Since becoming independent at the break-up of the Soviet Union in 1991, the countries of Central Asia have made profound changes to their health systems, affecting organization and governance, financing and delivery of care. The changes took place in a context of adversity, with major political transition, economic recession, and, in the case of Tajikistan, civil war, and with varying degrees of success. In this paper we review these experiences in this rarely studied part of the world to identify what has worked. This includes effective governance, the co-ordination of donor activities, linkage of health care restructuring to new economic instruments, and the importance of pilot projects as precursors to national implementation, as well as gathering support among both health workers and the public.

**Introduction**

Since achieving independence in 1991, the former Soviet countries of Central Asia have undertaken profound changes to their health systems, affecting governance arrangements, financing mechanisms and health care delivery. Yet, in contrast to other former Soviet countries such as Russia, Ukraine or the Baltic States, they have received relatively little attention. There are only few comparative studies (Rechel and McKee 2009), most of which are now outdated (McKee et al. 1998). In this article we review developments in health systems and policies in Central Asia in the two decades since independence. The experiences of these countries offer lessons for those undertaking health reforms in the region and in other low- and middle-income countries in transition.

Although the countries of Central Asia differ in many respects, most notably in terms of their socio-economic...
development (Table 1) but also Tajikistan’s experience of civil war between 1992 and 1994 and Turkmenistan’s international isolation, they have shared many of the same challenges in reforming their health systems. These include the common Soviet legacy, a marked economic decline in the first years of transition, young populations and a large share of people living in rural areas with poor infrastructure.

They also share a similar pattern of disease (McKee et al. 1998), with very high rates of non-communicable disease (the main cause of death), but also high rates of communicable disease (in particular tuberculosis, but increasingly also HIV/AIDS), and high maternal and infant mortality (Table 2). Life expectancy, estimated to be between 64.8 and 67.8 years at birth in the different countries of the region (World Bank 2010), is much lower than in Western Europe, where it stood at 80.4 years in 2007 (WHO 2010).

### Methods

This paper draws on our work producing the Health Systems in Transition (HiT) country profiles on Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan, led by the European Observatory on Health Systems and Policies and prepared by national experts and Observatory staff, in consultation with Ministries of Health, as well as on our separate studies on health in Turkmenistan. The HiT profiles are based on a common template designed to ensure the comparable description of health systems and policies (Rechel et al. 2010). We complemented the information retrieved with a review of documents produced by the governments in question and international agencies (collected through our work in these countries over 15 years) as well as an updated search of PubMed, using the search terms “Central Asia”, “Kazakhstan”, “Kyrgyzstan”, “Tajikistan”, “Turkmenistan” and “Uzbekistan”, in combination with “health reform” and “health care reform”. We have benefitted from our ongoing links with each health ministry, with the exception of Turkmenistan; its Ministry of Health not only refused to provide information, but, as we have shown previously, systematically manipulates health data (Rechel et al. 2009a; Rechel et al. 2009b; MSF 2010).

### Results

#### Timing

The countries of Central Asia have pursued different reform trajectories. Most started to embark on wide-ranging reforms in the second half of the 1990s, often assisted by external agencies, such as the World Bank, WHO, USAID, DFID or the Asian Development Bank. However, the pace varied, with Kazakhstan only adopting a systematic approach after 2004 (Kulzhanov and Rechel 2007), while reforms in Tajikistan were delayed by the civil war (Mirzoev et al. 2007). In Turkmenistan, initial reforms were halted under the eccentric president Niyazov and have not yet resumed under president Berdymukhamedov who came to power in 2007 (Rechel et al. 2009b).

#### Organization and governance

Following independence, the national Ministries of Health assumed responsibility for developing and implementing national health policies. They had inherited from the Soviet period a health system that was divided into three administrative tiers: republican (national), oblast (regional), and district (rayon) or city, being funded from separate budgets. Each level carried out core functions of health systems: the collection of revenues, the pooling of funds, the purchase of health services and the provision of care. Within each oblast, these functions were implemented by each rayon government and also by the oblast government. This organization of the health system resulted in the duplication of functional responsibilities and overlapping population coverage (Ibrahimova et al. 2011). The system was
further fragmented by the existence of many specialized health services (such as those for tuberculosis) being delivered through separate vertical systems, while numerous bodies (such as the Ministry of Internal Affairs, the Ministry of Defence and large companies) traditionally ran their own parallel health systems. The resulting fragmentation of health financing and service provision was one of the major challenges to reforming health systems (Kutzin et al. 2010; Ibraimova et al. 2011).

