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Recommended Citation

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**The Community Health Worker: Improving Prenatal Health in Rural and Minority
Populations**

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April 11, 2022

Abstract

The United States continues to have an unacceptably high rate of preventable deaths among pregnant and new mothers—the highest rate among developed countries. Pregnancy outcomes are especially poor in minority, rural, and medically-underserved populations, with lack of access to healthcare being identified as a primary factor in poor pregnancy outcomes and pregnancy-related deaths. It is imperative that action be taken to reverse this disturbing trend.

Introduction of the Community Health Worker (CHW) into the multidisciplinary healthcare team is a solution that results in increased access to healthcare, along with many other positive health outcomes, and is one way in which our healthcare system can begin to address this unacceptable trend in high MMRs. A CHW is a lay health worker and trusted member of the community served, whose role has shown to be successful in bridging knowledge gaps, reducing resource utilization, and increasing access to care. This literature review introduces the role of the CHW as a vital member of a multidisciplinary healthcare team, and describes the ways in which the CHW provides a promising solution to increasing access to care, and thereby reducing the number of preventable pregnancy-related deaths.

KEY WORDS: *Community Health Worker, Maternal Health, Underserved, Minority*

The Community Health Worker: Improving Prenatal Health in Rural and Minority Populations

The High Maternal Mortality Rate (MMR) in the United States

The Centers for Disease Control and Prevention (CDC) defines maternal mortality as “the death of a woman while pregnant, or within 1 year of the end of pregnancy, from any cause related to or aggravated by the pregnancy” (CDC, 2019). The MMR is defined as “an estimate of the number of pregnancy-related deaths for every 100,000 live births” (CDC, 2020). The United States has the highest MMR among developed countries (Tikkanen et al., 2020). In 1987, when the CDC began monitoring maternal deaths in the United States using the Pregnancy Mortality Surveillance System (PMSS), the MMR was 7.2; however, by 2019 it had almost tripled to 20.1 per 100,000 live births (CDC, 2020). The National Center for Health Statistics (NCHS) further explicated the MMR by ethnicity in 2019: non-Hispanic black women 44.0, Hispanic women 12.6, and non-Hispanic white women 17.9 (Hoyert, 2021).

According to the Pan American Health Organization (PAHO), the majority of maternal deaths are preventable and “pregnancy-related complications can be managed or prevented with well-known healthcare solutions” (PAHO, 2017). The World Health Organization (WHO) cites hemorrhage, infection, and pre-eclampsia as the top causes of maternal deaths worldwide, and further cites that most maternal deaths are associated with inequalities in, and lack of access to, quality health services. This fact is highlighted by the statistics that show that women living in rural and poorer communities, with less access to healthcare services, have among the highest incidence of maternal mortality (WHO, 2017 & 2019). The issue of access to care is illustrated within the state of California, where there is a large difference in pregnancy-related deaths (MMR) within the state—ranging from 10.8 in the coastal regions, where there is greater access

to care, as compared to 17.8 in the rural central valley regions, where there is less access to care (California Department of Public Health [CDPH], 2021, pg. 28).

Maternal health continues to be a global health issue that disproportionately affects women in low-resource settings, and the lack of availability of human resources (such as emergency services, OB/GYNs, and midwives) has a large role in maternal health problems (Ahmadian et al., 2020). The higher mortality rate in underserved areas are often associated with lower numbers of healthcare providers (Government Office of Accountability [GOA], 2021).

The CHW Role – A Solution in Addressing the High MMR in the United States

The CHW—also known as *lay healthcare provider*, *peer mentor*, *community health representative/advisor*, *promotores de salud*, or *promotora*—are “frontline public health workers who are trusted members of and/or have an unusually close understanding of the community served” (American Public Health Association [APHA], 2009). It is this shared living experience that provides the CHW a valuable and unique position in understanding the particular challenges and needs of their community. As trusted members of the community, CHWs can serve as liaisons between health (and social) organizations and their clients, can provide education, and can perform outreach and advocacy services. According to Parker et al. (2020), CHWs are capable of providing evidence-based healthcare interventions within underserved immigrant communities, and research and studies from rural and/or medically underserved areas have shown that the CHW can increase access to care, decrease healthcare knowledge gaps, and improve maternal outcomes for women and their families living in rural (and often isolated and culturally separate) communities (Boyd et al., 2021; Lutenbacher et al., 2018 & WHO, 2017). The purpose of this literature review is to understand how the CHW, and CHW programs, can improve perinatal health through addressing factors that contribute to poor maternal outcomes.

