



Over-Enrollment in the Early Grades

In this short note, we summarize findings from a forthcoming analysis for 39 countries with unusually large over-enrollment in the early primary grades. We investigate the scope of the problem, the underlying causes and some potential solutions. Our analysis reveals that this over-enrollment is explained primarily by excessive, sustained repetition in the early grades. This pattern results in substantial system inefficiencies and wastage. We discuss policy implications related to expansion of pre-primary education, improvement of quality in the early grades and allocation of resources.

The world is facing a learning crisis.

As countries around the world have abolished school fees, millions of new children have entered education systems. Many of these children, however, cannot read, write, or do basic math, even after several years of primary school. Recent estimates suggest more than 600 million children are not reaching basic proficiency.ⁱ

This learning crisis has its roots in children's earliest years when we fail to invest in quality early learning experiences to build strong foundations.

There seems to be a problem in the “Foundational First Five” by which we mean the two years before primary school and the first three years of primary school. Too many children enter school without the preparation they need to succeed, and then enter classrooms that are overcrowded and low quality. Without strong foundations, children risk churning through a cycle of underperformance, repetition, and, eventually, drop-out.

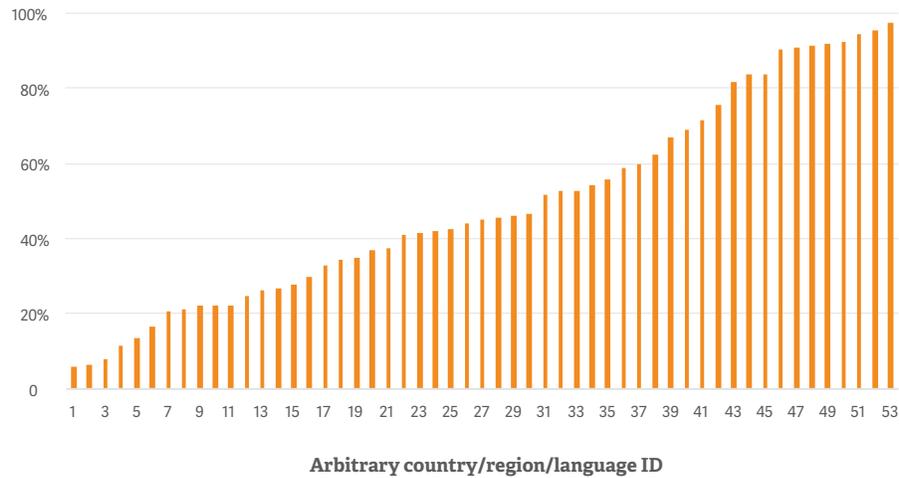
In many low-income countries, approximately half of the children in Grade 2 cannot read a single word in a simple sentence. Figure 1 shows the distribution of these students who are unable to read across a set of 53 country/language combinations.

KEY MESSAGES

- There is a substantial problem of unusually large over-enrollment across many low-income countries.
- This over-enrollment is primarily caused by repetition in the early grades of primary school (which is under-reported within official statistics in many countries). The large gap between enrollment in Grade 1 and 2 is often attributed to dropping out, when in most cases it is just differential over-enrollment.
- This excessive repetition results in substantial system inefficiencies and wastage, with estimated costs for some countries of 1.2 extra years of education per child and an estimated 5% to 10% of the education budget wasted.
- There is evidence to suggest that increasing access to pre-primary enrollment could help alleviate this over-enrollment.
- Many countries are already paying for an inefficient version of early childhood education because parents are choosing to enroll children in primary school early with the expectation that they will repeat early primary grades.
- Countries could potentially afford expansion of pre-primary education using the resources that are currently wasted on repetition and over-enrollment in the early grades.

This brief summarizes findings from a longer forthcoming report “Over-Enrollment in the Early Grades,” prepared jointly by teams at RTI and the World Bank. Lead authors for RTI are Luis Crouch and Katherine Merseth. Lead author for the World Bank is Amanda Devercelli, with Min Ju Choi, Amina Denboba and Anita Gurgel contributing.

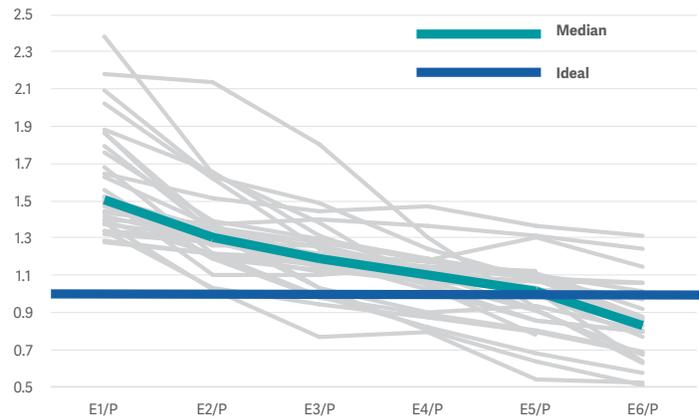
Figure 1: Students who cannot read a single word within a simple sentence¹



The education system is dramatically overcrowded in the early primary grades.

