How Pro-poor and Progressive Is Social Spending in Zambia?

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Abstract

This paper analyzes the distributional effect of public spending in Zambia using the most recent data from the 2010 Living Conditions Monitoring Survey. The analysis focuses on both the “traditional” social sectors, such as education and public healthcare, as well as other spending areas less thoroughly studied, such as agricultural support programs. Ultimately, this benefit incidence analysis addresses the extent to which spending is pro-poor and progressive; that is, it primarily benefits the poor and does so at an increasing rate as welfare levels decrease.

The results indicate that overall public education spending in Zambia is neither pro-poor nor progressive, but while this is true for the system as a whole it is not true for all of its parts. The net unitary benefits of primary and secondary education are clearly both pro-

poor and progressive. However, their progressivity is ultimately outweighed by the extreme concentration of tertiary education benefits among the wealthiest members of Zambian society. Health spending is also regressive and not pro-poor. Although unitary net benefits are slightly progressive, unequal access remains the key constraint. In contrast, the benefits of agricultural-input subsidy programs follow a somewhat progressive pattern (for each beneficiary in the top quintile there are almost two beneficiaries in the poorest quintile) but clearly suffer from targeting problems. Consequently, without better-designed and more conscientiously implemented targeting mechanisms, public spending on health, education, and fertilizers will not be able to further the government’s larger objectives for pro-poor and progressive development policy.

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1. Introduction

The Zambian economy has enjoyed rapid economic expansion throughout the last decade, following a long period of low growth and declining per capita income since independence in 1964, with growth cycles driven by international commodity-price fluctuations (World Bank, 2011). After 1996 the economy began to grow again, albeit slowly, as a result of a relatively stable macroeconomic environment and improved macroeconomic policies. The economy grew at a faster pace in the 2000s following the privatization of the mining industry and a return to fiscal discipline and low inflation. However, real GDP per capita in 2010 was still equivalent to just 69% percent of GDP per capita in 1965. In addition, higher recent growth rates have not translated into higher living standards, and Zambia's rank in the 2011 UN Human Development Index was 150 out of the 169 countries assessed.

The recent period of sustained economic growth also seems to have had a limited impact on poverty reduction. This is due to the fact that growth has been narrowly focused on capital-intensive industries (especially mining and construction) and on the service sectors (tourism and banking), and has had little impact on employment or wages in the labor-intensive rural economy, where the majority of the poor and very poor are employed (World Bank 2011). However, the moderate reduction in overall poverty observed in the past decade has been accompanied by more substantial improvements in social indicators, though at an uneven pace. There has been continued progress in education indicators, including rising school enrollment rates at the primary and secondary levels, with more modest improvements observed in the youth literacy rate (see Table 1). However, significant challenges still remain, including overcrowded classrooms and limited access to education in rural areas. There have also been some improvements in health outcomes, including a reduction in the under-5 mortality rate and a decline in maternal mortality rates, but Zambia is still not likely to meet the 2015 Millennium Development Goals (MDGs) for the health sector. The prevalence of HIV remains at about 13.5 percent for Zambians aged 15-49.

Table 1: Zambia: Selected Social Indicators

	Latest single year		
	1999-2002	2003-2006	2007-2010
Primary school enrollment (% net)	72.5	94.2	91.3
Progression to secondary school (%)	55.2	58.3	66.1

Youth literacy rate (% of people ages 15-24)	69.1	n.d.	74.6
Life expectancy at birth (years)	42.3	45.3	47.8
Under-5 mortality rate (per 1,000 live births)	149.6	133.2	111.0
Maternal mortality rate (per 100,000 live births)	600.0	560.0	470.0
Prevalence of HIV (% of population ages 15-49)	14.2	13.8	13.5
Headcount Poverty ratio (% of population)	n.d.	59.3	n.d.

Source: World Bank World Development Indicators.

Aside from simple growth, fiscal policy is one of the main tools to promote economic equity and reduce poverty. Goñi, Lopez, and Serven (2008) demonstrate the redistributive potential of fiscal policy. They show that the difference in income inequality between Latin America (the most unequal region in the world) and Western Europe (the most equal region) is striking only after taxes and transfers are taken into account.² In Sub-Saharan Africa, Sahn and Younger (2000) conclude that even though social spending is progressive, it is not pro-poor because social services and other public expenditures disproportionately benefit the wealthy.³ Similarly, analyses of Zambian public expenditures do not support the notion of a deliberate equalization policy. Giugale, Narayan and Saavedra (2011) show that greater equality in children's access to key services, such as education and immunization, are mostly explained by a scale effect, that is, an expansion of service coverage rather than the more equitable distribution of the service.

At the sector level, recent evidence (see Cuesta and Martinez-Vazquez [2012]) shows that not every fiscal tool has the same distributive impact: primary and secondary education spending and income taxation are found to be generally progressive, while tertiary education, curative health care, energy subsidies, and indirect taxes are by and large regressive. However, the redistributive impacts of fiscal policy are not universal, and large differences are observed across countries. For example, Breceda, Rigolini, and Saavedra's (2009) benefit -incidence analysis of key social spending and revenue sources highlights notable differences in the degree of progressiveness of fiscal policy between Honduras and Colombia in the Latin America region and between the United States and the United Kingdom among OECD countries.

² The Euro-15 Gini coefficient drops from 0.45 to 0.35 when social spending and taxes are added to the initial distribution of incomes. For Latin America-6 (Argentina, Brazil, Chile, Colombia, Mexico, and Peru), the Gini coefficient falls only slightly from 0.49 to 0.47.

³ By contrast, a host of literature (see Fiszbein and Schady 2009) has shown substantive redistributive social impacts from well-targeted conditional cash transfers (CCTs) at a relatively low fiscal cost, between 0.5 and 1 percent of GDP.

The statistics for Africa are far worse: only 13 percent of people in the poorest income quintile benefit from social safety net programs⁴, well below the 41% share for the world. See Table 2. While 20 percent of all the beneficiaries of safety nets in Africa belong to the poorest quintile, that share is 30 percent for the world (World Bank 2012a). Evidence also shows that the fiscal policies of many developing countries are even less effective at reducing income inequality in practice than they are in principle, typically because transfers do not contribute much to inequality reduction and the scope for active redistribution is limited by low levels of revenue collection. Zambia's capacity to use its fiscal policy for redistributive purposes seems limited at best. Figure 1 below depicts a range of countries in terms of their GDP per capita and fiscal capacity, specifically tax revenues as a percentage of GDP. Zambia is in the low per capita income/low tax collection quadrant.

Table 2: Safety Nets in the World

	Poorest 20%						
	Country-specific wellbeing distribution *						
	Latin America & Caribbean	Europe & Central Asia	East Asia & Pacific	Africa	Middle East & North Africa	South Asia	World
Social Assistance/Safety nets	51.9	51.1	63.3	13.2	15.6	33.2	41.6
Cash Transfer programs	5.9	9.2	16.4	2.9	3.8	0.9	5.7
Social Pensions	2.6	4.4	9.5	0.1	4.4	0.4	2.9
Other cash transfers programs: family, child or disability allowances	1.9	32.0	1.2	0.1	5.6	0.1	5.0
Conditional Cash Transfer program	29.6	0.0	0.0	0.3	0.0	0.4	5.1
In-kind food programs	7.1	8.8	7.0	5.1	0.5	27.1	15.4
Other social assistance programs	18.5	11.7	35.6	7.3	2.8	9.1	15.0

Source: World Bank (2008)

Note: *Country-specific wellbeing distribution: Quintile distribution estimated for each country.

⁴ Safety nets include cash transfers (conditional or unconditional), social pensions, other cash transfers such as family or disability allowances, in-kind food programs and other social assistance programs such as school feeding, cash-for-work programs, for example. See World Bank (2008).

Figure 1: Per Capita GDP and Tax Revenues (as % of GDP)

Source: Authors' estimates based on World Bank (2010).

This paper analyzes the distributional effect of public spending in Zambia using the most recent data from the 2010 Living Conditions Monitoring Survey (LCMS) and focusing on both the “traditional” social sectors, such as education and public health, as well as other spending areas with a significant but less thoroughly studied impact on income disparity, such as agricultural support programs. Ultimately, the analysis addresses the extent to which spending is pro-poor and progressive; that is, it primarily benefits the poor and does so at an increasing rate as welfare levels decrease. The paper is organized as follows: the next section briefly describes the benefit-incidence analysis methodology. Section 3 presents an overview of key institutional issues involved in the public provision of education, healthcare and fertilizer subsidies in Zambia. Section 4 discusses data sources and procedures for linking official information on public spending with household data on beneficiaries. Section 5 discusses the results, which are separated into two sets: one breakdown for beneficiaries, and the other for benefits. Section 6 concludes the analysis.

