



Briefing Note: Release of Equity Index Technical Report and He Whakaaro

To:	Hon Chris Hipkins, Minister of Education		
Date:	19 September 2019	Priority:	Low
Security Level:	In Confidence	METIS No:	1205440
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Messaging seen by Communications team:	No	Round robin:	No

Purpose of Report

The purpose of this paper is for you to:

Note that the Ministry plans to release the 'Equity Index Technical Report' and 'Accounting for Disadvantage' *He Whakaaro* on the *Education Counts* website.

Note that over the past year, the Ministry has been redeveloping and refining the Equity Index model to better identify the equity challenge faced by schools and services.

Agree that this Briefing be proactively released.

Agree / Disagree

Summary

- The Ministry will release two papers that provide an overview of the development of the first iteration of the Equity Index and some of the insights of the analysis.
- The papers are timed to follow the Cabinet discussion seeking in principle-agreement to replace the decile system with an Equity Index. We expect that a decision to replace the decile system will generate significant public interest, so having these documents publicly available will help to build trust and support in the new system.



Dr Philip Stevens
Group Manager
Analysis, Research & Evaluation
Evidence, Data & Knowledge
19/9/19



Hon Chris Hipkins
Minister of Education

26/9/19

Background

1. On 16th September, Cabinet agreed in-principle to replace deciles with the Equity Index [CAB-19-MIN-0472]. This will enable us to provide certainty around the future of the decile system to the education sector and the New Zealand public.
2. The Ministry will continue the detailed design of the operational use of the Equity Index. This work will include consideration of the practicalities of the implementation, once the package of supports has been designed and agreed. Financial impacts on individual schools and services and transitioning of other supports currently targeted using decile will also be considered.
3. The Ministry has begun engagement with the sector through an Equity Sector Reference Group and a Technical Reference Group.
4. The *Equity Sector Reference Group* is made up of a group of principals from a range of schools across Aotearoa New Zealand, including coverage of all deciles, urban and rural areas, Maori-medium and mainstream education, and primary, intermediate and secondary schools. This ensures we are able to incorporate a broad range of views into the design of the new resourcing system and understand impacts across the schooling system.
5. The *Technical Advisory Panel for the Ministry of Education Equity Index Model* was set up in 2018 to provide independent expert advice and recommendations to improve the performance of the equity index model in identifying disadvantaged students. The panel members are technical experts from academic or not-for-profit organizations, but are not appointed as representatives of any organization. The Group members are as follows:
 - a. **Dr Philip Stevens** (Chair), GM Analysis, Research & Evaluation, Ministry of Education
 - b. **Prof Gavin Brown**, Associate Dean Postgraduate Research and the Director of the Quantitative Data Analysis and Research Unit in the Faculty of Education and Social Work at the University of Auckland.
 - c. **Charles Darr**, Chief Researcher, New Zealand Council for Educational Research;
 - d. **Elliot Lawes**, Psychometrician, New Zealand Council for Educational Research;
 - e. **Dr Michael Johnston**, Associate Dean (Academic) School of Education, Victoria University Wellington;
 - f. **Dr Peter Keegan**, Senior Lecturer, Faculty of Education and Social Work, University of Auckland;
 - g. **Dr Brigid McNeill**, Associate Professor, College of Education, Health & Human Development, University of Canterbury ;
 - h. **Dr Nichola Shackleton**, Senior Research Fellow and Deputy Director of COMPASS Research Centre, University of Auckland;
 - i. **Prof Jeffrey Smith**, Associate Dean, College of Education, University of Otago;
 - j. **Jason Timmins**, Principal Analyst/Manager, Insights, Education Review Office

6. The Group provided extensive review of the model and provided technical guidance on model revisions and enhancements to deliver the greatest modelling efficiency gains.

