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Inequalities in child and maternal health outcomes in CEE and the CIS

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ABSTRACT

Following the collapse of the Soviet Union and socialism in Europe, there was a universal drop in economic wellbeing in former socialist countries. This in turn influenced demographic behaviours, with a slump in fertility and fall in life expectancy. Maternal and child health also suffered setbacks, due to rising poverty rates and the erosion of service provision. This paper evaluates progress in former socialist countries in Central and Eastern Europe since the fall of socialism, with a particular focus on the health related Millennium Development Goals. In particular, we analyse child health with a focus on child nutritional status, immunisation and the maternal health indicators of pre- and ante-natal care and skilled birth attendance. Data are taken from the UNICEF multiple Indicator Cluster Survey (MICS-3) for countries in Southern/Balkans Europe (Albania, Bosnia, Macedonia, Montenegro, Serbia) and the CIS/Caucasus (Belarus, Georgia, Kazakhstan, Krygystan, Tajikistan, Uzbekistan). We compare overall variation between and within countries, as well as by key demographic characteristics of urban/rural residence, (maternal) education, household wealth and ethnicity.

KEYWORDS

Child Health; Maternal Health; Inequality; Central and Eastern Europe; Nutrition; Ante-natal care; Skilled Birth Attendance

EDITORIAL NOTE

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INEQUALITIES IN CHILD AND MATERNAL HEALTH OUTCOMES IN CEE AND THE CIS

TABLE OF CONTENTS

1. INTRODUCTION

This paper uses data from the UNICEF Multiple Indicator Cluster Survey (MICS) to examine maternal and child health outcomes and their differentials in selected countries of Central and Eastern Europe (CEE) and the Commonwealth of Independent States (CIS) (see Table 1). In particular the paper focuses on the nutritional status of children under 5 (based on standard WHO anthropometric measures), complete child immunisation and the key maternal health indicators of ante-natal care and skilled birth attendance. Inequalities in these outcomes are assessed according to region, urban/rural residence, gender, mother's education, wealth quintile and, where data are available, ethnicity.

Albania	2005
Belarus	2005
Bosnia and Herzegovina	2006
Georgia	2005
Kazakhstan	2006
Kyrgyzstan	2005-06
Macedonia (The former Yugoslav Republic of)	2005
Montenegro	2005-06
Serbia	2005-06
Tajikistan	2005
Turkmenistan	2006
Ukraine	2005
Uzbekistan	2006

Table 1: Countries of CEE and the CIS which have carried out the UNICEF Multiple Indicator Cluster Survey, Round 3 (MICS-3).
Note: Countries in CIS denoted in Bold.

Following the break up of the Soviet Union and the collapse of socialism in Central and Eastern Europe, most former socialist countries experienced a decline in economic wellbeing at both the macro and micro level, with falls in GDP and worsening labour market conditions. Figure 1 shows the time series of Gross Domestic Product per capita for selected countries in the CIS and Balkans region. There are clear falls in the level of GDP in the post 1991 period. Although GDP recovered in the last decades of the twentieth and early part of the twenty first centuries, this recovery was generally slow. Taking values indexed as a percent of 1990 GDP, Figure 2 demonstrates that many countries in the CIS and Balkans did not

recover their former economic position for a decade, the last to recover being Tajikistan which did not achieve GDP per capita at a 1990 value until 2009.

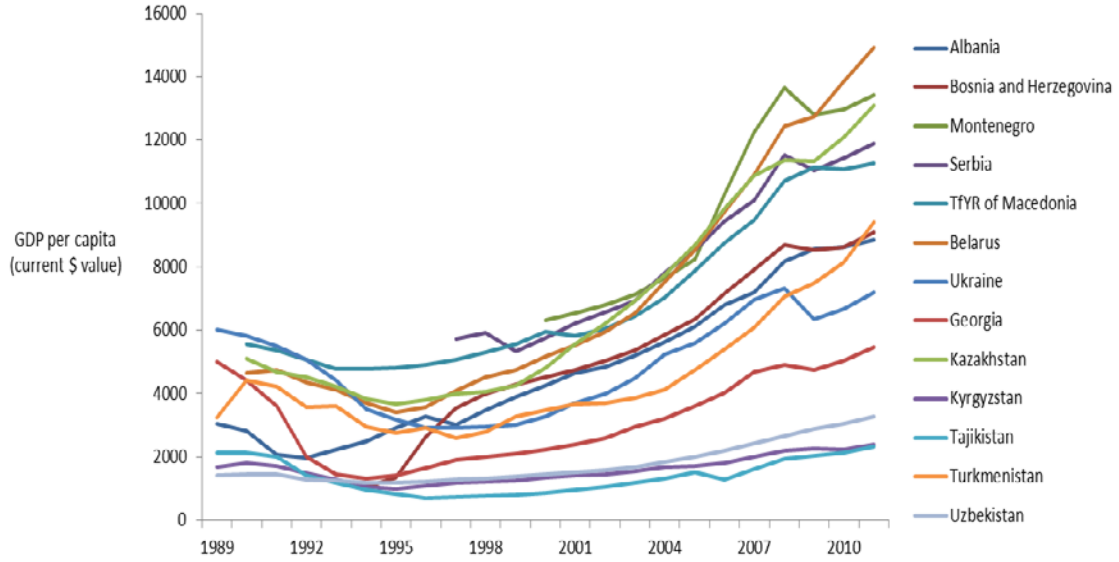

Figure 1: Gross Domestic Product per capita (current $ value) for selected countries of the CIS and Balkans.
Source: UNICEF TransMONEE database. (2012)

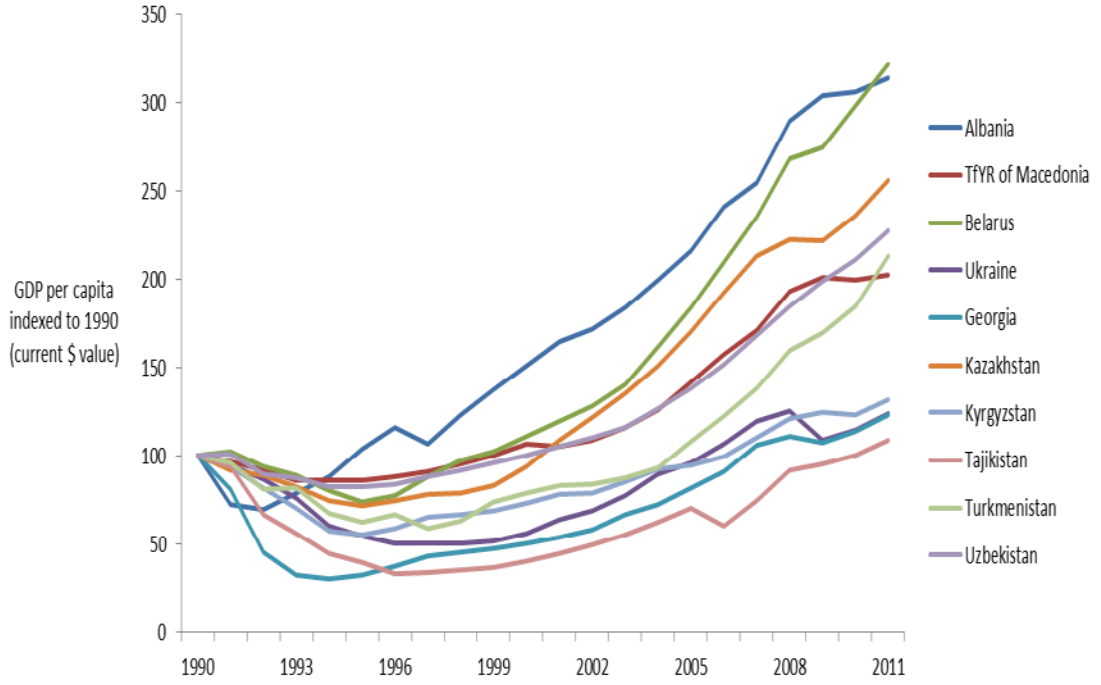

Figure 2: GDP per capita (current $ value) indexed to 1990 values.
Note: Values of 100 or greater indicate parity with 1990 GDP
Source: UNICEF TransMONEE database. (2012)

Declining economic circumstances inevitably affected both demographic and health outcomes within the CIS and Balkans. Fertility in the post Socialist era continued its long term downward trend, although there is some degree of variation between countries. Cross-national variation in fertility can be seen in Figure 3. Across the time series available CIS countries generally demonstrates falls in fertility, albeit from relatively high starting points with the result that fertility is generally above replacement level. In contrast, in the Balkans and European countries, fertility fell below replacement level in the immediate post-Socialist period, and although there is some evidence of recovery, fertility remains generally low.

