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Education for All 2000-2015: achievements and challenges

Evolution of policies on teacher deployment to disadvantaged areas

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BACKGROUND REPORT FOR EDUCATION FOR ALL GLOBAL MONITORING REPORT 2015:
Evolution of policies on teacher deployment to disadvantaged areas

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1. Abstract

Teacher shortages and resource constraints have been among the primary challenges facing educational systems in developing countries over the past two decades. Equity in resource distribution, including the distribution of teachers, has been a secondary focus during this period. Country case studies in Guinea, India, Mexico, and Tanzania, along with our prior work, highlight five conditions, or 5 'Cs', that are crucial for equitable teacher deployment: commitment to equity, collaboration of key stakeholders, cost-consciousness, careful design, and context specificity. We conclude that the post-2015 focus on quality should not turn attention away from equity-related concerns.

2. Introduction: Importance of equitable teacher deployment for delivering better quality education

'The quality of an education system cannot exceed the quality of its teachers' (Barber and Mourshed, 2007, p. 2). These words aptly summarize the importance of teachers and equitable teacher deployment to ensure high-quality education. Teachers are key to increasing educational quality (e.g., Global Campaign for Education [GCE], 2006; OECD, 2005; Rivkin, Hanushek and Kain, 2005; Chetty, Friedman and Rockoff, 2011). According to the GCE and Education International, low quality of education in many developing countries stems largely from a 'severe lack of well-trained, well-supported teachers' (GCE and EI, 2012, p. 2).

For the most disadvantaged students, teacher shortages are compounded by uneven distribution. Growing international evidence indicates that more qualified teachers disproportionately work with more privileged children (e.g., Akiba et al., 2007). This challenge is particularly acute in developing countries, where access to and quality of teachers are severely constrained for the most marginalized children (Chudgar and Luschei, 2013).

Equitable (or inequitable) teacher deployment has clear consequences for educational equity. UNESCO'S 2010 EFA *Global Monitoring Report* focused on reaching marginalized children and emphasized that teacher shortages have led to severe negative consequences for these children (UNESCO, 2010). Evidence suggests that equitable teacher deployment holds great promise for closing SES-based achievement gaps. In a widely cited study using data from the U.S. state of Texas, Rivkin et al. (2005) found that poor children who enjoyed five successive high-performing teachers could essentially close poverty-based achievement gaps. In a more recent cross-national analysis using TIMSS 2003 and 2007 data, Akiba and Liang (2014) found that countries where low-SES students are more likely than high-SES students to be taught by qualified teachers have relatively small SES-based achievement gaps. In contrast, in countries where high-SES students have greater access to qualified teachers than low-SES children do, inequities in achievement tend to be larger.

In addition to clear consequences for educational equity, equitable teacher deployment also impacts educational quality. A lack of qualified teachers can lead to a number of negative educational outcomes for disadvantaged students, including lower enrollments, increased dropouts and greater repetition rates (Birdsall, Levine and Ibrahim, 2005; Davico, 1990; Hanushek, Lavy and Hitomi, 2008). Deploying high-quality teachers to work with the most disadvantaged students may reverse these trends, promoting equity as well as quality. Equitable teacher deployment can be a powerful tool to support both the EFA goal of universal primary enrollment and a post-2015 focus on learning for all (Steiner-Khamsi and Simelane, 2010).

The objective of this report is to inform post-2015 efforts to ensure educational quality through an examination of issues of equity in teacher deployment. We first review the main global challenges and policy approaches related to equitable teacher deployment around the year 2000. Next we discuss evidence of policy evolution since 2000 and outline the current status of key policies. We then present case studies from Guinea, India, Mexico and Tanzania that support our main arguments related to policy evolution, including a discussion of policy characteristics, drivers of change and impact on teacher distribution. We conclude with a discussion of conditions under

which equitable teacher deployment reforms can succeed and key priorities for a post-2015 education agenda.

3. **Main challenges facing governments and evidence on policy approaches in relation to equitable teacher deployment around 2000**

The most recent UIS estimates indicate that more than 1.5 million teachers are needed to achieve universal primary enrollment by 2015, with almost one million of these teachers needed in Sub-Saharan Africa (Gagnon, 2014). Although exact estimates vary over time, the magnitude of teacher shortages is staggering.

Teacher shortage, which is both a cause and a symptom of key global challenges to equitable teacher distribution, can be traced to a series of factors. The 1990 Education For All conference in Jomtien, Thailand precipitated the introduction of compulsory education policies and the reduction or elimination of user fees in many developing countries, a move that often came with promises of support from international donors (Heyneman, 2006; Chapman and Quijada, 2009). For many countries in the Arab States, East Asia, the Pacific, West Asia, South Asia and Sub-Saharan Africa, the 1990s and early 2000s were characterized by unprecedented attention to and growth of basic education (UNESCO, 2006). A concentration of financial and political support for universal primary education triggered an expansion in enrollments. Between 1999 and 2009, global primary school enrollment swelled from 646 million to 702 million children, with most of the growth occurring in Sub-Saharan Africa and Southwest Asia (UNESCO, 2011).

Many education systems lacked the resources or infrastructure to respond adequately to enrollment growth, which strained the capacity of teaching sectors across the globe and created a complex set of challenges, particularly in African countries. For instance, between 1990 and 2000, Zambia experienced an enrollment increase of 25.4% and a corresponding increase in pupil-teacher ratios of 31.4%. Pupil-teacher ratios reached 84 in Central African Republic, 65 in Rwanda and 48 in Cambodia (UNESCO, 2011). Table 1 presents data on the growth in primary enrolment and the commensurate growth in the pupil-teacher ratio in several countries across the globe from1990 to 2000 including our four case study countries.

