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# Burkina Faso

## Opportunities for Children

### A Policy Note 4

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## **CURRENCY EQUIVALENTS**

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1 US\$ = CFAF 500

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## **ABBREVIATIONS AND ACRONYMS**

FCFA	Franc CFA
GDP	Gross Domestic Product
HOI	Human Opportunity Index
INSD	Institut National de la Statistique et de la Demographie
MDG	Millennium Development Goals
UNDP	United Nations Development Programme

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## **ABSTRACT**

This document presents an analysis of the access to opportunities for children in Burkina Faso, using as a framework the Human Opportunity Index (HOI). The analysis is done considering three periods of time (1998/99, 2003 and 2009/10). The results suggest that the access to opportunities falls far short of universal. There are important challenges in improving access to education, health and infrastructure and reducing inequality in access to these goods and services.



# 1. Opportunities for Children in Burkina Faso

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## A. INTRODUCTION

1.1 **Burkina Faso is one of the poorest countries in the world. The country ranks at 181 out of 187 countries and territories on the 2011 Human Development Index.** The country's GDP per capita was US\$535 in 2010. Despite rapid economic growth over the past decade, access to basic services and goods remains limited. Under-five mortality rate is one of the highest in the world (176 deaths per 1,000 live births in 2010), comparable only to other Sub-Saharan African countries like Chad, Sierra Leone, Mali and Somalia. Moreover, national poverty headcount rate is 46.7% of the population and there is a large disparity between urban and rural areas (27.9 and 52.6% respectively).

1.2 **The country has a long history of migratory movement, political instability and corruption.** This together with evidence of limited and unequal access to basic opportunities (goods and services) and recent work done in the equality of opportunity agenda by the World Bank for other African countries (i.e. Liberia, Côte d'Ivoire) constitute a motivation for an in-depth country report for Burkina Faso on equality of opportunities. This will be of interest to the Bank, country policymakers and other stakeholders in Burkina Faso's development process.

1.3 **The purpose of this report is to measure and analyze inequality of opportunities for children in Burkina Faso, where opportunities are defined in terms of access to basic goods and services in education, health and infrastructure facilities like water, sanitation and electricity.** The use of the equality of opportunities framework involves looking beyond measures of *average* access to basic goods and services. Rather, the measure used in this analysis, the Human Opportunity Index, takes into account the extent to which *existing* opportunities are equitably distributed across children of different characteristics, such as gender, economic status, location and family or parental attributes, which are all circumstances that a child is born into.

1.4 **This report is organized as follows.** In Section 2, the underlying concept, properties and empirical methods for estimating the Human Opportunity Index (HOI) are briefly discussed. Section 3 presents the data and analytical choices that have to be made in order to define opportunities and circumstances. In Section 4, the main results related to opportunities are analyzed. Section 5 concludes.

## B. THE HUMAN OPPORTUNITY INDEX: CONCEPTS AND MEASUREMENT

1.5 A large body of social science literature has been concerned with equality of opportunity for some time. Amartya Sen (1979, 2001) has been deeply influential in arguing for an equitable distribution of "capabilities," which essentially amount to a person's ability and effort to convert resources into outcomes they have reason to enjoy. John Roemer's 1998 work *Equality of Opportunity* was the first to formalize an equality of opportunity principle and remains the most relevant piece of academic literature underpinning the proposed work.

1.6 *Opportunity* in this context, and in the context we will be using throughout this report, is understood as the set of basic services or goods that make it possible for an individual with to lead a life with dignity and freedom of choice. Opportunity in other words is a good or service for which there is a social consensus that everyone should have access (i.e. primary education, water and sanitation, etc.).

1.7 On the other hand, *circumstances* are personal, family or community characteristics which people are born into, and society wants to be completely unrelated with the access to opportunities (i.e. gender, ethnicity, religion, etc.).<sup>1</sup>

1.8 **The World Bank’s 2006 World Development Report, Equity and Development, argues that inequality of opportunity, both within and among nations, results in wasted human potential and weakens prospects for overall prosperity.** Conducting an analysis of equality of opportunity, however, requires a measure or a set of measures that provide a practical way to track a country’s progress towards equalizing opportunities for all its citizens. To be useful to analysts and policymakers alike, such a measure must combine a few attractive properties: intuitive appeal, simplicity, practicality (especially in relatively data scarce environments) and sound microeconomic foundations to ensure that it has an interpretation that is consistent with its objective.

1.9 **Much of the empirical work in developing countries till recent times has focused mainly on measuring (and comparing) average rates of access to goods or services in health and education for the population and different subgroups within.** What has been lacking in the most part is an intuitive and unified framework to address a range of questions across different types of opportunities, such as: How far away is a country from universalizing each type of opportunity? How unequally are available opportunities distributed across different subgroups of the population? How important are circumstances to which an individual is born into in determining access to opportunities? Which are the circumstances that matter for access, and in that sense, contribute the most to inequality in access? What would it take, in terms of resources, to reduce inequality in opportunities, when providing universal access is clearly not possible in the near term?

1.10 **World Bank staff and external researchers in recent years have made significant progress in addressing questions such as above in a simple and intuitive framework,** as demonstrated by the 2009 publication *Measuring Inequality of Opportunities in Latin America and the Caribbean region*. This report develops a “Human Opportunity Index” by examining children’s access to a set of basic goods and services that significantly improve their likelihood of being able to reach their human potential. The report computes HOI for and analyzes five indicators: access to clean water, sanitation and electricity, completing sixth grade on time, and attending school from age ten to 14. The analysis focuses on children because unlike adults, children cannot be expected to make the efforts needed to access these goods and services, implying that these indicators can be considered as proxies for opportunities available to a child. The report, and the updated 2010 version, “Do Our Children Have a Chance?” analyze these five indicators for 19 LAC countries using the HOI measure, exploring both changes over time within countries and comparisons between countries.

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<sup>1</sup> Barros et al. (2009) present a detailed definition of basic opportunities and circumstances and define some criteria about how to identify these categories.

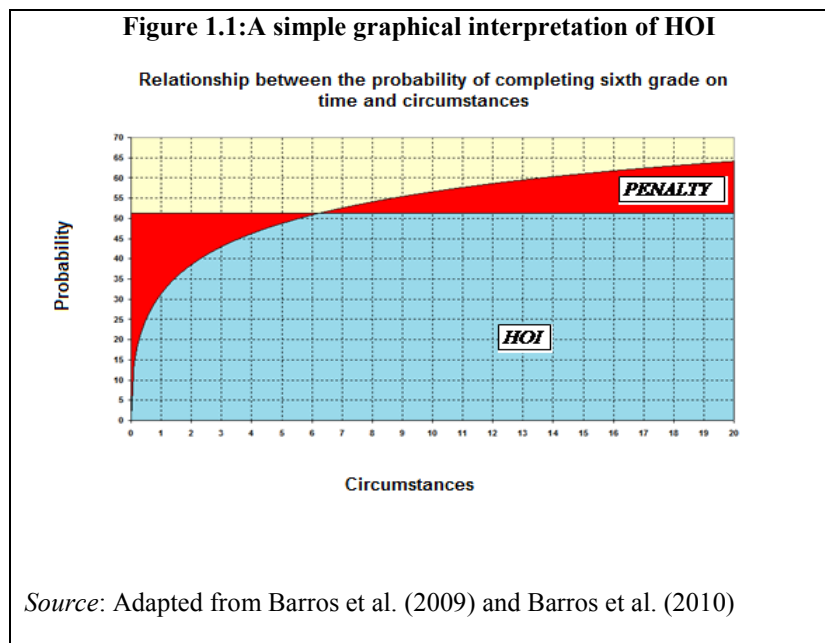


1.11 **The Human Opportunity Index (HOI) measures how far a society is from universal provision of basic services and goods, such as sanitation, clean water, education, and the extent to which those goods and services are unevenly distributed.**<sup>2</sup> A key feature of HOI is that it not only takes into account the overall coverage rates of these services, but also how *equally* the coverage is distributed – by measuring the extent to which those *without* coverage are concentrated in groups with particular circumstances (e.g., economic status, gender, parental education, ethnicity and so on), which are conditions a child is typically born into. More specifically, *HOI is an inequality-sensitive coverage rate* that incorporates: a) the average coverage of a good or service, which society accepts should be universal (which implies that the *individual* is not held responsible for lack of access); and b) if it is allocated according to an equality of opportunity principle.

### Unpacking the HOI

1.12 **The HOI is defined as the difference between two components:** the overall coverage rate of the opportunity (C); and a “penalty” for the share of access to opportunities that is allocated in violation of the equality of opportunity principle (P).  $HOI=C-P$ ; which implies that the maximum value HOI for a particular opportunity can take is the average access (or coverage) rate for that service. It also implies that an HOI of 1 would be possible only when access is *universal* (C is equal to 1 and P is equal to 0).

1.13 **Figure 1 shows a simple graphical interpretation of HOI.** It graphs the probability of a child of a particular circumstance (e.g. percentile of per capita income or wealth) completing sixth grade on time, with circumstance (on the horizontal axis) improving from left to right. The horizontal line is the average coverage rate for the entire population of children. The curved line shows access rates for different levels of circumstance. There is no equality of opportunity in this case, since probability of access



to the opportunity is positively correlated with circumstance, which is shown by the fact that the curved line does not coincide with the horizontal line. Opportunities allocated in the red area above the average coverage violate the equality of opportunity principle: they show dependence of the access to education on income or wealth. There is an intuitive interpretation of the red area: it is the share of the total number of opportunities that are “misallocated” across groups of different circumstances, which is to say allocated to children with better circumstances so that

<sup>2</sup> This discussion draws from three sources: Barros et al. (2009), Barros et al. (2010), and Barros et al. (2012).

they have higher than average access to the opportunity.<sup>3</sup> The HOI corresponds to the blue area in the graph, which is the area below the curved line discounted by the red area above the average coverage rate. A second interpretation of the HOI invokes an index (D), equivalent to (P/C), which is known as the “inequality of opportunity” or “dissimilarity” index. The D-index corresponds to the share of opportunities that would have to be reallocated across groups – for an unchanged rate of overall coverage – in order to achieve equality of opportunity, out of the total amount of opportunities available in society.  $HOI=C-P=C*(1-D)$ .

1.14 **Box 1 below outlines a simple example of how HOI is measured**, in a hypothetical situation with two countries with identical population of children and average coverage rate of primary school enrollment. The example demonstrates how HOI is sensitive to inequality in coverage and how it would change in response to an increase in overall coverage or reallocation favoring the more disadvantaged group.

**Box 1.1: A simple and intuitive example of HOI**

Consider 2 countries, A and B, each with a total population of 100 children. Each country has two groups of children, I and II, which consist of the top 50 percent and bottom 50 percent by per capita income, respectively. Coverage rate of school enrollment (or the average enrollment rate) for both countries is 0.6, i.e. 60 children attend school in each country. The table below A shows the number of children going to school in each group for each country.

Given the total coverage rate, the principle of equality of opportunity will hold true for each country if each of the 2 groups in each country has the same rate of coverage, i.e. if each group has 30 children going to school. But in reality group II has 20 enrollments in country A and 25 in country B. This suggests that firstly, opportunities are unequally distributed, and secondly, inequality of opportunities is higher in country A. The D-index is the share of total enrollments that is “misallocated”, namely 10/60 and 5/60 for A and B, respectively. Therefore,  $HOI_A = C_0 (1-D) = 0.6 * (1-10/60) = 0.50$ ;  $HOI_B = C_0 (1-D) = 0.6 * (1-5/60) = 0.55$ .

