JOE BREW (UFID: 0402-8902)
PHC 7065
Assignment 1
Concept Paper

Assignment 1: Concept Paper

Write a "concept paper" outlining your project. Use the curiosity, question, aim, hypothesis format as discussed over last week's Skype session.

Curiosity

I would like to know how the built environment (roads, sidewalks, parks, kinds of shopping and food stores nearby, traffic laws, etc.) affects a population's susceptibility to obesity, particularly among young people.

Question

Does the built environment of an area (neighborhood, census tract, city, county, etc.) have a *causal* impact on the likelihood of the youth residents of that area to develop obesity?

Aim

My main aim for this project is to determine the extent to which the built environment exerts an influence on an area's residents propensity to develop obesity. My secondary aims are

- to identify which factors of the environment increase one's risk for obesity, and which factors are "protective"
- quantify the relationship between these factors and the likelihood of developing obesity
- carry out a cost-effectiveness analysis, keeping in mind that the factors which are most closely linked with obesity may or may not be those that are realistically "modifiable" (from the point of view of a public health practitioner)
- quantify the return on investment for built environment modifications, using a cost-utility approach as well as a cost-effectiveness approach

Hypothesis

I hypothesize that an area's built environment is causally associated with the health outcomes of that area's residents, particularly the likelihood of that area's younger residents to develop obesity. My justification for this hypothesis is that

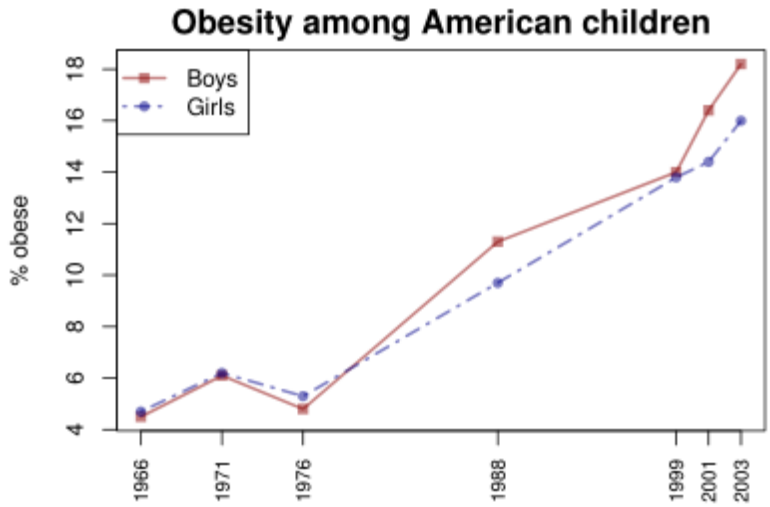
- Previous studies have highlighted the importance of built environment in health outcomes
- Intuitively, "walkability" should correlate with how much one walks, and availability of certain kinds of foods such correlate with consumption of those foods, etc.

Unlike previous studies, I hypothesize that this relationship is *causal* and can be demonstrated as such through longitudinal methods.

JOE BREW (UFID: 0402-8902)
PHC 7065
Assignment 1
Concept Paper

Importance

Childhood obesity is a health issue of growing concern, especially in the United States. In addition to being correlated with adult obesity, it is associated with depression, poor learning outcomes, and metabolic syndrome at a young age.[1] As of 2015, nearly a quarter of American youth were obese.



(Original chart, but data from NIH)

Literature

Though new research has highlighted the importance of genetics in an individual's predisposition towards obesity, the recent growth in the youth obesity rate (above) cannot be attributed to rapid changes in our genome.[2] Rather, childhood obesity's rising rates are due to a combination of factors which are environmental[3], exercise-related[4], inter-generational and social.[5]

---

[1] http://info.skolesundhed.dk/mwg-internal/de5fs23hu73ds/progress?id=_I3OYhreyJ-1OIJCX3iO0JMdl9I8RMZ-Y1F-Xcn6cBs,

[2] N Bonnet, E Somm, and C Rosen. Diet and gene interactions influence the skeletal response to polyunsaturated fatty acids. Bone, 68:100–107, nov 2014. doi: 10.1016/j.bone.2014.07.024. URL http://dx.doi.org/10.1016/j.bone.2014.07.024.

