
YEMEN POVERTY NOTES

June 2017

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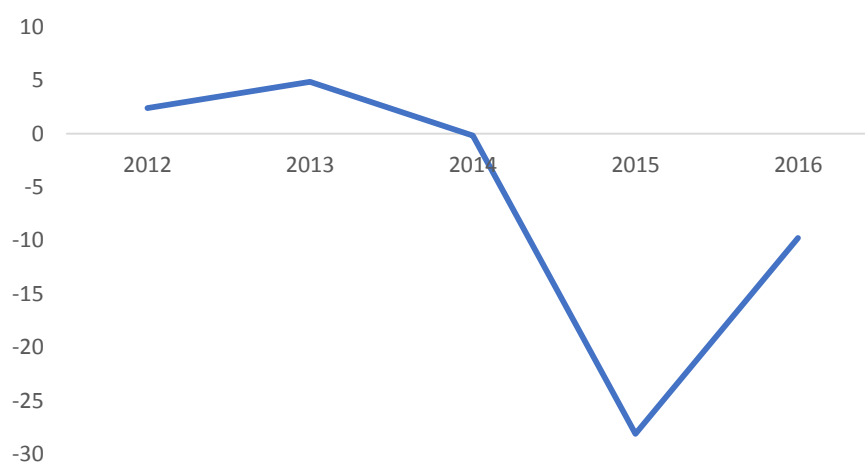
Acronyms and Abbreviations

CBN	Cost of Basic Needs
CPI	Consumer Price Index
EARs	Estimated Average Requirements
FAO	Food and Agriculture Organization
FHH	Female-Headed Household
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GWP	Gallup World Poll
HBS	Household Budget Survey
IDPs	Internally Displaced Persons
MDER	Minimum Daily Energy Requirement
MENA	Middle East and North Africa Region
MHH	Male-Headed Household
NDC	National Dialogue Conference
NTL	Night-Time Lights
QER	Quality Enhancement Review
SWF	Social Welfare Fund
TFPM	Task Force on Population and Movement
YRI	Yemeni Riyals
UNHCR	United Nations High Commissioner for Refugees
USDA	United States Department of Agriculture

Overview

From a country described throughout history as the “Arabian Felix”—a land of prosperity and happiness—Yemen has descended into war, economic collapse and destitution. The escalation of conflict in the past two years has had enormous human costs and the damage to physical infrastructure and the deterioration of the overall security environment has paralyzed the economy. Latest estimates suggest that real GDP has contracted by 35 percent since late 2014. An estimated 8 million Yemenis have seen their livelihoods collapse and are living in communities with minimal to no basic services.

Figure O.1: Real GDP growth in Yemen, 2012-16



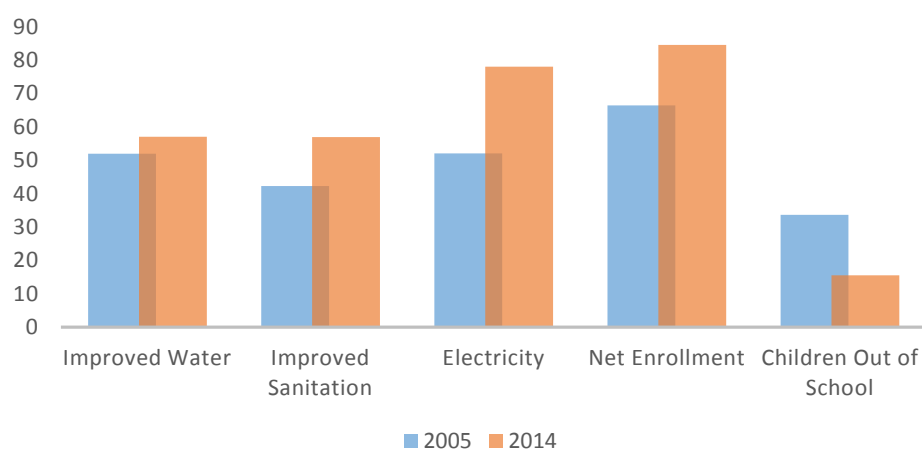
Source: IMF staff estimates.

Poverty was high in Yemen and the post-2014 escalation of violence and conflict is likely to have depressed living standards further. Analysis of data from the most recent nationally representative household survey in Yemen, the Yemen Household Budget 2014, suggests that poverty in Yemen was 49 percent in 2014. With over 35 percent of the population reporting to have lost their main source of income in 2015 and 2016, and close to 10 percent of the population reporting having experienced a decline in remittances or having had to rely on help from others, housing damage or physical displacement, living standards are likely to have deteriorated even further.

Food access in Yemen was already very poor in 2014 and the conflict has worsened it further. About 10.8 million Yemenis were undernourished in 2014—about 41 percent of the total population—and much larger shares of the population suffered from nutrient deficiencies. Prevalence of both undernourishment and nutrient deficiencies among children in 2014 was already high, suggesting that a large share of the young Yemeni population could struggle to develop adequate human capital to lead productive lives, and future generations might continue to be affected by the poor state of food access in 2014. A little over half of the population was directly affected economically by the conflict by August 2016, which suggests the current food security situation is dire for a large share of Yemenis.

Yemen had made important gains in non-income dimensions of well-being before the current crisis. Looking at non-monetary measures, Yemen seems to have made decent progress between 2005/6 and 2014. For example, despite declining water-resource availability within the country, there was a slight improvement (52 percent to 57 percent) in access to improved water. Similarly, access to improved sanitation increased from 42 percent in 2005 to 57 percent in 2014, with larger proportional improvements realized by the poorer segments of the population. Electricity access increased from 52 percent of the population to 78 percent during the same period, propelled by a significant increase in rural electrification. School enrollment increased (66 percent to 84 percent), fewer children were out of school (34 percent to 16 percent), and gender gaps were significantly closer.

Figure O.2: Non-income dimensions of well-being – access to key services



Source: World Bank staff calculations based on HBS 2005 and HBS 2014.

Yemeni households relied significantly on public and private transfers at the start of the current crisis in 2014. In 2014, just prior to the current crisis, many Yemeni households relied on public and/or private transfers. Private remittances from within and outside the country were particularly critical to household living standards: reaching 27 percent of the population and equaling 27 percent of recipients' living standards, although only 3 percent if considering Yemen's total population. Government pensions also afforded their few beneficiaries, around 8 percent of Yemen's population, an adequate standard of living. Finally, some 45 percent of the national population lived in households that benefitted from at least one type of public social assistance or charity-related transfer.

Internally displaced individuals (IDPs) are doing worse than the general population. Nearly 3 million people have been displaced since the conflict escalated in 2015, and over 2 million of those people remained displaced as of January 2017. According to the GWP, there was a dramatic decline in indices that track peoples personal well-being, optimism, feelings about the state of the economy, and community attachment. Also, Food and Shelter Index demonstrates that over 60 percent of IDP's had trouble affording adequate food and over 40 percent of IDP's had trouble affording adequate housing.

Introduction

Yemen is in the midst of an unprecedented crisis. Following the Houthi capture of Sana'a in September 2014 and the gradual takeover of government institutions in the first quarter of 2015, the incumbent government, including President Hadi, fled and took refuge in the southern port city of Aden and later in Riyadh, Saudi Arabia.¹ The Houthis kept pressing south while a Saudi Arabian-led coalition of nine Arab countries initiated a military campaign to restore the ousted government to power.² This plunged the country into a civil war that is still ongoing.

This conflict has had wide-ranging effects. The violence has eroded peoples' earnings and contributed to the unreliable payment of public sector employees; violence has disrupted supply chains and a blockade of the ports have restricted the imports of both food and fuel, which is particularly harmful given Yemen imported approximately 90 percent of its food prior to the conflict; a crippling of civilian health facilities at a time during which poor health and disease is pervasive have further diminished peoples' welfare and eroded their ability to lead productive lives; and a number of natural disasters have further affected household assets and their ability to earn a living. Given all of these factors, household reliance is at a breaking point, and large swaths of the country are facing the risk of famine.

In the midst of these events, this note projects the poverty rate in 2016 utilizing the 2014 Yemen Household Budget Survey (HBS). Coming almost a decade after the last similarly comprehensive analysis of living standards was carried out in the country using the 2005 version the data, the survey provides insight in how households might adapt to the conflict, and also provides a useful benchmark of income and non-income dimensions of poverty in 2014 before the conflict escalated in 2015. Additionally, particular attention is paid to food security and social protection given their importance following the escalation of the conflict.

The Impact of Conflict on Income

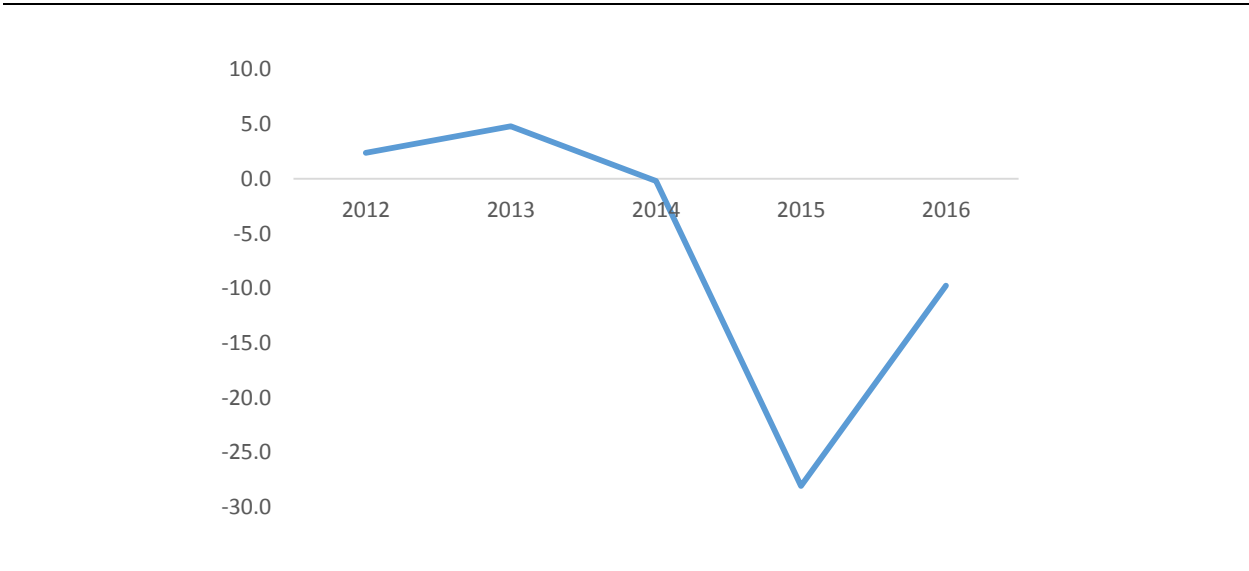
The picture of overall well-being of the Yemeni population described in this note so far relies on data from the household budget survey (HBS) implemented in 2014. Yemen has been embroiled in a prolonged conflict since the HBS was fielded and the conflict is likely to have affected the lives and livelihoods of the country's populace in deep and profound ways. A number of other organizations have demonstrated that many measures of welfare have dramatically declined since the beginning of 2015. For example, the Task Force on Population and Movement (TFPM), co-led by the Office of the United Nations High Commissioner for Refugees (UNHCR) and the International Organization of Migration (IOM), has estimated that 3 million people, about 11 percent of the population, were displaced as of January 2017 (TFPM, 2017). Likewise, an FAO assessment in November 2016 estimated that nearly 17 million individuals, or about 65 percent of the population, were food insecure. This is 6 million people more than the size of the food-insecure population estimated using the 2014 HBS data.