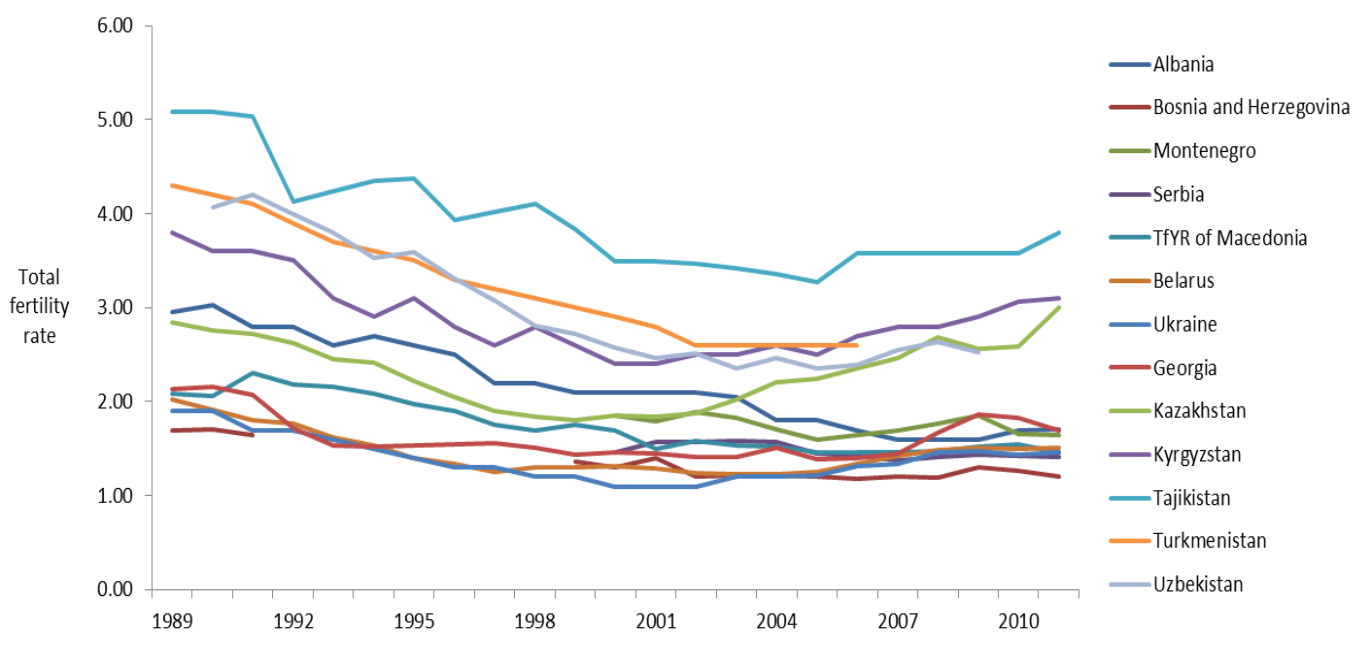

Figure 3: Total fertility rates for selected countries
Source: UNICEF TransMONEE database

Some of the fall in fertility can be accounted for through decreases in cohort fertility levels (Sobotka, 2003), the CIS and Balkans have exhibited increased postponement of childbearing. Figure 4 shows the mean age at first birth for the selected countries, which has increased from an average across all countries from 23.1 in the Socialist era to over 25. Some countries in particular, such as Albania, exhibit particularly high mean age at first birth. This is a sharp contrast to the historic Socialist pattern of early fertility. Note that mean age of first birth is inversely associated with overall fertility levels (Figure 3).

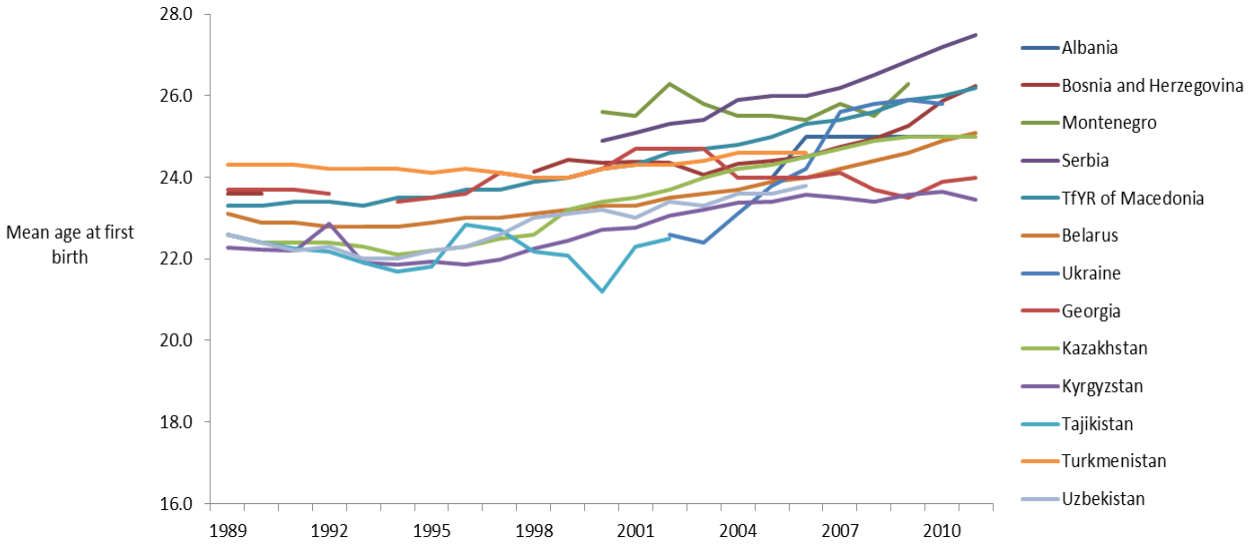

Figure 4: Mean age at first birth for selected countries of CIS and Balkans.
Source: UNICEF TransMONEE database

Populations in CEE and CIS have generally started to age, both as a result of plunging fertility rates, but more significantly large scale out migration among the working age populations. This can have significant effects on the population remaining (Falkingham et al, 2009). Figure 5 shows the proportion of the population age 0-17. In general, this has declined reflecting the ageing of the population in the CIS and CEE. In general, it should be noted that the CIS countries tend to have more youthful populations than those in the Balkans region, due to both historic and current higher fertility rates.

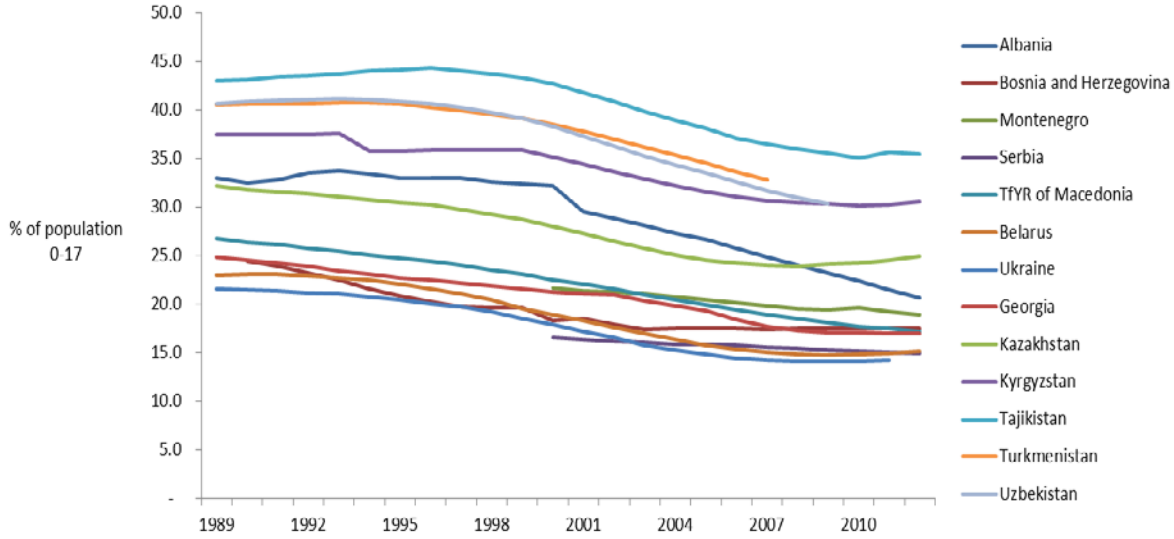

Figure 5: Percentage of population age 0-17 for selected countries
Source: UNICEF TransMONEE database

The remainder of this paper examines child and maternal health in the CEE and CIS countries. Data for these analyses are drawn from the MICS-3, which are a series of consistent, nationally representative sample survey collecting data for health outcomes. Since most surveys are not self-weighting, weights are applied in all analyses to ensure national representation. Details of the design of individual surveys are available elsewhere [1]. Where possible we have included information on all countries indicated in Table 1, although not all indicators were available in all surveys, or were of sufficient quality to conduct meaningful analysis.

Our analysis concentrates on two aspects of child health, and two aspects of maternal health. Child health is measured by nutritional status; measured by standardised weight and height for age and height for weight, and immunisation. Maternal health is assessed via indicators of antenatal care; 4 indicators of tests in pregnancy and institutional birth, and the presence of skilled birth attendants.

[1] Please see http://www.childinfo.org/index.html

2. CHILD HEALTH

2.1. CHILD NUTRITIONAL STATUS

Access to adequate safe and nutritious food is a basic human right (Convention on the Rights of the child, UN 1989). Sound nutrition leads to improved life chances for infants and children and increases the likelihood that children will complete primary education and benefit from the learning experience. Conversely poor nutritional status early in life may have long-term developmental consequences (Martorell 1996). Malnutrition, or hunger, is therefore an important indicator of the presence of severe child deprivation and forms one of the key indicators for MDG #1.

This section presents information for the three standard indices of physical growth:

- weight-for-age (WAZ): percentage of children severely or moderately underweight, being is a good overall indicator of the child population's nutritional health.
- weight-for-height (WHZ): percentage of children severely or moderately wasted, reflecting acute or recent malnutrition; and
- height-for-age (HAZ): percentage of children severely or moderately stunted, reflecting chronic under nutrition;

In a healthy, well-nourished population of children, it is expected that approximately 2.3 percent of children will fall below two standard deviations of the reference population and will be classified as stunted, wasted or underweight. Moderate malnutrition is when a child's nutritional status is between 2-3 standard deviations from the reference population whilst a child is considered severely malnourished if the score is less than 3 standard deviations. The World Health Organization considers the level of malnutrition to be 'high' when the prevalence of stunting exceeds 30 percent and wasting reaches 10 percent (WHO 2006).

