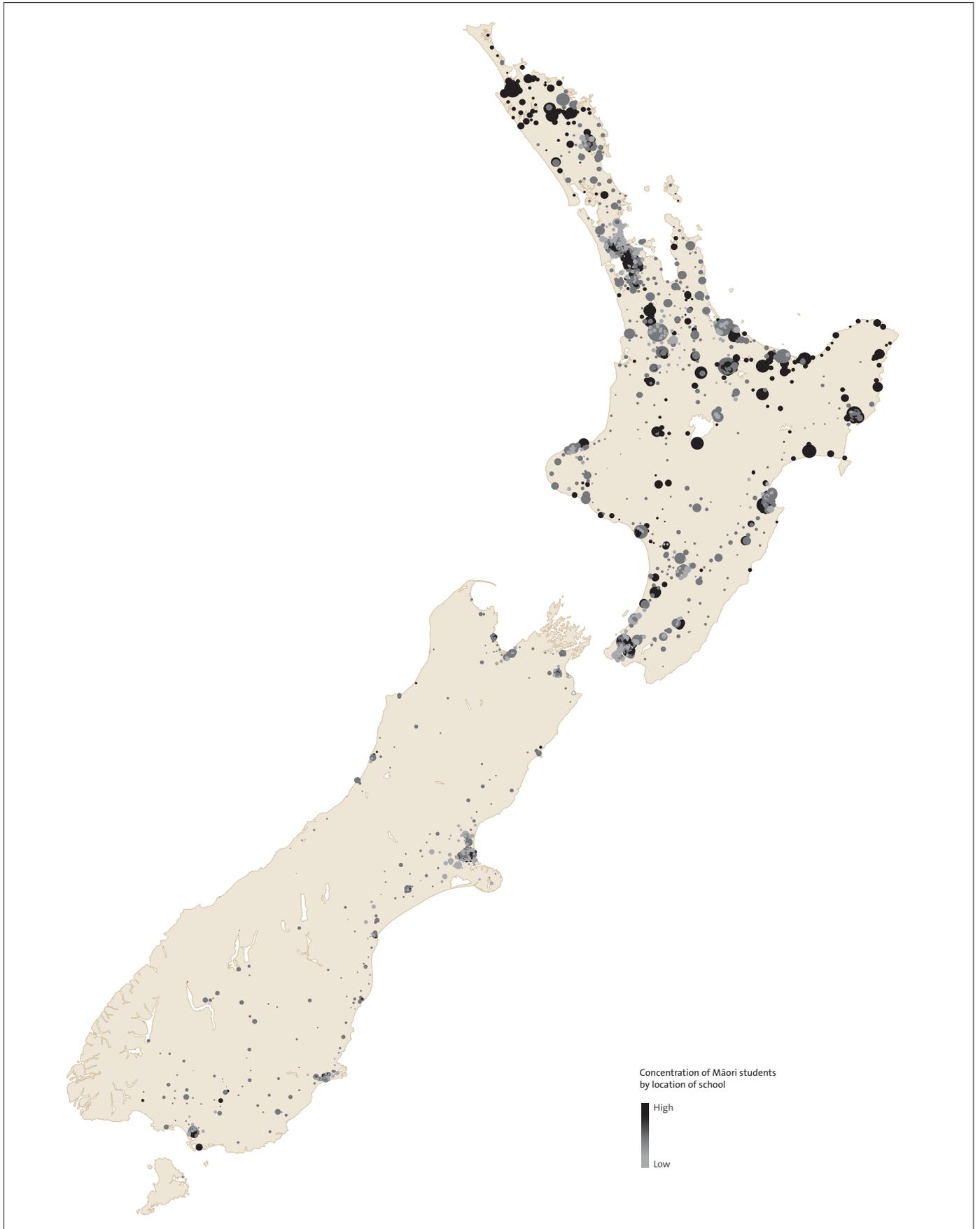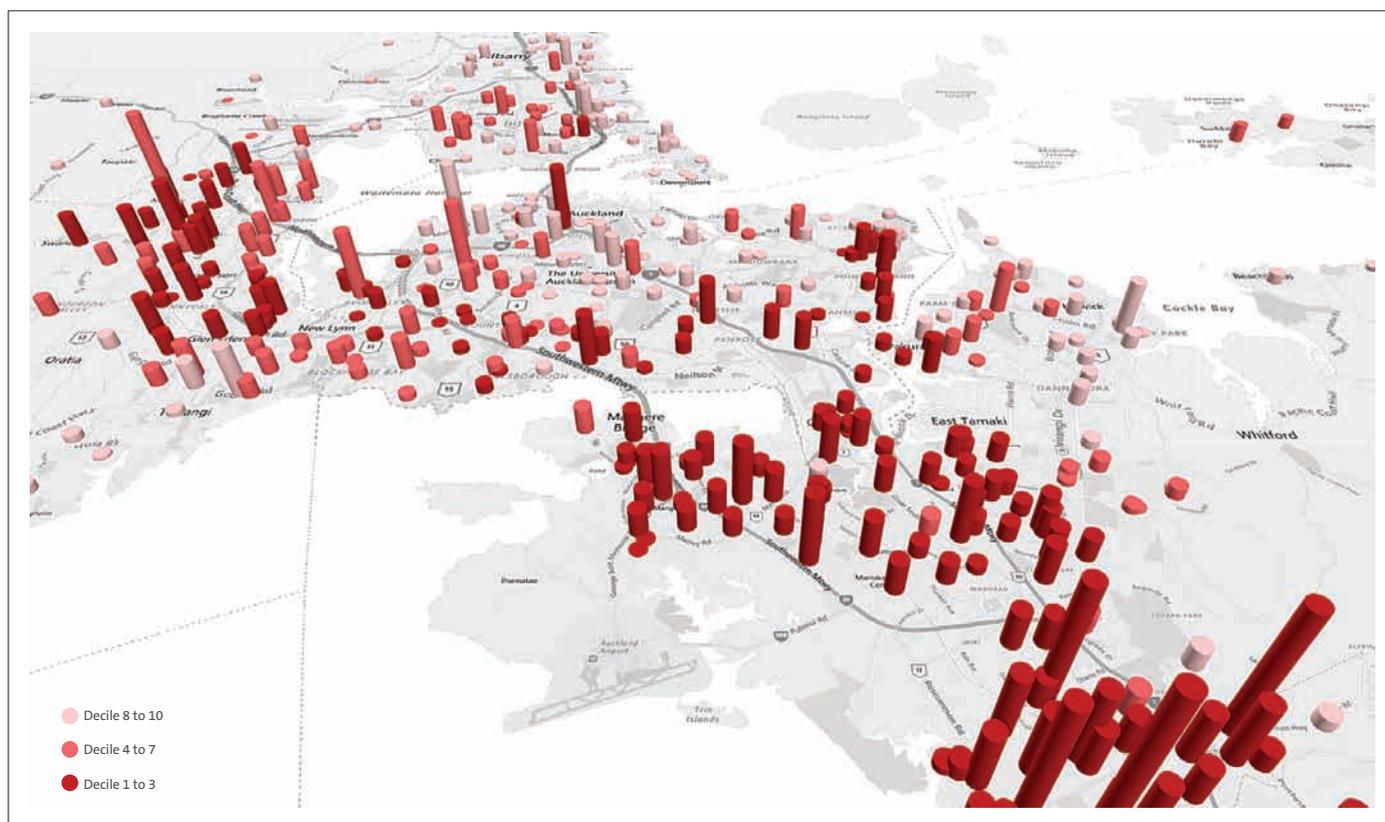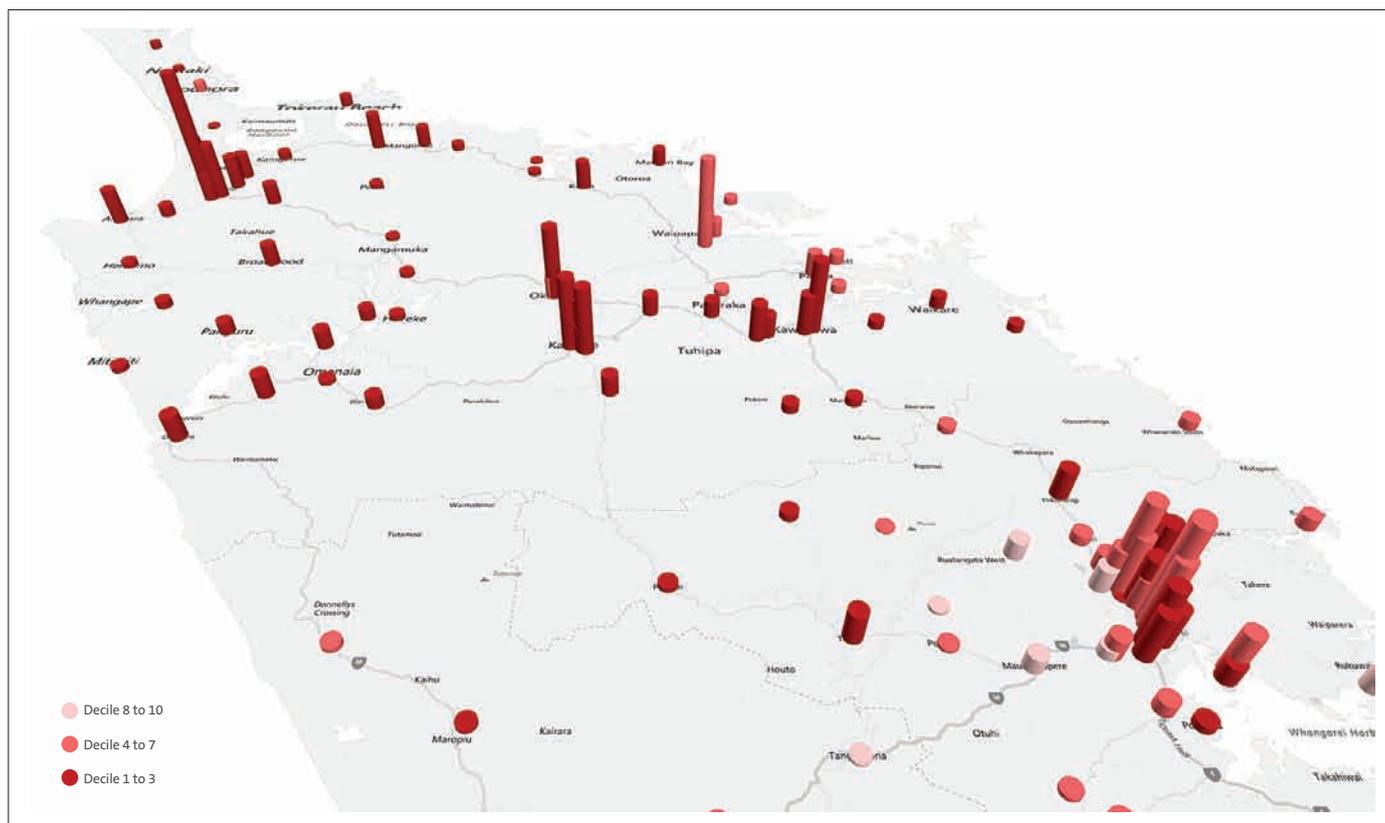
Source: Data from the Ministry of Education, Education Counts, School Directory May 2015.

