Review of funding systems for early learning and schooling

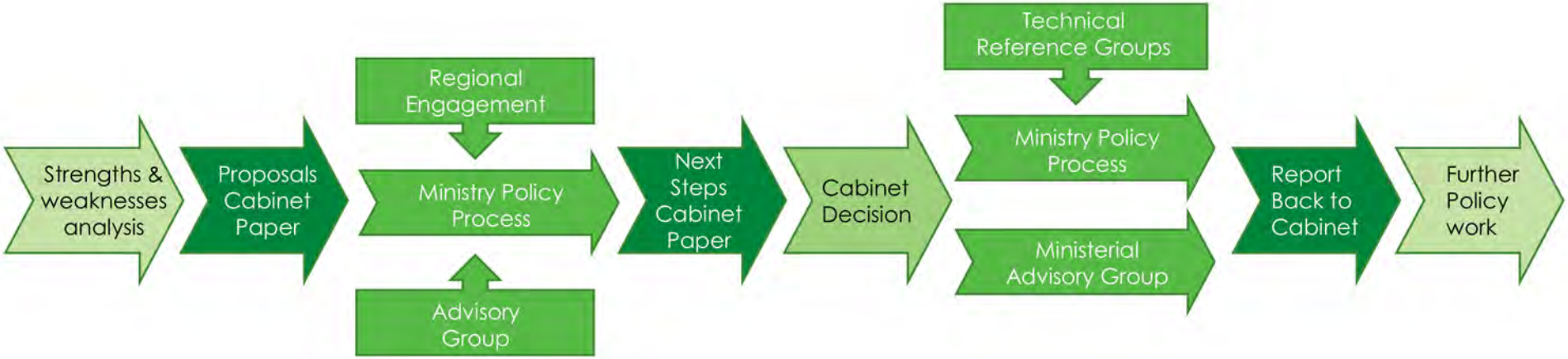
The Policy Cycle and results of predictive modelling of risk of educational under-achievement

Ellen McGregor-Reid: Deputy Secretary, Strategy, Planning and Governance

Damian Edwards: Associate Deputy Secretary, Education System Policy

OUT OF SCOPE

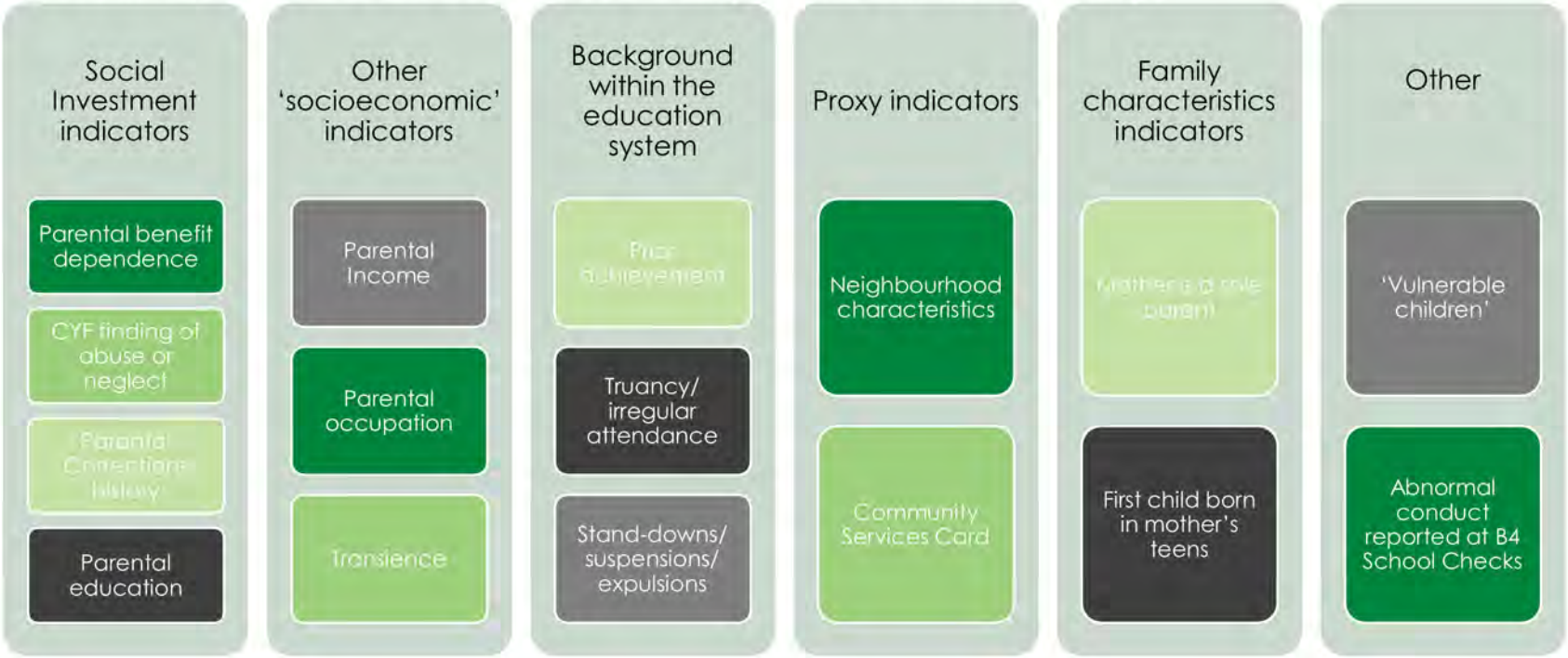
Where are we in the process?



Can we better identify those at risk of under achievement?

DRAFT

Following sector feedback, the Ministry, Treasury and the Social Investment Unit carried out analysis of the predictiveness of possible indicators, individually and collectively.



