

Country report Kazakhstan – December 2014



Report by **Prof. Kairat Davletov**

National CVD Prevention Coordinator for Kazakhstan
Prepared for the EACPR "Country of the Month" initiative

Contact: [email](#)

For more information about the European Association for Cardiovascular Prevention and Rehabilitation (EACPR), visit our [webpage](#)

Health care | Risk factors| Prevention methods| Prevention activities| Cardiac rehabilitation| Future

Background information about Kazakhstan

Kazakhstan, which became independent in 1991 following the dissolution of the USSR, has a huge territory of 2.7 million square kilometres (about the size of the Western Europe). It is the 9th largest country in the world, just slightly smaller than India and Argentina but population reached only 17.3 million in 2014. Kazakhstan is also the world's largest landlocked country, bordered by Russia, China, Kyrgyzstan, Uzbekistan and a substantial part of the Caspian Sea.

Kazakhstan is enormously rich with natural resources, the country possesses huge oil, gas, coal and metal deposits and within the World's top 10 largest exporters of grain and milled grain products. Kazakhstan's economy was in a very deep crisis after gaining independence but started impressive growth since 1996. Currently, Kazakhstan is an upper-middle income country with a gross domestic product (GDP) per capita (purchasing power parity; PPP) (\$23,200, World Bank 2013 estimates) comparable to such Eastern European countries as Latvia, Hungary and Poland (1). It is projected that by 2020, the GDP per capita (PPP) will reach almost \$32,000 that will elevate the country in the list next to Portugal and Greece (2). At the same time, 50% of working people had an average monthly salary less than 400 Euro equivalent and 70% had a monthly salary less than 540 Euro equivalent in 2013, not mentioning many unemployed, so the majority of population is near a poverty line, according to European standards.

Kazakhstan is a unitary state with a presidential form of government. The country divided into 14 regions and two cities Almaty (former capital) and Astana (new capital) - the biggest and wealthiest cities of the country with population around 2 million and 800,000 inhabitants respectively.

Kazakhstan is ethnically diverse: ethnic Kazaks and other Turkic groups (such as Uzbeks, Uigurs and other) account for around 75% of the population, with Russians and other European nations accounting for a further approximately 25%. In total, there are more than 100 ethnic groups living in Kazakhstan. It explains by the fact that many ethnic groups were exiled to Kazakhstan during Stalin's rule, including Germans, Poles, Chechens, Turks, Koreans and many others (for example, almost 1 million ethnic Germans used to live in Kazakhstan during 1989 census and despite massive out-

migration in 1990th , almost 200,000 of them still live in the country). Ethnic Kazakhs and other Turkic groups are the vast majority on the South and West, while Russians and other European nations comprise up to 50% of the population on the North and East regions of the country. Rural population is around 45%, approximately 50% of Kazakhs and 75% of Russians live in cities, and a half of Kazakhs living in cities are recent migrants from rural areas. That is said that Russians and other European nations living in Kazakhstan have on average higher income and education level, as well as better access to the quality health care.

Kazakhstan has a relatively young age structure thanks to high fertility of ethnic Kazakhs and other Turkic groups (mean age around 25 year). Slavic and other European nations, have an older age structure (mean age around 40 years). Only 7% of Kazakhstan's total population is older than 65 years.

References

1. <http://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD>
2. [http://en.wikipedia.org/wiki/List_of_countries_by_past_and_projected_GDP_\(PPP\)_per_capita](http://en.wikipedia.org/wiki/List_of_countries_by_past_and_projected_GDP_(PPP)_per_capita)

I. Structure of Health care in Kazakhstan

The Ministry of Health is responsible for the development of the national health policies. Many services are organised in vertical structures, such as tuberculosis, oncology, HIV services or health systems by the other ministries and government agencies. Such fragmentation and poor horizontal integration results in duplication and ineffectiveness (1). The ongoing health reforms aim to build up the effective health care system based on solidarity and focus on primary health care and health promotion. After 2010, Unified National Health System allows free choice of physician and health care facility.

Kazakhstan inherited oversized hospital infrastructure from the Soviet times. The number of beds across the country has decreased from 845 per 100,000 inhabitants in 1997 to 594 per 100,000 inhabitants in 2013 but still is higher than in developed countries, where this rate is around 350-400 per 100,000 inhabitants. Median number of cardiologist is 6 per 100,000 inhabitants in Kazakhstan compared to 7 per 100,000 inhabitants in the world but, for example, Almaty city has 14 cardiologists per 100,000 inhabitants. Total health expenditures as % of GDP was only 4.2 % in 2012 (WHO estimates), which is one of the lowest in the WHO Europe region (2).

Health revenue comes from the state budget (national and oblast level) and private payments. Proportion of private expenditure of the total health expenditures is 42.2%, government expenditure on health – 57.8%. In general, the inpatient care is mainly paid from the national pool of funds (62.5%) and outpatient services are mostly paid by the region funds level (37.5%). At present, there is no State insurance system, although the government plans to re-introduce health insurance system in 2016. An attempt to create mandatory health insurance system has failed in 1999. Outpatient services are provided by government-funded policlinics and Family Medical Centres and by private medical clinics (mainly in major cities).