2.15   Figure 4 shows that the Māori rolls in medium-decile and high-decile schools are growing.

Figure 4
Number of Māori students in schools as at 1 July, 2000 to 2015
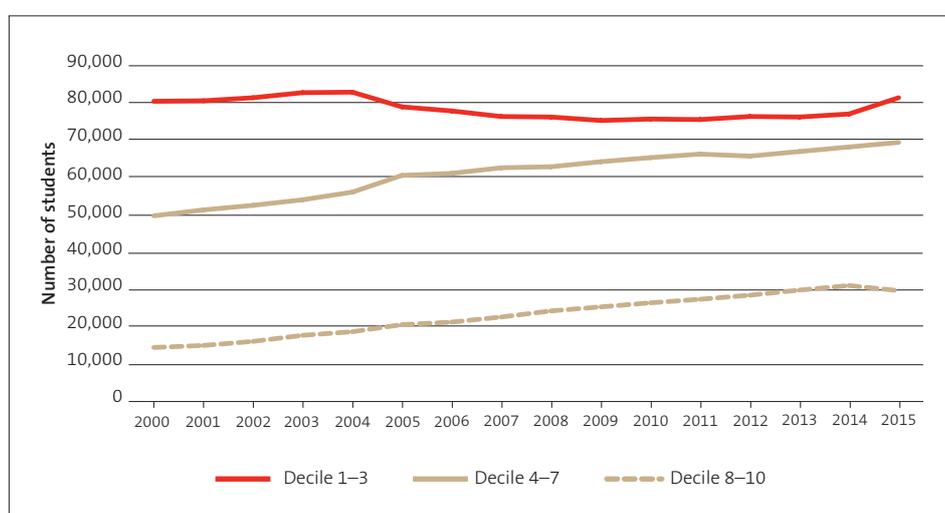
Source: Ministry of Education, Education Counts, Student Roll by School Decile.

Māori student achievement

2.16   Māori educational achievement is improving over time in absolute terms and relative to non-Māori educational achievement. However, the results for Māori students from roughly similar communities who are being educated in roughly similar settings and circumstances vary markedly.

2.17   This implies that many Māori students have poorer educational outcomes than their peers in similar schools and communities. This is likely to have life-long effects on the life choices and employment options available to those students. In our view, addressing this variation in educational success is essential for New Zealand's future.

2.18   Primary schools (years 1 to 8) use National Standards to assess educational progress. National Standards were introduced in 2010. Although they are not a qualification, they set clear expectations for reading, writing, and mathematics that students need to meet.

2.19   At secondary school, the main qualification is NCEA. This is obtained through a combination of internal and external assessments. There are three levels to NCEA at secondary school level. In practice, these three levels correspond to years 11, 12, and 13 of teaching for many students.

2.20   One of the three goals that the Ministry is responsible for under the Better Public Services (BPS) programme is that, in 2017, 85% of 18-year-olds will have achieved NCEA Level 2 or an equivalent qualification.[10]

2.21   Figures 5 and 6 show that Māori students' achievement of NCEA Levels 2 and 3 are, on average, lower than that of other students. However, the difference in achievement is reducing over time.

Figure 5
Percentage of 18-year-olds who achieved a minimum of NCEA Level 2 or equivalent, by ethnic group, 2011 to 2014
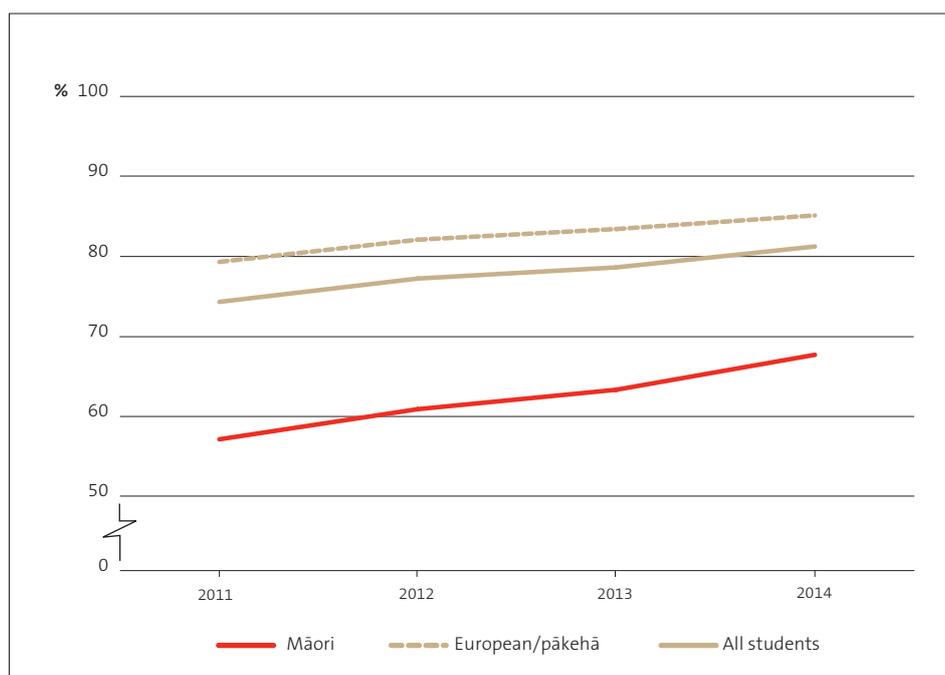
Source: Ministry of Education, Education Counts 2015.

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10 The two other goals are:
    • In 2018, 60% of 25-34 year olds will have a qualification at level 4 or above.
    • In 2016, 98% of children starting school will have participated in early childhood education.

Figure 6
School leavers with NCEA Level 3 and above, by ethnic group, 2011 to 2014
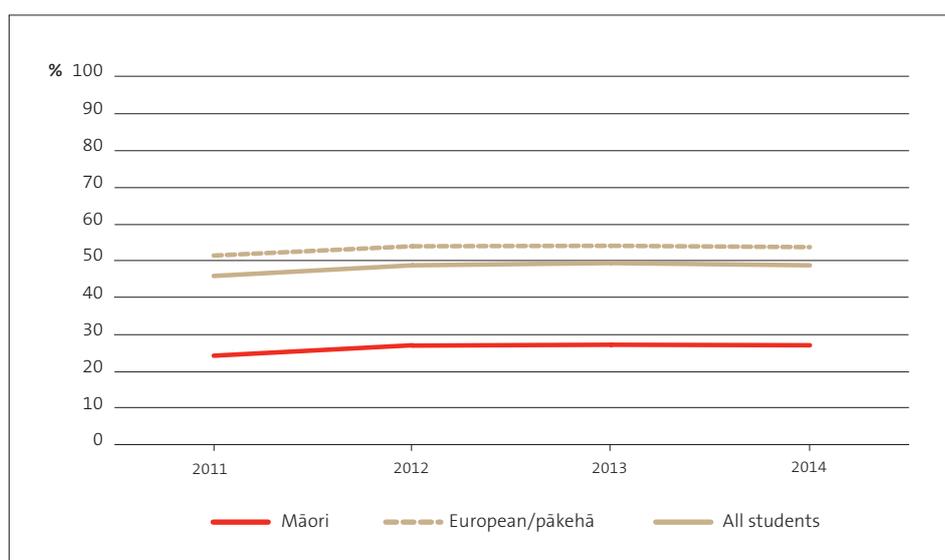
Source: Ministry of Education, Education Counts 2015.

The kind of schools Māori students attend is related to achievement

2.22   Using the Ministry's data, we explored whether similar schools achieved similar results for Māori students.

2.23   Figure 7 shows that the proportion of Māori students at or above the National
        Standards average for maths, reading, and writing is more than three times higher
        in the best-performing decile 1 small primary school compared with the poorest-
        performing decile 1 small primary school.

Figure 7
**Percentage of Māori students at or above the National Standards average,
decile 1 small primary schools, 2014**
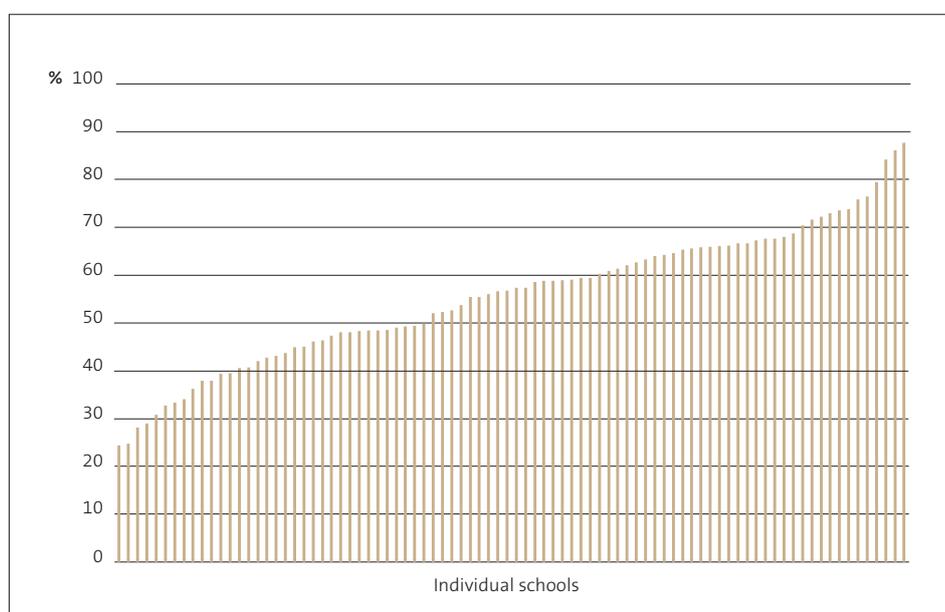
Source: Our analysis of the Ministry of Education's National Standards data. We have excluded schools with fewer
than 30 Māori students.

2.24   Figure 8 shows the variability in National Standards results for Māori students between similar-decile medium primary schools in 2014.

Figure 8
Variability in National Standards results for Māori students, medium primary schools, 2014
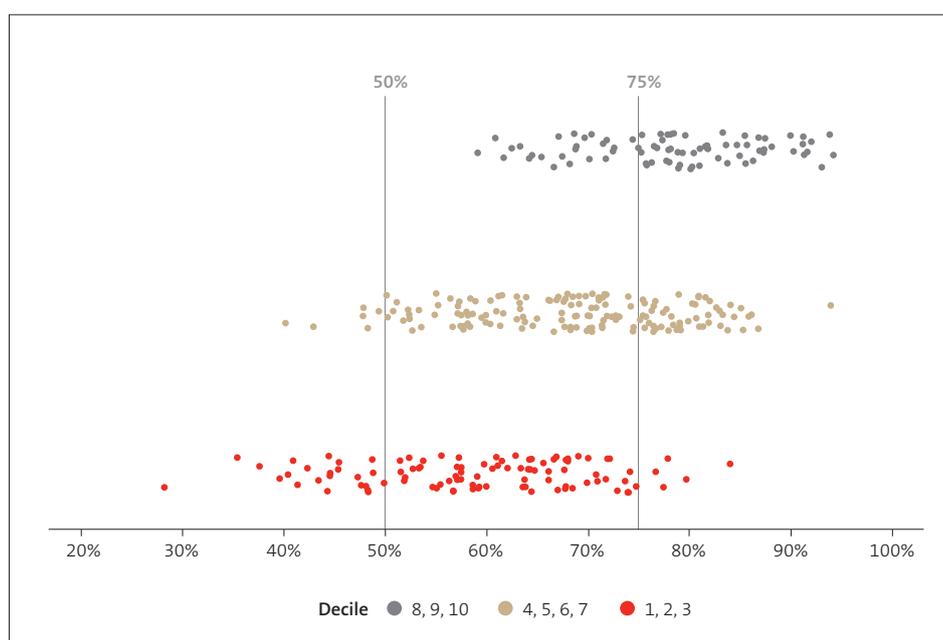
Source: Our analysis of the Ministry of Education's National Standards data. We have excluded schools with fewer than 30 Māori students.

2.25   We did the same analysis using NCEA Level 2 results for Māori students and reached similar conclusions.

2.26   Figure 9 shows that the proportion of Māori students at or above average NCEA Level 2 results is almost three times higher in the best-performing decile 2 small secondary school than in the lower-performing decile 2 small secondary school.

