Explaining health outcomes in transition countries: the role of health system reforms.

(Work in progress)

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1. Introduction

The countries of Central and Eastern Europe (CEE) and the Former Soviet Union (FSU) – the so called 'transition' region – experienced a well-documented deterioration in the health profiles of their populations long before the fall of communism [Carlson, 2004; Velkova et al, 1997; Watson, 1995; Wilkinson, 1996]. Nevertheless, most countries of the region experienced a further sharp deterioration in their health profiles as transition began. For some, this was followed by a steady improvement, others remained stubbornly adrift, while for others still the decline continued and deepened through the course of transition. The causes of health outcomes are complex and inter-related with important contributions stemming from lifestyle patterns and cultures, the environment, genetics, socio-economic well-being, social and economic policy and of course the health system. Indeed, for many diseases such as tuberculosis, diabetes, heart disease, the deaths that result are completely or partially attributable to health care and prevention [Nolte & McKee, 2004].

For the transition countries, there is a rich and growing literature examining the explanations for the emergent patterns in mortality and morbidity and a cautious consensus developing that attributes the fluctuating experiences of the region to alcohol and tobacco misuse [Zaridze et al, 2009; Denisova, 2010], deteriorating diet [McKee et al, 2001], stress associated with socio-economic upheaval [Shapiro 1995; Brainerd and Cutler, 2005] and socio-economic restructuring itself [Pridemore et al, 2010]. The role of the health system, to the extent it has been considered at all, tends to appear only indirectly and there has been relatively little by way of comparative, systematic attempts to pinpoint the nature of health system reform or its (changing) role in influencing health outcomes. In this paper, we try to address that gap, by relocating health systems and their reforms to the very centre of the transition-health story.

In particular, we set out to answer two questions: a) how can the diverse health system reforms across the transition region be captured empirically? b) to what extent and how can the differing health outcomes in transition countries be attributed to the observed differences in the emergent health care structures? Employing an innovative, mixed methodology we proceed in two stages. We undertake a detailed, systematic qualitative assessment of the 25 health systems

under review[1]. In identifying key characteristics (e.g. coverage, financing and resource allocation, primary care, etc) we formulate a strategy, drawing on the Hsiao-Heller [Hsiao & Heller, 2007] and Starfield-Shi [Macinko, Starfield & Shi, 2003] frameworks of health care classifications, to empirically capture health systems in a manner amenable to our second stage cross-country, panel econometric analysis.

We proceed as follows. In section 2 we briefly review the most relevant empirical literature. Section 3 describes our approach to measuring health systems and health system reforms in transition. In section 4 we describe our data, while in sections 5 and 6 we present our empirical strategies and results for our cluster analysis and panel econometrics respectively. Section 7 concludes.

2. Review of the empirical literature

Our research proceeds in the spirit of the raft of cross country studies that examine the fluctuating health outcomes of the transition region. The early empirical literature is cogently reviewed by Brainerd and Cutler [2005]. They explore four of the most popular explanations for the deterioration in health outcomes observed across the region: individual lifestyle choices as reflected in dietary habits, smoking and drinking; material deprivation; psychosocial stress; and the collapse of the health care system. They conclude that increased alcohol (and surrogate alcohol) use and the stress associated with socio-economic upheaval account for around half of the increase in mortality but that a large residual remains unexplained. More recent literature has built on this conclusion in revisiting the role of alcohol [Zaridze et al, 2010; Treisman, 2010; Leon et al, 2007] and diet [Zatonski et al, 1998] in particular, while new lines have been emphasised, stressing the role of economic policy choices [Stuckler et al, 2009; Gerry et al, 2010, Earle and Gehlbach, 2010] and the labour market [Denisova, 2010].

There has been only limited focus within this literature on the role of health systems or their reforms as determinants of health outcomes. One practical reason for this is that finding suitable empirical proxies for health care system inputs, reflective of differences between countries and over time is notoriously tricky. The most common proxies for health system characteristics are raw health care expenditures in the form of total, public or private spending, usually as a percentage of GDP [Berger & Messer, 2002; Hitiris & Posnett, 1992]. Another, relatively common measure, draws on the information relating to the physical resources of the health system, typically, number of hospitals, hospital beds, physicians, etc. Indeed, the combination of these two categories is frequently introduced into estimates of the aggregate

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[1] Out of all 28 transition countries: Serbia, Kosovo and Bosnia and Herzegovina were excluded from research on grounds of unavailability of data.

health production function [Joumard et al, 2008; Cremieux et al, 1999; Self & Grabowski, 2003]. In related attempts to proxy the health system, others [Elola et al, 1995; Wagstaff & Moreno-Serra, 2007] have used dichotomous system indicators capturing whether the funding arrangements are social health insurance (SHI) or tax financing.