Nearly 40 countries in the world have enrollment rates in Grade 1 that exceed the population of children of corresponding grade-for-age by 30% or more. Figure 2 presents the progression of enrollment as children proceed through the education system in the 39 countries which we have analyzed. Each line represents data for one country and the teal line represents the median. The blue line represents the hypothetical line where the number of children enrolled would match the number of children at the appropriate age. In the earlier grades (grades 1-3), there is substantial over-enrollment; this decreases over time so that by the end of primary school there is substantial under-enrollment.

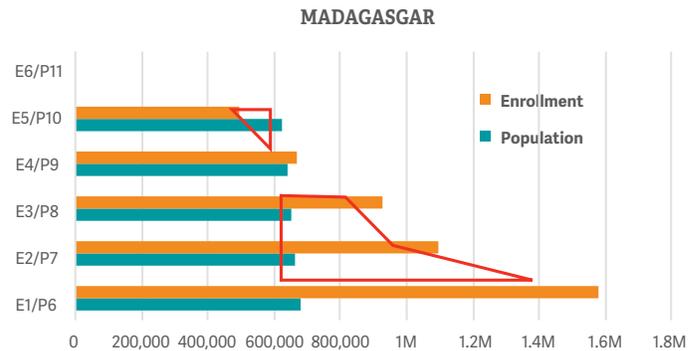
Figure 2: Trends in over-enrollment in primary school from 39 countries



This unusually large over-enrollment is largely the result of persistent repetition in the early primary grades.

Figure 3 shows enrollment trends in Madagascar as an example. The red triangle highlights the unusually large over-enrollment in the early grades. In Madagascar, there is extreme over-enrollment in Grade 1 with more than 1.5 million children enrolled, compared with only 680,000 children at the appropriate age. The over-enrollment continues to exist but drastically decreases in Grade 2 and 3, before evening out in Grade 4 and then inverting by Grade 5, so that there are fewer children enrolled than in the appropriately-aged population.

Figure 3. Enrollment compared to population of children at appropriate age in Madagascar



¹This analysis is based on data from real countries, but we are not using individual countries' name.

Figure 4 shows the enrollment trends in Nepal. The yellow triangle for Nepal highlights the larger size of over-enrollment in earlier grades. In Grade 1, there are 1.1 million children enrolled, despite there being less than 630,000 children of the appropriate age. Over-enrollment decreases throughout the grades but still continues to exist in Grade 5, with more than 730,000 enrolled children compared to just over 660,000 children of the appropriate age.

In Malawi, children in Grade 2 are, on average, 1.7 years older than children in Grade 1. This cannot happen through late enrollment, as even late enrollees into Grade 1 should age only 1 year, if they do not repeat. The fact that children “actively” age 1.7 years in Grade 1 suggests large scale, though perhaps informal, repetition. The same survey confirms that there are about twice as many children in Grade 1 as there are in the population of appropriate age. In Burundi, according to the most recent MICS survey, children age three years in the first two grades. Similar to the case of Malawi, there are about twice as many children in Grade 1 as in the population.

Low levels of pre-primary education enrollment, permanently-inflated Grade 1 intake rates, over-enrollment and repetition in Grade 1, and a large drop-off between Grades 1 and 2 are tightly associated.

Table 1 presents a summary of our analysis for the 39 countries, primarily using four indicators:

1. Grade 1 enrollment to population of appropriate age (column 3)
2. Grade 2 enrollment to Grade 1 enrollment (column 4)
3. Gross intake into primary schooling (column 5)
4. Pre-primary gross enrollment ratio (column 6)

We used these four variables to create an index or indicator of foundation years dysfunctionality for all low, lower-middle, and upper-middle income countries. The 39 countries with the highest scores (indicating the most severe over-enrollment and other related variables) are presented in Table 1. The variables shown in Table 1 are averages of the most recent 5-year period, 2011 to 2015.² In addition, the table presents countries’ values on a summary indicator of foundation years dysfunctionality (column 2).