Thus even though both countries have equal coverage rates for enrollment, the higher inequality of opportunity in country A leads to the D-for B, and HOI being higher easy to see that HOI will the number of enrollments in (in proportionate or absolute any group increases without of the other group; and (iii) increases, keeping the total unchanged (implying by an equivalent amount). the “scale”, “Pareto “redistribution” properties of properties that are intuitively appealing.

<i>Groups by circumstance (e.g. income)</i>	<i>No. of children of age 6-10 yrs enrolled in school</i>	
	<i>Country A (100 children)</i>	<i>Country B (100 children)</i>
<i>Group I (top 50% by income)</i>	40	35
<i>Group II (bottom 50% by income)</i>	20	25
<i>Total</i>	60	60

index being higher for A than for B than for A. It is also increase in a country if: (i) each group increases equally terms); (ii) if enrollment for decreasing the coverage rates enrollment for group II number of children enrolled enrollment in group I reduces These three features relate to improvement” and HOI, respectively –

<sup>3</sup> This also implies that the red area is the share of total opportunities that would have to be reallocated to children with lower than average opportunities, in order to achieve equality of opportunities, for a given level of coverage.

1.15 **The HOI is an inequality sensitive coverage rate in the sense that it improves when inequality decreases with a fixed number of opportunities in a society, or when the number of opportunities increase and inequality stays constant.** In more formal terms, the properties of the HOI guarantees that the improvement in the index is sensitive to: a) the overall coverage: when the coverage for all groups increases by factor  $k$  the HOI increases by the same factor; b) Pareto improvements: when the coverage for one group increases without decreasing the coverage rates of other groups the HOI increases; c) redistribution of opportunities: when the coverage rate of a vulnerable group increases for a constant overall coverage rate there is decrease in inequality and an increase in the HOI.

1.16 **To compute HOI for a particular opportunity for the children of a country, household survey data is essential.** To allow computation of HOI for education and health opportunities, the survey must have a minimum set of information, at the individual (child) or household level, as appropriate. Examples of these would be whether the child is attending school or not, grade level, last grade completed and health indicators such as weight and height of child and whether the child has been immunized or not. Computing HOI for access to basic infrastructure, like safe water, electricity and sanitation would require that household level information on these indicators is available. With regard to circumstances, the minimum information needed to make the analysis meaningful would be gender, age and location (urban/rural and/or regional) of the child, demographic characteristics of the household (size and composition), characteristics of parents (gender, age and education) and some measure of household income, consumption or wealth.

1.17 **In practical terms, computing HOI for a particular opportunity when the number of circumstances is relatively large (more than three) requires an econometric exercise,** which involves obtaining a *prediction* of the D-index from observed access to opportunities and circumstances among children. In simple terms, the exercise consists of running a logistic regression model to estimate the relationship between access to a particular opportunity and circumstances of the child, on the full sample of children for whom the HOI measure will be constructed. The estimated coefficients of the regression are used to obtain, for each child; his/her predicted *probability* of access to the opportunity; which is then in turn used to estimate the D-index, the coverage rate and eventually the HOI (see Appendix for more technical details on the econometric exercise).<sup>4</sup>

1.18 **Change in HOI over time can be used to assess progress in access to opportunity in a society, taking into account both universality of access and inequality in access among different circumstance groups.** The help understand the factors that contribute to a change in HOI, a decomposability property of HOI is useful. A change in HOI can be decomposed into : a) *Composition* effect, which refers to changes in the distribution of circumstances (e.g., if the distribution of wealth improves, chances of accessing opportunities are likely to increase); b) *Scale* effect, which refers to proportional change in the coverage rate of all groups (e.g., if there is policy directed towards increasing coverage of an opportunity across all groups); c) *Equalization* effect, which refers to change in the coverage of vulnerable groups (groups with coverage below the national average), with the average coverage rate held unchanged – in other words a move towards greater (or less) inequality for the same average level of coverage.

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<sup>4</sup> More details can also be found in Barros et al. (2010); and Barros et. al. (2012).

1.19 **Interpretations of the three decomposed components are quite intuitive.** A positive composition effect shows whether the underlying circumstances that children are born into are improving over time, as a result of demographic changes, economic growth or social progress. A positive scale effect shows whether opportunities are improving for all groups in the society, perhaps as result of public policy or social progress (e.g. increased awareness among all households). The equalization effect in essence indicates the trend in equity in a society, showing whether available opportunities are distributed more equitably among its members, so that the circumstances a child is born into begins to matter less for access to basic goods and services.

### **C. CHOICE OF OPPORTUNITIES AND CIRCUMSTANCES FOR BURKINA FASO**

1.20 **This section presents the opportunities and circumstances that are used in the analysis.** The list of opportunities was defined taking into account the opportunities used in other studies for LAC and African countries. The opportunities can be classified in three dimensions: education, infrastructure and health. In selecting the final set of indicators that can be analyzed, two criteria were considered: (i) data availability and (ii) the indicator must be relevant for Burkina Faso.

1.21 **Table 1.1 summarizes the list of opportunities considered and the period for which the indicator is available.** At this point is important to notice that the sources of information used in this analysis correspond to the Demographic and Health Survey (DHS) for Burkina Faso in 1998/99 and 2003 and the Household Living Standards Survey 2003 and 2009/10.

1.22 **In the education dimension, four opportunities were considered.** School attendance as a measure of access is not conditional on the level to which the children are attending. Started primary on time and finish sixth grade are indicators to capture completion and access to the services in an appropriate age. In the infrastructure dimension, the opportunities included are access to water, sanitation and electricity. A child is considered with access to water if the source of drinking water in the household is piped water (in the dwelling or yard), well water, a public tap or rainwater. Access to sanitation is considered as having a flush toilet or pit toilet latrine (in the dwelling or yard) and access to electricity is having electricity connection in the dwelling. Finally, in the health dimension, two indicators: one of access (immunization against measles) and one of outcome (no being underweight) are considered, it is worth mention that these two indicators are Millennium Development Goal's indicators.

1.23 **On the other hand, Table 1.2 presents the list of circumstances considered in each case.** The circumstances are exogenous characteristics which children are born into. These circumstances include individual characteristics such as gender and characteristics of the household where the child lives (presence of elderly, total number of children, wealth, characteristics of the household head, etc.).

**Table 1.1: List of opportunities**

Opportunity	1998/99	2003		2009/10
	Demographic and Health Survey		Household Living Standards Survey	
School Attendance (6 to 11 years)	X	X	X	X
School Attendance (12 to 15 years)	X	X	X	X
Started primary on time (6 to 7 years)	X	X	X	X
Finish sixth grade (12 to 15 years)	X	X	X	X
Access to Electricity (0 to 16 years)	X	X	X	X
Access to Water (0 to 16 years)	X	X		
Access to Sanitation (0 to 16 years)	X	X		
Immunization against measles (1 year)	X	X		
No being underweight (0 to 4 years)	X	X		

1.24 **It is important to note that the list of circumstances do not include all the circumstances that may be relevant in determining the access to opportunities of a child.** This is because our choice of circumstances – that define the groups between which we can examine equality of opportunities – is necessarily limited by the information that is available from surveys. Given that the list of circumstances cannot be comprehensive enough to guarantee that all (or even the most important of) circumstances influencing access have been taken into account, it is important to recognize a key property of HOI. In case of “missing” circumstances, the HOI that is computed using just the available circumstances would serve as a theoretical “upper bound”. This means that even if important circumstances are missing from the analysis, adding the missing circumstances will only increase the penalty for inequality and drive HOI downwards.

**Table 1.2. List of circumstances**

Demographic and Health Survey (1998/99 and 2003)		Household Living Standards Survey (2003 and 2009/10)
Education and Infrastructure Opportunities	Health Opportunities	Education and Infrastructure Opportunities
<ul style="list-style-type: none"> <li>• Gender</li> <li>• Total number of children 0 to 15 years in the household</li> <li>• Presence of elderly in the household</li> <li>• Age of the household head</li> <li>• Gender of the household head</li> <li>• Education of the household head</li> <li>• Location (Urban/Rural)</li> <li>• Wealth Quintiles<sup>5</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Gender</li> <li>• Number of siblings</li> <li>• Single mother</li> <li>• Age of the mother</li> <li>• Gender of the household head</li> <li>• Education of the mother</li> <li>• Location (Urban/Rural)</li> <li>• Wealth Quintiles</li> <li>• Birth order</li> </ul>	<ul style="list-style-type: none"> <li>• Gender</li> <li>• Total number of children 0 to 15 years in the household</li> <li>• Presence of elderly in the household</li> <li>• Age of the household head</li> <li>• Gender of the household head</li> <li>• Education of the household head</li> <li>• Location (Urban/Rural)</li> <li>• Expenditures Quintiles</li> </ul>

<sup>5</sup> Access to basic services is used to construct the original wealth index in DHS. For this reason, we recalculated the wealth index excluding access to basic services in the estimation of basic infrastructure opportunities.

## Data sources

1.25 The sources of information used in this analysis correspond to the Demographic and Health Survey (DHS) for Burkina Faso in 1998/99 and 2003 and the Household Living Standards Survey 2003 and 2009/10. From the DHS we can construct all the opportunities considered in the three dimensions (education, infrastructure and health), however from the household survey the set of opportunities is more limited.

1.26 **Table 1.3 presents the average coverage rate of the relevant opportunities.** Some important fact can be obtained. First and most important, access to all opportunities falls far short of universal. Second, there is a large heterogeneity in the levels achieved in each dimension. While in 1998/99 the 5% of the children population had access to electricity, the proportion of children no underweighted was 66.2%<sup>6</sup>. Third, it can be seen that most of the opportunities have improved over time. However, the most significant improvements are in school attendance between 2003 and 2009/10.

1.27 **For 2003, information from the two sources (DHS and household survey) is available.** It can be seen that the average coverage rate for most of the opportunities are very similar. Finish sixth grade is the only opportunity which shows a significant difference between the two surveys. In DHS the average coverage rate is 20% compared with 9.4% from the household survey. However, these two surveys are not necessarily comparable. For this reason all the analysis developed in the next section is based on two different stage, first we compare the results between 1998/99 and 2003 using DHS and then the results between 2003 and 2009/10 are analyzed using the household survey. We present decompositions of the changes for these two periods separately.

