



Cardiovascular diseases in European ethnic minorities: Beyond the traditional cardiovascular risk factors

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Abstract

This editorial is intended to be a reflection on cardiovascular disease (CVD) burden in European ethnic minorities. In some European countries, ethnic minority realities, due to their recent appearance, are still to be studied in depth. The experience of several European countries, where the migration processes started earlier, even more than a century ago, can help by being an example. Many studies have shown that major differences in CVD burden exist not only between countries, but also within the same country when considering different social strata and ethnic groups. The CV risk factors underlying heart disease have been well established. Important epidemiological studies have helped us understand that the underlying causes of heart disease as well as the behaviors that can help prevent them are the same. We are now well aware that CVD should be treated by considering a holistic approach. This is why the social determinants (SDs) of health that may worsen the disease burden or that, vice versa, may improve the treatment, and even more significantly, the prognosis of a patient's illness should be taken into consideration. For ethnic minority patients, this holistic, hermeneutic approach is of importance. Several SDs of health that influence CVDs have been identified but their relevance for the health of ethnic minorities has not yet been clearly defined. In some European countries, most ethnic minorities are largely also religious minorities. Only a few studies have evaluated the role of religion, which is an important SD that affects the probability of having CV risk factors and diseases. Adolescents, particularly those belonging to the second generation, seem to be the weak link. If we believe that these young people are really citizens of their country of birth, then a way of recognizing their belonging to the community starts from a will to better understand their condition, in order to assist them while they grow physically and mentally. Thinking about safeguarding the health of this population should be more than a health task, rather a goal of social justice.

Key Words: Cardiovascular diseases; Cardiovascular risk factors; European ethnic minorities; Social determinants of health

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Core Tip: A wealth of data highlight the existence of important differences in cardiovascular (CV) disease burden within the same country, when considering different social strata and ethnic groups. Both CV diseases and risk factors have been shown to be related to several social determinants of health. Thus, in ethnic minority individuals, a holistic, hermeneutic approach should be considered.

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INTRODUCTION

With the end of the Cartesian dualism that the mind and body exist as distinct entities, the biomedical paradigm, according to which the cardiovascular (CV) system is merely a set of hydraulic pipes and an array of valves and pumps, has lost some of its predominance. In addition, the reduced prevalence and incidence of the most common intermediate risk factors (e.g. hypertension, diabetes, dyslipidemia, smoking, sedentary behavior), as a result of increasingly effective drugs and lifestyle changes and the improved surgical and interventional procedures for the correction of diseased pipes, valves and pumps, proved not to be enough to reduce CV morbidity and mortality[1]. Both longitudinal and cross-sectional epidemiological studies have identified several important international, national and regional CV health gradients that cannot be explained with the sole use of the previous biomedical paradigm criteria.

In the field of cardiology, research on conventional risk factors has been successful in significantly reducing the CV disease (CVD) burden in ethnic minority individuals. With this approach, however, the feeling is to arrive probably when the game is almost over. Moreover, only a few studies have evaluated traditional CV risk factors and CVDs in European ethnic immigrants, and the landscape shows green patches with large barren areas[2]. However, over the last two decades, growing attention has been devoted to ethnic minorities in the scientific literature, although no definitive conclusion can be drawn on the effect of traditional CV risk factors in this population due to the limited number of studies, different outcome measures and sometimes inconclusive results. This disappointing situation has led clinicians and epidemiologists to search for novel risk factors to account for the lower CV morbidity and mortality observed in high-income countries[3] and to develop a new approach to better define the burden of CV risk factors and diseases.

According to this new paradigm, body organs, and particularly the CV system, are to be put in a model where the main essence of the human being should be considered, that is, its sociality. It is only by considering social factors such as socioeconomic, cultural, gender and ethnic issues that some of these inconsistencies could be adequately addressed. Therefore, both CV diseases and risk factors have been linked to several social factors that affect their occurrence positively or negatively. These social factors, largely occurring outside the formal medical and healthcare setting, include the social determinants (SDs) of CVDs[4], which are also defined as the causes of the causes of traditional CV risk factors [5]. As outlined in the scientific statement from the American Heart Association, “at present, the most significant opportunities for reducing death and disability from CV disease in the United States lie with addressing the SD of CV outcomes”[4]. This holds true for industrialized countries, but also for developing countries.