Figure 9
Percentage of Māori students at or above average NCEA Level 2 results, decile 2 small secondary schools, 2014
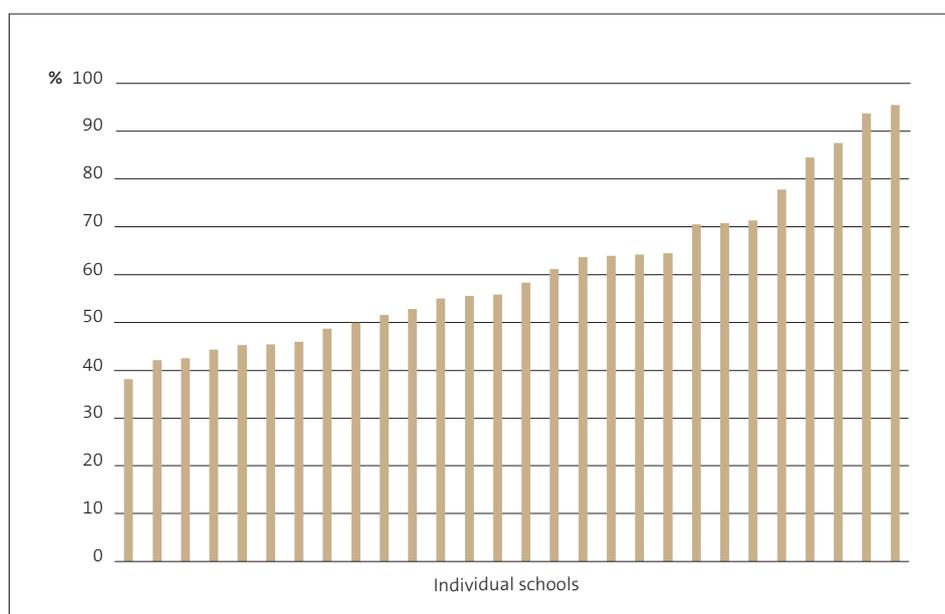
Source: Our analysis of the Ministry of Education's NCEA data. We have excluded schools with fewer than 30 Māori students.

2.27   Figure 10 shows the variability in NCEA Level 2 results for Māori students between similar-decile small secondary schools in 2014.

Figure 10
Variability in NCEA Level 2 results for Māori students, small secondary schools, 2014
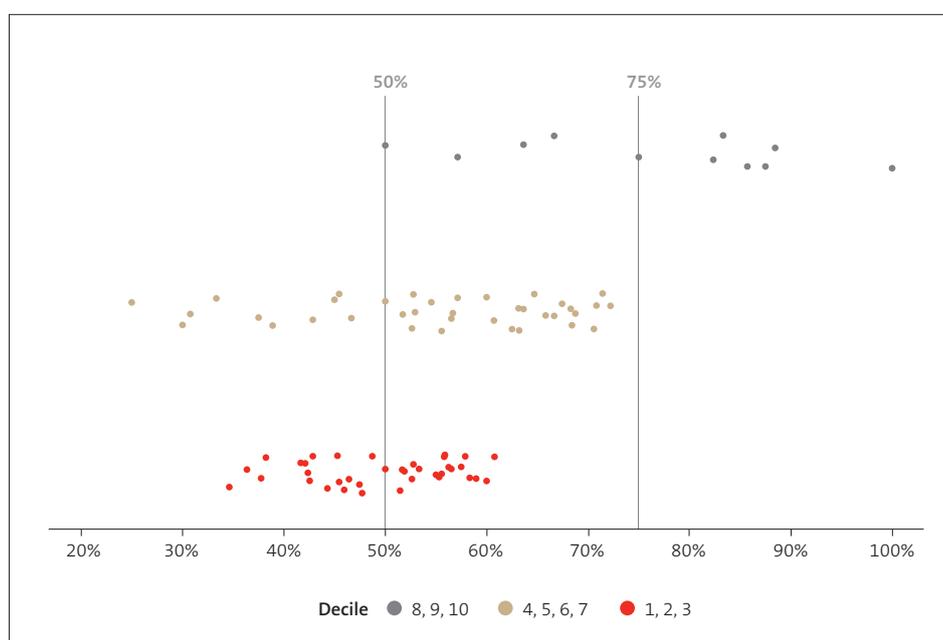
Source: Our analysis of the Ministry of Education's NCEA data. We have excluded schools with fewer than 30 Māori students.

2.28   Although many factors are related to achievement, it is clear that there is a link between the school a Māori student attends and their achievement. Appendix 3 further shows this disparity for a range of school sizes, types, and deciles.

Positive and negative factors influencing success

2.29   Our school visits gave us insight into the factors that might influence Māori students' achievement. We visited 13 schools throughout the country. Of those 13 schools, 10 schools were similar in decile, type, and size but had different levels of Māori achievement.

2.30   We found that schools that use information better had more experienced leadership and capability.

2.31   We also found that many of the schools operating in the most challenging circumstances had the least experienced leaders. To show the different approaches schools take, we asked some schools we visited whether they set separate achievement targets for Māori students. Some schools did and some did not. There could be possible links between the schools' approach and the differences in Māori student achievement. Figure 11 sets out what we found helps and hinders schools to use information effectively to support Māori students' success.

Figure 11
What helps and hinders schools to use information to support Māori student achievement

| What helps	What hinders
Information technology that makes it easy to integrate and share multiple information sources.	Challenges in getting information about incoming students and the success of students after they leave a school, in part because student management systems are not aligned.
Experienced principals.	
Active questioning of achievement data by the school's board of trustees.	Lack of confidence in the consistency of overall teacher judgements.
Critical mass of teachers able to investigate and comprehend achievement data.	Small numbers of Māori students in some schools, making trend and comparative analysis between years difficult.
Teachers as a group examining achievement data because it encourages robust discussion of the issues.	School's board of trustees does not take an active interest in discussions about student achievement information.
A clear inquiry cycle focused on improvement.	Inability of some student management systems to support different levels of access to information about a student.
Acknowledgement in a school's strategic documents of the importance of using information to improve education outcomes.	High levels of transient students.
Providing information to whānau about the progress and achievement of Māori students within a school.	No access to historical student results when using some assessment tools (this is related to ownership of the unique student identifier and associated information).
Coherent professional planning and mentoring support for staff to use the "teaching as inquiry" approach.	
Teachers willing, and having the disposition, to reflect on their own teaching information.	

Source: Our school visits.

Using information well raises questions and identifies opportunities

2.32   The data about Māori student achievement, participation, and engagement held by the Ministry is useful for raising questions and stimulating discussion about Māori student achievement. It can help identify opportunities for performance improvement.

Our approach to analysing Ministry data

2.33   To explore Māori students' achievement, we asked the Ministry for a range of achievement, engagement, participation, and administrative data.

2.34   We tested factors that we considered were related to our three measures of Māori student achievement (see paragraph 2.37). Our analysis is exploratory and descriptive. It examines whether there is a relationship between the factor and student achievement. The testing does not show the strength of the relationship.

2.35   We looked at three broad areas of administrative data and categorised them under:

· school management;

· school capability; and

· school characteristics.

2.36   We did not include cost information or data that supports the measurement of Māori succeeding as Māori because of its limited availability. We explain this later in the report.

2.37   We used the following as measures of Māori student achievement:

· the proportion of Māori students at a school who were "at or above" National Standards (as an average of reading, writing, and maths);

· the proportion of those "at or above" NCEA Level 2; and

· the proportion of Māori students who stayed at school until they were aged 17.

2.38   We did not look at Ngā Whanaketanga Rumaki Māori results. We excluded schools with fewer than 30 Māori students to remove sharp variability in achievement rates.

2.39   Our analysis is not intended to provide conclusive proof of the factors that determine Māori student achievement. Rather, we intend this analysis to start conversations about the school-related factors that may relate to Māori student achievement.

2.40   This analysis does not take into account the variability and strength of the relationship between the school-related factors and Māori student achievement. Our analysis is intended to provide a different lens to view how this information can be used.

Our analysis relates some factors to Māori student achievement

2.41   Figure 12 summarises the relationships we found between selected school-related factors and Māori student achievement. Against each school-related factor, we show whether our analysis found that Māori student achievement varied against what would have been expected from what the statistical analysis predicted (see Appendix 2).

2.42   These results led us to ask more questions about the relationship between the school attended and Māori student achievement.

Has the education sector got the distribution of skill and experience right?

2.43   As shown in Figure 12, our analysis found that Māori students were doing better in schools where the principal had been in the job for longer and the turnover of staff was lower. This raises questions about whether the sorts of schools that Māori students attend have the same level of experience among their principals and whether the staff turnover is similar to other schools.

Does the proportion of Māori students in a school matter?

2.44   Our analysis indicates that, in schools with a high proportion of Māori students, Māori achievement is more likely to be worse than in a school with a low proportion of Māori students. This again raises questions about whether the schools with higher proportions of Māori students are getting the right support they need to help improve Māori student achievement. This excludes the Māori immersion schools that follow Ngā Whanaketanga Rumaki Māori.

Figure 12
School-related factors and Māori student achievement against NCEA Level 2, National Standards, and length of time at school

	School-related factors	Māori student achievement is …		
		better than expected	mixed	worse than expected
Management	Financial difficulty			▓
	Larger working capital		▓	
	Larger operating surplus		▓	
	Larger public equity		▓	
	Larger operating grant			▓
	Larger spend on professional development		▓	
	Not under statutory intervention	▓		
Capability	Satisfactory ERO reviews	▓		
	Longer principal tenure	▓		
	Lower staff turnover rate	▓		
	Participates in Positive Behaviour for Learning programmes			▓
	Participates in Achievement, Retention, and Transition programmes		▓	
Characteristics	Higher proportion of Māori students			▓
	State-integrated school	▓		
	Has an enrolment scheme*	▓		

Source: Our analysis of the Ministry of Education's data.

* School enrolment schemes or school zoning is a means of preventing overcrowding at a school, by limiting enrolment mainly to students who live in the school area (zone).

Has the education sector got the distribution of resources right?

2.45   Figure 13 shows that Māori students attend mostly small schools. This raises questions about whether, overall, Māori students are accessing the same range of experiences (for example, those provided by specialist teachers and guidance counsellors) that are more likely to be available in larger schools. Our analysis showed that 75% of all decile 1-3 schools are small. Although small schools offer many benefits, there are fewer teachers to share the burden of, for example, disruptive behaviour.

Figure 13
Percentage of students' ethnicity by school size
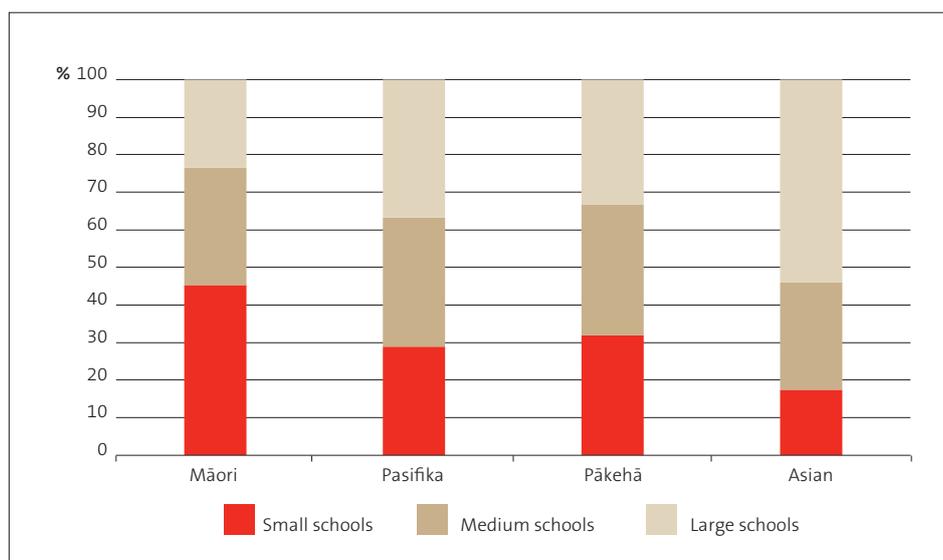
Source: Our analysis of the Ministry of Education's data.

2.46   We did not see many consistent relationships with the financial factors we selected. However, there is a relationship between Māori student achievement and whether a school is in financial difficulty, and whether a school has a large operating grant (the budget for running the school). This might suggest that how schools manage their finances is more important than how much funding they receive. This raises questions about a potential link between good financial management and student achievement.