2. Methodology

To assess the progressivity and pro-poor orientation of public spending in Zambia, this analysis uses traditional benefit-incidence techniques to explore how the welfare benefits of public education, health care and fertilizer subsidy expenditures are distributed across the population. Incidence analysis is a

procedure used to estimate how much of a given expenditure (or taxation) category is received (imposed) by (on) a particular socioeconomic group or geographical area. Incidence analysis aims not only at identifying how much people in the lowest income groups receive or pay (that is, how “pro-poor” spending or revenue collection is), but also how “progressively” it does so—that is, how the cost or benefit correlates with a given welfare measure, such as income, consumption or wealth. Incidence analysis consists of several steps (see van de Walle [1998],):

- (i) Approximate the value to consumers of a public service—typically by equating it to the cost of providing the service;
- (ii) Identify all beneficiaries of the service;
- (iii) Obtain *gross* unitary benefits by dividing total benefits (from step i) among total beneficiaries (from step ii);
- (iv) Rank the identified beneficiaries in the household dataset according to some agreed measure of welfare (such as, for example, deciles or quintiles of household per capita consumption); and
- (v) Assign the gross unitary benefit (as obtained in step iii) across the distribution of beneficiaries identified in the household dataset and compute the shares of the services that are allocated to different portions of the population. The unit of analysis is, typically, the representative household by quintile or decile of the income or consumption distribution on a per capita basis.

In order to calculate *net* benefits two additional steps are needed:

- (i) Calculate the out-of-pocket household per capita spending from the household dataset; and
- (ii) Subtract the out-of-pocket household per capita spending to the expenditure assigned as the benefit. The resulting figure is the net unitary benefit per individual or household after receiving a public service. .

As for data requirements, the first three steps rely on information about public spending in the relevant sectors and the beneficiaries or users of those services, which is typically available from the implementing agencies of the government. The last four steps require information on household consumption and expenditure patterns by income category, which can be obtained from national survey data, in this case the *Zambian LCMS*.

This approach has a number of important strengths, but is not without its weaknesses as well. A significant advantage of this methodology is in the simple and powerful policy implications it produces. The analysis identifies which socioeconomic groups are benefiting the most from various fiscal policies, and highlights how these policies impact the poor. Conceptually, however, the incidence analysis rests on strong operational assumptions: for instance, the approach assumes that publicly provided services are homogeneous across all consumers, yet quality may vary enormously. Incidence analysis also assumes that benefits received by individuals are equal to the costs of service provision; a perfect translation of taxes to consumers with no significant distortions arising from illegal behavior. Additionally, since data are more often available at the household rather than the individual level, additional assumptions must be made about the distribution of resources within the household. A common practice is to assume equitable intra-household allocations and to rely on per capita measures as the household's representative welfare measure. Finally, incidence analysis says nothing as to why the results are the way they are and rarely provides insights about how a certain program or policy influences behavior of beneficiaries (or non-beneficiaries).

The precision of an incidence analysis depends on the quality and disaggregation of the available data. For example, an incidence analysis on health care in Zambia would ideally require that public healthcare expenditures be disaggregated at the provincial level by type of provision: hospitals (levels 1 to 3), clinics and health posts, and type of attention, i.e. inpatient versus outpatient. However, it is only possible to obtain data at the provincial level for combined expenditures on level 1 and 2 hospitals and combined expenditures on clinics and health posts. Additionally, only nationally aggregated expenditure data on level 3 hospitals are available. This limits the precision of the estimates.⁵ In addition, households are assumed not to change their behavior after they receive (or fail to receive) benefits. All households are also assumed to value the transfers they receive and the contributions they make equally, regardless of quality differentials or household composition, circumstances, and preferences: one Zambian kwacha (ZMK) worth of primary education services is valued exactly the same as one kwacha of secondary education. Also, all expenditures are valued equally within each spending category, regardless of income level or expenditure subset. For example, a kwacha contributed by a poor household towards the primary

⁵ It is, however, hard to say by how much. To the extent that there are wide differentials across regions not explained by population or demographic factors (or even socioeconomic factors that can be controlled for with available information, such as level of income), the assumption of uniform allocation may be seriously misleading.

education of its children is valued the same as a kwacha provided by a rich household toward the provision of tertiary education.

3. Education, Health Care and Fertilizer Subsidies in Zambia

3.1. Education

The 1996 national education strategy, “Educating our Future”, laid down the basis for the reform of the sector in terms of increasing access to quality education at all levels of the education system, achieving high levels of student retention, and strengthening educational progression and completion rates with an emphasis on girls, the poor and members of vulnerable groups. Three major policy initiatives were launched under this strategy, including the elimination of school fees for up to grade 7, the establishment of a re-enrollment policy for girls who leave school because of pregnancy, and the adoption of the 9-3-4 education structure (detailed in Appendix 1). Fifteen years later, the education chapter of the Sixth National Development Plan (GRZ 2011) insists on increasing the equitable access to quality education in addition to improving skills training to enhance human capacity for sustainable national development. In particular, the focus is on expanding access to high school and tertiary education. Particular attention will also be placed on teacher availability especially in the rural areas and curriculum development. In order to do that, the SNDP intends to almost double the education budget between 2011 and 2015.

The restructured education system is organized according to four levels: early childhood education (pre-schooling), basic schooling, high school, and tertiary degree programs. Basic education consists of nine years of schooling, high school requires three years, and tertiary education (including universities, business colleges, technical colleges, teacher training colleges and skills training institutes) varies depending on the particular field and degree program, but generally requires about four years. This system was revised from the previous 7-5-4 structure (seven years of primary, five of secondary and four years of university education) to the current 9-3-4 structure (nine years of basic, three of high school and four years of university education).⁶

In terms of public spending, as shown in Table 3, the education sector accounts for a steady 4 percent share of GDP and 19 percent of all government expenditures. This share of GDP is comparable with that

⁶ However, the new administration of the Patriotic Front elected in September 2011 is considering reverting to the 7-5-4 structure in an attempt to confront the many challenges in terms of inadequacies in infrastructure, institutional and human capacity especially in the rural area (as acknowledged in Ministry of Education, 2008).

of neighboring Namibia and South Africa (World Bank 2012b). Primary education expenditures are relatively steady at about 2 percent of GDP or 8-9 percent of total government spending. Secondary education expenditures fluctuate slightly at around 0.4 percent of GDP or 2 percent of total government spending. See Table 3.

Table 3: Government expenditures on education, 2006-2009

	2006	2007	2008	2009
Total educ. exp. as % of GDP	3.8	3.8	4.2	4.2
o/w primary school/GDP	1.7	1.5	2.0	2.0
o/w secondary school/GDP	0.4	0.3	0.4	0.5
Educ. exp. as % of total exp.	19.1	18.0	18.5	19.7
o/w primary/total exp.	8.3	7.0	8.8	9.3
o/w secondary/ total exp.	2.2	1.5	1.8	2.2

Source: Authors' compilation from MoFNP financial reports

As shown in Figure 2, primary education receives the largest share of education spending, followed by administration at the various levels. However, in terms of expenditure per student, the tertiary level has the highest average followed by the secondary level, with primary education having the lowest average expenditure per student.⁷ In 2009, expenditure per student at the secondary-school level was 3 times that of the primary level, while spending per student at the tertiary level was a full 35 times that of the primary level. These averages –although falling over time– place Zambia right up in the middle of the African distribution: the averages of these two ratios for all 18 African countries for which data are available are 4 and 36 times in 2003, respectively.

⁷ Expenditure per student is calculated by dividing public expenditure in each educational level by the number of students enrolled in the corresponding level as indicated in Table 2.

Figure 2: Allocation of education sector expenditure, 2009

Source: Authors' estimate, compiled from MoFNP financial reports

The reform of the education sector has contributed to increasing enrollment rates at both the primary and secondary levels. According to the Ministry of Education, between 2005 and 2009 primary-school enrollment grew by 15 percent, while secondary-school enrollment grew by 30 percent.⁸ However, enrollment at the tertiary level fell by 14 percent during the same period, indicating that the increased ‘throughput’ from the secondary level could not be absorbed. Recent efforts to address this challenge include the establishment of new tertiary institutions as well as the upgrading of existing ones that was recently announced by the new Government in 2011. However, it remains to be seen whether such measures will come to fruition and therefore help absorb the increasing demand.