Some groups, so called registered patients (a method from the earlier period including some disease categories, i.e. established cardiovascular disease [CVD]) are entitled to

free drugs on the outpatient level of care, including for hypertension, coronary heart disease (CHD), heart failure. Diagnosis related group based financing is used in hospitals.

The government states that prevention is a priority in its strategic plans but this claim is not always supported by financing. For example, only 0,17% of regional health expenditures was devoted to health promotion (1). Healthy Lifestyle system is mainly responsible for the health promotion and prevention in Kazakhstan. National Healthy Lifestyle Centre monitors behavioural risk factors and coordinates the national screening program. Public health expenditures on hospital care are almost twice of that in outpatient care, the proportion that kept from the Soviet times. The Ministry of Health is trying "to reverse the pyramid", increasing primary health care (PHC) financing. The main urgent and specified inpatient and outpatient services are covered through the State Guaranteed Benefit Package (up to 60% on the regional and national level).

The government introduced so called differentiated salary for health workers, in 2012 around 30% of health workers in hospitals received bonuses to their base salary; it works especially well on the primary care level, where almost all health workers received bonuses that is almost equal to their base salary.

References

1. Katsaga A, Kulzhanov M, Karanikolos M, Rechel B. Kazakhstan: Health system review. *Health Systems in Transition*. 2012;14 (4):1–154.
2. WHO. European Health for All Database, January 2013 version. Copenhagen: World Health Organization Regional Office for Europe, 2013.
<http://apps.who.int/gho/data/node.country.country-KAZ>

Percutaneous coronary intervention (PCI) resources

In 2008, the country started almost from scratch to implement the State Program on Cardiology and Cardiosurgery Development. For the short time 48 angiography machines were deployed (in 33 regional hospitals and 15 republican institutions), 48 stroke centres were set up (working mostly on 24/7 basis) in all regional centres, the staff needed was trained across the country and incentives for these types of procedures have been provided. It resulted in sharp increase of invasive procedures: in 2013, more than 13,000 stenting and angioplasty were done in the country (4,392 for acute myocardial infarction [AMI] and 5,800 for acute coronary syndrome [ACS]) compare to only 700 in 2007; around 32,000 coronary angiographies were conducted in 2013.

The number of invasive procedures per population is still less compared to European countries; according to the Ministry of Health official sources, in 2012 the need in coronary artery graft (CAG) and stenting was met only on 30% in the country, but it increases very fast every year. On the other hand, given the huge territory of the country, low population density and that 45% of the population lives in rural areas, it probably does not make sense to try to reach European rates.

II. Risk factor statistics

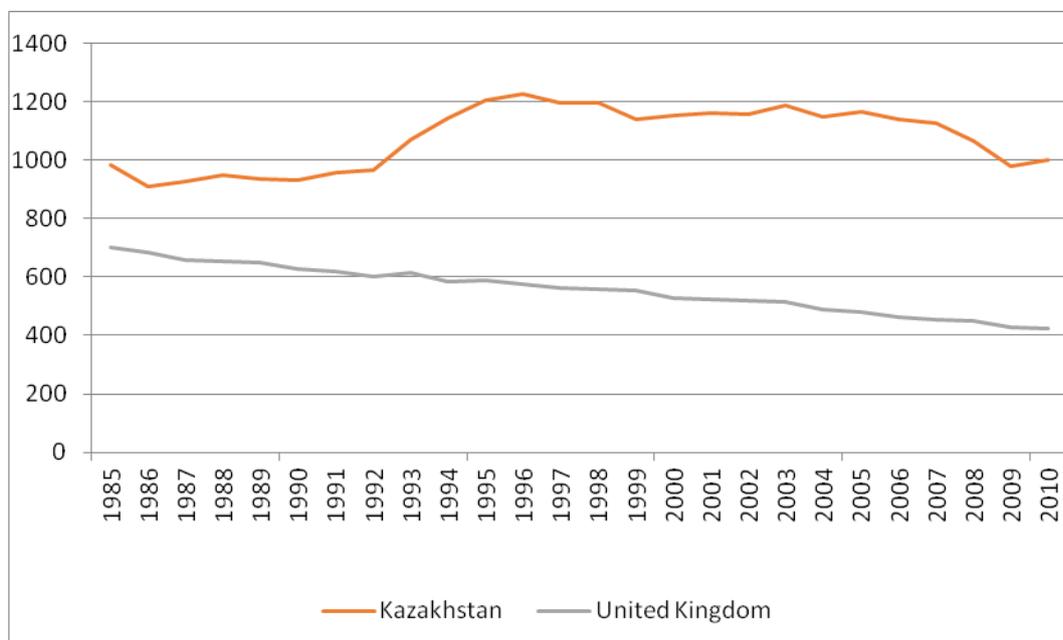
CVD Mortality

Kazakhstan suffers from one of the highest cardiovascular mortality rates in the world. According to the WHO data, age-standardised CVD mortality rates in Kazakhstan were 650 per 100,000 inhabitants in 2008. CVD mortality among men is especially high, the age-standardised CVD mortality rates among men were 859 per 100,000; the age-standardised CVD mortality rates among women, 546 per 100,000 inhabitants, are also much higher than that in the developed countries (1).

