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REVIEW

# EPIDEMIOLOGICAL ASPECTS OF CORONARY HEART DISEASE INCIDENCE, PREVALENCE AND MORTALITY RATE WORLD-WIDE AND IN THE REPUBLIC OF ARMENIA

**Saiyan A.E.**

"Erebouni" Medical Scientific Center, Yerevan, Armenia

***Abstract***

*Annually, over seven million people worldwide (12.2% of total incidences) die of coronary heart disease (CHD). According to WHO forecast, by 2030 about 23.6 million people shall die of cardiovascular diseases, predominantly of cardiac disease and cerebrovascular accidents. Prevalence of CHD disease in the USA makes about 13.5 million people and is the cause of death in more than 1/5 of all cases. In European countries about 30 000 per 1 000 000 population suffer from coronary heart disease.*

*On post-soviet territory the highest rate of mortality from CHD is noted in the following countries: Turkmenistan 583.7; Uzbekistan 465.0; Azerbaijan 435.9; Kazakhstan 419.2; Estonia 408.7 (per 100 000 population, accordingly).*

*According to official data of Information Analysis Center of the National Institute of Health of the Republic of Armenia, over the last years CHD incidence growth is noted in Armenia as well. For example, within the period from 2004 to 2010 incidence of first diagnosed CHD per 100 000 population increased from 330.5 to 559.4 (1.8 times), and total incidence – from 1414.5 to 2091.6 (1.6 times). CHD mortality slightly decreased along with it: from 265.4 to 252.2 per 100 000 of population.*

*A brief review of indicators of official statistics confirms, yet another time, the urgency of the problem for national healthcare and dictates the necessity of further detailed analysis of the morbidity, prevalence and rate of mortality caused by CHD in Armenia aiming at establishment of the National Registry of CHD and National Patient Management Protocols.*

***Keywords:*** coronary heart disease, epidemiology, prevalence, mortality rate.

In the middle of the last century an epidemiological upheaval took place in the structure of population morbidity and mortality rates: non-contagious diseases (NCDs) came to replace contagious diseases. The NCDs are the most common and disabling diseases, which for the most part affect population of an active age [*Andreasyan D., 2006; WHO, 2005; 2010 a; b*].

By its severity, unpredictability, tendency of year-to-year growth of morbidity, mortality and juvenation rates the NCDs represent the most urgent problem of healthcare systems of different countries [*WHO, 2004; 2010a; b*].

***Address for Correspondence:***
"Erebouni" Medical Scientific Center,
14 Titogradyan Street, 0087 Yerevan, Armenia
Tel.(+37410) 47 23 40,
E-mail: hasmik.saiyan@mail.ru

In the European region of the WHO no less than 86% of total number of deaths and 77% of the entire disease burden fall to this group of health situations featured by common risk factors, common determinants and common possibilities for prevention and correction. In 2006, pursuant to the resolution adopted by WHO European Regional Committee a complex European strategy to combat NCDs was elaborated [*WHO, 2006*].

The overall goal of this Strategy is to prevent premature mortality and to significantly reduce the disease burden related to NCD by improving life quality of people and providing a more even distribution of expected healthy life indicators both among European region member states and in each of these latter.

As obvious from Figure 1, the first place, "place of honor" in the pyramid illustrating rate of mortality from NCDs among population of the European

region is occupied by cardiovascular diseases (CarVDs), the specific gravity of which within the structure of total mortality rate is 51%, the second place is occupied by oncological diseases (21.6%), the third place: by chronic respiratory diseases (11.5%), and the fourth: by pancreatic diabetes (3.3%) [*WHO, 2010 a; b*].

In 2010, the UN General Assembly adopted a resolution referring to prevention of the NCDs. It was noted that these diseases, *mostly cardiovascular events (CVEs), cancer, chronic respiratory diseases and diabetes*, annually bring death to 35 million people worldwide, including 9 million people under 60, among which about 90% of cases in developing countries [*WHO, 2010 a; b*].

According to WHO estimates, 17.1 million people died of CVEs in 2004, which constituted 29% of all death cases worldwide; 7.2 million of the mentioned number died of coronary heart disease and 5.7 million of cerebrovascular accidents. This problem is commensurately related to countries with both low and medium income level. Over 82% of CVEs related cases of death happen in these countries almost evenly distributed between men and women [*WHO, 2004; 2010 a; b; 2011*].

Within CVEs structure a particular place is occupied by the coronary heart disease (CHD). High level of morbidity and prevalence, frequency of complications leading to early invalidization and premature death of patients explain high social significance and the interest, which is expressed to relevant research by both representatives of theoretical disciplines and clinicians [*Ageev F. et al., 2000*].

