

# ¿Existe efecto de migrante sano en salud cardiovascular?

## Revisión narrativa de literatura científica.

ISABEL C. RADA RAMÍREZ, BALTICA B. CABIESES VALDÉS

### Resumen

La migración internacional es un proceso complejo que impacta la salud poblacional, siendo considerado un determinante social de la salud (DSS). Se ha expuesto una posible ventaja en salud en migrantes con respecto a nativos, llamada efecto de migrante sano (EMS). Actualmente su evidencia es controversial en salud cardiovascular. Se realizó una búsqueda en Web of Science y PubMed con términos referentes a migración, factores de riesgo enfermedades cardiovasculares y DSS. La búsqueda arrojó 2933 registros, se seleccionaron 90 publicaciones: 46 reportan evidencia del EMS (a favor, en contra, mixta o neutros) y 44 describen DSS asociados. El EMS parece aplicar selectivamente en condiciones específicas y subgrupos según origen y destino analizados. La evidencia de los DSS asociados favorece la comprensión de estas diferencias. Por lo tanto es necesario un enfoque de análisis amplio que integre las diversas exposiciones del proceso migratorio que podrían afectar la salud cardiovascular.

### Referencias

Segal U. Globalization, migration, and ethnicity. *Public Health*. 2019;172:135-42. doi: 10.1016/j.puhe.2019.04.011.

Castelli F. Drivers of migration: why do people move? *J Travel Med*. 2018;25(1):tay040. doi: 10.1093/jtm/tay040.

Organización Internacional para los migrantes. Términos fundamentales sobre migración [Internet]. Ginebra: OIM 2020. [citado 21 de septiembre de 2020]. Disponible en: <https://www.iom.int/es/terminos-fundamentales-sobre-migracion#migracion>.

Organización Internacional para los migrantes. WORLD MIGRATION REPORT 2020 [Internet]. Ginebra: OIM 2020. [citado 21 de septiembre de 2020]. Disponible en: [https://publications.iom.int/system/files/pdf/wmr\\_2020.pdf](https://publications.iom.int/system/files/pdf/wmr_2020.pdf).

Wickramage K, Vearey J, Zwi AB, Robinson C, Knipper M. Migration and health: a global public health research priority. *BMC Public Health*. 2018;18(1):1-9. doi: 10.1186/s12889-018-5932-5.

Zimmerman C, Kiss L, Hossain M. Migration and health: a framework for 21st century policy-making. *PLoS Med*. 2011;8(5). doi: 10.1371/journal.pmed.1001034.

Organización Mundial de la Salud. Determinantes sociales de la salud [Internet]. Ginebra: OMS 2020. [citado 21 de septiembre de 2020]. Disponible en: [https://www.who.int/social\\_determinants/es/](https://www.who.int/social_determinants/es/).

Davies AA, Basten A, Frattini C. Migration: a social determinant of the health of migrants. *Eurohealth*. 2009;16(1):10-2.

Castañeda H, Holmes SM, Madrigal DS, Young M-ED, Beyeler N, Quesada J. Immigration as a social determinant of health. *Annu Rev Public Health*. 2015;36:375-92. doi.org/10.1146/annurev-publhealth-032013-182419.

Thomas F. *Handbook of migration and health*. Cheltenham, UK: Edward Elgar Publishing; 2016. doi.org/10.4337/9781784714789.

Castelli F, Tomasoni LR, El Hamad I. Migration and chronic noncommunicable diseases: is the paradigm shifting? *J Cardiovasc Med*. 2014;15(9):693-5. doi: 10.2459/JCM.0000000000000096.

World Health Organization. *Migration and health: key issues 2020* [Internet]. Ginebra: WHO 2020. [citado el 21 de septiembre de 2020]. Disponible en: <https://www.euro.who.int/en/health-topics/health-determinants/migration-and-health/migration-and-health-in-the-european-region/migration-and-health-key-issues#292115>.

Yeates K, Lohfeld L, Sleeth J, Morales F, Rajkotia Y, Ogedegbe O. A global perspective on cardiovascular disease in vulnerable populations. *Can J Cardiol*. 2015;31(9):1081-93. doi: 10.1016/j.cjca.2015.06.035.

Roth GA, Johnson C, Abajobir A, Abd-Allah F, Abera SF, Abyu G, et al. Global, regional, and national burden of cardiovascular diseases for 10 causes, 1990 to 2015. *J Am Coll Cardiol*. 2017;70(1):1-25. doi: 10.1016/j.jacc.2017.04.052.

Francula-Zaninovic S, Nola IA. Management of measurable variable cardiovascular disease risk factors. *Curr Cardiol Rev*. 2018;14(3):153-63. doi: 10.2174/1573403X14666180222102312.

Agyemang C, van den Born B-J. Non-communicable diseases in migrants: an expert review. *J Travel Med*. 2019;26(2):tay107. doi: 10.1093/jtm/tay107.

