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PISA in Low and Middle Income Countries

Simone Bloem

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ABSTRACT

This paper explores the participation of low- and middle-income countries in OECD's Programme for International Student Assessment (PISA). It provides a detailed description of partner countries' participation across PISA rounds and the challenges faced by low- and middle-income partner countries in effectively implementing and deriving policy value from PISA. Specific challenges are illustrated with examples from Tunisia and Kyrgyzstan.

Many partner countries lag considerably behind OECD countries on various dimensions of social and economic development. Three OECD countries – Chile, Mexico, Turkey – also differ from higher-income OECD countries in regards to educational achievement and other indicators of social and economic development. After grouping countries based on income (GNI per capita), this paper shows that the cognitive performance of students in countries participating in PISA varies considerably not only between different country income groups but also within them. Analysis of PISA performance in relation to national wealth provides strong arguments for grouping countries according to their social and economic development when reflecting on challenges of participation and effective use of PISA. Lack of funding and governments' fear of bad performance have been stated as potential deterrents to participation. Lack of institutional capacity and less relevant results due to a non-representative sample of 15 year-olds and clustering of students at low proficiency levels are discussed as main challenges for the effective use of PISA. The paper concludes with some considerations on how to improve the effective use of PISA results in these countries that may be particularly relevant in the context of the OECD's recently launched initiative called PISA for Development.

RÉSUMÉ

Ce document examine la participation des pays à revenu faible ou intermédiaire au Programme international de l'OCDE pour le suivi des acquis des élèves (PISA). Il étudie de façon détaillée la participation des pays partenaires aux différents cycles PISA et les enjeux rencontrés, notamment par les pays partenaires à revenu faible ou intermédiaire, pour mettre en œuvre de façon efficace l'enquête PISA et en tirer les bénéfices escomptés en termes d'action publique. Ces enjeux spécifiques sont illustrés par des exemples tirés de l'expérience de la Tunisie et du Kirghizistan.

De nombreux pays partenaires accusent un retard important par rapport aux pays de l'OCDE concernant différents indicateurs de développement économique et social. Trois pays de l'OCDE – le Chili, le Mexique et la Turquie – se distinguent également des pays de l'OCDE à revenu plus élevé de par leurs résultats éducatifs et d'autres indicateurs de développement économique et social. Après regroupement des pays sur la base de leur revenu (RNB par habitant), ce document montre que les performances cognitives des élèves des pays participant au PISA varient considérablement non seulement entre les différents groupes de pays regroupés par revenu, mais aussi au sein de ces derniers. L'étude de la relation entre la performance aux évaluations PISA et la richesse nationale apporte des arguments solides en faveur du regroupement des pays sur la base de leur développement économique et social lors de l'analyse des enjeux de la participation au PISA et de son utilisation efficace. Le manque de financement et la crainte des pays d'obtenir de mauvais résultats aux évaluations ont été identifiés comme des éléments pouvant dissuader les pays de participer au PISA. L'insuffisance des capacités institutionnelles et la moindre pertinence des résultats en raison de la non-représentativité de l'échantillon d'élèves de 15 ans et de la concentration des élèves aux faibles niveaux de performance sont examinés comme principaux obstacles à une utilisation efficace du PISA. Le document s'achève par une série de recommandations sur la façon d'améliorer l'efficacité de l'utilisation des résultats du PISA dans ces pays, recommandations qui pourraient s'avérer particulièrement pertinentes dans le cadre de l'initiative *PISA pour le développement*, lancée récemment par l'OCDE.

PISA IN LOW AND MIDDLE INCOME COUNTRIES

Simone Bloem, OECD, Directorate for Education and Skills[1]

1. INTRODUCTION: INTERNATIONAL BENCHMARKING IN LOW- AND MIDDLE-INCOME COUNTRIES

In 1997, OECD member governments established the Programme for International Student Assessment (PISA). The central objectives of the triennial survey are to provide cross-nationally comparable evidence of student performance on the skills that are judged to be important for adult life in the context of globalisation and the emerging knowledge society and to provide governments with a powerful tool to shape their policy making (OECD, 2004; Schleicher, 2007). These main PISA surveys of reading, mathematics and science performance are administered to a random sample of 15 year-olds in each participating country.[2]

Because PISA is administered every three years, performance can be monitored over time. For each survey cycle, one of the three testing areas is selected as the major domain; the other two areas are the minor domains and fewer items are assessed. In the first three PISA cycles, reading was the major domain in 2000, mathematics in 2003 and science in 2006. The same pattern is being repeated for the current PISA cycle which began in 2009 and will conclude in 2015. PISA also collects contextual information through a student and school questionnaire. The responses can be linked to students' performance to provide insight on how quality and equity in schooling outcomes are associated with specific factors. In recent cycles, PISA also included options for additional assessments, such as financial literacy and problem solving as well as additional questions on computer familiarity, the student's educational history and questionnaires for parents.

Although PISA was initially constructed to evaluate the performance of school systems in OECD countries, the involvement of non-OECD countries and economies, referred to as partner countries and economies, has grown progressively.[3] Over 40 partner countries and economies[4] took part in the PISA

1 . The author would like to thank Simon Breakspear for his inputs on an earlier draft and Alejandro Gomez Palma for his comments and suggestions. The paper has also been reviewed by OECD colleagues Michael Davidson, Michael Ward and Felix Zimmermann. Please send any comments to simone.bloem@oecd.org.

2 . Specifically, students must be between the ages of 15 years 3 months and 16 years 2 months at the time of the assessment (OECD 2010c: 24). Across countries/economies, students may be in different school grades, depending on national policies. PISA also provides countries with the option of including a different sample of students in the assessment for linking purposes with national assessments which are not internationally reported as part of the main PISA assessment.

3 . The OECD has co-operated with partner countries on education since the early 1990s. In the area of education statistics, the OECD has been involved in the joint UIS/OECD/EUROSTAT "World Education Indicators" (WEI) programme since 1996. WEI provides internationally comparable data on key aspects of education systems, including student enrolment, institutional information, education personnel and educational expenditure (UNESCO-UIS, 2006). Most of WEI countries also participate in PISA.

4 . Official jurisdictions which are not countries, such as Hong Kong-China and Miranda-Venezuela, can participate in PISA. For the sake of brevity, when this paper refers to countries in PISA, it includes these sub-national economies.

2009 survey, bringing the total number of PISA countries and economies to about 70; many of these partner countries belong to the group of low- and middle-income countries.

Little has been written on the nature of these countries' participation and the challenges that have arisen when trying to effectively implement PISA or derive policy insights from the data. This paper seeks to help fill this important gap in the literature.

1.1 The approach taken in the paper

The three central questions of this paper are:

1. What are the partner countries and economies that have participated across PISA survey rounds, how have they performed in PISA, and how can these results be compared with indicators of their social and economic development?

2. What are the potential deterrents to participation and what are the challenges facing low- and middle-income countries in effectively implementing and deriving policy value from PISA?

3. How can PISA be made more accessible relevant and useful to low- and middle-income countries?

This paper draws on a range of evidence and insights to address these core research questions. Sources include, first, OECD documentation and PISA Governing Board (PGB) minutes; second, semi-structured interviews with OECD staff and informed staff from other international organisations; third, a survey[5] of PGB representatives from 23 partner countries including follow-up phone conversations and e-mail communications. Moreover, the author's own analysis is based on direct engagement with PISA within the OECD.

The OECD Secretariat and the PGB are aware of the challenges facing low- and middle-income countries participating in PISA. This theme was discussed at the Education Policy Committee[6] in October 2012 and presented in the proposal for "PISA for Development". The proposal highlights the benefits of participation among low- and middle-income countries and encourages development partners (*e.g.* co-operation agencies, donors and development organisations) to support developing countries' participation both financially and technically. In particular, it notes that there is increasing awareness that low- and middle-income countries need to build institutional capacity for assessment and analysis. PISA allows countries, regardless of their starting point, to establish achievement targets that can be referenced to internationally comparable scales for planning purposes and to monitor their progress. In the "PISA for Development" framework, enhanced PISA survey instruments which are more relevant for developing countries should be created to enhance their policy relevance in these countries (OECD, 2013a, 2013b). This working paper is the first of a possible series of papers focusing on the issues of PISA in low- and middle-income countries. It complements and adds to existing work by providing a detailed description of partner countries' participation across PISA rounds and the challenges faced by low- and middle-income partner countries in effectively implementing and deriving policy value from PISA. Specific challenges are illustrated with examples from Tunisia and Kyrgyzstan.

5 . Based on a questionnaire prepared by Simon Breakspear (Breakspear, 2012)

6 . The Education Policy Committee (EDCP) is one of the four specialised governing bodies of the OECD with regards to education work. As such, the EDPC has a mandate to oversee the work of the Directorate for Education and Skills.

The goal of this paper is modest: to provide a coherent overview of low- and middle-income countries' participation in PISA as a platform for future robust empirical investigations.

The paper is organised in three sections. Chapter 2 describes the participation of partner countries and economies in PISA across the four survey rounds completed since 2000 and highlights changes over time, as well as some key results from PISA 2009. Chapter 3 assesses the deterrents to participation and challenges to the effective implementation and use of PISA in low- and middle-income countries. The two country case studies on Tunisia and Kyrgyzstan presented in Chapter 4 provide examples of challenges faced by participating countries. Chapter 5 focuses on strategies to improve the implementation and use of PISA across low- and middle-income countries.

2. THE PARTICIPATION OF LOW- AND MIDDLE-INCOME COUNTRIES IN PISA

Since the mid-1990s, policy makers in industrialised countries have paid increasing attention to the relative performance of their own education system's performance relative to other countries. This focus on educational performance is to be seen in the context of labour market internationalisation and emerging knowledge societies in which the knowledge and skills stock of the populations are increasingly important for national social and economic development.

International student assessments aim to provide a more objective source of information on student performance than national assessments. International assessment results may provide participants with an opportunity to not only compare their results internationally, but to also learn about other countries' education policies with a view to making use of this information to develop their own policies. These are important factors for countries that decide to participate in an international student assessment survey like PISA, regardless of their level of social and economic development. Low- and middle-income countries joining PISA may likely have similar motivations as OECD countries, but given their level of wealth other factors may also be important. As reported by country representatives that were surveyed, "capacity building" is often mentioned as an important benefit of participation in international assessments like PISA. In the context of international assessments, capacity-building includes developing the technical capacity related to cognitive item development and adaption of contextual survey questionnaires. In addition, technical and administrative assistance is also provided with regards to sampling procedures, quality-assurance protocols and the planning and implementation of data collection with students and schools. Last but not least, an often overlooked but important aspect of capacity building relates to strengthening the capacity of participating countries to use their own results for secondary analysis and the full exploitation of data sets through the drafting of national reports and establishing communication plans to effectively disseminate results (Lockhead, 2012). Research that has been carried out on this topic provides some evidence that participation in international student assessments may contribute to capacity building in developing countries (Lockhead, 2010; Cariola *et al*., 2011). There may be significant differences; however, among the capacities of countries that participate in international assessments to fully take advantage of the capacity-building opportunities while in the case of low- and middle-income countries, it is exactly these kinds of capacities that appear to remain as challenges.

2.1 Partner country involvement in PISA over the first four survey cycles

Four non-member countries and economies took part in the first PISA 2000 survey along with 28 of the then 29 OECD countries.[7] Due to increased country interest, the PISA 2000 survey was repeated in 2002 as PISA 2000+, with an additional 11 partner countries and economies taking part. In PISA 2003, 14 of the 41 participating countries were non-members. In PISA 2006, 18 partner countries/economies took part in the survey in addition to all 30 OECD countries. A combined total of 40 partner countries and

7 . Turkey was the only OECD country that did not participate in PISA 2000.

economies participated in PISA 2009 and the later PISA 2009+. As a consequence, the number of partner countries and economies involved in PISA is now larger than the number of OECD countries. (There are now 34 OECD countries, with the accession of the Slovak Republic in 2000 and Chile, Estonia, Israel and Slovenia in 2010.)

PISA participants include countries and economies across all continents, although participation from countries on the African continent has been limited. There are no participants from sub-Saharan Africa and Tunisia is the only country that has participated in the three cycles since 2003. Algeria has joined PISA 2015. Mauritius participated in PISA 2009+ but did not participate in PISA 2012. The number of participating countries in East and South Eastern Asia has grown over the last two cycles. The same holds true for Central Asian and Central and Eastern European countries as well as for countries in Latin America and the Caribbean. Middle Eastern countries and economies that have participated in PISA include Jordan, Qatar and the United Arab Emirates.