In the original model, primary care and basic community (central rayon) hospitals were managed by city and rayon authorities, general hospitals were managed by oblast health authorities, and specialized hospitals and related institutions were managed by the Ministry of Health. This model, with management of primary and community care by the central rayon hospital, has persisted in Kazakhstan, Tajikistan and Uzbekistan, with the exception of a few localized pilot schemes, confirming the subordination of primary care to secondary care and constraining the scope for development of the former.

In these three countries, most official health financing is raised and spent at sub-national (oblast and rayon) levels. In Uzbekistan in 2005, for example, 87.7% of government health expenditure came from local budgets (Ahmedov et al. 2007a). Given the considerable variation in revenue raising potential among sub-national units, these systems are prone to high levels of geographical inequality. Only two countries, Kyrgyzstan and Kazakhstan, have introduced national pooling systems (see below).

The private sector and professional associations do not yet make a significant contribution to health policy making. So far, the private sector is largely confined to pharmacies, dental care and small diagnostic facilities.

### Financing, pooling and payment

The countries have fared very differently following independence, largely due to changes in the absence of natural resources, in particular oil and gas. Consequently, health expenditure per capita varies considerably, from US$405 in Kazakhstan to US$93 in Tajikistan (Table 3). However, countries have made different choices about how much of the available resources they spend on health, with Kyrgyzstan spending 6.5% of its GDP on health in 2007, despite being one of the poorer Central Asian countries, although it should be noted that this expenditure includes state expenditure, private expenditure and funding from external agencies.

Informal payments (in cash or in kind) as well as the use of blat, or connections, was a ubiquitous, if rarely acknowledged, feature of the Soviet health system, although care (except for outpatient drugs) was formally free. While historical comparative data are unavailable, it is widely accepted that there has been a marked increase in the importance of out-of-pocket payments (including both formal co-payments and informal, under-the-table payments), which have now become a main source of health revenue. Private health expenditure amounted to 78.5% of total health financing in Tajikistan in 2007 (Table 3). International development agencies have also grown in importance, especially in Kyrgyzstan and Tajikistan, contributing to 10% of health financing in the latter in 2007 (Khodjamurodov and Rechel 2010). However, donor co-ordination has become a problem and so far Kyrgyzstan is the only country in the region that has adopted the framework of a sector-wide approach.

Experience with health financing reform has been mixed.

Kyrgyzstan introduced a health insurance scheme nationwide in 1996 (Ensor and Rittmann 1997), but discontinued it in 1998 (Rechel and McKee 2009). Kyrgyzstan introduced mandatory health insurance in 1996, while Turkmenistan created a nominal system in 2006. However, these schemes are all fairly marginal in relation to total health expenditure, amounting to 4.1% in Turkmenistan and 9.0% in Kyrgyzstan in 2006 (Rechel and McKee 2009). Voluntary (private) health insurance is almost non-existent, despite being encouraged in Kazakhstan, where it covered about 5% of the population in 2005 (Kulzhanov and Rechel 2007).

The reforms in Kyrgyzstan meant that the newly created Mandatory Health Insurance Fund became a single purchaser of health services, with pooling of funds at the national level (following initial pooling at oblast level) (Kutzin et al. 2009a; Ibraimova et al. 2011), so abolishing the previous fragmented budgetary structure (Kutzin et al. 2009a; Kutzin et al. 2010). Geographical pooling of funds has also been introduced in Kazakhstan, using general government revenues, initially with oblast health authorities as single payers for both oblast and rayon facilities within their borders (Kulzhanov and Rechel 2007). Since 2010 pooling of funds for hospital care has taken place at the national level.

The challenge of funding systems guaranteeing universal coverage (Preker et al. 2002) when faced with severely constrained resources has led all governments to introduce defined benefit packages and official patient co-payments (Rechel and McKee 2009). In Uzbekistan, a state-guaranteed basic benefit package was adopted in 1996 (Ahmedov et al. 2007a; Ahmedov et al. 2007b). In Kyrgyzstan, a state-guaranteed benefit package was piloted in 2001 and rolled out nationwide in 2004 (Meimanaliev et al. 2005; Kutzin et al. 2009a). In Kazakhstan, a basic benefit package existed between 1996 and 1998 as part of the short-lived health insurance system; a new basic benefit package was adopted in 2005 (Kulzhanov and Rechel 2007).