Cardiovascular diseases are the main contributors to the extreme premature male mortality and the huge male/female life expectancy gap that reached almost 10 years in 2010 in Kazakhstan, one of the widest in the world. CVD mortality and external causes mortality rates among men of working age are especially high and explain a large part of the 13,4 year difference in life expectancy between males in Kazakhstan and those in the EU in 2010. Life expectancy in Kazakhstan was 70.3 in 2013, 74.8 for women and 65.6 for men, among the lowest in the WHO Europe region, although steadily growing, especially during the last 10 years.

As in other former Soviet Union countries, CVD mortality dramatically increased after the collapse of the USSR in 1991. In Kazakhstan, it was staying on a stable high level up to 2008, since that time a steep decline of CVD mortality has been observing (2).

Fig. 1. Age Specific Death Rate (ASDR) per 100 000 - Total deaths all causes, all ages - both sexes, Kazakhstan, UK, 1985-2010



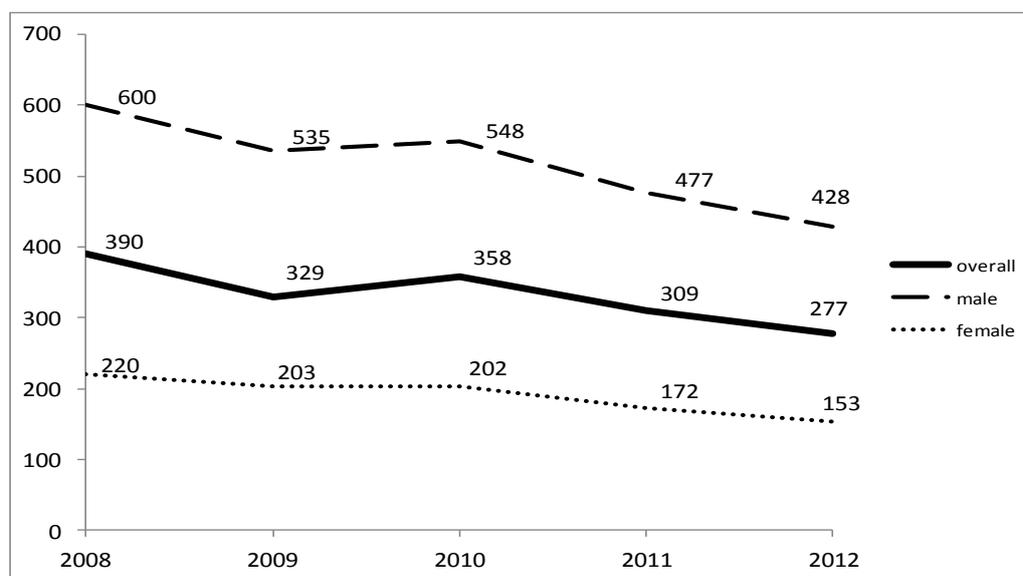
Source: From the WHO mortality database (2), <http://apps.who.int/healthinfo/statistics/mortality/whodpms/>

Mortality in the age groups 25-64 declined by almost 30% in this period, from 390 to 277 per 100,000 inhabitants. However, steep declines in 2009 and 2011-2012 were interrupted by an increase in mortality of 8% in 2010, although this was almost entirely due to an increase among men (3). The trends in age-standardised CVD mortality rates

were almost identical for men and women. It is notable that such steep yearly decline of CVD and all-cause mortality more than 10% was observed only in 1986, after alcohol prohibition measures (Fig.1).

Both CHD and stroke mortality declined for the period, on 40% and 20% respectively. Our preliminary calculations shows even steeper decline in CVD mortality in 2013, around 20% compare to 2012, the decline trend is continuing in 2014. But it is worth to note that even with this significant improvement, CVD mortality rates are still much higher of that in countries with comparable GDP per capita, especially for stroke mortality.

Fig. 2. Age-standardized CVD mortality for the age group 25-64 in 2008-2012, overall, males and females



Source: Prof. Kairat Davletov

Our preliminary analysis of age-standardised regional CHD and stroke mortality found that while CHD mortality is much higher in the more Russian populated regions of the country, stroke mortality is higher or equal in the predominantly Kazakh populated regions. It results in an interesting fact that females in Kazakhstan have different stroke/CHD proportion, higher mortality rate from stroke than from CHD, the opposite of European countries. More in- depth studies are required to learn the reasons of such differences.

Overall decline in CVD mortality was not accompanied with decline in 30-day case fatality rate in 2008-2010 but it started to decline for stroke from 15% in 2012 to 12.6% in 2014; AMI from 11.9% in 2012 to 10% in 2013.

Kazakhstan has pronounced regional and ethnic differences in all cause and CVD mortality that have never been properly analysed. There are substantial differences in CVD mortality rates across regions in the country, as well as between males and females. With the exception of Almaty and Astana cities, mortality rates are highest in the country's North-Eastern regions and lowest in South-Western regions, despite the fact that North-Eastern regions have higher income levels. The results of previous studies

found that both self-reported alcohol consumption and recorded alcohol sales are higher in regions with high levels of CVD mortality (3). While both measures are likely to capture only part of overall consumption, their consistency suggests that they are capturing true differences in levels of consumption.