Is the quality of teaching interactions with Māori students understood well enough?

2.47 It was not possible to work out whether there are differences in the quality of teaching engagement that Māori students receive, compared with others. Each school should understand how its teachers are engaging with their students, but information about teaching engagement does not exist at an education-system level.

2.48 We recognise that getting this information would be challenging. However, it is important to understand whether Māori students receive similar engagement and quality of teaching to other students.

2.49 This lack of information also raises questions about whether Māori students are getting appropriate engagement and quality of teaching that supports their cultural needs. This is important for Māori students to achieve as Māori.

Using information well contributes to success

Schools that use information better achieve better outcomes for Māori students

2.50 We looked at contrasting pairs of schools to assess whether the way each school used information made a difference. The pairs were of similar size, type, and decile. Each pair consisted of one high-scoring and one low-scoring school based on the performance of Māori students in NCEA Level 2 or National Standards.

2.51 In the schools we visited, we saw a high correlation between the school using information effectively and higher Māori student achievement. We observed several common attributes of schools using information effectively. These are:

- an intense focus on using information to change processes;
- managing and using information about individual students; and
- monitoring the relationship between the school, students, and whānau.

2.52 Schools we assessed as using information effectively were:

- setting strategic goals;
- measuring the school's performance;
- building relationships with, and working hard to understand, their students and the wider community;
- exhibiting a culture of inquiry and challenge; and
- asking how all of this relates to achievement.

2.53   Our observations are consistent with what ERO found in the same schools. Our analysis also indicates in Figure 12 that ERO is appropriately focusing its resources through school reviews, as the better performing schools have less frequent reviews. Figure 14 shows some of ERO's review comments about the schools we visited. These comments support our observation that using information well supports student achievement.

Figure 14
Education Review Office's review comments about the schools we visited

Schools we visited that had a large percentage of Māori students at or above NCEA Level 2 or National Standards	Schools we visited that had a small percentage of Māori students at or above NCEA Level 2 or National Standards
Medium secondary: "More active monitoring of student achievement by senior leaders and staff helped most students to achieve numeracy and literacy requirements for NCEA Level 1 in 2012."	Medium secondary: "A continued focus on teachers using evidence to inquire into the effectiveness of their practice will further enhance outcomes for students."
Large primary: "... a clear emphasis on collecting and analysing student achievement data and using it effectively to make positive changes."	Large intermediate: "Data is being used increasingly, and effectively, to make significant improvements to the levels of student achievement over their two+ years at school ... There is a deliberate approach by school leaders and teachers to ensure assessment information related to National Standards is valid and accurate."
Small secondary: "... uses high quality self-review to shape and reshape strategies that enhance student engagement, progress and achievement. Their results exceed and exemplify their high expectations and commitment to student's achievement."	Small secondary: "Senior leaders and middle managers have received considerable Ministry professional development to help them manage and use achievement information. Work with Ministry personnel did help the school improve the collation and tracking of student achievement. However, it has not been sustained."
Large primary: "... leaders and teachers are increasingly using student achievement information to strengthen teacher practice and monitor student progress."	Large intermediate: "As some teachers rely on data from standardised testing at set intervals, they have insufficient evidence to evaluate the effectiveness of strategies they use. With more detailed analysis of data, and closer tracking of priority students, more positive changes could be made."
Small primary: "These teachers are improving how they use student achievement information to inform teaching and learning programmes, and are improving their focus on target learners."	Small primary: "Staff and trustees are focused on improving Māori students' success in the Māori world and academically, especially in National Standards. School improvement teams have been established to implement this focus and are building a strong bicultural foundation for learning."

Source: Latest Education Review Office reports for each school.
Note: The two columns represent the way we sampled schools. The schools in the left-hand column had a large percentage of Māori students at or above National Standards or NCEA Level 2. The schools in the right-hand column had a small percentage of Māori students at or above National Standards or NCEA Level 2. We measured this performance using 2014 data.

2.54   One of the better-performing schools we visited produced a two-page summary about what information meant to the school and how it was used. The principal composed this summary and consulted with staff about its contents. Figure 15 is the first page of that summary. It shows the school's positive approach to using information. In our view, this is an approach that other schools could learn from.

Figure 15
How one school told us it used and valued information

GATHERING STUDENT INFORMATION

Student information is gathered from the following sources:

- Personal Information – this is usually gathered at enrolment, and stored on the SMS. It incorporates ethnicity, health and welfare factors, and any particular child- or family-specific matters. This can be added to as new information becomes available. This information determines those students who fall into the Priority Learners category.

- Achievement Information – this is the data held that shows each student's learning achievement and current levels. From this information, teachers analyse the data to establish their Target Students for accelerated learning. Students who would benefit from learning extension opportunities are also identified.

- Student Voice Information – this comes from a variety of sources. Some of it is anecdotal, drawn from student conversations with their teacher, informal teacher observations and responses to student surveys. This information gives some insight into how students see the school is meeting their learning and other needs.

- Community Information – in various ways, teachers and school staff engage with parents and whanau. This occurs in formal settings, such as Three Way Conferences or through external agencies involved with families. On other occasions, information comes from less formal interactions with whanau.

- Operational Information – at times, a student's attendance can lead to interaction with the family. In these situations, a discrete approach can lead to a different strategy by the school, and prove supportive of the student's needs. A similar approach is taken with behavioural issues; collation of this information can lead to tailored solutions, with involvement of whanau.

USING STUDENT INFORMATION

Student information is used in the following ways:

- Personal Information – this information enables us to identify Priority Learners. In terms of Maori students, this information is used to set achievement data against this category of students. Specific information about each student can also be used to establish support systems and opportunities.

- Achievement Information – from this data, teachers establish their Target Students, and plan for accelerating their learning. The data informs planning and leads to differentiated practice. It enables us to challenge deficit thinking, and work toward attaining an evenness of learning outcomes for all students. Achievement information also identifies students who would benefit from extension learning opportunities.

Source: Our school visits.

2.55   This summary highlights how the school demonstrates effective leadership and integrates a wide range of "hard" and "soft" information. The school was also switching to a new student management system that it considered would provide it with a greater capability to collect and use a wider range of student information. ERO also supported the school's approach to using information. ERO commented in its 2013 review report that:

> The school is well placed to sustain and improve its performance. Strong foundations have been established ... The school is well led by the principal, whose strategic approach to leadership guides ongoing school improvement ... Performance management systems have been refined to promote improvements to teaching practice ... Teachers are given opportunities for leadership ... ERO, trustees and school leaders agree that evaluating progress against strategic goals and more evaluative reporting would better assist the school's self-review processes.

2.56   Another school we visited had participated in a specific university programme aimed at improving Māori and Pasifika student outcomes. As a result, the school improved its use of information to change teaching practices to produce better results. When we visited, this school was considering information about the effect of class streaming.

2.57   Several schools highlighted how they use information to focus resources on students who need more support. These practices included:

- using tracking forms for specific students who need help in making better progress;
- involving students in tracking their own progress;
- using National Standards data to identify students who need help; and
- the principal using assessment information to question teaching practice and working with teachers to see what can be improved.

2.58   The better-performing schools we visited showed a stronger relationship between the school, students, and community. Some schools used student and whānau surveys to evaluate their teaching practice.

2.59   Schools that did not use information quite as well appeared less methodical or less willing to use and analyse information actively to make decisions.

2.60   Our findings are consistent with ERO's findings. It is clear that there is a wide variation in practices between schools. In our view, this relates to variability in leadership, purpose, and the quality of practices for measuring performance and improving processes. There is significant potential for improvement through more consistent practices.

Information currently used and its limitations

<div style="text-align:right">3</div>

3.1 In this Part, we discuss:

- what achievement and student information is currently used;
- gaps and issues with the quality of the information; and
- limitations with student management systems.

Summary

3.2 In some areas, the Ministry, agencies, and schools use information well. This includes achievement, participation, and engagement information.

3.3 However, there are currently significant gaps in the available information. This includes a lack of cost information, particularly for initiatives targeted at improving Māori student achievement. Also, information about Māori enjoying educational success as Māori is varied.

3.4 There are also limitations with the schools' student management systems and some issues with data quality that restrict how well information can be used.

Main information currently used

3.5 As we discussed in Part 2, the main sources of achievement information are National Standards and NCEA. The Ministry and NZQA administer this information, which is readily available and used throughout the education system.

3.6 Information about the number of students enrolled in schools is available. However, the Ministry and NZQA use different forms of enrolment information that involves different students. NZQA's data does not include students enrolled in schools not registered with NZQA.

3.7 The Ministry and NZQA also use different definitions to measure and report on NCEA achievement. The different reporting methods are used for different purposes. In our view, to support a "joined-up" education system working towards common goals, the different uses for the information needs to be made clearer.

3.8 Schools collect and use students' attendance information. Well-performing education systems have high levels of attendance and retention. Attendance and retention are strongly correlated to educational success.

3.9 The Ministry also collects information on suspensions and expulsions of students (which measures student engagement).

3.10 All this information is useful for the education sector to understand the achievement and performance of Māori students. This information is typically available in student management systems.

Soft information used in schools

3.11   Schools have a mixture of hard and soft information for informing their work on, and tracking their progress with, Māori students' achievement. The importance of soft information to provide a more holistic view of student success is nicely summarised by the statement from one of the school staff we spoke with, who said that "There's a story behind the data." The stories are the broader information that schools value and use in their day-to-day practice.

3.12   Some better-performing schools used softer information more effectively than some of the poorer-performing schools. Several schools were also looking for better capability in their student management systems to record this sort of information. This softer information provides important context about circumstances that could affect a student's learning.

3.13   The Ministry's guidance does not focus on how to effectively use soft information. Figure 16 sets out some examples of the types of information collected by the schools we visited. Schools do not necessarily formally record all of this information.

Figure 16
Examples of information that schools we visited use to track Māori educational success

Soft information	Hard information
Feedback (face-to-face, by telephone, email, or other written communication such as a survey) from: • Māori community • parents • teachers • students through hui • students through a student council • whānau • whānau hui Some entry-assessment information from contributing schools Some information from health, welfare, and educational support entities, and the Police	NCEA results National Standards Some information from health, welfare, educational support entities, and the Police Enrolment information Some entry-assessment information from contributing schools Ministry-produced infographics Student self-assessment, including interests, hobbies, and goals Student observational and whānau surveys

Source: Our school visits.

Gaps and limitations in information

3.14 There are two significant information gaps. These are information about Māori enjoying educational success as Māori and costing information for initiatives and programmes focused on Māori students. There are also issues with the collection of ethnicity data by schools.

Varied information about Māori students enjoying educational success as Māori

3.15 The overall goal of Ka Hikitia is to enable Māori to enjoy and achieve educational success as Māori.

3.16 Even though Ka Hikitia highlights Māori enjoying and achieving educational success as Māori, none of its measures are specifically about identity and culture. This raises the questions of:

- how the achievement of the overall goal of Ka Hikitia will be measured; and
- how the agencies contributing to the progress of Ka Hikitia can assess their performance.

3.17 In practice, maintaining and enhancing identity and culture as Māori depend on the context of the individual student, whānau, hapū, and iwi. Achieving as Māori means different things to different people.

3.18 This presents a challenge to the education sector in terms of the information that could be available and collected at the aggregate level to determine a holistic view of Māori achievement.

3.19 During our visits to schools, we asked what Māori enjoying educational success as Māori meant. We received a wide range of responses. In short, the responses can be summarised as what is valued by Māori as identified in the context of each school, student, and whānau.

3.20 One principal said that Māori enjoying educational success as Māori " ... is what we identify". A teacher told us "It is what Māori people value." A parent on a board of trustees said that it is when " ... the Māori aspect is part of the fabric of the school".

3.21   Figure 17 shows examples of what the schools we visited identified as Māori enjoying educational success as Māori.

