



## **Screening of Arterial Hypertension in the Republic of Kazakhstan: Advantages, Disadvantages and Ways of Improving**

**\*Aigul SHINBOLATOVA<sup>1</sup>, Maksut KULZHANOV<sup>1</sup>, Altyn ARINGAZINA<sup>1</sup>, Ardak NURBAKHYT<sup>2</sup>**

1. *Dept. of Population Health and Social Science, Kazakhstan School of Public Health, Almaty, Kazakhstan*
2. *Dept. of Information Technologies and Evidence Based Medicine, Kazakhstan School of Public Health, Almaty, Kazakhstan*

**\*Corresponding Author:** Email: aigulksph@gmail.com

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### **Abstract**

**Background:** In the Republic of Kazakhstan, the State screening program for early detection of Arterial Hypertension (AH) and other cardiovascular diseases (CVD) for the target age groups was established in 2008.

**Methods:** The results of cross-sectional survey conducted at 8 primary health care facilities of Almaty city and Almaty region of Kazakhstan from September 2012 until May 2013 was used. A multistage sampling approach was used to select patients with diagnosed arterial hypertension between 18 to 64 years of age residing in a city (n=405, 50.6%) or village (n=395, 49.4%). Data collection was done via face-to-face interviews using a semi-structured questionnaire.

**Results:** Rural residents (62.7%) mainly were “no-screened”. These patients get treatment in polyclinics only in case of serious health problems. At younger ages of 18 and 39 years, AH is diagnosed less often among rural than among urban residents ( $P<0.05$ ). In addition, 71% of the rural residents have incomes below the national average, which has a significant impact on their ability to purchase quality medicines and food and to engage in sports; 16.3% of the rural respondents do not follow doctor's prescriptions due to the lack of money to buy medications.

**Conclusion:** The screening for AH and the dissemination of information about screening in rural areas needs a lot of improvement, and that it is necessary to reconsider and improve the public policy for the distribution of free medications.

**Keywords:** Arterial hypertension, Awareness, Screening

### **Introduction**

In Kazakhstan, as in most countries of the world, arterial hypertension is one of the most common diseases and poses a serious challenge to public health. According to official statistics, the prevalence of hypertension among adults in Kazakhstan is 24.3% (1-3). Between 2009 and 2013, this prevalence has significantly increased from 10777.7 to 13391.6 per 100.000 inhabitants (1,4). At the same time, mortality rates related to hypertension rose as well and now rank first among the

causes of death. Approximately 40% of the deaths are observed during active working age (20-64 years), of which 64% in the male population (3). According to World Health Organization (WHO), premature mortality from CVD in Kazakhstan is the second largest amongst the countries of the European region (5, 6).

To curb this epidemic, the State Health System of Kazakhstan established a screening program for early detection of cardiovascular diseases and their

risk factors within the State Health system development Program (3,7,8). The screening program was established from 2008 onwards, targeted to the population aged between 18 and 64 years old, and conducted by trained physicians and nurses at primary health care facilities (territorial polyclinics). Screenings for all non-communicable diseases are free of charge in Kazakhstan, and are covered within the guaranteed volume of free medical care at primary health care level.

Screening for early detection of cardiovascular diseases (arterial hypertension, ischemic heart disease) and diabetes is carried out in several stages following a well-developed scheme. Firstly, men and women aged 18, 25, 30, 35, 40 and each two years after 40 to 64 years are identified as the target groups. Secondly, a two stage screening process was implemented. The first stage is carried out by nurses of prevention care departments of polyclinics. The second stage is performed by a physician and is conducted only among those patients who have indications for specialized surveys a specialist (7-9).

However, despite of the health system's and health professionals' efforts, the involvement of the population in the screening remains very low (3). This lack of response by the population leads to a delayed onset of the treatment for hypertension, with more severe stages of the disease and complications. In addition, it increases the expenses both for the patients and for the health system, and increases the burden of the disease to the society (10-13). It is well established that reduction of the risk factors for hypertension, early detection and adhering to physicians' recommendations considerably reduces the risks of stroke and heart attack (9, 14).

