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IMPOVERISHMENT, FOOD CONSUMPTION AND HEALTH IN CENTRAL AND EASTERN EUROPE DURING THE TRANSITION

Renato Paniccià

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UNU World Institute for
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List of abbreviations

CDR Crude Death Rate
CEE Central and Eastern Europe
CVD Cardio-Vascular Disease
FBS Food Balance Sheet
FSU Former Soviet Union
HBS Household Budget Survey
HCR Poverty Head Count Ratio
IPD Infectious and Parasitic Disease
SEE South-Eastern Europe
TBC Tuberculosis
LBW Low Birth Weight

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This paper could be considered as a first attempt to assess the impact of the impoverishment process in Central and Eastern Europe (CEE) on the health status of the population. In doing that it will be utilized as analytical framework the so called 'recession model' proposed by Mosley-Chen (1984), Cornia-Jolly-Stewart (1988), and more recently respecified by Anand-Chen (1996).

After a description of the analytical framework the analysis will focus on the CEE situation, starting with a description of the impoverishment process. The evolution of the food-nutrient-micronutrient intake during the transition will constitute the subject of the third part. The dependent variable (health status) will be analysed in the fourth part with a view to establishing a causal relationship.

1. The analytical framework

The recession model was formulated for the first time by Mosley-Chen (1984, henceforth MC). In the attempt to identify the model explaining child survival in developing countries they proposed to combine the socio-economic approach with the epidemiological analysis. The causality established by MC is the following: "Socio-economic determinants must operate through more basic proximate determinants that in turn influence the risk of disease and the outcome of the disease process", furthermore, 'Specific diseases and nutrients deficiencies observed in a surviving population may be viewed as biological indicators of the operation of the proximate determinants', so 'Growth faltering and ultimately mortality in children are the cumulative consequences of multiple disease processes'.

The exogenous (explanatory) variables of the model are socio-economic and they refer mostly to income-based indicators plus health system variables like disease control and accessibility to heath care. But what distinguishes the MC model is the introduction of the concept of proximate determinants of the dependent variable as defined above 'A novel aspect of this conceptual framework is its definition of a specific disease status in an individual as an indicator of the operation of the proximate determinants (intermediate variables) rather than as a cause of illness and death' (Mosley-Chen, 1984). The intermediate variables define by MC are: maternal risk factor, environmental contamination, nutrient deficiencies, injury, and personal illness control. Those intermediate variables are function of the exogenous variables and can affect the 'health

dynamics' of the population defined as 'the rate of shift of healthy individuals toward sickness', which is a transitory process, that nonetheless can lead to its ultimate consequence – death. The first four proximate causes are onset proximate determinants, as personal illness control acts as the offset instrumental variable for the pace of deterioration of the health dynamics.

Murray-Chen (1992) and Anand-Chen (1996) developed that model by introducing the concept of health stock. Health dynamics, the dependent variable in the MC model, could be considered as the flow of a particular stock variable, that is, health. The proximate determinants of the MC model affect the health stock of a population by depreciating/appreciating it. A high level of income means a rich nutritional status and so an appreciation of the health stock, as well as the investment in heath promotive assets like medical infrastructure but also investment in improvement of the quality of medical personnel could constitute an increase of the health stock. Morbidity and above all mortality are in turn function of that stock. The hazard rates linked with this two phenomena are of course different and are function of a threshold (critical minimum)

> '...a net reduction of the health stock in response to economic deterioration may lead to increased morbidity, but not will necessarily lead to mortality. Only the depletion of the health stock below a critical minimum will lead to death' and so 'the likelihood of the mortality as a consequence of the economic crisis will depend on (1) the duration and steepness and hence cumulative extent of the decline (2) the level of the initial health stock'.

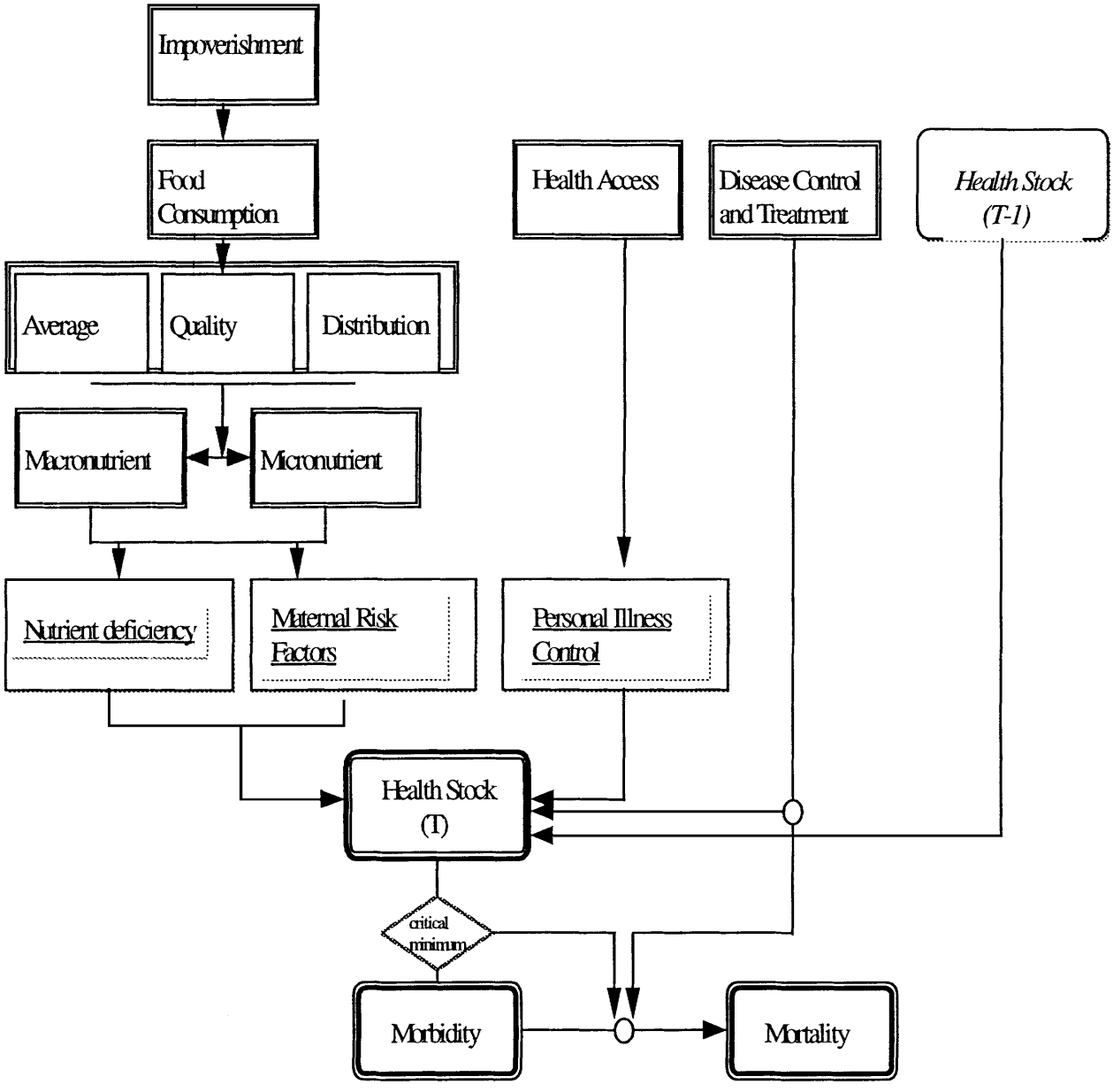
It is important to note how the new specification of the model implies the introduction of the temporal dimension (lag structure) in the analytical framework. A flow chart illustrating the causal relationships of the model is provided in Figure A.

The MC model was inserted in a more systemic socio-economic analytical framework by Cornia et al. (1988 – henceforth CJS). Their purpose was to build a consistent structural model able to asses the impact of adjustment policies on the welfare of population, especially children. In doing that they identified and tested five crucial relationships generated by a change in the underlying causes (socio-economic factors in MC) and that affecting the immediate causes (proximate causes) of deaths. The crucial relationship identified and supported by some empirical evidences were the following:

1. Food price, household food availability, nutrients intake, nutritional status, mortality;
2. Household income, household food availability, nutrients intake, nutritional status, mortality;
3. Food subsidies, food intake, nutrition;
4. Availability of health services, personal illness control, morbidity, infant mortality;
5. Unemployment, income, food and prenatal care availability, prenatal mortality.

These 'causal chains' identified in a better way the socio-economic explanatory variables and be easily inserted into the MC structure. In explaining the situation in CEE this paper will utilise the causal sequences 2 and 4.

FIGURE A
FLOW CHART OF THE RECESSION MODEL



2. The impoverishment process during the Transition

2.1 Incidence and depth

The transition process brought a massive increase in HCR through the region. An UNICEF ICDC estimate (Table 1, see annexe) for all transition countries puts the number of persons below the poverty line at 20, or around 35 per cent of the total population.

The most dramatic situation has developed in the FSU. Since the explosion of the HCR in 1992 (from 2.3 to 23.5), no signs of recovery have been recorded, rather a slight worsening, indicated also by other sources (World Bank 1994[1]). Poverty figures in Ukraine, Moldova and Belarus also appear to have deteriorated through that period. According to a World Bank survey source[2], almost 37.4 per cent of the families in Ukraine (around 23 million people) were living below the subsistence minimum in 1995. In Moldova the situation is similar, with around 40 per cent of the population living in poverty in 1994 after the sharp increase in 1992. The only data available for Azerbaijan shows that 4 million people are living in poverty. In the Baltic States, poverty incidences have stabilised after the 1992-3 shock, but at very high levels: 2.5 million people (nearly one third of the population) are now below the poverty line in the subregion, and two million of them are 'new poor' since the beginning of the transition.

In south-eastern Europe, the HCR increase was just a little bit less pronounced. In Romania, six million people, of whom two million were children, were impoverished in 1994 after two years of constant extension. The incidence of poverty among children was more than eight percentage points higher than that of the overall population. In Bulgaria 2.5 million people fell into poverty between 1991-4.

In Central Europe the probability to become poor was definitely less pronounced than the rest of CEE. Nevertheless, with the exception of the Czech Republic, the risk to all poor persons did not recover after the first year of transition and the most vulnerable group like children are still running a higher risk of falling into poverty than any other population group.

Throughout the entire region, an increase in the poverty rate affects children more than the rest of the population (again, with the exception of the Czech Republic and Slovenia) (Figure 1).

