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| School Expenditure and Revenue  Report to the Ministry of Education  Draft:  7 October 2016 |

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Introduction and summary

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| This report provides an information baseline for the Review of Education Funding Systems, currently underway by the Ministry of Education |

Background

The Ministry of Education (the Ministry) is undertaking a Review of the Education Funding Systems. The Review is part of the Government’s Education Work Programme for building a sustainable, fit for purpose education system that enables all young New Zealanders to achieve educational success.

As the Ministry tests proposed directions for change in greater depth, it requires more fine grained information on how state and state-integrated schools spend their funding. This includes funding the Government allocates to them, through staffing entitlements and the operational grant, and also areas where schools spend additional funding they raise from other sources, such as funding raised from international students and parental donations.

Purpose of this report

The purpose of our report is to present analysis and findings from research we have conducted over a two-month period. It illustrates:

* The sources of funding for schools, and how broadly they vary
* The types of expenditure for schools, including staffing, and how broadly they vary
* How schools allocate resources across year groups proportionally, and how that compares to government funding

As such, this report provides an information baseline that will be useful for testing potential directions of change and for guiding further detailed analysis that will form part of the Review.

The report does not provide specific recommendations or conclusions.

Findings are indicative

The analysis in this report is based on large datasets (more than 2,000 schools) for payroll and financial information, but on very limited data (53 survey respondents and 17 interviews) in other areas.

Therefore the findings should be interpreted as indicative. We have referenced the data sources and sample sizes throughout the sections of the report.

Summary of findings

Allocation of teachers

Allocations of teachers across year groups from schools that responded to our survey are broadly in line with the FTTE allocations the Ministry provides. Specifically, the allocations show lower student to teacher ratios at very junior and very senior years. Because of the small sample size, this information should be seen as indicative.

We have seen little evidence that schools seek to mirror the funding formulae, with most schools treating the total FTTE entitlement as a single whole, and then allocating it based on their environment and needs.

Distribution of funding per student

The range of government funding per student is quite broad. At the high end of funding per student, this is largely explained by school size and the nature of schools (e.g. Special Education schools).

In the densest part of the distribution that represents the majority of schools, the range is also relatively high. This is not due to any one factor but reflects combinations of:

* School size
* Targeted funding for students with particular needs
* Special programmes or additional responsibilities
* Maori Immersion

Locally raised funds

On average, secondary schools have higher net locally raised funds[[1]](#footnote-1) than other schools ($560 per student compared to $296 per student for primary and intermediate schools).

While lower decile schools tend to have less locally raised funds than higher decile schools, all deciles are represented across the spectrum – i.e. some lower decile schools have relatively high locally raised funds per students, and some higher decile schools have relatively low locally raised funds per student.

International student income

For some schools, the ability to generate additional income from international students creates opportunities that benefit all of their students. While accounting practices to reflect the costs of international students vary, most schools with international students are able to invest surplus revenue into additional resources for all students.

Through our reviews of the financial statements and interviews with some of these schools, we believe accounting practices to reflect the costs of international students vary. We believe the surplus generally reflects direct incremental costs only and does not include:

* Infrastructure costs – e.g. capacity / buildings required to accommodate international student numbers
* Teaching costs – i.e. the additional teachers needed by a school or across the sector to teach international students

If the above were taken into account, the surplus on international students is likely to be significantly smaller.

Cash reserves

While there are a number of schools that have significant cash balances (at year-end), there are very few that might be considered “cash-rich” when taking financial considerations such as working capital and liquidity requirements into account.

Relationship between funding sources and expenditure

Schools do not tend to relate specific line items of expenditure to specific line items of funding. While the funding line items are occasionally used as guidance by schools, the general approach is that all funding goes into a “pot” and then all expenditure draws from that pot. For example, if a school subsidises co-curricular activity such as cultural or sports groups, it does not specifically consider whether that money comes from the Ministry’s operations grant, surplus revenue from international students, or general donations.

Distribution of expenditure varies

The pattern of expenditure across individual schools varies more for primary and intermediate schools than for secondary schools. Generally, average expenditure per student trends down as roll size increases. The table below shows the levels of variation via the proportion of schools within a percentage margin of the moving average[[2]](#footnote-2) (for roll size 100+ for primary and intermediates; roll size 500+ for secondary).

|  |  |  |  |
| --- | --- | --- | --- |
| **Proportion of schools within X% of moving average** | | | |
|  | **within 10%** | **within 15%** | **within 20%** |
| **Primary & Intermediate** | 46% | 73% | 92% |
| **Secondary** | 59% | 84% | 99% |

Note the distribution of expenditure is predominantly driven by the way government funds, which is determined by a range of factors (see above).

Average expenditure per student levels off at different points for different school types

The average expenditure per student levels off rapidly for primary and intermediate schools with roll-sizes of around 100 students or more, with modest decline for increasing number of students thereafter. Conversely, the average expenditure per student for secondary schools only levels off from around 750 students.

It is unclear whether those patterns are indicative of different economies of scale for the different types of school because overall expenditure is driven predominantly by how government funds schools – i.e. the pattern simply reflects funding rather than real economies.

Teacher Aides / teaching support roles

Employing Teacher Aides is the most significant and common expenditure schools make to reduce barriers to educational achievement for students. 81% of respondents to our survey identified this as a key investment, compared with only 28% identifying additional teachers to reduce class sizes.

Smaller schools tend to employ more teaching support roles, proportionally, than larger schools. Schools with up to 120 students average 1 teacher support role per 5.1 teachers, whereas schools with more than 120 students average 1 teacher support role per 8.5 teachers.

Similarly, lower decile schools tend to employ more teaching support roles, proportionally, than higher decile schools. The average number of teachers per teaching support roles is 5.15 for schools in deciles 1-2 compared with 9.50 for schools in deciles 8 to 10.

Relieving teachers from FTTE entitlements

A significant number of Relievers are employed from schools’ FTTE entitlement (1,249 FTE or 46% of Relievers). Many schools that make relatively high use of Relievers use 5% or more of their FTTE entitlement on these (70% of 600 such schools).

Smaller schools tend to employ more Relieving Teachers, proportionally, than larger schools. The average number of teachers per Relieving Teacher (on an FTE basis) is:

* 14.81 teachers for schools with up to 160 students
* 17.97 teachers for schools with 161 to 750 students
* 24.15 teachers for schools with more than 750 students

Employing teachers from operational grants

Operational grants give schools flexibility in how to use funding, with the expectation that some of this might be spent on teachers (e.g. TFEA, SEG, Maori Language funding). The operational grant also includes specific funding for relieving teachers.

The majority of schools employ more teachers (Regular Teachers as well as Relievers) than their FTTE entitlements. Lower decile schools tend to employ a greater proportion of their teachers from bulk grants than higher decile schools, but this is a relatively small difference.

Overall, schools employ 4.8% of Regular Teachers from bulk grants (2,209 FTE). Netting off the number of Relievers employed through FTTE entitlement would reduce this to 2.1% of Regular Teachers (959 FTE).

Acknowledgments

We would like to acknowledge the support we have had from the Advisory Group for the Review of the Education Funding Systems, who have provided valuable input into the nature of our analysis and actively sought out schools to participate in the research.

We are very grateful for the time and effort individual school principals and staff have put into participating in the research, completing survey templates and making the time to talk with us.

We have also had the support of the Ministry’s teams, sourcing information and helping us interpret it.

Approach

Summary

For this report, we have:

* Compiled data sets of schools’ financial information
* Compiled data sets of schools’ payroll information
* Conducted a survey across schools (53 respondents)
* Conducted follow up interviews with schools (17 schools)

The Advisory Group identified schools to be involved in the survey, and in selecting this sample, as well as for the interviews, we were mindful of representing the diverse range of different school types.