3.2. Healthcare

The basic operational guidelines of the Zambian healthcare system are set out in the Health Policy Framework of 1991: “Managing for Quality: A Healthy People Policy Framework”. That strategy aimed to develop a health-service delivery system characterized by “equity of access to cost effective, quality health care as close to the family as possible”. As a result, the government embarked on a set of ambitious health-sector reforms, the most visible outcome of which was a three-tiered organizational structure for public health institutions and services. As it was the case with education, the strategic focus laid out in the SNDP (GRZ 2011) prioritizes the equitable access to quality health services. To do so, the health chapter

⁸ Ministry of Education Statistical Bulletin, 2005, 2006, 2008, 2009.

of the SNDP reports on plans to expand access to both primary health care (such as the Maternal, Newborn and Child Health and primary Mobile Hospital services) and specialized services (such as promoting outreach programs from tertiary hospitals to districts or the provision of mobile referral hospital services) and creation of additional health posts, district hospitals and expansion and improvement of existing hospitals and health centers.

The first tier of care is provided at the local level by district hospitals, health centers and health posts. The second tier consists of the larger provincial general hospitals. These hospitals both provide care directly and receive referrals from first-tier institutions, treating patients in need of more sophisticated care. The third tier consists of national and specialized hospitals, the highest-level referral hospitals in Zambia, which focus on patients with rare conditions or in need of complex treatments. Cases that cannot be effectively treated at second-tier hospitals are referred to third-tier hospitals. At each level a specified basic health-service package is publicly funded and available to the public at no charge. Importantly, more specialized services at the higher levels of the healthcare system may also be free if they are accessed by referral from a lower-level institution.

In an attempt to address unstable public-health funding arising from broader fiscal and macroeconomic volatility, Zambia introduced a system of user fees in 1993, though certain exemptions for specific services and specific age groups were allowed. In 2006 these fees were abolished for all primary health services in rural areas. In November 2011 user fees for primary healthcare were also eliminated in urban areas. According to Masiye et al (2008), the removal of user fees in rural areas was seen as a tool for bridging the rural-urban income divide and improving healthcare equity. However, its impact on the quality and accessibility of health care remains unclear, even after additional efforts were undertaken to increase health funding and provide for a more efficient distribution of drugs and other medical supplies.

In order to address public health priorities in a cost-effective and equitable manner, a substantial share of resources should be allocated to the lowest level of the healthcare system, i.e. first-tier institutions. However, in practice just over a third of health expenditures are allocated to primary healthcare (see Table 4). Expenditure data show that total public health spending is estimated at 2 percent of GDP, well below the expenditure share of many other countries in Sub-Saharan Africa.⁹ Between 2006 and 2009,

⁹ Shares of public health care spending over GDP in the region are 9.3% in Sierra Leone, 3.9% in Namibia, 3.8% in Chad, 3.6% in Malawi, 3.5% in Niger, 3.4% in South Africa, 3.2% in Senegal. Nigeria and Ethiopia, at 2.1%, have similar shares than Zambia. Kenya, at 1.4%, has a lower rate. See World Bank, Data Indicators, 2012b.

public health spending as a share of total government expenditures stood at 9 percent on average, significantly below the Abuja declaration target of 15 percent.¹⁰

Table 4: Public Health Spending, 2006-2009

Percent	2006	2007	2008	2009
Health/GDP	1.7	2.0	2.2	1.8
Health/total govt'	8.6	9.5	9.8	8.6
2 nd tier/total health	8.4	7.7	8.5	9.0
1 st tier/total health	31.5	34.9	33.9	38.4

Source: Authors' compilation based on MoFNP financial reports

A more refined measure of primary health spending used by the Ministry of Health (MoH) is the allocation of non-personnel funds at the district level. The latest available estimates show that non-personnel allocations of healthcare spending to districts increased from 8 percent of the total spending at districts in 2006 to 14 percent in 2007 and 16 percent in 2008 (MoH 2009).

Despite these relatively low levels of public spending, Table 5 shows that there has been a general improvement in all key indicators for utilization of health services, which has been attributed in part to the abolition of rural user fees for primary care in 2006. These improvements, however, have not been equally strong across indicators.

Table 5: Key indicators on utilization of Health services, 2006-2008

Percent	2006	2007	2008
Utilization rate of PHC services	1.2	1.3	1.6
Institutional deliveries	43	45	45
Immunized children (worst performing districts)	67	62	68
HIV positive eligible clients accessing ARVs	33	53	67
HIV positive pregnant women receiving a complete course of ARVs	11	15	23

Source: Ministry of Health

¹⁰ In April 2001, heads of state of African Union countries met and pledged to set a target of allocating at least 15% of their annual budget to improve the health sector. Ten years after Abuja, only one country had met this target (WHO, 2011).

3.3. Fertilizer and Seed Subsidy Programs

Fertilizer and seed subsidies are implemented under two separated programs, the Fertilizer Input Support Program (FISP) by the Ministry of Agriculture and Cooperatives (MACO) and the Food Security Pack Program (FSP) by the Ministry of Community Development and Social Services (MCDSS).¹¹

3.3.1. Farmer Input Support Program

The FISP was designed in 2002 and was originally called the Fertilizer Support Program. Its aim was to improve small-scale farmers' access to agricultural inputs and to enhance the participation and competitiveness of the private sector in the supply and distribution of inputs (MACO, 2009). The program was originally targeted at providing fertilizer and corn (maize) seed: each farmer was to receive a standard input package—sufficient for cultivation of at least one hectare of maize—consisting of eight 50kg bags of fertilizer and one 20kg bag of maize seed at 50 percent of the market price.¹² Private sector firms were to be brought in to the program through their participation in both the supply of inputs and the marketing of produce, but with little progress obtained thus far the government remains the single largest player in the market. Table 6 below shows the program's budget and the enrollment targets.

Table 6: Benefits and Beneficiaries of FISP

Season	Budget (ZMK Billion)	Fertilizer (Metric Tons)	Seed (Metric Tons)	Target number of beneficiaries
2002/03	100	48,000	2,400	120,000
2003/04	114.5	60,000	3,000	150,000
2004/05	112.6	50,000	2,500	125,000
2005/06	140	50,000	2,500	125,000
2006/07	252	84,000	4,200	210,000
2007/08	150	50,000	2,500	125,000
2008/09	492	80,000	4,000	200,000
2009/10	430	100,000	5,000	530,000
2010/11	485	178,000	8,800	

Source: Authors compilation from MACO and budget speeches

¹¹ As of September 2011 the Ministry of Agriculture and Cooperatives and the Ministry of Community Development and Social Services have been renamed the Ministry of Agriculture and Livestock and the Ministry of Community Development, Mother and Child Health, respectively.

¹² MACO FISP Implementation manuals: Each package includes 20kg of seeds, 4 50 kg bags of Compound D (basal) and 4 50 kg bags of Urea (top dressing).

The program has been subject to a number of changes over time. During the 2002/2003 agriculture season, the first year of its implementation, 48,000 metric tons (Mt) of fertilizer and 2,400 Mt of maize seed were distributed to 120,000 small farmers. This was done on a 50 percent matching grant basis. Over the next 4 years, the input amounts as well as the farmers covered only grew marginally and in some years even declined. However in 2006/2007 the number of targeted farmers as well as the amounts of fertilizer increased substantially, rising by 60 percent over the previous season. In the same year the fertilizer subsidy increased from 50 percent to 60 percent. The fertilizer subsidy was further increased to 75 percent in 2008/2009 by setting the farmers' contribution at ZMK50,000 (approximately US\$10) per 50kg bag, while the seed subsidy remained at 50 percent.

The 2009/2010 season saw another change when the government increased the total quantity of fertilizer covered by the program but also reduced the size of the input package per beneficiary by half. A complete pack now consists of two 50kg bags of basal dressing fertilizer, two 50kg bags of top dressing fertilizer and a 10kg bag of maize seed.¹³ This move was meant to increase the number of program beneficiaries. The program was further extended to cover inputs for crops other than maize in the 2010/2011 season: for example, the government included 30 Mt of rice seed in the program, although, the FISP remains largely a maize-orientated program.

