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For the Ministry of Education

Asian Development Bank

Myanmar Comprehensive Education Sector Review (CESR)

Phase 1: Rapid Assessment

Supplementary Annex:

Informal Note on IHLCS Household Survey Analysis as an Input to the CESR

Final version (revised 7 March 2013)

Foreword

This report was prepared as part of the Rapid Assessment (Phase 1) of Myanmar's Comprehensive Education Sector Review (CESR), which is led by the Union of Myanmar Ministry of Education (MOE), coordinating inputs from other government agencies and support from an array of development partners. The report serves as a Supplementary Annex to the compilation "Volume 1" for CESR Phase 1. Under the umbrella of the CESR and as an input to Phase 1, this document provides a summary of initial analysis conducted by Asian Development Bank (ADB) staff in collaboration with the CESR Team, utilizing the dataset for the 2009/10 Integrated Household Living Conditions Survey (IHLCS) in addition to MOE's Education Management Information System (EMIS).

This Informal Note serves as an appendix to the *CESR Phase 1 Technical Annex on the Secondary Education Subsector* (supported by ADB and the Government of Australia under technical assistance TA 8187-MYA: Support for Education Sector Planning) and focuses to some degree on the secondary education subsector. However, it also presents first-pass findings regarding other education subsectors, ranging from preschool through technical and vocational education and training (TVET) and higher education. Similarly, while the analysis focuses principally on education access, it provides at least indirect insights into some dimensions of education quality and management.

While the Informal Note was principally drafted by ADB staff Chris Spohr, it reflects a collaborative effort involving inputs from the CESR Team throughout the process, including in particular Tin Tin Shu, Tun Hla, Thin Thin Khine, Ya Min Aung, Aye Aye Myint, Myat Myat Khine, and Khin Yone. The Informal Note incorporates (and is structured around) research questions posed by the CESR Team. However, any errors herein are those of the author alone. Additionally, the analysis is subject to various caveats, and while figures generally show 1 decimal place, this is **not intended to convey statistical precision**, particularly for analysis using subsamples of the data (as IHLCS is understood to be nationally representative at the national level). More generally, the findings herein will be subject to more in-depth analysis under Phase 2 of the CESR.

The Note also reflects inputs from other members of ADB's core staff team for Myanmar education (Yasushi Hirosato and Wolfgang Kubitzki) and ADB-mobilized consultants supporting CESR Phase 1 (in alphabetical order, Martin Hayden, Carsten Huttemeier, Anthony Welch). It also benefited significantly from dialogue with counterparts from AusAID and UNICEF (which are supporting overall CESR coordination), CESR international advisers Maurice Robson and Ian Birch, as well as other development partners supporting the CESR including GIZ, JICA, and UNESCO.

Disclaimer:

Informal Note on IHLCS Household Survey Analysis as an Input to the CESR[1]

I. Introduction

1.   The landmark Comprehensive Education Sector Review (CESR)—which is led by the Myanmar Ministry of Education (MOE), coordinating inputs from other relevant agencies and development partners organizations (DPOs)—will be fundamentally important in strengthening and reshaping Myanmar's education sector. To help guide potential Asian Development Bank (ADB) support to the CESR and provide an input to CESR analysis, during the first half of 2012, ADB staff prepared a draft Initial Assessment of Post-Primary Education (PPE) in Myanmar.[2] Initial quantitative analysis for basic education access in that document principally utilized data from MOE publications and calculations using Education Management Information System (EMIS) data kindly provided by MOE. Findings were presented to MOE officials and the CESR Team in June and September 2012, respectively.

2.   Shortly following the CESR Launch, on 29 October and 2 November 2012, the CESR Office hosted an informal 2-part seminar on quantitative analysis, during which the CESR Team explored the potential of utilizing household survey data—in particular, from the Integrated Household Living Conditions Survey in Myanmar, 2009-10 (IHLCS)—to complement administrative data available in the EMIS and other data sources. During the first day, the CESR Team reviewed education-related content in the IHLCS household questionnaire and identified an initial set of research questions that could be analyzed using the IHLCS data and would provide important inputs to broader CESR analysis related to PPE as well as primary education. The second day engaged the CESR Team in reviewing and interpreting the raw findings of first-pass analysis into those questions.

3.   Following a short discussion on relevant EMIS-based findings from the noted ADB Initial Assessment of PPE in Myanmar in Section II, this note presents (in Section III) key findings from this first-pass analysis of the IHLCS data, which may input to and be further explored during the remainder of CESR Phase 1 and/or Phase 2.

II. EMIS-based Analysis of Transitions across Basic Education Grades

4.   Although estimates for gross enrolment rate (GER) and net enrolment rate (NER)—see also para. 12— provide a useful yardstick for education access at a given level of schooling, they provide a rather limited understanding of the dynamics and underlying issues. Caution is also needed in interpreting these figures: e.g., a higher GER is not necessarily better (since, for example, repetition tends to inflate GERs, which may be above 100%). The same applies for other singular indicators: e.g., estimates of the completion rate using the official normative age of completion often substantially understate the actual share of children completing a given level of schooling. Where possible, singular indices like GER and NER should be complemented by approaches that allow for more detailed investigation of dynamics, which can help better understand these indexes (e.g., including, for example, a large gap between the GER and NER) and also give policy-relevant information as to the underlying dynamics (e.g., pinpointing where in the education cycles is drop-out occurring).

5.   While the EMIS in Myanmar (and nearly all countries) does not allow for tracking individual students across multiple calendar years (i.e., it does not provide true "panel data"), EMIS data can provide a very useful, if only approximated, picture of grade progression via at least 2 approaches: (i) tracking a cohort across numerous years of data; and (ii) look at grade-specific transitions across 2 recent years of data.

II.1 Cohort tracking using 11 years of EMIS data

6.   While this approach involves some simplifying assumptions (particularly regarding repetition), it approximately allows tracking of children entering grade 1 in a given year across subsequent years of data, which

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[1] This document was prepared in early November 2012 by Chris Spohr, Senior Education Economist, Asian Development Bank (ADB) at the request of the CESR Office, with minor updates in January 2013 to add survey weights and some requested findings. The note attempts to respond to very astute inquiries raised by the CESR Team, however, any errors herein are those of the author alone. While figures generally show 1 decimal place, this is **not intended to convey precision**, particularly for analysis using subsamples of the data.

[2] PPE consists of the secondary education subsector (SES), technical and vocational education and training (TVET), and higher education subsector (HES).

in turn captures how students in that cohort progressed across grades or dropped out from the education system between certain grades. The noted Initial Assessment of PPE in Myanmar used EMIS data for SY2000/01 through SY2010/11 to construct a cohort profile showing an approximated transition path of **new entrants** to primary school (grade 1) in SY2000/01 as they progressed across grades of primary education, lower secondary education (LSE or "middle school"), and upper secondary education (USE or "high school"), or alternately exited from schooling. While data limitations preclude more rigorous and precise assessment, Figure 1 gives a crude indication of the profile of shares of children progressing through successive grades.[3]

Figure 1

Approximated Enrolment Profile of Cohort of New Grade 1 Entrants in SY2000/01, Showing Transition Across Grades and Levels
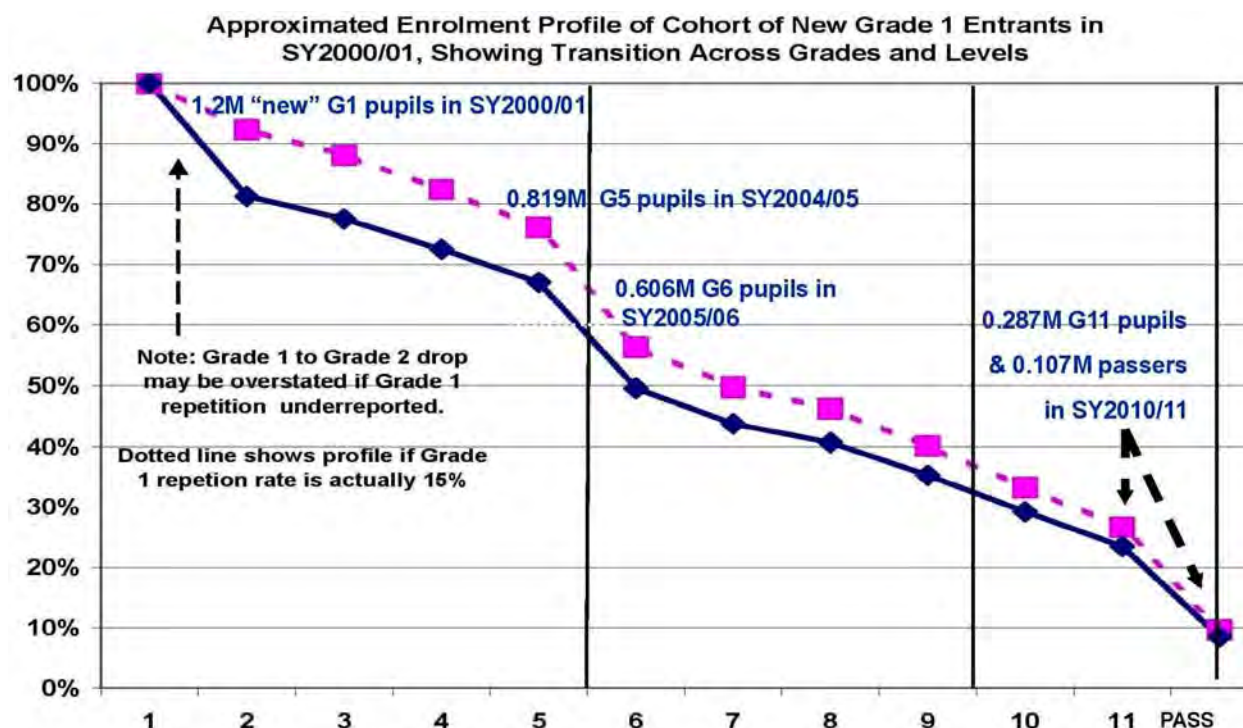
7.   The shares indicated for grades of SES would tend to imply a lower NERs for primary and secondary education than published estimates from the 2009-10 IHLCS (see also para. 12) of 87.7% and 52.5%.[4] One potential explanation would be a possible understatement of grade 1 repetition rates in EMIS figures (reported as only 14,838 or 1.2% of an enrolment of 1.24 million children in grade 1 in SY2000/01), and thus an overstatement of new grade 1 entrants. If the actual repetition rate were higher, this would decrease the apparent large drop-off from primary grade 1 in SY2000/01 to grade 2 in SY2001/02, and thus drag the remainder of the graph upwards. However, this should not overly affect relative drop-offs across subsequent grades, and the crude profile is at minimum useful to understand qualitative patterns. In particular, the Figure suggests that that much of primary school dropout occurs during or immediately after grade 1 (though the magnitude depends on accuracy of repetition figures), but also that exit from school is particularly marked at the transition from primary to secondary school: among children in that cohort, it appears that fully 1 in 4 primary school completers never entered middle school. Importantly, analysis using IHLCS reported in Appendix 1 generally collaborates the EMIS-based profile shown in Figure 1, while suggesting (i) just above 96% of children in recent cohorts have completed at least primary grade 1; (ii) sizeable shares of children repeat grade 1, and among grade 1 completers, there is very little sign of dropout up through grade 3, which further supports the view that EMIS may be underreporting true grade 1 repetition, thus leading to overestimation of dropout after grade 1 (see Figure 1); and (iii) the rate of dropout accelerates after grade 3, with a particularly marked drop after grade 5: roughly 1 in 5 primary graduates in recent years appear not to have continued into middle school. Looking at either EMIS or IHLCS data, a key question is thus what happens to this large number (more than 200,000) of primary school completers who do not enter SES, and to what extent they may be able to avail of various forms of skill training or nonformal education.

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[3] The calculations reflected in the figure involve simplifying assumptions, including related to grade repetition, and should thus be treated as indicative.

[4] Published reports for the Multiple Indicator Cluster Survey, 2009-2010 (MICS) estimate the net attendance ratio for primary of 90.2% and 58.3% for secondary education.

II.2 Grade-specific transitions using EMIS data for SY2009/10 and SY2010/11

8. This analysis uses 2 years data (in this case for SY2009/10 and SY2010/11) to look at students in grade X to the next grade (X+1): e.g., of grade 1 students in SY2010/11, what shares moved on to grade 2, repeated grade 1, dropped out in the middle of grade 1, or completed grade 1 but did not continue further. While this analysis allows the use of more recent data, it should be noted that each grade-specific transition refers to a different cohort. Figure 2 shows estimated transition rates across the latest 2 years of EMIS data.[5] The share of grade 1 students in SY2009/10 who entered grade 2 the following year appears to have risen (dropout has fallen to 11.7%). However, transition to middle school remains problematic: more than 207,000 grade 5 students (including 22.2% of students successfully completing grade 5) in SY2009/10 are estimated to have exited schooling.[6] Problems of SES dropout, repetition, and failure to graduate high school also appear to remain sizeable. The CESR Team proposed further analysis of repetition using IHLCS, with initial results in Appendix 1.

