Chapter 1

INTRODUCTION

Good nutrition is widely regarded as one of the key factors for advancing human well-being and economic prosperity.[1] Recent research clearly shows that malnutrition—and especially undernutrition—is not only a consequence of poverty, food insecurity, and disease but also one of the reasons for the lack of progress in economic development throughout the developing world (IFPRI 2014).[2] Undernutrition slows economic growth and deepens poverty through productivity losses from poor physical performance and cognitive capacity (World Bank 2006). Productivity losses to individuals are estimated at more than 10 percent of lifetime earnings, and productivity losses to the gross domestic product (GDP) in developing countries are at least 2–3 percent annually (Horton 1999; World Bank 2006). These economic costs vary considerably by country and may exceed 10 percent of GDP in countries with high prevalence rates of undernutrition and relatively high per capita workforce productivity (Horton and Ross 2003; IFPRI 2014).

Losses in household income potential and GDP are due to impaired cognitive abilities, which are especially relevant in more advanced economies

1 Malnutrition is a chronic condition caused by under- or overconsumption of any or several essential macro- or micronutrients or by adverse health conditions affecting nutrient absorption or storage in the human body. According to Mayer (1976), four forms of malnutrition can be differentiated: (1) protein-energy undernutrition (caused by dietary deficiencies in carbohydrates and/or proteins and frequently referred to as "hunger"), (2) micronutrient undernutrition (caused by dietary mineral and vitamin deficiencies, frequently referred to as "hidden hunger"), (3) overnutrition (mostly resulting from overconsumption of carbohydrates), and (4) secondary malnutrition (that is, under- or overnutrition primarily caused by illness or disease). This book looks at both ends of the malnutrition spectrum and therefore differentiates terminologically between under- and overnutrition.

2 "Poverty is pronounced deprivation in well-being. . . . It includes low incomes and the inability to acquire the basic goods and services necessary for survival with dignity" (World Bank 2012, adapted from Haughton and Khandker 2009).

"Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO 1996, par. 1). The "four pillars of food security are availability, access, utilization, and stability" and "the nutritional dimension is integral to the concept" (FAO 2009, fn. 1).

(Hoddinott et al. 2008; Selowsky and Taylor 1973). Chronically undernourished children tend to have lower intelligence quotient (IQ) scores, by 5 to 11 points, and worse school performance compared to their well-nourished peers (Caulfield et al. 2006; World Bank 2006). Undernutrition among young children and women of reproductive age is of particular concern from a societal perspective, because prevalence rates among them are highest; their nutritional status is most crucial for the prosperity of the next generation; and nutritional interventions are most effective during the window of opportunity in the life cycle, comprising the time of pregnancy and the first two years of life (Bryce et al. 2008; Engle et al. 2007; Victora et al. 2008). In addition to losses in GDP, both under- and overnutrition also increase healthcare costs (World Bank 2006), thus contributing an additional burden to often strained budgets and potentially drawing resources away from other urgently needed social or developmental expenditures.

While undernutrition is still the main nutritional problem in the developing world, overnutrition is rapidly on the rise in many countries. The global prevalence of obesity nearly doubled between 1980 and 2008, reaching 14 percent among women and 10 percent among men (Finucane et al. 2011; Stevens et al. 2012). Along with North America, two developing regions—the Middle East and North Africa (MENA) and Latin America and the Caribbean (LAC)—exhibit the highest prevalence of obesity, with rates among women of more than 30 percent (Finucane et al. 2011; Stevens et al. 2012).

Rising rates of overnutrition often go along with a growing prevalence of noncommunicable diseases (NCDs), which entails substantially increasing healthcare costs and productivity losses to the individual and the society (Finkelstein, Fiebelkorn, and Wang 2003; Finkelstein, Ruhm, and Kosa 2005; Popkin et al. 2006; Trogdon et al. 2008). For example, the costs attributable to overweight and obesity in China are expected to rise from about US$50 billion in 2000 (or 4 percent of gross national product [GNP]) to about US$112 billion in 2025 (or 9 percent of GNP) (Popkin et al. 2006). Deaths related to NCDs are projected to increase by 15 percent worldwide between 2010 and 2020, with the greatest increases expected to exceed 20 percent in MENA, Africa south of the Sahara, and Southeast Asia (WHO 2011).

The rapid rise of overnutrition, combined with the relatively slow decline of undernutrition, has led in recent years to a new nutritional challenge of growing public health concern in several developing countries. The coexistence of over- and undernutrition—often referred to as "the double burden of

malnutrition"—has been particularly prevalent in middle-income countries and especially those in the MENA and LAC regions.