Nowadays, we are well aware that CVDs should be treated with a holistic approach. For ethnic minority patients, this holistic, hermeneutic approach is even more important. Nevertheless, most health research funding is primarily allocated to tackle biomedical challenges, rarely addressing specifically the role of the SDs of health. The concept of SDs of health related to CVDs was first introduced in 1980, highlighting the increasing social inequalities[6] associated with increased CVD mortality in high-income countries[7]. One of the first reports to address this issue was the Black Report (named after chairman Sir Douglas Black, President of the Royal College of Physicians) published in the United Kingdom in 1980 [8]. The report showed that, among the British population, morbidity and mortality were unequally distributed, and that since the establishment of the National Health Service (NHS) in 1948, these inequalities have been increasing rather than diminishing. The conclusion of the report was that these inequalities were not related to shortcomings in the NHS, but rather to the fact that health is influenced by many other social inequalities, including income, education, housing, diet, and conditions at work. Thus, the report recommended to combat inequalities in health through a wide strategy of social policy measures. Since the formalization of the Commission of Social Determinants on Health by the World Health Organization (WHO) in 2005 chaired by Sir Michael Marmot, research on the SDs of health has increased significantly[9].

It is not easy to give a simple definition of the SDs of health. Sociology, and more in-depth medical sociology, deal extensively with this topic. The WHO Regional Office for Europe, which reflects much of the work developed at the International Centre for Health and Society at University College London, gives a comprehensive description of SD: “SD of health are the conditions in which people are born, grow up, live, work and age. These conditions influence a person’s opportunity to be healthy, his/her risk of illness and life expectancy. Social inequities in health—the unfair and avoidable

differences in health status across groups in society—are those that result from the uneven distribution of SD”[10]. Thus, according to the WHO definition, health and illness and the resources to prevent illness and its effects are not distributed randomly throughout human society[11]. Tackling these inequities should be a high priority at all levels of governance because from the social point of view it achieves health equity and avoids unfair, unjust, avoidable, and unnecessary suffering. Tackling these inequities is advantageous also economically because on the long run it reduces the costs of health services and increases government revenue by improving productivity[12]. Finally, addressing these issues is not only a moral and a human rights imperative, but it helps promoting human well-being, prosperity, and sustainable development[13].

Several SDs of health that influence CV risk factors and diseases have been identified but their relevance for the health of ethnic minorities has not yet been clearly defined. As outlined in a recent report of the WHO Regional Office for Europe, although Europe is regarded as one of the healthiest and most prosperous regions in the world, substantial health inequalities exist both between and within countries, with trends showing that these gaps did not change or widened over the last decades. The WHO stigmatizes health inequalities within and between countries by simply considering they should never happen[14].

Many reports have shown that health inequalities are particularly pronounced in European ethnic minorities[15]. Moreover, the recent coronavirus disease 2019 (COVID-19) pandemic disproportionately affected ethnic minority groups, and this trend was also observed among healthcare personnel. The higher incidence of COVID-19 in ethnic minorities is also related to their SDs of health[16]. However, it is worth noting that there is a difference between minority health and health disparities. Although some ethnic minority individuals or groups have higher socioeconomic position (SEP), are highly educated, and have adequate access to care and thus may have even better health outcomes than the general population, health disparities may persist suggesting that additional factors, such as biology, cultural and environmental interactions, and structural discrimination may contribute to health disparities[17].

Ethnic minorities have been present for more than a century in many northern European countries. Historically, in southern Europe, there have been religious minorities, but ethnic minorities began to settle after World War II, especially in the last three decades of the 20th century. Europe still needs migrant labor in many sectors to fill low-skilled jobs because of the falling of birth rates and the aging populations[2]. Nevertheless, while the first waves of immigrants were well accepted and managed to organize ethnic minority realities, more recent immigrants have found it difficult to be integrated and feel that they are not accepted. This is also related to the fact that after the recent economic downturns, in several European countries, anti-immigrant parties have made electoral gains with anti-ethnic and anti-Islamic rhetoric. This negative perception is now seriously affecting also the already settled ethnic minorities, especially Muslims.

The offspring of ethnic minorities, born and raised in Europe, should not be involved in such debates. Ethnic minority youth should be considered an integral part of the society to which they actually belong and should be protected through legal and policy measures. This goal could be achieved also by taking care of the health of ethnic minority individuals, as health is an essential element of well-being. However, data on ethnic minority health in Europe are heterogeneous, with little research dealing with the health of first-generation[18] and beyond first-generation migrants[19], limiting the possibility of monitoring and improving their health. Unfortunately, Europe does not have an institute such as the United States National Institute on Minority Health and Health Disparities or a law equivalent to the 1993 United States National Institutes of Health (NIH) Revitalization Act, which demand researchers to include in their studies ethnic minority populations, unless there is a scientific reason not to do so. In the United States, it is not legally, ethically, or scientifically acceptable to exclude ethnic minorities from scientific research[20].