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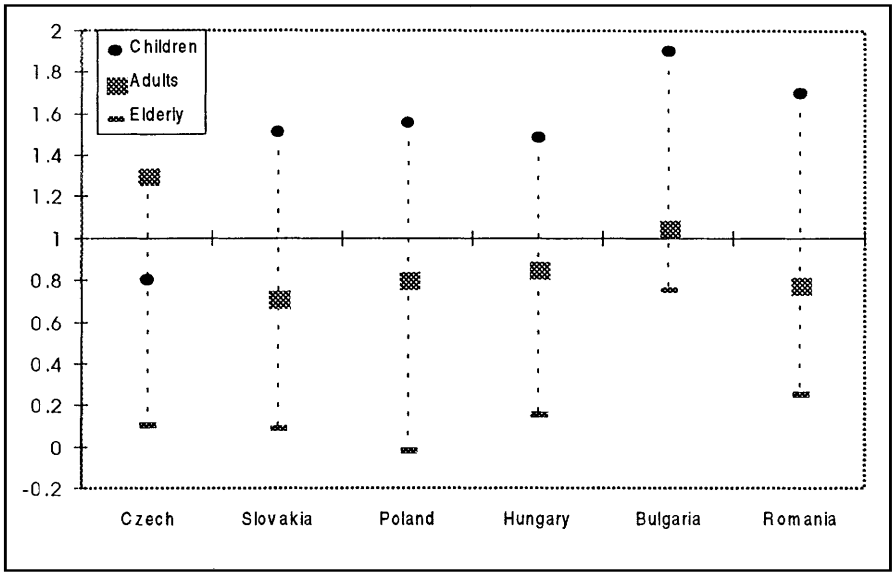
[1] World Bank. 1994. *Russia: Poverty Policy and Responses.* Vol.1 September. Washington DC: World Bank.

[2] The only available data for that country.

FIGURE 1
RELATIVE INCREASES IN HCR BY AGE GROUP, 1989-1993/94

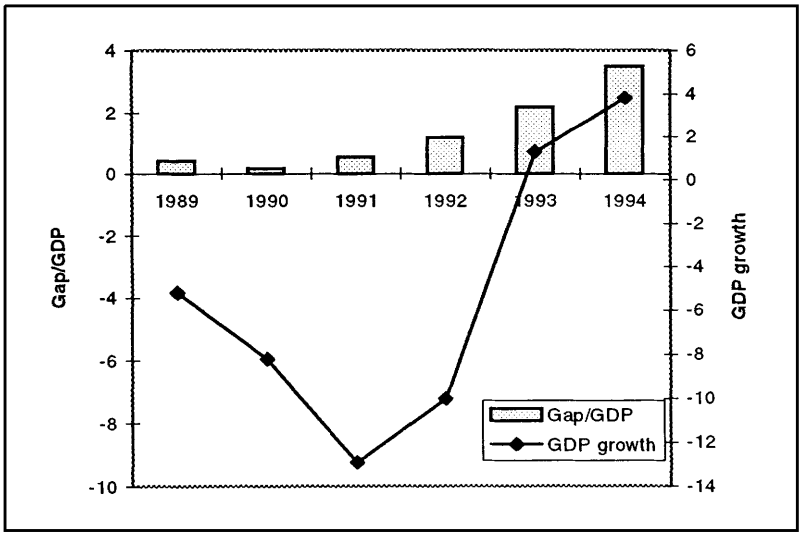


Source: TRANSMONEE Database.

Note: (a) for allowing comparability the poverty incidences have been standardised by the Hungarian demographic composition; (b) for Poland and the Czech Republic the period is 1989-1992

Poverty is becoming deeper in south-eastern Europe, as measured by the average distance of the poor below the poverty line (UNICEF 1996). As a result, households will find it increasingly difficult to emerge from their circumstances of poverty, exposing the population for longer periods to all the risk factors that accompany their condition of deep poverty. In the same region the cost of alleviation from poverty, despite the economic recovery began to rise after 1992. In Romania the poverty gap as a percentage of GDP increased in 1993 and 1994, despite steady GDP growth in those two years (Figure 2).

FIGURE 2
POVERTY GAP/GDP RATIO VS. GDP GROWTH IN ROMANIA



Source: TRANSMONEE Database.

Variables which together can proxy the poverty depth (income distribution, poverty incidence, and real incomes) indicate that also FSU countries follow similar patterns, but with higher poverty levels.

2.2 Who is poor?

Of all vulnerable groups, elderly people have the lowest risk of falling into deep poverty in most countries. Pensions have substantially maintained their absolute values (in real terms) and kept or improved their relative position compared with other benefits. Only in a few countries, such as the Baltic states, has the situation of pensioners worsened relatively. In Central Europe pensions started from a relatively high level, and their position improved until 1993. In the FSU and south-eastern European countries, the improvement has either been much less, from about 35 per cent to 45 per cent of the average wage, or pensions have maintained their real 1989 value. In these countries, pensioners risk deeper poverty when there is more than one unemployed/dependant in the household.

Children with unemployed parents and single parenthood have the greatest risk of falling into poverty, and, if unemployment persists, deep poverty. Parental unemployment is therefore generally seen as the principle cause of child poverty. Losing one's job translates into a 75 per cent probability of becoming poor in Romania and 54 per cent in Hungary (UNICEF 1995).

In the initial stages of unemployment, poverty is shallow as unemployment benefits, although currently too low to alleviate poverty, are sufficient to maintain beneficiaries near the poverty line. But the downsizing of benefits over the transition has dramatically increased the risk of poverty (UNICEF 1995). The risk of falling into deep poverty worsens as unemployment persists. The risk of poverty is quite high if parents are in that category of workers. Many of these families hover close to the poverty line, although increasingly they are dropping well below it. As noted above, the working poor is a phenomenon particularly characterising the FSU, and to a lesser extent south-eastern Europe, where the fall in real wages combined with other kinds of 'job disguisement' place a great many of workers in poor conditions. In Romania one fourth of all heads of household are working poor, while in FSU the situation of the working poor is aggravated by the large amount of wage arrears in state enterprises (about 25 per cent in 1994).

Families with children have been massively struck by the transition. As children represent the group with the highest probability of being poor, each extra child in a family increases that household's probability of falling below the poverty line. There is a clear correlation between the number of children in a household and the probability of being in poverty. While the cost of bringing-up children has increased substantially, income support has declined in both real values and relative terms.

The poverty incidence of households increases steadily with each additional child and soaring after the second child (World Bank 1996, World Bank 1995, Zamfir 1996, Libanova 1996). Income inequality plays an increasing role in the deepening of poverty in the region. The recovery in personal income (net per-capita available income) registered in the majority of countries was counterbalanced by the expansion of income disparity.

By updating and extending the analysis performed in the 1995 Monitoring Report (UNICEF 1995), it is possible to estimate the relative importance of income inequality in determining poverty.

The relation between inequality/poverty and income/poverty elasticities[3] (Table 2) indicates how income distribution has contributed to raising and maintaining levels of poverty during the second part of the transition.

TABLE 2
RATIO BETWEEN INEQUALITY/HCR AND INCOME/HCR ELASTICITY

Country	1989-1991	1992-1994
Bulgaria	2.12	4.13
Hungary	1.59	1.75
Poland	2.12	2.54
Romania	1.67	3.92
Slovakia	1.51	2.81

Source: Author's calculation

3. The consequences of impoverishment on consumption: food, macronutrient, micronutrient

The nutritional and nutrition-related impact of impoverishment in CEE could be analysed in three different ways. First, in terms of average level; the decline of income associated with the transition provoked a fall in average food, kcalories and protein intake. The drop in the intake was definitely more moderate than the income fall. This was mainly due to the role played by the low elasticities, as the Engel's theory states, greater self-production of food, a significant qualitative change in the daily diet led by the relative-price effect. Second the main impact was on the distribution of the intake. As resulted from the HBS data the impact of impoverishment was definitely greater on the distribution of food, kcalories, protein and micronutrients intake, with a drastic reduction of those amongst the poorest. Third, the change both in level and in the distribution, and the substitution effect mostly led to a drastic change in the quality of nutrients, of the energy intake (from proteins, carbohydrates and fat), and last but not least the quantity of micronutrients (vitamins and minerals).

The nutritional situation of CEE in the pre-transition period should briefly analysed.

3.1 Initial conditions

Unfortunately pre-transition nutritional data are based on FBS that only reflect the food supply available for consumption. They have adjusted as described above to take into account waste and other factors affecting distribution, nonetheless these data clearly overstate the amount of nutrients intake. However even by adjusting the FBS data by 10-15 per cent, it seems that the food supply was definitely adequate, furthermore low

[3] The elasticities were calculated by simulating different distributions, keeping constant alternatively the average income per capita and its income distribution. This was possible by using the parameters of the Dagum functional form in 1989, 1991, 1992 and 1994.

inequality stable income per capita, subsidised prices, ensured an adequate food consumption even for the poorest part of population. The pre-transition problem was not represented by undernutrition, rather by an highly unbalanced diet. From the 1960s onwards, the diet became considerably imbalanced towards rich protein food like meat and also highly energetic in terms of kcalories[4], most of them derived from fat. In fact one of the features of the pre-transition diet was the high-cholesterol component given the preference to animal food, especially fatty meats. Evidences from pre-transition *ad hoc* surveys on the diet composition by income class in Russia and in Hungary indicates that the main difference between poor and middle-income people is not in the amount of food consumed but in the structure of intake. The diet of impoverished persons is particularly poor in terms of micronutrients derived from milk, fruit and vegetables and richer in terms of energy coming from fat and carbohydrates.

3.2 Food consumption

3.2.1 Food intake: average evolution

In analysing the impact of the impoverishment on food consumption it has been utilised, for countries with available HBS, a system of demand based on the ELES (Lluch 1973). Given the nature of 'grouped data', the parameters of the system have been estimated by using the concentration analysis as developed by Kakwani (1980). Table 3 summarises the two different effects (income and price compensated).

TABLE 3
INCOME AND PRICE ELASTICITIES FOR FOOD: 1989-1994 AVERAGE

	Y-C	Y-F	C-F	Food	Alcohol + tobacco	Clothing	Rent + heating	Health/ educ.	Other durables
Bulgaria	0.956	0.515	0.538	-0.134	-0.013	0.022	-0.035	0.007	0.077
Poland	0.760	0.372	0.489	-0.144	-0.012	0.029	-0.069	0.016	0.050
Romania	0.926	0.586	0.645	-0.222	-0.016	0.037	-0.018	0.010	0.023
Slovakia	0.857	0.470	0.548	-0.104	-0.090	0.015	-0.035	0.001	0.014
Hungary									

Source; author's calculation, based on TransMONEE database

As expected, the food-income income elasticities witness the relative higher rigidities of the food consumption to changes of income, as the elasticity of total consumption indicates how the impact was absolutely relevant in Bulgaria and in Romania (quite close to unity for both countries) and less pronounced in Poland, Slovakia and Hungary. The food consumption showed a more than expected less pronounced elasticities, this is could be explained by using the usual Engel theory and by another three others factors.