The program-selection criterion requires a farmer to be a member of a registered cooperative or farmers' organization. The farmer is selected by a Camp Agriculture Committee on the recommendation of the cooperative or farmer organization and must meet the following criteria: (i) be a small scale farmer and actively involved in farming within the camp coverage area; (ii) have the capacity to grow at least 0.5 hectares of maize; (iii) have the capacity to pay ZMK50,000 per 50kg bag of fertilizer and ZMK80,000 per 10kg bag of seed; (iv) not concurrently be enrolled in the Food Security Pack Program (FSP); and (v) not have defaulted on any agriculture credit program.

3.3.2. Food Security Packs

The government introduced the Food Security Pack Program (FSP) in 2000. It was aimed at empowering potentially successful but vulnerable farmers who had lost asset value due to recurrent adverse weather conditions but still had access to land and basic tools. The FSP was also designed to act as a social safety

¹³ MACO 2010/2011 FISP Implementation Manual.

net program under the Ministry of Community Development and Social Services (MCDSS) by improving household food security in vulnerable rural communities (MCDSS, undated). The FSP program is jointly coordinated by the Ministry of Finance and National Planning (MoFNP) and MACO. The Programme against Malnutrition (PAM), an NGO, was contracted to implement the program until 2009, after which all the executing responsibilities were shifted to the MCDSS.

The target groups for the program include the following socio-economic groups: (i) female- or child-headed households; (ii) victims of natural disasters; (iii) institutions caring for orphans; (iv) the disabled; (v) unemployed youths; (vi) the elderly; and (vii) households headed by the terminally ill. Community-based committees comprising of leaders from various local authorities and organizations select beneficiaries according to the above criteria. A full FSP pack consisting of inputs for the cultivation of 0.25 hectares of each of the following: one cereal grain (maize, millet, rice or sorghum), one legume (peanuts, beans, cowpeas or soybeans), and one tuber (cassava or sweet potato). The pack also includes fertilizer for beneficiaries cultivating maize and may include agricultural lime for beneficiaries in areas affected by soil acidity. The range of crops cultivated under the FSP is more diverse than that of the FISP and the FSP has been lauded as the only government program with a crop diversification component targeting needy households.

Unlike the FISP, the FSP requires repayment in kind by the beneficiaries. According to an MCDSS report, a beneficiary who received one 50kg bag each of basal and top dressing fertilizer and 5kg of maize seed was expected to repay 60kg of maize grain after the harvest, the value of which would equal roughly 20 percent of the cost of inputs.

The FSP was designed to target 20 percent of the viable but vulnerable small-scale farmers identified by the program in all 72 districts of Zambia. This translated to a target of 200,000 beneficiaries in the first five years, as shown in Table 7 below.

Table 7: Benefits and Beneficiaries of FSP

Season	Budget (ZMK Billion)	Targeted Beneficiaries	Actual spending (ZMK Billion)	New beneficiaries	Total Beneficiaries
2000/01	32	200,000	32	60,000	
2001/02	32	200,000	4	83,902	135,000
2002/03	58	200,000	26	70,141	136,500

2003/04	89	200,000	43	89,859	165,000
2004/05	32	200,000	9	15,123	15,123
2005/06	32	150,000	21	34,942	34,942
2006/07	58	150,000	10	27,641	27,641
2007/08	10	150,000	10	26,843	26,843
2008/09	10	150,000	10	8,804	10,915
2009/10	10	150,000	10	21,500	32,231
2010/11	15		9	11,400	11,400

Source: MCDSS

However, due to funding constraints the program never managed to reach 200,000 in any single year of its first five years of operation. Furthermore, the number of beneficiaries fell drastically after its peak in 2003/04. The inadequate funding and unrealistically high beneficiary targets set by the government frequently resulted in the provision of incomplete packs and/or the splitting of packs between farmers. For instance, between 2001 and 2004 beneficiaries received incomplete packs consisting of 0.25 hectares worth of maize seed, 0.125 hectares of legumes and 0.03125 hectares of tubers. For the 2004/2005 season, the input pack size was increased to cover 0.5 hectares of cereal instead of the standard 0.25.

One notable difference between the FSP and FISP programs is that the former has been able to graduate significant numbers of beneficiaries. Since the 2005/2006 agricultural season the FSP pack has been largely provided to new beneficiaries only.

4. Data Sources and Allocation of Benefits

4.1. Data Sources

The empirical analysis presented below is based on the Living Conditions Monitoring Survey of 2010 (LCMS VI), which was designed to monitor the impact of the Fifth National Development Plan (2006-2010) and to constitute a baseline for the Sixth National Development Plan (2011-2015).¹⁴ The survey includes modules covering health, education, economic activities, household expenditures and household agricultural production. The LCMS VI is a nationwide survey covering both rural and urban areas in all nine provinces. The survey includes representative samples for each of Zambia's 72 districts. The total

¹⁴ Both plans are part of a series of medium-term strategies with the objective of "making Zambia a prosperous middle-income country by 2030" (Government of the Republic of Zambia, 2011).

sample set includes 19,398 households, 8,469 of which are rural. The information was collected between February and March of 2010.

The LCMS VI also identifies beneficiaries of public spending programs, though not always precisely. The survey identifies individual and household beneficiaries of public health and education services and identifies whether a household received fertilizer and seeds from a public program, but not which one, FISP or FSP. In addition, the LCMS does not include information on beneficiaries of the Public Welfare Assistance Scheme (PWAS), either those receiving food subsidies or other cash transfers, nor does it record beneficiaries of school feeding programs or programs providing support to orphans and vulnerable children.

The benefit incidence analysis (BIA) presented here combines LCMS data on government expenditures in education, health care, and fertilizer subsidy programs at the provincial level. The latest available information for the education sector is for 2009 and covers both total spending and the number of beneficiaries enrolled in basic, secondary and tertiary institutions; enrollment data for 2010 are also available. For healthcare, the latest provincial-level information is from 2008 and includes expenditure data and the number of beneficiaries (counted as patients or recorded as services provided) at tier 1 and 2 healthcare providers. Finally, the 2010 budget allocations for all fertilizer and seed packages provided by the Fertilizer Support Program and/or the Fertilizer Support Program were used.

4.2. Allocation of Education Benefits

The LCMS VI collects information about school attendance in 2010 and 2009 of each household member; additionally, it collects each household's aggregate expenditure in education¹⁵. The information about 2009 is not as complete as the 2010 one; mainly it does not contain information about the type of school attended (public or private). In order to calculate the allocation of school benefits we face data limitations and we need to make some assumptions explained in Table 8.

¹⁵ Appendix 3 provides detailed information about the education related questions in LCMS VI as well as a figure with the education data flow.

Table 8: Education Data (Scenarios/Assumptions)

	Problems	Solutions/Assumptions
1	<p>Inconsistencies between reported age, grade and school level and between grades individuals reportedly attended in 2009 and 2010.</p> <p>(These problems affect 6.5% of those attending school in 2010)</p>	<p>Main Assumption: Children do not attend a grade if they are more than two years below the official enrollment age.</p> <ul style="list-style-type: none"> • We check potential inconsistencies in the data using the official age-to-grade correspondence showed in Appendix 1. The official age to be enrolled in 1st grade is 7. We therefore assume as infeasible any information on children aged 4 or less who are reported to be in first grade or higher. • We follow this rule of “enrollment feasibility” with high school and tertiary education students: it is assumed that anyone aged 13 or younger in 2009 could not be in high school and anyone 16 or younger could not be in college or university. • Since primary school is the lowest level considered, we eliminate from the sample everyone who was 4 years old or younger in 2009. • In cases with missing information about the school level attended in 2009, we used the age of the students to estimate school level.
2	<p>Information about whether the school attended is public or private is only provided for 2010. No information is available about the type of school attended in 2009 or before.</p>	<p>Main assumption: Students attended the same type of school (public or private) in 2009 as in 2010.</p> <ul style="list-style-type: none"> • We ignore the possibility of students changing between public and private schools between years. • As a result, cases involving individuals enrolled in 2009 but not enrolled in 2010, possibly because they graduated or left school, are without data on school type. (This affects 2411 of 33268 cases, or 7.2% of cases) <p>Since we cannot obtain additional information about the type of school attended for those observations, we consider <u>two scenarios</u>:</p> <ul style="list-style-type: none"> • Scenario 1 We assume that <u>all</u> students for whom we do not have school-type information attended public school. • Scenario 2 We assume that <u>all</u> students for whom we do not have school-type information attended private school. <p>These two scenarios provide an upper and a lower value for our calculations.</p>
3	<p>Contributions to education are reported at the household level, so it is not possible to know the amount spent on each individual. (69% of households with at least one enrolled student have more than one enrolled student)</p> <p>Households may have members at different levels and</p>	<p>Main assumption: In households with more than one member attending school we evenly distribute the amount spent on education between school attendants. That is, we assume that households spent the same amount in each student independently of the type of school or the school level he or she attended.</p>