In an era of budgetary constraints, the high costs of fieldwork implementation, alongside insufficient researchers' experience to access ethnic minorities, and probably also lack of interest, are among the reasons for the scarcity of ethnic minority health research[21]. Conducting research that includes people from ethnic minority groups will allow European research to become equitable, ethical, and not institutionally racist. Advancing the understanding, for instance, of the relationships between CV risk factors and diseases[22] will improve the healthcare not only of ethnic minorities, but also of the general population. In this regard, research on international and national interethnic differences and similarities provides a unique view of the role of environmental and genetic factors in CVD development[23]. The health of the whole population improves when all segments of the population benefit from the health system. It is unfair if ethnic minorities are subject to direct or indirect social and health discrimination, increasing inequalities. In order to narrow the inequalities of ethnic minorities who have higher CV risk factor prevalence than the general population, their CV risk factors should be treated faster than those of the more advantaged ethnicities. Otherwise, the inequalities between different ethnicities will widen or, at best, remain unchanged[15]. Although this is not an easy goal to achieve, it represents a formidable challenge for public health research and practice.

As recently emphasized by the United States NIH, after “rigorous scientific approaches to minority health and health disparities, building on decades of studies addressing social inequality and health, behavioral epidemiology, and access to quality health care”, “it is not enough to identify factors that contribute to health disparities: Intervention science must be applied in full force to seek solutions”[24]. Ethnic minority health inequalities can be reduced by removing physical, behavioral and cultural barriers to healthcare, closing disparities in quality of care, designing public health strategies, and implementing interventions to reduce health risks at the community level. Practically, in the field of CVD, for instance, it means to screen African or South Asian ethnic individuals at a younger age, to use new approaches to estimate their risk, to start treatment at lower thresholds, to lower blood pressure therapeutic goals, to lower obesity cutoffs, and to intensively monitor them to reduce their high premature mortality[25,26].

Most European ethnic research usually focused on both first-generation immigrants and ethnic minorities despite the often-divergent needs of the two groups. Thus, the utility of dedicated research on ethnic minority adolescents[25]. Another issue is related to irregular or undocumented migrants who are not officially registered and to refugees, whose numbers are increasing. Although all EU member states have formally recognized the right for every person to the

highest attainable standard of physical and mental health, many of these individuals are not engaged in or able to afford health care[27]. On the other side, refugees are at increased CVD risk due to interruption of medical care along the migratory route, psychological stressors, post-traumatic stress syndrome, and racism. For these individuals, the organizational and administrative issues including language, cultural and communication barriers, alongside their economic situation, limits the possibility of controlling their CVD risk burden. Thus, refugees seem to have a different CV risk factor pattern than migrants from the same country[28].

Undoubtedly, primordial prevention, when correctly done, leads to good results. However, individual prevention and treatments are expensive, especially for those who are in the lower social strata, and do not always completely solve the problems. Today, not much can be done regarding the genetic or epigenetic causes of CVDs in ethnic minorities. In my opinion, however, the main task is to move medical prevention from a purely biomedical approach that analyses conventional risk factors to give particular importance to the SDs of CVDs.

The end of the biomedical dominance has opened new horizons on the role of ethnicity and society and their dynamics in the determinism of diseases. Except for variations by country and age, no other epidemiological variable is as potent as ethnicity in exploring population-level differences in major CV risk factors and diseases[29]. The role of SDs of health is of special relevance if analyzed within ethnic minorities. This is because the society exerts a *sui generis* role in ethnic minorities. The existence of ethnic minorities is affected by the society in which they live. Thus, the role of SDs of health in individuals belonging to an ethnic minority is crucial. Particular attention should be given to the role of three SDs, which should not be considered singularly; rather their interaction should be sought.

Firstly, the role of the SEP as it is probably the most important SD factor, whose effects on the health of the whole society have been extensively studied[4]. In particular, the SEP of ethnic minority adolescents is conditioned by external factors linked to the type of the society in which they live, and also by internal factors related to the ethnic minority and the specific individual characteristics[30]. For ethnic minority adolescents as well as for autochthonous adolescents, the most commonly used SEP indicators are income, education level, employment, life course context, psychological stress, and neighborhood characteristics. It is not yet known to what extent the SEP of southern European ethnic minority adolescents is converging to that of autochthonous adolescents, similarly to what is happening in other European societies.