First, the substitution effect between food and not basic needs, in turn helped by both a less than sustained dynamics of food prices and a strong rigidity towards its own price. It should also remarked, especially in Poland and Bulgaria by the effect in reducing food

[4] It should be noted that the dietary norms in CEE exceed by about 20% levels recommended by WHO.

consumption played by the increasing price in the other basic needs (such as heating and rent).

Second the decisive role played by the self-produced food (Table 4). Especially in Romania, particularly hit by the impoverishment process, the self-produced food constituted in 1994 almost a half of the total consumption of food[5]. It increased, even if only slightly, in Hungary and reached dramatic proportions in Georgia. The growing consumption of self-produced food is quite common in the Region, even amongst urban population with access to small plots of land near the city (Snustskiene 1994, Pop 1994, Bordian 1994, Gantcheva 1995). A 1991 survey in Bulgaria (the year of the first economic shock) showed that 69 per cent of interviewed households were engaged in the self-production of food

TABLE 4
PERCENTAGE OF SELF-PRODUCED FOOD OVER THE TOTAL FOOD CONSUMPTION

	1989	1990	1991	1992	1993	1994
Czech				7.3	8.8	8.5
Georgia	37.8	50.7	66.8	70.8		
Hungary	23.0		24.6		23.0	24.1
Poland	16.9	15.6	14.4	15.1	15.4	14.6
Romania	34.6	33.1	38.8	43.2	43.0	45.5
Slovakia	18.5	18.7	20.7	20.3		
Slovenia	18.8	16.3	15.5	18.0	21.2	

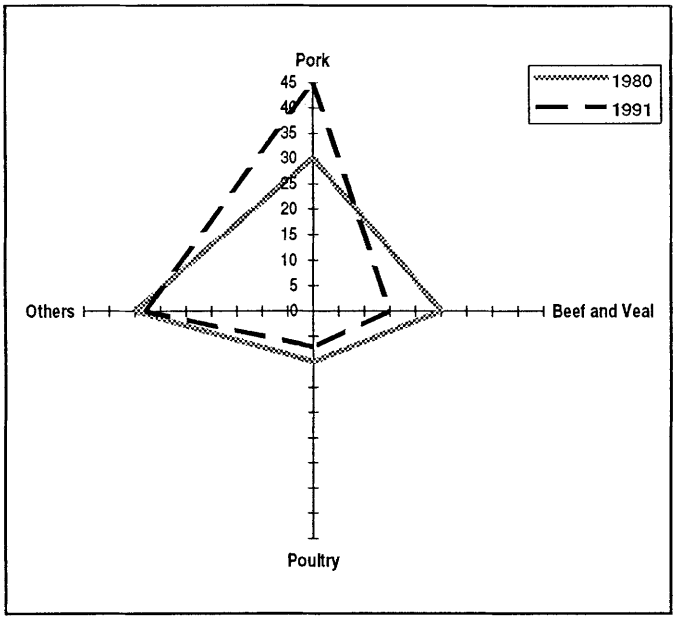
source: TransMONEE database

Third is the substitution between different kinds of food due to both different income elasticities and different price-elasticities. In the majority of countries there was a shift of food expenditure from meat and milk to bread and fats. The only exception were represented by Poland (Ochosky 1994) and Hungary (Lakatos 1994), in these countries the price of bread and milk increased much more rapidly due to delayed subsidies removal. Unfortunately the available breakdown does not allow to catch properly the direction of the substitution, and, definitely more likely, the infra-food-group substitution has been more pronounced. Evidences from scattered nutritional surveys indicate that the shift was toward less rich food products as pork meat instead of beef and veal. Figure 3 shows how the first year of economic shock drastically changed the proportion of meat intake in Bulgaria.

However the result of those factors could be well summarised by Table 5, which shows the situation in Belarus (in 1995) which faced a sharp increase in the impoverishment process in the last two years (World Bank, UNDP 1996), and even on the average none of the food product matches the minimum requirements.

[5] The proof that self-produced food was one of the instruments for sustaining the food consumption is given by both the income elasticities priceelasticities derived from the concentration curves – they are higher than the overall food consumption both income and food price elasticities, respectively 0.673 and 0.572.

FIGURE 3
PROPORTION OF MEAT INTAKE BY ORIGIN IN BULGARIA: 1980, 1991



Source: National Centre of Hygiene, Ecological Medicine and Nutrition, Sofia

TABLE 5
FOOD CONSUMPTION IN BELARUS, 1995

Food item	State-set minimum consumption level for family of four	Actual 1995 levels for family of four	Ratio actual levels, minimum consumption
Bread/bread products	164.0	92.8	0.57
Potatoes	123.0	94.4	0.77
Vegetables	110.0	65.1	0.59
Fruits/berries	99.1	29.0	0.29
Sugar/sugar products	24.6	20.2	0.82
Meat/meat products	48.4	42.8	0.88
Fish	14.3	7.5	0.52
Milk/milk products	440.0	264.9	0.60
Eggs (units)	342.0	160.1	0.47

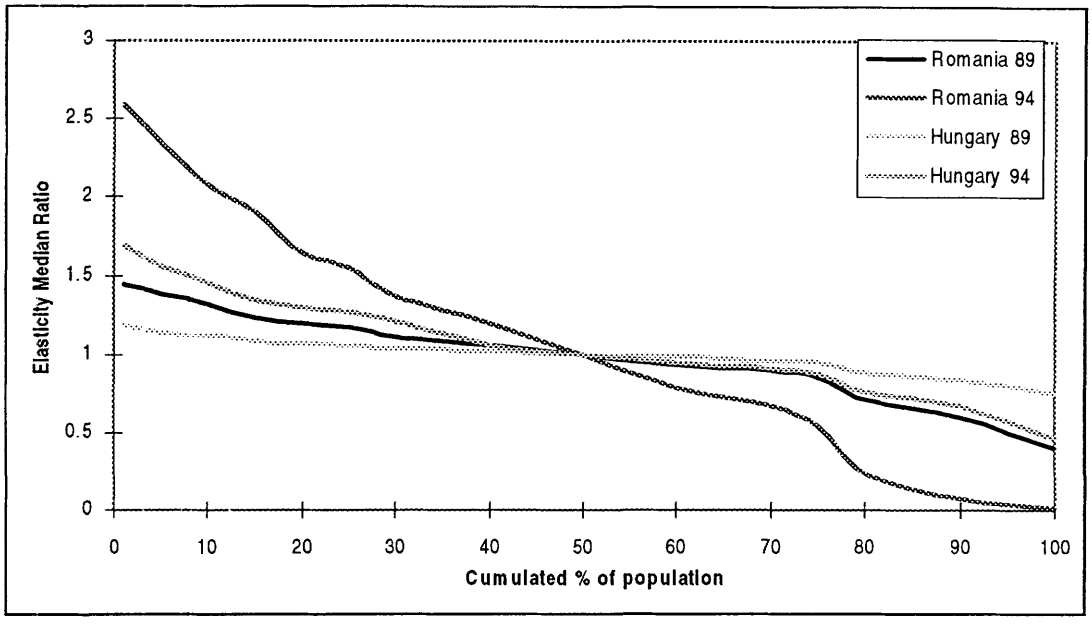
Source: Gasyuk/Morova, Changes in Living Standards in the Transition, Report on Belarus for the MONEE project, March 1996.

3.2.2 Food intake distribution

Another effect of the impoverishment has been the change of the distribution of food intake amongst population. From the HBS it is quite clear that the impoverishment process provoked a rapid change in the income elasticities structure of food consumption. The food-income elasticity is a good indicator of how much the consumption of a group of individuals has been affected by income variation, and, despite the coping strategies implemented (self-produced food; change in the daily diet),

the elasticity gap between different groups of population increased as the process of impoverishment went ahead.

FIGURE 4
FOOD-ELASTICITY-MEDIAN RATIO FOR SELECTED COUNTRIES: ROMANIA AND HUNGARY



source: TransMONEE database

Countries particularly affected by this process (like Romania) showed a huge increase in such a differential as countries in Central Europe (like Hungary) retained the impoverishment process (especially the poverty gap) and so the differential was definitely less pronounced. As expected the distribution of food intake changed significantly for food with higher elasticity such as milk and meat (Table 6) and where the release of subsidies (especially milk) were more pronounced through the region.

TABLE 6
CONCENTRATION RATIOS FOR TYPE OF FOOD IN SELECTED COUNTRIES: 1989-1994/3

	Romania		Hungary		Slovakia		Poland		Bulgaria	
	1989	1994	1989	1994	1989	1994	1989	1994	1989	1994
Bread	0.03	0.04	0.03	0.04	0.05	0.07	0.13	0.09	0.05	0.07
Meat	0.12	0.16	0.12	0.13	0.10	0.15	0.15	0.15	0.14	0.22
Milk	0.09	0.18	0.07	0.10	0.07	0.10	0.14	0.09	0.08	0.14
Oils + fat	0.08	0.13	0.09	0.09	0.05	0.09	0.15	0.12	0.04	0.07
Sugar	0.07	0.12	0.05	0.09	0.10	0.12	0.18	0.11	0.14	0.16

source: TransMONEE database

Even in this case, greater impoverishment meant increasing inequality in food distribution. In terms of physical quantity intake, with few exception, it declined at considerably faster pace for the extremely poor segment of the population than for the segment with *per capita* income equal to the average (Table 7). The extent of the decline

of food intake amongst the poor seems strictly linked to the severity and depth of poverty, in turn related to the deterioration of income inequality.

TABLE 7
FOOD INTAKE IN SELECTED COUNTRIES: 1989-1993

	Bread			Meat			Milk			Vegetables		
	1989	1993	varia tion	1989	1993	varia tion	1989	1993	varia tion	1989	1993	variati on
Bulgaria												
First decile	12.9	11.8	*-8.3*	3.8	3.2	*-15.8*	10.1	7.0	*-30.1*	5.4	4.1	*-23.0*
Second & third deciles	14.0	12.9	*-7.9*	5.2	4.5	*-14.3*	11.2	7.5	*-32.9*	6.8	5.4	*-21.1*
Average	15.8	14.9	*-5.6*	6.5	5.9	*-9.2*	11.0	7.9	*-28.5*	8.6	9.0	*4.1*
Hungary												
First decile	7.3	6.5	*-10.0*	3.7	3.4	*-9.5*	6.8	5.6	*-17.6*	6.0	5.5	*-8.6*
Second & third deciles	7.9	7.1	*-9.6*	4.4	4.3	*-2.3*	7.4	6.7	*-9.5*	8.0	7.8	*-1.8*
Average	7.8	7.7	*-1.7*	6.1	6.0	*-2.4*	8.6	8.5	*-0.7*	10.9	10.5	*-3.7*
Poland												
First decile	9.7	9.7	*-0.3*	4.7	4.0	*-15.4*	10.9	8.0	*-26.4*	6.2	5.8	*-5.9*
Second & third deciles	9.7	10.0	*2.2*	5.0	4.7	*-5.1*	10.9	9.0	*-17.0*	7.1	7.4	*4.5*
Average	10.0	10.2	*1.8*	5.6	5.6	*-0.9*	10.7	9.2	*-14.7*	8.7	9.3	*7.5*
Romania												
First decile	10.3	10.3	*0.2*	3.3	2.7	*-17.0*	6.5	5.5	*-15.0*	7.9	6.4	*-18.5*
Second & third deciles	10.9	10.9	*0.3*	4.0	3.8	*-5.2*	7.4	7.1	*-4.5*	10.0	8.8	*-11.8*
Average	11.4	11.5	*0.5*	4.8	4.8	*-0.6*	8.3	8.2	*-1.2*	12.0	10.8	*-10.1*

source: TransMONEE database

The sharpest decline amongst the lowest population strata in food consumption took place once again in respect of milk, meat, and fruit and vegetables. Two extremely food items, milk and vegetables, dropped dramatically amongst the poor population. Milk particularly suffered by the release of subsidies, which in turn affected more poor people. The most striking situation is in Bulgaria where the consumption of milk dropped from 11 to 7 litres *per capita* in the first and second decile from 1989 to 1993. Concerning vegetables and fresh fruit, the pattern of consumption has been affected by the amount of self-produced food, that is mainly concentrated in the production of that kind of food. A better comparative situation amongst income group could be provided by Table 8, showing the high degree of differentiation in food consumption in Belarus in 1995. Still, vegetables, fruit, milk and meat are the basic food suffering the greatest polarisation.

