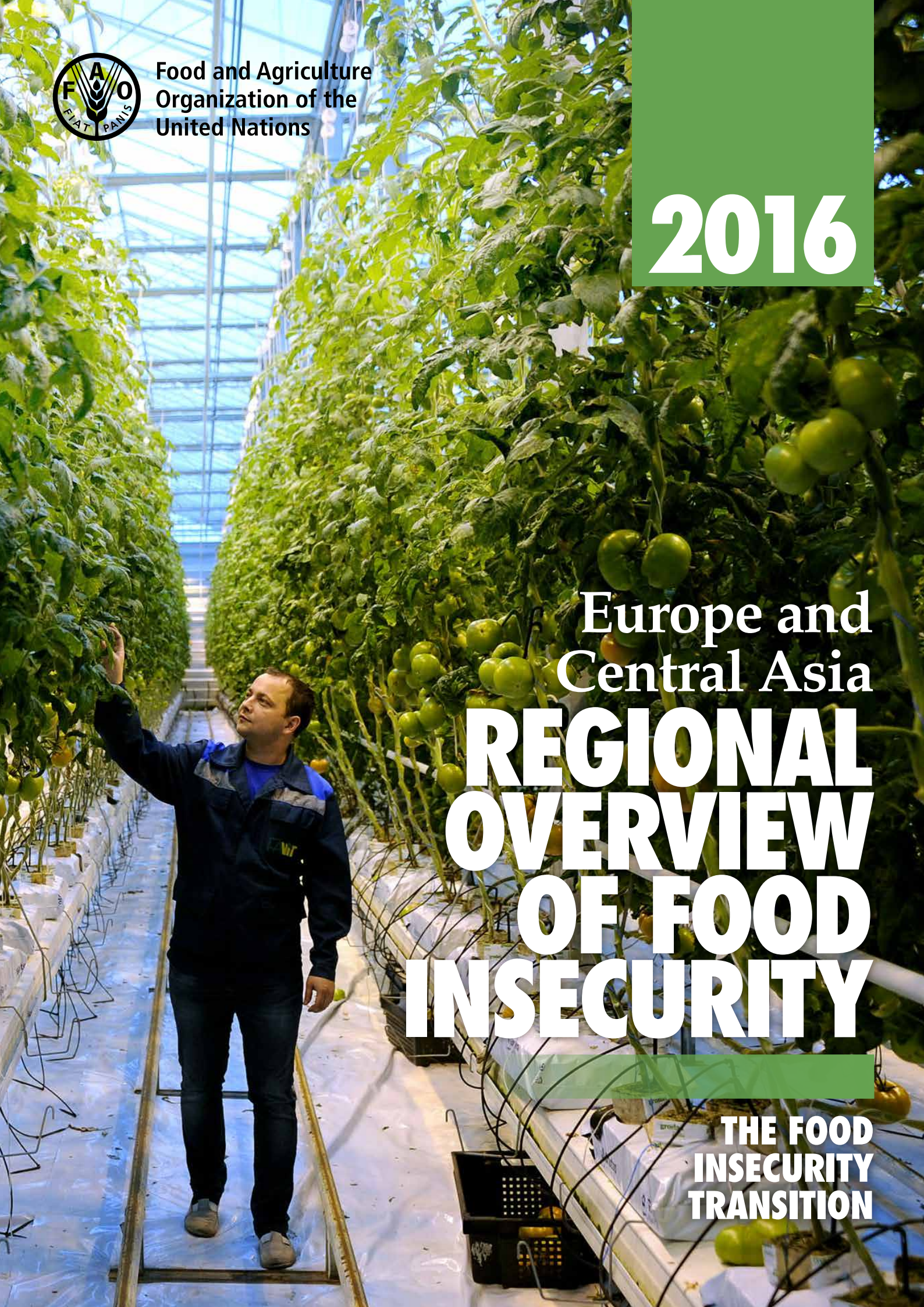

Food and Agriculture Organization of the United Nations

2016

Europe and Central Asia

REGIONAL OVERVIEW OF FOOD INSECURITY

THE FOOD INSECURITY TRANSITION

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2016

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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
BUDAPEST, 2017

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FOREWORD

The year 2015 marked the end of the international development agenda embodied in the Millennium Development Goals (MDGs), and 2016 marks the transition to the new 2030 Agenda for Sustainable Development. The Sustainable Development Goals (SDGs) recognize the unfinished nature of efforts to eradicate poverty and hunger, but also expand the coverage of programmes to include both developing and developed countries and widen the range of the goals to include sustainability as a fundamental leitmotif. The FAO 2015 Regional Overview of Food Insecurity for Europe and Central Asia quite positively assessed the progress made by countries in this region[1] in reducing by half the proportion of people affected by hunger, thereby achieving Millennium Development Goal 1c.

The expansion of country coverage and the conceptual basis of the food insecurity agenda in the Europe and Central Asia (ECA) region from the rather narrow base of the MDGs requires a rethinking of the focus of efforts under the SDGs. Looking forward, reducing food insecurity in the region will require a shift in emphasis from fighting undernourishment to addressing the need for a healthier diet to reduce micronutrient deficiencies and health risks from an overweight or obese population. Both rich and poor countries in the region suffer from malnutrition in the form of micronutrient deficiencies, and the 'burden' of overweight and obesity is growing.

With this conceptual change in mind, Part I of this year's edition of the Regional Overview of Food Insecurity in Europe and Central Asia is devoted to the theme of how the nature of food insecurity has evolved in the region over the past 23 years. The familiar four pillars of food security are used to demonstrate how the character of food insecurity in the region has changed substantially, owing to pro-poor economic growth, particularly in the poorer countries of the region. Today, the main indicators and issues on household food insecurity concern malnutrition, rather than the physical or economic access or stability of access to food.

The different characteristics of food insecurity in the ECA region require different policies. Therefore, Part II discusses a range of policies designed to address the principal malnutrition issues by groups of countries, classified by their predominant food insecurity and malnutrition concerns.

As UN Member States transition to the 2030 Agenda for Sustainable Development, we should recognize the remarkable progress made by this region in sharply improving food and nutrition security since 1990. At the same time, we must renew our commitment to tackle the unfinished agenda of eradicating the newer dimensions of food insecurity, such as malnutrition, obesity and hidden hunger.

[1] The Europe and Central Asian (ECA) region, as tracked by the FAO indicator of undernourishment for the assessment of MDG 1c, includes the eight countries of Central Asia and the Caucasus.

ACRONYMS AND ABBREVIATIONS

BMI
Body mass index

BIH
Bosnia and Herzegovina

CA
Central Asia

CGIAR
Consultative Group for International Agricultural Research

CIMMYT
International Maize and Wheat Improvement Center

CIS
Commonwealth of Independent States

DALY
Disability-adjusted life years

DES
Dietary energy supply

ECA
Europe and Central Asia

EAEU
Eurasian Economic Union

EACU
Eurasian Customs Union

EAEC
Eurasian Economic Commission

EU
European Union

FAO
Food and Agriculture Organization of the United Nations

FLABEL
Food labelling to advance better education for life

FAPs
Food assistance programmes

FYROM
The Former Yugoslav Republic of Macedonia

GDA
Guideline daily amounts

ICARDA
Centre for Agricultural Research in the Dry Areas

MBPF
Monthly benefit for poor families with children programme

MDG
Millennium Development Goals

GBD
Global Burden of Disease (project)

GDP
Gross domestic product

HLPE
High-level Panel of Experts on Food Security and Nutrition

IMF
International Monetary Fund

IOM
International Organization for Migration

NCD
Noncommunicable disease

R&D
Research and Development

SDG
Sustainable Development Goals

SNAP
Supplementary Nutritional Assistance Program

SOFI
The State of Food and Agriculture (annual FAO publication)

USD
United States dollar(s)

WIC
Women, Infants and Children (scheme)

WFS
World Food Summit

INTRODUCTION

Food security is important. Over 795 million people suffer from hunger globally, representing about 11 percent of the world population (FAO, 2015). The roots of hunger and how to eliminate it are issues of intense interest to policymakers, researchers and development practitioners around the world. Moreover, rising food prices were an important motivating factor behind political actions in the period following the 2007-2008 food price increases (HLPE, 2011), and there is ample documentation that a poorly nourished population is economically less productive (World Bank, 2006).

Governments and other actors throughout the ECA region are taking the first steps to align and implement the 2030 Agenda for Sustainable Development. In line with Goal 2 of the Sustainable Development Goals (SDGs) calling for the eradication of hunger, achieving food security, and the elimination all forms of malnutrition, national authorities in the ECA region will build on progress made in the region in sharply improving food and nutrition security since 1990 by identifying their national priorities to achieve this goal.

While the issue of food insecurity is widely recognized as important, the great majority of the population of the ECA region live in countries where the prevalence of undernourishment is under 5 percent, a level exceeded in only five out of 53 countries. Moreover, between 1990 and 2015 all but one of the 12 post-Soviet countries of the region succeeded in reducing the prevalence of undernourishment by half, thereby achieving Millennium Development Goal 1c. It is therefore appropriate to question whether the topic of household food insecurity, as measured by country-level statistics, is still a significant issue for the region in the post-MDG era.

In the current report, we argue that the concept of food security, when properly understood, is still pertinent in the ECA region, even though the nature of food insecurity has changed as countries of the region have grown wealthier, and the conflicts that characterized the early 1990s have subsided.

To understand the significance of the economic transformation that occurred in the region, consider that between 1992 and 2015 GDP grew by nearly 50 percent in both the 28 member countries of the European Union and the Commonwealth of Independent States (CIS) (and Georgia), while growth in Central Europe, the Western Balkans and Turkey exceeded 100 percent (IMF, 2016). Per capita economic growth has been even more impressive in many countries of the region (Table 1), with some of the poorer countries growing by over 100 percent and average performers growing by 50 percent. Such substantial increases in welfare have changed the pattern of consumption and the nature of food insecurity, particularly in the poorer countries of the region where growth has been the fastest. As countries in the region have become more affluent, the availability of macronutrients (proteins, carbohydrates and fats) and their associated calories, even in the poorest countries, has risen well above minimal daily needs.[2] As part of this process, consumption patterns have also changed, giving rise to new threats to food security.

[2] The sole exception to this generalization is Tajikistan where the average daily availability of calories per capita is just at the level deemed adequate by FAO.

TABLE 1

PER CAPITA ECONOMIC GROWTH IN THE ECA REGION, 1992-2015 (INDICES, 1992 =100)

Selected best performers		Selected average performers		Selected slow performers	
Country	Per capita GDP in 2015, 1992=100	Country	Per capita GDP in 2015, 1992=100	Country	Per capita GDP in 2015, 1992=100
Bosnia and Herzegovina	696	Finland	150	Ukraine	86
Armenia	400	Sweden	152	Italy	107
Albania	365	Luxembourg	154	Tajikistan	114
Lithuania	286	Iceland	157	Greece	115
Latvia	278	Slovenia	159	Kyrgyzstan	120
Georgia	265	Croatia	163	Cyprus	122

SOURCE: World Bank, WDI (2016c).

BOX 1

THE NUTRITION TRANSITION

Barry Popkin's empirical research describes the nutrition transition in developed, developing and transition countries around the world (Popkin, 2003, 2008; Popkin and Gordon-Larsen, 2004). According to Popkin, the nutrition transition is preceded, or occurs simultaneously, with two other significant shifts in social development, namely a demographic shift from a population characterized by high fertility and high mortality to one of low fertility and low mortality (typical of modern industrial societies), and an epidemiological shift from a population characterized by a high prevalence of infectious disease to one characterized by a high prevalence of chronic noncommunicable diseases (NCDs).

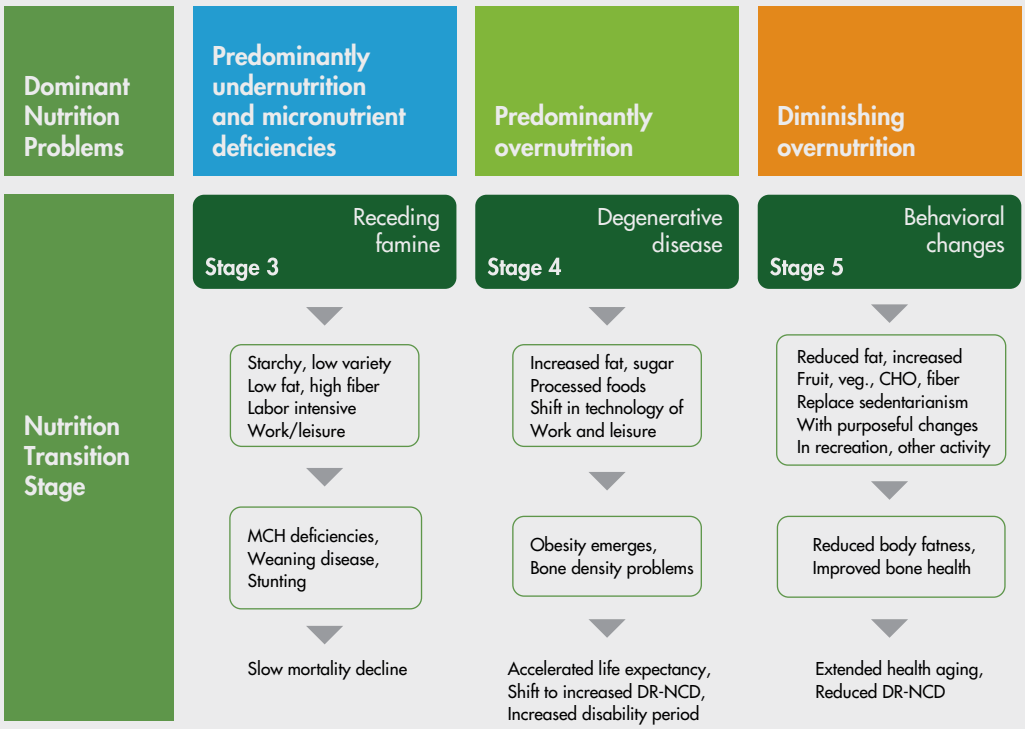
Popkin describes five broad nutrition patterns. The first, is associated with Palaeolithic man and hunter-gatherer populations, and is not relevant today. The second is primitive agriculture, and is associated with periodic famine and various nutritional deficiencies, and only relevant today in parts of sub-Saharan Africa (Popkin, 2006). The trajectory of most developing countries falls within the third pattern (stage 3 in Figure 1), namely receding famine but continuing nutritional deficiencies. Populations in high- and middle-income societies (and segments of low-income societies as well) fall into the stage 4 nutrition pattern. In stages 4 and 5 populations enjoy longer and healthier life expectancy, and their diet changes to include higher levels of total fat, cholesterol, sugar, and other refined carbohydrates and lower levels of fibre. This consumption is often accompanied by an increasingly sedentary life, leading to an increased prevalence of overweight and obesity that cause nutrition-related noncommunicable diseases (NR-NCD), such as diabetes, heart disease and cancer. The final nutrition pattern (stage 5) is characterized by changes in diet aimed at preventing or delaying degenerative diseases and prolonging health. It may also be accompanied by behavioural changes to increase activity levels. These changes may lead to significant changes in body composition and increased life expectancy.

