DOI: 10.32481/djph.2018.05.011

Maternal Health Disparities Among Puerto Ricans

Yukiko Washio, PhD;[1] Omar Khan, MD, MHS, FAAFP;[2] Ralph Rivera-Gutiérrez, PhD, MSW[3]

1. Maternal and infant health researcher, Obstetrics and Gynecology, Christiana Care Health System; College of Health Sciences, University of Delaware

2. Editor-in-Chief, Delaware Journal of Public Health; President, Delaware Public Health Association; President-Elect, Delaware Academy of Medicine; CEO, Delaware Health Sciences Alliance; Physician Leader, Partnerships and Academic Programs, Christiana Care Health System; Co-Director, Community Engagement & Outreach, Delaware Clinical & Translational Research Program (ACCEL).

3. Professor, Graduate School of Public Health, University of Puerto Rico; Principal Investigator and Director, UPR Center for Public Health Preparedness

The primary causes of death in females – i.e., causes of over 1 million deaths – are cardiovascular diseases, infectious and parasitic diseases, cancer, respiratory diseases and infections, unintended injuries, and perinatal conditions.[1] Given the significant role of women in families, loss of women can result in further poverty, higher mortality among children, food insecurity, and children being withdrawn from school.[1] The World Health Organization (WHO) identified four main risk factors contributing to these causes of death: tobacco use, harmful use of alcohol, malnutrition, and limited physical activity.[1] If pregnant or immediately postpartum women are exposed to these risk factors, there are significant health effects on maternal and pediatric outcomes.[2–7] The economic consequence of exposure to these risk factors is not trivial.[8–10]

Puerto Ricans are the second largest Hispanic subgroup in the U.S., following those of Mexican origin.[11] The number of Puerto Ricans living in the U.S. (4.6 million) surpassed that living in Puerto Rico (3.7 million) in 2010.[12] Moreover, given the economic reality facing the island, over the next few years, more Puerto Ricans may migrate to the United States mainland in search of better economic opportunities.[13] Moreover, newer Puerto Rican migrants tend to be poorer than their earlier counterparts, and face a higher probability of living in poverty.[14] The state of Pennsylvania has a population of 366,082 Puerto Ricans (2.9% of the entire state population[15]), and the state of Delaware is within the top 10 states with the most Puerto Rican residents by proportion (2.5%).[15]

Puerto Ricans living in the U.S. have worse health outcomes relative to other Hispanics, including chronic liver disease, heart disease, diabetes, cancer, and homicide.[16] Some of these non-communicable diseases are attributable to unhealthy behaviors, including the highest smoking rates among Hispanics and a sedentary lifestyle.[16] Puerto Rican pregnant women living in the U.S. once had the second highest prenatal smoking rate (12.2%) in the U.S., following American Indian/Alaska Native populations.[17] Recent evidence showed that the self-reported prenatal smoking rate among Puerto Rican women was 21% in one region of the U.S.[18]

This may have significantly impacted breastfeeding rates among Puerto Rican mothers, due to inverse correlations between prenatal smoking and breastfeeding rates.[19,20] Low-income mothers in Puerto Rico maintain a median breastfeeding duration of five months[21]; however, a considerable disparity in breastfeeding duration has been observed among low-income Puerto Rican women in the U.S., with a median duration of only two weeks.[22] The disparity in

breastfeeding is also observed between Puerto Rican mothers and other Hispanic subgroups within the U.S., in which 45% of low-income, overall Hispanic women breastfeed for six months, similar to non-Hispanic White women.[23]

In terms of healthy lifestyle during pregnancy, only about 13% of Puerto Rican pregnant women in a U.S. region met physical activity guidelines and 19% met fruit/vegetable guidelines.[18] The overall prevalence of meeting the guidelines of healthy nutrition and physical activity is low; however, Spanish-language preference (an indicator of less acculturation), and college education were significantly associated with meeting the healthy guidelines.[18]

Given the economic and long-term health consequences from adverse pregnancy and postpartum outcomes, as well as a growing number of Puerto Ricans migrating to the mainland, attention should be paid to their maternal and infant health indicators. Psychosocial and behavioral interventions to address maternal smoking range from brief counseling to comprehensive psychosocial support,[24–26] and psychosocial interventions such as incentive use and counseling show significant effects on prenatal smoking cessation rates.[24] Physical exercise interventions and nutritional and exercise counseling for overweight and obese pregnant women[7,27] have had a significant reduction in the incidence of gestational diabetes, albeit with no consistent impact on preventing adverse birth outcomes.[27] Peer support has been the most promising component to increase continued breastfeeding rates[22,28] as shown by recent evidence in significantly increasing continued breastfeeding rates by combining that with incentive use.[29]

The Delaware Department of Public Health funds a community outreach program (Health Ambassadors) to educate and make community referrals for managing maternal and infant health in the state. This type of program can suggest the value of racial and ethnic diversity in the approach to communities, and also demonstrate the efficacy and cost-effectiveness of evidence-based, multi-component interventions to address prenatal smoking, prenatal healthy eating and physical activity, and breastfeeding.