¹The Houthis, also known as "Ansarullah", represent a religious sect named after its founder Hussein Al-Houthi. Based in Sa'adah in the north of the Republic of Yemen, the Houthis had already fought six wars with the central government.

²This information is sourced from World Bank (2016). "Country Engagement Note for the Republic of Yemen".

The consequences of war on the socioeconomic fabric of the country have been devastating. An already polarized country has even deeper divisions today. There has been large-scale destruction of life and property, and the economy has contracted sharply since the conflict erupted. Available estimates suggest that real GDP has contracted by 35 percent since late 2014 (Figure 1). Enterprises are operating at half the capacity compared with before the conflict. An estimated 8 million Yemenis have seen their livelihoods collapse and are living in communities with minimal to no basic services. Civil service salaries have been paid only partially since last September 2016 (teachers). Fiscal revenues are weak, while deficit financing is increasingly being secured through a build-up of arrears, undermining state functions and impairing the situation for the private sector. The financial sector is facing enormous difficulties with runaway non-performing loans. Oil and gas exports, the main source of revenue and foreign exchange prior to the conflict, have largely dried up. Important economic institutions such as the Central Bank of Yemen have been unable to curb runaway inflation.

Figure 1: Real growth in Yemen, 2012-16



Source: IMF estimates.

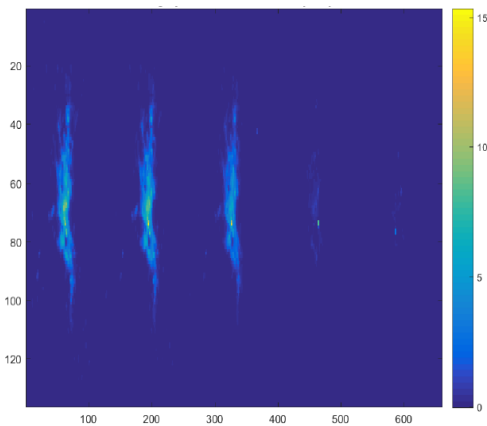
Box 1: Conflict and the economy - night-time lights over Yemen

It is now recognized and accepted that the radiance from night-time lights correlates strongly with GDP, with richer countries tending to be brighter on average. But recent evidence shows even more strikingly that changes in countries' light intensities tend to track annual GDP growth. In other words, there may be a proportional relationship between changes in light intensity and changes in GDP.

This has led to the increasing usage of night-time lights as a proxy for the level of economic activity. In underdeveloped or conflict-affected regions in particular, where the availability and reliability of survey or census data at high level of granularity is limited, night-time lights data have become a useful resource. Recent studies have used night-time lights to study city growth in sub-Saharan Africa (Storeygard, 2016), production activity in blockaded Palestinian towns of the West Bank (van der Weide et al., 2015), and urban form in China (Baum-Snow & Turner, 2012) and India (Harari, 2016).

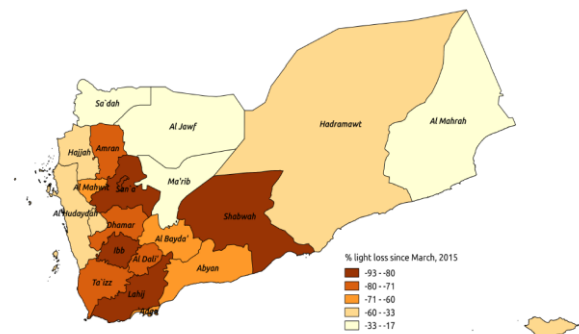
Night-time lights' satellite imagery encompasses almost all inhabited areas of the globe, including Yemen, and records the average quantity of light observed at each pixel over a given time period. The Defense Meteorological Satellite Program (DMSP) series offers annual composite images across cloud-free nights for every year in 1992-2012. Pixels are just under 1km North-South and vary from 1/2 to 1km in their East-West width, allowing researchers to study questions at a relatively fine spatial scale worldwide. Since 2012, a new global NTL series has become available at the monthly level, collected by NASA's VIIRS satellite. As described in Elvidge et al. (2013), VIIRS is a more powerful and specialized instrument than its DMSP predecessors, enjoying a much higher resolution. The research community has only just begun to explore the potential of VIIRS imagery for tracking economic changes around the world.

(a) VIIRS imagery over Sana'a, January-May 2015



Source: VIIRS, satellite imagery.

(b) Light loss by governorate before and after March 2015 (as of August 2015)



Source: World Bank staff estimates based on VIIRS satellite imagery.

VIIRS imagery over Sana'a between January and May 2015 shows a precipitous fall in light intensity beginning in March 2015, which was the month during which the Saudi air campaign on Sana'a intensified. By April 2015, the light footprint over Sana'a all but disappeared. Taking the average light intensity between January 2014 and March 2015 as the base, it is apparent that every governorate experienced a decline in light intensity between April and August 2015. The losses varied by governorates, obviously, with the least-affected province (Al-Mahrah) losing 17 percent of its baseline radiance and the more badly affected governorates of Shabwah, Ibb, Sana'a losing upward of 80 percent. The capital city itself suffered a 93 percent light loss.

What do these light losses imply for the level of economic activity? Using the global lights-GDP elasticity of 0.277 (Henderson, Storeygard and Weil, 2012), it would appear that provincial output loss just in the first few months of conflict among the most affected governorates would be in the range 22-25 percent.

Poverty Update

Utilizing the 2014 HBS, the standard poverty measurement exercise consists of three major steps (i) construction of a consumption aggregate, (ii) setting poverty lines, and (iii) aggregation of poverty measures, such as the poverty headcount rate. The consumption aggregate consists of two major components: food and non-food. In the case of Yemen, the non-food consumption can be further divided into four sub-categories of: durable goods, housing, education and other non-food items and services.

The second step in poverty measurement is setting poverty lines to classify households into poor and non-poor based on their consumption values. The most common approach to estimating poverty lines is the cost-of-basic-needs (CBN) approach developed by Ravallion (1998; 1994). Poverty lines under the CBN consist of two components: the food poverty line and the non-food allowance. The food poverty line represents a monetary value (in Yemeni riyals in this context) required to purchase a basket of food items that satisfies a basic minimum caloric threshold. This basket consists of items commonly consumed by the less well-off segment of the population. The price of the basket is the food poverty line to which the non-food allowance is added to account for the basic minimum needs for non-food goods and services. The total poverty line is a sum of the food poverty line and the non-food allowance. Anyone whose consumption is below this line is considered poor.

The final step is to estimate poverty and inequality statistics using the consumption aggregate and the total poverty line. For Yemen using Yemen Household Budget Survey (2014), a consumption aggregate was constructed from various components: food consumption, non-food consumption (education, durable goods, housing and other non-food items and services). It was then adjusted for spatial price variations by the Paasche index. The total poverty line of YRI 162,528 per person per year was estimated using the CBN approach.

The Impact on Poverty

Utilizing this poverty line, this chapter makes an effort to extrapolate Yemen's poverty trend from 2014 to 2016 utilizing the decline in real GDP. First, a microsimulation method is used that takes into account the impact of the economic collapse on available labor market opportunities (employment as well as earnings), the partial non-payment of public sector salaries and other public transfers such as those through the Social Welfare Fund – Yemen's flagship social assistance program. Second, utilizing smaller-scale instances of conflict that occurred during the collection of the 2014 HBS to estimate a lower bound of the impact the current conflict is having on poverty. Results suggest that headcount poverty rates in 2016 range between 62 and 78 percent. In terms of number of poor, this translates to a range of 17 and a half million and 21 million people, and is at least 4 million higher than the number of poor estimated from the Household Budget Survey of 2014. The results also suggest a significant increase in the depth as well as severity of poverty in 2016.

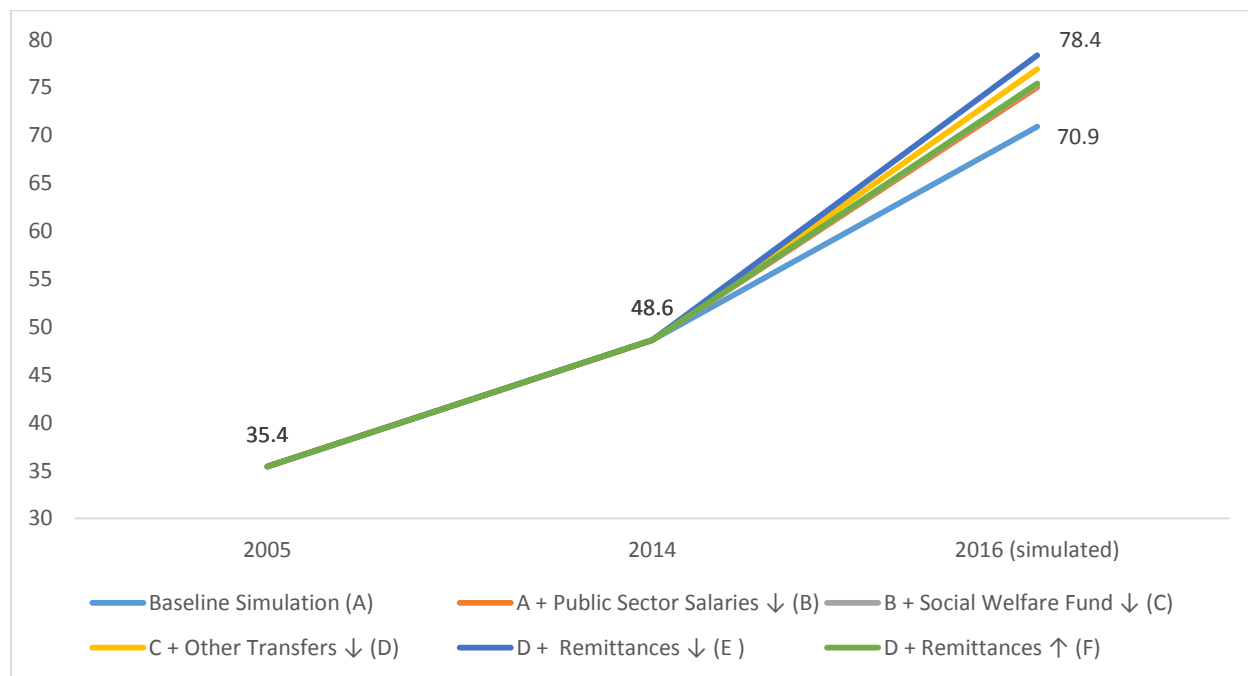
The simulation entails the following steps. First, using the 2014 HBS, we estimate how individuals choose occupations and the determinant of their incomes. Second, using this information, we make projections of how households are affected by GDP shocks of varying sizes after taking into account how employment, earnings, and the demographic composition of the population is expected to change. On

methodological issues see Bourguignon et al. 2008, Ferreira et al. 2008, Olivieri et al. 2014, and Krishnan and Olivieri 2016.

Using this methodology, we present estimates from a number of scenarios in Figure 2. First, the baseline simulation represents the scenario in which non-labor incomes and the income of public sector workers remains unchanged and all the impact on poverty comes from the labor earnings. It is noteworthy that this alone causes estimated poverty in 2016 to jump by roughly 21 percentage points to 70.9 percent. In the second scenario, in addition to this baseline, public sector wages and salaries are adjusted to 75 percent of their annual levels in 2014. This amount is consistent with reports from the country that salaries have not been paid since September 2016. For the year 2016, this would imply a 25 percent reduction in wages/salaries. This causes the headcount poverty rate to jump to 75 percent of the population. In addition, if the household only receives 75 percent of social welfare fund along with the decrease in public sector salaries than the poverty rate would increase to 75.3 percent. This suggests that even though a large fraction of population receives social welfare funds the amount they receive is quite low.