Table 1: Partner countries/economies participating in PISA (2000-2015)

Country or economy	PISA 2000 and 2000+	PISA 2003	PISA 2006	PISA 2009 and 2009+	PISA 2012	PISA 2015
East and Southeast Asia						
China						x
Hong Kong-China	x	x	x	x	x	x
India (2 States)				x		
Indonesia	x	x	x	x	x	x
Macao-China		x	x	x	x	x
Malaysia				x	x	x
Shanghai-China				x	x	
Singapore				x	x	x
Chinese Taipei			x	x	x	x
Thailand	x	x	x	x	x	x
Vietnam					x	x
Central, Mediterranean and Eastern Europe, and Central Asia						
Albania	x			x	x	x
Azerbaijan			x	x		
Bulgaria	x		x	x	x	x
Croatia			x	x	x	x
Estonia*			x	x	x	x
FYR Macedonia	x					x
Georgia				x		x
Kazakhstan				x	x	x
Kosovo						x
Kyrgyzstan			x	x		
Latvia	x	x	x	x	x	x
Liechtenstein	x	x	x	x	x	x
Lithuania			x	x	x	x
Malta				x		x
Moldova				x		x
Romania	x		x	x	x	x
Russian Federation	x	x	x	x	x	x
Republic of Montenegro			x	x	x	x
Serbia[1]			x	x	x	
Slovenia*			x	x	x	x
The Middle East						
Dubai (UAE)				x		
Israel*	x		x	x	x	x
Jordan			x	x	x	x
Lebanon						x
Qatar			x	x	x	x
United Arab Emirates[2]				x	x	x
Central and South America						
Argentina	x		x	x	x	x
Brazil	x	x	x	x	x	x
Chile*	x		x	x	x	x
Colombia			x	x	x	x
Costa Rica				x	x	x
Dominican Republic						x
Panama				x		
Peru	x			x	x	x
Uruguay		x	x	x	x	x
Trinidad and Tobago				x		x
Venezuela-Miranda				x		
Africa						
Algeria						x
Mauritius				x		
Tunisia		x	x	x	x	x

Note: Countries that are marked with an asterix are now Member countries of the OECD.
1. In PISA 2003 participated as one 'Serbia and Montenegro'
2.The United Arab Emirates except Dubai participated in PISA 2009+ because Dubai participated in the main round.

As shown in Table 1, the majority of countries and economies participating in PISA 2009 or PISA 2009+ are also participating in the PISA 2012 survey.[8] There are, however, some exceptions. Azerbaijan and Kyrgyzstan, which participated in two cycles, did not take part in PISA 2012. Furthermore, the two Indian States, Tamil Nadu and Himachal Pradesh, as well as Venezuela-Miranda, Malta, Mauritius, Panama, and Georgia did not participate in PISA 2012 after having participated in 2009 or 2009+. Malta and Georgia will participate in PISA 2015. With the exception of the newest participants, few partner countries have participated in only one PISA survey. Some partner countries and economies have participated regularly for three or four cycles, providing opportunities to track performance trends (see below).

2.2 Economic and social development of PISA participants

Many partner countries are characterised by lower levels of economic and social development than most OECD countries and the few wealthy partner countries and economies.

The majority of partner countries belong to the group of upper middle-income countries. Few partner countries are in the lower middle-income category, and only Kyrgyzstan, which did not participate in PISA 2012, is in the group of low-income countries. But some partner countries and economies also belong to the richest economies worldwide, notably Liechtenstein, Singapore, the oil-rich Qatar and United Arab Emirates, and the three special administrative regions in China – Hong Kong, Macao and Shanghai. Despite having considerably lower national income than the very rich economies, Croatia, Malta and Trinidad and Tobago still belong to the group of high-income countries.

All OECD member countries belong to the group of high-income countries, with the exception of Chile, Mexico and Turkey. These three countries had a per capita GNI between USD 9 400 and USD 12 200 in 2011 and are thus situated at the upper end within the group of upper middle-income countries. Yet there is also quite a large variation in national wealth across high-income countries. Luxembourg, Norway, Sweden and Switzerland generated a per capita GNI of more than USD 50 000 in 2011 whereas the Czech Republic, Estonia, Hungary, Poland and the Slovak Republic each had a per capita GNI of less than USD 20 000 in 2011.

8 . Dubai as an individual system was part of the United Arab Emirates in 2012.

Table 2: Participating countries in PISA (all cycles), by income group

Least Developed Countries/ economies	**Other Low Income Countries/economies** *(per capita GNI $1,025 or less in 2011)*	**Lower Middle Income Countries/economies** *(per capita GNI $1,026 - $4,035 in 2011)*	**Upper Middle Income Countries/economies** *(per capita GNI $4,036 - $12,475 in 2011)*	**High income Countries/economies** *(per capita GNI $12,476 or more in 2011)*
0 countries *None*	1 country Kyrgyzstan	8 countries and economies Albania Georgia Himachal Pradesh-India1 Indonesia Kosovo Moldova Tamil Nadu-India1 Vietnam	28 countries and economies Algeria Argentina Azerbaijan Brazil Bulgaria China Chinese Taipei Colombia Costa Rica Dominican Republic FYR Macedonia Jordan Kazakhstan Latvia Lebanon Lithuania Malaysia Mauritius Panama Peru Republic of Montenegro Romania Russian Federation Serbia Thailand Tunisia Uruguay Venezuela-Miranda2	11 countries and economies and 31 OECD member countries Croatia Dubai (UAE) Hong-Kong China Liechtenstein Macao-China Malta Qatar Shanghai-China3 Singapore Trinidad and Tobago United Arab Emirates *And all OECD member countries (31) except Chile, Mexico and Turkey (upper middle income countries)*

Notes:
1. GNI per capita 2011 for India.
2. GNI per capita 2011 for Venezuela.
3. Classification based on GDP per capita 2011. Source: http://www.globaltimes.cn/NEWS/tabid/99/ID/700783/Top-10-richest-provincial-regions-in-China.aspx

Source: World Bank Indicators 2012. GNI per capita Atlas method from 2011.

Development also has a social dimension. Statistical information about the state of the education and health systems as well as general living standards serve as proxies for measures of social development in a country. For example, the United Nations Human Development Index (HDI) is a composite indicator which takes into account indicators related to education, health and living standards, mean and expected years of schooling, life expectancy, and per capita GNI as a measure of the decent standard of living (UNDP, 2013). The HDI pays particular attention to the living conditions of rural populations and women, as they are most vulnerable to poverty and exclusion from the benefits of modern industrialised societies. Participating partner countries' positions in the HDI ranking vary widely, ranging from the 8th ranked country of Liechtenstein to the 134th ranked India. The Russian Federation and Kazakhstan rank in the middle at 66 and 68. The economically weakest OECD countries of Chile, Mexico and Turkey rank 44th, 57th and 92nd respectively. Thus Turkey is situated below the majority of partner countries and economies that participated or will participate in PISA up to 2015 (see Table Annex).

Coverage in education is directly related to development levels of countries. Already in the 1950s, the large majority of OECD countries were striving for universal participation in education, and realised this objective in the ensuing decades, although some sooner than others. Over the second half of the 20th century, compulsory years of schooling OECD countries increased to an average of 16 years (OECD, 2012a). Moreover, with the introduction of mass schooling in the 1950s and 1960s, the share of illiterate population was drastically reduced. The share of youth (15-24 year olds) with limited literacy skills is very low among OECD countries, with exception of Chile, Mexico and Turkey where youth literacy rates are still slightly below 98%.

Youth literacy rates are lower in many partner countries. However, among PISA participants, only Algeria, India and United Arab Emirates have youth literacy rates below 95%. While the share of girls and young women among illiterate youth is disproportionally high in Algeria and India, in the United Arab Emirates three-quarters of those who are illiterate are boys. In Algeria, Peru, Tunisia and Turkey, and girls are often disproportionally represented (65% or more are girls and young women). In some partner countries and economies with literacy rates below 98%, more boys and young men than girls and young women are illiterate, notably in the Dominican Republic, Mauritius and Qatar (Table Annex).

The out-of-school rate for lower secondary school-age children is also very high in some partner countries, exceeding 10% in Azerbaijan, Algeria, Bulgaria, Latvia, Macao-China, Malaysia and Trinidad and Tobago. The highest rates are in Indonesia, Jordan, Lebanon, Qatar, Uruguay and Vietnam (see Table Annex). For PISA, a high share of children no longer in school at the age of 15 is problematic, as the test will not capture a representative sample of 15 year-olds in a country. Equity indicators are also less meaningful, as the most disadvantaged are the most likely to drop out of school before completing compulsory education. Specific gender or regional patterns in regards to illiteracy, school drop-out, etc. are important aspects to consider in sampling and data collection (see Chapter 4).

Furthermore, due to the increasing length of compulsory schooling, in these countries as well as a trend towards higher educational attainment levels in OECD countries, the mean and expected years of schooling are high. In OECD countries, mean years of schooling, *i.e.* the average number of years of participation in education among those 25 and older is 10 years or more. Expected years of schooling, *i.e.* the number of years of schooling that a child of school-entrance age can expect to receive if prevailing patterns of age-specific enrolment rates persist throughout the child's life is considerably higher at 15 years or more in most OECD countries. In many partner countries, but also in Turkey, mean and expected years of schooling are considerably below this level (Table Annex).

These differences are also apparent in the educational attainment of adult populations. While across OECD countries, three-quarters of the adult population have attained at least upper secondary education (OECD, 2012a), in most partner countries the share of the population with secondary attainment is

considerably lower in most partner countries. In several partner countries, less than half of the population has attained at least lower secondary education. Large differences in educational achievement across age cohorts may pose particular challenges. For example, in societies where children largely overtake their parents' level of educational achievement; parents will not be available to assist their children in their school work and may have different expectations as to what the education should deliver.

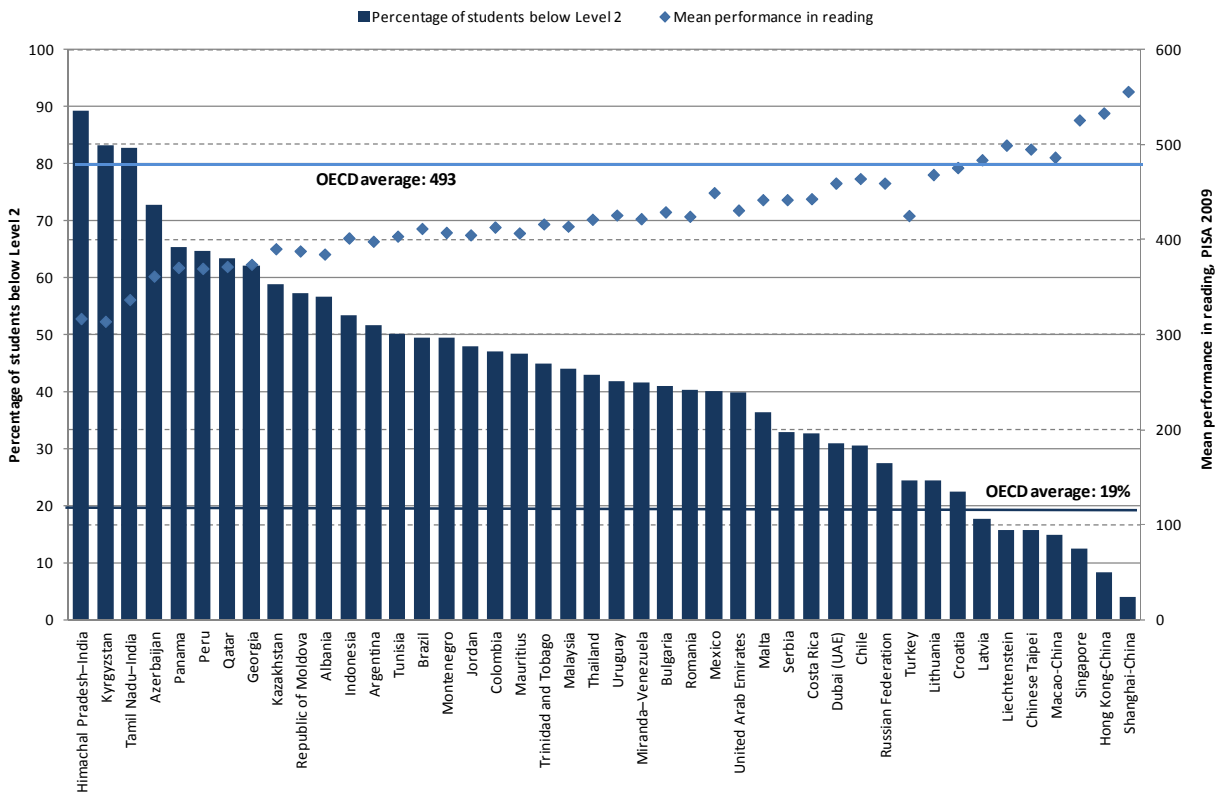
This short description of various dimensions of the social and economic development of partner and OECD countries has demonstrated that some partner countries lag considerably behind OECD countries. It may be somewhat misleading to think in terms of OECD versus partner countries as the three low-income OECD countries of Chile, Mexico and Turkey differ from their high-income counterparts in regards to educational achievement and other indicators of social development. It may also be more fruitful to differentiate country groups in terms of their level of social and economic development, independent of OECD membership status, when reflecting on challenges of participation and effective use of PISA.