Figure 5 shows that these variables move with each other and do so in a manner that is related to the overall level of development of the countries. Over-enrollment in Grade 1 and the gross intake into Grade 1 both decrease with GDP per capita, and the ratio of Grade 2 to Grade 1 enrollment and the pre-primary gross enrollment ratio both increase with GDP per capita. However, these factors are generally correlated with each other more strongly than they are correlated with GDP per capita. Thus, the solution cannot simply be “let general development solve the problem.”

Figure 4: Enrollment compared to population of children at appropriate age in Nepal

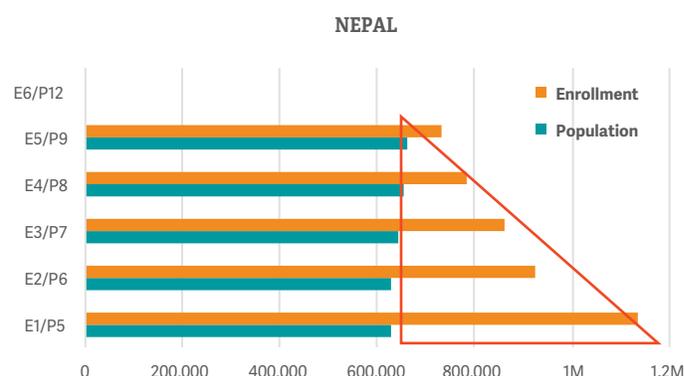


Figure 5: Relationship between foundational year variables and GDP per capita.



Source: Calculated from downloaded World Bank EdStats database.

Legend: G1to7 = Grade 1 enrollment to population of age 7
 G2toG1 = Grade 2 enrollment to Grade 1 enrollment
 GERPRE = Pre-primary gross enrollment ratio
 INTAKE = Gross intake ratio into Grade 1

²An average was used because not all countries report data for all years and averaging allows smoothing of unstable numbers and inclusion of countries which report for different, but close years. In a few cases the most recent available data are not for the period 2011-2015 but earlier (Guinea-Bissau and Nicaragua).

TABLE 1: DYSFUNCTIONALITY IN THE EARLY YEARS

Country	Index of foundation years issues (2011-2015)	Ratio of Grade 1 enrollment to population	Ratio of Grade 2 to Grade 1 enrollment	Gross Enrollment Ratio pre-primary	Gross Intake Ratio to Grade 1	Ratio of Grade 1 enrollment to population 2006-2010	Ratio of Grade 1 enrollment to population 2001-2005	Change 2006-2010 to 2011-2015	Gross Intake Ratio into Grade 1 2001-2005
Madagascar	98	2.25	0.70	15	179	2.04	2.02	-0.21	144
Rwanda	91	2.11	0.76	15	167	2.37	2.27	0.26	164
Guinea-Bissau	86	1.74	0.71	6	154	1.74	NA	0.00	NA
Sierra Leone	84	1.83	0.77	9	153	2.10	1.84	0.26	NA
Benin	81	1.54	0.88	20	152	1.40	1.18	-0.14	103
Ethiopia	79	1.61	0.69	19	148	1.40	1.07	-0.21	96
Uganda	77	1.54	0.69	11	141	1.78	2.05	0.24	177
Angola	76	1.78	0.94	79	169	1.53	NA	-0.24	NA
Togo	71	1.54	0.85	13	132	1.53	1.40	-0.01	102
DRC	71	1.38	0.74	4	127	1.31	0.81	-0.07	69
Chad	70	1.59	0.68	1	125	1.30	1.08	-0.29	84
Nicaragua	70	1.78	0.77	58	148	1.99	1.84	0.21	155
Malawi	70	1.99	0.76	82	158	2.01	2.21	0.02	177
Burundi	69	1.78	0.74	9	126	1.92	1.04	0.13	80
Nepal	69	2.04	0.73	83	158	2.11	1.87	0.07	114
Cambodia	68	1.39	0.87	15	127	1.76	2.07	0.37	157
Yemen	64	1.21	0.81	1	114	1.13	1.09	-0.08	104
Cameroon	63	1.44	0.77	32	126	1.34	1.36	-0.10	98
Timor-Leste	63	1.79	0.84	17	118	1.94	2.36	0.15	107
Syrian Arab Republic	62	1.32	0.86	10	114	1.33	1.31	0.00	117
Myanmar	62	1.23	0.86	23	120	1.14	1.22	-0.10	125
Mauritania	61	1.10	0.97	7	112	1.07	1.15	-0.03	104
Bangladesh	59	1.27	1.03	29	117	1.28	1.33	0.01	119
LPDR	59	1.45	0.82	28	116	1.86	1.81	0.41	116
Botswana	58	1.19	0.94	17	110	1.18	1.20	-0.01	113
Mozambique	NA	1.59	0.87	NA	154	1.54	1.49	-0.05	119
Vanuatu	NA	1.45	0.84	99	NA	1.43	1.41	-0.02	NA
Namibia	55	1.31	0.85	18	106	1.23	1.23	-0.08	104
Solomon Islands	44	1.32	0.92	97	120	1.31	1.18	-0.01	NA
Liberia	34	1.35	0.81	157	128	1.22	NA	-0.13	NA

How much is unusually large over-enrollment costing countries?