Within the transition region research on the influence of health care on health is even rarer. This is part in relation to the practical and data problems but also reflects that the interest of researchers is often drawn to the role of the fast-paced socio-economic changes and their influence on health [Bobak et al, 2000; Stuckler et al, 2009; Gerry et al, 2010 among many others]. There are though two important exceptions. Moreno-Serra and Wagstaff (2007) examine the influence of the introduction of SHI in the initially tax-based health care systems of the post-Communist countries. They find that, though SHI adoption did increase overall government spending on health, it did not have a major impact on the health status of the population. In a later study, Moreno-Serra and Wagstaff (2009) argue that the way health providers are paid influences system performance. They find that the switch from the historical in-line budgeting of hospitals in the post-Communist countries to the new methods (either patient-based or fee-for-service) does indeed increase health spending, but does not necessarily improve health outcomes.[2] Outside of these two studies though, there is little empirical evidence regarding the relationship between health care and health systems in transition and what there is takes a rather restrictive view on the health care system, focusing largely on expenditure and resources, the SHI-tax divide and/or payment methods.

3. Health System Measurement

In the absence of ideal proxies reflecting the qualitative structure of the health system, we analyse health systems using the framework of Hsiao-Heller and incorporating the Starfield-Shi primary care analysis framework. Hsiao and Heller (Hsiao & Heller, 2007) distinguish five major categories, from which systems can be characterised: financing, organisation, payment or incentive structure, regulation and persuasion. We augment their system oriented characterisation by drawing on the primary care oriented approach of Starfield and Shi (Macinko, Starfield & Shi, 2003) and so identify six classifying criteria relevant for countries in transition: *financing, organisation, payments, regulation, persuasion, primary care* and *patient-orientation*.[3]

Financing is one of the most complex, but nevertheless most easily quantifiable aspects

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[2] Specifically, they find that only a few quite distinct and amenable mortality indicators (such as SDR ischaemic heart disease, SDR cerebrovascular diseases) have been influenced by the introduction of the patient-based reimbursement method.
[3] Appendix I provides the full list of classification variables according to these 6 criteria, including definitions and measurements. Appendix II provides the descriptive statistics.

of classification and has been at the forefront of the most significant reforms of health care in transition. For ease of classification, we divided this category into sub-components covering different financing methods (SHI or tax-based, usage of external aid, the development of voluntary (VHI) or private health insurance (PHI)), resource allocation techniques (redistribution and risk adjustment of pooled funds) and diverse institutional arrangements of the financing structures (collecting and pooling of funds, purchasing services).

Organisational reforms had to be high on the agenda of transitional countries, because without structural changes any financing reforms would be ineffective, or less effective than they could have been. Ownership, sectoral structures, competition, coordination and decentralisation are thus essential parts of the organising scheme of each health care system and we draw on these in our classifications. Also of particular salience for the transition countries are the *provider payment schemes*, where informal payments and varieties of corruption as a form of financing health care systems have been particularly widespread [Lewis, 2000]. In this institutional context, incentives for medical personnel, for example, take on particular prescience on the supply-side.

The final Hsiao-Heller criterion – *regulation* and *persuasion* captures the effort made by the systems' actors in regulating and managing systems efficiently and in promoting healthy lifestyles. This is a complex category and can only be considered qualitatively and even then assessment is constrained by information shortages. One possible indicator we consider here is the role played by professional organisations, rather than centralised ministry officials, in licensing.

From the Starfield and Shi framework we cull two additional indicators: *primary care* and *patient orientation*. The countries under the Communist Semashko model typically concentrated on curative inpatient care, largely at the expense of primary care. Thus, in the transition context, the special attention of reformers towards *primary care* merits close examination. We therefore distinguish the role of preventive services, the primary care structure and the role of GPs. Correspondingly, under the Semashko model, individual patient or individual practitioner roles were limited and so we also consider the progress made in re-orienting towards the patient as an important marker of system reform.