Figure 17
Examples of Māori enjoying educational success as Māori

Overall on par, and sometimes above par, performance of Māori compared with non-Māori

Encouraging of identity and cultural activities

Having a successful kapa haka group

Children singing waiata every day

Speaking successfully at a pōwhiri

Being part of a kapa haka group

Confidence in giving a mihi on a marae

Achievement rates and positive choices after leaving school

Achievement of defined academic, cultural, employment, and community competencies

Source: Our school visits.

3.22   The better-performing schools we visited collected and used cultural information. This is a rich source of information. The challenge for the education sector will be to better collect this information at the aggregate level to inform and improve its decision-making. To improve the quality of this information, the range and quantity of guidance from the Ministry and other agencies on how to support and measure Māori enjoying educational success as Māori needs to improve. The guidance currently does not clearly and consistently set out what is required.

3.23   Schools could also learn from each other and share how they collect and use cultural information. Improvements in these areas would greatly enhance knowledge of cultural success and reduce this significant information gap.

Recommendation 1

We recommend that the Ministry of Education work with schools to establish a framework for collecting cultural information (for example, a student's ties with their iwi) and other information (for example, a student's goals and aspirations) about Māori enjoying educational success as Māori.

Recommendation 2

We recommend that the Ministry of Education help those schools that do not have enough understanding about what Māori enjoying educational success as Māori means, by providing better guidance and information that they can use to measure Māori enjoying educational success as Māori.

Recommendation 3

We recommend that the Ministry of Education use currently available information to investigate the variation in Māori educational achievement of similar schools in similar circumstances and help the lower-performing schools to do better.

Limited cost information available

3.24   The education sector uses some cost information. This includes information from school financial statements on staffing, the day-to-day running of the school, property, and student-funded places.

3.25   Other cost information is available for some programmes the Ministry funds. However, this is limited. Overall, it is difficult to identify the direct costs and value for money of specific interventions. There are few examples of cost evaluations of programmes aimed at supporting Māori students.

3.26   The Ministry could not accurately identify the funding for all programmes focused at Māori students. Appendix 1 shows the many programmes and initiatives that support student achievement, including Māori student achievement. Attributing the effect of specific programmes on individual Māori students is difficult. However, it is important to identify what value these programmes and initiatives have added.

3.27   Because it is using public money to fund these programmes and initiatives, the Ministry needs to work out how much they cost, whether they are effective, and whether they add any value overall and to Māori students in particular.

Issues with data quality

Collecting ethnicity data is variable

3.28   Schools collect ethnicity data when a student enrols, and the Ministry uses this data to identify who Māori students are.

3.29   We wanted to test whether schools collect this data consistently. We reviewed a random sample of 50 online school enrolment forms. We saw large variations in the design of enrolment forms that schools use to collect basic student data, which resulted in variations in the quality of data collected.

3.30   Schools generally followed the Ministry's guidance on collecting ethnicity data, but there are varying approaches to collecting such data. In our view, the

Ministry's guidance could be improved to better reflect Statistics New Zealand's best-practice guidelines on collecting ethnicity data.

3.31   Although nearly all schools asked an ethnicity question, most did not say why they collect this data. Many schools have no instructions on how to answer the ethnicity question. Those that do have varying instructions about how to answer the question. Schools also use free text fields widely, which contributes to categorisation and coding errors with this data.

3.32   The methods of collecting ethnicity data in schools raise questions about the quality of other data collected.

3.33   Inconsistent collection processes by schools might have a significant effect on Communities of Learning. This is an initiative where schools are expected to work together to share expertise in teaching and learning, and support each other.

3.34   At the local and regional level, improving the consistency and standard of ethnicity data collection would give the education system a more accurate picture of the number and distribution of Māori students. It would also improve the accuracy of ethnicity data for all ethnic groups.

Data quality is validated by the Ministry, but controls are variable in schools

3.35   Where the Ministry and NZQA collect data from schools, there are controls to ensure that schools comply with data standards for inputting and transmitting the data. This includes reminders on the checks schools need to do to ensure that they enter the data correctly. The Ministry also has computer checks to ensure that the data it receives is complete and appropriately recorded.

3.36   Although this level of validation ensures that data is good enough for reporting at an education system level, it poses questions about ensuring that data quality is of a high and consistent level at schools. Different standards of data collection by schools is likely to have an immediate effect at a regional and local level. This is especially so where schools are asked to work together in Communities of Learning because their collaboration requires information sharing. This view is supported by the inconsistent collection of ethnicity data outlined in paragraphs 3.28 to 3.34, together with the potential variability in National Standards assessment information.

3.37   During our fieldwork, some schools raised questions about the reliability of National Standards information. In particular, the large number of potential assessment tools, the lack of moderation of results, and the high level of discretion teachers have, have raised doubts about the reliability of National Standards information.

3.38   One school we visited ignored some National Standards information because the school was of the view that it was too unreliable. We cannot say how widespread this practice is, but it does raise questions about the use of National Standards information if schools perceive it to be unreliable. High-quality information is needed to ensure that all policies, including National Standards, can be implemented appropriately.

Limitations with student management systems

3.39   Schools use a wide variety of student management systems. Schools use these systems to collect student achievement, enrolment, and attendance information for use nationally and in schools.

3.40   Student management systems should have a profound effect on the way schools are managed and how effective teaching is. The OECD reports:

> *In the best cases, student data from a range of assessment resources is held within the SMS, follows the student from class to class and is used for reporting to parents, families and whānau. Teachers use aggregated student data to adapt and plan their classroom programmes, tailoring instruction according to student need. School leaders use school-wide aggregated data to investigate the effectiveness of school programmes and student learning, set targets for achievement, make resourcing decisions and determine professional development priorities.*[11]

3.41   During our visits, schools highlighted the problems of not having consistent student management systems. They told us of the difficulty in exchanging information between different student management systems and in transferring existing information to a new system when changing to a new provider.

3.42   The student management systems currently in use do not always enable schools to use the information effectively.

3.43   One teacher responsible for maintaining a school's student management system told us that "A lot of what the Ministry of Education want[s] is different to what we produce."

3.44   The variety of student management systems do not always support schools to share information or to collect cultural and pastoral information. Student management systems that are able to interact with others might help to avoid the manual transfer of information that schools said is common for providing information about incoming students. Also, student management systems that are capable of collecting softer information could be used within schools and for national purposes.

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11   Ministry of Education (2010), *OECD Review on Evaluation and Assessment Frameworks for Improving School Outcomes – New Zealand Country Background Report 2010*, Wellington, page 66.

3.45   The Ministry is aware of these issues and has set up a special project to improve student management systems. The Ministry has received and published feedback from users about the two main problems.

3.46   The first problem is that there is no common understanding of, or approach to, what student information is captured and how to capture it. The second problem is that there is no common model for the development of future student management systems.

3.47   In our view, it is important that the Ministry continues to progress its project to address these issues.

Improving how information is used

<div style="text-align: right; font-size: large;">4</div>

4.1 In this Part, we discuss:
- what is needed for the education system to make better use of information; and
- improvements currently under way in the education system.

Summary

4.2 The education sector recognises that it has much to do. It is going through a transition in how it views and uses information.

4.3 A planned and more joined-up approach is needed to support the better use of information. To put those plans into effect, there needs to be strong leadership. This includes leadership in schools to set goals and targets for Māori student achievement.

4.4 Capability and capacity to use information better will also need to be enhanced.

4.5 The education sector needs to have a clear understanding of how to use hard and soft information together to better support the goals of Ka Hikitia.

4.6 The education sector will need to ensure that it builds its collaborative arrangements to improve the sharing of practices and information, and also to take the opportunities presented by a unique student identifier.

The scale of the problem

4.7 The education system is made up of many people and organisations that collect, process, create, distribute, and use information. Overall, this system supports most students to be successful, and more students are becoming successful each year.

4.8 However, many students do not achieve success – and a disproportionate number are Māori.

Factors that need strengthening to use information better

4.9 We identified two significant factors that contribute to the education system using information better. They are:
- education sector leadership and school leadership; and
- capability and capacity to use information to make decisions.

Providing leadership about the use of information

4.10   Improvements need to be driven by a clear understanding throughout the education sector of how using performance and other information supports the goals of Ka Hikitia. Leadership at all levels is needed to improve the collection, quality, and active use of hard and soft information.

4.11   This challenge includes improving the accessibility of information and sharing information throughout the education system for the specific purpose of improving Māori student achievement. This means improving:

- the range of information;
- the systems used to collect and analyse the information; and
- guidance provided to schools on how to consistently collect and use information.

4.12   To help overcome these challenges, an identifiable and joined-up strategic and planned approach is needed. This is important for managing and using information throughout New Zealand's highly devolved education system.

4.13   The Ministry, ERO, NZQA, and Careers New Zealand have their own strategic commitments to improving Māori student achievement. Using information plays a part in each of their strategies. However, we could not find a joined-up strategy or plan about how these agencies would share and use information together. Nor could we find a strategy or plan that showed how these agencies and schools would share and use information to improve Māori student achievement.

4.14   In our view, managing information throughout the education system would be improved by a planned approach that:

- ensures that information is properly cared for and valued;
- provides clarity, direction, and shared goals about the purpose of collecting information;
- provides clear responsibility and accountability for the ownership, security, quality, management, and sharing of information; and
- enables more consistent, effective, and efficient use of information to make a difference for Māori students.

Showing leadership on the use of information in schools

4.15   The National Administration Guidelines require each school to convey to its community its plans and targets for improving the performance of Māori students.[12] It is reasonable then to expect that school charters would contain these plans and targets. As part of our audit work, we looked at 553 school charters to find out whether they had achievement targets for Māori. Of these charters, 23% had no achievement targets for Māori students.

4.16   Schools that had low proportions of Māori students on their roll tended to not have identifiable targets and goals for improving Māori student outcomes in their charter.

4.17   Having a small proportion of Māori students on a school roll or knowing that those students are doing as well as other students is not a substitute for seeking ways to continually improve Māori student achievement.

4.18   Figure 18 shows that there are also strong regional differences in the proportion of schools that do and do not have identifiable targets and goals for improving Māori student outcomes in their school charters.

Figure 18
Schools with targets and goals in their charters to improve Māori student outcomes, by region, 2014
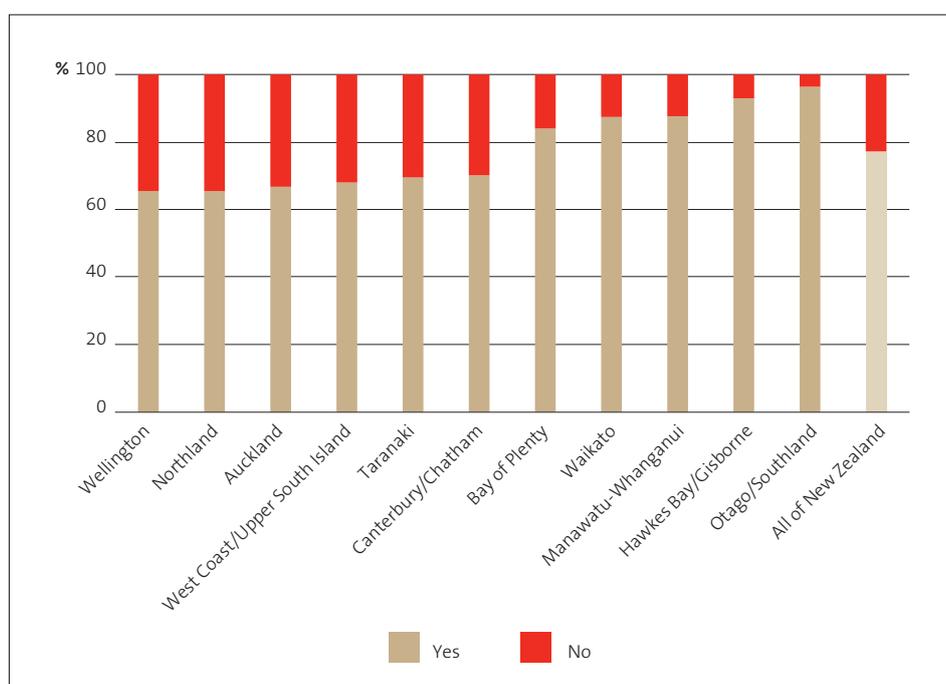
Source: Our analysis of school charters.

