

Growing Healthy Communities Initiative: Transforming the Built Environment to Combat Obesity

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Abstract

A contributing factor to the U.S. national obesity epidemic is the built environment—the physical aspects of a community in which we live, work and engage in our everyday activities. Therefore, modifying the built environment can be a solution to address the epidemic. Such an example is the Arkansas Coalition for Obesity Prevention (ArCOP) Growing Healthy Communities (GHC) initiative. The GHC initiative encourages community health workers, health education specialists, government officials and other stakeholders to embrace community collaboration in efforts to improve built environments by equipping them with resources that increase community access to healthy foods and physical activities to help combat obesity. ArCOP to date has funded 100+ GHC communities in Arkansas. One of the five communities being highlighted by the authors for their GHC efforts includes: the University of Arkansas at Little Rock University District community, in which the authors have contributed to implementing various GHC projects for the residents of this community. The GHC, a state initiative, has implications for national and global use, and it is emerging as an exemplary best practice model. It provides communities with effective strategies to help address the health inequities of obesity, through prevention and intervention measures to improve health behaviors.

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Introduction

There is no consensus on the precise causes of the obesity epidemic, more likely culprits are changes in societal and environmental conditions that have led to changes in diet and physical activity (Havranek, Mujahid, Barr, Blair, Cohen, Cruz-Flores, & Rosal, 2015). This makes it extremely important for action to take place in assessing the health of our communities' built environments. The built environment includes the physical makeup of where we live, learn, work, our homes, schools, businesses, streets and sidewalks, open spaces, and transportation options; it can influence the overall community health and individual behaviors such as physical activity and healthy eating (Centers for Disease Control and Prevention (CDC), 2017). Data from the National Center for Health Statistics (NCHS) National Health Examination Survey revealed the prevalence of obesity was 39.8% among adults and 18.5% among youth in the United States in 2015–2016 (CDC, 2017). These statistics

indicate that the prevalence of obesity in the United States currently remains higher than the Healthy People 2020 goals of 14.5% among youth and 30.5% among adults (Healthy People 2020, 2018).

Healthy environments, particularly 'built environments and healthy neighborhoods' are among the five key areas included in the approach towards meeting Healthy People 2020 goals of 'creating physical and social environments that promote good health for all' (Healthy People, 2020). At the national level, Centers for Disease Control and Prevention's 'Built Environment and Health Initiative', the only existing federal program has the noble purpose of improving the health of all Americans through evidence-based changes in the built environment. The key tenets of the CDC's Built Environment and Health Initiative revolve around factors such as support towards health impact assessments, forging

relationships with local governments, providing scientific expertise and training to local officials and monitoring various environmental indicators (Centers for Disease Control and Prevention, 2015). In models such as ecological model and structural model of health behaviors, the role of environments, such as food environment, physical environment and recently the built environment contribute largely towards healthy outcomes across the population health spectrum (Cameron et al., 2012; Diclemente, Salazar & Crosby, 2013). Food environment, particularly in the socio-economically disadvantaged populations, can influence chronic diseases such as obesity and other non-communicable diseases (Pessoa, Mendes, Gomes, Martins, & Velasquez-Melendez, 2015). Built environments such as parks, pavements, buildings, walkability are important determinants for risk of being obese and creating an obesogenic environment along with unhealthy diets, physical inactivity and gene-lifestyle interactions (Hruby et al., 2016).

Obesity is not just a public health concern in the United States; it is a global issue. The worldwide prevalence of obesity more than doubled between 1980 and 2014 (World Health Organization (WHO), 2016). According to Blumenthal & Levin (2017) "Every country included in the World Health Organization's data repository experienced an increase in adult obesity rates from 2010 to 2014. None of these nations' obesity rates stayed the same or declined during this time period" (p. 1). Many of the indicators found by these authors that played major roles in the increase of obesity-included lack of education, eating more processed foods, and physical inactivity. Obesity is a serious concern because it is often associated with poorer mental health outcomes, reduced quality of life, and the leading causes of death (chronic diseases e.g. heart disease, diabetes, and some types of cancer) in the United States and worldwide (CDC, 2018).

