

# DIAGNOSTICS OF PREVENTABLE DISEASES IN CARDIOLOGY

*Aida Pilav<sup>1</sup>, Anes Jogunčić<sup>2</sup>*

<sup>1</sup>Public Health Institute of Canton Sarajevo, Dr. Mustafe Pintola 1, Sarajevo, Bosnia and Herzegovina,

<sup>2</sup>Public Health Institute of Canton Sarajevo, Department of Epidemiology, Dr. Mustafe Pintola 1,  
Sarajevo, Bosnia and Herzegovina

Corresponding author:

Aida Pilav

Public Health Institute of Canton Sarajevo

Dr. Mustafe Pintola 1

Sarajevo, Bosnia and Herzegovina

idanap@bih.net.ba

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## Abstract

Despite many efforts to diagnose and treat preventable cardiovascular diseases (CVD), more specifically to detect known risk factors, these diseases continue to be the leading cause of morbidity and mortality. Bosnia and Herzegovina belongs among the high-risk countries with standardized death rate (SDR) of 385 per 100 000 inhabitants in 2018. Two leading causes of death are acute myocardial infarction, with rate around 90 deaths per 100 000 inhabitants and stroke with the rate around 80 deaths per 100 000 inhabitants in one year. Both incidents are preventable. Digital interventions are necessary for strengthening of the healthcare system. Benefits of eHealth could be seen in transmission of customized health information for different audiences: transmission of health-event alerts to a specified population group; transmission of health information based on health status or demographics; alerts and reminders to clients; transmission of diagnostic results (or of the availability of results) or even notifications and reminders for appointments, medication adherence, or follow-up services. Successful implementation of digital health requires multidisciplinary approaches, from mass dissemination of recommendations through public health education programs directly in the field, to clinical treatments for patients. All this requires the involvement of numerous actors, from the strategic to the operational level of management within the healthcare system in the country.

**Key words:** Cardiac disease, prevention, digital health

## Introduction

Despite many efforts to diagnose and treat preventable cardiovascular diseases (CVD), more specifically to detect known risk factors, these diseases continue to be the leading cause of morbidity and mortality. Bosnia and Herzegovina belongs among the high-risk countries. Based on information of Public Health Institute of Federation of Bosnia and Herzegovina, standardized death rate (SDR) for cardiovascular diseases is 385 per 100,000 inhabitants (1). In contrast, in the European Union, yearly deathrate due to the cardiovascular diseases is 315 per 100,000 inhabitants (2). Access to digital information and communication has an increasing importance in both the work of healthcare professionals and in patients' everyday life and has transformed what we do and how we carry out activities. It changes the way in which healthcare is delivered, how information is exchanged within and between organizations and how patients and other actors access and manage information (3). Electronic health (eHealth) — technology to support health, well-being, and healthcare — can offer many benefits, such as increased quality of care, easily accessible healthcare, and increased self-management (4). Digital medicine (also called telemedicine or telehealth) and eHealth form a growing contemporary field in primary health care hastened by the Covid-19 pandemic. According to an EU-report, 96% of GPs in Europe used electronic health records in 2018 [5]. The Nordic countries together with Estonia, Spain and the UK have adopted eHealth to a high degree and most patients in Denmark, Estonia, Finland, Sweden and the UK can view their medical records and test results electronically [6].

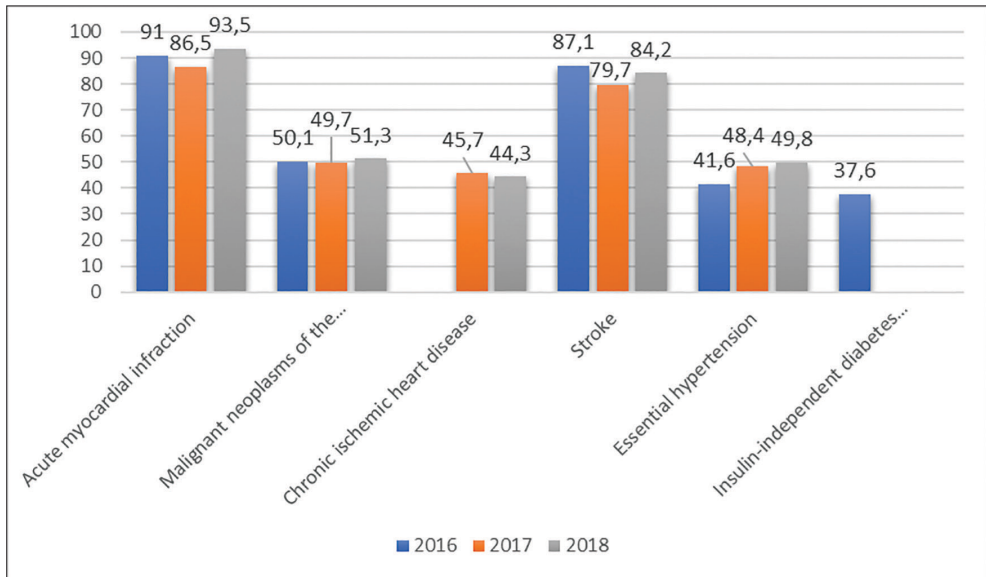
Aim of our paper was to show the importance of implementing new technologies in health system which could lead to timely and adequate reactions of the competent health authorities.