4. The Data

To assess the health care systems according to the framework outlined above we qualitatively examine and carefully scrutinise the available Health in Transition (HiT) Reports of the European Observatory of the World Health Organisation (WHO). Through this we develop a structural healthcare panel dataset for 25 transition countries. In accord with our framework, for

example, characteristics such as SHI financing status, the existence of a purchaser-provider split, an indicator of whether funds are collected by the state or not, payment forms to hospitals, and so on were identified and recorded. The full list of qualitatively generated characteristics is presented in appendix I.

We classified data according to the following strict algorithm. First, we adopted 'transition' years in preference to calendar years. Countries of this region started their transitions at different times. To capture this important temporal distinction we therefore classify 'transition year 1' as 1989 for the countries of CEE and as 1991 for the countries of the CIS and FSR Yugoslavia. This approach allows us to compare the actual transition processes of countries, rather than calendar-based processes. We then systematically recorded the binary health system status in each of our categories on a year-by-year basis based on the available expert reports of the WHO.

By definition, such an approach, results in large numbers of missing variables (the WHO does not report for all countries in all years) and in any event institutional change tends to be discrete and stable rather than fluctuating rapidly year on year. We therefore adopt an exploratory approach which classifies health systems across three broad 'transition' periods: 'initial conditions' (t_0, the year prior to transition year 1); 'early reforms' (t_1 - t_7); 'further reforms' (t_8 - t_{15}). In each case, the health system status at the end, or as close as possible to the end, of the period was recorded. Appendix II presents descriptive statistics for these data, according to the 3 time periods.

We supplemented this qualitative data with the collection of a comprehensive panel of WHO data covering healthcare (including health care expenditures; physical resources such as physicians, hospital beds; vaccination rates; and health care capacity based on admissions and visits) and socioeconomic data from the World Development Indicators (WDI) [2009] and Transmonee databases [2009].
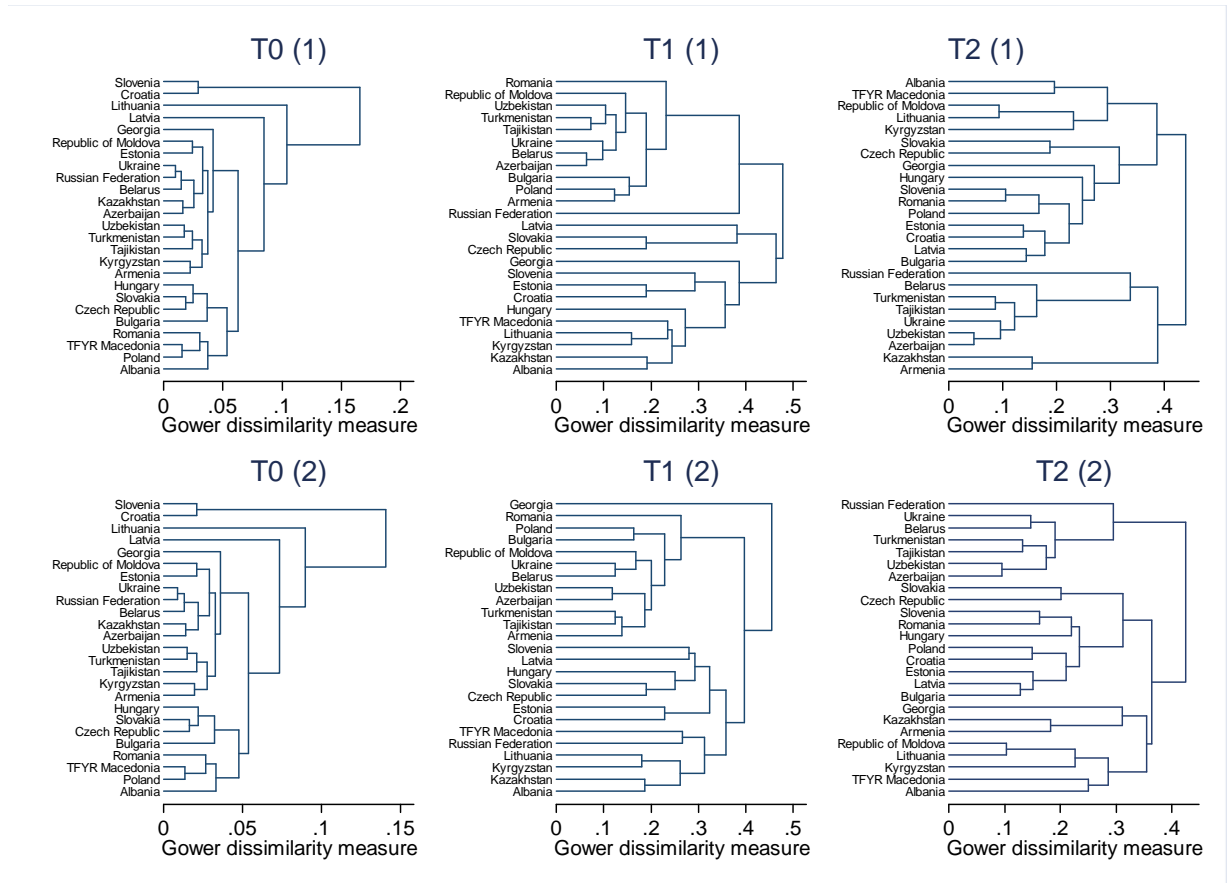
5. Health system classifications: cluster analysis