Certainly, not all countries have fared so well over the past 23 years. As can be seen in Table 1, the slowest performers have experienced numerous problems that have limited growth. Ukraine and Tajikistan suffered the worst economic contractions of any post-Soviet country in the 1990s. Italy, Greece, Cyprus and Ukraine were negatively impacted by the 2007-08 financial crisis and the fiscal austerity measures that were introduced thereafter. Finally, the Ukrainian economy experienced more than its fair share of political and financial upheavals in recent years, leading to an 11 percent fall in per capita incomes since 2013.

We refer to the change in the character of food insecurity in the region as the 'food insecurity and nutrition transition' (Box 1 and Figure 1). In Part I of this report we explore the implications of this transition, focusing on both nutrition issues and the 'burden' of malnutrition. Part II examines policies that have been shown to be effective in reducing the 'burden' of malnutrition in the region.

FIGURE 1

THE NUTRITION TRANSITION



SOURCE: Adapted from Popkin (2003).

Notes: MCH (mean corpuscular haemoglobin) deficiencies are used as an indicator of iron deficiency in infants. CHO are carbohydrates and DR-NCD are diet-related noncommunicable diseases.

PART 1

THE FOOD INSECURITY TRANSITION IN THE ECA REGION SINCE 1992

TBILISI, GEORGIA
A vendor selling sweets and cakes in the street.
©FAO

PART 1

THE FOOD INSECURITY TRANSITION IN THE ECA REGION SINCE 1992

In Part I we adopt a long-term (23-year) view of the evolution of food insecurity in the ECA region, and consider this evolution against the World Food Summit (WFS) definition of food insecurity, namely: physical access; economic access; stability of access; and utilization. We find that physical access to food has not been an issue of concern in the region over this period, except during periods of conflict and for countries experiencing particularly long land and farm reforms, as in Tajikistan. Economic access to food, however, is an issue of concern in the region, but according to FAO's prevalence of undernourishment indicator, this problem persists in only a few countries of the Caucasus and Central Asia. However, the overwhelming impression created by regional undernourishment data is one of tremendous progress, including in Tajikistan. The reduction in food insecurity in the region is predominantly due to the cessation of military conflicts of the early 1990s and growing affluence.

Growing affluence in the region has brought changes in diets, as well as a more sedentary lifestyle, leading to changes in nutritional and anthropomorphic outcomes. To illustrate how these outcomes are distributed throughout the region, we divide the countries of the region into four groups with different nutrition problem profiles, namely those characterized by: (a) undernutrition and micronutrient deficiencies; (b) the triple burden of undernutrition, micronutrient deficiencies and overnutrition; (c) overnutrition; and (d) countries where nutrition problems are of less concern. We then attempt to quantify for each of these country groups the 'burden' that is attributable to malnutrition-related risk factors in 2010, and note the mismatch in healthcare facilities with the malnutrition-related 'burdens'.

PHYSICAL ACCESS TO FOOD HAS SELDOM BEEN A PROBLEM IN THE REGION

Physical access to food in the sense of the overall availability of food in the country has not been a severe problem in the region (Table 2). In 2014-16, the only country with quite low dietary energy supply compared to average requirement is Tajikistan. It is difficult to draw strong conclusions from this statistic, because Cyprus (a high-income country) and Serbia (a middle-income country) have similar statistics. For the region, the unweighted mean average dietary energy supply (DES) adequacy was 130 in 2014-2016, which by all standards indicates a region with little problems of food availability.

In fact, food availability constituted a problem in only a few countries of the region in the early 1990s. In 1992-93, DES adequacy levels were below 100 in Bosnia and Herzegovina and the Former Yugoslav Republic of Macedonia (FYROM), while in Croatia this problematic situation lasted until 1995. These temporary disruptions were likely caused by conflict and the dissolution of economic ties between the former Yugoslav republics. Military conflict in Croatia lasted from 1991 to 1995 and from 1992 to 1995 in Bosnia and Herzegovina (Figure 2). Armenia and Georgia exhibit a similar picture. Both countries experienced conflict, land reform and the cutting of economic links in the early 1990s (Figure 3). The DES adequacy indicator for Tajikistan exhibits a similar pattern of evolution as in the five other countries cited above, but stretched out over a much longer period of time, perhaps due to the longer period required for genuine land reform.

TABLE 2

AVERAGE DIETARY ENERGY SUPPLY ADEQUACY IN THE ECA REGION (PERCENT), 2014-2016

Country or group of countries	DES adequacy (%)
Mean	**130**
Median	**132**
Bottom quintile	**112**
Of which:	
Tajikistan	97
Cyprus	104
Serbia	108
Top quintile	**148**
Of which:	
Austria	151
Turkey	156
Israel	161

SOURCE: FAO (2016).
Note: The dietary energy supply (DES) adequacy indicator is computed as the ratio of the total calories of food available in the country per capita, calculated from commodity balances, to the average dietary energy requirement.

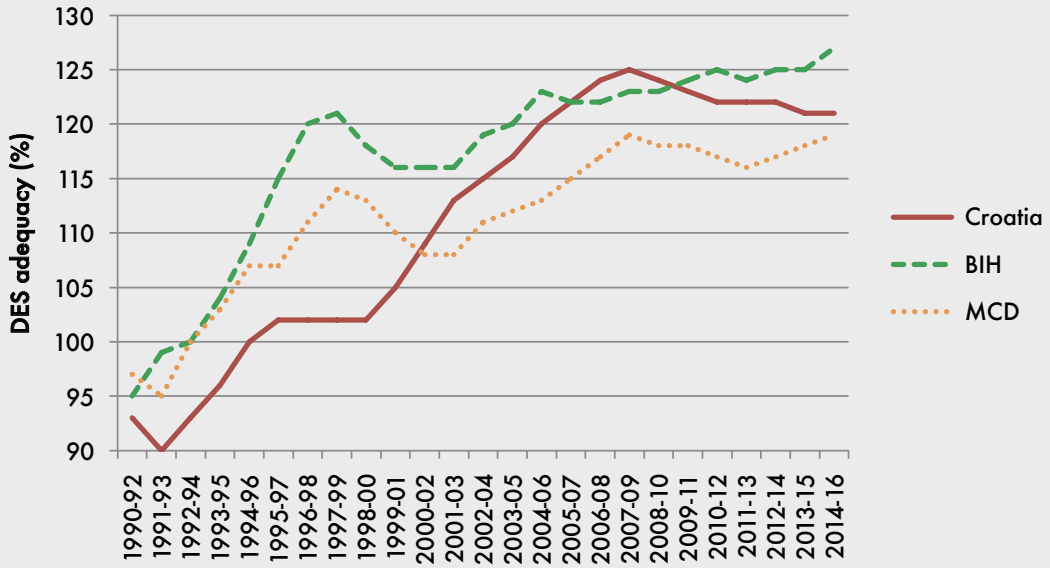
FOOD AVAILABILITY RISES WITH INCOME

Across the ECA region, food availability (and, as a result, DES adequacy) grows as countries become richer (Figure 4). According to available cross-sectional data, DES adequacy is higher in countries with higher levels of per capita GDP.

This makes sense if one considers the definition of DES adequacy, which is computed as the ratio of the total calories of food available in the country per capita to average dietary energy requirements. As incomes rise consumers demand more food, but as they continue to grow, the portion of income spent on food falls rather quickly, and consumers focus more on quality than quantity. This explains why the trend line in Figure 4 is logarithmic, rising steeply at first, but then less so.

FIGURE 2

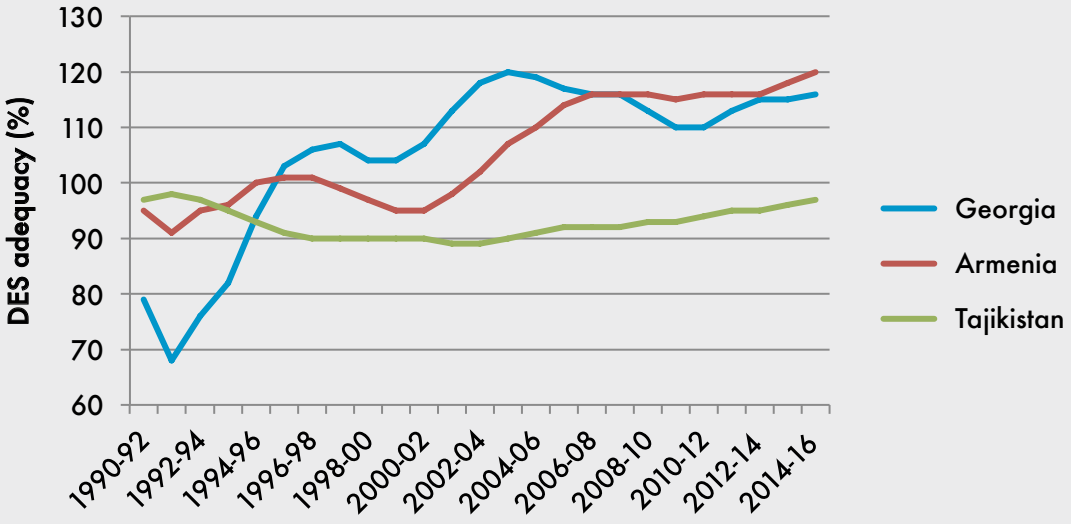
DES ADEQUACY IN SELECTED COUNTRIES OF SOUTHEAST EUROPE, 1990-92 TO 2014-16



SOURCE: FAO (2016).

FIGURE 3

DES ADEQUACY IN SELECTED COUNTRIES OF THE POST-SOVIET REGION, 1990-92 TO 2014-16



SOURCE: FAO (2016).

The deviation of country DES adequacy estimates from the trend line indicates that income is not the only factor explaining DES adequacy. As one might expect, other factors also need to be taken into consideration; for example, changes in per capita GDP seem to account for about 30 percent of the changes in DES adequacy in this cross-sectional comparison.

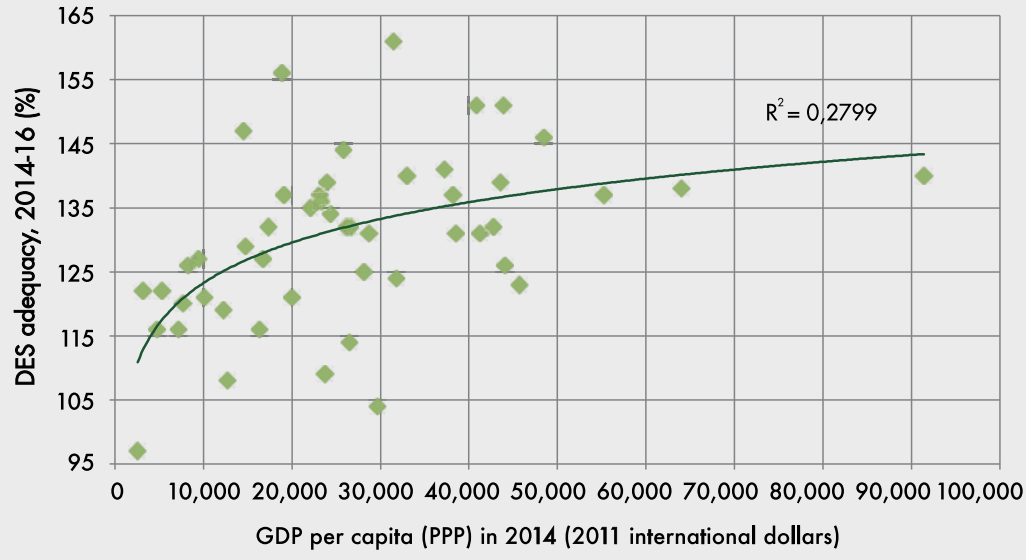
ECONOMIC ACCESS TO FOOD CRITICAL IN ONLY A FEW COUNTRIES

Economic access to food for certain groups of individual households is still an issue of concern, even in the richest countries of the region, but this is a critical issue at the national level only in a limited number of countries in the Caucasus and Central Asia sub-region. The primary FAO indicator of food insecurity which explicitly takes into account economic access is the prevalence of undernourishment.[3] In the ECA region, this indicator is only published for Central Asian and Caucasus countries, while in other countries the prevalence of undernourishment is less than 5 percent, which is considered to fall within an acceptable range (Table 3).

[3] The prevalence of undernourishment expresses the probability that a randomly selected individual from the population consumes an amount of calories that is insufficient to cover her/his energy requirement for an active and healthy life. The indicator is computed by comparing a probability distribution of habitual daily dietary energy consumption with a threshold level referred to as the minimum dietary energy requirement. Both are based on the notion of an average individual in the reference population.

FIGURE 4

HIGHER LEVELS OF FOOD AVAILABILITY IN RICHER COUNTRIES OF THE ECA REGION



SOURCE: FAO (2016).

Central Asian and Caucasus countries have made tremendous progress in reducing the prevalence of undernourishment since 1990-92. For Armenia, Georgia and Kyrgyzstan these reductions, most of which came after 2000, occurred more rapidly than in other developing countries in the ECA region. For instance, Armenia, Kyrgyzstan and Uzbekistan achieved the truly remarkable feat of reducing the prevalence of undernourishment by 6-12 percent per year over this decade (2000-2002 to 2010-2012). Georgia, on the other hand, achieved significant reductions in the prevalence of undernourishment in the 1990s and after 2010, and Tajikistan made impressive reductions in the DES indicator, particularly since 2010.

How were these reductions in food insecurity accomplished? It is difficult to establish a one-to-one correspondence between reductions in the prevalence of undernourishment and poverty rates, or between the prevalence of undernourishment and movements in GDP per capita over time (Table 4). At times, the prevalence of undernourishment and poverty move in tandem, and at other times they move in opposite directions. The same can be said about undernourishment and GDP per capita. Over the longer run (1990-2012), however, undernourishment and poverty have both decreased as per capita income has increased. A comparison of data for 2012 and 1999 shows this rather robust relationship.

TABLE 3

PREVALENCE OF UNDERNOURISHMENT IN CENTRAL ASIA AND CAUCASUS AND DEVELOPING COUNTRIES, 1990-92-2014-16

	1990-92	2000-02	2010-12	2014-16	Average annual percentage change
Caucasus and Central Asia	**14.1**	**15.3**	**8.9**	**7.0**	**-2.9**
Armenia	27.3	23.0	6.8	5.8	-6.3
Azerbaijan	23.6	17.1	<5.0	<5.0	---
Georgia	56.5	16.3	10.1	7.4	-8.1
Kazakhstan	<5.0	<5.0	<5.0	<5.0	---
Kyrgyzstan	15.9	16.7	7.2	6.0	-4.0
Tajikistan	28.1	39.5	36.8	33.2	-1.2*
Turkmenistan	8.6	8.4	<5.0	<5.0	---
Uzbekistan	<5.0	14.4	7.7	<5.0	---
Developing countries	**23.3**	**18.2**	**14.1**	**12.9**	**-2.4**

SOURCE: FAO (2016).
*Note: The average percentage change per year is calculated from the end points, except for Tajikistan for which the calculation is from 2000-02 to 2014-16, since the civil war there lasted from 1992 to 1997.