In Tajikistan, a basic benefit package, as well as formal patient co-payments, were introduced nationwide in 2005,
but discontinued after only 2 months due to dissatisfaction among both patients and staff. A revised benefit package was introduced in 2007 on a pilot basis but had not been extended by early 2010 (Rechel and Khodjamurodov 2010).

Payment to providers was initially based on the Soviet model of historical budgeting, in which line-item budgets with little scope for virement (re-allocation) limited managerial autonomy. This approach is still used for paying hospitals in Tajikistan, although capitation for primary health care was introduced in 2008. Capitation-based payment for primary health care is also used increasingly in Uzbekistan, Kazakhstan and Kyrgyzstan. Hospitals in Kyrgyzstan are paid per case according to clinical cost groups, a type of diagnosis-related group (DRG). Kazakhstan also used an adaptation of DRGs but, starting in 2010, this is being replaced with reimbursement of actual expenditures.

**Physical and human resources**

The countries inherited Soviet-era health infrastructures that were extensive but inefficient. The absence of opportunities to migrate, coupled with controls on prices of basic goods, made it possible to pay low wages and the health sector was a means of ensuring full employment. Hospitals also fulfilled an important social care role. Faced with declining government revenues, each country has sought to reduce hospital capacity, although not without difficulty (Ensor and Thompson 1999). Bed numbers dropped substantially in the 1990s and now more closely resemble the levels seen in Western Europe (Figure 1).

Levels of capital investment were low throughout the 1990s, but Kazakhstan and Turkmenistan, both beneficiaries of revenues from oil and gas, have embarked on major new investments in infrastructure in recent years (Rechel et al. 2009a; MSF 2010).

In contrast to what has been seen in Western Europe, the ratio of physicians per population has declined in most countries of the region, except Kazakhstan (Figure 2). This has had particularly adverse consequences for Kyrgyzstan and Tajikistan, which have lost health workers to Russia and Kazakhstan. However, national averages are misleading, with physicians highly concentrated in urban areas (Ahmedov et al. 2007b; Kulzhanov and Rechel 2007). In Kazakhstan in 2008, for example, the number of physicians per 100,000 population was 588 in urban areas but only 130, nearly five times fewer, in rural areas. Kyrgyzstan and Kazakhstan have responded by mandatory posting of state-funded medical graduates to rural areas, but many health workers are able to evade this. Turkmenistan requires separate consideration. The late president Niyazov virtually stopped higher education, so that only 6 nurses per 100,000 population graduated in 2007, compared with the Central Asian average of 91 (Rechel et al. 2009a; Rechel et al. 2009b).

The Soviet model of medical training, with specialization at undergraduate level and physicians trained in very limited areas (so a primary care facility might have a paediatrician, internist and obstetrician, all operating at a very basic level) is gradually giving way to a broader curriculum and the creation of family medicine programmes (Ahmedov et al. 2007b; Parfitt 2009). There are also efforts to upgrade nursing training (Parfitt and Cornish 2007; Pirnazarova and Schlickau 2010). Kyrgyzstan has made particularly good progress and 98% of doctors working in primary care have retrained in family medicine (Hardison et al. 2007). However, ‘specialists’ still receive higher incomes than generalists (Ahmedov et al. 2007a) and there is a lack of evidence on changes in the quality of medical education.

Another legacy of the Soviet era is the much lower wages in the health sector than in other parts of the economy, a situation exacerbated by the introduction of market economies. For example in Tajikistan in 2007, the average monthly salary of physicians was US$17, as compared to a workforce average of US$53 (Khodjamurodov and Rechel 2010), while in Kazakhstan in 2004, the average salary in the health sector was only half the national average for all sectors combined (Kulzhanov and Rechel 2007). This is an obvious factor in the persistence of widespread informal payments.

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**Figure 1** Number of beds in acute care hospitals per 100,000 population. Source: WHO (2010).

**Figure 2** Number of physicians per 100,000 population. Source: WHO (2010).
Provision of services
All countries in the region have embarked on primary health care reforms. Models of health care provision differ in urban and rural areas. In urban areas, primary and secondary care are delivered in polyclinics/family medicine centres, with basic secondary care in rayon hospitals; specialized secondary care in oblast or city hospitals; and more complex care in national hospitals.

