Education and Health Services in KENYA
Data for Results and Accountability

JULY 2013
Launch edition

Gayle H. Martin
Obert Pimhidzai
The Service Delivery Indicators provide a set of metrics for benchmarking service delivery performance in education and health in Africa. The overall objective of the indicators is to gauge the quality of service delivery in primary education and basic health services. The indicators enable governments and citizens to identify gaps and track progress within and across countries over time. It is envisaged that the broad availability, high public awareness and persistent focus on the indicators will mobilize policymakers, citizens, service providers, donors and other stakeholders into action. The ultimate goal is to sharply increase accountability for improved quality of services toward the ultimate end of improving human development outcomes, along the lines originally proposed by *World Development Report 2004: Making Services Work for Poor People*.

The Service Delivery Indicators initiative is an Africa-wide program that collects facility-based data from schools and health facilities every 2-3 years. The perspective it adopts is that of citizens accessing a service. The indicators can thus be viewed as a service delivery report card on education and health care. Complementing other sources that draw on citizens’ perceptions to assess performance, the indicators assemble objective and quantitative information from a survey of schools and health facilities.

The SDI initiative is a partnership of the World Bank, the African Economic Research Consortium and the African Development Bank to develop and institutionalize a set of robust measures of service delivery. The measurement of these indicators is based on survey instruments underpinned by rigorous research and embraces the latest innovations in measuring provider competence and effort. The survey instruments were piloted in Tanzania and Senegal. Kenya is the first country where the SDI is being rolled out, using a standardized methodology, but with adaptation to each country’s context. The countries where implementation is currently happening are: Mozambique, Nigeria, Togo and Uganda. More countries will follow in 2014.

The major funders of the SDI initiative are The William and Flora Hewlett Foundation and the World Bank. Complementary funding for the Kenya SDI was provided by the Canadian International Development Agency (CIDA) and the USAID-funded Health Policy Project.

More information on the SDI survey instruments and data, and more generally on the SDI initiative can be found at: www.SDIIndicators.org and www.worldbank.org/SDI, or by contacting sdi@worldbank.org.

*July 2013*
Education and Health Services in KENYA
Data for Results and Accountability

Will all Africans share in the continent’s rising prosperity? Africa is clearly on the move. Headlines such as “Africa Rising,” “Africa 2.0” and “The sun shines bright (for Africa)” have been used to highlight Africa’s economic prospects with much enthusiasm in recent years. And within this transformed picture of Africa, Kenya’s Vision 2030 promises to transform the country into a newly industrializing, middle-income country. But the question in Kenya, as indeed in much of Africa, is how to ensure that the human capital exists to realize the promised economic growth, as well as how to ensure that all citizens share in newfound national prosperity. The answer lies partly in whether people are well educated and healthy enough to gain access to more productive work.

Although Kenya’s Vision 2030 highlights investment in human development, public spending on health and education in Africa has not guaranteed results. Macro- and microeconomic evidence on the links between education and economic growth is robust. And at the household level it is clear that good health improves the capacity to learn and work, which dramatically improves income and welfare. But what can policy do to improve education and health to realize this potential? Spending money is one thing—but the relationship between spending on education and health, and human development outcomes is weak, suggesting gaps in the quality of service delivery (see Figure 2). This is particularly disconcerting given that governments spend roughly a third of their recurrent budgets on education and health. Fundamental to delivering quality education and health services is the role of frontline service providers—teachers, nurses and doctors. If these providers exert effort and have the right skills, more resources for education and health can indeed have beneficial outcomes.

Closing the gap between promises, spending and results depends on what service providers know and what they do: provider behavior is key. Teachers and health providers overcome major obstacles to provide services in difficult conditions. They are intrinsically motivated and often go above and beyond the call of duty. But the environment in which they work, and the institutional incentives they face are not always aligned with education and health sectoral objectives. The 2004 World Development Report: Making Services Work for Poor People, one of the most frequently cited reports in this series, highlighted the accountability relationships between the various actors—policymakers, frontline service providers, and the users of services—as being critical for better results in public service delivery. This is because (i) Central ministries cannot monitor precisely what the frontline providers do; (ii) The effort provided is highly discretionary, i.e. determining how much effort to provide on which patient or student is a judgment.

---

1 Vision 2030 is the country’s development program covering the period 2008 to 2030. Launched on 10 June 2008 by President Mwai Kibaki, its objective is to help transform Kenya into a “newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment.”