The IDI Admin+*Census* Indicator Set – Disadvantage Index

DRAFT

HIGH MARGINAL CONTRIBUTION

- Proportion of time spent supported by benefits since birth
- *Mother's qualifications*
- Gender
- Child has a CYF care and protection notification
- *Mother smokes*
- Mother's age at birth of first child

MEDIUM MARGINAL CONTRIBUTION

- *Father's qualification*
- Asian (positive factor)
- Youth justice referral
- Number of addresses recorded in the last five years
- Pacific
- Father's offending and sentence history

LOW MARGINAL CONTRIBUTION

- Mother Maori
- Migrant
- Benefit mother unqualified
- "Child has a substantiated finding of abuse or neglect "
- Country of birth
- Number of children (mother)
- Industry of employment (father)
- Mother has proven charges
- No father listed on child's birth certificate
- *Father smokes*
- *Family income*
- Age of mother
- Mother received sole parent benefit
- Mother European
- Mother is MEELA
- *Fathers occupation*
- *Equivilised HH income*
- Father Pacific
- European
- Mother has a community sentence history
- *Mothers Labour Force Status*
- Father Asian

DRAFT

If we just used IDI admin indicators – Disadvantage Index

HIGH MARGINAL CONTRIBUTION	MEDIUM MARGINAL CONTRIBUTION	LOW MARGINAL CONTRIBUTION
• Proportion of time spent supported by benefits since birth • Child has a CYF care and protection notification • Gender • Mother's age at child's birth • Father's offending and sentence history	• Asian (positive factor) • Youth Justice referral • Benefit mother unqualified • Proportion of time spent overseas since birth • Mother's average earned income over previous five years • Number of addresses recorded over last five years • Maori • Country of birth • Father's average earned income over previous five years	• Migrant category/NZ born • Number of children (mother) • Mother received third tier benefits • Most recent male caregiver is not the birth father • Pacific

So what did we find ?

DRAFT

	If 25% of population defined as 'disadvantaged'		
	Proportion of those who didn't achieve identified as 'disadvantaged'	Proportion of those who did achieve identified as 'disadvantaged'	Predictive power (ROC score*)
Set of Census meshblock indicators used for decile	42%	22%	0.65
Set of four social investment indicators**	39%	13%	n/a
Set of administrative indicators in disadvantage index	57%	19%	0.78

* A 'ROC score' is a measure of the accuracy of a set of indicators across a range of cut-off thresholds. The range is from 0.5 to 1.0, with a score of 1.0 meaning perfect accuracy and a score of 0.5 meaning no better than random chance.

** Long term beneficiary status; Child, Youth and Family finding of abuse or neglect; parental Corrections history, and maternal or primary caregiver educational qualifications.

s 9(2)(f)(iv) OIA

Some provisos

DRAFT

Document - 1

- The results in this presentation are not official statistics, they have been created for research purposes from the Integrated Data Infrastructure (IDI) managed by Statistics New Zealand.
- Access to the anonymised data used in this study was provided by Statistics NZ in accordance with security and confidentiality provisions of the Statistics Act 1975.
- Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business or organisation and the results used in this presentation have been confidentialised to protect these groups from identification.
- Careful consideration has been given to the privacy, security and confidentiality issues associated with using administrative and survey data in the IDI.
- Further detail can be found in the Privacy Impact Assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

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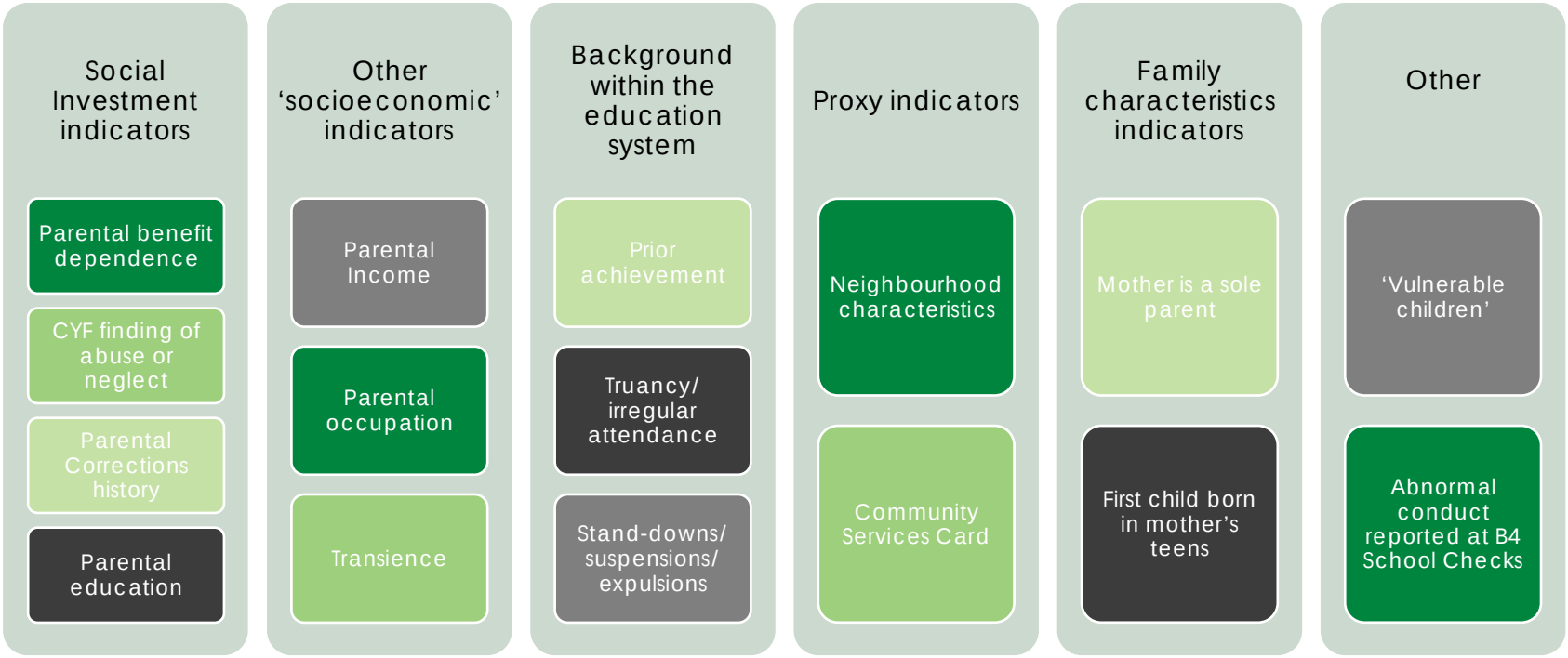
Review of funding systems for early learning and schooling