Problems with CVD mortality coding among older age groups have been observed in the country lately, therefore, the analysis of all-cause mortality should be also taken into account: CVD mortality comprised around 40% of all-cause mortality for the 25-64 age groups in 2010. The overall decline of all-cause age-standardised mortality in the age groups 25-64 for 2008-2012 was 15%, while for all ages it was 11% in the country. Age-standardised all-cause mortality in the age groups 25-64, both for men and women, was significantly lower among ethnic Kazakhs than among ethnic Russians (Table 1). Ethnic differences were especially pronounced for men, reaching almost 40% in 2012, compared to a 34% difference for women. Among those aged 25-64, gender differences in age-standardised all-cause mortality are pronounced in both ethnic groups, around a multiple of 2.8 for ethnic Russians and 2.6 for ethnic Kazakhs. Considering the place of residence mortality among Kazakh men and women was higher in rural than in urban areas in 2012. Among ethnic Russians mortality was higher for women in rural areas, but higher for men in urban areas (4).

Table 1. Age-standardised all-cause mortality rates per 100,000 inhabitants for the age groups 25-64, 2012

	25-64 age group			
	Males		Females	
	Kazakhs	Russians	Kazakhs	Russians
Total	976	1 602	374	570
Urban	959	1 643	351	562
Rural	993	1 497	398	596

Source: Prof. Kairat Davletov

Thus, while the available data do not allow exploring the role of other risk factors and of medical prevention and treatment, it is certainly plausible that the huge regional and sex differences, as well as trends over time, reflect levels of alcohol consumption. It is also notable that patterns of CVD mortality in Kazakhstan are mirrored by mortality trends in external causes of deaths (injuries, accidents and poisoning) that are likely to be closely linked to alcohol abuse.

Age-standardised mortality rates for external causes of deaths declined from 145 per 100,000 inhabitants in 2007 to 98 in 2012. Overall, higher mortality among urban compared to rural males (that has no access to modern PCI resources) indicates that behaviour risk factors are more important than access to quality health care in Kazakhstan.

References

1. WHO website, NCD Country Profile
http://www.who.int/nmh/countries/kaz_en.pdf?ua=1
2. WHO mortality database
<http://apps.who.int/healthinfo/statistics/mortality/whodpms/>
3. Davletov, K., M. McKee, S. Berkinbayev, Z. Battakova, M. Vujnovic and B. Rechel (2014). "Regional differences in cardiovascular mortality in Kazakhstan: further evidence for the "Russian mortality paradox"? (in press)." *European Journal of Public Health*.
4. Davletov K, M. McKee, S. Berkinbaev, Z. Battakova, B. Zhussupov, B. Amirov, B. Rechel. Ethnic differences in health outcomes in Kazakhstan: an analysis of all-cause mortality rates. (in press) *Int. J .P. Health*.

Major CVD risk factors

As can be seen from the table 2, the prevalence of "classic" risk factors can hardly explain the excessive premature CVD mortality and huge gender gap in Kazakhstan. In general, it seems there is a recent shift to healthier behaviour in the country that can be concluded from the decline of strong alcohol and tobacco sales, more consumption of vegetables and fruits.

Table 2. Risk factors prevalence in Kazakhstan

Risk Factors, year, reference	Males	Females	Total
Smoking (2011), (1)	40%	9%	24%
Alcohol per capita consumption, in liters of pure alcohol (2010), (1)	15.7	5.5	10.3
Prevalence of physical inactivity rates (2008), (1)	30.9%	31.2%	-
Raised blood pressure (2012), (2)	36.1%	37.7%	36.7%
Overweight (2012), (2), BMI 25-29.9 kg/m ²	36.8%	30.6%	32.7%
Obesity (2012), (2) BMI > 30 kg/m ²	15.9%	27.6%	23.5%
Blood lipids (2012), (2):			
Total cholesterol >5.2 mmol/l	39.8%	56.5%	50,8
Mean cholesterol, mmol/l	4.8	5.3	5,1
Triglycerides > 1.7 mmol/l	34.6%	33.6%	34,0
Glucose (2012), (2):			
6.1-6.9 mmol/l	9.9%	13.0%	11,9
>7.0 mmol/l	6.4%	10.1%	8,8
Mean, mmol/l	5.2	5.5	5,4
Yearly vegetable consumption (2011), (3) kg per capita	-	-	225
Yearly fruit consumption (2011), (3) kg per capita	-	-	71.2

References:

1. WHO website, NCD Country Profile, http://www.who.int/nmh/countries/kaz_en.pdf?ua=1
2. Kazakh Academy of Nutrition report, 2012
3. FAO database, <http://faostat3.fao.org/download/FB/FBS/E>

Hypertension

There were no national representative surveys on arterial hypertension prevalence, awareness, treatment and control. One of the few surveys of hypertension, the HITT survey showed that up to 73% of patients with hypertension receive irregular treatment of hypertension in Kazakhstan (4).