Sohail QZ, Chu A, Rezai MR, Donovan LR, Ko DT, Tu JV. The risk of ischemic heart disease and stroke among immigrant populations: a systematic review. *Can J Cardiol*. 2015;31(9):1160-8. doi: 10.1016/j.cjca.2015.04.027.

Davies AA, Blake C, Dhavan P. Social determinants and risk factors for non-communicable diseases (NCDs) in South Asian migrant populations in Europe. *Asia Eur J*. 2011;8(4):461-73. doi: 10.1007/s10308-011-0291-1.

Aldridge RW, Nellums LB, Bartlett S, Barr AL, Patel P, Burns R, et al. Global patterns of mortality in international migrants: a systematic review and meta-analysis. *Lancet*. 2018;392(10164):2553-66. doi: 10.1016/S0140-6736(18)32781-8.

Kirch W. *Encyclopedia of Public Health: Volume 1: A-H Volume 2: I-Z*: Springer Science & Business Media; 2008.

Helgesson M, Johansson B, Nordquist T, Vingård E, Svartengren M. Healthy migrant effect in the Swedish context: a register-based, longitudinal cohort study. *BMJ open*. 2019;9(3):e026972. doi:10.1136/bmjopen-2018-026972.

Krämer A, Fischer F. *Refugee Migration and Health: Challenges for Germany and Europe*: Springer; 2018. doi.org/10.1007/978-3-030-03155-8.

Kennedy S, Kidd MP, McDonald JT, Biddle N. The healthy immigrant effect: patterns and evidence from four countries. *J Int Migr Integr*. 2015;16(2):317-32. doi: 10.1007/s12134-014-0340-x.

Spallek J, Zeeb H, Razum O. What do we have to know from migrants' past exposures to understand their health status? a life course approach. *Emerg Themes Epidemiol.* 2011;8(1):6. doi: 10.1186/1742-7622-8-6.

Domnich A, Panatto D, Gasparini R, Amicizia D. The "healthy immigrant" effect: does it exist in Europe today? *Ital J Public Health.* 2012;9(3). doi: 10.2427/7532.

Zavaleta-Abad RA, Campos-Uscanga Y. Health effects after migration and the mediating role of acculturation and family cohesion. *Univ Salud.* 2019;21(3):261-9. doi: 10.22267/rus.192103.163.

Hombrados-Mendieta I, Millán-Franco M, Gómez-Jacinto L, Gonzalez-Castro F, Martos-Méndez MJ, García-Cid A. Positive Influences of Social Support on Sense of Community, Life Satisfaction and the Health of Immigrants in Spain. *Front Psychol.* 2019;10. doi: 10.3389/fpsyg.2019.02555.

Riosmena F, Kuhn R, Jochem WC. Explaining the immigrant health advantage: Self-selection and protection in health-related factors among five major national-origin immigrant groups in the United States. *Demography.* 2017;54(1):175-200. doi: 10.1007/s13524-016-0542-2.

Markides KS, Rote S. The healthy immigrant effect and aging in the United States and other western countries. *Gerontologist.* 2019;59(2):205-14. doi: 10.1093/geront/gny136.

Loi S, Hale JM. Migrant health convergence and the role of material deprivation. *Demogr Res.* 2019;40:933-62. doi: 10.4054/DemRes.2019.40.32.

Lê-Scherban F, Albrecht SS, Bertoni A, Kandula N, Mehta N, Roux AVD. Immigrant status and cardiovascular risk over time: results from the Multi-Ethnic Study of Atherosclerosis. *Ann Epidemiol.* 2016;26(6):429-35. e1. doi: 10.1016/j.annepidem.2016.04.008.

Sharifi F, Shah BR. Cardiovascular Risk Factors and Events in Iranian Immigrants Versus Other Immigrants from the Middle East. *J Immigr Minor Health.* 2019;21(4):788-92. doi: 10.1007/s10903-018-0799-1.

Tamez M, Ríos-Bedoya CF, Rodríguez-Orengo JF, Tucker KL, Mattei J. Sociodemographic and Lifestyle Factors, and Health Conditions of Dominican Adults Living in Puerto Rico. *J Immigr Minor Health.* 2018;20(5):1085-93. doi: 10.1007/s10903-017-0637-x.

Okraïnec K, Bell CM, Hollands S, Booth GL. Risk of cardiovascular events and mortality among a population-based cohort of immigrants and long-term residents with diabetes: are all immigrants healthier and if so, for how long? *Am Heart J.* 2015;170(1):123-32. doi: 10.1016/j.ahj.2015.04.009.

Garcia C, Garcia MA, Ailshire JA. Sociocultural variability in the Latino population: Age patterns and differences in morbidity among older US adults. *Demogr Res.* 2018;38:1605. doi: 10.4054/DemRes.2018.38.52.