2.3 Cognitive performance results for partner countries and selected OECD countries

PISA performance outcomes vary widely across partner countries and economies. Shanghai-China achieved the highest performance level of all the countries participating in PISA 2009. Other high-performing partner countries and economies include Hong Kong-China and Singapore. Partner countries also account for the lowest performers across all countries participating in PISA, such as the Azerbaijan the two Indian States, Tamil Nadu and Himachal Pradesh, and Kyrgyzstan. PISA results can be interpreted based on the proficiency levels that students reach in the assessment of reading, mathematics and science. Across all three subjects, PISA defines baseline proficiency as Level 2 that can be understood as the level at which students show sufficient mastery of content and sufficient skills and competencies to be successful in their later lives as continuing students, in the labour market and as citizens (OECD, 2010c).

In the majority of partner countries, the share of students below Level 2 proficiency in reading exceeds 40%, compared to the OECD average of 19%. In Mexico, which is notably below the OECD average, 40% of students score below proficiency Level 2. In several partner countries more than one-half of all students do not reach the baseline level and the share of top-performing students in these countries is negligibly small. The share of low-performing students is above the OECD average in Turkey, where almost one-quarter of students perform below the baseline level, and in Chile, where almost one third of students perform at the lowest proficiency levels.

Figure 1: Mean performance and percentage of students below Level 2 in reading in partner countries and the OECD countries Turkey, Chile and Mexico, PISA 2009



Note: *Countries are ranked in descending order of the percentage of students below Level 2 on the PISA reading scale*.
Source: ACER (2012), Tables B.2.1 and B.2.2.

Regular PISA participation allows countries to track their performance over time. Experience shows that improvement in PISA scores is possible - independent of the performance level from which countries depart. In fact, lower-performing countries have achieved the greatest gains, relative to other countries. This is notably the case for Qatar which improved by 60 score points within 3 years. Argentina, Bulgaria, Kyrgyzstan, Romania, Serbia and Tunisia have also improved rapidly, adding 20 score points over the course of their participation in PISA. In addition, the Russian Federation improved by 19 score points between 2006 and 2009, but its performance in 2006 was lower than in 2003 and 2000. Albania, which did not participate in 2003 or 2006, improved by 36 score points in the 8 years between tests. Indonesia has steadily improved from cycle to cycle, from 370 score points in 2000 to 402 score points in 2009. Brazil has improved its performance by 16 score points since it started participating in 2000. The three OECD countries Chile, Mexico and Turkey have all improved their performance over time, with the highest gains for Chile. Chile has been particularly successful in reducing the share of low-performing students, improving reading performance by 40 score points between 2000 and 2009, which represents a performance gain of about one year of schooling (39 score points represent approximately one year of schooling) (OECD, 2010d).

Table 3: Trends in PISA reading performance in partner countries and the OECD countries Chile, Mexico and Turkey

	Number of years for which PISA results are available	Change between PISA 2009 and PISA 2000		Change between PISA 2009 and PISA 2003		Change between PISA 2009 and PISA 2006		Observed linear trend		Annualised observed change between 2000 and 2009, 2003 and 2009 or 2006 and 2009		Annualised observed change between 2000 and 2009, 2003 and 2009 or 2006 and 2009 adjusted for demographic differences	
		Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.	Score dif.	S.E.
Partners													
Albania	8	**36**	(7.2)	m	m	m	m	**4.5**	(0.9)	**4.5**	(0.9)	**6.0**	(0.9)
Argentina	8	**-20**	(12.0)	m	m	**25**	(9.5)	**-3.2**	(1.5)	-2.5	(1.5)	-1.6	(1.2)
Azerbaijan	3	m	m	m	m	9	(6.1)	2.9	(2.8)	2.9	(2.0)	3.0	(2.1)
Brazil	9	**16**	(6.4)	9	(6.7)	**19**	(6.2)	1.2	(0.7)	**1.7**	(0.7)	**2.0**	(0.7)
Bulgaria	8	-1	(9.6)	m	m	**27**	(10.4)	-0.7	(1.1)	-0.2	(1.2)	1.6	(1.1)
Chile	8	**40**	(6.9)	m	m	7	(7.2)	**5.1**	(0.8)	**5.0**	(0.9)	**4.9**	(0.8)
Chinese Taipei	3	m	m	m	m	-1	(5.9)	-0.3	(2.4)	-0.3	(2.0)	-3.3	(2.0)
Colombia	3	m	m	m	m	**28**	(7.5)	**9.3**	(3.1)	**9.3**	(2.5)	**9.6**	(2.3)
Croatia	3	m	m	m	m	-2	(5.7)	-0.5	(2.7)	-0.5	(1.9)	0.0	(1.9)
Hong Kong-China	8	**8**	(6.1)	**24**	(5.9)	-3	(5.2)	**2.0**	(0.8)	1.0	(0.8)	1.3	(0.8)
Indonesia	8	**31**	(7.4)	**20**	(6.5)	9	(8.1)	**3.8**	(0.9)	**3.9**	(0.9)	**4.1**	(0.9)
Jordan	3	m	m	m	m	4	(6.2)	1.5	(2.8)	1.5	(2.1)	2.2	(2.0)
Kyrgyzstan	3	m	m	m	m	**29**	(6.2)	**9.8**	(2.9)	**9.8**	(2.1)	**8.3**	(2.0)
Latvia	9	**26**	(7.8)	-7	(6.2)	4	(6.3)	**2.2**	(0.9)	**2.9**	(0.9)	**3.5**	(0.9)
Liechtenstein	9	**17**	(7.0)	**-26**	(6.1)	-11	(6.3)	1.2	(0.8)	**1.9**	(0.8)	**2.5**	(1.0)
Lithuania	3	m	m	m	m	-2	(5.6)	-0.5	(2.7)	-0.5	(1.9)	-0.1	(1.8)
Macao-China	6	m	m	**-11**	(4.7)	-6	(4.3)	-1.8	(1.3)	**-1.8**	(0.8)	**-2.0**	(0.8)
Mexico	9	3	(6.3)	**26**	(6.1)	**15**	(5.5)	0.7	(0.8)	0.4	(0.7)	0.4	(0.6)
Montenegro	3	m	m	m	m	**16**	(4.6)	**5.2**	(2.4)	**5.2**	(1.5)	**4.1**	(1.6)
Peru	8	**43**	(7.7)	m	m	m	m	**5.3**	(1.0)	**5.3**	(1.0)	**5.9**	(0.9)
Qatar	3	m	m	m	m	**60**	(4.3)	**19.8**	(2.4)	**19.8**	(1.4)	**17.6**	(1.4)
Romania	7	-3	(7.3)	m	m	**29**	(7.4)	-0.9	(1.0)	-0.5	(1.0)	-1.4	(1.1)
Russian Federation	9	-2	(7.3)	**17**	(6.6)	**20**	(6.8)	-0.3	(0.8)	-0.3	(0.8)	-1.3	(0.7)
Serbia	6	m	m	**30**	(5.9)	**41**	(5.9)	**5.0**	(1.4)	**5.0**	(1.0)	**4.6**	(0.9)
Thailand	8	-9	(6.5)	1	(5.6)	5	(5.5)	-1.0	(0.8)	-1.2	(0.8)	**-1.7**	(0.8)
Tunisia	6	m	m	**29**	(5.7)	**23**	(6.4)	**4.8**	(1.4)	**4.8**	(1.0)	**7.8**	(1.7)
Turkey	6	m	m	**23**	(7.9)	**17**	(6.8)	**3.9**	(1.7)	**3.9**	(1.3)	**5.3**	(1.1)
Uruguay	6	m	m	-8	(5.9)	**13**	(5.9)	-1.4	(1.4)	-1.4	(1.0)	1.3	(1.0)

Notes*:* Values that are statistically significant are indicated in bold.
Countries are shown in alphabetical order.
Source*:* OECD (2010d), Table V.2.1 and Table V.2.8.

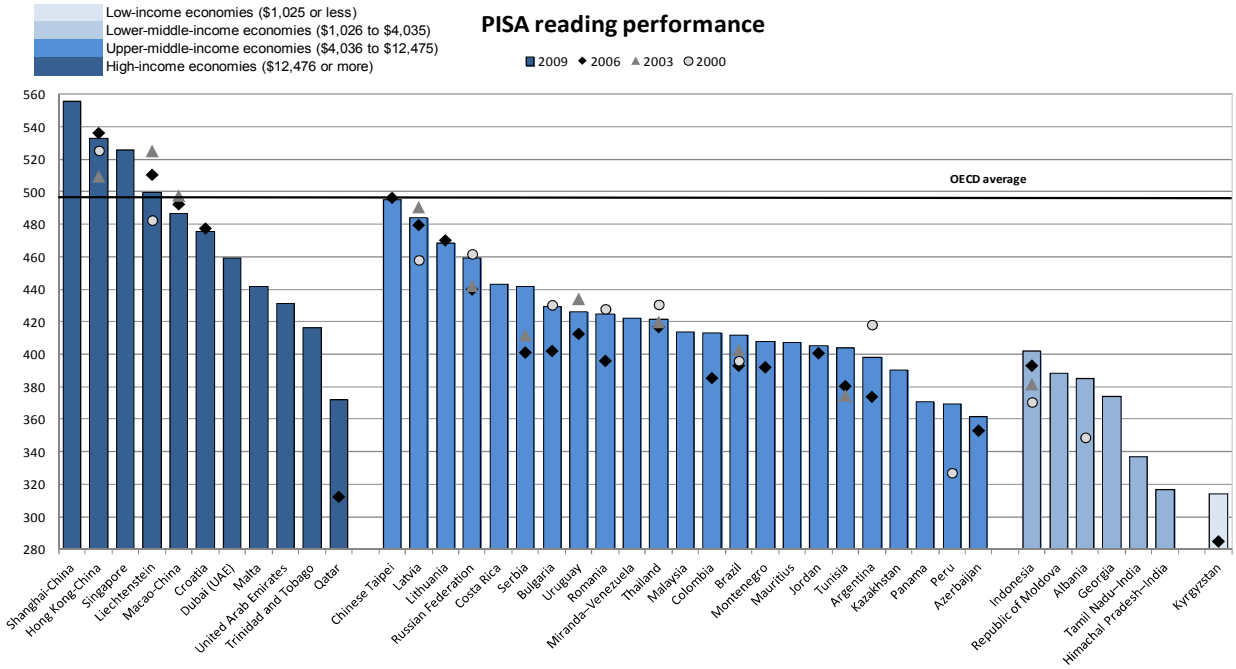
Low average performance is certainly not desirable for countries, but should not be viewed as an argument against participation in PISA. PISA is not only useful for countries to gauge where they stand relative to others; it also helps them to track their evolution over time. Many low-performing countries have improved their performance, although they may still lag significantly behind typical OECD countries. Reliable data are crucial for this kind of trend observation. The correct application of sampling and data collection techniques, however, can be problematic in low- and middle-income countries (see Chapter 4).

Figure 2 shows partner countries by level of economic development and mean performance in PISA 2009 or PISA 2009+. The diagonals, triangles, and dots indicate mean performance in past PISA cycles for those countries which have participated in more than one cycle.

An examination of cognitive performance levels for the different economic income groups to which countries belong makes clear that performance in 2009 varies considerably across country groups but also within these groups. Within the group of high-income economies, the performance gap between the highest performing economy, Shanghai-China, and the lowest performing country, Qatar, is 184 score points. For upper middle-income countries, the performance gap between Azerbaijan and Chinese Taipei is 133 score points. For lower middle-income countries, the gap between the highest and lowest performers is 75 score points. Despite the variation among countries within the same national income group, there is a clear indication of lower average performance for those countries with lower levels of economic development. Average performance for high-income countries and economies is 472 score points, which is around 25 score points below the average performance across OECD countries. Partner countries belonging to the

group of upper middle-income economies average 420 score points. Average performance of lower middle-income economies in PISA 2009 was 372 score points, thus 100 score points below that of partner countries with high national income. Kyrgyzstan, the only country participating in PISA belonging to the group of low-income economies, had a mean performance of 314 score points and was the lowest achieving country in PISA 2009 (and also 2006).

Figure 2: Mean performance of partner countries in reading across the PISA cycles (2000, 2003, 2006, 2009), by income group



Sources: OECD (2010), Table V.2.1, ACER (2011), Table B.2.1.
Income group classification based on GNI per capita, Atlas method (current US$), World Bank 2012. data.worldbank.org/data-catalog/GNI-per-capita-Atlas-and-PPP-table

Notes: GNI per capita 2011 for Tamil-Nadu and Himachal Pradesh for India; Miranda for Venezuela; Dubai for United Arab Emirates; Chinese Taipei for China. Country classification for Shanghai-China based on GDP per capita from http://www.globaltimes.cn/NEWS/tabid/99/ID/700783/PageID/622649/Top-10-richest-provincial-regions-in-China.aspx

Countries are sorted by income group and ranked by mean reading performance in PISA 2009/PISA 2009+ within the income groups.