Literature Review

Search Strategy and Yield

The search strategy included a systematic search and critical appraisal of the literature guided by the Population, Intervention, Comparison, Outcome, and Time “*PICO(T)*” question. The search consisted of review and screening of titles and abstracts in the database Cumulative Index of Nursing and Allied Health Literature (CINAHL) searching the terms “*prenatal OR perinatal OR maternal health OR birth*” and “*community health worker*” which returned 862 results; upon narrowing the search to include “*United States*” 29 results were returned. In a PubMed search, the terms “*community healthcare workers AND maternal health*” returned 296 results. Using the PICO(T) formula for the literature search, the question was asked: “*Do minority pregnant women residing in low-resource, rural areas who work with CHWs (vs. no CHW) have improved maternal health outcomes?*” This variation on the PICO(T) question was also used: “*Does the CHW improve the quality of health in rural and/or minority perinatal women?*”

Inclusion and Exclusion Criteria

The inclusion criteria consisted of studies, reviews, and journal articles in the English language, and on human populations regarding maternal care in rural, underserved, and minority populations with dates 2012-2022. The exclusion criteria were articles in languages other than English, and dates older than 2012.

Evaluation of Evidence

The literature reviewed demonstrated that CHWs were successful in addressing the health disparities that exist for perinatal women in minority, underserved and rural, communities. Further, positive maternal health outcomes were observed when the CHW was involved with the

care needs of pregnant clients, showing that CHWs are capable of improving health outcomes and reducing health risks in perinatal women by increasing access to care.

The primary articles cited and included in this literature analysis were reviewed and appraised utilizing the Johns Hopkins Nursing Evidence-Based Practice Evidence Level and Quality Guide (included in the appendices). These articles are Level I to III with Grades A and A/B, and all of the articles and statistics included in this manuscript are strong enough to recommend and support a change in practice towards implementation of CHW programs and/or inclusion of the CHW on the multidisciplinary team. Data and statistics regarding maternal and infant health were obtained from state and government agencies (CDC, NVSS, WHO, and CDPH).

Literature analysis

The CHW-client Relationship

CHWs have close ties to their local community, and being part of the public health workforce, they are well-positioned to address the healthcare gaps that often exist in rural and underserved communities. The shared living experiences between the CHW and client sets the stage for strong trusting relationships, that in turn creates the foundation for increasing access to care, decreasing knowledge gaps, and ultimately preventing disease complications. The CHW has an enduring history of “accomplished service in the U.S. and abroad by reaching traditionally underserved populations within communities that typically have both complex medical and social needs” (Phalen & Paradis, 2015).

It is this foundation, created from the trust-based CHW-client relationship, that fosters positive healthcare behaviors in perinatal women, and it is also this strong trusting relationship that paves the way to improving maternal and infant health for vulnerable perinatal women

(Boyd et al., 2021). Additionally, according to Mundorf et al. (2017), it is this important therapeutic CHW-participant relationship that benefits psychosocial health.

Improved Access to Care

Lack of access to care is a major factor that influences maternal health. A well-structured CHW program can provide improved client access to care by means of the CHW's ability to prioritize, address, and assist clients' needs through trust-based relationships. The features of the trust-based CHW-client relationship shown to promote positive health outcomes include emotional attendance, authenticity, and emotional support. Clients reported reduced stress, improved health behaviors, and increased engagement with the healthcare system as a result of their relationship with the CHW (Boyd, et al., 2021). Increased engagement in care, facilitated through the CHW-client relationship, led to decreased gaps in healthcare access and resulted in reduced rates of adverse events and improved perinatal outcomes (Pan et al., 2020). Further, a CHW program designed to improve the health outcomes of pregnant women, demonstrated improved access to—and quality of—prenatal care; which in turn resulted in decreased antenatal inpatient admissions and increased postpartum visit adherence and contraceptive use (Cunningham, 2020).

Pregnant Women with Chronic Medical Conditions

The rate of low-income pregnant women with chronic medical conditions is increasing in the U.S. Pregnant women with chronic conditions, such as cardiovascular disease, diabetes, and hypertension, have an increased risk for life-threatening complications. Support provided to pregnant clients by CHWs resulted in improvement of the quality of care. (Boyd, et al., 2021). Risks were decreased in participants with hypertension and diabetes through the CHW intervention, and clients self-reported improved behaviors and knowledge (CDC, 2015, pg. 13).

Further highlighting the benefits of the role of the CHW in promotion of health and reducing health risks, the National Heart, Lung, and Blood Institute (NHLBI) implemented the Community Health Worker Health Disparities Initiative, whose focus is on developing programs for CHWs to deliver health education to racial and ethnic minority and underserved communities.

Culturally Appropriate Care (Cultural Sensitivity)

Implementation of a CHW program focused on community-based risk reduction in underserved communities showed that the Promotores de Salud (Spanish-speaking CHWs) were capable of implementing evidence-based interventions in order to address the reproductive health disparities within immigrant Latino communities. This model of care demonstrated a culturally relevant approach that was successful in reaching the underserved immigrant communities and providing evidence-based healthcare interventions (Parker et al., 2020). Within the Mexican immigrant community, the barriers that affected healthcare utilization included cost, language differences, and poor service quality. When the promotora model of care was implemented and studied within this population, the results showed increased community outreach, connection to services, and facilitated communication between providers and clients (Betancourt, et al., 2012). Improved maternal and child health outcomes in underserved communities were shown with a home visiting program where peer mentors (CHWs) provided culturally sensitive services to immigrant and underserved families. The outcomes included breastfeeding self-efficacy and exclusivity, decreased levels of maternal depressive symptoms and parenting stress, and newborn safe sleep practices (Lutenbacher et al., 2018).