In an effort to enhance the participation of the target population in the hypertension screening, the current study aimed to explore the attitudes, perceived advantages and disadvantages, and potential barriers to hypertension screening in Kazakhstan, taking into consideration the differences between urban and rural groups. As education level, employment and income level is lower in rural areas, and accessibility to health care services is not equal in urban and rural places, we expect

significant difference in terms of information level, participation rate, and severity of the disease.

## **Method**

### *Participants*

A cross-sectional survey was conducted from September 2012 until May 2013 among patients between 18 to 64 years of age with diagnosed arterial hypertension. A multistage sampling approach was used to select patients from 8 primary health care facilities of Almaty city and the Almaty region of Kazakhstan. The sites represent a representative sample from the primary health care facilities (polyclinics) providing AH screenings in Kazakhstan. The list of participating polyclinics was approved by the Health Care Department of Almaty region. Using the patients' medical charts, 4800 (18% of all patients with AH in the region) patients with arterial hypertension were identified. Out of these, every sixth patient under the physicians' supervision was selected for inclusion in the survey. The resulting sample consisted of 800 patients, 405 of which (50.6% of the respondents) had an urban background (Almaty city) and 395 (49.4%) a rural background (Almaty region). The respondents' age ranged from 18 to 68 years, with a mean age of 46.5 years.

### *Questionnaire*

To explore the attitudes, perceived advantages, disadvantages, and potential barriers to hypertension screening, face-to-face interview were held with all patients. To conduct the personal interview, a semi-structured questionnaire was developed based on the WHO recommendation for prevention and control of non-communicable diseases, the European experience on prevention of AH, the local Order of the Ministry of Health for yearly detection of AH, and the specific interest of this study on additional expenses for prevention and treatment of AH (5,7,8,14,15). The resulting questionnaire consisted of 36 questions, divided in four sections: 1) Demographic part includes seven questions asking for the respondent's age, gender, place of residence, education and social status, and

monthly income; 2) Four questions concerning relevant health related behavior, asking for the smoking status, physical activity level, height and weight; 3) Fifteen questions regarding screening and hypertension, inquiring about the awareness about screening, sources of information about screening, screening status (screened or non-screened), disease history, age of AH diagnosis, method of disease detection, main reasons of visits to primary health care facilities, stage of AH, type of treatment, adherence to the physicians' recommendations, reasons of refusing to follow the recommendations, other diseases or complications after establishing of AH, frequency of observation at PHC; 4) Eight questions regarding treatment for hypertension, including awareness about free medications, the level of satisfaction with free medications, additional expenses for the medications, additional expenses in case of hospital treatment, stage of disability. The questionnaire also included a number of open questions that allowed the respondents' to write their opinion, requirements or recommendations on improving screening program.

#### ***Data collection***

Following official approval by the Local Ethical Committee of KSPH, every respondent (independently or in groups of patients) was asked to complete the questionnaire in the presence of the researcher. If needed, the latter provided clarification of the questions. Completed questionnaires were examined and refined in the presence of the respondent.

#### ***Statistical analysis***

All received data were inputted to a Microsoft Excel database after ensuring the information was correct and complete. Data was analyzed using SPSS version 19.0. Descriptive statistics were used to explore the data. Independent t-tests were used to define the differences regarding the mean age at the time of screening, education level, smoking status, family history of the disease, stage of hypertension, income level, awareness about screening and adherence of treatment between the urban and rural residents.

## **Results**

### ***Demographic status***

Out of the 800 participants of the study, 60.6% were females. There is no significant difference between urban (58.0% females) and rural (63.3% females) respondents ( $P>0.05$ ) in terms of gender. The majority of the respondents (64.5%) were in the age group between 40 to 60 years, and a large majority (81.2%) was of working age.