Figures 6 and 7 present the proportion of children underweight (Fig 6) and severely underweight (Fig 7). There is a considerable range in the rate of underweight children in the countries studies. Tajikistan (the poorest country in our dataset) has the highest proportion underweight and severe underweight children at 17% and 4.5% respectively. Other countries exhibit lower rates, with some countries such as Belarus

exhibiting consistently low rates of underweight. In general, countries with higher levels of GDP tend to exhibit lower rates of underweight children, while there is a concentration of high rates of underweight and severely underweight in poorer countries. The exception to this overall trend is Albania, which demonstrates high rates of rates of both underweight and severe underweight despite high GDP. We also note considerable within country variation. In particular, regional variation is strong in Kazakstan, which has the largest range of any country in our dataset. To put this in context, the rate of underweight in the region with the worst nutritional status in Kazakstan is equivalent to that of the worst region in Albania (see figure 6), which has a national rate of underweight over 50% higher. Regional variation is also very strong in Macedonia, with the rate of underweight in the worst performing region higher than the national average in Uzbekistan, Kazakhstan and Kyrgyzstan.

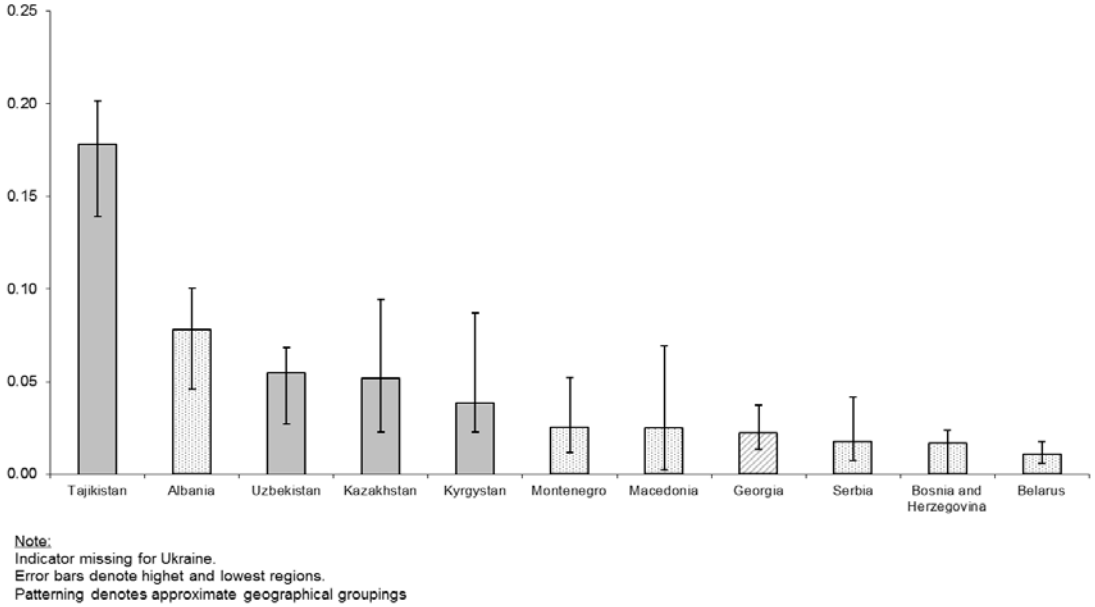

Figure 6: Proportion of children under 5 moderately or severely underweight
Source: Authors' own analysis UNICEF MICS-3 data

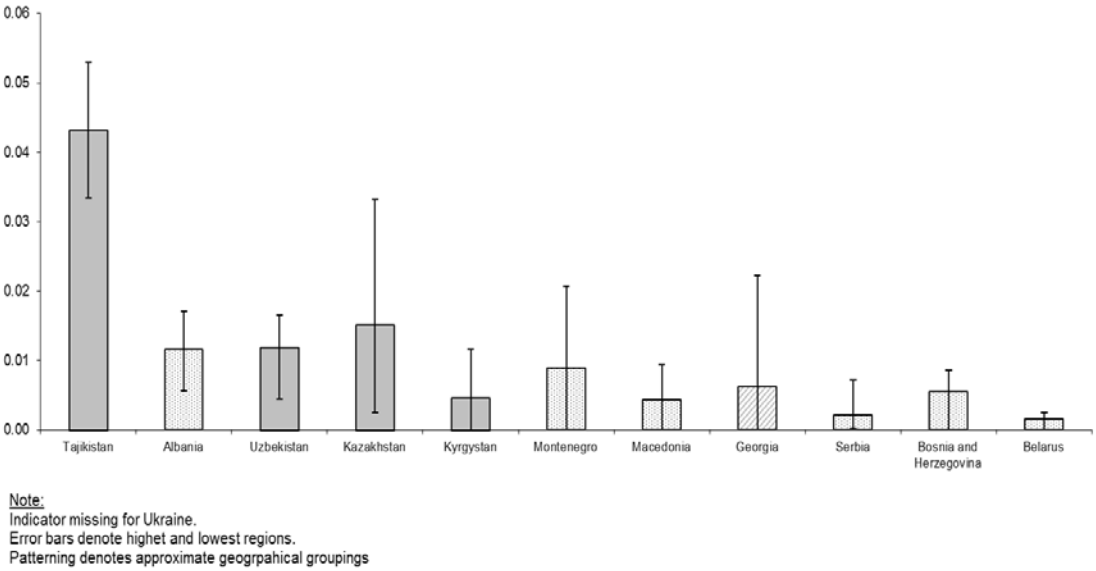

Figure 7: Proportion of children under 5 severely underweight
Source: Authors' own analysis UNICEF MICS-3 data

Figures 8 and 9 present the rate of stunting and severe wasting respectively. Again, in general there is a broad correlation between overall GDP and the rate of

wasting. However, regional variation is large in the context of wasting, and the overall national rate masks some high rates at a sub-national level. In particular, the worst performing regions in Tajikistan, Kazakhstan, Serbia, Kyrgyzstan and Macedonia all exceed wasting rates of 10%, indicating a high prevalence of wasting in these regions. This intra-country variation is also evident for the rates of severe wasting (Fig 9). In particular, although the national rate of wasting in Macedonia is toward the lower end of this set of countries, the rate in the worst performing region is the highest in our sample.

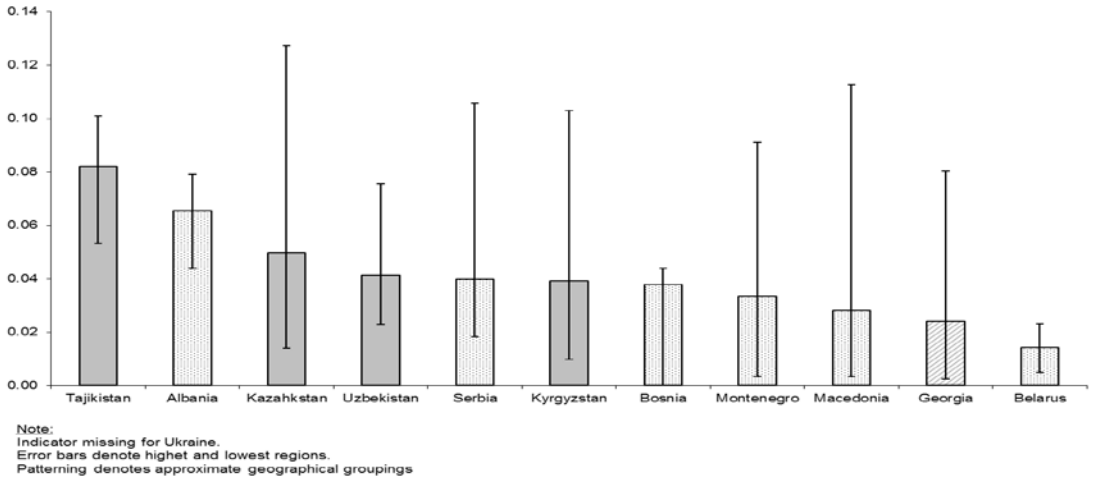

Figure 8: Proportion of children under 5 moderately or severely wasted
Source: Authors' own analysis UNICEF MICS-3 data

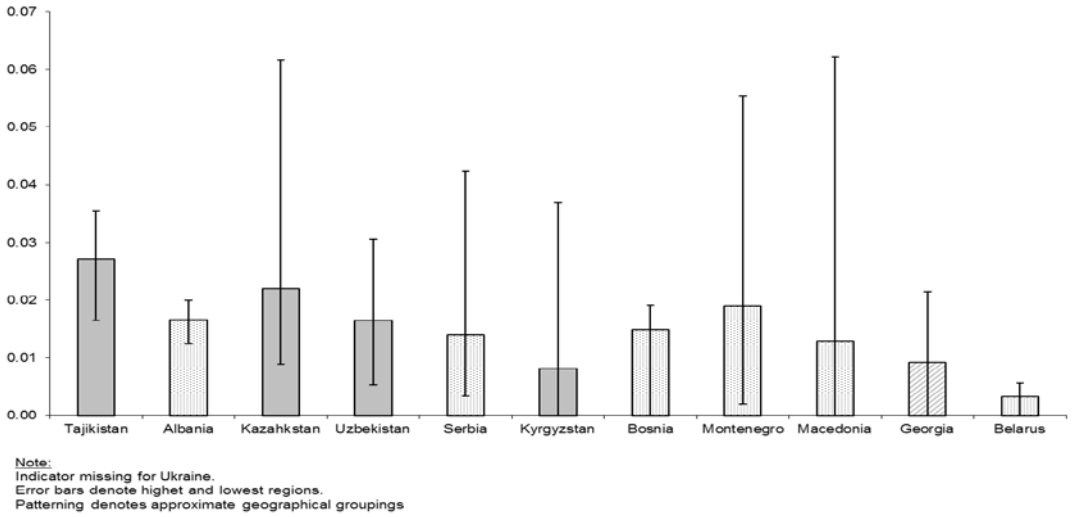

Figure 9 : Proportion of children under 5 severely wasted
Source: Authors' own analysis UNICEF MICS-3 data

Figures 10 and 11 present the prevalence of stunting. In general, there is a stronger correlation between the rate of stunting (Fig 10) and severe stunting (Fig 11) than for the other nutritional indicators. We again note that there is considerable within country variation in the rate of stunting. In Tajikistan, Kazakhstan and Kyrgyzstan, although the national stunting rate is below 30%, the worst perfuming regions can be said to have a high prevalence of stunting by WHO standards.