TABLE 1: Primary enrolment, pupil-teacher ratios in 2000 and percent change since 1990, select countries

	Primary Enrolment in 2000	Pupil-teacher ratio in 2000	Change in Primary Pupil Enrolment (1990-2000) %	Change in Pupil-teacher Ratio (1990-2000)%
Chad	1,350,012	68.6	37.00	2.10
Cuba	1,033,712	11.5	16.40	-6.60
Egypt	8,120,652	23.0	7.70	-8.60
Eritrea	527,225	47.5	-9.00	24.40
Guinea	1,325,122	45.59	53.66	19.31
India	121,067,067	39.99	13.46	n/a
Indonesia	26,494,030	22.4	-0.50	-3.50
Mexico	13,422,083	27.16	5.03	-12.58
Mongolia	258,842	32.6	58.80	9.30
Nepal	3,209,512	38.0	26.80	-2.90
Nicaragua	825,996	35.7	14.00	7.20
Nigeria	19,571,642	42.9	22.00	4.60
Pakistan	19,858,203	33.0	27.50	-19.70
Tanzania	6,420,984	41.37	31.89	18.54
Tunisia	1,229,070	23.2	0.40	-21.80
Zambia	1,896,791	57.8	25.40	31.40

Source: UIS Data Centre, various years

Other more localized phenomena also influenced growth in PTRs. For example, many countries in Sub-Saharan Africa also lost teachers to the HIV/AIDS epidemic (UNAIDS, 2005). Twenty years ago, comparative global data were not systematically collected, but recent evidence suggests that during this time countries' limited resources, including qualified teachers, were likely distributed in favour of more developed urban areas. However, the need for teachers was greatest in rural and remote areas. This paradox introduced an additional challenge of inequity to the problem of teacher shortage.

Efforts to increase the supply of teachers faced a dual challenge of (1) lack of resources for additional teacher salaries and (2) inability of secondary- and tertiary-level teacher education systems to produce sufficient numbers of teachers (Chudgar et al., 2014). Moreover, at the same time they attempted to ramp up teacher production with limited resources, many countries with high debt levels adopted structural adjustment policies (SAPs) that emphasized public sector austerity (Carnoy, 1995).

Although countries negotiated with and responded to international donors differently, SAPs, which offered a series of interconnected recommendations, strongly influenced the decisions of many governments. Chisholm, Soudien, Vally and Gilmour (1999) note that countries undergoing structural adjustment in the 1990s undertook teacher-related policies focusing on a set of 'standard themes', including 'restructuring and reducing the salary component of the national budget, rationalization, and redeployment of teachers across regions and schools in terms of pupil-teacher ratios' (p. 388). Governments also slowed or froze the growth of teacher salaries, often with consequences that proved costly in other ways (Welmond, 2002). According to Welmond (2002), the teacher salary freeze policy in Benin compromised educational quality and created 'an embittered teacher corps' (pp. 59-60). At the same time, many governments in Sub-Saharan Africa adopted policies that increased teachers' workloads, such as multiclass and double-shift teaching (Samoff, 1996). Reductions in salary were also directly related to minimized qualification requirements for teachers (Carnoy, 1995). This approach received implicit and explicit support from SAPs, which advocated reallocation of public funding from higher to lower levels of education.

The key challenge facing education systems in developing countries around 2000 was the need to meet an increasing demand for teachers with insufficient resources. Since most of these systems already favored urban or more developed areas, teacher shortages and the stress of limited resources were experienced unevenly within these countries. The uneven distribution of resources across less and more privileged students --especially sufficient and qualified teachers-- was a persistent concern for many education systems. Yet due to the paramount challenge of and attention to teacher shortages, inequity in resource distribution may have been viewed and attended to as secondary problem.

4. Evidence on policy evolution since 2000 and current status of key policies

Governmental and non-governmental bodies have devoted considerable effort to addressing the teacher supply challenges discussed above. A recent study of 15 African countries found that 140,000 teachers were recruited from 2000 to 2005—more than double the number recruited between 1995 and 2000. However, continuing the inequitable trends noted above, the location of these new recruits' teaching assignments is often influenced by urban biases and disparities in terms of gender, ethnicity and language (GMR 2013/2014).

4.1 Governmental responses to teacher deployment challenges

Some of the most salient government responses appear to be directly influenced by emphases of SAPs on efficient and rational use of limited resources. In the responses we discuss below, equity concerns are not always central to policy.

4.1.1 Position-based versus career-based teaching

The need to expand the teaching force quickly and with limited resources prompted a rise in position-based hiring of teachers, or contract teaching, leading to hybridization of the teacher workforce (Schwille and Dembélé, 2007). In contrast to career-based teaching, where teachers are part of a professional teaching force for the entirety of their careers, position-based teaching involves hiring teachers on a contract basis by communities or governments. Contract teaching was adopted in a number of countries, such as India, Cambodia and Nicaragua (Robinson and Yi, 2010) as well as in many Francophone African countries (Schwille and Dembélé, 2007). Contract teachers typically had less job security and earned significantly lower salaries than the regular civil service teacher labor force (Chudgar et al., 2014). Due to the emphasis of contract teacher policies on increasing cost-efficiencies, the shift toward contract teachers was supported by the priorities of SAPs.

Although hybridization in teacher hiring remains prevalent today, in some cases governments may be aware that such arrangements have explicit equity implications for both teachers and their students, and are thus working to integrate these teachers into the regular workforce.

4.1.2 Changes in teacher training and entry requirements

Many governments faced the trade-off between producing large numbers of teachers at low costs or pursuing more expensive and rigorous training that yielded fewer teachers (Lewin, 2002). Several governments opted for less costly teacher training options, such as on-the-job training in Trinidad and Tobago (George et al., 2000). Countries like Senegal also lowered requirements to enter the teaching profession (Ndoye, 2001). Cross-country consistency can also be observed in the trend of reduced entry qualifications for contract teachers (e.g., Nkengne Nkengne, 2010, Duthilleul, 2004).

In recent years, there may have been some reversal in the trend toward lowering training and entry requirements. For example, aid agencies such as CIDA and USAID have provided financial assistance to countries that have both required and allowed teachers to upgrade their credentials while teaching (Mattson, 2004; Luschei and Chudgar, 2011). For example, USAID supported large-scale efforts in Indonesia and Pakistan to increase educational preparation and requirements for practicing teachers (Luschei and Chudgar, 2011). Moreover, in a World Education Indicators study of 19 middle-income countries, UIS and OECD (2005) found that, between 1995 and 2003, all participating countries increased the number of teachers with tertiary qualifications (in Luschei and Chudgar, 2011).