Figure 2

Transition Rates for Students Entering Various Grades in SY2009/10
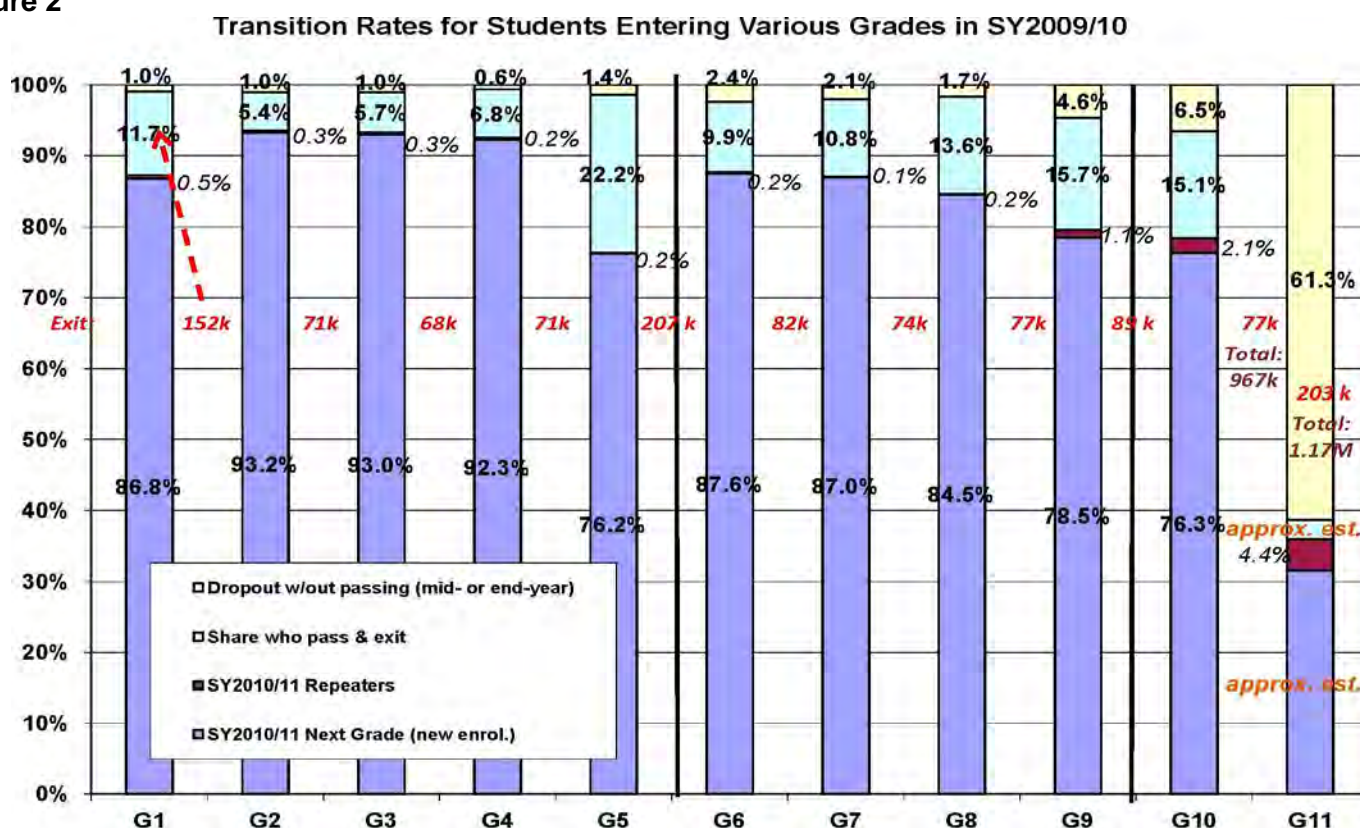
III. Analysis Using IHLCS Household Survey Data

9. In addition to issues noted above, a shortcoming of aggregate (national-level) analysis of EMIS data is that this cannot provide any information on potentially sizeable geographic and socioeconomic gaps. While not elaborated here, the Initial Assessment of PPE in Myanmar notes evidence that disparities in access are sizeable in primary education access but become much more marked at the secondary level. The noted drop-off at the transition from primary to middle school likely exacerbates inequality, as prospects for entry into middle school appear to be weakest for disadvantaged groups (e.g., ethnic group students from remote rural areas), who may also have weaker academic preparedness, increasing their risk of dropout if they do enter secondary education. That Initial Assessment also compiles published estimates using the MICS household surveys (particularly the MICS) that suggest, among others:

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[5] In contrast to Figure 1, Figure 2 shows different cohorts of children at different grades. Data on numbers of new HES entrants in SY2010/11 was not available, though it is believed that most of the 34.3% of grade 11 finishers who passed the matriculation exam (shown at the far right) probably entered HES the following year.
[6] It is noted that transition rates calculated herein are marginally lower than the 80.2% reported in MOE (2012).

(i) Disparities across **states and regions** (and likely between affluent and poor areas) are stark. The data indicate an NER in Yangon of roughly 74.7% versus only 30.9% in Rakhine: more than four-fifths of children age 10-15 in Yangon are in school (at least in primary), while more than half (52.9%) in Rakhine are already out-of-school;

(ii) The relationship between **wealth quintile** and share of 10-15 year olds who are out-of-school youth (OSY) is dramatic and strikingly linear, confirming that enrolment and dropout are strongly affected by socioeconomic status;[7]

(iii) In terms of **gender**, while a marginally larger share of girls (58.6%, versus 58.3% of boys) age 10-15 is in secondary school, the share of girls out-of-school is also slightly larger (30.5%, versus 29.8% for boys). Moreover, poverty appears to more strongly affect female dropouts: with the exception of the richest quintile, the gender gap in shares of OSY is roughly inversely related to wealth quintile, and for the poorest quintile, the share of OSY girls is 7 percentage points higher than for boys. The share of girls who are OSY is also slightly higher in rural areas and marginally lower in urban areas. These gender dynamics are much sharper for children of secondary school age (10-15 years old) than those of primary school age (5-9 years old).[8]

10. This informal note uses a larger dataset from the second round of the IHLCS, also conducted during 2009-10.[9] IHLCS is reported to be a nationally representative sample consisting of more than 95,000 individuals from more than 18,600 households in all 17 states and regions.[10] During the 29 October session of the noted seminar, the CESR Team reviewed education-related content in the IHLCS questionnaire and identified an initial set of research questions that can be analyzed using the IHLCS data and would provide important inputs to broader CESR analysis related to PPE as well as primary education. These queries can be clustered into 7 areas:

1. Estimates on enrolment rates by age group/level;
2. Shares of primary school students with preschool experience;
3. Distribution of basic education (grade 1-11) students by type of school;
4. Numbers of children who have never attended school and the main reasons;
5. Number of out-of-school youth (OSY) and the main underlying reasons;
6. Initial analysis on role of parents' education and socioeconomic status; and
7. Other questions on participation, including TVET, and role of socioeconomic status.

11. The seminar's second day (2 November) engaged the CESR Team in reviewing and interpreting the raw findings of first-pass analysis into those questions, as summarized below: *see also footnote 1 on precision*.

III.1 Estimates on enrolment rates by age group/level

12. In the absence of a recent national census, the CESR Team recognized that IHLCS (as well as MICS) may play a key role in estimating GERs and NERs for various levels of education.[11] Published reports for IHLCS[12] and MICS[13] provide GER and NER estimates for primary and secondary education, with MICS also providing an estimate for preschool participation. However, neither of these reports presents any analysis on enrolment in higher education or TVET (including various forms of training), despite their coverage in the questionnaires. The CESR Team was unaware of any estimates of enrolment rates for post-secondary levels of education, and proposed to obtain NER and GER estimates for higher education and other levels using the IHCLS. Section 5 of Table 1 presents estimates of NER and GER for higher education based on 2 age groups: (i) 16-19 year-olds, based on Myanmar's official norms; and (ii) 18-21 year-olds, as used in many countries. As these are the first known estimates of NER and GER for higher education, they cannot be compared to estimates

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[7] IHCLS breaks children into 2 groups, suggesting secondary NERs of 35% and 59% for the poor and non-poor, with rural and urban NERs of 47% and 75% for rural versus urban children.

[8] Based on MICS, at the primary level, Rakhine is the only state in which noticeably more girls are out-of-school (26.3% versus 22.0% of boys), though there is at least indication that slightly more girls may drop out at age 9.

[9] The IHLCA office kindly provided ADB a copy of the IHLCS dataset to support analysis related to the CESR.

[10] This 2009-10 second round of the IHLCS, was conducted in 2 sub-rounds, in December 2009-January 2010 and May 2010. Analysis reflected in this note uses education variables collected during the first of these sub-rounds.

[11] GER and NER cannot be calculated from EMIS data, since EMIS does not capture the age of children in school or the total number of children in Myanmar in a given cohort.

[12] IHLCA Project Technical Unit. 2011. *Integrated Household Living Conditions Survey in Myanmar: Poverty Profile (2009-10)*. Yangon.

[13] MNPED, MoH, UNICEF. 2011. Multiple Indicator Cluster Survey 2009-2010. Yangon.

from other sources, however, they appear fairly plausible, especially once corroborated by more detailed analysis in Section III.7 of this note.

Table 1

Calculations of Gross and Net Enrolment Rates Using IHCLS (with Weights), based on Age at Date of Survey

	Total obs.	Share of sample	GER	NER	IHCLS published	Out-of school	In-school
(1) Primary school-age							
Children of primary age (5-9)	8,289	0.0872					
Primary enrollees	9,682	0.1019	1.168				
On-time primary enrollees (age 5-9)	7,264	0.0765		0.876	0.877		
Out-of-school youth (OSY), age 5-9	932	0.0098				11.2%	88.8%
(2) Secondary school-age							
Children of secondary age (10-15)	11,054	0.1163					
Secondary enrollees	7,268	0.0765	0.657				
On-time secondary enrollees (age 10-15)	5,766	0.0607		0.522	0.525		
Out-of-school youth (OSY), age 10-15	2,894	0.0305				26.2%	73.8%
(3) Middle school-age							
Children of middle school age (10-13)	7,378	0.0777					
Middle school enrollees	5,066	0.0533	0.687				
On-time middle school enrollees (age 10-13)	3,744	0.0394		0.507			
Out-of-school youth (OSY), age 10-13	1,317	0.0139				17.9%	82.1%
(4) Highschool-age							
Children of Highschool age (14-15)	3,676	0.0387					
Highschool enrollees	2,202	0.0232	0.599				
On-time Highschool enrollees (age 14-15)	942	0.0099		0.256			
Out-of-school youth (OSY), age 14-15	1,576	0.0166				42.9%	57.1%
(5) Post-secondary-age groups							
Population aged 16-19	7,974	0.0839					
Tertiary enrolment (incl. part-time)	1,529	0.0161	0.192				
Enrollees aged 16-19	856	0.0090		0.107			
Out-of-school youth (OSY), age 16-19	5,706	0.0600				71.6%	28.4%
Population aged 18-21	7,716	0.0812					
Tertiary enrolment (incl. part-time)	1,529	0.0161	0.198				
Enrollees aged 18-21	815	0.0086		0.106			
Out-of-school youth (OSY), age 18-21	6,467	0.0681				83.8%	16.2%
(6) Preschool age[1]							
Population aged 2-4	3,838	0.0404					
Preschool enrollees age 2-4	642	0.0068		0.167			
Out-of-school youth (OSY), age 2-4	3,196	0.0336				83.3%	16.7%

Note   [1] The IHLCS questionnaire only asks questions related to preschool/ECCD for children aged 2-4. IHLCS data may thus understate actual participation rates if sizeable numbers of children enrol in preschool at age 5 or above (later than the Myanmar norm).

13.   Estimates for primary and secondary GER and NER (shown section 1-2 of the table) are similar to published estimates.[14] It is noted that the NER for primary may be slightly understated, since the IHCLS survey was conducted in December 2009-January 2010 (such that a minority of 5 year-old respondents would actually have been 4 years old at the June start of the SY2009/10 school year), while the effect on secondary GER is ambiguous. For both levels, the CESR Team observed the sizeable distinction between GER and NER rates, particularly for primary schooling (with GER estimated at 1.17). This could suggest sizeable shares of late commencement and/or grade repetition, and is investigated further using more detailed analysis in Section III.7.

14.   The analysis went beyond published figures by subdividing secondary education into middle and high school levels. Comparison of GERs or NERs shows a steady decline at successive tiers of education. NER

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[14] NER estimates for primary (87.6%) and secondary schools (52.2%) are very similar (but not identical) to published IHLCS estimates.

estimates suggest that roughly 10-11% of youth in either age group analyzed (age 16-19 or 18-21) are enrolled in higher education. The more precise patterns of enrolment in higher education and other levels (including skill training) enrolment is also investigated in Section III.7.

III.2   Shares of primary school students with preschool experience

15.   As per the notes at the bottom of Table 1, IHCLS does not capture information on possible participation in preschool by children age 5 or older. That table thus shows an estimated NER for 2-4 year olds' participation in preschool of 16.7%, however this may understate the actual share of children participating in preschool, and it is not possible to accurately estimate a GER. The CESR Team thus proposed to use the IHLCS data to estimate the share of current primary students who are reported to have completed at least some preschool (Table 2).[15]

Table 2

IHLCS2-based Estimates for Shares of Current Primary Students who Had Previously Attended at Least Some Preschool

	Total	Urban	Rural
Share with preschool experience			
Current primary enrollees	18.8%	49.1%	11.6%
Grade 1 enrollees	22.5%	58.5%	15.7%

16.   Among respondents currently enrolled in primary school (grade 1-5), 1 in 5 (18.8%) have participated in preschool, with a somewhat larger share (22.5%) among primary grade 1 pupils. The latter may reflect an increase in preschool participation in recent years. The CESR Team also observed that there are sizeable gaps between urban and rural access to preschool: more than half of urban grade 1 students have attended at least some preschool, versus fewer than 1 in 6 (15.7%) for their rural counterparts.

III.3   Distribution of basic education students by type of school

17.   The CESR Team also proposed investigation of the shares of basic education students enrolled in various types of schools. The overall breakdown by level is show in Table 3.