The acculturation process is the second SD. The Berry framework, which considers both the will to acquire the way of life of the host country and that to preserve the values of one's own country of origin, is the one most studied[31]. Data from the literature show that ethnic minorities have different acculturation processes, and often these differences are present also within families of the same ethnic group or even between the same family members. Some communities, such as the Chinese, usually maintain traditional attitudes for generations, while communities from eastern European countries have greater assimilation attitudes, whereas other communities, such as those from the Middle East or North Africa, prefer integrational models. It is important to note that, despite having an impact, the acculturation process alone cannot account for the CV risk factor and disease burden of the various ethnic minorities due to its intrinsic difficulty in being understood and measured[32].

The third SD is religion; an important SD that affects the probability of having CV risk factors and diseases. In some European countries, most ethnic minorities are largely also religious minorities. Religion, despite being an important identity factor, is not usually taken into consideration in medicine[33], especially when it comes to young people. Nevertheless, religion was found to influence CV risk factors and diseases in adult populations[34]. For those who believe, religion may condition many elements of their life, beginning from simple nutrition to the acculturation process itself.

Adolescents, particularly those of beyond second generation and of mixed ethnic background couples, seem to be the weak link. If we really believe that these young people are citizens of their country of birth, then a way of recognizing their belonging to the community starts from a will to better understand their condition, in order to assist them while they grow physically and mentally. Thinking about safeguarding the health of this population should be more than a health task, rather a goal of social justice.

CONCLUSION

A wealth of data highlight the existence of important differences in CVD burden within the same country, when considering different social strata and ethnic groups. Both CV diseases and risk factors have also been shown to be related to several SDs of health. Thus, in ethnic minority individuals, a holistic, hermeneutic approach should be considered.