The Equity Index Model

7. The Equity Index is a statistical model developed to estimate the level of schools' socio-economic disadvantage that impacts children's educational achievement. Primarily, it can be used to better allocate resources to support disadvantaged students than the current decile system.
8. The Index is made up of a large set of socio-economic predictors weighted differently depending on the age of the child. The predictors were selected from an array of socio-economic predictors. The selection was based on the strength of the correlations between the achievement of students who have recently completed their schooling and the socio-economic predictors in their lives.
9. Using the Equity Index together with administrative data held in the IDI, each child enrolled in a school or service can be assigned a score depending on the unique combination of factors characterising the socio-economic context of that child. Thus, the index looks at the full combination of socio-economic circumstances to determine a child's level of disadvantage, rather than any one specific factor.
10. The Equity Index for schools is created using a basket of data points (or variables) that are statistically linked with socio-economic disadvantage and educational achievement. The initial version of the index uses 29 variables and further variables are being considered. These variables are anonymised government administrative data in the IDI and are used as a 'basket' rather than being individually ordered (i.e. two identical scores could be arrived at via two different baskets of variables). Within the IDI, school enrolments are matched with the data points. These are weighted and then combined at a school level to create a measure the level of schools' socio-economic disadvantage as it affects children's educational achievement. The Equity Index value per school is then extracted from the IDI, subject to Statistics New Zealand privacy rules. Individual variables are never extracted, nor is student level data.

The Technical Report

11. The IDI is not easily available to everyone to use or interrogate and therefore a model such as the Equity Index runs the risk of not being transparent. To improve transparency, the Technical Report clearly explains how the model has been developed and the factors that it uses. This is designed to build trust and confidence in the model and any future applications of the information generated by the model.
12. The Technical Report details the process of development of the first iteration of the Equity Index, including the choice of factors included in the model, tests of model performance and validity, operational considerations and suggestions future work to improve the model.
13. The work to improve the model is well underway, informed by the suggestions of and discussions with the Technical Advisory Panel. Changes to the Equity Index methodology also respond to concerns raised by the education sector that the measure of educational success used in the Risk Index was too blunt. It measured a simple

pass/fail at NCEA level 2. The measure of educational success has been broadened in response to this technical and sector feedback. Instead the measure will now consider the spectrum of actual achievement at NCEA. This gives a more nuanced view of the equity challenge at each school.

Accounting for Disadvantage He Whakaaro

14. *He Whakaaro – Education Insights* are a series of short, easy to read papers, which look across the range of New Zealand education system evidence. They provide interesting and useful insights and highlight latest findings, new analysis or ways of looking at issues. They are designed to provoke further thought and discussion on key issues such as; student progression and attainment, the factors that support learning and patterns and trends across education.
15. We have produced a *He Whakaaro – Accounting for Disadvantage* – to introduce the insights into the level of socio-economic disadvantage across New Zealand's schools provided by our work on the Equity Index so far.
16. We present insights into the distribution of individual disadvantage within schools, and compare the Equity Index with school deciles – our current instrument for identifying the level of disadvantage within a school. These insights have been presented to you previously in a number of Education Reports and Strategy Sessions [e.g. METIS: 1169230].
17. In short, the key messages are that:
 - a. Disadvantage exists everywhere across New Zealand, but is spread unevenly across our schools;
 - b. Deciles are a blunt instrument for identifying the level of disadvantage in a school. Across the schools in any given decile, we see large variation in the proportion of their students who are disadvantaged;
 - c. These results are from the first iteration of the Equity Index methodology, which is being refined to improve its reliability and comprehensiveness.

Key Risks and Benefits

18. The papers provide transparency around the development of a more effective means of accounting for socioeconomic disadvantage to replace the decile system. We expect that there will be significant interest in the Equity Index once it is made public that it are replacing the decile system and wider public engagement begins. Having this information publicly available will help to build trust and support in the new system.
19. We will work with your office to coordinate the release of the Technical Report and He Whakaaro on Education Counts to align with announcements regarding the Decile replacement.

Next Steps

20. The papers will be published on the *Education Counts* website in the week commencing 23 September.

21. We are currently preparing a communications plan and will provide this to your office closer to the anticipated public release date of 23 September 23 and will work with your office to coordinate the release.

Proactive Release

22. We recommend that this Briefing is proactively released as per your expectation that information be released as soon as possible. Any information which may need to be withheld will be done so in line with the provisions of the Official Information Act 1982.