Table 3
IHLCS2-based Estimates for Shares of Basic Education Students by Type of Institution

	Basic Educ. (G1-11)	Primary (G1-5)	Middle/LSE (G6-9)	High/USE (G10-11)
Public/community schools				
Basic ed. primary school (BEPS)	33.3%	56.4%	3.5%	0.2%
Branch primary school (BPS)	0.8%	1.3%	0.3%	0.0%
Affiliated primary school (APS)	0.6%	0.8%	0.4%	0.0%
Basic ed. Post-primary school (BEPPS)	14.6%	17.4%	15.7%	0.2%
Basic ed. middle school (BEMS)	9.0%	6.2%	18.0%	0.8%
Branch middle school (BMS)	3.7%	3.6%	5.4%	0.3%
Affiliated middle school (AMS)	4.0%	3.0%	7.3%	0.8%
Basic ed. high school (BEHS)	25.0%	6.4%	37.4%	78.5%
Branch high school (BHS)	3.8%	1.9%	6.0%	7.1%
Affiliated high school (AHS)	3.4%	1.6%	5.3%	6.8%
Monastic/private schools				
Monastic	0.9%	1.2%	0.7%	0.4%
Private school	0.7%	0.1%	0.1%	5.0%

Note: IHCLS2 does not include type of provider for preschool, TVET, or higher education

18.   For primary grades (1-5), IHLCS data suggest that basic education primary schools (BEPS) account for a narrow majority (56.4%) of total enrolments.[16] The table also indicates that BEPS also appear to be providing

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[15] Unlike current participation in preschool, the questionnaire asks prior preschool participation of all respondents age 5 and up.
[16] IHLCS' sample and household-level weighting is expected to produce fairly accurate percentages but not total population/headcount measures. EMIS data indicate there were a total of roughly 5.13 million primary students in SY2009/10, so 56.4% would this would

secondary grade education to a small but non-negligible share of students: the CESR Team conjectured this might reflect the situation in the most remote rural areas. Basic education post primary schools (BEPPS) account for 17.4% of enrolments in grades 1-5 (the second a largest share), followed by basic education high schools (BEHS, at 6.4%) and basic education middle schools (BEMS, at 6.2%). The IHLCS data suggest that the monastic system enrolls only 1.2% primary students (which would comprise roughly 60,000 based on EMIS data).

19.   For SES students (grades 6-11), the table shows that BEHS comprise the largest share: IHCLS data suggest that BEHS account for roughly 37.4% of middle school (grade 6-9) and 78.5% of high school (grade 10-11) students.[17] BEMS and basic education post-primary schools (BEPPS) account for sizeable shares of middle school students (18.0% and 15.7% respectively). Shares in monastic schools remain non-negligible, but drop at higher levels. Interestingly, 5.0% of high school enrollees are reported to attend private schools in SY2009/10, even though this preceded the promulgation of the Private School Registration Law, effective in SY2012/13.

20.   It is possible that such shares are not constant within grade levels. In particular, MOE reports suggest that BEPPS typically cover only 1-3 grades of middle school. Figure 3A presents a more detailed breakdown, decomposing enrolments by each specific grade. It shows shares for enrolments at each of grades 1-11, where the total height of the segmented bar refers to 100% of students enrolled in a given grade level in SY2009/10. Dark green shows BEPS, with lighter shades depicting branch and affiliated primary schools, and similar shading for middle schools (in blue) and high schools (in black/grey), with other types in brighter colors.

Figure 3A. Grade 1-11 Student Distribution by School Type
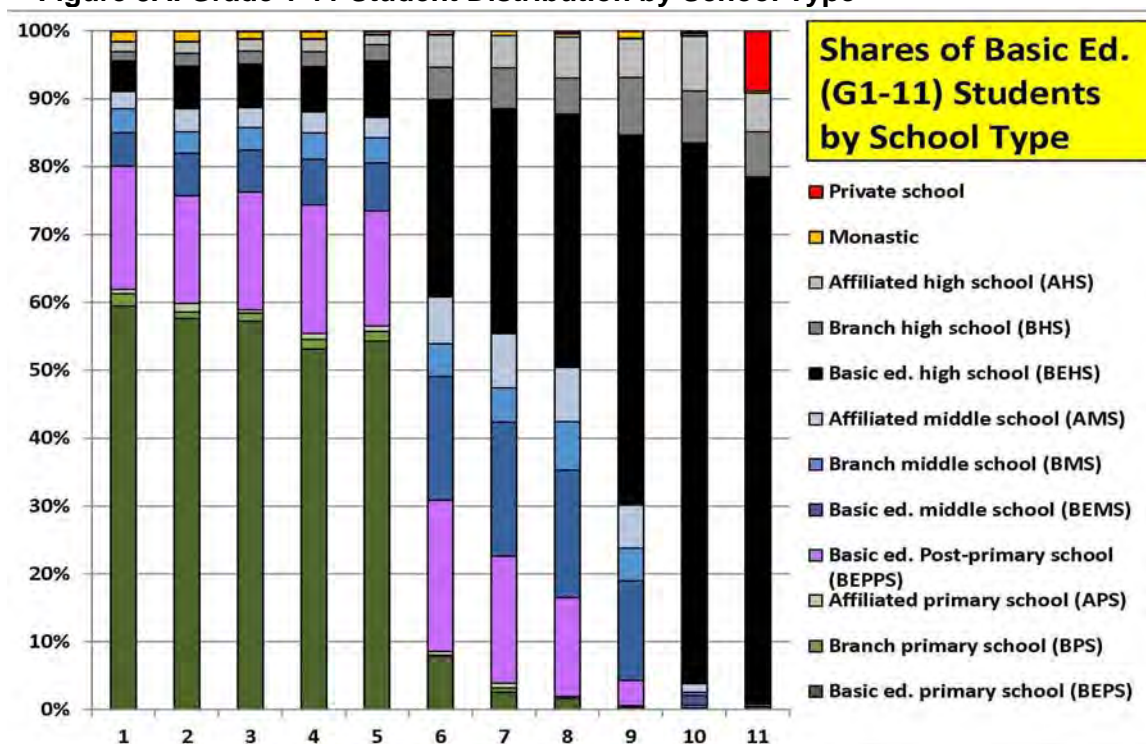
21.   While the breakdown of primary enrolments across school type is relatively stable across grades 1-4 (with dark green segments showing the share enrolled in BEPS), shares show more variation within middle school and high school grades. As expected, the share of middle school students in BEPPS (light purple segments) falls from at least 20% of grade 6 or 7 students to roughly 15% of grade 8 students and less than 4% for grade 9. By contrast, the share of middle school students enrolled in BEHS (black segments) rises from grade 6 to 9, with the majority of grade 9 students enrolled in BEHS. Also noteworthy is the sharp emergence of private schools (red segments at the top) in grade 11: initial analysis suggests that this reflects "cramming schools" (one type of private tuition), including for repeating grade 11 students who failed the matriculation exam on the first try.

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represent 2.9 million students in BEPS.
[17] EMIS data indicate there were a total of roughly 2.18 million middle school and 673,719 high school students in SY2009/10, so the Table would suggest that BEHS served roughly 815,000 grade 6-9 and 530,000 grade 10-11 students.

22.   To assess whether these patterns differ by geographic area, Figures 3B and 3C give the breakdown of urban and rural basic education students by type of school. Unsurprisingly, BEHS comprise a much larger share of student enrolments in each basic education grade in urban versus rural areas. Another key conclusion with important implications for education policy and management is that rural education provision is much more diverse, particularly in middle school (especially grades 6-9). In urban areas, at least 80% of grade 6-8 students are in "mainstream" schools (the dark BEMS and BEHS bars) and roughly 90% of high school students are in BEHS. By contrast, in rural areas, BEMS and BEHS account for only around 40% of grade 6-8 enrolments—8 different types of schools account for at least 5% of grade 6 enrolments, with BEPPS covering the largest share—and affiliated and branch high schools and each account for roughly 10% of high school enrolments.

Figure 3B. Urban Grade 1-11 Student Distribution by School Type
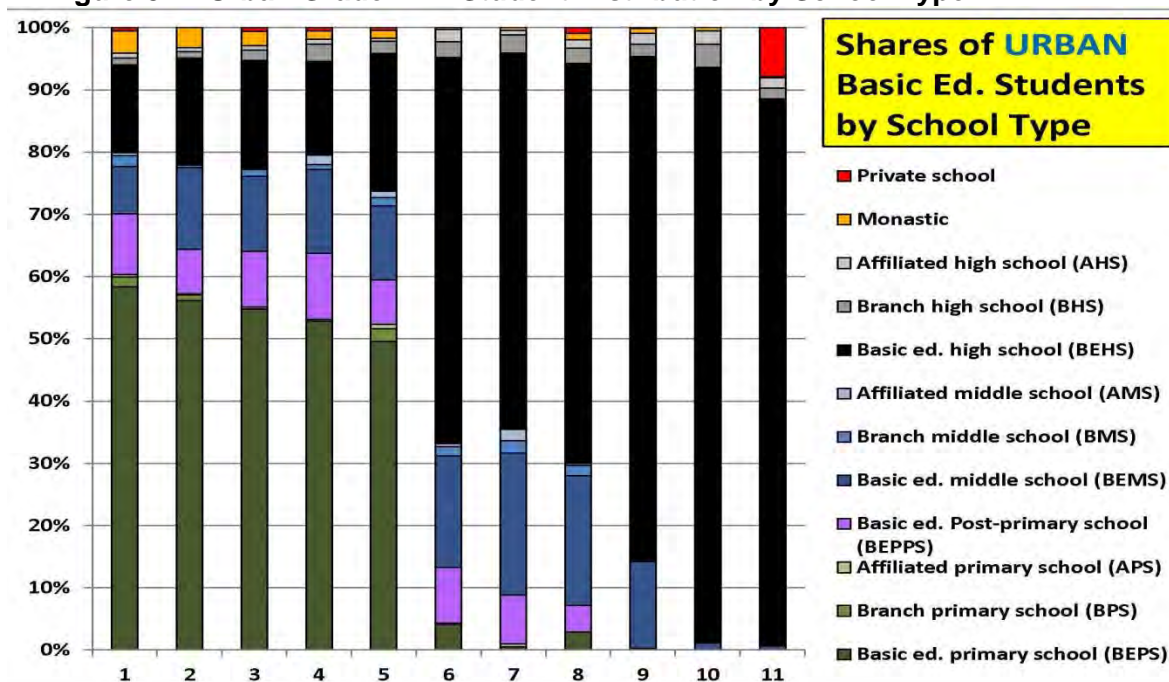
Figure 3C. Rural Grade 1-11 Student Distribution by School Type

63
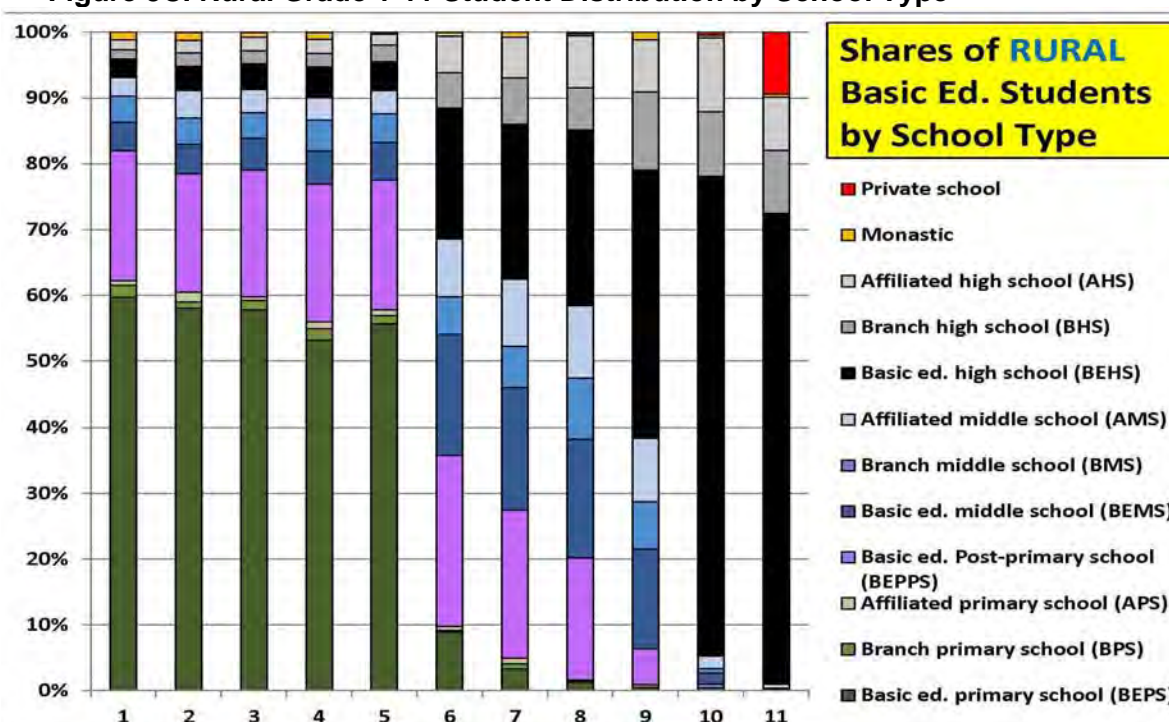
23.   Finally, it was proposed by the team working on CESR Phase 1 finance study to run similar analysis dividing students residing in areas administered by MOE's 3 departments of basic education (DBEs). Distributions of grade 1-11 students in areas covered by DBE1, DBE2, and DBE3 are shown in Figures **3D-F** on this page. Among distinctions, BEHS account for the largest shares of middle school (more than 50%) and high school (nearly 95%) students in Yangon (covered by DBE3). Branch and affiliated schools at various levels cover substantial numbers of students in areas administered by DBE1 and DBE2, with post-primary schools account for the largest shares of students at both primary and middle school levels in areas administered by DBE2. DBE2 is also characterized by having the smallest shares of primary students in "mainstream" BEPS and middle school students in BEMS, as well as a marginally larger share of grade 11 students in private schools.