Financial Benefits to the Healthcare System with implementation of the CHW Role

Cost-saving benefits to the healthcare system occur as a result of successful CHW programs, as evidenced by the reduction of resource utilization among clients who worked with CHWs. The National Heart, Lung, and Blood Institute (NHLBI) implemented the Community Health Worker Health Disparities Initiative, whose focus was on developing programs for CHWs to deliver health education to racial and ethnic minority and underserved communities. It was found that the CHW intervention improved self-reported behaviors and knowledge, and risks were decreased in participants with hypertension and diabetes. (CDC, 2015, pg. 13). It is through appropriate utilization of primary care and specialty services that overall health outcomes are improved, and inpatient and prescription costs are reduced (Johnson et al., 2020).

Synthesis of the Literature

The literature provides strong evidence that the CHW, especially as part of a multidisciplinary team, provides a promising solution in addressing the high MMR in the U.S. Because the high MMR is largely related to lack of access to healthcare, CHW programs are especially important as they have been shown to increase access to care. CHWs are influential in addressing health disparities in underserved communities, thereby improving health outcomes and reducing health risks, especially in pregnant clients as is the focus of this prospectus.

Clinical Implications

According to the literature, CHW programs have shown remarkably positive results in contributing to physical, mental, and community health, thereby increasing positive health outcomes and decreasing risks. Studies involving the CHW-perinatal client relationship have resulted in improved health behaviors, reduced stress, and increased engagement with the healthcare system by clients (Boyd, et al., 2021). The inclusion of the CHW on the

multidisciplinary healthcare team provides a timely and promising solution for increasing access to care for perinatal patients, therefore addressing a main factor in the high MMR in the U.S.

The CHW can provide culturally-sensitive and meaningful care beyond the clinic walls, which can expand and enhance the patient-provider relationship. Through their role as a trusted member of the community and advocate for patient needs, the CHW shows promise in not only improving birth outcomes, but also improving patient activation, and medical care adherence, and all which all result in a positive return on investment. The CHW-client relationship results in increased access to care, which is demonstrated by positive health benefits, especially in medically-underserved patients; and these benefits extend to the healthcare system in the form of reduced costs (Johnson et al., 2020).

Discussion

The U.S. has an unacceptably high MMR—especially within our rural communities, ethnic minorities, and socially disadvantaged patients—largely due to lack of access to care. Increasing healthcare access is a vital step in addressing this high MMR, and can be accomplished by implementing the CHW role into the multidisciplinary healthcare team. CHWs can help bridge the gap in healthcare services that contribute to poor maternal outcomes, and employing the CHW as part of the healthcare team to reach our underserved communities is an important and timely venture. CHWs are well-positioned to extend the reach of the primary care provider in the community setting by providing culturally sensitive education, support, resources, and screening that supports improvement in many areas of healthcare beyond maternal health. As healthcare providers become busier, with less time for patients, it is the CHW that can bridge the gap. The literature shows that the CHW is a vital and important partner in health and community, and when the CHW role is implemented, the possibilities to make a positive impact in

community health are encouraging. Finally, because rural and socioeconomically disadvantaged areas have higher rates of maternal mortality and chronic health issues, the CHW is especially important in decreasing fragmentation of care.

Conclusion

“From the standpoint of prevention of death...the most effective public health objective is to prevent the precipitating cause from operating.” (WHO, 2011, pg. 31). The literature provides strong, compelling evidence for the implementation of a CHW program as part of an effective solution in addressing the high MMR in the U.S.

A major theme that emerged from this literature review is the benefit of the CHW role in increasing access to care for patients, other outcomes of CHW programs show many benefits, from improved health outcomes to a cost-benefit to the healthcare system. CHW programs are useful in addressing health disparities, especially in underserved communities, thereby improving healthcare access and reducing health risks. The collaboration between healthcare providers and CHWs can maximize efforts to eliminate health disparities in our vulnerable populations. As the needs of patients change and evolve, the way in which healthcare is provided also needs to adapt to meet these needs.

References

- Ahmadian, L, Salehi, F. & Bahaadinbeigy, L. (2020). Application of geographic information systems in maternal health: A scoping review. *Eastern Mediterranean Health Journal*, 26(11), 1403-1414. <https://doi.org/10.26719/emhj.20.095>.
- American Psychological Association, 7th ed. (2021).
- American Public Health Association. (2009). Support for Community Health Workers to increase health access and to reduce health inequities. Policy Number 20091. <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/09/14/19/support-for-community-health-workers-to-increase-health-access-and-to-reduce-health-inequities>
- Betancourt, G.S., Colarossi, L., & Perez, A. (2012). Factors associated with sexual and reproductive health care by Mexican immigrant women in New York City: A mixed method study.
- Boyd, L.M., Mehra, R., Thomas, J., Lewis, J.B., & Cunningham, S.D. (2021). Features and impact of trust-based relationships between community health workers and low-resource perinatal women with chronic health conditions. *Maternal & Child Health Journal*, 25(12), 1866-1874. DOI: <https://doi.org/10.1007/s10995-021-03242-z>
- California Department of Public Health (CDPH). (2021). California pregnancy related deaths, 2008-2016. *California Pregnancy Mortality Surveillance System (PMSS), Maternal, Child & Adolescent Health*. <https://www.cdph.ca.gov/Programs/CFH/DMCAH/surveillance/CDPH%20Document%20Library/CA-PMSS/CA-PMSS-Surveillance-Report-2008-2016.pdf>

