

# ESC Prevention of Cardiovascular Disease Programme

November 2019

## Report on unmet prevention needs: Hypertension

Katarzyna Czerwińska-Jelonkiewicz (Acca)

Anna Oleksiak (Acca), Gabrielle McKee (ACNAP), Ian Graham (EAPC), Margrét Hrönn Svavarsdóttir (ACNAP), Joep Perk (EAPC), Izabella Uchmanowicz (ACNAP), Arno Hoes (EAPC)

Report produced within the framework of the ESC Prevention of Cardiovascular Disease Programme, led by the European Association of Preventive Cardiology (EAPC) in collaboration with the Acute Cardiovascular Care Association (Acca) and the Association of Cardiovascular Nursing and Allied Professions (ACNAP)

**Aim:** To report the prevalence of hypertension and the rate of blood pressure on target among patients with high-risk coronary heart disease (CHD) in Europe.

**Methods:** Population inclusion criteria were high-risk CHD patient, from any country in Europe. Studies were included if they reported percentage of the population that had established hypertensive disease. Searches were carried out with a date limit of 2010 for publication. Studies were excluded for the following reasons: data from many countries which could not be separated, and data presented was from a source already used.

The outcome of this report was percentage of population with hypertension and the percentage off efficient blood pressure control among it. Baseline data within studies were used. Data extraction included, percentage of hypertension, percentage of blood pressure at target, main cardiac profile of population, dates of data collection and countries of data origin. In papers where data was divided into groups these were merged. Excel was used to derive average per country from all sources.

Hypertension was defined as arterial blood pressure  $>140/90$ mmHg (for diabetic patients, blood pressure  $>140/80$  mmHg) [1,2]. The blood pressure target was defined as:  $<140/90$  mmHg, and  $<140/80$ mmHg for diabetics [1].

**Sources:** EUROASPIRE V survey hospital arm, SURF registry and eight other articles were used in the analysis [1-12]. The majority of studies included patients with established coronary artery disease diagnosis. The hospital arm of EUROASPIRE V included patients treated with elective PCI or CABG and patients with ACS (STEMI/NSTEMI treated with PCI or CABG, and UA during index hospitalization) as presented by De Bacquer at EuroPrevent 2018 [3]. The SURF registry included outpatients with defined CHD (previous PCI/CABG, ACS or stable angina established on the basis of functional or imaging tests) [4]. Results of national registries which were used also concerned patients with established CHD [5-12].

The studies included different ranges of study period, with the longest periods from 1987 to 2011 [9], followed by data from 1995 to 2015 [7], from 1996 to 2008 [5], from 1997 to 2011 [10] and between 2001-2013 in AGNES registry [12]. Narrower time ranges of observation were 2000 - 2008 [6], 2003 - 2009 [11], 2011 - 2014 [9] and 2012 - 2013 [4].

**Results:** Data from 30 different countries in Europe was available, 10 countries had data from two sources, 20 countries had data from one source.

Taking the percentages from all sources and all countries, overall mean prevalence of hypertension was  $50.27 \pm 13.35\%$  (median - 47%) and ranged between 37.0% in Greece and 88.9% in Russia. The overall mean percentage of hypertension across the main studies was the highest in SURF the 73.05%, while in the EURASPIRE hospital arm the average was 45.8%. Substantial differences between reported values were noted for Russia (88,9% - SURF, 36% - EUROASPIRE V hospital arm), Italy (72,8% - SURF, 36% - EUROASPIRE V hospital arm), Belgium (68,6% - SURF, 44% - EUROASPIRE V hospital arm), Romania (75,5% - SURF, 44% - EUROASPIRE V hospital arm), and Croatia (83,5% - SURF, 50% - EUROASPIRE V hospital arm) [3,4]. Figure 1

According to the hospital arm of EUROASPIRE V, mean drug adherence among patients was 78% (49% - 93%) [3].