TABLE 8
FOOD CONSUMPTION IN SELECTED DECILES IN BELARUS: 1995

	Households in the lowest income decile	Households in the highest income decile	Ratio highest/lowest decile
Bread/bread products	106.5	168.9	1.59
Potatoes	136.4	145.8	1.07
Vegetables	57.6	139.1	2.41
Fruits/berries	11.3	70.7	6.26
Sugar/sugar products	13.1	57.2	4.37
Meat/meat products	28.8	97.5	3.38
Fish	3.5	20.5	5.86
Milk/milk products	221.6	545.5	2.33
Eggs (units)	131.1	336.3	2.56

Source: Gasyuk/Morova, Changes in Living Standards in the Transition, Report on Belarus for the MONEE project, March 1996.

3.3 Macro-Nutrients intake

3.3.1 Kcalories and proteins: average consumption

The decline in food consumption had less of an impact over the average amount of energy and proteins intake. According to the figures in Table 9 the drop in kcalories *per capita* was particularly pronounced in south-eastern Europe (Romania, Bulgaria) and in the FSU, especially in Ukraine and Moldova. Nevertheless, the income elasticities have been definitely lower than those of food incomes, ranging between from 0.11 for Slovakia to 0.359 for Bulgaria. This is an expected extent and it was mainly due to the substitution processes in the food intake as suppliers of kcalories. According to the figures derived from the HBS there was not a dramatic decrease of kcalories in relation to the impoverishment process.

TABLE 9
AVERAGE NUTRIENT INTAKE IN SELECTED COUNTRIES: 1989-1993

	% decline in Kcalories 1989-1993	1993 Kcalories	% decline in Proteins 1989-1993	1993 proteins	Income-kcalories elast.	Income-Proteins elast
Bulgaria	-17.9	2682	-6.1	69	0.35	0.12
Hungary	-3.4	3126	-1.6	98	0.16	0.08
Latvia	-13.5	2375			0.13	
Moldova	-13.0	2566			0.21	
Poland	-1.1	2667	-2.6	75	0.11	0.13
Romania	-11.7	2759	-3.5	79	0.29	0.10
Russia	-6.8	2552	-7.9	92	0.22	0.23
Ukraine	-20.5	2860	-12.0			
Slovakia	-2.8	3143			0.12	

source: TransMONEE database

For proteins the data are even more scarce but still, the evidences from the HBS suggest that impact was lower than the kcalories, except for Russia where the amount of proteins intake declined much more than the kcalories.

Given the pre-transition nutritional pattern described above the declining level of nutrients do not necessarily suggest that, on average, there is an incumbent problem of mass undernutrition, even if different sources pointed out how the current levels of nutrients intake are not adequate according to the national recommended dietary allowance. This is the case of Russia where both in 1992 and 1993 the average energy intake was below the RDA (respectively 76.8 in 1992 and 71.8 in 1993) as the percentage of proteins intake over the RDA dropped dramatically from 114 per cent in 1992 to 101 per cent in 1993, but what is more worrying is that persons below 18 years of age still have a deficit of about 20 per cent over the RDA.

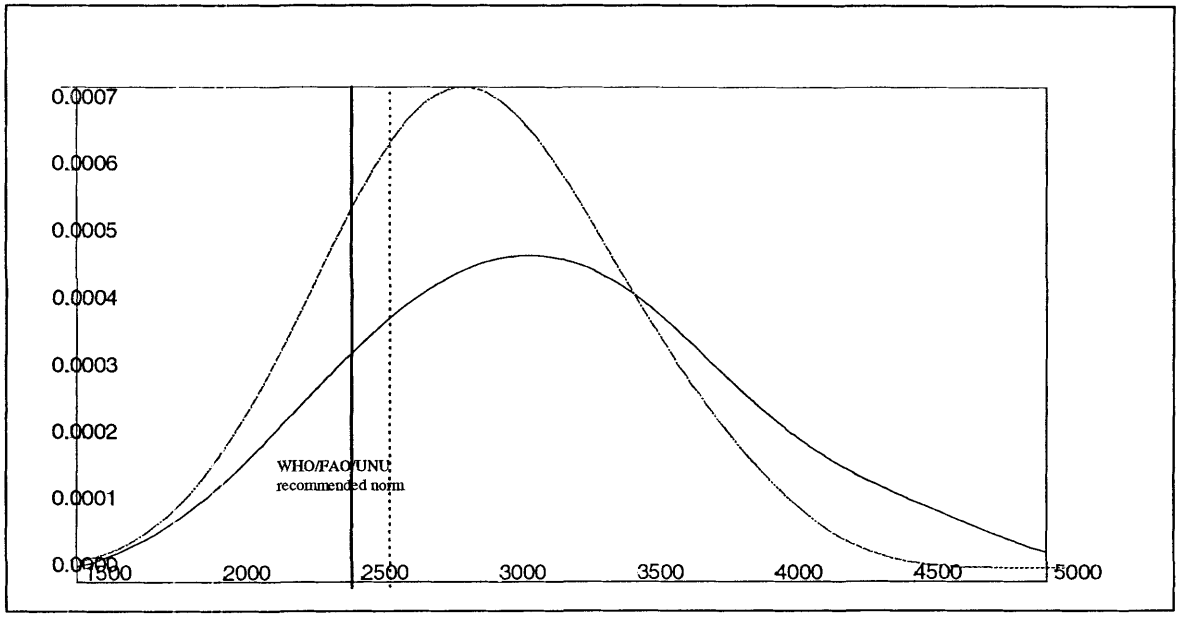
3.3.2 Kcalories and proteins: quality

In analysing the nutrient intake an important factor is constituted by the quality of energy intake. As discussed above the quality of energy intake in the pre-transition period was completely unbalanced toward fat and carbohydrates with a low proportion of energy from proteins. The food and diet transformation of the Transition period recorded an increase in energy from carbohydrates and decreases from the other two sources. Nevertheless, as the contribution from fat declined softly, contribution from protein fell significantly. Still The RMLS shows as in Russia from 1992-3 the percentage of energy from proteins fell from 14.5 to 12.5 (-14 per cent) as the fat one from 36.2 to 34 (-6.6 per cent). The last available WHO/HFA data (1992) records the same patterns for practically all CEE, with remarkable drops in Ukraine, Moldova and Romania.

3.3.3 Kcalories and proteins: distribution

The distribution of macronutrients has followed the same pattern of the food intake. Both kcalories and proteins distributions showed a more skewed distribution like in Bulgaria from 1989 to 1993 (Figure 5).

FIGURE 5
KCALORIES DISTRIBUTION IN BULGARIA: 1989-1993



Source: TransMONEE database

Note: adult equivalent population

The drop in kcalories and proteins intake in the poorest strata of population has affected the region with a differenet extent in relation to the depth of impoverishment. In some cases like in Bulgaria and Romania the quantity of both kcalories and proteins intake went well below the average recommended WHO/FAO/UNU (2400-2580) kcalories intake and the safe level of protein intake (58-63) in the first decile.

TABLE 10
KCALORIES AND PROTEINS IN THE FIRST TWO DECILES OF THE POPULATION IN SELECTED COUNTRIES: 1989-1993

	PROTEINS			KCALORIES		
	1989	1993	Variation	1989	1993	Variation
Bulgaria						
First decile	60	51	*-14.6*	2750	2145	*-12.7*
Second & third deciles	66	59	*-10.6*	3100	2442	*-11.9*
Hungary						
First decile	75	64	*-9.4*	2475	2330	*-6.7*
Second & third deciles	88	85	*-3.1*	2507	2404	*-4.1*
Poland						
First decile	74	66	*-11.1*	2611	2245	*-14.0*
Second & third deciles	78	71	*-9.0*	2695	2528	*-6.2*
Romania						
First decile	65	56	*-14.2*	2558	2303	*-11.1*
Second & third deciles	76	73	*-4.7*	2596	2420	*-7.2*

source: TransMONEE database.