4.1.3 Teacher deployment, redeployment and transfers with varying attention to equity

Attempts to 'rationalize' the teacher labor force or to ensure that teacher demand is addressed efficiently have been reflected in various policy decisions related to teacher deployment, redeployment and transfers. In some cases, these policies—especially those related to redeployment—are guided at least in part by equity concerns. For example, South Africa's 1995 SAP employed teacher rationalization to decrease inequalities in pupil-teacher ratios across provinces and racial groups. Primary schools with more than 40 pupils per class and secondary schools with more than 35 pupils per class were required to reduce class sizes, while schools with fewer pupils were to increase class sizes. This was to be done through a combination of voluntary severance packages for teachers and compulsory transfers of teachers from low- to high-PTR schools (Chisholm et al., 1999).

South Africa's rationalization policy was terminated only a year after its implementation (Chisholm et al., 1999). According to Weber (2007), one challenge was that the rationalization strategy occurred simultaneously with reductions in educational spending. Ultimately, 'cost cutting in education had become more important than equity', resulting in the retrenchment of thousands of teachers (Weber, 2007, p. 287). According to Chisholm et al. (1999), by early 1998, 'pupil-teacher ratios had not been equalized, many experienced teachers had left the system, pass rates had not improved and inequalities in the system appeared to be widening rather than narrowing' (p. 392).

Other governments have attempted to increase equity through teacher deployment, redeployment and transfer policies. Such policies include, but are not limited to, recruiting teachers specifically to work in hard-to-staff remote locations and/or requiring novice teachers to work in remote locations. The Mexico country case study below provides an example of such a practice. Governments may also prevent teachers from transferring from challenging locations, or allow transfers only once a suitable replacement has been found. This is something that reflects to varying degrees in the country case study for India and Tanzania. To attract local, tribal and indigenous youth to teach in their own communities, some governments such as India and Mexico have set reservations or quotas. Recent evidence suggests that teachers' own preferences and behaviors may be crucial for the ultimate success of such policies. For example, teachers' desire to be close to urban conveniences presents major challenges for the recruitment of teachers to remote locations (Chudgar and Luschei, 2013).

Transparency in teacher deployment and transfers is critical. Toward this end, some developing countries have more recently employed technology-based systems to disseminate information about vacant posts and hiring, transfer and deployment decisions. Case studies from India and Mexico reflect some of these changes.

4.1.4 Limited use of incentives and accountability mechanisms

Some governments have attempted to influence teacher behavior through incentive and accountability mechanisms. These approaches range from financial incentives, such as rural hardship allowances (Mulkeen and Chen, 2008), to alternative incentives, such as improved working conditions, job stability and accelerated promotion potential (Vegas and Umansky, 2005). For example, in Laos the government has encouraged teaching in underserved areas through housing allowances and education stipends for teachers working in these areas (Somarno and Suharwoto, 2012). Mulkeen and Chen (2008) cite various strategies to incentivize teachers to accept assignments in rural schools in Lesotho, Malawi, Mozambique, Tanzania, and Uganda. In contrast, evidence from Gambia—which provides a bonus for teachers to work in schools that are more than three kilometers from the main road—suggests more positive impacts of teacher incentives. Gambia's allowance is as high as 30% to 40% of teachers' regular salary. In some cases, teachers have actually requested transfers into such hardship posts, while few teachers have requested transfers out of these areas. In Uganda teacher housing allowances have met with success in slowing teacher attrition (UNESCO, 2010).

UNESCO (2006) identifies several Latin American countries—Cuba, El Salvador, Panama, Peru, and Venezuela—that offer salary bonuses for teachers willing to work in rural areas. In Ecuador, teachers working in remote areas receive both bonuses and priority in earning tenure. In Bolivia, teachers receive a 0.3% bonus to teach in bilingual schools and a 1.1% bonus to teach in rural schools. Yet these incentives have not been sufficient to truly change the allocation of teachers (UNESCO, 2010) or to improve their attendance or performance (Rogers & Vegas, 2009).

Non-monetary incentives have also been used to support more equitable teacher deployment. For example, Ecuador grants early tenure to teachers willing to work in difficult areas (UNESCO, 2006). Mexico's *Carrera Magisterial* teacher incentive program offers participating teachers working in marginalized areas opportunities to advance more rapidly through the promotion system than teachers in wealthier areas (Santibañez et al., 2007).

Although the success of incentives in attracting teachers to hard-to-staff schools has been mixed, an increased focus on accountability (or disincentives for underperformance) has generated an extensive interest in studies of teacher behavior, such as the World Bank teacher absenteeism survey (Chaudhury, Hammer, Kremer, Muralidharan and Rogers, 2006). Increased accountability is also often cited as a rationale for the use of contract based teachers with low or no job security compared to a civil service teacher labor force.

4.2 Non-governmental, not-for-profit and for-profit responses and reaction to teacher deployment challenges

The increasing influence of non-governmental organizations on teacher deployment challenges has also been an important recent international trend. The NGO response to teacher shortage has taken several different forms, from providing teacher training to creating cadres of teachers. BRAC, which began in Bangladesh, hires mainly married women with limited education and professional experience and provides them with training to teach low-primary grades (Anwar and Islam, 2013). The Teach For All model addresses similar challenges, but it offers alternative entry into the teaching profession for university graduates with strong subject matter knowledge who are willing to teach in disadvantaged areas (GMR, 2013/4).

The growth in regular and low-free private schools represents another non-governmental response to resource shortage and teacher deployment challenges. Private schools seem to tap an even slightly different teacher labor pool. In Pakistan for instance, Andrabi and others (2008) found that private primary schools employed primarily young, untrained, unmarried, female teachers from local communities.

Non-traditional labor pools and lower wages—which promote cost savings—appear to be common traits of non-governmental and private sector approaches to teacher hiring and deployment. The main focus of both governmental and non-governmental responses thus far appears to be mitigating shortages and achieving cost-efficiency. This approach has been successful to varying degrees in resolving the challenges of access. There is also some limited but less consistent evidence that such cost-efficient approaches have led to improved student performance, possibly through the introduction of greater accountability in the teaching force. Yet the equity implications of these approaches are unclear. On the one hand there is adequate evidence to show that reducing the cost of teacher hiring has helped address the issue of school access. More children, many of whom are first-generation learners in poor remote locations, have access to a teacher. The implications for learning are somewhat less clear. The evidence is mixed about the effectiveness, as measured by increased student achievement, of low-cost and often untrained teachers (see Chudgar, Chandra and Razzaque, 2014 for a review these issues and Chudgar, 2015).