5 World Development Indicators


Service Delivery Indicators for Kenya – Highlights

The Service Delivery Indicators for Kenya are based on surveys of about 600 primary schools and health centers and nearly 5,000 teachers and health providers. They reveal that the country does better on the availability of inputs such as equipment, textbooks, and most types of infrastructure, than it does on provider knowledge and effort, which are relatively weak. Significantly, more investments are needed in “software” than “hardware”.

What service providers have to work with

- Kenya public facilities do relatively well on the availability of inputs: 95% of health facilities have access to sanitation, 86% of schools have sufficient light for reading, and the average number of textbooks exceeds Kenya’s target of 3 per pupil. The availability of important drugs for mothers remains a challenge: only 58% of tracer drugs for mothers was available in public facilities.

What service providers do

- In both education and health, the problem of low provider effort is largely a reflection of suboptimal management of human resources. This is evidenced by the findings that:
  - Over 29% of public health providers were absent, with the highest absence rate in larger urban health centers. Eighty percent of this absence was approved absence, and hence within management’s power to influence.
  - In public and private schools teachers are roughly equally likely to show up at school. The main difference is that public teachers may be at school, but are 50% less likely to be in class teaching.
- A public school child receives 1 hour 9 minutes less teaching than her private school counterpart. The implication is that for every term, a child in a public school receives 20 days less of teaching time.

What service providers know

- While better than in many other countries, significant gaps in provider knowledge exist among both public and private providers in both sectors.
- Only 58% of public health providers could correctly diagnose at least 4 out of 5 very common conditions (like diarrhea with dehydration and malaria with anemia). Public providers followed less than half (44%) of the correct treatment actions needed for management of maternal and neonatal complications. Provider competence was correlated with level of training.
- Just a third (35%) of public school teachers showed mastery of the curriculum they teach. Seniority and years of training among teachers did not correlate with better teacher competence.

(For complete results, see Table 1 on page 4)
that needs to be made by each provider; and (iii) Policymakers and communities have different information than do providers; this complicates accountability for quality education and health services. These factors make other services, like ‘commercial services’ such as buying a sandwich, fundamentally different from education and health service provision: if you don’t like the sandwich that one seller provides, you just go to another.

The Service Delivery Indicators (SDI) aim to provide critical information to improve accountability for health and education results. Kenya’s citizens currently lack the information to hold their government and providers accountable for education and health services. The SDI provide a set of metrics for benchmarking service delivery performance in education and health in African countries, and have been published for Kenya for the first time in July 2013. This brief draws from the SDI Kenya Technical Report which contains more detailed information on the survey methodology and results. Such information will also enable the government to carry out highly targeted improvements and track their impact over time.

More generally, there is a growing and unprecedented emphasis on high-quality information about what works and what does not, and on tracking progress. This is true from Bono and Bill Gates to the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda. A cross cutting theme in the first report of this panel calls for a data revolution to improve the quality of statistics and information available to citizens. SDI aims to be a part of that revolution.

SDI in Kenya: Implementation and Scope

Survey implementation was preceded by extensive consultation with Government and key stakeholders on survey design, sampling and adaptation of survey instruments. Survey implementation took place in the latter half of 2012. The survey was implemented by the Kenya Institute of Public Policy Research and Analysis (KIPPRA) and Kimetrica with quality assurance and oversight from the World Bank. Funding was provided by the World Bank, the Canadian International Development Agency (CIDA) and the USAID-funded Health Policy Project.

Information was collected from about 303 primary schools (public and private) and 294 health facilities (public and non-profit private), 2,960 teachers, and 1,856 health providers. The surveys provide a representative snapshot of the learning environment and key resources in both public and private schools, and the quality of health service delivery and the physical environment within which services are delivered in public and private (non-profit) health facilities.

THE INDICATORS

The SDI indicators—which will soon be standard across several African countries—are grouped into three categories:

(i) **What providers know (knowledge and ability).** Teachers need to have at least a minimum level of knowledge of the subjects they are teaching and skills to transform their knowledge into meaningful teaching. Similarly, health providers need to be skilled and competent to manage the conditions they are presented with.

(ii) **What providers do (provider effort).** A minimum requirement for service delivery, for example, is that teachers and health providers are present in the facility and working.

(iii) **What providers have to work with (availability of key inputs).** These indicators deal with the service delivery environment, including the availability of teaching and medical equipment and supplies and school and health facility infrastructure.

The annex provides a detailed description of the indicators.

---

8 The transaction intensive nature of service delivery in health and education makes the cost of the inability to monitor extremely costly.
9 Available at www.SDIndicators.org and www.worldbank.org/SDI, or by contacting sdi@worldbank.org.
Summary of the Findings

What do teachers and health workers know?