Shares of DBE1 Basic Ed. Students by School Type

Shares of DBE2 Basic Ed. Students by School Type

DBE3 (Yangon) Basic Ed. Students by School Type
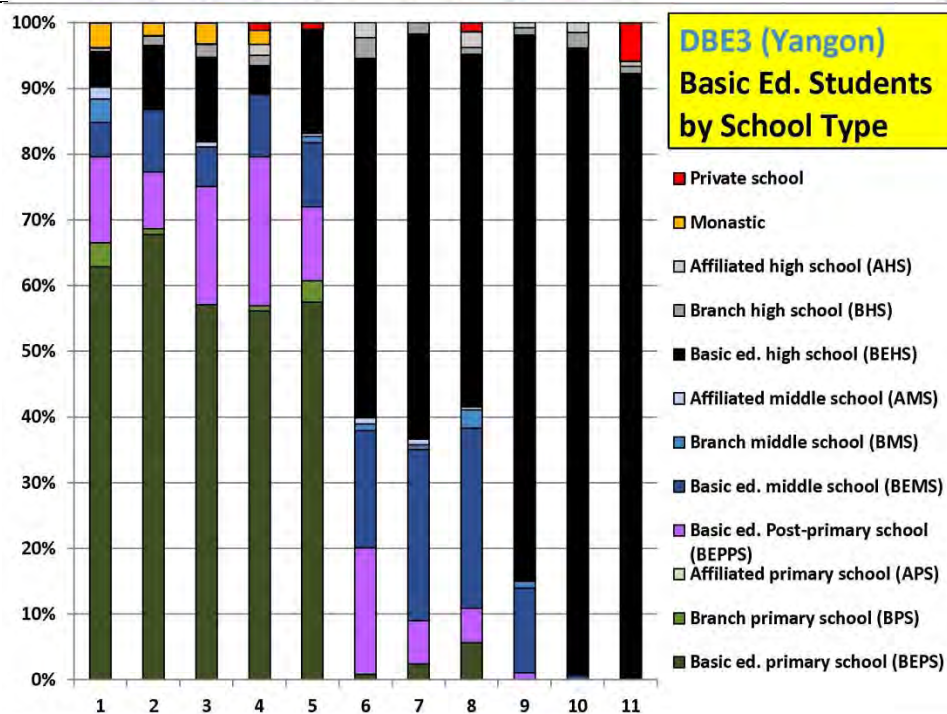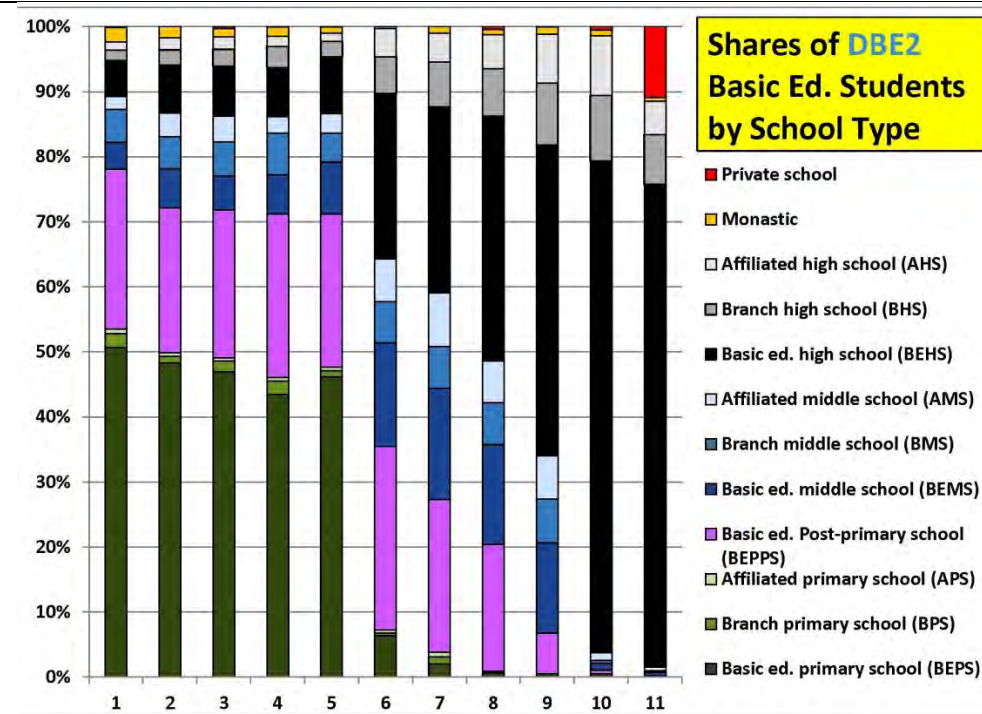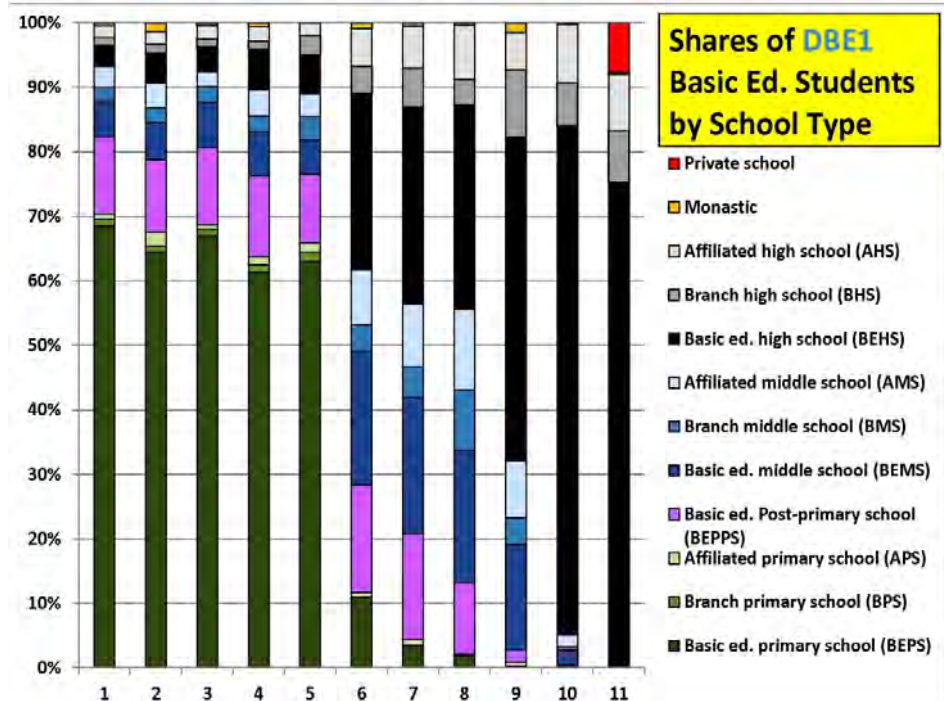
III.4   Numbers of children who have never attended school and the main reasons

24.   The CESR Team noted the importance of understanding how many children never enroll in school and the main underlying reasons. Table 4 presents this for official primary age children (age 5-9) and various age groups of respondents.

Table 4

IHLCS2-based Estimates for Shares of Children/Indivduals of Different Ages Who Had Never Attended Any Formal School and Reasons

	Primary age (age 5-9)	Age 10-15	Age 16-19	Age 20-29	Age 30 & up
Share who never attended formal schooling	8.7%	2.3%	3.4%	4.4%	12.6%
Of whom, reasons:					
Costs not affordable	19.3%	47.3%	46.1%	45.0%	27.8%
Personal illness	11.2%	12.9%	8.0%	6.5%	2.8%
Lack of interest	13.1%	28.1%	22.0%	24.4%	14.3%
Care for family	0.2%	2.6%	7.3%	8.5%	15.3%
Agricultural work	0.0%	3.5%	9.0%	7.4%	13.9%
Other (non-ag.) work	0.0%	0.2%	0.4%	0.8%	2.0%
School too far	1.6%	1.1%	3.2%	3.8%	19.4%
Other reasons	54.4%	4.3%	4.0%	3.7%	4.5%

25.   The first column suggests that many children start school at least one year behind the normative age of 5 (the category "other reasons" likely principally reflects parents' decisions that a child is not yet mature enough to enroll). The timing of the IHCLS survey in December 2009-January 2010 also means that a minority of 5 year-old respondents would actually have been 4 years old at the June start of the SY2009/10 school year. Section III.7 allows for more detailed investigation of age of entry into primary school. Comparing remaining columns in the lead row of the table suggests that access to schooling has increased in recent years: namely, the estimate of 2.3% of 10-15 year-olds who have never attended school is sizeable, but much smaller than the corresponding share for successively older cohorts (who would have been of primary schooling age 10 or more years ago).

26.   The CESR Team also discussed the reasons for why some children had never attended schooling. The table shows that, for all age groups, the lead reason relates to direct costs. In many countries, the direct costs of schooling include (i) tuition, specific fees (e.g., for textbooks, registration, school upkeep, activities, etc.), and/or other forms of contributions; and (ii) costs of purchasing uniforms/clothing and various school supplies, transportation, food, etc. A second type of cost is "opportunity cost": i.e., the fact that a child attending school cannot be spending that same time working in the home, family farm, etc., to support their family's income. These opportunity costs would be captured principally in rows for agricultural work, non-agricultural work, and appear (at least based on parents' expressed responses) to be considerably less important.[18] The CESR may shed further light on such direct and opportunity costs in the Myanmar context.

27.   The team also observed the large share of responses for "lack of interest", which were cited in nearly one-third of cases of 10-15 year-olds who have never been schooled. This is discussed further below in Section III.5. Illness plays a sizeable role, accounting for roughly 12.9% of cases of 10-15 year-olds who have never enrolled. Finally, it is rather encouraging that for recent cohorts of children, few parents cite distance from schools—a key type of "physical access" barrier in many countries—as a reason why their child has never attended school, suggesting an expansion of Myanmar's primary school network in recent years.

III.5   Number of out-of-school youth (OSY) and the main underlying reasons

28.   Table 5 reflects the CESR Team's similar investigation of the phenomenon of out-of-school youth (OSY),

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[18] Older children may also need to spend time caring for younger siblings, freeing up their parents to work, so "care for family" might in some cases be viewed as a type of opportunity cost.

breaking the sample down into children of normative age ranges for primary education, LSE (middle school), and USE (high school) levels.

Table 5

IHLCS2-based Estimates for Shares of Children/Indivduals of Various Ages Who are not Enrolled and Reasons for Exiting From Formal Education

	Primary age (age 5-9)	LSE age Age 10-13	USE age Age 14-15	Higher Ed. Age Ranges Age 16-19	Age 18-21	Age 22-29	Age 30 & up
Share who are out-of-school	*11.2%*	*17.9%*	*42.9%*	*64.0%*	*82.7%*	*94.2%*	*99.4%*
Of whom, reasons:							
Costs not affordable	7.5%	33.1%	35.4%	27.4%	24.5%	20.3%	18.4%
Personal illness	2.1%	3.0%	3.4%	2.0%	1.7%	1.6%	1.5%
Lack of interest	5.9%	29.3%	26.6%	30.6%	29.5%	24.0%	18.7%
Got married/pregnant	0.0%	0.0%	0.2%	0.8%	1.0%	2.1%	2.2%
Care for family	0.9%	6.5%	8.3%	8.1%	8.4%	9.3%	16.5%
Agricultural work	1.2%	7.7%	9.4%	11.9%	12.2%	11.2%	11.3%
Other (non-ag.) work	0.5%	3.3%	6.6%	7.0%	6.7%	7.1%	7.0%
School too far	0.4%	2.4%	1.8%	1.7%	1.8%	1.8%	3.3%
No teacher	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
No school supplies	0.0%	0.1%	0.2%	0.2%	0.1%	0.1%	0.0%
No clothing/shoes	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Bad weather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Finished at least undergrad. diploma	0.5%	0.0%	0.2%	3.0%	7.8%	16.8%	7.5%
Never started school	77.3%	12.2%	5.9%	4.8%	4.7%	4.8%	12.6%
Other reasons/not reported	3.6%	2.4%	2.0%	2.6%	1.6%	1.0%	0.8%

29. As with the results in Section III.4, the estimated share of OSY among primary age children may largely capture children starting late and those who may have turned age 5 just prior to the survey: of the 11.2% of children who are OSY in this age group, more than three-quarters have never (at least not yet) enrolled. The share of OSY rises rapidly in higher age groups, with 17.9% and 42.9% of children of LSE (middle school) and particularly USE (high school) age being OSY, rising further to 64.0% and 82.7% among youth aged 16-19 and 18-21. Since enrolment here is defined to include participation in training programs, the fact that only 0.6% of the population above age 30 is enrolled suggests that participation in adult training programs is very limited (something explored further in Section III.5).

30. Excepting the age 5-9 group noted above, the leading reasons for being out-of-school are once again direct costs and what is termed "lack of interest", followed by opportunity costs (e.g., a total of 18.9% of youth aged 16-19 have earlier exited education in order to work in either agriculture or other sectors). The large share of OSY reporting lack of interest is rather puzzling, though ADB analysis of household data for the Philippines shows a very similar phenomenon. At least in the Philippines case, dropout or other forms of exit from the schooling sector (e.g., between primary and LSE levels) due to "lack of interest" appears to reflect both demand-side factors (e.g., low parental recognition of the value of education) as well as quality-related issues. The latter, in turn, may range from students' and parents' perceptions that the education offered is not relevant to the real world, to a dynamic wherein rote-based instruction and classroom overcrowding promotes a cycle wherein children with weaker academic and socioeconomic backgrounds are allowed to slip increasingly far behind, become marginalized and/or stigmatized, and then eventually dropout. The potential explanation in the Myanmar context merits further assessment during Phase 2 of the CESR.

31. IHLCS responses (assuming these accurately reflect the real reasons) suggest that other supply-side factors such as distance to schools or lack of teachers may be less important. The fact that "illness" is cited less frequently for reasons for exiting education compared to children who never entered schooling is at least consistent with the explanation that disabilities are being enumerated as "illness", and that disability is a more significant deterrent to entry to school than to progress once enrolled.

32.   Finally, Table 6 looks at adolescent respondents in the age range of 10-18, who (according to normative ages in Myanmar) should have completed primary education. The left portion shows that just under half (46.9%) of these adolescents have indeed completed primary schooling and remain in schooling, while another 28.9% have completed primary but subsequently exited education. A sizeable share (12.6%) remain enrolled in primary school, while 11.4% have dropped out of or never commenced primary schooling, which suggests they will face the most daunting obstacles to participation in the modern economy. For this final group of adolescents, the right portion of the table then shows the responses for the reasons they are out-of-school.