We propose that any effective intervention should be culturally tailored to the intended audience. This has obvious benefits in terms of initial acceptance and continued sustainability. We further propose that in these efforts, Puerto Rican women remain a high priority given their high level of vulnerability.

References

1. World Health Organization. (2011). The NCD Alliance. Non- communicable diseases: a priority for women's health and development, International Diabetes Federation. Retrieved from: http://www.who.int/pmnch/topics/maternal/2011_women_ncd_report.pdf

2. Aliyu, M. H., Wilson, R. E., Zoorob, R., Chakrabarty, S., Alio, A. P., Kirby, R. S., & Salihu, H. M. (2008). Alcohol consumption during pregnancy and the risk of early stillbirth among singletons. *Alcohol (Fayetteville, N.Y.)*, *42*(5), 369–374. 10.1016/j.alcohol.2008.04.003

3. Bailey, B. A., McCook, J. G., Hodge, A., & McGrady, L. (2012, February). Infant birth outcomes among substance using women: Why quitting smoking during pregnancy is just as important as quitting illicit drug use. *Maternal and Child Health Journal*, *16*(2), 414–422. PubMed https://doi.org/10.1007/s10995-011-0776-y

4. Bartick, M. (2013, October). Mothers' costs of suboptimal breastfeeding: Implications of the maternal disease cost analysis. *Breastfeed Med*, *8*(5), 448–449. PubMed https://doi.org/10.1089/bfm.2013.0070

5. Catalano, P. M., & Shankar, K. (2017, February 8). Obesity and pregnancy: Mechanisms of short term and long term adverse consequences for mother and child. *BMJ (Clinical Research Ed.)*, *356*, j1. Retrieved from http://www.ncbi.nlm.nih.gov/ pubmed/28179267 PubMed https://doi.org/10.1136/bmj.j1

6. Dupraz, J., Graff, V., Barasche, J., Etter, J. F., & Boulvain, M. (2013, May 25). Tobacco and alcohol during pregnancy: Prevalence and determinants in Geneva in 2008. *Swiss Medical Weekly*, *143*, w13795. PubMed https://doi.org/10.4414/smw.2013.13795

7. Yeo, S., Walker, J. S., Caughey, M. C., Ferraro, A. M., & Asafu-Adjei, J. K. (2017, April). What characteristics of nutrition and physical activity interventions are key to effectively reducing weight gain in obese or overweight pregnant women? A systematic review and meta-analysis. *Obes Rev*, *18*(4), 385–399. PubMed https://doi.org/10.1111/obr.12511

8. Bartick, M. (2011, October). Breastfeeding and the U.S. economy. *Breastfeed Med*, *6*(5), 313–318. PubMed https://doi.org/10.1089/bfm.2011.0057

9. Florence, C. S., Adams, E. K., & Ayadi, M. F. (2007, Fall). Pediatric health care costs attributable to exposure to second-hand smoke: An exploratory analysis. *Journal of Health Care Finance*, *34*(1), 36–43. Retrieved from http:// www.ncbi.nlm.nih.gov/pubmed/18972984 PubMed

10. Popova, S., Lange, S., Burd, L., & Rehm, J. (2014). Canadian children and youth in care: The cost of fetal alcohol spectrum disorder. *Child Youth Care Forum*, *43*(1), 83–96. PubMed https://doi.org/10.1007/s10566-013-9226-x

11. Pew Research Center. (2012). The 10 Largest Hispanic origin groups: characteristics, rankings, top counties. Retrieved from: http://www.pewhispanic.org/2012/06/27/the-10-largest-hispanic-origin-groups-characteristics-rankings-top-counties/

12. Pew Research Center. (2011). A demographic portrait of Puerto Ricans. Retrieved from: http://www.pewhispanic.org/2011/06/13/a-demographic-portrait-of-puerto-ricans/

13. Pew Research Center. (2016). Historic population losses continue across Puerto Rico. Retrieved from: http://www.pewresearch.org/fact-tank/2016/03/24/historic-population-losses-continue-across-puerto-rico/

14. Pew Research Center. (2014). Puerto Rican population declines on island, grows on U.S. mainland. Retrieved from: http://www. pewhispanic.org/2014/08/11/puerto-rican-population-declines-on-island-grows-on-u-s- mainland/

15. Rodriguez, F. V. M. (2010). Puerto Ricans in the United States: past, present and future. Retrieved from: http://www.csg-erc.org/wp-content/uploads/2013annualmeeting/documents/Matos.pdf

16. HNGN News. (2015). CDC: Puerto Ricans in the U.S. have the worst health. Retrieved from: http://www.hngn.com/articles/90053/20150505/cdc-report-puerto-ricans-u-s- worst-health.htm

17. National Center for Health Statistics. (2012). Health, United States, 2011: with special feature on socioeconomic status and health. Hyattsville, MD.