Smoking

Kazakhstan ratified the WHO framework convention on tobacco control in 2007, since then gradually raise taxes on tobacco, banned smoking in public places, tobacco advertising and promotion, and introduced health warning on tobacco packs. Smoking cessation support can be received only in few PHC facilities, unfortunately (5).

Changing smoking patterns are likely to play a role as well in the overall decline in CVD mortality and in regional differences, as well as between men and women. Nationally representative surveys found smoking prevalence among men declining from 65.3% in 2001 to 51.2% in 2010, with the most prominent decline in the age group 18-29 years and those older than 60 years. However, smoking prevalence did not change among women (9.3% in both 2001 and 2010), increasing among women aged 30-39, from 10.9% in 2001 to 17.0% in 2010, and declining in the age group 18-29, from 16.1% in 2001 to 8.7% in 2010 (6). On the other hand, the country has one of the lowest percentage of smoking women in European region contrasting with the one of the highest CVD mortality rates.

Alcohol

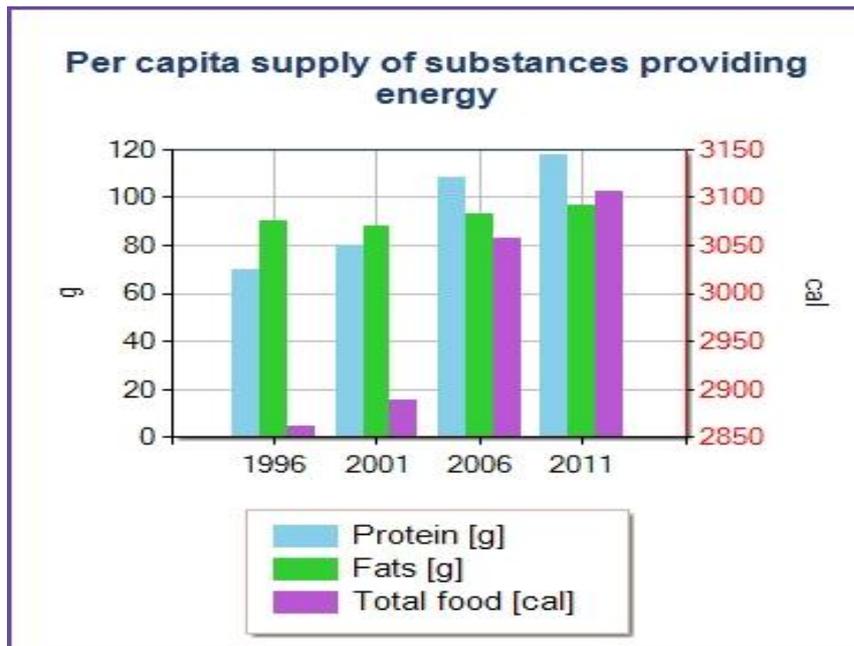
It seems that strong alcohol consumption is the biggest contributor to CVD mortality in the country. The data on alcohol sale has shown a steep decline of strong alcohol sales from 2008 but increase of beer and wine consumption in the country. Strong alcohol (mainly vodka) prices are increasing but still among the lowest in the European region.

The problem with data on average alcohol consumption in Kazakhstan is that they are not capturing a dangerous pattern of alcohol consumption, especially, strong alcohol consumption, so called binge drinking that is believed can lead to excessive premature CVD mortality.

Nutrition

As can be seen from the FAO data below, with economic improvement in the country, total daily calories intake has increased from 2850 cal in 1996 to 3,100 cal in 2011. Daily vegetables consumption increased from 427 g per day in 2008 to 616 g per day in 2011, compared to 318 g per day on average in Europe in 2008 (7). Fruit consumption in 2008 was much lower compared to Europe, 93 g per day compared to 285 g per day, but increased to 195 g per day in 2011 (3).

Fig.3. Nutrition trend in the country, 1996-2011.



Source: FAO database (3), <http://faostat3.fao.org/download/FB/FBS/E>

Obesity and overweight

There is a trend of overweight and obesity increase among women: in 1999, obesity among women was 12.6% and overweight was 19.9% (1); in 2012, these proportions increased to 27.6% and 30.6% respectively. But it seems there is a decline of obesity proportion among men: from 19.1% in 2008 to 15.9% in 2012. Data of nationwide study shows increase in blood pressure level, dyslipidemia and glycaemia prevalence with BMI increase (2).

Lipids

Lipid level shows some consistency with obesity trends. There is an increase of the mean blood total cholesterol level for women from 4.9 mmol/l in 2008 to 5.3 mmol/l in 2012 and a slight decline for men from 4.9 mmol/l in 2008 to 4.8 mmol/l in 2012.

Physical exercise

According to the National Healthy Lifestyle Center, the proportion of persons, who are regularly exercising increased from 23% in 2007 to 35.5% in 2012. The percentage of those who have any types of physical exercise at least 30 min per day grew up to 68% in 2012. In general, availability of healthy lifestyle is increasing with average personal income growth. There is a trend of an increasing number of fitness centres; there are around 200 centres only in Almaty, according to media.