The share of teachers with minimum content knowledge is calculated on the basis of a customized teacher test administered to the grade 4 mathematics and English teachers. The English test results were for teachers teaching English, and the mathematics test results were for teachers teaching mathematics. The test was validated against the Kenyan primary school curriculum. In addition to assessing knowledge of the subjects themselves, the tests assessed pedagogical knowledge—the ability of teachers to teach effectively.

Teachers’ knowledge of the subjects they teach was relatively modest, and the pedagogical skills to transform their knowledge into meaningful teaching was worryingly low. Only a third (35%) of public school teachers scored at least 80% on a test based on the curriculum they teach. Who are most likely to perform best in the teacher assessments? Teachers who are female, younger, less experienced, and on short-term contracts score better on the assessment. As one would expect, teachers who teach higher grades and have more completed years of education score better. Strikingly, there is no significant relationship between performance on the teacher assessment and teacher training and seniority.

Quality in the health sector was assessed using two indicators of process (the adherence to clinical guidelines in five tracer conditions and the management of maternal and newborn complications) and an indicator of outcomes (diagnostic accuracy in the five tracer conditions). Three of the tracer conditions were childhood clinical vignettes are a widely used teaching method used primarily to measure clinicians (or trainee clinicians) knowledge and clinical reasoning. A vignette can be designed to measure knowledge about a specific diagnosis or clinical situation at the same time as it measures trainees’ skills in performing the tasks necessary to diagnose and care for a patient. According to this methodology, one of the fieldworkers acts as a case study patient and he/she presents to the clinician specific symptoms from a carefully constructed script while another acts as an enumerator. The clinician, who is informed of the case simulation, is asked to proceed as if the fieldworker is a real patient. For each facility, the case simulations are presented to up to ten randomly selected health workers who conduct outpatient consultations. If there are fewer than ten health workers who provide clinical care, all the providers are interviewed. For more information on the methodology, see www.SDIndicators.org.

11 They were also validated against curricula from 12 other SSA countries (“Teaching Standards and Curriculum Review” prepared as background document for the SDI by David Johnson, Andrew Cunningham and Rachel Dowling.)

12 Clinical vignettes are a widely used teaching method used primarily to measure clinicians (or trainee clinicians) knowledge and clinical reasoning. A vignette can be designed to measure knowledge about a specific diagnosis or clinical situation at the same time as it measures trainees’ skills in performing the tasks necessary to diagnose and care for a patient. According to this methodology, one of the fieldworkers acts as a case study patient and he/she presents to the clinician specific symptoms from a carefully constructed script while another acts as an enumerator. The clinician, who is informed of the case simulation, is asked to proceed as if the fieldworker is a real patient. For each facility, the case simulations are presented to up to ten randomly selected health workers who conduct outpatient consultations. If there are fewer than ten health workers who provide clinical care, all the providers are interviewed. For more information on the methodology, see www.SDIndicators.org.
conditions (malaria with anemia; acute diarrhea with severe dehydration, and pneumonia), and two conditions were adult conditions (pulmonary tuberculosis and diabetes mellitus). Two other conditions were included: post-partum hemorrhage, the most common cause of maternal death during birth, and neonatal asphyxia, the most common cause of neonatal death during birth.

Public providers managed to correctly diagnose less than three quarters (72%) of the tracer conditions. Diagnostic ability scores progressively declined among the three cadre types: doctors, clinical officers and nurses. While diagnostic ability generally appears high, a patient may view these results differently given how basic the tracer conditions are and expect providers to correctly diagnose all five of these cases. Only 58% of public providers were able to correctly diagnose at least four out of the five tracer conditions (see Figure 3). On measures of process quality, public health providers followed less than half of Kenya’s clinical guidelines for these conditions and the most prevalent maternal and neonatal complications.

Public-private comparisons

Differences by provider type in quality of education and health services are often attributed to the notion that the private sector attracts better skilled providers. This is only partially supported by the evidence from Kenya. The public-private differences in health provider knowledge and ability were small or not statistically significant. In education, the overall average score on the teacher test was not significantly different. At the same time, however, private sector teachers did score better on the assessment of minimum knowledge (40% higher; see Table 1).

What do providers do?

Measuring absence rates is difficult—but it is an important measure of what providers do. SDI relies on an unannounced visit to assess the extent of absenteeism. In the health survey hospitals were excluded because of the complex shift arrangements.