TABLE 4

PREVALENCE OF UNDERNOURISHMENT, POVERTY RATE AND GDP PER CAPITA IN SELECTED COUNTRIES, 1990-2012

	1990	1999	2002	2010	2012
Armenia					
Prevalence of undernourished (%)	27.3	21.4	19.2	6.8	6.7
Poverty (%)	10.9	16.9	15.1	2.5	1.7
GDP per capita (PPP, in 2011 int. dollars)	3 013	2 958	4 156	6 860	7 480
Georgia					
Prevalence of undernourished (%)	56.5	14.8	10.5	10.1	9.1
Poverty (%)	---	18.7	15.6	19.6	15.5
GDP per capita (PPP, in 2011 int. dollars)	5 912	3 301	4 035	6 321	6 955
Kyrgyzstan					
Prevalence of undernourished (%)	15.9	15.2	15.0	7.2	6.2
Poverty (%)	20.1	23.0	34.2	4.0	2.9
GDP per capita (PPP, in 2011 int. dollars)	3 102	2 077	2 272	2 860	3 053
Tajikistan					
Prevalence of undernourished (%)	28.1	38.8	42.6	36.8	35.0
Poverty (%)	1.1	63.0	32.9	4.3	4.7
GDP per capita (PPP, in 2011 int. dollars)	3 079	1 194	1 521	2 232	2 457
Uzbekistan					
Prevalence of undernourished (%)	<5.0	11.5	17.7	7.7	5.5
Poverty (%)	6.6	71.7	66.6	35.6	27.1
GDP per capita (PPP, in 2011 int. dollars)	2 849	2 476	2 723	4 434	5 008

SOURCES: FAO (2016); World Bank (2016a).
Notes: The headcounts use the $1.90 international poverty line calculated on the Povcalnet website (povertydata.worldbank.org/poverty/home/). GDP per capita is expressed in terms of purchasing power parity terms denominated in 2011 international dollars.

ECONOMIC GROWTH AND POVERTY REDUCTION IN THE ECA REGION

Some observations may be made about the correlation between growth and poverty reduction, which may (or may not) apply to the prevalence of undernourishment. First, an analysis of the role of growth vs. changes in the distribution of income in reducing poverty shows the overwhelming importance of growth in reducing poverty within all subregions of Europe and Central Asia between 1998 and 2003 (World Bank, 2003). In other words, the key to poverty reduction in the region has been overall growth, rather than policies aimed at redistributing income. The pro-poor economic growth witnessed between 1998 and 2010 has resulted in the incomes of the poor growing more rapidly than those with average or high incomes (World Bank, 2003; 2014). For instance, the incomes of households in the bottom 40 percent of the income distribution expanded 20 percent more rapidly than national average incomes between 2005 and 2010. Furthermore, growth was more pro-poor in countries where incomes were more equal and per capita incomes were higher to begin with. For instance, in the period 1998-2003, poverty levels fell much more in the middle-income group of CIS countries (Belarus, Kazakhstan, Russian Federation, Ukraine) and the Western Balkan countries (Bosnia and Herzegovina and Romania) than in the low-income CIS countries (Armenia, Kyrgyz Republic, Moldova, Tajikistan, Uzbekistan) (World Bank, 2003).

Second, studies on the sources of growth in transition economies reveal that the main source of growth in these countries has been the growth of total factor productivity. Rapacki and Prochniak (2009) and Voskoboynikov and Solanko (2014) showed that this is the case for the Russian Federation from 1995-2001. Transition policies, such as liberalized domestic prices and trade, privatization of enterprises and a more supportive regulatory environment for the development of private services, eliminated the substantial sectoral distortions inherited from the socialist period, thus stimulating growth. After 2001, growth in the Russian Federation is driven more by a combination of total factor productivity growth in services and capital investment, particularly in the oil and gas sector.

Third, an important reason for the pro-poor nature of growth is related to employment and wage policies. Since 1998, formal employment income was correlated with pro-poor growth. Countries in which the bottom 40 percent of the income distribution were more likely to be formally employed (as opposed to self-employed) experienced more pro-poor growth. One major reason for this is the elimination of wage arrears in 1998-2003, which disproportionally impacted the formally employed. This policy addressed the poor quite directly, which in this case predominantly concerned those formally employed with children (World Bank, 2003). The labour policy of maintaining employment while running wage arrears is not new in the region. The downside of wage arrears is that some employees and workers, many of whom are employed in declining or low-wage industries (e.g. mining, construction, processing and agriculture) are not paid even though they have continued to work during periods of economic downturns. Wage arrears, which more than doubled in Russia between January 2015 and August 2016, are a main source of labour unrest (Guillory, 2016; Federal State Statistics Service, 2016).

Another example of the importance of formal employment is the differences between growth in Kazakhstan and Ukraine, where the poor were more likely to be employed, and Georgia, where the poor were more likely to be self-employed. Between 2005 and 2010 growth in Kazakhstan and Ukraine was much higher for the bottom 40 percent of the income distribution, while in Georgia the incomes of the bottom 40 percent fell despite an increase in average incomes (World Bank, 2014).

Last, a characteristic trait of incomes in the ECA region has been the substantial role of public and private non-market transfers. Although the largest portion of incomes (about 60 percent) is derived from labour, non-market income, such as remittances and pensions, also account for a significant portion of total incomes in the region. For instance, pensions accounted for between 15 and 40 percent of household incomes in 2010 (World Bank, 2014), reflecting the age distribution of the population. Remittances also play an important role in a number of the poorer economies of the region, such as Tajikistan, Kyrgyzstan, Moldova and Armenia, where they are equivalent to between 15 and 30 percent of GDP. While transfers loom large in the structure of incomes, their role in income growth is somewhat smaller. For example, increases in labour earnings in Tajikistan from 2007 to 2010 accounted for about 40 percent of the total growth in incomes, while increases in remittances accounted for only 12 percent (World Bank, 2014).

None of the above observations on the pro-poor growth that has taken place across the region necessarily applies specifically to the prevalence of undernourishment. In fact, in the absence of comprehensive data and specialized studies – data are available on the prevalence of under-nourishment for only five countries – it is difficult to speculate at all about the actual policy drivers behind improved food security in the

TABLE 5

STRUCTURE OF DIETARY ENERGY SUPPLY (DES) BY GDP PER CAPITA QUINTILES, 1992 AND 2011

		Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Sweeteners (%)	1992	6.9	10.8	10.7	11.9	12.6
	2011	7.5	10.8	11.7	10.0	11.7
Vegetable oils (%)	1992	5.2	5.6	7.5	12.6	11.5
	2011	6.8	9.8	11.0	14.3	12.3
Cereals (%)	1992	57.9	41.1	38.0	26.6	23.0
	2011	49.3	34.4	32.2	26.3	25.6
Animal products (%)	1992	17.6	26.8	27.8	29.2	34.0
	2011	20.3	25.1	25.2	30.2	31.7
Other (%)	1992	12.4	15.6	16.0	19.6	18.9
	2011	16.2	19.8	19.9	19.2	18.7
GDP per capita PPP in 2011 dollars	1992	3 381	8 561	14 233	24 401	37 696
	2011	7 404	16 105	24 160	35 543	49 828

SOURCES: FAOSTAT (2016) for dietary energy supply figures in Kcal/capita/day. World Bank WDI (2016c) for GDP figures.
Notes: Quintiles are based on GDP per capita in 1992 for countries in Europe and Central Asia, calculated in purchasing power parity terms in constant 2011 dollars. The same country quintiles are used for the 1992 and 2011 values. Thus, a comparison of quintile 1 over time, for example, follows the same countries over 19 years.

region. However, if we focus more narrowly on policies aimed at reducing malnutrition, we are on firmer ground, a topic that will be taken up further in Part II.

DIETARY SHIFTS WITH ECONOMIC DEVELOPMENT: CROSS-SECTIONAL AND TIME SERIES EVIDENCE

Looking at food security across the ECA region, we can identify several key differences between richer and poorer countries in cross-sectional data. These trends are also visible in time series data as we follow countries grouped by income per capita over time (Table 5 and Figure 5). Taken together, the structural changes in diet described below constitute the heart of the dietary aspect of the nutrition transition in the ECA region.

Table 5 shows the structural changes in DES by per capita GDP quintiles between 1992 and 2011. Generally speaking, as we trace the structure of diets as incomes increase from the poorest (1) to richest (5) quintile, we find that the portion of total calories derived from sweeteners, vegetable oils and animal products increases, while that derived from cereals declines. There are important nuances as incomes increase above a certain level, but the general tendency is clear.

To be more precise, we must consider differences between GDP quintiles in detail. Consider the portion of total DES derived from cereals: Cross-sectional evidence from 2011 shows very large reductions in the portion of cereals in diets when moving from quintile 1 to quintile 2, but the rate of reduction slows thereafter. Time series evidence is consistent with this trend, as the changes over time by quintile become smaller, the richer the quintile. In fact, the portion of DES derived from cereals even increased slightly for the highest quintile between 1992 and 2011, probably due to health concerns.

A mirror-like picture can be painted for the portion of calories derived from animal products and sweeteners. Animal products include meat and dairy products, while sweeteners include sugar, as well as other foodstuffs derived from cereals (such as high fructose corn syrup), fruits, milk, or honey. These proportions grow quite rapidly from quintile 1 to quintile 2, but the rate of growth diminishes thereafter. Moreover, the portion of DES derived from animal products even decreased slightly for the richest quintile between 1992 and 2011, perhaps due to health concerns. An analogous reduction is also to be found in the case of sweeteners between 1992 and 2011 for both the fourth and fifth quintiles.

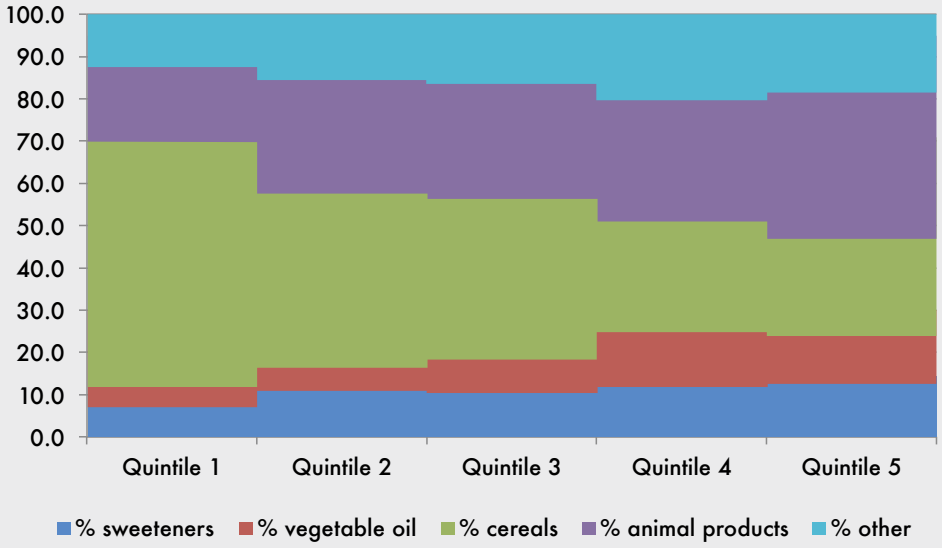
For vegetable oils the pattern is a bit different, rising slowly between the first and second quintiles, peaking in the fourth quintile and then decreasing slightly thereafter. This cross-sectional pattern holds for both 1992 and 2011, but the overall importance of vegetable oils in diets rose for each quintile between 1992 and 2011. Such cross-sectional evidence is a good indicator of the pattern of demand and supply in individual countries of the region as incomes increase over time.

The portion of calories derived from cereals, roots and tubers in the diet of consumers in low- and middle-income countries decreases as incomes increase (Figure 6). However, in the case of high-income countries in Western European countries, the pattern is one of stable or even increasing consumption of cereals, roots and tubers – perhaps for health reasons – as incomes increase.

An opposite pattern can be discerned for the supply of animal-based protein (from meat and dairy products, for instance) in countries of the region (Figure 7). For the low- and middle-income countries, the supply of animal proteins increases with income, whereas for the high-income countries on the right of the figure the supply of animal proteins is nearly flat or declining (France), perhaps due to health concerns.

FIGURE 5

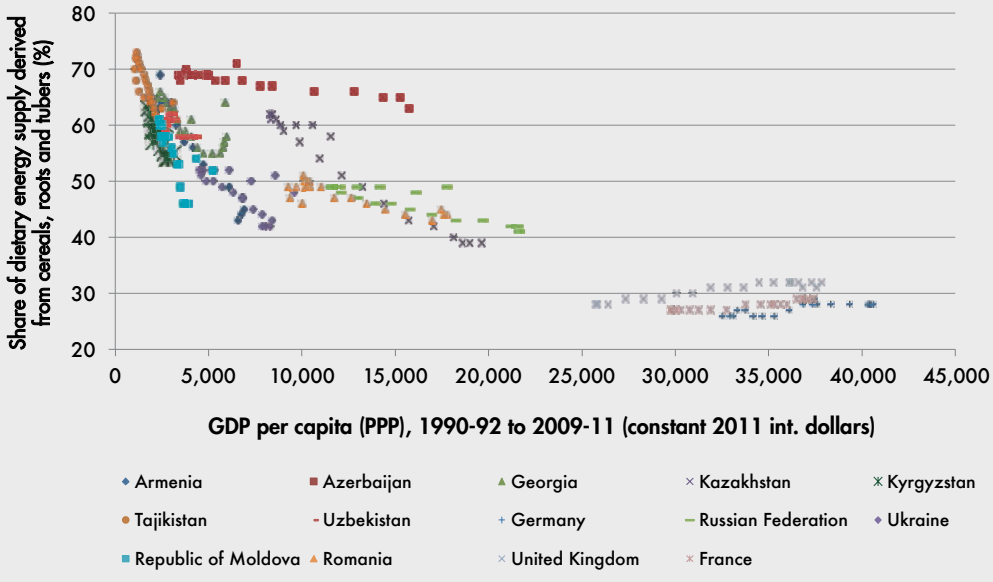
STRUCTURE OF DES BY PER CAPITA GDP QUINTILE, 2011



SOURCE: Table 5.