5. Case studies supporting the main arguments on different aspects of policy evolution: Policy characteristics, drivers of change and impact on teacher distribution

In this section we focus on four case study countries, Guinea, India, Mexico and Tanzania. Tables 2 and 3 provide general country background information. Table 4 provides additional details on primary pupil teacher ratio from the UIS database for the study countries.

TABLE 2: Case study countries, general background

	Population, 2014	GDP per capita, PPP (US$), 2013	Gini Index	% GDP invested in education	Geographic area (km^2)
Guinea	11,474,383	1,100	39.4 (2007)	2.50	245,857
India	1,236,344,631	4,000	36.8 (2004)	3.20	3,287,263
Mexico	120,286,655	15,600	48.3 (2008)	5.10	1,964,375
Tanzania	49,639,138	1,700	37.6 (2007)	6.20	947,300

Source: CIA World Factbook, 2014: https://www.cia.gov/library/publications/the-world-factbook/

TABLE 3: Case study countries, educational background

	Primary Enrolment (Net), 2011	Secondary Enrolment Ratio, 2011 (N= Net, G= Gross)	Primary Pupil/ Teacher Ratio	Out-of-school Children	EFA Dev Index (Rank out of 120 Countries), 2007
Guinea	74.4 (2012)	30.41(N) (2011)	42.18 (2010)	431,051 (2012)	0.622 (123)
India	93.3 (2011)	68.5 (G) (2011)	28.00 (2012)	1,387,374 (2011)	0.775 (105)
Mexico	95.6 (2011)	67.3 (N) (2011)	28.14 (2010)	405,347 (2011)	0.959 (55)
Tanzania	97.6 (2008)	35.0 (G) (2012)	50.76 (2010)	168,478 (2008)	Not available

Sources: UNESCO Institute for Statistics Data Centre, 2014: http://www.uis.unesco.org/datacentre/pages/default.aspx; UNESCO EFA Global Monitoring Report, 2014: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/ED/GMR/images/Index_Tables_2011.xls, NUEPA 2012-13 data from India, UNESCO, 2010, Annex on "The Education for All Development Index"

Table 4: Case study countries, pupil-teacher ratio in primary education (headcount basis)

	1990	1995	2000	2005	2010	2011	2012
Guinea	38.2	46.7	45.6	44.9	42.2	44.1	43.6
India	..	..	40.0	..	..	35.2	..
Mexico	31.1	28.7	27.2	28.3	28.1	28.1	28.0
Tanzania	34.9	36.8	..	55.9	50.8	..	45.6

Source: UNESCO Institute for Statistics Data Centre, 2014: http://www.uis.unesco.org/datacentre/pages/default.aspx

5.1 Country background, Guinea
5.1.1 Educational background and teacher deployment
Until 1990, Guinea had one of the weakest education systems in the world, with a literacy rate of 30% (Condé, 1995). The period 1980-2000 was marked by a concentrated effort to grow the education sector, and the primary net enrollment ratio climbed from 18.2% in 1990 to 74.4% in 2010 (UIS, 2014).

Guinea's new regime of 1984 initiated a number of changes to education; the effects of these changes continue to shape education in Guinea today. The language of instruction shifted from local languages to French (Anderson-Levitt, 2004) and the private sector began playing a more significant role in schools due to a newly liberalized economy (Condé, 1995). Governmental reforms to education were fueled by an SAP in 1988, which led to the country's Education Sector Adjustment Policy (ESAP). ESAP's main objectives were to increase pupil-teacher ratios (to raise efficiency), raise enrollment and ensure primary school completion (Condé, 1995).

A major question confronting Guinea in the early 1990s was how to produce enough teachers for the anticipated surge in student enrollment? This was further complicated by distribution challenges, as teachers had traditionally been deployed with great unevenness. In the early 1990s, huge variation existed across the country in pupil-teacher ratios (Condé, 1995), in part because teachers were posted according to their preferences, 'irrespective of educational requirements' (Condé, 1995, p. 7). This ensured that teachers with more options moved away from

the highest need schools. However, as the following case study illustrates, Guinean deployment policies have since been restructured in an effort to redress these inequities.

5.1.2 Policy evolution

While Guinea, like our other case study countries, faced the pressures of growing enrollment and increasing teacher shortages, it appears to be an exception in terms of its attention to equity. The inequities in teacher deployment of the 1990s were met with a three-pronged redeployment policy. Vertical redeployment entailed transferring secondary teachers with only primary qualifications to teach in primary schools. Geographic redeployment shifted teachers across the country in an effort to 'iron out variations' in pupil-teacher ratios (Condé, 1995, p. 12). Finally, specific redeployment was used to transfer teachers with certain administrative duties so that various skills and roles were present at every school (Condé, 1995). As more children enrolled in school, Guinea's redeployment effort facilitated equitable teacher distribution (Condé, 1995), providing an example of equity-enhancing teacher redeployment discussed in Section 4.1.

The initiative to redistribute existing teachers was complemented by the hiring of contract teachers, also discussed in Section 4.1. Guinea's contract teacher policy, FIMG (*Formation Initiale des Maîtres de Guinée*) was launched in 1998 with World Bank support (CONFEMEN 2006; Bonnet 2007). This policy emerged from cooperation between teachers unions and the government. The collaborative approach undertaken in Guinea was exceptional: 'Conversely to what happened in other (francophone African) countries, teachers unions and the government worked together to find solutions to this lack of teachers' (Nkengne Nkengne, 2010, p. 23). Perhaps because of this unique collaboration, contract teachers in Guinea receive a number of benefits that their peers in other countries do not enjoy, such relatively higher salaries, and systematic teacher training (CONFEMEN, 2006).