Wirth LS, Tobo BB, Hinyard L, Vaughn MG. Foreign-born blacks no different from whites for odds of stroke. *J Epidemiol Community Health.* 2017;71(8):786-93. doi: 10.1136/jech-2016-208125.

Bacon E, Riosmena F, Rogers RG. Does the Hispanic health advantage extend to better management of hypertension? The role of socioeconomic status, sociobehavioral factors, and health care access. *Biodemography Soc Biol.* 2017;63(3):262-77. doi: 10.1080/19485565.2017.1353407.

Commodore-Mensah Y, Matthie N, Wells J, Dunbar SB, Himmelfarb CD, Cooper LA, et al. African Americans, African Immigrants, and Afro-Caribbeans differ in social determinants of hypertension

and diabetes: evidence from the national health interview survey. *J Racial Ethn Health Disparities*. 2018;5(5):995-1002. doi: 10.1007/s40615-017-0446-x.

Ford ND, Narayan KV, Mehta NK. Diabetes among US-and foreign-born blacks in the USA. *Ethn Health*. 2016;21(1):71-84. doi: 10.1080/13557858.2015.1010490.

Lu Y, Kaushal N, Denier N, Wang JS-H. Health of newly arrived immigrants in Canada and the United States: Differential selection on health. *Health Place*. 2017;48:1-10. doi: 10.1016/j.healthplace.2017.08.011.

Wändell P, Carlsson AC, Li X, Gasevic D, Ärnlöv J, Holzmann MJ, et al. Atrial fibrillation in immigrant groups: a cohort study of all adults 45 years of age and older in Sweden. *Eur J Epidemiol*. 2017;32(9):785-96. doi: 10.1007/s10654-017-0283-6.

Song Y-S, Choi S-W. Low Estimated Glomerular Filtration Rate Is Prevalent among North Korean Refugees in South Korea. *Korean J Fam Med*. 2018;39(3):161. doi: 10.4082/kjfm.2018.39.3.161.

Kuerban A. Healthy migrant effect on smoking behavior among Asian immigrants in the United States. *J Immigr Minor Health*. 2016;18(1):94-101. doi: 10.1007/s10903-014-0155-z.

El Masri A, Kolt GS, Astell-Burt T, George ES. Lifestyle behaviours of Lebanese-Australians: cross-sectional findings from The 45 and Up Study. *PLoS One*. 2017;12(7). doi: 10.1371/journal.pone.0181217.

Hayfron-Benjamin CF, van den Born B-J, Maitland-van der Zee AH, Amoah AG, van der Linden EL, Stronks K, et al. Higher prevalence of peripheral arterial disease in Ghana compared to Ghanaian migrants in Europe: The RODAM study. *Int J Cardiol*. 2020;305:127-34. doi: 10.1016/j.ijcard.2019.12.028.

Beltrán-Sánchez H, Palloni A, Riosmena F, Wong R. SES gradients among mexicans in the United States and in Mexico: a new twist to the hispanic paradox? *Demography*. 2016;53(5):1555-81. doi: 10.1007/s13524-016-0508-4.

Fleischer NL, Ro A, Bostean G. Smoking selectivity among Mexican immigrants to the United States using binational data, 1999–2012. *Prev Med*. 2017;97:26-32. doi: 10.1016/j.ypmed.2017.01.004.

de Back TR, Bodewes AJ, Brewster LM, Kunst AE. Cardiovascular health and related health care use of Moluccan-Dutch immigrants. *PLoS One*. 2015;10(9). doi: 10.1371/journal.pone.0138644.

Raza Q, Nicolaou M, Dijkshoorn H, Seidell JC. Comparison of general health status, myocardial infarction, obesity, diabetes, and fruit and vegetable intake between immigrant Pakistani population in the Netherlands and the local Amsterdam population. *Ethn Health*. 2017;22(6):551-64. doi: 10.1080/13557858.2016.1244741.

Fedeli U, Cestari L, Ferroni E, Avossa F, Saugo M, Modesti PA. Ethnic inequalities in acute myocardial infarction hospitalization rates among young and middle-aged adults in Northern Italy: high risk for South Asians. *Intern Emerg Med*. 2018;13(2):177-82. doi: 10.1007/s11739-017-1631-y.

Marshall GN, Schell TL, Wong EC, Berthold SM, Hambarsoomian K, Elliott MN, et al. Diabetes and cardiovascular disease risk in Cambodian refugees. *J Immigr Minor Health*. 2016;18(1):110-7. doi: 10.1007/s10903-014-0142-4.

Fei K. Racial and ethnic subgroup disparities in hypertension prevalence, New York City Health and Nutrition Examination Survey, 2013–2014. *Prev Chronic Dis*. 2017;14. doi: 10.5888/pcd14.160478.