Table 6
Further Analysis of 10-18 Year-Olds and Out-of-School Youth (OSY)

Categorized status of all 10-18 year olds		10-18 year-olds who are (i) OSY; and (ii) haven't completed primary school	
		Share OSY & non-completers	11.4%
Share of 10-20 year olds who are:		Of whom, reasons:	
(1) Completed primary & still in school	46.1%	Costs not affordable	32.4%
(2) Completed primary but now OSY	29.8%	Personal illness	2.8%
(3) Not yet completed primary & still in school	12.6%	Lack of interest	22.7%
(4) Not completed primary & OSY	11.4%	Got married/pregnant	0.4%
	100.00%	Care for family	5.4%
		Agricultural work	6.5%
		Other (non-ag.) work	3.9%
		School too far	1.2%
		No teacher	0.0%
		No school supplies	0.0%
		No clothing/shoes	0.1%
		Bad weather	0.0%
		Finished at least undergrad. diploma	0.0%
		Never started school	23.0%
		Other reasons/not reported	1.6%

33.   The table suggests that the lead reasons why these adolescents had been unable to complete primary school are direct costs, lack of interest, as well as non-entry to grade 1 (perhaps due to these same factors). As this group exited (or never entered) specifically at the primary level, it is not surprising that factors such as opportunity costs (i.e., work), distances to schools, and marriage/pregnancy are less important.

34.   In the tables above, it is encouraging that supply-side measures (e.g., factors like "school too far" and "no teacher") are not cited as key reasons for lack of entry to or for exiting from education. At least for primary education, physical access does not appear to be the most binding constraint. However, this should not be interpreted as saying that supply-side issues are not important. It is possible, for example, that the noted "lack of interest" variable at least partly captures parents and/or children's low valuation of education because of inadequate infrastructure and equipment/books, and/or a poor perceived quality of teachers. Similarly, in some other countries, the need to provide fees or other contributions for school repairs, provision of furniture, etc. are major cost deterrents to enrolment. Such factors merit further investigation during the CESR. Likewise, another area for further investigation is to assess the relative importance of reasons for dropout from middle school and high school, as well differences in reasons for exiting schooling among children from rural versus urban areas, etc. While such analysis will continue during CESR Phase 2, the CESR Team proposed urgent, first-pass analysis to try to explain EMIS-based findings (see Section II) suggesting that between 1 in 4 to 1 in 5 primary completers in recent years have not proceeded into middle school. Initial IHLCS analysis of transition rates and especially exit by primary completers (i.e., low primary-to-secondary school transition rates) is reported in Appendix 1*.

III.6   Initial analysis on role of parents' education and socioeconomic status
35.   The CESR Team proposed further analysis on the determinants of access to education: in particular, whether parents' education makes it more or less likely that a child will complete primary schooling, or whether

only factors such as location by state/region or in rural versus urban areas are important. As noted in para. 9, published MICS analysis used cross-tabulation to show large apparent gaps in children's education access across various dimensions, including gaps across households in different geographic areas, between poor and non-poor households, and based on grouping by mothers' education. However, if more educated parents also tend to live in more urban areas and/or are wealthier, it would be difficult to clearly attribute any differential in children's education access to parents' education vis-à-vis influences from these other factors. Econometricians often use regression methodologies to capture correlation across multiple variables. Although considerable caution is needed in setting up and interpreting regressions, the basic idea is that a regression looks for a correlation between variable X and variable Y after distinguishing (or "controlling for") the effects of other variables factors. At the request of the CESR Team, an initial analysis was thus conducted, using as the outcome variable an indicator or dummy variable (with values of 0 and 1) for whether IHLCS respondents age 10-15 had completed primary schooling. Several "explanatory variables" were selected from among factors that could conceivably affect children's education in a causal manner.[19]

36.   As a useful starting point prior to regression analysis, Table 7 shows shares of primary completers among children age 10 (per the norm) and also age 10-15, cross-tabulating averages by location groupings. In the absence of any time trends, the shares shown would be equivalent to the likelihood that a child in these areas would of complete primary school by a given age.

Table 7

Shares of Children Who Have Completed Primary School on Time
(by Age 10) and Allowing for some Delay (Age 10-15)

State/Region	Age 10			Age 10-15		
	ALL	BOYS	GIRLS	ALL	BOYS	GIRLS
Nationwide	35.0%	33.1%	37.2%	70.5%	69.1%	72.0%
By urban/rural						
Urban	49.6%	45.4%	54.8%	84.2%	81.8%	86.6%
Rural	31.3%	29.8%	33.0%	66.9%	65.8%	68.2%
Rural proxy-poor	23.0%	19.4%	27.2%	57.2%	55.6%	59.0%
By state/region						
Tachin	39.9%	38.6%	41.4%	77.6%	75.6%	80.2%
Kayah	38.0%	16.2%	55.3%	84.4%	80.7%	88.9%
Kayin	30.3%	29.0%	32.1%	68.5%	65.9%	71.3%
Chin	27.7%	18.8%	34.4%	71.4%	71.4%	71.3%
Sagaing	40.9%	36.0%	46.3%	78.7%	77.4%	80.1%
Taninthayi	25.2%	25.6%	24.6%	68.6%	64.4%	73.5%
Bago (East)	27.0%	37.3%	13.3%	69.2%	71.2%	66.7%
Bago (West)	29.2%	22.6%	35.7%	66.9%	67.4%	66.4%
Magwe	33.0%	29.4%	36.1%	69.8%	69.1%	70.3%
Mandalay	42.6%	40.5%	44.6%	76.3%	75.0%	77.6%
Mon	41.4%	29.8%	54.1%	75.5%	71.0%	79.8%
Rakhine	21.2%	19.8%	22.7%	45.5%	44.3%	46.9%
Yangon	39.3%	34.1%	44.6%	83.0%	81.5%	84.6%
Shan (South)	52.7%	53.8%	50.9%	77.5%	76.1%	79.0%
Shan (North)	28.8%	23.1%	34.6%	69.0%	63.7%	74.0%
Shan (East)	32.1%	32.3%	31.8%	61.1%	54.2%	68.4%
Ayeyarwady	32.3%	32.0%	32.5%	65.0%	65.3%	64.8%

37.   For the entire sample ("ALL") and for subsamples of boys and girls, the table demonstrates sizeable gaps by geographic area, with similar patterns to cross-tabulations reported in the noted IHLCS and MICS publications.

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[19] For example, it appears safe to assume that a parents' education (likely completed before a child's birth) could causally affect a child's access to education, and not the reverse. Similarly, the state/region in which a household lives would seem to be valid (in econometrics terminology, "exogenous") as an explanatory variable, except if a substantial number of households migrate across state/region specifically to provide better education for their children.

For example, in rural households, only roughly 31.3% of 10 year-olds have already completed primary school, versus 49.6% in urban areas, with values of 66.4% and 84.2% for 10-15 year olds in rural and urban areas. As part of the first-pass analysis, the CESR Team proposed to use poor housing conditions (namely, residence in a hut with post life of only 1-3 years) as a proxy for rural poverty that would not be subject to manipulation (since IHLCS enumerators visually inspected housing). For this group (labeled "rural proxy-poor"), less than 3 in 5 (57.2%) children aged 10-15 had completed primary school. Other poverty measures may be constructed later. The latter part of the table suggests that only around 46% of 10-15 year old children in Rakhine have completed primary school, versus 83% in Yangon and 84% Kayah (a gap of 37-38 percentage points).

38.   Appendix 2 then tabulates the results from a first-pass multivariate regression analysis, with the explanatory variables shown in the left column, and values in each column to the right being the set of coefficients from a given regression specification (columns 1-8 use the subsample of boys, and columns 9-18 use the subsample of girls). Columns 1-4 and 9-12 use a specification based on the approximated years of schooling of these adults, while columns 5-8 and 13-16 use sets of 0-1 dummy variables for whether the adult male (variables starting with "dad") and adult female (variables starting with "mom") have completed specific tiers of education.[20] The initial rows in Appendix 2 reflect the same variables used in Table 7 above, except that these are now included as variables in the same regression. As elaborated below, the coefficients in the columns to the right show the relative influence of living in urban and rural areas and in each of the 17 states and regions. Subsequent rows then add proxy variables for parents' education. Since is not possible to identify which adults in a given household are the parents of a given 10-15 year-old child, the analytical routine (programmed in Stata software) identified the male and female adult aged 25 or above with the highest level of education in the household: in the large majority of cases, these are likely to be the father and the mother. Finally, as shown in the last set of rows, the regression includes dummy variables for respondents' ages to allow for a time trend or specific effects (e.g., the fact that many 10 year olds are still in primary school compared to 15 year olds). .

39.   Since the outcome variable is a discrete variable that can only be valued either 0 or 1, logit regression is used in most of the columns as a basis to show whether variables appear have a statistically significant effect. Columns 4, 8, 12, and 16 present coefficients from a more standard ordinary least squares (OLS) regression, with further explanation given below. OLS is not, strictly speaking, appropriate (particularly in terms of standard errors generated), given the 0-1 outcome variable, the coefficients are easier to interpret, since a value of "0.1" or "-0.1" approximates an increase or decrease of 10 percentage points per unit of the explanatory variable.

40.   **Basic regression results.** Near the top of Panel A1 (for 10-15 year-old boys) and boys) and Panel A2 (for 10-15 year-old girls) of Appendix 2, regression coefficients tabulated column 4 suggest that, controlling for the other variables, living in a rural area decreases the probability of a boy having already completed primary school by around 6.5 percentage points compared to boys residing in urban areas: for 10-15 year-old girls (column 12), rural residence is associated with an 8.1 percentage point decrease in the probability of having completed primary school.[21] The effect of rural poverty (proxied by poor housing conditions) is associated with a further drop of 10.9 percentage points for boys and 9.4% for girls vis-à-vis rural residents living in less poor conditions—in other words, adding these effects together, rural living in poor conditions (as proxied herein) are roughly 17.5 percentage points less likely to have completed primary school by the time surveyed than urban counterparts, even after controlling for state/region and other factors included.

41.   Further down the tables in Appendix 2, Panels A1 (boys) and A2 (girls), differences in values of the next set of coefficients confirm that state and region of residence remain an important determinant of education access. However, the effect is smaller than suggested by simple cross-tabulation. Using OLS results in columns 4 and 12 again (for ease of interpretation, but with the caveats noted), after controlling for urban/rural status and the other variables in the regression, the gap between coefficients associated with residence in Yangon and Rakhine is 21.4 and 24.5 percentage points for boys and girls respectively. Differences in coefficient values also suggest slightly more regional variation for girls: being a girl in Kayah versus Rakhine would be associated with an

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[20] For example, if the adult male has completed only middle school, this would be reflected as values of 1 for "dadprim" and "dadmid" (since he completed primary as well as middle school), with zeros for the other dummy variables. So each coefficient captures the marginal impact of an additional level of education.

[21] As noted in Appendix 2, logit regressions find the effects of both residence in a rural area alone and the additive effect of living in poor rural housing conditions (i.e., the variable ruralproxypoor) to be statistically significant at the 5% level.

increase in likelihood of completion of 34 percentage points, while the largest regional gap for boys is roughly 31 percentage points (Shan-South versus Rakhine).

42.   The next set of coefficients in column 4 indicates that the likelihood that a 10-15 year old boy has already completed primary school rises by around 0.8 percentage points per additional year of schooling for either the father or mother (proxied by the co-resident male or female adult with the most education). Both of the effects are strongly statistically significant, while the effect of the father's education appears very marginally stronger than that for mother's education. By contrast, for girls (columns 9-12), the effect of father's education is smaller and only marginally significant, and logit results suggest that the effect of mother's education is at least twice as large, with the difference being statistically significant: OLS coefficients would suggest that each additional year of mother's education raises the likelihood that a 10-15 year-old daughter has completed primary schooling by roughly 1 percentage point (versus 0.4 percentage points for each additional year of father's education). This echoes results from many developing countries, which find that mother's education is particularly important for children's educational prospects, especially for girls.[22] The specifications in columns 5-8 and 13-16 show a particularly robust and statistically significant impact effect of either parents' completion of primary education on sons' or daughters' educational opportunities. For example, per column 16, mother's primary school completion appears associated with a 10.2 percentage point rise in the chance that a daughter will have completed primary schooling, while the effect of father's primary school completion is a 4.0 percentage point rise. Coefficients on other levels of completion are mostly positive but not statistically significant (though sometimes larger), due to larger estimated standard errors.[23]

43.   **The role of ECCD participation.** Numerous studies suggest that ECCD plays an important role in children's school readiness and other education outcomes. The CESR Team thus suggested the analysis additionally look for effects of ECCD participation on primary school completion. To assess this, similar sets of logit and OLS regressions were run after adding a variable for whether a child has previously attended any ECCD. Results are reported in Panels A2 and B2 in Appendix 1, however, some caution is needed in interpreting the coefficient on this variable ("everpreschool"). In economics terminology, a child's participation in ECCD is not exogenous (e.g., randomly determined; see also footnote 19): the fact that child *A* received ECCD and child *B* may reflect a variety of factors ranging from parents' valuation of education, to the availability of local ECCD services, to the child's inherent maturity or demonstrated intelligence at an early age. It is very likely that such hidden factors—which can at best only be partially controlled by other variables included the regression—would also positively affect the outcome variable regardless of ECCD participation, and these combined influences are being captured in the estimated coefficient on everpreschool: i.e., the latter would likely have a "positive bias" if interpreted as a measure of the impact of actual ECCD participation alone. With those caveats, Panels A2 and B2 suggest that ECCD participation has a strong and statistically significant correlation with children's later primary school completion, which appears strongest for boys. After controlling for the other variables, prior participation in ECCD is associated with a nearly 11 percentage point rise in the likelihood that 10-15 year old boy respondents have completed primary school (versus 8 percentage points in the case of girls). Overall, addition of the variable everpreschool does not change the remaining regression results: i.e., the coefficients on parents' education are virtually unchanged, though it does marginally decrease the effects of rural versus urban residence as well as distinctions linked to state/region of residence. In short, ECCD participation appears to be an important predictor of primary school completion, though this may be capturing other factors (e.g., parents' valuation of education).

44.   In sum, while more analysis is needed, results from this first-pass regression analysis are fairly plausible and consistent with findings from similar analyses in other countries. Even after controlling for factors such as locality of residence, parents' education and children's prior participation in ECCD appear to be strong positive determinants of children's access to and ability to progress through schooling (proxied by completion of primary school), while rural residence, a proxy measure for rural poverty, and residence in certain states/regions appear to pose considerable obstacles to educational attainment.