California Future Health Workforce Commission. (2019). Meeting the demand for health: Final report of the California future healthcare workforce commission.

<https://futurehealthworkforce.org/wp-content/uploads/2019/03/MeetingDemandForHealthFinalReportCFHWC.pdf>

California Health Workforce Alliance. (2015). Community health workers in California: Sharpening our focus on strategies to expand engagement.

<https://calfutureworkforce.files.wordpress.com/2017/08/2015-chwa-community-health-workers-in-california-sharpening-our-focus-on-strategies-to-expand-engagement.pdf>

California Maternal Quality Care Collaborative. (2021). Who we are. <https://www.cmqcc.org>

Capitman, J.A., Gonzalez, A., Ramirez, M., and Pacheco, T.L. (2009). Promotoras: Lessons learned on improving healthcare access to Latinos. Fresno, CA: Central Valley Health Policy Institute.

Center for Continuing Study of the California Economy. (2019). *Numbers in the news: Central valley economic and demographic trends*. <http://www.ccsce.com/PDF/Numbers-May2019-Central-Valley-Economic-and-Demographic-Trends.pdf>

Centers for Disease Control and Prevention. (2015). Addressing chronic disease through community health workers, second edition.

https://www.cdc.gov/dhdsp/docs/chw_brief.pdf

Centers for Disease Control and Prevention. (2021). Maternal mortality rates in the United States, 2019. <https://www.cdc.gov/nchs/data/hestat/maternal-mortality-2021/maternal-mortality-2021.htm>

Centers for Disease Control and Prevention. (n.d.). Policy options for facilitating the use of

Community Health Workers in health delivery systems. Policy Brief.

<https://mail.google.com/mail/u/1/#inbox/FMfcgzGmtXBKGJglnXlNtSlkkTQzLxvd?projector=1&messagePartId=0.1>

Centers for Disease Control and Prevention. (2020). Pregnancy Mortality Surveillance System.

https://www.cdc.gov/reproductivehealth/maternal-mortality/pregnancy-mortality-surveillance-system.htm?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Freproductivehealth%2Fmaternalinfanthealth%2Fpregnancy-mortality-surveillance-system.htm

Centers for Disease Control and Prevention. (2020). Resources for community health workers, community health representatives, and health promoters.

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/community-health-workers/>

Centers for Disease Control and Prevention. (2021). What we can do to promote health equity.

<https://www.cdc.gov/coronavirus/2019-ncov/community/health-equity/what-we-can-do.html>

Community Health Worker Core Consensus Project (C3). (n.d.). <https://www.c3project.org/>

Cramer, M.E., Mollard, E.K., Ford, A.L., Kupzyk, K.A., & Wilson, F.A. (2018). The feasibility

and promise of mobile technology with community health worker reinforcement to

reduce rural preterm birth. *Public Health Nursing* 35(6), 508-516. DOI:

10.1111/phn.12543

Cunningham, S.D., Riis, V., Line, L., Patti, M., Bucher, M., Durnwald, C., Srinivas, S.K. (2020).

Safe Start Community Health Worker Program: A multisector partnership to improve

perinatal outcomes among low-income pregnant women with chronic health conditions.

American Journal of Public Health, 110(6), 836-839. DOI: 10.2105/AJPH.2020.305630

Ely, D.M. & Hoyert, D.L. (2018). Differences between rural and urban areas in mortality rates for the leading causes of infant death: United States, 2013 – 2015. National Center for Health Statistics, *NCHS Data Brief No. 300*.

<https://www.cdc.gov/nchs/products/databriefs/db300.htm#Summary>

Fawcett, J. & Ellenbecker, C.H. (2015). A proposed conceptual model of nursing and population health. *Nursing Outlook*, 63. DOI: <https://doi.org/10.1016/j.outlook.2015.01.009>

Gingrey, J.P. (2020). Maternal mortality: A U.S. public health crisis. *American Journal of Public Health*, 110(4), 462-464. DOI: 10.2105/AJPH.2019.305552.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7067092/>

Glanz, K., Rimer, B., & Viswanath, K. (2015). *Health Behavior: Theory Research and Practice* (5th edition). Jossey-Bass.

Government Accountability Office (GAO). (2021). Maternal mortality and morbidity: Additional efforts needed to assess program data for rural and underserved areas. GAO-21-283.