	in both the public and private systems, but we cannot analyze expenditure differences between individuals (Households with at least one member going to public schools and another to private school include some 10.5% of all households with at least one member in public school under Scenario1, and 17.1% under Scenario 2).	
4	Even after these assumptions there are still students for which we do not have schooling information for 2009. (2.5% of subjects age 7-31 do not have schooling information for 2009)	Main assumption: All subjects for whom we do not have complete information about schooling, school level or type of school are assumed not to be attending school.
5	Official data on per-student public expenditure for colleges reported by the Ministry of Education refers only to teachers' colleges, excluding trade colleges, technical schools, agricultural colleges or nursing and paramedical schools. (In 2009 combined public spending on technical colleges and agricultural colleges was 3% higher than spending on teachers colleges; the number of students, however, is not available.)	Main assumption: Public expenditure per student in all colleges is the same as the expenditure per student in teacher colleges.
6	Outlier observations (0.1% of households)	Main assumption: Expenditures on education larger than the mean log-expenditure plus three times the standard deviation (considering only positive values of expenditure) are considered unreliable and are excluded from the analysis.

Source: Authors

4.3. Allocation of Healthcare Benefits

LCMS VI collects health information for 2010, the year the survey was collected (see Appendix 3). However, 2008 is the most recent year for available official information on the number of public healthcare beneficiaries (patients/visits) and for government expenditures on: (i) Health Posts and Clinics; (ii) Provincial Hospitals; and (iii) National and Specialized Hospitals. Ideally, the BIA would obtain from the survey data each member's number of visits to public health facilities during the year and then combine that information with official expenditure reports. However, in practice this is not possible. Table 9 describes the assumptions that were necessary in order to resolve a number of inconsistencies in matching the official administrative data with the household-level information recorded in the LCMS.

Table 9: Heath care data

	Problems	Solutions/Assumptions
1	Most recent official beneficiary and expenditure information refers to 2008, while household-level LCMS information refers to 2010.	<p>Main Assumption: 2008 spending is representative of 2010 spending.</p> <ul style="list-style-type: none"> We deflate the private expenditure data for 2010 (from the LCMS survey) and the government expenditure data for 2008 (from official sources) and express both in 2009 prices. We assume that government expenditures (both in terms of real value and distribution) remained constant between 2008 and 2010. We assume that the number and distribution of beneficiaries by welfare level remained constant between 2008 and 2010. We assume that households' healthcare expenditures (both real value and distribution) remained equal between 2008 and 2010.
2	<p>From the survey we know:</p> <ol style="list-style-type: none"> The number of people who were ill or injured during the 15 days before the survey. The amount spent on healthcare for each individual during the 15 days before the survey. If subject visited a public health facility for treatment. <p>But we do not know:</p> <ol style="list-style-type: none"> If a reported visit actually took place during the 15 days before the survey or earlier. If a patient visited a health facility other than the reported visit to a hospital The number of visits to hospitals or health posts during the 15 days before the survey. 	<p>Assumptions for Method 1:</p> <ul style="list-style-type: none"> We assume that all reported visits occurred during the 15 days before the survey. If a respondent reported going to a hospital, we assume he/she went to the hospital during the 15 days before the survey and assign the official per-beneficiary hospital expenditure to that respondent. We then aggregate that information to determine total healthcare expenditures per quintile. <p>Assumptions for Method 2:</p> <ul style="list-style-type: none"> We assume that annual government expenditures on healthcare facilities are distributed homogeneously across the year. Therefore we divide the official information by 24 to pro-rate for a 15-day period. We use the household survey data to determine the composition of beneficiaries by income quintile. We use these proportions to assign to each quintile a share of the 15-day government expenditure. <p>Assumptions for both methods:</p> <ul style="list-style-type: none"> Households' out-of-pocket expenditure is the same under both methods. The 15-day government expenditure calculation, however, ends up being different for each method. In
3	All information on public spending and number of beneficiaries (i.e. patient visits) is annual.	
4	The number of survey participants who reported visiting a hospital during the previous 15 days is almost equal to the number who reported visiting a clinic. But this does not correspond with the	

	information from official sources, which shows that the annual number of health center beneficiaries is 9 times the number of hospital beneficiaries.	method 1 we keep expenditure-per-beneficiary constant according to the official data, where each health-facility visit is recorded as a separate beneficiary. In method 2, we hold official annual expenditure constant and divide it by the number of beneficiaries (not visits) reported in the survey.
5	Some individuals reported being injured during the survey period, but did not report any further information about their condition. (1.71% of surveyed individuals)	Since respondents did not report any additional information about their condition or any treatment they may have received, we consider these cases as misreported and treat them as if no injury occurred.
6	A small number of respondents received medicines from public facilities but did not report an official patient visit. (1% of those who received medicines from public facilities)	The proportion of respondents reporting treatment without a visit is very small and we disregard the discrepancy. We consider only the expenditure of those who received treatment as a patient.
7	The survey does not differentiate between facility levels, and we cannot determine the number of patient visits to third-tier hospitals.	We add public expenditures on third-tier hospitals to the other two tiers and divide by the total number of patients. We then assign the resulting expenditure to each patient.
8	The LCMS records information about health posts and clinics separately, but the official public spending data does not differentiate between them.	We aggregate health post and clinic data to match it with the official spending reports.
9	Outlier observations. (0.3% of sample)	Within each quintile we discard cases in which household expenditures on hospitals or other facilities were larger than the mean log-expenditure plus three times the standard deviation (including only positive expenditure values).

Source: Authors

4.4. Allocation of Fertilizer Subsidies

LCMS VI contains information about whether a household grew maize crops during the 2008/2009 period or not. The survey also asked if they received fertilizer (organic or inorganic) or seeds, who they received them from and how much they spent to get the inputs. A household is considered as beneficiary of FISP if they grew maize crops and received fertilizer from the government or from cooperatives (see Appendix 3).

Ideally, in order to identify the beneficiaries of FISP and the FSP, the LCMS VI should have included information about which households were participants in each of these programs, the amount of fertilizer and seeds they received from the programs, and the amount they paid in cash or in kind for these inputs. However, the data available are far less comprehensive and a complete reconstruction of participation in and benefits received from these programs is not possible. Table 10 summarizes the operational assumptions that were made.

Table 10: Fertilizer data

	Problems	Solutions/Assumptions
1	The survey asks if a household received inputs from the government or a cooperative, but it does not ask if they were received through the FISP or FSP program, or if the household participated in these programs.	Main Assumption: A household is considered a participant of the FISP or FSP in the period 2008/2009 if it did all of the following: <ul style="list-style-type: none"> • Grew maize. • Used fertilizer and/or purchased seeds. • Obtained seeds and fertilizer from the government or from a cooperative.
2	Related to the previous problem, we cannot differentiate households that received benefits from FSP from those that benefitted from FISP.	Main Assumption: Given that households which benefitted from FSP received a smaller package than FISP participants, and that FSP is targeted to household that grow on smaller areas, scenario 2 described below, partially accounts for this problem.
3	The survey does not allow respondents to record more than one source of fertilizer and seeds.	Main Assumption: We assume that the household only received fertilizer and seeds from the government if it reported doing so. All expenditures associated to these inputs were recorded as paid to the government.
4	The survey does not specify the amount of fertilizer and/or seeds that households received from the government or cooperatives.	Main assumption for Scenario 1: All households received one full FISP package of seeds and fertilizer. Main assumption for Scenario 2: All households with more than 1 hectare of maize received one full FISP package. Households with less than 1 hectare received a proportional amount.
5	Some households reportedly received fertilizer and seeds, but the reported expenditure is too high with respect to the area cultivated and the cost of a FISP package (2.1% of beneficiaries).	We eliminate “outlier” expenditure values from the sample. An outlier is defined as a value outside of the range formed by the mean +/- three times the standard deviation of the expenditure variable (54 cases).