Predictive modelling of risk of educational under-achievement

Damian Edwards: Associate Deputy Secretary, Education System Policy

We can better identify those at risk of under achievement

Following sector feedback, the Ministry, Treasury and the Social Investment Unit explored a range of indicators that could better identify children at risk of underachievement.



We assessed the predictiveness of possible indicators, individually and collectively

The IDI Admin+*Census* Indicator Set – Disadvantage Index

HIGH MARGINAL CONTRIBUTION

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If we just used IDI admin indicators – Disadvantage Index

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So what did we find ?

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** Long term beneficiary status; Child, Youth and Family finding of abuse or neglect; parental Corrections history, and maternal or primary caregiver educational qualifications.

What is a predictive risk index

- **A predictive model uses historical events to predict likely future events**
- **It uses a number of indicators – some are more predictive than others - the combination of indictors is also important**
- **Some children will have associations with more indicators than others**
- **The indicators are correlated with risk of not achieving – they do not imply causation**
- **Prediction is not destiny- some children predicted by the index to be at greater risk will achieve and some predicted to be at lower risk will not**

Questions

- **What judgements do we need to apply in defining disadvantage (setting a threshold)?**
- **Are there factors (such as gender and ethnicity) that should be excluded from the index?**
- **What concerns you about the use of a predictive index to support the allocation of funding for disadvantage?**
- **What are the practical considerations we need to address?**
- **What else do we need to consider if we were to introduce a disadvantage index?**

Some provisos

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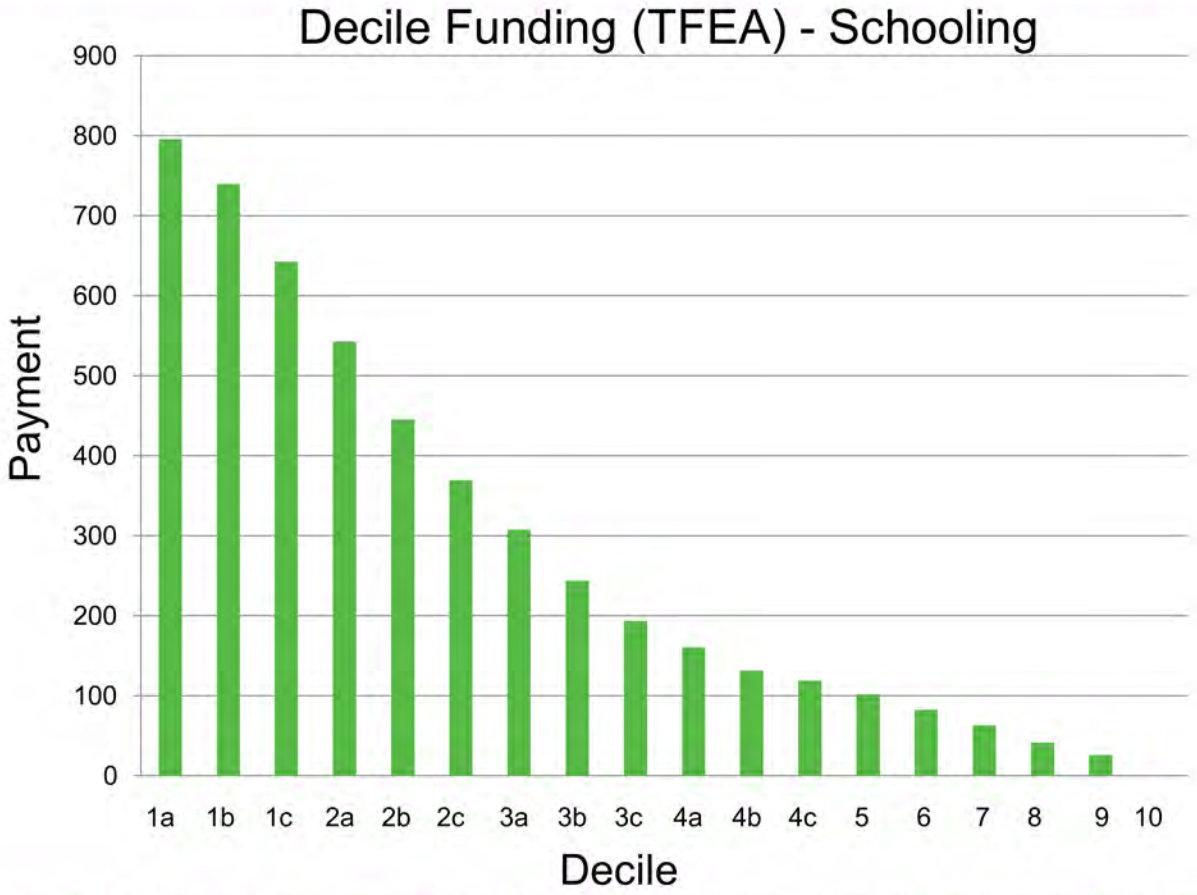
Review of funding systems for early learning and schooling

Understanding and Defining Disadvantage

Damian Edwards: Associate Deputy Secretary, Education System Policy

Our current approach ranks services and schools on the relative socio-economic circumstances of their populations ….