The other main source of income is remittances. During times of economic distress, remittances flows from household members that reside in other parts of the country (or in other countries) can increase to compensate for loss in income from other sources. However, if the shock is covariate in nature (as opposed to idiosyncratic) and affects the economic circumstances for the migrant worker as well, then his/her ability to remit more may be limited as well. Naturally, depending on which effect dominates, remittances could play a mitigating or exacerbating role. (Scenarios E and F).

Figure 21: Poverty Trend in Yemen Using Simulated Results for 2016 (% of population)



Source: World Bank staff calculations using HBS 2005/6 and HBS 2014

Under scenario D, which is the one with employment and labor market adjustments affecting labor earnings, public sector salaries and all public transfers at 75 percent of their 2014 and remittances remaining at the 2014 levels, the headcount poverty rate is predicted to rise to 76.9 percent in 2016. This is a substantial increase from the 48.6 estimated for 2014 in the baseline year. The poverty gap and severity measures too jump quite substantially suggesting that the poor are likely to be more deeply mired in poverty in 2016. Aggregate inequality is likely to have increased with the Gini going from 36.7 to 48.9. This suggests that the crisis in the Republic of Yemen has not only made people worse off but has had a disproportionately larger effect on the poor and vulnerable. (Table 1)

Table 1: Simulated Poverty and Inequality Changes in Yemen, 2014-2016

		2014 (actual)	2016 (simulated)
Poverty	Headcount	48.6	76.9
	Poverty Gap	15.5	43.7
	Severity	6.7	30.1
Inequality	Gini	36.7	48.9
	Theil L	22.2	50
	Theil T	25.5	50.1

Source: World Bank staff calculations using HBS 2014 and simulated data.

In addition to the microsimulation model, we also estimate the poverty utilizing a unique feature of the baseline data of 2014. Although the current conflict in Yemen truly escalated with the Saudi and other coalition forces entering the fray in March 2015, there were some low level skirmishes already ongoing in several parts of the country even in 2014, when the Yemen Household Budget Survey data was being collected. The Houthi march on and capture of the capital city Sana'a in September of 2014 was one such event. This was a culmination of anti-government protests that began in the city at the end of August, and continued through mid-September. Clashes and a 4-day siege of the city by Houthi rebels began on September 16, after which the capital was under Houthi control.³

An important feature of the Household Budget Survey (HBS) is that a decent number of households in Sana'a were interviewed both before and right after the siege. In particular, 757 households were surveyed prior to the capture of the city, and 231 households were surveyed after the siege had concluded. This allows for the investigation of changes in household welfare in response to the capture of the city, which was, again, a small portion of the conflict and instability Yemen has witnessed in the last few years. Moreover, by comparing this change in welfare before and after September 2014 with the change in average welfare before and September of the earlier survey round in 2005/6, can help rule out seasonal factors that might affect welfare and yield an arguably better estimate of what welfare would have looked like without the capture of the capital.

The results of this exercise are presented in Table 2 below. Following the capture of the city, household expenditure declined and the share of individuals who were poor increased. When comparing these

³ See Al Jazeera (Accessed March 2017): <http://america.aljazeera.com/articles/2014/9/25/houthi-yemen-takeover.html>.

changes to the changes over the same time period in 2005, that the decline in welfare was large. In particular, expenditure decreased by 22 percent relative to 2005, and poverty increased by 8.8 percent. During the same period and in the rest of Yemen however, one cannot rule out the possibility of no changes in expenditure and poverty.

Table 2: Change in Expenditure and Poverty Following the Capture of Sana'a by Region

	Sana'a (City)		Rest of Yemen	
	Percentage Increase in Expenditure	Increase in Poverty	Percentage Increase in Expenditure	Increase in Poverty
Change after the capture of Sana'a-2014	-0.141	0.043	0.006	-0.048
Change over Same Period-2005	0.082	-0.045	0.053	-0.071
Difference-in-Difference	-0.224***	0.088**	-0.047	0.024

Source: World Bank Staff calculations using HBS 2005/06 and HBS 2014

Furthermore, assuming that the change in poverty in the city of Sana'a would be the same as the rest of Yemen in absence of the capture of the city, the increase in the incidence of poverty attributable to the conflict would be 13.5 percent (8.8 percent less -4.7 percent), and the resulting change in poverty if the conflict extended to the rest of the country would be 62 percent (the sum of 48.1 percent and 13.5 percent). Given that the severity of the conflict was likely much worse following 2015, the decline in welfare was likely much larger and this estimate likely represents a lower bound for the poverty rate in 2016.

The Human Cost

A key question of interest is how the conflict and its consequences on the economy might have affected the lives and livelihoods of the Yemeni population. Beginning in the November 2015 survey round, the Gallup World Poll (GWP) began to inquire into whether respondents in Yemen had been affected by the conflict and inquire about their perceptions of the conflict. Of interest to household welfare, respondents were asked a number of questions about changes in their livelihoods and assets "as a result of the recent conflict." These responses permit an estimate of the prevalence of particular types of adverse consequences of the conflict. Furthermore, the full GWP questionnaire allows us to track changes in a number of self-reported indices of welfare, and to compare the changes of households whose livelihoods and assets were directly affected by the escalation in conflict to the changes of households whose livelihoods and assets were indirectly affected.

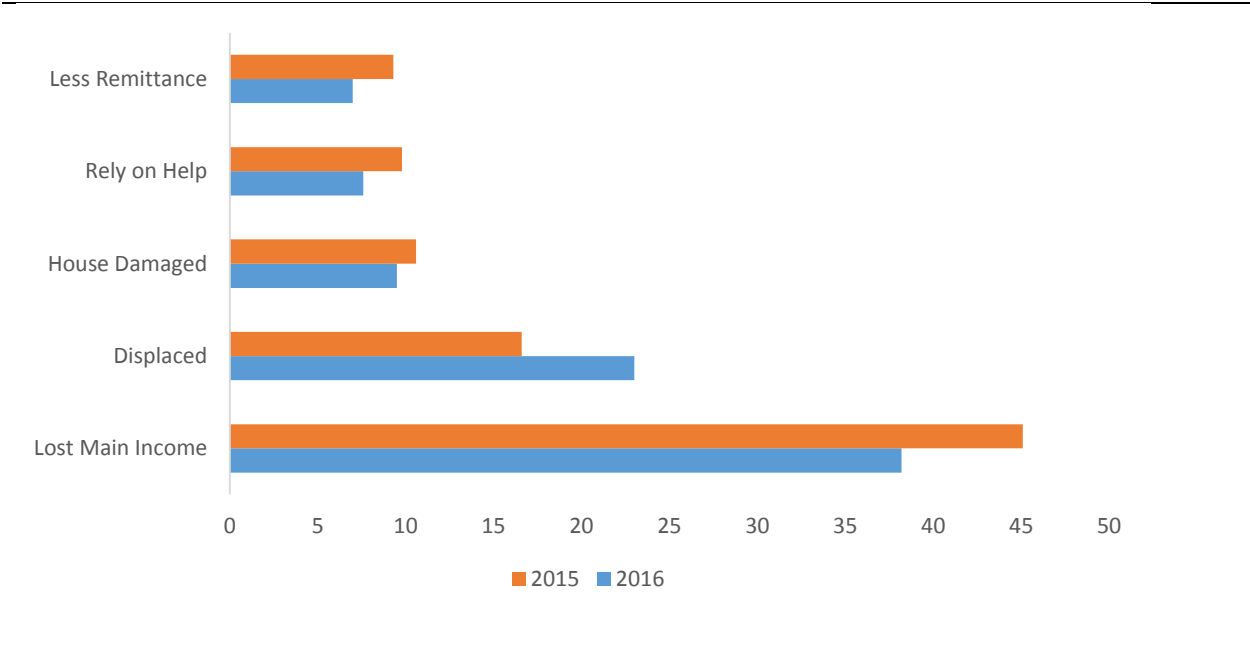
Table 3: Conflict questions in the GWP administered in Yemen in 2015 and 2016

1. <i>Was your house damaged or destroyed by bombing during the recent conflict in this country?</i>
2. <i>Did your household lose its main source of income as a result of the recent conflict in this country?</i>
3. <i>Did your household have to rely totally on help from others outside your household for food and other basic necessities as a result of the recent conflict in this country?</i>
4. <i>Were you unable to get the financial support you usually receive from people in another country as a result of the recent conflict in this country?</i>
5. <i>Were you displaced from one part of the country to another as a result of the conflict?</i>

Source: Gallup World Poll Questionnaires.

Based on the GWP, a large share of the Yemeni population had their livelihood or assets adversely affected due to conflict by November of 2015. Slightly more than 56 percent of the population had responded affirmatively to at least one of the livelihood questions listed in Table 3. In 2016, the share of the population that had had their livelihoods or assets adversely affected remained roughly constant, where slightly more than 53 percent of the population indicated an adverse effect of the conflict. The small decline in the affected population was similar across all questions, except for the share of the displaced population, which increased between 2015 and 2016 (Figure 3).

Figure 3: Loss of livelihood and assets, by August 2016



Source: World Bank staff calculations based on GWP surveys.

The prevalence of households that lost their main source of income was of particular concern for the population in both 2015 and 2016, where about 46 percent of households responded affirmatively in 2015 and 38 percent of households responded affirmatively in 2016. Furthermore, nearly 10 percent of households responded affirmatively to each question listed above, suggesting that there was a broad range of ways that household livelihoods had been affected. Importantly, nearly one-quarter of the population reported having been displaced from one part of the country to another by 2016. This latter estimate of displacement was larger in magnitude than the estimate by the TFPM, which found that about 11 percent of the population had been displaced by January of 2017, and that 80 percent of these individuals had been displaced for more than one year (TFPM, 2017).

However, these dramatic effects of the conflict are not uniform throughout the country, and there were significant variations by governorate. By 2016, four governorates all had over 70 percent of respondents reporting that their livelihoods or assets had been adversely affected by the conflict and three governorates where less than one quarter of respondents responded affirmatively.

GWP also collects information on several subjective measures of well-being. For example, the Financial Life Index and the Food and Shelter Index inquire into the economic well-being of each respondent, such as whether they had enough money to afford necessities. Alternatively, the Daily Experience Index, Negative Experience Index, and Positive Experience Index all track whether individuals had positive, negative, or stressful experiences on the day before the survey. In addition to the individual-specific questions, the survey also collects information about the beliefs the respondent had about the well-being of the economy and the government in the Economic Confidence Index, Job Climate Index, and the National Institutions Index. In all cases aside from the Negative Experience Index, a decline indicates that well-being or perceptions have changed for the worse.

Consistent with FAO estimates, welfare had declined dramatically by August of 2016 relative to the levels reported in 2014. Between the 2014 and 2016 rounds of the survey, there was a sharp worsening in nearly all indices that track perceptions and measures of subjective well-being (Table 4). Many of these declines were consistent with an increase in households not even being able to afford basic necessities, such as an increase in the share of people who could not afford basic food or shelter (Food and Shelter Index). Furthermore, the worsening of well-being and perceptions was stronger in nearly every instance for individuals whose livelihoods and assets had been directly affected by the conflict. However, it is important to note that there was also a worsening of self-reported well-being among households whose livelihoods were not reported to have been directly affected by conflict. Thus, on average, the entire population reported having experienced a decline in welfare and the FAO estimates of food insecurity may not only be driven by displaced individuals and those who have had their livelihoods dramatically affected by the escalation in conflict (FAO, 2016).