The survey was completed over the course of 2-3 weeks by most schools, and the interview phase covered a further 2-3 weeks. The project and this report were completed over an 8-week period.

As such, the analysis presented in this report has been constrained by time and information availability, and should be considered indicative. We have included a section in the report with our thoughts on what might be considered for further research.

About the information sources we have used

Base data about schools

We used the EducationCounts 2015 Schools Directory, which is a publicly available dataset that lists New Zealand schools and characteristics, including decile, school type, and roll size. This information was used to prepare segment-based analysis of various data – e.g. by decile or school size groupings. All analysis in this report is based on the 2015 school year.

Financial information

Most schools provide annual reports of their financial information to the Ministry. The “Kiwi Park” model financial statements are a relatively recent development, and this is making schools’ financial information more consistent.

We extracted the financial information for over 2,100 schools from the Ministry’s consolidated data set – **FIDS** (Financial Information Database for Schools). This includes:

* Profit and loss
* Balance sheet
* Cash flow statement

The information was for the 2015 year, although in a small number of cases we used 2014 data where 2015 was not available.

The FIDS information shows the funding sources and expenditure areas schools have reported for accounting purposes. While consistency is improving, we note that schools do not always treat similar revenues and expenses in the same way.

We also obtained a detailed breakdown of the Operations Grant the Ministry paid to each school in 2015. The Operations Grant has a number of different components, e.g. Targeted Funding for Educational Achievement (TFEA) and funding for Relieving Teachers.

Payroll information

The schools’ payroll system provided by Education Payroll Ltd as a service is used by all schools and is used to pay all teachers.

We extracted transactional data for the 2015 calendar year for more than 2,400 schools. Note this transactional data will not match the 2015 annual financial reporting information exactly due to timing differences.

The data provides:

* Employee id numbers, their designations and the type of contract they are on
* FTE (full-time equivalent)
* Funding source

The funding sources are:

* Teacher FTTE Entitlement, which is the allowance for teachers the Ministry calculates for each school on an FTTE basis and pays for directly
* Bulk Grant, which is paid directly from schools’ other funding sources such as the Operational Grant
* Other, which comprises a set of other specific funding sources (e.g. MQ National Study Award) included for completeness only in this analysis

The “Other” category above is very small, including only 0.4% of teaching-related staff, and has largely been excluded from consideration in our analysis.

We used this information to analyse use of staff across schools with a focus on teaching-related staff. Because our focus was on what staff do, we have used designations and tenure (rather than contracts) to identify the various types of teaching-related role.

Survey

We developed a survey to gather additional information from schools. The primary purpose was to identify how schools allocate teacher resources across year groups, so that we could compare that to the way government funds. The survey also asked about schools’ initiatives to lower barriers for students at risk of not achieving, and key reasons why schools were paying for additional teachers from Bulk Grants.

We received 53 responses to the survey, providing coverage across most types of schools. Appendix B provides a description of the schools that responded.

We are conscious that many schools had not provided or collected this sort of information before, and the responses varied in terms of accuracy and completeness. As such, the results from the survey are indicative rather than figures that could be extrapolated robustly across the population of schools.

Interviews

We followed up with interviews with 17 schools. These provided us with more qualitative information about how schools plan and approach their budgets, determine their classes, and allocate teaching resource. Appendix B provides a description of the schools we interviewed.

Glossary of Terms

|  |  |
| --- | --- |
| **$** | New Zealand Dollars |
| **Bulk Grant** | Funding source category in the schools’ payroll system, which is a proxy for staff paid out of schools’ Operations Grants or locally raised funds |
| **Decile** | School deciles indicate the extent each school draws their students from low socio-economic communities |
| **FIDS** | Financial Information Database for Schools |
| **FTE** | Full Time Employee |
| **FTTE** | Full Time Teaching Equivalent |
| **FTTE Entitlement** | The number of FTTE teaching staff, calculated for each school, where the Ministry directly meets the salary costs. This is a funding source category in the schools’ payroll system and reflects the staff funding the Ministry provides to schools for curriculum learning and management. |
| **Ministry** | The Ministry of Education, Te Tahuhu o te Matauranga |
| **Operations Grant** | Cash funding government provides to schools with a range of different components and calculations |
| **Other Schools** | Used in several places as a category of schools and includes: Composite (Year 1-15), Restricted Composite (Year 7-10) or Special Schools per the school type in the list of New Zealand schools |
| **Primary Schools** | Includes schools categorised as Contributing or Full Primary per the school type in the list of New Zealand schools |
| **Regular Teachers** | For the purposes of this report, all teachers in permanent or fixed term employment as per the schools’ payroll data |
| **Relievers** | For the purposes of this report, all teachers identified as “Reliever” in the tenure of the schools’ payroll data |
| **RTLB (Resource Teacher: Learning and Behaviour)** | The RTLB service is a Ministry-funded learning and behaviour service that sits alongside the Ministry’s Special Education Specialist Support service. |
| **Secondary Schools** | Includes schools categorised as Secondary (Year 9-15) or Secondary (Year 7-15) per the school type in the list of New Zealand schools |
| **Teaching-Related (staff)** | For the purposes of this report, all staff (teachers and teaching support) we have identified as directly involved in teaching activities, through designations in the schools’ payroll data |
| **Teaching Support (roles)** | For the purposes of this report, all staff similar to teacher aides who support teachers in schools, identified through designations in the schools’ payroll data |
| **TFEA (Targeted Funding for Educational Achievement)** | This funding is provided to schools to help lower barriers to learning that students from low socio-economic communities might face, and is calculated based on each schools’ decile |
|  |  |

Funding sources

Summary

Our analysis has identified four findings we believe are of particular interest.

Distribution of funding per student

The range of Government funding per student is quite broad. At the high end of funding per student, this is largely explained by school size and the nature of schools (e.g. Special Education schools require additional resourcing).

In the densest part of the distribution that represents the majority of schools, the range is also relatively high. This is not due to any one factor but reflects combinations of:

* School size
* Targeted funding for students with particular needs
* Special programmes or additional responsibilities
* Maori Immersion

Locally raised funds

On average, secondary schools have higher net locally raised funds than other schools ($560 per student compared to $296 per student for primary and intermediate schools).

While lower decile schools tend to have less locally raised funds than higher decile schools, all deciles are represented across the spectrum – i.e. some lower decile schools have relatively high locally raised funds per students, and some higher decile schools have relatively low locally raised funds per student.

International student income

For some schools, the ability to generate additional income from international students creates opportunities that benefit all of their students. While accounting practices to reflect the costs of international students vary, most schools with international students are able to invest surplus revenue into additional resources for all students.

Through our reviews of the financial statements and interviews with some of these schools, we believe accounting practices to reflect the costs of international students vary. We believe the surplus generally reflects direct incremental costs only and does not include:

* Infrastructure costs – e.g. capacity / buildings required to accommodate international student numbers
* Teaching costs – i.e. the additional teachers needed by a school or across the sector to teach international students

If the above were taken into account, the surplus on international students is likely to be significantly smaller.

Cash reserves

While there are a number of schools that have significant cash balances, there are very few that might be considered “cash-rich” when taking financial considerations such as working capital and liquidity requirements into account.

Overall composition of funding

The majority of schools’ funding comes from Government, with the Teachers Salaries Grant the greatest single source.

The charts below show the composition of total gross funding for the schools in our sample of FIDS information. Note school funding can vary by scope of operations, including the extent to which schools educate international students, school hostel facilities and direct provision of school transport.

All schools (2,136 schools)

Teachers salaries grants is the revenue category schools use to account for the Ministry’s FTTE entitlement and makes up just over half of total funding.

“Use of land and buildings” is a grant schools do not receive in cash or have discretion in how to use. It is a charge for school property that reflects depreciation and the cost of capital of the government’s investment in school property.