## Methods and materials

The authors used official data from the Federation of Bosnia and Herzegovina, the European Union and the World Health Organization to present the importance of projects focused on the prevention of cardiovascular diseases. The possibilities of using digital technologies are a combination of published official materials of the World Health Organization and the personal views of the authors.

## Results and discussion

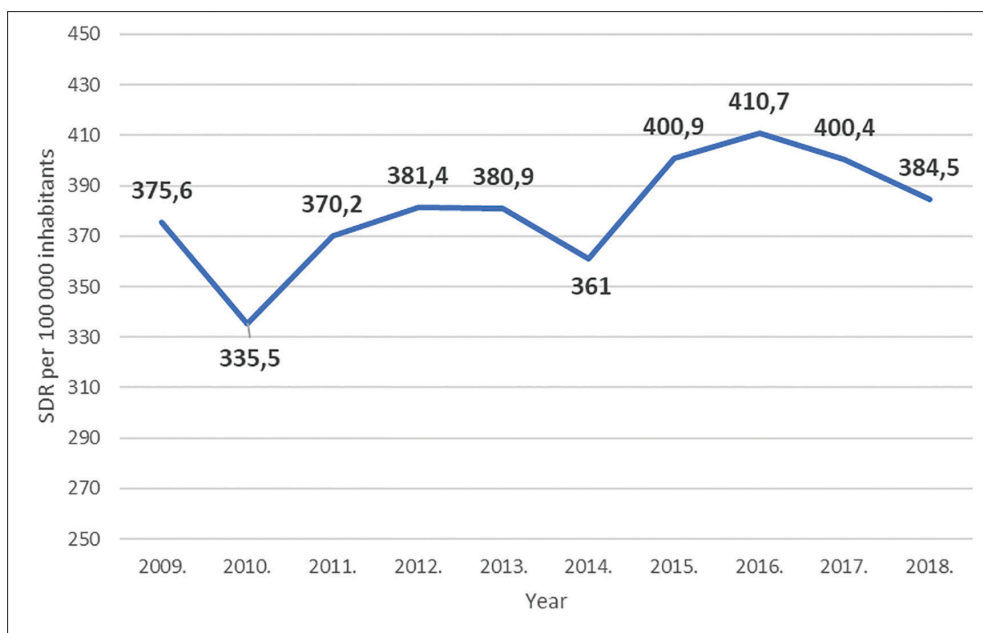
Cardiovascular disease SDR was at the peak in year 2016, with SDR = 410,7/100,000 inhabitants. It is slowly declining since that period. At the same time, chronic respiratory incidence is increasing, along with the deaths caused by it. Five leading diseases as causes of death in Federation of Bosnia and Herzegovina in period of 2016 – 2018 are shown in Graph 1.



*Graph 1. Five leading diseases as causes of death in the Federation of BiH  
Rates are calculated per 100,000 inhabitants in period 2016 – 2018*

As seen in the Graph 1, two leading causes of death are acute myocardial infarction, with rate around 90 deaths per 100 000 inhabitants, and stroke with the rate around 80 deaths per 100 000 inhabitants per year. Both incidents are preventable.

These rates are even higher in male population, with the acute myocardial infarction deathrate reaching a peak (108/100,000) in year 2018. In contrast, in female population, mortality rate was 79 per 100 000 inhabitants in the same year. In male population the rate of malignant neoplasms is also increasing over the period of three years, while rate of deaths caused by stroke is around 75 per 100,000 people. Standardized death rates from cardiovascular diseases are showing wave like pattern (Graph 2).