References

1. WHO website, NCD Country Profile
http://www.who.int/nmh/countries/kaz_en.pdf?ua=1
2. Kazakh Academy of Nutrition report, 2012
3. FAO database, <http://faostat3.fao.org/download/FB/FBS/E>
4. Roberts B., Stickley A., Balabanova D., Haerpfer C., McKee M. The persistence of irregular treatment of hypertension in the former Soviet Union. *J.Epidemiol. Community Health*, 2013, v.66, p.1079-1082.
5. WHO report on tobacco epidemic, 2013. Kazakhstan country profile.
http://www.who.int/tobacco/surveillance/policy/country_profile/kaz.pdf
6. Roberts B, Gilmore A, Stickley A, Rotman D, Haerpfer C, Prohoda V, et al. Changes in smoking prevalence in eight countries of the former Soviet Union between 2001 and 2010 *American Journal of Public Health*. 2011 July;102(7):1320-8.
7. European cardiovascular disease statistics, 2012 edition

III. Main actors and Prevention methods

The principal actor in charge of overall coordination of CVD national prevention strategy is the Ministry of Health and Social Development. And as such, it formulates, evaluates and periodically updates the national program of health care development (e.g., "Salamatty Kazakhstan 2010-2015"), including its preventive branch, and the role of prevention has grown substantially in the government strategies which focus on increasing the average life expectancy up to 80 years. For example, from 2008 the country runs an ambitious program of mass screening for main risk factors (1) of many non-communicable diseases (NCDs), including CVD and diabetes mellitus (DM). The program ends next year, and the government is evaluating its efficacy, in order to formulate the next 5-year strategy of development of health care in Kazakhstan, with focus on primary care level.

Among others, the following institutions are charged with most organisational and methodological backup of all relevant activities on national level:

1. **National Centre of Healthy Lifestyles (NHLS)**, with branches in all 14 regions of Kazakhstan – develops information material for population, mass activities dedicated to formation of healthy lifestyles, body weight control, promotion of physical exercise, fight against smoking, obesity, alcohol abuse, annual events to commemorate the World Heart Day, No Tobacco Day, etc.
2. **Research Institute of Cardiology and Internal Diseases (RICID)** – conducts CVD epidemiology studies, develops strategies and programs to fight NCDs, and prepares guidelines and information materials both for health workers and population. In particular, RICID is instrumental in translation, adaptation and dissemination of ESC guidelines, including the [European Guidelines on CVD Prevention in Clinical Practice](#)
3. **Republican Centre for Health Care Development (RCHD)** – conducts collection and analysis of statistical data and is involved in auditing of quality of care
4. **Higher School of Public Health (SPH)** – provides trainings and re-trainings for health managers and practitioners, including certain aspects of preventive work in public health.
5. **Kazakh Academy of Nutrition (KAN)** – coordinates all the activities and research in the field of adiposity and its association with NCDs.

Along with this, six medical universities of Kazakhstan, post-graduate medical schools and medical colleges incorporate in their curricula topics on CVD prevention and ESC guidelines.

The next level where the actual delivery of preventive strategies and approaches occurs are the inpatient settings (specialised cardiology dispensaries and cardiology departments at general hospitals) (2) and primary health care centres (PHC).

"Grass-root" care providers:

The main actors in charge of consistent cardiovascular prevention are PHC specialists – GPs and nurses, cardiologists at regional dispensaries. The proportion of GPs reached 30% of all PHC physicians.

Currently over 670 "Schools of Arterial Hypertension and Ischemic Heart Disease" and over 420 "Diabetes Mellitus schools" staffed with GPs and nurses are operational at

primary care centres and dispensaries nationwide in the frame of 252 “Health promotion schools”. Starting 2013, new positions of social workers have been introduced at primary care centres: they are expected to be actively involved in preventive and follow-up care of CVD patients and their families.

NGOs and private sector:

There are several NGOs focusing on preventive activities, among them the most visible are the Association of Cardiologists of Kazakhstan (ACK) and Association of Therapists of Kazakhstan which regularly hold national and international forums devoted to CVD problems, including prevention measures and promotion of best international practices be enrooted in domestic health care practice such as ESC guidelines on different areas of cardiovascular care and health. This association also engages the private sector like pharmaceutical companies in promotion of preventive activities on the population level. NGO “Coalition for Kazakhstan free from tobacco smoke” is very active in the country and together with the National Healthy Lifestyle Center were the driving force of tobacco tax increase and tobacco ban legislations.

CVD prevention efforts are routinely controlled through regular reports of “Health promotion schools”, and selective quality control of primary care centres is conducted by experts from the Research Institute of Cardiology and Internal Diseases and through studies dedicated to assessment of compliance with the established standards of treatment and care. RCHD conducts regular trainings for health professionals in public health issues and assesses the quality of care in both in-patient and out-patient levels.

ESC guidelines are endorsed and translated by the Association of Cardiologists of Kazakhstan, pocket versions are distributed to regional association branches during its yearly national cardiology congress.

References

1. Order of Minister of Health of the Republic of Kazakhstan, dated 22 September, 2011, No.647. On Approving the Guide on Health Care Facilities Providing Cardiology, Intervention Cardiology and Cardio-Surgery Care to Population of the Republic of Kazakhstan.
2. Order of MOH RK No.685, dated of 10 November, 2009. On Approving the Rules of Prophylactic Health Checks of Target Population.