Role of Built Environment and Positive Health Outcomes

Nationally, there is a consensus on the need to help combat the obesity epidemic. According to Caballero (2007), we still tend to regard obesity as a disorder of individual behavior, rather than highly conditioned by the socioeconomic built

environment. Obese persons are often blamed for their weight, with common perceptions that weight stigmatization is justifiable and may motivate individuals to adopt healthier behaviors (Puhl & Heuer, 2010). However, these perceptions must change in order to recognize that the threat of obesity and its comorbidities are affecting communities throughout the world.

In a very recent international study, which assessed the role of built environment characteristics and their relation to physical activity with varying socioeconomic status, significant differences were found in terms of playground/play areas, public open spaces, marked road crossings across various neighborhoods (Brazdova et al., 2015). Yang, Spears, Zhang, Lee & Himler (2012) assessed the relationship between multiple built environment factors and individual characteristics of people on long-term physical activity, results revealed that no long-term physical activity was significantly associated with individual factors including: older age, less education, lower income, being obese, and low life satisfaction. No long-term physical activity was also significantly associated with the following community factors: more commute time, higher crime rate, urban residence, higher population density, but not for distance to recreation facilities. Although this was a good cross-sectional study, it suggested future use of spatial analyses for improved understanding of the relationship between population health and built environmental characteristics (Yang, Spears, Zhang, Lee, & Himler, 2012). A deeper understanding of the relationship between built environments and physical activity was studied using latent profile analyses of seven GIS (geographic information system) measured built environment features. This study concluded that walkability along with transit and recreation access did contribute to healthy aging among older populations (Todd et al., 2016).

Although the above literature suggests that built environment contributes largely to positive health outcomes and positive health behaviors, recent studies show a mixed picture particularly due to variations in study designs and heterogeneous reporting of results (Schule & Bolte, 2015). The

current challenges to derive any significant correlation, or, for that matter, inference to a causal pathway between built physical environments and positive health outcomes do exist. They point to intermediary variables such as associations between diet, physical activity and built environments (Drewnowski et al., 2016), high income vs. middle income countries (Blay, Schulz, & Mentz, 2015), younger populations vs. older populations (Siu, Lambert, Fu, Hillier, Bosworth, & Michael, 2012). Hence, it has become extremely important that in addition to choosing specific built environment variables, better tools need to be designed and implemented which could assess large amounts of spatial data covering wider geographic extent (Kroeger, Messer, Edwards, & Miranda, 2012). Such actions will help align best approaches to improving the built environments to foster positive health outcomes.

Healthy Communities

Healthy communities result from healthy choices and environments that support shared responsibility (Norris & Pittman 2000). Not everyone who resides in a community has an interest in wanting to contribute to the work in making it healthier. However, a few may be willing to collaborate with others to work toward making positive change happen. Efforts of Drs. Len Duhl and Trevor Hancock were instrumental to the development of the initial Healthy Communities movement that began in the mid-1980s, and first implemented via the Healthy Cities initiative spearheaded by the World Health Organization. Since that time, the movement has spread to more than 3,000 communities in more than 50 countries on every continent (Norris & Pittman, 2000). There is no known evidence that this initial movement has contributed to the development of the Arkansas Coalition of Obesity Prevention (ArCOP) Growing Healthy Communities (GHC) initiative. Yet, its existence has helped increase the awareness of the importance of improving the health of our communities.

Prevention is key to combating obesity and as community health workers our roles and responsibilities in helping to promote, increase awareness and encourage fellow community

members to embrace positive health behaviors are of extreme importance. Reshaping people's economic, physical, social, and service environments can help ensure opportunities for health and support healthy behaviors (Rudolph, Caplan, Ben-Moshe, & Dillion, 2013). Collaborating with community partners will help make change happen at a greater scale, as no one entity can be as impactful alone in addressing this obesity epidemic. This has been the focus of the Arkansas Coalition for Obesity Prevention (ArCOP) Growing Healthy Communities (GHC) initiative. This grant-funded project, (GHC) was established in 2009 and has contributed to helping ArCOP increase access to physical activity and healthy foods, and implement environmental and policy changes to support combating obesity among diverse communities in Arkansas.