2.3 Education system development

It is important to keep national income in mind when comparing the performance of education systems across countries. The Gross National Income (GNI) is an indicator of the potential resources available for education. The relative prosperity of some countries allows them to spend more on education, while spending in other countries with lower national income is constrained. It should also be kept in mind that GNI is not only related to financial resources available, but may also relate to human and technical resources and capacities within the education system. As described below, lack of these capacities presents major obstacles to participation in PISA as well as the ability to make use of the results.

Analysis of PISA 2009 and 2009+ data on the relationship between students' average reading performance and national income, as measured by the GNI (which is the threshold value of high income

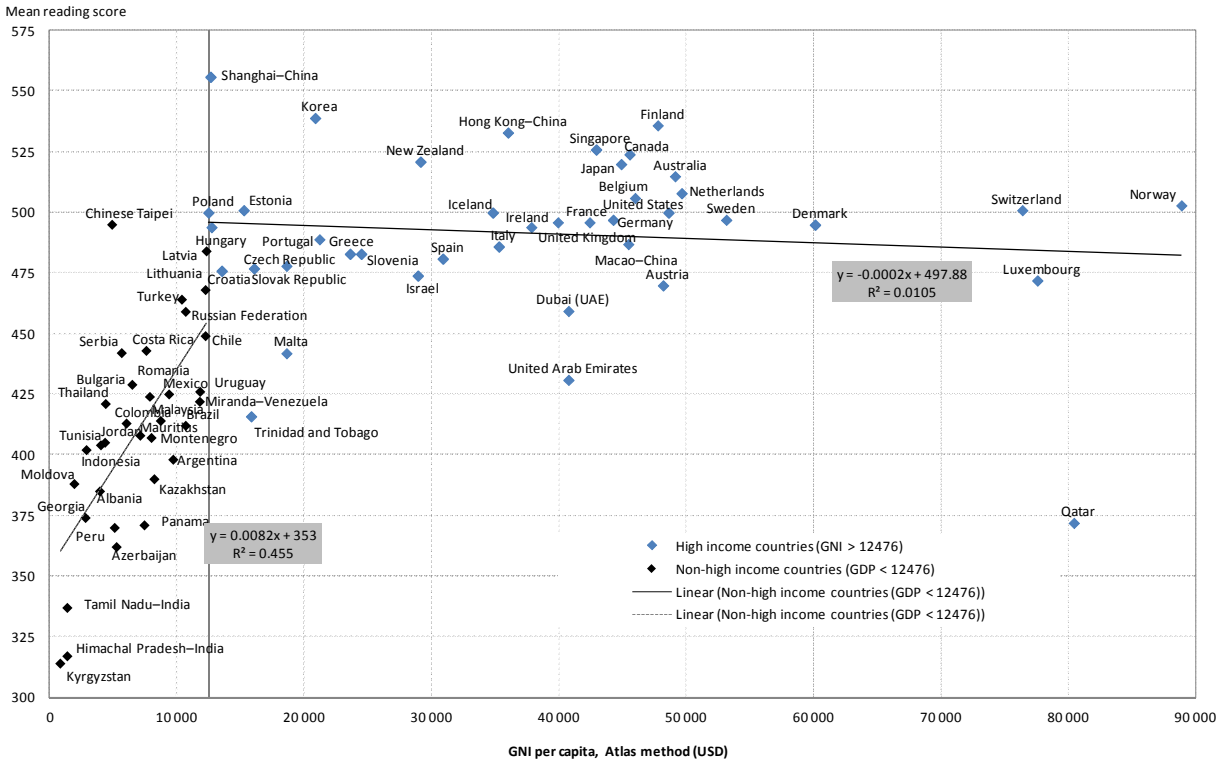
countries according to the World Bank's income grouping), reveals interesting relationships and patterns.[9] The relationship is not linear, instead flattening for countries with greater wealth. In fact, above the threshold of USD 12 475 per capita GNI (the threshold of high income countries), national wealth is no longer a predictor of a country's mean performance in PISA.

For countries with national income below USD 12 475 (low- and middle-income countries), however, money counts to a far larger extent. The relationship between performance and national wealth is much stronger for non-high-income countries. Thus, the statement "money alone can't buy a good education system" holds true as long as a certain minimum of financial resources is available to support adequate performance as well as improvement across the system.

Qatar and the United Arab Emirates are outliers among high-income countries. These exceptions highlight, once again, that along with economic development, social development should be taken into account in the interpretation and analysis of results and consideration of challenges of participating in PISA. Despite very high national income levels, Qatar and the United Arab Emirates show relatively low educational attainment levels among the adult population, and mean years of schooling considerably below many high-income countries.

9. The OECD addressed the issue of national wealth and performance in an earlier publication, using per capita GDP instead of per capita GNI in the analysis (OECD, 2011b). Results are very similar to the analysis based on GNI, whereas a per capita GDP of at least USD 20 000 can be considered as the threshold level from which national wealth no longer predicts performance (see Figure in Annex).

Figure 3: Average reading performance and national wealth (per capita GNI)



Source: OECD (2011c), *Table* I.2.3, OECD (2011d), Table IV.3.21c. ACER (2012), Table 2.1.
GNI per capita 2011 from World Bank Indicators.
GNI per capita for Chinese Taipei reported for China. GNI per capita for Dubai (UAE) reported for the United Arab Emirates. GNI per capita for Venezuela-Miranda for Venezuela, for the Indian States Tamil Nadu and Himachal Pradesh for India. For Shanghai-China GDP per capita is reported from http://www.globaltimes.cn/NEWS/tabid/99/ID/700783/PageID/622649/Top-10-richest-provincial-regions-in-China.aspx.
Linear regression lines, based on simple regression, are shown separately for high (GNI > USD 12 476) and non-high income countries (GNI < USD 12 476)
Notes: Liechtenstein did not report per capita GNI data.
12 476 USD is the threshold value of high income countries according to the country income group classification of the World Bank.

This finding has implications for OECD's work on PISA, and particularly "PISA for Development". It strongly supports the often-raised concern that what applies to OECD countries does not apply equally to all countries. "Between-system analysis" using PISA data, which takes all countries and economies into account, may lead to results and subsequent policy recommendations which could not be supported if analyses were to take different country groupings into account, notably in regards to national wealth.

3. POTENTIAL DETERRENTS TO PARTICIPATION AND CHALLENGES TO THE EFFECTIVE IMPLEMENTATION AND USE OF PISA IN LOW- AND MIDDLE-INCOME COUNTRIES

This chapter assesses the challenges to the effective implementation and use of PISA faced by low- and middle-income countries and economies. Whilst this analysis seeks to identify some common trends, the diversity of partner countries and economies participating in PISA highlight the importance of not automatically generalising trends to all contexts. The case studies from Tunisia and Kyrgyzstan included in this paper illustrate the challenges faced in these countries.

3.1 Funding for PISA

All countries joining PISA must cover the international and national costs involved in their participation; this can be a real challenge for countries and economies with low fiscal capacity or that do not have development partners to support them. The cost for participation in the PISA 2015 cycle was EUR 182 000 for new participants, paid in instalments of around EUR 45 000 per year over 4 years. These costs are for international development and implementation, and include staff costs at the OECD secretariat and sub-contractors. Participating countries must also bear all costs related to the national implementation of the programme, including staff costs related to the review of items, sampling activities, training of the test instructors, data coding, analysis of the national results and material costs such as printing test, travel expenses for the National Project Manager,[10] etc. Countries also must bear the costs for translation of items and questionnaires. These costs can vary greatly from country to country, depending on the country size, language(s) of testing and options that countries may choose to implement, such as parents' or teachers' questionnaires or financial literacy testing. It is important to note that national costs far surpass the international costs. The translation of assessment materials demands a substantial level of financial and human resources that are not readily available for low- or middle-income countries. For example, Tunisia used mainly Arab-language test items and context questionnaire questions from original translation done in Qatar, despite the fact that particular technology-related expressions are not used in Tunisia as was reported from a key informant.

As PISA is designed to allow the study of performance trends over time, countries interested in making long-term use of PISA results need to cover their ongoing participation. For some countries, this regular long-term expense requires a substantial share of the annual education budget.

In some cases, the involvement of low- and middle-income countries in PISA is supported by other international organisations, donor agencies or countries. The World Bank and Open Society Foundation have been the main sponsors of PISA participation for low- income countries. However, it should be borne in mind that external coverage of the participation costs is generally not sustainable over the long term, as donors are unlikely to commit over several cycles.

Large-scale international surveys offer reliable nation-wide data that are important for better organising and allocating assistance to the education sector and for defining priorities. PISA data on performance outcomes may also strengthen development assistance as PISA information may help donors to allocate funds more effectively and also ensures that countries are accountable to those donors for better results. Donor support for PISA may be promising, but it should be based on the principle of local ownership and national capacity building if PISA is to have a high profile (see Paris Declaration on Aid Effectiveness 2005, Accra Agenda for Action 2008, and Busan Partnership Agreement 2011).[11] In some instances, a countries' involvement in PISA may be driven by the donors' interest in obtaining reliable data for their own development activities in the country, rather than by national policy makers themselves. Lockhead (2012: 166) for instance, suggests the example of the World Bank in the early 1990's when the bank funded participation of developing countries in international student assessments due to "its own information and accountability needs as well as by the needs of its researchers (...) for data that could justify the bank's investment in the education sector". In such cases, the uses and perception of PISA results in national policy making and public debate may be attenuated.

10 . National Project Managers are appointed by their governments and are responsible for the implementation of PISA at the national level, subject to the internationally agreed administration procedures.

11 . All documents can be downloaded here: www.oecd.org/dac/effectiveness/parisdeclarationandaccraagendaforaction.htm

3.2 Fear of bad performance

Fear of bad performance (*i.e.* appearing at the bottom of the PISA "league tables") may be a potential deterrent to participation in PISA. Statistics, and in particular performance measures, increase transparency and demands for accountability. The likelihood of low performance may be worrisome to governments as they may invite resentment from the education stakeholders and the general public. PISA may not only reveal low performance, but may also shed light on stark inequalities within a country, which policy makers would not like to make public. Past experiences from certain countries have shown that, in reaction to disappointing PISA performance, governments pay little attention to PISA results and do not make any further analysis of results in the national context.

High attention to PISA in the worldwide media and on the international policy stage may also raise governments' concerns that bad performance may lead to stigmatisation. Fear that other governments, organisations or interest groups may question their capacity to deal with such fundamental education issues as the ability to assure equality and a minimum level of student competences, may also deter some countries from participating in international assessments like PISA. This point may be particularly relevant in developing countries that are dependent on donors who might include PISA results in the criteria used for investment decisions or actions.

3.3 Lack of institutional capacity

The first subsection discusses potential challenges to the effective implementation and use of PISA which may be commonly grasped under the heading, "lack of institutional capacity". These potential challenges are related to national survey implementation, and include aspects such as the choice of language for the testing instruments. The lack of analytical capacity is a challenge to effective use of PISA results. Finally, the lack of human and financial resources may as previously noted deter participation in other international collaborative efforts related to PISA.

3.3.1 National survey implementation

Countries and economies participating in PISA are responsible for test implementation at the national level. The implementation process involves working with the international sampling contractor to define and draw a representative sample of schools and students in compliance with the PISA Technical Standards. The Standards define the target population and sampling procedures. Implementation also involves school recruitment and the actual administration of the assessment in the participating schools. Countries and economies need to deal with issues such as translation, and the preparation and distribution of the assessment booklets. These tasks require substantial institutional capacity, which certain low- and middle-income countries may not have. "Institutional capacity", as used here, refers to the capacity of an institution – in this case the centre, organisation or institution in charge of implementing PISA in the country – to apply effective methods of oversight, management, organisation and revenue control (administrative capacity), and includes the availability of experts and trained personal that can help with the implementation (technical capacity) and analysis of the data (analytical capacity).

For example, if statistical information about schools and students is incomplete or inaccurate it will be very difficult to draw a representative sample. Although general statistical information about the structure and characteristics of educational systems around the world have been collected by international organisations like the World Bank or UNESCO's Institute for Statistics (UIS) for several decades, many poor countries still lack accurate data (notably, annually updated information, characteristics of particular student groups, accurate number of schools and students, etc.).

The two Indian states participating in PISA 2009+, Himachal Pradesh and Tamil Nadu, did not meet PISA standards for student sampling. As a consequence, caution must be exercised when comparing their results with other countries, and, perhaps even more importantly, results for the student population in those states cannot be considered as representative within the country context. The Miranda State of Venezuela, which also participated for the first time in 2009, could not meet international standards for school response rate. It should be noted that in some cases, rigorous international standards for sampling could not be met by OECD countries either, such as the Netherlands in 2000, and the UK in 2003.