Yi SS, Thorpe LE, Zanowiak JM, Trinh-Shevrin C, Islam NS. Clinical characteristics and lifestyle behaviors in a population-based sample of Chinese and South Asian immigrants with hypertension. *Am J Hypertens*. 2016;29(8):941-7. doi: 10.1093/ajh/hpw014.

Essilfie G, Shavelle DM, Tun H, Platt K, Kobayashi R, Mehra A, et al. Association of elevated triglycerides and acute myocardial infarction in young Hispanics. *Cardiovasc Revasc Med*. 2016;17(8):510-4. doi: 10.1016/j.carrev.2016.06.001.

Nokes B, Sim Y, Gibson B, Byreddy S, Labiner DM, Coull B, et al. Assessment of stroke risk in southern Arizona, the pairing of acculturation and stroke risk factor development. *J Immigr Minor Health*. 2015;17(2):513-8. doi: 10.1007/s10903-013-9940-3.

Cohn T, Miller A, Fogg L, Braun LT, Coke L. Impact of individual and neighborhood factors on cardiovascular risk in white Hispanic and non-Hispanic women and men. *Res Nurs Health*. 2017;40(2):120-31. doi: 10.1002/nur.21778.

Minneboo M, Lachman S, Snijder M, Vehmeijer J, Jørstad H, Peters R. Risk factor control in secondary prevention of cardiovascular disease: results from the multi-ethnic HELIUS study. *Neth Heart J*. 2017;25(4):250-7. doi: 10.1007/s12471-017-0956-5.

Modesti PA, Castellani S, Calabrese M, Malandrino D, Zhao D. Comparison of type 2 diabetes prevalence in Chinese migrants vs Caucasians and new perspectives for screening of cerebrovascular disease in Chinese: a proof of concept study. *Diabetes Res Clin Pract*. 2017;130:196-203. doi: 10.1016/j.diabres.2017.05.023.

Snijder MB, Galenkamp H, Prins M, Derks EM, Peters RJ, Zwinderman AH, et al. Cohort profile: the healthy life in an urban setting (HELIUS) study in Amsterdam, The Netherlands. *BMJ open*. 2017;7(12). doi: 10.1136/bmjopen-2017-017873.

Snijder MB, Agyemang C, Peters RJ, Stronks K, Ujcic-Voortman JK, van Valkengoed IG. Case finding and medical treatment of type 2 diabetes among different ethnic minority groups: the HELIUS study. *J Diabetes Res*. 2017;2017. doi: 10.1155/2017/9896849.

Skogberg N, Laatikainen T, Jula A, Härkänen T, Vartiainen E, Koponen P. Contribution of sociodemographic and lifestyle-related factors to the differences in metabolic syndrome among Russian, Somali and Kurdish migrants compared with Finns. *Int J Cardiol*. 2017;232:63-9. doi: 10.1016/j.ijcard.2017.01.051.

Bennet L, Lindblad U, Franks PW. A family history of diabetes determines poorer glycaemic control and younger age of diabetes onset in immigrants from the Middle East compared with native Swedes. *Diabetes Metab*. 2015;41(1):45-54. doi: 10.1016/j.diabet.2014.08.003.

Agyemang C, Kieft S, Snijder MB, Beune EJ, van den Born B-J, Brewster LM, et al. Hypertension control in a large multi-ethnic cohort in Amsterdam, The Netherlands: the HELIUS study. *Int J Cardiol*. 2015;183:180-9. doi: 10.1371/journal.pone.0182077.

Fedeli U, Avossa F, Ferroni E, Schievano E, Bilato C, Modesti PA, et al. Diverging patterns of cardiovascular diseases across immigrant groups in Northern Italy. *Int J Cardiol*. 2018;254:362-7. doi: 10.1016/j.ijcard.2017.12.014.

Gupta S, Aroni R, Lockwood S, Jayasuriya I, Teede H. South Asians and Anglo Australians with heart disease in Australia. *Aust Health Rev*. 2015;39(5):568-76. doi: 10.1071/AH14254.