Annexes

Annex 1: Equity Index Technical Report

Annex 2: Accounting for Disadvantage He Whakaaro

Annex 1 is available here: https://www.educationcounts.govt.nz/__data/assets/pdf_file/0003/196005/Equity-Index-Technical-Report-Final.pdf

Annex 2 is available here: https://www.educationcounts.govt.nz/__data/assets/pdf_file/0017/196001/Accounting-for-education-disadvantage.pdf



Communications Report Briefing Equity Index Technical Report and He Whakaaro insights report

DRAFT

For distribution to:

- Minister of Education
- Office of Deputy Secretary, Evidence Data & Knowledge

Date: 24 Sept 2019

Introduction/background/context

In May 2018 [CAB-18-MIN-0208] Cabinet agreed to rescind the previous Government's decision to replace the decile system (used to target funding to schools and services) with the predictive Risk Index, instead redeveloping it as an Equity Index. The Risk Index had been developed to estimate the number of children in each school and service at greater risk of educational underachievement due to disadvantage. The Minister instructed the Ministry of Education to proceed with recalculating deciles for the 2020 calendar year.

Over the past year, the Ministry of Education has been redeveloping and refining the Equity Index to better identify the equity challenge faced by schools and services. Replacing deciles with this Equity Index designed to enable better targeting of resourcing to mitigate the impacts of disadvantage.

On 16th September, the Minister obtained a Cabinet in-principal decision to replace school deciles with the Equity Index. The Minister will make an announcement in the week beginning 23 September. This will be supported by a website news item and page on education.govt.nz.

To get to this point, the Ministry has been running a model development process using the Integrated Data Infrastructure (IDI) to understand the relationship between socioeconomic factors and educational achievement.

The Technical Reference Group on Funding for Disadvantage was established to determine the best ways to target funding for learners most at-risk of underachievement and replace the decile system. This group met several times throughout 2017 and advised on the development of the Equity Index and points to consider when changing the way funding is targeted to mitigate the effects of disadvantage.

Summary of Report

'Accounting for Disadvantage' He Whakaaro.

- Disadvantage exists everywhere across New Zealand, but is spread unevenly across our schools;
- Deciles are a blunt instrument for identifying the level of disadvantage in a school. Across the schools in any given decile, we see large variation in the proportion of their students who are disadvantaged;
- These results are from the first iteration of the Equity Index methodology, which is being refined to improve its reliability and comprehensiveness.

Equity Index Technical Report

- The Equity Index is a statistical model (and its output) developed to estimate the level of schools' socio-economic disadvantage that impacts educational achievement. It is designed as a replacement to the decile-based allocation of operational school funding.
- Using and operating within Statistics New Zealand's Integrated Data Infrastructure (IDI), the Index combines administrative data at an individual level from a range of government agencies. The model relates NCEA level 2 to children's socio-economic characteristics only.
- In previous studies we have shown that individual-level information better identifies disadvantaged students than neighbourhood meshblock information such as the deciles. Moreover, this report finds that the model performs well in its ability to identify disadvantage at a rate 2 - 2½ times better than assuming all children start from the same place.
- Some biases in the model are found with respect to ethnicity and migrant status, with a major discovery being that non-resident students were missing parental variables, indirectly lowering the coverage of these variables for Asians, who were more frequently non-residents.

- Explanatory work was also done, to investigate the effect of pooling the scores, as opposed to using age-based modelling. Results from the pooled approach found that older (16-18) children were less likely to be identified as disadvantaged, with 7 to 13 year olds more likely to be identified as disadvantaged, under the pooled system, compared to the non-pooled system currently used.
- Suggestions for model improvement are provided in this paper; work is planned for 2019 and most of 2020 for improvements to the model.

Communications issues and concerns

Explain any communications issues or concerns that relate to the report and/or the Ministry's response to the report. Who might be impacted? What is being done to address these concerns?