12   Issued under section 60A(1)(c) of the Education Act 1989. National Administrative Guideline 1(e): in consultation with the school's Māori community, develop and make known to the school's community policies, plans and targets for improving the achievement of Māori students.

4.19   In the same review of school charters, we looked for whether schools had plans to improve staff knowledge about Māori students. Figure 19 shows that schools that set targets and goals for Māori students tended to have plans to increase staff knowledge about Māori students.

Figure 19
Relationship in school charters between setting goals and targets and a focus on increasing staff knowledge, 2014

Goals and targets for improving Māori achievement	Plans to increase staff knowledge about Māori students		
	No	Yes	Total
No	12%	11%	23%
Yes	14%	63%	77%
Total	26%	74%	100%

Source: Our analysis of school charters.

4.20   We looked at school charters to see whether they contained five actions we had identified that aim to improve student achievement and relationships with whānau. We found wide variation between regions. Figure 20 shows this, using information from two contrasting regions.

Figure 20
Actions in school charters that aim to improve Māori student achievement and relationships with whānau in two regions

Percentage of school charters

Otago/Southland   Canterbury/Chatham
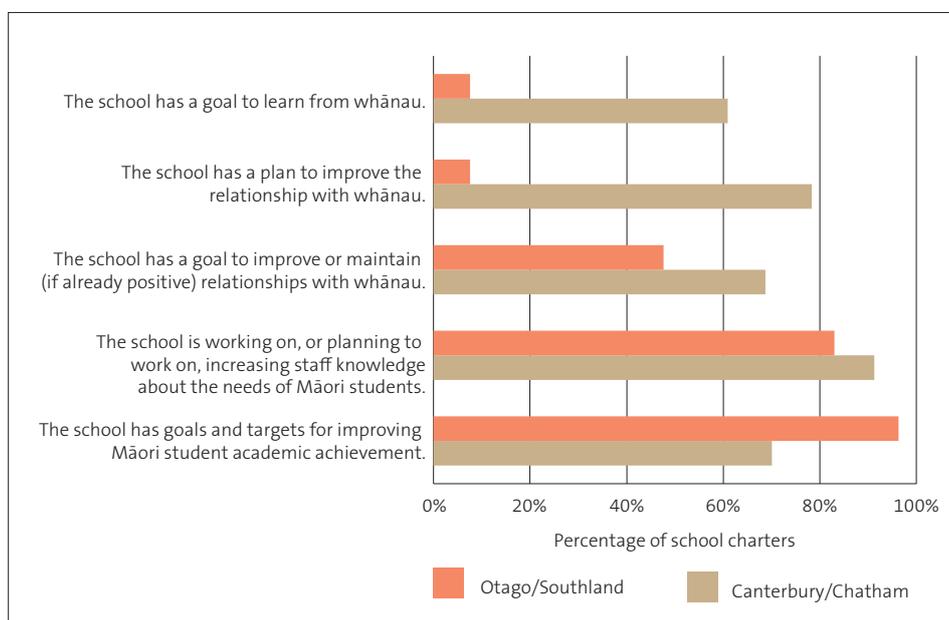
Source: Our analysis of school charters.

4.21   Some of the schools we visited set separate achievement targets for Māori students, and others did not. In our view, some improvement in strategic leadership in schools is still required.

Improving the capability and capacity to use information

4.22   During our visits, we asked schools about the analysis and reporting they did about Māori achievement. The amount and sophistication of analysis and reporting varied widely. In our view, the different levels of ability to use information reflected the different organisational cultures, time available, and skill set.

4.23   We have summarised three main features of analysis and reporting that we saw at the better-performing schools we visited. They are:

- **Leading from the top helps** – School leadership and the boards of trustees at better-performing schools actively use information about student achievement. We found considerable variability in the extent to which school boards of trustees actively use information to progress the objectives of Ka Hikitia. In some schools, boards do not use information at all. In our view, it is difficult to build and practice a culture of actively using information if it is not led from the top.

- **More detailed analysis of achievement information within the school** – Better-performing schools analyse in detail the achievement of different groupings of students, whether by year, gender, ethnicity, learning needs, or level of transience.

- **One size does not fit all** – Better-performing schools focus on individual students in terms of goal setting and teaching practice. As one interviewee said, being specific to an individual student, "One size fits one."

4.24   Figure 21 lists some of the types of analysis and reporting that helped schools to focus on improving Māori student achievement.

4.25   The education sector's capability to use information effectively needs to improve. During our audit, people told us that:

- *We are still learning to use data, and understand it. Quite a shift* (staff member of Wellington-based agency).

- *Many of us don't know what question we should be asking, to get the right data, to answer the right questions* (staff member of Wellington-based agency).

- *Schools struggle to identify what data they have and what to do with it* (an adviser to schools).

- *Teachers are only starting to understand data use* (school principal).

Figure 21
Examples of analysis and reporting of Māori educational success in schools we visited

Analysis and reporting to the board of trustees

- Frequent reports to the board of trustees on "targeted children's progress".

- Periodic reporting to the board of trustees about the progress of high-risk students.

- The board of trustees uses information about educational success to set key performance indicators and vision.

- Summary report of school-wide achievement is produced three times a year. The report compares Māori and non-Māori achievement. The report is provided to the board of trustees.

Analysis and reporting by defined student groups

- Tracking of the progress of students with high needs or specific learning needs with an individual form that records the interventions made for those students and the effect of those interventions for each student.

- Segmentation of students into cohorts and then analysis of the relative changes in achievement for each cohort between years.

- Class-by-class comparison of progress against a Māori achievement plan using assessment information.

- Reporting on each year group's progress (for years 1 to 6) against the school's te reo objectives for each year group.

- Weekly review of achievement data for specific student cohorts.

- Trend analysis of achievement by different ethnic groups.

- Summary report of school-wide achievement produced three times a year. The report compares Māori and non-Māori achievement. The report is used by senior teaching staff.

Analysis and reporting at the individual student level

- Principal reviews summary of student achievement after five-week targeted exercise that results in the principal working with individual teachers to question teaching practice and what can be improved.

- Statistical information used to identify priority learners and their potential learning needs.

- Teachers review student achievement information daily and weekly.

- Individual student learning plans with achievement targets informed by a student's performance in the previous year. Student progress against the plans is reviewed each term.

- Summary report of school-wide achievement produced three times a year. The report compares Māori and non-Māori achievement. The report is used by senior teaching staff and is provided to the board of trustees.

- Periodic review of achievement at a subject departmental level.

Source: Our school visits.

4.26   The education sector understands that its capacity to use and act on the information needs to improve. Schools prioritise their time and effort on fundamental issues such as the welfare and safety of children. In some schools, this can consume a lot of time, including senior leaders' time.

4.27   Māori student achievement varies between similar types of school. Not every school needs to respond equally to improve its leadership or raise its capacity and capability to use information. Those schools that perform less well should be a clear priority for receiving support and assistance to improve their leadership and information practices.

Improvements under way

4.28   Improvements are starting to happen. The education sector, led by the Ministry, understands the importance of good quality information to inform its decision-making. Although there is much to do, the sector is going through a transition in how it views and uses information. We have seen positive examples that support this change in approach.

4.29   We have seen such examples throughout the education sector:
   •   In its Statement of Intent, the Ministry said that improving the range and use of achievement information is one of its main outcomes.
   •   The Ministry is leading a project to improve student management systems and how they share data.
   •   Careers New Zealand has been redeveloping its engagement with young Māori, with a special focus on improving the flow and quality of information.
   •   The Ministry has strengthened its quality assurance processes for policy development so that it uses the best available information from throughout the Ministry.
   •   Initiatives (for example, Communities of Learning) in the school education system provide support and professional development to grow the capability and competencies to use information effectively.

4.30   We have not seen evidence of how the examples above and other initiatives contribute to a joined-up and strategic approach that transforms how information is collected, used, and shared within the Ministry and throughout the education sector. It is important that the Ministry ensures a joined-up approach to developing its use of information.

4.31   To encourage the sharing of information, the Ministry and agencies are working together through a mix of formal and informal arrangements. This will establish what information the education sector has, what can be shared, and how that can be done appropriately.

4.32   People spoke with enthusiasm about the meetings and sector forums held under these arrangements and felt they were adding value. However, no one pointed us to an identifiable outcome. We agree that there is a time and place to establish

relationships and share information. We expect these meetings to develop quickly and lead to a more defined result.

Unique identifier and pipeline analysis

4.33   The national student number enables the Ministry, agencies, and schools to collect detailed information about a student, and the interventions and funding that student receives. It also enables comparisons with educational achievement.

4.34   The Ministry and the Treasury have used individual student information for some analysis to understand the effect of educational success on life outcomes and lifetime use of government-funded social services.

4.35   This type of "pathway" analysis is easier to perform and more accurate when an individual's contact with different parts of the education sector and other social services can be uniquely identified. The existence of a unique student identifier is an important and positive building block for this better use of information.

4.36   One of the main reasons this type of analysis has been limited to date is because information about who is participating in which initiatives, and the direct cost of participation in those initiatives, is not collected systematically at the school level or centrally. It is not possible to identify who is participating in specific initiatives, including whether the participants are Māori, or what the cost of their participation is.

4.37   In our view, the ability to do a "pathway" type of analysis at an individual student level will increase over time. This presents an opportunity for the education system to really understand educational achievement for Māori and other students. However, this enhanced use of information requires better cost information and softer cultural information, as identified earlier in our report.

Recommendation 4

We recommend that the Ministry of Education work with education agencies and schools to ensure that there is effective leadership and common understanding of the purpose and use of information to improve outcomes for Māori students. This includes:

- ensuring that school charters have targets for Māori achievement, where appropriate;

- having a planned approach to improve the quality and use of information;

- taking stock of information the education sector has and how it is used; and

- encouraging the education sector to work together to ensure that staff have the capability to use information effectively.

Recommendation 5

We recommend that the Ministry of Education improve practices to collect, analyse, use, and share information about Māori educational achievement. Priority should be given to:

- sharing effective collection and analysis practices throughout the education system to improve Māori student achievement;

- sharing practices so that schools use information and enquiry effectively to improve Māori student achievement;

- improving the way schools collect student ethnicity data, which should include updating the Ministry of Education's ethnicity data collection guidance and examples; and

- improving the availability of important and relevant cost information to inform decisions about investing in initiatives to improve Māori student achievement.

Appendix 1
Initiatives to improve Māori student outcomes

Figure 22 gives an indication of the range and variety of initiatives available to improve student outcomes, and identifies those targeted at or emphasising Māori students. It is not a comprehensive list. The cost information is based on information provided by the Ministry of Education and is not audited.