FIGURE 6

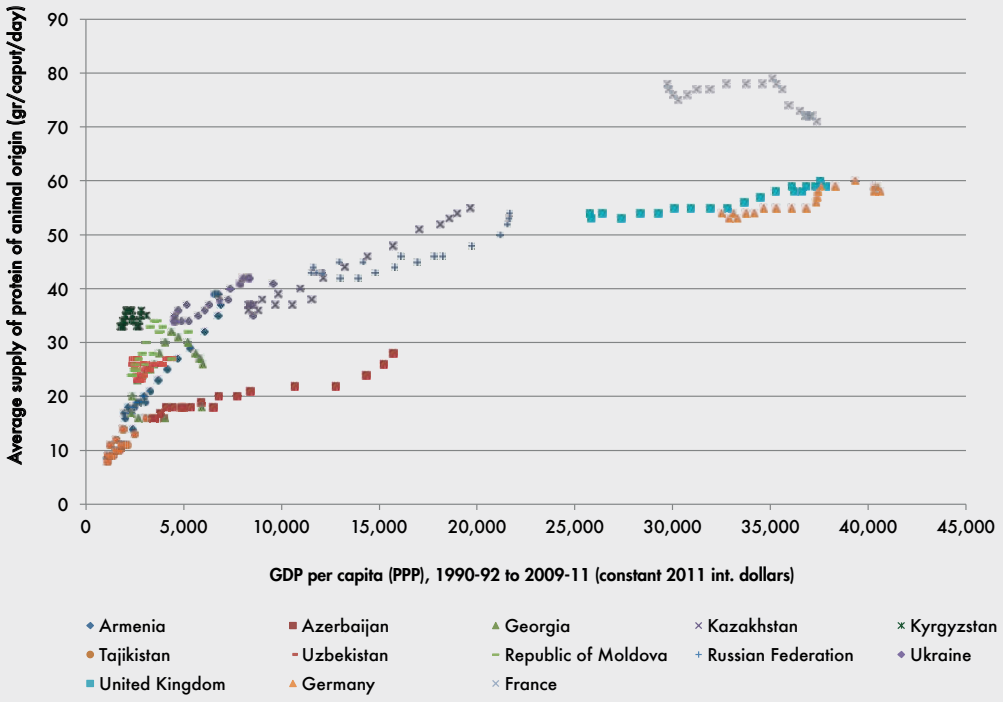
PORTION OF CALORIES DERIVED FROM CEREALS, ROOTS AND TUBERS MOSTLY DECLINES AS INCOME RISES IN LOW- AND MIDDLE-INCOME ECA COUNTRIES, 1990-92 TO 2009-11



SOURCES: FAOSTAT (2016) for dietary energy supply figures in Kcal/capita/day. World Bank WDI (2016c) for GDP figures.

FIGURE 7

ANIMAL PROTEIN SUPPLY MOSTLY INCREASES WITH INCOME IN LOW- AND MIDDLE-INCOME ECA COUNTRIES, 1990-1992 TO 2009-2011



SOURCES: FAOSTAT (2016) for supply of protein of animal origin in gr/capita/day. World Bank WDI (2016c) for GDP figures.

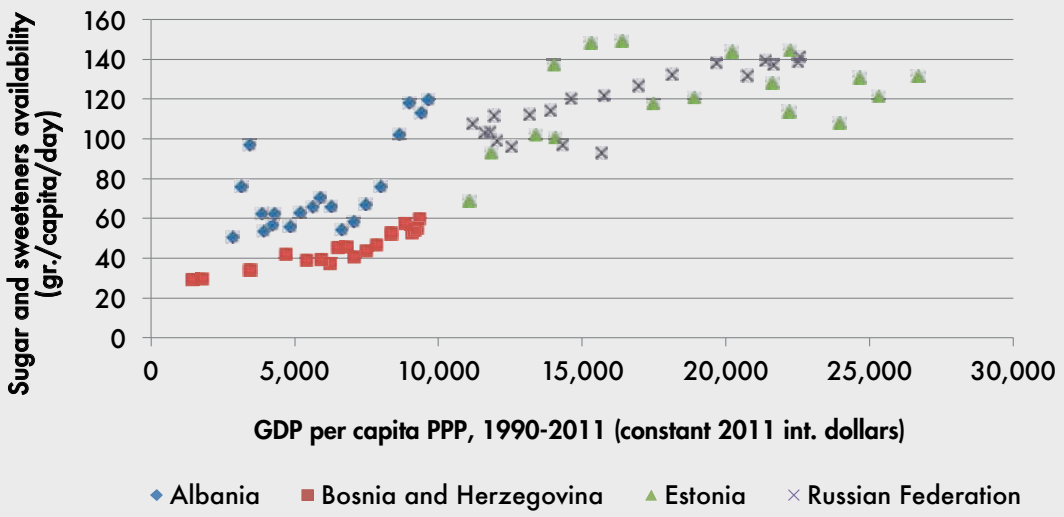
These two patterns, i.e. decreasing cereal, roots and tuber consumption and higher consumption of animal products, are two of the important dietary changes that have occured during the nutrition transition.

Two other important, but weaker, patterns stand out during the nutrition transition in the ECA region, namely changes in the availability of sugar and sweeteners and of vegetable oils.

In Albania and Bosnia and Herzegovina, two of the poorest countries undergoing rapid growth, sugar and sweetener availability has increased rapidly, while for middle- to high-income countries, such as Estonia and the Russian Federation, the increases have been much slower (Figure 8). The availability of vegetable oil shows a less nuanced pattern, and increased across the board for low- and middle-income countries (Figure 9).

FIGURE 8

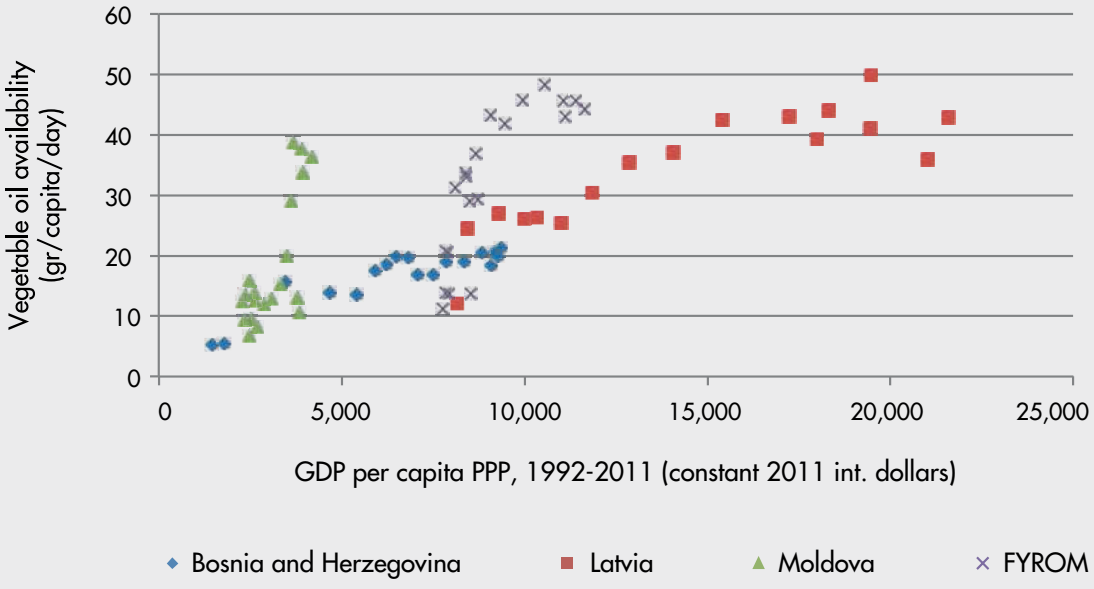
SUGAR AND SWEETENER AVAILABILITY, SELECTED COUNTRIES (GR./CAPITA/DAY)



SOURCES: FAOSTAT (2016) for sugar and sweetener availability in gr/capita/day. World Bank WDI (2016c) for GDP figures.

FIGURE 9

VEGETABLE OIL AVAILABILITY IN SELECTED ECA COUNTRIES



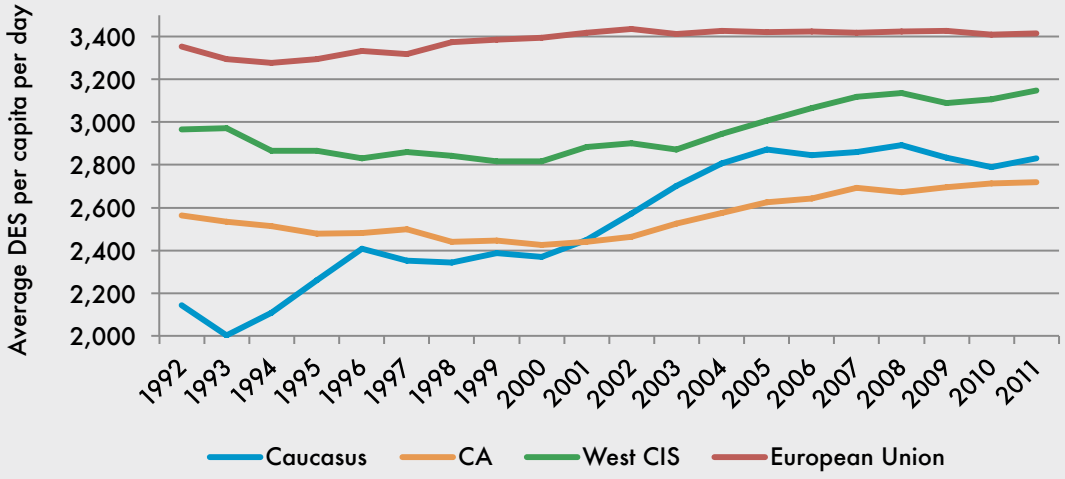
SOURCES: FAOSTAT (2016) for vegetable oil availability in gr/capita/day. World Bank WDI (2016c) for GDP figures.

INSTABILITY OF FOOD SUPPLIES VERY LOW IN THE ECA REGION

The year-to-year variability of the food supply (i.e. the average daily DES per capita) has not been an issue of concern for the countries of the region. In the 28 European Union (EU) Member States, the average availability of food supplies is quite high and has increased at a moderate pace and with minimal year-to-year variability since 1993. Outside of the EU, the average availability of food is comfortably above macronutrient requirements, and any 'variability' in food supplies has been due to periods of steep increases in food availability (Figure 10). The timing of these increases coincided with periods of robust land reform and farm restructuring measures in the post-Soviet countries. Thus, the average availability of food in the Caucasus countries was only 2000 kcal in 1993. However, land reform, first in Armenia, then in Georgia and Azerbaijan, led to two waves of increased food availability (1993-96 and 2000-05), which raised average availability comfortably above requirements. In the Central Asian and Western CIS countries food availability fell during the 1990s before land reforms, farm restructuring and managed bankruptcy redistributed land and assets to more productive farms in the early 2000s, resulting in a recovery in agricultural production (Lerman and Mirzakhanyan, 2001; Lerman and Sedik, 2009; Lerman and Sedik, 2010; Sedik *et al.*, forthcoming 2016).

FIGURE 10

FOOD SUPPLIES IN THE ECA REGION HAVE BEEN STABLE OR RISING SINCE 2000



SOURCE: FAO (2016).

Notes: The Caucasus countries include Azerbaijan, Armenia, Georgia. Central Asian (CA) countries include Turkmenistan, Tajikistan, Uzbekistan, Kazakhstan and Kyrgyzstan. The western CIS countries are Belarus, Russia, Ukraine, Moldova. The European Union includes the 28 EU Member States.

MALNUTRITION IS THE PREDOMINANT FOOD INSECURITY ISSUE OF CONCERN IN THE ECA REGION

The previous analysis has demonstrated that neither food availability nor the stability of access to food pose any significant problems for the countries in the ECA region. While economic access to food continues to be an issue in the region, the prevalence of undernourishment exceeds 5 percent for only a handful of countries, as was the case for Armenia, Georgia, Kyrgyzstan and Tajikistan in 2014-16. Thus, the predominant character of food insecurity in the ECA region concerns neither physical and economic access, nor the stability of access.

Rather, the predominant regional food insecurity issue is malnutrition. The effects of economic development in the region, as reflected in both cross-sectional and time series, indicate important shifts in the diet of populations living there. Taken together, these changes indicate a progression towards what has been called a 'western diet', i.e. one that is high in sweeteners, vegetable and animal fat and low in grains. The effects of these changes have not been uniformly bad or good. Indicators of undernutrition and micronutrient deficiencies have fallen significantly as incomes have risen. However, overnutrition has also become an increasing problem in line with rising incomes. In sum, the change in diets implies that malnutrition affects most of the countries of the ECA region, although it affects each country differently, depending primarily on its level of income.

COUNTRY INDICATORS OF MALNUTRITION IN THE ECA REGION

The three main malnutrition issues of concern in the ECA region are undernutrition, micronutrient deficiencies and overnutrition. Available indicators of these three conditions are broadly correlated with per capita incomes. However, while indicators of undernutrition and micronutrient deficiencies are moderately correlated with income, those for obesity and overweight are highly correlated with per capita incomes.

Undernutrition. The FAO prevalence of undernourishment is commonly used as an indicator of undernutrition. The previous discussion (Table 4) of this indicator suggested that it is a significant problem in only five countries of the region, namely Armenia, Georgia, Kyrgyzstan, Tajikistan and Uzbekistan. However, it is difficult to use this indicator as an analytical tool due to the small number of countries where it is relevant. As can be seen in Table 6 below, anthropometric indicators (i.e. wasting and stunting) suggest that undernutrition is a significant problem in Tajikistan, though Azerbaijan, Armenia, Uzbekistan and perhaps Turkmenistan and Ukraine are also at risk.

Stunting and wasting are only moderately correlated with per capita income (Table 6, last line), and the correlation has decreased during the 2000s. On the other hand, the correlation between stunting and wasting in Table 6 is high (82 percent in the 'last year'), indicating that these two indicators may be driven by similar underlying phenomena, one of which is undoubtedly poverty. However, the two measures differ. Stunting (low height for age) indicates the failure of a child to reach growth potential as a result of poor health or nutrition. High levels of stunting are indicative of poverty and frequent or early exposure to illness or inappropriate feeding practices. Wasting (low weight for height),

or thinness, indicates in most cases a recent and severe process of weight loss which may be associated with hunger and/or severe disease. However, wasting may also be the result of chronic poverty. If there is no severe food shortage, the prevalence of wasting is usually below 5 percent. A prevalence exceeding 5 percent is alarming given the parallel increase in mortality that can accompany this. A prevalence of wasting of between 10-14 percent is regarded as serious and thought to be critical if above or equal to 15 percent (WHO, 2016a).

Micronutrient deficiencies. Iron, vitamin A and zinc deficiencies were the three leading risk factors connected with micronutrients reported in the WHO 2002 World Health Report on the Global Burden of Disease (Darnton-Hill *et al.*, 2005).

The prevalence of these micronutrient deficiencies is most severe in the poorer countries of the Caucasus and Central Asia, as well as in Moldova (Table 8). Micronutrient deficiencies can be caused by the inadequate intake of vitamin rich-foods, as well as the insufficient consumption of foods containing nutrients important for their absorption. This could involve, for example, improper feeding practices for infants or small children. Diet is thus affected by maternal education as well as by socioeconomic factors, such as income levels (Darnton-Hill *et al.*, 2005; de Queiroz *et al.*, 2013).