Primary and intermediate schools (1,751 schools)

For primary and intermediate schools, the proportion of funding from government across the various grants is greater than average (around 92%), with very little income from international students.

Secondary schools (262 schools)

For secondary schools, the proportion of funding from government across the various grants is lower than average (around 85%), with more significant income from international students.

Other schools (96 Composite and 27 Special Schools)

The pattern for composite schools is similar to the overall average, with somewhat greater proportion through the Operations Grant.

Special schools receive significant other government grants, targeted at the particular needs of their students.

Government funding per student

This section provides analysis of total Government funding (i.e. including all grants) per local student (i.e. excluding international students who are not included in the funding formulae).

All schools

The distribution of government funding per student is quite broad, reflecting the diverse nature of schools and the range of factors the Ministry takes into account to determine funding.

*FIDS data and School Directory, 2,135 schools*

The chart above includes the Use of Land and Buildings grant for completeness. However, we have excluded that grant for the analyses by type of school below, as schools do not have discretion in how to use it.

The sections below also discuss the large “tail” of very high per-student funding. Significant differences in per-student funding come about predominantly from:

* School size
* Targeted funding for students with particular needs
* Special programmes or additional responsibilities
* Maori Immersion

Primary and intermediate schools

Most of these schools receive between $5,000 and $7,000 per-student funding.

*FIDS data and School Directory, 1,751 schools*

Of the schools with very high per-student funding (over $9500 per student), 83% are very small (up to 50 students).

The other 17% is mainly made up of a mix of lower decile (1-3) schools, Maori Medium schools and rural schools with more than 50 students.

Secondary schools

Most of these schools receive between $6,500 and $8,500 per-student funding.

*FIDS data and School Directory, 261 schools*

Of the schools with very high per-student funding (25 schools over $12,000 per student), 76% (19) are relatively small with roll sizes up to 300 students. None of the other six schools has more than 400 students.

Other schools

Composite schools include area schools as well as many Maori Medium schools. Of the schools with high per-student funding, one school had 114 students and all others had fewer than 90 students. The majority are also Maori Medium schools.

*FIDS data and School Directory, 96 schools*

Special schools require more funding and resources than other schools. Most are also relatively small – the largest has nearly 200 students. Because many of these schools also provide services to other schools (e.g. through outreach programmes) we do not have a meaningful funding per student metric available for comparison.

Locally raised funds per student

This section highlights analysis of net locally raised funds per student. This excludes revenue from international students (considered in its own section below) and local expenses have been netted off local income, as reported by schools (from FIDS).

Note there are some examples with negative net local funds, which may be due to particular accounting practices or because some schools do indeed spend more on activities than the money generated. Note we have not been able to specifically follow up the consistency of accounting practices and the economic reality of reported surpluses through further investigation.

Composition of net locally raised funds

The chart below shows the revenues and expenses we have included in net locally raised funds.

*FIDS data, 2,135 schools*

“Other categories” includes house rents, boarding fees and scholarships, local transport and bequests. In aggregate, net locally raised funds of $252 million are based on $451 million of revenue less $199 million of expenses.

*FIDS data, 2,135 schools*

Donations are the largest net item, followed by Activities and Other Local Funds. However, we would caution against drawing conclusions about the net surplus for each component of locally raised funds as accounting practices may vary between schools and may not be designed to provide accurate information about the surplus of these components. For example, it is possible that some schools have reported a surplus on activity fees in FIDS, but have excluded support staff salaries from those expenses.

Range within school types

On average, secondary schools raise significantly more local funds than other school types. The chart below shows the distribution for four categories of schools using quartiles of net locally raised funds per student. Special schools have been included based on the number of schools directly on their roll (i.e. excluding students served via outreach programmes or similar) and therefore the information is not directly comparable:

|  |
| --- |
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*FIDS data and School Directory, 2,135 schools*

The chart shows primary & intermediate schools have lower net locally raised funds on average than other types, somewhat similar to composite schools although those have a significantly higher upper quartile. The chart also shows that the distribution is quite broad.

The following table shows average net locally raised funds per student for different school sizes across types.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Primary & intermediate | Secondary | Composite | Special |
| Up to 50 students | $669 |  | $377 | $541 |
| 51-100 students | $478 | $723 | $370 | $521 |
| 101-200 students | $310 |  | $274 | $479 |
| 201-400 students | $283 | $660 | $258 | no data |
| 401-800 students | $259 | $579 | $251 | no data |
| 801-1200 students | $368 | $631 | $255 | no data |
| 1201-1600 students | no data | $407 | $1,149 | no data |
| 1601-2000 students | no data | $437 | no data | no data |
| Over 2000 students | no data | $680 | no data | no data |

*FIDS data and School Directory, 2,135 schools*

This suggests smaller composite, primary and intermediate schools raise more net local funds per student on average. The average for the first three size categories for secondary schools has been combined, because there are only 14 schools with up to 200 students.

The next sections analyse each of the main school categories and the impact of decile on net locally raised funds per student.

Primary and intermediate schools

On average, high decile schools raise more local funds than low decile schools. The analysis shows that, while this holds in general, there are schools in each decile that cover the range of low and high net local funding.

*FIDS data and School Directory, 1,751 schools*

Secondary schools

Again, the average local funds raised is greater for high decile schools than for low decile schools, and that difference is both more pronounced and less even for secondary schools than primary and intermediate schools.

*FIDS data and School Directory, 261 schools*

Other schools

There is no clear pattern for composite or special schools in relation to local funds by decile. The charts below show that – collectively – these schools span from low to high net local funds per student.

Many special schools provide services to other schools (e.g. through outreach programmes) and we only have information about the number of students enrolled directly (rather than the total students served). We have included special schools based on the number of students enrolled directly at those schools to provide an indicative figure.

**Composite - Net Local Funds Raised Per Student**

*FIDS data and School Directory, 96 schools*

**Special Schools - Net Local Funds Raised Per Student**

*FIDS data and School Directory, 27 schools*

Income from international students

Our analysis of FY15 FIDS data identified a total of 478 schools who received income from international students. We identified 121 schools with either 20 or more international students or where international students make up 5% or more of the total school roll. The chart below shows the majority of these are higher decile secondary schools, though a range of deciles and other types of school are also represented.

**Number of schools with more than 20 or 5% international students**

|  |
| --- |
|  |

*School Directory, 121 schools*

While most are decile 6 or higher, the list also includes 22 schools ranging from deciles 2 to 5. Decile 9 schools in this subset have the highest number of international students with 74 on average, whereas decile 2 in this subset schools have only 20 international students on average.

Surplus on international students

The FIDS information we had available included financial information for 101 of these schools. In 2015, these schools had total revenue from international students of $84.3 million and net international student revenue of $42 million (a margin of 49.8%). The majority of these schools earned a positive margin (surplus) on international students

Through our reviews of the financial statements and interviews with some of these schools, we believe accounting practices to reflect the costs of international students vary. We believe the surplus generally reflects direct incremental costs only and does not include:

* Infrastructure costs – e.g. capacity / buildings required to accommodate international student numbers
* Teaching costs – i.e. the additional teachers needed by a school or across the sector to teach international students

If the above were taken into account, the surplus on international students is likely to be significantly smaller.

The reported level of surplus is uneven across schools. The chart below shows most earned a surplus of 40% - 70% on international students.

**Net International Student Revenue: Margin over Expenses**

|  |
| --- |
|  |

*FIDS data and School Directory, 101 schools*

Cash reserves

In this section we have looked at the cash and liquidity position of schools, in order to identify whether there are a significant number of “cash-rich” schools.

High levels of cash on the balance sheet may lead a casual observer to perceive a school as cash-rich, without considering the true liquidity needs of schools. In order to avoid this, we evaluated the working capital and liquidity position of each school by using a series of ratio filters.