18. Gollenberg, A., Pekow, P., Markenson, G., Tucker, K. L., & Chasan-Taber, L. (2008, June). Dietary behaviors, physical activity, and cigarette smoking among pregnant Puerto Rican women. *The American Journal of Clinical Nutrition*, *87*(6), 1844–1851. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/18541576 PubMed https://doi.org/10.1093/ajcn/87.6.1844

19. Collins, B. N., DiSantis, K. I., & Nair, U. S. (2011, December). Longer previous smoking abstinence relates to successful breastfeeding initiation among underserved smokers. *Breastfeed Med*, *6*(6), 385–391. PubMed https://doi.org/10.1089/bfm.2010.0076

20. Higgins, T. M., Higgins, S. T., Heil, S. H., Badger, G. J., Skelly, J. M., Bernstein, I. M., . . . Preston, A. M. (2010, May). Effects of cigarette smoking cessation on breastfeeding duration. *Nicotine Tob Res*, *12*(5), 483–488. PubMed https://doi.org/10.1093/ntr/ntq031

21. Sinigaglia, O. E., Ríos, E. M., Campos, M., Díaz, B., & Palacios, C. (2016, August 30). Breastfeeding practices, timing of introduction of complementary beverages and foods and weight status in infants and toddlers participants of a WIC clinic in Puerto Rico. *SpringerPlus*, *5*(1), 1437. PubMed https://doi.org/10.1186/s40064-016-3154-9

22. Chapman, D. J., & Pérez-Escamilla, R. (2012, January). Breastfeeding among minority women: Moving from risk factors to interventions. *Adv Nutr*, *3*(1), 95–104. PubMed https://doi.org/10.3945/an.111.001016

23. Sparks, P. J. (2011, September-October). Racial/ethnic differences in breastfeeding duration among WIC-eligible families. *Womens Health Issues*, *21*(5), 374–382. PubMed https://doi.org/10.1016/j.whi.2011.03.002

24. Chamberlain, C., O'Mara-Eves, A., Oliver, S., Caird, J. R., Perlen, S. M., Eades, S. J., & Thomas, J. (2013, October 23). Psychosocial interventions for supporting women to stop smoking in pregnancy. *Cochrane Database Syst Rev*, *10*(10), CD001055. PubMed

25. Logan, C. A., Rothenbacher, D., & Genuneit, J. (2016, March 1). Postpartum smoking relapse and breast feeding: Defining the window of opportunity for intervention. *Nicotine Tob Res*, *19*(3), 367–372. https://doi.org/10.1093/ntr/ntw224 PubMed

26. Risica, P. M., Gavarkovs, A., Parker, D. R., Jennings, E., & Phipps, M. (2017, January). A tailored video intervention to reduce smoking and environmental tobacco exposure during and after pregnancy: Rationale, design and methods of Baby's Breath. *Contemporary Clinical Trials*, *52*(1), 1–9. PubMed https://doi.org/10.1016/j.cct.2016.10.010

27. Magro-Malosso, E. R., Saccone, G., Di Mascio, D., Di Tommaso, M., & Berghella, V. (2017, March). Exercise during pregnancy and risk of preterm birth in overweight and obese women: A systematic review and meta-analysis of randomized controlled trials. *Acta Obstetricia et Gynecologica Scandinavica*, *96*(3), 263–273. PubMed https://doi.org/10.1111/aogs.13087

28. Howell, E. A., Bodnar-Deren, S., Balbierz, A., Parides, M., & Bickell, N. (2014, March). An intervention to extend breastfeeding among black and Latina mothers after delivery. *American Journal of Obstetrics and Gynecology*, *210*(3), 239.e1–239.e5. PubMed https://doi.org/10.1016/j.ajog.2013.11.028

DOI: 10.32481/djph.2018.05.011

29. Washio, Y., Humphreys, M., Colchado, E., Sierra-Ortiz, M., Zhang, Z., Collins, B. N., . . . Kirby, K. C. (2017, March). Incentive-based intervention to increase breastfeeding duration among low-income Puerto Rican mothers. *Pediatrics*, *139*(3), e20163119. PubMed https://doi.org/10.1542/peds.2016-3119