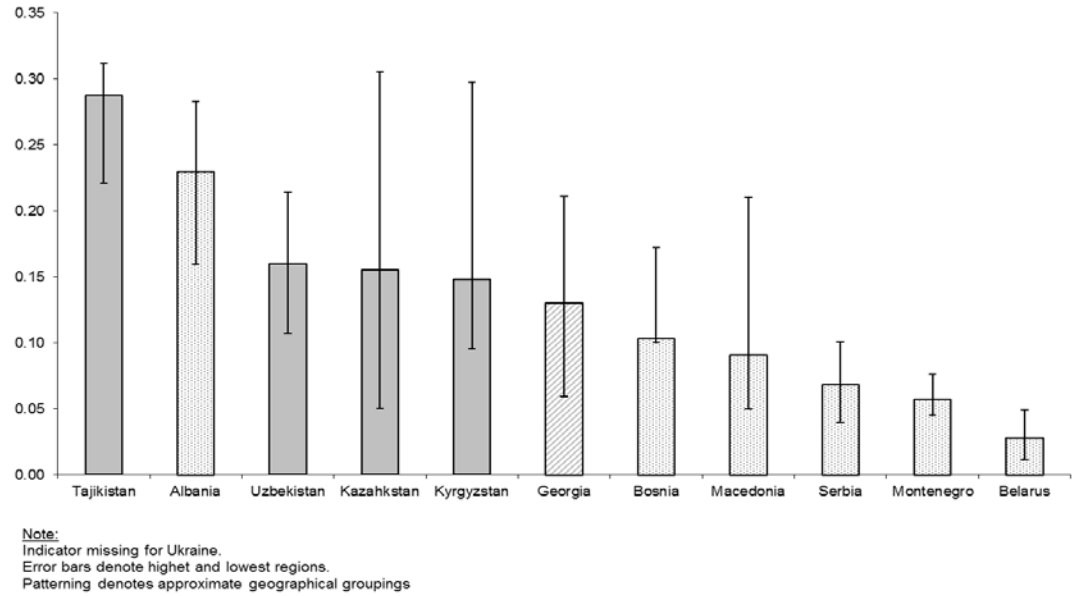

Figure 10: Proportion of children under 5 moderated or severely stunted
Source: Authors' own analysis UNICEF MICS-3 data

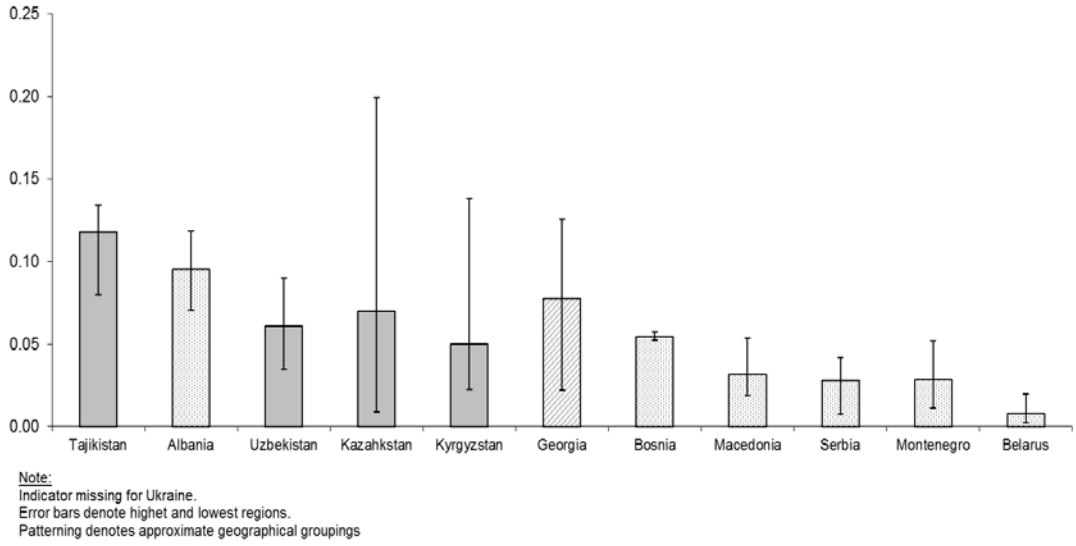

Figure 11: Proportion of children under 5 severely stunted
Source: Authors' own analysis UNICEF MICS-3 data

2.2. INEQUALITIES IN CHILD NUTRITIONAL OUTCOMES

Given the high levels of intra-country variation noted above, this section examines inequalities in child nutritional outcomes by a range of indicators including place of residence, maternal education, household wealth, ethnicity and religion in order to provide a portrait of the distribution of child health in CEE and the CIS.

2.2.1. PLACE OF RESIDENCE

Differences in child nutritional status according to place of residence are not clear cut. Table 2 shows that in most countries children living in urban areas experience slightly better health outcomes than those in rural areas but this is not universally the case, depending on the measure and country setting. For example, a lower proportion of rural children than urban children suffer acute malnutrition in the CIS countries, reflecting the fact that most people outside the major cities have access to plots of land on which households grow basic foodstuffs. However chronic malnutrition tends to be higher in rural than urban areas, reflecting longer term differences in living standards.

	Chronic malnutrition (< 2 sd HAZ score)		Acute malnutrition (< 2 sd WHZ score)		Under-weight (< 2 sd WAZ score)	
	Urban	Rural	Urban	Rural	Urban	Rural
Southern Europe						
Albania	23.1	22.9	4.9	7.4	5.5	9.1
Bosnia	9.8	10.5	4.9	3.3	2.7	1.2
Macedonia	8.9	9.3	2.1	3.7	2.7	2.2
Montenegro	5.4	6.3	2.7	4.4	3.0	1.8
Serbia	6.5	7.3	4.3	3.6	2.1	1.4
CIS						
Belarus	2.0	4.5	1.6	0.9	0.7	1.8
Georgia	10.8	15.3	2.3	2.5	2.0	2.5
Kazakhstan	13.4	17.8	5.9	4.0	4.4	6.0
Kyrgyzstan	12.1	16.7	2.9	4.6	3.9	3.8
Tajikistan	27.5	29.2	8.3	8.1	17.4	18.5
Uzbekistan	15.6	16.1	4.7	3.9	5.3	5.5

Table 2: Percentage of children aged under 5 suffering from malnutrition by urban and rural residence
Source: Authors' own analysis UNICEF MICS-3 data

2.2.2. MATERNAL EDUCATION

Table 3 presents variation in child nutritional outcomes by maternal education. There are significant differences in child nutritional status according to mother's education in the Balkans. For example, in Albania, children whose mother did not attend secondary school were twice as likely to experience acute malnutrition (12%) than those who did (6%) and in Montenegro the differential was almost four-fold (7.8% v 2%).

Education was, however, less of an important differentiator in the countries of the CIS, where as a the legacy of the Soviet Union, enrolment in primary education remains almost universal and a high proportion of children still go on to complete secondary schooling. In Tajikistan there even appears to be a slight advantage in having a less well educated mother, although this is not statistically significant and probably reflects the fact that those children with mothers with no or primary education are more likely to live in rural areas, with access to home produced food.

	Chronic malnutrition (< 2 sd HAZ score)		Acute malnutrition (< 2 sd WHZ score)		Under-weight (< 2 sd WAZ score)	
	None/ primary	Secondary / higher	None/ primary	Secondary / higher	None/ primary	Secondary / higher
Southern Europe						
Albania	31.4	22.7	12.2	6.3	7.1	7.8
Bosnia	12.2	9.4	3.8	3.8	2.1	1.5
Macedonia	10.7	6.4	3.4	1.9	3.3	1.1
Montenegro	9.9	4.5	7.8	2.0	7.2	1.2
Serbia	10.5	5.9	5.4	3.6	4.3	1.1
CIS						
Kazakhstan	19.1	15.3	4.1	5.0	6.7	5.1
Tajikistan	31.6	28.7	7.7	8.2	17.7	17.9

Table 3: Percentage of children aged under 5 suffering from malnutrition by mother's education
Note: Numbers of children whose mothers have less than secondary education were negligible in Belarus, Georgia, Kyrgyzstan and Uzbekistan so they have been excluded here.
Source: Authors' own analysis UNICEF MICS-3 data

2.2.3. HOUSEHOLD WEALTH

The MICS collect data on a range of household assets, such as ownership of televisions and bicycles, materials used for housing construction, and types of water access and sanitation facilities. These variables are then used to construct a composite

measure of the living standard of a household. The wealth index places individual households on a continuous scale of relative wealth. Households are then allocated to quintiles.

Table 4 below shows differentials in chronic malnutrition according to the wealth index quintile of the child's household. There is a clear gradient by household wealth, with the proportion of children being stunted falling as wealth rises. The relative differences tend to be highest in those countries with low average prevalence rates such as Belarus and Montenegro, with children in the poorest households being two and half to three times more likely to stunted than children from the richest households. The pattern for acute malnutrition (Table 5) is more complex, although in the majority of countries children in the poorest quintile have a higher risk of wasting than those in the richest. However the reverse is true in Albania, Bosnia, Belarus and Kazakhstan. Looking at Table 6, the inequalities in general child nutritional status are clear. Rates of underweight are highest in the poorest wealth quintile, with marked differences in Tajikistan and Albania, were the difference between poorest and richest wealth quintiles amount13.4-3.5 to 12.1% points and 9.9% points respectively.