<https://www.gao.gov/products/gao-21-283>

Healthy People 2020. (n.d.). Maternal, Infant, and Child Health.

<https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health>

Hoyert, D.L., Uddin, S.F.G., Minino, A.M. (2020). Evaluation of the pregnancy status checkbox on the identification of maternal deaths. *National Vital Statistics Reports*, 69(1).

<https://www.cdc.gov/nchs/products/index.htm>

Hoyert, D.L. (2019). Maternal mortality rates in the United States, 2019. *NCHS Health E-Stats-2021*. DOI: 10.15620/cdc:103855

Johnson, D., Saavedra, P, Sun, E., Stageman, A., Grovet, D., Alfero, C., Maynes, C., Skipper, B.,

- Powell, W., & Kaufman, A. (2012). Community Health Workers and Medicaid managed care in New Mexico. *Journal of Community Health, 37*(3), 563-571. DOI: 10.1007/s10900-011-9484-1
- Katigbak, C., Van Devanter, N., Islam, N., & Trinh-Shevrin, C. (2015). Partners in health: A conceptual framework for the role of Community Health Workers in facilitating patients' adoption of health behaviors. *American Journal of Public Health, 105*(5), 872-880. DOI: 10.2105/AJPH.2014.302411
- Kaur, M. (2016). Community health workers – Birth of a new profession. *Journal of the American Society on Aging, 40*(1).
- Klein, K. (2017). When it comes to doctor access, the San Joaquin Valley is being left behind. *NPR for Central Valley: Struggling for care*. <https://www.kvpr.org/post/when-it-comes-doctor-access-san-joaquin-valley-being-left-behind>
- Kissam, E., Mines, R., Quezada, C., Intili, J.A., & Wadsworth, G. (2019). San Joaquin Valley Latino immigrants: Complications of survey findings for Census 2020. San Joaquin Valley Census Research Project, San Joaquin Valley Health Fund. https://www.shfcenter.org/assets/SJVHF/SJVCRP_Survey_Findings_Report_011819_Web.pdf
- Lutenbacher, M., Elkins, T., Dietrich, M.S., & Riggs, A. (2018). The efficacy of using peer mentors to improve maternal and infant health outcomes in Hispanic families: Findings from a randomized clinical trial. *Maternal and Child Health Journal, 22*, 92-104. <https://doi.org/10.1007/s10995-018-2532-z>
- MacDorman, M.F., Thoma, M., Declercq, E., & Howell, E.A. (2021). Racial and ethnic

- disparities in maternal mortality in the United States using enhanced vital records, 2016-2017. *American Journal of Public Health*, 111(9), 1673-1681. DOI: 10.2105/ajph.2021.306375 (Addressed non-Hispanic Black MMR)
- Main, E.K., Marlow, C., & Gould, J. (2018). Addressing maternal mortality and morbidity in California through public-private partnerships. *Health Affairs*, 37(9). DOI: 10.1377/hlthaff.2018.0463 <https://www.healthaffairs.org/doi/10.1377/hlthaff.2018.0463>
- The Maternal, Infant, and Early Childhood Home Visiting Program. (2021). Health Resources & Services Administration. <https://mchb.hrsa.gov/sites/default/files/mchb/about-us/program-brief.pdf>
- McCain, C., Krakowiak, P., Sun, D., Reynen, D., Ramos, D., Ahmad, S., Amian, R., Mitchell, C., Main, E.K., Morton, C.H., & Alvarez, D. (2021). California pregnancy-associated mortality review: California pregnancy-related deaths, 2008-2016. Public Health Institute. <https://www.phi.org/thought-leadership/california-pregnancy-associated-mortality-review-california-pregnancy-related-deaths-2008-2016/>
- Mehra, R., Boyd, L.M., Lewis, J.B., & Cunningham, S.D. (2020). Considerations for building sustainable community health worker programs to improve maternal health. *Journal of Primary Care & Community Health*, 11, 1-8. DOI: 10.1177/2150132720953673
- Mellon, M., Schiller, A., Nelson, A.L., & Stohl, H.E. (2020). Awareness of pregnancy-associated health risks among pregnant women and male partners surveyed in a prenatal clinic. *Journal of Women's Health*, 29(3), 376-382. DOI: 10.1089/jwh.2018.7585
- Mundorf, C., Shankar, A., Peng, T., Hassan, A., & Lichtveld, M. (2017). Therapeutic