According to data of numerous epidemiological studies, the prevalence of CHD constitutes from 4 to 12% among adult population of the Earth. Over seven million people die from that disease every year globally (12.2% of total mortality rate): more than from other NCDs. In economically developed countries CHD constitutes about 50-60% of total mortality rate from CVEs, whereas frequency of lesion grows with age reaching its maximum in the group of 50 and above [*WHO, 2004*].

Based upon the WHO forecast, 23.6 million shall die of CVEs by 2030, mainly of heart diseases and cerebrovascular accidents, which shall remain the main causes of death [*Rose G et al., 1984*].

Only in the USA, 2.5 million people are hospitalized to cardiological clinics annually with different presentations of CHD. Prevalence of CHD in the

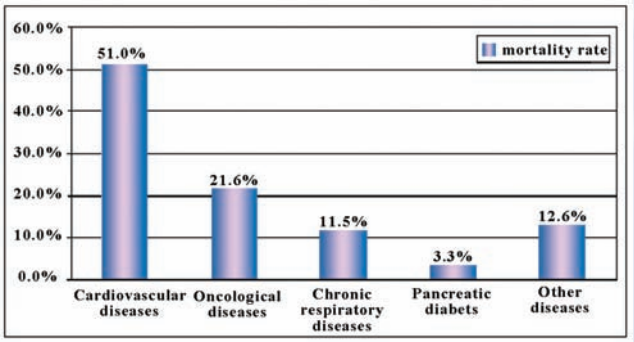


**Figure 1.** *Rate of mortality cause by NCDs in the European region.*

USA is about 13.5 millions of people, which constitutes cause of death of over one fifth of all cases [*Anderson J. et al., 2007*].

In European countries over 30 000 per 1 000 000 population suffers from stenocardia [*Graham I. et al., 2007*].

Likewise, in Russia, CVEs represent the first cause of death (56%) bringing death to about 1 300 000 of people every year. Over the last years, significant growth of mortality rate from CVEs is registered in Russia, the share of which in structure of premature death increased among men makes from 53 to 61% and among women amounts from 61 to 70%. CHD and cerebrovascular diseases (CerVDs) still remain main reasons of such significant growth of these indices. Thus, in 2000 mortality from CVE in Russia made 376.2 and CerVDs related mortality was 299.7 (per 100 000 of population, accordingly) [*Kharchenko V. et al., 2005*].

Noticeable augmentation of CHD morbidity and mortality rates is registered also on the entire post-soviet territory. According to analytical review of official data presented by Federal State Statistics Service and Ministry of Healthcare and Social Issues of Russia, the highest CHD fatality rates are noted in the following countries: Turkmenistan 583.7; Uzbekistan 465.0; Azerbaijan 435.9; Kazakhstan 419.2; Estonia 408.7 (per 100 000 population, accordingly) [*Kharchenko V. et al., 2005*]. According to the same review, mortality from CHD in Armenia in 1997 constituted 253.4 per 100 000 population. Validity of the last index is fallible, as according to the official information contained in the statistical yearbook of the National Institute of Health of the Republic of Armenia (NIH MH RA) [*Healthcare and Health, 2010*] the CHD mortality rate per 100 000 of population in Armenia in 1997 constituted 224.3.

In the Republic of Belarus 13% of adults (about 900 thousand) are noted to have CHD. Every year 75 thousand people die in Belarus of CVEs, which makes 54.6% of all *exitus letalis*. At active working age every third person dies of CVEs: 30.7% [*Manak N., 2003*].

In Ukraine among all causes of sudden death, almost 80% of cases fall to CHD [*Vaturin N., Mikhalchenko E., 2008*].

According to data of M.T. Khairidinov [*Khairidinov M., 2005*], in Tajikistan the CHD prevalence rate among men at the age of 45-54 is 20.3%, at 55-64: 33.2%; among women CHD prevalence rate is 15% and 27.5%, correspondingly.

At the same time, there exists data about paradoxically low CHD incidence and mortality rates, which "knit together" aboriginal inhabitants of the North – Eskimos in Greenland, Canada and Alaska, Laplanders in Finland, Yakuts, Chukchis and Eskimos of the Chukchi peninsula [*Alekseev V. 1989; Tanuseputro P. et al. 2003; Khamnagadaev I., 2008; WHO 2011*].