- Jin K, Neubeck L, Gullick J, Koo F, Ding D. Marked differences in cardiovascular risk profiles in middle-aged and older Chinese residents: Evidence from a large Australian cohort. *Int J Cardiol.* 2017;227:347-54. doi: 10.1016/j.ijcard.2016.11.062.
- Fang J, Yuan K, Gindi RM, Ward BW, Ayala C, Loustalot F. Association of birthplace and coronary heart disease and stroke among US adults: National Health Interview Survey, 2006 to 2014. *J Am Heart Assoc.* 2018;7(7):e008153. doi: 10.1161/JAHA.117.008153.
- Tu JV, Chu A, Rezai MR, Guo H, Maclagan LC, Austin PC, et al. Incidence of major cardiovascular events in immigrants to Ontario, Canada: the CANHEART Immigrant Study. *Circulation.* 2015;132(16):1549-59. doi: 10.1161/CIRCULATIONAHA.115.015345.
- Di Giuseppe G, Chu A, Tu JV, Shanmugasegaram S, Liu P, Lee DS. Incidence of Heart Failure Among Immigrants to Ontario, Canada: A CANHEART Immigrant Study. *J Card Fail.* 2019;25(6):425-35. doi: 10.1016/j.cardfail.2019.03.006.
- Van Oeffelen AA, Vaartjes I, Stronks K, Bots ML, Agyemang C. Sex disparities in acute myocardial infarction incidence: Do ethnic minority groups differ from the majority population? *Eur J Prev Cardiol.* 2015;22(2):180-8. doi: 10.1177/2047487313503618.
- Cainzos-Achirica M, Vela E, Cleries M, Bilal U, Mauri J, Pueyo MJ, et al. Cardiovascular risk factors and disease among non-European immigrants living in Catalonia. *Heart.* 2019;105(15):1168-74. doi: 10.1136/heartjnl-2018-314436.
- Rabanal KS, Meyer HE, Tell GS, Igland J, Pylypchuk R, Mehta S, et al. Can traditional risk factors explain the higher risk of cardiovascular disease in South Asians compared to Europeans in Norway and New Zealand? Two cohort studies. *BMJ open.* 2017;7(12):e016819. doi: 10.1136/bmjopen-2017-016819.
- Etchi DT, Lilja E, Koponen P, Laatikainen T. Disparities in treatment of diabetes and hypertension among groups of foreign origin and the general Finnish population. *Eur J Public Health.* 2019;29(5):894-9. doi: 10.1093/eurpub/ckz045.
- Guo S, Lucas RM, Joshy G, Banks E. Cardiovascular disease risk factor profiles of 263,356 older Australians according to region of birth and acculturation, with a focus on migrants born in Asia. *PLoS One.* 2015;10(2). doi: 10.1371/journal.pone.0115627.
- Parackal S, Stewart J, Ho E. Exploring reasons for ethnic disparities in diet-and lifestyle-related chronic disease for Asian sub-groups in New Zealand: a scoping exercise. *Ethn Health.* 2017;22(4):333-47. doi: 10.1080/13557858.2016.1246424.
- Lee H, Cho S, Kim YK, Kim JH. Is there disparity in cardiovascular health between migrant workers and native workers? *Workplace Health Saf.* 2016;64(8):350-8. doi: 10.1177/2165079916633222.
- Linares JD, Jackson II LR, Dawood FZ, Swett K, Benjamin EJ, Schneiderman N, et al. Prevalence of atrial fibrillation and association with clinical, sociocultural, and ancestral correlates among Hispanic/Latinos: The Hispanic Community Health Study/Study of Latinos. *Heart Rhythm.* 2019;16(5):686-93. doi: 10.1016/j.hrthm.2018.11.033.
- Li X, Sundquist J, Forsberg P-O, Sundquist K. Association Between Neighborhood Deprivation and Heart Failure Among Patients With Diabetes Mellitus: A 10-Year Follow-Up Study in Sweden. *J Card Fail.* 2020;26(3):193-9. doi: 10.1016/j.cardfail.2019.04.017.

López L, Swett K, Rodriguez F, Kizer JR, Penedo F, Gallo L, et al. Association of acculturation with cardiac structure and function among Hispanics/Latinos: a cross-sectional analysis of the echocardiographic study of Latinos. *BMJ open*. 2019;9(11). doi: 10.1136/bmjopen-2018-028729.

Hernandez R, Carnethon M, Giachello AL, Penedo FJ, Wu D, Birnbaum-Weitzman O, et al. Structural social support and cardiovascular disease risk factors in Hispanic/Latino adults with diabetes: results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). *Ethn Health*. 2018;23(7):737-51. doi: 10.1080/13557858.2017.1294660.

Morbach C, Gelbrich G, Tiffe T, Eichner F, Wagner M, Heuschmann PU, et al. Variations in cardiovascular risk factors in people with and without migration background in Germany—Results from the STAAB cohort study. *Int J Cardiol*. 2019;286:186-9. doi: 10.1016/j.ijcard.2018.10.098.

Lo CC, Adame JL, Cheng TC. Explaining Chronic Illness and Self-Rated Health Among Immigrants of Five Hispanic Ethnicities. *J Racial Ethn Health Disparities*. 2020;7(1):177-91. doi: 10.1007/s40615-019-00647-z.

Shah SM, Loney T, Sheek-Hussein M, El Sadig M, Al Dhaheri S, El Barazi I, et al. Hypertension prevalence, awareness, treatment, and control, in male South Asian immigrants in the United Arab Emirates: a cross-sectional study. *BMC Cardiovasc Disord*. 2015;15(1):30. doi: 10.1186/s12872-015-0024-2.