In the early 2000s the Central Asian countries led an extraordinarily effective campaign to reduce the incidence of iron deficiency through flour and salt fortification measures (ADB, 2010). The effects of this campaign can be seen in Table 7 by comparing

TABLE 6

SELECTED INDICATORS OF UNDERNUTRITION FOR COUNTRIES IN THE ECA REGION

		Stunting (percent of children <5 y.o.)		Wasting (percent of children <5 y.o.)	
Country	**Years**	**First year**	**Last year**	**First year**	**Last year**
Armenia	1998, 2010	15.1	20.8	3.3	4.2
Azerbaijan	2001, 2013	18.0	18.0	3.2	3.1
Belarus	2005		4.5		2.2
Georgia	1999, 2009	16.1	11.3	3.1	1.6
Kazakhstan	1999, 2010	13.9	13.1	2.5	4.1
Kyrgyzstan	1997, 2014	32.6	12.9	3.3	2.8
Moldova	2005, 2012	11.3	6.4	5.8	1.9
Tajikistan	2005, 2012	33.1	26.8	8.7	9.9
Turkmenistan	2000	28.1		7.1	
Ukraine	2000, 2002*	22.9	3.7	8.2	0.3
Uzbekistan	1996, 2006	39.0	19.6	13.7	4.5
Correlation with income per capita, 2010		-0.45	-0.29	-0.48	-0.33

SOURCES: *Age-adjusted data from UNICEF, WHO, World Bank (2015); FAOSTAT (2016).

the reductions of anaemia in children under 5 between 1998 and 2010 in Central Asia with changes in anaemia in other countries. Even post-civil war Tajikistan has had success on this issue, judging by the figures in Table 7. These impressive reductions in anaemia were accompanied by just as impressive falls in the incidence of stunting and wasting shown in Table 6.

Turning to the other two indicators in Table 7, a cross-country comparison of the levels of micronutrient deficiencies with per capita incomes indicates that zinc deficiencies are moderately correlated with country-level per capita incomes, but vitamin A deficiency in children attending pre-school is only weakly associated with per capita incomes. The moderate or weak correlation with per capita

TABLE 7

MAJOR MICRONUTRIENT DEFICIENCIES FOR COUNTRIES IN THE ECA REGION

	Anaemia, children aged under 5*		Vitamin A deficiency in pre-school aged children**	Prevalence of zinc deficiency***
Country	1998	2010	1995-2005	2004
Austria	12	13		8.4
European Union	15	16		
France	12	13		4.2
Germany	12	13		12.5
United Kingdom	10	12		8.6
Armenia	27	33	0.6	49.4
Azerbaijan	41	36	32.1	47.5
Belarus	26	25	17.4	5.8
Georgia	31	26	30.9	47.3
Kazakhstan	45	30	27.1	9.6
Kyrgyzstan	44	36	26.3	13.8
Moldova	29	29	25.6	30.8
Russian Federation	26	26	14.1	11.7
Tajikistan	42	29	26.8	66.8
Turkmenistan	55	44	28.0	24.2
Ukraine	27	26	23.8	15.8
Uzbekistan	55	44	53.1	24.4
Correlation with income per capita, 2010	-0.77	-0.83	-0.26	-0.60

SOURCES: FAOSTAT (2016); (WHO, 2009); (Hotz and Brown, 2004).

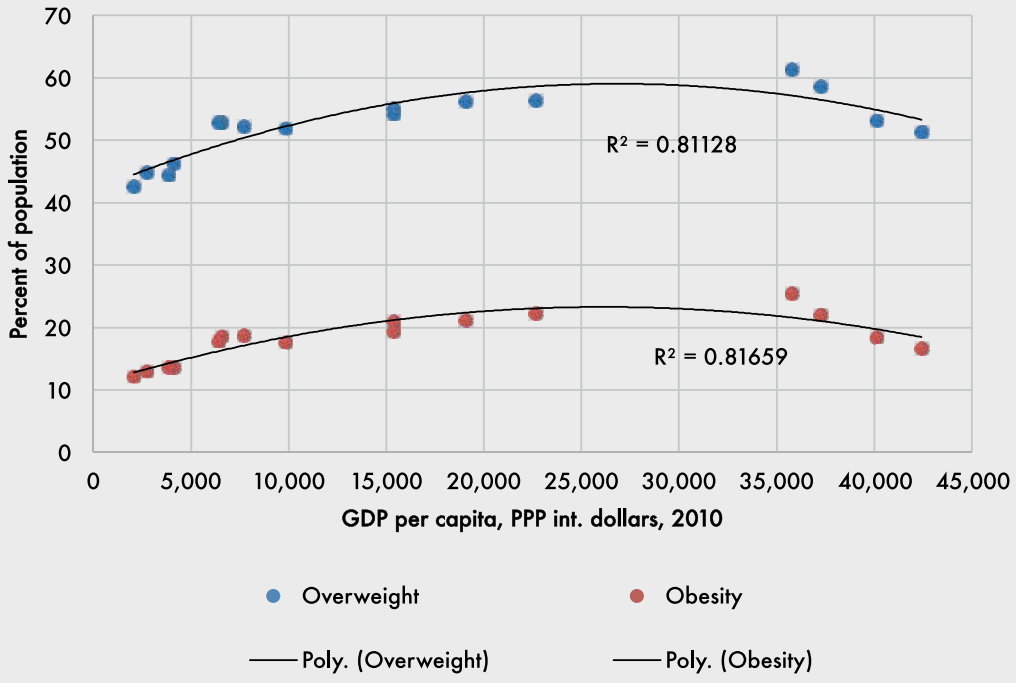
* Estimated percent of children 0 to 5 with with Hb<110 g./L (FAOSTAT, 2016).

** Estimated percent of the children aged 0-5 with serum retinol <0.70 µmol/l (WHO, 2009, Table A3.3).

*** Estimated percent of population at risk for inadequate zinc intake. The recommended daily allowance of zinc consumption for a male of 65 kg. was estimated at between 13 and 19 mg./day, depending on the type of diet (Hotz and Brown, 2004, Appendix 1).

FIGURE 11

PREVALENCE OF THE OVERWEIGHT (BODY MASS INDEX >= 25) AND OBESE (BODY MASS INDEX >= 30) POPULATION IN THE ECA REGION (AGE STANDARDIZED ESTIMATES), 2010



SOURCES: FAOSTAT (2016) for supply of protein of animal origin in gr/capita/day. World Bank WDI (2016c) for GDP figures.

income indicates that non-income factors play a role in undernutrition and micronutrient deficiencies in the ECA region. However, with the exception of the flour and salt fortification measures implemented in Central Asia in the 2000s, it is not possible to identify which factors explain the differences in these indicators in individual countries.

Overweight and obesity. If undernutrition and micronutrient deficiency indicators are only moderately correlated with income, the overweight and obesity data are closely tied to per capita incomes. Those segments of the population that are overweight and obese display clear upside-down U-curves (second degree polynomial) as per capita incomes increase (Figure 11). In other words, this population segment tends to increase as per capita incomes grow until a level of between USD 30,000-40,000 (in 2010 international dollars), after which the trend is reversed.

TABLE 8

MEAN VALUES OF NUTRITION INDICATORS IN THE ECA REGION, BY COUNTRY CLUSTER

Primary nutrition indicator	Year	Country cluster			
		Undernutrition and micronutrient deficiencies	Triple burden	Overnutrition	Less concern
Undernutrition					
Prevalence of undernourishment (2011) (%)	2011	11	15	<5	<5
Average dietary energy supply (DES) adequacy (2010) (100=adequacy)	2010	113	123	129	136
Prevalence of stunting in children aged under 5 (%)	Latest data, 2005-2010	23	20	8	6
Micronutrient deficiencies					
Prevalence of anaemia, children aged under 5, (percentage of children aged under 5 whose haemoglobin level is less than 110 grams per litre at sea level)	Latest data 1990-2005	40	36	24	13
Prevalence of anaemia among pregnant women (%)		40	40	26	16
Prevalence of anaemia in non-pregnant women (%)		43	32	20	14
Proportion of preschool age children with vitamin A deficiency (serum retinol <0.70 µmol/l)		32	32	12	3
Estimated percentage of population at risk of inadequate zinc intake (1992-2000)		32	47	17	9
Overnutrition					
Prevalence of obesity in the adult (18+) population (%)t	2008	15	23	26	21
Prevalence of overweight or obesity in the adult (18+) population (%)	2008	42	55	60	55
Per capita income					
Per capita GDP (PPP) (2005 international dollars)	2010	4 587	10 231	24 399	32 229
Total population of country cluster (millions)	2010	59.6	118.6	510.6	205.9

SOURCES: World Bank WDI, (2016c); Mazzochi *et al.*, (2014), tables 3 and 4. See Table 1 for sources.
Note: unweighted averages by cluster.

EFFECTS OF THE NUTRITION TRANSITION IN THE ECA REGION

The nutrition transition paradigm describes changes in the pattern of consumption as incomes increase, thus altering the balance of the three main malnutrition problems experienced by ECA countries. In a previous section, we have shown how patterns of consumption changed with incomes ("Dietary shifts with economic development: cross-sectional and time series evidence"). In the present section, we analyse four groups or clusters of countries exhibiting similar nutrition profiles at various stages of the nutrition transition. We then explore the differences in the economic burden of malnutrition associated with these country clusters. However, before doing so and in order to group countries according to their predominant nutrition profile, we first need to select indicators for the three main malnutrition issues of concern in the region. However, there is no one ready indicator for each of the nutrition issues. Rather, there are multiple indicators that can be used to track the three nutrition problems. Therefore, we first need to create synthetic indicators (linear combinations of a group of indicators) that reflect the three nutrition problems.[4] This means that for each country in our sample we have three synthetic indicators which capture the degree of undernutrition, micronutrient deficiencies and overnutrition in the country concerned.

We then use cluster analysis to separate the countries into four groups based on a ranking of these synthetic indicators. This statistical methodology gives us four groups of countries, each with an identifiable nutrition problem profile, and characterized by: (a) Undernutrition and micronutrient deficiencies (corresponding to 7 percent of the total population of the region); (b) a triple burden of all three problems (undernutrition, micronutrient deficiencies and overnutrition, 13 percent of the population of the region); (c) overnutrition (57 percent of the population of the region); and (d) countries where nutrition problems are of less concern (23 percent of the population of the region).[5] The four country clusters are listed in Table 8 along with the mean values of the underlying primary nutrition indicators, their per capita income and the total population of the affected countries. The countries included in each cluster are listed in Appendix A.

The country clusters may also be plotted on a map (Figure 12) which shows that the undernutrition and micronutrient deficiency countries are located in Central Asia and the Caucasus, while Kazakhstan, Ukraine and the Balkan countries suffer from the triple burden of malnutrition. As can been in this figure, about half of western European countries are afflicted by overnutrition issues, while the other half of western European countries fall into the category of less concern. However, obesity remains an issue even in country cluster of less concern as over 20 percent of the population of these countries suffer from this malady.

THE SOCIOECONOMIC BURDEN OF DISEASE AND MALNUTRITION

Understanding the distribution of malnutrition-related diseases in the ECA region is a first step in designing appropriate health policy interventions. However, in order to focus policies on the most detrimental health problems, policymakers need a common measure of the disease burden. Such a measure can, for example, help them to decide whether their interventions

[4] The statistical methodology of creating these indicators that minimizes the loss of variability associated with the reduction of the original variables into one indicator is described in Capacci *et al.* (2013).

[5] On the methodology used, see Capacci *et al.* (2013), section 3.2.

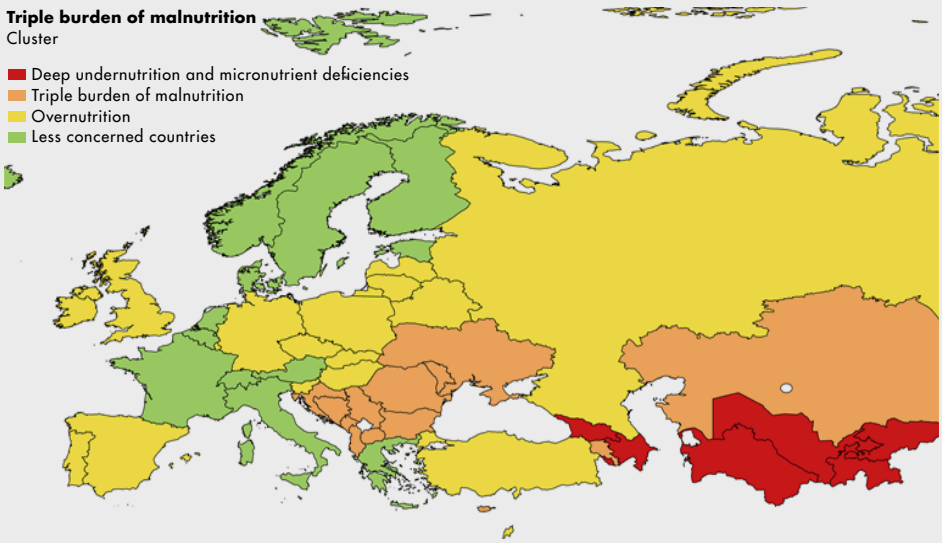
should be directed towards fighting heart disease, diabetes or preventing alcohol abuse. All three diseases result in a social burden, but which of the three result in a higher burden?

We can use the results of the Global Burden of Disease (GBD) project pioneered by the World Bank, and now headed by the Institute for Health Metrics and Evaluation at the University of Washington to define the disease burden. The GBD approach quantifies the comparative magnitude of health loss due to diseases, injuries and risk factors by country and by year (Murray and Lopez, 2013). Policymakers can then compare the social disease burden and decide which diseases require focused policy interventions. The GBD project has developed a single measurement – disability-adjusted life years (DALYs) – to quantify the number of years of life lost as a result of premature death and disability (caused by disease, for example). One DALY is equivalent to one lost year of healthy life, and decision-makers can use them to compare the social burden caused by conditions, e.g. cancer vs depression, using a comparable metric.

Health policy should aim at preventing illness, not just addressing the consequences of illness. In public health, each disease is associated with various risk factors. For instance, overnutrition and obesity are risk factors for diabetes and heart disease, while childhood undernutrition, sub-optimal breastfeeding, child underweight and zinc deficiencies are among the risk factors for lower respiratory tract infections. The GBD Project provides standardized data on potentially preventable risk factors for diseases (IHME and HDNWB, 2013), which facilitates comparison of

FIGURE 12

MAP OF EUROPE AND CENTRAL ASIA BASED ON THE THREE DIMENSIONS OF MALNUTRITION



SOURCE: Mazzocchi *et al.*, (2014).

the burden (in DALYs) of various risk factors. Using this approach, we can compare the number of DALYs lost from risk factors, such as unhealthy diet, tobacco and alcohol use, lack of exercise and air pollution.

The burden of malnutrition in ECA countries

The top five health risk factors in ECA countries in 2010 were (in order of importance): (a) dietary risks; (b) high blood pressure; (c) tobacco; (d) alcohol use; and (f) a high body mass index (Mazzocchi *et al.*, 2014). High blood pressure and high BMI are not always attributable to malnutrition, but often are. Thus, three out of the top five health risk factors in the ECA region in 2010 could be partially or completely attributed to malnutrition. Table 9 presents an analysis of the lost DALYs attributable to the top risk factors in the ECA region in 2010, arranged by country group, as well as the malnutrition-related health risk factors and two other major risk factors unrelated to malnutrition (e.g. alcohol and smoking) for comparison.