IV. Main Prevention activities

In Kazakhstan, prevention activities are part of the official public health policy announced in the State Health care development program "Salamatty Kazakhstan" (Healthy Kazakhstan) (1). As such, prevention strategies are structured as public events offered through the National Healthy Lifestyle Centre (NHLS) (which has 14 provincial and 2 municipal affiliates across the country), and routine activities on the level of primary care and clinics.

The NHLS supervises a national mass screening program (2) intended to early identification of cardiovascular diseases, diabetes mellitus, pre-cancer and cancers of various locations, and holds regular campaigns dedicated to mass media coverage of various World Days, like World Health Day, World Diabetes Day, World Hypertension Day, World No Tobacco Day and others. As a rule, prior to such days, NHLS and local health authorities remind to health facilities (both hospitals and primary care centers) the necessity of attracting the attention of population to relevant health issue and organising local campaigns like free examinations, health checks, and provide them information materials.

NHLS is also in charge of uniform health information policy and regulates dissemination of information in internet resources and mass media, develops uniform educational materials and health advertising aids (billboards, banners, LED displays, etc.), video and TV products for national and regional TV companies, involves NGOs in social projects dedicated to prevention of non-communicable chronic diseases.

In coordination with demands of the Ministry of Health, RICID, NHLS and other institutions periodically review and issue so called "methodological recommendations" (guidelines) both for in-patient and out-patient settings dedicated to prevention and management of common CVDs and other NCDs.

Currently all medical and nursing schools and almost all research institutions provide training and retraining courses for undergraduate and post-graduate students in various medical specialties. One of the requirements of the Ministries of Health and of Education and Science (which jointly validate the trainings curricula) is to include in curricula relevant topics on prevention and management, including CVD. Along with formal curricula of educational institutions, there are available public health courses delivered in the Kazakhstan School of Public Health (including distance learning), NHLS, RICID and other institutions which use interactive training methods and so called "simulation classes" equipped with visual and simulation aids for training of primary care specialists in preventive medicine. The Kazakh Academy of Nutrition supervises Nutrition Chairs in some medical schools and takes part in formulation of national policy on healthy nutrition (food fortification, iodination, overweight prevention, etc.).

In general, despite the overall structured approach to preventive activities, Kazakhstan still needs to establish a system of quality control and consistency of preventive activities, especially in the light of forthcoming switch to health insurance which may radically change the whole picture of delivery of preventive strategies in the country.

References

1. Decree of the President of the Republic of Kazakhstan. "On Approval of State Program of Health Care Development "Salamatty Kazakhstan" for 2011-2015.
2. Order No.704 of the Minister of Health of the Republic of Kazakhstan, dated September 9, 2010. "On Approval of Rules of Organization the Screening Program".

V. Cardiac rehabilitation

It can be stated that cardiac rehabilitation remains still severely underused in Kazakhstan and major efforts, both economic and educational, are clearly needed to meet the rehabilitation needs of cardiac patients.

According to the national policy on overall rehabilitation of any chronic condition, the following approach is applied for cardiac disorders:

- a) **Medical rehabilitation:** a set of curative and preventive activities to restore as much as possible patient health during his/her hospital stay. Along medications and interventions, they include various "physiotherapy" procedures, dependent on actual condition of the patient
- b) **Physical rehabilitation:** various remedial exercises, massage, naturopathy
- c) **Psychological/mental rehabilitation:** counselling on personal and emotional issues, psychotherapy, educational programs, counselling of relatives, etc.
- d) **Social rehabilitation:** working with families and patients inner circle, ensuring self-maintenance, involvement of social workers and social protection services.
- e) **Labor rehabilitation:** training and retraining to restore working ability with consideration of saved capabilities.

The state mandates universal coverage with these rehabilitation activities (1, 2) both during acute phases (Phase I rehabilitation) diseases and in out-patient settings, through the so called "dispensary follow-up" (Phase II rehabilitation).

But despite the availability of regulating enactments, the sustainability of cardiac rehabilitation activities is still far behind of the ideal. Therefore, in an attempt to systematise the approaches and streamline the cardiac rehabilitation activities, the Institute of Cardiology and Internal Diseases has set up a Centre for Medical Rehabilitation and Balneology. The Centre is in charge of formulating both the strategy and practical steps to implement the evidence-based approaches in cardiac rehabilitation.

At present, the only cardiac rehabilitation department exists in the new National Cardiosurgery Center in Astana. The Department has 90 beds and a large part of patients after around 1,500 operations conducted in this center, are offered rehabilitation. To our knowledge no other cardiac hospitals have a dedicated rehabilitation department. Few privatised premium-class sanatoriums in Almaty and Astana offer rehabilitation after the cardiac events but it is quite expensive. However, for stroke patients the situation is better: there are more than 40 stroke centers in the country.

Currently the first cardiac rehabilitation starts immediately in in-patient settings in the form of "physiotherapy" and affordable exercises under the cardiologist's supervision. In particular, due to a relatively recent introduction of major cardiac surgeries in the country, just a few cardiac clinics practice elementary cardiac rehabilitation (some light exercises). Therefore, there is a need for upgrading the post-cardiac surgery rehabilitation and training of appropriate specialists.