3.4 Micronutrients

The importance of micronutrients in the development and functioning of the human body is mainly given by the crucial role played by minerals and vitamins in the construction and working of the essential enzymatic process. Unfortunately no systematic data are available such nutrients, but only scattered nutritional surveys which confirm that during the transition period there was a deterioration of micronutrient intake. The extent of the deterioration is recorded in different ways by different surveys – but it is significant, increasing, and above all affecting school age children, women of child-bearing age and pregnant women. It must be noted that the extent and severity of micronutrient deficiency is strictly correlated to the quality of food intake; high-quality meat, vegetable and fresh fruit, milk and fish are the main suppliers of minerals and vitamins, and an impoverishment of the diet unbalances the micro-nutrient status. In Russia the decrease in energy from proteins has been accompanied by rising deficiencies in all micronutrients. The only nation-wide available information on minerals intake shows a persistent decline from 1989 to particularly pronounced in 1992 (Table 11)

TABLE 11
SELECTED MICRONUTRIENTS INTAKE IN RUSSIA

	1989	1991	1992
Vitamin A	0.6	0.6	0.5
Vitamin B2	1.4	1.3	1.2
Vitamin C	41	39	38
Calcium	769	722	617

source: Health Policy Report, 1993

In an *ad hoc* survey conducted in April-June 1992 in the cities of Bryansk, Tula and Kaluga 50 per cent of population were found to be deficient in vitamin C, and relevant deficits were also found for other vitamins (A, E, B1, B2, B6). In Bulgaria a survey amongst children 6-10 year olds in 1993 indicates that just three micronutrients are above the RDA (Table 12)

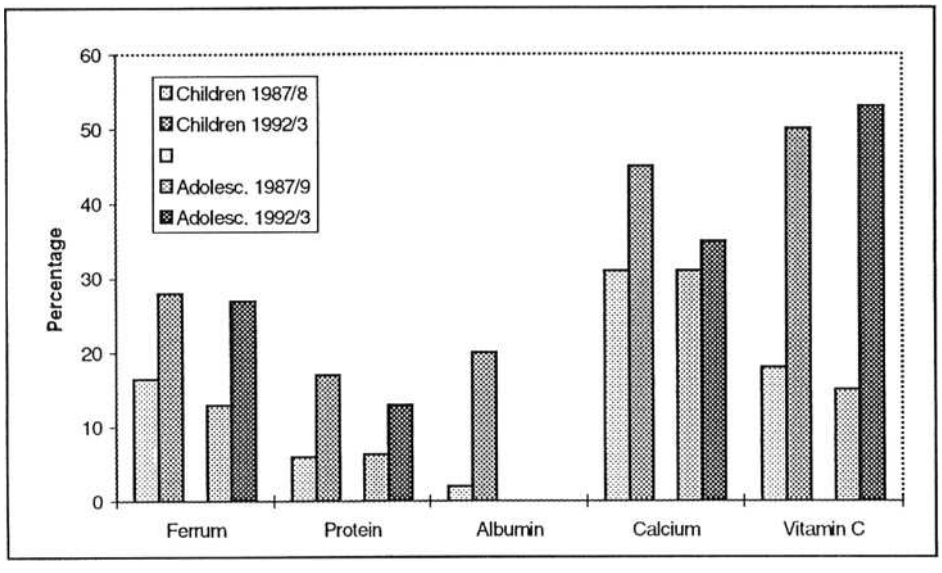
TABLE 12
MICRONUTRIENTS INTAKE AS PROPORTION OF THE RDA: BULGARIA 1993

	Percentage over Recommended Daily Allowance
Calcium	75
Iron	101
Zinc	85
Magnesium	110
Vitamin A	138
Vitamin B1	82
Vitamin B2	85
Vitamin PP	60
Vitamin C	140
Vitamin B6	95
Folacin	62

source: National Centre of Hygiene and Nutrition, 1994

Another ad hoc survey conducted in Slovakia (Figure 6) indicates how the prevalence of nutrient deficiencies in children and adolescents steadily increased.

FIGURE 6
PREVALENCE OF MICRO-NUTRIENT DEFICIENCY: SLOVAKIA 1987-1993



Source: Slovak Institute of Research on Nutrition

One worrying aspect is the iodine deficiency which is spreading through out the region. This is not strictly related to the household impoverishment process but to the lack of public resources devoted to iodination process and its quality. As pointed out in UNICEF 1994, in Albania, Romania and Bulgaria the production and distribution of iodised salt practically ended. In Albania just 5 per cent of factory iodised salt, despite regulations. In the FSU just 30 per cent of salt was iodised in 1992 even though salt iodination programmes have been legislated. Later on will be described the impact that such as factor have been on the spread of iodine deficiency related disease.

3.4.3 The dependent variable: health dynamics in CEE

The change in nutrients intake mainly affects health status by means two different ways: the first one is the lowering of the host resistance. Even mild and moderate malnourishment can lead to both an increasing immuno-deficiencies with a stronger exposure to infectious and parasitic diseases (frequency) and an increasing duration and severity of the disease once the host is infected (Martorell-Ho, 1984)

The second one is related to the deficiency of some micro-nutrients, and to a certain pathology related to the enzymatic process, in this case the main target is constituted by individuals with high proportion of metabolism dedicated to growth; children, and pregnant and lactating women (Martorell-Ho, Brown, Huffman-Lampere).

The health dynamics will be monitored in its linkage with the nutrient intake described above by using both morbidity and mortality indicators; like IPD mortality and incidence and pathology related to micronutrient deficiency.

3.5 IPD Cause specific mortality

Despite such a collapse in income-consumption and nutrient intake, the relative contribution to the overall mortality due to infectious and parasitic diseases was extremely low. Cornia-Paniccià' (1995 and Table 12) showed that the main contribution, in all countries, to the increase in mortality was mainly due to CV and violent causes diseases (around 45 per cent) as the IPD contributed just for the 3 per cent.

TABLE 13
CONTRIBUTION OF CAUSES OF DEATH TO CDR CHANGES, 1989-1993

	Absolute change in CDR	Infectious diseases	Cancer	Heart + circ. diseases	Respir-atory diseases	Digestive diseases	External causes	Other causes
Belarus	2.5	1.5	6.1	25.4	-5.6	1.2	16.7	56.3
Bulgaria	1.2	4.2	16.7	54.5	-32.3	2.6	7.6	46.8
Hungary	0.9	-1.1	38.8	30.4	2.4	26.3	2.3	0.9
Lithuania	2.2	2.7	10.0	29.2	0.2	2.1	28.2	27.5
Romania	1.0	1.0	15.5	66.8	-34.3	10.7	-3.8	45.1
Russia	3.8	1.0	4.4	45.1	4.0	2.9	35.7	7.0
Slovakia	-0.6	-3.7	-32.3	-25.5	52.7	27.8	10.9	70.1
Ukraine	2.6	1.1	3.2	47.2		15.0	1.0	32.5

Source: TransMONEE database

In turn the differentials in mortality were explained as effects of increasing psychosocial stress, given the age concentration of deaths (middle-aged men) and its characteristic (CV disease and violent causes). It still unknown what exactly is the contribution of further change towards a more fat-based diet. Which is a typical medium term effect – not able to fully explain a sudden and massive increase in mortality as experienced in FSU.

In terms of dynamics, the mortality due to IPD sharply increased from 1992, attaining in 1994 the highest rates of change amongst other causes of death (UNICEF 1994) in all countries,except in Central Europe where the SDR is stabilised at pre-transition period. There are three patternsemerging in the IPD mortality in EE (Table 13). The first one, quiet common in FSU, after a decade of steady decline it reached a turning point around 1990-1991 and after that it soared at high rate of growth. The second type of evolution has been noticed in Romania and Moldova after a stable increase during the 1980s it started to grow at higher rates after 1991. The Hungarian trend is common in CEE (Hungary, Czech, Slovakia and Poland) where the IPD mortality has kept on its pre-transition pattern towards much lower rates.

In countries where the IPD increased, men were affected more than women in Russia, Moldova and Romania as in the Baltic countries the gender differentials in IPD mortality declined.

TABLE 14
STANDARDIZED IPD DEATH RATES IN SELECTED COUNTRIES: 1985-1994

		1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1989/1985	1991/1989	1994/1991
Estonia	Total	10.5	7.9	7.5	8	8.2	8.2	9	9	11	11.5	-21.90	9.76	27.78
	Male	18.3	15	10.9	12.6	14.3	14.9	15.5	16.5	20.4	20.3	-21.86	8.39	30.97
	Female	5.4	3.5	5.3	4.5	3.9	3.2	4.2	3.3	4.2	5.5	-27.78	7.69	30.95
Hungary	Total	9.7	9	9.9	9.2	10	8.5	8.3	8.3	8.5	7.6	3.09	-17.00	-8.43
	Male	15.4	14.2	15.9	14.1	15.7	13.7	13.1	13.3	13.9	12.3	1.95	-16.56	-6.11
	Female	5.5	5.1	5.5	5.6	5.7	4.7	4.6	4.5	4.3	3.8	3.64	-19.30	-17.39
Lithuania	Total	12.6	8.1	9.2	9.8	9.3	9.6	10.6	10.9	13.9	15.3	-26.19	13.98	44.34
	Male	20.6	13.8	15.6	16.1	14.9	17.2	18.1	18.1	24.4	26.7	-27.67	21.48	47.51
	Female	6.8	3.8	4.6	5.1	4.8	3.7	4.8	5.4	5.7	6.3	-29.41	0.00	31.25
Latvia	Total	18.1	15.8	13.2	11.2	12.5	11.1	11.1	10.8	11.7	17.7	-30.94	-11.20	59.46
	Male	25.4	21.7	17.3	16.1	17.8	17.3	17.8	17.1	18.8	27.9	-29.92	0.00	56.74
	Female	12.1	11.1	9.9	7.1	8.3	6.1	5.6	5.5	5.6	9.2	-31.40	-32.53	64.29
Moldova	Total	11.1	10.6	10.1	11.7	12.7	11.4	11.6	13.9	15.5	20.4	14.41	-8.66	75.86
	Male	16.9	16.1	15.4	18.2	20.6	17.9	18.9	22.5	26.3	35.4	21.89	-8.25	87.30
	Female	6.8	6.7	6.6	7.2	7.2	6.6	6	7.4	7.3	9	5.88	-16.67	50.00
Romania	Total	10	10.9	12.3	11.4	12.1	12.5	12.1	13.5	15.1	17.9	21.00	0.00	47.93
	Male	14.2	15.3	17.3	16.3	17.4	19.1	18.4	21.3	24.3	30.3	22.54	5.75	64.67
	Female	6.1	6.7	7.6	6.8	7.1	6.4	6.1	6.2	6.4	9	16.39	-14.08	47.54
Russia	Total		14.8	14.1	13.8	13.3	12.8	12.7	13.9	18.3	21.1	-10.14	-4.51	66.14
	Male		24.7	23.7	22.9	22.8	22	21.8	24.5	32.2	36.8	-7.69	-4.39	68.81
	Female		7.7	7.2	7	6.1	5.8	5.7	5.6	7.1	8.1	-20.78	-6.56	42.11

source: WHO/HFA database

Middle-aged men recorded the highest rates amongst age groups. In table 14 it is possible to see the age structure of IPD mortality for males in Czech and Russia. In the first country, the IPD death rates increased in the first period of transition slightly. After 1991 the mortality rates decreased returning to the 1989 levels in 1993. In the second country there was a slight increase in the first period of transition which disappeared in the second period. The contribution of TBC to the IPD mortality raised in 1991 for stabilising two years after at lower level in 1993.