The average absence in schools was relatively low at 16%. While low on average, a fifth of schools had a school absence rate between 20-40%, and for a tenth of schools it is above 40%. But the SDI reveal an even bigger concern: teachers who are present at school but absent from class. For every 100 public school teachers, only 55 teachers were in class teaching and 27 were at school but not in the classroom teaching (see Figure 4). This translates into an average teaching time of only 2 hours and 40 minutes in public schools out of a 5 hours and 40 minutes official teaching day.13

In the public schools, who is most likely to be absent from class? They are teachers with seniority, who are better educated, more experienced and who reside in the district where they teach.14 Absence
was also more likely among teachers who teach higher grades, who were born in the same district as the school they are working in and who are on permanent contracts. Excluding head teachers and principals, a male teacher with a permanent contract is 64% more likely to be absent from the classroom compared to a female teacher with no permanent contract (33% absent versus 64%). There may be various reasons that underpin absenteeism—some sanctioned and some not. But the bottom line is that excused or unexcused absence has the same result: pupils that are not being taught.

In the health sector, close to a third (29%) of public providers was found to be absent. Who were most likely to be absent? Absence was more likely among health providers at urban facilities and in facilities with staff in excess of six workers. In urban facilities, close to 4 in 10 providers were absent on average. There was no difference in absence rates among health cadre-types.

In any workplace setting, absence may be sanctioned or not sanctioned. The survey found that the overwhelming share of absence from health facilities (88%) was indeed sanctioned absence (see Figure 5). But, from the consumer’s perspective, these providers are not available to deliver services—whether sanctioned or not. It is possible that absence can be improved by more prudent sanctioning of absence. As with education, this suggests that management improvements and better oversight of staff can potentially improve the availability of staff for service delivery.

Another measure of health provider effort is patient caseload—usually of concern because a shortage of health workers may cause caseload to rise and potentially compromise service quality. The outpatient caseload indicator is defined as the number of outpatient visits (recorded in outpatient records) in the three months prior to the survey, divided by the number of days the facility was open during the 3-month period and the number of health workers who conduct patient consultations. The term caseload rather than workload is used to acknowledge the fact that the full workload of a health provider includes work that is not captured in this measure, such as administrative work. From the perspective of a patient or a parent coming to a health facility, caseload is arguably the critically important measure.

The data for Kenya shows average caseload per public provider was surprisingly low at 8.7 patients per provider per day, and the caseload for half of health providers was less than 7 cases per day. Providers at some facilities, however, have higher caseloads. For example, the average caseload among the top 20% busiest public health centers and dispensaries is 22.3 and 15.6 respectively. Comparison to findings from other countries provide some context: A recent study in Tanzania reported a caseload of 18.5 patients per day.\footnote{Maestad O., G. Torsvik and A. Aakvik. Overworked? The Relationship Between Workload and Health Worker Performance in Rural Tanzania. Health Economics, 29: 686-698.}

For a large share of health providers—especially those in moderately sized facilities which account for half of the facilities in the country—there are very low caseload levels of about 6.5 patients per provider. One may ask, why do health staff who are present for work, feel that their true workload is higher than these numbers suggest? This is in part because of the relatively high absence rate, causing the burden of work to fall on a smaller number of staff than necessary.
Public-private comparisons

Unlike measures of teacher and health worker ability, the private sector does significantly better on measures of provider effort. Specifically, private school teachers were a third less likely to be absent from the classroom and spend 50% more time in the classroom. Notably, these differences translate into, on average, 1 hour and 9 minutes more teaching time per day in private schools. This echoes the findings that 30% of classrooms with children in public schools were without a teacher, almost twice as much compared to private schools.

Public health providers also underperform compared to their private counterparts, especially at the level of health centers, where public providers were 66% more likely to be absent than at private non-profit health centers.

What are the inputs that providers have to work with?

A few critical inputs for service delivery were tracked by SDI. In schools, the following “availability of teaching resources” assessed were: (i) whether a grade 4 classroom has a functioning blackboard and chalk; (ii) the share of students with pens; and (iii) the share of students with notebooks. An index was calculated as a simple average of these three components. Minimum infrastructure resources were assessed as: (i) functioning toilets assessed as being clean, private, and accessible; and (ii) sufficient light to read the blackboard from the back of the classroom. In addition, the student-teacher ratio and students per textbook were assessed.

The supply of school inputs such as these school infrastructure and teaching equipment indicators, compares favorably with Kenya’s own norms. Several measures are at or better than the Kenyan benchmark. For example, student-teacher ratio (of 33:1), the number of students per textbook (of 3:1), and the availability of teaching equipment compare favorably with the benchmark.