3.3.2 Language of testing instrument

The PISA Technical Standards recommend testing students in their language of instruction in order to ensure analogous testing conditions for all students within a country. It is assumed that students have reached a sufficient level to participate the PISA test if they sit it in their language of instruction. Countries have the option of providing a choice of language at the student, school or regional/national level. In cases where the language of instruction differs across subject domains, students may be tested in different languages, whereby the test language for each domain must match the language of instruction for that domain.

In many low-income countries, the students' mother tongue is not the language of instruction for large minorities and sometimes even the majority of students. Although UNESCO has stressed the importance of schooling in the mother tongue since the 1950s (UNESCO, 1953), educational practices have not yet or have only recently changed in many low- and middle-income countries[12]. Differences in achievement due to language issues, and the analytical and theoretical implications for student assessments, have not been sufficiently taken into account in research, policy or practice (Naumann, 2005).

In countries where a majority of students speak a language at home that is not the official language at school, or where students change the language of instruction during their school life, the choice of the language of assessment is crucial. A precondition for a reasonable decision on the test language or languages would be to have a sound knowledge of students' language situation.

The diversity of languages spoken and taught within a country can be challenging, in particular for low- and middle-income countries with less financial and institutional capacity to translate and adapt items and questions appropriate to their linguistic context. Moreover, countries are responsible for the translation of all assessment materials, including test items, questionnaires and manuals into one or more test languages. While the Technical Standards provide the PISA translation and adaptation guidelines (which recommend translation from two equivalent original versions of the assessment material in English and French) and a team of international verifiers conduct the linguistic quality control of translated materials, the actual exercise of translation is the responsibility of the countries themselves.

3.3.3 Lack of analytical capacity to gain insight from the results

The OECD Secretariat publishes a series of international reports that present and discuss the main results of all countries participating in the different survey cycles (for PISA 2009 the results were presented in 6 volumes, OECD, 2010 b,c,d,e,f,g). But these international PISA reports cannot substitute for national-level data analysis; national reports cover country-specific issues and policy priorities and go well beyond themes and analysis of the international reports. Moreover, national reports play an important role in informing education stakeholders, and provide a common basis for discussion. National reports in the national language contribute to further this goal.

[12] There are also high-income and high-performing countries and economies where this is the case, as for example in Singapore, where all students do PISA in English.

The policy benefit of PISA participation is often determined by the extent to which the results also serve national education systems' objectives and interests. Most OECD countries therefore produce national reports that deal with national issues in much greater detail than the international reports. In some countries, divisions within national research centres or even new research institutes have been set up to analyse PISA data and produce national reports drawing on these analyses. Yet this is rarely the case in low- and middle-income countries. In most of these countries, there is no PISA national report and no national data analysis. Reasons vary, from low analytical capacity to human and financial resource restrictions, or lack of political interest (*e.g.*, low performance may lead to results being withheld rather than further analysed and disseminated among stakeholders).

Countries may contact the contractors responsible for PISA's development and implementation for assistance with national reports, including the analysis and interpretation of the findings, within the national policy context. Yet, these options for assistance are costly and are hardly used as reported in key informant interviews. Without internal analytical capacity, low- and middle-income countries often rely on external consultants. This is a promising option, but suitable candidates need to be recruited and adequate financial resources are needed.

OECD country assistance has proliferated in recent years, offering national reviews under the series "Lessons Learned from PISA". Notably the Canary Islands[13] (OECD, 2012b), Kazakhstan (OECD, 2013c, forthcoming) and Kyrgyzstan (OECD, 2010a) have chosen this option. Here again, money is an important factor, as these reviews must be paid for by the country or region. Financial support, or even full financial coverage by international donors, is possible. Additional factors include lack of awareness and possibly also a lack of interest in reports that may point out problems in education systems that the government or certain stakeholder groups would prefer not to make public.

In contrast to the cross-national *Southern and Eastern Africa Consortium for Monitoring Educational Quality* (SACMEQ) study by 15 participating ministries of education from that region, PISA does not focus on national analytical capacity building. Countries may improve their analytical capacity as a result of their participation in PISA,[14] and this is considered as a positive feature, but it is not the principal objective. Since 1995, SACMEQ has conducted three sub-regional comparative studies of student performance in reading, mathematics and, in the latest cycle, HIV and AIDS knowledge of sixth graders based on common aspects of the 6th grade curriculum in the 15 participating education systems. The mandate of SACMEQ is to undertake research in order to generate information for policy making, with a strong focus on training activities to obtain the technical skills required to monitor, evaluate and compare empirical findings for educational planners and researchers within the ministries. All 15 ministries write national reports, although they may take several years to complete.

3.3.4 Capacity for full participation and international collaboration

International participation and collaboration in PISA involves two yearly PISA Governing Board (PGB) meetings, meetings of the National Project Managers (NPMs), and other events such as training meetings for implementation in schools, data analysis or translation. At these meetings, each country is represented by the NPMs, who carry out the surveys in the national context, and a PGB representative who is responsible for specifying the policy priorities and standards for the development of indicators and of the assessment instruments, and the reporting of results. These meeting are important platforms for exchange of experiences among countries and experts. Rare or no participation in international collaboration may be

13 . The Canary Islands are a region of Spain and thus part of the OECD.

14 . For example, some OECD countries used PISA in guiding technical and methodological changes to the way their own national assessments are conducted (Breakspear, 2012).

an impediment to the feeling of ownership, which is generally considered important for motivation and engagement of stakeholders

Participation in the PGB is optional for partner countries, which have only *observer* status in the development and governance of PISA, and thus no decision-making power. As observers, they have rights to access materials developed for the PGB members, although access to some materials is restricted to OECD members. Under certain conditions partner countries may also become *Associates* of the PGB, with full decision-making power - although no country has yet applied for this status.

Requirements regarding the NPM's roles are clearly stated in the official agreement for partner countries' participation. According to this agreement, the NPM should have high-level oral and written communication skills, fluency in English, and knowledge of the national education system in their country. Mastery of English is crucial as it is the language of communication among NPMs, and is also the language used in the written documentation. Some low- and middle-income countries have difficulty in recruiting an NPM who meets all of the required criteria. In some cases, NPMs are recruited from senior level staff in the Ministries of Education, and as reported in key informant interviews, they may have little experience in the implementation of student assessment surveys or international cooperation.

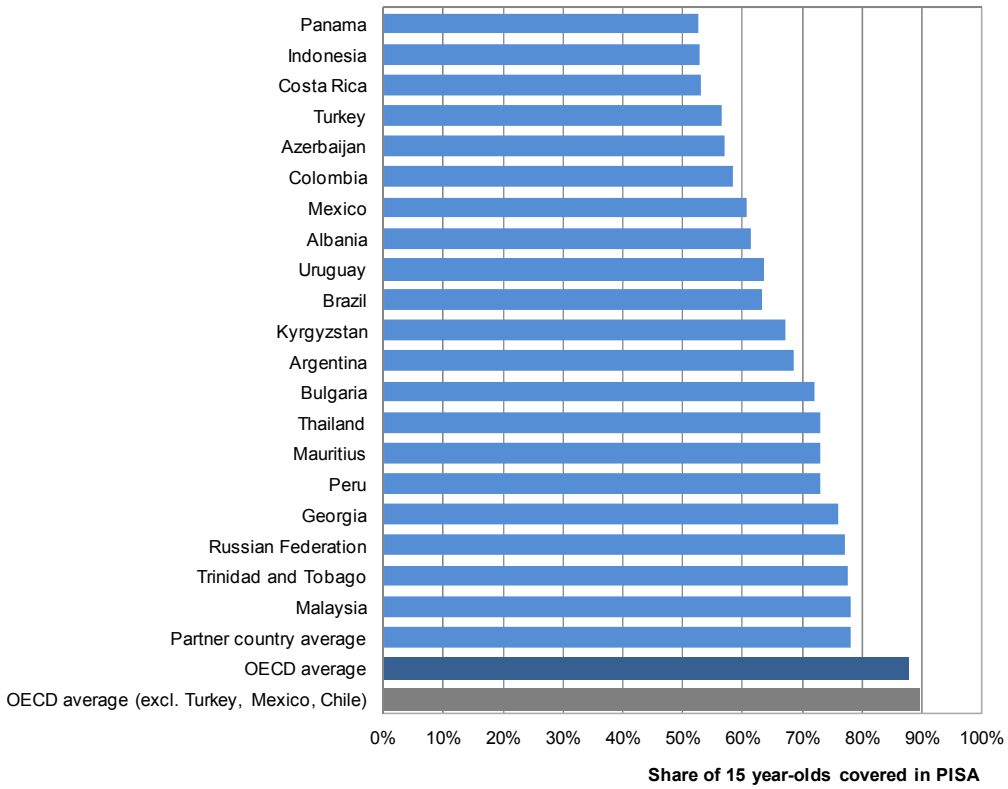
Moreover, participation in international activities is costly and countries are responsible for paying their own expenses. The travel expenses may be insignificant for rich countries, but may represent a substantial sum for low- and middle-income countries with very limited educational budgets, as stressed in interviews with informants from some of these partner countries.

3.4 15 year-olds as target population

The decision to target 15 year-olds was central in the design of PISA. This is the age at which students generally complete their compulsory education in most OECD countries. In all OECD countries, with exception of Mexico and Turkey, the end of compulsory schooling is age 16 or above, so at least in theory, all 15 year-olds are still attending school when PISA is conducted. Thus, PISA surveys can derive a representative sample of all 15 year-olds in a country. But this is not the case for several participating countries.

Figure 4 shows the share of the 15 year-old population covered in PISA in selected countries. In most OECD countries, PISA covers at least 85% of 15 year-olds, on average, and when Chile, Mexico and Turkey are excluded, 89% of all 15 year-olds. In various low- and middle-income countries, PISA reaches less than 80% of all 15 year-olds, in some even less than two thirds. Again, the OECD countries Mexico and Turkey are among participating countries with the lowest coverage of 15 year-olds in PISA

Figure 4: Coverage of 15 year-olds in PISA 2009 and 2009+, selected countries



Notes: The chart shows the coverage of 15 year-olds in PISA 2009 and 2009+. It shows countries where the coverage of 15 year-olds is below the average coverage in partner countries for which data are available. It also shows the partner country average, the OECD average and the OECD average excluding Turkey, Mexico and Chile as the three OECD countries with lowest coverage rates. No data are available for Venezuela-Miranda and the Indian States Himachal Pradesh and Tamil-Nadu.
Countries are ranked in ascending order of the share of 15 year-olds covered in PISA.
Source: OECD (2010b), Table A2.1; ACER (2012), Table A.2.

In many low- and middle-income countries, school enrolment of 15 year-olds is not universal: the school-leaving age may be lower than 15 years-old or there may be higher levels of out-of-school children or drop-outs. In addition, precise numbers of youth not in school and contextual information on their schooling history are not known. PISA thus cannot capture all of the 15 year-old population, yet it can capture a representative sample of 15 year-old students in school.

It is likely that performance results in these countries would be lower if all 15 year-olds were to be included. Other measures, most importantly, equity measures, would be less meaningful if most disadvantaged students were no longer in school at this age, and the PISA results would refer to an already relatively privileged student population.

Cross-country comparisons are also affected by differences in population coverage. Additional insights are needed to adequately assess the significance of enrolment rates and to find solutions as to how to make more reliable comparisons for countries with different enrolment rates.

Moreover, PISA uses age-based sampling, which is relatively independent of the grade the students attend (they must be at least in grade 7). Thus, students assessed in PISA are at various grade levels. In OECD countries, most students are in grades 9 or 10 when they are 15 years old. In many low- and middle-income countries, 15 year-olds attend lower grade levels (OECD, 2011b, Table A2.4a). The reasons are manifold: school-starting age may be higher than in highly industrialised countries which have gradually

reduced school-starting age over the last decades. Repetition rates may also be higher, or students may interrupt their schooling for a certain period due to their socio-economic circumstances (*e.g.* family wealth, family structure, expectations, etc.) or crisis situations in the country or their local community. The likelihood that 15 year-old students are in a grade below grade 7, and thus not part of the PISA target population, is higher in developing countries, with implications for sample representativeness.

The "PISA for Development" Project includes plans to assess out-of-school 15 year-olds in order to gather information about their socio-economic background, schooling history and current situation, as well as information about their cognitive performance (OECD, 2013a,b).