FOOTNOTES

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REFERENCES

- 1 Ford ES, Ajani UA, Croft JB, Critchley JA, Labarthe DR, Kottke TE, Giles WH, Capewell S. Explaining the decrease in U.S. deaths from coronary disease, 1980-2000. *N Engl J Med* 2007; **356**: 2388-2398 [PMID: 17554120 DOI: 10.1056/NEJMsa053935]
- 2 Rechel B, Mladovsky P, Ingleby D, Mackenbach JP, McKee M. Migration and health in an increasingly diverse Europe. *Lancet* 2013; **381**: 1235-1245 [PMID: 23541058 DOI: 10.1016/S0140-6736(12)62086-8]
- 3 Harper S, Lynch J, Smith GD. Social determinants and the decline of cardiovascular diseases: understanding the links. *Annu Rev Public Health* 2011; **32**: 39-69 [PMID: 21219168 DOI: 10.1146/annurev-publhealth-031210-101234]
- 4 Havranek EP, Mujahid MS, Barr DA, Blair IV, Cohen MS, Cruz-Flores S, Davey-Smith G, Dennison-Himmelfarb CR, Lauer MS, Lockwood DW, Rosal M, Yancy CW; American Heart Association Council on Quality of Care and Outcomes Research, Council on Epidemiology and Prevention, Council on Cardiovascular and Stroke Nursing, Council on Lifestyle and Cardiometabolic Health, and Stroke Council. Social Determinants of Risk and Outcomes for Cardiovascular Disease: A Scientific Statement From the American Heart Association. *Circulation* 2015; **132**: 873-898 [PMID: 26240271 DOI: 10.1161/CIR.0000000000000228]
- 5 Kreatsoulas C, Anand SS. The impact of social determinants on cardiovascular disease. *Can J Cardiol* 2010; **26**: 8C-13C [PMID: 20847985 DOI: 10.1016/s0828-282x(10)71075-8]
- 6 Lee H, Kim D, Lee S, Fawcett J. The concepts of health inequality, disparities and equity in the era of population health. *Appl Nurs Res* 2020; **56**: 151367 [PMID: 33280788 DOI: 10.1016/j.apnr.2020.151367]
- 7 Martínez-García M, Salinas-Ortega M, Estrada-Arriaga I, Hernández-Lemus E, García-Herrera R, Vallejo M. A systematic approach to analyze the social determinants of cardiovascular disease. *PLoS One* 2018; **13**: e0190960 [PMID: 29370200 DOI: 10.1371/journal.pone.0190960]
- 8 The Health Foundation. 'Black report' on health inequalities. Aug 30, 1980. [cited 31 January 2024]. Available from: <https://navigator.health.org.uk/theme/black-report-health-inequalities>
- 9 Marmot M; Commission on Social Determinants of Health. Achieving health equity: from root causes to fair outcomes. *Lancet* 2007; **370**: 1153-1163 [PMID: 17905168 DOI: 10.1016/S0140-6736(07)61385-3]
- 10 World Health Organization Regional Office for Europe. Social determinants for health. [cited 31 January 2024]. Available from: https://www.who.int/health-topics/social-determinants-of-health#tab=tab_1
- 11 Okwuosa IS, Lewsey SC, Adesiyun T, Blumenthal RS, Yancy CW. Worldwide disparities in cardiovascular disease: Challenges and solutions. *Int J Cardiol* 2016; **202**: 433-440 [PMID: 26433167 DOI: 10.1016/j.ijcard.2015.08.172]
- 12 World Health Organization Regional Office for Europe. Social determinants of health, The solid facts. Second edition, 2003. [cited 31 January 2024]. Available from: https://intranet.euro.who.int/_data/assets/pdf_file/0005/98438/e81384.pdf
- 13 World Health Organization. Rio Political Declaration on Social Determinants of Health. Oct 21, 2011. [cited 31 January 2024]. Available from: <https://www.who.int/publications/m/item/rio-political-declaration-on-social-determinants-of-health>
- 14 World Health Organization Regional Office for Europe. Review of social determinants and the health divide in the WHO European Region – final report. [cited 31 January 2024]. Available from: <https://www.who.int/publications/i/item/9789289000307>
- 15 Bhopal RS, Humphry RW, Fischbacher CM. Changes in cardiovascular risk factors in relation to increasing ethnic inequalities in cardiovascular mortality: comparison of cross-sectional data in the Health Surveys for England 1999 and 2004. *BMJ Open* 2013; **3**: e003485 [PMID: 24052612 DOI: 10.1136/bmjopen-2013-003485]
- 16 Ayoubkhani D, Nafilyan V, White C, Goldblatt P, Gaughan C, Blackwell L, Rogers N, Banerjee A, Khunti K, Glickman M, Humberstone B, Diamond I. Ethnic-minority groups in England and Wales-factors associated with the size and timing of elevated COVID-19 mortality: a retrospective cohort study linking census and death records. *Int J Epidemiol* 2021; **49**: 1951-1962 [PMID: 33349855 DOI: 10.1093/ije/dyaa208]
- 17 Duran D, Asada Y, Millum J, Gezmu M. Harmonizing Health Disparities Measurement. *Am J Public Health* 2019; **109**: S25-S27 [PMID: 30699026 DOI: 10.2105/AJPH.2019.304952]
- 18 Agyemang C. Lonely and bored stiff: challenging phase for ethnic minority and migrant health in Europe. *Eur J Public Health* 2016; **26**: 898-899 [PMID: 27742717 DOI: 10.1093/eurpub/ckw112]
- 19 Bamoshmoosh M. Social determinants of health, the religiosity and cardiovascular diseases in Italy's ethnic minority youth. Doctoral Thesis, The Sophia University. 2021
- 20 Authenticated United States Government Information. One Hundred Third Congress of the United States of America. Joint Resolution designating January 16, 1994, as "Religious Freedom Day". [cited 31 January 2024]. Available from: <https://www.congress.gov/103/bills/sjres/154/BILLS-103sjres154enr.pdf>
- 21 Ranganathan M, Bhopal R. Exclusion and inclusion of nonwhite ethnic minority groups in 72 North American and European cardiovascular cohort studies. *PLoS Med* 2006; **3**: e44 [PMID: 16379500 DOI: 10.1371/journal.pmed.0030044]
- 22 Modesti PA, Agostoni P, Agyemang C, Basu S, Benetos A, Cappuccio FP, Ceriello A, Del Prato S, Kalyesubula R, O'Brien E, Kilama MO, Perlini S, Picano E, Reboldi G, Remuzzi G, Stuckler D, Twagirimukiza M, Van Bortel LM, Watfa G, Zhao D, Parati G; ESH Working Group on Hypertension and Cardiovascular Risk in Low Resource Settings. Cardiovascular risk assessment in low-resource settings: a consensus document of the European Society of Hypertension Working Group on Hypertension and Cardiovascular Risk in Low Resource Settings. *J Hypertens* 2014; **32**: 951-960 [PMID: 24577410 DOI: 10.1097/HJH.0000000000000125]