Contract teaching in Guinea is a unique case study in ensuring attention towards equity and even quality while being driven by cost-efficiency constraints. Guinea's uniqueness is reinforced in a recent paper by Chudgar (2015). Using 2001-2004 data from *Programe d'Analyse des Systèmes Éducatifs de le CONFEMEN* (PASEC), Chudgar noted that contract teachers in Guinea receive high levels of educational support and access to continuing education opportunities. Furthermore, contract teachers were significantly more educated than regular teachers. The students of contract teachers in Guinea also generally outperform those of regular teachers, in contrast to students of contract teachers in some other countries studied (Chudgar, 2015).

As illustrated by the relative effectiveness of contract teachers and the coordinated redeployment efforts, Guinea's education sector has invested considerable time and attention to the goal of producing and equitably distributing teachers. Overall, Guinea appears to be an exception in terms of a well-planned and functioning teacher workforce, including teacher training (Schwille and Dembélé, 2007). A recent education sector plan appears to maintain this focus on teacher preparation (République de Guinée, 2007).

As a result of these efforts, Guinea performs at the top of African nations in terms of allocating teachers based on student enrollment rather than teachers' preferences or other considerations. Unlike many other countries, in Guinea there are no significant differences in the distribution of teachers by region (CONFEMEN (2006, Table 2.9).

5.2 Country background, India
5.2.1 Educational background and teacher deployment

India is a low EDI country, ranking 105th out of 120 countries. The Indian education system has been in a phase of rapid transformation over the last decade or more. At the beginning of the 21st century India was home to the largest number of unenrolled children in the world. A national policy launched in 2002 and backed by large financial commitments, the Sarva Siksha Abhiyan, focused on this issue. By the end of the first decade of the 21st century, the numbers of unenrolled children in India have fallen dramatically. The national secondary school mission, the Rashtriya Madhyamik

Shiksha Abhiyan (RMSA), now seeks to increase secondary enrollment from 68.5% to 75% by 2017 (Government of India, 2012). Volunteer-driven assessments by the NGO Pratham are the primary source of understanding the status of learning in the country. The most recent report (ASER Center, 2013) notes 'no significant improvement' in children's already limited ability to read, along with a continued struggle with basic arithmetic. Government and civil society attention thus has now shifted to ensuring that these children learn and remain in school.

According to a 2010–2011 estimate, India employs close to 6.5 million teachers at the elementary level (grades 1 through 8). Four million of these teachers (66%) are working in government schools (Mehta, 2012). The challenges, policies and practices associated with a large teacher labor force have some overarching national dimensions, but they are also distinctly varied across the Indian states. Quantity, quality and distribution are all concerns that the Indian teacher system currently contends with. In spite of its size, the quantity of teachers in India is still not adequate. A recent national estimate identifies the need for 500,000 additional elementary teachers to fill vacant positions. The quality of current teacher training, and in many cases of current teachers, also leaves room for improvement (See Chudgar, 2013 and Chudgar and Pippin 2013). Uneven teacher distribution emerges as an important issue in the recent report by Chudgar and Pippin (2013). Remote, rural locations with limited amenities are harder to staff across the country. This often leaves these areas with young and less experienced teachers, whereas senior teachers transfer out to more desirable locations. This issue also has gender dimensions, wherein schools in rural and remote locations find it more challenging to hire and retain female teachers due to social, cultural and safety concerns (Chudgar and Pippin, 2013). For instance, close to 25% of Indian schools with two teachers or more do not have a single female teacher (National University of Educational Planning and Administration [NUEPA], 2013).

5.2.2 Policy evolution

In India the national government decides the broad policy and legal framework for the teacher workforce and then states execute and implement these various policies. States vary greatly in terms of their key concerns and capacity. For instance, while some states on average are able to ensure reasonable class-sizes and a regular teacher labor force, other states contend with extremely large class-sizes and a fair amount of reliance on teachers hired on contract basis, paralleling the trend of position- vs. career-based bifurcation discussed in Section 4.1. As recently as 2011-12, 12.16% of the Indian teacher labor force was hired on a contract basis; this number declined to 7.20% in 2012-13. However, these national averages conceal drastic cross-state variations in the reliance on contract teachers. In 2012-13 in the state of Jharkhand, for instance, close to 54% of teachers were on a contract; in contrast, in the state of Karnataka, the percentage is far lower at less than 1% (NUEPA, 2013).

Reduced teacher training (a trend referred to in Section 4.1) is accepted as a norm for contract teachers, but in some instances, training requirements are also reduced for career-based teachers. In particular, teacher deployment policies that reserve seats for local, tribal, indigenous teachers, or that ensure caste-based reservations, place lower qualification and performance expectations on teachers. Beyond this however, there is also a general disenchantment with the quality of teacher education (Chudgar and Pippin, 2013). These sentiments have been echoed by various government reports and discussions over the years (see Chudgar 2013 for a review).

Most recently the National Curriculum Framework (NCF, 2005) and the Right of Children to Free and Compulsory Education (RTE) Act, 2009 represent efforts to address teacher education quality challenges. These efforts are similar to the more recent international trends to reform teacher education discussed in Section 4.1. RTE in particular has created a greater need for more pre- and in-service teacher training by proposing minimum qualification requirements (Chudgar, 2013).

The recent policy recommendations through RTE have increased focus on teacher rationalizing by mandating a specific student-teacher ratio per class and specifying that no schools can have more than 10% their teacher positions vacant. Yet states vary greatly in how they deploy

and transfer teachers. In several states, formal or informal rules require novice and lower-performing teachers to take assignments in less desirable locations. Some states have been especially effective at using technology to ensure a more equitable and transparent process, in keeping with international trends noted in Section 4.1. State of Karnataka provides one such example of a well-functioning system. The state uses a well-designed, transparent, and technology based system for every aspect of teacher hiring, retention, and transfer. Technology is also used for information dissemination for soliciting teacher application (Chudgar and Pippin 2013).

Teacher transfer policies also seem to have mixed implications for equity. Transfers out of some remote hard-to-staff areas are made especially difficult. For instance, in the state of Rajasthan the government has declared certain regions of the state "Dark Zones". Teachers once posted there, are often required to stay in the position for a decade or more due to the fear that these positions would be hard to fill. However, this difficulty itself can act as a deterrent in attracting teachers to these posts and even in retaining these teachers once they get hired in such locations. We also see in India a practice noticed elsewhere in which senior teachers are more readily able to secure transfers to desirable locations (Chudgar and Pippin 2013). Some prior policy efforts have emphasized the need to ensure that 50% of the teacher labor force is female (Chudgar and Sankar, 2008), but that appears to be an unfulfilled promise.