Table 4: Changes in subjective measures of well-being from GWP surveys, 2014-16

Index name	2014	2016- Livelihood	2016- Livelihood	Change where	Change where
		directly affected	indirectly affected	livelihood directly affected (Column 1 - Column 2)	livelihood indirectly affected (Column 1 - Column 3)
Daily Experience Index	65.7	57.2	68.5	-8.49***	2.8
Economic Confidence Index	-52.2	-80.6	-61.5	-28.4***	-9.30**
Financial Life Index	22.3	9.6	18.3	-12.7***	-4.01***
Food and Shelter Index	72.2	50.9	72.5	-21.2***	0.358
Job Climate Index	16.6	3.67	7.29	-12.9***	-9.31***
National Institutions Index	38.9	29.6	38.4	-9.34***	0.488
Negative Experience Index	28.1	30.1	20.3	1.97	-7.80***
Optimism Index	128.7	18.3	23.5	-110.4***	-105.2***
Positive Experience Index	59.9	44.8	58.4	-15.2***	-1.57

Source: World Bank Staff estimates based on data from GWP.

Internal Displacement

As mentioned above, nearly 3 million people have been displaced since the conflict escalated in 2015, and over 2 million of those people remained displaced as of January 2017 (TFPM 2017). Although the 2014 HBS cannot address the welfare of internally displaced people (IDP's) following the escalation of the conflict, the Gallup World Poll (GWP) collects information on a number of measures of welfare. In

particular, the GWP has conducted annual surveys in Yemen and began inquiring whether respondents had been displaced at some point due to the escalation of conflict beginning in the 2015 survey.⁴

Each survey includes face-to-face interviews with 1000 households that is representative of the country, less three governorates.⁵ However, the sampling was necessarily affected given the difficulties of conducting surveys in the midst of conflict, where regions were substituted based on the security situation.⁶ Given the possibility that households that were most affected by the conflict were under sampled, the decline in welfare might actually underestimate the true decline.

Despite this substitution, there was a dramatic decline in nearly all indices that track peoples personal well-being, optimism, feelings about the state of the economy, and community attachment. Out of the 21 indices tracked by the GWP in Yemen both before and after the start of the civil war, 17 had large and statistically significant declines amongst IDP's.⁷ Thus, relative to 2014 country averages, IDP's on average had significantly more stress, had more financial struggles, had less favorable opinions of the economic climate, and were less optimistic about their futures.

What do these declines in relatively abstract indices imply for welfare? The component questions of the Food and Shelter Index demonstrates that over 60 percent of IDP's had trouble affording adequate food and over 40 percent of IDP's had trouble affording adequate housing in the 2016 survey, which is consistent with the finding that IDP's primary concern is food (TFPM 2017). Furthermore, over half of IDP's reported experiences consistent with extreme undernourishment in 2016- running out of food, going to bed hungry, or going a whole day without food. Figure 4 further demonstrates that each of these measures of deprivation has approximately doubled relative to the average of the population in 2014 prior to the escalation of the conflict.⁸

⁴ In particular, the question asked “were you displaced from one part of the country to another as a result of the conflict?” It is possible that households interpreted the question differently, and could have answered based on whether they were currently displaced. However, the question is worded such that returnees should answer affirmatively.

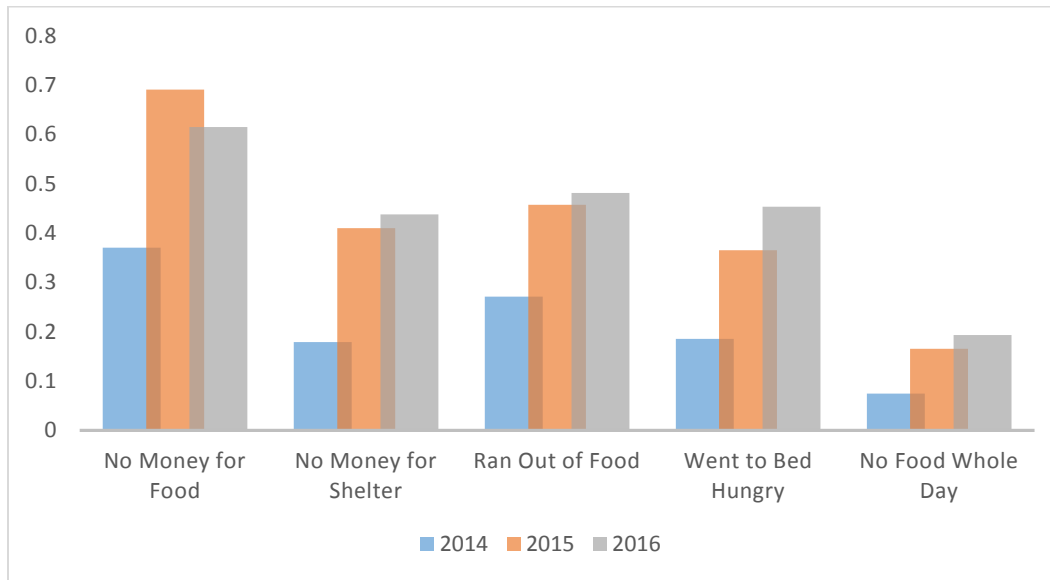
⁵ The GWP does not survey households from Amanat Al Asimah, Al Mahrah, or Socotra. The 2016 survey also was unable to be conducted in Sa'ada.

⁶ This is reflected in the fact that the number of IDP's were higher in 2016 than indicated in the TFPM (2017), where relatively secure areas where IDP's would be more likely to relocate might have been oversampled.

⁷ The four that did not have persistent declines were the Social Life Index, the Community Basics Index, the Civic Engagement Index, and the Law and Order Index.

⁸ The unemployment figure is defined using the respondent and is meant to capture individuals who have been out of work for the past seven days, have looked for work in the past four weeks, and who would have been available to work in the past four weeks.

Figure 4: Change in IDP Welfare Following Escalation of Conflict

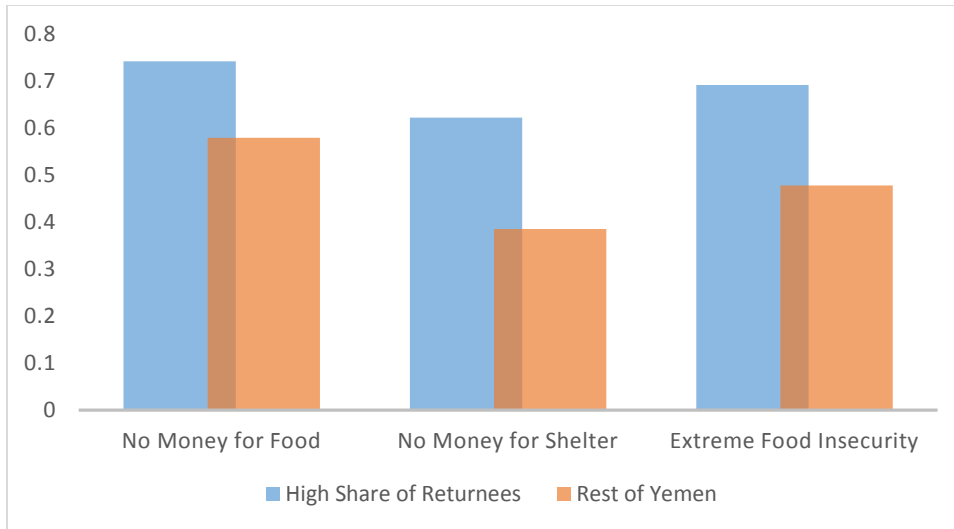


Source: Gallup World Poll; the 2014 average includes all surveyed households, whereas the 2015 and 2016 include averages of individuals who responded affirmatively to the displacement question. The 2015 survey was conducted in November, and the 2016 survey was conducted in October.

However, in addition to the dramatic drop in welfare of IDP’s, there are three other important factors to note. First, the GWP demonstrates that IDP’s might continue to need significant support once returning to their homes. Out of the entire population that has been displaced since the beginning of the conflict, the governorates with the largest share of households that had returned by the beginning of 2017 are Aden (92 percent), Shabwah (79 percent), Lahj (54 percent), and Al Dhale (51 percent) (TFPM 2017).⁹ However, figure 5 demonstrates that the welfare of individuals that responded affirmatively to having been displaced since the start of the conflict in those governorates was actually worse than respondents from governorates with much lower shares of respondents who are likely to be returnees.

Figure 52: Welfare of Returnees Versus Those Currently Displaced in October 2016

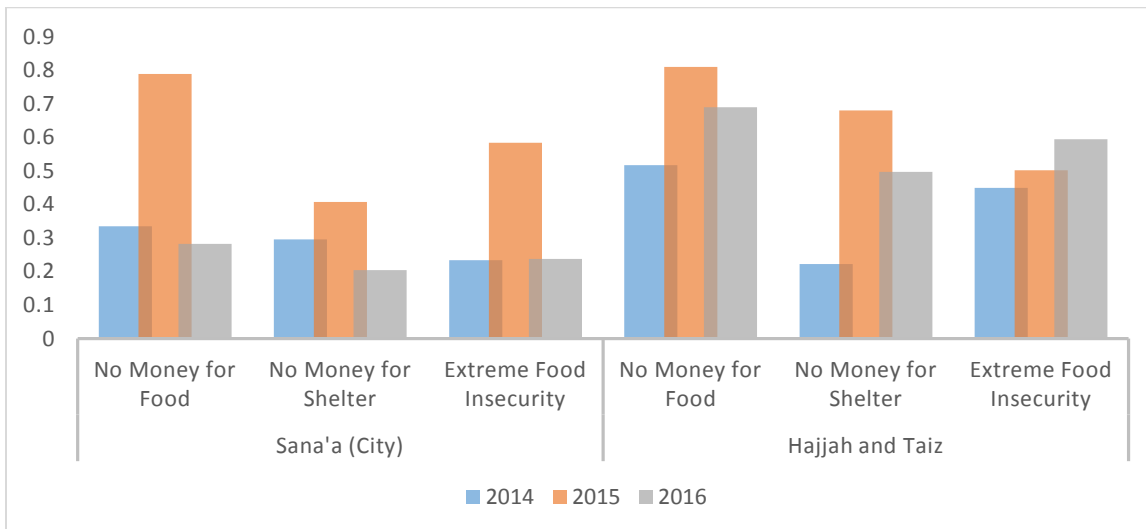
⁹ These measures are designed to capture the share of Gallup respondents who had returned to their place of origin out of all individuals in a governorate who responded affirmatively to the displacement question in the GWP. Thus, the share is calculated as the number of households that had returned to their place of origin in the governorate, divided by the sum of the number of households that had returned and the number of households that are currently displaced living in that governorate.



Source: Gallup World Poll; the averages include only 2016 averages. The governorates characterized as those with a high share of returnees were Aden, Shabwah, Lahj, and Al Dhale.

Second, it is possible that IDP’s in particular cities might be receiving more support or having greater opportunities than those in other regions. In particular, figure 6 demonstrates that IDP’s in the city of Sana’a in November 2016 are reporting levels of welfare that are comparable to levels reported in 2014 prior to the escalation of conflict. This is in contrast to the averages reported at the governorate level, which show welfare in the 2016 being comparable to that reported in 2015 and significantly higher than reported in 2014. Figure 6 highlights this pattern in the governorates of Hajjah and Taiz, the two governorates with the highest number of IDP’s (TFPM 2017).

Figure 6: IDP Welfare in Sana’a (City), Hajjah, and Taiz



Source: Gallup World Poll; the 2014 average includes all surveyed households, whereas the 2015 and 2016 include averages of individuals who responded affirmatively to the displacement question. The 2015 survey was conducted in November, and the 2016 survey was conducted in October.