Five issues are important to note in this table. First, the undernutrition cluster stands apart from the other clusters in terms of the importance of child and maternal undernutrition-related risk factors. The average DALYs lost to child and maternal undernutrition (which includes micronutrient deficiencies) in the ECA region is only 384 (Table 9, line 2a), which is far less than the other risk factors shown in the table. However, if one considers the undernutrition cluster (Azerbaijan, Georgia, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan), the burden from child and maternal undernutrition-related risks is almost six times higher, with 2,174 DALYs lost per year, a figure comparable to losses due to high BMI or tobacco consumption, as well as those attributable to alcohol consumption. Most of the DALYs lost to child and maternal malnutrition issues are due to improper breast feeding and micronutrient deficiencies, not child underweight.

Second, a snapshot of the ECA undernutrition cluster, reveals differences with the situation in developing countries where the child undernutrition burden per 100,000 population is three times the size of the burden from high BMI (calculated from GBD 2010 data). This is consistent with the attention and importance that developing countries attach to undernutrition-related issues. However, in the undernutrition cluster of the ECA region, the child undernutrition burden per 100,000 population is only 0.86 of the high BMI burden (Table 9, country group 1, lines 2a and 2b). This difference is partly due to major results in tackling undernutrition (including underweight), as shown by the rapid decrease in DALYs lost to child and maternal undernutrition (-5.7 percent per year between 1990 and 2010, Table 10, line 2). A close to 6 percent annual decrease in the total burden of child and maternal undernutrition over a 20-year period is a phenomenal achievement, as it translates into a 69 percent decrease in the health and social consequences of undernutrition over the same period! This decrease was accompanied by a rapid growth in the total overnutrition burden of +1.6 percent per year, or 37 percent in total (Table 10, line 3). This "nutrition transition" sets the ECA undernutrition cluster apart from the typical nutrition profile of other developing countries.

Third, DALYs lost due to micronutrient deficiencies are much higher in the poorest group of countries and their decline (-0.4 percent per year, Table 10, line 4) has been relatively slow when compared to the cluster affected by the triple malnutrition burden. Clearly, here is an important area for improvement in the undernutrition cluster where the triple burden countries have achieved some success.

Fourth, the triple burden countries (Kazakhstan, Ukraine and the Balkan countries) bear the highest social burden from high BMI, even though their overweight rates are lower than those for the overnutrition cluster (see Table 8, overnutrition section). This seeming inconsistency can be explained by noting the significantly higher per capita health expenditure than in the overnutrition cluster of countries (Table 11, line 1). Better health care mitigates the adverse health effect of malnutrition, and countries with a less developed health care system are also those suffering the highest loss.

TABLE 9

DALYS ATTRIBUTABLE TO MALNUTRITION-RELATED RISK FACTORS IN 2010, BY COUNTRY GROUPS (DALYS LOST) PER 100,000 POPULATION

Indicator		Country groups				
		1	2	3	4	Total ECA
		Under nutrition	Triple burden	Over nutrition	Less concerned	
1	**TOTAL DALYs lost (per 100 000 pop) to disease**	33 925	38 996	33 156	26 912	32 574
2	**Malnutrition-related risk factors**					
a	Child and maternal undernutrition-related risk factors	2 174	471	294	48	384
	---Childhood underweight	*298*	*22*	*8*	*2*	*27*
	---Suboptimal breastfeeding	*1 033*	*74*	*20*	*0*	*88*
	*---Micronutrient deficiencies**	*843*	*375*	*266*	*46*	*268*
b	High body mass index (BMI)	2 535	4 452	3 788	2 186	3 431
c	Dietary risk factors**	5 602	9 515	6 236	3 304	5 972
d	High blood pressure	4 256	8 425	5 092	2 573	4 916
e	High total cholesterol	899	2 390	1 877	886	1 657
3	**Alcohol use**	1582	5 425	4 161	1 095	3 465
4	**Tobacco smoking**	2 769	5 089	4 251	2 793	3 936

SOURCE: Mazzocchi *et al.*, (2014). Processing of GBD 1990 and 2010 data.

*The GBD 2010 dataset does not include an aggregate estimate for micronutrient deficiencies. Our estimate is the simple difference between total DALYs lost to child and maternal undernutrition and DALYs lost to childhood underweight and suboptimal breastfeeding. This figure may be an underestimate of the actual burden, because childhood underweight and suboptimal breastfeeding are likely to be associated with micronutrient deficiencies.

Note: weighted averages using country populations as weights.

**Dietary risk factors include a diet low in fruit, vegetable, fibre, polyunsaturated fatty acids, calcium, whole grains, nuts and seeds, seafood omega-3 fatty acids and milk. Dietary risk factors also include a diet high in sodium, processed meat, trans-fatty acids, sugar-sweetened beverages and red meat (Mazzocchi *et al.*, 2014).

Fifth, based on the trends of the past 20 years, the undernutrition cluster is set to transition into the triple burden category, with DALYs from high BMI growing more rapidly than in any other cluster, and those from child and maternal undernutrition decreasing more than in the other clusters (Table 10, lines 2 and 3). As these countries transition to the triple burden category, health expenditures will need to rise rapidly and substantially to deal effectively with the higher healthcare costs associated with a higher level of NCDs.

To get an idea of the relative difficulties in paying for the higher level of NCDs, consider to what extent real per capita health expenditures increased per year of life expectancy over the period 1995-2010 by country group (Table 11, line 7). For the undernutrition group health expenditures increased by about USD 181 dollars per capita (in PPP 2005 international dollars), while life expectancy at birth increased by 2.56 years. That is about USD 71 per year gained. But USD 71 is about the same level that was spent on

health care in 1995 (in PPP 2005 international dollars). This shows that, on average, an increase in life expectancy of one year was accompanied by a nearly 100 percent increase in per capita healthcare expenditure (line 7). For the triple burden countries, this ratio is 144 percent, and considerably smaller (37 and 24 percent) for the overnutrition and less concerned country groups.

By making this comparison we do not mean to imply that life expectancy at birth is solely due to per capita health expenditures. However, the logic underpinning the comparison is easy to understand. In countries where the main disease burden are NCDs, the health infrastructure is already in place to deal with these challenges. Thus, increases in life expectancy can be achieved through relatively modest increases in health expenditures (at least in terms of the percentage of funds already spent on health care) and, although the absolute values of increases per year of life expectancy gained are large, the percentage increases become smaller as countries build up their health infrastructure. However, in countries where the increasing NCD burden is a new phenomenon, a different health infrastructure needs to be built, requiring a high (compared to current levels) initial investment.

In short, as countries grow, their predominant food insecurity concerns shift from primarily undernutrition to include micronutrient deficiencies and overnutrition as well. High initial costs are to be foreseen in addressing the growing challenge of NCDs and mitigating the effects of the triple burden.

TABLE 10

ANNUAL CHANGE IN DALYS LOST TO RISK FACTORS IN THE ECA REGION, 1990-2010 (IN PERCENT)

Indicator		Country groups				
		1	2	3	4	Total ECA
		Under nutrition	Triple burden	Over nutrition	Less concerned	
1	Total disease	-1.4	0.2	-0.4	-0.4	-0.4
2	Child and maternal undernutrition	-5.7	-2.9	-4.0	-0.5	-4.3
3	High body mass index	1.6	1.5	0.8	0.0	0.8
4	Micronutrient deficiencies	-0.4	-1.1	-0.7	-0.4	-0.7
5	Dietary risk factors	0.4	0.9	-0.5	-1.6	-0.4

SOURCE: Mazzocchi *et al.*, (2014). Processing of GBD 1990 and 2010 data.

TABLE 11

HEALTH EXPENDITURE IN THE ECA REGION, 2010

	Indicator	Country groups				
		1	2	3	4	Total ECA
		Under nutrition	Triple burden	Over nutrition	Less concerned	
1	Health expenditure per capita, PPP (2005 international dollars) (2010)	252	730	2 257	3 817	2 275
2	Health expenditure, public (percentage of total health expenditure) (2010)	42	62	71	77	69
3	Health expenditure, total (percentage of GDP) (2010)	5.8	7.2	8.2	10.6	8.5
4	Life expectancy at birth (years) (2010)	69	72	75	81	76
5	Change in life expectancy (total years gained) (1990-2010)	2.6	1.5	4.2	4.6	3.8
6	Annual change in real per capita health expenditure (1995-2010) (percentage per year)	8.8	8.0	6.5	5.1	6.0
7	Change in health expenditures per year of life expectancy gained (1995-2010) (percent)	99	144	37	24	36

SOURCE: Mazzocchi *et al.*, (2014). Processing of GBD 1990 and 2010 data.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PART 2

POLICIES TO ADDRESS FOOD INSECURITY IN THE ECA REGION

ZSAMBOK, HUNGARY
A row of organic Stuttgart onions at the Biokert farm.
©FAO/Mark Milstein

PART 2

POLICIES TO ADDRESS FOOD INSECURITY IN THE ECA REGION

What does the analysis of Part I tell us about the policies that should be employed to eradicate food insecurity in the ECA region? First, evidence from the past 23 years indicates that general growth lies at the heart of poverty reduction in this region. The origins of general growth lie in the gradual implementation of transition policies (including redistributive land reforms) throughout the economy in the 1990s, as well as the devaluation of the rouble in 1998 and the rise of oil prices in 1999 and 2000. Once general growth was underway, agricultural, social protection and other redistributive policies played a secondary role in poverty reduction. Social assistance benefits, with the partial exception of pensions, are quite small, often so small that they remain unclaimed (Abdurazakova, unpublished). This is not to say that targeted social support policies are not important for individuals. However, it should be noted that pro-poor policies have not led to significant poverty reduction in the ECA region, and that poverty reduction is attributable to general economic growth in the region.

Second, growth in this region has tended to be highly pro-poor, mostly due to labour and employment policies. Pro-poor growth has been rooted in the socioeconomic profile of the poor in the region, i.e. they have tended to be employees with children, as well the labour practice of keeping workers employed during recessions by running wage arrears. Reductions of wage arrears during economic upswings have had a profound pro-poor effect on incomes. Pensions and remittances are also important parts of the incomes of the poor in the region. However, even in Tajikistan, the poorest country of the region with a high rate of self-employment, 40 percent of the increases in income from 2007 to 2010 resulted from increases in labour earnings, while only 12 percent were a result of increases in remittances.

Third, growing affluence in the region has shifted the focus of food insecurity in the region from ensuring adequate calories — which was a problem for certain countries in the early 1990s (see Figures 2 and 3) – to improving the quality of the diet. Food insecurity in the region is therefore largely connected to malnutrition, which is reflected in the malnutrition profiles of country clusters in Table 9. The country groups in this table show that in countries with 57 percent of the region's population, the predominant malnutrition (and food insecurity) issue is overnutrition, while 13 percent of the region's population reside in countries with a triple burden of undernutrition, micronutrient deficiencies and overnutrition. On the other hand, only 7 percent of the population lived in countries where the predominant food insecurity concerns are undernutrition and micronutrient deficiencies, and another 23 percent live in countries where malnutrition is of lesser concern. The experience of the past 23 years suggests that ensuring sustained long-term growth of the economy is central to further poverty reduction in the region, and is thus assumed to be key to ensuring food security. Beyond this, policies aimed specifically at malnutrition may be appropriate. The following measures encapsulate the types of policies which have successfully been implemented in this region. The country clusters for which the policies are most relevant are indicated in parentheses. The following sections on nutrition policies are based on earlier work by Mazzocchi *et al.* (2014) and FAO (2014).

FOOD AND BIO-FORTIFICATION (UNDERNUTRITION CLUSTER)

Food fortification is a way to address population-wide deficiencies in basic vitamins and minerals which can result in a medical condition. For example, in the 1920s in the United States research indicated that iodine could prevent goitre – a then widespread medical condition. This evidence provided the basis for arguments for salt iodization. Fortification of milk with vitamin D began in the United States in the 1930s to prevent rickets in children. Furthermore, flour and bread began to be fortified with B vitamins in 1941 when deficiencies of these vitamins were widespread in both the United States and Europe (Samaniego-Vaesken *et al.*, 2012).

In the 2000s, the Asian Development Bank and UNICEF formed a partnership with Central Asian governments and the private sector to develop programmes to iodize salt and fortify wheat flour. These programmes have helped achieve near universal salt iodization and fortification of wheat flour with iron, folic acid, thiamine, riboflavin, niacin and zinc (ADB, 2010). This initiative has led to a situation in which countries in Central Asia and the Caucasus are either planning, or already have, active folic acid fortification programmes for wheat flour – similar programmes are for the most part absent in Western Europe (Food Fortification Initiative, 2016). It is also one of the chief reasons for the observed falls in the prevalence of stunting, wasting and micronutrient deficiencies evident in Tables 6 and 7.

Bio-fortification uses plant breeding to increase the micronutrient content of crops (Bouis and Islam, 2012). However, while bio-fortification cannot always provide the same level of nutrients as food supplements or fortified food, they can nonetheless increase the intake of micronutrients in Central Asian countries where wheat is the main dietary staple. Modern high-yield wheat cultivars are a poor source of micronutrients, particularly iron and zinc. Wheat loses micronutrient content in the milling process and also contains anti-nutritional components, such as phytic acid that reduces the bioavailability of these nutrients (Cakmak *et al.*, 2010). A programme of bio-fortification can thus be recommended to offset the relatively poor micronutrient content of wheat in the region. This is particularly relevant in Caucasus and Central Asian countries, where cereals supply more than 50 percent of dietary energy and per capita consumption of meat and/or milk is relatively low (Bruinsma, 2012).

HarvestPlus (see Box 2) and International Maize and Wheat Improvement Center (CIMMYT) programmes have demonstrated that bio-fortified staple crop seeds can be developed and marketed in less developed countries, and can contribute to reducing micronutrient deficiencies in the population. Regional iron and zinc fortified wheat breeding programmes may be a cost-effective way to reduce zinc and iron deficiencies as wheat plays such an important part in the diets of the poor. In an analysis of major wheat varieties grown in Central Asia, Morgounov (2007) notes a strong positive correlation between iron and zinc concentrations and grain protein content. Thus, a programme aimed at increasing zinc and iron micronutrients could simultaneously increase protein content as well. The International Centre for Agricultural Research in the Dry Areas (ICARDA), International Maize and Wheat Improvement Centre (CIMMYT) and other regional organizations, may wish to allocate R&D funding to bio-fortification, and encourage national agricultural research services to launch a joint pilot programme to develop bio-fortified wheat varieties.

FOOD REFORMULATION (ALL CLUSTERS)

Convenience foods can contain 'unhealthy' levels of nutrients, such as salt, trans- and saturated fats and sugar. Nutrition labelling, though useful, is often not enough to raise the awareness of consumers on the overall nutritional composition of their meals (Mayer, 2008). Food product reformulation to reduce levels of specified nutrients in processed foods may be mandated through legislation; one example of this is the banning of trans-fats in Denmark (Capacci *et al.*, 2012). More commonly, industry and governments may collaborate to reduce the proportion and amount of particular nutrients in processed food products (e.g. the Responsibility Deal in the United Kingdom, and initiatives in Spain, France and several other European countries).