The following country examples illustrate that countries are spending almost twice as much as they could to educate students in the early grades because many children repeat the early grades at least once. To illustrate the potential costs to systems, we present here three scenarios, all representing real data from real countries. All three of these cost-efficiency analysis approaches confirm that countries are losing significant resources due to wastage during the Foundational First Five years.

1 Unusually large over-enrollment in the early grades can cost 5% of the annual education budget of a country each year.

How did we calculate this?

- Enrollment in Grade 1 accounts for 28% of total primary enrollment in Rwanda.
- Rwanda spends about 34% of its education budget on primary education.
- 56% of Grade 1 enrollment is over-enrollment.
- Therefore, reducing Grade 1 over-enrollment could free up about 5% of the primary education budget.

Rwanda spends only about 0.2% of its education budget on pre-primary education. By addressing wastage due to Grade 1 over-enrollment, Rwanda could free up 5% of the education budget, which could be used to dramatically increase spending on pre-primary (even more resources would be available if over-enrollment in Grades 2 and 3 was addressed as well).

2 Over-enrollment, mostly due to repetition, costs education systems the equivalent of approximately 1.2 grades of extra education per student.

A second approach offers a way to double-check the above calculations by approximating the costs in similar countries that do not repeat students. For example, the identified countries with high over-enrollment had a median share of primary schooling in total education expenditure at 46%. Over-enrollment in the first two grades in these countries represented some 20% of enrollment. If this could be eliminated, the median share of primary schooling in total education expenditure could be reduced to 37%. In addition, we looked at a set of countries with similar GDP per capita to those with unusually large over-enrollment, which managed to enroll all their children without creating over-enrollment. For these countries, the share of primary schooling in total education spending was 38%. These comparisons suggest that, with efficiency savings, spending on primary education could be reduced somewhat.

3 A combination of the factors during the Foundational First Five years of education explains 34% of the variance in completion rates across countries, which is more than expenditure per student explains, signaling that these factors account for a lot of the internal inefficiency of these systems.

In order to determine how these variables affect the production efficiency of primary school completers, we created a summary variable proxying for “foundation years issues” -- a simple combination of the four variables indicated earlier (Pre-primary gross enrollment ratio; Gross intake into primary schooling; Grade 1 enrollment to population aged 7; Grade 2 enrollment to Grade 1 enrollment). As a measure of expenditure, we used public per-pupil spending in primary school as a proportion of GDP per capita. We observed very little relationship between primary school completion and per pupil expenditure as a share of GDP per capita. In contrast, our summary indicator explains 34% of the variance in the completion rate. Thus, a combination of the “Foundational First Five” factors explains completion more effectively than expenditure per student does, signaling that these factors account for substantial internal inefficiency within these systems.

What are the implications for policy, planning, and financing for education?

1 Families are choosing to enroll their children in primary school early (possibly due the absence of affordable pre-primary education).

Some parents are expecting their children not to learn enough in their first “run-through” of Grade 1. A recent household survey in Uganda indicated that 28% of parents sent their children to primary school “early” because it was free (unlike pre-primary school) and that 56% of these parents did so understanding that their children might have to repeat Grade 1.^v

2 Current official statistics may drastically underestimate the actual repetition rate and thus insufficiently account for it during education sector planning.

Or, they may interpret the enrollment drop-off between Grades 1 and 2 as dropping out, when it is most likely just higher repetition in Grade 1, and would have vastly different policy and expenditure implications.

3 Even those who enter at the right age do not learn at adequate levels.

For many of the countries examined, children in Grades 2 and 3 also continue to age more than one year per grade, indicating substantial repetition in Grades 2 and 3. It is likely that the continued over-enrollment in Grades 2 and 3 is a consequence of the lack of preparation for schooling and the low levels of learning in Grade 1.

4 Some countries are already spending substantial resources on early childhood education because of either official or (more likely) unofficial repetition.

Data suggest that, by having ratios of enrollment to the appropriately aged population of 1.50 and 1.28 in Grades 1 and 2, respectively, these 39 observed countries may be, to some extent, already paying for pre-primary education, either explicitly (when funding formulas are driven by enrollment numbers) or implicitly (in the form of inefficiency and wastage).