Lastly, not all indices declined following the escalation in conflict. In particular, the Civic Engagement Index and Social Life Index actually increased amongst IDP's in 2015 and 2016 relative to 2014. These indices ask whether individuals volunteered, donated money, or donated time or money to those in need. The increase in charity is further corroborated by the approximately ten percent of the population that reported completely relying on the support of others for basic necessities (estimated from the GWP), and the reported 40 percent of IDP's living with relatives and 10 percent of IDP's living with non-relatives (TFPM 2017). Thus, even as the conflict continued to adversely affect welfare, informal networks might have actually strengthened support of the worst-off and potentially helped to avert some of the most adverse consequences of the conflict.

Income Poverty and the Profile of the Poor in 2014

Although all poverty projections suggest a dramatic spike in 2016, it is important to note that the actual poverty rate in 2014 was already high. The poverty estimates for 2014 are summarized in Table 5 below. The national poverty rate was estimated to be 48.6 percent. Rural poverty rate was estimated at 59 percent, significantly higher than estimated urban poverty rate of 24 percent. The poverty gap index is often understood as the cost of eliminating poverty (relative to the poverty line), as it depicts the average amount of resources as a percentage of the poverty line that would need to be transferred to bring the incomes of all the poor in the population up to the poverty line, giving all individuals below the poverty line equal weight. The squared poverty gap index puts a higher weight on observations that fall well below the poverty line. The poverty gap and squared poverty gap were estimated as 15.5 and 6.7 respectively. Rural areas showed higher poverty gap and squared poverty gap compared to urban areas.

Table 5: Headcount Poverty Rate in Yemen, 2014

	National	Urban	Rural
Headcount poverty rate (P0)	48.6	23.9	59.2
Poverty gap (x100)	15.5	6.6	19.3
Squared poverty gap (x 100)	6.7	2.6	8.5

Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

The poverty estimates for 2005/6 and 2014 are summarized in the table below. The national poverty rate in 2014 was estimated to be 48.6 percent. Rural poverty rate was estimated at 59 percent, significantly higher than estimated urban poverty rate of 24 percent for urban areas. Given the best approximation, national poverty rate in 2005/6 was 35.4 percent and urban and rural rates were 17.5 percent and 42 percent, respectively. While questions remain regarding comparability of consumption data due to changes in the survey instruments, it is highly unlikely that changes in the questionnaire could have single-handedly altered the national poverty rate by as much as 13 percentage points.

In addition to the overall headcount, the depth and severity of poverty also increased over time. The depth of poverty, which is conventionally measured by the poverty gap index, increased from 9.5 to 15.5 during this period. The severity, as measured by squared poverty gap, increased from 3.6 to 6.7 between 2005/6 and 2014, suggesting an increase in poverty severity.

Headcount poverty rate in Yemen

	2005/6			2014		
	National	Urban	Rural	National	Urban	Rural
Headcount poverty rate (P0)	35.4	17.5	42.1	48.6	23.9	59.2
Poverty gap (x100)	9.5	3.8	11.7	15.5	6.6	19.3
Squared poverty gap (x 100)	3.6	1.3	4.5	6.7	2.6	8.5

Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

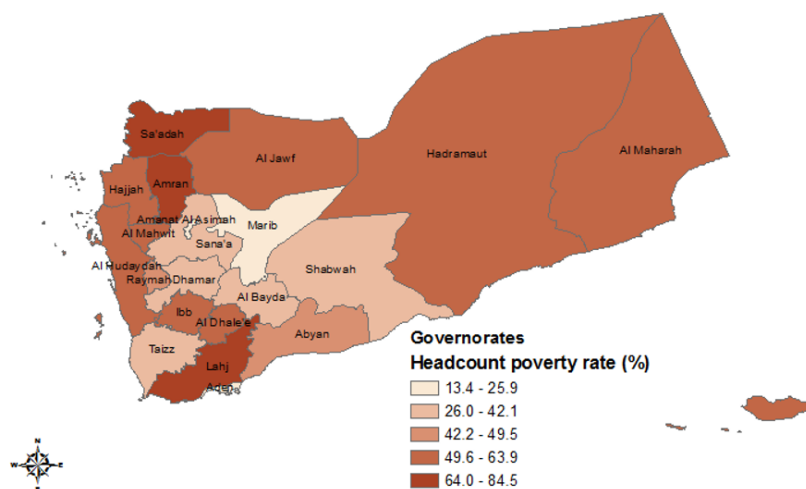
These poverty numbers suggests that the number of poor increased from 7.0 million to 12.6 million, with an overall increase of 5.5 million between the two survey rounds. Regional poverty estimates translates the number of poor in urban areas as an increase from 960,000 to 1.9 million, and a more dramatic increase from 6.1 million to 10.7 million in rural areas.

Box 2: Comparison between 2005/6 and 2014 Poverty

The Yemen Household Budget Survey (HBS) 2014 provides an useful snapshot of income and non-income dimensions of poverty in 2014. Even though Yemen has undergone dramatic changes since the year of data collection, this section presents a poverty profiles for Yemen based on the 2014 round of the HBS. There is a sizeable variation in headcount poverty rates between governorates (Figure 7 and Table 6). In 2014, Sadaah and Amran were the poorest governorates, with headcount poverty rates of 84.5 percent and 75.9 percent, respectively. The incidence of poverty was lowest in Sana'a City, at 13.4 percent of the population. Aden, the second-largest city in the country, had a headcount poverty rate of 22.2 percent. Most of the population of the Republic of Yemen lives in the western part of the country, so a high level of poverty in these governorates contributes significantly to national poverty estimates.

In fact, Al-Hudeida, Ibb, Taiz and Hajjah were the governorates with the largest poor populations in the country.

Figure 7: Poverty rates at the level of Yemeni governorates, 2014



Source: World Bank staff calculations based on HBS 2014.

Table 6: Governorate-level poverty rates and number of individuals below poverty line, 2014

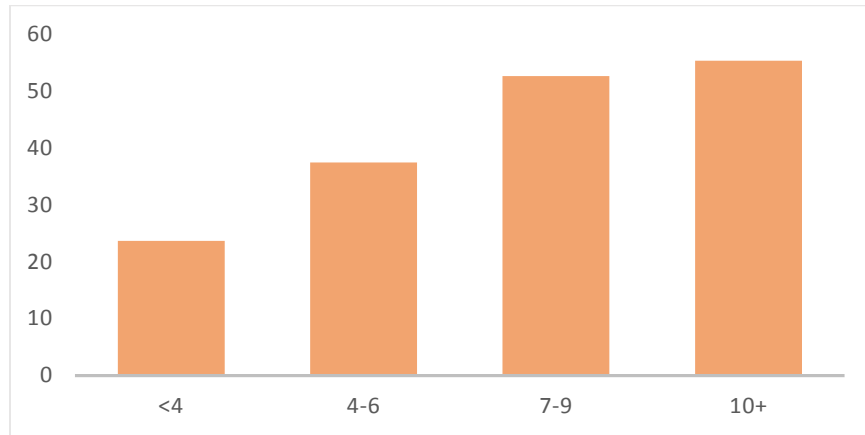
	Poverty rate (% of population)	Number of poor
Ibb	56.6	1,503,818
Abyan	48.6	259,572
Sanaa City	13.4	376,818
Al-Baida	39.2	279,228
Taiz	41.4	1,236,077
Al-Jawf	55.4	305,807
Hajja	63.9	1,251,550
Al-Hodeida	58.1	1,685,621
Hadramout	60.6	828,631
Dhamar	31.1	547,049
Shabwah	42.1	248,665
Saadah	84.5	824,799
Sanaa Region	42.1	460,756
Aden	22.2	185,636
Laheg	69.1	634,004
Mareb	25.9	79,154
Al-Mahweet	60.7	390,135
Al-Maharh	57.8	76,832
Amran	75.9	768,438
Al-Dhale	59.8	391,412

Remah	49.5	257,867
Socatra	50.1	22,017

Source: World Bank staff calculations based on HBS 2014.

Poverty was higher among larger households. Grouping households into four mutually exclusive categories with fewer than four members, four to six members, seven to nine members, and more than 10 members, it appears that there is a clear positive relationship between household size and poverty incidence, with larger households more likely to be poor (Figure 8). The incidence of poverty for households who had less than four members was 23.7. This increased to 55.4 if the household had more than ten or more members.

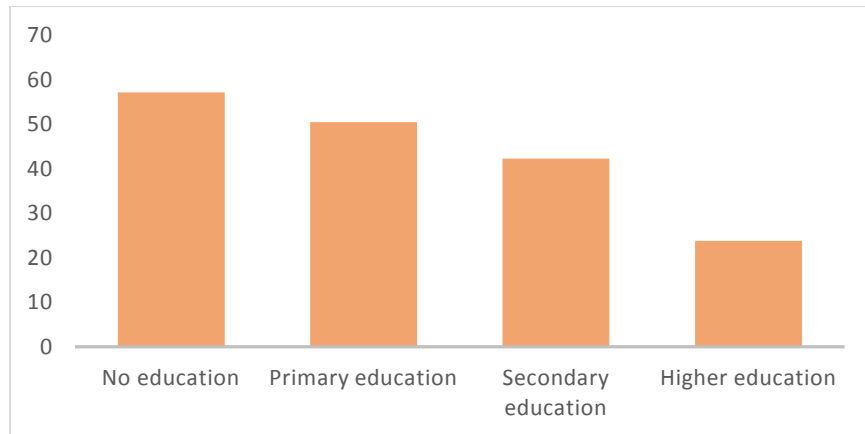
Figure 8: Household size and poverty, 2014



Source: World Bank staff calculations based on HBS 2014.

Households headed by better-educated household heads were less likely to be in poverty. There was a monotonic relationship between household-head education levels and poverty rates. Households with heads with no education had a 57.2 percent poverty rate in 2014 (Figure 9). In comparison, households with heads with higher education had a significantly lower poverty rate of 23.8 percent. These results broadly suggested a positive association between the level of education and households not being in poverty.

Figure 9: Poverty by education level of the household head, 2014



Source: World Bank staff calculations based on HBS 2014.

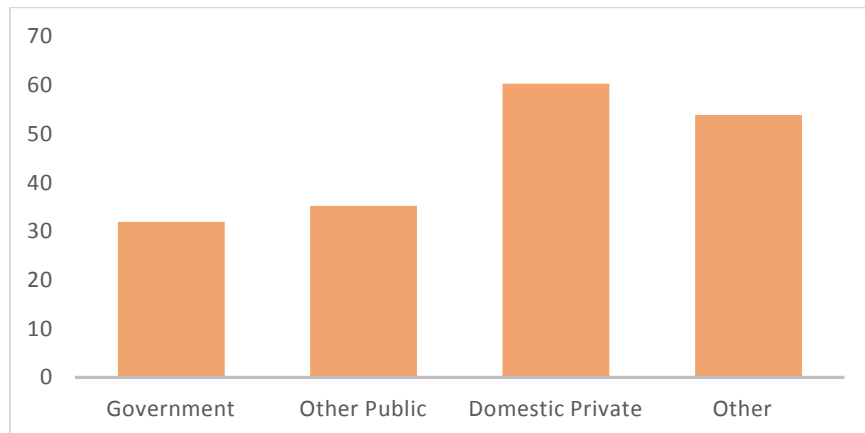
Households headed by individuals working in wage agriculture had the highest likelihood of being in poverty, followed by those in agricultural self-employment/worker and wage employment in non-agricultural sectors (Figure 10). Households self-employed/worker in non-agricultural sectors have the lowest probability of being in poverty. Among households headed by individuals holding wage paying occupations, the highest poverty rate was among those engaged in the domestic private sector and the lowest was among those in government and other public sector employment (Figure 11).