In order to dictate a three-period classification of the transition countries according to health system characteristics, cluster analysis proves the appropriate methodology for effectively identifying the similarities from numerous characteristics and in a complex setting (StatSoft, 2007). Assuming that health care systems can be divided into smaller and broader groupings, we argue that the clusters are inevitably nested and so hierarchical cluster analysis is used[4]. We use the weighted pair-group average method (WPGMA) as it is more effective than the unweighted

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[4] Hierarchical cluster analysis allows for the creation of nested clusters. The precise number of clusters depends on the level of (dis-)similarity one chooses and the stopping rules.

equivalent in cases where there are significantly different cluster sizes and it is more efficient at identifying outliers. As we have a mixed dataset (with both categorical binary and numerical variables present), the only relevant distance measure was found to be the Gower measure of dissimilarity, while we used the Duda and Hart index as a stopping rule[5].

Figure 1. Dendrograms for cluster analysis.

The cluster analysis was performed separately for each time-period (t_0, t_1 and t_2) and in two variations, for additional robustness (Figure 1): (1) using the same variables over time and (2) adding variables as available over time. For example, the data on health care expenditures are not available for T_0, thus results set (1) does not contain that data for any period, while results set (2) are essentially different for each time-period and use the data as it becomes available. As the cluster analysis does not add 'value' to any variables, the inclusion of quantitative variables can distort the results. To avoid this and to ensure the clusters reflect structural classification, rather than physical resources, we assess all groupings qualitatively according to our conceptual framework.

Initial conditions (t_0)

Initially, most countries' health care systems are structurally very similar, as until transition they followed (with some variations) the Communist Semashko model. Nevertheless,

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as the resources available in the systems were also used for clustering, several groupings (consistent across result sets) capturing the subtle diversity of initial conditions were possible. Stopping rules indicated that either very broad (2-3 clusters) or very detailed (7-8 clusters) classifications are possible. However, knowing that structurally the health care systems were very similar, we have minimised the cluster disruption generated by resources alone and reverted to the broader cluster classification. The results (Table 1) are intuitively appealing: countries of the CEE formed the first group; the Former Soviet Union (FSU) countries formed the second group[6]; and Croatia and Slovenia, with quasi-SHI systems already in place, form a structurally distinct group.

Table 1: Initial conditions (t_0)

1 - CEE	2 - FSU		3 - Quasi SHI
Bulgaria	Albania	Kazakhstan	Croatia
Czech Republic	Armenia	Kyrgyzstan	Slovenia
Hungary	Azerbaijan	Moldova	
Poland	Belarus	Russia	
Romania	Estonia	Tajikistan	
Slovakia	Georgia	Turkmenistan	
Macedonia	Latvia	Ukraine	
	Lithuania	Uzbekistan	

Early reforms (t_1)

The cluster analysis for the early reform period produces five groups (Table 2): a) rapid reformers; b) inconsistent reformers; c) non- or slow reformers but with a comprehensive basic benefits package (BBP); d) non-reformers; e) Georgia.