…and every child in the service or school generates that funding

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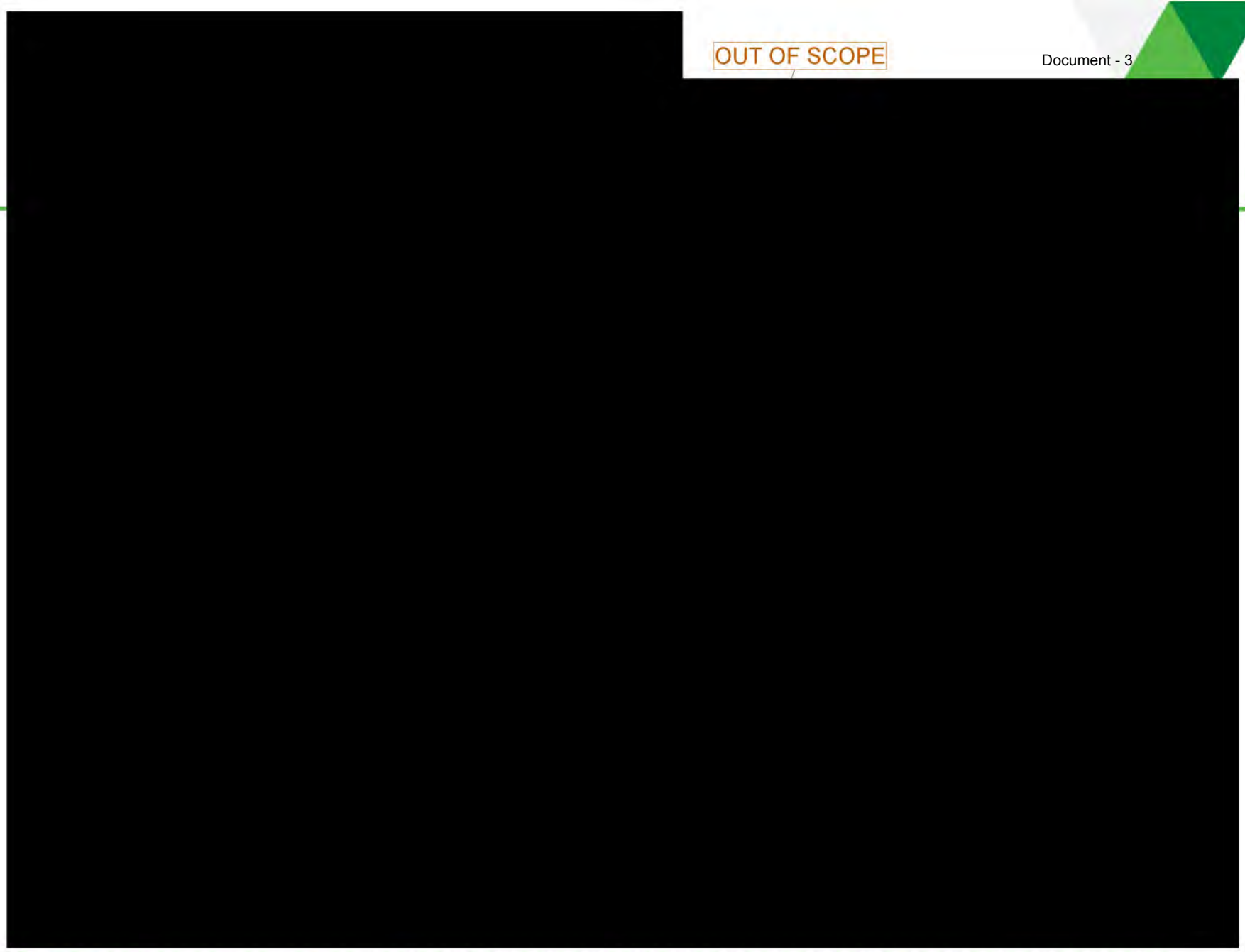
[redacted]



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Review of Funding Systems Technical Reference Group for Dealing with disadvantage: Draft Terms of Reference

Introduction

The Government is reviewing the design of funding systems for schools, early childhood education (ECE) and ngā kōhanga reo services as part of exploring improvements to the overall design of the education system to ensure that all New Zealand children and young people receive the best possible education.

The Review forms a critical part of the whole-of-system work programme, to build a sustainable, fit-for-purpose education system for children and young people aged 0-18.

The Minister of Education has commissioned the Ministry of Education (the Ministry) to provide further advice on a range of options with the potential to strengthen the funding systems.

Current funding systems

Current funding systems for schools and services have been in place for some time and are in need of a substantive review. They are not sufficiently focused on children and young people, their needs and progression. The Government is interested in the role that funding can play in enabling schools and services to better meet the needs of all children and young people.

Terms of Reference

Objectives of the review

The overall objective of the Review is to direct funding to the size of the educational challenge faced by schools, services and Communities of Learning| Kāhui Ako rather than the size of their rolls and the cost of their inputs; and to shift the focus to growing the learning and achievement of all children and young people, and particularly those most at risk of educational under-achievement and those with learning support needs.