The medical equipment indicator focuses on the availability of minimum equipment expected at a facility: a weighing scale (adult, child or infant), a stethoscope, a blood pressure meter and a thermometer at all facilities; and sterilizing equipment and a refrigerator at health centers and hospitals. In each case the equipment needed to be observed by the enumerator and assessed as functioning. It is an important achievement that refrigeration is available in more than 98% of all health centers and hospitals, and in 100% of public rural health centers and hospitals. Three quarters (72%) of public health facilities met the basic equipment requirements.

In terms of health facility infrastructure, more than ninety percent (95%) of public facilities had access to sanitation and two thirds (68%) had a source of electricity. About 75% of public facilities had access to a clean water source.

Drug availability is defined as the number of drugs of which a facility has one or more available, as a proportion of all the drugs on a list of 26 tracer medicines for children and mothers identified by the World Health Organization (WHO). Enumerators need to observe the drugs and assess that they were unexpired in order to be counted for this purpose. On average, 78% of tracer drugs for children were available at public facilities. Furthermore, the availability of tracer drugs for mothers at 58% was relatively low given the national concern about maternal mortality and efforts to improve maternal health outcomes.

It is commonly reported that rural facilities suffer severe drug shortages compared to their urban counterparts. In Kenya, there was no evidence to support this. Rural public facilities had 67% of the tracer drugs compared to 63% in urban public

---

**TABLE 2. Comparison with Kenyan Norm and other SDI Surveys**

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Kenya</th>
<th>Kenyan norm</th>
<th>Tanzania SDI</th>
<th>Senegal SDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children per classroom</td>
<td>31</td>
<td>45</td>
<td>74</td>
<td>34</td>
</tr>
<tr>
<td>Pupil-teacher ratio</td>
<td>33:1</td>
<td>40:1</td>
<td>49:1</td>
<td>29:1</td>
</tr>
<tr>
<td>Students per textbook (for std 4)</td>
<td>3.1</td>
<td>3.0</td>
<td>Not comparable</td>
<td>Not comparable</td>
</tr>
<tr>
<td>Availability of teaching resources</td>
<td>95%</td>
<td>100%</td>
<td>Not comparable</td>
<td>Not comparable</td>
</tr>
<tr>
<td>Grants reaching schools (/pupil)</td>
<td>KSh988</td>
<td>KSh1,020</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>

---


17 The 10 tracer drugs for children and 16 tracer drugs for mothers are available from www.worldbank.org/SDI or www.SDIndicators.org. Some drugs are not dispensed at the lowest level facilities (dispensaries) and the estimates of drug availability are adjusted for level of facility.
facilities. In fact, rural public facilities had 13% more of tracer drugs for children compared to urban public facilities (79% versus 70%).

**Public-private comparisons**

There were two areas where the public-private differences were more stark—clean water and electricity. The share of private facilities with a clean water source was 29% greater than public facilities (97% versus 75%). The share of facilities with access to electricity was 32% higher in private facilities driven by lower access to electricity in public rural facilities.

**How do measures of provider effort and ability relate to the availability of inputs?**

Poor quality infrastructure is often cited as a reason for low teacher morale and motivation. One might then expect that better infrastructure would be associated with more teacher effort. Looking at the SDI data, however, there is little evidence that better school resources are correlated with improved teacher effort.

**How does teacher ability and effort correlate with pupil outcomes?**

Interestingly—and across the board—there are fairly strong relationships between student knowledge indicators capturing provider effort and ability but not with input measures. In public schools higher absence rates and higher student-teacher ratio are significantly negatively correlated with pupil test scores. Time spent teaching and teacher test scores are significantly positively correlated with pupil test scores.

**The combination of inputs is what matters—and that raises even more concerns.**

A unique feature of the Service Delivery Indicator survey is that it looked at the production of services at the frontline. Successful service delivery requires that all the measures of service delivery need to be present at a facility in the same place and at the same time. While the average estimates of infrastructure availability are relatively positive, the picture is quite bleak when we assess availability of inputs at the same time in the same facility—only 49% of facilities had clean water and sanitation and electricity. Even more disconcerting is the finding that not a single health facility had all 10 tracer drugs for children or all 16 tracer drugs for mothers. Only 16% of providers were able to correctly diagnose all five of the tracer conditions, 13% of providers successfully adhered to the country’s prescribed guidelines for the tracer conditions. More optimistically, 62% of providers followed the prescribed treatment actions to manage the two most common maternal and neonatal complications, and in the area of inputs, more than three quarters of public facilities met the minimum equipment requirements.