The first group is made up of the CEE and two Baltic countries. Generally, most CEE countries started reforms rigorously, though often inconsistently, and it is no surprise that they form a distinct sub-group. At the same time CIS countries were clearly reform laggards both in the socio-economic sphere and in terms of health care reforms. While the latter governments grappled with political and macroeconomic instability, they typically paid little attention to health care reform and the associated under-financing, corruption, disorganisation and service reduction. However, our analysis flags up one or two nuances dictating that we distribute the CIS countries over 4 separate groups.

Our second grouping incorporates the 'inconsistent reformers' for whom reforms were partial and inconsistent. These are qualitatively distinct from the group of basically non-reformers (group 3) but where a comprehensive BBP is available (e.g. Belarus, Poland and others) and both of these are in turn different to the group (4) of complete non-reformers, for whom structural changes simply did not follow the start of transition and where there occurred a gradual reduction of publicly available services, access and equity.

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[6] We include two 'outliers', Latvia and Lithuania in this group because the only major differences are found in physical resources, which do not reflect the structural diversity of Semashko systems.

The final group (5) consists of an outlier - Georgia. In Georgia, reforms were technically in place, privatisation was proceeding apace, SHI was introduced in 1995 and the payment structure had been changed, but at the same time, public health expenditures were only 8.7% of all health expenditures with about 89% of total health expenditures being Out of Pocket (OOP) payments and reform monitored was lax. So, despite the apparent reform efforts, the real burden of payment for health services lay with the patients themselves and the reality was an emerging system with limited services and growing inequity and where reforms, such as there were, were only loosely monitored and implemented

Table 2: Early Reforms (t_1)

1 - Fast reformers	2 - Inconsistent reformers	3 - non/slow Reformers + BBP	4 - non-reformers	5 - Outlier
Czech Rep. Croatia Estonia Hungary Latvia Slovakia Slovenia	Albania Kazakhstan Kyrgyzstan Lithuania Russia Macedonia	Belarus Bulgaria Poland Moldova Romania	Armenia Azerbaijan Tajikistan Turkmenistan Ukraine Uzbekistan	Georgia

Further reforms – (t_2)

In the next time period (transition years 8 to 15), we again identify five groupings: (i) Liberalised; (ii) Reformed; (iii) Diverse and inconsistent; (iv) Non-reformed; (v) Outliers.

First, we note new developments among the countries reforming most quickly, with the Czech Republic and Slovakia progressing most rapidly towards full liberalisation while retaining the most comprehensive health care systems. These two now form a separate group. Meanwhile, most of the previously slow reforming countries which preserved comprehensive BBP and universal coverage, have accelerated their reform programmes and, in the case of Poland, Bulgaria and Romania, are now able to join the group of 'reformed' countries. These first two groups are predominantly SHI systems (Latvia is an exception), all with a clear and well-functioning purchaser-provider split and (mostly) strong empowerment of regulation. Inpatient facilities are mostly public, while outpatient services are mostly privatised or mixed by now. The payment structures to doctors do vary, while the hospitals in all of them are no longer paid according to line-items. All of these countries provide universal coverage for their population.

Of the two remaining slow/non-reformers, Moldova implemented some reforms (e.g. introduction of SHI), but is not reformed enough to join the CEE countries, thus moves to the group of inconsistent reformers while Belarus remained largely unreformed and joins the remaining CIS and Central Asian countries in the non-reformed group. Georgia, previously an outlier, is now joined by Armenia as they share in common a substantial degree of instability and an ongoing reduction of coverage and services for their citizens.

Comparing our final 5 qualitative classifications with the dendrograms (Figure 1), there

are a few important points worth noting. First, it is abundantly clear that the non-reformers stay together even in this latter period of transition. To the extent that they introduce reforms at all they still do not introduce working reforms, often centred on the superficial churning of ministry officials and jobs. All of these countries are tax-based, the majority of their facilities are publicly owned, and medical personnel are salaried, while the hospitals are paid based on line-items. Their systems are strictly hierarchical and centralised, and often with an 'executive style of government', planning comes directly from presidential decree. The real empowerment of regulations remains extremely weak and corrupt throughout this latter period[7].