Arkansas Coalition for Obesity Prevention

The Arkansas Coalition for Obesity Prevention was established in 2008. The coalition has been supported with secured funding from the Blue & You Foundation for a Healthier Arkansas, the Arkansas Department of Health, and the University of Alabama at Birmingham Midsouth Transdisciplinary Collaborative Center for Health Disparities Research (ArCOP, 2017). This financial support has contributed to efforts and the success of the coalition for over a decade and helping local Arkansas communities contribute to combating obesity within the state. In 2003, Arkansas Act 1220 became the first law in the nation with comprehensive multi-pronged approaches that bring families, schools, and communities together to combat the epidemic of obesity (ArCOP, 2017).

The coalition's mission is focused on helping community residents increase their physical activity and improve their consumption of healthier foods with an overarching goal of combating obesity among Arkansans. This collaborative coalition consists of diverse partners but not limited to: stakeholders of local communities, government agencies, community health workers, health educators, non-profit organizations, businesses, and advocates for schools. The coalition has made concentrated efforts in working towards its vision of improving

lifestyles of Arkansans by helping communities increase access to physical activity and healthy foods as a way to help combat and prevent obesity. With secured funding, the coalition has been able to provide financial support in the mode of grants to communities that submit successful proposals. In 2009, ArCOP collaborated with community partners which included: the Blue & You Foundation for a Healthier Arkansas, the Arkansas Department of Health's CDC Cooperative Agreement, UAMS Partners for Inclusive Communities, UAMS College of Public Health, and the Winthrop Rockefeller Institute. The collaboration helped launch the Growing Healthy Communities project that has been very impactful in growing healthier Arkansas communities as a way to help combat obesity for the past nine years. These positive GHC initiative outcomes have included yet not limited to: increased access to physical activity and healthy foods, and the implementation of environmental and policy changes. The GHC initiative efforts alter the built environment in communities for possible successes in obesity prevention. It is emerging as a best practice model.

Growing Healthy Communities (GHC) Initiative: An Emerging Best Practice Model

The Arkansas Coalition for Obesity Prevention has been extremely ambitious in encouraging communities to apply for coalition grant funding to become a selected GHC. Such funding allows them to plan and implement community projects not limited to (e.g. farmers markets, walking/bike trails, community health fairs, physical activity programs at local elementary schools, healthy cooking classes, complete street projects, and joint use agreements) that will benefit their communities. Funded communities are then required to participate in a 3-day immersion training that includes the participation of the mayor and other community stakeholders from each GHC community team. A representative(s) of each GHC team presents a photovoice presentation; this presentation highlights the strengths and weaknesses of the selected community, which serves as a catalyst for the work plan each team develops. Throughout the training, community work teams develop, network, and participate in lecture presentations from state, local, and national leaders about

effective policy and environmental changes. Each community is provided assistance in creating a work plan to address the specific weaknesses of their community. Upon agreement of the work plan, each GHC team is granted a 12-month cycle to work toward the implementation of their community projects. There is a mid-year report that is due within the initial 6-month period that requires a summary from each GHC team about the GHC projects their team implemented to date and detailed outcomes. At the conclusion of the 12-month cycle, an end of the year report is due, that also requires a summary about the GHC projects implemented to date and detailed outcomes along with the submission of photos capturing project activities. This grants communities' the opportunity to self reflect and evaluate their GHC efforts. However, there is a need for ArCOP to take additional measures to evaluate the effectiveness and overall impact of these efforts.