- 23 **Gong Z**, Zhao D. Cardiovascular diseases and risk factors among Chinese immigrants. *Intern Emerg Med* 2016; **11**: 307-318 [PMID: 26350421 DOI: [10.1007/s11739-015-1305-6](https://doi.org/10.1007/s11739-015-1305-6)]
- 24 **Pérez-Stable EJ**, Collins FS. Science Visioning in Minority Health and Health Disparities. *Am J Public Health* 2019; **109**: S5 [PMID: 30699033 DOI: [10.2105/AJPH.2019.304962](https://doi.org/10.2105/AJPH.2019.304962)]
- 25 **Bamoshmoosh M**. Cardiovascular risk factors in migrants: beyond the first-generation. In: Modesti PA, Cappuccio FP, Parati G, eds. *Ethnic Diversities, Hypertension and Global Cardiovascular Risk*. Switzerland: Springer 2018: 271-298 [DOI: [10.1007/978-3-319-93148-7_21](https://doi.org/10.1007/978-3-319-93148-7_21)]
- 26 **Perini W**, Snijder MB, Agyemang C, Peters RJ, Kunst AE, van Valkengoed IG. Eligibility for cardiovascular risk screening among different ethnic groups: The HELIUS study. *Eur J Prev Cardiol* 2020; **27**: 1204-1211 [PMID: 31345055 DOI: [10.1177/2047487319866284](https://doi.org/10.1177/2047487319866284)]
- 27 **Lebano A**, Hamed S, Bradby H, Gil-Salmerón A, Durá-Ferrandis E, Garcés-Ferrer J, Azzedine F, Riza E, Karnaki P, Zota D, Linos A. Migrants' and refugees' health status and healthcare in Europe: a scoping literature review. *BMC Public Health* 2020; **20**: 1039 [PMID: 32605605 DOI: [10.1186/s12889-020-08749-8](https://doi.org/10.1186/s12889-020-08749-8)]
- 28 **Al-Rousan T**, AlHeresh R, Saadi A, El-Sabrouh H, Young M, Benmarhnia T, Han BH, Alshawabkeh L. Epidemiology of cardiovascular disease and its risk factors among refugees and asylum seekers: Systematic review and meta-analysis. *Int J Cardiol Cardiovasc Risk Prev* 2022; **12**: 200126 [PMID: 35199106 DOI: [10.1016/j.ijcrp.2022.200126](https://doi.org/10.1016/j.ijcrp.2022.200126)]
- 29 **Bhopal R**, Rafnsson S. Global inequalities in assessment of migrant and ethnic variations in health. *Public Health* 2012; **126**: 241-244 [PMID: 22342833 DOI: [10.1016/j.puhe.2011.11.016](https://doi.org/10.1016/j.puhe.2011.11.016)]
- 30 **Singh GK**, Daus GP, Allender M, Ramey CT, Martin EK, Perry C, Reyes AAL, Vedamuthu IP. Social Determinants of Health in the United States: Addressing Major Health Inequality Trends for the Nation, 1935-2016. *Int J MCH AIDS* 2017; **6**: 139-164 [PMID: 29367890 DOI: [10.21106/ijma.236](https://doi.org/10.21106/ijma.236)]
- 31 **Berry JW**, Phinney JS, Sam DL, Vedder P. Immigrant youth: acculturation, identity, and adaptation. *Appl Psychol* 2006; **55**: 303-332 [DOI: [10.1111/j.1464-0597.2006.00256.x](https://doi.org/10.1111/j.1464-0597.2006.00256.x)]
- 32 **Commodore-Mensah Y**, Ukonu N, Cooper LA, Agyemang C, Himmelfarb CD. The Association Between Acculturation and Cardiovascular Disease Risk in Ghanaian and Nigerian-born African Immigrants in the United States: The Afro-Cardiac Study. *J Immigr Minor Health* 2018; **20**: 1137-1146 [PMID: 28852948 DOI: [10.1007/s10903-017-0644-y](https://doi.org/10.1007/s10903-017-0644-y)]
- 33 **Collier KM**, James CA, Saint S, Howell JD. Is It Time to More Fully Address Teaching Religion and Spirituality in Medicine? *Ann Intern Med* 2020; **172**: 817-818 [PMID: 32423346 DOI: [10.7326/M20-0446](https://doi.org/10.7326/M20-0446)]
- 34 **Koenig HG**. Religion, spirituality, and health: the research and clinical implications. *ISRN Psychiatry* 2012; **2012**: 278730 [PMID: 23762764 DOI: [10.5402/2012/278730](https://doi.org/10.5402/2012/278730)]



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