5 As suggested by other research and buttressed by the research presented here, programs to target the children most in need of stronger foundations are likely to yield high returns,

not just via better social indicators in the long term, but in terms of short-run fiscal savings.

6 Countries can promote learning by having young children attend school in developmentally appropriate, child-centered classrooms with same-age peers.

If children enter primary school at the right age, with better foundations, they are more likely to progress through primary school on time, with less repetition and less drop-out. In Uganda, for example, a recent in-depth analysis and household survey revealed that attending pre-primary school reduced the risk of repetition of Grade 1 by approximately half.

7 Progress is possible through improved quantity and quality early childhood education and improved attention to the first few grades.

Many countries in Latin America demonstrated the same patterns we have described in this paper during the 1980s but have since made progress. In Peru, for example, a combination of increased access to early childhood education, reforms to improve basic education quality and targeting of early education to those most in need helped contribute to a reduction in Grade 1 enrollment from 165% of the population in 1995 to an almost even 100% today.

Could expansion of pre-primary education help reduce unusually large over-enrollment?

Countries with substantial over-enrollment in Grade 1 (and to some degree Grade 2 as well) largely coincide with those having very low pre-primary enrollment ratios.

For the 39 countries with Grade 1 over-enrollment exceeding 30%, the pre-primary school enrollment ratio was 24% on average. Low levels of pre-primary service provision are not surprising, because the poorest countries have the least resources to devote to education services that have long been considered “nonessential.”

The cost of improving the Foundational First Five years in many countries is already being paid, either in terms of direct fiscal costs or in terms of wastage and inefficiency, but without good results.

Expansion of pre-primary education is one potential solution to alleviate the current bulge in enrollment in the early grades. Countries could open pre-primary classrooms by shifting resources currently spent on overcrowded classrooms and repetition in Grade 1 and Grade 2. In the countries identified as having unusually large over-enrollment, pre-primary enrollment is associated with a reduction of the over-enrollment and repetition in Grade 1. An increase of one standard deviation in pre-primary enrollment is associated with a reduction of 0.27 standard deviations of over-enrollment in Grade 1, and increasing from none to complete pre-primary enrollment is associated with a 21% reduction in the Grade 1 over-enrollment.

Pre-primary education could be part of the solution, but only if it is high quality.

Expanding pre-primary education without addressing grade repetition and classroom quality risks further bloating a system that is already over-paying. In fact there is some evidence that simply adding one more grade to inefficient systems just transfers the over-enrollment problem one grade down. Stimulating and supportive interactions between teachers and students and effective use of age-appropriate curriculum are essential elements of quality; governments must develop their capacity to ensure that these conditions of quality can be met.

It is important to admit that shifting resources from wastage in the early primary grades to quality pre-primary programs might not be cost-neutral on a per child basis.

Expansion of pre-primary might cost more per child if the current over-enrollment is absorbed through crowding. But if pre-primary expansion and quality improvements in the first few grades are paired together, the cost per primary school completer is likely to come down. In other words, many systems can expect some primary-cycle cost-savings through improving system efficiency, and reducing the cost per primary school completer (i.e., reducing the “cycle cost per completer”), which could be used to fund pre-primary expansion, which in turn would further reduce wastage during the primary cycle possible (assuming quality design and implementation).

RESOURCES

ⁱUNESCO. Counting the Number of Children Not Learning: Methodology for a Global Composite Indicator for Education. UIS Information Paper 47 (2017) <http://uis.unesco.org/sites/default/files/documents/ip47-counting-number-children-not-learning-methodology-2017-en.pdf>

ⁱⁱCrouch, L. & Merseth, K.A. Stumbling at the First Step: Efficiency implications of poor performance in the foundational first five years. *Prospects* (2017). doi:10.1007/s11125-017-9401-1.

ⁱⁱⁱMalawi National Statistical Office and UNICEF 2008, p. 313.

^{iv}Burundi Institut National de Statistiques et d'Études Économiques 2008, Tables DQ1 and DQ8

^vWeatherholt, T., Crouch, L., Pressley, J., Healey, H., Jordan, R., Merseth, K., and Dombrowski, E. (March, 2018). Uganda Early Years Study. Report prepared by RTI International for the UK's Department for International Development, East Africa Research Hub.

^{vi}Schiefelbein, E., & Wolff, L. (1993). Repetition and inadequate achievement in primary schools in Latin America: Magnitudes, causes, relationships and strategies. Santiago, Chile: UNESCO Bulletin of the Principal Project in Education.