- relationship and study adherence in a community health worker-led intervention. *Journal of Community Health*, 42(1), 21-29. DOI: 10.1007/s10900-016-0220-8
- Natsoulis, A. & Sloom, J. (2020). Gaps in health services for immigrants in the Central Valley. *Berkeley Interdisciplinary Migration Institute*. Berkeley, CA
https://bimi.berkeley.edu/sites/default/files/shared/Health%20Clinics%20Data%20Brief%20Central%20Valley_Final%20Draft.pdf
- Novick, G., Sadler, L.S., Knafl, K.A., Groce, N.E., and Kennedy, H.P. (2012). The intersection of everyday life and group prenatal care for women in two urban clinics. *Journal of Health Care for the Poor and Underserved*, 23(2).
- Palmer, J. & Silverwood-Cope, O. (2021). Maternity care is not the same for everyone. *Midwifery Matters*, 169, 8-11.
- Pan, Z., Veazie, P., Sandler, M., Dozier, A., Molongo, M., Pulcino, T., Parisi, W., & Eisenberg, K.W. (2020). Worker-supported home-visiting program in Rochester, New York, 2015-2018, *American Journal of Public Health*, 110(7), 1031-1033. DOI: 10.2105/AJPH.2020.305655
- Parker, A., Johnson-Motoyama, M., Mariscal, E Susana, Guilamo-Ramos, V., Reynoso, E., & Fernandez, C. (2020). Novel service delivery approach to address reproductive health disparities within immigrant Latino communities in geographic hot spots: An implementation study. *Health & Social Work* 45(3), 155-163. DOI: 10.1093/hsw/hlaa014
- Phalen, J. & Paradis, R. (2015). How Community Health Workers can reinvent health care delivery in the US. *Health Affairs Forefront*. DOI: 10.1377/forefront.20150116.043851
- Rural Health Information Hub. (2020). California.
<https://www.ruralhealthinfo.org/states/california>

Tikkanen, R., Gunja, M.Z., Fitzgerald, M., & Zephyrin, L. (2020). Maternal mortality and maternity care in the United States compared to 10 other developed countries.

Commonwealth Fund, Nov 2020. DOI: 10.26099/411v-9255

United States Department of Health & Human Services. (n.d.) Think cultural health: Promoting healthy choices and community changes: An E-learning program for Promotores de Salud. Minority Health.hhs.gov.

https://promotores.thinkculturalhealth.hhs.gov/default_en.asp

United States Geological Society. (2021). California Water Service. *California's Central Valley: Regional characteristics.* <https://ca.water.usgs.gov/projects/central-valley/about-central-valley.html>

Valley Children's Healthcare. (2021). *Diversity, disparity, advocacy, service.*

<https://www.valleychildrens.org/pediatric-residency-program/diversity-of-the-central-valley>

World Health Organization (2009). International statistical classification of diseases and related health problems, 10th revision 2008 ed. Geneva, Switzerland.

https://www.who.int/classifications/icd/ICD10Volume2_en_2010.pdf

World Health Organization (2017). Maternal Health. Pan American Health Organization, World Health Organization. <https://www.paho.org/en/topics/maternal-health>

World Health Organization (2019). Maternal mortality.

<https://www.who.int/news-room/fact-sheets/detail/maternal-mortality>

Appendix A: Appraisal of Evidence, Boyd et al.

EVIDENCE APPRAISAL

ARTICLE TITLE: Features and impact of trust-based relationships between community health workers and low-resource perinatal women with chronic health conditions

AUTHORS: Boyd, L.M., [Mehra](#), R. Thomas, J., Lewis, J.B., & Cunningham, S.D.

PUBLICATION DATE: 21 OCT 2021

JOURNAL: Maternal & Child Health Journal, 25(12), [pgs 1866-1874](#)

DOI: <https://doi.org/10.1007/s10995-021-03242-z>

SETTING: Eastern U.S.

SAMPLE (COMPOSITION & SIZE): 18 CHWs and 39 clients (majority Black or Latina) from Merck for Mothers-funded programs and the National Institute of Mental Health of the National Institutes of Health*

PURPOSE/ OBJECTIVE	DESIGN/METHOD /CONCEPTUAL FRAMEWORK	MAJOR VARIABLES STUDIED/ DEFINITION	MEASUREMENT OF VARIABLES	DATA ANALYSIS	STUDY FINDINGS	LEVEL OF EVIDENCE/ CRITICAL APPRAISAL SCORE/ CONCLUSION/ RECOMMENDATIONS
To examine which aspects of the CHW-client relationship are most beneficial for promoting positive change in low-resource perinatal women w/ chronic conditions.	Qualitative Study. Grounded theory-informed thematic approach	Specific features of the relationship between CHW and client that promote positive change in health behaviors. Two main sections studied: <ol style="list-style-type: none"> Three salient qualities of the CHW-client relationship The way in which the relationship encouraged clients to make positive health changes. 	Nine focus groups w/ CHW and clients, and interviews. Emotional attendance, authenticity, and prioritization of client's needs were the specific features of the client-CHW relationship that helped facilitate health-promoting behaviors.	Grounded-theory-informed thematic approach Coding and analysis performed w/ DEDOOSE qualitative analytic software.	CHWs are effective at building meaningful, trust-based relationships with patients, which results in improvement in client stress levels, emotional well-being, health behaviors, and life circumstances.	LEVEL: III QUALITY: A/B Support provided to clients by CHWs was shown to improve the quality of care. CHWs represent cost-savings for state Medicaid programs. Community healthcare programs should promote trust-building as an explicit program goal. Findings of this study are meant to determine how to support CHWs in promoting maternal health in low-income pregnant women w/ chronic conditions, and to expand community-based care. Future studies are recommended to determine best practices for sustainable funding of CHW programs.