Second, according to results set (1) Russia is identified as a distinct outlier while in set (2) it appears as a non-reformer. Russia, as so often, is a complex case incorporating elements of both the 'old' and the 'new' systems. On the one hand, it provides a 'quasi' purchaser-provider split (in the form of multiple insurance funds), on the other hand, medical facilities receive funding directly from taxes. The methods of payments did change, with about half of contracted hospitals expenditure covered by DRG, some through the per diem system, and some through line-item budgets. On the other hand there is a large regional variation within the country itself, which influences accessibility, equity, coverage and outcome greatly. We therefore, for the purposes of our subsequent econometric analysis, group it with the other diverse and inconsistent reformers, while noting that there is a case to be made that it is itself an outlier. The group of countries with indecisive and inconsistent reforms are indeed a diverse clustering, even though retaining many key similarities. All of them are SHI based with very low contribution rates (only 2-4% in comparison to 13-15% in the 'reformed' group), most facilities are publicly owned, but the range of BBP differs somewhat, with Albania and Kyrgyzstan being more restrictive.

Table 3: Further Reforms (t_2)

1 - Liberalised	2 - Reformed	3 - Diverse & inconsistent	4 - Non-reformers	5 - Outliers
Czech Rep. Slovakia	Bulgaria Croatia Estonia Hungary Latvia Poland Romania Slovenia	Albania Kyrgyzstan Lithuania Moldova Macedonia Kazakhstan **Russia**	Azerbaijan Tajikistan Turkmenistan Ukraine Uzbekistan **Belarus**	Armenia Georgia

6. Econometric Strategy and Results

Having developed proxy indicators of health system reform in the previous section, we now incorporate that information in a series of panel econometric regressions exploring the determinants of health outcomes in the transition period. We estimate the following model using

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[7] For the purposes of our subsequent analysis we include Belarus in this group. However, while Belarus somewhat shares all of these 'non-reform' characteristics, it retains a far more comprehensive BBP and universal coverage, thus it could be argued that Belarus could be considered as a separate 'outlier'.

system GMM techniques (Arrellano and Bond, 1991; Blundell and Bond, 1998; Roodman, 2009):

$$(1) \quad LMR_{it} = \alpha + \beta_1 HS_{it} + \beta_2 GDP_{it} + \beta_3 EBRD_{it} + \beta_4 TRADE_{it} + \beta_5 DEM_{it} + \beta_6 DEP_{it} + \beta_7 WAR_{it} + \beta_8 URBAN + \beta_9 EDUC_{it} + \mu_i + \varepsilon_{it}$$

In (1), the subscripts i and t refer to country and time; LMR refers to the log of the age standardised, adult male (and separately female) mortality rate, HS is a vector of various health reform indicators culled from the previous section, GDP is log GDP per head in purchasing power parity $US, EBRD is the average of the EBRD reform index, TRADE is the WDI indicator for trade openness, POL is the Polity IV democratisation index, DEP is the dependency ratio, WAR is a dummy variable for the occurrence of military conflict, URBAN is the percentage of population in urban settings and EDUC is the percentage of population with tertiary education.

Results to follow

7. Discussion (further to follow)

In this paper we analyse health care systems reforms in transition countries and their role in driving observed health outcomes. The relationship is necessarily complex but also of crucial importance for explaining the diverse health outcomes in the transition area and for understanding pathways of future reforms. Our core contributions are twofold. First, we provide a first detailed three-period classification of health systems in transition, based on the structural characteristics of the individual country health care systems. Second, we incorporate these classifications into a series of novel econometric estimations of the cross-country health production function.

Among our key findings we note two in particular. First, transition countries can indeed be classified according to *structural* characteristics, *and* health care transition *paths*. These classifications suggest that the key characteristics of the most 'successful' transitions include equity, access, comprehensive basic benefits package and universal coverage of the whole population. Interestingly, the classification before transition expectedly distinguishes groups of CEE vs. CIS countries, which diverge with the start of transition. While CEE rapidly progress, CIS countries take very different pathways at different speeds, resulting in at least 5 groups in health care classification in the latest period.

Second, using the structural groupings in health production functions we conclude that health outcomes can be partially explained by the structural differences across health care systems.

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Appendix I.