	Poorest	2nd	Middle	4th	Richest
Southern Europe					
Albania	31.0	23.1	25.8	18.7	14.6
Bosnia	15.8	11.0	7.2	10.4	7.6
Macedonia	12.2	8.3	10.7	6.1	5.2
Montenegro	10.9	3.8	6.3	2.7	4.3
Serbia	9.8	7.8	5.0	6.5	5.6
CIS					
Belarus	6.0	2.9	2.5	1.4	1.9
Georgia	19.9	14.5	13.4	11.8	7.7
Kazakhstan	18.1	16.5	17.0	13.1	10.8
Kyrgyzstan	17.6	19.4	12.7	13.3	11.7
Tajikistan	33.6	30.5	32.2	25.6	21.6
Uzbekistan	16.7	18.4	16.7	14.3	13.3

Table 4: Percentage of children aged under 5 suffering from chronic malnutrition (stunting) by household wealth quintile
Source: authors' own analysis UNICEF MICS-3 data

	Poorest	2nd	Middle	4th	Richest
Southern Europe					
Albania	5.2	11.9	2.7	6.4	5.9
Bosnia	3.6	3.6	2.9	2.0	7.2
Macedonia	3.8	1.6	1.9	4.0	2.2
Montenegro	5.9	4.3	2.4	2.5	1.1
Serbia	3.7	3.0	2.9	3.6	7.1
CIS					
Belarus	0.7	1.7	0.8	1.1	2.4
Georgia	3.1	2.8	1.6	3.3	1.6
Kazakhstan	3.6	4.4	5.1	5.9	6.8
Kyrgyzstan	3.7	4.8	6.0	2.7	2.6
Tajikistan	10.	7.4	10.6	7.4	5.4
Uzbekistan	5.0	3.6	4.1	3.4	4.5

Table 5: Percentage of children aged under 5 suffering from acute malnutrition (wasting) by household wealth quintile
Source: Authors' own analysis UNICEF MICS-3 data

	Poorest	2nd	Middle	4th	Richest
Southern Europe					
Albania	13.4	9.1	8.6	3.2	3.5
Bosnia	2.6	1.3	0.6	0.6	3.6
Macedonia	4.1	2.2	2.5	1.3	0.9
Montenegro	5.0	3.4	2.1	0.4	1.4
Serbia	4.2	1.6	0.6	0.5	2.4
CIS					
Belarus	1.7	1.2	1.1	1.0	0.6
Georgia	2.3	2.9	1.7	2.8	1.7
Kazakhstan	5.6	6.1	5.5	5.4	2.7
Kyrgyzstan	3.1	4.8	4.7	4.1	2.7
Tajikistan	23.9	20.1	18.3	14.3	11.8
Uzbekistan	6.3	7.3	5.2	4.6	3.7

Table 6: Percentage of children aged under 5 underweight by household wealth quintile
Source: Authors' own analysis UNICEF MICS-3 data

2.2.4. ETHNICITY AND RELIGION

Table 7 presents the rate of chronic malnutrition by ethno-religious group. Although there is variation between ethnicities in all setting, the rate of chronic malnutrition among the Roma group is striking. In all cases, the rate of stunting among the Roma (highlighted in **Bold** in the table) is greater than for any other ethnic group. In

Montenegro, the rate of chronic malnutrition among the Roma is 23% higher than the next highest rate of malnutrition, while in Serbia the rate is more than double the next highest. This indicates a pattern of considerable disadvantage concentrated in children of this ethnicity.

	% chronically malnourished (stunted)
Albania	
Muslim	24.1
Orthodox/Catholic/Other	16.8
Georgia	
Georgian	11.5
Azeri	25.7
Armenian	17.8
Other	5.7
Kazakhstan	
Kazakh	17.3
Russian	11.0
Other	13.0
Macedonia	
Macedonian	8.0
Albanian	8.5
Vlachs	4.6
Roma	**17.2**
Turks	16.9
Other	4.0
Montenegro	
Montenegrin	5.0
Serbian	3.0
Bosnian	13.3
Muslim	7.3
Roma	**17.8**
Albanian	6.0
Other	14.4
Serbia	
Serbian	6.1
Montenegrin	5.7
Hungarian	3.9
Bosnian	9.1
Muslim	4.4
Roma	**19.2**
Albanian	8.6
Other	7.1

Table 7: Percentage of children aged under 5 chronically malnourished by ethnicity or religion

Source: Authors' own analysis UNICEF MICS-3 data

2.3. CHILD IMMUNISATION

Immunisation is a simple and effective way of reducing mortality and morbidity from preventable childhood diseases such as measles, tetanus, and whooping cough and is an essential part of UNICEF and WHO's strategy for achieving Millennium Development Goal 4 on reducing under-five mortality by two thirds by 2015. The MICS collects data on immunisation, where appropriate mothers are asked to provide vaccination cards for children under 5 to substantiate answers given in the questionnaire.

For the purposes of our analysis, we consider a child to be fully immunised when they have received the following vaccinations:

- Bacillus Calmette–Guérin (BCG)
- Polio
- Hepititus-B (Hep-B)
- Measles, Mumps and Rubella (MMR)
- Diptheria, Pertussis (Whooping cough) and Tetanus (DPT)

Figures 12 and 13 illustrate that there are significant variations in the coverage of immunisation, with almost complete coverage in Kazakhstan and Belarus, whilst in Uzbekistan and Kyrgyzstan very few children have all the relevant vaccinations. The error bars highlight that there are major differences by region within countries. In particular, the range in both Bosnia and Albania is particularly large, amounting to some 54% points and 37% point at first birthday, and 29% and 30% points by age 29 months respectively.

A number of countries also exhibit headline rates of complete immunisation which are worryingly low. In particular, the rates for Georgia, Tajikistan, Serbia, Macedonia, Uzbekistan and Kyrgyzstan are below 5% at age 1 year, and (with the exception of Georgia) remain below 5% by age 29 months.

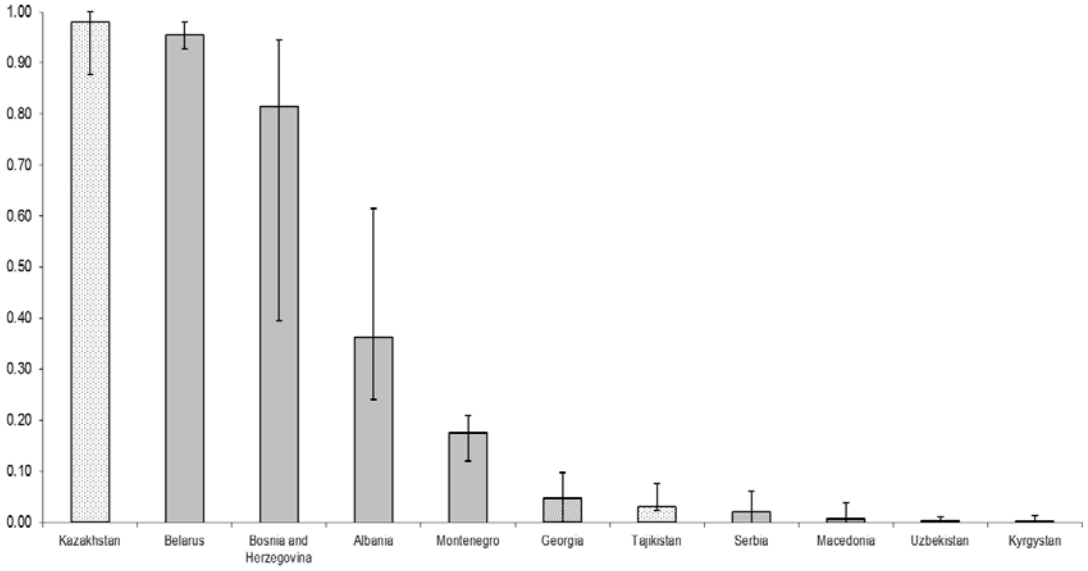

Figure 12: Percentage of children receiving complete immunisation by first birthday
Source: Authors' own analysis UNICEF MICS-3 data

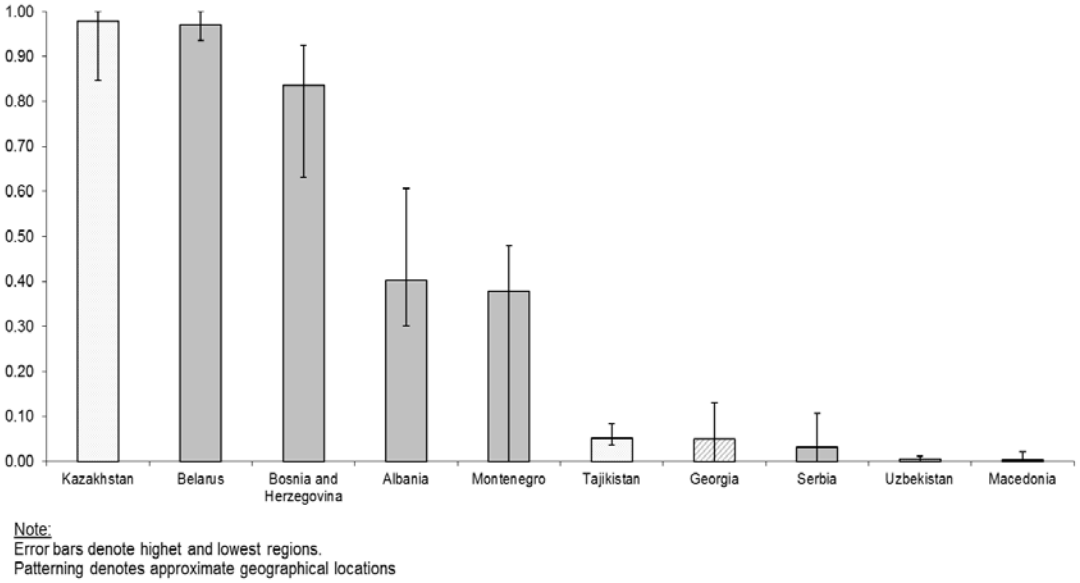

Figure 13: Percentage of children receiving complete immunisation between ages of 18 to 29 months
Source: Authors' own analysis UNICEF MICS-3 data

In examining the MICS data, we note a caveat which is worth mentioning: We relaxed the criterion for complete immunisation by dropping one vaccination at a time ('vaccine deleted rate'). Results are presented in Table 8. For four of the five vaccines there was a close correlation between the overall rate and the vaccine deleted rate (in

excess of 0.99), the association is considerably weaker when the HEP-B vaccine is deleted.