Figure 22
Initiatives to improve student outcomes

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
Programme for Students – Accelerated Learning in Literacy and Mathematics, and Mathematics Support Teacher						
Teachers	No	No	Supports schools to inquire into their teaching practices to accelerate the progress of students who are below the National Standards for reading, writing, or mathematics.	No		
Building on Success						
School leadership and teachers	Yes	Yes	Encourages school leaders to work with whānau, hapū, iwi, and Māori organisations to ensure that their support and expertise with Māori language and culture can be positively directed towards Māori student engagement and achievement outcomes. It brings together the successful elements of Te Kotahitanga (discontinued), He Kākano (discontinued), and the Starpath project.	No	10,930	10,451
Count Me In						
Students	Yes	Yes	Provides targeted support to Māori and Pasifika 16 to 18 year-olds who have left school without NCEA Level 2, to give them the best chance at gaining a Level 2 qualification.	No		

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
E-Ako Pāngarau						
Students	Yes	Yes	Provides online learning modules for students in each strand of the Pāngarau Learning Area of Te Mātauranga o Aotearoa.	No	Combined with English medium costs	Combined with English medium costs
Hautū						
School leadership	Yes	Yes	A Māori cultural responsiveness self-review tool for boards of trustees.	Yes		
Investing in Educational Success						
School leadership and teachers	No	No	Focuses on improving teacher quality to raise student achievement. It provides a process to get communities involved in raising student achievement by working together with schools to identify and address common achievement challenges.	No		
Joint Initiative						
School leadership and teachers	No	No	A collaboration between New Zealand Education Institute and the Ministry of Education. Aims to identify what works in schools and communities to encourage greater collaboration and support successful transition.	No		
Kimihia Rangahaua (Māori medium research and evaluation)						
Teachers, students, Ministry staff, sector leaders, whānau	No	No	To address lack of well-researched strategies for teaching literacy, and to ensure effective evaluation of Māori medium literacy materials and training programmes.	Yes	266	168

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
Learning and Change Networks						
School leadership, teachers, parents, students, community	Yes	No	A group of schools/kura working together to grow capability and to accelerate achievement of priority learners in ways that recognise cultural diversity and grow innovative and future-focused learning. It has a particular focus on Māori, Pasifika, special education needs, and learners from low socio-economic backgrounds.	Yes	1,352	1,219
Learning Experiences Outside the Classroom						
Students	Unclear from the information provided	Unclear from the information provided	Provides authentic Māori language experiences, hands-on practical experiences including waiata-a-ringa, maurakau, weaving, and historical enactments in the context of a marae.	No	46	46
Māori Achievement Collaboration						
School leadership and teachers	Yes	Yes	Led by the New Zealand Principals Federation, uses the knowledge of school principals who have lifted Māori achievement to guide clusters of schools to engage with the local iwi and whānau.	Yes	109	109
Māori Language Programme						
Students	Yes	No	Provides specific funding for Māori language learning.	No	17 (2014) 18 (2015)	
Māori and Pasifika mentoring						
Students	Yes	Yes	Aims to support young Māori and Pasifika students, in a culturally responsive way, to successfully achieve NCEA.	No	1,870	1,647

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
Mauri Tū, Mauri Ora (Māori medium programmes for students)						
Students	Yes	Yes	To accelerate students who are Manawa āki and Manawa taki in te reo matatini and pāngarau.	No	2,500	2,200
Mātaiako (kura and Māori medium only)						
School leadership, teachers, parents	Yes	Yes	Is about gathering and interpreting information about student progress and achievement, and using that information to improve teaching and learning in schools.	No	1,055	894
Mutukaroa Project						
Parents	No	No	A home school learning partnership that seeks to accelerate learning progress and achievement for students in years 1, 2, and 3 by fostering the active engagement of parents and whānau. The project also aims to provide parents with the knowledge necessary for them to support the development of core skills in their children.	Yes	1,474	1,389
NCEA and the Whānau						
Parents	Yes	No	NZQA-led information programme aims to help whānau understand NCEA through a series of interactive workshops.	No		
Partnering for Achievement						
Parents	No	No	A package of initiatives designed to strengthen the ability of parents, families, and whānau to enhance their children's education.	No		

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
Partnership Schools						
Students	Yes	No	These schools were set up to raise achievement among Māori, Pasifika, learners from low socio-economic backgrounds, and learners with special education needs.	No	5,296	N/A
Positive Behaviour for Learning						
Students, teachers and school leadership	No	No	10 initiatives (five in development) that help parents, whānau, teachers, early childhood centres, and schools address problem behaviour, improve children's well-being, and increase educational achievement.	Yes		
Puawaitanga Scholarships						
Students	Yes	Yes	For students enrolling in Tutahi Māori Boarding Schools who demonstrate leadership.	No	1,152	1,083
Rauemi whānui (Māori medium publishing)						
Students and teachers	Yes	Yes	Develops teaching and learning resources for Kura Tau 1-8 and Wharekura Tau 9-15.	Yes	4,522	4,630
Reading Together						
Students and parents	No	No	Involves schools facilitating a series of workshops for parents and whānau to support their child's reading at home.	Yes		

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
Resource Teachers: Learning and Behaviour (RTLB) Support						
Teachers and students	Yes	No	Provides learning and behaviour support to schools. The RTLB teams work with schools, teachers, and students with learning and behaviour needs, to improve schools' capability to provide an inclusive environment.	No		
Schooling Improvement – Iwi partnership						
Students, teachers, Ministry, sector leadership	Yes	Yes	Projects to realise opportunities for iwi and Māori to have increased responsibility for influencing, designing and implementing solutions.	No	3,900	N/A
Starpath						
School leadership and management, teachers, students, and parents	Yes	No	University of Auckland worked with several secondary schools in Auckland and Northland to identify and address the barriers that prevent participation and success in degree-level education.	Yes		
Student Achievement Function						
School leadership	No	No	Expert practitioners work with schools during a 26-week programme to promote cultural changes to help raise student achievement.	Yes	Combined with English medium costs	Combined with English medium costs

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
Tailored Training and Support (this has been subsumed into the master service agreement with the New Zealand School Trustees Association)						
School leadership	No	No	Provides support and advice to schools' boards of trustees so that they are supported to understand their governance and accountability roles. This includes setting a strategic direction that contributes to raising student achievement, especially for the priority groups in their school.	No		
Tātaiako						
School leadership and teachers	Yes	Yes	A resource to help schools think about their current practice and how responsive that practice is to the needs of Māori learners.	Yes		
Te Kauhua						
School leadership, teachers, community	Yes	Yes	Supports school-based action research projects to help schools and whānau to work together in ways that improve Māori learners' outcomes.	Yes	267	267
Te Marautanga o Te Aho Matua						
Students and teachers	Yes	Yes	Development of Te Marautanga o Te Aho Matua and supporting resources.	No	1,013	1,018
Te Matakura (Māori medium NCEA)						
Students and teachers	Yes	Yes	Provide a full suite of NCEA Levels 1-3 Te Mātauranga o Aotearoa – derived achievement standards and associated teaching and assessment resources for Māori medium students to use towards nationally and internationally recognised qualifications.	No	2,440	1,590

For	Emphasis on Māori learners?	Targeted at Māori learners?	Description	Outcomes known?	2014/15	
					Budget $000	Actual $000
Te Mātānuku (Māori medium professional learning and development)						
Teachers	No	No	Supports centrally funded professional development and learning.	No	14,110	14,190
Te Whare Kōrero Pāngarau o Aotearoa						
Teachers, students, and whānau	Yes	Yes	Provides online resources to support all strands of pāngarau.	No	120	120
Wharekura curriculum support						
Teachers	Unclear from the information provided	Unclear from the information provided	To share wharekura teacher expertise.	No	1,198	1,110
Whānau Education Action Plans						
Teachers, social workers, students, and parents	Yes	Yes	The plans are a tool to help students and their whānau map education goals and define a set of actions, time frames, and responsibilities about how the plan will be implemented.	Yes	286	N/A
Youth Guarantee programmes: Vocational Pathways; Achievement, Retention, and Transition; Secondary-Tertiary programmes; Fees Free; Secondary Tertiary Alignment Resource; Gateway						
Students and school management	Yes	No	The suite of programmes gives 16-19 year olds options for education and training to gain a New Zealand Qualifications Framework Level 1 to 3 qualification (including NCEA).	Some		

Source: Ministry of Education and Office of the Auditor-General.

Note: For the data on whether outcomes are known, "No" can mean that it is too early to measure outcomes.

Appendix 2
Our methodology for analysing the Ministry of Education's data

Request for data to the Ministry of Education

In September 2015, we decided we would carry out our own analysis of data held about schools by the Ministry of Education (the Ministry). We did this to provide assurance that data about school-level achievement of Māori students is accessible, able to be integrated with other (mainly financial) data, and able to be analysed to provide information about achievement.

We asked the Ministry for, and were provided with, aggregated achievement data and aggregated administrative data about schools from a range of different Ministry databases. The data was for 2014.

Importing and organising the data

Using secure transfer methods, we imported data into an Excel data model to three main tables. One table was about the characteristics of schools (for example, size, decile, location). Another table was about student achievement (at the school level, not individual students), and a final table contained aggregated school financial information. Other tables were added to the data model as the analysis progressed (such as aggregated information about school staff).

Data testing of results using Excel

We looked at the range and distribution of the data. We had earlier decided on an analysis plan after examining the achievement of Māori students within similar schools. We asked the Ministry to include aggregate data for Māori students by school for National Standards and NCEA results. We did not want to compare Māori and non-Māori students because our focus is on the performance of schools and the education system. Instead, we decided to look at whether Māori students succeeded consistently throughout schools. To support this reasoning, we identified an analytical way to compare schools so they were alike in important ways.

We chose decile, school type, and school size (roll) as a set of parameters to create groups of schools that were alike.

We grouped schools into three categories by decile: 1-3, 4-7, and 8-10. We chose these categories for consistency with our second Education for Māori audit report.

We combined school type (primary, secondary, composite, and special) and school size to produce 12 categories — small, medium, and large for each of the four school types.

Because of the "long-tailed" distribution of school size (many small schools, some with a school roll measured in single digits; many more schools with a few

hundred students to a thousand or so; and a small number of very large schools, some with rolls in the thousands), we based the division of small, medium, and large for each school type on the cumulative percentage of the total school roll for each school type.

For example, we arranged primary schools in order from smallest to largest (according to school roll numbers as at May 2015, which were also made available to us) and then calculated the percentage and cumulative percentage that each school contributed to the total count of students. We then divided the cumulative percentage into thirds and gave the smallest third the label of "small primary", the middle third "medium primary", and the largest third "large primary". If we had divided the list of smallest to largest primary schools into three equal numbered groups, we would still have had quite a range of schools within each grouping, especially the schools with the largest number of students on their roll.

Figure 23 shows the number of schools in each category, by decile, that we used as the basis of our analysis. Some data is missing because some schools have not been assigned a decile rating.

Figure 23
Number of schools in each category of our analysis, by decile

School type/size	Decile 1-3	Decile 4-7	Decile 8-10	Missing data
Large secondary	4	21	23	1
Medium secondary	14	44	27	2
Small secondary	68	87	34	41
Large composite	1	0	3	5
Medium composite	3	9	9	9
Small composite	64	26	9	28
Large primary	47	80	125	3
Medium primary	109	165	140	2
Small primary	406	519	336	29
Large special	2	4	1	0
Medium special	3	5	1	0
Small special	12	8	1	1
Total	**733**	**968**	**709**	**121**

Source: Our analysis of the Ministry of Education's data.

Figure 24 shows the distribution of the total school rolls and total Māori rolls for the 12 school size and type categories.

Figure 24
Student rolls by school category

School type/size	Total rolls	% of total rolls	Total of Māori rolls	% of total Māori rolls
Large secondary	90,874	12	13,149	7
Medium secondary	91,195	12	17,907	10
Small secondary	90,244	12	25,623	14
Large composite	17,620	2	2,474	1
Medium composite	17,455	2	2,580	1
Small composite	17,303	2	9,833	6
Large primary	149,841	20	26,185	15
Medium primary	144,845	19	35,055	20
Small primary	144,808	19	45,155	25
Large special	1,123	0.1	255	0.1
Medium special	974	0.1	242	0.1
Small special	976	0.1	295	0.2
Total	**767,258**	**100**	**178,753**	**100**

Source: Our analysis of the Ministry of Education's data.

Figure 24 shows that about 45% of Māori students attend a small school — whether that school is a secondary, composite, primary, or special school.

Our main intention was to test in a practical way whether the data could be used once it had been accessed. Our intention was not to research possible causes of, or contributors to, Māori student achievement. We also wanted to know whether the data we had asked for could be linked with financial and other data. We explored the practical considerations of making this linkage, and we consider that we have been able to generate new ideas and questions worth further investigation (see Part 2).

To start our exploration, we selected independent variables that we considered related to student achievement. We used the Chi-square function in Excel to examine relationships between the variables. We selected National Standards, NCEA, and "remained at school at the age of 17" as our dependent variables. We did not look at Ngā Whanaketanga Rumaki Māori results.