**Table 1.3. Average coverage rate for all the opportunities**

Opportunities	Demographic and Health Survey		Household Living Standards Survey	
	1998/99	2003	2009/10	
School Attendance (6 to 11 years)	25.4%	27.6%	30.2%	48.4%
School Attendance (12 to 15 years)	21.1%	27.1%	29.5%	47.1%
Started primary on time	11.5%	16.7%	17.9%	19.7%
Finish sixth grade	15.0%	20.0%	9.4%	20.6%
Access to Electricity	5.0%	8.3%	7.4%	10.1%
Access to Water	94.4%	86.1%		
Access to Sanitation	21.6%	27.7%		
Immunization against measles	49.1%	56.6%		
No underweight	66.2%	64.3%		

## D. RESULTS FROM HOI ANALYSIS

1.28 **This section summarizes the main results from the HOI analysis.** First the levels of the HOI in the three periods are presented. Second, the changes and decomposition of changes over time are analyzed. Third, an alternative version of the HOI is used to present the levels of equality of opportunities by region. Fourth, in order to explore the sources behind the inequality

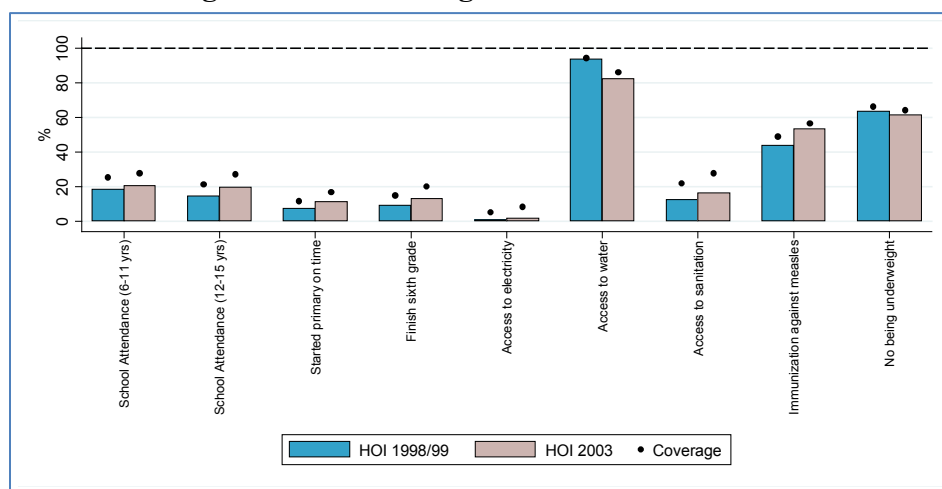
<sup>6</sup> This does not mean that all opportunities are equally valued in a social welfare function. It is likely that in a social welfare function, eliminate malnutrition and hunger is more appreciated than provide universal access to electricity.

of opportunities Shapley decompositions are presented to identify which circumstances have a larger marginal contribution to inequality. Finally, a characterization of the least and most vulnerable groups in probability of access to opportunities is presented. Some of the results are presented for boys and girls separately due to importance that gender inequalities has in the policy discussions.

## Human Opportunities in Burkina Faso

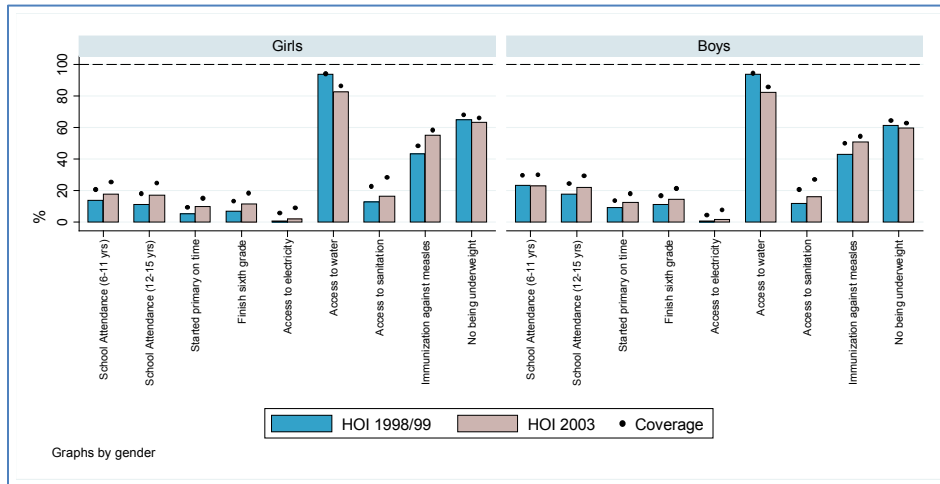
1.29 **Figure 1.2 shows the levels of the Human Opportunity Index (HOI) and coverage for all the opportunities in 1998/99 and 2003.** It can be seen that in the two periods the access to educational opportunities is more limited compared with access to health opportunities and access to water. The inequality (gap between the coverage and HOI) is much lower for the health than for the educational opportunities. It is also important to notice that the direction of the change in HOI mimics the direction of change in coverage in all cases.

**Figure 1.2: HOI using DHS 1998/99 and 2003**



1.30 **Analyzing the results by gender (Figure 3), it can be seen that in 1998/99 and 2003 the access to educational opportunities was higher for boys than for girls,** access to infrastructure opportunities didn't show significant difference by gender and access to health opportunities is slightly higher for girls. It interesting than in the educational dimension access to opportunities is more favorable for boys, but the opposite happens in the health dimension. Besides this difference in the educational and health dimension, there are no major differences by gender, levels of inequality and trends in coverage and HOI between 1998/99 and 2003 are similar for boys and girls.

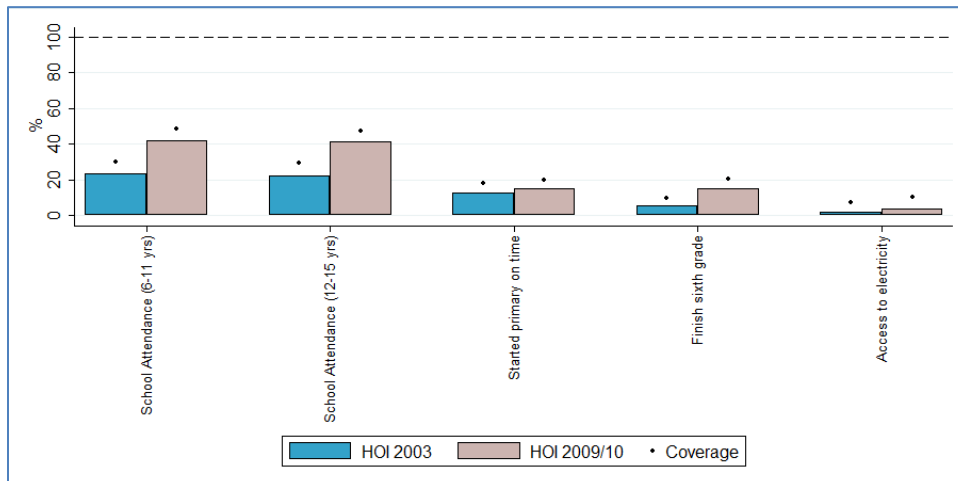
**Figure 1.3: HOI using DHS 1998/99 and 2003 by gender**



1.31 Similar to the trends showed in Figure 1.2, the five opportunities that are comparable between 2003 and 2009/10 show a slightly improvement over time (see Figure 1.4). In all opportunities the expansion in coverage also was reflected in an expansion in the HOI. Despite the improvement in access to opportunities, the overall access remains low. Less than 50% of the children have access to education and only 10% of them live in a household with access to electricity.

1.32 When we compare the results by gender between 2003 and 2009/10, the findings are similar to those presented for the 1998/99 and 2003 analysis: trends in coverage and HOI are similar, access to educational opportunities is more likely for boys and inequality in all dimensions is similar by gender.

**Figure 1.4: HOI using household survey 2003 and 2009/10**



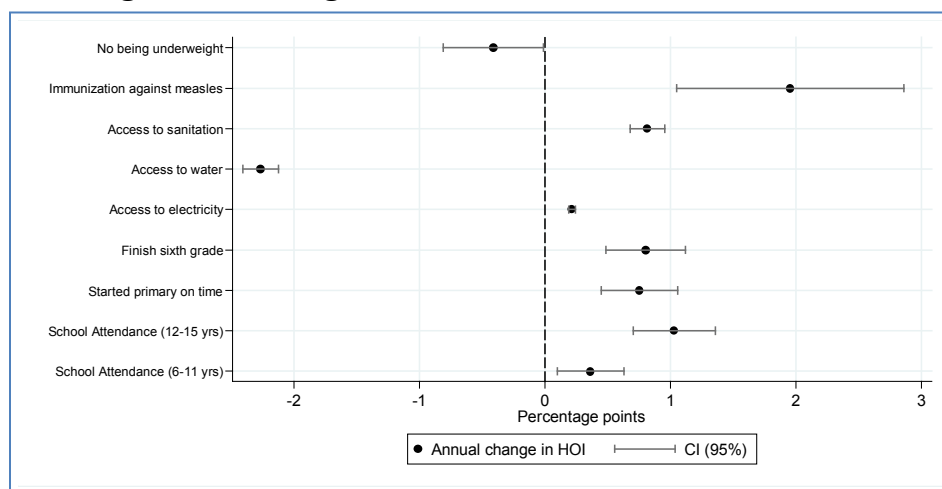


## Changes over time

1.33 **Beyond the current levels of access to opportunities, it is important to analyze the evolution in the recent years in the access to opportunities.** Figure 1.5 presents the annual changes in the HOI for all the opportunities between 1998/99 and 2003 and its respective confidence intervals (95% confidence). It can be seen that significant improvements were reached in almost all the opportunities (except for access to water and no being underweight). Nevertheless, the magnitude of the annual improvements is relatively low given the low access to opportunities in 1998/99.

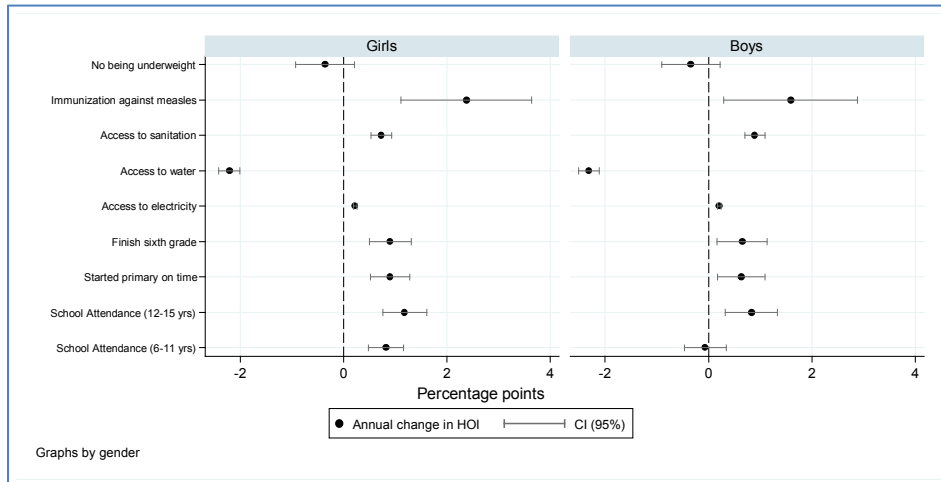
1.34 **For the nutritional opportunity “no being underweight” the change in the HOI was negative and barely statistically significant (at 95% confidence).** However, when the change by gender is considered it can be seen that the changes were not statistically significant (See Figure 1.6). Moreover, except for school attendance 6-11 years, all the other changes in the HOI over time were similar for boys and girls. For school attendance 6-11 years, boys did not experience a significant improvement in access to the opportunity contrasting the positive change for girls.