TABLE 15
IPD MORTALITY RATES FOR MALES BY AGE GROUPS IN RUSSIA AND THE CZECH REPUBLIC

Russia	1989			1991			1993			Total		TBC	
	Total	of which	%	Total	of which	%	Total	of which	%	1993/199	1993/1989	1993/1991	1993/1989
0	172.0	0.4	0.2	139.0	0.6	0.4	167.0	1.3	0.8	1.20	0.97	2.17	3.25
1-4	10.9	0.1	0.9	7.5	0.1	1.3	8.4	0.2	2.4	1.12	0.77	2.00	2.00
5-14	1.0	0.0	0.0	1.0	0.0	0.0	1.0	0.0	0.0	1.00	1.00	1.00	1.00
15-25	2.9	1.5	51.7	2.7	1.4	51.9	4.2	2.5	59.5	1.56	1.45	1.79	1.67
25-35	10.9	9.4	86.2	11.9	10.3	86.6	18.6	16.2	87.1	1.56	1.71	1.57	1.72
35-44	23.2	20.7	89.2	25.5	23.1	90.6	41.4	37.1	89.6	1.62	1.78	1.61	1.79
45-54	35.9	31.5	87.7	38.2	33.8	88.5	61.0	53.3	87.4	1.60	1.70	1.58	1.69
55-65'	42.1	35.1	83.4	40.9	35.1	85.8	60.8	53.2	87.5	1.49	1.44	1.52	1.52
65-74	39.0	30.0	76.9	36.9	29.5	79.9	49.5	39.1	79.0	1.34	1.27	1.33	1.30
74+	41.5	31.1	74.9	30.4	22.0	72.4	39.5	27.2	68.9	1.30	0.95	1.24	0.87
Czech Ren.	1989			1991			1993			Total		TBC	
	Total	of which	%	Total	of which	%	Total	of which	%	1993/199	1993/1989	1993/1991	1993/1989
0	6.1			9			4.8			0.53	0.79		
1-4	0.7			0.4			1.5			3.75	2.14		
5-14	0.1			0.1			0.1			1.00	1.00		
15-25	0.5	0.1	20.0	0.4			0.5	0.1	20.0	1.25	1.00		1.00
25-35	0.4			0.9	0.3	33.3	0.9	0.6	66.7	1.00	2.25	2.00	
35-44	2.0	0.5	25.0	2.5	1.6	64.0	1.9	0.6	31.6	0.76	0.95	0.38	1.20
45-54	1.9	0.9	47.4	3.0	2.3	76.7	2.5	1.3	52.0	0.83	1.32	0.57	1.44
55-65'	12.6	4.6	36.5	9.9	5.6	56.6	5.3	1.9	35.8	0.54	0.42	0.34	0.41
65-74	15.9	5.9	37.1	13.7	6.5	47.4	13.1	4.8	36.6	0.96	0.82	0.74	0.81
74+	38.6	10.5	27.2	32.1	14.0	43.6	30.9	11.8	38.2	0.96	0.80	0.84	1.12

source: WHO/HFA database

In Russia, men between 25-49 years of age recorded the highest increase in the IPD mortality in the two subperiod 89-91 and 1991-1993[6] and from the WHO statistics it is quite clear that almost 80-85 per cent of that mortality is due to TBC. Mortality amongst children rose only in the second subperiod but with at a significant pace, ending the positive declining trend of the 80s. From more detailed available records, that mortality was mainly due pathologies related to maternal immuno-deficiency like intestinal infection and septicaemia and/or poor hygienic condition like meningococcoal infection[7]. This mortality pattern is common in all FSU countries and in a lesser extent in south-eastern Europe.

3.6 IPD morbidity: incidence and distribution

After 1989/1990 some IPD started to grow after a decade of decline. The incidence of infectious diseases, such as diphtheria and tuberculosis have grown particularly in the FSU and Romania after a decade of either steady decline (TBC) or almost null incidence (Diphtheria). In Russia, diphtheria has begun to reach epidemic proportions, 6000 cases in 1992, 18.000 in 1993 and 43.000 in 1994 and the projections for 1995 indicates almost 60.000 new cases doubling the number of deaths due to such as infection between 1993 1994(WHO 1996). In Ukraine, as in CEE and SEE, the infection did not record a

[6] To be noted that 1991 was the year of the turning point of the IPD mortality in Russia.

[7] In FSU the mortality due to intestinal infectious disease accounts for almost 50% of the total deaths in 1993, the meningococcoal infection (almost non-existent in western cointrues) is respensible for 18% of deaths due to IPD and with highest rate of increase between 1991-3. The deaths due to septicaemia are 30% of the total

sign of outbreak, with Albania being the exception where between 1992-4 60 cases were recorded. Children have particularly been affected in Armenia, Azerbaijan and Moldova; in Russia Ukraine and Belarus, the middle-aged group seem to mostly suffer from this condition.

The number of new tuberculosis cases has also risen substantially, and 10 per cent of theseincidence affect children (UNICEF 1996). A higher incidence of tuberculosis among adults is usually followed by equally large increases among the child population. Particularly hit by TBC are Romania Russia, Lithuania and Latvia, where the incidence went up by 50-60 per cent from 1989. It s quite striking to see how the dynamics of the TBC incidence, substantially stable in all countries up to 1991, it increased sharply in FSU and in Romania from 1992 reaching high rate of variation in that countries.

As Mosley-Chen and Anand-Chen pointed out, there is a relationships between mortality and morbidity, particularly for IPD ' (Mosley-Chen 1993). This suggest that IPD mortality rates are also function of the duration and intensity of morbidity. By using the duration model framework, it means that the hazard function related to the event of the death is function of the duration of pathology and its intensity, given the other off/onset variables (especially public disease control).

Certainly this could be the case of FSU and SEE where the sudden and significant surge in mortality of the more recent years (1993, 1994, and probably 1995) after the 1991-2 turning point was proceeded by two years of increasing and rooted increase especially in TBC.

Another important type of morbidity is related to the increases of the maternal risk factors as consequence of nutrient imbalance, especially micronutrient and general living conditions.

TABLE 16
TBC INCIDENCE PER 100,000 POPULATION

	1989	1990	1991	1992	1993	1994	89/94	89/91	91/94
Armenia	89.6	85.9	86.2	86.9	82.4	89.6	99.9	96.2	103.9
Belarus	31.1	29.8	30.9	33.7	37.1	42.1	135.4	99.4	136.2
Czech	15.1	15.9	16.5	16.1	18.0	19.0	126.0	109.3	115.2
Estonia*			21.0	21.3	29.1	34.6			164.2
Hungary	35.6	34.6	35.4	38.4	40.9	40.6	113.9	99.4	114.7
Latvia	26.8	27.4	28.8	29.3	33.6	44.4	165.5	107.5	154.2
Lithuania	32.3	33.8	34.4	36.8	43.6	54.3	168.1	106.5	157.8
Moldova	40.6	39.6	43.8	43.1	44.6	50.8	125.1	107.9	116.0
Poland**	42.6	42.3	43.1	43.1	43.8			101.2	101.6
Romania	63.4	70.0	61.6	73.4	92.7	98.7	155.7	97.2	160.2
Russia	36.7	34.3	34.0	35.8	42.9	47.9	130.2	92.6	140.9
Ukraine		32.0	32.3	35.0	38.3	39.7			122.9

source: TransMONEE database

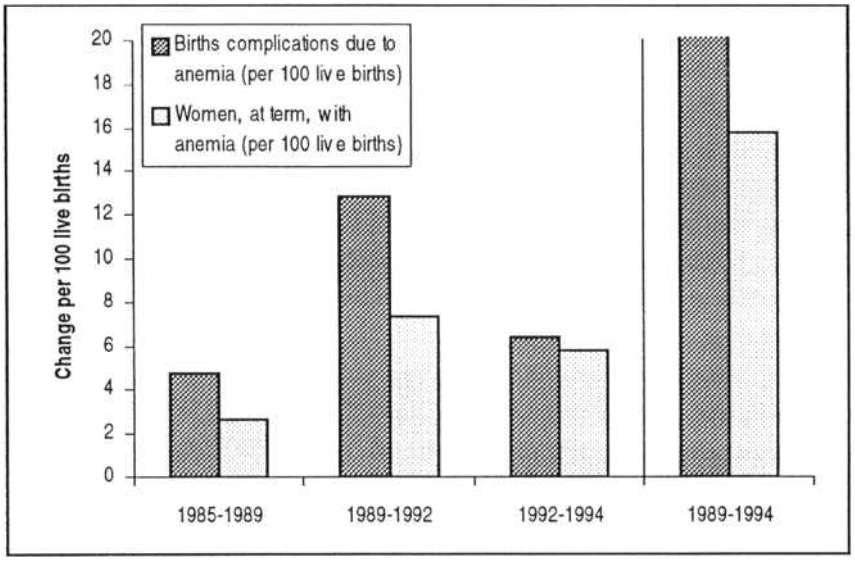
Note: *1992/1994 ratio, **1989/1993 ratio

The risk related to maternal factors has increased during the transition. As UNICEF 1996 pointed out '...While the number of 'high-risk' births has increased or remained stable, their share over the total births has risen even more sharply, given the drop in the fertility rates in most countries'.

Conditions like anaemia or iron deficiency, who traditionally witness the presence of micronutrient disorder have been growing. In China, Africa and Latin American countries, the proportion of anaemia does not exceed 40 per cent, and in most Western market economies, it affects about 15 per cent of expecting mothers. In 1994 Russia, the number of women, upon term, suffering from anaemia has more than tripled since 1985 (Figure 7), now affecting almost 33 per cent of mothers and in 1994 was the cause of complications in almost 20 per cent of births. In the Sofia region of Bulgaria, it increased by 18.6 per cent amongst pregnant women from 1989 to 1992. The impact of micronutrient imbalance affects mostly the vulnerable groups of the population (such as children, and pregnant/lactating mothers, with an high percentage of metabolism devoted to growth)[8].

[8] Growth faltering was one of the component of the dependent variables in the original MC model.

FIGURE 10
BIRTHS COMPLICATIONS DUE TO ANAEMIA IN RUSSIA



Source: Goskomstat, Meditsinskoye obsluzhivaniye naseleniya RF, 1992; 1993; 1994,

Micronutrient deficiencies, such as iron, vitamin A, and iodine, which are particularly important during the pregnancy period, both for the mother and child. The growing number of premature births, foetal deaths and children borne with low birth weight suggests that the problem of maternal health and nutrition is deepening.
A good proxy of maternal malnutrition is provided by low birth weight (Table 15), given high degree of dependence between the maternal nutritional status and the weight of the children..

TABLE 17
LOW BIRTH WEIGHT INCIDENCE IN CENTRAL AND EASTERN EUROPE: 1989-1994

	1989	1990	1991	1992	1993	1994
Azerbaijan	5.63	5.25	4.87	5.19	5.42	5.50
Belarus	4.23	4.26	4.27	4.33	4.61	4.10
Bulgaria	6.21	6.38	7.43	7.67	8.30	7.48
Estonia				4.90	4.32	5.01
Hungary	9.16	9.27	9.28	9.01	8.60	8.70
Latvia					5.07	5.00
Lithuania	3.82	3.71	4.07	4.38	4.40	4.26
Moldova		5.88	5.93	5.74	5.80	6.09
Poland	7.60	8.05	8.02	7.86	7.90	7.20
Romania	7.32	7.14	7.86	8.21	10.90	9.00
Russia	5.70	5.70	5.70	5.90	6.00	6.30
Slovakia	5.63	5.77	6.10	6.50	6.40	6.70
Slovenia	5.94	4.99	5.31	5.36	5.19	

Source: TransMONEE database.