Sustainability of GHC Communities

After the initial year of funding GHC teams are invited and encouraged to attend an ArCOP annual regional state training summit usually hosted in a funded GHC community. The summits provide additional training opportunities for GHC teams, which allows them to learn more about sustaining their current GHC projects as well as learn about new projects that could be implemented within their communities. The summit consists of various training topics not limited to: (e.g. farmers market, Cooking Matters cooking classes, grant writing, and community gardening). For example, a GHC team could attend a farmers' market training session and be educated on how to develop and manage a farmers' market. In addition, for attending the farmers' market training session they would be eligible to submit a grant proposal to ArCOP for funding based on their proposed plan they developed after attending the training. This allows for GHC team members to stay active in sustaining or implementing new projects to continue to improve their community.

Communities are often acknowledged annually for their efforts in helping to improve their communities. For the GHC projects conducted each year, ArCOP extends a request for GHC

teams to complete a recognition application after their initial year. This application requests highlights, a summary of activities the GHC teams implemented throughout the year including policy changes, environmental changes, research conducted, and evaluations. ArCOP's president at the annual GHC celebration recognizes successes of the GHC teams' efforts as well shares statistical data about how the GHC efforts are impacting the state's obesity rates.

The following descriptions highlight the three levels of recognition that communities can strive to be. An "Emerging Community" is a community within the phase of one to three years, building a foundation, and recruiting and converting stakeholders to the cause for life through education and awareness. A "Blossoming Community" is a community within the phase of five or more years. It is transitioning into a strategic action plan, setting reachable goals and implementing projects, engaging GHC team members and utilizing their skills, network, and available resources. Last, a "Thriving Community" is a community beyond six years and is keeping community excited and engaged by celebrating each completed project, sustaining projects, and implementing environmental and policy changes, and tracking improvements with data collection (ArCOP, 2017). ArCOP provides this recognition at an annual conference celebration that GHC teams are invited to attend to be recognized and celebrated.

ArCOP's GHC initiative compliments the efforts of the World Health Organization (WHO) in increasing awareness about obesity and the importance of collaboratively striving to combat it. Supportive environments and communities are fundamental in shaping people's choices, by making the choice of healthier foods and regular physical activity the easiest choice (the choice that is the most accessible, available and affordable), and therefore preventing overweight and obesity (WHO, 2016). There are several GHC communities in the state of Arkansas that are proactive in such efforts.

These GHC efforts often align with the CDC's Built Environment Assessment Tool (BE Tool) that measures the core features and qualities of

the built environment that affect health, especially walking, biking, and other types of physical activity. The five core features assessed in the BE Tool includes the built environment infrastructure: such as road types, intersections, crosswalks, and public transportation. The second core feature is walkability: access to safe, attractive sidewalks and paths. The third core feature is bikeability: the presence of bike lanes or bike paths. The fourth core feature is recreational sites. The fifth core feature is the food environment: such as access to grocery stores and farmers markets (CDC, 2017). GHC communities are recognized for their built environment efforts that mirror improving such measures as indicated by the CDC's (BE Tool). The authors have been active in such measures, and details the success of their GHC efforts of implementation for the UA Little Rock University District community, and highlights the GHC efforts of four other Arkansas communities: Bryant, Hot Springs, and Southside Bee Branch.

Growing Healthy Communities Successes

The Arkansas Coalition for Obesity Prevention has recognized the city of Hot Springs, Arkansas as a "Thriving community". Hot Springs has been successful in increasing access to healthy affordable fruits and vegetables. This city has developed two community gardens and is currently participating in a farmers' market nutrition assistance program, with a doubling incentive for customers who are recipients of the Supplemental Nutrition Assistance Program (SNAP). SNAP provides nutrition assistance to millions of eligible, low-income individuals and families and serves as the largest program in the domestic hunger safety net (United States Department of Agriculture, 2017). This supported GHC nutrition assistance project saw a tremendous increase in SNAP customer participation. According to ArCOP (2017) in 2014, there were 61 transactions with total sales of \$732.05 in 13 weeks and in 2015, there were 377 SNAP transactions with total SNAP sales of \$4,743.28 in 24 weeks. This project has helped increase access and consumption of healthy whole foods to community members as a way to help combat obesity. Another "Thriving Community" that has been recognized by the Arkansas Coalition for Obesity for Prevention for

its GHC success is the city of Bryant, Arkansas for implementing community projects focused on increasing access to engagement in physical activity as a way to help combat obesity. These have included the city having roads painted to encompass bike lanes as well as the creation of natural mulch trails at community parks to increase community access to physical activity resources (ArCOP, 2017). There have been other communities also praised for their efforts in growing healthier communities.

