

A narrative review on policies and practices for gender equity in cardiovascular disease prevention and management

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ABSTRACT

Women's health global agenda has recently reformulated to address more accurate cardiovascular diseases (CVDs) prevention, diagnosis and treatment. The aim of the present work was to review the hitherto global and national policies and practices which address gender equality in health with the focus oriented towards CVDs in women. Scientific databases and health organizations' websites that present/discuss policies and initiatives targeting to enhance a sex-centered approach regarding general health and/or specifically cardiac health care were reviewed in a systematic way. In total, n=53 relevant documents were selected. The selected policies and initiatives included position statements, national action plans, evidence-based guidelines, guidance/recommendations, awareness campaigns, regulations/legislations and state-of-the art reports by national/international projects and conferences. The target audiences of large stakeholders (e.g., American Heart Association, European Society of Cardiology, Centre of Disease Control and Prevention) were female citizens, health professionals and researchers. Much as policy makers have recognized the sex/gender gap in CVD field, there is still much to be done. Thereby, tailor-made strategies, should be designed, evaluated and delivered on a global, yet most importantly a national basis, to achieve gender equity against CVDs.

KEY WORDS: Heart disease, cardiovascular, women, health policy, health management

INTRODUCTION

After the introduction of the United Nations Millennium Development Goals in 2000, there is an imperative focus

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ABBREVIATIONS: AHA: American Heart Association, BHF: British Heart Foundation, CVD: Cardiovascular disease, CDC: Centre of Disease Control and Prevention, ESC: European Society of Cardiology, National Heart, NHLBI: Lung and Blood Institute, NIH: National Institute of Health, NCDs: Non-communicable diseases; UN: United Nations, WHO: World Health Organization

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of policy makers around the globe to improve women's sexual and reproductive health¹. Much as this remains on the top of the list in the global agenda of women's health, NCDs seem to be an even bigger threat considering the enormous burden of CVD in terms of morbidity/mortality rates, life-years lost, poor quality of life and direct or indirect medical health care costs^{1,2}; 18.1 million women died from NCDs of which almost half of them were attributed to CVDs, based on estimations for 2012¹. Most importantly, besides the "success-story" of the past four decades regarding the decline in age-adjusted CVD mortality rates, this was not the case in women, even the younger ones³.

International and especially national health plans lack in gender sensitivity⁴. This phenomenon is even more apparent in case of CVDs. The lack of sex- and gender-sensitive studies in CVD spectrum possesses indicative defaults in the NCDs research field^{5,6}. It is imperative that CVDs in women were always being sidelined over the unanimously propagated claim that this chronic disease was supposed to be a male privilege or that man and woman were to be equal against it⁵. Nonetheless, indicative heterogeneities have been convincingly demonstrated regarding CVD manifestation, risk factors burden and disease prognosis between men and women due to not only their biological status (i.e. sex) but also various social determinants (i.e. gender identity)⁵⁻⁶. Most importantly, the lack of women's awareness regarding this threat is impressive; the majority of women usually falsely recognize breast cancer as the principal cause of death in female population^{7,8}. In this context women are to wait longer between seeking and receiving medical advice⁹. On the other side, female patients are susceptible to under-diagnosis, inappropriate therapeutic decisions or even remain untreated as physicians usually underestimate their risk burden^{10,11}.

The goal of this review was to present what is actually happening in terms of policies and practices which aim at enhancing a sex-centered approach in cardiac health.

METHODS

The literature search included scientific papers in peer-reviewed journals, as well as any other relevant documents and Organizations' websites (gray literature), that present/discuss policies and initiatives targeting a sex-centered approach regarding CVDs. For scientific papers, Pubmed and Scopus were included in the literature search, which was carried out during December 2019 – October 2020 and extended from 1993. No restriction was made for publication language or status. The search was completed using cross referencing from the papers found, whereas for papers in which additional information was required, the authors were contacted via email. The search terms