Scope of the review

The scope of the Review is about how the design of the existing funding systems for schools and ECE and ngā kōhanga reo services could be better targeted to support the educational achievement of all children and young people as they progress through each stage of their educational journey.

Public funding for schools and services is within scope of the review.

Stages of the Review

The first phase of the Review was undertaken during 2016. Between May and September, the Ministry engaged with the sector to test seven elements for change. The proposal was at a conceptual level. Cabinet has directed work to progress on six of the elements.

The next phase of the Review will involve more detailed policy development and analysis by the Ministry on the following:

- a curriculum-based per-child funding amount for schools
- a move from place-based to per-child funding in early childhood education

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- targeted funding for individual challenges for children from disadvantaged backgrounds, and those needing additional learning support (special education)
- funding for small and isolated state and state integrated schools and early childhood education (ECE) and ngā kohanga reo services
- separating the funding for property maintenance and heat, light and water
- a per-child subsidy set for independent schools, set at a fixed proportion of the per-child funding amount for state and state integrated schools[1]
- strengthening the line of sight between the investment government makes in education and the outcomes achieved by children and young people (data for outcomes).

It's important to note that we are still in the early stages of the Review and no decisions have been made.

Technical Reference groups

In order to assist with this work, small (10-15 members), topic specific technical reference groups made up of experts from the sector have been established to advise on detailed design and inform further policy development.

Members of the groups will contribute to the Review drawing on their technical knowledge, expertise and advice to assist in answering topic specific questions that have arisen as part of the early policy development process.

Members of the Reference groups have been selected based on their knowledge and expertise of the curriculum including learning areas, competencies, values and assessment.

Reference groups will be participating in the next steps of the Review and will help inform recommendations for a new design of the funding system. No decisions have yet been made regarding any changes.

Purpose and role of the technical reference group for additional funding for individual challenges of disadvantage

To advise on the question of how to allocate additional per-child funding funding for children from disadvantaged backgrounds to better align funding to the curriculum based achievement challenge. This will be done by exploring the following:

- establishing a disadvantage index (as an alternative to the decile census based meshblocks)
- measuring the size of the achievement challenge for those identified through the disadvantage index
- determining what it takes to address disadvantage
- establishing the best mechanism for allocating this funding
- informing the development of an operational allocation mechanism.

[1] Further detail about the decisions that Cabinet made around these streams of work can be found in the October 2016 Cabinet Paper: Review of Education Funding Systems Update and Next Steps on the Ministry of Education website

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Where relevant, the Group will make connections to other work in the social sector that addresses disadvantage for children and young people, in particular through the new Ministry for Vulnerable Children Oranga Tamariki.

Principles for operation

The Group will have access to data, research and analysis, as appropriate around the specific topics under discussion. This will include material that is still at a conceptual stage of development.

The responsibilities of the Group members are:

- to act in an advisory role to the Ministry, by providing technical advice and analysis to the Ministry in order to inform and assist with progressing specific aspects of the Funding Systems Review. The group will not be in a decision making role or be asked to produce a separate report
- to attend all scheduled meetings. When members cannot attend substitutes will not be able to be sent.
- to undertake pre-meeting reading, if provided; engaging fully with the material at each meeting; and completing any post-meeting actions
- to maintain the confidentiality of information provided for their advice, comment and critique.

Disclosure

The Terms of Reference and Group membership will be published on the Ministry's website, on the dedicated Review page.

The Ministry of Education will maintain oversight of the Group and is responsible for keeping the Minister informed of any relevant outcomes, risks and issues.

Meetings and administration

Wellington meetings will be held at the Ministry's National Office, Mātauranga House, 33 Bowen Street. The Ministry will cover all costs directly associated with hosting the meetings, including transport, catering and any other actual and reasonable expenses associated with members' attendance. This does not include professional fees.

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Members
Clare Wells Chief Executive Officer, New Zealand Kindergartens Inc Dave Appleyard, Rata St School, Naenae Allan Vester, Edgewater College, Auckland Dianne Pollard Williams, Melville Primary School, Hamilton Brendon Morrissey, Kaitaia Primary School, Northland Cathy Chalmers, Greenmeadows Intermediate, Auckland Kararaina Cribb, Te Kōhanga Reo National Trust Board Iain Taylor, Manurewa Intermediate, Auckland Phil Heeney, Te Kura Kaupapa Maori o Te Waiu o Ngati Porou, Ruatoria Anne Miles, McAuley High School, Otahuhu Richard Edmundson, Linwood College, Christchurch John Murdoch, Mana College, Wellington

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Improving funding for disadvantage

Our achievement problem: New Zealand has a gap in educational achievement between higher and lower socio-economic groups.

Our funding problem: Funding arrangements could do more to help address this gap.

OUT OF SCOPE

[redacted]

Problems with the decile system

Poor identification of disadvantaged children

The decile system is a blunt mechanism for identifying disadvantaged students and where they are enrolled.

- Decile ratings are based on the socioeconomic characteristics of the neighbourhoods (Census meshblocks) where children attending a school or service live at one point every five years, rather than the specific circumstances of individual children every year.

The decile system is a measure of relative disadvantage.

- Services and schools are ranked relative to each other, and divided into ten equally-sized groups. Changes in a school's/service's decile are driven by changes in its own circumstances and those of other schools/services.

Other problems

Disruptive decile recalibrations.