**What does this mean for Kenya?**

Almost every report on Kenya’s economic prospects calls for improvements in the effectiveness of Kenya’s education expenditure. Today 10 million students are of primary school-going age and that cohort will account for half of the next decade’s youth bulge. Whether that cohort is educated or not will determine whether Kenya will experience the education dividend required for Vision 2030, Kenya’s blueprint for economic and human development. Education is one of the single most powerful predictors of social mobility. Quality of education will also determine if the promise of Vision 2030 will be shared by the third of the population who live on less than $2 a day.

Kenya has invested heavily in education—today the government spends more than any of its neighbors, both as a share of government spending and as a share of GDP. Figure 2 shows the disconnect between Kenya’s spending on education and learning outcomes. More of the same is not good enough. The SDI results point to gaps in teacher knowledge, time spent teaching and absence from classroom that require urgent action.

Unlike education, government spending on health is modest in relation to its regional comparators.18

---

18 In 2012 government health spending was 8.5% of total government spending, and government health expenditure has remained at a constant 4.8% of GDP since 2001.
That said, Kenya has made tangible progress towards the health Millennium Development Goals. Significant gaps remain—gaps which can only partly be explained by lack of resources. The room for a budget increase in any sector in the immediate future is potentially constrained by the past and the present: fiscal expansion over the past few years needed to bolster the economy and likely budgetary pressure posed by the new constitution’s county reforms. More than ever before is it true that quality improvements in Kenya’s health sector will have to initially come from productivity and efficiency gains. Further, the success of the health sector in attracting a greater budget allocation will be strongly bolstered by demonstrating value for money and the effectiveness of existing health spending.

Kenya has made some phenomenal gains in recent years. For example, the infant mortality rate has fallen by 7.6% per year, the fastest rate of decline among 20 countries in the region. Arguably, the next set of gains will be more challenging—marginal women and children will become harder (and costlier) to reach, and addressing the performance gaps identified in the SDI survey at the frontline health facilities and service providers will be a critical determinant of progress.

The SDI results found that Kenya does relatively well on the availability of key inputs such as infrastructure, teaching and medical equipment, and textbooks. On measures of provider productivity and efficiency, the results were less positive. Regarding the availability of drugs, there are some important gaps: only two-thirds of the tracer drugs are available, and some gaps remain especially in the availability of tracer drugs for mothers. The greatest challenge is in the area of provider effort (evidenced by the provider absence data), and provider ability (evidenced by the assessments of providers’ knowledge and abilities). High provider absence and sub-optimal provider ability suggest room for improvement in the efficiency of spending on human development and reflect systemic problems.

The results should not be viewed narrowly as a criticism of teachers or health providers, but as a snapshot of the state of the education and health systems as a whole. Over time, as the impact of reforms is tracked through repeat surveys in each country, the indicators will allow for tracking of efforts to improve service delivery systems. Valuable cross-country insights will also emerge as the database grows and more country partners join the SDI initiative.

Finally, improvements in service quality in Kenya can be accelerated through focused investments on reforms to the incentive environments facing providers, and in the skills of providers to ensure that inputs and skills come together at the same time and at the same place. This will be critical to ensure that Kenya’s gains in human development outcomes continue beyond 2015, bringing the country closer to achieving the promises set out in the Vision 2030.

19 Expansionary fiscal policy years have caused the Kenyan government’s 2012 budget to be at about 30% of GDP. Kenyan public sector debt has doubled between 2007 and 2012. Debt as a proportion of GDP has now increased by about 4 percentage points from 39% in 2007 to 43% at the end of 2012 but it is still below the policy target of 45%.
### Annex 1. The Service Delivery Indicators defined