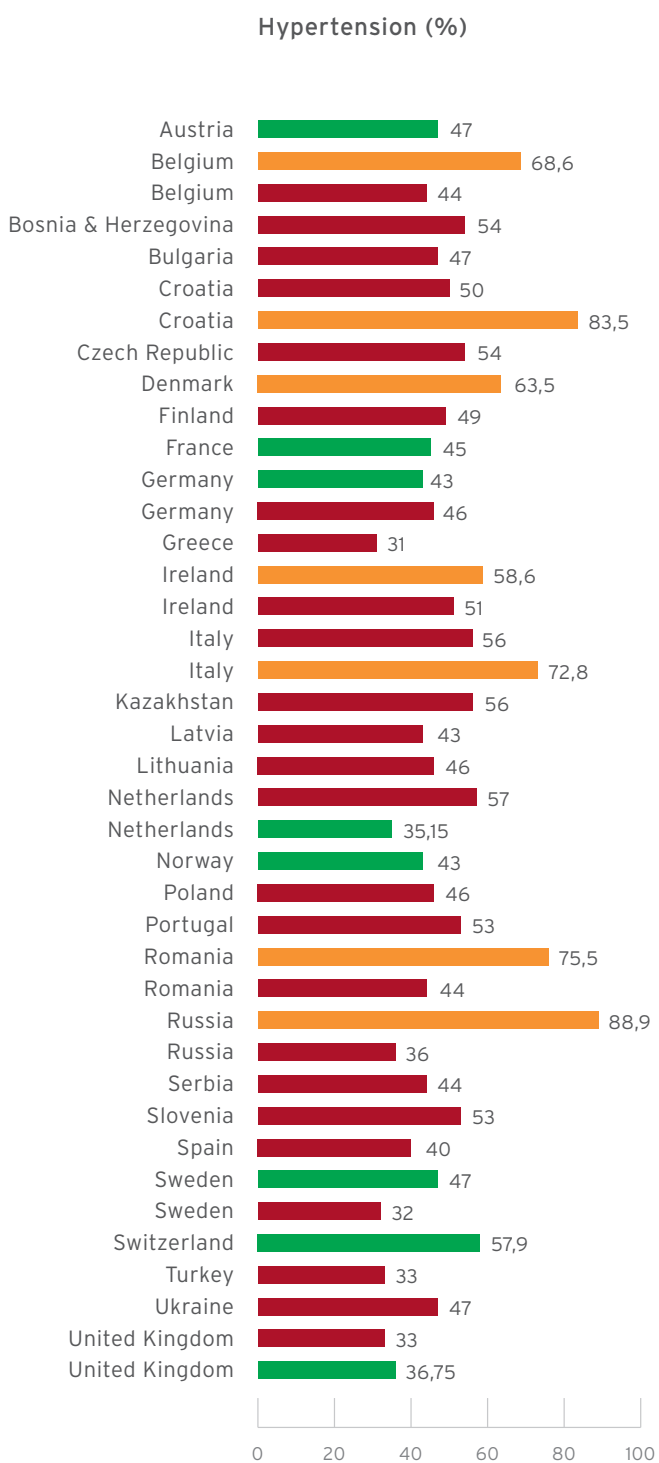
The rate of blood pressure (BP) control was reported only by 3 studies [3,4,9]. Overall, BP at target was achieved in  $50.75 \pm 9.2\%$  of hypertensive patients (median - 52.5%). In the hospital arm of EUROASPIRE V on average  $49.7 \pm 9.3\%$  of patients had proper BP control [3]. The SURF outcomes with similar patients population proved that BP at target was achieved in  $54.2 \pm 8.3\%$  of patients [4]. The worst BP control was reported in NORwegian CORonary (NOR-COR) Prevention Study [9]. Although 93% of patients were prescribed hypotensive therapy after coronary event, only 41% of them reached BP target during follow-up [9]. Figure 2

According to the results of NORwegian CORonary (NOR-COR) Prevention Study inadequate BP control was more frequent with increasing age ( $p < 0.001$ ) [9].

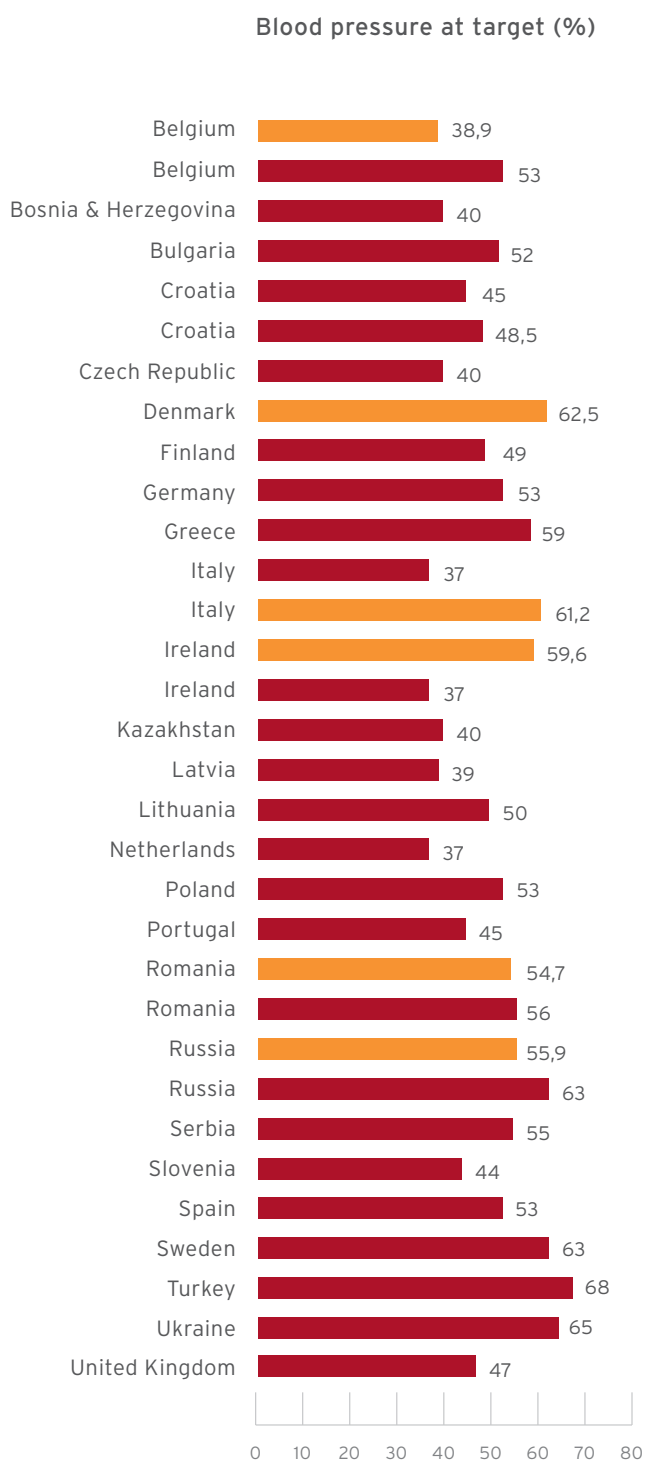
In FAST-MI Program over twenty years of observation the prevalence of hypertension increased from 44% to 45% in STEMI patients, and from 50% to 63% in NSTEMI patients [7]. In the SWEDETHEART Registry the rate of hypertension increased from 32.5% to 47% over twelve years of study [5].