Source: Authors

5. Results

5.1. The Analysis of Beneficiary Participation

5.1.1. Education

Access to public primary education in Zambia is relatively uniform across consumption, which is the yardstick used to describe different socioeconomic groups in this analysis. This is particularly true across the lower four quintiles of the consumption distribution, and it is only among the richest quintile that the number and share of beneficiaries decline significantly. The breakdown is very different for secondary education, where the number and share of beneficiaries increase rapidly with consumption levels, and for

tertiary education, where the vast majority of beneficiaries (over 85 percent) are concentrated in the top quintile. See Figure 3, below. The methodology for assigning beneficiaries in scenarios 1 and 2 (see Table 8 above) does not alter these findings.

Figure 3: Distribution of beneficiaries for education

Source: LCMS VI

Note: Poorest quintile represents the lowest consumption level; richest quintile captures the part of the distribution with the largest consumption per capita.

5.1.2. Healthcare Services

Those individuals who reported being ill or injured during the 15 days before the survey follow a uniform distribution across socioeconomic groups. (See “Injured or Ill” in Figure 4.) The same distribution is observed both for those who did not report visiting any public facility and among those visiting a public

facility. In contrast, the distribution of beneficiaries visiting clinics (or health posts) and hospitals follows an uneven pattern: the distribution is somewhat equal for the intermediate three quintiles of the distribution, but shares vary significantly for the top and the bottom quintiles. In effect, the share of the poorest individuals going to clinics or posts is double that of the richest quintile, while the opposite is the case for hospital attendance. In fact, the distribution of hospital beneficiaries is very similar to that of private healthcare providers. (See “Private” in Figure 8, below).

Figure 4: Distribution of demand for healthcare

Source: LCMS VI

Figure 5 shows the behavior of respondents who reported being ill during the reference period. All socioeconomic groups demonstrate very similar behavior when deciding not to visit a healthcare provider despite feeling ill (just below 30 percent for all quintiles). When they do seek care, however, respondent behavior differs by socioeconomic group in terms of the health provider they access. Respondents in the richest quintile are roughly twice as likely to use a private provider as those in other quintiles. They are also less likely to visit a public clinic or health post.

Figure 5: Distribution of healthcare provider consulted across consumption levels

Source: LCMS VI

Looking at the socioeconomic distribution of patients attending *public* healthcare institutions, Figure 6 displays a non-linear pattern, with increasing shares of patients across the intermediate quintiles (2 to 4). Patients from the richest quintile are the least likely to use public providers, as one would expect. What is somewhat more surprising is that when visiting public facilities they are equally likely to go to public clinics and health posts (tier 1 institutions) as to public hospitals (tiers 2 and 3): other socioeconomic groups rely more on primary services and are twice or even three times more likely to attend a clinic or health post than a hospital. This could reflect wider opportunities for choice among richer households, that is, a greater capacity to select services according to the specific needs of their health condition. Also, it might suggest that rich households assess a better quality of clinics that is sufficient high to meet their demand for services. However, there is no evidence by which to evaluate any quality consideration.

Figure 6: Distribution of patients by type of healthcare provider and levels of consumption

Source: LCMS VI

Quality considerations aside, the data indicate that the proportion of households not paying for services received in health posts or clinics and hospitals is both high and similar across socioeconomic groups, except for the richest quintile (see Figure 7). A significant share (40 percent of patients) from the richest quintile did not pay fees for services either in health posts or hospitals.

Figure 7: Percentage of patients who reported not making a payment for public health services by levels of consumption

Source: LCMS VI

5.1.3. Beneficiaries of Fertilizer Subsidies

Beneficiaries of the FISP and FSP programs—that is, households that cultivate maize using fertilizers and/or seeds provided by the government or agricultural cooperatives—almost evenly distributed across the first four quintiles, with around one in ten agricultural households from each quintile participating in government maize programs. FISP/FSP participation decreases sharply to just one in twenty for the richest quintile. However, as consumption levels increase the share of agricultural households producing maize decreases markedly (see Figure 8). 72 percent of the poorest respondents identified as maize producers, while only 25 percent of respondents in the richest quintile grew maize. Consequently, as a share of *maize producers*, respondents in the richest quintile are in fact significantly more likely to receive government support than respondents in the poorest.

This disparity is even more pronounced for all respondents who identified as farmers, whether or not they produced maize. 88 percent of respondents in the poorest quintile engaged in agriculture, while only 26 percent of the richest quintile did. Since 9 percent of the poorest and 5 percent of the richest received

FISP/FSP support, farmers in the richest quintile were almost twice as likely to participate in government maize programs as were farmers in the poorest quintile.

Figure 8: Distribution of agricultural practices among farming households

Source: LCMS VI

The area cultivated by the farmer is relevant at the time of distributing benefits since, by regulation, to qualify for public subsidies cultivated plots must be at least one hectare in size. The average area cultivated per beneficiary increases with consumption levels from an average of 1.01 hectares among producers of the bottom quintile to 1.8 hectares for producers in the top quintile.¹⁶

In addition, when looking at the aggregate distribution of land cultivated for maize, Figure 9 shows that producers belonging to the richest quintile cultivated 14 percent of the total maize hectares using inputs from the program. Producers in the poorest quintile cultivated a very similar share of that type of land, 16 percent. This again calls into question the targeting of the program, which does not seem to concentrate on the most vulnerable producers but rather focuses on producers in the middle quintiles, as they represent the lion's share of maize production in Zambia.

¹⁶ The average area cultivated for maize with inputs from government programs for the second to fourth quintiles were 1.23, 1.39 and 1.43 hectares, respectively. Average cultivated areas for maize (with or without inputs from public programs) are: 1.05, 1.02, 1.15, 1.39 and 2.17 hectares respectively. Source: Authors' estimates from LCMS VI.

Figure 9: Distribution of maize-growing households benefiting from public programs and hectares cultivated

Source: LCMS VI

5.2. The Analysis of Benefits

5.2.1. Education

Public education spending in Zambia is not progressive, in fact among students in the richest quintile public spending is dramatically regressive. When education spending is considered in aggregate terms, that is, without differentiating by education level (see Figures 10a and 10b, below), per capita educational transfers are nearly flat across the first four quintiles and then rise sharply for the richest quintile. This is true whether assuming that unidentified students are enrolled in public or private schools (scenarios 1 and 2, respectively; see Table 8, above). In net terms—that is, when households' out-of-pocket contributions to public education are considered—the distribution of benefits turns slightly progressive for the first four quintiles, as out-of-pocket contributions tend to increase with income level. However, that progressivity disappears at the richest quintile, for which the net benefits of public education significantly exceed those accruing to other quintiles (see Figures 10a and 10b, below). The same conclusions are obtained when looking at *total* net benefits rather than *per student* net benefits.

Results by educational level, (see Figures 11 to 13), confirm that the distribution of tertiary education benefits drive the trend for aggregate education spending. For both primary school (see Figures 11a and 11b) and high school (see Figures 12a and 12b) net transfers per beneficiary are clearly progressive:

unitary benefits after discounting households' out-of-pocket contributions inversely correlate with household consumption. Interestingly, the richest households contribute almost as much as they received from public education (both in primary and secondary school), a sign of systemic progressivity. In contrast, the net unitary benefits of tertiary education (Figures 13a and 13b) are deeply regressive and pro-rich. The richest quintile captures a disproportionate share of the benefits from tertiary education, but the second-richest quintile benefits substantially more from tertiary education than all other consumption quintiles, including the richest. This is due to the richest quintile's greater private contribution to public tertiary education.

This regressive and pro-rich distribution is the result of the dramatic overrepresentation of the top quintile in tertiary education. Students from the top quintile constitute about 89 percent of total enrollment in tertiary education, compared to 42 percent of total enrollment in secondary education. In other words, regressive benefits are driven by inequality of access, not necessarily by public spending itself (which is typical of a universal education system). The selection of scenarios does not change these results: the inability to determine the type of education establishment attended causes imprecision but does not call into question the regressive nature of the system.