Filter Composition

In order for a school to be classified as cash-rich in this analysis, it needed to demonstrate the following liquidity characteristics:

|  |  |  |  |
| --- | --- | --- | --- |
| Liquidity Analysis: Filter Parameters | | | |
| Filter Metric | **Description** | **Filter Requirement** | **Assumption about filter requirement** |
| Current Ratio | Current Assets/Current Liabilities | 4.24x | Average ratio plus one standard deviation |
| Cash Ratio | Cash/Current Liabilities | 2.25x | Average ratio plus one standard deviation |
| Balance Sheet Cash | Cash held | $594,000 | Average cash plus one standard deviation |
| Net Working Capital | Current Assets – Current Liabilities | $329,000 | Average net working capital across schools |
| Defensive Ratio | Working Capital/Daily Cash Opex | 194 days | Average ratio across schools |
| Months of Cash Expense Cover | Cash/Monthly Cash Expenses | 2 | At least 60 days (2 months) of cash expense cover |

Results of Analysis

Of the 2140 schools listed in FY15 FIDS data, only 16 passed the filters above. This result suggests that very few schools have large cash reserves to fund schools’ activities.

There are different reasons a school might be cash-rich at a point in time, e.g. after completing sales of land, while seeking to co-fund capital investment.

Note our analysis could not take into account cash reserves of bodies associated with schools (e.g. trusts), nor did we have time-series data to review trends.

Expenditure overview

Summary

In this section, we have provided an overview of total operating expenditure by schools across various categories. There is a separate section below with specific analysis of staffing.

Our analysis has identified four findings we believe are of particular interest.

Relationship between funding sources and expenditure

Schools do not tend to relate specific line items of expenditure to specific line items of funding. While the funding line items are occasionally used as guidance by schools, the general approach is that all funding goes into a “pot” and then all expenditure draws from that pot. For example, if a school subsidises co-curricular activity such as cultural or sports groups, it does not specifically consider whether that money comes from the Ministry’s operations grant, surplus revenue from international students, or general donations.

This excludes specific programmes, or where schools raise local funds for specific purposes (e.g. school trips or equipment).

Distribution of expenditure varies

The pattern of expenditure across individual schools varies more for primary and intermediate schools than for secondary schools. Generally, average expenditure per student trends down as roll size increases. The table below shows the levels of variation via the proportion of schools within a percentage margin of the moving average (for roll size 100+ for primary and intermediates; roll size 500+ for secondary).

|  |  |  |  |
| --- | --- | --- | --- |
| **Proportion of schools within X% of moving average** | | | |
|  | **within 10%** | **within 15%** | **within 20%** |
| **Primary & Intermediate** | 46% | 73% | 92% |
| **Secondary** | 59% | 84% | 99% |

Note the distribution of expenditure is predominantly driven by the way government funds, which is determined by a range of factors (see above).

Average expenditure per student levels off at different points for different school types

The average expenditure per student levels off rapidly for primary and intermediate schools with roll-sizes of around 100 students or more, with modest decline for increasing number of students thereafter. Conversely, the average expenditure per student for secondary schools only levels off from around 750 students.

It is unclear whether those patterns are indicative of different economies of scale for the different types of school because overall expenditure is driven predominantly by how government funds schools – i.e. the pattern simply reflects funding rather than real economies.

Teacher Aides

Employing Teacher Aides is the most significant and common expenditure schools make to reduce barriers to educational achievement for students. 81% of the 53 respondents to our survey identified this as a key investment, compared with only 28% identifying additional teachers to reduce class sizes.

Overall composition of expenditure

For the analysis below, we have used FIDS information that consolidates schools’ annual financial statements into several common categories for accounting purposes. We have included the following expenditure categories:

* Administration Expenses (including Finance Costs)
* Expenditure on Learning Resources
* Property Expenses (excluding “Use of land and Buildings” which has an offsetting grant for State Schools)
* Other Expenses

Overall, Expenditure on Learning Resources represents the majority of schools’ expenditure (including teacher salaries), with Property Expenses the next highest.

Primary and intermediate schools

## School size

The chart below shows the average proportion of expenditure across expenditure categories by groupings of school size:

*FIDS data and School Directory, 1,751 schools*

This shows that smaller schools spend proportionally less on Learning Resources than larger schools due to fixed costs associated with running a school (particularly Property and Administration).

Looking at average expenditure per student (refer chart below) shows smaller schools tend to spend more across all categories than larger schools.

*FIDS data and School Directory, 1,751 schools*

This reflects that a minimum number of teachers / staff are required for very small schools.

## School decile

The chart below shows the average proportion of expenditure across expenditure categories by school deciles:

*FIDS data and School Directory, 1,751 schools*

This profile suggests that, proportionally, expenditure is very similar across deciles.

Looking at average expenditure per student (refer chart below) shows lower decile schools spend more across all categories than larger schools on average.

*FIDS data and School Directory, 1,751 schools*

The higher average Learning Resources expenditure comes predominantly from staffing (salaries for teachers etc).

## Variability

The chart below illustrates the variability of expenditure by student as school size increases (excludes RTLB lead schools):

*FIDS data and School Directory, 1,204 schools*

To assess the level of variation, we calculated the moving average (for schools of 100+ students, ordered by increasing size) and compared average expenditure per student to that moving average for each school:

|  |  |  |  |
| --- | --- | --- | --- |
| **Proportion of schools within X% of moving average** | | | |
|  | **within 10%** | **within 15%** | **within 20%** |
| **Primary & Intermediate** | 46% | 73% | 92% |

The variation is relatively high, particularly across the most common school sizes, with less than half of schools within 10%.

Secondary schools

## School size

The chart below shows the average proportion of expenditure across expenditure categories by groupings of school size:

*FIDS data and School Directory, 261 schools*

The pattern for secondary schools is less consistent than for primary and intermediate schools, which may partly be due to a significantly smaller number of secondary schools.

Smaller secondary schools spend proportionally more on Administration and less on Other costs, but on average the differences are less pronounced than for primary and intermediate schools.

Looking at average expenditure per student (refer chart below) shows smaller schools tend to spend more across all categories than larger schools.

*FIDS data and School Directory, 261 schools*

Even with school sizes up to 750 students, the average expenditure on Learning Resources is 12% higher than the average for larger schools. Because expenditure is largely determined by how government funds, this may or may not be indicative of greater challenges achieving economies of scale for secondary schools.

## School decile

The chart below shows the average proportion of expenditure across expenditure categories by school deciles:

*FIDS data and School Directory, 261 schools*

Unlike for primary and intermediate schools, this indicates that lower decile schools spend proportionally more on Learning Resources, though the difference is not great. In part, this is due to a greater portion of higher decile schools having more Other Expenses – e.g. relating to International Students. However, analysis of average expenditure per student (refer chart below) shows lower decile schools do spend more on Learning Resources per student, though decile 2 has a higher average than decile 1. This is likely to be because decile 2 schools are smaller on average than decile 1 schools (467 students cf 638 students).

*FIDS data and School Directory, 261 schools*

Again, staff costs drive the majority of the difference in Learning Resources expenditure.

## Variability

The chart below illustrates the variability of expenditure by student as school size increases (excludes RTLB lead schools):

*FIDS data and School Directory, 162 schools*

To assess the level of variation, we calculated the moving average (for schools of 500+ students, ordered by increasing size) and compared average expenditure per student to that moving average for each school:

|  |  |  |  |
| --- | --- | --- | --- |
| **Proportion of schools within X% of moving average** | | | |
|  | **within 10%** | **within 15%** | **within 20%** |
| **Secondary** | 59% | 84% | 99% |

While there is some significant variation, this is to a lesser degree than primary and intermediate schools.