**Conclusions:** Hypertension is one of the most frequent risk factors among high CHD risk patients and its prevalence across Europe populations is constantly increasing. There are considerable differences in the reported prevalence of hypertension between European countries. There is a paucity of data on hypotensive drug compliance and BP control across Europe. According to available data control of BP in patients with hypertension and high CHD risk is inadequate.

**Figure 1:** Prevalence of hypertension in CHD patients across Europe from separate sources



**Figure 2:** Blood pressure at target in high CHD risk patients across Europe from separate sources



Source: ■ EUROASPIRE ■ SURF ■ Other

## References

---

1. Piepoli MF, et al. 2016 European Guidelines on cardiovascular disease prevention in clinical practice. *Eur Heart J* (2016) 37, 2315-2381.
2. Williams Bryan, et al. *European Heart Journal* (2018) 00, 1-98.
3. De Bacquer, et al. *EuroPrevent 2018*.
4. Zhao, et al. Simplifying the audit of risk factor recording and control: A report from an international study in 11 countries *European Journal of Preventive Cardiology* 2016 DOI: 10.1177/2047487316647827.
5. Desta L, et al. Incidence, Temporal Trends, and Prognostic Impact of Heart Failure Complicating Acute Myocardial Infarction. The SWEDHEART Registry (Swedish Web-System for Enhancement and Development of Evidence-Based Care in Heart Disease Evaluated According to Recommended Therapies): A Study of 199,851 Patients Admitted With Index Acute Myocardial Infarctions, 1996 to 2008. *J Am Coll Cardiol HF* 2015;3:234-42.
6. Kirchberger I, et al. Long-term survival among older patients with myocardial infarction differs by educational level: results from the MONICA/KORA myocardial infarction registry. *International Journal for Equity in Health* 2014;13:19
7. Puymirat E, et al. Acute Myocardial Infarction Changes in Patient Characteristics, Management, and 6-Month Outcomes Over a Period of 20 Years in the FAST-MI Program (French Registry of Acute ST-Elevation or Non-ST-Elevation Myocardial Infarction) 1995 to 2015. *Circulation*. 2017;136:1908-1919. DOI: 10.1161/CIRCULATIONAHA.117.030798
8. Gitsels LA, et al. Survival prospects after acute myocardial infarction in the UK: a matched cohort study 1987-2011. *BMJ Open* 2017;7:e013570. doi:10.1136/bmjopen-2016-013570.
9. Sverre E, et al. Unfavourable risk factor control after coronary events in routine clinical practice. *BMC Cardiovascular Disorders* 2017;17:40. DOI 10.1186/s12872-016-0387-z
10. Radovanovic D, et al. Temporal trends in treatment of ST-elevation myocardial infarction among men and women in Switzerland between 1997 and 2011. *European Heart Journal: Acute Cardiovascular Care* 2012;1(3):183-191.
11. Haller PM, et al. Impact of age on short- and long-term mortality of patients with ST-elevation myocardial infarction in the VIENNA STEMI network. *Wien Klin Wochenschr*. 2018 Mar;130(5-6):172-181. doi: 10.1007/s00508-017-1250-7.
12. Gho JMIH, et al. Heart failure following STEMI: a contemporary cohort study of incidence and prognostic factors. *Open Heart* 2017;4:e000551. doi:10.1136/openhrt-2016-000551

---

The ESC Prevention of CVD programme is supported by Amgen, AstraZeneca, Ferrer, and Sanofi and Regeneron in the form of educational grants.