A possible explanation for the rise of the double burden of malnutrition is a rapid "nutrition transition." This phenomenon describes the shift in dietary patterns and physical activity levels that emerges from economic growth and transformation in combination with technological advances (especially in communications and transportation) (Popkin 1993, 1994). Rapid shifts in dietary patterns and eating habits such as toward more processed foods and eating outside the home, in combination with a reduced physical workload from increasingly sedentary economic activities and a lack of physical exercise have increased overweight and obesity at a faster rate than undernutrition has been reduced (Prentice 2006; Schmidhuber and Shetty 2005; Shrimpton and Rokx 2012). In fact, several MENA countries, including Egypt—the most populous country in the region—have been going through a substantial nutrition transition since the mid-1970s, associated with rapid economic development (Galal 2002).

There is growing evidence that in addition to the nutrition transition, economic and social policies and programs may contribute to the rapid rise of overnutrition and the double burden of malnutrition in developing countries. For example, Asfaw (2006, 2007a, 2007b) finds that women's body mass indexes (BMIs) and the probability of female overweight and obesity in Egypt increase as prices of the foods that are subsidized under the national food subsidy system fall. And Leroy et al. (2013) show that cash and in-kind transfers lead to excess weight gain in a population of women in rural Mexico with a high prevalence of overweight. These case study findings are supported by evidence from studies in high-income countries, and particularly studies on the effects of the United States' Food Stamp Program on overweight and obesity (e.g., Chen, Yen, and Eastwood 2005; Meyerhoefer and Pylypchuk 2008; Ver Ploeg et al. 2007; Zagorsky and Smith 2009).

This book contributes to the literature on the effects of social policies and public programs on contemporary nutritional problems, using Egypt as a case study country. Specifically, our study serves two objectives: First, it provides a comprehensive overview of Egypt's two major nutritional challenges—which are exceptionally pronounced in Egypt compared to other developing countries—and their potential key drivers. These two nutritional challenges are (1) the double burden of malnutrition and (2) the phenomenon of high, decades-long economic growth that, contrary to expectations, was not accompanied by declining prevalence rates of chronic (child) undernutrition—a challenge referred to as the "growth-nutrition disconnect." Second, our study

econometrically investigates causal relationships between one of the potential key drivers—consumer food subsidies—and nutritional outcomes. We hypothesize that Egypt's large and long-standing food subsidy system has contributed to sustaining and even aggravating both nutritional challenges.

To serve the first objective, we document that the double burden of malnutrition and the growth-nutrition disconnect are indeed exceptionally pronounced in Egypt compared to other developing countries, describe the respective patterns of malnutrition among the Egyptian population, and elaborate on four—possibly interlinked—factors that often have been hypothesized to cause or to contribute to the high prevalence of malnutrition in Egypt. In addition to the global phenomenon of the nutrition transition, they include rising poverty resulting from a succession of economic crises, the food subsidy system, and insufficient nutrition-sensitive investments.

The analysis in the first part of the book draws on a combination of literature reviews and descriptive statistics that we derived from various cross-country databases, official data sources, and cross-sectional household surveys, including several rounds of the Demographics and Health Survey (DHS) (MOH, El-Zanaty and Associates, and Macro International 2008; MOHP, NPC, and ORC Macro 2000; MOHP et al. 2003; MOHP et al. 2005). In the second part, we turn to the second objective by focusing on the causal effects of the Egyptian food subsidies on nutrition and the double burden of malnutrition in particular. For the main empirical analysis, we use both a quasi-experimental design and unique cross-sectional household survey datasets—compiled from the 2010–2011 Egypt Household Income, Expenditure, and Consumption Survey (HIECS) (CAPMAS and WFP 2011)—to estimate the hypothesized direct effects of the food subsidy system on child under- and overnutrition, maternal overnutrition, the coexistence of under- and overnutrition in the same children and the same child-mother pairs, and household diet quality. Providing statistical evidence for the existence of the causal relationships between received food subsidies and nutritional outcomes is fundamental for the hypothesized role of the food subsidy system as a driver of the double burden of malnutrition. In addition, a potential adverse effect of food subsidies on chronic child undernutrition is likely to contribute to the observed growth-nutrition disconnect.