were: ["Cardiovascular disease(s)", "heart", "gender", "sex", "women", "female", "disease", "policy", "public health", "strategic plan"]. Based on the CDC-definition of the term "policy" (<https://www.cdc.gov/policy/analysis/process/definition.html>) the type of manuscripts selected in the present review included position statements, supportive-to-the scientific community discussion papers and articles, national action plans, evidence-based guidelines, guidance/recommendations, awareness campaigns, regulations/legislations, state-of-the art reports by international projects and national/international conferences and other relevant initiatives/practices. Policies and practices had to state or speculate among their main objectives the reduction of gender equities in general health and/or in cardiac health care. The manuscripts selected to cover the purposes of the present work were reviewed by two independent authors (MK, DP) following a systematic approach.

RESULTS

In total, n=27 publications in scientific databases were considered as relevant to the present work. In addition to them, n=26 documents/references regarding global and national policies and practices, were retrieved from the aforementioned Organizations' websites and discussed here.

DISCUSSION

In 1993 a guidance for researchers towards this issue was published by the FDA regarding how to address gender differences in the clinical evaluation of drugs¹². A reveal from the NIH was among the very first references regarding this issue; in 1994 a policy-guidance regarding the consideration of women in clinical trials was published¹³. In 1995, the UN in a report from the fourth world conference on women, underscored the fact that a policy decision should be published only after a sex-specific evaluation regarding its effectiveness¹⁴. Since then some updated versions of policy-guidance from the NIH were revealed in 2000 and 2001^{15,16}. The books "*Exploring the Biological Contributions to Human Health; Does Sex matter?*" and the "*Women's Health Research; Progress, pitfalls and Promise*" published by the Institute of Medicine in 2001 and 2010 respectively, were milestones for global health research and policy-making and one of the very first official recognitions of sex (i.e. the biological dimension) and gender (i.e., the socially constructed dimension) as variables with critical health impact, interacting with each other^{17,18}. Since then, in 2010, the Canadian Institutes of Health Research and its Institute of Gender and Health subdivision revealed a user-friendly tool for health researchers regarding the integration of sex and gender in their study

design¹⁹. In 2014, the WHO provided guidance on the integration of gender-responsive sustainable approaches and promoted disaggregated data analysis and health inequality monitoring²⁰. The same year, the FDA published an action plan to address the collection and availability of subgroup data, including the sex as strata²¹. In 2015, the NIH with the notice “NOT-OD-15-102” required from investigators sex-specific reporting in any kind of study or an evidence-based justification in case of its omission²². At the same time, the UN underscored the necessity for gender-sensitive strategies in all sustainable development goals for 2030, while the 5th sustainable goal was incorporated to “achieve gender equality and empower all women and girls”²³. In 2015 the League of European Research Universities published a list of recommendations for universities, governments, funders and peer-reviewed journals to adopt strategies and policies towards a gendered research and innovation approach²⁴. The Lancet Commission on Women and Health in 2015 recognized women’s health as a key for sustainable development²⁵. In 2016, the report “Women’s Health: a new global agenda” provided a redefinition of the women’s health agenda setting different priorities according to the reality depicted by the disease epidemiological data around the globe²⁶. In this context, an updated version of the “Global Strategy for Women’s, Children’s and Adolescents’ Health” (2016-2030) was launched by the WHO-UN Secretary General partnership; the roadmap report provided recommendations to diminish all preventable deaths in women, children and adolescents making a commitment to one-third reduction in premature NCDs mortality till 2030²⁷. At the same period of time, the European Association of Editors published a set of guidelines for reporting of “Sex and Gender Equity in Research (SAGER)” to provide to researchers and authors a tool to achieve sex- and gender- standardization in scientific publications while the European Commission in the context of the Horizon 2020 programme published a guidance to address the gaps in the participation of women in the Framework Programme’s projects and to achieve a gender balance in the produced knowledge, innovation and technology^{28,29}.

In 1986, a workshop was convened by the NIH NHLBI to lay the groundwork for researchers and clinicians to perform endeavors towards the “cardiovascular disease in women” field, while in 1987 the key highlights of the workshop were summarized in a report being available in the scientific world (*Coronary Heart Disease in Women: Reviewing the Evidence, Identifying the Needs*). This was the very first initiative that emerged the “female heart” from the shadows^{30,31}.