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[22] See for example Chris Spohr, "Formal Schooling and Workforce Participation in a Rapidly Developing Economy: Evidence from "Compulsory" Junior High School in Taiwan", *Journal of Development Economics*, Vol. 70/2 (April 2003), pp. 291 – 327, and sources therein.

[23] The dummy variables are defined to provide marginal effects of each subsequent level, which may explain why some coefficients are negative (but not statistically significant).

III.7 Other questions on participation, including TVET, and role of socioeconomic status

45.   Finally, the CESR Team proposed further analysis, in order to better understand the dynamics of not only enrolment but also grade progression, while shedding light on such questions as age of entry, at what ages or grade levels disparities among different groups (e.g., urban versus rural) emerge, and other dimensions. The CESR Team requested that this include post-secondary education, since little is known about the share of youth and young adults enrolled in such programs. The latter is particularly true in the case of TVET programs, defined herein to include programs below the tertiary level that may be either prior to entry into employment or mid-career: partly due to the structure of the data, but consistent with definitions used in some countries, this **excludes** engineering/technical programs at level of undergraduate diploma and up (captured as higher education).

46.   **Age-specific enrolment and grade progression profiles.** An approach believed to be developed by ADB provides an analytical tool for exploring such dimensions and including all forms of education (including formal and informal TVET) that are included in a household survey, including Myanmar's IHLCS. The analysis uses household survey data to generate age-specific enrolment rates for children and youth grouped into (in this case) 22 groups corresponding with each age in the range 2-23 years of age, and estimates what percentage of children at that specific age are enrolled in some form of education institution. As noted above, this first-level disaggregation provides at least indicative age-specific enrolments for children in each age cohort. However, the analysis goes beyond that first level to ask the distribution of children by grade level, **for each age cohort** in the range 2-23 years-old (in this case).   This analysis can be run in parallel for IHLCS subsamples of children grouped by gender, urban or rural residence, etc., thus allowing for comparisons of detailed profiles of how children of different socioeconomic status progress through (and exit) the school system. For example, it allows at least approximate comparisons of not only whether the shares of children enrolled in some form of education at a given age differ between urban and rural areas, but also a deeper (albeit somewhat imprecise[24]) understanding of whether there are differences in patterns of the shares of children whose grade progression is "on track" or lagging vis-à-vis national norms.

47.   Detailed quantitative estimates are not reported herein, but in general suggest that the gross majority of girls and boys at least enter schooling, even in rural areas and those appearing to be from poor rural families (based on the housing condition-related proxy noted above, for purposes of this first-pass analysis). However, as captured in the graphical depictions further below), the figures suggest that age-specific enrolments begin to drop off starting around age 11, and there are stronger (albeit signs of repetition), particularly in rural areas. The net effect is disparities in participation (both in terms of enrolment and shares of children on-track and lagging in grade progression) widen starting from the early grades of primary education, with substantially lower levels of participation in rural areas in higher education and TVET (defined as noted above).

48.   To better understand these dynamics, the analysis focused principally on generate graphical enrolment profiles depicting grade progression and dropouts by age cohort. For brevity, findings for four IHCLS subsamples are shown herein, comparing the enrolment profiles of (i) children or youth aged 2-23 (denoted "children" for brevity) in the sample, (ii) children in urban areas, (iii) rural children, and (iv) children in rural households that appear to be poor using the noted proxy measure. Analysis was also conducted for other groupings, though (for example) patterns for girls and boys appear fairly similar and are not reported herein.

49.   Profiles generated by this analysis using the 4 subsamples are presented in Appendix 3. The first figure reflects the entire IHLCS sample of children (nationwide, and including boys and girls), with total height of each bar capturing the **age-specific participation rate**: i.e., the share of children in each age cohort in the range 3-23 years who is participating in some form of education service. The 3 dark red bars to the far left thus represent shares of children aged 2, 3, and 4 participation in various types of preschool (ECCD). Starting with age 5, the center depicts grade progression for basic education for each age cohort: for a given age (along the x-axis). Again, the total height of the segmented bars measures overall participation in some form of education: while that for age 5 is likely understated (since the survey does not include participation of 5 year olds in preschool), the first 3 segmented bars suggest that roughly 65.2% of 5 year-olds are in primary school, rising to roughly 89.4% for

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[24] The "on track" baseline refers to those entering grade 1 at age 5 and progressing without repetition. As noted earlier, IHLCS surveys age at the date of survey (December or January), hence it may somewhat overstate the share of children lagging behind.

children age 6 and 95.2% for children age 7. Looking at the specific colored segments **within** each bar, the purple segment captures the share of children that are in school at a grade level that is "on-track" vis-à-vis MOE's norm of entry to grade 1 at age 5, the green segment depicts the share who are further advanced than expected, while the turquoise segment shows the share of children lagged by 1 year, and the remaining colored segments show attainment lagging by 2, 3, or at least 4 years. Further to the right, the reduction in the total height of the bars captures the extent to which children are exiting the school system, while the collapse of the green and purple segments relative to the other segments is suggestive of at least modest repetition. While only 5.4% of 9 year-olds are OSY, that share rises to 12.0% of 11 year-olds and 38.0% of 14 year-olds, rising to 59.9% by age 16. The segments to the far right show shares of youth age 16 and up who are still enrolled in basic education, or are enrolled in higher education (dark blue segments), TVET (red segments), or both (yellow segments). The very small share of youth enrolled in TVET—as noted above, measured in IHLCS as "other trainings", while engineering/technical studies towards a higher education diploma or degree or captured as higher education—is particularly striking.

50.   The remaining profiles show sharp distinctions between urban, rural, and rural poor subsamples. Among these, at the basic education level, the pace of exit from the system (captured by the total height of the bars) is much more rapid in the rural and particularly the rural poor subsamples. Meanwhile, the relative shifts across segments (including the collapse of the purple and blue bars for progressing on-schedule or at most 1 year lagged) suggest more substantial repetition in the rural poor subsample, particularly in grade 1. Looking to the right, much larger shares of urban youth enter TVET and higher education, and do so at a somewhat younger age. Among urban households, roughly 33.0% of 18 and 19 year-olds are enrolled in higher education, TVET, or both, compared to only 4.2% of those in poor rural households.

51.   Finally, further analysis during the CESR is clearly needed into the very low participation in TVET, particularly in rural areas and the poor, and in skills relevant to Myanmar's agricultural and industrial sectors. As an input to that, Table 8 captures the breakdown of adolescents and adults by general-track educational attainment and participation in various sub-types of TVET.

Table 8

Training Participation and Educational Attainment among Youth and in the Workforce

	Age group			
	15-19	20-29	30-39	40 & up
Completed general-track education:				
At least 5 years (primary)	85.14%	81.46%	73.92%	60.45%
At least 9 years (middle)	47.64%	44.49%	32.06%	20.61%
At least 11 years (HS)	14.93%	25.66%	17.24%	9.11%
At least HES diploma/degree	2.02%	15.23%	12.44%	5.48%
Ongoing training				
At least 1 type	*1.46%*	*1.34%*	*0.40%*	*0.12%*
language	0.55%	0.46%	0.12%	0.00%
computers	0.97%	0.71%	0.11%	0.02%
primary (e.g. agric.)	0.01%	0.02%	0.01%	0.01%
industrial	0.31%	0.14%	0.06%	0.02%
crafts	0.14%	0.11%	0.09%	0.04%
clerical/business	0.01%	0.03%	0.00%	0.00%
others	0.24%	0.20%	0.09%	0.04%
Completed training				
At least 1 type	*1.90%*	*4.74%*	*3.20%*	*1.45%*
language	0.44%	1.80%	1.00%	0.45%
computers	1.20%	2.88%	1.82%	0.42%
primary (e.g. agric.)	0.10%	0.12%	0.12%	0.09%
industrial	0.22%	0.49%	0.50%	0.29%
crafts	0.24%	0.49%	0.35%	0.24%
clerical/business	0.05%	0.21%	0.18%	0.10%
others	0.21%	0.84%	0.38%	0.41%

Appendix 1. Additional Initial Analysis (Pending Further Review during CESR Phase 2)

52.   **Grade completion profiles.** As noted in para. 7, as a comparator for EMIS-based estimates, the CESR Team proposed the use of IHLCS data to further investigate the educational attainment profile and, in particular, primary-to-secondary school transition rates. IHLCS can be used to generate estimates for highest grade of school completed, with some limitations.[25] Among these, using recent cohorts can only generate estimates through early secondary school grades, since (for example), IHLCS suggests that 2% of 15 year-olds are still in primary schools, but calculations would count them as never having transitioned to middle school (even if some of them will later do so). The problem becomes more serious with younger cohorts and later grades. In view of this, the analysis focused principally on primary grade completion and the transition to grade 6, using IHLCS data to generate a completion profile similar to the EMIS-based enrolment profile (Figure 1) for for 3 cohorts: (i) youth aged 15-17 at the time of the survey (i.e., those born sometime around 1993), who would have most recently progressed through schooling compared to the other 2 cohorts; (ii) 18-20 year-olds; and (iii) 21-23 year-olds (i.e., those born sometime around 1987). The resulting profile is shown below.

Figure A1.1

IHLCS-based Grade Completion Rate Profile and Primary-Middle School Transition
(Shares of Young Adult Respondents Who Have Completed at Least Grade "*X*")
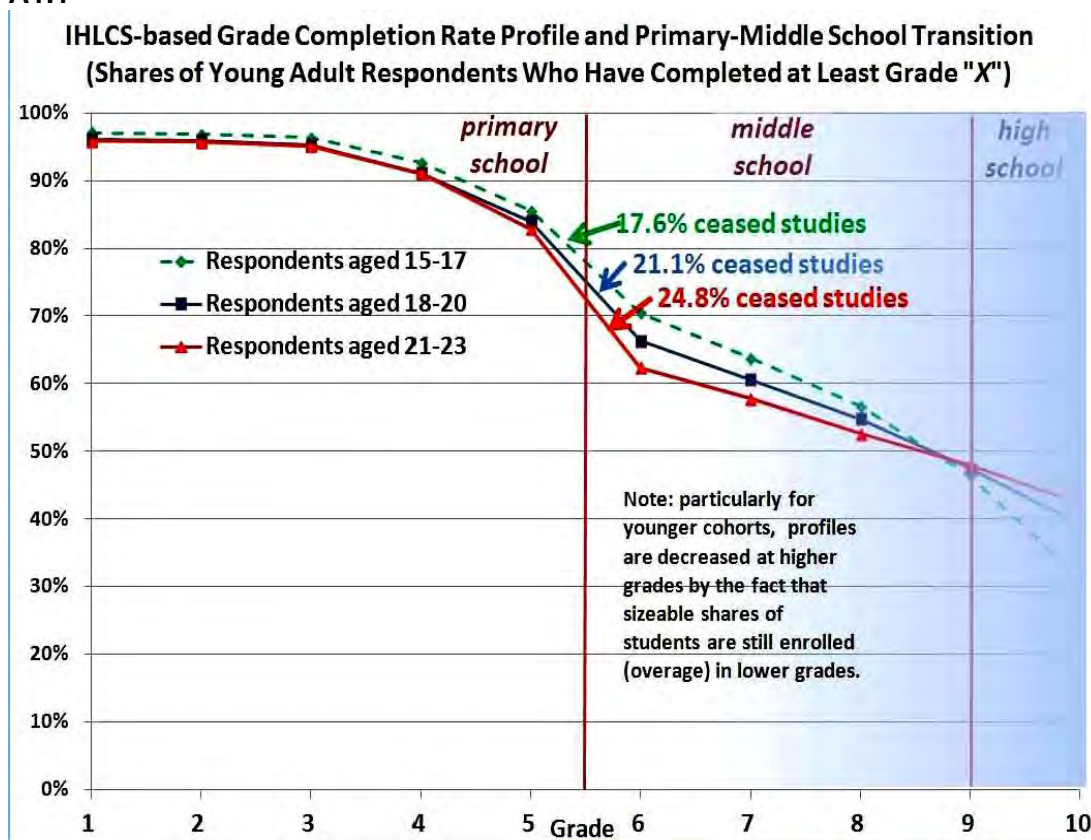
53.   Overall, the shape corresponds fairly closely to that of the EMIS-based enrolment profile shown in Figure 1, while noting that the cohorts and data (i.e., grade completion versus enrolment) are not identical. Additionally, the IHLCS-based completion profile shown in Figure A1.1 and additional analysis noted below suggest that (i) just above 96% of children in recent cohorts have completed at least primary grade 1; (ii) among grade 1 completers, there is very little sign of dropout up through grade 3 (the profile is nearly horizontal), in contrast to the EMIS-based profile—as noted below, IHLCS points to much larger shares of children repeating grade 1 compared to EMIS, which would partly explain the divergence in the profile in early gradescompared to EMIS based Figure 1; and (iii) the rate of dropout accelerates after grade 3, with a particularly marked drop after grade 5. On the latter point, comparisons of the 3 cohorts points to modest improvement in recent years. Namely, the analysis suggests

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[25] IHLCS includes a question (q32003) on highest grade or level "passed". However, investigation suggests that responses with children still in school may have confused this question with highest grade or level "reached", particularly in cases where the child is repeating a grade. The analysis attempts to adjust q32003 for this, so as to measure grades successfully completed.

that only 82.9% of children in the oldest cohort shown (those born sometime around 1987) completed primary school and 62.4% completed at least grade 6 (i.e., 24.8% of grade 5 completers did not continue into middle school), whereas 85.5% of children in the youngest cohort shown (those born sometime around 1993) completed primary school and 70.5% completed at least grade 6 (i.e., 17.6% of grade 5 completers did not continue into middle school).