Figure 10a and 10b: Aggregate Unitary Benefits of Education

Source: LCMS VI, MoE

Figures 11a and 11b: Unitary Benefits by Level of Education: primary

Source: LCMS VI, MoE

Figure 12a and 12b: Unitary Benefits by Level of Education: secondary

Source: LCMS VI, MoE

Figures 13a and 13b: Unitary Benefits by Level of Education: Tertiary

Source: LCMS VI, MoE

5.2.2. Public Healthcare Benefits

The distribution of public health resources in Zambia is not pro-poor. Reviewing the results from method 1 (see Figure 14a), beneficiaries in the poorest quintile received about a third less in total public healthcare spending than their wealthier counterparts. This cannot be explained by a significantly lower incidence of illness among the poor, as they consulted for health services at roughly the same rate as other consumption groups (see Figure 4). Especially disproportionate is the share of benefits accruing to the richest quintile, which represents only 15 percent of total beneficiaries but captures a third more in total benefits than the poorest quintile (even after out-of-pocket expenses are considered). In unitary terms, (see Figure 14b), the situation is even less pro-poor: net unitary benefits are regressive, that is, they increase along with the consumption level of beneficiaries. This is a result of public transfers not being targeted to the poor in any particular way. Although out-of-pocket contributions are progressive they are not significant even for the richest quintiles. And among the poorest quintiles out-of-pocket contributions are nearly flat, since a substantial proportion of beneficiaries do not pay for pay for care either in health posts or in hospitals (see Figure 7, above). Finally, the share of beneficiaries among the richest quintile that use tier 2 or tier 3 hospitals (rather than tier 1 clinics) is twice that of the poorest quintile, which further contributes to the pro-rich nature of the healthcare system.

Figures 14a and 14b: Gross and Unitary Benefits of Public Health Care, Method 1

Source: LCMS VI

Unlike education, healthcare results are sensitive to the assumptions made on the periodicity of health-related episodes. Interestingly, the results of the second method—which annualizes the information

reported by the household in the 15 days prior to the survey—differ significantly from the non-annualized distributive results of method 1,(see Figures 20a and 20b). Method 2 calculates a lower share of benefits accruing to the richest quintile and, more importantly, produces a mixed picture as far as net unitary benefits are concerned. Net unitary benefits increase with welfare levels for the first three quintiles but decrease thereafter, and the change is especially pronounced from the fourth to the fifth quintiles, (see Figures 15a and 15b).

Two factors contribute to these results. First, method 2 turns sporadic visits during the 15 days prior to the survey into frequent visits throughout the year. First, mistakes from annualizing sporadic visits may be larger for health posts than they are for hospitals, since hospital visits are typically associated with more severe conditions. Second, those visiting hospitals may have previously visited clinics or health posts, but these visits may not be reported as the individual is asked only to identify the facility from which services were received. As poor households use clinics and health posts more frequently, and some clinic and health-post visits by richer households are not reported in the survey, these two effects make the distribution less regressive than in method 1.

Figures 15a and 15b: Gross and Unitary Benefits of Public Healthcare, Method 2

Source: LCMS VI

Figures 16a and 16b disaggregate the analysis between health posts/clinics and hospitals. The BIA results are driven by the mixed pattern of hospital-related net benefits. Again, the richest quintile captures more benefits than the poorest quintile—both in total and per-patient terms—while the opposite is the case for

health post- and clinic-provided services. The key here is that net benefits received via hospitals substantially exceed those provided by posts and clinics because hospitals provide more sophisticated, and costly, forms of care. The second scenario (see Figures 17a and 17b), however, changes the distribution for hospital benefits: assuming annualized benefits, the poorest now capture a larger share than the richest, for the reasons indicated above, i.e. sporadic visits are treated as routine and rich patients' visits to clinics and health posts are not considered,(see Figures 17a and 17b).

Figure 16a and 16b Gross and Unitary Benefits of Public Healthcare by Provider, Method 1

Source: LCMS VI

Figure 17a and 17b Gross and Unitary Benefits of Public Healthcare by Provider, Method 2

Source: LCMS VI

5.2.3. Fertilizer Subsidy Program¹⁷

The World Bank (2010) estimates the cost per complete FISP package for the 2008/2009 season at ZMK 2,460,000 (US\$ 639) based on the official program budget. Under scenario 1, each beneficiary household is assumed to have received a full package with a value equivalent to that amount; under scenario 2, households that cultivated 1 hectare or more received a full package, while those which planted a fraction of a hectare received a proportional package.¹⁸ Total costs incurred by the household are assumed to be as reported in the survey.¹⁹ The results of the BIA can be observed in Figures 18a and 18b.

Figures 18a and 18b: Fertilizer Subsidy Gross and Unitary Benefits

Source: LCMS VI, WB(2010)

¹⁷ It is worth emphasizing again that household data do not allow distinguishing if households are receiving fertilizers and/or seeds from FISP or FSP. By assuming that household reporting benefits from the program receive fertilizer, we are assuming that they are beneficiaries of the FISP program. As we also assume in Scenario 1 that they receive the full package, we may be overestimating the true impact of the FISP. However, the FISP is a much larger program than the FSP (see Tables 5 and 6), for which the assumption of all FISP beneficiaries is reasonable.

¹⁸ For example, we assume that households that planted 0.5 hectare received half a package, while those that planted 0.25 ha received a quarter of a package. Sampling data from World Bank (2010) indicate that 28 percent of beneficiaries grew less than 1 hectare even after receiving the full package and 4.5% grew more than 5 ha. The World Bank (2010) states that “many farmers reported that they requested less than a full input pack and/or engaged in sharing of inputs with neighbors because they could not afford a full pack.”

¹⁹ According to the World Bank (2010) the government provided a subsidy of around 70-80 percent of the official cost of the package to farmers during the 2008/2009 period.

As shown in the left hand sides of Figures 18a and 18b, which present the aggregate results, the total benefits of the program are concentrated in the middle quintiles, especially the third and fourth quintiles. This remains the case even when the offsetting effect of private contributions is included. In addition, the distribution of benefits per farmer is regressive. Under both scenarios, maize producers from the poorest quintiles receive a smaller average net transfer than wealthier maize producers. This is largely explained by the fact that participation is regressive, i.e. the share of farmers receiving agricultural inputs from the government increases with consumption level (see Figure 9 above), yet participant contributions do not increase proportionally, as it is the case with fixed statutory benefits and contributions not related to farm size.

6. Conclusions and Policy Implications

This benefit-incidence analysis evaluates the extent to which public spending on education, healthcare and agricultural-input subsidies is pro-poor and progressive in Zambia. In order to be pro-poor, a policy must concentrate its benefits on the poorest members of society. In order to be progressive, it must display an inverse correlation of benefits to welfare level across all beneficiaries: the poorer the beneficiary, the greater the benefit. Evaluating the progressivity and pro-poor nature of public programs is fundamental to understanding the equity implications of development policies, even when their ultimate explicit objective may not be, or may not exclusively be, to offset income inequality or promote social welfare.

The results of the analysis clearly indicate that overall public education spending in Zambia is neither pro-poor nor progressive, but while this is true for the system as a whole it is not true for all of its parts. The net unitary benefits of primary and secondary education are clearly both pro-poor and progressive. However, their progressivity is ultimately outweighed by the extreme concentration of tertiary education benefits among the wealthiest members of Zambian society. This is not so much a result of spending inequities or a tertiary education spending bias (only 12 percent of the total education budget is goes to tertiary education) but of unequal access to tertiary education and its benefits. Members of the richest quintile attend universities, colleges and technical schools at a rate that vastly exceeds that of the poor. In contrast, access to primary education is basically uniform, in line with the government's objective of providing universal service. Secondary education is neither as pro-poor, nor as progressive as primary,

and a large proportion of beneficiaries are from the richest quintile. But when including private contributions, secondary education is progressive.

The state of public healthcare is quite different. Access to public facilities follows a bell curve, with the middle quintiles more likely to receive benefits than either the richest or the poorest. This result is not explained by differences in health status, as the reported incidence of illness (within the 15 days prior to the survey) is essentially uniform across socioeconomic groups. In the upper quintiles this result is to be expected, since the rich contribute more to finance their demand of public healthcare and are also more likely to seek care from private providers. Nevertheless, out-of-pocket contributions could be better targeted, as the analysis shows that more than 40 percent of beneficiaries from the top quintile do not pay anything whatsoever for care received in public facilities.

A great scope for distributional improvement is also observed in access to care for members of the lower-income quintiles, and in particular access across multiple tiers of the healthcare system. Whereas large numbers of members of the top quintile are to access free public health services from all levels of the healthcare system, the analysis suggests that the poor is less likely to seek care at any level. It is not clear whether the poor also fail to move on to provincial or national facilities, as the information available only in the LCMS VI reports only the first provider consulted and not all visits. To the extent that the driving force behind the regressive nature of healthcare benefits among the lower income quintiles be that the poor typically access only first-tier facilities, which offer more basic, lower -cost treatments—while wealthier patients receive more expensive and sophisticated care at provincial and nation hospitals—healthcare expenditures on the poor will remain disproportionately low.