Figure 10: Poverty rates by household head occupation, 2014



Source: World Bank staff calculations based on HBS 2014

Figure 11: Poverty rates by sector of employment (among those in wage occupations), 2014



Source: World Bank staff calculations based on HBS 2014

Inequality

The Gini index was 36.7 in 2014. The Gini index is one of the most commonly used measures of inequality. Its value ranges from a 0 to 100 with the value of 100 corresponding to perfect inequality and value of 0 corresponding to perfect equality. However, one shortcoming of the Gini is that it does not satisfy the additive decomposability property, which is often useful in practical applications to show the

sources of inequality. There is an entire class of generalized entropy measures of inequality that satisfies these decomposability properties. Theil L, which is also the GE (0) measure or the mean log deviation, was 22.2. Likewise, the Theil T index, or GE (1), was 25.5 (Table 7).

Table 7: Inequality measures, 2014

Gini	36.7
Theil L – GE (0)	22.2
Theil T – GE (1)	25.5

Source: World Bank staff calculations based on HBS 2014.

Inequality in urban areas is higher than inequality in rural areas, suggesting more unequal consumption distribution in urban areas. The Gini measurement was 37 for urban and 30.6 for rural areas. Similarly, Inequality within urban and rural areas explained a large share of the overall inequality (Table 8).

Table 8: Inequality measures 2014

	Urban	Rural	Within	Between
Gini	37	30.6
Theil L- GE (0)	23	15.4	17.7	4.5
Theil T- GE (1)	25.6	16.8	20.7	4.7

Source: World Bank staff calculations based on HBS 2014.

Non-Income Dimensions of Poverty

How did Yemen fare between the two survey years, 2005/6 and 2014, on non-monetary measures of well-being? There are several advantages to measuring, monitoring and analyzing poverty that is based on a money-metric measures of utility. But in settings in which not all goods and services that households require to have a decent life are available for purchase in the market, monetary measures of poverty often provide only a partial picture of welfare. In particular, this section provides comparability of some non-income dimensions between two surveys.

While this section does not develop a full blown multi-dimensional poverty index for Yemen, it presents some statistics on the access of Yemeni people to some basic services that are unambiguously linked with human welfare. The spirit is to begin an exploration that will hopefully provide a well-rounded picture of poverty. This note on non-income dimensions to compare the changes over-time in Yemen. Focusing on the regional and national trends allows to make the inferences on changes in living standards in Yemen without alluding to income poverty.

Water and sanitation

Yemen is an arid to semi-arid country with very high water scarcity. Agriculture uses 90 percent of the water resources, a significant portion of which is being used for the cultivation of *qat*. According to the recently conducted WASH-Poverty Diagnostics (March, 2017), this scarcity is exacerbated by the lack of

governance and any regulatory mechanism to support an enforceable system to allocate water resources efficiently. Making matters worse, the availability of renewable water is declining: annual per-capita renewable water resources declined from 221 m³ in 1992 to only 80 m³ in 2014, and was a scant 1.3 percent of the global per capita average (5,925 m³) and just 14 percent of the MENA region per-capita average (554 m³) (WDI, 2016). This makes the issue of access to improved drinking water a critical marker of well-being for the Yemeni people.

Despite deterioration of overall water-resource availability, there was a slight increase in access to improved water from 52 percent in 2005/6 to 57 percent in 2014 (Table 9). This aggregate increase hides the decline in access to improved water for households living in urban areas. Improved sources of water include piped water into a dwelling; to a yard or plot; from a public tap or standpipe, tube well, or bore well, protected dug well or a protected spring; or rainwater. Unimproved sources of drinking water include an unprotected spring and dug well, a cart with small drum or tank, tanker water and surface water. Bottled water is defined as an improved source.

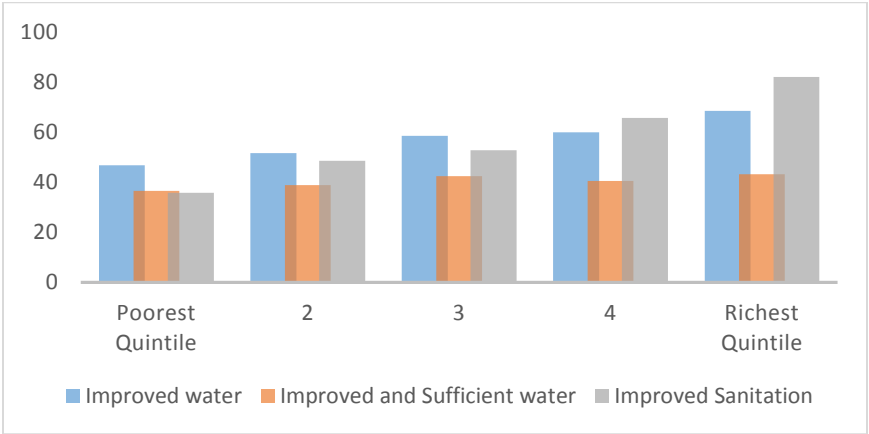
Table 9: Household access to improved water, sufficient and improved water, and improved sanitation

	2005/6			2014		
	National	Urban	Rural	National	Urban	Rural
Improved water	51.9	80.0	41.4	57.0	76.9	48.4
Improved water and sufficient	37.6	59.2	29.5	40.2	47.0	37.3
Improved sanitation	42.2	85.6	25.8	56.9	94.3	40.7

Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

Despite the improvement, there was a slight decline in perceived sufficiency of water among the non-poor who benefitted from improved water. In general, wealthier households appeared to have a higher likelihood of not being satisfied with the adequacy of their water, despite being the group with the highest likelihood of having access to improved sources (Figure 12).

Figure 12: Household access to improved water, sufficient and improved water, and improved sanitation, by quintile, 2014



Source: World Bank staff calculations based on HBS 2014.

Access to improved sanitation also improved in Yemen during this period, with larger proportional improvements for rural than urban households (Table 9). Rural areas had higher levels of poverty and lagged in improved access to sanitation as well. A household is deemed to have improved sanitation if it has all of the following: either a public network or covered pit for sewage disposal, a flush or non-flush toilet, and the toilet is non-shared. If a household has one of these it is defined as having improved sanitation. The average improvements still do not mask the fact that rural households were less likely to have access to improved sanitation than urban households.

Electricity

Access to electricity increased from 52 to 78 percent between 2005/6 and 2014, with much of the improvement coming from what appears to be a significant expansion of rural electrification (Table 10). Electricity coverage in rural areas increased from 36 to 68 percent during this period. It is not possible to infer from the data whether the improvement was due to the expansion of access to the national grid, which was a major infrastructure challenge for the country, or due to other small and medium sources including solar and wind power.

Table 10: Access to electricity, 2005/6 and 2014

	2005/6	2014
Urban	95.3	99.0
Rural	35.5	68.2
Poorest quintile	24.6	49.9
2	41.9	72.9
3	51.2	80.8
4	62.4	88.1
Richest quintile	79.3	95.6
Total	51.9	77.5

Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

Education

School enrollment rates increased between 2005/6 and 2014, and fewer children were out of school (Table 11). Gross enrollment rates increased from 73.4 to 88.3 percent, while net enrollment rates increased even faster, from 66.4 to 84.5 percent. The proportion of children out of school more than halved, from 33.6 to 15.5 percent. This progress was particularly pronounced at the lower end of the distribution. Gender gaps in all three of these indicators were reduced significantly, although these were not eliminated entirely.

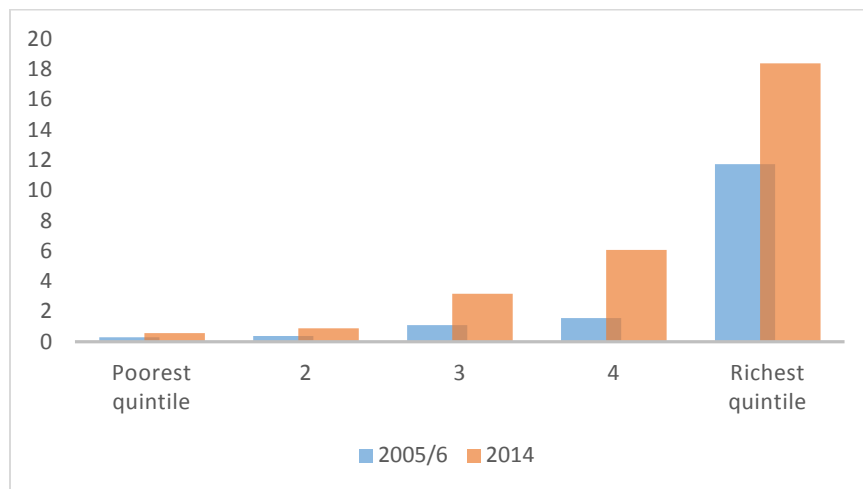
Table 11: Gross and net enrollment in school for children, percent

	Gross enrollment		Net enrollment		Not in school	
	2005/6	2014	2005/6	2014	2005/6	2014
Urban	87.2	91.2	81.5	87	18.5	13
Rural	68.1	87	61.6	83.5	38.4	16.5
Male	82	90.1	75.9	86.2	24.1	13.8
Female	62.6	86.1	56	82.4	44	17.6
Poorest quintile	59.7	87.8	53.3	85.3	46.7	14.7
2	71.2	86.6	65.6	83.2	34.4	16.8
3	74.2	86.9	67.5	82.9	32.5	17.1
4	77.8	89.3	71.3	85.1	28.7	14.9
Richest quintile	87	91	80.7	86.3	19.3	13.7
Total	73.4	88.3	66.4	84.5	33.6	15.5

Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

Education quality, especially in public schools, is often a key issue in many developing countries. Private alternatives have emerged in many settings and are available to parents able to afford these options. In Yemen too, enrollment in private schools increased from 4.1 percent in 2005/6 to 7.4 percent in 2014. And, as one may speculate, the use of private alternatives for children’s education was more prevalent among the better off parents (Figure 13). Data from 2014 show that around 18 percent of children from the richest quintile went to private schools, while the number for those in the poorest quintile was less than 1 percent. The steep jump from 6.1 percent to around 18 percent between the 4th to the 5th quintile suggests that private schools cater to the richest consumption expenditure quintile group in Yemen. Nonetheless, the fact that even in the richest segment fewer than one-fifth of children used private providers suggests that public schools remain still extremely important for the country.

Figure 13: Use of private schools for children's education



Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

Health

Households with higher consumption self-reported sickness or accidents at a higher level than poorer households (Table 12). Around 24 percent of the household in the top 60 percent reported being sick or having an accident in 2014. This was in contrast to the bottom 40 percent among whom only 20 percent reported being sick or having an accident. It is often difficult to infer anything from this statistic on the health shocks experienced by households across the income ladder. For the same kind of health shock, health seeking behavior increases with increasing living standards, so it is not surprising that self-reports of being in need of medical attention is higher among the wealthy.

But when they needed care, the wealthy were also more likely to receive health care, with those in the top 60 percent having a 10-percentage-point higher likelihood of receiving care when they needed it than the bottom 40 percent. Poorer households were more likely to use public facilities for their health care, although the difference was only slight and the overall level of public-facility use declined for the entire population. There was a higher likelihood of utilizing a facility located in the neighborhood for the richer households. One possible reason for this is that richer people tend to live in urban areas, as noted earlier.