Vaccine	Correlation between complete immunisation % and vaccine deleted immunisation %
Hep-B	0.813
MMR	0.999
BCG	0.999
Polio	0.996
DPT	0.998

Table 8: Correlation between complete immunisation, and immunisation rate using a vaccine deleted definition.
Source: Authors' own analysis UNICEF MICS-3 data

Comparing the rate of vaccination with and without the HEP-B vaccine reveals substantial differences. Figure 14 presents the immunisation rate at first birthday using the two definitions. In particular, the countries which were previously exhibiting negligible rates of complete immunisation now demonstrate rates which, although not comparable to the very best countries, now all exceed 40% (50% in the best region within the country). While therefore the effect of Hep-B vaccination seems to have a downward influence on rate of vaccination for a substantial number of countries, we are unable to determine whether this is due to differential performance of HEP-B administration, or whether the reporting for HEP-B vaccination is uniquely poor.

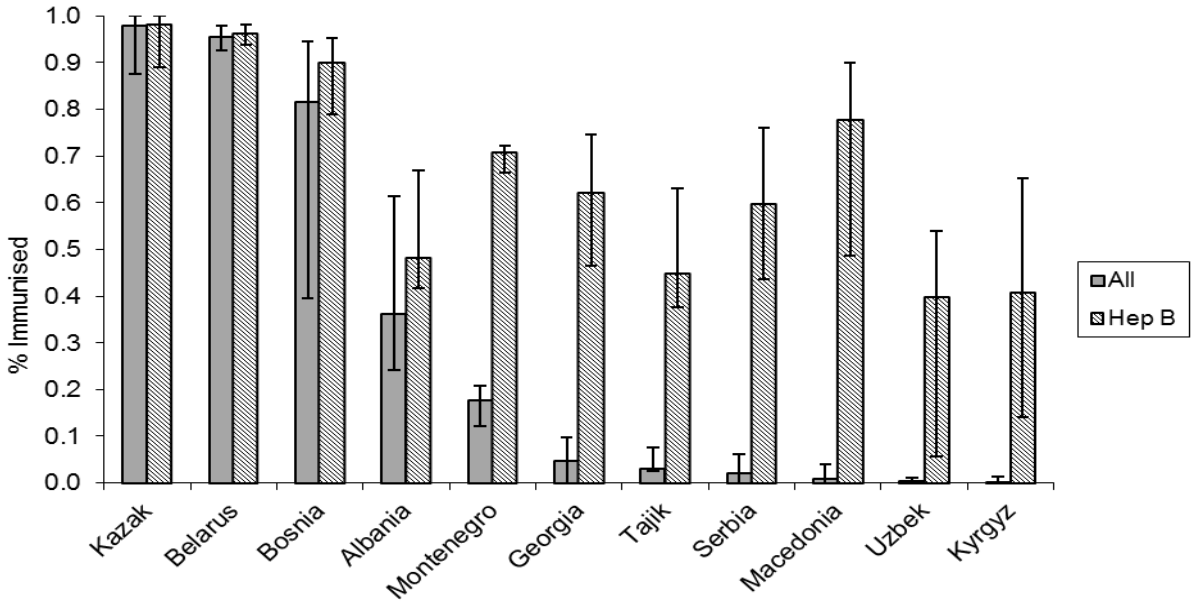

Figure 14: Percentage of children with complete vaccination using a) all Vaccines and b) Hep-B deleted rate.
Source: Authors' own analysis UNICEF MICS-3 data

3. MATERNAL HEALTH

3.1. PRE AND ANTE NATAL CARE VISITS

The World Health Organization (WHO) recommends a minimum of four antenatal visits. According to WHO guidelines, antenatal care visits should include, at a minimum, the measurement of blood tests to detect syphilis and severe anaemia (Figure 15) , testing of urine for bacteriuria and proteinuria (Figure 16), blood pressure (Figure 17) and as well as measurements of weight (Figure 19).

In general the rates of testing are relatively high in most countries, with the lowest rates of testing exceeding 80% for blood, urine and blood pressure and 70% for weight testing.

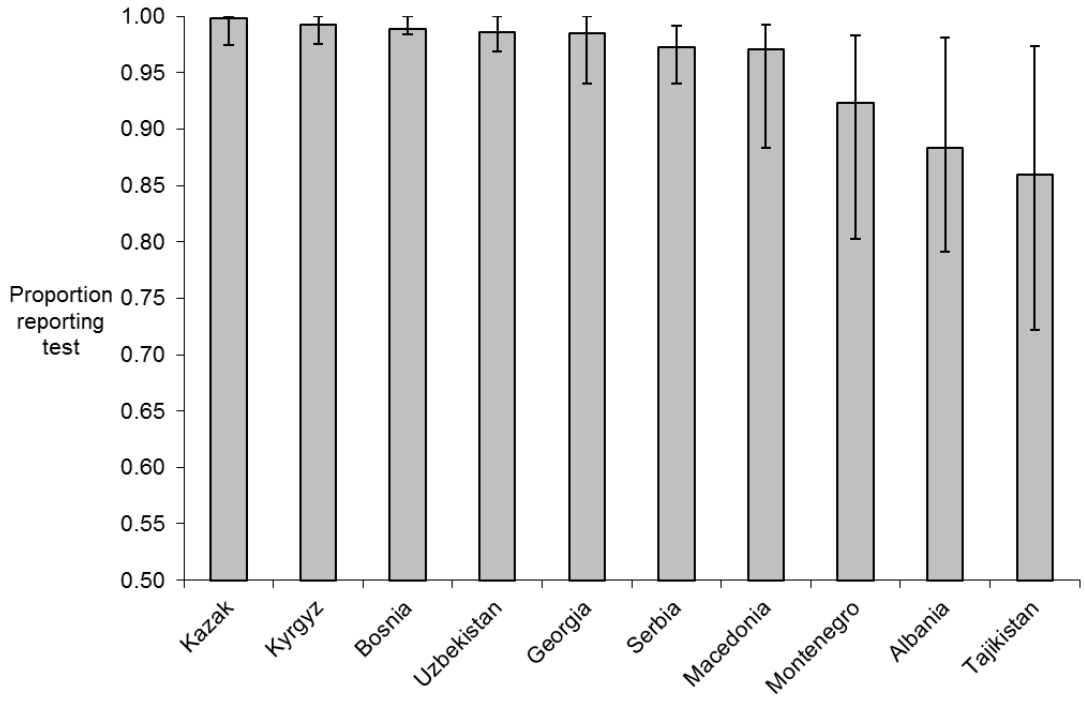

Figure 15: Proportion of women reporting a prenatal blood test
Source: Authors' own analysis UNICEF MICS-3 data

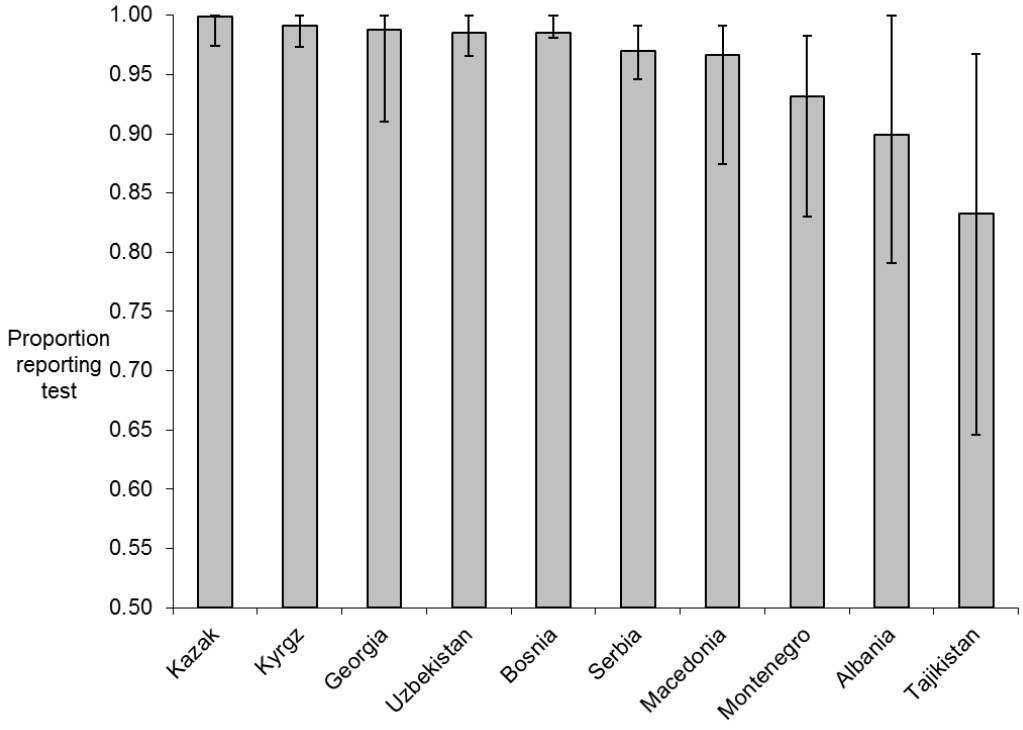

Figure 16: Proportion of women reporting a prenatal urine test
Source: Authors' own analysis UNICEF MICS-3 data