3.5 Less relevance of descriptions and analysis related to the students' distribution on the proficiency levels scale

The majority of students in many low- and middle-income countries achieve at the lower end of the PISA proficiency scale in each of the disciplines tested. For example, in Brazil, 50% of students achieve below PISA reading proficiency Level 2, whilst across the OECD, on average, 19% of students achieve at this level. This leads to two particular challenges. First, whenever proficiency is particularly low across a large proportion of a population, many of the descriptive statistics and analyses that are currently being produced may not be very informative. For example, proficiency levels reported by PISA are based on psychometric analyses, with assessment frameworks for each domain drawing on research evidence of what 15 year-olds in OECD countries are capable of. Thus, the lowest levels of proficiency, which include a relatively small proportion of students in most OECD countries, likely include a large proportion of students in some low- and middle-income countries. Moreover, only a very small proportion of students from these countries achieve at the highest proficiency levels, so most students are clustered in low proficiency levels. The potential information content in relation to descriptions and analysis related to the students' distribution within and across proficiency levels may be more limited. Second, as an issue of test-targeting, reliability of measurement is, by definition, lower at the bottom of the performance distribution due to smaller number of test items at these levels. This can influence the quality of results for low performing low- and middle-income countries that have a large percentage of students performing at these levels. PISA has already made progress in this area by introducing the option for countries to administer test booklets containing easier items in 2009. These questions are aimed at assessing performance at the lowest levels of proficiency in order to increase the reliability of measurement for low- performing students. This "Easy Booklet Option" was recommended to countries with a mean score below 400 score points. Yet, not all countries with a large share of students at low or very low proficiency levels chose this option.

In PISA 2012, reading was a minor test domain, and so fewer reading items were administered to participating students. Nevertheless, countries had the option to choose the component reading skills assessment which allows for a more detailed capture of reading proficiency levels at the lower end of the scale. Yet only two countries chose this option in PISA 2012. This points to a dilemma. Lower performing OECD countries are reluctant to use this option, which they may think is for low- performing partner countries and thus "for the others". Partner countries may be reluctant to use it in order to have the status of a "normal participant" of OECD's PISA programme.[15] There is also a perceived risk of stigma when using options which target particularly low performance.

3.6 The potential for public debate on education performance and equity

Empirical data provide a common basis for discussion among stakeholders with varying roles and interests. For political reforms to be successful, stakeholder compliance and engagement is considered as

15 . This has been a point of discussion in the "PISA for Development" project discussions.

crucial. Only then is there some guarantee that reforms will actually be implemented and thus lead to hoped-for improvements.

> *The multiple factors that influence education and their degree of interconnection mean that the extent to which education policies are successful depends markedly on the amount of processed knowledge available at the points of decision when policies are conceived and throughout their implementation. This does not mean that education policies should ignore opportunity criteria, which cannot be dissociated from the public action, but the more solidly based the policies, the more likely it is that pertinent compromise will be achieved between the underlying criteria of a short term view and those of a longer term view, inherent in the very nature of education. Furthermore, when there is mature public opinion, a solid internal basis for education policies provides many plausible arguments, facilitates their justification and communication and favours the indispensable support of society. (Rupérez, 2003, p. 255)*

Achieving consensus among stakeholders is a difficult endeavour in any country, but may be particularly difficult in countries where democratic institutions are weak. In many low- and middle-income countries, the policy making process is highly centralised and the different stakeholder groups have only very little influence in decision-making bodies, or are not present at all. Often, the stakeholder groups themselves are badly organised and unable to reach consensus among their members. This may lead to resentment and resistance to reforms, rendering their implementation difficult.

National-level research and political and scientific debates raise the impact of PISA (*e.g.*, Egelund, 2008 for Denmark; Ertl, 2006 for Germany; Grek 2009; Takayama, 2008 for Japan). However, in developing countries in particular, national expertise to analyse PISA country-level data and to use these analyses in national education debates is often lacking. Moreover, PISA results often are not widely shared with the public.

Specific PISA findings, notably equity of learning outcomes, may be considered less important in low- and middle-income countries. PISA captures the level of equity of all 15 year-olds in school and it does so for all countries. Yet, questions related to equity in the school system may be less relevant in countries where a large number of 15 year-olds are no longer in school, as described above. On the other hand side, questions of equity in general may be different, but may be even more relevant, in countries with many out-of-school 15-year-olds.

This may also be the case for other analyses based on PISA data, due to diverging policy priorities between lower-income countries and OECD countries, as these two country groups have very different socio-economic and cultural circumstances. For example, the classic immigration countries in the OECD area are particularly interested in the equity of student outcomes for students with who have immigrant backgrounds and those who do not, while in many low- and middle-income countries, equity issues primarily relate to the achievement of ethnic, religious or language minorities.

In general, PISA measures skills that are judged to be important for adult life in the context of globalisation and the emerging knowledge society. By testing the application of knowledge in everyday life situations, PISA measures competencies and not only knowledge. These knowledge and competencies are certainly important for OECD countries and partner countries alike. However, developing countries that are still dealing with the spatially inclusive and comprehensive elaboration and implementation of curriculum may be more concerned with assessing whether schools are successfully meeting objectives of national curricula. Curriculum-based national or international student assessments, may better fit the policy priorities of the education ministries of these countries as such assessments may provide a better answer to the questions, like, have students actually learned in school what they are supposed to learn, and, do

schools successfully teach students what they should as set in the curriculum.[16] That said, even in these countries, the final objective is to have students who can actually apply knowledge at school and in their daily lives so PISA remains very relevant to them.

4 CASE STUDIES

The following case studies illustrate the challenges faced specifically in Tunisia and Kyrgyzstan.

4.1 Case study 1 - Tunisia

Tunisia has participated in PISA since 2003 and completed its fourth cycle with the 2012 study. Tunisia also participated in TIMSS for 4th grade mathematics and science over two cycles – 2003 and 2007 -- and for 8th grade mathematics and science over three cycles – 1999, 2003 and.2007.

4.1.1 Some key results…

In 2009, Tunisia achieved a mean score of 404 points in reading. This is similar to Argentina, Jordan, Indonesia and Montenegro. Half of Tunisian students perform below the baseline proficiency level (Level 2). Almost no students achieve at the highest proficiency levels, Levels 5 and 6 (0.2%), and 3% of students achieve at Level 4. Girls outperform boys by 31 score points, which is below the OECD average of 39 score points. As in all participating countries, students' socio-economic background influences their performance, although the effect of background on performance is lower in Tunisia than the OECD average.

The low-average performance in Tunisia reflects, in part, the fact that, on average, students are more socio-economically disadvantaged than in OECD countries; three-quarters of students have a *PISA index of economic, social and cultural status* below -1, and thus belong to the 15% of students in the PISA sample who are most disadvantaged. Taking the disadvantaged socio-economic profile of Tunisian students into account would improve average reading performance in Tunisia by 22 score points with a mean score of 426. Despite this improvement, which is purely hypothetical, Tunisia would still lag far behind performance in a typical OECD member country.

Comparing results between PISA 2003 and 2009 shows that Tunisia has significantly improved in all three domains, with the greatest gains in reading. Despite these improvements, Tunisia's student performance is still far below average OECD performance, lagging behind OECD countries by almost three years (39 score points are associated with one year of schooling). The proportion of students at "below Level 1" decreased from more than 50% to 43% between 2003 and 2009. The share of students at Level 1 decreased slightly between 2003 and 2006 and increased again by 5 percentage points to 30% in 2009. Tunisia has a very high repetition rate, with 43% of students having repeated one or more years during their schooling, compared to the 13% OECD average. Tunisian students in rural areas are particularly disadvantaged compared to students in urban areas. Even after controlling for students' socio-economic background, students in rural areas perform 45 score points below their peers in urban areas.

Mean performance in TIMSS for fourth graders was 359 score points in mathematics and 346 score points in science in 2011. Eighth graders achieved 425 score points in mathematics and 439 in science. As in PISA, the country's mean performance remains far below the international average of 500 score points. The results indicate an increase in mathematics performance of 4th graders of 32 score points between 2007 and 2011, science performance also increased by 27 score points. For 8th graders, results in 2011 were not significantly different from those achieved in 2007. In particular, the high performance in mathematics of

16 . This point was raised by a UNESCO education expert.

448 score points in 1999 dropped significantly in 2003 and although performance increased slightly in 2007 and 2011, it remains below the level achieved in 1999 (IEA, 2012a,b).

4.1.2 Challenges of participation

Despite Tunisia's long participation in PISA and other international studies, the results of are largely unknown among the general public, policy makers and other education stakeholders. Up to the present, no efforts have been made to mobilise the different school-level actors, notably school principals and teachers. Moreover, the national PISA database has hardly been exploited and no national report has been produced, so those Tunisians who are aware of PISA rely almost exclusively on results from the international PISA reports.

The Quality Improvement Department (*Département d'évaluation*) within the CNIPRE, *Centre National d'Innovation Pédagogique et de Recherches en Éducation*, which was founded after the Tunisian revolution in January 2011, is responsible for the implementation of the PISA test. These political and institutional changes, we have been told, have contributed to a now strong willingness to better benefit from PISA and other international studies. It is hoped that data will no longer be kept hidden from the public view, but that results will guide the education discourse.

Tunisia notes "lack of political will and know-how" as the main factors which have in the past and still now hamper the use of PISA for national education policy making. Know-how, in terms of human and technical capacities to accurately interpret international analysis and to conduct further country-level analyses, is crucial to ensuring the pertinence of PISA for national policy making.

Tunisia rarely participates in PISA activities, *e.g.* PISA Governing Board meetings or data analysis training workshops, due to language problems and restricted financial resources. Tunisia reported experiencing serious difficulties in finding people who are trained in statistics and familiar with PISA, and who have a level of English sufficient to participate in workshops or read publications and reports produced in English.

Tunisia experiences additional language-related problems, notably translation of test items and the questionnaires, and more generally, the question of which test language to use. Due to limited financial and human resources, Tunisia administered the Arabic test version used in Middle Eastern countries and economies in PISA 2009 and earlier cycles. Yet Tunisia has its own Arabic dialect with different words and expressions, often mixing Arab and French. While children begin school in Arabic, French is the language of instruction for natural science subjects and for mathematics from the upper secondary school level onwards. In addition, Arabic is mainly a spoken, and not written, language in Tunisia. The assessment of competencies in Arabic has thus led to some difficulties, as a portion of students will have been taught in French when they sit the PISA test. Such language-related problems may appear in other countries with high linguistic heterogeneity and, possibly, the use of different languages of instruction over the school career.

4.2 Case Study 2 – Kyrgyzstan

Kyrgyzstan participated in PISA for two cycles, 2006 and 2009. The country did not participate in the 2012 cycle. In reaction to disappointing PISA results in 2006, Kyrgyzstan commissioned an OECD review of its education system (OECD, 2010a). Financing for the report was provided within the framework of the Education Programme Development Fund under the Education for All Fast Track Initiative managed by the World Bank. Additional in-kind support was provided by the European Training Foundation (ETF).

4.2.1 Some key results…

The PISA results were extremely disappointing in that Kyrgyzstan's 15 year-olds were ranked last in overall performance in reading, science, and mathematics literacies among all countries participating in PISA in 2006 and 2009. In 2006, students in the Kyrgyz Republic achieved a mean score of 322 points in science, 311 points in mathematics, and 285 points in reading. In 2009, reading performance improved to 314 score points, in mathematics to 331 score points and to 330 score points in science. But Kyrgyzstan remains last among participating countries and economies – despite significant government investment of resources and efforts in education.

In Kyrgyzstan, 83% of 15 year-olds do not reach Level 2, the baseline level of achievement on the PISA scale. Virtually no Kyrgyz 15 year-olds reach Level 5 on the reading scale (OECD average 8%; Kyrgyzstan: 0.1%) and only 1% of students can be considered as strong performers (Level 4, OECD average: 21%). Results for mathematics and science are similar.

Students' performance is strongly related to school location. Students in schools in large cities, and thus in the capital Bishkek, tend to perform the best (420 score points in reading), followed by students in schools in cities, towns and small towns (398, respectively 338 and 313 score points). Students in schools in villages have the lowest scores (284 points). Students in city schools outperform students attending rural schools by 122 score points. A certain proportion of this performance variation between schools can be explained by the differences in the average socio-economic background of students in the schools, but a 94 score point performance gap persists even after accounting for students' socio-economic background – a difference equivalent to more than two years of schooling. Students in schools with Russian as the main language of instruction, often situated in cities (and thus correlated to rural-urban differences), perform better than those in schools where students are taught mainly in Kyrgyz, Uzbek or other languages (OECD, 2010a).

4.2.2 Challenges of participation

As was stated in the 2010 OECD country review, Kyrgyzstan's education policy making depends heavily on external expertise and funding, as the Kyrgyz Ministry of Education has only limited capacities for data handling and analysis. PISA and its results are unknown to the general public and education stakeholders in education. Moreover, the country review authors concluded that external interests seem to have shaped the Kyrgyz Education Strategy. This conclusion was based on an assessment of ownership for the Education Development Strategy 2007-2010, which was undertaken in 2008 and described as a donor-driven document. The Ministry of Education considers the document to be a "Fast Track Initiative Strategy" rather than a national Education Strategy (Steiner-Khamsi and Chachkhiani, 2008). It is thus not surprising that the involvement of stakeholders in the policy dialogue – schools, parents, and local communities –hardly takes place. Moreover, partly due to government changes, there are frequent changes of policy priorities, hampering longer-term funding commitments (OECD, 2010a).

Kyrgyzstan has never participated in any PISA Governing Board meetings or training workshops. It will not take part in PISA 2015 and thus will not be able to monitor evolution of performance and other indicators with PISA, such as performance difference between rural and urban students or students from different migration backgrounds.