Other schools

## School size

The chart below shows the average proportion of expenditure across expenditure categories by groupings of school size for composite schools (note none in the sample are between 280-300 students):

*FIDS data and School Directory, 96 schools*

Again, the pattern is less consistent than for primary schools, which reflects a smaller number of schools and varying nature of these schools (e.g. area schools and Maori Medium schools). The pattern of smaller schools spending more on fixed costs is consistent with the other categories.

We have not shown the pattern for special schools because of the small number of schools across size categories.

## School decile

Lower decile composite schools tend to spend more on Learning Resources, and the uneven distribution reflects the relatively small number of schools.

*FIDS data and School Directory, 96 schools*

The distribution for special schools is more mixed, reflecting that each of the small number of schools is almost unique. Because the overall quantum of expenditure is higher on average, the proportions for Property, Administration and Other expenses is lower than for other school types.

We have not shown average expenditure per student because we do not have accurate information about the total number of students served by each school (e.g. including outreach programmes etc).

Expenditure to reduce barriers

As part of our survey (53 respondents) and our follow up interviews with 17 schools, we asked about expenditure to reduce barriers to educational achievement. The discussion below is based on 53 survey responses, and therefore needs to be seen as indicative.

Teacher Aides

Of the schools that responded, 81% selected additional Teacher Aides as a significant item. In the staffing section below we have analysed the ratios of teaching support staff (predominantly Teacher Aides) to teachers across schools, which shows lower decile schools tend to have proportionally higher Teacher Aides.

The schools that told us they employ additional Teacher Aides ranged across all deciles. Our interviews suggest there are two main ways Teacher Aides are commonly used:

* To support individuals with behavioural needs
* Working with individuals or small groups to address learning difficulties

Lower class sizes and special programmes

Only 28% of respondents told us they employ additional teachers specifically to reduce class sizes, in order to lower barriers. This included some higher decile schools, but the majority was in deciles 1 to 5.

42% of respondents have special programmes for sets of students to lower barriers. This included common programmes (e.g. Reading Recovery, ESOL, Accelerated Literacy Learning) as well as general life skills educational experiences.

Subsidising costs for students

Via the survey, 53% of respondents included subsidising costs as a way to reduce barriers, and this included high decile as well as most schools in lower deciles. There are costs normally met directly by families of students such as uniforms and stationery, and schools take a range of approaches to help families who might struggle to meet these costs.

Our interviews suggest the subsidisation of certain types of cost is relatively common, although it is not practical to gauge a precise level.

The lower decile schools we talked to all use funding to provide opportunities to their students – outdoor activities, sports, culture etc. Most also provide help with uniforms, food programmes and educational materials, where they see a risk that parents would struggle to afford these. Many of the lower decile schools we talked to also engage in specific fund-raising, e.g. seeking grants from charitable trusts, so that they can provide these subsidies and materials.

The higher decile schools we talked to also essentially subsidise co-curricular activities in a similar way. While most of these receive greater amounts in parent donations than lower decile schools, the full costs of participating in such activities is seldom passed on directly to students.

Staffing

Summary

This section provides detailed analysis of staffing across schools, which is the area of greatest operating expenditure.

The Ministry provides an FTTE entitlement for teachers to all schools, based on school type, roll size and composition, and whether teaching is Maori Immersion. Funding is also separately provided in the operational grant to meet the cost of relief teachers.

Our analysis has identified four findings we believe are of particular interest.

Relieving teachers from FTTE entitlements

A significant number of Relievers are employed from schools’ FTTE entitlement (1,249 FTE or 46% of Relievers). Many schools that make relatively high use of Relievers use 5% or more of their FTTE entitlement on these (70% of 600 such schools).

Employing teachers from operational grants

Operational grants give schools flexibility in how to use funding, with the expectation that some of this might be spent on teachers (e.g. TFEA, SEG, Maori Language funding). The operational grant also includes specific funding for relieving teachers.

The majority of schools employ more teachers (Regular Teachers as well as Relievers) than their FTTE entitlements. Lower decile schools tend to employ a greater proportion of their teachers from bulk grants than higher decile schools, but this is a relatively small difference.

Overall, schools employ 4.8% of Regular Teachers from bulk grants (2,209 FTE). Netting off the number of Relievers employed through FTTE entitlement would reduce this to 2.1% of Regular Teachers (959 FTE).

Including Relievers, 50% of schools employ from 4%-12% of teachers from bulk grants, and 32% of schools employ less than 4% of teachers from bulk grants.

Average salary differences between funding sources

The average salary of Regular Teachers[[3]](#footnote-3) paid through the FTTE entitlement is 11% higher than for Regular Teachers paid from other funds.

This is not surprising given the Teachers Salaries Grants provide an FTTE entitlement (i.e. the Ministry carries the salary risk) whereas staff employed from other funding are real cash expenses for schools.

Teacher Aides and Teaching Support

Smaller schools[[4]](#footnote-4) tend to employ more teacher aides and similar roles, proportionally, than larger schools. Schools with up to 120 students average 1 teacher support role per 5.1 teachers, whereas schools with more than 120 students average 1 teacher support role per 8.5 teachers.

Similarly, lower decile schools tend to employ more teacher aides and similar roles, proportionally, than higher decile schools. The average number of teachers per teacher support role is:

* 5.15 teachers for decile 1 and 2 schools
* 7.44 teachers for schools with deciles 3 to 7
* 9.50 teachers for schools with deciles 8 to 10

Relieving Teachers

Smaller schools[[5]](#footnote-5) tend to employ more Relieving Teachers, proportionally, than larger schools. The average number of teachers per Relieving Teacher (on an FTE basis) is:

* 14.81 teachers for schools with up to 160 students
* 17.97 teachers for schools with 161 to 750 students
* 24.15 teachers for schools with more than 750 students

The average ratio across all these schools is 18.98 teachers per Relieving Teacher.

While the decile 1 and 2 schools have slightly higher use of Relieving Teachers than the overall average (ratio of 17.49 cf 18.98 on average), this is due to a greater proportion of lower decile schools being small. Taking school size and deciles into account, higher decile schools tend to employ slightly more Relieving Teachers than lower decile schools, though the trend is not significant.

Overview of our dataset

We were provided with a dataset from the schools’ payroll system for the 2015 calendar year, comprising around 2,400 schools. We have excluded the Correspondence School from the analysis. Note the totals will differ somewhat from accounting information and / or other sources because of timing differences or completeness, but nonetheless provide a sound basis for analysing the education workforce in 2015. We used this dataset to classify staff in teaching-related roles as follows:

|  |
| --- |
|  |

In the remainder of this section, we have aggregated permanent and fixed term teachers as “Regular Teachers”.

How teachers are funded

The Ministry provides an FTTE entitlement for teachers to all schools, based on school type, roll size and composition, and whether teaching is Maori Immersion. Funding is also separately provided in the operational grant to meet the cost of relief teachers.

Sources of funding used for teachers

The following table shows the breakdown of these roles across funding sources in the payroll system.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **FTTE Entitlement** | **Bulk Grant** | **Other** | **Total** |
| **Teaching Support** | 2 FTE | 7,034 FTE | 39 FTE | **7,074 FTE** |
| **Regular Teachers** | 43,669 FTE | 2,209 FTE | 196 FTE | **46,074 FTE** |
| **Relievers** | 1,249 FTE | 1,467 FTE | 10 FTE | **2,726 FTE** |
| **Total** | **44,920 FTE** | **10,709 FTE** | **245 FTE** | **55,874 FTE** |

This shows that:

* Out of 2,726 Relievers, 46% are employed through the FTTE entitlement
* Schools overall employ 2,209 Regular Teachers from Bulk Grant, or in addition to their FTTE entitlement (4.8% of total)

Netting off Relievers from Regular Teachers in the Bulk Grant funding category would suggest the school system as a whole employs around 960 FTE Regular Teachers above entitlement.