The benefits of agricultural-input subsidy programs follow a somewhat progressive pattern but clearly suffer from targeting problems. For each beneficiary in the top quintile there are almost two beneficiaries in the poorest quintile, but the distribution is far from progressive across all income groups. On an aggregate basis, the results show that despite their intended targeting of very poor and economically vulnerable farmers, the largest benefit shares accrue to farmers in the middle-income quintiles. Moreover, in unitary terms the distribution is regressive, with farmers in the second-richest quintile benefitting slightly more than those in the richest and significantly more than farmers in all other income groups.

Taken together, these public spending patterns lend themselves to three overall conclusions. First, due to unequal access to public services the gross benefits of public spending *increase* with consumption level,

meaning that service provision is neither pro-poor nor progressive. Second, households contribute more to public services as their welfare levels increase, meaning that public services are progressive on the private contribution side. Third, when both of these patterns are combined, the distribution of net benefits is more mixed: unitary *net* benefits (the benefits to each individual minus any costs they incur) are regressive for education and agricultural-input subsidies, but slightly progressive for healthcare.

The policy recommendations derived from this analysis are not meant to be sector-specific given the level of aggregation used for the analysis; however, it is clear that *access* to education, healthcare and agricultural-input subsidies is neither progressive nor pro-poor despite their stated policy objectives. The goal of universal service provision does not necessarily translate into a uniform distribution of benefits, let alone one that is pro-poor and progressive; even where public policies are deliberately targeted to benefit the poorest and most vulnerable, as Zambia's agricultural-input support programs are, progressivity is far from assured.

The distortions affecting each policy area are unique, and addressing them will require tailored solutions. In education, the progressivity of access to primary and secondary school, which should be a laudable achievement in its own right, is obliterated by the effective restriction of university, college and technical school access to only the very richest members of Zambian society. Alleviating this inequality will require policies that actively strive to expand the benefits of tertiary education to members of all income groups.

Access is also a key concern in public healthcare. Low-income patients are less likely to seek care than their wealthier counterparts and might also more unlikely move beyond their primary-care provider, despite their frequent eligibility for no-cost treatment at provincial or national hospitals. This is likely due to a combination of factors, including the limited availability of health-service providers in remote areas (and consequent difficulty of access among the rural poor) and the relatively high transportation and opportunity costs faced by poor patients attempting to seek care in a provincial or national center. Meeting the challenge of expanded healthcare access will require innovative solutions, such as the possible use of transportation vouchers for referral patients or other measures specifically designed to reduce the cost of healthcare access across all its dimensions, not merely the expense of the treatment itself.

Finally, agricultural-input support programs suffer from serious targeting problems. Although the distribution of beneficiaries initially appears to be highly progressive, it is crucial to realize that these

programs are designed on paper to benefit the poorest agricultural producers. In relative terms, it becomes clear that these programs are significantly more likely to benefit wealthy farmers than poor farmers. Moreover, participant contributions are made on a fixed-cost basis, which is inherently advantageous to wealthier participants. An effective strategy for enhancing the targeting of agricultural-subsidy programs must utilize some form of means-testing, either as a participant criterion or a method to scale contributions, or both. Without better-designed and more conscientiously implemented targeting mechanisms, public spending on health, education and fertilizers will not be able to further the government's larger objectives for pro-poor and progressive development policy.

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Appendix 1

Educational Structure

Age	School Year	Type of schooling			Other	
30	24	University Education (Doctorate, Masters and Bachelors Degrees)	<div>Various Training Programs</div>		C O N T I N U I N G E D U C A T I O N	
29	23					
28	22					
27	21					
26	20					
25	19					
24	18					
23	17					
22	16					
21	15					
20	14					
19	13					
18	12	High School (Grade 10-12)		Various Vocational Training Programs		
17	11					
16	10					
15	9	B A S I C	Upper Basic (Grade 8-9)			
14	8		Middle Basic (Grade 5-7)			
13	7					
12	6					
11	5		Lower Basic (Grade 1-4)			
10	4					
9	3					
8	2					
7	1					
6		Pre-school Education				
5						
4						
3						

Source: MoE. As seen in (IOB, 2008)

Appendix 2

Methods to calculate distribution of health benefits

The main challenge to calculate the distribution of health care benefits is the different definitions of beneficiary across official administrative data and LCMS VI (household survey). In the official data each visit to a health facility made by a single person is considered a beneficiary; therefore, if a person visits a hospital 5 times, those visits count as 5 beneficiaries. In contrast, LCMS asked each person -who had been ill during the past 15 days- about the first health facility he/she visited because of the illness but numbers of visits were not collected. If a person had visited a hospital 5 times for an illness, then he/she is considered a single beneficiary. In the LCMS the number of patients is the number of beneficiaries, while in the official data the number of visits determines the number of beneficiaries.

Furthermore, LCMS VI asks about the first health facility visited because of a specific illness suffered during the last 15 days. A first problem is that if a person had gone, for example, to a hospital and a clinic, but went to the clinic first, she should report going to a clinic and the visit to the hospital is left undeclared. In the official data these two episodes would count as two visits, one to the hospital, and one to the clinic. The second problem is that the question about visits does not specify a time span for which the first visit occurred. If a person is facing a chronic

disease, which started before the 15 days period but continued during that fortnight, and visited a hospital a month ago, she might wrongly report the visit in the survey.

In order to account for these differences in definition, two methods are used in order to calculate the distribution of health care benefits. The first method is a traditional BIA, where an average expenditure per beneficiary is obtained from the official data and assigns it to every “visitor” reported in the survey. The second method takes the share of visitors from the survey, and uses it to distribute the official expenditure in each province among quintiles. A big assumption used in the second method is that the annual expenditure is distributed uniformly and we can find the fortnight expenditure by dividing it by 24.

Appendix 3

Education, Health and Fertilizer information on LCMS VI

A.3.1. Education

The LCMS VI has information on school enrollment for all households both for 2010 (the year the data were collected) and 2009. Additionally, it reports household’s total expenditures on education in 2009. In 2010, survey participants were asked about each household member’s attendance at school between February and March of that year. For each household member attending school, he or she was asked for the specific level, grade year and type of school, and whether it was a public or private institution. The survey also asked the informant to report on his or her situation in 2009. Furthermore, household members not enrolled in school at the time of the survey were asked if they had ever attended school, and what was the highest education level they had reached. No other information was collected for those enrolled in 2009 but not in 2010. Figure A.3.1 shows the questions answered by households about each member’s education, which are used in this analysis.

Households were also asked about their education expenditures. Answers report the total amount spent by the household on the education of all its members in 2009, but no expenditure information was recorded for 2010. The LCMS VI includes disaggregated information on school fees, other contributions, private tuition, textbook fees, the cost of stationery and other school supplies, uniforms and other education expenses, which make up the household total. Because households were only asked to report their 2009 expenses, the current BIA focuses only on students who were attending basic education, high school, or tertiary education institutions in 2009, regardless of their status in 2010.

Figure A.1: Education data flow

Source: Authors

A.3.2 Health

The public health section of LCMS VI contains health-status information for each household member during the 15 days before the survey. Figure A.3.2 shows the questions answered by households about each member's health, which are used in this analysis.

Figure A.2: Health care data flow

Source: Authors

A.3.3 Fertilizer Subsidies

The agricultural information section of the LCMS VI asked if any member of the household grew food crops (or had someone grow them on their behalf) during the 2008/2009 agricultural period. If they responded positively, the survey asked about the type of crops and the total area under cultivation. Given the characteristics of the FISP and FSP programs, we focus on households that reported growing maize, or about 45.5 percent of respondents.

The survey also asked the same group of households about their use of various production inputs during the 2008/2009 agricultural period as well as their associated expenses. Among the inputs, the survey asked if the households used fertilizer (organic or inorganic) or purchased seeds, seedlings, or other supplies. If a household reported such expenses, the survey asked how much the household spent in cash (or in kind) and the source of the input (including those publicly provided). Figure A.3 shows the sequence of the questions.

Figure A.3: Use of fertilizer and input purchase data flow

Source: Authors