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School absence rate</strong></td>
<td>Share of a maximum of 10 randomly selected teachers absent from school during an unannounced visit. During the first announced visit, a maximum of ten teachers are randomly selected from the list of all teachers who are on the school roster. The whereabouts of these ten teachers are then verified in the second, unannounced, visit. Teachers found anywhere on the school premises are marked as present.</td>
</tr>
<tr>
<td><strong>Classroom absence rate</strong></td>
<td>Share of teachers who are present in the classroom out of those teachers present at school during scheduled teaching hours as observed during an unannounced visit. The indicator is constructed in the same way as School Absence Rate indicator, with the exception that the numerator now is the number of teachers who are both at school and in the classroom. The denominator is the number of teachers who are present at the school. A small number of teachers are found teaching outside, and these are marked as present for the purposes of the indicator.</td>
</tr>
<tr>
<td><strong>Classroom teaching time (also referred to as Time on Task)</strong></td>
<td>Amount of time a teacher spends teaching during a school day. This indicator combines data from the Staff Roster Module (used to measure absence rate), the Classroom Observation Module, and reported teaching hours. The teaching time is adjusted for the time teachers are absent from the classroom, on average, and for the time the teacher remains in classrooms based on classroom observations recorded every minute in a teaching lesson. A distinction is made between teaching and non-teaching activities based on classroom observation done inside the classroom. Teaching is defined very broadly, including actively interacting with students, correcting or grading student’s work, asking questions, testing, using the blackboard or having students working on a specific task, drilling or memorization, and maintaining discipline in class. Non-teaching activities is defined as work that is not related to teaching, including working on private matters, doing nothing and thus leaving students not paying attention, or leaving the classroom altogether.</td>
</tr>
<tr>
<td><strong>Minimum knowledge among teachers</strong></td>
<td>Share of teachers with minimum knowledge. This indicator measures teacher’s knowledge and is based mathematics and language tests covering the primary curriculum administered at the school level to all teachers currently teaching maths and English in grade 4, those who taught English and maths at grade 3 in the previous academic year, and up to 3 randomly selected upper primary maths and English teachers.</td>
</tr>
<tr>
<td><strong>Textbooks per student</strong></td>
<td>Number of mathematics and language books used in a grade 4 classroom divided by the number of students present in the classroom. The indicator is measured as the number of mathematics and language books that students use in a grade 4 classroom divided by the number of students present in the classroom. The data will be collected as part of the classroom observation schedule.</td>
</tr>
<tr>
<td><strong>Equipment availability</strong></td>
<td>Unweighted average of the proportion of schools with the following available: functioning blackboard with chalk, pencils and notebooks. Minimum teaching resources is assigned 0-1 capturing availability of (i) whether a grade 4 classroom has a functioning blackboard and chalk, (ii) the share of students with pens, and (iii) the share of students with notebooks, giving equal weight to each of the three components. Functioning blackboard and chalk: The enumerator assesses if there was a functioning blackboard in the classroom, measured as whether a text written on the blackboard could be read at the front and back of the classroom, and whether there was chalk available to write on the blackboard. Pencils and notebooks: The enumerator counts the number of students with pencils and notebooks, respectively, and by dividing each count by the number of students in the classroom one can then estimate the share of students with pencils and the share of students with notebooks.</td>
</tr>
</tbody>
</table>
## Infrastructure availability

Minimum infrastructure resources is assigned 0-1 capturing availability of: (i) functioning toilets operationalized as being clean, private, and accessible; and (ii) sufficient light to read the blackboard from the back of the classroom.

- Functioning toilets: Whether the toilets were functioning was verified by the enumerators as being accessible, clean and private (enclosed and with gender separation).
- Electricity: Functional availability of electricity is assessed by checking whether the light in the classroom works gives minimum light quality. The enumerator places a printout on the board and checks (assisted by a mobile light meter) whether it was possible to read the printout from the back of the classroom given the slight source.

## Caseload per health provider

The number of outpatient visits recorded in outpatient records in the three months prior to the survey, divided by the number of days the facility was open during the three month period and the number of health workers who conduct patient consultations (i.e. excluding cadre-types such as public health nurses and out-reach workers).

## Absence rate

Number of health workers that are not off duty who are absent from the facility on an unannounced visit as a share of ten randomly sampled workers. Health workers doing fieldwork (mainly community and public health workers) were counted as present. The absence indicator was not estimated for hospitals because of the complex arrangements of off duty, interdepartmental shifts etc.

## Adherence to clinical guidelines

For each of the following five case study patients: (i) malaria with anemia; (ii) acute diarrhea with severe dehydration; (iii) pneumonia; (iv) pulmonary tuberculosis; and (v) diabetes mellitus.

### History Taking Questions

Assign a score of one if a relevant history taking question is asked. The number of relevant history taking questions asked by the clinician during consultation is expressed as a percentage of the number of important history questions to be asked based on the guidelines for management of the case (IMIC and Kenya National guidelines).

### Relevant Examination Questions

Assign a score of one if a relevant examination question is asked. The number of relevant examination taking questions asked by the clinician during consultation is expressed as a percentage of the total number of relevant examination questions included in the questionnaire.