### ***Education***

Significant differences were seen between respondents in urban and rural areas with regard to education level, with a much higher percentage of respondents having had higher education in urban (61.5%) than in rural areas (35.9%). Similar differences were also observed with regard to income, with a high proportion (64.8%) of urban respondents benefiting from a monthly income above the national average, while the majority of rural respondents (71%) had an income below the average. The latter influence their ability to pay for quality medicine, purchase healthy food, or engage in sports

### ***Risk factors***

Analysis of the disease data revealed an average duration of the respondents' disease of 3.7 years. Analysis of the health related behaviors revealed significant differences between the two groups ( $P<0.01$ ) on smoking at the time of the survey, with 38.3% of the urban and 48.1% rural respondents declaring to be smoking. Moreover, 39.5% of the respondents residing in an urban setting gave up smoking after the diagnosis of hypertension, compared to 22.0% of those in a rural setting ( $P<0.001$ ). Respondents of both groups (70.0%) have body mass indexes (BMI) higher than normal.

One of the well-known risk factor of hypertension development is having a family history of the disease. In our research, 56.0% of the respondents stated that they had close relatives (mothers/sisters in age less than 65 or father/brother aged 55) with AH. There is no significant differ-

ence of family history of hypertension between urban and rural residents.

### Screening

With regard to the screening program, 78.3% of the respondents were aware about the screening program offered by the State Health System of Kazakhstan. The main source of information for both urban and rural residents was the information from the nurse of territorial polyclinic (39.2%), followed by information from relatives or neighbors (24.7%), with minor differences according to the place of residence ( $P>0.05$ ). A negligible proportion of respondents obtained information via television or radio, or from brochures and posters. It is to be noted, however, that this form of notification was available only if the patient came to the clinic.

With regard to the reason for attending the screening, a significant proportion of respondents attended screening on the invitation of nurse, both among urban (35.8%) and among rural (28.6%) residents. Urban and rural respondents differed in several ways, in the sense that the proportion of urban respondents who attend screening voluntarily (33.8%) is 1.8 times higher than among rural respondents (18.2%;  $P<0.001$ ). In contrast, 21.3% of the rural residents, as opposed to 11.6% of the urban ones, attended screening on the insistence of relatives.

Of considerable interest is also the group of non-screened patients, the proportion of which is 1.7 times higher amongst rural residents (31.9%) than among urban ones (18.5%;  $P<0.001$ ). Amongst the non-screened patients, the majority are pa-

tients with 3<sup>rd</sup> stage of AH (55.7%) and with a 2<sup>nd</sup> stage (28.4%). The largest proportion is patients aged up to 60 years old (45.8%). The diagnosis of AH was established for the main part (53.2%) by visiting a polyclinic due to health problems. Other events were hospital treatment because of other diseases, or visiting a private medical center. The main reasons of visiting a polyclinic were frequent headaches (more than 2 times per week) (25.3%); changes of physical condition due to weather (21.9%); pain in the heart (14.8%); and high pulse rate (12.0%). For the latter, there is a higher proportion among rural residents, which may be connected to the fact that among the rural respondents there are more with an excessive body weight (66.1%).

An important principle of screening is the need to detect a disease at early stages of its development. As shown in Table 1, rural residents were much less likely to be screened and treated at early stages of the disease ( $P<0.05$ ), with earlier stages of hypertension being identified more frequently in urban respondents (40.9%), while detection at the 3<sup>rd</sup> stage of hypertension is more prevalent among rural respondents (25.6%). In addition, 11.4% of the rural respondents were not aware about their level of hypertension, which may cause of improper treatment or even serious complications. Amongst the non-screened patients under physician observation for arterial hypertension, those aged 60 years and above are the largest age group (45.8%), with a higher prevalence among rural residents (48.4%).

**Table 1:** Stage of Arterial Hypertension by place of residence (urban or rural)

	Urban abc(%)	Rural abc(%)	Total abc(%)	P-value
1st	166(40.9)	106(26.8)	272(34.0)	$P<0.001$
2nd	139(34.4)	143(36.2)	282(35.3)	$P>0.05$
3rd	76(18.8)	101(25.6)	177(22.1)	$P<0.05$
Do not know	24(5.9)	45(11.4)	69(8.6)	$P<0.01$
Total	405(50.6)	395(49.5)	800(100)	