**Figure 1.5: Change in the HOI between 1998/99 and 2003**



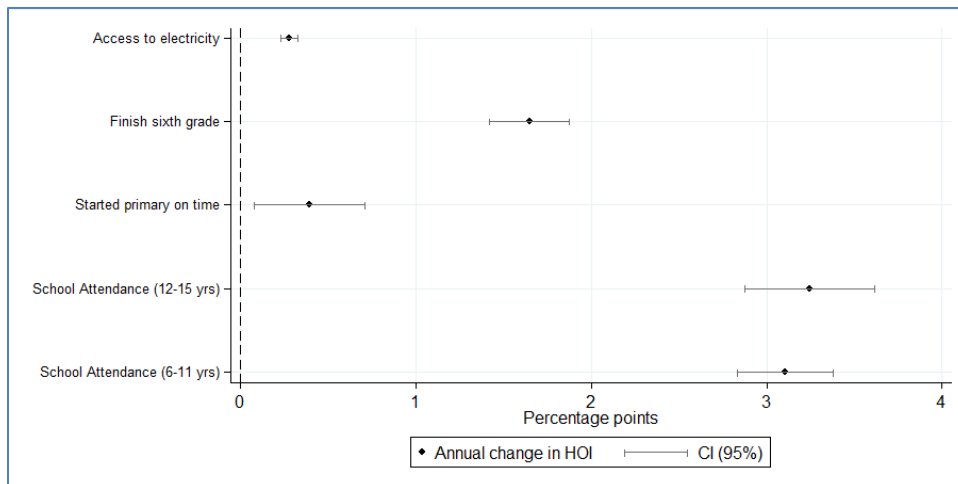
1.35 **In the case of “access to water” the significant decrease in access to the opportunities could be a consequence of the flexible definition used.** The definition of this opportunity considers as having access to those children who live in household with piped water (in the dwelling or yard), well water, a public tap or rainwater as the source of drinking water. However, most of these sources are not easily influenced through policy. It means that the change in “access to water” could be the result of changes in the availability of natural resources or habits of the population and not necessarily a consequence of a reduction in the public provision of the opportunity. Moreover, the proportion of children with access to piped water (dwelling or yard) slightly increases between 1998/99 and 2003 from 2.9% to 4.6%.

**Figure 1.6: Change in the HOI between 1998/99 and 2003 by gender**



1.36 **Between 2003 and 2009/10 there were also significant improvements in the five opportunities analyzed.** It seems that the increments in school attendance were bigger than in the period 1998/99 to 2003. While the increments in the HOI of the school attendance opportunities in the early 2000s were around 1 annual percentage point in the late 2000s the increment was approximately 3 percentage points. In this period of time, there were not differences in the changes in the HOI by gender.

**Figure 1.7: Change in the HOI between 2003 and 2009/10**

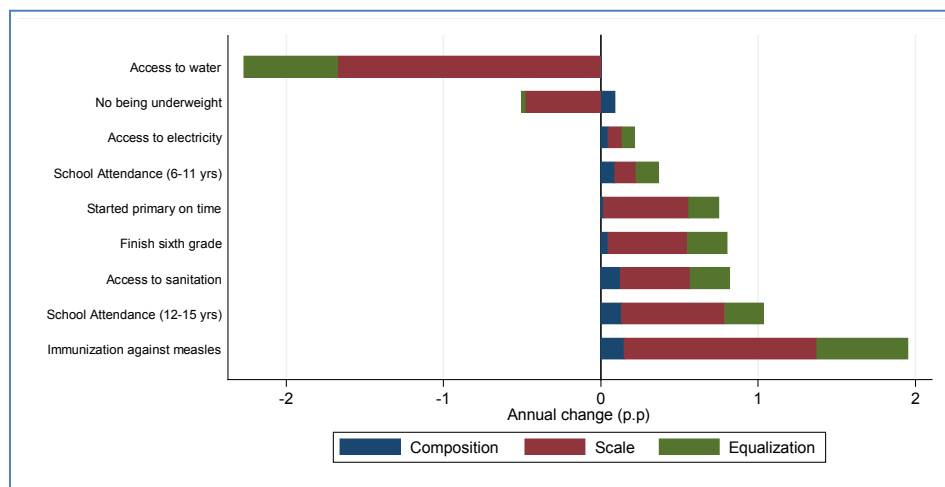


1.37 **The evidence presented suggests that the expansion of equal opportunities was limited in the last decade for Burkina Faso.** Except for the school attendance opportunities in the period 2003 to 2009/10, the annual increments in the HOI are statistically significant but relatively small considering the initial low levels of access to these basic goods and services (opportunities). However, the gross changes mask a more complex story behind, it is that the change in the HOI could be the result of (i) increments in the coverage rate for all the circumstance groups, (ii) equalization of opportunities or (iii) changes in the characteristics of

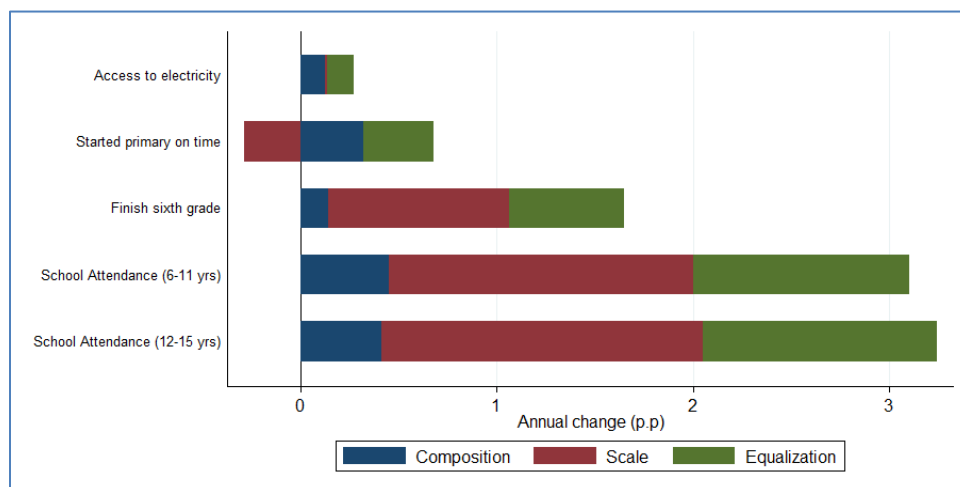
the population. In order to disentangle these three factors Figure 1.8 and Figure 1.9 presents the decomposition of the changes for the early 2000s and late 2000s respectively.

**1.38 The decomposition of the changes over time shows that most of the effect is explained by the scale effect.** The scale effect is due to the same proportional increase in the coverage rate for all circumstance groups, it means a generalized expansion of opportunities in the population. In some few cases the equalization effect plays an important role. This is the case of the school attendance opportunities in the late 2000s, where the equalization effects explains almost one third of the total change in the HOI. It is also worth to mention that the decomposition of the changes does not show relevant differences by gender.

**Figure 1.8: Decomposition of the change in HOI between 1998/99 and 2003**



**Figure 1.9: Decomposition of the change in HOI between 2003 and 2009/10**



## Regional Analysis

**1.39 This section presents an alternative measure to the original HOI.** This is a slightly different measure which uses a geometric mean in order to aggregate the opportunities among the different circumstance groups. The advantage of this alternative measure is that is sub group

consistent. It means that the geometric-HOI by subgroups can be aggregated to obtain the geometric-HOI of the total population. This is not a property in the original specification of the HOI<sup>7</sup>. This property is particularly important in the sub regional analysis.

**1.40 Figure 1.10 presents the geometric-HOI for all the opportunities considered in 2003 by region (14 regions are considered).** It can be seen that the access to opportunities is significantly higher in the capital (Ouagadougou) compared with the other regions. The other regions show similar levels of opportunities in all dimensions. There are 4 regions which present slightly higher HOIs which are Centre-est, Centre-ouest, Cascades and Hauts Bassins. However, there is not too much variation in the overall level of access to opportunities by regions (except for Ouagadougou).

**1.41 In Ouagadougou, despite the fact that is the region with the higher HOIs, the universal coverage is very far from being reached (except in access to water).** It is worth mention that the levels of inequality (difference between the HOI and coverage) tend to be small using the geometric-HOI and are not necessarily comparable with the original-HOI.

**1.42 Figure 1.11 shows the geometric-HOI by region in 2009/10.** In the household survey the capital (Ouagadougou) is grouped with the Centre region. The story in 2009/10 has not change dramatically; the Centre region (driven by Ouagadougou) has more access to opportunities than the others. Moreover, there is not a large dispersion among the other regions in access to opportunities. The results using DHS in 2003 and the household survey in 2009/10 are not necessarily comparable; nonetheless, one important conclusion can be derived from the analysis: progress in school attendance opportunities was proportional in all regions (the average geometric-HOI increases from 21 to 43 approximately, excluding Ouagadougou and the Centre region).

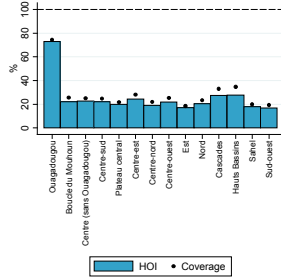
**1.43 In general, the regional comparison shows that access to opportunities falls far short of universal in all regions.** It is also significant the difference in access to opportunities between the capital and the rest of the country. The low dispersion not only in levels but also in changes of the geometric-HOI by regions might suggest that local and regional policies are not being implemented or are not having a differential impact compared with the rest of the country.

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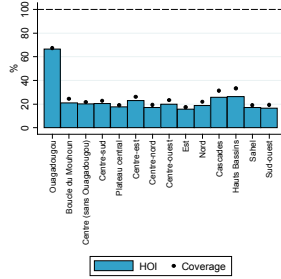
<sup>7</sup> For a detail description of the geometric-HOI and its properties see Barros et al. (2010)

**Figure 1.10: Geometric HOI using DHS by region – 2003**

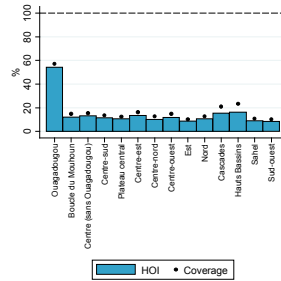
School Attendance (6 to 11 years)



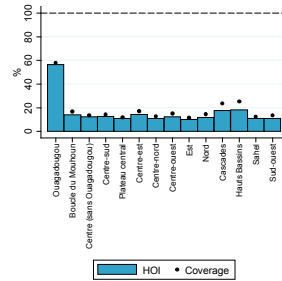
School Attendance (12 to 15 years)