The non-government response from private schools, especially low-fee private schools, is also prominent in India, especially in urban India (Srivastava et al., 2013). However, the impact of this sector on teacher distribution is not yet well studied.

5.3 Country background, Mexico
5.3.1 Educational background and teacher deployment
The Mexican education system has made important progress in primary school enrolment since the late 1990s, leading to a net primary enrollment rate of 96% in 2011. However, Mexico's secondary net enrollment rate of 67% indicates a substantial drop-off in access for adolescents (UIS, 2014). Mexico's 2007 EDI, which ranked 55th of 120 countries, suggests that Mexico is on track to achieve the six EFA goals by 2015 (UIS, 2014). Nonetheless, Mexico faces major concerns in terms of educational equity and quality. Results from national examinations have indicated both low overall performance and particular challenges for indigenous and rural children (Martínez Rizo, 2002). In the 2012 Programme for International Student Assessment (PISA), Mexican students performed below the OECD average in reading, math and science (OECD, 2013).

Like India and Guinea, Mexico faces challenges of quantity, quality and distribution of teachers. According to Puryear, Santibañez and Solano (2011), pre-service teacher education often places much more emphasis on theory than on subject-matter knowledge and practice. Once they begin teaching, novice teachers generally receive little orientation or mentoring. Although in-service training is widely available, little evidence indicates positive impacts on student learning (Puryear et al., 2011). Problems of teacher quality are particularly acute in rural areas and among indigenous communities. A 2012 UNICEF Mexico report observes that one of the keys to improving education for indigenous children is to address barriers to educational supply, including 'the presence of precarious and low-quality infrastructure and teachers' (p. 41). According to Treviño (2013), 'enhancing teacher quality appears to offer the greatest potential for improving indigenous student performance' in Mexico (p. 103). Yet there are insufficient incentives for teachers to work in the remote rural areas where indigenous children often live (Puryear et al., 2011). Evidence suggests that, as a result of these challenges, more qualified teachers are disproportionately concentrated in urban areas, wealthier municipalities and in schools with higher-achieving children (Luschei, 2012; Luschei, Chudgar and Rew, 2013). Recent case study work in Mexico also found that in general, teachers with the most seniority choose to teach in more urban areas, leaving positions in remote rural areas for new, inexperienced teachers (Luschei and Navarro, 2013). For example, a recent report found that while 19.1% of Mexican teachers in urban public schools are under the age of 29, 27.5% of rural public school teachers and 27.0% of teachers of

indigenous children are under 29. Moreover, 9.4% of urban teachers have two or few years of experience in primary education, compared to 17.4% of rural teachers and 18.4% of teachers of indigenous children (INEE, 2013, p. 185).

5.3.2 Policy evolution

To meet the demand for teachers in the most marginalized areas of Mexico, in 1971 the Mexican government instituted the *Consejo Nacional de Fomento de la Educación* (CONAFE), or the National Council for the Promotion of Education. The CONAFE program recruits young people—often recent high school graduates—to work for one year as instructors in small remote communities in exchange for scholarships to support their future studies. Although CONAFE teachers do not receive a salary, they receive room and board from the local community. In 2013, more than 40,000 CONAFE instructors taught over 320,000 children in Mexican basic education (SEP, 2013). In CONAFE, the government has addressed teacher shortages in remote communities through a low-cost, temporary and position-based arrangement. In some respects, this approach reflects the international trend toward position-based arrangements that we discuss above in Section 4.1. Yet CONAFE instructors differ from most contract teachers in that they make only one-year commitments and receive educational scholarships in lieu of salaries. By relying on primarily young teachers without post-secondary education, CONAFE also parallels the international trend of deploying teachers with lower levels of training to remote areas. Evidence also suggests that Mexico has hired teachers without necessary qualifications to fill shortages in schools with indigenous children. Not only do many CONAFE teachers work with indigenous children, in other cases teacher qualification requirements have been lowered to recruit and hire teachers who speak indigenous languages, which is a requirement to work with indigenous children (Treviño, 2013).

Since 1992, Mexico has also run a voluntary national teacher incentive program known as *Carrera Magisterial* (Teaching Career). To encourage teachers to work in less developed areas, *Carrera Magisterial* allows teachers in these areas to advance more quickly through the system than other teachers (SEP, 1998). However, CONAFE teachers, who arguably work with the most marginalized children in Mexico, are not eligible to participate in *Carrera Magisterial.* Mexico's *Carrera Magisterial* teacher incentive system represents a national effort to incentivize teachers to both exert more effort and to work with disadvantaged populations. In this respect, Mexico's emphasis on incentive-based teacher deployment represents one of the most important examples of the international trend toward the use of incentives and accountability that we discuss in Section 4.1. However, recent evidence suggests that by emphasizing professional development opportunities that are often unavailable in remote areas, this program may actually encourage teachers to abandon remote rural areas. Several respondents in a recent qualitative case study of teachers of marginalized children in Mexico reported that by encouraging greater in-service training, *Carrera Magisterial* actually provides an incentive for teachers to move to locations in urban areas where such training opportunities are more available (Luschei and Navarro, 2013). In 2011, *Carrera Magisterial* was modified to adjust the weight for student achievement from 20% to 50% of a teacher's total score. Although this change could induce greater efforts by teachers to increase student learning, it may also induce teachers to transfer to higher-scoring classrooms and schools (Luschei, 2013).