The “Guide to Preventive Cardiology for Women” was the first official report, published in 1999, with some

recommendations regarding the CVDs prevention and management in women focusing on female-specific factors and medical treatments (e.g. hormone replacement therapy) conducted by AHA³². However, the first set of evidence-based women-centered guidelines regarding the primary and secondary prevention of chronic vascular atherosclerotic diseases came in 2004³³. Since then two updates of this guidance have been published. Initially, the AHA underscored the common misconception that women and men are equal against the disease and challenged the belief that the two sexes should be commonly treated^{34,35}. The highlight of those guidelines was the underrepresentation of females in clinical trials. Since then, health professionals were triggered towards a more sex-specific research approach giving the potential for more definitive recommendations and passing from the evidence-based strategies to the effectiveness-based preventive action plans in 2011; notably, in the last AHA guidelines update, some primary prevention strategies were proved to be inappropriate for women (i.e. aspirin prescription) while it was underscored that women are susceptible to other comorbidities and conditions which multiply their CVD risk and challenge the effectiveness and appropriateness of the hitherto typical prevention and management strategies³⁵. In the “Circulation” Journal, the journal of the AHA, a themed issue focusing on women’s cardiac health (i.e. Cardiovascular Disease of women) highlighted major challenges and gaps in the sex- and gender- centered CVD prevention, diagnosis and treatment calling health professionals for additional research^{5,36,37}. Additionally, the FDA OWA funded projects have contributed to highlight major gaps in the field of CVDs in women³⁸. Nonetheless, apart from the limited number of high quality sex-specific studies, the AHA recognized another challenge in the field of CVD in women; CVD was the first cause of death in females yet those were unaware of this threat³⁹. In 2002, NHLBI along with, among others, the AHA teamed up to sponsor the “Heart Truth” awareness campaign with the “Red Dress” as centerpiece-symbol and the message “Heart Disease Doesn’t Care What You Wear – It’s the #1 Killer of Women” aiming at raising women’s awareness regarding their cardiac health and enhancing the knowledge of health professionals and researchers regarding this issue⁴⁰. In 2004 a national campaign in the United States called “Go Red for Women” was launched⁴¹. This campaign, which continues till today, includes passionate, emotional and social initiatives designed with a dual avail; a. to empower women to take charge of their own cardiac health and b. to support health professionals’ daily clinical practice. More than one decade later this campaign has moved beyond the borders of the United States in more than 50 countries

TABLE 1. Global policies and practices to address cardiovascular diseases in women, on scientific and community basis