Teachers employed above FTTE Entitlement

The chart below shows the distribution of schools by what proportion of additional teachers (Regular and Relievers) each school employs from other than staffing entitlement:

**Bulk Grant[[6]](#footnote-6) Teacher FTE/Total Teacher FTE**

*Payroll data, around 2,400 schools*

Reasons for additional teachers

Schools who participated in our survey reported a range of reasons for employing additional Regular Teachers. Several schools have significant numbers of International Students, and in those cases additional teachers are often employed from those revenues to manage the additional students – e.g. if a school has 80 International Students, it might expect to need to employ four additional teachers over its FTTE entitlement overall.

## Additional teachers for International Students and Secondary Tertiary Programme

We analysed staffing from bulk grants for 121 schools that have either 20 or more international students or more than 5% of their roll as international students. We set an expected number of teaching-related FTE for these at a ratio of 1:20, and only one school employed fewer FTE from its bulk grant. On average, this estimated additional teacher requirement accounted for around 40% of the extra teachers employed by these schools.

We also carried out similar analysis for Secondary Tertiary Programme students, who are not funded through the FTTE entitlement. Of 80 schools with 20 or more such students, none employed fewer than 1:20 additional teaching-related staff through their bulk grants.

Overall, there were over 13,000 international students and Secondary Tertiary Programme students across non-private schools in New Zealand in 2015. Taking a range of ratios from 1:25 to 1:20 would provide an estimated 530 – 660 FTE of teaching-related staff that need to be funded from Bulk Grant to manage this volume.

## Reasons for additional teachers from our survey

Other reasons reported (from most to least frequent) are:

* Smaller class sizes for specific students or subjects
* Smaller class sizes in general
* Broader subject choice for students
* Providing additional responsibilities for teachers

Difference in average salary for funding source

The average salary of Regular Teachers[[7]](#footnote-7) paid through the FTTE entitlement is 11% higher than for Regular Teachers paid from other funds.

This is not surprising given the Teachers Salaries Grants provide an FTTE entitlement (i.e. the Ministry carries the salary risk) whereas staff employed from other funding are real cash expenses for schools.

Tendency to employ additional teachers by decile

There are more low decile schools than high decile schools that employ a relatively large number of additional teachers from bulk grants, but each decile includes a range of schools that are relatively high and relatively low in terms of employing such additional teachers.

**Bulk Teacher FTE/Total Teacher FTE – By Decile**

|  |
| --- |
|  |

*Payroll data, around 2,400 schools*

Differences between school types

The following chart shows differences between school types:

**Bulk Teacher FTE/Total Teacher FTE – By School Type**

|  |
| --- |
| *Payroll data, around 2,400 schools* |

This shows secondary schools tend to employ a greater portion of additional teachers than other school types.

Teachers Aides and similar support roles

For this analysis, we have excluded Special Schools and used the designations given to staff in the schools’ payroll system to identify types of role for staff.

From our interviews, schools generally use these teaching support roles in the classroom, focused on students or small groups with particular needs.

The chart below shows the distribution across schools of the teaching support staff as a proportion of total teaching staff (on an FTE basis):

**Teaching Support Staff as a proportion of Total Teaching Staff**

|  |
| --- |
|  |

*Payroll data, 2,379 schools*

This distribution is reasonably broad, with a mean of 11.4% based on individual schools, but a weighted mean of 8.0% taking school size into account. This suggests that smaller schools tend to use a greater proportion of teaching support staff than larger schools. We analysed the use of teaching support staff across a range of school sizes and across deciles of schools, and these charts are provided below. The metric for these charts is the number of teachers per teaching support staff member (using FTE), i.e. the lower the metric, the greater the use of teaching support staff.

**Average Teachers per Teacher Support (School Size)**

|  |
| --- |
| *Payroll data, 2,379 schools*  Schools with up to 120 students average 4.86 teachers per teacher support staff, whereas schools with more than 120 students average 7.71 teachers per teacher support staff.  **Average Teachers per Teacher Support (Decile)** |
|  |

*Payroll data, 2,379 schools*

Lower decile schools tend to employ more teacher aides and similar roles than higher decile schools. The average number of teachers per teacher support role is:

* 6.1 teachers for decile 1 and 2 schools
* 7.5 teachers for schools with deciles 3 to 7
* 8.7 teachers for schools with deciles 8 to 10

Both school size and decile drive schools’ usage of teaching support staff. This can be seen in the map below, which highlights the average ratio across both decile and school size.

**Teachers per Teacher Support Ratio**

|  |
| --- |
|  |

*Payroll data, 2,379 schools*

Darker cells indicate schools have relatively high usage of teaching support staff, green cells indicate schools have relatively low usage of teaching support staff.

School types

Different types of schools are represented very differently in terms of the teachers per teacher support staff metric. The chart below shows what proportion of each school type has a ratio of 5 teachers or lower per teaching support FTE.

**Schools with less than 5 Teachers per Teaching Support Staff**

|  |
| --- |
|  |

*Payroll data, 2,379 schools*

The majority of Intermediate schools (79 out of 115 in this sample) have more than 300 students, as do the majority of secondary schools (273 out of 323 in this sample).

Conversely, the majority of primary schools (1,307 out of 1,815 in this sample) have 300 students or fewer, and nearly 50% have 160 students or fewer.

Relieving teachers

For this analysis, we have excluded Special Schools and used information in the Schools Payroll system to distinguish between relieving teachers (Relievers) and those on permanent or fixed contracts (Regular Teachers).

The chart below shows the distribution across schools of the teaching support staff as a proportion of total teaching staff (on an FTE basis):

**Proportion of Total Teaching Staff**

|  |
| --- |
|  |

*Payroll data, 2,379 schools*

This distribution is reasonably broad, with a mean of 6.2% based on individual schools, but a weighted mean of 5.0% taking school size into account. This suggests that smaller schools tend to use a greater proportion of Relieving Teachers than larger schools. We analysed the use of Relievers across a range of school sizes and across deciles of schools, and these charts are provided below. The metric for these charts is the number of Regular Teachers per Reliever (using FTE), i.e. the lower the metric, the greater the use of Relievers.

**Average Regular Teachers per Reliever**

|  |
| --- |
|  |
| The average number of Regular Teachers per Reliever (on an FTE basis) is:   * 14.81 for schools with up to 160 students * 17.97 for schools with 161 to 750 students * 24.15 for schools with more than 750 students   The average ratio across all these schools is 18.98 teachers per Reliever.  **Average Regular Teachers per Reliever** |
|  |

*Payroll data, 2,379 schools*

The pattern across deciles is far less clear. While the decile 1 and 2 schools have slightly higher use of Relievers than the overall average (ratio of 17.49 cf 18.98 on average), this is due to a greater proportion of lower decile schools being small.

Taking school size and deciles into account, higher decile schools tend to employ slightly more Relieving Teachers than lower decile schools for smaller-size schools, though the trend is not significant. This can be seen in the map below, which highlights the average ratio across both decile and school size.

**Teachers per Relief Teacher**

|  |
| --- |
|  |

*Payroll data, 2,379 schools*

School types

Different types of schools are represented very differently in terms of the Regular Teachers per Reliever metric. The chart below shows what proportion of each school type has a ratio of 12 or lower.

**Schools with fewer than 12 Teachers per Reliever**

|  |
| --- |
|  |

*Payroll data, 2,379 schools*

The same comments about size apply as for the teaching support role discussion above. With only one out of 323 secondary schools having a ratio of 12 or lower, compared with 32% of primary schools, clearly the type of school is a factor in relatively high use of Relievers.

Conclusions

Relatively high use of both teaching support and Relievers

The analyses for teaching support staff and Relievers above suggest that small schools tend to make relatively high use of both teaching support staff and Relievers.