The dependent variables were the proportion of Māori students in a school who:

- were below, at, or above National Standards (an average rating of the three assessments made in reading, writing, and mathematics);
- were below, at, or above NCEA Level 2; or
- remained at school at the age of 17.

The first variable applied mainly to primary, intermediate, and some contributing schools. The last two applied mainly to secondary and some contributing schools.

The dependent variables and independent variables were usually organised as two by two, and sometimes as two by three, tables.

The Chi-square Test of Independence is a hypothesis test. We stated the null hypothesis and alternative hypotheses respectively as:

- H_0: The data are consistent with a specified distribution – the expected frequencies.
- H_a: The data are not consistent with a specified distribution – the observed frequencies.

We set a high significance level of 0.001. This meant that we rejected the null hypothesis only when the likelihood of observing the relationship was equal to or smaller than 1 in 1000. Moreover, our intention was to explore and focus on performance throughout different dependent variables, so we looked for a consistency of the relationship and its direction between the independent variable and the dependent variables. We converted ratio variables, specifically the financial variables measured in dollar units, to equal categorical units by dividing the range of dollar values into thirds: small, medium, and large.

As we calculated the proportions of Māori students below or at and above the two main achievement categories, we noted a varied distribution of results throughout schools of the same decile group and school type and size. This invited further analysis, so we investigated individual decile levels. This investigation also showed a wide distribution of results between schools. This led us to make a qualitative selection of schools at either end of the distribution of achievement so that we could observe, in our school fieldwork, how they collect and use information.

School visit sample methodology

The first two dependent variables used in the data analysis (about National Standards and NCEA Level 2) formed the criteria to select schools for audit fieldwork. We categorised the proportions a school achieved in the 0-25%, 26-50%, 51-75%, or 76-100% range. To obtain a clearer picture, we included only schools with more than 30 Māori students in the calculation.

To maximise the chances of selecting schools that had the biggest differences, we labelled those schools categorised as 0-25% and 26-50% as "low" and those as 76-100% as "high". We then sorted the list of schools by location, decile, and school type to identify suitable candidate schools. We preferred schools in the upper North Island, to concentrate our fieldwork and reduce costs associated with travel and accommodation.

The sample schools were paired, but the pairing and reasons for it were kept to one member of the audit team. We did this so those visiting the schools could carry out their fieldwork without bias toward the selection criteria.

After we identified the pairs of schools, we sought advice from the Ministry and ERO about any reasons why we should not visit any of the schools in the sample – for example, because the school was under or about to be put under management intervention or an ERO review was scheduled at the same time. Two schools from an initial sample of 12 were identified as inappropriate to visit at the time, so the sample was reduced to 10 schools. The sample pairing was not exact, and we used some flexibility to find a match – for example, we matched a large primary school with a large intermediate school.

We contacted schools by telephone and email to ask them to take part in the audit. We asked to talk with people responsible for collecting, managing, and using information and those responsible for achievement, in particular Māori student achievement.

Including our pilot visits, we visited 13 schools between June and November 2015.

Appendix 3
# Range in Māori educational success within similar schools and communities

Figures 25-28 show the variability in Māori students' achievement in National Standards and NCEA Level 2 for four selected school categories. A common pattern is that, on the whole, higher decile schools achieve better results. However, there is a large overlap in performance between the groups. Results for Māori students attending schools in similar circumstances vary markedly.

Figure 25
Variability in NCEA Level 2 results, medium secondary schools, 2014
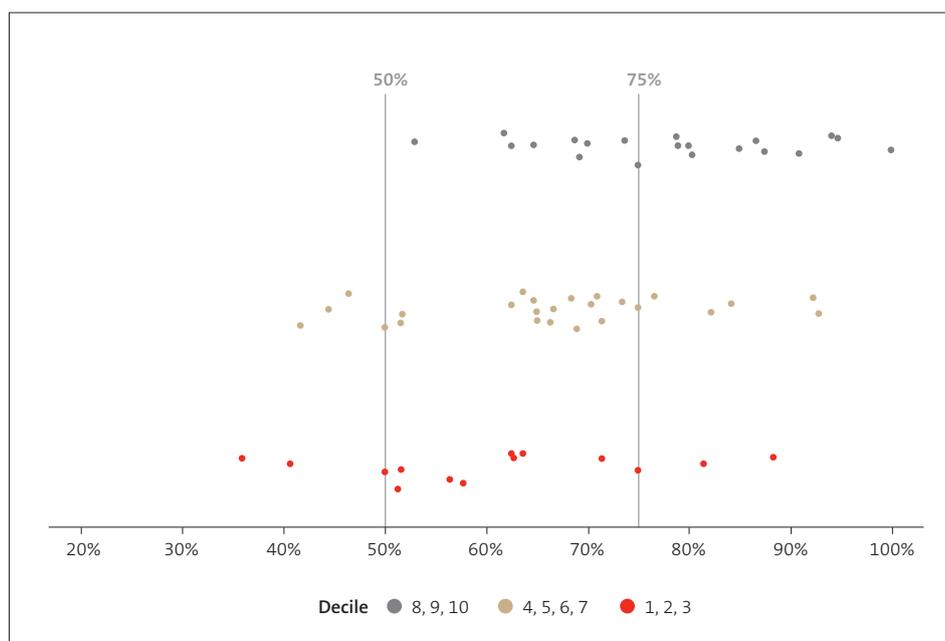

Source: Our analysis of the Ministry of Education's NCEA data. We have excluded schools with fewer than 30 Māori students.

Figure 26
**Variability in NCEA Level 2 results, large secondary schools, 2014**
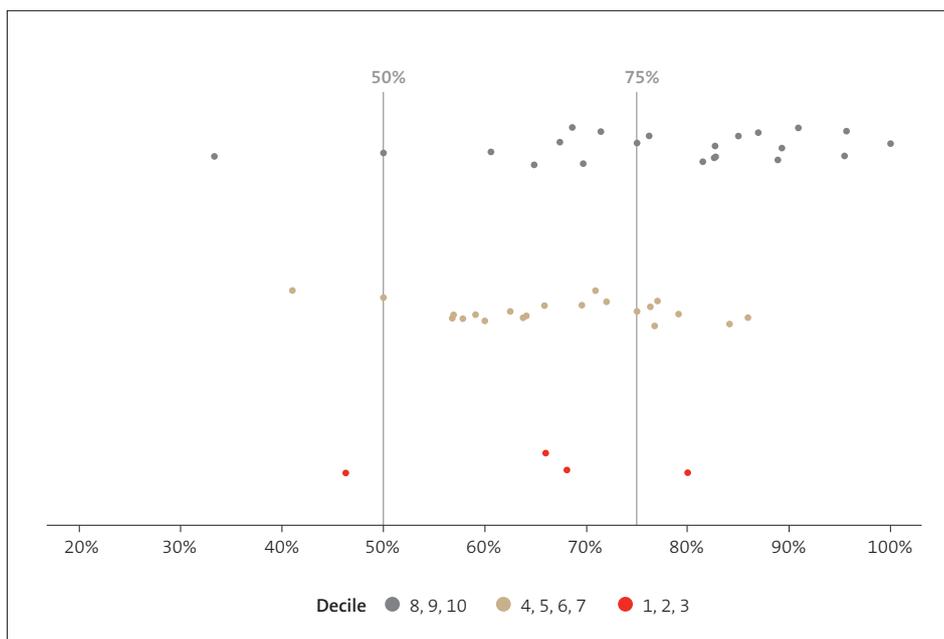
Source: Our analysis of the Ministry of Education's NCEA data. We have excluded schools with fewer than 30 Māori students.

Figure 27
Variability in National Standards results, small primary schools, 2014
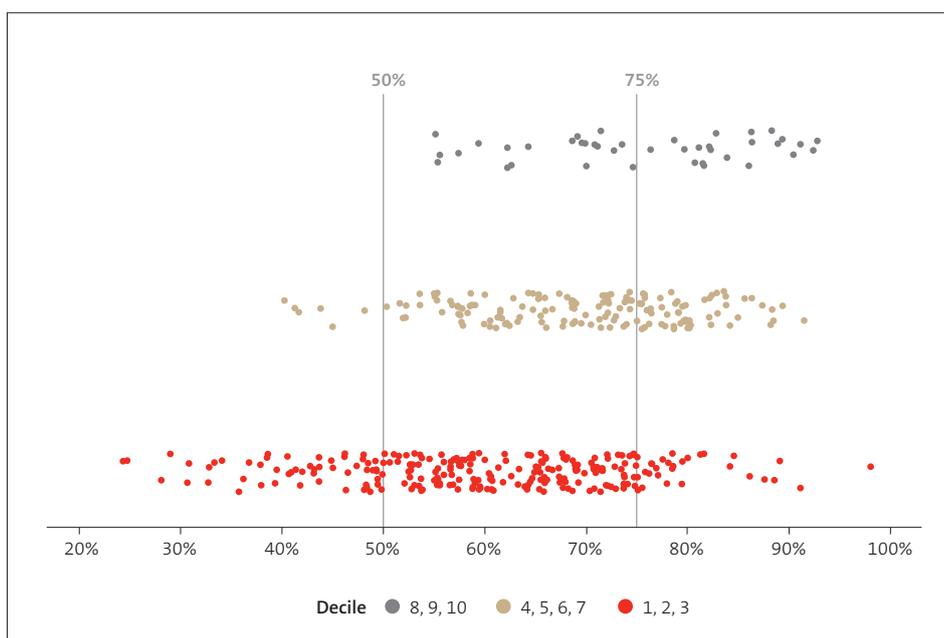
Source: Our analysis of the Ministry of Education's National Standards data. We have excluded schools with fewer than 30 Māori students.

Figure 28
Variability in National Standards results, large primary schools, 2014
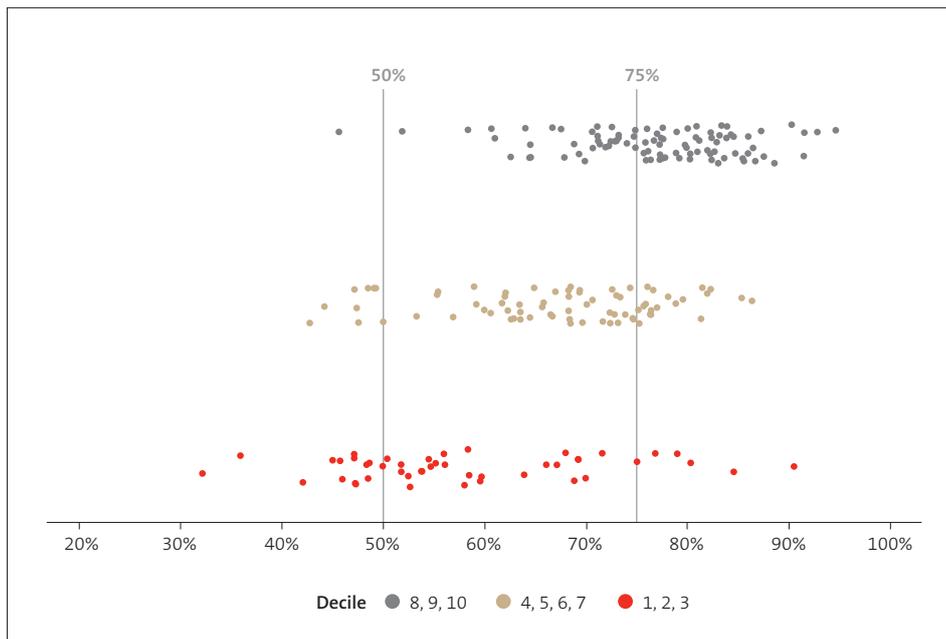
Source: Our analysis of the Ministry of Education's National Standards data. We have excluded schools with fewer than 30 Māori students.

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Other publications issued by the Auditor-General recently have been:

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- Response to query about Housing New Zealand's procurement processes
- Reflections from our audits: *Governance and accountability*
- Draft annual plan 2016/17
- Local government: Results of the 2014/15 audits
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