Organization	Year	Title of policy/practice	Type of policy/practice	Target audiences	References
National Institutes of Health's National Heart, Lung, and Blood Institute (NHLBI)	1987	Coronary Heart Disease in Women: Reviewing the Evidence, Identifying the Needs	State-of-the art report	scientific community, policy makers	(Eaker et al. 1987; Hayes et al. 2015)
Centre of Control and Prevention of Disease –division for heart disease and stroke prevention	1993	WISEWOMAN (Well-Integrated Screening and Evaluation for WOMen Across the Nation)	awareness campaign	female citizens	(CDC, 2014)
American Heart Association	1999	Guide to Preventive Cardiology for Women	guidelines	scientific community	(Mosca et al. 1999)
Heart and Stroke Foundation of Canada, University of Ottawa and University of Alberta	2000	Heart disease and stroke in Canadian women: policy development	position statement	scientific community, policy makers	(Plotnikoff et al. 2000)
National Heart, Lung and Blood Institute	2002	Heart Truth	awareness campaign	female citizens	(NHLBI, 2016)
Danish Heart Foundation	2003	Mind Yourself Woman!	awareness campaign	female citizens	(EHN, 2004)
European Health Network, European Health Management Association and Bristol-Myers Squibb	2004	Workshop from the 7th European Policy Forum: A healthy heart for European women	state-of-the art report	scientific community, policy makers	(EHN, 2004)
American Heart Association	2004	Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women	guidelines	scientific community	(Mosca et al. 2004a)
American Heart Association	2004	Go Red for Women	awareness campaign	female citizens, scientific community, policy makers	(AHA, 2016)
European Society of Cardiology	2005	Women at Heart	scientific community motivational program	scientific community	(ESC, 2004)
European Society of Cardiology	2005	Cardiovascular diseases in women: a statement from the policy conference of the European Society of Cardiology	position statement	scientific community, policy makers	(Stramba-Badiale et al. 2005)
European Society of Cardiology & European Health Network	2006	EuroHeart project Work Package no 6: "to question gender differences in the management of CVDs and consequently provide recommendations for research & regulatory policy makers"	transnational project for prevention and management of cardiovascular diseases	scientific community, policy makers	(ESC et al. 2007)
WomenHeart: The National Coalition for Women with Heart Disease	2006	10Q Report: Advancing Women's Heart Health through Improved Research, Diagnosis and Treatment	position statement	scientific community, policy makers	(Wenger et al. 2013)
American Heart Association	2007	Evidence-Based Guidelines for Cardiovascular Disease Prevention in Women: 2007 Update	guidelines	scientific community	(Mosca et al. 2007)
Hellenic Cardiac Society	2008	National Action Plan for Cardiovascular Diseases (2008-2012)	national action plan	scientific community, policy makers	(HCS, 2008)
European Society of Cardiology, European Society of Hypertension and International Menopause Society	2008	Assessment and Management of Cardiovascular Risks in Women	guidance	health professionals	(ESC et al. 2008)

TABLE 1. Global policies and practices to address cardiovascular diseases in women, on scientific and community basis (*continued*)

Organization	Year	Title of policy/practice	Type of policy/practice	Target audiences	References
European Society of Cardiology & European Health Network	2009	Red Alert for Women's Hearts	report in the context of EuroHeart project	scientific community, policy makers	(Maas et al. 2011)
American Heart Association	2011	Evidence-Based Guidelines for the Cardiovascular Disease Prevention in Women: 2011 Update	guidelines	scientific community	(Mosca et al. 2011)
American House of Representatives	2011	Heart Disease, Education, Analysis, Research, Treatment for Women Act" or the "Heart for Women Act"	legislation	scientific community, policy makers	(House of Representatives, 2011)
International Council on Women's Health Issues	2011	The health of women and girls determines the health and well-being of our modern world: A white paper from the International Council on Women's Health Issues	white paper	scientific community, policy makers	(Davidson et al. 2011)
Minneapolis Heart Institute, the Minneapolis Heart Institute Foundation and the University of Minnesota	2012	Women and Heart Disease: A Summit to Eliminate Untimely Deaths in Women	report from a 2-day summit	scientific community, policy makers	(Lindquist et al. 2012)
International Council on Women's Health Issues	2012	Improving women's cardiovascular health: a position statement from the International Council on Women's Health Issues.	position statement	scientific community, policy makers	(Davidson et al. 2012)
European Society of Cardiology	2011	ESC Guidelines on the management of cardiovascular diseases during pregnancy: the Task Force on the Management of Cardiovascular Diseases during Pregnancy of the European Society of Cardiology (ESC)	guidelines	scientific community	(ESG et al. 2011)
Centre of Control and Prevention of Disease –division for heart disease and stroke prevention	2014	WISEWOMAN (Well-Integrated Screening and Evaluation for WOMen Across the Nation): Technical Assistance and Guidance Document	guidance	scientific community, policy makers	(CDC, 2014)
British Heart Foundation	2015	Bag it. Beat it	awareness campaign	female citizens	(BHD, 2016)
Heart Institute in the University of Ottawa / Canadian Women's Heart Health Centre	2016	Women@Heart	peer support program	female citizens	(Canadian Women's Heart Health Centre, 2016a)
Heart Institute in the University of Ottawa / Canadian Women's Heart Health Centre	2016	IMPROVE Postpartum Program	peer support program	female citizens	(Canadian Women's Heart Health Centre, 2016b)

around the globe⁴¹. In 2006, the Society for Women's Health in collaboration with a non-profit organization, called "WomenHeart: The National Coalition for Women with Heart Disease" (<http://www.womenheart.org/>) revealed the report "10Q Report: Advancing Women's Heart Health

through Improved Research, Diagnosis and Treatment" to enhance researchers and health practitioners towards a female-specific cardiac care⁴².