*Merck for Mothers is a 10-year \$500 million global initiative to address maternal mortality. The article is solely the responsibility of the authors and does not represent the official views of Merck or the National Institutes of Health.

Appendix B: Appraisal of Evidence, Cunningham et al.

EVIDENCE APPRAISAL

ARTICLE TITLE: Safe Start Community Health Worker Program: A multisector partnership to improve perinatal outcomes among low-income pregnant women with chronic health conditions
AUTHORS: Cunningham, S.D., Riis, V., Line, L., Patti, M., Bucher, M., Durnwald, C., & Srinivas, S.K.
PUBLICATION DATE: June, 2020
JOURNAL: American Journal of Public Health, 110(6), pgs. 836-839
DOI: 10.2105/AJPH.2020.305630
SETTING: Maternity Care Coalition and Hospital of the University of Pennsylvania
SAMPLE (COMPOSITION & SIZE): Publicly insured pregnant women; Study Group (Safe Start Group) n = 291; Control Group n = 300.

PURPOSE OF ARTICLE OF REVIEW	DESIGN/METHOD/CONCEPTUAL FRAMEWORK	MAJOR VARIABLES STUDIED	MEASUREMENT OF VARIABLES	DATA ANALYSIS	STUDY FINDINGS	LEVEL OF EVIDENCE/ CRITICAL APPRAISAL SCORE/ RECOMMENDATIONS
To improve health outcomes for pregnant women with chronic health conditions by addressing social determinants through the direct outreach to clients by a CHW.	Prospective cohort study. Safe Start is a CHW program that is provided to pregnant patients along w/ multisector partnerships to investigate the promising strategy of reducing chronic disease and associated adverse pregnancy outcomes with the utilization of the CHW on the healthcare team. Safe Start CHW program designed to improve outcomes through comprehensive and integrated medical care.	Adequacy of prenatal care, inpatient admissions and emergency visits during pregnancy, delivery mode, preterm birth, neonatal intensive care unit admission & length of stay, neonatal abstinence syndrome, and postpartum visit attendance and contraceptive use. Comparison group controlled for potential confounders.	Data came from the CHW client database and EHR data maintained by Maternity Care Coalition and University of Pennsylvania Two datasets were merged quarterly	Multivariable logistic and Poisson regression	Safe Start participants had lower odds of inadequate prenatal care, antenatal inpatient admissions, and higher odds of postpartum visit attendance and contraceptive use.	<p>LEVEL: II QUALITY: A/B Strong compelling evidence for change in practice with a focus on community partnerships that improve maternal and child health, especially among low-income pregnant women w/ pre-existing chronic health conditions.</p> <p>The Safe Start model is in alignment with quality improvement and community based care components.</p> <p>Challenges remain in the transition to value-based payment contracts from Medicaid managed care contracts.</p> <p>Uncertainty at the national level regarding existing and future healthcare policy may affect incentives for community health models.</p>

Appendix C: Appraisal of Evidence, Lutenbacher et al.

EVIDENCE APPRAISAL

ARTICLE TITLE: The efficacy of using peer mentors to improve maternal and infant health outcomes in Hispanic families: Findings from a RCT

AUTHORS: Lutenbacher, M., Elkins, T., Dietrich, M.S., & Riggs, A.

PUBLICATION DATE: 22 AUG 2018

JOURNAL: Maternal and Child Health Journal, (22), pgs. 92-104

DOI: [10.1007/s10995-018-2532-z](https://doi.org/10.1007/s10995-018-2532-z)

SETTING: home visiting program in large city in Tennessee

SAMPLE (COMPOSITION & SIZE): <26 weeks' pregnant thru 6 mos postpartum Hispanic women; n=188; MEI = 94 and MIHOW = 94

PURPOSE OF ARTICLE OF REVIEW	DESIGN/METHOD/ CONCEPTUAL FRAMEWORK	MAJOR VARIABLES STUDIED/ DEFINITION	MEASUREMENT OF VARIABLES	DATA ANALYSIS	STUDY FINDINGS	LEVEL OF EVIDENCE/ CRITICAL APPRAISAL SCORE/ CONCLUSION/RECOMMENDATIONS
Hypothesis: maternal and infant outcomes would be better in women assigned to the Maternal Infant Health Outreach Worker (MIHOW) program than the women assigned to the minimal education intervention (MEI) group.	RCT Random assignment to MIHOW or MEI group. Research-based curriculum. MEI group received printed educational materials only. MIHOW group received	Breastfeeding self-efficacy and exclusivity, levels of depressive symptoms and parenting stress, safe sleep practices, and infant stimulation (reading to their babies) in the home.	Primary outcomes assessed w/ standardized measures and established questions from national sources	SPSS used to summarize study data and test hypothesis. All analyses were done using intention-to-treat principles. Blind status of data collectors maintained	MIHOW intervention is an effective intervention in reducing depressive symptoms and parenting stress, and improving social and emotional support. No statistically significant differences were noted in number of prenatal visits. More referrals for additional services in MIHOW group.	LEVEL: I QUALITY: A MIHOW is a viable option for providing culturally sensitive services to immigrant and underserved families. Strong evidence in support of the effectiveness of MIHOW on improving health outcomes in this sample of Hispanic mothers and their infants. Coupling MIHOW w/ standard prenatal care shows strong potential to improve maternal and child health outcomes. Limitations: all participants received the written educational materials, therefore no true control group; and the length of study (MIHOW intervention designed to continue until child is age 3)

Appendix D: Appraisal of Evidence, Mehra et al.