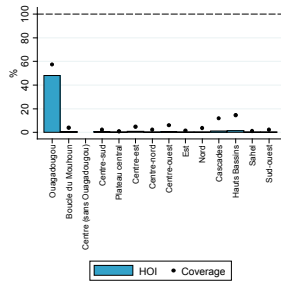
Started primary on time



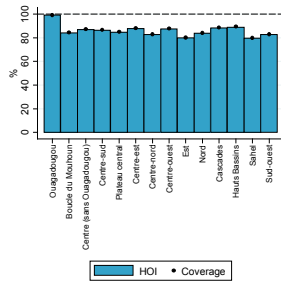
Finish sixth grade



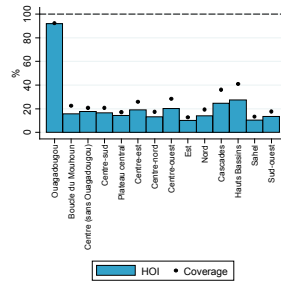
Access to electricity



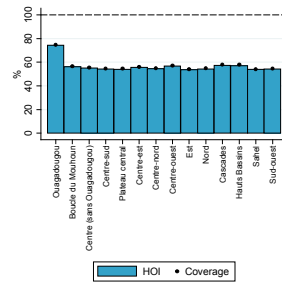
Access to water



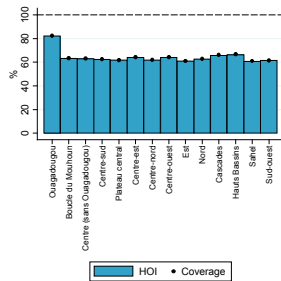
Access to sanitation



Immunization against measles

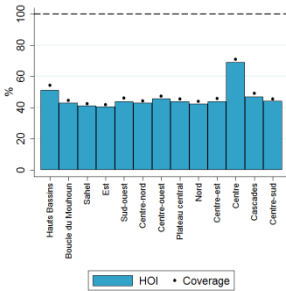


No being underweight

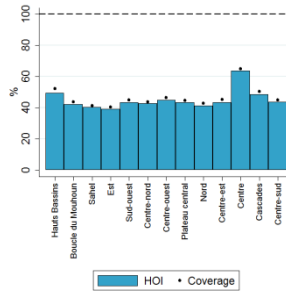


**Figure 1.11: Geometric HOI using the household survey – 2009/10**

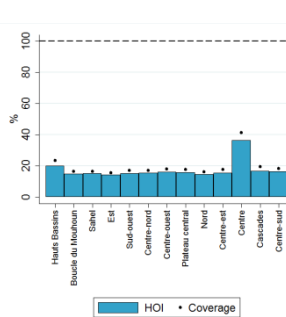
School Attendance (6 to 11 years)



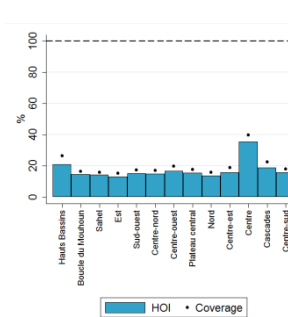
School Attendance (12 to 15 years)



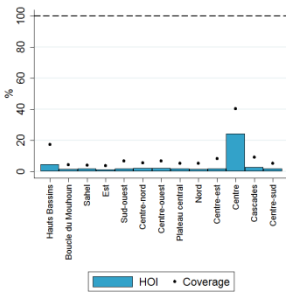
Started primary on time



Finish sixth grade



Access to electricity



### How important are the circumstances?

1.44 This report has presented the overall levels of opportunities, inequality in access to those opportunities, progress over time and sub regional analysis. However, a question which remains to be answered is which are the circumstances that are explaining the inequality? Is the inequality explained by difference in access by gender, by geographic location, etc.? To answer this question we use a method to decompose the D-Index in the relative marginal contribution of each circumstance in the total inequality of opportunities. This method is the Shapley decomposition, which was introduced by Shorrocks (2012). The idea of this decomposition is to calculate the marginal contribution to the D-Index of adding a specific circumstance, considering all possible set of initial circumstances.<sup>8</sup>

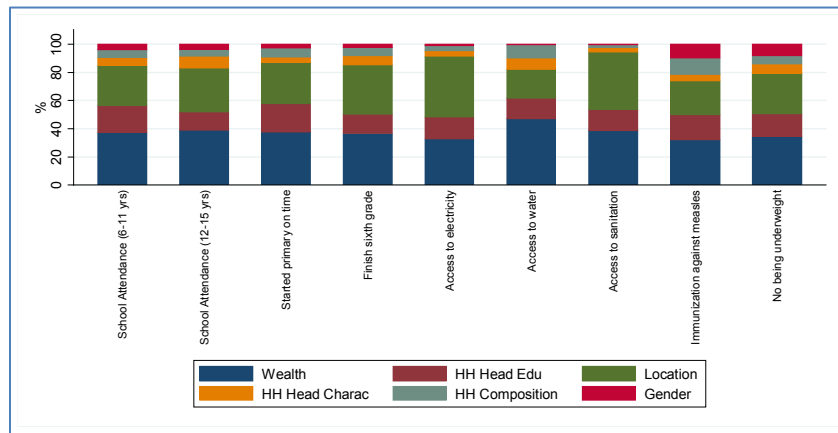
1.45 Figure 1.12 shows the decomposition for all opportunities using DHS 2003. It is clear that wealth quintiles of the household where and location (urban/rural) are the most important circumstances across all opportunities. The socioeconomic status (wealth quintiles) explains on average 37% of the inequality of opportunities in Burkina Faso. The second most important circumstance which is location (urban/rural) explains on average 31% of the inequality. Education of the household head is a relatively another important circumstance which on average explains 16% of the inequality in access to opportunities.

<sup>8</sup> For a more detailed explanation of the use of the Shapley decomposition in the HOI framework see Hoyos and Narayan (2011)

1.46 It is evident the role of gender explaining the access to health opportunities compared with the other circumstances. For “no being underweight” and “immunization against measles” gender explains between 8.5 and 10.2% of the inequality of opportunities, respectively. While for the other opportunities the importance of gender is on average 2%.

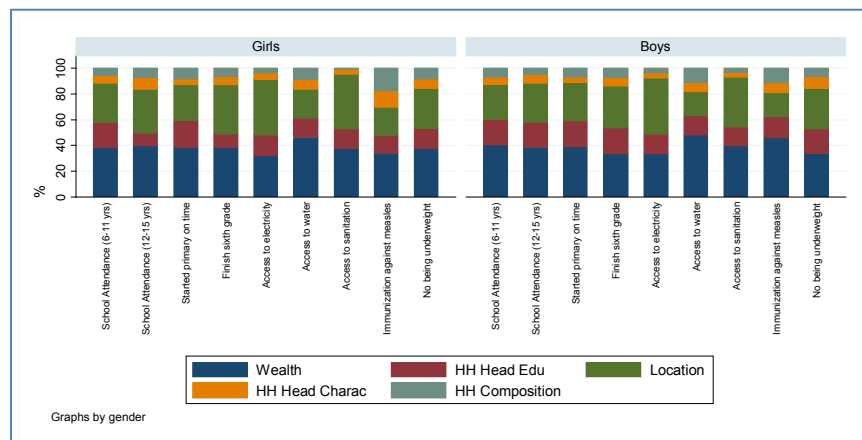
1.47 The analysis by gender does not show significant differences (see Figure 1.13). The average relative importance of each of the circumstances is similar for boys and girls. However, in some particular cases the relative importance of some circumstances could differ by gender. This is the case of education of the household head for school attendance 12 to 15 and start primary on time. The relative importance of this circumstance in these two opportunities for girls is around 10%, while for boys it is approximately 20%.

Figure 1.12: Shapley decomposition using DHS 2003

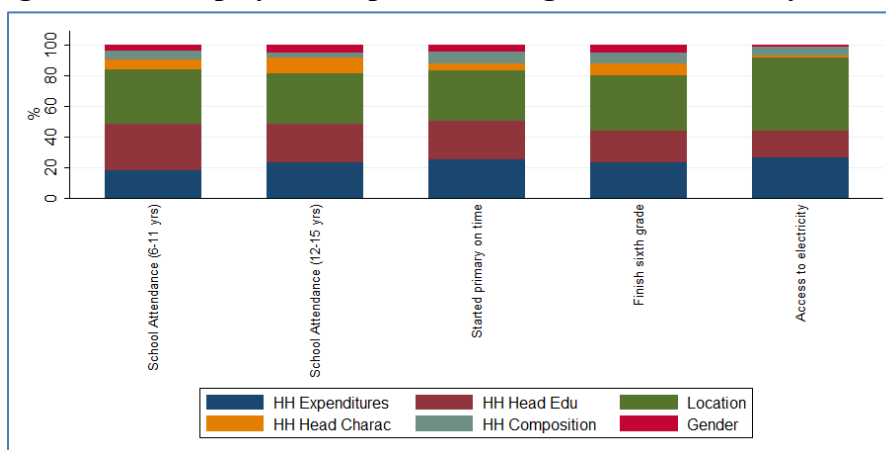


1.48 For 2009/10, Figure 1.14 presents the relative contribution of each circumstance to the total inequality. The two most important circumstances are location (43% on average) and education of the household head (22% on average). The socioeconomic status (expenditures quintiles) is the third most important circumstance (19% on average). The comparison of the relative contributions between 2003 and 2009/10 is not possible because the two surveys are different, the set of circumstances is similar but not identical and the number of opportunities that can be obtained from the household survey is more limited. It is also worth to mention that there are not large differences in the marginal contributions by gender.

Figure 1.13: Shapley decomposition using DHS 2003 by gender



**Figure 1.14: Shapley decomposition using household survey 2009/10**



1.49 Table 1.4 and 1.5 present the vulnerable profiles for each all opportunities for the least and most vulnerable groups. These profiles are useful to identify which are the segments of the population with lower changes to access to opportunities and propose policy interventions with more emphasis in those specific groups. From the vulnerable profiles, a characterization of the most vulnerable population can be done: rural households, with a non-educated household head in the lowest socioeconomic quintiles.

**Table 1.4: Vulnerable Profile using DHS – 2003.**

Opportunity	Quintil	Male	Total children (0 to 15 years) in the HH	Presence of Elderly in the HH	Urban	Years of Education of the HH head	Age of the HH head	Male (HH head)	Wealth Quintil 1	Wealth Quintil 2	Wealth Quintil 3	Wealth Quintil 4	Wealth Quintil 5
School Attendance (6 to 11 years)	Bottom 20%	25.8%	7.4	20.0%	0.0%	0.0	52.2	97.7%	69.1%	22.0%	5.2%	3.7%	0.0%
	Top 20%	53.8%	5.0	21.2%	65.3%	3.6	46.2	88.8%	74.6%	1.4%	7.1%	16.1%	75.2%
School Attendance (12 to 15 years)	Bottom 20%	13.7%	7.1	32.9%	0.0%	0.0	53.7	99.2%	54.4%	34.7%	5.1%	5.8%	0.0%
	Top 20%	50.9%	4.7	16.3%	83.6%	4.3	47.8	81.5%	92.6%	0.1%	1.3%	5.2%	93.5%
Started primary on time	Bottom 20%	35.7%	7.0	8.6%	0.0%	0.0	49.7	97.6%	75.7%	16.3%	3.7%	4.3%	0.0%
	Top 20%	56.3%	4.9	24.6%	60.6%	3.4	46.2	90.8%	72.0%	2.3%	10.9%	14.2%	72.5%
Finish 6th grade	Bottom 20%	7.4%	7.0	39.7%	0.0%	0.0	52.7	98.0%	44.5%	38.8%	10.9%	5.9%	0.2%
	Top 20%	47.0%	4.4	15.3%	90.9%	4.4	48.1	81.7%	92.3%	0.1%	1.2%	5.5%	93.2%
Access to Electricity	Bottom 20%	64.8%	4.9	6.0%	0.0%	0.0	45.1	100.0%	20.6%	79.4%	0.0%	0.0%	0.0%
	Top 20%	46.8%	5.8	26.4%	73.3%	3.4	48.5	87.8%	74.9%	1.4%	3.2%	19.7%	74.4%
Access to Water	Bottom 20%	53.3%	4.5	0.2%	0.0%	0.0	42.4	100.0%	71.7%	28.2%	0.1%	0.0%	0.0%
	Top 20%	48.7%	5.5	29.2%	73.2%	3.8	48.3	87.0%	68.8%	1.8%	4.8%	23.8%	68.2%
Access to Sanitation	Bottom 20%	49.8%	4.3	19.1%	0.0%	0.0	46.5	98.7%	87.8%	11.6%	0.6%	0.0%	0.0%
	Top 20%	49.4%	5.9	23.7%	73.3%	3.6	48.0	87.7%	73.6%	1.7%	3.7%	20.3%	73.0%