We have analysed the overlap between those schools that have:

* A ratio of 5 or lower for teachers per teaching support staff FTE
* A ratio of 12 or lower for Regular Teachers per Reliever FTE

Only about a third of those with low teachers per teaching support FTE also have low Regular Teachers per Reliever FTE.

|  |
| --- |
|  |

Around 78% of those 199 schools are primary schools with 160 or fewer students. This is about 17% of all primary schools with 160 or fewer students in the sample. Essentially, of that sample:

* 28% have relatively high use of teaching support staff (only)
* 23% have relatively high use of Relievers (only)
* 17% have relatively high use of both
* 32% have relatively high use of neither

Funding Relievers through FTTE entitlement and relatively high use of Relievers

We also analysed schools that have funded Relievers through their FTTE entitlement and have relatively high use of Relievers, using:

* Ratio of 12 or lower Regular Teachers per Reliever FTE
* Use of FTTE entitlement of 5% or higher for Relievers

This shows significant overlap of around 70%.

|  |
| --- |
|  |

97% (411 out of the 422) are primary schools. The pie chart below shows how these break down over school size grouping by number of students, with a total of 67% having 160 students or fewer.

|  |
| --- |
|  |

In total, the 422 schools employed:

* 286 FTE Relievers from FTTE Entitlements
* 184 FTE Relievers from Bulk Grants
* 109 FTE Regular Teachers from Bulk Grants

Allocation across year groups

Summary

The Ministry provides FTTE entitlements to schools, based on the roll size for each year group, and with a range of student to staff ratios. In practical terms, this provides more funding for years 1 and 2, as well as for years 12 and 13, than for other year groups.

Schools have flexibility in how they deploy the FTTE entitlement, and this section explores how the decisions schools make in allocating teachers to year groups compare with the way government funds.

Because of the small sample size, the discussion in this section needs to be seen as indicative only. In our comparisons with government funding we have considered only the year group curriculum staffing (i.e. not including Maximum Average Class Size factors or other base staffing entitlement that is not allocated to a year group).

Our analysis has identified two findings we believe are of particular interest.

Allocation of teachers

Allocations of teachers across year groups from schools that responded to our survey are broadly in line with the FTTE allocations the Ministry provides. Specifically, the allocations show lower student to teacher ratios at very junior and very senior years.

The greatest degree of alignment was for secondary schools, while primary and composite schools had greater variation from the Ministry’s formulae.

How schools approach allocation

We have seen little evidence that schools seek to mirror the funding formulae, with most schools treating the total FTTE entitlement as a single whole, and then allocating it based on their environment and needs.

From our interviews, we noted a range of approaches schools take to determining class sizes and consequently allocating their teachers.

Senior students

For senior students in years 12 and 13, schools consciously wish to provide broad curriculum choices. This can lead to classes for some subjects being relatively small (e.g. 8-12 students). Schools told us broad curriculum choices are important to attract students and to achieve good levels of student engagement with their education.

The majority of schools we talked to trade these small classes off with relatively high class sizes (e.g. up to 30) for core subjects with a large number of students and several classes, such as English. Overall, this leads to smaller average class sizes for year 12 and 13, but that appears to be a result of broader subject choice rather than schools seeking smaller class sizes for senior students in general. Very few schools stated they had an absolute minimum number of students required for a subject to be offered.

Small schools with few senior students (e.g. only around 20 in each of years 12 and 13) do not have the ability to trade-off large core subject classes. The majority offer subject choice through electronic learning, and students are supervised either as a group while each studying their online subjects, or as part of another general class.

Composite classes

For years 1 to 8, many schools use composite classes. This makes it easier for those schools to group students with similar needs, to move students between classes where that may help their learning, and to maintain similar class sizes.

For smaller schools (e.g. 10-15 students in each year group) composite classes are necessary to balance students, classrooms and teachers. Some larger schools use composite classes deliberately with relatively high student numbers (e.g. 30) so that they can offer a range of specialist subjects such as technology, arts and sciences for junior years.

Composite classes are also used in Maori Medium education, with modern learning environments where students study some subjects in “home” classes (e.g. 20 or more students) but also mix between classes for learning with quite different student / teacher modes such as 90 students with four teachers, small group work (e.g. 8-12 students with a teacher) and larger ratios (e.g. 90 students with a teacher) for group and self-organising activities.

New beginners

All the schools we talked to deliberately maintained lower student to teacher ratios for year 1 and new beginners, either through small core classes or ensuring those classes have Teacher Aides or similar support.

Little choice for many schools

There are probably 800 – 1000 schools that do not have any significant choice about their classes and teacher allocation.

A large proportion of the schools do not appear to have the scale or critical mass of students to provide them with flexibility. These have either 15 students or less in their year groups (e.g. leading to composite classes), have a high number of new entrants that do not stay at the school (e.g. 2 new entrant classes then single classes), or have around 20-30 students in each year group.

Analysis of Allocation Data

Approach

Our analytical focus was on the shape of the allocation across year groups rather than the number of teachers. We therefore took survey responses from schools and determined the proportion of teacher effort each school had allocated to each year group, which normalised between different metrics schools had used in their responses (e.g. hours per week or year, FTTE).

The sample of survey respondents does not represent the relative number of students across year groups for the whole student population, so our results should not be interpreted or extrapolated for national averages. We normalised the effect of roll size and the various different units respondents provided, using the two approaches below:

1. Dividing the allocated proportion of staff in each teaching year by proportion of students in that year (for each school), which provides a curve of similar shape to a “teachers per student” metric.
2. Calculating the weighted average allocation proportion for each teaching year, using roll size as a weighting.

These approaches are set out in more detail in Appendix A.

It is important to note that the charts below should not be used to infer student to teacher ratios, as the conversions we applied provide metrics by year only to allow comparison between the Ministry’s formulae and survey responses.

Comparing schools’ allocation with the funding formulae

The chart below shows the average allocation ratio for each teaching year across respondent schools compared to the allocation of staffing through the school funding model. The chart uses the average across each school, i.e. is not weighted for the roll sizes of the schools that participated.

**Comparison of schools’ allocation and funding (unweighted)**

These suggest that schools’ teacher allocation is broadly similar to that of the FTTE entitlement formulae. Respondent schools allocate more teachers to early education years resulting in an elevated teacher-per-student ratio in Year 1. Allocations in the remaining teaching years are relatively flat with a modest upward trend for later education years.

We also calculated the weighted average allocation of both respondent schools and funding model data as a second approach to compare allocations. The chart below shows the weighted average (i.e. taking account of differences in roll size between schools) allocation of respondent schools compared to funding model data.

**Comparison of schools’ allocation and funding (weighted)**

Again, the allocation across most year groups is broadly in line with the funding model. The largest difference is in the first year, where the student to teacher ratio is lowest and the effect of a different actual ratio amongst the sample has a greater proportional impact. Because there were three intermediate schools in the sample, years 7 and 8 are unusually high, and comparison for these years is only valid between the actual allocation and the funding model allocation (i.e. not with other years).

Both the unweighted and weighted results above are indicative, and we do not believe – for our small sample – that one should be considered a better indication than the other.

Differences between schools in the sample

The analysis above has provided an aggregate across the sample, but there was significant variation in responses. We stress that many schools found providing us such information was difficult, and we expect individual responses include estimation errors or different interpretations by schools (e.g. how to allocate teacher time for a composite year 1 and year 2 class). We believe the information is a useful indication at the aggregate level, but no conclusions should be drawn from individual school data variations.

We have therefore provided the information in this section only for context.