BOX 2

HARVESTPLUS: BREEDING CROPS FOR IMPROVED MICRONUTRIENT CONTENT

HarvestPlus is a R&D programme for breeding and disseminating new varieties of crops with enhanced micronutrient content, with a special focus on iron, zinc and vitamin A, and forms part of the Consultative Group for International Agricultural Research's (CGIAR) Agriculture for Nutrition and Health (A4NH) programme.

HarvestPlus makes available new micronutrient-dense varieties of key crops and aims to help lower the burden of micronutrient malnutrition in the developing world. HarvestPlus' current portfolio consists of iron-fortified beans and pearl millet, vitamin-A fortified cassava, maize and sweet potato, and zinc-fortified rice and wheat.

SOURCE: HarvestPlus (2016).

Voluntary reformulation combined with information campaigns has contributed to a 10 percent reduction in salt intake in the United Kingdom (Shankar *et al.*, 2013), but there are still concerns about excessive levels of salt and trans-fats in certain processed and take-away foods in some Eastern European countries (European Heart Network, 2011).

Dietary intake of salt affects blood pressure levels and should be limited in order to reduce the risk of coronary heart disease and stroke (WHO, 2007). WHO recommends a target salt intake level of 5 g per day. In most Western European and Baltic countries salt intake is between 5 to 10 g per day. However, in other areas of Europe salt intake ranges from 13.6 g per day in the Czech Republic to 14.8 g in Hungary and 18 g per day in Turkey. These countries have now begun actions to lower salt levels (e.g. maximum levels of salt in bread in Turkey). There is little information on salt intake levels in other ECA countries (Powles J., Fahimi S., Micha R. *et al.*, 2013).
A survey of policies in ECA countries (WHO, 2013) showed that maximum limits of salt and added fat have been established for processed

foods in FYROM, whereas in the Russian Federation there are voluntary limits, and in Ukraine draft salt reduction legislation has been prepared. In high-income countries salt is to a very large extent consumed through processed foods, so intakes may be much lower in countries with low consumption of processed food. However, evidence from Eastern Europe suggests that in the early stages of food chain modernization, higher levels of salt may be used. Government-industry collaboration for raising consumer awareness and agreeing on voluntary limits during these early stages would perhaps prevent salt becoming a severe problem, thus reducing an important risk factor for coronary heart disease and stroke.

FISCAL MEASURES (TRIPLE BURDEN, OVERNUTRITION AND LESS CONCERNED COUNTRIES)

Fiscal measures – taxes or subsidies designed to change the relative prices of foods or nutrients depending on their healthiness – have been introduced in Denmark, Hungary, Finland and France (Wang *et al.*, 2012). Three of these countries (Denmark, Hungary and Finland) have also introduced taxes on saturated fats and sugars in foods, while France has introduced taxes on soft drinks. The United Kingdom plans to introduce a tax on soft drinks in 2018, and France is considering introducing a saturated fat tax (BBC News, 2016; The Telegraph, 2016).

The effectiveness of reducing consumption of targeted foods through tax measures has been shown in simulation studies (Cecchini *et al.*, 2010) and in empirical studies, although the implications for public health from taxes alone seem to be marginal. Assessments of the Danish tax (which was repealed in 2013) indicate that it was effective in reducing consumption of saturated and unsaturated fats, as well as dietary cholesterol (Jensen and Smed, 2013; Bodker *et al.*, 2015). These reductions were associated with marginal changes in the population risk of ischemic heart disease. Although the financial consequences of fiscal measures are regressive (their financial impact is proportionally greater for the poor), the health benefits are progressive; in other words, they are greatest for the poor, since low-income groups are more responsive to price changes and their initial consumption levels are 'worse' (e.g. Smed *et al.*, 2007; Allais *et al.*, 2010). Furthermore, even if moderate taxation levels have only a modest effect on diet or health, they can generate large revenues for national governments.

Subsidization of so-called 'social' foods, such as certain types of bread, vegetable oil, salt, groats and other basic foods, is still a widespread practice in the post-Soviet countries, such as Kazakhstan, Kyrgyzstan, Uzbekistan, the Russian Federation, Turkmenistan and others. These programmes are justified for their supposed effect in lowering the cost of basic foods for the poor. In reality, the bulk of subsidies embodied by price controls is transferred to the non-poor, limiting the effectiveness of these measures as anti-poverty measures. In the current period of lower regional growth some governments have begun to cut back on such programmes. For instance, the Government of Kazakhstan cancelled price controls on certain types of bread in 2016 (EurasiaNet.org, 2015).

NUTRITION EDUCATION (ALL CLUSTERS)

The main goal of nutrition education is to inform people on what constitutes a healthy, balanced diet, as well as how to improve their diet and lifestyle. Interventions aimed at children in schools are widespread throughout the European Union; adults in the workplace are not currently the focus of awareness-raising campaigns, but could be targeted at a future date. At present nutrition education is not compulsory in most EU countries, nor in other ECA countries, except in the Russian Federation. However, it is possible to find nutrition education aimed at children in most countries. Nutrition education is vital as it makes it possible to make informed choices and should

be introduced as a compulsory component of the school curriculum in all countries. As suggested by FAO's The State of Food and Agriculture 2013 (FAO, 2013), another educational target are mothers of young children. The progress made in reducing the DALYs associated with child and maternal undernutrition in the undernutrition and triple burden countries (Table 10, line 2) suggests that considerable progress may have been made in maternal nutritional education in the low- and middle-income countries in the ECA region between 1990 and 2010.

FOOD SAFETY (ALL CLUSTERS)

Food safety and food security are interlinked concepts with a clear impact on the quality of human life. A major part of food security is ensuring that food is safe from microbiological hazards, such as bacteria, viruses and parasites. In addition, inadequate food safety control and enforcement significantly inhibits regional agribusiness growth. Two issues which have the potential to improve food safety control in the region are the establishment of single food safety control agencies and the introduction of standardized food safety regulations in the countries belonging to the five countries (Armenia, Belarus, Kazakhstan, Kyrgyztan, and the Russian Federation) belonging to Eurasian Economic Union (EAEU).

Fragmented food safety systems can cause inconsistent oversight, ineffective coordination, and inefficient uses of resources. Several countries in the region, including Croatia (2005), Albania (2010), Bosnia and Herzegovina (2006), Georgia (2011), Kosovo (2010), Moldova (2013), FYROM (2005) and Ukraine (2015), have established single food safety agencies to streamline food safety control in their countries. These agencies should be viewed as part of long-term strategies to rationalize food safety control systems, rather than a one-time reform measure. The transition of authority to a new single food safety agency has usually been phased in gradually, allowing for the old and new systems to work in parallel in order to compensate for lack of capacity in new structures. At the end of the transition period, however, single food safety agencies have the potential to reduce bureaucratic fragmentation, but only with adequate funding and political will.

One of the potential advantages of the establishment of the Eurasian Customs Union (EACU) in 2010, and the Eurasian Economic Union in 2015, is the standardization of food safety, sanitary, phytosanitary and hygiene regulations. Food safety regulations introduced by the EACU in 2011 stipulates that unprocessed raw food products of animal origin (e.g. raw milk or meat) should be subjected to veterinary and sanitary examination before they can be marketed. Veterinary and sanitary inspections are, however, carried out in accordance with national regulations. Since then, the Eurasian Economic Commission (EAEC) (the central intergovernmental regulatory body of the EAEU has taken a more active role in issuing food safety, sanitary and phytosanitary regulations; these are applicable in EAEU member states and do not need to be integrated into their domestic legislation. For instance, unified veterinary certificates were approved by decision of the EAEC Collegium on 1 November 2016, and the EAEC's Collegium published a draft decision on unified veterinary (veterinary-sanitary) requirements for objects subject to veterinary control (supervision) for public discussion on 7 November 2016. Finally, on 30 September 2016 the Collegium published a draft decision of the EAEC Council on a common list of quarantine objects (pests) for the EAEU. These and other regulations indicate that the EAEC is gradually moving toward standardizing regulation in the sphere of sanitary, phytosanitary and food safety issues. However, all issues relating to implementation are left to country-level authorities, which presents formidable obstacles for the actual enactment of standardized regulations (Sedik, Ulbricht and Dzhamankulov, 2016).

NUTRITION LABELLING (ALL CLUSTERS)

Nutrition labelling seeks to inform consumers about the nutritional composition of food. It has a relatively long history and is heavily regulated in many high-income countries, including in the EU. The most widespread format used is the back-of-pack nutrition table (compulsory for packaged groceries in the EU), while visual information, typically guideline daily amounts (GDAs), is more commonly present on front-of-pack (Storcksdieck genannt Bonsmann *et al.*, 2010). While nutrition labels allow healthier food choices, it is not clear whether they are effective in instigating behavioural change among consumers. Evidence from the EU's Food Labelling to Advance Better Education for Life (FLABEL) initiative suggests that attention is greater for front-of-pack labelling, but is more frequently read by already motivated consumers.

The EAEU has also proposed revised regulations on product labeling. On 2 February 2016, the EAEC published its draft amendment No. 1 to the EAEU Technical Regulation "On Food Products Labeling" for public comment. The draft aims to specify the criteria for legibility, adequacy and clarity of food labelling.

Along with nutritional labelling, labelling is also needed to indicate the use of fortification (iodine, iron, vitamins, etc.). It may also be important for countries that favour the adoption of voluntary reformulation to lower salt levels, saturated and trans-fats in processed foods to introduce some form of government authorized and approved logo to avoid consumers becoming confused if companies began to use their own individual signaling conventions. In Sweden, Denmark and Norway, a keyhole logo is used, while in Central Asia a Healthy Food smiley face logo has been approved. Consumer clarity and confidence is vital if consumers are to be willing to pay a premium for fortified food. (Up to now, these reformulation initiatives are voluntary but may need to become mandatory in the future). Of course, all forms of labelling need to be accompanied by education and social marketing.

FOOD ASSISTANCE POLICIES (ALL CLUSTERS)

Food assistance programmes (FAPs) include voucher and food subsidy programmes, as well as food transfer programmes and cash transfers. Vouchers for food purchases for vulnerable populations, particularly for pregnant women, new mothers and children, are used in the United States' Supplementary Nutritional Assistance Program (SNAP, formerly food stamps) and the Women, Infants and Children (WIC) scheme. Evidence suggests that targeting children under two and pregnant women is likely to provide the greatest nutritional payoff, and therefore the WIC scheme has been shown to be highly cost-effective in promoting the nutritional health of its recipients in the United States (Nord and Golla, 2009). SNAP, meanwhile, has been shown to be a cost-effective manner of improving the diets of low-income families.

In the United Kingdom, Healthy Start seeks to achieve similar objectives and distributes vouchers to pregnant women and new mothers to purchase milk, fresh and frozen fruits and vegetables and infant formula and vitamins. The National Health Service in the United Kingdom recommends that other EU Member States recognize the benefits of targeted voucher programmes, such as Healthy Start, as a cost-effective way to improve the nutrition of important vulnerable populations.

School feeding programmes in the post-Soviet region have been used to provide subsidized milk and meals to school children. For example, the Kyrgyz Ministry of Education and Science is expanding the Kyrgyz Republic's school meals programme in the country's poorest rural areas with financial and technical support from the Russian Federation and other donors (WFP, 2015). Since 2013, the Kyrgyz government has worked to scale up and enhance school feeding programmes, and now supports core school feeding programmes in many schools and school vegetable and garden pilot projects (WFP, 2016). Programmes that

combine school feeding with agricultural development are the subject of experimental pilots in many parts of the world, and often directly procure food for school feeding from local farmers. However, it remains to be seen how successful these programmes will be, as coordinating farmers and service delivery systems to work together to supply schools is challenging (Sumberg and Sabates-Wheeler, 2011). The Kyrgyz pilot project employs gardens located directly at the schools in order to partially remedy potential logistical problems.

Globally, traditional in-kind food assistance initiatives, such as the Kyrgyz school feeding programme, have over time been replaced by cash transfer programmes, due to substantially lower administrative costs and the ability to meet the various needs of poor, nutritionally vulnerable households in a flexible manner. Local food markets have become the predominant means of procuring food for assistance programmes, and as the vehicle for enabling access to food through cash transfers.

Kyrgyzstan and the Russian Federation are examples of countries that have increased public funding for the implementation of cash transfer programmes. In 2015, the Government of Kyrgyzstan adopted the National Social Protection Programme, which aims to shift spending toward the "Monthly Benefit for Poor Families with Children Programme" (MBPF) to reach 45 percent of the total benefit budget. This means-tested transfer initiative provides monthly cash benefits to lift per capita income of children in eligible households to the Guaranteed Minimum Income (GMI). Furthermore, the Russian Federation increased funding for family grants of the Maternity Capital Programme in 2015. The grant is indexed, and was equal to 453,000 roubles (7 342 USD) on 1 January 2015, which was an increase over the average for the previous year (429 000 roubles or 11 178 USD) in rouble terms, but a decrease when converted to US dollars. The grant is issued in the form of a voucher to families with a second or subsequent child, whether born or adopted, regardless of a family's income status. In addition to mothers of two or more children, single fathers of adopted children or children themselves (upon the loss of both parents) are entitled to the Maternal (Family) Capital. Targeted beneficiaries can use the voucher to: (a) improve their housing conditions (e.g. buying an apartment, building a house or paying off a mortgage); (b) pay for their children's education (including early childhood education); and (c) contribute to mother's pension fund (to increase the amount of her retirement income) (ILO, 2016).

The Russian Maternity Capital Programme is a 'category programme', in other words it is not targeted at the poor. Category social protection policies are an important reason why social protection programmes in the post-Soviet countries have only a limited effect on poverty and food insecurity (Abdurazakova, unpublished). Even in Kyrgyzstan, where targeted social protection is perhaps most developed, more than two-thirds of social assistance spending goes into poorly targeted programmes (World Bank, 2016b).

CONCLUSION

In this review of food insecurity in the Europe and Central Asian region over the past 23 years, we have identified three sets of important factors which seem to be responsible for the reduction of food insecurity in the region.

(1) Reduction of armed conflicts. The cessation of armed conflicts in the Western Balkans (1991-1995), Armenia and Georgia (early 1990s) and Tajikistan (1995-1997), and the distributional land reforms of the mid-1990s made it possible for countries to re-establish physical access and stability of access to food in the mid-1990s to 2000s.

(2) General economic growth. A second and decisive factor responsible for the reduction of food insecurity in the region was general economic growth. One reason why economic growth has played such a decisive role is that it has been pro-poor, meaning that the incomes of the poor grew more rapidly than that of those with average incomes (World Bank, 2003; 2014). Part of the reason for the pro-poor nature of economic growth is the region's poverty profile , which is principally composed of working poor employees and children. The tendency in the post-Soviet countries to prefer running employee wage arrears to layoffs during economic downturns means that economic upturns bring a sharp rise in employee incomes which tend to benefit the poor.

A second reason for the importance of economic growth is connected with initial conditions. Income growth was more pro-poor in countries where incomes were more equal and per capita incomes were higher to begin with. For instance, in the period 1998-2003, poverty fell much more in the middle-income group of CIS countries (Belarus, Kazakhstan, Russian Federation, Ukraine) and the Western Balkan countries (Bosnia and Herzegovina and Romania) than in the low-income CIS countries (Armenia, Kyrgyz Republic, Moldova, Tajikistan, Uzbekistan) (World Bank, 2003).