Addo J, Agyemang C, Aikins Ad-G, Beune E, Schulze MB, Danquah I, et al. Association between socioeconomic position and the prevalence of type 2 diabetes in Ghanaians in different geographic locations: the RODAM study. *J Epidemiol Community Health*. 2017;71(7):633-9. doi: 10.1136/jech-2016-208322.

Shah AD, Vittinghoff E, Kandula NR, Srivastava S, Kanaya AM. Correlates of prediabetes and type II diabetes in US South Asians: findings from the Mediators of Atherosclerosis in South Asians Living in America (MASALA) study. *Ann Epidemiol*. 2015;25(2):77-83. doi: 10.1016/j.annepidem.2014.10.013.

Wassink J, Perreira KM, Harris KM. Beyond race/ethnicity: Skin color and cardiometabolic health among blacks and hispanics in the United States. *J Immigr Minor Health*. 2017;19(5):1018-26. doi: 10.1007/s10903-016-0495-y.

McCurley JL, Penedo F, Roesch SC, Isasi CR, Carnethon M, Sotres-Alvarez D, et al. Psychosocial factors in the relationship between socioeconomic status and cardiometabolic risk: the HCHS/SOL Sociocultural Ancillary Study. *Ann Behav Med*. 2017;51(4):477-88. doi: 10.1007/s12160-016-9871-z.

Al-Sofiani ME, Langan S, Kanaya AM, Kandula NR, Needham BL, Kim C, et al. The relationship of acculturation to cardiovascular disease risk factors among US South Asians: Findings from the MASALA study. *Diabetes Res Clin Pract*. 2020;161:108052. doi: 10.1016/j.diabres.2020.108052.

Commodore-Mensah Y, Ukou 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(5):1137-46. doi: 10.1007/s10903-017-0644-y.

Efoe VS, Chen H, Moran A, Bertoni AG, Bluemke DA, Seeman T, et al. Acculturation is associated with left ventricular mass in a multiethnic sample: the Multi-Ethnic Study of Atherosclerosis. *BMC Cardiovasc Disord*. 2015;15(1):161. doi: 10.1186/s12872-015-0157-3.

Divney A, Echeverria SE, Thorpe L, Trinh-Shevrin C, Islam N. Hypertension prevalence jointly influenced by acculturation and gender in US immigrant groups. *Am J Hypertens*. 2019;32(1):104-11. doi: 10.1093/ajh/hpy130.

Fox RS, Carnethon MR, Gallo LC, Wiley JF, Isasi CR, Daviglius ML, et al. Perceived Discrimination and Cardiometabolic Risk Among US Hispanics/Latinos in the HCHS/SOL Sociocultural Ancillary Study. *Int J Behav Med*. 2019;26(4):331-42. doi: 10.1007/s12529-019-09782-7.

Whitaker KM, Everson-Rose SA, Pankow JS, Rodriguez CJ, Lewis TT, Kershaw KN, et al. Experiences of discrimination and incident type 2 diabetes mellitus: the Multi-Ethnic Study of Atherosclerosis (MESA). *Am J Epidemiol*. 2017;186(4):445-55. doi: 10.1093/aje/kwx047.

Everson-Rose SA, Lutsey PL, Roetker NS, Lewis TT, Kershaw KN, Alonso A, et al. Perceived discrimination and incident cardiovascular events: The Multi-Ethnic Study of Atherosclerosis. *Am J Epidemiol*. 2015;182(3):225-34. doi: 10.1093/aje/kwv035.

Chilunga FP, Boateng D, Henneman P, Beune E, Requena-Méndez A, Meeks K, et al. Perceived discrimination and stressful life events are associated with cardiovascular risk score in migrant and non-migrant populations: The RODAM study. *Int J Cardiol*. 2019;286:169-74. doi: 10.1016/j.ijcard.2018.12.056.

Castañeda SF, Buelna C, Giacinto RE, Gallo LC, Sotres-Alvarez D, Gonzalez P, et al. Cardiovascular disease risk factors and psychological distress among Hispanics/Latinos: the Hispanic Community Health Study/Study of Latinos (HCHS/SOL). *Prev Med*. 2016;87:144-50. doi: 10.1016/j.ypmed.2016.02.032.

Isasi CR, Parrinello CM, Jung MM, Carnethon MR, Birnbaum-Weitzman O, Espinoza RA, et al. Psychosocial stress is associated with obesity and diet quality in Hispanic/Latino adults. *Ann Epidemiol*. 2015;25(2):84-9. doi: 10.1016/j.annepidem.2014.11.002.