Communication issues, concerns	Likelihood (high, moderate, low)	Impact (high, moderate, low)	Mitigation (what is being done or will be done to address the concerns)
The Equity Index is a complex tool and many people may struggle to understand the technical details	High	High	Communications material and the He Whakaaro paper supporting the in-principal announcement of the Equity Index is being designed to draw attention to the key differences between the Equity Index and school deciles and other things that are 'need to know' for the majority of stakeholders. The Technical Report is being prepared so stakeholders have confidence in the methodology. The abridged and simplified version of the technical explanation is being made available as soon as possible so as many stakeholders as possible can access the technical details when the in-principle decision is announced.
Stakeholders are likely to be concerned about privacy and use of individuals' information from the IDI	Moderate	Moderate	This material contains accessible explanations of how the IDI works and how the law protect individuals' data so they cannot be identified.
Stakeholders misunderstand the links between this work and the work to replace the decile	Moderate	Moderate	This material contains descriptions of the broader policy and funding context. We are working closely with policy colleagues to ensure the announcement of the in-principal of the equity index and this supporting technical work are aligned.

Communications approach and objectives

- These papers are timed to follow the Cabinet discussion that occurred last week seeking in principle-agreement to replace the decile system with an Equity Index. We expect that a decision to replace the decile system will generate significant public interest, so having these documents publicly available will help to build trust and support in the new system.

- They are part of a broader communications approach to support the announcement of the in-principle decision to replace school deciles with the Equity Index.
- The objectives of this approach are to:
 - **Inform** parents, school boards, communities and other stakeholders (including internal stakeholders and other agencies) of the decision to replace deciles with the Equity Index and its implications for them
 - **Inform** people about the need for targeted resourcing for equity in New Zealand's education system
 - **Reduce and mitigate** potential stigma related to the Equity Index
 - **Generate** trust and understanding in the Equity Index as a way to allocate resources.
- This will be a soft release, in that it will be published on the Education Counts website. However, it will be referred to in material supporting the announcement of the in-principal replacement of deciles by the Minister.

Questions and Answers

What does the Equity Index do?

What this model does is generates a measure of educational disadvantage using a range of socioeconomic characteristics of children and their whānau, weighted according to their average influence on the education achievement of previous students.

What is the measure of educational achievement?

The measure of educational achievement used in the initial model described in these releases is NCEA Level 2 achievement.

Why NCEA Level 2?

NCEA Level 2 was used as the measure of educational achievement because it is a national qualification framework that tracks achievement across most schools and students. NCEA Level 2 is a suitable outcome in the schooling context for several reasons:

1. Complete data coverage is available;
2. It relates directly to the educational context;
3. It is considered a minimum for subsequent participation in the education system.

NCEA Level 2 was selected in particular as it has been found to better predict later life outcomes and is considered a minimum requirement in the job market and further education. Those who do not achieve NCEA Level 2, but did achieve NCEA Level 1, are more likely to be unemployed, earn less, and incur justice and welfare costs compared to those with NCEA Level 2 attainment.

Is this what will be used replace deciles?

While the general model will be used to replace deciles, there are a number of improvements already underway that will be introduced before this model is used to allocate resources to schools.

Audiences, Channels, Products, When, and Who responsible

This section is only used when we have a good narrative or response that we would like to share more widely with the sector or general public. It is also useful if the narrative or key messages are to be repurposed for various audiences in order to tailor the messages to them.

If you want to share the report findings more widely, explain how we will get our messages out to key audiences, which channels will be used to reach them, and what products, if required will be used to do this most effectively (e.g. media release, website content, bulletin, tweet, Gazette article, intranet, etc.).

Audience	Channel	Product	Due Date	Who
External audiences (e.g. sector, media, parents, communities, employers)	<i>Education Counts</i>	Technical report He Whakaaro		CSCM, EDK
Internal audiences (e.g. managers, regional education directors, staff)	e.g. Dep sec newsletter, Manutaki, Te Tahuhu, face to face/email.	Toolkit, fact sheet, powerpoint,		

Sign off process for the report

Ensure other business units that may be impacted by the report findings and Ministry response are included.

Signoff	Who	When
Author	Philip Stevens, Group Manager, ARE, EDK	23 Sept
Read by/input to briefing	David Sanders	24 Sept
Communications sign off	Michael Parker	24 Sept
Final Sign off	Wendy Hamilton Acting Deputy Secretary, EDK	24 Sept



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