Criteria	Variable	Sub-variables	Description	Measure
Financing	SHI		SHI existence	1-yes, 0-no
	Earmark		Health taxes/contributions are earmarked	1-yes, 0-no
	Collect		Collecting of funds by state	1-non-state, 0-state
	Pool		Pooling of funds by state	1-non-state, 0-state
	Purchasing		Selective purchasing of services by insurance	1-yes, 0-no
	Risk adj.		Existence of risk adjustment	1-yes, 0-no
	Split		Existence of the purchaser-provider split	1-yes, 0-no
	VHI	Exists	Existence and functioning of VHI/PHI	1-yes, 0-no
		On paper		1-yes, 0-no
		No		1-yes, 0-no
	THE		Total health expenditure as a share of GDP	% of GDP
	PbHE		Public health expenditure as a share of GDP	% of GDP
	GvHE		PbHE as a share of total government expenditures	% of gov exp
	PrHE		Private health expenditure as a share of THE	% of THE
	OOP		Out-of-pocket payments as a share of PrHE	% of PrHE
	SHI of PbHE		SHI as a share of PbHE	% of PbHE
	ExtHE		External financing in the THE	% of THE
	HE pc PPP		Per capita health expenditure	PPP dollars
	PbHE pc PPP		Per capita public health expenditure	PPP dollars
Organisation	Multiple funds	No funds	Existence of multiple insurance funds	1-yes, 0-no
		One fund		1-yes, 0-no
		Multi funds		1-yes, 0-no
	Competition IF		Competition between funds	1-yes, 0-no
	Inpatient organisation		Type of inpatient organisation	1-Public (or Quasi-Public), 0-Mixed
	Outpatient organisation	Public	Type of outpatient organisation	1-yes, 0-no
		Mix		1-yes, 0-no
		Private		1-yes, 0-no
	Provider choice	No choice	Free choice of provider	1-yes, 0-no
		Limited		1-yes, 0-no
		Free		1-yes, 0-no
	Hospitals		Hospitals per 100,000	
	HB		Hospital beds per 100,000	
	Psych HB		Psychiatric hospital beds per 100,000	
	Physicians		Physicians per 100,000	
	Dentist		Dentists per 100,000	
	Nurse		Nurses per 100,000	
	Midwife		Midwives per 100,000	
	Admissions		Inpatient admissions per 100	
	ALOS		Average length of stay	Days
	Outp. contacts		Outpatient contacts per person, per year	
Primary care	GP as gatekeeper	No	GP acts as a gatekeeper to the system	1-yes, 0-no
		On paper		1-yes, 0-no
		Yes		1-yes, 0-no
	Immunisation		Share of infants vaccinated from tuberculosis	%
Payment or Incentive Structure	Primary physicians	Salary	Payment of primary physicians	1-yes, 0-no
		Capitation		1-yes, 0-no
		FFS		1-yes, 0-no
	Outp specialists	Salary	Payment of outpatient specialists	1-yes, 0-no
		FFS		1-yes, 0-no
	Hospitals	Line item	Payment of hospitals – line item budgeting	1-yes, 0-no
		PBP	Patient-based payment	1-yes, 0-no
		FFS	Fee-for-service payment	1-yes, 0-no
	Bonus to doctors		Bonuses to doctors for quality	1-yes, 0-no
	Bonus to hospitals		Bonuses to hospitals for quality	1-yes, 0-no
Patient orientation	BBP		The scope of the basic benefit package	1-Comprehensive, 0-Limited
Persuasion	Role of professional organisations	No	The role of professional organisations in decision-making, licensing, etc. (No – organisations do not exist; Minor – exist, but have a very limited role)	1-yes, 0-no
		Minor		1-yes, 0-no
		Big		1-yes, 0-no

Appendix II. Descriptive Statistics.