Opportunity	Quintil	Male	Presence of Elderly in the HH	Urban	Male (HH head)	Wealth Quintil 1	Wealth Quintil 2	Wealth Quintil 3	Wealth Quintil 4	Wealth Quintil 5	Number of Siblings	Second birth	Third or more birth	Age of the mother	Years of Education of the mother	Single mother
Immunization against measles	Bottom 20%	72.6%	39.1%	0.0%	92.6%	59.0%	4.7%	16.3%	19.9%	0.0%	2.0	21.6%	61.5%	26.7	0.0	9.8%
	Top 20%	39.9%	10.2%	60.3%	95.0%	0.7%	11.1%	8.2%	13.8%	66.2%	1.4	19.2%	57.6%	28.6	3.1	7.3%
No underweight	Bottom 20%	91.9%	22.0%	0.0%	100.0%	49.6%	16.0%	33.3%	1.1%	0.0%	1.3	16.8%	59.1%	27.1	0.0	1.6%
	Top 20%	44.3%	16.0%	64.3%	81.7%	2.4%	3.8%	6.5%	16.7%	70.6%	1.7	21.3%	53.3%	28.9	3.0	17.0%



**Table 1.5: Vulnerable Profile using household survey – 2009**

Opportunity	Quintil	Male	Age of the HH head	Male (HH head)	Primary education (head)	Secondary education (head)	Superior education (head)	Urban	Expenditures Quintil 2	Expenditures Quintil 3	Expenditures Quintil 4	Expenditures Quintil 5
School Attendance (6 to 11 years)	Bottom 20%	23.5%	44.6	100.0%	0.0%	0.0%	0.0%	0.0%	33.5%	0.0%	0.0%	0.0%
	Top 20%	57.8%	44.8	83.8%	35.5%	20.0%	3.5%	80.6%	10.0%	19.2%	26.1%	41.5%
School Attendance (12 to 15 years)	Bottom 20%	33.4%	46.2	98.8%	0.0%	0.0%	0.0%	0.0%	27.0%	2.2%	2.1%	0.0%
	Top 20%	54.9%	49.5	76.0%	34.7%	17.6%	5.3%	83.2%	5.9%	20.2%	25.7%	44.3%
Started primary on time	Bottom 20%	20.1%	43.3	100.0%	0.0%	0.0%	0.0%	0.0%	34.1%	0.1%	1.2%	0.0%
	Top 20%	60.4%	43.9	84.7%	29.3%	23.6%	3.9%	70.8%	8.8%	15.9%	23.7%	48.9%
Finish 6th grade	Bottom 20%	17.6%	47.1	99.4%	0.0%	0.0%	0.0%	0.0%	39.4%	7.9%	2.1%	0.0%
	Top 20%	54.4%	49.1	74.2%	27.5%	20.6%	5.7%	83.9%	5.3%	18.7%	26.4%	46.5%
Access to Electricity	Bottom 20%	55.2%	38.4	88.7%	1.9%	0.0%	0.0%	0.0%	36.3%	0.0%	0.0%	0.0%
	Top 20%	47.4%	46.0	87.0%	26.2%	19.7%	4.2%	84.4%	8.0%	15.1%	25.6%	48.7%

## E. CONCLUSION AND IMPLICATIONS FOR POLICY

1.50 **Despite the progress made in some indicators in the last decade, access to opportunities for children is very limited in Burkina Faso.** The purpose of this report has been to analyze opportunities for children in, where "opportunities" refer to basic services and goods (access to education, good habitation and health conditions) that improve the likelihood of a child to maximize his/her human potential and pursue a life of dignity. The principle that guides the analysis is one of equality of opportunity, which is that the "circumstances" a person is born into (e.g. gender, location, parental, social and economic background) should not determine access to opportunities.

1.51 **The results from analysis indicate that access to opportunities is low and unequally distributed across children of different circumstances.** In the case of education, there have been significant improvement in coverage and HOI for the school attendance opportunities; however, almost half of the children do not attend to a school. In the case of infrastructure opportunities the situation is even worse, only 10% of children had access to electricity in 2009/10. In the health dimension the coverage and HOI is much higher than in the other dimension however this does not mean that the situation is better.

1.52 **There are large disparities in access to opportunities by region.** The capital (Ouagadougou) has coverage and HOI significantly larger than the rest of the country and there is not dispersion in the levels or changes in access to opportunities for the remaining regions. This suggests that some local and regional policies must also be implemented.

1.53 **Burkina Faso has to implement policy actions in order to provide the basic goods and services to the population (especially children).** The analysis indicates that location, socioeconomic status and education of the household head are the most important sources of inequality in access to opportunities. The implication of this finding, it is that policies implemented to expand the access to opportunities, should focus more attention in the rural, non-educated population living in poverty.

## Appendix 1: Additional tables and figures

**Table A1. HOI using DHS**

Opportunity	Coverage (%)		D-Index (%)		HOI (%)	
	1998/99	2003	1998/99	2003	1998/99	2003
School Attendance (6 to 11 years)	25.4	27.6	26.6	26.1	18.6	20.4
School Attendance (12 to 15 years)	21.1	27.1	31.3	27.4	14.5	19.6
Started primary on time	11.5	16.7	35.5	32.9	7.4	11.2
Finish 6th grade	15.0	20.0	39.5	34.4	9.1	13.1
Access to Electricity	5.0	8.3	84.9	77.8	0.8	1.8
Access to Water	94.4	86.1	0.6	4.1	93.9	82.5
Access to Sanitation	21.6	27.7	42.9	40.6	12.3	16.4
Immunization against measles	49.1	56.6	10.8	5.4	43.8	53.5
No underweight	66.2	64.3	3.9	4.3	63.6	61.6

**Table A2. HOI using DHS by gender**

Opportunity	Coverage (%)		D-Index (%)		HOI (%)	
	1998/99	2003	1998/99	2003	1998/99	2003
<b>Girls</b>						
School Attendance (6 to 11 years)	20.9	25.2	34.0	29.1	13.8	17.9
School Attendance (12 to 15 years)	18.0	24.7	38.7	31.2	11.1	17.0
Started primary on time	9.4	15.3	43.0	35.5	5.4	9.9
Finish 6th grade	13.1	18.4	47.6	38.3	6.9	11.4
Access to Electricity	5.5	9.1	84.3	77.9	0.9	2.0
Access to Water	94.4	86.3	0.6	4.1	93.8	82.8
Access to Sanitation	22.7	28.3	43.0	41.4	12.9	16.6
Immunization against measles	48.2	58.5	10.4	5.8	43.2	55.1
No underweight	68.0	66.1	4.1	4.1	65.2	63.4
<b>Boys</b>						
School Attendance (6 to 11 years)	29.6	30.0	21.6	23.7	23.2	22.9
School Attendance (12 to 15 years)	24.2	29.3	26.4	25.2	17.8	22.0
Started primary on time	13.4	18.0	31.4	31.2	9.2	12.4
Finish 6th grade	16.8	21.4	33.5	32.5	11.2	14.5
Access to Electricity	4.5	7.5	85.6	77.4	0.6	1.7
Access to Water	94.5	85.9	0.7	4.1	93.9	82.3
Access to Sanitation	20.6	27.1	42.7	39.9	11.8	16.3
Immunization against measles	50.0	54.6	13.9	6.7	43.0	51.0
No underweight	64.5	62.7	4.5	4.5	61.6	59.9

**Table A3. HOI using household survey**

Opportunity	Coverage (%)		D-Index (%)		HOI (%)	
	2003	2009/10	2003	2009/10	2003	2009/10
School Attendance (6 to 11 years)	30.2	48.4	23.0	13.5	23.2	41.8
School Attendance (12 to 15 years)	29.5	47.1	26.0	12.3	21.9	41.3
Started primary on time	17.9	19.7	29.0	23.7	12.7	15.0
Finish 6th grade	9.4	20.6	43.4	26.2	5.3	15.2
Access to Electricity	7.4	10.1	73.3	64.1	2.0	3.6

**Table A4. HOI using household survey by gender**

Opportunity	Coverage (%)		D-Index (%)		HOI (%)	
	2003	2009/10	2003	2009/10	2003	2009/10
<b>Girls</b>						
School Attendance (6 to 11 years)	26.1	46.3	28.8	14.1	18.6	39.7
School Attendance (12 to 15 years)	26.5	45.2	29.7	13.4	18.6	39.1
Started primary on time	16.3	17.8	36.6	26.7	10.3	13.0
Finish 6th grade	8.5	18.8	51.5	30.8	4.1	13.0
Access to Electricity	7.8	11.0	73.6	63.9	2.0	4.0
<b>Boys</b>						
School Attendance (6 to 11 years)	34.0	50.4	18.4	12.9	27.8	43.9
School Attendance (12 to 15 years)	32.3	49.0	23.8	11.5	24.6	43.3
Started primary on time	19.4	21.6	24.0	22.1	14.8	16.9
Finish 6th grade	10.3	22.3	37.9	22.5	6.4	17.3
Access to Electricity	7.0	9.2	73.0	64.3	1.9	3.3

**Table A5. Progress between 1998/99 and 2003 using DHS.**

Opportunity	All (percentage points)				Girls (percentage points)				Boys (percentage points)			
	Total Progress	Composition	Scale	Equalization	Total Progress	Composition	Scale	Equalization	Total Progress	Composition	Scale	Equalization
School Attendance (6 to 11 years)	1.8	0.4	0.7	0.7	4.1	0.2	2.1	1.7	-0.3	0.7	-1.0	0.0
School Attendance (12 to 15 years)	5.2	0.7	3.3	1.2	5.9	0.6	3.4	2.0	4.2	0.4	3.1	0.7
Started primary on time	3.8	0.1	2.7	1.0	4.5	0.1	2.8	1.6	3.2	0.3	2.3	0.5
Finish 6th grade	4.0	0.2	2.5	1.3	4.5	0.3	2.3	1.9	3.3	0.0	2.6	0.7
Access to Electricity	1.1	0.2	0.4	0.4	1.1	0.3	0.5	0.4	1.0	0.2	0.4	0.5
Access to Water	-11.3	0.0	-8.4	-3.0	-11.1	0.0	-8.1	-3.0	-11.6	0.0	-8.6	-2.9
Access to Sanitation	4.1	0.6	2.2	1.3	3.7	0.7	1.9	1.1	4.5	0.6	2.5	1.4
Immunization against measles	9.8	0.7	6.1	2.9	11.9	2.3	7.2	2.4	7.9	0.1	4.2	3.6
No underweight	-2.1	0.4	-2.4	-0.1	-1.8	0.0	-2.1	0.3	-1.7	0.6	-2.6	0.2