### Treatment adherence

Within the framework of guaranteed distribution of free medication, patients receive free medica-

tion in the territorial polyclinics (7,16). In our sample, 54.3% of the respondents received free medication for AH, with no significant differences be-

tween urban and rural residents ( $P>0.05$ ). However, 45.8% of respondents did not know about the availability of free medication and did not get them free. Overall, 48.2% of the screened respondents bought additional medication. A significant difference ( $P<0.001$ ) is noted between urban (80.5%) and rural (53.9%) respondents with regard to the adherence to the recommendations of the physician, whereby urban residents take up more responsibility for their health. Urban respondents (15.5%) comparing to rural respondents (32.4%) use medication only if necessary, often forget to drink, or use other analgesics ( $P<0.001$ ). It is important to note that in our survey, 16.3% of the rural respondents stated they lacked the money to buy medication. Whereas patients with stage 1 AH are not legally entitled to get free medication (7, 16) 71% of rural respondents in our survey had incomes below the national average, which reduces their ability to purchase quality medicine and food or visit sports facilities.

## Discussion

In accordance with the official publications "Health of population and health care in the Republic of Kazakhstan in 2010–2013", the prevalence of arterial hypertension has increased dramatically over the past years, despite the establishment of a designated screening program. Part of the explanation for this is the low participation in the screening especially among rural residents (1, 4). The present study aims to enhance the participation in AH screening by way of identifying the main factors that enhance or impede participation in AH screening, including demographic factors, the presence of risk factors such as the family history of hypertension and the age of diagnosis and stage of hypertension awareness about screening, and the degree of responsibility to attend screening, with specific attention to differences depending on the patient's place of residence.

In our study, as in studies conducted in Asian and European countries, indicated that prevalence of arterial hypertension is higher among urban citi-

zens (17,18). However, despite their lower prevalence of AH, rural citizens with AH more often remain non-screened, and the severity of the disease and its complications are significantly higher. At younger ages of 18 and 39 years, AH is diagnosed less often in rural residents than in urban ( $P<0.05$ ). Rural respondents tend to get treatment in polyclinics only in case of serious problems with health. In this group, the disease is more often diagnosed at a later age and at later stages of development, which leads to increased health risks and additional costs for both the patient and the health care system. It seems therefore indicated to enhance efforts and provide additional information about the importance and benefits of AH screenings to citizens in rural settings. Moreover, there is a need to create a connection between public and private health centers to develop cooperation mechanisms for the registration of patients with established diseases.

As appears from our study, the main source of information on AH for both urban and rural residents is a nurse, as well as relatives and neighbors. Other sources of information are less often cited, especially among rural respondents. This suggests that the dissemination of information about AH screening in rural areas needs a lot of improvement. For instance, information about a Hypertension Day is not readily available or even absent amongst the participants of our survey. As it is well known that blood pressure control and timely treatment of AH significantly decreases the risk of cardiovascular and renal diseases (18-20), it is necessary to enhance the information about screening through various media. In addition to advice by medical professionals, modern communication technology can play a key role, for instance by providing information about AH and screening through telephone messages (sms), television news programs, domestic sitcoms and other means available to the public. The use of media should not be limited to promote screening but can be extended to primary prevention. Given the important role of behavioral factors in the development of hypertension (21), it is possible to unite the efforts of the public health care system and the media to inform the population on the need to

adopt a health enhancing behavior and weight control (9,21) and to change attitudes towards a healthy lifestyle. It is evident that only a change of health behavior such as dietary habits and physical activity on the long term can change the health profile of a population (15).

As pointed out by many scholars (11,15,21,22) the main aspects in the successful treatment of hypertension are both early detection and the adherence to the physician's recommendations and regular monitoring of blood pressure. In this regard, we found a significant difference between urban and rural respondents, with urban residents taking up more responsibility for their own health. One of the reasons why patients do not follow doctor's prescriptions may be the lack of resources, 16.3% respondents stated they lacked the money to buy medications and 71% of rural residents had income below the national average. It is necessary to reconsider and improve the public policy with regard to the distribution of free medication for the patients with AH.

## Conclusion

We believe that screening program and increasing of information level about early detection of hypertension will contribute to the improvement of population's health. For the period of screening program establishment some positive results were achieved, but still require joint responsibilities of health system, medical personnel, media and community itself.

## Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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