5 CONSIDERATIONS MOVING FORWARD

Several actions and steps might be undertaken to improve the implementation and effective use of PISA in national policy making. The "PISA for Development" project set up by the OECD at the end of 2012 aims to enhance the policy relevance of PISA for developing countries. The initiative acknowledges

that, given the large numbers of middle-income countries that already participate in each PISA cycle; the challenge now is to increase the relevance and accessibility of PISA for developing countries. It will attempt to do so through the development of enhanced PISA survey instruments and data collection methods that are more relevant in the context of developing countries, including a strand of work focusing on methods to engage out-of-school 15 year-olds (OECD, 2013a,b). The following three recommendations are tied to the project framework of "PISA for Development".

5.1 Improve the measurement and descriptive information at the bottom end of the achievement scale

An increase in the number of less difficult test items in reading, mathematics and science will help strengthen evaluation of the knowledge and capacities of those students at the bottom end of the achievement scales. Despite progress in this area, notably in the reading skills assessment, the PISA assessment frameworks could be developed further to define and operationalise the knowledge and skills of students at very low proficiency levels. This would provide meaningful results for analysis in lower-performing countries.

Through the 2009 cycle, countries with low mean performance were given the option of administering the easy-booklet test, with a larger number of items at lower proficiency levels. Only 17 countries chose this option in PISA 2009 and PISA 2009+. There is no explanation as to why this option has not been used by more low-performing countries, particularly since it is fully compatible with the regular PISA test and the PISA performance scale, and still allows effective measurement of higher proficiency levels. One reason may be that countries were afraid that such a choice might lead to stigmatisation.[17] Yet, this does not seem to be a strong argument, as mean performance of countries is not affected. Another explanation may be that countries have not been made fully aware of the advantages of this option. It is possible that the information the PGB has provided has been insufficient and should be followed up with direct discussions with the countries concerned. Another reason may be that low-performing countries have been informed of this option but have simply not responded (on time) to the request.

In the PISA 2015 cycle, countries are able to administer PISA in either computer-based or paper-based mode. In the computer-based tests, there will be some limited piloting of adaptive assessment, which it is hoped will lead to further development of adaptive testing in future cycles. This method of adaptive testing would automatically assign test items to students better corresponding to their proficiency level; students who answer questions correctly are directed to a more difficult question, and those answering incorrectly are directed to an easier question. This would improve the accuracy of measurement of students' knowledge and capacities at the different proficiency levels, as the information about what students know and can do, would be measured in a more differentiated fashion and more extensively for each proficiency level. This would be particularly relevant in countries with a large share of students at low proficiency levels, and potentially large differences among those students that could be better captured with adaptive testing. This new method could, in future cycles, replace the Easy Booklet option.

It would probably be beneficial for all countries, and for the reasons outlined above, for low- and middle-income countries in particular, to move towards computerised adaptive testing. However, apart from the still many unresolved technical and methodological issues related to computer-based and adaptive testing, it is questionable if all low- and middle-income countries would be able to use this testing method. Computer-based assessment requires high technical capacity which may not be available in those countries. Important questions are, for instance, whether schools have sufficient and suitable computers available, if additional laptops will need to be provided, and if the risk of electrical power outages is negligibly small (for more information on computer-based assessment, see OECD, 2011c).

17. This has been raised as a potential explanatory factor from PISA team members.

5.2 Enhance the student background questionnaires

The PISA background questionnaires for students and schools should be adapted to better reflect the schooling contexts and policy priorities of low- and middle-income countries. This will enhance the PISA's policy relevance for issues related to quality and equity. This includes, for example, the adaptation of questions to capture students' ethnic background, school resources and facilities and/or school management. Countries may decide whether to include additional national-level questions. However, this needs careful and timely preparation, which often is not guaranteed due to specific circumstances and challenges, as outlined above. Moreover, this is also an issue of cost, as countries must pay for the development, implementation, and analysis of national questionnaire options.

The OECD Secretariat would need to be more proactive in encouraging and assisting countries to adapt background questionnaires to better correspond to their schooling conditions and policy priorities. Under the "PISA for development" project, for example, further adaptation of the items used for the *PISA Index of economic, social and cultural status* (ESCS) beyond the already existing country-specific items are foreseen. In addition, the Secretariat is planning the development of new questionnaire items, which aim to better capture policy challenges and priorities in developing countries (OECD, 2013a,b).

5.3 Assist countries in national data analysis and peer-to-peer exchanges

Steps could be undertaken to make it easier for countries to have secondary analysis conducted by the OECD or other contractors. These analyses may need to be built into the original costing plans for each PISA cycle, *e.g.* as an option for countries might choose. This may help with the way in which PISA funding is delivered. The OECD could also actively approach funding agencies and suggest the additional benefits of funding a secondary analysis report.

Additional funding would be necessary for low- and middle-income countries to develop assessment materials that are appropriate to their national context. Countries with the same language (but with different dialects) may collaborate for a more efficient and less costly translation process. Such a network has been set up for Spanish-speaking countries. Similar networks could be formed for other language groups.

The PGB could also strategically build national assessment capacity. The PGB has already offered several data analysis workshops for NPMs and/or ministry of education staff carrying out the PISA data analysis. However, the PGB could offer more workshops like these. The Secretariat could also be more proactive in encouraging countries to get in contact if specific issues or problems arise and seek ways to hold further workshops regarding common concerns keeping costs to a minimum. It may also be useful to form country support groups where a high capacity OECD country assists a low capacity country with data analysis.

CONCLUSION

The number of low- and middle-income countries participating in PISA has increased from cycle to cycle. Countries participating in PISA differ widely in regards to their social and economic development. Low- and middle-income countries tend to perform at significantly lower levels in the cognitive assessment than do typical OECD countries. The share of students not achieving a minimum level of reading proficiency exceeds half of the student population in some countries. Yet experiences from low-performing countries that have participated in more than one cycle show that improvement is possible. Some countries have successfully reduced their share of low-performing students over time.

The discussion in this paper suggests that classification of countries solely on the basis of OECD membership is not useful as large differences (and similarities) can be found within OECD and non-OECD

countries as well as between them. Analysis of PISA performance in relation to national wealth gives reason to assume that a classification on the basis of a certain status of economic and social development, rather than on the basis of OECD membership, is a more useful approach to dealing with particular challenges to participation and use of PISA.

Lack of funding and has been stated as potential deterrents to participation. Lack of institutional capacity and less relevant results due to a non-representative sample of 15 year-olds and clustering of students at low proficiency levels have been discussed as main challenges for participation and effective use of PISA. The discussion also touched upon elements of the PISA design and implementation that may pose particular difficulties or challenges for low- and middle-income countries. The case studies from Tunisia and Kyrgyzstan illustrate the challenges faced in these specific country examples.

The paper concludes with considerations on how the OECD and its partners may address these challenges. These recommendations are part of the planned actions in the framework of the "PISA for Development" project. The discussion presented suggests that it is a good opportunity for the OECD Secretariat to take action to further improve the measurement and descriptive information provided at the bottom end of the achievement scale. In order to improve the policy relevance of PISA, and also validity of contextual information, the background questionnaires should be adapted to better reflect the needs of low- and middle-income countries. Lastly, the discussion presented in this paper highlights the demand of countries for national data-analysis assistance and peer-to-peer exchanges to which the OECD Secretariat is well positioned to contribute.

REFERENCES

Australian Council for Educational Research Ltd. (ACER) (2012), PISA 2009 Plus Results. Performance of 15-year-olds in Reading, Mathematics and Science for 10 Additional Participants, ACER Publishing, Camberwell.

Breakspear, S. (2012), "The Policy Impact of PISA: An Exploration of the Normative Effects of International Benchmarking in School System Performance", OECD Education Working Papers, No. 71, OECD, Paris. http://dx.doi.org/10.1787/5k9fdfqffr28-en

Cariola, L.; Covacevich, C.; Grubler, J.; Lagos, E; Oritz, M. (2011), Chilean Participation in IEA Studies, in Papanastasiou, C.; Plomp, T.; Papanastasiou, E. (eds.) IEA 1958-2008: 50 years of experiences and memories, Cultural Center of the Kykkos Monstery, Nicosia, Cyprus.

Egelund, N. (2008). "The Value of International Comparative Studies of Achievement - A Danish Perspective", *Assessment in Education: Principles, Policy & Practice*, Vol. 15, No. 3, pp. 245-251.

Ertl, H. (2006), "Educational Standards and the Changing Discourse on Education: The Reception and Consequences of the PISA Study in Germany", *Oxford Review of Education*, Vol. 32, No. 5, pp. 619–634.

Grek, S. (2009), "Governing by Numbers: The PISA Effect in Europe", *Journal of Education Policy*, Vol. 24, No. 1, pp. 23-37.

International Association for the Evaluation of Educational Achievement (IEA) (2012a), TIMSS 2011 International Results in Mathematics, IEA Publishing, Amsterdam.

IEA (2012b), TIMSS 2011 International Results in Science, IEA Publishing, Amsterdam.

Kamens, D. (2012), Globalization and the Emergence of an Audit Culture: PISA and the search for `best practice` and magic bullets, in: Meyer, H.-D.; Benavot, A. (eds.), PISA, Power and Policy: the emergence of global educational governance, Oxford Studies in Comparative Education, Vol.23, No.1, pp. 117-140.

Lockhead, M. (2010), The Craft of Education Assessment: Does Participating in International and Regional Assessments Build Assessment Capacity in Developing Countries? International Association for the Evaluation of Educational Achievement, Amsterdam.

Lockhead, M. (2012), Causes and Consequences of International Assessments in Developing Countries, in: Meyer, H.-D.; Benavot, A. (eds.), PISA, Power and Policy: the emergence of global educational governance, Oxford Studies in Comparative Education, Vol.23, No.1, pp.163-185.

OECD (2004), Learning for Tomorrow's World– First Results from PISA 2003, OECD, Paris.

OECD (2010a), Kyrgyz Republic 2010: Lessons from PISA, Reviews of National Policies for Education, OECD, Paris.

OECD (2010b), PISA 2009 Results: Overcoming Social Background, Equity in Learning Opportunities and Outcomes (Volume 2), OECD, Paris.

OECD (2010c). PISA 2009 Results: What Students Know and Can Do: Student Performance in Reading, Mathematics and Science (Volume I), OECD, Paris.

OECD (2010d), PISA 2009 Results: Learning Trends: Changes in Student Performance Since 2000 (Volume 5), OECD, Paris.

OECD (2010e). PISA 2009 Results: What Makes a School Successful? Resources, Policies and Practices (Volume 4), OECD, Paris.

OECD (2010f). 2009 Results: Learning to Learn (Volume 3), OECD, Paris.

OECD (2010g). 2009 Results: Students On Line. Digital Technologies and Performance (Volume 6), OECD, Paris.

OECD (2011a), Adaptive Testing for PISA: Benefits, Opportunities, Issues and Implications; 32nd meeting of the PISA Governing Board, EDU/PISA/GB(2011)15

OECD (2011b), "Does Money Buy Strong Performance in PISA? PISA in Focus", No.13., OECD, Paris, http://www.oecd.org/pisa/49685503.pdf

OECD (2011c), PISA 2015 "Computer Based Assessment: Cost Benefit Analysis", 33rd meeting of the PISA Governing Board, EDU/PISA/GB(2012)6.

OECD (2012a), Education at a Glance 2012: OECD Indicators, OECD, Paris.

OECD (2012b), Guidance from PISA for the Canary Islands, Spain, OECD, Paris.

OECD (2013a), "PISA for Development" website, www.oecd.org/pisa/pisafordevelopment/, accessed 29 May 2013

OECD (2013b), "The OECD's Contribution on Education to the Post-2015 Framework: PISA for Development", www.oecd.org/pisa/pisafordevelopment/POST-2015%20%20paper%20education_20%20Feb.pdf, accessed 29 May 2013

OECD (2013c), Review of Policies of Secondary Education in Kazakhstan, OECD, Paris, forthcoming.

Naumann, J. (2005), "TIMSS, PISA, PIRLS and Low Educational Achievement in World Society", Prospects: *Quarterly Review of Comparative Education*, Vol. 35, No. 2, pp. 229-248.

Rupérez, F.L. (2003), "Globalization and Education", *Prospects: Quarterly Review of Comparative Education*, Vol. 33, No. 3, pp. 249-261.

Schleicher, A. (2007), "Can Competencies Assessed by PISA be Considered the Fundamental School Knowledge 15-year-olds Should Possess?", *Journal of Educational Change* (2007), Vol. 8, pp. 349–357, DOI 10.1007/s10833-007-9042-x

Steiner-Khamsi, G. and K. Chachkhiani (2008), Donor Involvement Analysis in Education Sector Development in Kyrgyzstan: Analyses and Recommendations, Ministry of Education and Science, Bishkek, Kyrgyzstan.