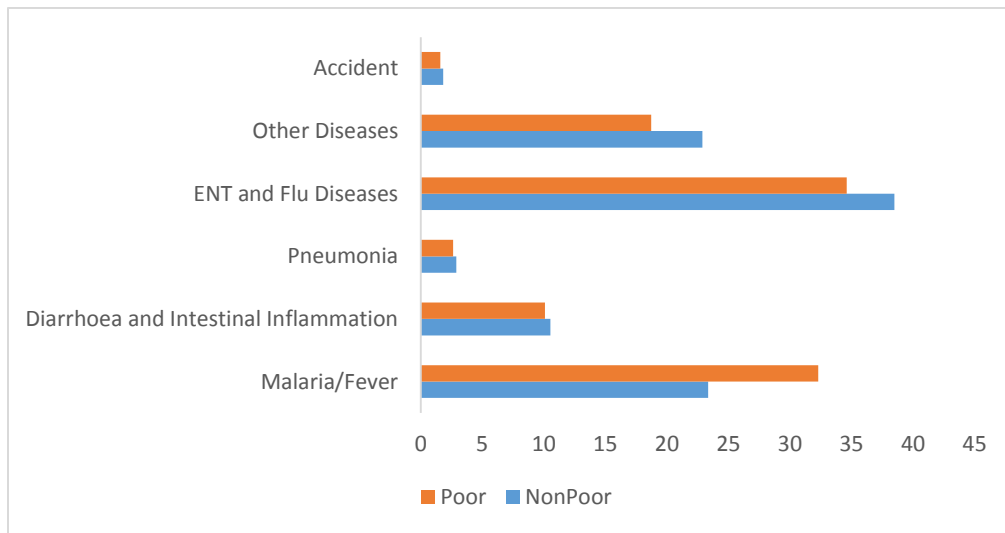
Table 12: Illness and health care, 2005/6 and 2014

	2005/6			2014		
	Top 60%	Bottom 40%	Total	Top 60%	Bottom 40%	Total
Had sickness or accident	10.1	9.4	9.9	23.7	20.1	22.3
Received medical care	76.4	66.9	72.8	79.9	69.1	76
Went to a public facility	30.6	33.2	31.5	21.7	25.9	23.1
Located in the neighborhood	29.9	24.9	28.2	40.6	26.5	36.1

Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

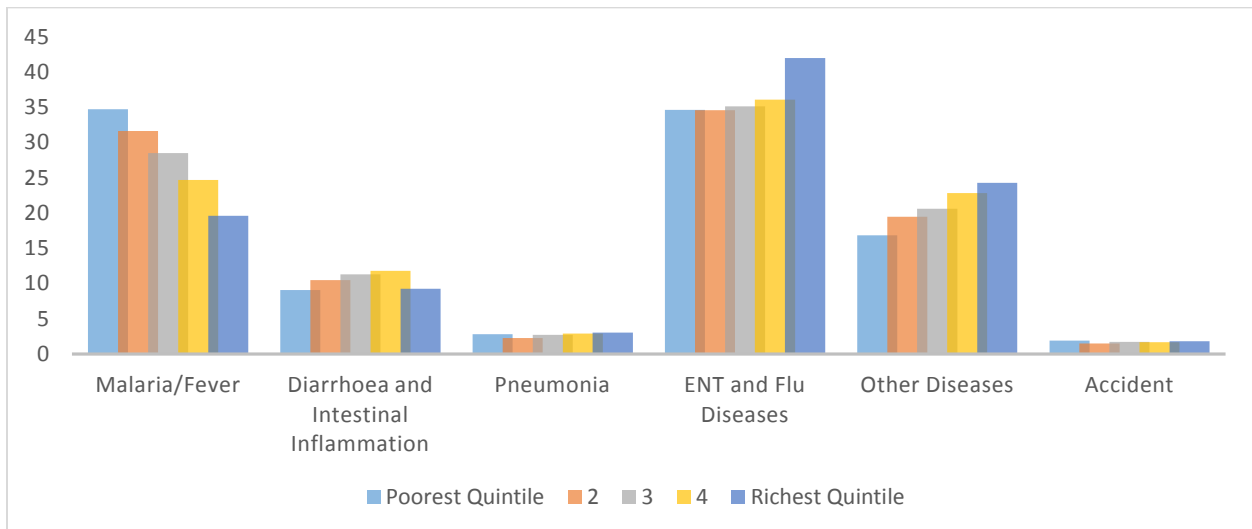
There were some interesting differences in the burden of diseases between rich and poor in 2014 (Figure 14). The rich and the poor had almost equal probabilities of having an accident or catching pneumonia, or even to some extent being afflicted with diarrhea or other intestinal diseases. However, the non-poor were more likely to report ENT and other flu-related diseases. Looking more deeply into incidence by quintile, it becomes apparent that the likelihood of reporting malaria/fever had a clear and a monotonic wealth gradient, whereas the ENT and flu diseases appeared fairly even for the bottom four quintiles and spiked up considerably in the top 20 percent (Figure 15). While there were no further data here to adequately explain this curious pattern, two conjectures can be made. First, perhaps there were physical environmental factors associated with malarial incidence that were correlated with place of residence, which may in turn be correlated with income. In other words, poorer households may live in areas with higher susceptibility to certain diseases. Second, for ENT and flu-type issues, the wealthiest may be more likely to seek medical attention than any other groups for the same kind of symptoms.

Figure 14: Types of disease and accident, 2014



Source: World Bank staff calculations based on HBS 2014.

Figure 15: Types of disease and accident, 2014



Source: World Bank staff calculations based on HBS 2014.

Vaccinations are linked with reduction in infectious diseases worldwide and the WHO considers a child to be fully immunized only after the child receives one BCG shot, at least three polio shots, three DPTs and one shot for measles. It is also recommended that children receive these vaccines within one year of birth. Data from the most recent round of the HBS (2014) show that Yemen was very far from universalizing full immunization of children in their second year: only two in five Yemeni children were found to be fully immunized, with important variations in vaccination rates by specific vaccines (Table 13). While the results of the 2014 HBS and the Demographic and Health Survey, which was conducted in

2013, are very similar, the immunization results in the Multi Indicator Cluster Survey (MICS) and the earlier round of the HBS, both conducted broadly in 2005 and 2006, appear to diverge dramatically. In particular, the numbers from the earlier HBS stand in sharp contrast to reports of an improvement in overall immunization rates between 1997 and 2006 reported in the DHS 2013 report.¹⁰ Due to these methodological issues, this note refrains from commenting on any recent trends in Yemen and instead uses 2014 HBS to analyze the vaccination rates across different groups and regions (Table 14).

Table 13: Vaccination rates for children (12-23 months)

	BCG	DPT 3	Polio 3	Measles	Full vaccination	No vaccination
YMICS 2006	69.0	61.0	63.0	65.0	38.0	12.0
HBS 2005/6	74.3	67.6	78.9	75.7	59.8	7.6
YDHS 2013	67.6	59.6	58.7	63.3	42.6	16
HBS 2014	74.1	48.8	67.8	71.8	41.5	8.9

Note: Data for HBS 2005/06 and HBS 2014 were calculated by World Bank staff based on HBS 2005/6 and HBS 2014. Data for YDHS 2013 and YMICS 2006 are taken from the Yemen DHS 2013 report.

Poorer children were less likely to be vaccinated. In 2014, only 36 percent of children living in poor households were fully vaccinated, in contrast to 48 percent for the children living in non-poor households. There was also a significant difference between children living in urban and rural areas, with children in urban areas having a higher rate of full immunization. The gap in full immunization was more than 20 percentage points. There was no major difference in children receiving no vaccinations at all by urban or rural region.

Table 14: Vaccination rates for children (12-23 Months), 2014

	Full vaccination	No vaccination
Non-poor	47.9	7.5
Poor	35.8	10.1
Urban	57.7	7.4
Rural	35.4	9.4
Poorest quintile	35.9	13
2	37.8	7.8
3	33.9	7.4
4	48.3	9.7
Richest quintile	55.5	6.5
Total	41.5	8.9

Source: World Bank staff calculations based on HBS 2014.

¹⁰ <http://dhsprogram.com/pubs/pdf/FR296/FR296.pdf>

Migration and Remittances

Remittances have typically been an important source of income for many Yemeni households, particularly for those in rural areas (van de Walle, 2002). Table 15 examines migration and remittances over the previous 12 months by sector and gender of the head for 2014. Nationally, 8 percent of Yemeni households in 2014 had at least one household member who migrated abroad, with these households reporting on average 1.3 members who migrated abroad. During the same period, 4 percent had the same average number of returnees. Both rural (10 percent), and FHHs (19 percent) were more likely to have a family member who had migrated outside Yemen. Across all types of households, the number of family members within a household who had migrated abroad was larger on average than the number of persons who had returned, suggesting a net outflow of migrants. Rural and FHHs were more likely to receive remittances both from within and outside Yemen and were less likely to send them relative to urban and MHHs, respectively. For FHHs, remittances made up a considerable share of their total consumption—remittances received from outside Yemen represented 46 percent of total household expenditures, with the vast majority of remittances (93 percent) coming from a spouse or children. Another 24 percent of total expenditures for FHHs was derived from transfers within Yemen, with 66 percent of these transfers coming from a spouse or children. For rural households, remittances from abroad and internally accounted for 34 percent and 13 percent of total expenditures, respectively. Remittances from relatives abroad were by far the largest source of private transfers.

Table 15: Descriptive statistics for migration and remittances by sector and gender of head, 2014

	Sector		Gender of household head		National
	Rural	Urban	Male	Female	
<i>Migration</i>					
Someone migrated outside Yemen	0.095	0.06	0.075	0.193	0.084
Number of persons migrated	1.231	1.536	1.316	1.206	1.296
Someone returned from outside Yemen	0.047	0.017	0.039	0.019	0.038
Number of persons returned	1.205	1.434	1.246	1.022	1.237
<i>Remittances within Yemen</i>					
Receive remittances	0.119	0.097	0.105	0.199	0.112
Share of remittances received of total expenditure	0.127	0.156	0.117	0.243	0.134
Share of remittances received from spouse/children	0.637	0.286	0.527	0.662	0.546
Send remittances	0.038	0.078	0.052	0.026	0.05
<i>Remittances outside Yemen</i>					
Receive remittances	0.188	0.148	0.155	0.423	0.176
Share of remittances received of total expenditure	0.337	0.249	0.28	0.458	0.315
Share of remittances received from spouse/children	0.808	0.617	0.718	0.932	0.759
Send remittances	0.006	0.01	0.007	0.01	0.007

Note: World Bank staff calculations using HBS 2014. All statistics are population weighted. Receive remittances indicates that the household received a remittance. Send remittances indicates that the household sent a remittance. Remittance values are spatially deflated and in 2014 per capita riyals. Share received/sent from spouse/children and from others sum to 1. Migration and remittances were for the previous 12 months.

Table 16 begins by considering how the incidence and importance of remittances vary across gross and net expenditure population deciles.¹¹ The share of population living in households receiving at least some private transfer amounts varied between 20 and 36 percent across deciles, with an average of 27 percent receiving remittances either from within or outside Yemen overall. The table presents incidence under two assumptions about the counterfactual pre-transfer situation, namely fully excluding transfers from the ranking variable (net expenditure deciles), or fully including transfer incomes (gross) when assigning households to pre-intervention deciles. Concentrating on deciles defined on per-capita expenditures net of transfers in the last three columns of Table 16, the results suggest a somewhat more pro-poor incidence of transfers, with the poorest decile exhibiting the highest population share benefitting from remittances. But, it is also true that the shares do not vary much across deciles. Among recipients, these private transfers made up a significant proportion of household consumption—equaling almost 70 percent for the lowest decile and tapering off monotonically. A somewhat less progressive but still pro-poor pattern among recipients is evident when ranking by gross expenditure deciles. Although among recipients 27 percent of expenditures were attributable to remittances on average, this was reduced to only 3 percent when considering Yemen’s total population.