Another initiative in the CVD spectrum focusing on women's health was the WISEWOMAN (Well-Integrated

Screening and Evaluation for WOMen Across the Nation) program started in 1993⁴³. This program is administrated by the Centre of Disease Control and Prevention (CDC) and specifically its division for heart disease and stroke prevention. The target group of the WISEWOMAN program is women with low financial status aged 40-64 years. The aim of the program is to provide free of charge heart disease and stroke risk factor screenings, namely blood pressure control, along with evidence-based methods enhancing women's adherence to healthier behaviors, so as to promote lifelong heart-healthy lifestyle changes. The contributors of this program focus on strategies being applicable to both health-care practitioners and on the basis of community targeting from clinicians and pharmacists to farmers' markets which were recently revealed in a technical assistance and guidance document⁴³.

A bill to ameliorate the prevention, diagnosis and treatment of heart disease, stroke and other CVDs in women was introduced in the American House of Representatives in November 2011, called the "Heart Disease, Education, Analysis, Research, Treatment for Women Act" or the "Heart for Women Act"⁴⁴. This legislation was set to ensure the availability of gender-specific information in medical treatments to health care professionals, researchers and public, to expand the CDC-funded WISEWOMAN project to 20 additional states of America and to require the Secretary of Health and Human Services to perform an annual report for Congress regarding the quality of and access to health care services for women. This bill was highly supported, among other relevant associations and non-governmental organizations (NGOs), by the AHA and its American Stroke Association division⁴⁵.

In Europe important attempts have been performed towards the reformulation of women's health agenda. In 2004, a workshop was held at the 7th European Policy Forum based on which a report was revealed, underscoring the sex discrepancies in the CVD diagnosis and treatment methods and the challenges on community basis⁴⁶. Among the very first initiatives of the European Society of Cardiology (ESC) was the "Women at Heart" program launched in 2005 with the aim to coordinate research and educational initiatives regarding CVDs in females⁴⁷. The program started with a policy conference in June, 2005, during which Experts' opinions were selected, the scientific gaps were underscored and strategic plans were delineated to address this issue⁴⁸. The highlights of the conference and the state-of-the art in Europe were summarized in a policy statement being available in various languages; in this policy statement a flowchart with synergic actions implemented by the ESC, the European Union, the National Scientific Societies and the National Health Authorities at a European level was proposed to enhance researchers

and other relevant scientific sectors (e.g., research funders) to cover the gender gaps in CVD investigation field⁴⁸. On the 2005 ESC Congress a thematic subunit was deviated in "CVDs in women", so as to enhance the dissemination of this action in the scientific community while in 2006 an educational course was performed⁴⁷. In National Cardiac Societies (i.e. Swedish Cardiac Society, Polish Cardiac Society) roll outs of the "Women at Heart" program were revealed⁴⁷. Under this perspective, the joint of the European Health Network and the ESC applied for a grant regarding the EuroHeart project, a consortium among 30 partners in 21 European countries⁴⁹; among the primary purposes of this project presented in its work package n° 6 was "to question gender differences in the management of CVDs and consequently provide recommendations for research & regulatory policy makers"⁴⁹. This survey highlighted significant gender biases in the use of investigations and evidence-based medical treatments^{50,51}. In the context of this work package a report called "Red Alert on Women's Hearts" was revealed in November 2009 being available for the scientific community^{52,53}. Additionally, 60 and 15 awareness campaigns for women and their physicians in the participated in the project countries were launched⁵³. In 2008, a short guide called "Assessment and Management of Cardiovascular Risks in Women" was published by a joint workshop under the auspices of the ESC, European Society of Hypertension and International Menopause Society aiming at assisting menopause physicians in contributing to the overall management of women's cardiac health⁵⁴. In 2011, the ESC published guidelines on the management of CVDs during pregnancy⁵⁵. In the very recent prevention in clinical practice ESC guidelines some female-specific conditions have been reported (e.g., polycystic ovarian syndrome, pregnancy complications) yet a large scientific gap have been clearly stated; "*The young, women ... continue to be underrepresented in clinical trials*", "*Information on whether female-specific conditions improve risk classification in women is unknown*"⁵⁶.