*Graph 2: SDR from cardiovascular diseases per 100,000 inhabitants*

As seen from previous graphs, management of preventable diseases in cardiology should lead to the reduction of deaths from these causes. According to published WHO research, the main barriers to adequate management of preventable diseases in cardiology are: lack of unique clinical guides; inadequate training of health workers in the management of CVD in the Primary Health Care; inadequate access of patients to health services; insufficient use of modern health technologies (7). Digital interventions are necessary for strengthening of the healthcare system. What is proving inevitable in the current moment and in the modern environment is the proactive role of the healthcare system in the field of digital health as a support to cardiovascular health in Europe, which is included in the current action plan of the European Society of Cardiology (ESC). The term digital health stems from eHealth, which is defined as “the use of information and communications technology in support of health and health-related fields” (8). Mobile health (mHealth) is a subset of eHealth and is defined as “the use of mobile wireless technologies for health.” More recently, the term digital health was introduced as “a broad umbrella term encompassing eHealth (which includes mHealth), as well as emerging areas, such as the use of advanced computing sciences in ‘big data’, genomics and artificial intelligence.”

The future is focused on the digital transformation of healthcare and the need for efficient and safe innovation in order to improve the efficiency of health practices, and thus improving the diagnosis of preventable diseases, including preventable cardiac diseases. The development of innovative solutions to ensure people's access to prevention and treatment of CVD across Europe is a necessary and urgent priority. There is need for promoting innovation and modernizing research regulations to improve: Earlier recognition of cardiovascular disease; Repair of the heart and blood vessels; Knowledge on the interaction between CVD and other disorders; Treatment of chronic heart failure and atrial fibrillation. In primary prevention for example, mobile applications, text messaging and monitoring sensors for self-tracking, as well as online counselling, have the potential to identify people with high cardiovascular risk, and improve lifestyle management interventions to reduce cardiovascular risk. Supporting the digitalization of healthcare systems through the development of electronic health records and data repositories, as well as exploiting the potential of artificial intelligence, would play a key role in improving diagnosis and treatment of CVD. Benefits of eHealth could be seen in transmission of customized health information for different audiences: transmission of health-event alerts to a specified population group; transmission of health information based on health status or demographics; alerts and reminders to clients; transmission of diagnostic results (or of the availability of results) or even notifications and reminders for appointments, medication adherence, or follow-up services.

## Conclusion

Successful implementation of digital health requires multidisciplinary approaches, from mass dissemination of recommendations through public health education programs directly in the field to clinical treatments for patients. All this requires the involvement of numerous actors, from the strategic to the operational level of management within the healthcare system in the country.

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## DIJAGNOSTIKA BOLESTI KOJE SE MOGU SPRIJEČITI U KARDIOLOGIJI

### Apstrakt

Uprkos mnogim naporima u dijagnosticiranju i liječenju kardiovaskularnih bolesti (KVB) koje se mogu spriječiti ili preciznije u otkrivanju poznatih faktora rizika, ove bolesti su i dalje vodeći uzrok morbiditeta i mortaliteta. Bosna i Hercegovina spada među zemlje visokog rizika sa standardiziranom stopom smrtnosti od 385 na 100.000 stanovnika u 2018. godini. Dva vodeća uzroka smrtnosti bili su akutni infarkt miokarda, sa stopom od oko 90 smrtnih slučajeva na 100.000 stanovnika i moždani udar sa stopom od oko 80 smrtnih slučajeva na 100.000 stanovnika u jednoj godini. Oba incidenta se mogu spriječiti. Neophodne su digitalne intervencije za jačanje zdravstvenog sistema. Prednosti eZdravstva (eHealth) mogu se vidjeti u prenošenju prilagođenih zdravstvenih informacija za različite publike: prenošenje upozorenja o zdravstvenim događajima određenoj grupi stanovništva; prenošenje zdravstvenih informacija na osnovu zdravstvenog stanja ili demografskih podataka; upozorenja i podsjetnici klijentima; prenošenje dijagnostičkih rezultata (ili informacija o dostupnosti rezultata) ili čak obavještenja i podsjetnika o terminima, pridržavanju terapijama ili popratnim uslugama. Uspješna implementacija digitalnog zdravlja zahtijeva multidisciplinarnu pristupe, od masovnog širenja preporuka kroz obrazovne programe o javnom zdravlju direktno na terenu, do kliničkog liječenja pacijenata. Sve ovo zahtijeva uključivanje brojnih aktera, od strateškog do operativnog nivoa upravljanja unutar zdravstvenog sistema u državi.

**Ključne riječi:** kardiovaskularna bolest, sprečavanje, digitalno zdravlje