54.   **Transitions from primary to secondary school.** At the CESR Team's request, further analysis was also conducted to look at the reasons for non-transition from primary to secondary school, using the same framework reflected in Table 5 but restricting the focus to exit from school precisely at the threshold of entry into middle school (i.e., grade 6). Table A1.1 below shows findings for the same age groups used in Table 5, but is noted that caution is needed in interpreting the first 3 columns, since (as in the case noted above) sizeable shares of children in younger age ranges may still be in primary school (overage) with at some possibility of continuing to middle school. The top portion of Table A1.1 breaks all respondents into 5 categories, ranging from those who never completed any schooling, to those who have completed at least grade 6 (in most cases, more). The latter portion of the table then records the reasons for exiting of the group denoted #4. For example, of the 17.9% of 18-21 year-old respondents (orange column) who completed exactly 5 years of education[26], the largest share (32.5%) are reported to have exited schooling due to high costs, 25.0% cited lack of interest, and 18.3% cited agricultural work. Compared to Table 5 (showing exit at any grade level), it appears that financial and opportunity costs (particularly the need to work on the farm) are particularly important in explaining exit after grade 5. While still a major factor, "lack of interest" appears somewhat less important among those exiting after grade 5. Deeper analysis using various data sources is required during Phase 2.

Table A1.1

IHLCS2-based Estimates for Shares of Children/Indivduals of Various Ages Who Completed Primary but did not Transition to Middle School

	Primary age (age 5-9)	LSE age Age 10-13	USE age Age 14-15	Higher Ed. Age Ranges Age 16-19	Higher Ed. Age Ranges Age 18-21	Age 22-29	Age 30 & up
Share of children who							
1. were never schooled	8.7%	2.2%	2.5%	2.8%	3.9%	4.5%	12.6%
2. had incomplete primary	2.2%	6.4%	10.2%	10.5%	12.0%	14.5%	23.0%
3. are still in primary school	87.6%	30.4%	3.5%	0.6%	0.2%	0.0%	0.0%
4. Finished primary but not any middle school grades [1]	0.2%	4.9%	11.5%	15.2%	17.9%	21.4%	25.9%
5. had at least some middle school	1.4%	56.4%	72.3%	71.0%	66.0%	59.6%	38.6%
	100%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Of group #4 (primary completers who didn't enter middle school), reasons for exit:[2]							
Costs not affordable	33.1%	34.2%	39.6%	34.2%	32.5%	30.6%	24.5%
Personal illness	13.5%	2.6%	2.6%	1.0%	1.2%	1.5%	1.5%
Lack of interest	21.1%	32.2%	26.9%	27.4%	25.0%	22.8%	18.8%
Got married/pregnant	0.0%	0.1%	0.2%	0.1%	0.7%	1.3%	1.3%
Care for family	19.6%	6.9%	10.3%	9.2%	11.3%	12.7%	21.9%
Agricultural work	7.0%	13.1%	11.6%	17.0%	18.3%	19.7%	18.8%
Other (non-ag.) work	5.7%	4.2%	5.6%	7.6%	6.8%	6.5%	6.3%
School too far	0.0%	4.4%	2.1%	2.5%	2.9%	4.1%	6.1%
No teacher	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.1%
No school supplies	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
No clothing/shoes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bad weather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Finished at least undergrad. diploma							
Never started school							
Other reasons/not reported	0.0%	2.3%	1.2%	0.8%	0.9%	0.7%	0.6%

Notes: [1] Group #4 includes students who may have entered but did not complete grade 6.

[2] Caution is needed in interpreting gray values, since large shares of children are still in primary school.

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[26] It is noted that row for group #4 and other rows at the top calculate shares of **all** children in each category, whereas figures in the immediately preceding paragraphs and tables focus on shares of children who have completed at least primary school (i.e., the denominator is different).

55.   As a feed-in to Phase 2 analysis, Tables A1.2 and A1.3 show the same analysis after breaking the IHLCS sample into rural and urban subsamples. From the top sections of both tables, it is noted that a much smaller share of rural youth enter at least middle school (row #5). For example, only 59.6% of rural respondents age 18-21 (born around 1989) completed any middle school (or higher), with at least 18.6% failing to complete primary schooling (the sum of rows for groups #1 and #2) and 21.5% of these individuals exiting schooling after completing grade 5. By contrast, for rural youth in the same cohorts, 88.6% completed at least grade 6 while only about 6.1% failed to complete primary school and 5.3% completed primary but did not transition to secondary school.   Not surprisingly, comparisons of Tables A1.2 and A1.3 suggest that the need to work on the farm is a much stronger contributor to exit from schooling among rural children completing grade 5. Distance to the nearest school offering middle school grades also appears to be an issue only for rural children: it still ranks as only a secondary obstacle, however, it is likely that many parents may conceive of distances more in terms of costs in their responses. For urban youth, costs and lack of interest explain much larger shares of grade 5 completers who exit schooling, followed by non-agricultural employment (likely in the urban informal sector). The larger share of exiters attributed to costs in urban versus rural areas may possibly suggest a greater private cost burden for urban schooling (e.g., in many countries, urban schools impose a greater range of sanctioned and/or informal fees), however, this requires further investigation.

Table A1.2

IHLCS2-based Estimates for Shares of RURAL Children/Indivduals of Various Ages Who
Completed Primary but did not Transition to Middle School

	Primary age (age 5-9)	LSE age Age 10-13	USE age Age 14-15	Higher Ed. Age Ranges Age 16-19	Age 18-21	Age 22-29	Age 30 & up
Share of children who							
1. were never schooled	9.5%	2.4%	3.1%	3.3%	4.5%	5.6%	15.5%
2. had incomplete primary	2.4%	6.9%	11.8%	12.6%	14.1%	17.5%	27.6%
3. are still in primary school	86.6%	33.2%	4.4%	0.6%	0.2%	0.0%	0.0%
4. Finished primary but not any middle school grades [1]	0.2%	5.8%	14.1%	18.5%	21.5%	26.5%	31.0%
5. had at least some middle school	1.4%	51.8%	66.8%	65.0%	59.6%	50.4%	25.9%
	100%	100%	100%	100%	100%	100%	100%

Of group #4 (primary completers who didn't enter middle school), reasons for exit:[2]							
Costs not affordable	39.7%	34.0%	38.5%	33.5%	32.1%	30.0%	23.9%
Personal illness	17.0%	2.3%	2.5%	0.8%	1.0%	1.3%	1.3%
Lack of interest	24.7%	32.2%	27.3%	27.0%	24.1%	22.7%	17.6%
Got married/pregnant	0.0%	0.0%	0.2%	0.1%	0.7%	0.9%	1.0%
Care for family	2.7%	6.6%	10.4%	9.6%	11.6%	13.0%	21.6%
Agricultural work	8.7%	13.9%	12.1%	18.0%	19.6%	21.4%	21.7%
Other (non-ag.) work	7.2%	3.9%	5.7%	7.5%	6.7%	5.4%	5.6%
School too far	0.0%	4.5%	2.2%	2.7%	3.2%	4.3%	6.6%
No teacher	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%	0.1%
No school supplies	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.0%
No clothing/shoes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bad weather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Finished at least undergrad. diploma							
Never started school							
Other reasons/not reported	0.0%	2.4%	1.1%	0.8%	0.9%	0.8%	0.6%

Notes: [1] Group #4 includes students who may have entered but did not complete grade 6.

[2] Caution is needed in interpreting gray values, since large shares of children are still in primary school.

Table A1.3

IHLCS2-based Estimates for Shares of URBAN Children/Indivduals of Various Ages Who Completed Primary but did not Transition to Middle School

	Primary age (age 5-9)	LSE age Age 10-13	USE age Age 14-15	Higher Ed. Age Ranges Age 16-19	Age 18-21	Age 22-29	Age 30 & up
Share of children who							
1. were never schooled	5.5%	1.2%	0.6%	1.2%	1.7%	1.5%	5.7%
2. had incomplete primary	1.3%	4.1%	4.7%	3.3%	4.4%	6.1%	12.2%
3. are still in primary school	91.8%	19.5%	0.2%	0.6%	0.1%	0.0%	0.0%
4. Finished primary but not any middle school grades [1]	0.2%	1.3%	2.3%	4.2%	5.3%	7.0%	14.0%
5. had at least some middle school	1.3%	74.2%	92.1%	90.9%	88.6%	85.4%	68.1%
	100%	100%	100%	100%	100%	100%	100%

Of group #4 (primary completers who didn't enter middle school), reasons for exit: [2]

Costs not affordable	7.2%	36.3%	63.9%	44.7%	38.7%	37.6%	27.1%
Personal illness	0.0%	7.1%	4.7%	4.2%	4.2%	3.0%	2.6%
Lack of interest	7.3%	32.4%	18.4%	34.5%	38.5%	24.2%	25.1%
Got married/pregnant	0.0%	1.7%	0.0%	0.0%	0.8%	5.5%	3.0%
Care for family	85.5%	11.2%	7.0%	4.1%	7.1%	9.1%	23.5%
Agricultural work	0.0%	0.0%	0.9%	3.1%	0.5%	1.4%	3.9%
Other (non-ag.) work	0.0%	9.1%	2.6%	8.8%	8.4%	17.6%	10.2%
School too far	0.0%	2.3%	0.0%	0.0%	0.0%	1.2%	3.6%
No teacher	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
No school supplies	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
No clothing/shoes	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bad weather	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Finished at least undergrad. diploma							
Never started school							
Other reasons/not reported	0.0%	0.0%	2.5%	0.6%	1.7%	0.3%	0.7%

Notes: [1] Group #4 includes students who may have entered but did not complete grade 6.
[2] Caution is needed in interpreting gray values, since large shares of children are still in primary school.

56. Further analysis is required during Phase 2, if possible, also looking at transitions across higher levels of education (though IHLCS may not support such analysis). At the same time, an urgent priority for policy dialogue would seem to be to expand pathways for youth exiting formal education prior to or during SES to avail of various forms of skill training or nonformal education: Section III.7 (including Table 8) and Appendix 3 suggest that such opportunities are very limited, suggesting that it will be very difficult for youth exiting prior to completion of high school to obtain decent jobs, even at the base of the skill pyramid and particularly in modern sectors.

57. **Repetition.** At the CESR Team's request, analysis was done to generate at least imperfect estimates for repetition, calculated as shares of students currently in each Basic Education grade, summarized in Table A1.4.[27]

Table A1.4.

IHLCS-Estimated Repetition Rates for Current Students, by Grade and Subsample

	Grade	Repetition Rates		
		Total	Rural	Urban
Primary School	1	12.0%	12.5%	9.6%
	2	2.8%	3.0%	1.7%
	3	1.1%	1.2%	0.9%
	4	1.6%	1.5%	2.1%
	5	0.3%	0.3%	0.2%
Middle School	6	1.1%	1.0%	1.5%
	7	0.3%	0.3%	0.5%
	8	0.2%	0.2%	0.3%
	9	0.2%	0.0%	0.6%
High School	10	0.9%	1.0%	0.6%
	11	8.2%	8.6%	7.7%

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[27] The survey form asks up to 3 questions for each individual in the household: (i) highest grade or diploma completed; (ii) grade/level enrolled in the prior school year (SY2008/09), if any; and (iii) grade/level enrolled in the current school year (SY2009/10), if any.

58.   These initial estimates based on IHLCS confirm EMIS-based evidence that grade repetition is generally highest in high school—particularly in grade 11, likely due to the matriculation exam. Going beyond EMIS' aggregated estimates, IHLCS suggests that repetition rates are higher in rural areas for primary and high school grades, but perhaps marginally lower than in urban areas for middle school grades. Where IHLCS departs most markedly from EMIS is that survey responses suggests very sizeable grade 1 repetition rates, particularly in rural areas, where an estimated 12.5% of current grade 1 students are repeaters. Even these figures are likely a lower bound, since repetition is self-reported and parents may be embarrassed to report repetition.

Appendix 2: Logit and OLS Regression Results for the Likelihood that Children Aged 10-15 Have Completed Primary School

Panel A1: BOYS

Variables	Logit Coef. (1)	Std. Err. (2)	OLS Coef. (4)	Logit Coef. (5)	Std. Err. (6)	Sig. (7)	OLS Coef. (8)
Area type							
rural	-0.491	0.144 **	-0.065	-0.549	0.138	**	-0.075
ruralproxypoor	-0.576	0.104 **	-0.109	-0.580	0.104	**	-0.109
State/region							
Tachin	2.041	0.404 **	0.868	2.164	0.423	**	0.885
Kayah	2.290	0.210 **	0.902	2.395	0.236	**	0.910
Kayin	1.776	0.388 **	0.829	1.904	0.367	**	0.840
Chin	1.772	0.275 **	0.828	1.869	0.288	**	0.833
Sagaing	2.343	0.243 **	0.916	2.409	0.268	**	0.916
Taninthayi	1.520	0.369 **	0.782	1.689	0.356	**	0.799
Bago (East)	1.831	0.226 **	0.839	2.015	0.241	**	0.858
Bago (West)	1.842	0.273 **	0.842	1.885	0.299	**	0.837
Magwe	1.967	0.240 **	0.861	2.091	0.248	**	0.873
Mandalay	2.109	0.250 **	0.882	2.224	0.267	**	0.891
Mon	1.700	0.216 **	0.821	1.859	0.231	**	0.837
Rakhine	0.786	0.179 **	0.630	0.906	0.185	**	0.642
Yangon	1.915	0.253 **	0.843	2.086	0.263	**	0.862
Shan (South)	2.457	0.360 **	0.939	2.636	0.365	**	0.958
Shan (North)	1.608	0.317 **	0.797	1.744	0.312	**	0.813
Shan (East)	1.293	0.513 **	0.735	1.424	0.529	**	0.749
Ayeyarwady	1.735	0.243 **	0.824	1.880	0.264	**	0.837
Highest education level of male and female adults in household (generally father and mother)							
(i) Measured as adults'/parents' years of formal education							
edyears_male	0.059	0.011 **	0.009	n.a.	n.a.		n.a.
edyears_fem	0.048	0.012 **	0.007	n.a.	n.a.		n.a.
(ii) Measured as adults'/parents' highest completed level							
dadprim	n.a.	n.a.	n.a.	0.351	0.099	**	0.061
dadmid	n.a.	n.a.	n.a.	0.061	0.142		0.012
dadhs	n.a.	n.a.	n.a.	0.204	0.260		0.020
dad_HE_dip~h	n.a.	n.a.	n.a.	0.113	0.283		0.009
dadpostgrad	n.a.	n.a.	n.a.	0.973	0.995		0.145
momprim	n.a.	n.a.	n.a.	0.407	0.107	**	0.070
mommid	n.a.	n.a.	n.a.	0.166	0.136		0.022
momhs	n.a.	n.a.	n.a.	0.147	0.244		0.019
mom_HE_dip~h	n.a.	n.a.	n.a.	-0.412	0.338		-0.056
mompostgrad	n.a.	n.a.	n.a.	0.292	0.831		-0.031
Dummy variables for child's age at time of survey							
aged10	-2.705	0.213 **	-0.515	-2.706	0.213	**	-0.516
aged11	-1.372	0.167 **	-0.229	-1.402	0.172	**	-0.234
aged12	-0.854	0.154 **	-0.129	-0.862	0.155	**	-0.130
aged13	-0.279	0.177	-0.035	-0.285	0.176		-0.036
aged14	-0.077	0.226	-0.007	-0.101	0.226		-0.011