N.G. Vardugina presented rather appealing data referring to the fact that CHD mortality rate among women in the Russian Federation over the last decade have exceeded similar indices in countries of the Central and Easter Europe twice and five times exceeded those for the European Union [*Vardugina N., 2005*].

Recently, general growth of CVEs incidence in Armenia is also noted [*Adamyan K., Chilingarian A., 2008*], and CHD incidence in particular. Reviewing national literary sources on this problem in the electronic database "Armenian medicine" we detected only a few works related to prevalence and incidence of CHD [*Gabrielyan R. et al., 1995; Adamyan K., Astvatsatryan A., 2003; Varosyan M., 2004; Andreasyan D., 2006; Dzhuganyan A., 2007*], which, apart from analysis main issues, also contain fragmentary data on epidemiological aspects.

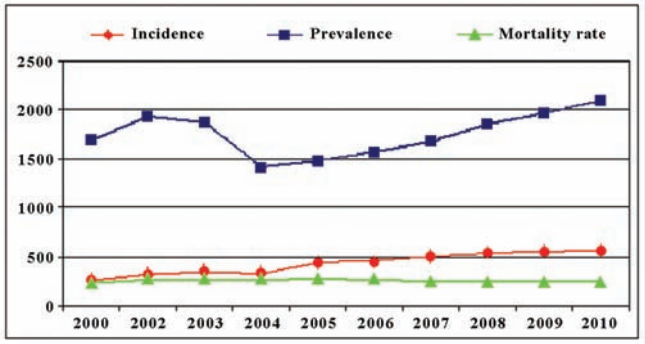


**Figure 2**. *Incidence, prevalence and mortality rate regarding coronary heart disease (per 100 000 of population) in Armenia from 1990 until 2010.*

Abstracting from references given above we referred to data contained in the information book of the Information Analysis Center of NIH MH RA [*Healthcare and Health, 2010*]. By reference to the official data in relation to incidence and prevalence of the firstly diagnosed disease, as well as CHD mortality rate we analyzed these indices on a year-to-year basis starting from 2000 to 2010 (Figure 2).

As presented in Figure 2, within the period from 2004 to 2010 a steady growth of indices of both incidence and prevalence of the CHD is observed.

For example, first diagnosed CHD incidence from 2004 to 2010 grew in absolute figures from 8278 to 14891 (1.8 times), and total morbidity from 35426 to 55678 (1.6 times). Per 100 000 of population these indices constitute correspondingly for incidence 330.5 and 559.4, and for prevalence: 1414.5 and 2091.6.

It must be taken into consideration that statistical indicators, presented in the information book, referred to above, are calculated mainly based on data annually provided by medical and preventive treatment facilities of the country to the Information Analysis Center of NIH MH RA. Thus, in essence, these indicators are indicators of *appealability prevalence.* However, considering reduction of appealability in relation to virtually any chronic illness to medical and preventive treatment facilities of the country in the past 10-15 years, it can be assumed that the real value of CHD prevalence is slightly higher.

On the contrary, as shown in Figure 1, CHD mortality rate reduced from 8529 in 2004 to 8212 in 2010, in absolute figures. Per 100 000 population these indices constitute correspondingly 265.4 and 252.2. Reduction of mortality rate is more likely conditioned by introduction of advanced interventional methods of CHD treatment and optimal schemes of therapeutic treatment, which is to be appreciated in its own turn.

More precise (valid) presentation on incidence and prevalence can be obtained from results of population examination: prevalence study, disease frequency survey. In this case, defining standard signs of disease, individuals, who have not yet noticed the disease and thus do not consider themselves ill enough to go to a doctor or simply have no access to medical assistance, can be identified. Disease prevalence identified this way is called *detectability prevalence* [*Fletcher R. et al., 1998; Vlasov B., 2004*].

However, judging from available sources, no such research on CHD incidence and prevalence was carried

in Armenia up to day. Consequently, there is no National Registry either on CarVDs in general or on CHD.

In general, essential morbidity, prevalence and mortality rates in relation to CHD registered in our country fall within the scope of rates of incidence of such pathology presented in WHO bulletins for countries with low and medium income level per capita.

Consequently, a brief review of both official statistics and results of epidemiological research of certain authors evidence in favor of apparent priority of the CVEs problem in general and of CHD in particular, for global medical science and practical healthcare of developed and developing countries.

The aforementioned confirms the urgency of discussed problems for national healthcare and dictates the necessity of further detailed analysis of the incidence, prevalence, and mortality rates caused by the CHD in the Republic of Armenia aiming at establishment of the National Registry of CHD and National Patient Management Protocols.

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