Commodore-Mensah Y, Hill M, Allen J, Cooper LA, Blumenthal R, Agyemang C, et al. Sex Differences in Cardiovascular Disease Risk of Ghanaian-and Nigerian-Born West African Immigrants in the United States: The Afro-Cardiac Study. *J Am Heart Assoc*. 2016;5(2):e002385. doi: 10.1161/JAHA.115.002385.

Lagisetty PA, Wen M, Choi H, Heisler M, Kanaya AM, Kandula NR. Neighborhood social cohesion and prevalence of hypertension and diabetes in a South Asian population. *J Immigr Minor Health*. 2016;18(6):1309-16. doi: 10.1007/s10903-015-0308-8.

Gallo LC, Fortmann AL, McCurley JL, Isasi CR, Penedo FJ, Daviglius ML, et al. Associations of structural and functional social support with diabetes prevalence in US Hispanics/Latinos: Results from the HCHS/SOL Sociocultural Ancillary Study. *J Behav Med*. 2015;38(1):160-70. doi: 10.1007/s10865-014-9588-z.

Morrison EJ, Clark MM, Wieland ML, Weis JA, Hanza MM, Meiers SJ, et al. Relationship between negative mood and health behaviors in an immigrant and refugee population. *J Immigr Minority Health*. 2017;19(3):655-64. doi: 10.1007/s10903-016-0506-z.

Fortmann AL, Roesch SC, Penedo FJ, Isasi CR, Carnethon MR, Corsino L, et al. Glycemic control among US Hispanics/Latinos with diabetes from the HCHS/SOL Sociocultural Ancillary Study: Do structural and functional social support play a role? *J Behav Med*. 2015;38(1):153-9. doi: 10.1007/s10865-014-9587-0.



Sirutis B, Brown C, Lopez JG, Weppelmann T, Ashourian K, Lozano J, et al. A Comparative Case Series of Haitian and non-Haitian Stroke Patients at a Single Center in Miami, Florida. *J Health Care Poor Underserved*. 2019;30(4):1560-8. doi: 10.1353/hpu.2019.0087.

Commodore-Mensah Y, Ukonu N, Obisesan O, Aboagye JK, Agyemang C, Reilly CM, et al. Length of residence in the United States is associated with a higher prevalence of cardiometabolic risk factors in immigrants: a contemporary analysis of the National Health Interview Survey. *J Am Heart Assoc*. 2016;5(11):e004059. doi: 10.1161/JAHA.116.004059.

Gill RM, Khan SA, Jackson RT, Duane M. Prevalence of the Metabolic Syndrome in Central and South American Immigrant Residents of the Washington, DC, Area. *J Nutr Metab*. 2017;2017. doi: 10.1155/2017/9531964.

Affuso O, Singleton CR, Brown SC, Perrino T, Huang S, Szapocznik J. Associations between neighborhood socioeconomic environment and physical activity in Cuban immigrants. *SSM Popul Health*. 2016;2:130-5. doi: 10.1016/j.ssmph.2016.02.010.

Hani AB, Abeeleh MA, Al Smady M, Shaban M, Al Kharabsheh M, Al-Tamimi Z, et al. Heart Disease in Adult Syrian Refugees: Experience at Jordan University Hospital. *Ann Glob Health*. 2019;85(1). doi: 10.5334/aogh.2474.

Commodore-Mensah Y, Selvin E, Aboagye J, Turkson-Ocran R-A, Li X, Himmelfarb CD, et al. Hypertension, overweight/obesity, and diabetes among immigrants in the United States: an analysis of the 2010–2016 National Health Interview Survey. *BMC Public Health*. 2018;18(1):773. doi: 10.1186/s12889-018-5683-3.

Savadatti SS, Bell EM, Gates MA, Hosler AS, Yucel RM, Misra R. Metabolic Syndrome Among Asian Indians in the United States. *J Public Health Manag Pract*. 2019;25(1):45-52. doi: 10.1097/PHH.0000000000000738.

Ghobadzadeh M, Demerath EW, Tura Y. Prevalence of blood pressure, blood glucose and serum lipids abnormalities among Ethiopian immigrants: A community-based cross-sectional study. *J Immigr Minor Health*. 2015;17(4):1070-7. doi: 10.1007/s10903-014-0051-6.

Sewali B, Harcourt N, Everson-Rose SA, Leduc RE, Osman S, Allen ML, et al. Prevalence of cardiovascular risk factors across six African Immigrant Groups in Minnesota. *BMC Public Health*. 2015;15(1):411. doi: 10.1186/s12889-015-1740-3.

Obisesan O, Kuo W-H, Brunet M, Obisesan A, Akinola O, Commodore-Mensah Y. Predictors of obesity among Nigerian immigrants in the United States. *J Immigr Minor Health*. 2017;19(2):328-32. doi: 10.1007/s10903-016-0404-4.

Patterson F, Zhang G, Davey A, Tan Y, Ma GX. American Heart Association's ideal cardiovascular health metrics in under-represented Asian Americans. *J Community Health*. 2016;41(6):1282-9. doi: 10.1007/s10900-016-0217-3.