The School District of Lamar, Arkansas has been recognized as a "Blossoming Community" because of their efforts in helping to cultivate an environment that is focused on making the whole child healthy. With funding from ArCOP, they have contributed to the establishment of school gardens. The school district has also been a recipient of 6 Joint Use Agreement grants to offer the school and community more options to get physical activity. The district is also involved with the Farm to School program and has partnered with a community farmer who grows peaches and offers fresh locally grown peaches to students during lunchtime (ArCOP, 2017).

The University of Arkansas at Little Rock University District Community, which is located in Little Rock, Arkansas is also considered a "Blossoming Community". This is the community in which the authors have been involved. This GHC team has collaborated with local community partners for the past seven years to help sustain their GHC project efforts. These projects have included: annual gardening classes that granted raised bed gardens to over one hundred residents homes, annual community wellness fairs to grant residents free annual gym memberships to the UA Little Rock campus fitness center to increase residents access to physical activity. Other projects have included: Garden to Grill cooking classes in which class participants are granted a free stovetop grill pan to help reinforce healthy cooking and eating at home, and community farmers market days (University of Arkansas at Little Rock, 2016). A newly selected GHC community has been rewarded by ArCOP for its' emerging efforts to grow a healthier community.

The Arkansas Coalition for Obesity Prevention has recognized the Southside Bee Branch (SSBB) School District community that resides in Bee Branch, Arkansas as an "Emerging Community". According to ArCOP (2017), this community's GHC efforts have included: (1) the Southside Bee Branch Wellness Committee, (2) recognizing a need for local healthcare services in the Bee Branch area, and (3) the SSBB School Board approving the use of district funds to renovate the superintendent's former house into a school-based health center (Hornet Health Care) for the community members to utilize for services. Such GHC efforts of this community and the many others will continue to help grow healthier communities. The Arkansas Coalition for Obesity Prevention efforts in supporting the growth and successes of over 100 Growing Healthy Communities will continue to be a great reinforcer that communities need to sustain their efforts (e.g. community gardens, farmers markets, healthy eating cooking classes, increased access to physical activity, and environmental and policy changes) in striving to combat obesity.

Conclusion

Environmental factors are crucial in impacting overall quality of healthy life and the Healthy Communities movement is transforming communities across the nation. Its goal is ambitious: to achieve radical, measurable improvements in health status and long-term quality of life. By many measures of health and well-being it's working (Norris & Pittman, 2000). A high percentage of studies have identified a beneficial relationship between the built environment and physical activity or obesity. Furthermore, studies that included populations from the South had similar positive findings (Ferdinand, Sen, Rahrkar, Engler, & Menachemi, 2012). These studies complement the Arkansas Coalition for Obesity Prevention GHC built environment improvement efforts in growing healthy communities: encouraging community partners to collaboratively work for the purpose of combating the obesity epidemic.

The State of Obesity (2018) recommends that federal, state and local governments should provide sufficient resources to support policies

and programs that support healthy communities, including obesity and chronic disease prevention programs; transportation, housing and community development policies that support active living; and nutrition assistance programs to ensure all Americans have access to affordable, healthy food. Authors Malik, Willett & Hu (2013) agree stating that due to the scope and

complexity of the obesity epidemic, prevention strategies and policies across multiple levels are needed in order to have a measurable effect. Such policies and prevention strategies could help influence the adoption and increased engagement of healthy behaviors among Americans, in which such actions could help foster combating the obesity epidemic within our communities.