Table 26: Remittances received as a share of household expenditure, 2014

Decile	Pop. share receiving remittances	Gross deciles		Net deciles		
		Remittances as a share of expenditures		Remittances as a share of expenditures		
		All	Recipients	Pop. share receiving remittances	All	Recipients
1	0.208	0.043	0.486	0.363	0.18	0.67
2	0.262	0.065	0.5	0.255	0.026	0.21
3	0.254	0.034	0.288	0.227	0.02	0.201
4	0.282	0.031	0.302	0.295	0.018	0.17
5	0.295	0.028	0.24	0.27	0.019	0.177
6	0.31	0.026	0.221	0.281	0.01	0.123
7	0.306	0.026	0.205	0.276	0.008	0.089
8	0.304	0.021	0.164	0.283	0.009	0.099
9	0.262	0.013	0.144	0.25	0.006	0.08
10	0.251	0.014	0.146	0.232	0.005	0.068
Total	0.273	0.03	0.269	0.273	0.03	0.269

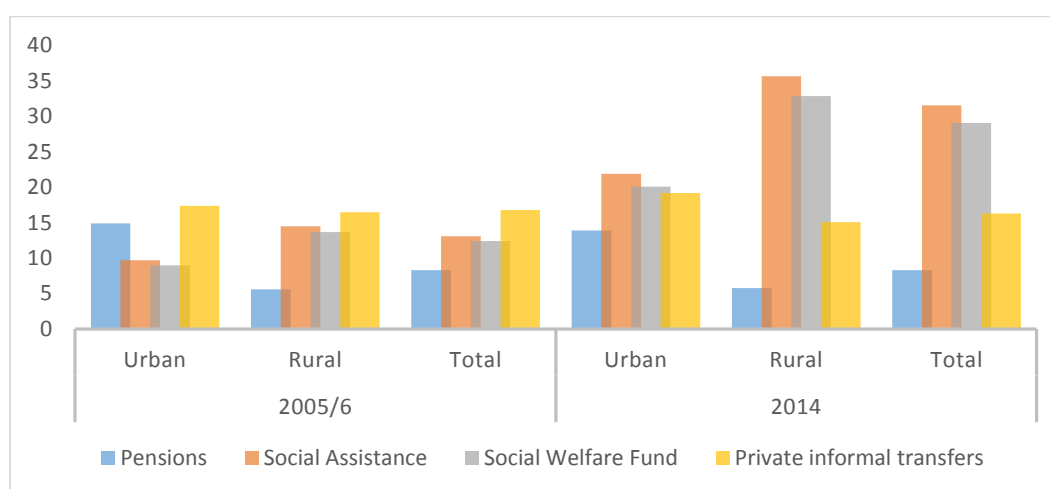
Note: World Bank staff calculations using HBS 2014. All statistics are population weighted. Remittances include those from both within Yemen and outside Yemen. All is all households; Recipients are only the households who received remittances. Expenditure is per capita and deflated spatially. Net expenditure is calculated as total household expenditure minus remittance amounts. Population deciles are created using gross and net expenditures, respectively.

¹¹ Population deciles are calculated by ranking the population into national deciles by household per capita expenditures. Deciles are thus comparable across rural, urban or national populations.

Transfers

Turning to public transfers, as well as informal private ‘charity’ transfers, figure 16 provides the share of population receiving transfers for the two survey in years 2014 and 2005/6, respectively. Statistics are listed for the rural, urban and national populations. Of the many programs, by far the most important public transfers in terms of participation is the SWF. At both dates, around 8 percent of Yemen’s population lived in a household that received a government pension. In 2005/6, this reflected 15 percent and 6 percent of the urban and rural populations, respectively, and in 2014, 14 percent and 6 percent. While there are many social assistance schemes in Yemen, with the exception of the SWF their coverage and cash benefits are low. In 2014, 29 percent of the population lived in households that benefitted from the SWF. Overall, coverage more than doubled between 2005/6 and 2014, from 12 to 29 percent of the national population. In 2005/6, the SWF covered just 14 percent and 9 percent of the rural and urban population, respectively, while in 2014 this had increased to 33 percent and 20 percent.

Figure 16: Share of population receiving public transfers



Source: World Bank staff calculations based on HBS 2005/6 and HBS 2014.

Food Security

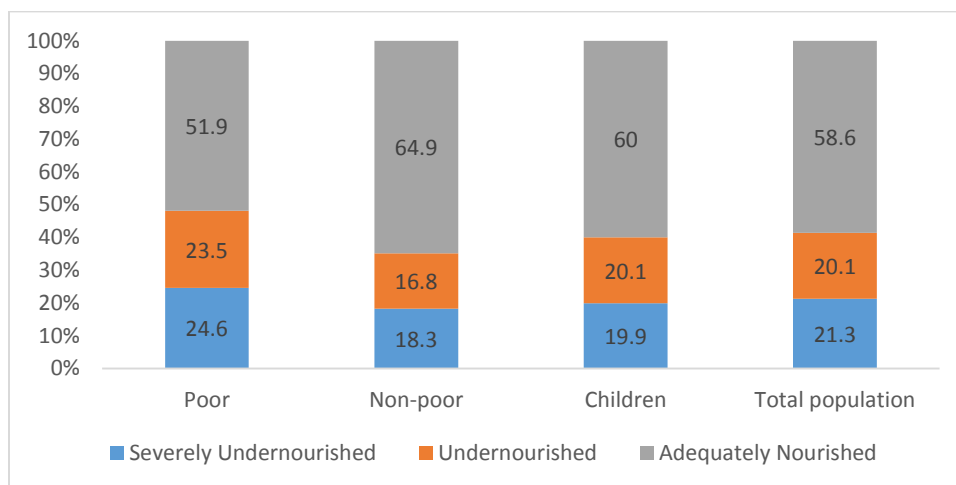
A large share of individuals in Yemen did not have adequate access to food in 2014. About 10.8 million Yemenis did not meet their estimated minimum daily energy requirement (MDER), which translates into about 41 percent of the population.^{12,13} Furthermore, about 21 percent of the population had a severe

¹² Average calories and nutrients contained per gram of each food item on the menu list of the HBS was obtained from the USDA National Nutrient Database for Standard Reference (accessed March 2017): <https://www.ars.usda.gov/northeast-area/beltsville-md/beltsville-human-nutrition-research-center/nutrient-data-laboratory/docs/usda-national-nutrient-database-for-standard-reference/>.

¹³ MDER's were estimated using FAO (2001), which are based on age, gender, activity level, and BMI. Although BMI's were not available in the HBS surveys, it is assumed that all individuals are moderately active and have BMI's roughly equal to the same reference weight and height for each age and gender group used by the Institute of

energy shortfall of over 25 percent. This high prevalence of under-nourishment in the overall population was qualitatively identical to the prevalence of undernourishment among all children and among children under four years of age. The high prevalence of undernourishment and nutrient deficiencies was a problem for both poor and non-poor individuals. (Figure 17)

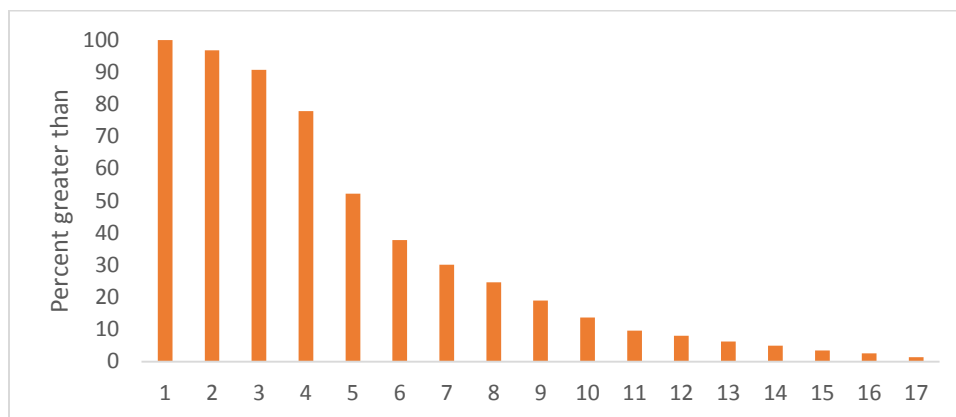
Figure 37: Under-nourishment in 2014



Source: World Bank staff calculations based on HBS 2014

In addition to the high prevalence of undernourishment, nutrient deficiency was also widespread. The median household did not meet Estimated Average Requirements (EARs) for five out of 17 nutrients for which the Institute of Medicine of the National Academies reports EARs by age and gender, and nearly 19 percent of the population did not meet EAR's for more than half of all 17 available nutrients (Figure 18).¹⁴ These patterns help to corroborate the high poverty rate in 2014.

Figure 18: Number of nutrient deficiencies



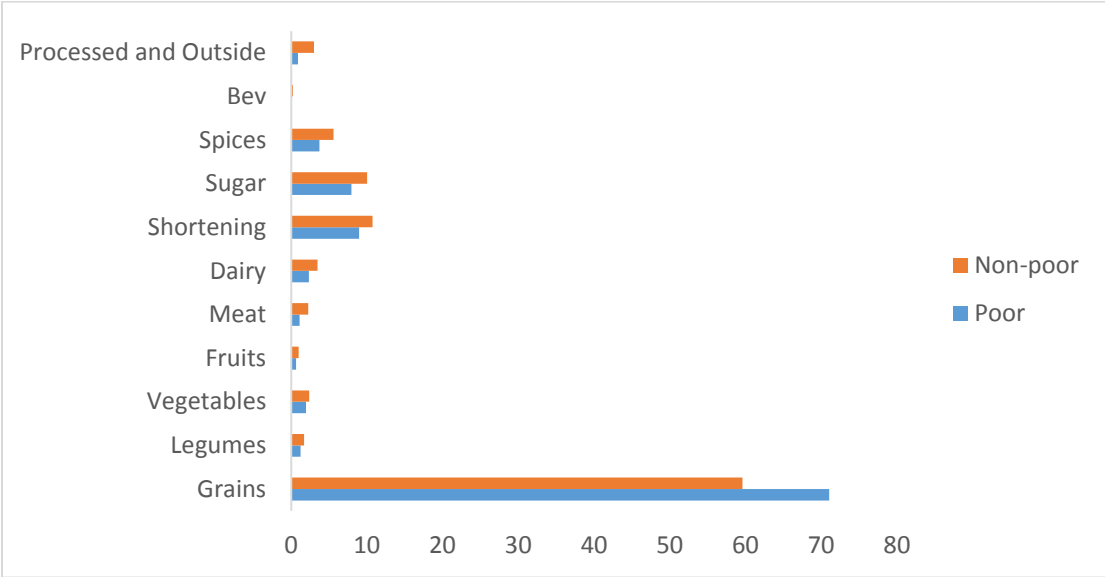
Source: World Bank staff calculations based on HBS 2014

Medicine of the National Academies (2006) in the estimation of Estimated Average Requirements (EAR's) for nutrient consumption.

¹⁴ EARs of nutrient consumption were estimated using Institute of Medicine of the National Academies (2006).

The composition of consumption further suggests that even non-poor households struggled with poor access to high quality foods. Figure 19 demonstrates that total calorie consumption for both the poor and non-poor was mostly composed of grains and food categories that are less dense with nutrients than fruits, vegetables, meat and dairy. Calories from grains accounted for about 71 percent of total consumption among poor households, and about 60 percent among non-poor households. Furthermore, consumption from the least nutrient dense food categories—grains, shortening, and sugar—accounted for about 88 percent of consumption among poor households, and about 80 percent among non-poor households. These consumption patterns corroborate the high prevalence of micronutrient deficiencies and help further corroborate the high poverty rate in 2014.

Figure 19: Share of food consumption



Source: World Bank staff calculations based on HBS 2014.

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