[3] S Møller, T Ajslev, C Andersen, C Dalgard, and I Sørensen. Risk of childhood overweight after exposure to tobacco smoking in prenatal and early postnatal life. PLoS ONE, 9(10):e109184, oct 2014. doi: 10.1371/journal.pone.0109184. URL http://dx.doi.org/10.1371/journal.pone.0109184.

[4] K Walton, J Simpson, G Darlington, and J Haines. Parenting stress: a cross-sectional analysis of associations with childhood obesity, physical activity, and TV viewing. BMC Pediatrics, 14(1):244, 2014. doi: 10.1186/1471-2431-14-244. URL http://dx.doi.org/10.1186/1471-2431-14-244

[5] E Taveras, M Gillman, K Kleinman, J Rich-Edwards, and S Rifas-Shiman. Racial/ethnic differences in early-life risk factors for childhood obesity. PEDIATRICS, 125(4):686–695, mar 2010. doi: 10.1542/peds.2009-2100. URL http://dx.doi.org/10.1542/peds.2009-2100; J Levine. Poverty and obesity in the u.s. Diabetes, 60(11):2667–2668, oct 2011. doi: 10.2337/db11-1118. URL http://dx.doi.org/10.2337/db11-1118.; K Bevelander, J Doeschka ütz, and Rutger C.M.E. Engels. Social norms in food intake among normal weight and overweight x. Appetite, 58(3):864–872, jun 2012. doi: 10.1016/j.appet.2012.

What is known is that the explosion in has coincided with rapid changes in the way people live, work and eat. Importantly, it has also coincided with changes in the 'built environment' where people live, and our interactions with that environment. This project aims to add to our knowledge of the built environment's effect on youth obesity, by examining the geographic dimensions to obesity, as well as the neighborhood-specific independent effects, with a focus on the principles of 'broken windows.'[6]

Research plan (design, methods, ethics, benefits)

I will collect local (Alachua County) data related to the built environment, geography and youth adiposity. My independent variables, in addition to latitude and longitude, will be a social surroundings index (SSI) composed of two primary data sources:

1. Crime (rate of violent crimes committed per 100,000 residents yearly.[7]
2. Economic growth (rate of new buildings licensed per 100,000 residents yearly).[8]

My dependent variable will be youth overweight (BMI percentile for age >= 85%) and obesity (95%).

For the feature construction phase of the project, I will also supplement with census data (from the American Community Survey), school zone data (socioeconomic and age make-ups by school),[9] and county assessor's data (a 300,000 polygon 'footprint' of Alachua county buildings).

02.003. URL http://dx.doi.org/10.1016/j.appet.2012.02.003

[6] D Tumminelli O'Brien and R Kauffman. Broken windows and low adolescent prosociality: Not cause and consequence, but co-symptoms of low collective efficacy. American Journal of Community Psychology, 51(3-4):359–369, nov 2012. doi: 10.1007/s10464-012-9555-1. URL http://dx.doi.org/10.1007/s10464-012-9555-1. H Kotabe. The world is random: a cognitive perspective on perceived disorder. Frontiers in Psychology, 5, jun 2014. doi: 10.3389/fpsyg.2014.00606. URL http://dx.doi.org/10.3389/ fpsyg.2014.00606.

[7] https://data.cityofgainesville.org/Public-Safety/Crime-Incident-Data-2013/9ccb-cyth

[8] https://data.cityofgainesville.org/browse?category=Economic+Development+%26+Redevelopment&limitTo=datasets&utf8=%E2%9C%93

[9] http://www.fldoe.org/eias/eiaspubs/xls/mem_schl_grd1213.xls