References

- Arkansas Coalition for Obesity Prevention (ArCOP). (2016). *Who we are*. Retrieved from <http://arkansasobesity.org/who-we-are/mission.html>
- Arkansas Coalition for Obesity Prevention (ArCOP). (2017). *Hot Springs*. Retrieved from <http://arkansasobesity.org/news-events/ghc-success-stories/hot-springs.html>
- Arkansas Coalition for Obesity Prevention (ArCOP). (2017). *City of Bryant*. Retrieved from <http://arkansasobesity.org/news-events/ghc-success-stories/city-of-bryant.html>
- Arkansas Coalition for Obesity Prevention (ArCOP). (2017). *Southside bee branch*. Retrieved from <http://arkansasobesity.org/news-events/ghc-success-stories/southside-bee-branch.html>
- Arkansas Coalition for Obesity Prevention (ArCOP). (2017). *Lamar school district*. Retrieved from <http://arkansasobesity.org/news-events/ghc-success-stories/lamar-school-district>.
- Blay, S. L., Schulz, A. J., & Mentz, G. (2015). The relationship of built environment to health-related behaviors and health outcomes in elderly community residents in a middle income country. *Journal Of Public Health Research*, 4(2), 135-141. doi:10.4081/jphr.2015.548
- Blumenthal, M.D. & Levin, S. (2017). Global Obesity: A Growing Epidemic, *The Huffington Post*, retrieved from <http://www.huffingtonpost.com/susan-blumentahl/global> 9139554 on 2/9/2017
- Brazdova, Z.D., Klimusova, H., Hruska, D., Prokopova, A., Burjanek, A., Wulff, K.R.S. (2015). Assessment of environmental determinants of physical activity: A study of built environment indicators in Brno, Czech Republic. *Central European Journal of Public Health*, 23, sup S23-29.
- Caballero, B. (2007). The global epidemic of obesity: an overview. *Epidemiol Rev* 2007; 29 (1): 1-5. doi: 10.1093/epirev/mxm012
- Cameron, C.M., Scuffham, P.A., Spinks, A., Scott, R., Sipe, N., Ng, S., Wilson, A., Searle, J., Lyons, R.A., Kendall, E., Halford, K., Griffiths, L.R., Homel, R., & McClure, R.J. (2012). Environments for Healthy Living (EFHL) Griffith birth cohort study: Background and Methods. *Maternal and Childhealth Journal*, 16, 1896-1905.
- Centers for Disease Control and Prevention. (2015). *CDC's built environment and health initiative*. Retrieved from https://www.cdc.gov/nceh/information/built_environment.htm
- Centers for Disease Control and Prevention. (2018). *Prevalence of obesity among adults and youth: United States, 2015–2016*. Retrieved from <https://www.cdc.gov/nchs/products/databriefs/db288.htm>
- Centers for Disease Control and Prevention. (2018). *Adult causes and consequences*. Retrieved from <https://www.cdc.gov/obesity/adult/causes.html>
- Centers for Disease Control and Prevention. (2017). *Built environment assessment tool*. Retrieved from <https://www.cdc.gov/nccdphp/dnpao/state-local-programs/built-environment-assessment/>
- DiClemente, R.J., Salazar, L.F., & Crosby, R.A. (2013). *Health behavior theory for public health: Principles, foundations and applications*. Burlington, MA: Jones and Bartlett.