(3) Nutrition-specific policies. A third factor with a proven record of effectiveness in reducing food insecurity in the region has been nutrition-specific policies, such as food fortification; food reformulation; food safety; public health and nutrition information campaigns; nutrition labelling, and others. Evidence exists in a variety of countries that these policies have led to decreases in nutrition-related risk factors.

The three above-mentioned policy areas have a proven record of reducing food insecurity in the region. Although agricultural and social protection policies are also part of the solution to food insecurity, the record for poverty reduction and reductions in malnutrition indicators in the region shows that conflict resolution, policies aimed at general economic growth and nutrition specific interventions have proven themselves as the main effective food security policies in this region.

APPENDIX A

APPENDIX A

MALNUTRITION COUNTRY CLUSTERS OF THE ECA REGION

Group 1	Group 2	Group 3	Group 4
Undernutrition and micronutrient deficiencies	**Triple burden**	**Overnutrition**	**Less concern**
Azerbaijan	Albania	Belarus	Austria
Georgia	Armenia	Czech Republic	Belgium
Kyrgyzstan	Bosnia and Herzegovina	Germany	Denmark
Tajikistan	Bulgaria	Hungary	Estonia
Turkmenistan	Croatia	Ireland	Finland
Uzbekistan	Cyprus	Israel	France
	Kazakhstan	Latvia	Greece
	The former Yugoslav Republic of Macedonia	Lithuania	Iceland
	Moldova	Luxembourg	Italy
	Montenegro	Malta	Netherlands
	Romania	Poland	Norway
	Serbia	Portugal	Sweden
	Ukraine	Russian Federation	Switzerland
		Slovakia	
		Slovenia	
		Spain	
		Turkey	
		United Kingdom	

SOURCE: Mazzochi *et al.*, (2013).

REFERENCES

Abdurazakova, D. *Social protection and rural population: the case of the post-Soviet countries*. Unpublished.

Asian Development Bank (ADB). 2010. *Satisfying Hidden Hunger. Addressing Micronutrient Deficiencies in Central Asia*. Asian Development Bank (ADB) Nutrition and Development Series, 8.

Allais, O., Bertail, P. & Nichèle, V. 2010. The effects of a fat tax on French households' purchases: a nutritional approach. *American Journal of Agricultural Economics* 92 (1): 228-245.

BBC News. 2016. Sugar tax - how will it work? 16 March.

Bodker, M., Pisinger, C., Toft, U. & Jorgensen, T. 2015. The Danish fat tax - Effects on consumption patterns and risk of ischaemic heart disease. *Preventive Medicine* v. *77*, pp. 200–203, August 2015.

Bouis, H. & Islam, Y. 2012. Delivering nutrients widely through biofortification: building on orange sweet potato. *2020 Vision, Focus 19* (11), IFPRI.

Bruinsma, J. 2012. European and Central Asian Agriculture Towards 2030 and 2050. *Policy Studies on Rural Transition,* 2012-1. Budapest, FAO.

Cakmak, I., Pfeiffer, W.H. & McClafferty, B. 2010. Review: Biofortification of durum wheat with zinc and iron. *Cereal Chemistry* 87(1): 10-20.

Capacci, S. & Mazzocchi, M. 2011. Five-a-day, a price to pay: An evaluation of the UK program impact accounting for market forces. *Journal of Health Economics,* 30 (1): 87-98.

Capacci, S., Mazzocchi, M., Shankar, B., Macias, J.B., Verbeke, W., Pérez-Cueto, F.J., Kozioł-Kozakowska, A., Piórecka, B., Niedzwiedzka, B., D'Addesa, D. & Saba, A. 2012. Policies to promote healthy eating in Europe: a structured review of policies and their effectiveness. *Nutrition reviews, 70* (3), pp.188-200.

Capacci, S., Mazzocchi, M., Shankar, B. & B. Trail. 2013. The triple burden of malnutrition in Europe and Central Asia: a multivariate analysis. *REU Policy Studies on Rural Transition.*

Cecchini, M., Sassi, F., Lauer, J.A., Lee, Y.Y., Guajardo-Barron, V. & Chisholm, D. 2010. Tackling of unhealthy diets, physical inactivity, and obesity: health effects and cost-effectiveness. *The Lancet,* 376(9754): 1775-1784.

Committee on World Food Security High Level Panel of Experts (HLPE). 2011. *Price volatility and food security.* A report by the High-Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome, FAO.

Darnton-Hill, I., Webb, P., Harvey, P., Hunt, J., Dalmiya, N., Chopra, M., Ball, M., Bloem, M. & de Benoist, B. 2005. Micronutrient deficiencies and gender: social and economic costs. *The American Journal of Clinical Nutrition,* 81 (suppl): 1198-1205.

de Queiroz, D., de Azevedo Paiva, A., Figueroa Pedraza, D., Lins da Cunha, M., Esteves, G., Gil de Luna, J. & Diniz, A. 2013. Vitamin A deficiency and associated factors in children in urban areas. *Rev Saúde Pública, 47* (2).

EurasiaNet.org. 2015. Kazakhstan: Era of cheap bread comes to a close.

European Heart Network. 2011. *Diet, physical activity and cardiovascular disease prevention in Europe*. Brussels, EHN.

Federal State Statistics Service. 2016. On wage arrears.

FAO (Food and Agriculture Organization of the UN). 2000. *The State of Food Insecurity in the World 2000*. Rome.

FAO. 2006. Policy brief on food security, Issue 2 (June 2006). Rome.

FAO. 2013. *The State of Food and Agriculture: Food Systems for Better Nutrition* (SOFA 2013). Rome.

FAO. 2014. *Agri-Food Systems for Better Nutrition in Europe and Central Asia*. European Commission on Agriculture, Thirty-Eighth Session, Bucharest, Romania, 1 and 2 April 2014. Rome.

FAO. 2015. *The State of Food Insecurity in the World 2015*. Rome.

FAO. 2016. FAO Suite of Food Security Indicators (updated February 2016).

FAO. FAOSTAT. Accessed 21 September 2016. (Available at faostat3.fao.org/home/E).

Food Fortification Initiative. 2016. Europe. Atlanta.

Guillory, S. 2016. After months of protest, Russian coal miners finally get paychecks. *Global Voices,* 15 September.

HarvestPlus. 2016. Biofortification: the evidence. Washington D.C.

Hotz, C. & Brown, K.H. 2004. Assessment of the risk of zinc deficiency in populations and options for its control. International Zinc Nutrition Consultative Group (IZiNCG) Technical Document #1, *Food and Nutrition Bulletin*, vol. 25, no.1 (supplement 2).

Institute for Health Metrics and Evaluation, Human Development Network, The World Bank (IHME & HDNWB). 2013. *The Global Burden of Disease: Generating Evidence, Guiding Policy - Europe and Central Asia Regional Edition*. Seattle, WA: Institute for Health Metrics and Evaluation.

International Labour Organization (ILO). 2016. Social Protection: Russian Federation. Geneva.

International Monetary Fund (IMF). 2016. *World Economic Outlook Database,* April 2016. Washington D.C.

Jensen, J. & Smed, S. 2013. The Danish tax on saturated fat - Short run effects on consumption, substitution patterns and consumer prices of fats. *Food Policy,* 42: 18-31.

Lerman, Z. & Mirzakhanyan, A. 2001. *Private Agriculture in Armenia*. Lanham, Maryland, Lexington Books.

Lerman, Z. & Sedik, D. 2010. *Rural Transition in Azerbaijan* (Lanham, Maryland, Lexington Books).

Lerman, Z. & Sedik, D. 2009. Agricultural Recovery and Individual Land Tenure: Lessons from Central Asia. *Policy Studies on Rural Transition,* 2009-3. Budapest, FAO.

Mayer, R. N. 2008. Measuring What Really Matters to Consumers. *Journal of Consumer Affairs,* 42 (1):113-122.

Mazzocchi, M., Capacci, S., Shankar, B. & B. Traill. 2014. Agri-Food Systems for Better Nutrition in Europe and Central Asia. *REU Policy Studies on Rural Transition.*

Morgounov, A., Gomez-Becerra, H.F., Abugalieva, A., Dzhunusova, M., Yessimbekova, M., Muminjanov, H., Zelenskiy, Y., Ozturk, L. & Cakmak, I. 2007. Iron and zinc grain density in common wheat grown in Central Asia. *Euphytica,* 155 (1-2): 193-203.

Murray, C. & A. Lopez. 2013. Global health: Measuring the global burden of disease. *New England Journal of Medicine,* 369: 5.

Nord, M. & Golla, A. 2009. *Does SNAP decrease food insecurity? Untangling the self-selection effect.* Economic Research Service, US Department of Agriculture, Economic Research Report 85. Washington DC, USDA.

Ofcom. 2010. HFSS advertising restrictions. Final review.

Popkin, B. 2003. The Nutrition Transition in the Developing World. *Development Policy Review,* 21 (5-6): 581-597.

Popkin, B. 2006. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with noncommunicable diseases. *The American Journal of Clinical Nutrition,* 84 (2): 289-298.

Popkin, B. 2008. *The World Is Fat: The Fads, Trends, Policies, and Products That Are Fattening the Human Race.* New York, Avery.

Popkin, B. & Gordon-Larsen, P. 2004. The nutrition transition: worldwide obesity dynamics and their determinants. *International Journal of Obesity,* 28, Suppl 3: S2–9.

Powles, J., Fahimi, S., Micha, R. *et al.* 2013. Global, regional and national sodium intakes in 1990 and 2010: a systematic analysis of 24 h urinary sodium excretion and dietary surveys worldwide. *BMJ Open,* 2013, 3: e003733.

Rapacki, R. & Próchniak, M. 2009. Economic Growth Accounting in Twenty-Seven Transition Countries, 1990-2003. *Eastern European Economics,* 2009, 47 (2): 69-112.

Samaniego-Vaesken, M., Alonso-Aperte, E. & Varela-Moreiras, G. 2012. Vitamin food fortification today. *Food and Nutrition Research.* 2012, 56.

Sedik, D., Lerman, Z., Yanbykh, R., Uzun, V. & Shagaida (forthcoming). *Agricultural and Rural Policies in Russia.* N. Meyers, W & T. Johnson, eds. Handbook of International Food and Agricultural Policies: A Four Volume Reference Set, Volume 1: Policies for Agricultural Markets and Rural Economic Activity (World Scientific).

Sedik, D., Ulbricht, C. & N. Dzhamankulov. 2016. "The Architecture of Food Safety Control in the European Union and the Eurasian Economic Union", *IAMO Discussion Paper no.156.* Halle, Germany, Leibniz Institute of Agricultural Development in Transition Economies.

Shankar, B., Brambila-Macias, J., Traill, B., Mazzocchi, M. & Capacci, S. 2013. An evaluation of the UK Food Standards Agency's salt campaign. *Health Economics*, 22 (2): 243-250.

Smed, S., Jensen, J.D. & Denver, S. 2007. Socio-economic characteristics and the effect of taxation as a health policy instrument. *Food Policy,* 32 (5-6): 624-639.

Storcksdieck genannt Bonsmann, S.S., Celemín, L.F., Larrañaga, A., Egger, S., Wills, J.M., Hodgkins, C. & Raats, M.M. 2010. Penetration of nutrition information on food labels across the EU-27 plus Turkey. *European Journal of Clinical Nutrition,* 64 (12): 1379-1385.

Sumberg, J. & Sabates-Wheeler, R. 2011. Linking agricultural development to school feeding in sub-Saharan Africa: Theoretical perspectives. *Food Policy,* 36 (3): 341-349.

The Telegraph. 2016. France chews over fast food tax to fight obesity.

UNICEF, WHO, World Bank. 2015. Joint child malnutrition estimates - Levels and trends (2015 edition).

Voskoboynikov, I. & Solanko, L. 2014. When high growth is not enough: Rethinking Russia's pre-crisis economic performance. *BOFIT Policy Brief*, 6. Helsinki, Bank of Finland &BOFIT, Institute for Economies in Transition.

Wang, Y.C., Coxson, P., Shen, Y.M., Goldman, L. & Bibbins-Domingo, K. 2012. A penny-per-ounce tax on sugar-sweetened beverages would cut health and cost burdens of diabetes. *Health Affairs,* 31 (1): 199-207.

World Bank. 2003. *Growth, poverty and inequality: Eastern Europe and the former Soviet Union*. Washington, D.C.

World Bank. 2006. *Repositioning nutrition as central to development: A strategy for large-scale action*. Washington, D.C.

World Bank. 2014. *Shared prosperity. Paving the way in Europe and Central Asia*. Washington, D.C.

World Bank. 2016a. Povcalnet. (Available at: povertydata.worldbank.org/poverty/home/) Accessed 21 September 2016.

World Bank. 2016b. World Bank-Kyrgyz Republic Partnership Program Snapshot April 2016. Accessed 21 September 2016.

World Bank. 2016c. World Development Indicators (WDI) Databank. (Available at: databank.worldbank.org/data/reports.aspx?source=world-development-indicators). Accessed 21 September 2016.

World Food Programme (WFP). 2015. WFP Works With Education Ministry And Russian Federation To Boost School Meals In Kyrgyz Schools. Rome.

WFP. 2016. DEV 200176 project coverage.

World Health Organization (WHO). 2007. *Reducing salt intake in populations*. Report of a WHO Forum and Technical Meeting. Geneva.

WHO. 2009. *Global prevalence of vitamin A deficiency in populations at risk, 1995-2005 WHO Global Database on Vitamin A Deficiency*. Geneva.

WHO. 2010. *Set of recommendations on the marketing of foods and non-alcoholic beverages to children*. Geneva.

WHO. 2013. *Mapping salt reduction initiatives in the WHO European region*. Copenhagen, WHO Regional Office for Europe.

WHO. 2016a. Global Database on Child Growth and Malnutrition: Description: Child growth indicators and their interpretation. Geneva.

WHO. 2016b. Obesity (body mass index >= 30) (age-standardized estimate), data by country. Geneva.

WHO. 2016c. Overweight (body mass index >= 25) (age-standardized estimate), data by country.

2016

Europe and Central Asia

REGIONAL OVERVIEW OF FOOD INSECURITY

THE FOOD INSECURITY TRANSITION

KEY MESSAGES

- The main source of poverty reduction in the region has been pro-poor economic growth. Redistribution policies have played little role in poverty reduction in the Europe and Central Asia (ECA) region.
- The experience of the past 23 years suggests that sustained economic growth is key to further poverty reduction and ensuring food security in the region.
- For the population of most countries in the region, the burden of overweight and obesity in terms of disability-adjusted labour years (DALYs) now far exceeds that from undernutrition.
- Beyond economic growth, policies aimed specifically at malnutrition that have worked in this region include:
  - Food fortification for iron, vitamin A, zinc, iodine and other deficiencies
  - Food reformulation to reduce salt, saturated fats and sugar
  - Fiscal measures, such as taxes on soft drinks, sugary foods or food items containing saturated fats
  - Public health and nutrition information campaigns to increase public awareness
  - Nutrition labelling to increase consumer awareness
  - Means tested food assistance policies for women with young children.

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