Tajikistan and Uzbekistan have sought to simplify primary health care delivery in rural areas. In Tajikistan, the formerly multi-layered provision of primary health care in rural areas is being transformed into a two-tiered system, with Health Houses as the gatekeepers to rural health centres (formerly rural physician clinics or rural hospitals) (Khodjamurodov and Rechel 2010). Similarly, in Uzbekistan, primary health care in rural areas has been switched to rural physician points and outpatient clinics of central rayon hospitals (Ahmedov et al. 2007b). In Kyrgyzstan, Family Group Practices, Family Medicine Centres and General Practice Centres provide most primary health services, but the traditional feldsher-midwifery posts have been retained in small villages and remote areas with populations of 500–2000 people. Despite these efforts, there continues to be an overreliance on hospitals for conditions that could be treated in primary care (Ibraimova et al. 2011).

Coordination of different levels of care remains a major challenge, given the fragmentation of health systems (Ahmedov et al. 2007a; Kulzhanov and Rechel 2007).

The public health system is also fragmented, with multiple vertical systems, including the traditional sanitary-epidemiological (san-epid) services, HIV/AIDS and tuberculosis services, programmes to improve nutrition and, increasingly, centres for the promotion of healthy lifestyles.

Health system performance
Although rigorous evaluations of the effects of reforms on health system performance are generally lacking, it is possible to identify key areas of concern for health systems in the region. One is the persistence of wide inequalities. In all five countries, money, health workers and facilities vary geographically, especially between urban and rural areas, with consequent marked disparities in access and utilization (Thompson et al. 2003). In Kazakhstan in 2001, health expenditure varied by a factor of 4.2 between the richest and poorest oblasts, narrowing to 2.1 times in 2008. These are the inevitable consequence of localized financing structures, so an obvious response is to pool resources nationally, as is being done in Kyrgyzstan and, to some extent, in Kazakhstan (Ibraimova et al. 2011). A further factor is physical geography. The mountainous terrain of Kyrgyzstan and Tajikistan results in major challenges in providing services to particularly remote rural areas, while Uzbekistan, Kazakhstan and Turkmenistan have large expanses of bleak and sparsely inhabited territory, with little transport infrastructure.

There are also financial barriers to access. The decline of government expenditure on health, with the accompanying widespread reliance on out-of-pocket expenditure (both formal and informal) has major implications for the accessibility of health services to poorer groups of the population, as has been shown in Kazakhstan (Ensor and Savelieva 1998; Danilovich 2010), Tajikistan (Cashin 2004a; Cashin 2004b; Falkingham et al. 2004; Habibov and Fan 2008; Tediosi et al. 2008; Fan and Habibov 2009; Habibov 2009), and Turkmenistan (Rechel and McKee 2005; Rechel et al. 2009a; MSF 2010). In Kyrgyzstan, however, the introduction of a single payer system, an expanded state-guaranteed benefit package, the introduction of formal co-payments and patient information campaigns have improved financial protection and reduced informal payments (Kutzin et al. 2009b; Falkingham et al. 2010). According to successive rounds of the Kyrgyz Integrated Household Surveys between 2000 and 2006, the proportion of the population that reported that they needed health care but did not seek it because it was too expensive or too far away has fallen significantly, from 11.2% in 2000 to 3.1% in 2006 (Ibraimova et al. 2011). The share of hospitalized patients making informal payments to medical personnel declined from 70% in 2001 to 52% in 2006, partly due to better awareness about patient rights (Ibraimova et al. 2011).

Inefficiency remains another problematic issue. The continued reliance on inpatient care, partly to address social needs of patients, is one reason why the health systems are so inefficient, a situation exacerbated by the fragmented nature of services and the lack of linkages, creating gaps and duplication (Kulzhanov and Rechel 2007). Integrated primary care, based on family medicine, could address this, creating a gatekeeping and navigating role, but investment here, while increasing, remains inadequate.