The present review reveals that much as there is an amount of public health initiatives, from policy statements to awareness campaigns, towards the gender equity in CVD spectrum supporting women's cardiac health, their resonance to scientific community is still remaining low; underrepresentation of women in CVD studies, lack of awareness of citizens and health practitioners, absence of gender sensitive analysis in scientific works. Additionally, the vast majority of such initiatives are located in the United States and less in Europe while scarce well-organized, integrated and focused plans exist on a national basis. Moreover, the dissemination of all these policies and practices seems quite low to adequately motivate the scientific community.

CONCLUSION

Much as the past two decades substantial efforts have been performed to ameliorate women's health on the whole, there is still much to be done. Giving a broader definition to women's health, primary and secondary prevention of CVDs has started to be prioritized and important initiatives have been launched towards this approach. To achieve this, global and most importantly national sectors should perform appropriate policy making; to support a sex- and gender- sensitive collection, usage and interpretation of health data and to enhance the level of awareness in citizens and health professionals. In a world with finite resources where there is

imperative need to maximize the cost-effectiveness of prevention and management strategies, health disparities have to be addressed by health practitioners and the case of women in CVD care remains an ongoing public health concern.

Conflict of interest

None

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ΠΕΡΙΛΗΨΗ

Ανασκόπηση των πρακτικών και πολιτικών υγείας σχετικά με την ισότητα των φύλων στην πρωτοβάθμια και δευτεροβάθμια πρόληψη καρδιαγγειακής νόσου.

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Η παγκόσμια ατζέντα με τα βασικά σημεία της υγείας των γυναικών έχει προσφάτως αναδιαμορφωθεί στοχεύοντας στη βελτίωση της πρόληψης καρδιαγγειακής νόσου τόσο σε επίπεδο πρόληψης όσο και σε επίπεδο διάγνωσης και θεραπείας. Σκοπός της παρούσας εργασίας ήταν να συγκεντρώσει τις μέχρι τώρα παγκόσμιες και εθνικές πολιτικές υγείας που σχετίζονται με την ισότητα των φύλων στην υγεία γενικά και στην καρδιαγγειακή υγεία ειδικότερα. Η αναζήτηση πραγματοποιήθηκε σε επιστημονικές βάσεις δεδομένων και διαδικτυακούς τόπους οργανισμών υγείας. Συνολικά συγκεντρώθηκαν n=53 δημοσιεύσεις. Οι πολιτικές που επιλέχθηκαν περιλάμβαναν τις θέσεις φορέων υγείας, εθνικά σχέδια δράσης, συστάσεις, καμπάνιες ενημέρωσης και ευαισθητοποίησης, νομοθεσίες κ.ά. Η κύρια ομάδα-στόχος των οργανισμών όπως η Αμερικάνικη και η Ευρωπαϊκή Καρδιολογική Εταιρία ήταν γυναίκες πολίτες, επαγγελματίες υγείας και ερευνητές. Αν και σε επίπεδο πολιτικών υγείας η καρδιαγγειακή υγεία των γυναικών φαίνεται να απασχολεί ιδιαίτερα απαιτούνται περαιτέρω ενέργειες τόσο σε εθνικό όσο και σε διεθνές επίπεδο.

ΛΕΞΕΙΣ ΚΛΕΙΔΙΑ: Καρδιαγγειακής νόσος, γυναίκες, πολιτικές υγείας, αντιμετώπιση νόσου

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