We chose Egypt as a case study because the two nutritional challenges of the double burden of malnutrition and the growth-nutrition disconnect are much more pronounced in Egypt than in other developing countries and because addressing them through the reform of existing policies and programs can be expected to make a critical contribution to accelerating the country's

economic and social development. Probably the most important ongoing social policy reform in Egypt is a substantial revision of the food subsidy system. We hope that the findings from our study will be useful for informing the ongoing food subsidy reform process and policies related to the country's social safety net in general. Because implications of food subsidies for nutrition and public health seem to have been hardly considered in past reforms, our study may offer a new perspective and an additional rationale for further changes and fundamental modifications.

From a public health perspective, the double burden of malnutrition is of particular concern. Almost every third Egyptian child under five years of age is chronically undernourished (according to 2011 estimates)—a prevalence rate that is more characteristic of developing countries with much lower national income levels than Egypt's. Egypt has also one of the highest female overweight rates in the world, affecting 78 percent of all (nonpregnant) ever-married women 15–49 years of age, while almost 40 percent are obese (El-Zanaty and Way 2009).[3] In addition, contrary to the global trend of decreasing undernutrition accompanying economic growth, chronic child undernutrition significantly increased over at least the first decade of the 2000s, despite high economic growth. A decade-average GDP growth of 4.8 percent was associated with an increase in the prevalence rate of child stunting, from 24.6 percent in 2000 to 31.2 percent in 2011. Although a few other developing countries have experienced increasing chronic child undernutrition in the face of economic growth in the 2000s, the magnitude of this growth-nutrition disconnect in Egypt is exceptional relative to other countries in the MENA region and other developing countries worldwide (as we will show in this book).

We argue that although the nutrition transition is an underlying development that has facilitated Egypt's contemporary nutritional challenges, it falls short of explaining Egypt's exceptionalism in the double burden of malnutrition. A common presumed explanation for the increase in the prevalence of child stunting is the cumulative impact of a succession of recent economic crises. These crises include the devaluation of the Egyptian pound (EGP) in 2003; the avian influenza epidemic in 2006; the global food, fuel, and financial crises of 2007–2009; and the macroeconomic instability caused by the revolution in the spring of 2011. Although these shocks have contributed to the continuous increase in (monetary) poverty, they fail to convincingly explain why child stunting increased most among the richest wealth/income

3 Adults are classified as overweight if their body mass indexes (BMIs) are 25 or larger, and as obese, if their BMIs are 30 or larger.

quintile of the Egyptian population and remained (nearly) stable among the poorest quintile (as we will show in this book).

We further argue that Egypt's large food subsidy system has been ineffective in reducing child and maternal undernutrition, and hypothesize that it has contributed to sustaining and even aggravating both nutritional challenges. The existence and the design of the food subsidy system may hence provide an explanation for the country's exceptionalism in the global comparison. The rationale for this hypothesis is twofold.

First, the food subsidy system may discourage good nutrition and possibly contribute directly to malnutrition—and to the double burden of malnutrition in particular—through incentivizing overconsumption of cheap, calorie-rich foods and unbalanced diets. Ample availability of cheap calories through subsidization creates an incentive for their consumption in excess, causing overweight and obesity. Calorie consumption above physiological requirement levels does not improve children's physical growth, while retardation in child growth in Egypt has been caused by insufficient micronutrient intakes from inadequate diets (possibly in addition to poor health conditions). Rapid increases of overweight and obesity and slow reduction, stagnation, or even increase of child stunting over past decades led to the double burden of malnutrition. In addition, inadequate reduction of—or even an increase in—child stunting despite high economic growth formed part of the growth-nutrition disconnect. The coverage and benefits of the Egyptian food subsidy system have been large and were even expanded in the 2000s—partly in response to the recent economic crises.

Second, the food subsidy system constitutes a heavy burden on the public budget (in addition to the even more sizeable fuel subsidies), so funds are unavailable for possibly more nutrition-beneficial investments. In this way, the subsidy system may maintain and aggravate malnutrition indirectly. This potential indirect effect of the food subsidies is omitted from our main empirical analysis because of a lack of the data required to conduct such an investigation.

Following this line of argumentation, the book is structured as follows. The second chapter analyzes the double burden of malnutrition and the growth-nutrition disconnect by comparing Egypt's situation with that of other developing countries and by exploring within-country differences between regions and population groups and over time. The third chapter investigates the potential key socioeconomic drivers of Egypt's exceptionalism. These potential drivers include the nutrition transition, the succession of recent economic crises, the food subsidy system, and the lack of

nutrition-sensitive investment. The fourth chapter presents the main empirical analysis of the hypothesized nutritional effects of the Egyptian food subsidy system. It explains the applied methodology, describes the data from the 2010–2011 HIECS that were used, and presents the estimation results. The fifth chapter concludes the book by summarizing the main findings and discussing implications for policy and research.