For each case study patient: Unweighted average of the: relevant history questions asked, and the percentage of physical examination questions asked. The history and examination questions considered are based on the Kenya National Clinical Guidelines and the guidelines for Integrated Management of Childhood Illnesses (IMCI).

## Management of maternal and neonatal complications

For each of the following two case study patients: (i) post-partum hemorrhage; and (ii) neonatal asphyxia. Assign a score of one if a relevant action is proposed. The number of relevant treatment actions proposed by the clinician during consultation is expressed as a percentage of the total number of relevant treatment actions included in the questionnaire.

## Diagnostic accuracy

For each of the following five case study patients: (i) malaria with anemia; (ii) acute diarrhea with severe dehydration; (iii) pneumonia; (iv) pulmonary tuberculosis; and (v) diabetes mellitus.

For each case study patient, assign a score of one as correct diagnosis for each case study patient if case is mentioned as diagnosis. Sum the total number of correct diagnoses identified. Divide by the total number of case study patients. Where multiple diagnoses were provided by the clinician, the diagnosis is coded as correct as long as it is mentioned, irrespective of what other alternative diagnoses were given.
### Drug availability

Share of basic drugs which at the time of the survey were available at the facility health facilities.

Priority medicines for mothers: Assign score of one if facility reports and enumerator confirms/observes the facility has the drug available and non-expired on the day of visit for the following medicines: Oxytocin (injectable), misoprostol (cap/tab), sodium chloride (saline solution) (injectable solution), azithromycin (cap/tab or oral liquid), calcium gluconate (injectable), cefixime (cap/tab), magnesium sulfate (injectable), benzathinepenicillin powder (for injection), ampicillin powder (for injection), betamethasone or dexamethasone (injectable), gentamicin (injectable) nifedipine (cap/tab), metronidazole (injectable), medroxyprogesterone acetate (Depo-Provera) (injectable), iron supplements (cap/tab) and folic acid supplements (cap/tab).

Priority medicines for children: Assign score of one if facility reports and enumerator confirms after observing that the facility has the drug available and non-expired on the day of visit for the following medicines: Amoxicillin (syrup/suspension), oral rehydration salts (ORS sachets), zinc (tablets), cotrimoxazole (powder for injection), artemisinin combination therapy (ACT), artesunate (rectal or injectable), benzylpenicillin (powder for injection), vitamin A (capsules)

We take out of analysis of the child tracer medicines two medicines (Gentamicin and ampicillin powder) that are included in the mother and in the child tracer medicine list to avoid double counting.

The aggregate is adjusted by facility type to accommodate the fact that some drugs are not expected to be available at lower level facilities as outlined in the Kenya Essential Drugs List.

### Equipment availability

Share of facilities with thermometer, stethoscope and weighing scale refrigerator and sterilization equipment.

Medical Equipment aggregate: Assign score of one if enumerator confirms the facility has one or more functioning of each of the following: thermometers, stethoscopes, sphygmomanometers and a weighing scale (adult or child or infant weighing scale) as defined below. Health centers and first level hospitals are expected to include two additional pieces of equipment: a refrigerator and sterilization device/equipment.

Thermometer: Assign score of one if facility reports and enumerator observes facility has one or more functioning thermometers.

Stethoscope: Assign score of one if facility reports and enumerator confirms facility has one or more functioning stethoscopes.

Sphygmomanometer: Assign score of one if facility reports and enumerator confirms facility has one or more functioning sphygmomanometers.

Weighing Scale: Assign score of one if facility reports and enumerator confirms facility has one or more functioning Adult, or Child or Infant weighing scale.

Refrigerator: Assign score of one if facility reports and enumerator confirms facility has one or more functioning refrigerator.

Sterilization equipment: Assign score of one if facility reports and enumerator confirms facility has one or more functioning Sterilization device/equipment.

### Infrastructure availability

Share of facilities with electricity, clean water and improved sanitation.

Infrastructure aggregate: Assign score of one if facility reports and enumerator confirms facility has electricity and water and sanitation as defined.

Electricity: Assign score of one if facility reports having the electric power grid, a fuel operated generator, a battery operated generator or a solar powered system as their main source of electricity.

Water: Assign score of one if facility reports their main source of water is piped into the facility, piped onto facility grounds or comes from a public tap/standpipe, tubewell/borehole, a protected dug well, a protected spring and harvested rainwater.

Sanitation: Assign score of one if facility reports and enumerator confirms facility has one or more functioning flush toilets with water or VIP latrines, covered pit latrine (with slab) or composting toilet.
References