The share of LBW has increased across the region, mostly at the beginning of the transition. In Romania, there has been a steady increase during this period and in 1994,

almost 10 per cent of new-borns were LBW in 1993. In FSU (apart from Belarus) there no signs of improvement, on the contrary the rate of change was definitely higher from 1993-1994. Completely opposite the situation in CEE where after two years of increase the LBW steadily declined below the pre-transition values. In SEE only in 1994 were recorded signs of recovery. It typically indicates that the mother was not receiving proper nutrition during pregnancy or even before the pregnancy period, thus the child was malnourished.

In Russia the overall share of sickly new-borns has also increased, affecting more than 25 per cent of births in 1994. While the increasing share is also the result of the steep drop in births, the absolute number of ill children born has increased by 27 per cent over the period. It should be remarked that the consequences of birth complications due to maternal malnourishment continues its impact on early child development.

A related risk factor is family type. A single mother faces many more difficulties, especially in both financially supporting and caring for her family. It has been shown in Section 2 that single mothers, particularly in Central and Eastern Europe, are at greater risk of poverty.

As with infant health, one of the most important determinants of normal physical and mental child development is proper nutrition. While the few and scattered available data do not show weak signs of severe malnutrition in terms of slow physical growth of children (usually measured by wasting, low weight for height), although in some countries, stunted growth (which is more related to micro-nutrient deficiency), has become more prevalent. The Russian RLMS shows that while there were not any indications of any major acute nutritional problems among young children, the prevalence of stunting among children under two years old increased from 9.4 per cent in September 1992 to 15.2 per cent in December 1994. The same pattern comes out from a nutritional survey conducted in Romania in 1992.

What is nagging in the nutritional situation of children is also the deficiency in micronutrients; the effects of which are extremely serious for the future physical and mental growth. In Russia the number cases of anaemia amongst children below 14 skyrocketed by 48 per cent from 1989 to 1992, In Romania and Slovakia ad hoc Nutritional Surveys recorded the incidence of hyposiderinemy (pre-clinical stage of iron deficiency) increased by 20-37 per cent during the period 1992-1993. Still in Slovakia, large deficits in calcium and vitamin C were found amongst children in the poorest parts.

In concluding this chapter it should be mentioned that it is very likely that a polarisation of the health stock amongst both income groups and regions has occured in the CEE . The Mexican experience during the 1980s well summarised in Lozano et al. (1991) indicates that one of the main consequences of the economic crisis were on the distribution of the health stock, partially hidden by the average figures on morbidity and mortality. Unfortunately we do not have data on the health status distribution, but only very little and scattered information (ad hoc multipurpose-health survey started just last years in Romania, Estonia, Poland and Bulgaria), but nonetheless geographical evidences from the spread of IPD (particularly in Russia) clearly show how this evolution has followed the spatial income dispersion.

4. The offset variable: health services

The CEE countries, despite inefficiencies (see Preker et al. 1995), inherited a sufficient level of physical health assets which, in turn, produced a sufficient output in terms of disease exposure and personal illness control. The quality did not reach the western standards, however the system guaranteed the essential health services (services with a low content of embedded technology) at very broad level, allowing for instance a sufficient quantity, quality and easily accessible of measures of minimisation of disease exposure like mass screening and vaccinations. The transition with budget cuts in the intermediary input (fuel, food and drugs) and a drastic reduction in the investment (medical equipment) and wages. The first impact was on the public disease control. The vaccination campaign recorded a significant drop in the first two-to-three years of the transition re-starting at the pre-transition period levels around 1992-3. Martin and Scott (1995) pointed out that one of the many causes of the diphtheria outbreak could be imputed to three years (1989-1992) when there was a huge drop in vaccination rates, which affected mainly the young cohort but which could affect the overall population level of immunisation It was no coincidence that the outbreak of diphtheria in Russia was proceeded by a huge drop in vaccination between 1990-1991[9]. These measures of reduction of disease exposure need very basic technology (for instance the iodination process) at very low costs, nonetheless the experience in developing countries (see, Macedo, 1988) show how the immunisation campaign is a crucial factor in the control of disease.

Furthermore, the activity of mass screening and vaccination is becoming more and more urgent as the population movements affecting that area are well recognised as one of the most important factor of the spread of IPD.

Another important aspect of the transition in public health has been the progressive weakness of the personal illness control, which is, in contrast with institutionalised measures of disease exposure, on a voluntary basis. The main variable affecting that proximate determinant has been the increase of the relative prices for medical services and drugs. This phenomenon hit all CEE countries reaching the highest peaks in Moldova, Bulgaria and Latvia where the relative price almost doubled between 1989-1994. Of course the impact of that evolution hit severely especially the marginalized families already pressed economically, introduces additional hardships. As noted in UNICEF 1996 ' This has led to the coping strategy of foregoing medical services, even for children, since families with children are most likely to be at risk of impoverishment and price barriers will certainly have an effect it'.

There are some exceptions, in the Czech republic, where medical services were rapidly turned over to local authorities or privatised and health care services became affordable for a large part of the population (Hirsl et al. 1995). Unfortunately this component of health assets and their output tends to be lost especially in FSU and SEE. In FSU the cuts in the public health budget increased the pace of deterioration of health care, now the health services are working well below the productive capacity, with scarcity of drugs, in

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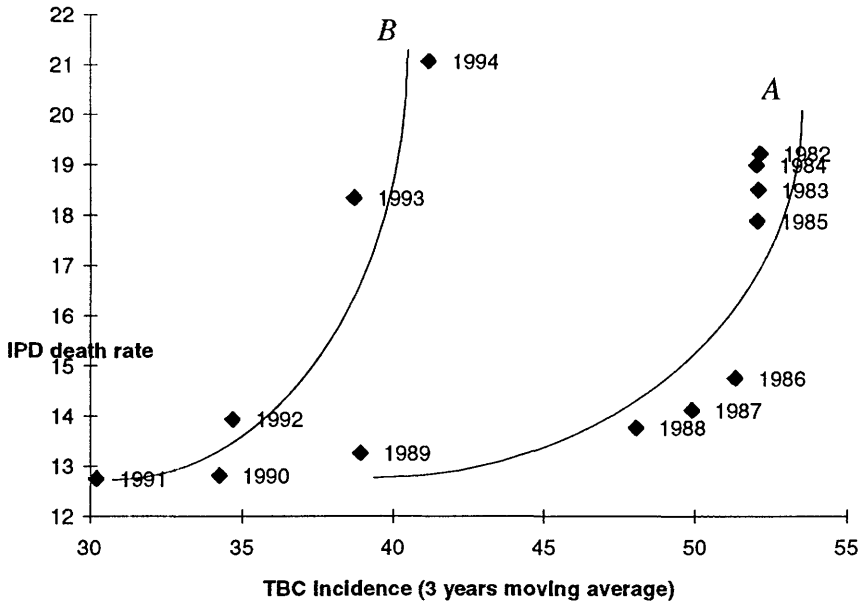
[9] The young cohorts, particularly 2-6 years are the age groups most exposed.

FIGURE 7
TBC INCIDENCE VS. IPD STANDARDIZED SPECIFIC DEATH RATE IN RUSSIA



Source: WHO/HFA database, TransMONEE database

Note: Data up to 1992 show that TBC specific mortality rate constituted almost the 80% of IPD mortality in Russia (WHO 1995)

Figure 7 could provide evidence about how the weakness of the disease control affected the capacity of the health system at least to prevent deaths. Before 1989 (line a) IPD mortality had a critical death minimum in terms of TBC incidence in Russia of about 53, which deteriorated sharply after 1989 (curve b) definitely lower than before, partly but significantly explained by a lesser effective working of disease control programs.

5. Assessing the causality

Lack of degrees of freedom due to scarcity of data, especially on poverty does not allow to asses quantitatively the MC model. However its possible to underline a causal relationship which is supported by the empirical evidences provided before. The stylised facts emerging from the analysis are the following.

First, the impoverishment process is becoming a persistent phenomenon in FSU and SEE, mostly linked to increasing income inequality, and thus producing an increasing poverty depth. Households depending on social benefits and with children are the most affected.

Second, people in a situation of extreme poverty and with a widening poverty gap are suffering from a situation of persistent and in some cases increasing under-nutrition, definitely below the international recommended standards. This is quite clear in FSU and SEE where the poverty gap is growing led by increasing inequality, and it is definitely less pronounced in Central Europe. However in FSU and SEE the degree of undernutrition could be considered mild, nevertheless sufficient for affecting the

immunocompetence of the individuals, especially if joined with poor and unhealthy external environment. The quality of macronutrient intake declined on the average and even worsened for people in poor conditions. This is a common pattern through Eastern Europe, and it worsens the already poor quality of food intake.

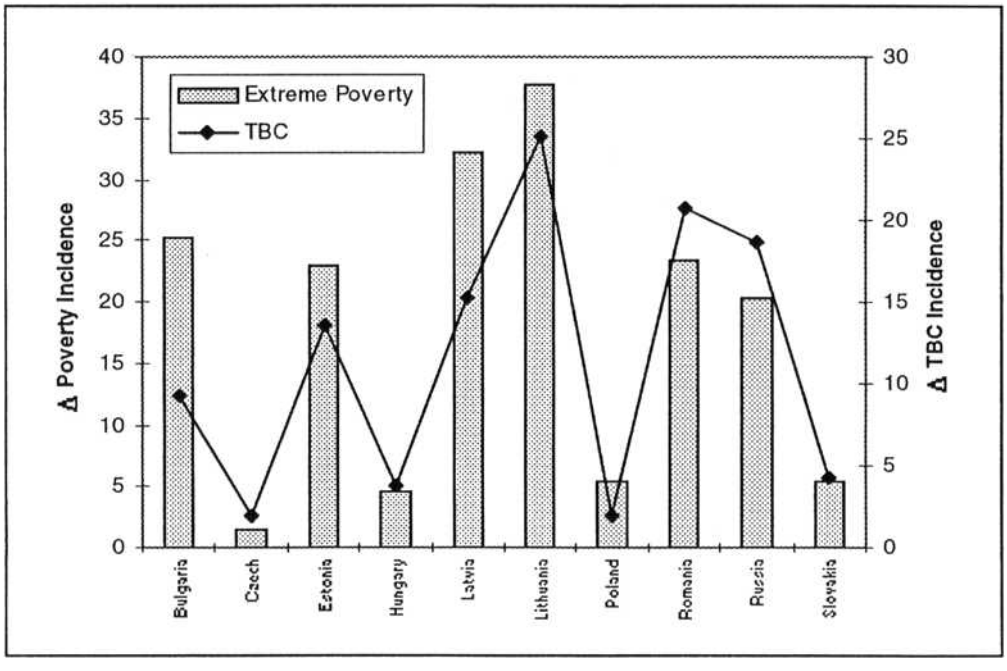
Third, there are evidences that children, pregnant and lactating mothers are the most exposed group to poverty and so to a series of effects linked with malnutrition. Especially the consequences of micronutrient deficiency are well established in terms of cognitive performance, physical work capacity, mental diseases, cretinism and premature deaths. This is one of the worst aspects of the nutritional crisis.