The distribution of individual school responses show:

* Secondary schools had a close fit between their allocations and the Ministry formulae
* Intermediate schools had a close fit between their allocations and the Ministry formulae, with no material difference in allocation between years 7 and 8
* Primary, contributing and composite schools showed the greatest variation

This is likely to reflect:

* Challenges allocating teacher time to year groups for schools with composite classes
* Timetabling systems in place for larger schools and secondary schools, making it easier to provide data
* Several smaller primary schools in the sample, where even 1-2 students difference in class size would show as a significant variance compared to the funding formulae

Timetables and subject choice

We were provided with indicative timetable information from two secondary schools. This data was consistent with our interviews of secondary schools, indicating that smaller average class sizes for years 12 and 13 tend to be the result of broad subject choice rather than deliberate efforts to maintain smaller class sizes for those years in general.

The information below is illustrative only because it is based only two schools.

Average class size across year groups

The timetable data for each school showed larger average class sizes for years 9 and 10, and lower average class sizes for years 12 and 13, as shown in the chart below:

**Average Class Size**

|  |
| --- |
|  |

Range of class size across year groups

However, the decreasing average is driven by a greater number of subjects with relatively small class sizes in years 12 and 13. The chart below shows the proportion of subjects for each year group that have selected class size characteristics:

**Class sizes by year group across subjects**

|  |
| --- |
|  |

Note this is weighted by the number of subjects and not the number of students. It supports what schools told us in interviews – i.e. that schools will trade off large class sizes in “core” subjects where there are a lot of students, so that they can offer other subjects with much lower numbers of students.

About information collection

Summary

In this section, we have provided some considerations for further or similar research relating to schools’ expenditure and decision-making processes. These reflect our learnings from this eight-week project.

Timeframes and availability of schools

The initial sample for our survey was 113 schools. Fewer than half were able to respond. In some cases, it was also very difficult to get through to key people to follow up – e.g. via emails and voicemails.

Staff at schools are clearly busy, and over any short period in the year there will be reasons why capacity to respond to information requests is limited – school trips, camps, and a secondary schools sports tournament were some of the reasons we know of why schools were unable to respond to us within our very limited timeframes.

We believe that rigorous information collection needs to allow for lead times to plan and communicate timeframes, establish the network of key contacts, and have dialogue about availability. It also requires sufficient time for schools to source or estimate data where that is not readily available to them, and for questions and support during the process to ensure consistent understanding.

We would like to acknowledge again that all of the people at schools we talked to saw this research as important, and were generous with their time in order to participate.

Information availability and quality

Information from schools

The systems and management resources available to schools vary significantly. Large secondary schools tend to have timetabling and similar systems, which can provide some structured data. Many of the schools who responded to our survey had to estimate the information we sought on a best endeavours basis.

Schools also interpret terms and classifications in different ways – for example, “co-curricular” is a commonly used term but means different things to different people. While Kiwi Park has already achieved a greater degree of consistency in schools’ financial information, there are clearly a range of ways schools account for similar items.

This suggests that information collection exercises need to spend time upfront engaging with the sector to:

* Achieve common understanding of objectives – e.g. to test specific hypotheses
* Understand schools’ perspectives and limitations about data sources
* Establish clear definitions for categories / terms
* Discuss mitigations and impacts relating to data quality

It may also be useful to engage with school advisors – e.g. accountants and software providers – who might have insights or channels to information for multiple schools. For example, timetabling data may be difficult to extract for individual schools in a structured and consistent format for analysis across large volumes. Timetable software providers, armed with an understanding of analysis requirements, may be able to facilitate extraction, aggregation and data cleansing.

Information from central sources

The Ministry’s holds a range of detailed information about schools. The data we used to inform our report was extracted specifically for us, and needed coordination across multiple sources and subject matter experts.

As is common with such bespoke extracts, the data required checking, identification of errors and cleansing.

The Ministry could consider a stock-take of its information about schools so that it can be checked, collated and stored in a consistent way to make future research projects easier.

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Appendix A: Data Normalisation

This appendix explains how we normalised data for allocation of teachers to year groups. We have provided a specific illustration to show how the approaches work.

The examples in this appendix are based on the following illustrative data:



Approach 1: Unweighted Normalisation

This approach divides the proportion of FTTEs for a given year by the proportion of students in that year, for each school. This approach does not weight the school based on roll size. The diagram below illustrates the formula used for School A, Year 1:



This calculation is applied across all years and all schools to calculate normalised figures. The table below shows the application of the normalisation for the example schools (A and B) and the result.



In order to aggregate the normalised results, we take a flat average of all survey respondents. Please note that the number for “normalised teachers” is not indicative of any ratio of teachers to students.

Approach 2: Weighted Normalisation

This approach calculates the weighted average teacher allocation proportion across all respondent schools by multiplying each allocation by the proportion of the total roll for a given year. This allows us to calculate an average that is weighted for each schools’ roll size. The diagram below illustrates the formula used for this calculation:



This calculation is applied across all years and all schools to calculate the weighted average allocation figure. The table on the following page shows the application of the normalisation for the example schools (A and B) and the result.



In contrast to approach 1, we take the sum of each weighted average to calculate the overall weighted average of the sample. Note that the weighted average allocation for each individual school is not a meaningful figure on its own and should not be interpreted as such.

Appendix B: Sample Schools

The total information on schools sampled includes 53 schools that returned completed surveys and 17 school interviews which were conducted either via phone or in person. Four schools only had an interview but no survey results.

|  |  |
| --- | --- |
| **School Type** | **Count** |
|  |  |
| Full Primary | 9 |
| Contributing | 21 |
| Intermediate | 3 |
| Secondary (Year 9-15) | 14 |
| Secondary (Year 7-15) | 4 |
| Composite (Year 1-15) | 4 |
| Special School | 2 |
| **Total** | **57** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample Schools** |  |  |  |  |  |
| **Decile Groups** | **1 & 2** | **3 & 4** | **5 & 6** | **7 & 8** | **9 & 10** |
| Full Primary | 2 | - | - | 2 | 5 |
| Contributing | 7 | 2 | 2 | 2 | 8 |
| Intermediate | 1 | - | - | 1 | 1 |
| Secondary (Year 9-15) | 2 | 2 | 3 | 3 | 4 |
| Secondary (Year 7-15) | 1 | - | - | - | 3 |
| Composite (Year 1-15) | 1 | 1 | 1 | 1 | - |
| Special School | 1 | - | 1 | - | - |
| **Total** | **15** | **5** | **7** | **9** | **21** |
| % | 26% | 9% | 12% | 16% | 37% |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample Schools** |  |  |  |  |  |
| **School Size** | **< 150** | **150 - 400** | **400 - 650** | **650 - 1000** | **> 1000** |
| Full Primary | 2 | 4 | 2 | 1 | - |
| Contributing | 2 | 9 | 7 | 3 | - |
| Intermediate | - | 1 | 2 | - | - |
| Secondary (Year 9-15) | - | 1 | 1 | 3 | 9 |
| Secondary (Year 7-15) | - | 2 | - | - | 2 |
| Composite (Year 1-15) | 1 | 3 | - | - | - |
| Special School | 2 | - | - | - | - |
| **Total** | **7** | **20** | **12** | **7** | **11** |
| % | 12% | 35% | 21% | 12% | 19% |

Three schools within our sample (both surveyed schools and those that participated in interviews) are Māori Medium Education Schools or schools with some students in mixed Māori language in education.



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1. Refer page 16 regarding the composition of net locally raised funds [↑](#footnote-ref-1)
2. Refer pages 24 and 27 for more detail [↑](#footnote-ref-2)
3. Excludes Principals [↑](#footnote-ref-3)
4. This analysis excludes Special Schools and the Correspondence School [↑](#footnote-ref-4)
5. This analysis excludes Special Schools and the Correspondence School [↑](#footnote-ref-5)
6. Refers to teachers employed using operational grant funding and other cash funding [↑](#footnote-ref-6)
7. Excludes Principals [↑](#footnote-ref-7)