- Drewnowski, A., Aggarwal, A., Tang, W., Hurvitz, P. M., Scully, J., Stewart, O., & Moudon, A. V. (2016). Obesity, diet quality, physical activity, and the built environment: the need for behavioral pathways. *BMC Public Health*, 161-12. doi:10.1186/s12889-016-3798-y.
- Ferdinand, A., Sen, B., Rahurkar, S., Engler, S., & Menachemi, N. (2012). The Relationship Between Built Environments and Physical Activity: A Systematic Review. *American Journal of Public Health*, 102(10), e7–e13. <http://doi.org/10.2105/AJPH.2012.300740>
- Havranek, E. P., Mujahid, M. S., Barr, D. A., Blair, I. V., Cohen, M. S., Cruz-Flores, S., & Rosal, M. (2015). Social Determinants of Risk and Outcomes for Cardiovascular Disease. *Circulation*, 132(9), 873-898.
- Healthy People 2020. (2018). *Social determinants of health*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>
- Healthy People 2020. (2018). *Nutrition and weight status*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/nutrition-and-weight-status/objectives>
- Hruby, A., Manson, J.E., Qi, L., Malik, V.S., Rimm, E.B., Sun, Qi, Willett, W.C., & Hu, F.B. (2016). Determinants and consequences of obesity. *American Journal of Public Health*, 106, supp 9, 1656-1662. doi 10.2105/AJPH.2016.303326.
- Kroeger, G. L., Messer, L., Edwards, S. E., & Miranda, M. L. (2012). A novel tool for assessing and summarizing the built environment. *International Journal Of Health Geographics*, 11(1), 46-58. doi: 10.1186/1476-072X-11-46
- Malik, V. S., Willett, W. C., & Hu, F. B. (2013). Global obesity: trends, risk factors and policy implications. *Nature Reviews Endocrinology*, 9(1), 13-27
- Norris, T., & Pittman, M. (2000). The healthy communities movement and the coalition for healthier cities and communities. *Public Health Reports*, 115(2-3), 118–124.
- Pessoa, M.C., Mendes, L.L., Gomes, C.S., Martins, P.A., & Velasquez-Melendez, G. (2015). Food environment and fruit and vegetable intake in an urban population: A multilevel analysis. *BMC Public Health*, 15, 1012 doi 10.1186/s12889-015-2277-1.
- Puhl, R. M., Heuer C. A., (2010). Obesity stigma: Important considerations for public health, *American Journal of Public Health* 100 (6), 1019-1028.doi: 10.2105/AJPH.2009.159491
- Rudolph, L., Caplan, J., Ben-Moshe, K., & Dillon, L. (2013). Health in all policies: a guide for state and local governments. Washington, DC and Oakland, CA: American Public Health Association and Public Health Institute
- Schüle, S. A., & Bolte, G. (2015). Interactive and independent associations between the socioeconomic and objective built environment on the neighborhood level and individual Health: A systematic review of multilevel studies. *Plos ONE*, 10(4), 1-31. doi:10.1371/journal.pone.0123456
- Siu, V. W., Lambert, W. E., Fu, R., Hillier, T. A., Bosworth, M., & Michael, Y. L. (2012). Built environment and its influences on walking among older women: Use of standardized geographic units to define urban forms. *Journal Of Environmental & Public Health*, 1-9. doi:10.1155/2012/203141
- State of Obesity (2018). Recommendations: Invest in Community-Based Policies and Programs to Improve Nutrition and Increase Physical Activity. Retrieved from <https://stateofobesity.org/policy/recommendations/introduction>
- Todd, M., Adams, M.A., Kurka, J., Conway, T.L., Cain, K.L., Burnan, M.P., Frank, L.D., Sallis, J.F., & King, A.C. (2016). GIS-measured walkability, transit and recreation environments in relation to older adults' physical activity: A latent profile analysis. *Preventive Medicine*, 93, 57-63.
- United States Department of Agriculture (USDA). (2017). *Supplemental nutrition assistance program*. Retrieved from <https://www.fns.usda.gov/snap/supplemental-nutrition-assistance-program-snap>
- University of Arkansas at Little Rock (UALR). (2016). *University district recognized for healthy community initiatives*. Retrieved from

<http://ualr.edu/news/2016/12/15/university-healthy-community-initiatives/#more-65994> <https://www.fns.usda.gov/snap/supplemental-nutrition-assistance-program-snap>
World Health Organization (WHO). (2014). *Obesity*. Retrieved from <http://www.wpro.who.int/mediacentre/factsheets/obesity/en/>
Yang, W., Spears, K., Zhang, F. Lee, W., & Himler, H.L. (2012). Evaluation of personal and built environment attributes to physical activity: A multilevel analysis on multiple population- based data sources. *Journal of Obesity*, 1-9. doi:10.1155/2012/548910

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