Panel B1: GIRLS

Variables	Logit Coef. (9)	Std. Err. (10)	Sig. (11)	OLS Coef. (12)	Logit Coef. (13)	Std. Err. (14)	Sig. (15)	OLS Coef. (16)
Area type								
rural	-0.650	0.200	**	-0.081	-0.728	0.203	**	-0.092
ruralproxypoor	-0.502	0.112	**	-0.094	-0.480	0.110	**	-0.089
State/region								
Tachin	2.267	0.276	**	0.912	2.359	0.295	**	0.910
Kayah	2.923	0.494	**	0.985	3.003	0.457	**	0.979
Kayin	1.945	0.257	**	0.858	1.982	0.244	**	0.847
Chin	1.819	0.258	**	0.840	1.902	0.244	**	0.837
Sagaing	2.422	0.273	**	0.928	2.447	0.276	**	0.914
Taninthayi	1.883	0.307	**	0.849	1.978	0.277	**	0.844
Bago (East)	1.560	0.316	**	0.793	1.685	0.283	**	0.795
Bago (West)	1.729	0.323	**	0.824	1.714	0.317	**	0.802
Magwe	1.950	0.316	**	0.862	2.009	0.287	**	0.854
Mandalay	2.217	0.268	**	0.901	2.269	0.263	**	0.891
Mon	2.155	0.329	**	0.886	2.272	0.303	**	0.885
Rakhine	0.811	0.252	**	0.641	0.862	0.245	**	0.637
Yangon	2.223	0.462	**	0.885	2.294	0.470	**	0.879
Shan (South)	2.392	0.250	**	0.924	2.523	0.237	**	0.928
Shan (North)	2.032	0.323	**	0.867	2.134	0.320	**	0.868
Shan (East)	1.790	0.400	**	0.827	1.909	0.415	**	0.836
Ayeyarwady	1.621	0.316	**	0.804	1.697	0.300	**	0.798
Highest education level of male and female adults in household (generally father and mother)								
(i) Measured as adults'/parents' years of formal education								
edyears_male	0.029	0.015	*	0.004	n.a.	n.a.		n.a.
edyears_fem	0.076	0.012	**	0.010	n.a.	n.a.		n.a.
(ii) Measured as adults'/parents' highest completed level								
dadprim	n.a.	n.a.		n.a.	0.250	0.095	**	0.040
dadmid	n.a.	n.a.		n.a.	0.139	0.139		0.018
dadhs	n.a.	n.a.		n.a.	-0.083	0.294		-0.019
dad_HE_dip~h	n.a.	n.a.		n.a.	0.138	0.270		0.020
dadpostgrad	n.a.	n.a.		n.a.	0.303	0.929		0.122
momprim	n.a.	n.a.		n.a.	0.613	0.078	**	0.102
mommid	n.a.	n.a.		n.a.	0.075	0.148		0.004
momhs	n.a.	n.a.		n.a.	-0.646	0.333	*	-0.088
mom_HE_dip~h	n.a.	n.a.		n.a.	0.815	0.279	**	0.106
mompostgrad	n.a.	n.a.		n.a.	1.479	0.877	*	0.144
Dummy variables for child's age at time of survey								
aged10	-2.438	0.174	**	-0.463	-2.449	0.173	**	-0.461
aged11	-1.081	0.162	**	-0.172	-1.088	0.162	**	-0.173
aged12	-0.724	0.152	**	-0.108	-0.721	0.155	**	-0.106
aged13	-0.074	0.156		-0.010	-0.069	0.157		-0.008
aged14	0.113	0.167		0.012	0.121	0.166		0.014

Notes: Regressions drop state/region dummy variables for age=15, hence age dummy coefficients shown measure relative likelihood vis-à-vis 15 year-olds

In the "Sig." columns 3, 7, 11, and 15, the mark ** denotes strong statistical signifance at the 95% confidence level, while * denotes statistical signifance at the 90% confidence level.

Appendix 2 (con't): Logit & OLS Regression Results for Likelihood that Children Aged 10-15 Have Completed Primary School

Panel A2: BOYS (adding ECCD participation)

Variables	Logit Coef. (1)	Std. Err. (2)	Sig. (3)	OLS Coef. (4)	Logit Coef. (5)	Std. Err. (6)	Sig. (7)	OLS Coef. (8)
Area type								
rural	-0.310	0.155	**	-0.039	-0.367	0.149	**	-0.049
ruralproxypoor	-0.577	0.108	**	-0.109	-0.581	0.107	**	-0.109
State/region								
Tachin	1.772	0.472	**	0.834	1.877	0.487	**	0.846
Kayah	1.909	0.271	**	0.847	2.000	0.307	**	0.850
Kayin	1.611	0.375	**	0.807	1.722	0.357	**	0.814
Chin	1.563	0.290	**	0.799	1.638	0.300	**	0.800
Sagaing	2.199	0.252	**	0.894	2.247	0.277	**	0.891
Taninthayi	1.362	0.373	**	0.761	1.513	0.359	**	0.774
Bago (East)	1.703	0.230	**	0.822	1.867	0.245	**	0.837
Bago (West)	1.693	0.282	**	0.822	1.717	0.304	**	0.813
Magwe	1.826	0.245	**	0.842	1.932	0.254	**	0.849
Mandalay	1.919	0.261	**	0.855	2.018	0.278	**	0.861
Mon	1.565	0.222	**	0.803	1.706	0.237	**	0.815
Rakhine	0.625	0.212	**	0.609	0.731	0.225	**	0.619
Yangon	1.669	0.241	**	0.809	1.825	0.253	**	0.824
Shan (South)	2.191	0.302	**	0.900	2.356	0.311	**	0.915
Shan (North)	1.413	0.343	**	0.769	1.534	0.341	**	0.781
Shan (East)	1.063	0.493	**	0.704	1.183	0.509	**	0.715
Ayeyarwady	1.599	0.253	**	0.805	1.725	0.273	**	0.814
Highest education level of male and female adults in household (generally father and mother)								
(i) Measured as adults'/parents' years of formal education								
edyears_male	0.057	0.011	**	0.008	n.a.	n.a.		n.a.
edyears_fem	0.042	0.012	**	0.006	n.a.	n.a.		n.a.
(ii) Measured as adults'/parents' highest completed level								
dadprim	n.a.	n.a.		n.a.	0.344	0.100	**	0.060
dadmid	n.a.	n.a.		n.a.	0.060	0.145		0.010
dadhs	n.a.	n.a.		n.a.	0.182	0.259		0.017
dad_HE_dip~h	n.a.	n.a.		n.a.	0.108	0.300		0.006
dadpostgrad	n.a.	n.a.		n.a.	0.892	0.981		0.125
momprim	n.a.	n.a.		n.a.	0.389	0.104	**	0.067
mommid	n.a.	n.a.		n.a.	0.150	0.140		0.017
momhs	n.a.	n.a.		n.a.	0.078	0.262		0.009
mom_HE_dip~h	n.a.	n.a.		n.a.	-0.423	0.349		-0.054
mompostgrad	n.a.	n.a.		n.a.	0.340	0.827		-0.015
Dummy variable for child having attended ECCD								
everpreschool	0.837	0.144	**	0.106	0.851	0.138	**	0.109
Dummy variables for child's age at time of survey								
aged10	-2.752	0.205	**	-0.518	-2.755	0.206	**	-0.518
aged11	-1.412	0.163	**	-0.235	-1.445	0.168	**	-0.239
aged12	-0.893	0.145	**	-0.134	-0.901	0.147	**	-0.136
aged13	-0.294	0.171	*	-0.037	-0.301	0.172	*	-0.039
aged14	-0.088	0.222		-0.008	-0.114	0.221		-0.012

Panel B2: GIRLS (adding ECCD participation)

Variables	Logit Coef. (9)	Std. Err. (10)	Sig. (11)	OLS Coef. (12)	Logit Coef. (13)	Std. Err. (14)	Sig. (15)	OLS Coef. (16)
Area type								
rural	-0.514	0.202	**	-0.060	-0.586	0.202	**	-0.070
ruralproxypoor	-0.503	0.112	**	-0.094	-0.481	0.111	**	-0.089
State/region								
Tachin	2.047	0.315	**	0.881	2.118	0.337	**	0.875
Kayah	2.641	0.517	**	0.938	2.700	0.466	**	0.928
Kayin	1.805	0.270	**	0.834	1.819	0.256	**	0.819
Chin	1.686	0.277	**	0.823	1.748	0.264	**	0.817
Sagaing	2.302	0.291	**	0.911	2.303	0.294	**	0.893
Taninthayi	1.760	0.328	**	0.834	1.833	0.295	**	0.826
Bago (East)	1.455	0.328	**	0.779	1.556	0.295	**	0.777
Bago (West)	1.603	0.330	**	0.806	1.564	0.320	**	0.780
Magwe	1.824	0.323	**	0.844	1.860	0.295	**	0.833
Mandalay	2.065	0.287	**	0.879	2.091	0.283	**	0.866
Mon	2.019	0.334	**	0.866	2.114	0.308	**	0.862
Rakhine	0.691	0.220	**	0.625	0.723	0.208	**	0.618
Yangon	2.018	0.467	**	0.858	2.058	0.469	**	0.846
Shan (South)	2.208	0.240	**	0.897	2.320	0.228	**	0.898
Shan (North)	1.900	0.335	**	0.846	1.983	0.331	**	0.843
Shan (East)	1.634	0.401	**	0.805	1.734	0.412	**	0.811
Ayeyarwady	1.515	0.323	**	0.788	1.568	0.306	**	0.779
Highest education level of male and female adults in household (generally father and mother)								
(i) Measured as adults'/parents' years of formal education								
edyears_male	0.028	0.015	*	0.003	n.a	n.a		n.a.
edyears_fem	0.073	0.012	**	0.010	n.a	n.a.		n.a.
(ii) Measured as adults'/parents' highest completed level								
dadprim	n.a.	n.a.		n.a.	0.245	0.091	**	0.039
dadmid	n.a.	n.a.		n.a.	0.140	0.143		0.018
dadhs	n.a.	n.a.		n.a.	-0.078	0.298		-0.021
dad_HE_dip~h	n.a.	n.a.		n.a.	0.100	0.275		0.016
dadpostgrad	n.a.	n.a.		n.a.	0.431	0.958		0.146
momprim	n.a.	n.a.		n.a.	0.613	0.077	**	0.101
mommid	n.a.	n.a.		n.a.	0.053	0.150		0.001
momhs	n.a.	n.a.		n.a.	-0.709	0.334	**	-0.096
mom_HE_dip~h	n.a.	n.a.		n.a.	0.831	0.284	**	0.110
mompostgrad	n.a.	n.a.		n.a.	1.464	0.914		0.133
Dummy variable for child having attended ECCD								
everpreschool	0.624	0.185	**	0.077	0.664	0.182	**	0.082
Dummy variables for child's age at time of survey								
aged10	-2.496	0.178	**	-0.469	-2.514	0.178	**	-0.468
aged11	-1.096	0.163	**	-0.175	-1.104	0.162	**	-0.175
aged12	-0.742	0.152	**	-0.110	-0.739	0.155	**	-0.109
aged13	-0.092	0.155		-0.013	-0.088	0.157		-0.011
aged14	0.091	0.167		0.009	0.098	0.166		0.010

Notes: Regressions drop state/region dummy variables for age=15, hence age dummy coefficients shown measure relative likelihood vis-à-vis 15 year-olds

In the "Sig." columns 3, 7, 11, and 15, the mark ** denotes strong statistical signifance at the 95% confidence level, while * denotes statistical signifance at the 90% confidence level.

Appendix 3: Indicative Age-Specific Enrolment Profiles Based on Initial IHLCS Analysis

Rural

At age 15, about **55.6**% of children are OSY, **9.6**% are on-schedule (grade 11), and **15.3**% are in grade 10. About **0.8**% are already in TVET or higher education

At age 16, roughly **66.3**% are OSY, **3.6**% are on-schedule (higher educ. or TVET), and **15.3**% are in grade 11.

At age 18, roughly **80.6**% are OSY, **9.5**% are still in high school, **8.7**% are in HES only, **0.6**% are in TVET only, and **0.6**% are in both

Legend:
- ECCD
- lag>=4
- lag=3
- lag=2
- lag=1
- lag=0
- ahead
- TVET only
- TVET & HES
- higher only

??? ECCD

Rural Proxy Poor

At age 15, roughly **67.3**% are OSY, **5.3**% of children are on-schedule (grade 11), and about **9.9**% are in grade 10. Less than **0.8**%% are in TVET or higher education

At age 16, about **73.7**% are OSY, **3.3**% are on-schedule (higher educ. or TVET), and **9.2**% are in grade 11, while about **5.8**% are in grade 10, and **7.9**% are still in middle school

At age 18, roughly **88.0**% are OSY, **8.1**% are still in high or middle school, **3.5**% are in HES only, **0.1**% are in TVET only, and **0.2**% in both

??? ECCD

81