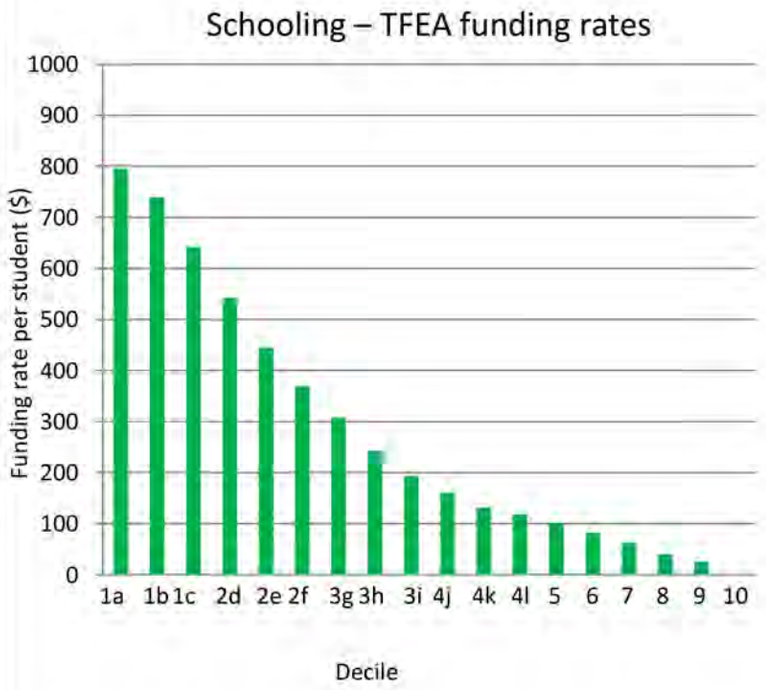
- Recalculation at five yearly intervals can result in large changes in funding for schools and services.

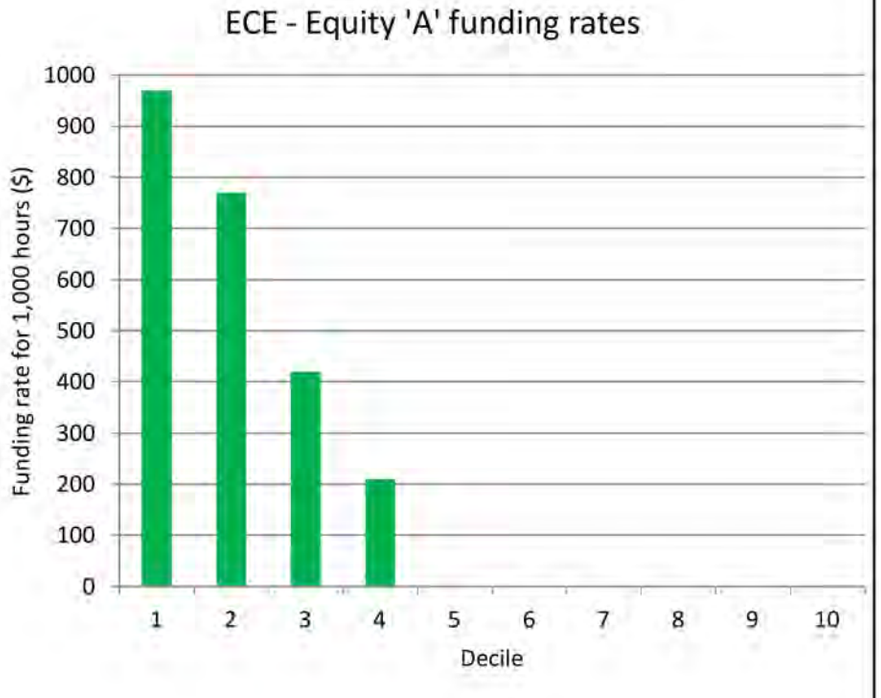
Unintended stigmatisation.

- Deciles are misinterpreted as indicator of educational quality, stigmatising some schools.

The current system allocates more funding to schools and services where the decile model assesses greatest need.

- Funding is heavily weighted to schools and services with high concentrations of students from disadvantaged neighbourhoods.
- All students in a school or service generate the funding rate associated with their school's/service's decile funding step.





We can improve how the funding system supports disadvantaged students by:

1. Better identifying which children are disadvantaged and which schools/services they are in.

[redacted]

s 9(2)(f)(iv) OIA

Better identifying disadvantaged children

s 9(2)(f)(iv) OIA

Predictive modelling to estimate each child's risk of not achieving NCEA Level 2

The concept:

- Information relating to the achievement of previous cohorts of children is used to predict the risk of not achieving NCEA level 2 for children currently in ECE services and schools. This is a prediction not a definite.

The method:

Using information on past children:

- All administrative data held in the IDI on children born in 1998 was used to statistically estimate which factors in their life were correlated with whether or not they achieved NCEA Level 2.
- This creates a risk index made up of a set variables. Some variables are more strongly predictive (CYF notification). Others are weaker predictors (ethnicity).
- A child is at low or high risk on this index due to their full combination of life factors, not because they have one specific factor or not.

HIGH MARGINAL CONTRIBUTION	MEDIUM MARGINAL CONTRIBUTION	LOW MARGINAL CONTRIBUTION
1. Proportion of time spent supported by benefits since birth	1. Asian (positive factor)	1. Migrant category/NZ born
2. Child has a CYF notification	2. Youth Justice referral	2. Number of children (mother)
3. Gender	3. Benefit mother unqualified	3. Mother received third tier benefits
4. Mother's age at child's birth	4. Proportion of time spent overseas since birth	4. Most recent benefit male caregiver is not the birth father
5. Father's offending and sentence history	5. Mother's average earned income over the previous 5 years	5. Pacific
	6. Number of addresses in the last 5 years	
	7. Māori	
	8. Country of birth	
	9. Father's average earned income over the previous 5 years	

And applying that to current children:

- This risk index is applied to current children to assess the risk of each child not achieving NCEA Level 2.