**Table A6. Progress between 2003 and 2009/10 using household survey.**

Opportunity	All (percentage points)				Girls (percentage points)				Boys (percentage points)			
	Total Progress	Composition	Scale	Equalization	Total Progress	Composition	Scale	Equalization	Total Progress	Composition	Scale	Equalization
School Attendance (6 to 11 years)	18.6	2.7	9.3	6.6	21.1	2.8	10.3	8.0	16.1	2.6	8.2	5.4
School Attendance (12 to 15 years)	19.5	2.5	9.8	7.2	20.5	3.0	9.7	7.8	18.7	2.1	9.8	6.8
Started primary on time	2.3	1.9	-1.7	2.2	2.7	2.0	-1.4	2.2	2.1	1.9	-1.8	2.0
Finish 6th grade	9.9	0.9	5.5	3.5	8.9	1.1	4.0	3.8	10.9	0.7	6.9	3.3
Access to Electricity	1.7	0.8	0.1	0.8	1.9	0.9	0.1	0.9	1.4	0.7	0.0	0.7

**Table A7. Regional Analysis using DHS 2003**

	Region	All		Girls		Boys	
		Coverage (%)	HOI (%)	Coverage (%)	HOI (%)	Coverage (%)	HOI (%)
School Attendance (6 to 11 years)	Ouagadougou	74.4	73.0	71.7	70.1	77.8	76.8
	Boucle du Mouhoun	25.4	22.2	22.5	19.4	28.3	25.3
	Centre (sans Ouagadougou)	24.9	22.6	20.6	18.9	28.9	26.5
	Centre-sud	24.5	22.0	21.4	18.9	27.3	25.1
	Plateau central	21.4	19.8	19.4	17.6	23.3	21.8
	Centre-est	27.9	24.4	24.0	20.6	31.2	28.1
	Centre-nord	21.9	19.0	19.3	16.7	24.5	21.7
	Centre-ouest	25.3	21.8	22.4	19.2	28.4	24.8
	Est	18.6	17.0	16.0	14.6	20.9	19.6
	Nord	23.1	20.5	19.8	17.6	26.2	23.7
	Cascades	32.9	27.3	31.7	25.1	34.2	29.5
	Hauts Bassins	34.8	27.8	32.0	24.5	37.1	30.8
	Sahel	20.0	17.9	17.0	15.3	22.7	20.7
	Sud-ouest	19.3	16.9	16.6	14.3	21.8	19.7
School Attendance (12 to 15 years)	Ouagadougou	67.5	66.5	62.2	61.7	75.2	73.9
	Boucle du Mouhoun	24.2	21.1	21.9	18.4	26.5	24.0
	Centre (sans Ouagadougou)	21.7	20.1	17.6	16.5	24.9	23.5
	Centre-sud	22.7	20.5	19.0	17.2	25.8	23.9
	Plateau central	19.0	17.6	16.0	14.8	21.9	20.6
	Centre-est	25.9	23.0	23.7	20.6	27.6	25.1
	Centre-nord	19.4	17.1	16.5	14.2	22.4	20.4
	Centre-ouest	23.1	19.9	19.5	16.2	26.2	23.2
	Est	17.3	15.7	14.2	12.9	19.8	18.5
	Nord	21.7	18.8	18.8	16.0	24.8	22.3
	Cascades	31.3	25.8	27.9	22.2	34.7	29.6
	Hauts Bassins	33.3	26.3	31.3	23.5	35.3	29.3
	Sahel	19.0	17.2	15.7	14.2	21.6	20.1
	Sud-ouest	19.3	16.5	14.9	12.5	23.6	20.4
Started primary on time	Ouagadougou	57.0	54.1	54.4	50.9	59.9	57.6
	Boucle du Mouhoun	14.8	12.0	14.0	10.6	15.4	12.9
	Centre (sans Ouagadougou)	15.3	13.1	13.6	11.3	17.4	15.0
	Centre-sud	13.5	11.5	10.8	9.5	15.4	13.0
	Plateau central	12.2	10.7	11.7	9.4	12.7	11.6
	Centre-est	16.3	13.5	13.7	10.6	18.6	16.0
	Centre-nord	12.6	10.2	11.0	8.5	13.9	11.6
	Centre-ouest	14.8	11.8	13.3	10.1	16.8	13.7
	Est	10.1	8.7	9.3	7.3	11.1	10.1
	Nord	12.6	10.6	10.9	9.0	14.5	12.3
	Cascades	21.1	15.3	20.4	14.1	21.7	16.0
	Hauts Bassins	23.2	16.3	21.2	14.1	25.1	18.4
	Sahel	10.6	9.0	9.1	7.4	11.7	10.2
	Sud-ouest	10.1	8.3	8.9	6.6	11.4	10.0
Finish 6th grade	Ouagadougou	57.9	56.5	51.6	51.0	67.8	65.3
	Boucle du Mouhoun	16.9	14.1	15.5	11.9	18.2	15.9
	Centre (sans Ouagadougou)	13.5	12.4	9.9	9.4	16.2	14.6
	Centre-sud	14.3	12.6	11.7	10.4	16.3	14.5
	Plateau central	11.7	10.8	10.0	9.3	13.3	12.5
	Centre-est	17.0	14.3	14.5	12.0	19.6	16.6
	Centre-nord	12.6	10.8	10.8	9.0	14.7	12.9
	Centre-ouest	15.1	12.3	13.5	10.4	16.6	13.9
	Est	11.4	10.0	8.6	7.4	13.1	12.1
	Nord	14.5	11.7	13.1	10.3	16.2	13.7
	Cascades	23.6	17.7	21.1	15.0	27.1	20.8
	Hauts Bassins	25.3	18.1	23.6	15.9	26.7	19.8
	Sahel	12.3	11.0	8.9	7.8	14.5	13.2
	Sud-ouest	13.4	10.9	10.2	8.0	16.8	13.5
Access to Electricity	Ouagadougou	57.4	48.0	57.5	47.5	57.3	48.5
	Boucle du Mouhoun	3.8	0.5	4.1	0.4	3.6	0.5
	Centre (sans Ouagadougou)						
	Centre-sud	2.3	0.6	2.1	0.5	2.4	0.7
	Plateau central	0.9	0.4	0.9	0.3	1.0	0.4
	Centre-est	4.7	0.8	4.9	0.7	4.4	0.8
	Centre-nord	2.4	0.3	2.7	0.2	2.0	0.4
	Centre-ouest	6.0	0.7	6.0	0.6	6.0	0.8
	Est	1.4	0.2	1.5	0.1	1.4	0.3
	Nord	3.8	0.4	3.8	0.3	3.8	0.5
	Cascades	11.6	1.2	13.2	1.1	10.0	1.1
	Hauts Bassins	14.4	1.5	16.3	1.4	12.8	1.5
	Sahel	1.1	0.3	1.1	0.2	1.2	0.3
	Sud-ouest	2.2	0.3	2.2	0.2	2.3	0.4

**Table A7. Regional Analysis using DHS 2003 (Cont'd)**

Access to Water	Ouagadougou	99.2	99.2			99.1	99.1
	Boucle du Mouhoun	84.5	84.2	84.7	84.3	84.4	84.0
	Centre (sans Ouagadougou)	87.1	86.9	87.0	86.8	87.2	86.9
	Centre-sud	86.6	86.4	86.4	86.1	86.8	86.5
	Plateau central	84.9	84.6	85.2	84.9	84.7	84.4
	Centre-est	88.2	87.9	88.1	87.8	88.1	87.8
	Centre-nord	82.9	82.6	83.3	83.0	82.6	82.3
	Centre-ouest	87.8	87.5	87.8	87.5	87.8	87.5
	Est	80.2	80.0	80.4	80.2	80.1	79.8
	Nord	84.0	83.7	84.1	83.9	83.9	83.6
	Cascades	88.7	88.4	88.8	88.5	88.5	88.2
	Hauts Bassins	89.3	88.9	89.5	89.1	89.1	88.7
	Sahel	80.1	79.8	80.0	79.7	80.1	79.8
Sud-ouest	82.9	82.7	82.9	82.7	82.9	82.6	
Access to Sanitation	Ouagadougou	92.4	92.1	92.5	92.2	92.4	92.1
	Boucle du Mouhoun	22.4	15.7	22.3	15.6	22.4	15.7
	Centre (sans Ouagadougou)	20.8	17.5	20.1	16.9	21.5	18.1
	Centre-sud	20.6	16.5	19.7	16.0	21.5	17.0
	Plateau central	17.2	14.3	17.2	14.4	17.1	14.1
	Centre-est	25.8	19.0	26.4	19.1	25.2	18.8
	Centre-nord	17.5	13.0	18.1	13.3	16.9	12.8
	Centre-ouest	28.2	20.1	27.8	19.7	28.6	20.5
	Est	12.5	10.2	12.5	10.1	12.6	10.3
	Nord	19.4	14.1	19.1	13.9	19.6	14.3
	Cascades	36.2	24.6	37.3	25.2	35.0	24.1
	Hauts Bassins	40.7	27.4	41.5	27.5	40.0	27.3
	Sahel	13.3	10.3	13.2	10.1	13.5	10.4
Sud-ouest	17.7	13.4	17.1	13.0	18.2	13.8	
Immunization against measles	Ouagadougou	74.8	74.5	78.3	78.2	70.3	69.2
	Boucle du Mouhoun	56.6	56.2	57.9	57.5	54.8	54.3
	Centre (sans Ouagadougou)	55.4	55.1	56.9	56.6	53.5	53.0
	Centre-sud	54.6	54.4	56.3	55.9	53.6	53.0
	Plateau central	54.5	54.1	55.6	55.2	51.4	50.9
	Centre-est	56.0	55.6	59.8	59.3	53.9	53.1
	Centre-nord	54.8	54.5	56.8	56.2	52.9	52.4
	Centre-ouest	57.1	56.6	58.5	58.0	55.0	54.0
	Est	54.0	53.6	55.4	55.0	52.6	52.1
	Nord	54.7	54.3	56.9	56.4	53.0	52.1
	Cascades	57.9	57.3	61.8	61.2	55.4	54.6
	Hauts Bassins	57.8	57.1	60.7	60.0	54.9	53.9
	Sahel	54.1	53.8	55.2	54.9	52.6	52.2
Sud-ouest	54.6	54.2	54.3	53.7	55.7	55.0	
No underweight	Ouagadougou	82.4	82.3	83.1	83.0	81.8	81.6
	Boucle du Mouhoun	63.5	63.3	65.4	65.2	61.7	61.5
	Centre (sans Ouagadougou)	63.1	63.0	65.1	65.0	61.3	61.2
	Centre-sud	62.6	62.4	64.1	64.0	60.9	60.7
	Plateau central	61.9	61.7	64.2	64.1	59.9	59.8
	Centre-est	64.4	64.1	66.0	65.8	62.6	62.3
	Centre-nord	61.9	61.7	63.9	63.7	60.2	60.0
	Centre-ouest	64.2	63.9	66.2	65.9	62.3	62.0
	Est	61.0	60.9	62.3	62.2	60.0	59.9
	Nord	62.9	62.7	64.4	64.2	61.4	61.1
	Cascades	66.3	65.8	68.0	67.6	64.4	63.9
	Hauts Bassins	66.8	66.2	69.1	68.6	64.5	64.0
	Sahel	60.9	60.8	62.0	61.8	59.8	59.7
Sud-ouest	61.5	61.4	63.7	63.6	59.9	59.8	