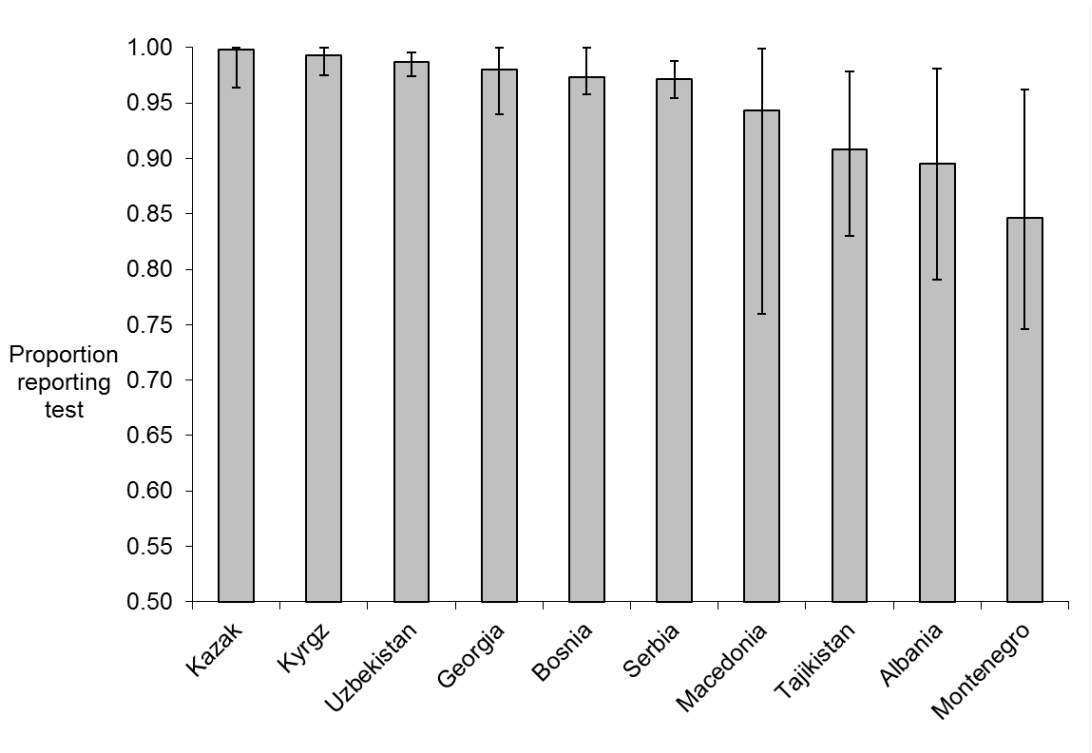

Figure 17: Proportion of women reporting a prenatal blood pressure test
Source: Authors' own analysis UNICEF MICS-3 data

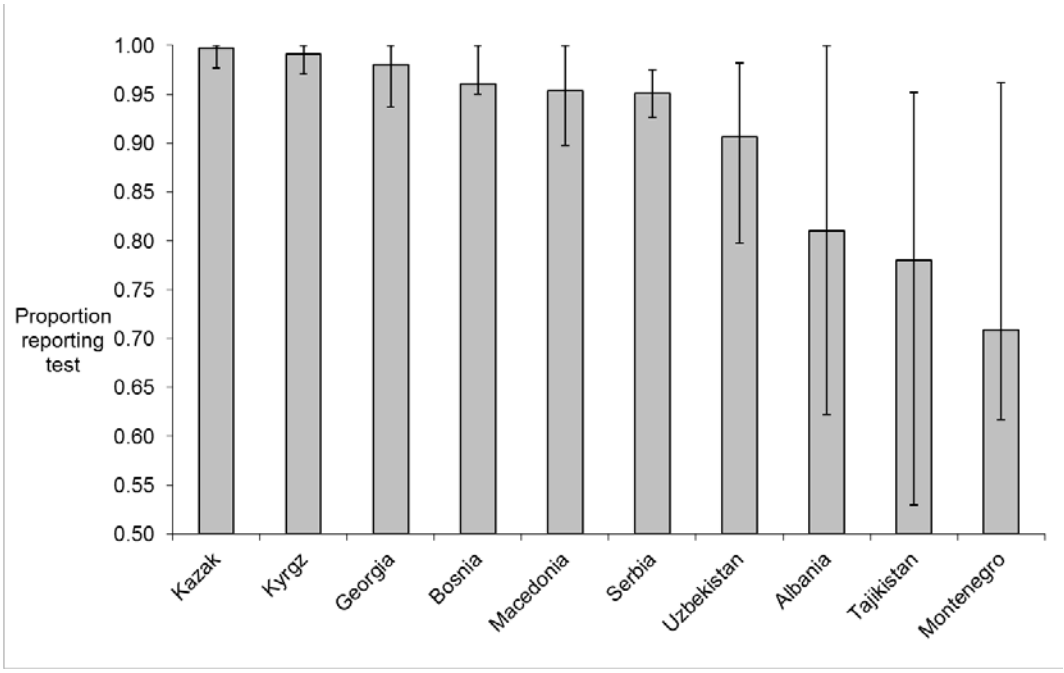

Figure 18: Proportion of women reporting prenatal weight test
Source: Authors' own analysis UNICEF MICS-3 data

Kazakhstan, Kyrgyzstan, Georgia and Bosnia all demonstrate consistently high rates of testing across the entire spectrum, and relatively little within country variation between regions. In contrast, the lowest rates Tajikistan, Montenegro and to a lesser extent Albania consistently demonstrate the lowest rates of maternal testing. These low rates are accompanied by great variability by region to such an extent that in some regions below 55% of women are receiving weight testing prior to pregnancy.

Table 9 presents within region data on differentials by rural/urban residence and women's education whilst Table 10 shows differences by wealth quintile. In general we note that testing tends to be higher in urban areas, although in most cases this difference is negligible. That said there is a marked difference in the testing rates between rural/urban residence in Tajikistan (c.12% points). In general, we note an educational gradient in the receipt of antenatal visits, with rates highest among the highest educational groups. In most cases, this effect is limited, although the rate of antenatal visit among higher education women is some 17% higher than for those with no education, with a 15% relative difference in Tajikistan.

	Locality		**Mother's education**		
	Urban	Rural	None / primary	Secondary	Higher
Southern Europe					
Albania	92.8	86.0	76.5	87.5	89.8
Bosnia	99.0	98.7	97.4	99.3	100
Macedonia	97.1	96.9	96.8	99.3	99.7
Montenegro	95.6	87.4	79.3	95.3	96.3
Serbia	97.8	96.7	92.2	98.8	98.9
CIS					
Georgia	98.6	98.3	100	96.3	99.8
Kazakhstan	100	99.7	100	99.8	100
Kyrgyzstan	99.9	98.8	100	99.0	99.9
Tajikistan	94.9	82.7	85.8	85.3	99.2
Uzbekistan	98.7	98.6	98.6	99.5	100

Table 9: Percentage of women who received at least one antenatal visit during last pregnancy
Source: Authors' own analysis UNICEF MICS-3 data

Table 10 presents differentials in antenatal visits by household wealth quintile. Largely, the rate of antenatal health visits is consistent across quintiles, indicating few economic barriers to maternal health in the majority of settings. That said, we identify gradients in the receipt of visits in Albania, Montenegro and Tajikistan. In these

countries, receipt of antenatal care is 27%, 17% and 21% higher in the richest wealth quintile than the poorest respectively.

	Poorest	2nd	Middle	4th	Richest
Southern Europe					
Albania	75.0	87.3	89.5	98.3	95.6
Bosnia	98.4	98.8	98.6	99.0	99.2
Macedonia	90.8	99.4	99.7	99.4	98.7
Montenegro	85.6	93.5	85.8	98.8	100
Serbia					
CIS					
Georgia	98.1	98.2	97.8	99.2	98.9
Kazakhstan	99.8	99.9	99.7	100	100
Kyrgyzstan	99.9	96.4	99.9	100	100
Tajikistan	78.7	82.1	83.4	88.8	95.9
Uzbekistan	98.0	98.0	98.7	98.7	99.8

Table 10: Percentage of who received at least one antenatal visit during last pregnancy
Source: Authors' own analysis UNICEF MICS-3 data

3.2. SKILLED BIRTH ATTENDANCE

Skilled birth attendance is associated with fewer complications during birth, and with resultant lower rate of post birth morbidity and mortality. The presence of a skilled birth attendant is particularly vital in the case of emergency births (UNFPA, 2010). Improving skilled birth attendance is a key goal of MDG#5. Figure 20 presents the percentage of women whose birth attendant was skilled. Due to data restriction in the MICS datasets, this data refers to women who had a birth within the two years previous to the survey. In general, most countries demonstrate high rates of skilled birth attendance, with relatively little intra-country variation. This implies a strong and regionally consistent implementation of skilled birth attendant programmes. The exception to this is Tajikistan, which demonstrates a comparatively lower rate of skilled birth attendance albeit still in excess of 80%. Tajikistan also demonstrates greater regional variation in coverage of skilled birth attendance, with a larger range between regions than any other country.