In recent years the Mexican government has put into place a number of key reforms designed to improve teacher quality and to rationalize teacher hiring and deployment. In 2008 the Mexican Secretariat of Public Education and the national teachers' union reached an agreement known as the Alliance for Educational Quality that changed the teacher hiring process. According to this agreement, all new teacher candidates must take a national exam, which determines whether they are hired. The objective of this new national system, which replaced many disparate state systems, was to make the process of hiring teachers and assigning them to vacancies more transparent and fair (SEP, 2011). In making use of the Internet to publish results, this reform mirrors the trend toward growing transparency that we note in Section 4.1 In December of 2012 an

educational reform law targeting teacher evaluation and hiring was backed by Mexican's newly elected president Enrique Peña Nieto and approved by Congress. This reform seeks to make significant changes to Mexico's General Education Law, particularly in the work and evaluation of teachers. Among other things, the reform is designed to create professional systems for hiring, evaluating and promoting teachers and to do away with the practice of buying or inheriting teaching positions (Miroff, 2013). Although many of the Mexican government's reforms are too new to fully evaluate, a comprehensive evaluation of *Carrera Magisterial* found little impact of participation in the program on teachers' effectiveness, even among teachers with the greatest incentive to raise student test scores (Santibañez et al., 2007).

As we note in Section 4.1, NGOs have increasingly played a role in teacher-related policies and issues. In Mexico, the work of NGOs ranges from training teachers who work with marginalized children to evaluating government education programs, conducting educational research, and advocating for teacher-related policy change. In the Mexican state of Zacatecas an NGO called ODISEA has worked with the state Secretariat of Education to train and support teachers working in 20 low-performing schools, 10 in urban settings and 10 in remote rural settings. In the state of Yucatán, an NGO called IEPACC has provided training and support for teachers working in indigenous schools, specifically in the high-need area of preschool indigenous education within the CONAFE system. In Mexico's Federal District, an NGO called *Mexicanos Primero* (Mexicans First) conducts research and evaluation of national educational policies and practices. The organization employs four principal strategies to address the issue of teacher quality for disadvantaged children: the evaluation and development of public policy related to teachers, community and social recognition for effective schools and teachers, attempts to influence civil demand for high-quality education and teaching, and legal action related to teachers and teaching (Luschei and Navarro, 2013).

5.4   Country background, Tanzania
5.4.1 Educational background and teacher deployment
Tanzania is a relatively small and poor country compared to India and Mexico, yet of our four case study countries it invests the largest proportion of its GDP for education (6.2%). Like India and Mexico, Tanzania has also achieved near universal primary school enrolment. Yet secondary enrolment levels in Tanzania are dismal (35% gross secondary enrolment). The primary pupil-teacher ratio (51:1) is also the highest in our case study sample. EDI data are not consistently available for Tanzania. According to SACMEQ II data, performance of Tanzanian sixth grade students on math and reading assessments is relatively high among participating countries. However, results from UWEZO's 2012 report raise concerns about reading levels of third grade children (UWEZO, 2013).

Particularly noteworthy in the Tanzanian context is the country's initial resistance to SAPs. During the debt crisis of the late 1970s, Tanzanian President Julius Nyerere resisted negotiations with Bretton Woods institutions and instead implemented his own brand of African socialism, *ujamaa* (or extended family), which consisted of policies of self-reliance and rural development (Vavrus, 2005). Primary and secondary school enrollments soared as the government abolished fees, nearly achieving universal primary education (Hardman, Ackers, Abrishamian and O'Sullivan, 2011). Yet, with continued economic crisis school fees reappeared in the mid-1980s; enrollments fell by between 15% and 25% over the next decade as families made the difficult choice between meeting basic needs or educating their children (Vavrus, 2005). The Tanzanian education system today faces serious challenges connected to expanding educational capacity, improving retention and ensuring quality of education for marginalized children.

Similar to our other case study countries, Tanzania's teacher labor market also faces challenges related to quantity, quality and equity. Availability of qualified pre-primary, special-needs, science, mathematics and English teachers is a serious concern in Tanzania. Deployment of teachers to rural areas is also challenging due to lack of housing and basic amenities like water,

electricity, health services and recreation. This is reflected in wide variations in PTR across the country (Mulkeen and Chen, 2008). Housing in particular can pose a major problem in recruiting and deploying teachers to work in rural areas (Mulkeen and Chen, 2008). Similar to India, this problem has a distinct gender dimension, as women teachers find it especially hard to work in remote and rural locations without safe housing options. A concern that is especially strong in Tanzania compared to other case study countries is the overall low status of the teaching profession. Teaching is viewed as a profession of 'last resort' that is unattractive to anyone with an alternative career option. According to Mkumbo (2012), recommending that a Tanzanian child become a teacher may be viewed as an insult rather than praise. The low status of teaching—along with difficult working conditions in many cases—has appeared to have a strong negative effect on teachers' motivation (Mkumbo, 2012). The teacher transfer process, similar to India and Mexico, tends to work in favor of more experienced and senior teachers. The challenges of living in remote locations, coupled with seniority-based transfers, implies that most vacant positions for new teachers are in remote and rural locations (Chudgar and Luschei, 2013). Moreover, because the processes of teacher training and allocation in Tanzania are centralized, new teachers are required to take the position they are assigned.

The quality of teachers and their training in Tanzania have also received criticism; for instance a 2008 study noted that 'primary teaching was largely made up of teacher-led rote, recitation and exposition' and in-service training was 'often uncoordinated, ad-hoc and of varying quality' (Hardman and Dachi, 2012, p. 7).

5.4.2 Policy evolution

Various government policies have attempted to address the challenges of teacher shortage and uneven teacher distribution. Under Primary Education Development Program (PEDP) I, 2001-2006, and PEDP II, 2007-2011, the government set specific goals for new teacher preparation and identified guidelines for teacher recruitment and deployment. These guidelines included the recruitment of additional teachers, placement of new teachers in hard to staff schools, incentive packages for teachers willing to work in hard to staff schools, instituting formal mentoring processes, meaningful professional development and the implementation of a new Teacher Development Management Strategy (TDMS).

Unlike India or Guinea, Tanzania does not have a position-based (or contract teacher) hiring system. Yet, similar to international trends discussed in Section 4.1, there exists a prevailing sense that entry requirements for teacher training colleges are low. The criteria for successful completion also appear to be quite modest: a score of only 21-26% is required to qualify to become a teacher. Yet, mirroring the potential reversal of this trend that we note in Section 4.1, the recent TDMS (2008-2013) aims to strengthen teacher education by creating an adequate pool of competent teachers to support education at all levels. TDMS also aims to improve the quality of pre- and in-service teacher education and training. In recent years, the government has also successfully instituted various in-service teacher education/training (INSET) reforms, with a greater use of technology (for example, Hardman and Dachi, 2012).