Fourth, in terms of MC models this means that two proximate factors like nutrient deficiency and maternal risk factors have been significantly hit by the impoverishment process.

Fifth, the two proximate causes provoked, firstly an increase in morbidity and then in IPD mortality. The steepness of the increase of the latter and the increasing polarisation of the health status indicate that the decline of the health stock below the critical minimum in the poorest part of population is spreading. The initial condition of the health stock delayed the impact of the impoverishment but whether the duration and severity of poverty persist this counter-effect will disappear. Still this phenomena affects the FSU and SEE countries particularly.

Undoubtedly the increasing extreme poverty in some countries (FSU and SEE particularly) could explain a significant part of variance of the increasing TBC incidence as shown in Figure 8 and in UNICEF 1995.

FIGURE 8
CHANGE IN EXTREME POVERTY VS. CHANGE IN TBC INCIDENCE IN SELECTED COUNTRIES: 1989-1994



Source: TransMONEE database.

Sixth, decisive offset variables (like health services) did not provide a significant contribution in tackling the worsening of the health stock; the function to reduce the disease exposure has been undermined by significant cuts in the public health budget as the accessibility is affected by and a regressive policy of medical services fees. Especially the later one particularly affects the personal illness control which is steadily declining amongst poor people. The result has been that the health assets inherited from the past, even with its inefficiencies, have been dismantling gradually.

These stylised facts support the MC-CJS model as good analytical framework in explaining the health status deterioration mostly related to the impoverishment process. However in CEE there are concurrent mortality/morbidity models operating which are affecting different part of population by socio-economic situation and degree of vulnerability. So if the model based on psychosocial stress (Cornia and Paniccià 1995) is able to explain mortality due CVD amongst middle age men, the recession model could provide a good analytical framework for the deterioration of the health status in the poor strata of population, which in turn cause the deepening of the impoverishment process and its effect on nutrition.

TABLE 1
INCIDENCE OF POVERTY AND LOW INCOME AMONG HOUSEHOLDS, CHILDREN, ADULTS AND ELDERLY

Incidence of Poverty and Low Income among Households, Children, Adults and Elderly in Selected Countries, 1989-94

		Low Income					Poverty				
		Households	Children	Adults	Elderly	Population	Households	Children	Adults	Elderly	Population
Czech Rep.	*1989*	4.6	4.2	4.4	5.7	4.2	0.3	0.3	0.2	0.4	0.2
Low income line = 35% of the 1989 average wage	*1990*	7.6	12.5	7.6	3.2	8.6	0.3	0.3	0.1	0.1	0.2
Poverty line = 60% of low income line	*1991*	23.8	43.2	26.8	12.9	29.8	0.8	0.2	0.5	0.3	0.2
	1992	19.6	40.1	22.9	10.9	26.7	1.8	1.2	1.8	0.5	1.4
Slovakia[a]	*1989*	4.1	5.8	3.0	4.5	4.1	0.1	0.1	0.1	0.1	0.1
Low income line = 40% of the 1989 average wage	*1990*	4.8	7.5	3.4	5.2	4.9	0.1	0.2	0.1	0.2	0.1
Poverty line = 60% of low income line	*1991*	27.2	45.7	23.3	25.6	30.2	2.4	5.8	2.1	2.3	3.1
	1992	24.4	42.9	21.8	23.3	27.8	2.1	5.8	2.1	1.7	3.0
	1993	24.3	52.1	30.7	18.8	31.3	3.4	9.4	4.2	0.6	5.1
Poland[a]	*1989*	22.3	30.6	19.0	26.8	24.1	4.8	8.4	4.7	5.2	5.8
Low income line = 40% of the 1989 average wage	*1990*	34.2	55.3	35.0	35.3	40.7	6.4	16.8	8.0	4.0	9.7
Poverty line = 60% of low income line	*1991*	30.6	55.0	33.9	25.3	37.9	5.4	14.4	7.5	2.4	8.4
	1992	29.6	52.6	32.2	20.4	36.3	7.2	19.9	9.2	3.4	10.9
Hungary[a]	*1989*	8.5	15.8	7.0	11.5	10.1	0.8	1.8	0.7	1.2	1.1
Low income line = 40% of the 1989 average wage	*1991*	11.9	25.2	13.6	12.5	15.6	1.3	4.3	2.0	1.4	2.3
Poverty line = 60% of low income line	*1993*	17.3	36.1	22.3	9.5	22.5	2.4	7.4	4.0	0.6	4.0
Slovenia	*1990*	..	..	..	..	35.1[b]	..	..	..	..	4.5[b]
Low income line = 35% of the 1989 average wage	*1993*	28.4	38.9	27.5	33.8	30.9	5.6	7.9	5.2	6.9	6.1
Bulgaria	*1990*	13.6	17.7	11.0	18.3	13.8	2.1	2.0	1.3	3.8	2.0
Low income line = 45% of the 1989 average wage	*1991*	49.0	61.7	49.2	50.0	52.1	11.3	16.8	12.0	10.6	12.7
Poverty line = 60% of low income line	*1992*	55.4	61.7	50.2	62.1	55.5	21.7	25.7	19.0	24.9	21.8
	1993	57.5	67.0	55.3	62.3	59.4	22.8	32.6	24.8	21.5	25.3
	1994	67.1	71.9	61.4	62.3	63.5	32.1	42.5	32.1	27.5	32.7
Romania[a]	*1989*	24.9	34.3	23.4	39.2	28.2	6.2	8.9	5.3	11.9	7.0
Low income line = 45% of the 1989 average wage	*1990*	17.8	29.0	17.8	25.8	21.8	2.9	4.4	2.7	6.3	3.5
Poverty line = 60% of low income line	*1991*	24.1	36.8	23.7	35.7	28.7	6.7	12.0	6.5	11.3	8.6
	1992	39.4	57.1	41.3	45.5	46.2	12.8	22.7	13.5	16.4	16.4
	1993	51.5	73.5	55.8	49.1	59.9	19.5	35.3	21.9	18.9	25.3
Estonia	*1989*	..	..	..	..	6.5[b]	..	..	..	..	1.0[b]
Low income line = 40% of the 1989 average wage	*1992*	40.0	52.1	37.3	57.7	43.8	18.8	26.6	16.4	37.5	21.4
Poverty line = 60% of low income line	*1993*	51.4	62.5	49.2	74.7	54.0	27.9	38.4	25.8	36.6	30.0
	1994	52.9	61.1	47.8	74.3	52.5	26.3	34.2	23.0	37.9	27.0
Latvia	*1989*	..	..	..	..	9.9[b]	..	..	..	..	1.3[b]
Low income line = 40% of the 1989 average wage	*1994*	54.9	79.4	59.1	55.3	60.0	27.1	50.7	31.4	14.9	33.5
Poverty line = 60% of low income line											
Lithuania[a]	*1989*	..	..	..	..	9.5[b]	..	..	..	..	1.5[b]
Low income line = 40% of the 1989 average wage	*1994*	62.8	73.8	57.3	78.3	64.7	35.7	48.5	32.8	47.7	39.1
Poverty line = 60% of low income line											
Moldova	*1989*	12.8	19.6	11.8	18.5	15.3	1.9	3.1	1.7	3.4	2.4
Low income line = 45% of the 1989 average wage	*1991*	12.3	17.6	11.2	16.5	13.9	1.9	2.3	1.8	2.9	2.1
Poverty line = 60% of low income line	*1992*	..	..	..	..	56.1[b]	..	..	..	..	25.5[b]
	1993	..	..	..	..	70.2[b]	..	..	..	..	40.6[b]
Azerbaijan	*1989*	..	..	..	..	35.1[b]	..	..	..	..	11.1[b]
Low income line = 45% of the 1989 average wage	*1994*[c]	80.9	87.7	81.7	82.3	85.1	60.5	72.5	59.1	65.4	65.2
Poverty line = 60% of low income line											

Source: TRANSMONEE Database.

Notes: a. Whenever the average income per capita derived from the household budget surveys was lower than that obtained from the national accounts, the latter was retained (together with the variance derived from the household budget surveys) to compute poverty rates. With this approach it is possible to correct in part the growing under-reporting of income in the household budget surveys; b. Due to lacking data on the demographic structure of income classes, it is impossible to estimate a poverty rate that takes into account different age structures of income classes. The normal procedure used in these estimates permits the weighting, even by using interpolated distributions, of the net personal income per capita with the demographic composition of each income class. To do so, the following equivalence scales have been used: additional adults: 0.8; child: 0.5; elderly person: 0.7; c. Refers to October 1994.

source: UNICEF ICDC 1995

Annexe 2 Methodological remarks

In studying food consumption, and nutrient intake the analysis is mainly based on two different sources. The first one is provided by the FAO FBS, which assess the amount of food and nutrient intake available on the basis of both production and trade of food, adjusted by wastage, cleaning and cooking losses. It is quite well known that this tend to overestimate the quantity of food intake, even if, lacking other sources, it could catch the overall pattern of consumption.

The second one is provided by the HBSs, whose collect data on expenditure and, in some cases, on physical quantity consumed of food by destination, regardless the origin (except for the self produced food). These types of data are extensively collected in TransMONEE database (UNICEF 1995) and they are provided by population decile, starting from 1989 up to latest year available (mostly 1994). Unfortunately only few eastern European countries are well covered, namely: Bulgaria, Slovakia, Poland, Hungary and Romania. Data on food consumption for FSU countries (Russia and in some extent Belarus) have been provided by respective CSOs and just for few years. The quality of these surveys changes substantially in moving from Central Europe (Hungary and Poland) to FSU and SEE. Atkinson-Micklewright (1993) analysed those surveys concluding that the quality in Central Europe was comparable to the Western European standards as in FSU the same surveys were considerably weaker. However, the degree of representation of such surveys deteriorated during the transition, as the result of growing underreporting, under estimation of other type of income emerging from the process of marketisation and privatisation, producing an increasing bias in the sample design. This critical situation almost ended up in the last years where both new sampling and reporting techniques were introduced, allowing in some cases to re-estimated and correcting the past surveys. The general tendency of the HBS data on consumption however is to underestimate the quantity intake.

The third type of source is constituted by the nutritional/health survey which have been carried out by different institution through CEE. They are probably the most reliable even if they are costly and therefore rare.

In this analysis these three source are utilised for extracting as much as information possible, with the caveat that these three different sources reflect different concepts and in some cases their comparability is very weak[10].

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[10] An example of how these three sources can diverge on average is provided by the following table which refers to Hungary in 1985:

	FBS	HBS	Nutritional Survey
Kcal per capita:	3520	3110	2185

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