[redacted]

Date: 2/02/2017
METIS: 1044340
Deputy Secretary:
Ellen Macgregor Reid

s 9(2)(f)(iv) OIA

Document - 8

Not Government policy : In Confidence

s 9(2)(f)(iv) OIA

Date: 2/02/2017
METIS: 1044340
Deputy Secretary:
Ellen Macgregor Reid

Not Government policy : In Confidence

[redacted]

Review of funding systems for early learning and schooling

Funding for Disadvantage Children Early Childhood Advisory Committee (ECAC)

Damian Edwards: Associate Deputy Secretary, Education System Policy

Risk index

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Equity funding

Objectives of Equity funding

- Reduce educational disparities between different groups in New Zealand communities
- Reduce barriers to participation
- Support ECE services in raising children's level of educational achievement.

We've made significant progress, but there's still room to improve…

- Sustained growth in ECE participation for our most vulnerable groups
- Disadvantaged children are still less likely to participate in ECE, and, on average, participate for shorter periods of time.
- Children in lower deciles are starting behind other children in higher deciles

Equity funding

The Equity Index measures the extent to which a service draws children from low socio-economic communities

- The Equity Index score (EQI) is worked out on the basis of enrolled children's addresses and information taken from the New Zealand Census.
- Equity funding = *EQI (funding rate) * funded child hours (claimed in RS7)*
- Services are then assigned an EQI based on their relative rank.

Funding is provided at a service level

- Every child in an eligible service, despite their circumstances, attracts Equity funding.
- Funding is not attached to individual children. A funding rate is attached to a service.

Equity funding Component A rate

EQUITY INDEX	LOWER SOCIO-ECONOMIC RATE PER FUNDING CHILD HOURS
1	$0.97
2	$0.77
3	$0.42
4	$0.21

Identifying disadvantaged children

We are exploring a funding model that targets funding to those children most at risk of poor educational outcomes

Current model

- Disadvantage is defined by children's neighbourhood characteristics
- Funding = EQI rate * total FCH
- All children in an eligible service (EQI 1 - 4) generate funding
- Funding eligibility can only be updated every 5 years

Potential future model

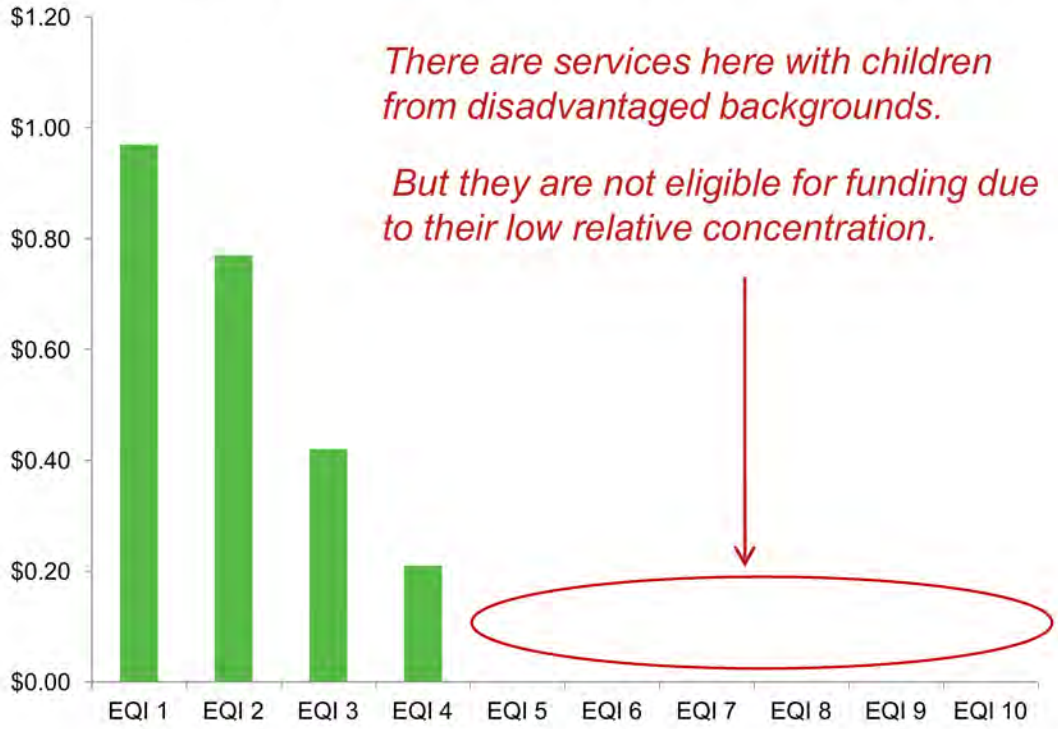
- Disadvantaged is defined by children's individual circumstances
- Funding = funding rate * at risk hours
- Only children identified as disadvantaged generate funding
- Funding eligibility is updated annually.

Equity Funding – concentration

Equity funding is concentrated between EQI 1-4

- Equity funding was established in 2002 with $5m in funding.
- When Equity funding was introduced a decision was made to:
  - Exclude services below a certain threshold
  - Provide more funding to services with higher concentrations

Equity funding: EQI rate by child-funded hour



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New Zealand Government

Date: 24/02/2017
METIS: 1048435
Deputy Secretary:
Ellen Macgregor Reid

REVIEW OF EDUCATION FUNDING SYSTEMS: FIRST DECISIONS

Objective of Funding Review

To develop a funding system that:

- Adequately supports children to make at least a year's worth of progress against the curricula every year.
- Strives for equitable outcomes for children at greater risk of educational underachievement because of disadvantage and children who require other forms of learning support to achieve to their potential.
- Better manages the maintenance risks to the Crown's substantial investment in school property.