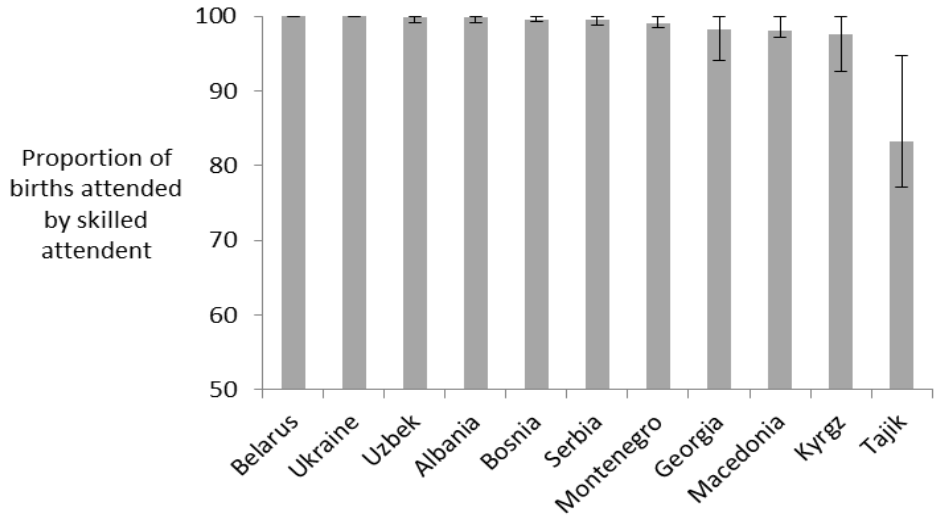

Figure 19: Percentage of mothers whose birth attendant was skilled
Source: Authors' own analysis UNICEF MICS-3 data

Table 11 presents the percentage of mothers who had a skilled attendant at birth (conditional on the birth being within the last 2 years). Broadly speaking, the high rate of skilled birth attendance seen at a national and regional level is replicated across wealth quintile, indicating little inequality by economic wellbeing. That said, there is some evidence of a wealth trend in Macedonia, Montenegro, Serbia, Georgia and Kyrgyzstan, although skilled attendance in the poorest wealth quintile is still in excess of 90%. The exception to this overall pattern is again Tajikistan, which demonstrates a clear wealth gradient in skilled attendance amounting to 21.6% overall, indicating a rate of skilled birth attendance some 31% higher in the richest wealth quintile compared to the poorest.

	Poorest	2nd	Middle	4th	Richest
Southern Europe					
Albania	99.0	100.0	100.0	100.0	100.0
Bosnia	98.8	100.0	100.0	99.0	100.0
Macedonia	95.5	99.0	98.1	100.0	100.0
Montenegro	97.7	100.0	100.0	97.4	100.0
Serbia	98.4	99.2	100.0	100.0	100.0
CIS					
Belarus	100.0	100.0	100.0	100.0	100.0
Georgia	95.0	99.3	98.7	99.4	98.5
Kyrgyzstan	93.4	98.6	97.2	98.2	100.0
Tajikistan	70.0	81.0	86.4	89.8	91.6
Ukraine	100.0	100.0	100.0	100.0	100.0
Uzbekistan	100.0	99.8	99.8	100.0	100.0

Table 11: Percentage of mothers whose birth attendant was skilled by wealth quintile
Source: Authors' own analysis UNICEF MICS-3 data

One factor which can explain variation in skilled birth attendance is the place of delivery. Where infants are delivered in an institutional setting, the rate of skilled birth attendance tends to be higher. Additional benefits can include improved access specialist intervention in the event of complication (UNFPA, 2011). Figure 20 presents the proportion of women who delivered in an institutional setting in the two years previous to the survey. In general, there is a close association between the rate of skilled birth attendance and the proportion of women delivering in an institution. The majority of countries report that the institutional delivery rate is in excess of 95%, although there is some geographic variation. Again, Tajikistan is a clear outlier, with both a lower overall rate of institutional delivery and considerably greater within country variation in the rate of institutional delivery by region.

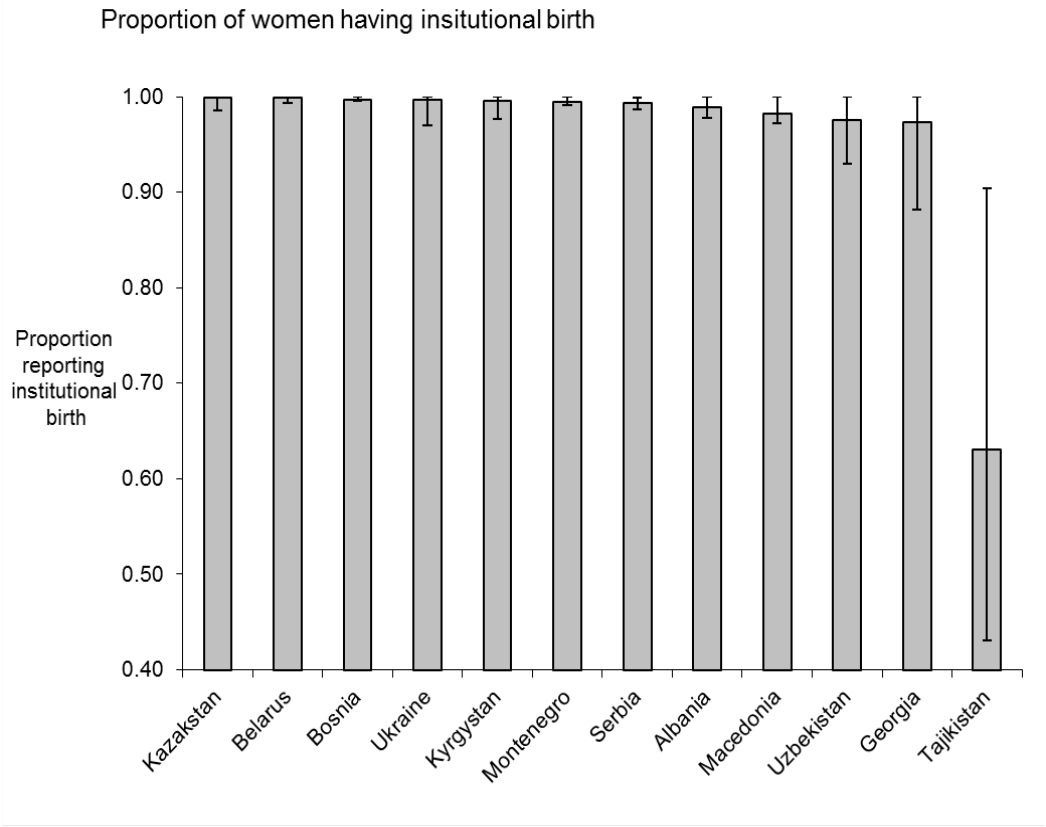

Figure 20: Percentage of mothers reporting institutional birth.
Source: Authors' own analysis UNICEF MICS-3 data

4. CONCLUSIONS

This paper presents data on inequality in child and maternal care across a number of countries in Central and Eastern Europe and the CIS. These countries all experienced traumatic transition from state socialism to a market oriented economy, which had a drastic effect on demographic and social indicators, as well as health care provision in the immediate post-transition period. The aim of this paper is to determine whether the decay of indicators of child nutrition and immunisation and maternal antenatal care and skilled birth attendance have persisted, and establish variation in the rates of these indicators both at a sub national regional level, as well as by individual characteristics.

We find that of all indicators presented, child nutrition is the most pressing problem in the countries examined. In all countries the proportion of children malnourished is above that expected in a well-nourished population (2.3%), in some instances more than 10 times this rate. Broadly speaking national economic wellbeing

seems to correlate strongly with nutritional status, with higher rates of underweight, stunting and wasting in poorer countries. Sub national variation is also a concern, indeed in the worst performing regions in some countries the rates of malnutrition are higher than those in considerably poorer countries. Clearly, while low national wealth is a key determinant of the rate of malnutrition, richer countries cannot be complacent and should address variation within their own borders. The rate of chronic malnutrition among the Roma population is also striking. Countries should ensure that isolated ethnic groups are not marginalised at the expense of child well-being.

Child immunisation rates produce a picture which is either disappointing or puzzling. Overall rates of child immunisation vary drastically between countries and the rate of complete immunisation across Hep-B, Polio, BCG, DPT and MMR is so low in Georgia, Tajikistan, Serbia, Macedonia, Uzbekistan and Kyrgyzstan to be a major concern. That said, when Hep-B vaccination is excluded the rate of immunisation jumps considerably across all other vaccines. This paper is unable to establish whether this is due to poor delivery of Hep-B vaccines, or whether the reporting structure is so poor as to cause major underestimates of the rate of immunisation. In either case, more should be done to ensure that Hep-B immunisation and its recording are improved across CEE and the CIS.

Maternal health tends to have better indicators than child health. For instance, a substantial proportion of countries demonstrate high rates of ante and pre natal testing for blood, urine, blood pressure and weight. Reassuringly where rates are high, they are consistently high not only across the battery of tests, but also by geographic region as well as locality, educational level and wealth quintile. Nevertheless, some countries demonstrate lower rates of testing, in particular, Albania, Montenegro and Tajikistan demonstrate provision of testing which is not only lower overall, but also tends to vary between region and across wealth quintile. Addressing this patchy service should be a future priority.

In terms of skilled birth attendance, the overall picture is somewhat encouraging. Rates of skilled birth attendance are high in nearly all countries, and variation between regions is small indicating consistency in service provision. There is little evidence of any gradient in skilled birth attendance by household wealth,

indicating near uniformity of accessibility by economic status. That said, Tajikistan appears an exception to this overall trend. The rate of both skilled birth attendance and delivery in an institutional setting is lower in Tajikistan than in any other country by a considerable margin. Tajikistan also demonstrates considerable variation in the rate of skilled birth attendance both in terms of region, but also in terms of household wealth bracket. Clearly, uniformity of access to skilled birth attendance should be a major priority in the Tajik context. Indeed, coupled with the low rates of antenatal testing, Tajikistan demonstrates lower levels of overall maternal health provision than any other country in our dataset.

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