**Table A8. Regional Analysis using household survey 2009/10**

	Region	All		Girls		Boys	
		Coverage (%)	HOI (%)	Coverage (%)	HOI (%)	Coverage (%)	HOI (%)
School Attendance (6 to 11 years)	Hauts Bassins	54.4	51.3	52.4	49.1	56.3	53.5
	Boucle du Mouhoun	44.6	43.1	42.9	41.3	46.1	44.8
	Sahel	42.3	41.3	40.3	39.2	44.4	43.4
	Est	42.0	40.7	39.5	38.2	44.1	42.9
	Sud-ouest	46.1	44.1	42.9	40.8	49.5	47.7
	Centre-nord	44.3	43.2	41.8	40.6	46.8	45.8
	Centre-ouest	47.4	45.7	45.1	43.2	48.8	47.3
	Plateau central	45.5	44.1	42.2	41.0	48.2	46.9
	Nord	44.1	42.5	41.7	40.2	46.0	44.6
	Centre-est	45.9	44.1	43.8	41.9	47.5	45.8
	Centre	71.0	69.0	69.2	67.2	71.3	69.5
	Cascades	49.2	46.9	47.7	45.4	50.6	48.6
	Centre-sud	45.6	44.3	43.3	42.1	47.4	46.1
School Attendance (12 to 15 years)	Hauts Bassins	52.2	49.5	49.1	46.5	55.2	52.4
	Boucle du Mouhoun	43.7	42.3	42.6	40.8	44.7	43.5
	Sahel	41.4	40.3	38.4	37.0	44.2	43.3
	Est	40.5	39.0	37.6	35.6	42.8	41.8
	Sud-ouest	44.9	43.3	43.6	41.5	46.1	44.6
	Centre-nord	43.8	42.6	41.3	39.8	46.0	45.1
	Centre-ouest	46.5	44.9	43.8	42.0	49.5	48.0
	Plateau central	44.6	43.3	42.3	40.9	47.2	45.8
	Nord	42.7	41.2	40.2	38.5	45.3	44.2
	Centre-est	45.2	43.4	42.5	40.5	47.4	45.6
	Centre	64.9	63.6	63.2	62.0	67.1	65.5
	Cascades	50.4	48.5	49.8	47.6	51.3	49.6
	Centre-sud	44.9	43.8	42.6	41.4	46.6	45.5
Started primary on time	Hauts Bassins	23.5	19.9	21.6	17.4	25.4	22.2
	Boucle du Mouhoun	16.3	14.9	15.4	13.3	17.1	16.2
	Sahel	16.5	15.2	14.3	12.8	19.1	17.7
	Est	15.4	14.1	13.4	11.9	17.6	16.4
	Sud-ouest	17.0	15.2	16.0	13.3	17.9	16.8
	Centre-nord	17.0	15.6	14.4	12.8	19.8	18.4
	Centre-ouest	17.8	15.9	15.3	13.1	19.3	17.9
	Plateau central	17.6	15.9	15.1	13.3	19.8	18.2
	Nord	16.1	14.6	14.1	12.6	18.3	16.9
	Centre-est	17.7	15.5	15.7	13.6	19.9	17.6
	Centre	41.3	36.3	36.9	31.5	45.7	41.3
	Cascades	19.3	16.8	18.9	15.4	20.3	18.7
	Centre-sud	18.3	16.3	15.9	13.7	19.9	18.3
Finish 6th grade	Hauts Bassins	26.3	20.8	24.5	18.5	26.8	22.7
	Boucle du Mouhoun	16.5	14.6	14.5	12.5	18.0	16.4
	Sahel	15.8	14.2	13.0	11.6	18.3	16.9
	Est	15.0	13.1	12.7	10.4	17.1	15.6
	Sud-ouest	17.4	15.0	14.6	12.2	19.6	17.3
	Centre-nord	16.9	14.9	14.1	12.0	19.0	17.7
	Centre-ouest	19.7	16.8	16.3	13.6	22.4	20.1
	Plateau central	17.6	15.3	14.5	12.4	20.4	18.2
	Nord	15.8	13.6	13.1	11.0	18.5	16.8
	Centre-est	18.8	15.8	15.5	12.7	20.8	18.2
	Centre	39.8	35.6	40.6	36.4	37.5	34.3
	Cascades	22.3	18.8	21.0	16.7	23.2	20.6
	Centre-sud	18.0	15.8	15.4	13.1	19.5	18.0
Access to Electricity	Hauts Bassins	17.2	4.5	17.8	5.0	16.8	4.0
	Boucle du Mouhoun	4.2	1.4	4.8	1.6	3.6	1.2
	Sahel	4.0	1.7	4.2	1.9	3.8	1.5
	Est	3.5	1.3	4.1	1.4	3.0	1.2
	Sud-ouest	6.6	1.8	7.7	1.9	5.4	1.6
	Centre-nord	5.3	2.2	5.5	2.3	5.2	2.2
	Centre-ouest	6.7	2.0	7.3	2.1	6.1	1.8
	Plateau central	5.1	1.7	5.1	1.8	5.0	1.6
	Nord	5.2	1.6	5.3	1.8	5.1	1.4
	Centre-est	8.2	2.0	8.4	2.1	7.9	1.8
	Centre	40.2	24.3	42.8	26.1	37.5	22.3
	Cascades	9.1	2.7	10.1	2.9	8.1	2.4
	Centre-sud	5.3	1.9	5.6	2.1	5.0	1.8

**Table A9. Shapley decomposition using DHS 2003.**

Opportunity	D-Index	Household Composition	Wealth Quintiles	Education of the Household Head	Age of the Household Head	Gender of the Household Head	Location	Gender
<b>All</b>								
School Attendance (6 to 11 years)	26.1%	5.9	37.1	19.0	3.6	2.1	28.5	3.9
School Attendance (12 to 15 years)	27.4%	5.4	39.0	12.6	3.2	4.8	31.7	3.4
Started primary on time	32.9%	6.8	37.5	20.2	2.5	1.4	29.0	2.5
Finish 6th grade	34.4%	6.4	36.4	13.5	3.1	3.3	35.2	2.2
Access to Electricity	77.8%	3.5	32.5	15.7	1.2	3.0	43.1	0.9
Access to Water	4.1%	9.7	47.0	14.7	3.8	3.8	20.5	0.5
Access to Sanitation	40.6%	1.7	38.5	15.2	0.3	3.0	40.9	0.5
Immunization against measles	5.4%	11.3	31.9	17.8	4.1	0.8	23.9	10.2
No underweight	4.3%	5.9	34.2	16.2	0.7	5.5	28.9	8.5
<b>Girls</b>								
School Attendance (6 to 11 years)	29.1%	5.3	37.9	19.7	4.0	2.2	30.9	
School Attendance (12 to 15 years)	31.2%	7.3	39.2	10.4	3.4	6.0	33.6	
Started primary on time	35.5%	8.3	38.4	20.8	3.3	1.4	27.8	
Finish 6th grade	38.3%	6.5	38.1	10.9	2.5	4.0	38.0	
Access to Electricity	77.9%	3.7	32.0	16.3	1.9	3.1	43.0	
Access to Water	4.1%	8.6	46.1	15.0	3.3	4.7	22.3	
Access to Sanitation	41.4%	0.9	37.2	15.6	1.0	2.8	42.5	
Immunization against measles	5.8%	17.7	33.9	13.9	7.5	5.1	21.9	
No underweight	4.1%	8.2	37.1	16.1	4.0	3.7	30.9	
<b>Boys</b>								
School Attendance (6 to 11 years)	23.7%	6.9	40.2	19.8	3.5	2.2	27.5	
School Attendance (12 to 15 years)	25.2%	4.5	38.3	19.4	3.5	3.8	30.5	
Started primary on time	31.2%	6.7	38.8	20.0	2.4	1.6	30.5	
Finish 6th grade	32.5%	7.1	33.4	20.3	4.4	2.9	32.0	
Access to Electricity	77.4%	3.5	33.5	15.4	0.8	3.2	43.6	
Access to Water	4.1%	10.9	48.1	14.6	4.3	3.2	18.8	
Access to Sanitation	39.9%	3.2	39.5	14.7	0.6	3.1	38.9	
Immunization against measles	6.7%	11.3	45.6	16.4	0.9	6.9	18.8	
No underweight	4.5%	6.5	33.9	19.2	0.9	8.6	30.9	

**Table A10. Shapley decomposition using household survey 2009/10**

Opportunity	D-Index	Household composition	Location	Education of the household head	Age of the Household Head	Gender of the Household Head	Expenditures Quintiles	Gender
<b>All</b>								
School Attendance (6 to 11 years)	13.5%	5.9	35.6	30.8	1.2	5.3	17.7	3.5
School Attendance (12 to 15 years)	12.3%	3.4	32.9	25.3	1.8	8.9	23.2	4.6
Started primary on time	23.7%	7.7	32.9	25.4	1.5	3.0	25.2	4.2
Finish 6th grade	26.2%	6.9	36.6	20.8	0.8	7.0	23.0	4.8
Access to Electricity	64.1%	5.7	47.6	17.8	0.5	0.8	26.3	1.3
<b>Girls</b>								
School Attendance (6 to 11 years)	14.1%	7.7	36.5	28.2	0.4	6.8	20.3	
School Attendance (12 to 15 years)	13.4%	5.1	28.7	29.5	2.0	9.6	25.2	
Started primary on time	26.7%	9.8	33.4	28.8	1.1	7.0	19.8	
Finish 6th grade	30.8%	9.0	38.5	20.6	1.8	6.2	23.8	
Access to Electricity	63.9%	6.4	46.0	19.6	0.5	0.7	26.9	
<b>Boys</b>								
School Attendance (6 to 11 years)	12.9%	5.3	36.2	34.5	3.0	4.5	16.5	
School Attendance (12 to 15 years)	11.5%	3.1	40.1	24.5	1.6	8.6	22.2	
Started primary on time	22.1%	7.5	32.4	22.7	2.6	1.0	33.8	
Finish 6th grade	22.5%	5.9	37.1	23.4	1.2	9.2	23.3	
Access to Electricity	64.3%	5.5	50.1	16.4	0.5	1.1	26.4	

## References

- Barros, R, F. Ferreira, J. Molinas Vega and J. Saavedra (2009). Measuring Inequality of Opportunities in Latin American and the Caribbean. The World Bank.
- Barros, R, J. Molinas Vega and J. Saavedra (2010). “Measuring Progress Toward Basic Opportunities for All”. *Brazilian Review of Econometrics*, 30 (2).
- Barros, R, J. Molinas Vega, J. Saavedra and M. Giugale (2012). Do Our Children Have a Chance? A Human Opportunity Report for Latin America and the Caribbean. The World Bank.
- Gräb, J. and M. Grimm (2010) Inequality in Burkina Faso – to what extent do household, community and regional factors matter? *Journal of the Royal Statistical Society*. 174 Part 3.
- Hoyos, A. and A. Narayan (2011). "Inequality of opportunities among children: how much does gender matter?" Background Paper for WDR 2012. Manuscript.
- Roemer, J. (1998). *Equality of Opportunity*. Cambridge, MA: Harvard University Press
- Shorrocks, A. (2012). “Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value,” *Journal of Economic Inequality*, Online First, 6 January 2012.
- UNDP (2011) Human Development Report. Sustainability and Equity: A better future for all. Burkina Faso
- World Bank (2006). *World Development Report: Equity and Development*
- Wouterse, F.S. (2008) Migration, Poverty, and Inequality. International Food Policy Research Institute. Discussion Paper 00786.