Variable	T_0			T_1			T_2		
	No.obs.	Mean	St.Dev.	No.obs.	Mean	St.Dev.	No.obs.	Mean	St.Dev.
SHI	25	0.08	0.28	25	0.52	0.51	25	0.64	0.49
Earmark	25	0.00	0.00	25	0.44	0.51	25	0.52	0.51
Collect	25	0.00	0.00	25	0.36	0.49	25	0.44	0.51
Pool	25	0.00	0.00	25	0.44	0.51	25	0.52	0.51
Purchasing	25	0.00	0.00	25	0.28	0.46	25	0.44	0.51
Risk adj.	25	0.00	0.00	25	0.12	0.33	25	0.20	0.41
Split	25	0.04	0.20	25	0.44	0.51	25	0.68	0.48
VHI exists	25	0.00	0.00	25	0.32	0.48	25	0.76	0.44
VHI on paper	25	0.04	0.20	25	0.48	0.51	25	0.16	0.37
No VHI	25	0.96	0.20	25	0.20	0.41	25	0.08	0.28
THE	0			25	6.12	1.39	25	6.31	1.41
PbHE	0			25	65.11	20.76	25	59.42	20.04
GvHE	0			25	10.22	2.86	25	10.48	3.16
PrHE	0			25	34.89	20.76	25	40.58	20.04
OOP	0			25	90.22	15.98	25	90.36	12.40
SHI of PbHE	0			25	32.31	38.64	25	49.46	39.88
ExtHE	0			25	1.79	3.42	25	2.15	3.59
HE pc PPP	0			25	329.48	251.80	25	682.84	798.07
PbHE pc PPP	0			25	246.16	226.27	25	472.12	606.91
No funds	25	0.92	0.28	25	0.44	0.51	25	0.32	0.48
One fund	25	0.00	0.00	25	0.40	0.50	25	0.56	0.51
Multiple funds	25	0.08	0.28	25	0.16	0.37	25	0.12	0.33
Competition IF	25	0.00	0.00	25	0.08	0.28	25	0.08	0.28
Inpatient organisation	25	0.00	0.00	25	0.12	0.33	25	0.24	0.44
Public outp ownership	25	1.00	0.00	25	0.64	0.49	25	0.48	0.51
Mixed outp ownership	25	0.00	0.00	25	0.32	0.48	25	0.44	0.51
Private outp ownership	25	0.00	0.00	25	0.04	0.20	25	0.08	0.28
No provider choice	25	1.00	0.00	25	0.24	0.44	23	0.13	0.34
Limited provider choice	25	0.00	0.00	25	0.24	0.44	23	0.22	0.42
Free provider choice	25	0.00	0.00	25	0.52	0.51	23	0.65	0.49
Hospitals	25	5.60	2.99	25	4.91	2.50	25	4.05	2.04
HB	24	1030.00	282.88	25	817.09	218.69	25	652.61	192.98
Psych HB	25	103.30	40.66	25	80.29	35.41	25	66.35	30.43
Physicians	25	319.77	91.02	25	307.50	89.01	25	305.81	86.26
Dentist	25	40.46	13.18	25	41.62	15.13	25	44.40	20.89
Nurse	23	804.96	216.24	25	698.37	191.08	25	631.99	224.64
Midwife	24	81.91	35.49	25	61.63	27.33	23	44.71	22.27
Admissions	24	19.25	4.58	25	16.04	5.51	25	16.76	6.25
ALOS	24	15.22	1.81	25	13.41	2.49	25	10.25	2.21
Outp. contacts	25	8.51	2.56	25	6.63	3.21	25	6.99	3.52
GP not gatekeeper	25	0.00	0.00	25	0.24	0.44	25	0.24	0.44
GP – gatekeeper on paper	25	0.00	0.00	25	0.56	0.51	25	0.44	0.51
GP - gatekeeper	25	1.00	0.00	25	0.20	0.41	25	0.32	0.48
Immunisation	25	93.42	4.09	25	96.26	4.91	25	96.10	5.97
GP salaried	25	1.00	0.00	25	0.48	0.51	25	0.32	0.48
GP capitation	25	0.00	0.00	25	0.44	0.51	25	0.72	0.46
GP FFS	25	0.00	0.00	25	0.20	0.41	25	0.08	0.28
Outp specialists salary	25	1.00	0.00	25	0.80	0.41	25	0.60	0.50
Outp specialist FFS	25	0.00	0.00	25	0.28	0.46	25	0.52	0.51
Line-item budgeting of hospitals	25	1.00	0.00	25	0.56	0.51	25	0.36	0.49
PBP budgeting of hospitals	25	0.00	0.00	25	0.24	0.44	25	0.68	0.48
FFS budgeting of hospitals	25	0.00	0.00	25	0.28	0.46	25	0.20	0.41
Bonus to doctors	25	0.00	0.00	25	0.08	0.28	24	0.25	0.44
Bonus to hospitals	25	0.00	0.00	25	0.04	0.20	21	0.10	0.30
BBP	25	1.00	0.00	25	0.60	0.50	25	0.60	0.50
No prof organisations	14	0.36	0.50	25	0.16	0.37	25	0.08	0.28
Minor prof organisation	14	0.50	0.52	25	0.60	0.50	25	0.60	0.50
Dev prof organisation	14	0.14	0.36	25	0.24	0.44	25	0.32	0.48