The final challenge is how to improve quality of care. There is considerable over-diagnosis and use of ineffective remedies (Duke et al. 2006). The reasons are many, including lack of investment in facilities and technologies, insufficient supply of pharmaceuticals, poor training of health workers, absence of systems for quality improvement (Khodjamurodov and Rechel 2010; Ibraimova et al. 2011), the paucity of locally generated evidence, and inadequate access to the international literature (Guindon et al. 2010). There have been many attempts to improve quality and establish evidence-based practice, with success in a number of pilot projects (Nugmanova et al. 2008), but they have been difficult to scale up in the presence of entrenched Soviet-era concepts of evidence (McKee 2007) and outdated training curricula (Asadov and Aripov 2009). However, there are some encouraging examples; in Kyrgyzstan, involving local communities and NGOs in the development and implementation of quality improvement programmes has proven to be very effective (Ibraimova et al. 2011).

Discussion
As this review of experience in the first two decades of independence has shown, the countries of Central Asia face many challenges that defy easy solutions. These include a difficult economic and political context, lack of resources and capacity, Soviet legacies, and the complex interplay between national and local authorities. Nevertheless, a number of important lessons emerge from health reform that are of relevance beyond the region.

The first is the importance of political leadership, governance and continuity. Countries that demonstrated a consistent commitment to comprehensive reforms (such as Kyrgyzstan) fared better than those that followed a more erratic approach (such as Kazakhstan). Continuity was facilitated by...
incorporation of capacity building into reform programmes, as in Kyrgyzstan, with its Health Policy Analysis Project that has now been transformed into the Health Policy Analysis Centre. The Centre has provided a range of reports and surveys on the reform process which fed back into health policy-making. In other countries, such as Tajikistan, a lack of local capacity-building has been identified as one of the factors impeding reforms (Rechel and Khodjamurodov 2010).

The co-ordination of donor activities has been another challenge (Rechel and Khodjamurodov 2010). So far, only Kyrgyzstan has adopted a sector-wide approach, which has helped to increase aid effectiveness and avoid fragmentation. A more general problem is that, given the lack of local capacity, health reforms in the region are largely driven by international agencies. This risks making reforms unsustainable, once external support is withdrawn or redirected, and underlines the need for local capacity-building.

Third, the pooling of health funds and the use of single payer mechanisms have been necessary to address regional and sectoral inequalities. The countries inherited a fragmented budgetary system from the Soviet period that was divided into three administrative tiers (republican, oblast or rayon or city), and the pooling of health funds at the national level allowed them to overcome this fragmentation and use resources more efficiently and equitably.

The fourth is the sequencing of health reforms and the combination of health care restructuring with new economic instruments (Kutzin et al. 2010). While in Kyrgyzstan the introduction of a state-guaranteed benefit package and patient co-payments was embedded in a wider reform of health care financing and delivery (Meimanaliev et al. 2005), in Tajikistan the new scheme was not accompanied by new mechanisms of health financing or an emphasis on primary health care. This meant that although most services under the basic benefit package were to be delivered at primary care level, the budget was still directed at the operating costs of hospitals (Ministry of Health et al. 2004).

Fifth, experience in Central Asia highlights the importance of piloting reform elements before rolling them out nationwide, a conclusion that has also been reached in other countries of Central and Eastern Europe and the former Soviet Union (World Bank 2003). An example is the failed introduction of the benefit package in Tajikistan, versus the more step-wise introduction elsewhere, such as in Kyrgyzstan, which allowed consentus to be built on reforms and for their refinement where necessary.

Finally, the involvement of the general population and of health workers has been an element of successful reforms in some countries of Central Asia and was missing in reform attempts that failed. This might not be surprising in many countries, but is so in the political context of Central Asia, which is generally characterized by the strong role of the executive and the powers vested in the presidency. It seems that even in less permissive political environments, health reforms depend on the buy-in of health workers and the general population.

Acknowledgements

Special thanks go to all those who contributed to the Health Systems in Transition profiles. We would like to thank in particular the author teams on Central Asia, including Ravshan Azimov, Vasilia Alimova, Bolot Elebesov, Aibek Ibraimov, Ainura Ibraimova, Maksut Kulzhanov, Elina Manzhieva and Adilet-Sultan Meimanalie. Thanks are also due to external reviewers and the valuable contributions of Ministries of Health. We are also very grateful to Inga Sikorskaya for her contributions on Turkmenistan.

Funding

The work of BR on Central Asia was supported by the European Observatory on Health Systems and Policies. The Health Systems in Transition profiles are financed by the European Observatory on Health Systems and Policies, while our studies on Turkmenistan were financed by the Open Society Institute, New York. The funding bodies had no involvement in the findings presented here.

Conflict of interest

The authors declare that they have no competing interests.

References