Russo V, Santarelli S, Magrini L, Moscatelli P, Altomonte F, Cremonesi G, et al. Multicentre Italian analysis on cardiovascular diseases: impact of immigrants' referral to emergency department. *J Cardiovasc Med*. 2017;18(3):136-43. doi: 10.2459/JCM.0000000000000228.

Obiang-Obounou BW. The Length of Residence is Associated with Cardiovascular Disease Risk Factors among Foreign-English Teachers in Korea. *Behav Sci*. 2018;8(1):2. doi: 10.3390/bs8010002.

López-Cevallos DF, Escutia G, González-Peña Y, Garside LI. Cardiovascular disease risk factors among Latino farmworkers in Oregon. *Ann Epidemiol.* 2019;40:8-12. e1. doi: 10.1016/j.annepidem.2019.10.002.

Gany F, Bari S, Gill P, Ramirez J, Ayash C, Loeb R, et al. Step on it! Workplace cardiovascular risk assessment of New York City yellow taxi drivers. *J Immigr Minor Health.* 2016;18(1):118-34. doi: 10.1007/s10903-015-0170-8.

Bharmal N, Kaplan RM, Shapiro MF, Mangione CM, Kagawa-Singer M, Wong MD, et al. The association of duration of residence in the United States with cardiovascular disease risk factors among South Asian immigrants. *J Immigr Minor Health.* 2015;17(3):781-90. doi: 10.1007/s40615-018-00547-8.

Bayog ML, Waters CM. Nativity, Chronic Health Conditions, and Health Behaviors in Filipino Americans. *J Transcult Nurs.* 2018;29(3):249-57. <https://doi.org/10.1177/1043659617703164>.

Klöfvermark J, Hjern A, Juárez SP. Acculturation or unequal assimilation? Smoking during pregnancy and duration of residence among migrants in Sweden. *SSM Popul Health.* 2019;8:100416. DOI: 10.1016/j.ssmph.2019.100416.

Parekh T, Desai R, Pemmasani S, Cuellar A. IMPACT OF SOCIAL DETERMINANTS OF HEALTH ON CARDIOVASCULAR DISEASES. *J Am Coll Cardiol.* 2020;75(11 Supplement 2):1989. doi: 10.1016/s0828-282x(10)71075-8.

Muncan B. Cardiovascular disease in racial/ethnic minority populations: illness burden and overview of community-based interventions. *Public Health Rev.* 2018;39(1):1-11. DOI: 10.1186/s40985-018-0109-4.

Bays HE. Ten Things to Know About Ten Cardiovascular Disease Risk Factors (“ASPC Top Ten–2020”). *Am J Prev Cardiol.* 2020:100003. <https://doi.org/10.1016/j.ajpc.2020.100003>.

van Anders SM, Schudson ZC, Abed EC, Beischel WJ, Dibble ER, Gunther OD, et al. Biological sex, gender, and public policy. *Policy Insights Behav Brain Sci.* 2017;4(2):194-201. <https://doi.org/10.1177/2372732217720700>.

Nielsen SS, Hempler NF, Krasnik A. Issues to consider when measuring and applying socioeconomic position quantitatively in immigrant health research. *Int J Environ Res Public Health.* 2013;10(12):6354-65. doi: 10.3390/ijerph10126354.

Keister LA, Aronson B. Immigrants in the one percent: The national origin of top wealth owners. *PLoS One.* 2017;12(2):e0172876. <https://doi.org/10.1371/journal.pone.0172876>.

Schultz WM, Kelli HM, Lisko JC, Varghese T, Shen J, Sandesara P, et al. Socioeconomic status and cardiovascular outcomes: challenges and interventions. *Circulation.* 2018;137(20):2166-78. doi: 10.1161/CIRCULATIONAHA.117.029652.

Choi M, Mesa-Frias M, Nüesch E, Hargreaves J, Prieto-Merino D, Bowling A, et al. Social capital, mortality, cardiovascular events and cancer: a systematic review of prospective studies. *Int J Epidemiol.* 2014;43(6):1895-920. DOI: 10.1093/ije/dyu212.

Lindström M, Rosvall M. Two theoretical strands of social capital, and total, cardiovascular, cancer and other mortality: A population-based prospective cohort study. *SSM Popul Health.* 2019;7:100337. doi: 10.1016/j.ssmph.2018.100337.

Berry JW. Acculturation strategies and adaptation. Immigrant families in contemporary society. Duke series in child development and public policy. New York, NY, US: Guilford Press; 2007. p.69-82.

Gushulak BD, MacPherson DW. Health aspects of the pre-departure phase of migration. PLoS Med. 2011;8(5). doi: 10.1371/journal.pmed.1001035.