In terms of teacher deployment discussed in section 4.1, in Tanzania teachers are allocated to their post centrally. These decisions are made based on teacher demand indicated by district education officers (DEOs). Once in their position, teacher transfers are allowed for special life-events such as marriage, illness, or during promotions. But in general teacher-initiated transfers appear hard to obtain. Such transfers require the teacher to write a letter to their district head explaining the reason for the move, forgo certain financial compensation in some cases, and in some other cases identify another teacher who is willing to trade positions with them (Chudgar and Luschei, 2013).

Teacher housing is identified as a crucial incentive in Tanzania to ensure equitable teacher allocation across remote and rural locations. In particular, the EDSP suggests providing housing for female teachers willing to accept positions in remote schools with poor working conditions (Woods,

2009). Yet a series of recent national reports indicate that teacher housing provision is far from adequate. For instance, government data have recorded up to an 80% shortfall in housing across the country (Mulkeen and Chen, 2008). More generally, the lack of incentives to teach in difficult-to-staff areas appears to be so widespread that a central government official noted in an interview that ultimately, to attract and retain teachers, remote communities may consider providing teachers with their own incentives, including housing, land to farm, furnishings and utensils (Chudgar and Luschei, 2013).

Another related concern that emerges in Tanzania is the payment of teacher salaries through their bank accounts. While this is convenient for teachers living in urban areas close to banks, teachers who work in more challenging environments are inconvenienced by this arrangement (Mulkeen and Chen, 2008).

Finally, reflecting our discussion in Section 4.1, in Tanzania we also note an active presence of non-governmental and external organizations such as the Aga Khan Foundation and UNICEF working to aid and support the country's teacher education efforts.

5.5 Summary: Drivers of change, policy characteristics and their impact on teacher distribution

The current state of teacher deployment can be attributed largely to the dual influences of global increases in student enrolments after the EFA conferences of 1990 and 2000 and severe resource constraints in lower-income countries. Governments have responded to these challenges with policies to increase access, cut costs and to a lesser extent, to promote equity. Throughout this process, international organizations, donors and non-governmental organizations have played a role in the evolution of teacher-related policies. Yet government actions only represent part of the picture, as teachers also respond to changing situations based on their personal preferences, including the desire to work in urban and more developed areas, and to remain close to family. Although international evidence is limited, the cumulative impact of these changes appears to have been an uneven distribution of teachers across schools and communities that dampens equity for less advantaged children (Chudgar and Luschei, 2013).

6. Conclusion: Conditions under which equitable teacher deployment reforms can succeed and key priorities in a post-2015 education agenda

The country case studies and our prior work highlight five conditions, or *5 "Cs",* that are crucial for equitable teacher deployment: commitment to equity, collaboration of key stakeholders, cost-consciousness, careful design, and context specificity. According to Luschei et al. (2013), explicit commitment to educational equity, which can manifest itself both in terms of expenditure decisions and teacher deployment policies, is a key determinant of whether teachers are equitably distributed across students and schools. Among our case study countries, Guinea provides an example of a country that has made an explicit commitment to equity in teacher deployment while facing serious resource constraints. Guinea also provides an example of collaboration of key stakeholders, as the government worked together with the teachers union and the World Bank to design and execute a comprehensive plan for recruitment and training of contract teachers.

In developing countries, concerns related to costs are omnipresent. Yet decisions that are cost-conscious, rather than cost-driven, are more likely to ensure equitable outcomes. Most importantly, a cost-conscious approach must be based on rigorous evidence of both costs and outcomes (Levin and McEwan, 2001). Evidence of costs and outcomes are also important for the careful design of policies, especially incentive policies. Poorly designed incentive programs can result in many negative unintended consequences. In the case of Guinea, the design of the contract teacher system appears to have had positive results. In contrast, evidence suggests that Mexico's national teacher incentive program may have actually incentivized teachers to leave schools in difficult areas to participate in training activities required to advance in their careers. Finally, as with all policies, teacher deployment policy must consider context, such as India's wide cross-state

variation in teacher labor markets. The context-specific conditions and status of teachers will have an enormous influence on whether and where teachers work. For example, the very low status of teaching in Tanzania presents an additional challenge of initial recruitment, even before decisions about teacher deployment can be made.

Issues of quality are likely to be at the center stage in the post-2015 agenda. After extensive attention to access, this seems appropriate. However, our work leads us to recommend that this important focus on quality *does not turn attention away from concerns about equity.* Inequity in education systems, especially in poor education systems, can be perpetuated in multiple and insidious ways. While no government is likely to seek inequity, policies to fill remote teaching positions with novice or untrained teachers may still promote uneven teacher distribution. And while most teachers want what is best for their students, qualified teachers who move away from remote schools to more desirable urban locations also unwittingly perpetuate inequities.

In the long run, a direct focus on educational equity will require a focus on developing local infrastructure and talent so that geographically remote locations can access teachers who are more likely to remain in the community. Such talent development needs to focus particularly on girls, as female teacher supply is often limited in such difficult locations (Chudgar and Luschei, 2013).

In the medium- and short-term, governments can increase use of data and technology to make fairer and more transparent teacher deployment, transfer, and compensation decisions. Transparency can also be addressed through the use of widely available media—such as newspapers and the Internet—that publish the results of teacher assignment and transfer decisions, along with criteria for how those decisions were made. Additionally, although the literature on teacher incentives seems to frequently identify what does not work rather than what works, policy makers must consider context-specific monetary and non-monetary incentives to increase teacher commitment to work in difficult areas.

Another important short- to medium-term reform is greater attention to teacher education. Although all teachers must receive relevant and high-quality training, the many challenges of teaching marginalized children demand even stronger and more focused preparation and support for teachers working with these populations. Yet cross-national evidence suggests that teachers of marginalized children generally have lower levels of both educational attainment and training than teachers of other children (Chudgar and Luschei, 2013). Teacher training efforts must focus on these teachers and the very specialized and demanding conditions that they face. More generally, education research in developing countries must continue to develop an evidence base about what does and does not work in teacher education and other efforts to improve teacher quality.

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