The Funding Review sits within a larger package of changes

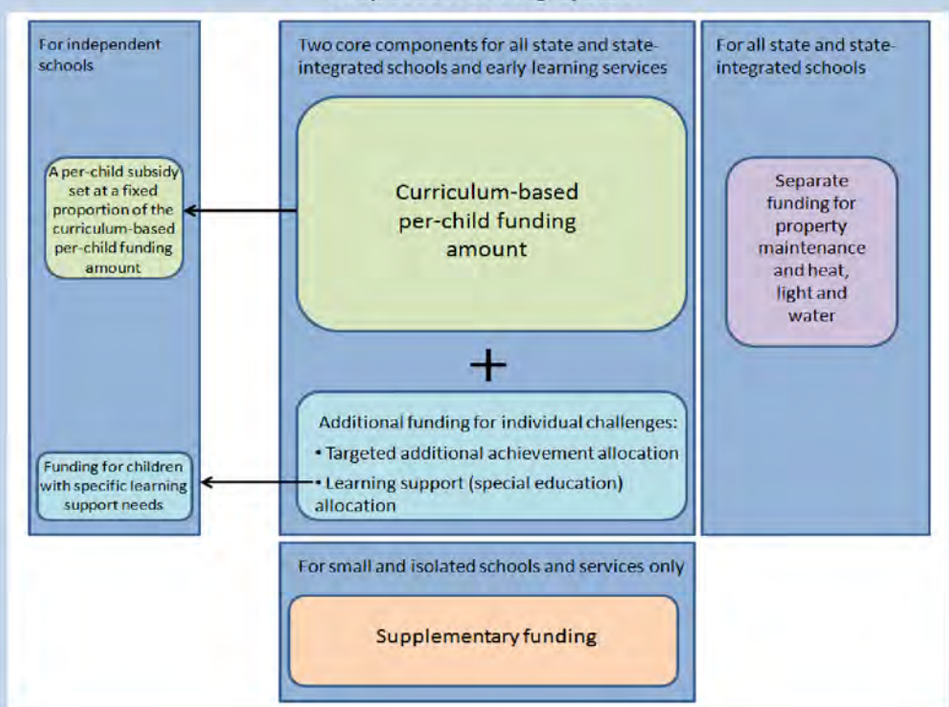
- The Review is one element of the Education Work Programme. The other elements create the supporting conditions to give more confidence that funding is used effectively.
- The proposed funding model is better aligned with the new operating model for services and schools provided by Communities of Learning | Kāhui Ako. In turn, Communities of Learning support more effective use of funding through their collaborative improvement focus and the sharing of expertise.
- Through the Education (Update) Amendment Bill we are improving school planning and reporting to help embed a learning progress and achievement focus and expanding the intervention toolkit for addressing school underperformance.
- Dialogue is progressing with the sector on strengthening the reliability and transparency of information on children's progress and development.

Cabinet Decisions

April 2016: Cabinet agreed to a review of funding systems for ECE, ngā kohanga reo and schools.

October 2016: Cabinet agreed to continuing to explore the following funding model with first decisions in March 2017.

Proposed Funding System



[redacted]

s 9(2)(f)(iv) OIA

Date: 24/02/2017
METIS: 1048435
Deputy Secretary:
Ellen Macgregor Reid

1. Improving funding arrangements for children at risk of educational underachievement because of disadvantage

The problem

New Zealand has a gap in educational achievement between higher and lower socio-economic groups. Funding arrangements could do more to help address this gap.

Problems with the decile system

Poor identification of disadvantaged children

The decile system is a blunt mechanism for identifying disadvantaged students and where they are enrolled.

- Decile ratings are based on the socioeconomic characteristics of the *neighbourhoods* (Census meshblocks) where children attending a school or service live at one point *every five years*, rather than the specific circumstances of *individual* children *every year*.

The decile system is a measure of relative disadvantage.

- Services and schools are ranked relative to each other, and divided into ten equally-sized groups. Changes in a school's/service's decile are driven by changes in its own circumstances and those of other schools/services.

Stigmatisation & disruption

Unintended stigmatisation.

- Deciles are misinterpreted as indicator of educational quality, stigmatising some schools.

Disruptive decile recalibrations.

- Recalculation at five yearly intervals can result in large changes in funding for schools and services.

The Solution

1. **Better identifying which children are most at risk of educational underachievement because of disadvantage and the schools/services they are in.** s 9(2)(f)(iv) OIA ← Current decision

[redacted]

1. Using predictive modelling to better identify which children are at greater risk of educational underachievement because of disadvantage (current decision)

The concept:

- Predictive modelling to estimate each child's risk of not achieving NCEA Level 2

The method:

Using information on past children:

- All administrative data held in the IDI on children born in 1998 was used to statistically estimate which factors in their life were correlated with whether or not they achieved NCEA Level 2.

To create a risk index

- This creates a risk index made up of a set variables. Some variables are more strongly predictive (for example: CYF notification, benefit dependency). Others are weaker predictors (for example: ethnicity).
- A child is at low or high risk on this index due to their *full combination* of life factors, not because they have *one specific factor* or not.
- All relevant factors have been included in the index including factors that could be more controversial (gender and ethnicity). This maximises the predictive accuracy of the index. Work with the sector suggests that if properly communicated, the inclusion of all the relevant factors is likely to have support.

And applying that to current children:

- This risk index is then applied to current children to assess the risk of each child not achieving NCEA Level 2.

The advantages:

- Enables more finely calibrated assessments of individual children's circumstances.
- Reassessments can be made annually.
- The methodology can be updated and improved as new information becomes available.
- This approach will not identify individual children to services and schools.
- Does not require services and schools to collect additional information from parents.

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OUT OF SCOPE

[redacted]