EVIDENCE APPRAISAL

ARTICLE TITLE: Considerations for building sustainable CHW programs to improve maternal health

AUTHORS: Mehra, R., Boyd, L.M.,

PUBLICATION DATE: 5 AUG 2020

JOURNAL: Journal of Primary Care & Community Health

DOI: 10.1177/2150132720953673

SETTING: Northeastern U.S. cities

SAMPLE (COMPOSITION & SIZE): 54 CHWs, CHW program staff, and community partners

PURPOSE OF ARTICLE OF REVIEW	DESIGN/METHOD/ CONCEPTUAL FRAMEWORK	MAJOR VARIABLES STUDIED/ DEFINITION	MEASUREMENT OF VARIABLES	DATA ANALYSIS	STUDY FINDINGS	LEVEL OF EVIDENCE/ CRITICAL APPRAISAL SCORE/ CONCLUSION/RECOMMENDATIONS
Improving maternal health outcomes by identifying institutional and community factors that may contribute to the sustainability of CHW programs	Qualitative Study; part of a larger evaluation of three Merck for Mothers-funded* CHW programs implemented. Socioecological framework; including intrapersonal, interpersonal, institutional, and community factors.	Mothers w/ chronic conditions. Factors that contribute to sustainability of CHW program to improve maternal health.	Focus groups, in-depth interviews.	Inductive qualitative approach.	CHWs have the potential to contribute to advancement of the Triple Aim for maternity care: improved healthcare and cost.	<p>LEVEL: III QUALITY: A/B</p> <p>Three themes identified as influencing sustainability of CHW programs to improve maternal health: 1) CHW support from supervisors, providers and peers, 2) relationships w/ healthcare system and insurers, and 3) securing adequate, continuous funding. Research should continue regarding integration of CHW programs w/ healthcare systems and long-term revenue streams by identifying best practices and supervisory support structures.</p> <p>Limitations: findings might not extrapolate to other settings/populations as population of focus is on reproductive-age women w/ chronic health conditions who are pregnant/postpartum.</p>

*Authors state that the role of Merck was solely funding and had no other involvement in the article.

Appendix E: Appraisal of Evidence, Pan et al.

EVIDENCE APPRAISAL

ARTICLE TITLE: Perinatal health outcomes following a community health worker-supported home-visiting program in Rochester, NY, 2015-2018.

AUTHORS: Pan, Z., Veazie, P., Sandler, M., Dozier, A., Molongo, M., Pulcino, T., Parisi, W., & Eisenberg, K.W.

PUBLICATION DATE: 11 MARCH 2020

JOURNAL: American Journal of Public Health, 110(7)

DOI: 10.2105/AJPH.2020.305655

SETTING: client's homes in Rochester, New York

SAMPLE (COMPOSITION & SIZE): 455 at-risk pregnant women; comparison group of 102

PURPOSE OF ARTICLE OF REVIEW	DESIGN/METHOD/CONCEPTUAL FRAMEWORK	MAJOR VARIABLES STUDIED/DEFINITION	MEASUREMENT OF VARIABLES	DATA ANALYSIS	STUDY FINDINGS	LEVEL OF EVIDENCE/ CRITICAL APPRAISAL SCORE/ RECOMMENDATIONS
To evaluate the effectiveness of a CHW-supported home visitor program on perinatal outcomes for at-risk pregnant women.	The Baby Love program (administered by the Social Work Division of the University of Rochester Strong Memorial Hospital) paired CHWs with master's prepared social workers to address barriers to health for socially and economically at-risk pregnant women. An interdisciplinary perinatal healthcare team approach was utilized to eliminate barriers to receiving high-quality reproductive care.	Preterm birth and low birth weights: NICU admission	Data was extracted from the University of Rochester Medical Center's EMR, (EPIC), and merged w/ records from the Baby Love program.	Multivariable logistic regression analysis; program data merged w/ EMR; Data was analyzed from pregnancy through 6 months post delivery	Program participants had fewer adverse outcomes than non-participants; including lower rates of preterm birth and low birth weight.	<p>LEVEL: III QUALITY: A/B</p> <p>THIS STUDY addressed the gap that exists d/t limited evidence that has been published in developed countries demonstrating improvement in perinatal health with the employment of the CHW.</p> <p>This program was effective at achieving improved perinatal outcomes for low-income mothers and children in the U.S.</p> <p>The Baby Love program provides crucial support for total population management as care delivery systems evolve.</p>