Takayama, K. (2008), "The Politics of International League Tables: PISA in Japan's Achievement Crisis Debate", *Comparative Education*, Vol. 44, No. 4, pp. 387-407.

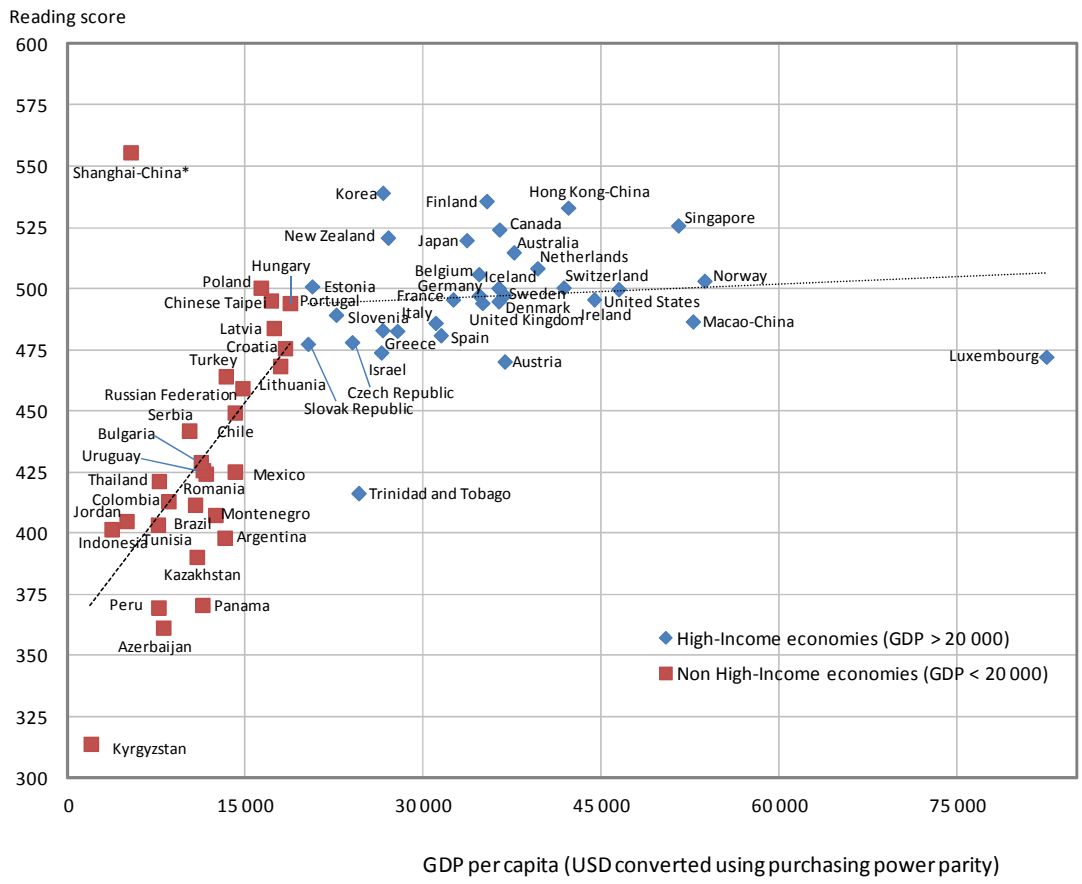
UNESCO (1953), The Use of Vernacular Languages in Education, UNESCO, Paris.

UNESCO Institute for Statistics (UIS) (2006), Education Counts: Benchmarking Progress in 19 WEI Countries, World Education Indicators – 2006, UNESCO Institute of Statistics, Montreal.

UNDP (2013). Human Development Report 2013, hdr.undp.org/en/reports/global/hdr2013/, accessed 15 March

ANNEX 1

Figure: Average reading performance in PISA 2009 and national wealth (per capita GDP)



* Data for China
Source: *PISA 2009 Results: What Students Know and Can Do: Student Performance in Reading, Mathematics and Science, Table* I.2.3, *PISA 2009 Results: Vol IV: What Makes a School Successful? Resources, Policies and Practices*, Table IV.3.21c
Note: Albania, Dubai (UAE), Liechtenstein and Qatar did not report per capita GDP data

Source: OECD (2011b), p.2.

Indicators of social development, selected countries (data from latest year available)

Country or economy	HDI rank	HDI rank change	Rural population (% of total population) (2011)	Population living below PPP $2.00 a day (2009)		Youth (15-24) literacy rate (2011)				Years of schooling (2011)			Gross enrollment ratio (2011)				Ratio of girls to boys in primary and secondary education (2011)		Out-of-school rate for children of lower secondary school age		Cumulative educational attainment of the adult population (aged 25 or older) (2011)						
						Total		Share of females among illiterate youth		Mean years of schooling		Expected years of schooling	Primary		Secondary						at least lower secondary education			at least upper secondary education			
	2011	2006–2011	%	%		%		%		Years		Years	%		%		%		%		Total	Men	Women	Total	Men	Women	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
Liechtenstein	8	m	86	m		m		m		10	c	15	105	1	69	1	99	1	5.3	1	m	m	m	m	m	m	
Hong-Kong China	13	14	0	m		m		m		10		16	108		80		103		9.0	1	74	78	71	57	59	55	1
Singapore	26	3	0	m		99.8	1	45.4	1	9	b	14	m		m		m		m		m	m	m	m	m	m	
United Arab Emirates	30	3	16	m		95.0	6	24.1	6	9		13	104	5	92	5	102	5	8.8	5	63	60	71	47	43	60	6
Malta	36	-3	5	m		98.3	6	25.0	6	10		14	101	1	101	1	94	1	4.8	2	70	75	65	27	31	23	
Qatar	37	-1	1	m		96.8	1	14.0	1	7		12	105		102		103		1.4	1	53	50	63	41	38	54	
Lithuania	40	0	33	0.4	3	99.8	1	47.8	1	11		16	96	1	99	1	98	1	8.0	1	92	95	89	82	85	79	
Latvia	43	-1	32	0.4	3	99.7	1	41.9	1	11	b	15	101	1	95	1	98	1	12.6	1	99	99	99	85	82	87	
Chile	44	3	11	2.7		98.9	4	48.5	4	10		15	103	1	89	1	100	1	2.8	2	75	76	73	53	54	52	1
Argentina	45	3	8	3.4		99.2	1	37.7	1	9		16	118	2	89	2	104	2	1.1	2	56	56	56	42	40	44	8
Croatia	46	0	42	0.1	3	99.6	1	46.0	1	10	b	14	93	1	96	1	105	1	0.8	2	78	85	72	59	70	50	10
Uruguay	48	5	7	1.6		98.8	1	31.3	1	8	b	16	112	1	90	1	104	1	22.5	2	49	48	51	27	24	30	1
Romania	50	2	47	1.7		97.3	1	46.4	1	10		15	96	1	97	1	99	1	5.8	3	87	91	84	64	71	58	1
Montenegro	54	-3	37	0.3	3	m		m		11		14	119		97		100		m		98	99	98	77	81	74	5
Bulgaria	55	0	27	0.4	4	97.9		53.6		11	b	14	103	1	89	1	97	1	12.7	2	93	95	92	70	71	68	1
Mexico	57	2	22	5.2	3	98.4	1	48.6	1	9		14	114	1	89	1	102	1	3.4	1	56	58	54	32	34	31	1
Panama	58	2	25	14.6		97.6	1	55.4	1	9		13	107		74		102		9.4	1	52	50	54	43	40	46	1
Serbia	59	-2	44	0.7		99.3	1	50.3	1	10	b	14	95		91		101		3.4	1	86	92	81	64	73	57	
Malaysia	61	2	27	2.3		98.4	1	47.9	1	10		13	96	6	68	2	104	6	10.7	2	68	71	65	51	52	50	1
Trinidad and Tobago	62	2	86	m		99.6	1	48.6	1	9		12	105	1	90	3	101	3	11.8	2	59	59	59	56	57	56	2
Russian Federation	66	-1	26	0.1		99.7	1	38.9	1	10		14	99	2	89	2	98	2	9.4	3	91	93	90	82	83	81	1
Kazakhstan	68	2	46	1.1		99.8	1	37.9	1	10		15	111		100		98		0.6	5	99	99	99	96	96	96	4
Costa Rica	69	-1	35	6.0		98.2	1	36.7	1	8		12	107		101		102		m		42	42	43	35	34	35	
Albania	70	-1	47	43.4		98.8	3	36.7	3	10		11	86		91		97		1.0	11	85	88	82	43	48	39	
Lebanon	71	3	13	m		98.7	4	35.9	4	8		14	108		83		103		14.2	1	54	55	53	33	33	32	4
Lebanon	71	3	13	m		98.7	4	35.9	4	8	m	14	108		83		103		14.2	1	54	55	53	33	33	32	4
Venezuela	73	7	6	12.9	5	98.5	4	40.1	4	8	b	14	102		83		102		9.6	1	54	51	56	43	39	46	2
Georgia	75	1	47	32.2	3	99.8	1	37.3	1	12	r	13	106		86	2	97	3	8.0	3	91	93	90	84	85	82	9
Mauritius	77	1	58	m		96.7	1	34.2	1	7		14	100		91		100		9.8	8	39	45	33	20	24	17	11
FYR Macedonia	78	1	41	5.9		98.7	2	54.9	1	8	r	13	90		84	1	100	1	4.2	7	48	56	40	m	m	m	9
Peru	80	4	23	14.0		97.4	4	61.8	4	9		13	106		91		99		5.4	1	59	65	53	53	58	48	1
Brazil	84	3	15	10.8		98.1	4	33.4	4	7		14	137	6	106	6	103	6	m		50	49	52	36	34	37	1
Colombia	87	4	25	18.5		98.1	1	38.4	1	7		14	112		97		103		4.7	1	56	56	57	42	41	42	
Azerbaijan	91	m	46	4.3		100.0	2	54.4	2	9		12	96		97	4	97		12.6	1	95	97	94	89	92	85	2
Turkey	92	2	29	4.2	3	97.8	4	77.3	4	6		12	104	1	82	1	95	1	2.6	2	34	42	27	26	32	21	2
Tunisia	94	3	34	8.1	6	96.8	3	68.7	3	6		14	109	2	90	2	101	2	m		39	46	33	m	m	m	1
Jordan	95	1	17	2.1	3	98.8	1	48.2	1	9		13	92	1	87	1	102	1	18.3	2	74	78	69	41	43	40	1
Algeria	96	2	27	m		91.8	5	65.0	5	7		14	109		95	2	98	2	11.3	7	24	27	21	8	9	7	5
Dominican Republic	98	2	30	10.0		96.8	1	33.1	1	7	b	12	107		76		99		7.7	1	54	53	55	32	29	34	
China	101	6	49	29.8	3	99.4	1	54.1		8		12	111	1	81	1	103	1	m		65	72	59	22	25	19	1
Thailand	103	-1	66	4.6		98.1	6	53.4	6	7		12	91	2	79		103	2	9.2	3	32	36	29	22	24	21	5
Moldova	111	-2	52	7.1		m		m		10		12	94		88		101		m		94	96	92	74	78	72	1
Indonesia	124	2	49	52.7		99.5	2	56.7	2	6		13	118	1	77	1	101	1	14.1	2	42	48	37	28	32	24	2
Kyrgyzstan	126	-1	65	21.7		99.8	2	40.2	2	9		12	101		88		99		8.8	1	96	97	95	88	89	87	2
Vietnam	128	1	69	5.0	3	96.9	1	56.2	1	5		10	106	1	77	1	102	1	13.4	10	m	m	m	m	m	m	
India	134	1	69	m		81.1	5	67.1	5	4		10	116	3	63	1	95	3	m		m	m	m	m	m	m	
Chinese Taipei	m	m	m	m		m		m		m		m	m		m		m		m		m	m	m	m	m	m	
Macao-China	m	m	0	m		99.6	5	42.9	5	m		m	91		96		95		10.1	1	61	64	57	36	38	33	5
Shanghai-China	m	m	m	m		m		m		m		m	m		m		m		m		m	m	m	m	m	m	
Kosovo	m	m	0	m		m		m		m		m	m		m		m		m	0	m	m	m	m	m	m	
Dubai (UAE)	m	m	m	m		m		m		m		m	m		m		m		m		m	m	m	m	m	m	

Notes:
b. Updated by HDRO based on UNESCO (2011) data. c. Assumes the same adult mean years of schooling as Switzerland before the most recent update.r. Based on data from UNICEF (2000–2010).

1. year of reference 2010
2. year of reference 2009
3. year of reference 2008
4. year of reference 2007
5. year of reference 2006
6. year of reference 2005
7. year of reference 2004
8. year of reference 2003
9. year of reference 2002
10. year of reference 2001
11. year of reference 2000

Sources: Columns 1, 2, 10, 11, 12: UNDP (2013) Human Development Report 2013. Columns 3,4,5, 6,7,8,9,13,14,15,16,17,18: World Bank Development Indicators. Columns:

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