So called "Stroke and Myocardial Infarction Schools" are provided at clinics which provide counselling and educational programs to reconvalescent patients. After the discharge from the cardiac hospital, relevant patient are referred to out-patient

departments which register them as “dispensary patients” requiring certain care and follow-up, as well as rehabilitation to improve their quality of life, recover from disability and ensure social integration. In particular, out-patient departments offer various health schools, like “Coronary Club”, “School of Arterial Hypertension Patients”, “Diabetes School”, “School of Behavioral Risk Factors” where they hold trainings and help patients change lifestyle as to smoking, overweight and physical activity. They are also in charge of various physiotherapy services which partly are co-paid by patients.

Phase III rehabilitation involves, along with health workers, social services provided through social protection agency, including provision of certain free medications, tickets for sanatoria (balneology and physiotherapy), and social rehabilitation through retraining and engagement in affordable labor activities.

With the forthcoming introduction of health insurance, the Ministry of Health is working, in particular, on restructuring the cardiac rehabilitation services, with a purpose to comply with reformatting of funding the rehabilitation and reconsidering the responsibilities between the health administrations and social services. At the same time, studies are required to prove the benefits of cardiac rehabilitation, in order to expand public funding of rehabilitation activities.

References

1. Decree #2136 of the Government of the Republic of Kazakhstan, dated 15 December, 2009, “On Approving the List of Warranted Volume of Free Health Care”
2. Decree #1342 of the Government of the Republic of Kazakhstan, dated 15 November, 2011, “On Approving the Rules of Restorative Treatment and Medical Rehabilitation, Including Medical Rehabilitation of Children”.

VI. The Future

Kazakhstan has very ambitious plans to become a member of the Organisation for Economic Co-operation and Development (OECD) and to enter in the list of 30 most developed countries in the world. The main goal in health care is to increase the life expectancy up to 80 years by 2030. There is the understanding that prevention is the main mechanism to reach this goal but there is still no clear vision as to the way ahead.

In this aspect low financing for public health research and a lack of a strategic vision and coordination of NCD activities remain significant obstacles. Even low motivation of primary care workers to deal with prevention is problematic. Could economic incentives, like the Dutch model, raise motivation? We see as major needs in our country:

- Leadership in coordinating activities is demanded: the Research Institute of Cardiology and Internal Diseases RICID is ready to provide the desired prevention coordination to avoid the present fragmented approach.
- More research is needed to identify the reason of regional, ethnic, gender, rural/urban differences in CVD mortality and to assess the barriers to CVD prevention on all levels: patient, provider, health care system and organisational level. There is an overreliance on low quality mass screening campaign, no data exist yet on its effectiveness in Kazakhstan.
- Efforts on establishing cardiac rehabilitation programmes, including its financing, should be a prime priority.
- Even though the government is open and supportive to transferring international experience to the country there remains a need of scientific assistance for applying European prevention technologies, especially regarding epidemiology and statistical methods. We believe that Kazakhstan may learn from other countries that passed CVD epidemics transition earlier and which have successfully created a system for NCD prevention.

Plans

Our main and immediate goal to meet at least some of these needs is to introduce a sustainable system of epidemiological surveillance of the main non-communicable diseases. A research programme is planned pending approval of the Ministry of Education and Science (the Ministry of Health and Social Development [MOHSD] has approved it). The objectives are:

- Analyse the current status of health statistics of main NCDs in the Republic of Kazakhstan and calculate standardised morbidity and mortality rates across the country.
- Study the prevalence of multi-morbidity chronic conditions in the studied regions.
- Develop a strategic plan to introduce the system of the epidemiological surveillance of main NCDs based on international practice, standards and guidelines.
- Perform a cross-sectional multicenter study in five regions of the country to collect baseline epidemiological data and indicators, assess risk factors of the main NCDs,

and assess administration and use of basic medications, in relation with demographic and social parameters and subsequent prospective follow-up.

- In primary care: develop and pilot preventive programs based on main risk factors assessment scales (SCORE, FINDRISK, etc.) and introduce new indicators of effective prevention and management of main NCDs. Develop a pilot management model of multi-disciplinary prevention: family-centered and led by a nurse (as in the EUROACTION model).

Other plans:

Kazakhstan joined the EUROASPIRE IV project for the first time in the summer of 2014, we are now planning to implement the hospital arm of the project.

Furthermore we are planning: "The Development of an Innovative Model of Treatment and Control of Arterial Hypertension Surveillance on the Primary Health Care level" with the following objectives:

- To assess the hypertension prevalence, awareness, regular treatment and control of arterial hypertension in different regions of Kazakhstan.
- To assess effectiveness of the current system of diagnostics, registration and management of hypertensive patients, the practice of the main drugs administration in PHC by interviewing health workers and the general population.
- To identify barriers preventing the achievement of target blood pressure levels from the side of medical doctor, patients and health care system.
- To develop a system of control of arterial hypertension on the basis of findings for nationwide dissemination.
- To develop the most effective indicators for the management of high blood pressure on primary care level.

For these ambitious plans cooperation with foreign prevention experts, especially from the EACPR will be most welcome!